START

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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
April 3, 1990 Volume 1113 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of March 1, 1990, and was announced in the *Official Gazette* at 1111 O.G. 24 on Feb. 20, 1990.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1242.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Jan. 26, 1990

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on March 31, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,653,119 through 4,654,892
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on March 29, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,377,872 through 4,378,605
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small entity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JANUARY 14, 1990
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,309,841	06/220,103	1/12/82
4,310,021	06/250,399	1/12/82
4,310,109	06/230,613	1/12/82
4,310,329	06/239,476	1/12/82
4,310,332	06/225,521	1/12/82
4,310,497	06/230,174	1/12/82
4,310,621	06/217,193	1/12/82
4,310,632	06/228,120	1/12/82
4,563,781	06/687,945	1/14/86
4,563,783	06/522,031	1/14/86
4,563,785	06/720,400	1/14/86
4,563,787	06/585,551	1/14/86
4,563,788	06/598,455	1/14/86
4,563,796	06/551,039	1/14/86
4,563,800	06/519,834	1/14/86
4,563,815	06/632,888	1/14/86
4,563,817	06/512,106	1/14/86
4,563,824	06/560,533	1/14/86
4,563,825	06/415,776	1/14/86
4,563,831	06/614,268	1/14/86
4,563,838	06/593,433	1/14/86
4,563,845	06/616,253	1/14/86
4,563,849	06/596,585	1/14/86
4,563,859	06/513,172	1/14/86
4,563,865	06/670,470	1/14/86
4,563,866	06/608,500	1/14/86
4,563,870	06/618,797	1/14/86
4,563,885	06/613,763	1/14/86
4,563,892	06/634,147	1/14/86
4,563,912	06/562,658	1/14/86
4,563,914	06/ 56,551	1/14/86
4,563,919	06/668,558	1/14/86
4,563,920	06/605,886	1/14/86
4,563,923	06/523,360	1/14/86
4,563,924	06/584,433	1/14/86
4,563,933	06/575,432	1/14/86
4,563,934	06/659,427	1/14/86
4,563,938	06/633,190	1/14/86
4,563,940	06/482,038	1/14/86
4,563,944	06/626,030	1/14/86
4,563,945	06/670,383	1/14/86
4,563,948	06/589,024	1/14/86
4,563,950	06/671,556	1/14/86
4,563,952	06/693,541	1/14/86
4,563,965	06/636,834	1/14/86
4,563,967	06/665,517	1/14/86
4,563,968	06/662,768	1/14/86
4,563,971	06/664,574	1/14/86
4,563,972	06/564,646	1/14/86
4,563,973	06/630,030	1/14/86
4,563,976	06/512,733	1/14/86
4,563,980	06/519,802	1/14/86
4,563,999	06/469,923	1/14/86
4,564,016	06/639,806	1/14/86
4,564,021	06/692,726	1/14/86
4,564,027	06/557,732	1/14/86
4,564,028	06/590,204	1/14/86
4,564,055	06/463,241	1/14/86
4,564,057	06/553,960	1/14/86
4,564,061	06/450,425	1/14/86
4,564,062	06/329,055	1/14/86
4,564,065	06/641,865	1/14/86
4,564,067	06/468,895	1/14/86
4,564,072	06/596,457	1/14/86
4,564,073	06/631,159	1/14/86
4,564,074	06/515,938	1/14/86
4,564,090	06/566,857	1/14/86
4,564,106	06/557,815	1/14/86
4,564,115	06/659,821	1/14/86
4,564,116	06/448,895	1/14/86
4,564,117	06/631,881	1/14/86
4,564,124	06/563,507	1/14/86
4,564,125	06/602,553	1/14/86
4,564,134	06/462,447	1/14/86
4,564,140	06/406,169	1/14/86
4,564,146	06/510,603	1/14/86
4,564,152	06/621,266	1/14/86
4,564,155	06/621,569	1/14/86
4,564,159	06/521,242	1/14/86
4,564,161	06/567,167	1/14/86
4,564,166	06/459,907	1/14/86
4,564,169	06/653,269	1/14/86
4,564,173	06/591,195	1/14/86
4,564,175	06/602,508	1/14/86
4,564,178	06/624,124	1/14/86
4,564,180	06/552,185	1/14/86
4,564,181	06/513,990	1/14/86
4,564,191	06/617,252	1/14/86

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Patent Number	Serial Number	Issue Date
4,564,192	06/573,660	1/14/86
4,564,199	06/575,195	1/14/86
4,564,200	06/681,934	1/14/86
4,564,201	06/520,854	1/14/86
4,564,203	06/674,238	1/14/86
4,564,205	06/638,445	1/14/86
4,564,206	06/540,534	1/14/86
4,564,208	06/590,903	1/14/86
4,564,224	06/439,346	1/14/86
4,564,225	06/545,821	1/14/86
4,564,237	06/725,502	1/14/86
4,564,241	06/506,348	1/14/86
4,564,242	06/545,749	1/14/86
4,564,245	06/623,794	1/14/86
4,564,257	06/478,707	1/14/86
4,564,258	06/495,632	1/14/86
4,564,272	06/476,540	1/14/86
4,564,274	06/320,133	1/14/86
4,564,276	06/580,543	1/14/86
4,564,292	06/614,722	1/14/86
4,564,297	06/524,653	1/14/86
4,564,303	06/502,671	1/14/86
4,564,312	06/500,630	1/14/86
4,564,324	06/419,421	1/14/86
4,564,327	06/488,206	1/14/86
4,564,331	06/458,479	1/14/86
4,564,340	06/670,535	1/14/86
4,564,350	06/715,058	1/14/86
4,564,351	06/621,164	1/14/86
4,564,356	06/713,069	1/14/86
4,564,357	06/401,333	1/14/86
4,564,365	06/476,704	1/14/86
4,564,368	06/483,840	1/14/86
4,564,370	06/694,803	1/14/86
4,564,378	06/578,573	1/14/86
4,564,381	06/540,093	1/14/86
4,564,382	06/669,762	1/14/86
4,564,383	06/523,228	1/14/86
4,564,386	06/520,211	1/14/86
4,564,390	06/684,775	1/14/86
4,564,398	06/690,671	1/14/86
4,564,410	06/625,454	1/14/86
4,564,412	06/665,361	1/14/86
4,564,415	06/556,583	1/14/86
4,564,417	06/538,964	1/14/86
4,564,418	06/695,745	1/14/86
4,564,420	06/558,020	1/14/86
4,564,421	06/380,548	1/14/86
4,564,422	06/528,220	1/14/86
4,564,432	06/516,793	1/14/86
4,564,455	06/560,806	1/14/86
4,564,459	06/599,924	1/14/86
4,564,466	06/563,871	1/14/86
4,564,469	06/536,505	1/14/86
4,564,472	06/509,669	1/14/86
4,564,481	06/654,662	1/14/86
4,564,493	06/602,097	1/14/86
4,564,504	06/556,091	1/14/86
4,564,509	06/509,871	1/14/86
4,564,511	06/672,394	1/14/86
4,564,514	06/510,162	1/14/86
4,564,520	06/423,271	1/14/86
4,564,525	06/595,280	1/14/86
4,564,537	06/692,706	1/14/86
4,564,569	06/639,573	1/14/86
4,564,589	06/577,536	1/14/86
4,564,592	06/460,057	1/14/86
4,564,611	06/518,295	1/14/86
4,564,613	06/651,001	1/14/86
4,564,615	06/441,177	1/14/86
4,564,622	06/728,061	1/14/86
4,564,631	06/532,237	1/14/86
4,564,691	06/602,215	1/14/86
4,564,718	06/640,769	1/14/86
4,564,722	06/665,176	1/14/86
4,564,728	06/599,820	1/14/86
4,564,732	06/661,888	1/14/86
4,564,738	06/551,483	1/14/86
4,564,749	06/600,718	1/14/86
4,564,751	06/716,200	1/14/86
4,564,755	06/509,993	1/14/86
4,564,762	06/610,760	1/14/86
4,564,763	06/517,394	1/14/86
4,564,765	06/489,852	1/14/86
4,564,769	06/531,340	1/14/86
4,564,775	06/482,434	1/14/86
4,564,780	06/589,002	1/14/86
4,564,785	06/604,611	1/14/86
4,564,790	06/505,308	1/14/86
4,564,795	06/572,134	1/14/86
4,564,802	06/514,103	1/14/86
4,564,807	06/593,801	1/14/86
4,564,824	06/595,437	1/14/86
4,564,832	06/480,915	1/14/86
4,564,844	06/610,809	1/14/86
4,564,856	06/252,474	1/14/86
4,564,862	06/406,331	1/14/86
4,564,866	06/444,414	1/14/86
4,564,871	06/565,879	1/14/86
4,564,874	06/399,936	1/14/86
4,564,876	06/443,922	1/14/86
4,564,887	06/516,540	1/14/86
4,564,888	06/675,955	1/14/86
4,564,891	06/718,425	1/14/86
4,564,894	06/680,921	1/14/86
4,564,912	06/762,801	1/14/86
4,564,933	06/526,728	1/14/86
4,564,939	06/589,611	1/14/86
4,564,950	06/633,983	1/14/86

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(C); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in veiw of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,475,855	06/392,544	10/09/84	6/28/82	2/26/90
4,490,779	06/357,892	12/25/84	3/15/82	2/26/90
4,525,875	06/514,324	7/02/85	7/15/83	2/22/90
4,529,193	06/563,597	7/16/85	12/20/83	2/26/90
4,535,778	06/235,274	8/20/85	5/13/83	2/28/90

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,315,927, Re. S. N. 07/484,549, Filed Feb. 26, 1990, Cl. 514/188, DIETARY SUPPLEMENTATION WITH ESSENTIAL METAL PICOLINATES, Gary W. Evans, Owner of Record: *United States of America as represented by the Secretary of Agriculture, Washington D.C.*, Attorney or Agent: Curtis P. Ribando, Ex. Gp.: 125

4,545,910, Re. S. N. 07/465,583, Filed Jan. 18, 1990, Cl. 210/651, SEMI-PERMEABLE MEMBRANES, Xavier Marze, Owner of Record: *Hospal Industrie*, Attorney or Agent: Gerald D. Sharkin, Ex. Gp.: 136

4,573,425, Re. S. N. 07/478,706, Filed Feb. 8, 1990, Cl. 441/003, RAPIDLY INSTALLABLE MOORING AND CARGO TRANSFER SYSTEM, George M. Pomonik, et al., Owner of Record: *Inventor*, Attorney or Agent: William L. Mathis, Ex. Gp.: 315

4,602,691, Re. S. N. 07/484,510, Filed Feb. 23, 1990, Cl. 175/329, DIAMOND DRILL BIT WITH VARIED CUTTING ELEMENTS, Gary E. Weaver, Owner of Record: *Hughes Tool Co. Houston, Tex.*, Attorney or Agent: Charles D. Gunter, Jr., Ex. Gp.: 356

4,693,733, Re. S. N. 07/407,613, Filed Sept. 15, 1989, Cl. 55/129, AIR CLEANER, Yasuyuki Fuzimura, Owner of Record: *Konkyo Co., Ltd., Yokohama-Shi, Japan*, Attorney or Agent: Joseph A. Kolash, Ex. Gp.: 135

4,694,594, Re. S. N. 07/411,034, Filed Sept. 22, 1989, Cl. 37/244, SINGLE STAGE SNOWTHROWER, Richard A. Thorud, et al., Owner of Record: *Toro Co., Minneapolis, Minn* Attorney or Agent: James W. Miller, Ex. Gp.: 351

4,706,436, Re. S. N. 07/438,755, Filed Nov. 17, 1989, Cl. 52/645, LATTICE BRIDGES, Bevil G. Mabey, Owner of Record: *Mabey & Johnson, Ltd., Twyford England*, Attorney or Agent. John B. Conklin, Ex. Gp.: 354

4,710,026, Re. S. N. 07/444,783, Filed Dec. 1, 1989, Cl. 356/349, POSITION DETECTION APPARATUS, Nobutaka Magome, et al., Owner of Record: *Nikon Corp., Tokyo, Japan*, Attorney or Agent: Nelson H. Shapiro, Ex. Gp.: 255

4,726,929, Re. S. N. 07/471,540, Filed Jan. 29, 1990, Cl. 422/68, APPARATUS FOR MEASURING A CHEMICAL ENTITY IN A LIQUID, Adrian Gropper, et al., Owner of Record: *Mallinckrodt Scensor Systems Inc., Ann Arbor, Mich.*, Attorney or Agent: Ronald W. Citkowski, Ex. Gp.: 181

4,727,632, Re. S. N. 07/482,032, Filed Feb. 20, 1990, Cl. 27/35, ARTICLE AND METHOD FOR ENCLOSING AND PROTECTING ENTOMBMENT CASKETS, David A. Yearsley, Owner of Record: *Inventor*, Attorney or Agent: Clifford A. Poff, Ex. Gp.: 331

4,728,395, Re. S. N. 07/483,531, Filed Feb. 20, 1990, Cl. 162/138, CONTROLLED RESISTIVITY CARBON FIBER PAPER AND FABRIC SHEET PRODUCTS AND METHOD OF MANUFACTURE, George P. Boyd, Jr., Owner of Record *Stackpole Fibers Co., Lowell, Mass.*, Attorney or Agent: Charles W. Helzer, Ex. Gp.: 133

4,730,283, Re. S. N. 07/482,265, Filed Feb. 16, 1990, Cl. 367/181, ACOUSTIC TRANSDUCER WITH IMPROVED ELECTRODE SPACING, Elmer V. Carlson, et al., Owner of Record. *Industrial Research Products, Inc., Elk Grove Village, Ill.*, Attorney or Agent: Stephen R. Arnold, Ex. Gp.: 221

4,786,765, Re. S. N. 07/485,669, Filed Feb. 27, 1990, Cl. 178/19, COORDINATES INPUT SYSTEM, Tsuguya Yamanami, et al., Owner of Record: *Wacom Co., Ltd., Saitama-Ken, Japan*, Attorney or Agent: Allan M. Lowe, Ex. Gp.: 261

4,853,720, Re. S. N. 07/482,508, Filed Feb. 21, 1990, Cl. 364/431, CONDITION ADAPTIVE-TYPE CONTROL METHOD FOR INTERNAL COMBUSTION ENGINE, Mikihiko Onari, et al., Owner of Record: *Hitachi Ltd., Tokyo, Japan*, Attorney or Agent: Donald R. Antonelli, Ex. Gp.: 234

4,856,802, Re. S. N. 07/465,964, Filed Jan. 16, 1990, Cl. 280/288, DROPOUT ASSEMBLY, Frederick C. Schilplin, Owner of Record: *Inventor*, Attorney or Agent: Douglas B. Farrow, Ex. Gp.: 316

Requests for Reexamination Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,314,990, Reexam No. 90/001,945, Requested Feb. 27, 1990, Cl. 424/52, TOOTHPASTE COMPOSITION, William D. Denny, et al., Owner of Record: *The Proctor & Gamble Co., Cincinnati, Ohio*, Attorney or Agent: Douglas C. Mohl, Ex. Gp.: 120, Requester: Doctors Frank, Faunce & William McCord, Houston, Tex.

4,457,847, Reexam No. 90/001,942, Requested Feb. 20, 1990, Cl. 210/698, CARBOXYLATE POLYMERS FOR INTERNAL SCALE CONTROL AGENTS IN BOILER SYSTEMS, Walter F. Lorenc, et al., Owner of Record: *Nalco Chemical Co., Oakbrook, Ill.*, Attorney or Agent: Henry L. Brinks, Ex. Gp.: 130, Requester: Calgon Corp., Pittsburgh, Pa.

4,550,059, Reexam No. 90/001,941, Requested Feb. 15, 1990, Cl. 428/409, METHOD OF FORMING A TINTABLE ABRASION-RESISTANT COATING ON A SUBSTRATE AND ARTICLE THEREBY, Jeffrey L. Dalton., Owner of Record: *Gentex Optics, Inc., New York, N.Y.*, Attorney or Agent: Shenier & O'Connor, Ex. Gp.: 150, Requester: Owner

4,725,664, Reexam No. 90/001,944, Requested Feb. 22, 1990, Cl. 528/176, IMPACT MODIFIED POLYESTER, C. B. Halmess, Owner of Record: *Celanese Corp., New York, N.Y.*, Attorney or Agent: Andrew P. Sayko, Ex. Gp.: 150, Requester: Ciba-Geigy Corp., Hawthorne, N.Y.

4,838,421, Reexam No. 90/001,943, Requested Feb. 21, 1990, Cl. 206/387, MULTIPLE USE CASSETTE CARRYING CASE, Patrick Mastronardo, Owner of Record: *Lebo Peerless, Inc. Bloomfield, N.J.*, Attorney or Agent: Marvin Feldmen, Ex. Gp.: 240, Requester: Owner

Service by Publication

A petition to cancel each of the registraions identified below having been filed, and the notice of such proceedings sent by certified mail to each registrant at the last known address having been returned by the Postal service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Entex Industries, Inc. Compton, Calif., Reg. No. 998,679, for the mark "ONE-ON-ONE", Canc. No. 18,233

Edibowl Sundaes (Partnership), Duluth, Minn., Reg. No. 1,409,004, for the mark "EDIBOWL SUNDAES" and design, Canc. No. 18,505

JEAN BROWN
Administrator, Trademark Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

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PATENT NOTICES

Certificates of Correction For Week of April 3, 1990

D. 297,092	4,804,175	4,830,843	4,841,311
D. 300,476	4,804,656	4,831,067	4,842,057
4,650,479	4,806,147	4,831,073	4,842,190
4,678,803	4,806,255	4,831,231	4,842,855
4,714,875	4,806,272	4,831,738	4,843,867
4,737,166	4,806,667	4,831,741	4,844,259
4,737,498	4,808,164	4,831,923	4,844,694
4,741,264	4,808,556	4,832,308	4,845,475
4,743,548	4,810,065	4,832,928	4,848,708
4,753,795	4,810,369	4,832,964	4,849,223
4,757,153	4,811,061	4,833,525	4,849,317
4,758,573	4,811,303	4,833,705	4,849,403
4,760,022	4,811,393	4,833,731	4,849,482
4,761,503	4,811,639	4,833,887	4,849,558
4,765,308	4,812,995	4,833,953	4,850,814
4,766,073	4,813,519	4,833,973	4,851,337
4,768,030	4,815,414	4,835,198	4,851,462
4,773,244	4,815,550	4,835,322	4,853,015
4,774,290	4,818,066	4,835,988	4,853,090
4,777,275	4,818,862	4,836,279	4,853,537
4,778,884	4,819,182	4,836,295	4,855,255
4,779,086	4,819,223	4,836,631	4,855,450
4,782,863	4,819,756	4,836,998	4,855,766
4,783,716	4,820,811	4,837,034	4,855,946
4,785,020	4,820,889	4,837,164	4,857,389
4,785,681	4,821,742	4,837,316	4,857,776
4,787,213	4,821,978	4,838,084	4,857,782
4,789,385	4,822,438	4,838,282	4,858,052
4,790,238	4,822,533	4,838,552	4,859,471
4,790,691	4,822,775	4,838,678	4,859,612
4,792,292	4,823,122	4,839,175	4,859,895
4,794,801	4,823,881	4,839,207	4,860,006
4,795,688	4,824,902	4,839,415	4,862,326
4,796,680	4,826,957	4,839,657	4,862,384
4,797,499	4,827,351	4,839,708	4,862,716
4,797,706	4,827,935	4,839,756	4,862,990
4,797,734	4,829,862	4,839,862	4,864,587
4,799,046	4,829,928	4,840,685	4,868,939
4,803,555	4,830,047	4,840,896	4,877,579
4,803,803	4,830,679	4,840,992	

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PATENT APPLICATION	New patent application and associated papers and fees.
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PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF January 27, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-5-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	1-13-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M BLIX, Director	9-1-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	12-24-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 STEWART LEVY, Acting Director	11-17-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	10-21-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	6-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	1-15-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-2-89

Expiration of patents: The patents within the range of numbers indicated below expire during January 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

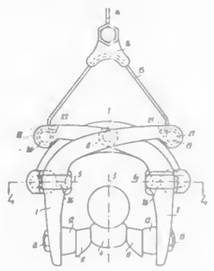
Patents ..... Numbers 3,707,729 to 3,714,667 inclusive
Plant Patents ..... 3281 to 3296 inclusive

REEXAMINATIONS

APRIL 3, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,163,482 (1230th)
CENTER-PULL CALLIPER BRAKES FOR BICYCLES AND THE LIKE
René Lauzier, Ruy, France, assignor to Angenieux CLB S.A., Loire, France
Reexamination Request No. 90/001,723, Feb. 28, 1989.
Reexamination Certificate for Patent No. 4,163,482, issued Aug. 7, 1979, Ser. No. 882,053, Feb. 28, 1978.
Claims priority, application France, Mar. 14, 1977, 77 08322
Int. Cl.[4] B62L *1/06*
U.S. Cl. 188—24.11



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 2 and 3 are cancelled.

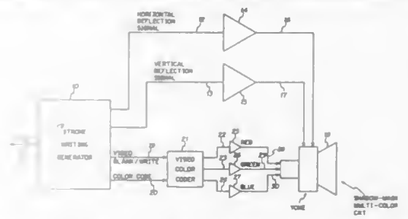
[1. A vehicle having a frame; a wheel; and centre-pull calliper wheel brake comprising two callipers, and means mounting the callipers relative to the frame for pivotal movement about respective axes which are inclined with respect to the median plane of the wheel rim and intersect at a point situated in said median plane, wherein said two axes diverge with respect to one another along the direction of the forward movement of the wheel rim relative to the frame during rotation of said wheel.]

B1 4,200,866 (1231st)
STROKE WRITTEN SHADOW-MASK MULTI-COLOR CRT DISPLAY SYSTEM
Lyle R. Strathman, Cedar Rapids, Iowa, assignor to Rockwell International Corp, El Segundo, Calif.
Reexamination Request No. 90/001,292, Jul. 27, 1987.
Reexamination Certificate for Patent No. 4,200,866, issued Apr. 29, 1980, Ser. No. 885,843, Mar. 13, 1978.
Int. Cl.[4] G09G *1/28*
U.S. Cl. 340—703

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

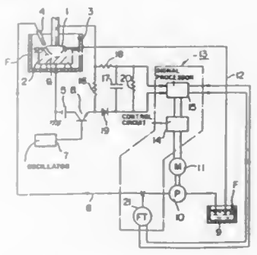
Claims 1–11 are cancelled.

[1. In combination: a multi-color, shadow-mask cathode ray tube including means for generating plural electron beams; a plurality of video amplifier means each associated with an individual one of said plural means for generating; a stroke-writing deflection signal generating means, means for simultaneously controlling deflection of said plural electron beams in response to the output of said deflection signal generating means, and color code means operable in synchronism with



said deflection signal generating means to effect selected turn-on permutations of said plurality of video amplifier means.]

B1 4,208,256 (1232nd)
FLUID PUMPING CONTROL METHOD AND APPARATUS FOR MACHINE TOOLS
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Japan
Reexamination Request No. 90/001,578, Aug. 17, 1988.
Reexamination Certificate for Patent No. 4,208,256, issued Jun. 17, 1980, Ser. No. 8,093, Jan. 31, 1979.
Claims priority, application Japan, Feb. 8, 1978, 53-13768
Int. Cl.[4] B23H *3/10, 7/36, 1/10*
U.S. Cl. 204—129.2



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 4–8 is confirmed.

Claim 1 is determined to be patentable as amended.

Claims 2 and 3, dependent on an amended claim, are determined to be patentable.

1. A method of controllingly supplying a machining fluid to a machining zone in an electroerosion machine having a reservoir for the machining fluid, a fluid conduit connecting between said reservoir and said machining zone, an electric motor and a pump with a rotor adapted to be driven by said electric motor, said method comprising the steps of:

applying an input to said electric motor for driving said pump to feed said machining fluid from said reservoir to said machining zone through said conduit;

sensing, during a given course of machining operation, a machining current passing between a tool electrode and a

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workpiece across a machining gap constituting said machining zone flushed with said machining fluid; and

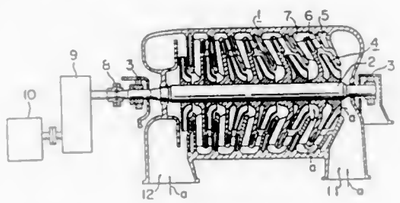
in response to said sensed machining current, modifying said input to said electric motor for controlling the output pressure of said pump to regulate the rate of delivery of said machining fluid to said machining zone.

B1 4,224,010 (1233rd)

MULTISTAGE TURBOCOMPRESSOR WITH DIAGONAL-FLOW IMPELLERS

Fujino Yoshikazu, Kobe, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Reexamination Request No. 90/001,738, Mar. 29, 1989.
Reexamination Certificate for Pateat No. 4,224,010, issued Sep. 23, 1980, Ser. No. 16,735, Mar. 2, 1979.
Claims priority, application Japan, Mar. 7, 1978, 53-26119
Int. Cl.⁴ F04D *17/12*
U.S. Cl. 415—199.2



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–8 are cancelled.

[1. In a multistage turbocompressor which has a casing having suction and discharge ends, a rotating shaft passing through the casing, and a plurality of impellers fixedly mounted on the shaft in successive tandem arrangement, and which operates to draw a gas in through the suction end, to compress the gas, and to discharge the gas out through the discharge end, the improvement wherein at least some of the impellers are diagonal-flow impellers with exit flow angles less than 90 degrees, and, when the impellers are considered to be divided in a plurality of successively tandem groups each having at least one impeller, the exit flow angle of an impeller of any group nearer the suction end is made less than the exit flow angle of an impeller of a group more remote from the suction end than the first named group thereby to cause the specific speed of each impeller to be of optimal value, the exit flow angle of an impeller being the angle between the velocity component along a streamline within an imaginary meridional plane extending from the flow entrance to the flow exit of that impeller and passing through the axis of rotation thereof and the axis of rotation.]

B1 4,319,492 (1234th)

PRESSURE TRANSMITTER MANIFOLD

John E. Hewson, and Marion L. Schomer, both of Houston, Tex., assignors to Keystone International Holdings Corp., Houston, Tex.

Reexamination Request No. 90/001,753, Apr. 14, 1989.
Reexamination Certificate for Patent No. 4,319,492, issued Mar. 16, 1982, Ser. No. 114,572, Jan. 23, 1980.
Int. Cl.⁴ G01L *7/00*
U.S. Cl. 73—756

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 3–7 is confirmed.

Claims 1 and 2 are determined to be patentable as amended.

1. A pressure transmitter manifold comprising

a body,

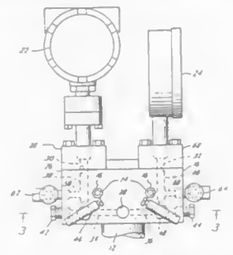
an inlet into said body,

a pair of ports into said body,

a first passage through said body between said inlet and one said ports,

a second passage through said body between said inlet and the other of said ports,

said inlet supplying a common pressure to both of said ports,



a first valve in said body controlling communication through said first passage,

a second valve in said body controlling communication through said second passage,

a first bleed connection into said block communicating with said first passage between said first valve and said connection,

[means] *a third valve for opening and* closing said first bleed connection,

a second bleed connection into said block communicating with said second passage between said second valve and said connection,

[means] *a fourth valve for opening and* closing said second bleed connection, and

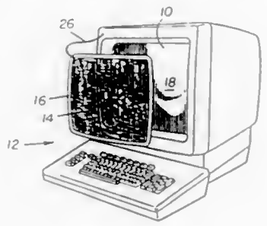
means for mounting said block in a preselected position.

B1 4,468,702 (1235th)

RADIATION AND STATIC ELECTRICITY SUPPRESSION DEVICE

Louis H. M. Jandreli, Ashley Gardens, South Africa, assignor to Daca International, B.V., Sligo, Ireland

Reexamination Request No. 90/001,649, Nov. 29, 1988.
Reexamination Certificate for Patent No. 4,468,702, issued Aug. 28, 1984, Ser. No. 369,127, Apr. 16, 1982.
Int. Cl.⁴ H04N *5/65, 5/64;* **G02B** *27/00*
U.S. Cl. 358—245



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 7, and 8 are determined to be patentable as amended.

Claims 2, 3, 4, 5, 6, and 9, dependent on an amended claim, are determined to be patentable.

1. A radiation and static electricity suppression device for a cathode ray tube comprising:

a fine mesh fabric in which at least some of either the warp or weft fibers are electrically conductive and further that the electrically conductive fibers are generally evenly distributed across the mesh;

said fine mesh fabric [conformable to] *being positionable in conforming contact with* the viewing surface of the cathode ray tube; *and*

means for electrically connecting said electrical conductive fibers with said cathode ray tube.

B1 4,479,821 (1236th)

N-PHENYLSULFONYL-N'-TRIAZINYLUREAS

Willy Meyer, Riehen, and Werner Föry, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, New York, N.Y.

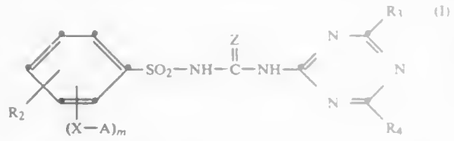
Reexamination Request No. 90/001,671, Dec. 16, 1988.
Reexamination Certificate for Patent No. 4,479,821, issued Oct. 30, 1984, Ser. No. 458,695, Jan. 17, 1983.
Continuation-in-part of Ser. No. 282,847, Jul. 13, 1981,

Claims priority, application Switzerland, Jul. 17, 1980, 5481/80; Nov. 5, 1980, 8216/80; Jun. 17, 1981, 3991/81
Int. Cl.⁴ C07D *251/46, 251/22, 251/44,* **A01N** *43/66*
U.S. Cl. 71—93

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–28 is confirmed.

1. A N-phenylsulfonyl-N'-triazinyl-urea of the formula I



wherein

A is a C_1–C_6alkyl radical which is substituted by C_1–C_4alkoxy, C_1–C_4alkylthio, C_1–C_4-alkylsulfinyl or C_1–C_4alkylsulfonyl,

X is oxygen, sulfur, a sulfinyl or sulfonyl bridge,

Z is oxygen or sulfur,

m is 1 or 2,

R_2 is hydrogen, halogen, C_1–C_5alkyl, C_2–C_5alkenyl, C_1–C_4-haloalkyl, or a radical —Y—R_5, —$COOR_6$, —NO_2 or —CO—NR_7R_8,

R_3 and R_4, each independently of the other, are hydrogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4alkylthio, C_1–C_4haloalkyl, halogen or alkoxyalkyl of at most 4 carbon atoms,

R_5 and R_6, each independently of the other, are C_1–C_5alkyl, C_2–C_5alkenyl or C_2–C_6alkynyl,

R_7 and R_8, each independently of the other, are hydrogen, C_1–C_5alkyl, C_2–C_5alkenyl or C_2–C_6alkynyl, and

Y is oxygen, sulfur, a sulfinyl or sulfonyl bridge, or a salt thereof.

26. A herbicidal and growth regulating composition which comprises an effective amount of at least one compound according to claim 1, together with a suitable carrier therefor.

B1 4,524,217 (1237th)

PROCESS FOR PRODUCING N-ACYL-HYDROXY AROMATIC AMINES

Kenneth G. Davenport, and Charles B. Hilton, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Reexamination Request No. 90/001,200, Mar. 20, 1987.
Reexamination Certificate for Patent No. 4,524,217, issued Jun. 18, 1985, Ser. No. 618,659, Jun. 8, 1984.
Int. Cl.⁴ C07C *103/12, 103/22*
U.S. Cl. 564—223

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–6 are cancelled.

[1. A process comprising contacting a hydroxy aromatic ketone with a hydroxylamine salt and a base to form the ketoxime of said ketone, and contacting said ketoxime with a Beckmann rearrangement catalyst to form an N-acyl-hydroxy aromatic amine.]

B1 4,587,163 (1238th)

PREPARATION OF ULTRA HIGH MOLECULAR WEIGHT POLYETHYLENE MORPHOLOGIES OF TOTALLY FUSED PARTICLES WITH SUPERIOR MECHANICAL PERFORMANCE

Anagnostis E. Zachariades, 65 Glen Garry Way, Hillsborough, Calif. 94010

Reexamination Request No. 90/001,568, Aug. 1, 1988.
Reexamination Certificate for Patent No. 4,587,163, issued May 6, 1986, Ser. No. 667,020, Nov. 1, 1984.
Int. Cl.⁴ B32B *27/32*
U.S. Cl. 428—292

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–4, 6, 9–15, 18 and 19 are determined to be patentable as amended.

Claims 5, 7, 8, 16 and 17, dependent on an amended claim, are determined to be patentable.

New claims 20–22 are added and determined to be patentable

B1 4,617,649 (1239th)

ERASABLE FPLA

Mikio Kyomasu; Toshiyuki Araki, both of Toyono; Shinobu Fukunaga, Kawanishi, and Masahiro Shindo, Toyonaka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Reexamination Request No. 90/001,719, Feb. 22, 1989.
Reexamination Certificate for Patent No. 4,617,649, issued Oct. 14, 1986, Ser. No. 689,703, Jan. 7, 1985.
Continuation of Ser. No. 442,167, Nov. 16, 1982, Pat. No. 4,503,520.
Claims priority, application Japan, Nov. 17, 1981, 56-185037
Int. Cl.⁴ G11C *13/00*
U.S. Cl. 365—189.01

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–7, 9–11, 15, 19, 23–27 and 31–34 are cancelled.

Claims 8, 12, 16, 20, 21 and 28 are determined to be patentable as amended.

Claims 13, 14, 17, 18, 22, 29 and 30, dependent on an amended claim, are determined to be patentable.

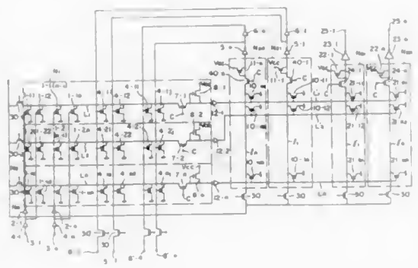
New claims 35–55 are added and determined to be patentable.

[1. A programmable logic array in which a desired logic function may be erasably programmed comprising:

a plurality of input terminals;

an AND plane including a plurality of AND gates each of which is operatively connected to receive a signal from the corresponding one of said plurality of input terminals; and

an OR plane including a plurality of OR gates each of which is operatively connected to receive a signal from the



corresponding one of said plurality of AND gates in said AND plane and to supply a logic output, wherein at least one of said AND and OR planes includes:

a matrix of conductors including first and second conductors which run in different directions thereby defining intersections therebetween and which are electrically isolated from one another; and

a plurality of reprogrammable memory elements each disposed at each of the intersections between said first and second conductors, each of said reprogrammable memory elements having a first electrode connected to the corresponding one of said first conductors, a second electrode connected to the corresponding one of said second conductors and a third electrode connected to a reference voltage.]

B1 4,733,998 (1240th)

METHOD AND APPARATUS FOR MACHINING THE SIDE EDGE SURFACE OF A WEB PLATE

Shingo Kurisu; Shunji Omori; Hiroyuki Takenaka; Tsuneo Egawa, all of Hiroshima; Takuro Mitsunaga, and Nobuo Kiyama, both of Mihara, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Reexamination Request No. 90/001,628, Oct. 27, 1988.

Reexamination Certificate for Patent No. 4,733,998, issued Mar. 29, 1988, Ser. No. 643,309, Aug. 22, 1984.

Claims priority, application Japan, Oct. 24, 1983, 58-197577

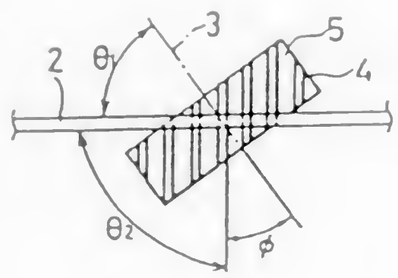
Int. Cl.[4] B21B *15/00*; **B23C** *3/12*

U.S. Cl. 409—132

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 4 and 5 are determined to be patentable as amended.

Claims 2 and 3, dependent on an amended claim, are determined to be patentable.



1. A method of machining a longitudinally extending side edge surface of a web plate having an upper and lower surface, comprising:

providing a rotary cutter having cutting edges on a radially outer peripheral surface of said cutter which are at a predetermined angle *other than 90 degrees* with respect to the rotary axis of said cutter;

orienting said cutter with respect to said web plate by having the rotary axis of said cutter inclined at a first angle [for] *other than 90 degrees to a plane containing the plane of said web plate, and* forming a second angle between the cutting edges and the longitudinal corner edge of the longitudinally extending side edge of said web plate to be machined, said second angle lying in a plane containing said longitudinally extending side edge surface and being within the range of 55 degrees to 125 degrees, and;

rotating said rotary cutter in rotation, while moving said cutter and said web plate relative to each other for moving the longitudinally extending side edge surface of said web plate into contact with said radially outer peripheral surface of said cutter and past said cutter, whereby the longitudinally extending side edge surface of a web plate is machined.

4. A method of machining the side edge surface of a web plate having an upper and lower surface, comprising:

providing a rotary cutter having cutting edges on the outer peripheral surface of said cutter which are at a predetermined angle *other than 90 degrees* with respect to the rotary axis of said cutter, said rotary axis of said cutter being inclined in a plane which is parallel to a desired machined edge surface of said web plate;

orienting said cutter with respect to said web plate by having the rotary axis of said cutter inclined at a first angle [for] *other than 90 degrees to a plane containing the plane of said web plate, and* forming a second angle between the cutting edges and the longitudinal corner edge of the side edge of said web plate to be machined, said second angle being within the range of 55 degrees to 125 degrees, and;

rotating said rotary cutter in rotation, while moving said cutter and said web plate relative to each other, for moving the side edge surface of said web plate past said cutter, whereby the side edge surface of a web plate is machined.

STATUTORY INVENTION REGISTRATIONS

PUBLISHED APRIL 3, 1990

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H758
SEALANT COMPOSITION

Steven S. Chin, 6301 Sierra Blanca #4009, Houston, Tex. 77083

Filed Dec. 23, 1987, Ser. No. 137,036

Int. Cl.[4] C08L *47/00*

U.S. Cl. 525—75 **16 Claims**

1. A sealant composition comprising:

(a) 100 parts by weight of a functionalized polymer component which is prepared by grafting carboxylic acid, dicarboxylic acid, or a derivative thereof onto a polymer component in an amount from about 0.5% to about 5.0% by weight of the polymer component to thereby functionalize the polymer component and provide a resultant sealant composition with adhesion improved to polar substrates;

said polymer component comprising a multiblock copolymer having at least two endblocks A and at least one midblock B, wherein:

the A blocks comprise monoalkenyl arene blocks and the B blocks comprise substantially completely hydrogenated conjugated diene polymer blocks, and the average molecular weight of the A blocks is greater than the minimum molecule weight needed to obtain microphase separation and domain formation of the A blocks, and is less than the maximum molecular weight which would render the polymer incapable of being melt processed;

the multiblock copolymer comprises a monoalkenyl arene content which is no more than the maximum weight percent needed to retain a modulus suitable as a sealant in the resultant composition and no less than the minimum weight percent needed to obtain the desired phase separation and the desired minimum cohesive strength; and

(b) an amount of a midblock compatible component wherein said midblock compatible component is at a concentration to maintain the resultant composition in a pliable condition at room temperature, to maintain the glass transition temperature of the resultant composition below 10° C., and to provide sufficient peel strength to allow cohesive failure of the sealant composition when applied to aluminum or anodized aluminum.

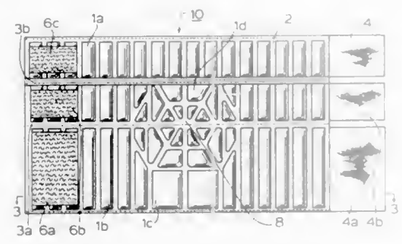
H759
E-Z CUSTOM ICE PACKS

Stanley J. Jones, Rte. 2, Box 735, Bush, La. 70431

Filed May 23, 1988, Ser. No. 197,330

Int. Cl.[4] A61F *7/00*

U.S. Cl. 128—402 **3 Claims**



1. An ice pack for cooling the affected body surface of a human being comprising:

a flexible rectangular or polyganol shaped wrap, said wrap consisting of two layers of rubber sheets heat sealed to contain small individualized compartments filled with propylene glycol coolant;

multiple hinge means between said compartments to provide flexibility and versatility to the user; and

detachable fasteners for securing said ice pack comfortably around the user's applied body surface.

H760
SILVER HALIDE PHOTOGRAPHIC MATERIALS

Tadashi Ogawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Jan. 3, 1989, Ser. No. 292,870

Claims priority, application Japan, Jan. 6, 1988, 63-001064

Int. Cl.[4] G03C *1/06*

U.S. Cl. 430—264 **28 Claims**

1. A silver halide photographic material comprising a support having thereon at least one emulsion layer containing an essentially silver iodide free silver chloride, silver bromide or silver chlorobromide emulsion obtained: (1) by recrystallization of from 0.3 to 15 mol % of total silver halide using fine crystals of a sparingly soluble bromide, chloride or chlorobromide under conditions in which at least one of a simple cyanine dye, a carbocyanine dye or a dicarbocyanine dye is present on the surface of the silver halide grains in a silver halide emulsion which has a grain size distribution such that the variation coefficient is not more than 0.25, and (2) by chemical sensitization.

H761
PROCESS OF MAKING CONSOLIDATED PROPELLANT CHARGES

Joseph B. Quinlan, 1126 Norwalk Rd., Philadelphia, Pa. 19115

Filed Jan. 17, 1989, Ser. No. 297,892

Int. Cl.[4] C06B *21/00, 45/10*

U.S. Cl. 264—3.1 **4 Claims**

1. In an improved process of making consolidated propellant charges by compacting propellant grains in a mold, the improvement consisting essentially of coating said propellant grains with a frangible microcapsule having an inner phase being a low volatile solvent for said propellant grains prior to said compacting step.

H762
POST-PASTEURIZATION

Thomas W. DeMasi, and Karl R. Deily, both of Greenville, S.C., assignors to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Apr. 7, 1989, Ser. No. 334,834

Int. Cl.[4] A23L *1/31*

U.S. Cl. 426—112 **4 Claims**

1. A method of treating cooked meat products comprising:

(a) packaging the cooked meat product in a flexible heat-tolerant container;

(b) placing the packaged meat product in a heated medium kept at a temperature of between about 160° F. and 205° F.; and

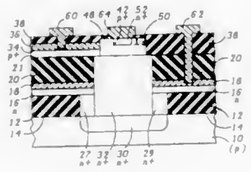
(c) maintaining the package in the heated medium for between about 30 seconds and 10 minutes.

VOL 1113 ISS 1 AP 3 1990 UMI

H763
SUBMICRON BIPOLAR TRANSISTOR WITH EDGE CONTACTS

Anatoly Feygenson, Exeter Township, Berks County, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 92,015, Sep. 20, 1987, abandoned. This application Mar. 21, 1989, Ser. No. 328,701
Int. Cl.[4] H01L *29/72, 29/04*
U.S. Cl. 357—34 5 Claims



1. A bipolar transistor comprising
a semiconductor substrate of a first conductivity type having predefined top and bottom major surfaces;
a buried collecting region of a second conductivity type formed in a selected region of said semiconductor substrate, extending downward a predetermined depth from the semiconductor substrate top major surface;
a collector region of the second conductivity type, including top and bottom major surfaces with vertical sidewalls extending therebetween, disposed over said buried collector region and extending upward from said semiconductor substrate top major surface such that the bottom major surface of said collector region is in contact with the top major surface of said substrate;
a base region of the first conductivity type and including top and bottom major surfaces with vertical sidewalls extending therebetween, said base region bottom major surface formed to contact the top major surface of said collector region;
an emitter region of the second conductivity type formed in a centrally located portion of said base region, extending downward into said base region from the base region top major surface;
a horizontal collector conducting layer of the second conductivity type extending from a sidewall of the collector region at a predetermined height above said semiconductor substrate top major surface;
a collector isolation region formed between the base region top major surface and said semiconductor substrate top major surface so as to surround the horizontal collector conducting layer;
a horizontal base conducting layer of the first conductivity type extending from a sidewall of said base region at a predetermined height above said semiconductor substrate top major surface;
a base isolation region formed between the base region top major surface and said semiconductor substrate top major surface so as to surround the horizontal base conducting layer;
collector ohmic contact means extending downward through the collector isolation region to contact the horizontal collector conducting layer;
base ohmic contact means extending downward through the base isolation region to contact the horizontal base conducting layer; and
emitter ohmic contact means disposed to contact the emitter diffusion region.

H764
NITRATION OF WOODPULP

David F. Fair, 102 Mountain View Dr., Hackettstown, Warren County, N.J. 07840

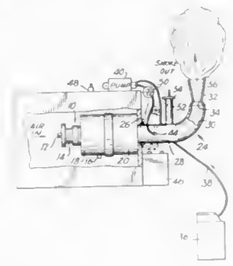
Filed May 3, 1989, Ser. No. 350,177
Int. Cl.[4] C08B *5/04*
U.S. Cl. 536—38 4 Claims

1. In the improved process of nitrating pellet-like bundles of woodpulp, the improvement of providing a shearing force to said bundles to physically break apart the same into component parts simultaneously with nitration of said woodpulp in a tank containing nitric acid, sulfuric acid, and water.

H765
SMOKE GENERATOR AND METHOD

Daniel Yu, University Park; and Charles D. Corum, Abingdon, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 23, 1989, Ser. No. 361,460
Int. Cl.[4] F02K *3/04*
U.S. Cl. 60—264 12 Claims



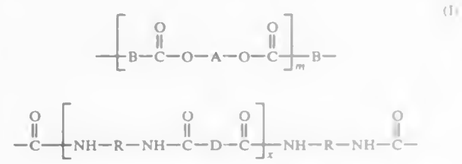
1. A smoke generator, comprising:
(a) combustion means for combusting air and fuel, and for discharging heated exhaust combustion gases;
(b) a supply of fog oil vaporizable at a smoking temperature to generate smoke;
(c) exhaust means for conveying the heated exhaust gases along a path through a vaporization chamber away from the combustion means;
(d) means for conducting the fog oil to the vaporization chamber for heating by the heated exhaust gases therein; and
(e) temperature control means in the exhaust means for increasing the temperature of the heated exhaust gases to be at least equal to the smoking temperature to vaporize the fog oil in the vaporization chamber, thereby generating smoke.

H766
POLYARYLATE COMPOSITIONS

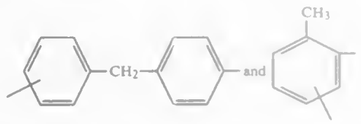
Thomas C. Yu, Chatham, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Filed May 31, 1989, Ser. No. 364,078
Int. Cl.[4] C08L *33/08*
U.S. Cl. 524—538 20 Claims

1. A polymer blend comprising:
(a) from 95 to 50% by weight of a polyarylate derived from a dihydric phenol and an aromatic dicarboxylic acid, and as the balance of said blend,
(b) a segmented polyesteramide characterized by a recurring unit of the formula



wherein R is selected from the class consisting of arylenes of the formulae:

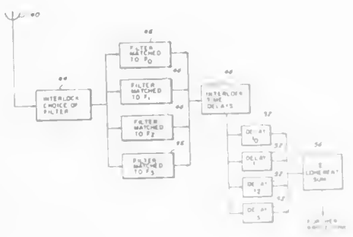


and mixtures thereof, A is the residue of a polymeric diol HO—A—OH having a molecular weight from about 400 to about 4,000, B is the residue of a dicarboxylic acid HOOC—B—COOH selected from the class consisting of aliphatic dicarboxylic acids having from 6 to 14 carbon atoms, inclusive, and isophthalic and terephthalic acids, m has a mean value of not more than 1 but greater than 0, D is the residue of a dicarboxylic acid HOOC—D—COOH such that the melt temperature of the hard segment is not greater than 280° C., and x is a number having an average value from zero to 10.

H767
RANGING METHOD AND SYSTEM, ESPECIALLY FOR RADAR SIGNAL PROCESSING FOR AMBIGUOUS RANGE RADARS

Frank F. Kretschmer, Jr., Laurel, and Karl R. Gerlach, Dunkirk, both of Md., assignors to United States of America, Washington, D.C.

Filed Jun. 29, 1989, Ser. No. 372,962
Int. Cl.[4] G01S *13/64, 13/10*
U.S. Cl. 342—145 2 Claims

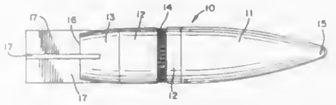


1. A method of ranging comprising steps for:
transmitting a sequence of coded pulses $F_1, F_2, \ldots F_0, F_1 \ldots, F_{N-1}$, each of said coded pulses F_n, n=0, 1, 2 . . . , N−1, being coded in accordance with the (n+1)th row of a Frank or P4 matrix of dimension N×N;
each of said coded pulses being spaced from adjacent ones of said coded pulses by time intervals $t_0, t_1, \ldots, t_{N-1}$, each F_n being followed immediately by a corresponding t_n, the last N of said time intervals being denominated detection intervals;
selecting an integer c from the set whose members are. 0, 1. 2, . . . , N−1;
detecting returns of said coded pulses during each of said detection intervals;
processing said returns, said step for processing using a plurality of N filters, each filter of said plurality of N filters being matched to a corresponding one of said coded pulses, said step for processing comprising steps for:
passing each of said returns detected in each said detection interval t_n through a corresponding one of said filters matched to one of said coded pulses F_j, j=(N+n−c) mod N; and
coherently summing the outputs of said filters generated during said detection intervals.

H768
PROJECTILE FOR LIMITED RANGE TRAINING AMMUNITION

Roy W. Kline, Newton, N.J., and Sung-Kwong Chung, Brooklyn, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 31, 1989, Ser. No. 387,743
Int. Cl.[4] F42B *8/00*
U.S. Cl. 102—529 1 Claim



1 In combination, a projectile for use on a limited range training ammunition consisting essentially of:
a. a projectile body having a tapered ogival forward section, a cylindrical center section, and a tapered conical trailing section,
1. said tapered ogival forward section having a rounded leading nose,
2. said cylindrical center section having a circumferential recess for the clamping of a cartridge case to said projectile body
a. said recess having a knurled surface,
3 said conical tapered trailing section having the configuration of a truncated cone,
a. said tapered conical trailing section terminating in a circular trailing end face,
b. a plurality of straight fins mounted longitudinally on said tapered conical trailing section for generating spin dampering torque to cause gyroscopic instability thereby creating high aerodynamic drag upon said projectile when fired from a weapon,
1. said fins mounted on the surface of said truncated cone,
2. said fins mounted on said tapered trailing section at 90° intervals about said projectile body,
3. said fins extending rearwardly from said tapered trailing section, and
4. said fins terminating beyond said circular trailing end face,
5. said fins having an outermost radial dimension not greater than the outermost dimension of said projectile body.

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H769
METHOD OF FORMING A SAFE VISUAL SMOKE SCREEN

William G. Rouse, Aberdeen; Michael J. Burnham, Kingsville; Erica R. Riley, Bel Air; Janon F. Embury, Towson, and Robert H. Frickel, Bel Air, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

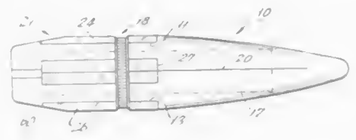
Filed Aug. 3, 1989, Ser. No. 389,195
Int. Cl.[4] C06D *3/00*; F42B *13/44*
U.S. Cl. 102—334 8 Claims

1. In an improved method of screening against visual light transmission, the improvement comprising injecting into the atmosphere a screening cloud of fine particles comprised of titanium dioxide composition, in which the particles are coated and of submicron diameter, said cloud being formed by bursting a compacted generally cohesive solid mass of said particles in the atmosphere to there aerosolize and disperse said particles in the atmosphere.

H770
TRACER TRAINING PROJECTILE

Roy W. Kline, Newton, N.J., and Sung-Kwong Chung, Brooklyn, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 11, 1989, Ser. No. 393,151
Int. Cl.[4] F42B *13/20*
U.S. Cl. 102—513 9 Claims



1. A reduced range bullet for a training cartridge; said bullet having a main elongated body having a nose end and a rear end; said rear end being adapted for mounting in a cartridge case; said main body having a central bore extending along its axis from its said rear end for a given axial distance and having a plurality of longitudinal slots which extend along at least a portion of the length of said body and separate said body into a plurality of longitudinal segments which are joined together at at least the nose end of said body; said central bore being at least partly filled with a high temperature burning tracer material; and a retainer member fixed to said body and holding said segments together and in a position to form a smooth aerodynamically shaped projectile profile; said retainer member having a melting temperature and thermal mass which is such that the mechanical integrity of said retainer member is destroyed after a predetermined burn time of said tracer material whereby said retainer member is thereafter incapable of preventing the outward bending of said segments due to the centrifugal force of the spin of said projectile induced by the firing of said projectile from a rifled barrel.

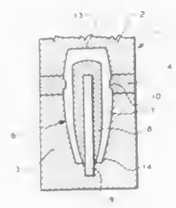
H771
METHOD FOR CASTING A ROTATING BAND ONTO A PROJECTILE

Sheldon Cytron, Mountain Lakes, and William P. Keown, deceased, late of West Milford, both of N.J. (by Evelyn Keown, executrix), assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 17, 1989, Ser. No. 396,716
Int. Cl.[4] B21K *21/06*
U.S. Cl. 29—1.23 7 Claims

1. A method for manufacturing a projectile having a metallic shell with a nose at one end, a closed base at the other end and a hollow core axially formed within said shell, said shell having a generally cylindrical band disposed there around, said method comprising the steps of:

a. forming a mold for casting said shell, said mold having three sections, a first section defining a cavity to form the nose end of said shell, a second section defining a cavity to form the closed base end of said shell; and a third section disposed between and engaging said first section and said second section, for forming an annular groove as a rotating band seat around the middle periphery of said shell;



b. casting hot metal into said mold to form said projectile therein;

c. removing said third section of the mold so as to expose the rotating band seat;

d. clamping a ring mold over and around the rotating band seat;

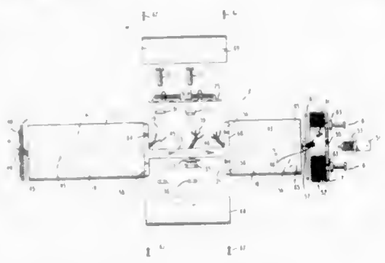
e. casting hot metal into said ring mold so as to cast a rotating band in the form of an annular ring within, above and below said rotating band seat; and

f. cooling said cast projectile with the rotating band thereon.

H772
POWER SOURCE CONVERTER

David J. Owens, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 28, 1989, Ser. No. 413,813
Int. Cl.[4] H02M *3/02*
U.S. Cl. 307—151 12 Claims



1. A DC power source converter comprising:

an elongated body having opposed first and second ends, and a chamber formed therein;

a first pair of electrical terminals mounted on the first end;

a second pair of electrical terminals mounted on the second end; and

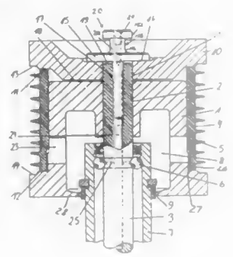
DC-to-DC converter means mounted in said chamber and connected between said first and second pair of terminals for converting DC power applied to the first pair of terminals to a predetermined DC voltage at the second pair of terminals.

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,190
ATTACHMENT DEVICE FOR AN OPENING ROLLER AND A METHOD FOR USING THE ATTACHMENT DEVICE

Fritz Stahlecker, Bad Überkingen, assignor to Hans Stahlecker, Fed. Rep. of Germany

Original No. 4,715,177, dated Dec. 29, 1987, Ser. No. 38,136, Apr. 14, 1987. Continuation of Ser. No. 224,139, Jul. 26, 1988.
Application for reissue May 8, 1989, Ser. No. 349,842
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1986, 3614033
Int. Cl.[4] D01H *7/895, 7/892*; D01G *15/28*
U.S. Cl. 57—408 25 Claims



1. Opening roller apparatus for an open-end spinning arrangement of the type having a shaft supporting the opening roller and an opening roller base body arranged on the shaft comprising:

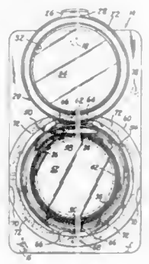
an exchangeable fitting ring means, said exchangeable fitting ring means fitting over said opening roller base body;

attaching means for attaching said exchangeable fitting ring means on said opening roller base body, said attaching means operating free of said opening roller base body.

Re. 33,191
BLISTER PACK PANEL FOR FACE POWDER COMPACT DISPLAY

Arthur Matney, 360 Furman St., Brooklyn, N.Y. 11201

Original No. 4,469,226, dated Sep. 4, 1984, Ser. No. 525,644, Aug. 23, 1983. Application for reissue Aug. 28, 1986, Ser. No. 901,430
Int. Cl.[4] B65D *73/00*
U.S. Cl. 206—470 6 Claims



1. A compact display unit permitting a compact to be opened to check the color face powder therein by the purchaser comprising:

a plate-like backing member *forming one layer* to which an enclosing cover *forming a second layer* is adapted to be affixed;

a pre-cut and pre-formed blister serving as the enclosing cover for the bottom of the compact enclosed therein and heat sealed in flat blister to panel relationship to said panel *to form a two layer unit;*

a compact comprising a top, a bottom, a hinge, and opposite said hinge a clasp consisting of a latch and a latching element, said compact being provided with a powder chamber in the bottom holding powder, a mirror chamber in the top holding a mirror, and face powder in said powder chamber;

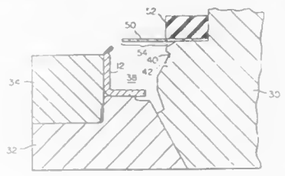
said pre-cut and pre-formed blister having a top wall which fits over the powder chamber of said compact between the mirror and the powder, an indented portion forming a depending stiffening groove which fits flat against the bottom of the compact, a [straight] cut-out portion *formed in the blister* adjacent the hinge of the compact [which is tangent to the edge of the powder chamber] and [directly opposite said cut-out portion folded over portions constituting an intermediate projection for the latching parts of the clasp and projecting portions to the right and left of said intermediate projection which project from the side walls of said blister] *centering means* to register the clasp and hinge with the blister in place;

said blister further provided with a flange at its bottom which surrounds the blister except at the hinge portion of the compact where the flange is provided with flange termination portions to register against the sides of the hinge when the flange is heat sealed to the panel to securely attach the blister around the bottom of the compact.

Re. 33,192
METHOD OF MOLDING AN ELASTOMERIC SHAFT SEAL WITH A POLYTETRAFLUOROETHYLENE LINER SIMULTANEOUSLY FORMED THEREON

Dean R. Bainard, Clover, S.C., and Dennis N. Denton, Besemer, N.C., assignors to Garlock, Inc., Palmyra, N.Y.

Original No. 4,171,561, dated Oct. 23, 1979, Ser. No. 746,392, Dec. 1, 1976. Continuation of Ser. No. 313,273, Oct. 21, 1981, abandoned. Application for reissue Oct. 6, 1983, Ser. No. 539,225
Int. Cl.[4] B29C *65/02*
U.S. Cl. 264—266 28 Claims



1. A method for making a shaft seal of the *molded lip* type including an annular elastomeric body [,] *having* a molded lip and the molded lip having *a sealing edge and axial sides on opposites of said sealing edge end* a liner of sintered polytetrafluoroethylene, comprising:

(a) molding [, at a temperature in the range of from about

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300° to 450° F.,] an annular elastomeric body *at a temperature at which the elastomeric body will flow and the polytetrafluoroethylene will not*; and

(b) simultaneously with said molding step, forming a ring of sintered polytetrafluoroethylene into a liner on said elastomeric body in the shape of [a] *the* molded lip and bonding said liner to *the surface of both axial sides of the molded lip of* said elastomeric body *by hydraulic pressure exerted by the elastomer of the elastomeric body during formation of the molded lip during said molding step.*

Re. 33,193

ION BEAM PROCESSING APPARATUS AND METHOD OF CORRECTING MASK DEFECTS

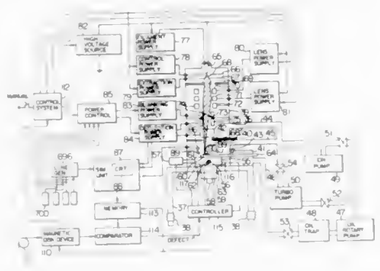
Hiroshi Yamaguchi, Fujisawa; Tateoki Miyauchi, Yokohama; Akira Shimase, Yokohama, and Mikio Hongo, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,503,329, dated Mar. 5, 1985, Ser. No. 427,584, Sep. 29, 1982. Application for reissue Mar. 5, 1987, Ser. No. 22,059

Int. Cl.[4] G01N *23/00*

U.S. Cl. 250—309 37 Claims

1. An ion beam processing apparatus provided within a vacuum container with a specimen chamber with a table for mounting a work piece or specimen provided therein comprising: a high [density] *intensity* ion source confronting said specimen chamber, an extraction electrode for extracting an ion beam out of said ion source, a grid electrode for controlling energy and stability of the ion beam, a first aperture controlling the focused spot diameter and the spot current, at least a set of electrostatic lenses for focusing the ion beam which is outputted through said first aperture to form a spot, X-axis and Y-axis deflection electrodes which cause the beam spot to scan over the specimen, a secondary charged-particle detector which detects the intensity of secondary charged-particles emitted from the specimen as it is exposed to a low-power ion beam and transduces the intensity of emission into an electrical signal, a TV monitor which receives the output of said detector and deflection signals applied to said deflection electrodes and performs the scanning of a spot having an intensity in proportion to the output of said secondary charged-particle detector in synchronization with the ion beam which scans the specimen so as to follow the observation of the surface of the specimen, setting means for setting the range of processing to said TV monitor, a second aperture for interrupting a projection of the ion beam to the specimen and provided between at least a



portion of said set of electrostatic lenses and said deflection electrodes, a beam blanking electrode disposed above said second aperture, said beam blanking electrode being operated by a signal produced by said setting means in correspondence to the deflection signal for deflecting the ion beam out of said second aperture, and switching means for switching the power supplies for detecting a [deflect] *defect* on the specimen by said detector and for processing said defect on said specimen by sputtering.

PLANT PATENTS

GRANTED APRIL 3, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,208

GERANIUM PLANT NAMED MARLICAT

Siegfried Klemm, Stuttgart, Fed. Rep. of Germany, assignor to Selecta Klemm KG, Stuttgart-Muhlhausen, Fed. Rep. of Germany

Filed Sep. 6, 1988, Ser. No. 241,095

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive geranium cultivar substantially as herein shown and described, characterized by the large size of its clear, pink colored flower clusters, the very large size of the florets with regularly imbricated and wide, almost round, petals, its abundant foliage of medium sized leaves, and its vigorous, upright and strong growth habit.

7,209

APPLE TREE: KEYSTONE

Randy L. Wick, Riverside, Wash., assignor to North American Tree Company, Portland, Oreg.

Filed Jun. 30, 1988, Ser. No. 213,317

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—34 1 Claim

1. A new and distinct variety of apple tree, substantially as herein shown and described, characterized by a fruit with firm flesh, a yellow color which may take on a cherry-red blush when exposed to full sunlight, and which is of a round-conic uniform shape.

7,210

DOGWOOD TREE 'CONSTELLATION'

Elwin R. Orton, Jr., Somerville, N.J., assignor to Rutgers University, New Brunswick, N.J.

Filed Oct. 26, 1988, Ser. No. 262,687

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—51 1 Claim

1. A new and distinct cultivar of Dogwood Tree, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its vigor and highly floriferous, small flowering form, similar to its seed parent *C. kousa* as to its upright, vase-shaped habit of growth but intermediate *C. Kousa* and its pollen parent *C. florida*, in the nature of the overwintering flower buds and the period of floral display, together with resistance to Dogwood Borer and Dogwood Decline.

7,211

CHRYSANTHEMUM PLANT NAMED CARTAGO

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Apr. 13, 1989, Ser. No. 337,461

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—74 1 Claim

1. A new and distinct Chrysanthemum plant named Cartago, as described and illustrated.

7,212

ROSE PLANT AUSLO

David C. H. Austin, Albrighton, England, assignor to David Austin Roses, Albrighton, England

Filed Oct. 18, 1988, Ser. No. 259,279

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—1 1 Claim

1. A new and distinct variety of rose plant of the shrub class, characterised as to novelty by its fully double, dark crimson flowers with abundant and continual blooming the unusual blend of coloring and shaping of the flower being substantially as shown and described.

7,213

ROSE PLANT 'AUSSPRY'

David C. H. Austin, Albrighton, England, assignor to David Austin Roses, Albrighton, England

Filed Oct. 18, 1988, Ser. No. 259,280

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—1 1 Claim

1. A new and distinct variety of rose plant of the shrub class, characterised as to novelty by its large double flowers with open centres exposing a bunch of golden stamens with abundant and continual blooming the unusual blend of colouring and shaping of the flower being substantially as shown and described.

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475-121	4,913,003
116-308	4,913,083
606-064	4,913,137
606-108	4,913,141
606-007	4,913,142
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362-061 4,914,747
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381-041 4,914,749
381-152 4,914,750
219-270 4,914,751

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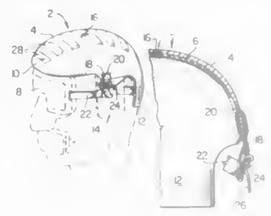
GRANTED APRIL 3, 1990

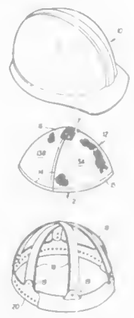
GENERAL AND MECHANICAL

4,912,777
DIVER'S SAFETY CAP
Tony J. Gasbarro, Apt. #6, 683 Churchill Avenue, Ottawa, Ontario, Canada K1Z 5G4
Filed Sep. 21, 1988, Ser. No. 247,288
Int. Cl.[4] A63B *33/00*
U.S. Cl. 2—2.1 R **11 Claims**



1. A safety cap to be worn on the head of a diver such as a scuba diver or snorkelor, for protecting against minor head injuries such as contusions, abrasions, incisions, lacerations and the like, the safety cap comprising an exterior, unitary shell of part-spherical configuration made of flexible plastic, to provide a smooth outer surface, the flexible plastic being of sufficient strength to resist small impact loads, and a continuous interior liner of open cell foam, the liner secured within the exterior shell to act as padding and to provide a thermally protective layer for the diver's head, and a pair of straps, one secured to each side of the shell, each strap being of a length and provided with securing means respectively for looping and securing about a proximal portion of a head strap of diver's face mask or goggles when worn by the diver.

4,912,778
HEAT REFLECTIVE SKULL CAP SHIELD FOR USE IN HARD HATS
Darleen Daniels, P.O. Box 1221, Port Neches, Tex. 77651
Filed Apr. 7, 1989, Ser. No. 334,463
Int. Cl.[4] A42B *3/00*
U.S. Cl. 2—7 **1 Claim**



1. For use with a hard hat shell of high impact plastic or plastic reinforced fibers of random orientation to withstand blows to the head of the wearer without permitting injury to the skull, a heat reflective shield comprising a plurality of spherical triangular panels having aluminum foil on one side and a heat resistant fabric adhered to the other side, said panels being stitched together along their long sides and along their bases with binding tape to define an equatorial stitched bound base border to form a highly reflective side of the shield directed upwardly toward the crown of the hard hat thus forming reflective heat shield to direct the heat from the sun or other hot heat sources away from the skull of the wearer of the hard hat, a strip of double sided adhesive tape one side of which is adapted to be adhered to the outside of the top of the heat reflective shield and the other side of which is adhered to the inside of the crown of the hard hat, an adjustable hat band secured within the hard hat positioned to lie between the hard hat shell and the head of the wearer, and suspension bands secured to the hat band at their ends with their intermediate portions flex arched to form supports to keep the heat reflective shield supported above and out of contact with the head of the wearer.

4,912,779
VISOR
Albert W. Laird, 652 Ridgecrest Dr., Bowling Green, Ky. 42101
Filed Sep. 6, 1988, Ser. No. 240,518
Int. Cl.[4] A61F *9/04*
U.S. Cl. 2—12 **2 Claims**

1. A visor complaining a single blank of resilient sheet material having an arcuate bill (**10**) and first and second straps (**16** and **18**) integrally extending therefrom,

said first strap (**16**) having a distal end (**24**) and a slot (**26**) extending obliquely and partially across said distal end (**24**) to separate said distal end into spaced first and second portions,

said second strap (**18**) having a rounded tab end (**38**) and oppositely disposed, inner and outer serrated edges (**32**) defining a series of triangular teeth,

each tooth of said series defining a generally isosceles triangle having first and second legs (**34** and **36**),

said rounded tab end (**38**) of said second strap (**18**) extending through said slot (**26**) whereby the first and second portions of said distal end (**24**) are adjustably disposed on said inner and outer serrated edges (**32**), respectively, and

said first portion engaging one of said second legs (**34**) and said second portion engaging one of said first legs (**36**), and said first portion being obliquely spaced from said second portion along an oblique line defined by said slot (**26**) to positively lock the first and second straps (**16** and **18**) together.

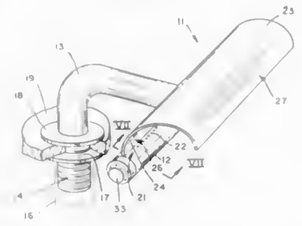
4,912,780
COMBINED SHIRT AND RELIGIOUS GARMENT
Jack Falack, 510 Quentin Rd., Brooklyn, N.Y. 11223
Filed Nov. 17, 1988, Ser. No. 278,550
Int. Cl.[4] A41D *1/04*
U.S. Cl. 2—102 7 Claims

1. A combined shirt and religious garment, comprising:
substantially rectangular-shaped garment having four corners;
a lateral axis in said garment defining a front panel and a back panel;
an opening formed in said garment substantially to one side of said lateral axis to form a passageway for the neck and head of the wearer in said front panel;
each of said four corners having a reinforcing layer of fabric and a hole formed therein;
a tassle of religious fringes tied to each of said corners through the hole formed in each corner;
said garment having two longitudinal edges, with each longitudinal edge having a front section and a back section; and
means for fastening the front and back sections of each longitudinal edge to form a pair of arm holes in said garment and to fit it to the torso of the wearer.

4,912,781
CUT RESISTANT YARN CONSTRUCTION AND BODY PROTECTIVE APPAREL
Steven D. Robins, Eden Prairie, Minn., and Robert H. Fleming, Jr., Ooltewah, Tenn.
Filed Oct. 11, 1988, Ser. No. 255,625
Int. Cl.[4] A41 *19/00;* D02G *3/36*
U.S. Cl. 2—167 22 Claims

1. A composite yarn construction particularly adapted for use in cut resistant body protective apparel, and comprising:
(a) a non-elastic core yarn;
(b) an abrasion and out resistant non-elastic monofilament covering yarn knitted onto and encasing the core yarn in a series of cut resistant loops.

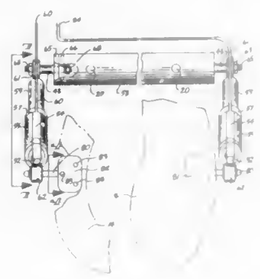
4,912,782
FLUID SPOUT PROVIDING LAMELLIFORM OUTFLOW
Tom E. Robbins, San Leandro, Calif., assignor to Kallista, Inc., San Leandro, Calif.
Continuation-in-part of Ser. No. 54,230, May 26, 1987, abandoned. This application Oct. 17, 1988, Ser. No. 258,670
Int. Cl.[4] E03C *1/04*
U.S. Cl. 4—192 13 Claims



1. A fluid spout for releasing fluid from a supply conduit into a receptacle in the form of a thin curtain of fluid which drops in a free fall from a discharge zone that is spaced away from the walls of said receptacle, said spout having a body with an internal chamber and means for communicating said chamber with said supply conduit and having outlet means for emitting fluid from said chamber along a thin linear emission zone extending longitudinally of said body to cause the outflow from said emission zone to have a thin sheet-like configuration, said emission zone being spaced apart from said discharge zone, and further having support means for securing said spout in place at said receptacle with said emission zone being held in a horizontal orientation, wherein the improvement comprises:
an outflow guide extending from said body to said discharge zone, said guide having a concave flow guiding surface with a first portion that is adjacent said emission zone and parallel thereto and which is positioned to substantially tangentially intercept said thin sheet-like outflow therefrom to cause said outflow to travel along said flow guiding surface to said discharge zone, said surface having a downwardly facing distal portion along which said thin sheet-like outflow approaches said discharge zone without underlying support of said outflow, at least said downwardly facing distal portion of said surface being curved to become more vertical as it approaches said discharge zone whereby momentum holds said outflow against said downwardly facing distal portion of said flow guiding surface.

4,912,783
TOILET LID CLOSING DEVICE
Steven E. Shafer, 14 11th St., Edwards AFB, Calif. 93523
Filed Nov. 18, 1988, Ser. No. 272,800
Int. Cl.[4] A47K *13/10;* E03D *5/04*
U.S. Cl. 4—251 10 Claims

1. In combination with a toilet including a generally vertical tank with a flushing lever, a bowl, a seat, and an overlying lid pivotally mounted by a hinge pin, a toilet lid closing device comprising:
spring means biasing said lid and said seat to a closed position;
a channel bracket having an elongated mounting surface, a pair of parallel support legs perpendicularly attached at opposite ends of said mounting surface;
said mounting surface secured on said toilet adjacent said hinge pin;
an elongated slot formed in each of said support legs;
a pair of spindles, each extending through one of said slots;
an L-shaped bracket, on each of said spindles, each having a circular aperture receiving one of said spindles, said L-shaped brackets each having a first leg extending in parallel overlying relation with said support leg and a second transverse leg extending adjacent an end of said support leg;
a stop screw extending through each of said L-shaped bracket transverse second legs for abutment with one of said support leg ends;
a first dampening cylinder secured between one of said support legs and said seat for controlling closure of said seat;



a second dampening cylinder secured between the other of said support legs and said lid for controlling closure of said lid;
locking pin means on at least said dampening cylinder secured to said seat for retaining said lid and said seat in an open position; and
cable means operatively connected for disengaging said locking pin means upon actuation of said flushing lever

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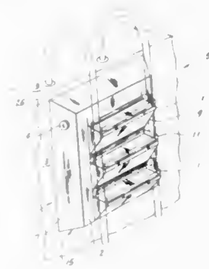
4,912,784
TOILET BOWL SPLASH GUARD
Earl B. Jacobson, 510 S. Shore Dr., and Keith R. Basler, 670 Coventry La., both of Crystal Lake, Ill. 60014
Filed Jul. 19, 1988, Ser. No. 221,506
Int. Cl.[4] E03D *9/02;* A47K *13/04*
U.S. Cl. 4—300.3 9 Claims

1. A device for shielding a toilet hinge between a toilet seat and a toilet bowl, damping the rotation of the toilet seat about the toilet hinge, and emitting a desired scent around the toilet hinge comprising:
a toilet bowl having a peripheral engagement surface around its top surface thereof;
a toilet seat;
a toilet lid;
a hinge for pivotably coupling said toilet lid and said toilet seat to said peripheral engagement surface of said toilet bowl at a desired location;
an elongated, hollow, elastically compressible member positioned between said toilet seat and said peripheral engagement surface of said toilet bowl proximate said hinge, said compressible member having an easily cleanable, impervious exterior surface and at least one aperture extending from its interior to its exterior surface and being capable of compressing between said toilet seat and said peripheral engagement surface of said toilet bowl to dampen the motion of said toilet seat and shield said hinge against foreign matter;
scented granules within the interior of said compressible member, said scented granules being capable of emitting a scent through said at least one aperture of said compressible member upon compression of said compressible member to scent the area around said hinge; and
means for releasably securing said compressible member to said peripheral engagement surface of said toilet bowl.

4,912,785
POOL ACCESSORY DEVICE
James L. Inman, 2518 Guebert Rd., Fenton, Mo. 63026
Filed Apr. 18, 1988, Ser. No. 182,385
Int. Cl.[4] E04H *3/18*
U.S. Cl. 4—496 10 Claims



9. The device of claim 7 wherein the holding means comprises at least one projection extending outwardly from the front wall of the body and adapted to engage at least one step to limit movement of the body relative to the ladder.

4,912,786
FEET IMMERSION TRAY
Francis N. Wheelock, 851 Elm St., Somerset, Mass. 02726
Filed Nov. 16, 1988, Ser. No. 272,066
Int. Cl.[4] A47K *3/022;* A61H *35/00;* E03C *1/00*
U.S. Cl. 4—622 1 Claim

1. A germicidal liquid-containment tray positionable at a swimming pool so that swimmers can stand in the tray to immerse their feet in the germicidal agent prior to entering the pool,
said tray comprising two separate spaced-apart tray sections;
one of said tray sections comprising a bottom wall and an upstanding side wall extending therearound, said side wall having the outline shape of a human right foot in top plan configuration;
the other tray section comprising a second bottom wall and a second upstanding side wall extending therearound, said second side wall having the outline shape of a human left foot in top plan configuration;
said upstanding side walls comprising curved toe sections, curved heel sections, generally straight outer side wall sections, and inner side wall sections having concave facing surfaces defining instep areas of the respective human foot outlines;

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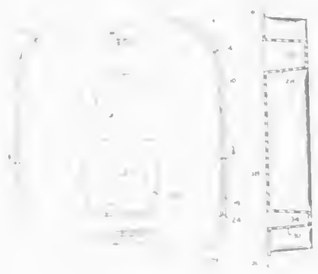
the first and second upstanding side walls having free upper edges terminating in a common horizontal plane spaced above the associated bottom walls a substantial distance sufficient for liquid immersion of a human foot; the vertical distance between said bottom walls and upper edges of the side walls constituting the entire vertical thickness of the liquid-containing tray;

a first channel wall structure extending between the separate tray sections a slight distance rearwardly from the curved toe sections;

a second channel wall structure extending between the separate tray sections a slight distance forwardly from the curved heel sections;



and a tray top wall extending between the separate tray sections in the horizontal plane defined by the upper edges of the tray

the first and second channel wall structures being located at opposite extremeties of the tray top wall; each channel wall structure including a flat bottom wall located in the same plane as the bottom walls of the separate tray sections;

said channel wall structures and tray top wall being molded components integral with the separate tray sections, whereby the top wall and channel wall structures act as reinforcement devices for the tray sections.

4,912,787

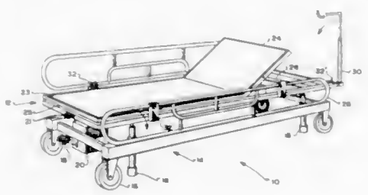
HYDRAULIC STRETCHER DEVICE

James M. Bradcovich, Akron, Ohio, assignor to Beta Medical Products, Akron, Ohio

Continuation-in-part of Ser. No. 31,652, Mar. 3, 1987, abandoned. This application Dec. 15, 1987, Ser. No. 132,927

Int. Cl.[4] A61G *1/02*

U.S. Cl. 5—62 18 Claims



17. A hydraulic stretcher device comprising:

a rectangular top support assembly;

a bottom frame assembly;

two independently operable pairs of hydraulic positioning cylinders, said positioning cylinders adjustably connecting said bottom frame assembly and said top support assembly;

wherein one pair of said cylinders is located adjacent to the head end of the stretcher, one cylinder on each side thereof, while another pair of said cylinders is located adjacent the foot end of the stretcher, one cylinder on each side thereof, each of said cylinders having a free-floating piston and a piston rod associated therewith, each of said piston rods being operatively connected to said top support assembly; separate pump powered hydraulic systems for each of said pairs of cylinders, one pair of said cylinders being connected to one of said hydraulic systems and the other hydraulic system being connected to the other pair of said cylinders, each hydraulic system including a pump, a two-way vaive that can be operated to direct hydraulic fluid to said pairs, or to direct said fluid therefrom, and a pressure relief valve that prevents the pressure of said fluid within said system from exceeding a predetermined amount;

the cylinders in each such pair being hydraulically connected and operating in tandem with each other;

a pair of piston stabilizing bars, each of said piston stabilizing bars connecting the piston rods of paired cylinders together;

said rectangular top support assembly including an X-ray permeable patient support structure fabricated from a lamination configured in a box structure which includes a core having an upper horizontal surface and a lower horizontal surface, each of said surfaces being covered with a surface skin wherein said core layer is formed from a foamed plastic material, or from balsa wood, and wherein a first surface skin covering one horizontal surface is made of a material selected from the group consisting of a mat layer comprising carbon graphite filamentary material encapsulated in a plastic resin, and a matrix of filamentary high molecular weight polyethylene encapsulated in a plastic resin, and a second skin covering the other of said horizontal surfaces is a layer of fiberglass in a plastic resin or filamentary high molecular weight polyethylene encapsulated in a plastic resin, said core being from about 0.19 inch to 2.00 inches thick, while each of said surface skins is from about 0.01 inch to 0.08 inch thick.

4,912,788

SEAT PAD FOR INVALID PATIENTS

Robert Lonardo, 680 Capri Blvd., Treasure Island, Fla. 33706, assignor to Robert Lonardo, Treasure Island, Fla., Trustee for Robert Lonardo Living Trust Agreement

Filed May 17, 1988, Ser. No. 194,869

Int. Cl.[4] A47C *20/02, 27/12*

U.S. Cl. 5—432 7 Claims

1. A seat cushion for use by a person sitting in a chair or bed comprising:

two layers of material having a normally closed perimeter edge so as to define opposite sides of a seat section:

at least one contoured compartment formed between the layers of material and being stuffed with padding so as to define contoured cushioned areas corresponding to large muscle masses of the person's buttocks and thighs so as to distribute the person's body weight over the large muscle masses;

the contoured compartment defining recessed areas void of said padding and corresponding at least to the person's ischial bone prominences so as to minimize pressure on the prominences;

the cushioned areas and recessed areas being present on both sides of the seat section; and

the material being covered with exterior padding in the cushioned areas to provide further padding to the cushioned areas and the material being substantially void of exterior padding in the recessed areas to provide further recession to the recessed areas.

4,912,789

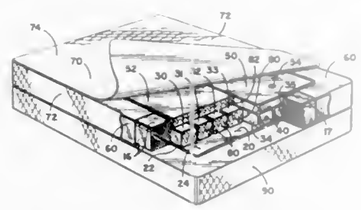
WATERBED MATTRESS

Peter Maxwell, Orange, Calif., assignor to Hi Life Products, Inc., Chino, Calif.

Filed Feb. 6, 1989, Ser. No. 306,589

Int. Cl.[4] A47C *27/10*

U.S. Cl. 5—450 13 Claims



1. A waterbed mattress construction, comprising:

box shaped frame means, made of resilient cushion material,

a base sheet attached to said box shaped frame means, the base member and frame means providing therein a cavity,

a plurality of elongated tubularly shaped water filled containers adjacently disposed in the cavity on said base sheet; and

a pair of flat rectangularly shaped water filled containers adjacently stacked over said elongated tubularly shaped water filled containers, said cavity being substantially filled by said tubularly and rectangularly shaped containers, said rectangularly shaped containers substantially covering said tubularly shaped containers.

4,912,790

FITTED BED SHEETS

Robert Macdonald, R.R. #1, Perth, Canada

Filed Aug. 9, 1988, Ser. No. 230,258

Claims priority, application Canada, Aug. 14, 1987, 544,584

Int. Cl.[4] A47G *9/04*

U.S. Cl. 5—497 9 Claims

1. A fitted bed sheet comprising:

a substantially rectangular main body portion having substantially the same dimensions as a selected mattress;

side portions extending from sides of said main body portion and terminating in longitudinal edges;

end portions extending from ends of said main body portion and terminating in end edges;

substantially vertical corner seams joining said side portions to adjacent said end portions, each seam extending from an inner end at a corner of said main body portion to an outer end at a junction of a longitudinal edge and an end edge, said side edges and said end edges thereby being joined together to define a perimeter; and

elastic attached at said end edges of said perimeter, to permit said sheet to fit snugly around said selected mattress;

said vertical corner seams being at least partly elasticized by a single only piece of elastic material extending from a first selected point on a first said corner seam, down said first seam, across an adjacent said end edge and up an opposite second said corner seam to a second selected point.

4,912,791

PRETREATMENT OF TEXTILE MATERIALS: ALKALINE SCOUR OR BLEACH WITH ORGANO-PHOSPHORUS COMPOUND

Werner Streit, Bobenheim; Wolfgang Schenk, Plankstadt; Matthias Kummer, Mannheim; Johannes P. Dix, Neuhofen, and Alfred Oftring, Bad Duerkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

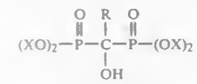
Filed Nov. 7, 1988, Ser. No. 268,339

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1987, 3737890

Int. Cl.[4] D06M *13/26, 1/06;* C11D *7/56;* D06L *1/12*

U.S. Cl. 8—127.1 3 Claims

1 A process for pretreating a textile containing cellulose and other fibers which comprises alkaline scouring and/or bleaching said textile in an aqueous medium containing a compound of the formula:



where R is a C_7-C_9-alkyl, X is H, Na, K or $NR^1R^2R^3R^4$ and R^1, R^2, R^3 and R^4 are each H, C_1-C_4-alkyl or —CH_2—CH_2—OH.

4,912,792

CONTINUOUS FINISH TREATMENT FOR WOOLEN FABRICS

Dieter Riedel, Porta Westfalica, Fed. Rep. of Germany, assignor to Johannes Menschner Maschinenfabrik GmbH & Co. KG, Kampweg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 927,388, Nov. 6, 1986. This application Jun. 29, 1988, Ser. No. 212,903

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1985, 3539792

Int. Cl.[4] D06M *13/16*

U.S. Cl. 8—128.1 11 Claims

1 A method for the continuous treatment of a wool or wool mixture fabric in which the fabric is subjected to a full permanent decatizing and fixing operation in a decatizing apparatus, including the steps of applying to said fabric upstream of said decatizing apparatus a liquid containing a crabbing or setting agent together with at least one hygroscopic substance which

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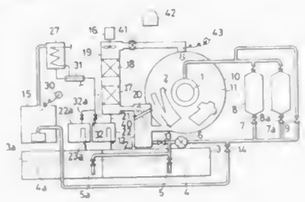
will not damage the fabric, said hygroscopic substance comprising a reaction agent capable of absorbing water by encapsulation, drying the fabric after the application of said liquid, and applying water to the dried fabric immediately prior to passage of said fabric through said decatizing apparatus for said full permanent decatizing and fixing operation, said application of water restoring the fabric to a moisture content of about 20 to 30% by weight in order to activate the crabbing agent and ensure that said crabbing agent is fully effective in said decatizing and fixing operation.

4,912,793

DRY CLEANING METHOD AND APPARATUS

Haruo Hagiwara, Nagoya, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 281,931, Dec. 6, 1988, abandoned, which is a continuation of Ser. No. 72,219, Jul. 10, 1987, abandoned. This application Jul. 24, 1989, Ser. No. 384,843
Claims priority, application Japan, Jul. 17, 1986, 61-168837
Int. Cl.[4] D06F *43/08*
U.S. Cl. 8—158 **3 Claims**



1. A method of dry cleaning, comprising:
drawing a plurality of mixed solvents from a first source into a container;
processing the contents of the container with the plurality of mixed solvents;
passing the plurality of mixed solvents through a fractionating arrangement to separate out the plurality of mixed solvents;
returning the fractionated plurality of mixed solvents to the first source;
drawing a cleaning fluid, having a cleaning characteristic and boiling point different from the plurality of mixed solvents, from a second source into the container;
processing the contents of in the container with the cleaning fluid;
passing the cleaning fluid through a fractionating arrangement to separate out the cleaning fluid;
returning the cleaning fluid to the second source.

4,912,794

BRIDGE HAVING CHORDS CONNECTED TO EACH OTHER BY MEANS OF PLEATED STEEL SHEETS

René Thivans, Gif Sur Yvette, France, assignor to Campenon Bernard BTP, Clichy, France

Filed Mar. 7, 1988, Ser. No. 165,116
Claims priority, application France, Mar. 11, 1987, 87 03337
Int. Cl.[4] E01D *1/00*
U.S. Cl. 14—3 **9 Claims**

1. A bridge having at least one top chord of concrete (1, 10, 15) and a bottom chord of concrete or of metal (2, 11, 16, 17, 20, 21) connected to each other by means of structural elements which afford resistance to shearing forces, wherein the structural elements aforesaid consist essentially of two pleated or corrugated continuous steel sheets (3, 4) extending substantially along the whole length of the bridge and placed on each side of a vertical mid-plane (P) of the bridge, the pleats or corrugations extending in a direction which is substantially perpendicular to the length of the bridge, said two pleated or corrugated continuous steel sheets (3, 4) being adapted to

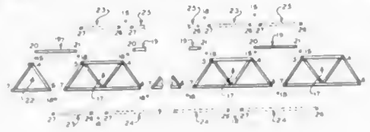
support all the shearing stresses (T_c) perpendicular to said chords.

4,912,795

PREFABRICATED UNIT CONSTRUCTION MODULAR BRIDGING SYSTEM

John R. Johnson, St. Annes-On-Sea, England, assignor to Acrow Corporation of America, Carlstadt, N.J.

Filed Sep. 6, 1988, Ser. No. 240,687
Int. Cl.[4] E01D *9/02*
U.S. Cl. 14—3 **6 Claims**



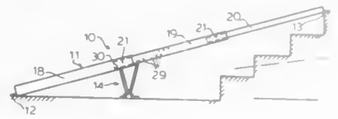
1. A modular bridge truss comprising:
a truss formed from a plurality of interconnected congruent panels having a neutral axis of zero stress when said truss is deflected;
each said panel having parallel, top and bottom chords with said top chord being substantially half the length of said bottom chord;
each said panel having first and second outer diagonal chords of equal length with the ends thereof rigidly connected to the ends of said top and bottom chords to form said panel into the shape of an isosceles trapezoid;
each said panel having a pair of inner diagonal chords rigidly connected between the mid point of said bottom chord to opposite ends of said top chord to divide said panel into three congruent isosceles triangles;
the ends of said bottom and top chords having apertures therein;
a first set of said panels being erected in a vertical plane with said bottom chords connected to each other in a row to form substantially a straight line and joined at said apertures by connecting elements;
a second set of panels, including at least one of said panels, erected in said vertical plane on top of and connected to said first set of panels;
the panels in said second set of panels having the top chords thereof mounted below the bottom chords thereof;
said top chords of both sets of panels being alternately interconnected to each other end-to-end with connecting elements placed in the apertures in the ends thereof to form a substantially straight line of chords along the neutral axis of said truss; and
said bottom chords of said second set of panels connected with connecting elements placed in said apertures in the ends thereof to form substantially a straight line of chords and constituting a top chord of said truss.

4,912,796

ADJUSTABLE HEIGHT WHEELCHAIR RAMP WITH SUPPORTING LEGS

Robert Crump, 333 Guthrie Rd., Louisville, Ky. 40202

Filed Jan. 13, 1989, Ser. No. 296,610
Int. Cl.[4] E01D *15/12*
U.S. Cl. 14—69.5 **17 Claims**



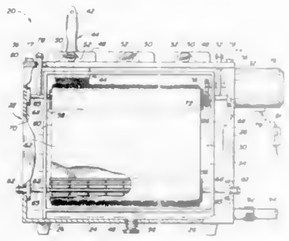
1. An adjustable height wheelchair ramp with supporting legs system comprising:
(a) a pair of ramps each containing a bottom and two sides, wherein each side contains a plurality of adjustment openings and wherein each ramp is composed of a plurality of telescoping sections;
(b) attached to each end of each ramp is a ramp end section; and
(c) attached to each ramp is a height adjustment mechanism comprised of a first and second leg and a generally flat foot wherein said first leg is secured to the bottom of the ramp and to the foot and wherein said second leg is secured to the foot and contains leg hooks which are insertable in the adjustment openings of the ramp.

4,912,797

PAINT BRUSH CLEANING DEVICE

Ted Brackett, 8330 Manchester Blvd., Apt. #5, Playa Del Rey, Calif. 90293

Filed Aug. 4, 1988, Ser. No. 228,139
Int. Cl.[4] A46B *17/06*
U.S. Cl. 15—38 **17 Claims**



1. An improved paint brush cleaning device, said device comprising, in combination:
(a) a housing having closed sides and bottom defining a central space containing paint brush cleaning liquid and an open top accessible to said space and covered by a removable lid; said lid having an opening communicating with said space;
(b) mounting means for removably mounting paint brushes in said opening so as to depend into said space for cleaning by said cleaning liquid;
(c) paint brush cleaning roller means rotatably mounted on opposite sides of said opening in said space for engagement of opposite sides of said paint brushes to contact said paint brushes;
(d) electrical motor means connected to said housing for rotating said rollers to clean said paint brushes;
(e) a plurality of spaced upwardly directed jet nozzles disposed in said central space below said brushes for cleaning the heels of said paint brushes; and,
(f) means for forcefully impelling a stream of said cleaning fluid through each of said nozzles vertically towards said heel so that said stream of fluid and roller means simultaneously act upon the paint brushes to effect cleaning thereof

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4,912,798

SWEEPER CYLINDER ON A STREETCLEANING VEHICLE

Herbert Ganzmann, Hausern, Fed. Rep. of Germany, assignor to Ing. Alfred Schmidt, GmbH, St. Blasien, Fed. Rep. of Germany

Filed Dec. 2, 1988, Ser. No. 279,046
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1987, 3741178
Int. Cl.[4] E01H *5/08*
U.S. Cl. 15—82 **4 Claims**

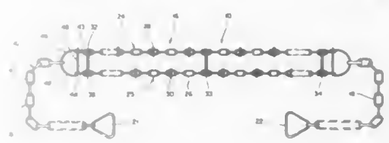
1 Sweeper roller mountable on a streetcleaning vehicle, in particular a snow sweeper replaceably mountable on such a vehicle, said sweeper roller being suspended, vertically swingable and rotatable about a horizontal longitudinal axle thereof capable of being set oblique to a lengthwise direction of the vehicle, the sweeper roller comprising at least a curb-side bearing as viewed in the direction of travel of the vehicle, said bearing including a bearing cover and being provided in a hub region thereof with a guard having an exterior which has a front cone converging towards a bearing axis, said guard being centrically rotatably supported on said bearing cover.

4,912,799

WATER MAIN SCRAPER

Lewis E. Coleman, Jr., 1650 Schooner La., Hanover Park, Ill. 60103

Filed Jan. 30, 1989, Ser. No. 303,119
Int. Cl.[4] B08B *9/02*; B23D *79/00*
U.S. Cl. 15—104.04 **8 Claims**



1 A pipe scraping assembly, comprising: two spaced flexible elongated operator sections each having a handle at one end thereof, a scraper section interconnecting the other ends of the operator sections including two flexible parallel members, and a plurality of scraper members extending transverse to and fixed to the parallel members.

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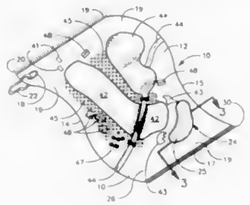
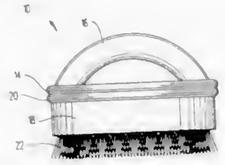
4,912,800
CLEANING DEVICE FOR GOLFERS AND CONSTRUCTION METHOD THEREFOR
Barry Zeltner, Littleton, Colo., assignor to Barrick Partnership, Lakewood, Colo.
Filed Aug. 15, 1988, Ser. No. 232,306
Int. Cl.[4] A44B *21/00*; A47K *10/02*
U.S. Cl. 15—114 **20 Claims**



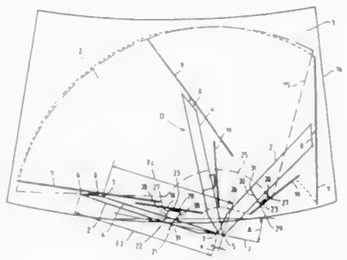
1. A cleaning device which is adapted to be secured to a golf bag for use by a golfer to clean his/her golfing implements and equipment, such as golf clubs, golf shoes, golf balls and the like, comprising:
a towel body constructed of a water absorbent material in the form of a panel having a front surface, a rear surface, a peripheral edge extending therearound and a peripheral margin adjacent the peripheral edge;
a brush member secured to said towel body on the front surface thereof, said brush member including a plurality of stiff, resilient and elongated bristles projecting generally perpendicularly outwardly from said front surface; and
mounting means for releasably mounting said towel body while in use at a point of attachment of said golf bag, said mounting means located in spaced apart relation to said brush member to suspend said brush member in spaced relation from the point of attachment so that said brush member can be easily and effectively maneuvered and employed by the golfer to clean his/her golfing implements and equipment without detaching said towel body from said golf bag.

4,912,801
CAN CLEANING BRUSH
Buster C. Hammill, 5279 Cynthia, Springfield, Oreg. 97478
Filed Dec. 22, 1988, Ser. No. 288,147
Int. Cl.[4] A46B *5/02*
U.S. Cl. 15—160 **7 Claims**



7. A can cleaning brush for cleaning the top surface of beverage cans, comprising:
a cylindrical body member having a central longitudinal bore;
a handle on a first end face of said body member;
a slotted portion on said handle for lifting pull tabs of beverage cans;
a bottle opener on said handle;
a plurality of bristles on a second end face of said body member, said bristles disposed in a circular pattern surrounding said central bore;
a cylindrical sleeve received for reciprocal longitudinal sliding movement around said body member;
a radially outwardly extending circumferential rib on said body member for limiting axial retraction of said sleeve;
an O-ring secured in a circumferential groove around said body member; and
a cooperating circumferential groove in an interior side wall of said sleeve for engagement with said O-ring for retaining said sleeve in an axially extended position.

4,912,802
SCREEN WIPER ASSEMBLY
Bernard Raymond, Paris, France, assignor to Valeo Systems D'Essuyage, Issy-les-Moulineaux, France
Filed Dec. 20, 1988, Ser. No. 286,792
Claims priority, application France, Dec. 24, 1987, 8718153
Int. Cl.[4] B60S *1/32*
U.S. Cl. 15—250.23 **9 Claims**

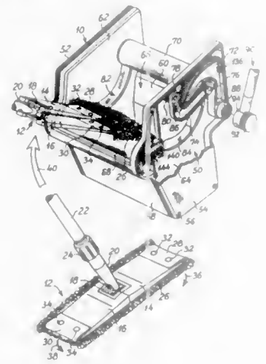


1. A screen wiper assembly comprising: a first arm rotatably mounted about a first fixed axis and a second arm mounted rotatably about a second fixed axis substantially parallel to said first axis but offset with respect thereto, said two arms being substantially parallel with each other, the ends of said arms furthest from said axes of rotation being coupled together by means of a link pivoted on each of said ends, a wiper blade carried by said link, the assembly of said arms being adapted to be driven in oscillating rotary movement, with one of said arms being a driving arm and the other arm being mounted in free rotation about its axis and driven by said link from said driving arm, the effective lengths of said two arms between their said pivots with said link and their axes of rotation being different from each other and so chosen that, at each end of the zone of a surface swept by said assembly, said link, and therefore said wiper blade coupled with said link, assume a different orientation with respect to a plane containing said two axes of rotation of said arms, thus increasing the area of the swept surface, a second wiper blade of substantially shorter length than the first said wiper blade and situated closer to said axes of rotation of said arms, said second wiper blade including a support, and pivot means connecting said support with a portion of each of said arms situated between the said end of the respective arm and its axis of rotation, said pivot means being so arranged that the orientation of said second wiper blade with respect to said first wiper blade is different as between one extreme position of its sweep and the other, thus further increasing the area of the swept surface.

4,912,803
WIPER BLADE RUBBER
Takemasa Yasukawa; Hiroshi Sugita, both of Ichinomiya, and Tetsushi Hiramitsu, Kasugai, all of Japan, assignors to Toyoda Gosei Co., Ltd., Aichi, Japan
Filed Mar. 31, 1983, Ser. No. 480,926
Claims priority, application Japan, Apr. 3, 1982, 57-055589; Apr. 3, 1982, 57-48393[U]
The portion of the term of this patent subsequent to Apr. 3, 2003, has been disclaimed.
Int. Cl.[4] A47L *1/00*
U.S. Cl. 15—250.36 **3 Claims**

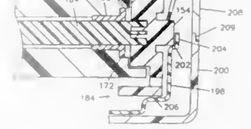
1. In a rubber wiper blade having an elongated shape comprising a rod-shaped base portion and a sliding portion integrally formed with said base portion in one body, said sliding portion including a thin plate-shaped lip, the improvement wherein:
at least said sliding portion having a smooth, substantially uniform surface layer composed of rubber and containing more than 50% by volume of a fine powder lubricant except for the tip end of said lip; and
said rubber surface layer is integrally bonded to and vulcanized with said sliding portion.

4,912,804
MOP WRINGER
John C. Pasbol, Humlebaek, Denmark, assignor to Fr. Ditlevsens Eftr. A/S, Lynge, Denmark
Filed Jul. 22, 1988, Ser. No. 223,785
Int. Cl.[4] A47L *13/60*
U.S. Cl. 15—262 **19 Claims**



1. A mop wringer comprising:
a housing,
a pair of rotatable, wringing rollers having resilient roller bodies, at least one of said rollers being movable between an inactive position in which said rollers are out of contact with one another and in spaced apart relation and an active position in which said rollers are in contact with one another and pressed against one another so as to cause said roller bodies to be deformed and to generate a wringing pressure between said roller bodies, and at least one of said rollers being provided with a drive wheel for receiving rotational motion for causing said rollers to rotate in opposite directions when in said active position, and
actuator means movable from a first position, through a second position and to a third position, and comprising a first and second cam surface and a roller drive means, said first cam surface guiding said movable roller from said inactive position to said active position, when said actuator means is moved from said first position to said second position, said second cam surface locking said movable roller in said second position, when said actuator means is moved from said second position to said third position and when said actuator means is moved from said third position to said second position, and said roller drive means transmitting rotational motion to said drive wheel when said actuator means is moved from said second position to said third position and when said actuator means is moved from said third position to said second position.

4,912,805
DUAL-PURPOSE ROTATING BRUSH FOR VACUUM CLEANER
Charles Z. Krasznai, Trumbull; Michael E. Bitzel, Monroe, and William D. Ryckman, Orange, all of Conn., assignors to Black & Decker Inc., Newark, Del.
Filed Jul. 13, 1988, Ser. No. 218,568
Int. Cl.[4] A47L *5/30*
U.S. Cl. 15—392 **13 Claims**



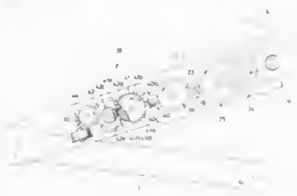
1. A floor tool for a vacuum cleaner comprising:
a brush mounted for rotation upon a brush spindle;
first and second support wheels;
cooperating means in said first and second support wheels and said brush spindle for supporting said brush spindle;
said first and second support wheels each including a hub extending axially therefrom in a first direction;
said floor tool including a support surface upon which said hub is supported against displacement in a first direction;
said floor tool further including a resilient locking tab affixed at a first end to said floor tool;
a second end of said locking tab being free;
said second end being disposed to contact said hub for locking said hub against motion in a second direction opposite to said first direction and to maintain said hub in contact with said first support surface; and
a resilience of said locking tab permitting said second end to be deflected out of locking contact with said hub, whereby said support wheel and said spindle can be installed in and removed from said floor tool.

4,912,806

DOOR CHECK

Makoto Orii, and Katsuhiko Hayashi, both of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Feb. 19, 1988, Ser. No. 157,665
Claims priority, application Japan, Feb. 20, 1987, 62-37029
Int. Cl.[4] E05F *3/00*
U.S. Cl. 16—64 4 Claims



1. A door check comprising:
input gear means for being rotated when a door rotates;
spring means for storing spring energy in accordance with rotation of said input gear means in a door opening direction;
means for transmitting to said input gear means release of the spring energy stored in said spring means;
means for braking the release of the spring energy;
a speed increasing gear train for the released spring energy to said braking means; and
worm gear means having a worm mounted on a worm shaft provided at a final output stage of said speed increasing gear train;
said means for braking comprising:
deformable friction plates having arm portions integrally formed therewith, said plates being supported by said worm shaft; and
a braking cup disposed at an end of said worm shaft so that said braking cup surrounds said plates;
said arm portions being elastically deformed when said worm shaft rotates at high speed so that said arm portions contact said braking cup causing braking of rotations of said worm shaft.

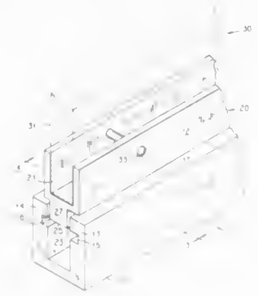
4,912,807

SLIDING DOOR/WINDOW TRACK ASSEMBLY

Clark R. Futch, 1406 S. Dogwood Dr., and Bobbie W. Futch, 1410 Cecil Rd., both of Nashville, Ga. 31639

Filed May 8, 1989, Ser. No. 349,045
Int. Cl.[4] A47H *1/04, 15/00;* E05D *13/02*
U.S. Cl. 16—90 5 Claims

1. A track assembly for slideably supporting a sheet of material for a door comprising:
(a) an elongated track member, each transverse cross-section thereof being approximately symmetrical; the track member including a first side wall which is disposed horizontally and a pair of guides which extend vertically therefrom; the guides being substantially mirror images of each other and spaced apart; the first side wall and the guides comprising a first single, unitary piece formed of plastic;
(b) each guide having an opposing elongated slot which is disposed horizontally;
(c) a frame member, each transverse cross-section thereof being approximately symmetrical; the frame member including a second side wall which is disposed horizontally and above the guides of said track member and a three-sided plug which extends vertically therefrom the plug extending substantially the length of the frame member; the frame member having third and fourth side-walls which extend vertically from the second side wall in a direction away from the plug, the second, third and fourth side walls forming a trough into which an edge of the sheet of material can be inserted; the plug being movable between the guides; the second, third and fourth sidewalls comprising a second single, unitary piece formed of plastic; and



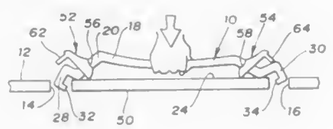
(d) a plurality of keys, each key being generally rectangular in shape and pivotally connected to a single side of the plug; contiguous pairs of keys being spaced apart; the ends of each key riding in the opposing slots.

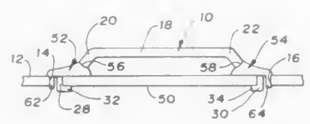
4,912,808

OCCUPANT ASSIST STRAP AND INSTALLATION METHOD

Jan B. Blakely, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 13, 1989, Ser. No. 322,476
Int. Cl.[4] A47B *95/02;* B60N *3/02;* E05B *1/00*
U.S. Cl. 16—114 R 4 Claims





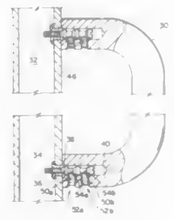
1. A method for installing a vehicle body assist strap device of the type having spaced apart ends adapted for insertion into spaced apart apertures in the body and a central strap extending between the spaced apart ends and being flexible to permit the central strap to be flexed toward and away from the vehicle body, comprising:
providing attaching legs on the ends of the assist strap, said attaching legs being spaced apart equal to the space of the spaced apart apertures of the body to permit insertion into the apertures and each attaching leg having a foot at the end thereof projecting toward the opposite end of the strap so that the space between the feet is less than the than the spacing between the spaced apart apertures of the body, aligning the attaching legs of the assist strap with the apertures of the body,
flexing the assist strap toward the body to pivot the attaching legs away from one another so that the spacing between the feet is increased to permit the feet and the attaching legs to insert into the apertures,
relaxing the assist strap so that the attaching legs are restored to the normal condition with the feet being spaced apart less than the spacing between the spaced apart apertures of the body whereby feet engage with the body to attach the assist strap on the body,
and installing a blocking device in the apertures to block the attaching legs from being again moved to the increased spacing therebetween so that the assist strap will not be removed from the body upon subsequent flexing the of the assist strap toward the body.

4,912,809

TANDEM CONE BOLT ANCHOR MOUNTING ASSEMBLY

Nicholas G. Scheuer, Michigan City, Ind., assignor to Kawneer Company, Inc., Norcross, Ga.

Filed Jan. 11, 1985, Ser. No. 690,603
Int. Cl.[4] A47B *95/02*
U.S. Cl. 16—114 R 15 Claims



3. The apparatus of claim 1, further comprising:
an annular collar axially disposed on said shaft of said anchor bolt between said second frustoconic annular ring and said threaded shank and received within said bore in said door handle;
whereby said annular collar bears against the door stile to dispose said first and second frustoconic annular rings in spaced apart relation to the door stile.

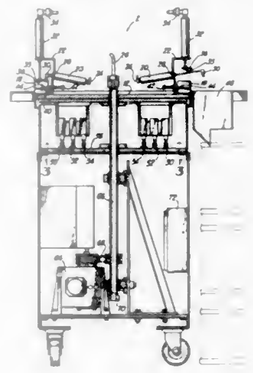
4,912,810

METHOD AND APPARATUS FOR PEELING CRUSTACEANS

Thomas J. Laughlin, Germantown, Tenn., and Donald R. Cowsar, Birmingham, Ala., assignors to Duzitall Equipment Corporation, Baton Rouge, La.

Filed Apr. 22, 1988, Ser. No. 184,626
Int. Cl.[4] D01B *1/04*
U.S. Cl. 17—48 26 Claims

1. A method of mechanically removing the meat from a crustacean, comprising the steps of:
a. loading the tail of said crustacean onto a guide means, dorsal side down;
b. extending said tail so said tail assumes a substantially horizontal position;
c. piercing said tail with the tip of a nozzle connected to a source of pressurized fluid;
d. separating the head and abdominal portions of said crustacean from said tail; and



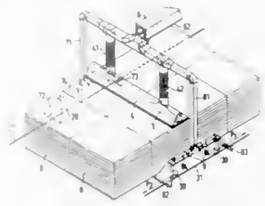
e. expelling said meat from said tail by means of said pressurized fluid from said tip impinging on said meat.

4,912,811

DEVICE TO OPEN FIBER BALES

Johann Walk, Eichstaett, Fed. Rep. of Germany, assignor to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 255,226
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1987, 3734480
Int. Cl.[4] D01G *7/06;* A47L *5/38*
U.S. Cl. 19—80 R 16 Claims



9 A machine for opening a row of bales of fiber, comprising:
(a) a plucking device having means for removing fiber from the upper surfaces of said bales and suction means associated therewith for drawing off fiber removed from said bales by said plucking device;
(b) a carriage for supporting said plucking device, having a plurality of wheels for supporting said carriage for traversing movement alongside said row of bales;
(c) spaced guide rails disposed alongside said row of bales for engaging said wheels for guiding said carriage and said plucking device alongside said row of bales;
(d) cleaning means disposed on said carriage for removing fiber from said guide rails ahead of said wheels as said carriage moves alongside said row of bales; and
(e) suction means for drawing off fiber removed from said rails by said cleaning means which is associated with said suction means for drawing off fibers removed from said bales by said plucking device for transporting said fibers to a common collection point.

VOL 1113 ISS 1 AP 3 1990 UMI

4,912,812

DEVICE FOR CONNECTING THE ENDS OF A TOOTHED BELT

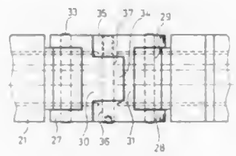
Manfred Henn, Heidelberg, and Herbert Bialek, Neckargemünd, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

Filed Dec. 22, 1988, Ser. No. 289,606

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744098

Int. Cl.[4] F16G *3/00*

U.S. Cl. 24—31 R 14 Claims



1. A device for connecting the ends of a toothed belt, said toothed belt having a plurality of longitudinal reinforcing cords and a plurality of teeth, said device comprising:

a connecting element;

said connecting element including at least two interconnected lock parts;

each of said lock parts having a plurality of holes, each hole for receiving an end of one of said reinforcing cords therein;

each of said ends of said reinforcing cords being connected with one of said lock parts by being force-locked within said hole of its corresponding lock part; and

each of said lock parts being positioned within an area defined by a single tooth of said plurality of teeth.

4,912,813

BELT CONNECTION MECHANISM

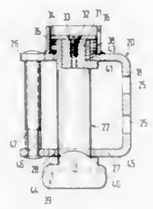
Anton Müller, Aalen-Unterkochen, and Hermann Schinko, Hüttlingen, both of Fed. Rep. of Germany, assignors to Eisen- und Drahtwerk Erlau Aktiengesellschaft, Aalen, Fed. Rep. of Germany

Filed Mar. 4, 1988, Ser. No. 164,176

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1987, 8703372[U]

Int. Cl.[4] B25B *25/00*

U.S. Cl. 24—68 CD 15 Claims



1. A belt connection mechanism having at least one rotatable connection element for a belt having an end, with said connection element being an inelastic rigid structure having ends respectively in two regions, being provided with a grip, and being mounted in a bracket, which has holes for said connection element to extend through, in such a way that said connection element has a longitudinal axis and can be shifted axially out of a locking position against spring force of spring means located on the bracket in a protected wall enclosure attached to said bracket and biasing said connection element in a direction toward the locking position, and thus biased back into said locking position with the aid of said spring force; said belt connection mechanism further comprising:

at least two detents, each extending transverse to the longitudinal axis of said connection element and provided respectively on at least said two end regions of said connection element which is rotatable by at least 360° before any engagement of said detents and as a result of which said belt end is wound onto said connection element, with said detents then engaging in appropriate arresting notches of said bracket in said locking position of said connection element; said connection element is furthermore provided with a pass-through slot for receiving said belt; and said bracket is provided with first abutment means, while said grip of said connection element is provided with second abutment means via which said grip, in said locking position and under said spring force, rests against said first abutment means.

4,912,814

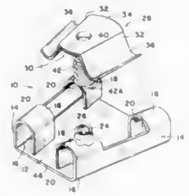
BOLO CLASP

Shirley D. McKenzie, 551 S. Memorial Dr., Tulsa, Okla. 74112

Continuation of Ser. No. 189,392, May 2, 1988, abandoned. This application Aug. 14, 1989, Ser. No. 394,315

Int. Cl.[4] A41D *25/14*

U.S. Cl. 24—115 H 1 Claim



1. A bolo clasp comprising:

a base means carried by the base defining a pair of recesses that open towards each other, said base having an opening therein and a circumferential short, generally tubular integral portion forming a base post positioned between said recess defining means, a clamping member positioned adjacent and parallelled said base and within said recesses, the clamping member having an opening therein and a circumferential short generally tubular portion forming a clamping member post extending towards and in alignment with said base post, means yieldably urging the clamping member away from the base, said yieldable means comprising a coiled compression spring disposed between the base and the clamping member, the coiled compression spring having opposed ends, one end thereof receiving said base post and the other end thereof receiving said clamping member post, and wherein said base is formed of a metal sheet having its edges bent up and over to define two pairs of spaced apart flanges providing said recesses, each of said flanges extending in U-shaped arrangement to close proximity of said base, any space between said flanges and said base being insufficient to permit said clamping member to be displaced laterally with respect to said base, said clamping member having a hat-shaped cross section defining a recess that opens towards the base with opposed ears which extend outward of each other, each of said ears extending between a said pair of flanges whereby said clamping member is guided in its full up and down movement towards and away from said base but restrained by said flanges from being laterally displaced relative to said base.

4,912,815

CLAMP ASSEMBLY

Peter D. Jenkins, Woodbridge, England, assignor to British Telecommunications public limited company, United Kingdom

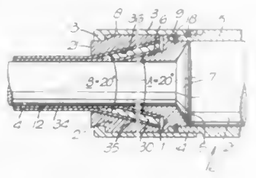
PCT No. PCT/GB87/00032, § 371 Date Sep. 10, 1987, § 102(e) Date Sep. 10, 1987, PCT Pub. No. WO87/04573, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 19, 1987, Ser. No. 124,111

Claims priority, application United Kingdom, Jan. 20, 1986, 8601278

Int. Cl.[4] F16G *11/00*

U.S. Cl. 24—122.3 23 Claims



1. A submarine telecommunications cable armour clamp assembly, for securing the ends of an annulus of longitudinal, tensile load-bearing elements, said assembly comprising:

a pair of rings, a first of which has a tapered out surface and a second of which has a complementary, tapered inner surface,

the tapered out surface of the first ring being roughened so as to enhance its grip on the load bearing elements in use,

the tapered inner surface of the second ring being smooth,

the load-bearing elements being disposed between the complementary tapered surfaces, and

an annular collar threadably connected to an annular housing and retaining said first and second rings between abutment surfaces of the collar and the housing,

said second ring including an end surface which extends in a direction away from said housing and beyond said collar abutment surface for application thereto of externally applied clamping forces.

4,912,816

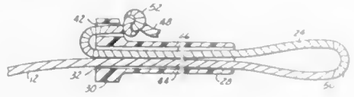
SLIDE AND LINE CLOSURE DEVICE FOR SECURING WATERCRAFT TO A MOORING POST DAVIT, COLUMN OR THE LIKE

Kenneth Brandt, 10403 Sheldon Rd., Plymouth, Mich. 48170

Filed Dec. 14, 1988, Ser. No. 284,209

Int. Cl.[4] F16G *11/00*; B63B *21/00*

U.S. Cl. 24—129 R 16 Claims



1. A device for fastening a line to a post or the like, comprising:

an elongate barrel having an axial bore therethrough, said bore having a cross-sectional area sufficient to slidably receive therein two sections of the line in side-by-side relationship to each other;

a third section of the line being connected with said two sections and extending away from one end of said barrel, said third section of said line forming a slip loop adapted to be positioned around said post such that pulling on one of said sections of the line tightens said slip loop around said post, said two sections frictionally engaging each other; and

a lateral extension on said barrel, said lateral extension including a passageway therethrough for receiving an end of the line therethrough and including an outer surface area surrounding said passageway against which a bulge in the end of the line may bear to secure the line on said device.

4,912,817

GRIPPING DEVICE FOR AN ELONGATED FLEXIBLE MEMBER

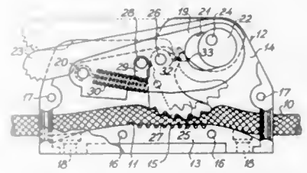
Alf J. Sandreid, Copenhagen, Denmark, assignor to Sophus Berendsen Marine A/S, Copenhagen, Denmark

Filed Jan. 23, 1989, Ser. No. 300,797

Claims priority, application Denmark, Jan. 21, 1988, 278/88

Int. Cl.[4] F16G *11/10*

U.S. Cl. 24—132 R 6 Claims



1. A griping device for selectively locking and releasing an elongated flexible member, such as a rope, extending therethrough, said device comprising

a frame defining a guide surface for guiding the flexible member,

a lever which is swingably mounted in the frame around an axis,

an engaging member which is movably mounted on said lever at a location spaced from said axis, said lever being swingable between an engaging position, in which the engaging member is in engagement with the elongated flexible member so as to clamp the same between the engaging member and the guide surface, and a releasing position, in which the engaging member releases the flexible member, and

an operating device which is movably mounted in the frame for interacting with the lever, and which comprises an eccentric cooperating with the lever and an operating handle connected to the eccentric, so as to move the engaging member between its engaging and releasing positions when the operating device is moved betweena locking position and a releasing position, respectively, and vice versa, said operating device including a force-transmitting member for force-transmittingly cooperating with the engaging member so as to press the engaging member into a tighter engagement with the flexible member, when the operating device is moved towards and beyond its locking position.

4,912,818

BELT ADJUSTING APPARATUS

Paul K. Meeker, Aurora, Ohio, assignor to Spalding & Evenflow Companies, Inc., Tampa, Fla.

Filed Jun. 26, 1989, Ser. No. 371,361

Int. Cl.[4] A47C *31/00*

U.S. Cl. 24—170 10 Claims

1. Belt adjuting apparatus comprising

a first substantially flat plate having opposed ends extending angularly therefrom;

a first slot extending through and laterally across a portion of said first flat plate;

a second slot extending through and laterally across a por-

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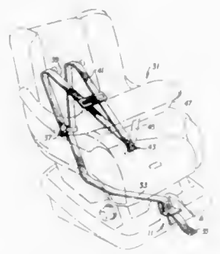
tion of said first flat plate and spaced a predetermined distance from said first slot;

a second substantially flat plate wider than said first slot in said first flat plate and terminating in a reduced section narrower than said first slot;

a third substantially flat plate integral with said reduced section and extending angularly therefrom, said reduced section passing through said first slot in said first flat plate, said third flat plate being in opposed relation to a portion of said first flat plate;



a third slot extending through and laterally across a portion of said second flat plate, said slot being at a greater distance from said reduced section than the distance between said first and second slots in said first flat plate; and

a belt passing between said third flat plate and said first flat plate, through said first slot in said first flat plate, through said third slot in said second flat plate, and through said second slot in said first flat plate.

4,912,819

HOOK ELEMENT FOR SURFACE FASTENERS

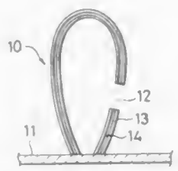
Yasuo Yamada, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Continuation of Ser. No. 126,253, Nov. 25, 1987, abandoned. This application Nov. 8, 1988, Ser. No. 270,438

Claims priority, application Japan, Nov. 26, 1986, 61-180554[U]; Mar. 16, 1987, 62-37219[U]

Int. Cl.[4] A44B *18/00*

U.S. Cl. 24—442 22 Claims



1. A surface fastener comprising:

a substrate in the form of a tape;

a hook element supported on said substrate;

said hook element being made of a thermal plastic monofilamentary material, being thermally set in a hook form and having a peripheral surface configuration to enhance the thermal setting of the hook shape and to enhance the retention of said hook shape, said surface configuration comprising at least one of protrubences in grooves extending longitudinally throughout the length of said hook element, said hook element being dyed with a predetermined color and said surface configuration affording increased surface tension and greater dye pick-up.

4,912,820

APPARATUS FOR STRETCHING A FILM OF PLASTIC MATERIAL

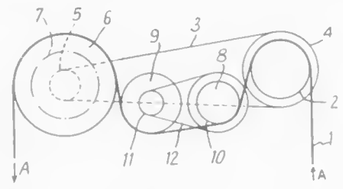
Michel Bregier, Paris, France, assignor to Rebichon Signode, Paris, France

Filed Mar. 2, 1989, Ser. No. 318,224

Claims priority, application France, Mar. 4, 1988, 88 02797

Int. Cl.[4] D06C *3/00*

U.S. Cl. 26—71 6 Claims



1. Apparatus for stretching a film of plastic material, the apparatus comprising a plurality of successive rolls with the film bearing over a sufficient area of each of them to prevent the film from sliding on any of them, said apparatus comprising an upstream roll and a downstream roll which are driven at different peripheral speeds to determine an elongation ratio for the film, together with a plurality of intermediate rolls disposed between said upstream roll and said downstream roll, said intermediate rolls being non-motorized and being mechanically coupled to one another with increasing peripheral speeds in the direction of film travel, with the ratio between the fastest and the slowest intermediate roll speeds corresponding to a determined intermediate elongation of the film which is less than the total elongation provided by the apparatus as a whole.

4,912,821

METHOD OF FORMING CRIMPS IN HIGH TENSILE MODULUS FILAMENTS

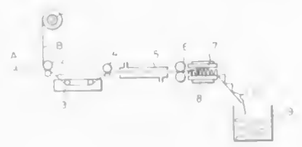
Katsu Mutsuo, Iwakuni, Japan, assignor to Teijin Limited, Osaka, Japan

Filed Jan. 18, 1989, Ser. No. 298,661

Claims priority, application Japan, Jan. 22, 1988, 63-10949

Int. Cl.[4] D02G *1/00, 1/12*

U.S. Cl. 28—265 11 Claims



1. A method of producing crimped high tensile modulus filaments, comprising the steps of:

mixing a plurality of high tensile modulus filaments having a tensile modulus of elasticity of 5,000 kg/mm^2 or more with a plurality of additional filaments having a tensile modulus of elasticity of 3,000 kg/mm^2 or less; and

compression crimping the resultant mixed filaments.

4,912,822

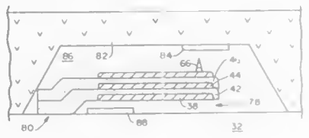
METHOD OF MAKING AN INTEGRATED SCANNING TUNNELING MICROSCOPE

Mark Zdeblick, Los Altos Hills, and Thomas R. Albrecht, Stanford, both of Calif., assignors to Stanford University, Stanford, Calif.

Division of Ser. No. 149,236, Jan. 27, 1988. This application May 8, 1989, Ser. No. 348,707

Int. Cl.[4] H01L *41/22*

U.S. Cl. 29—25.35 19 Claims



1. A method of manufacturing an integrated piezoelectric transducer in the form of a cantilevered beam of piezoelectric material attached to a substrate at one point comprising.

etching a pit in a first surface of said substrate having first and second surfaces, said first and second surfaces related in such a manner that an etch of said first surface, if continued long enough will reach said second surface, said pit in said first surface extending far enough to leave a diaphragm of material between the bottom of said pit and said second surface;

patterning a first electrode over said second surface so as to extend over said pit;

depositing a first layer of piezoelectric material over said first electrode so as to extend over said pit;

forming a second electrode over said first layer of piezoelectric material;

depositing a second layer of piezoelectric material over said second electrode;

forming a third electrode over said second layer of piezoelectric material; and

forming means of making separate electrical contact to each of said electrodes;

etching away the remaining material of said diaphragm at the bottom of said pit to free said cantilever from said substrate except at the point of attachment between said cantilever and said substrate.

4,912,823

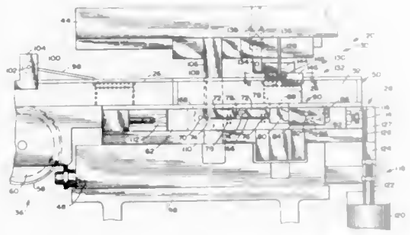
METHOD AND APPARATUS FOR FEEDING AND INDEXING A CONNECTOR

Hasmukh Shah, Wheaton; Henry Zielke, Hoffman Estates; Richard L. Patterson, Riverside, and Thomas P. Pellegrino, Lisle, all of Ill., assignors to Molex Incorporated, Wellington Court, Ill.

Division of Ser. No. 241,286, Sep. 7, 1988. This application Jun. 19, 1989, Ser. No. 371,470

Int. Cl.[4] H01R *43/04*

U.S. Cl. 29—33 M 11 Claims



1. A connector feed system for use in a connector terminating machine including reciprocating tooling for applying wires to connectors having terminals at a predetermined centerline spacing, and feed system comprising:

a connector feed track for supporting connectors to be terminated for movement in a connector feed direction;

a feed member mounted for movement adjacent said feed track;

means for reciprocating said feed member alternately in a retraction stroke opposite to the connector feed direction and in a feed stroke in the connector feed direction; and

pawl means for drivingly engaging the connectors with said feed member during said feed stroke and for releasing the connectors from the feed member during said retraction stroke;

the connector feed system being characterized by:

feed stroke adjustment means for selectively altering the length of said feed stroke in at least one increment equal to the predetermined centerline spacing.

4,912,824

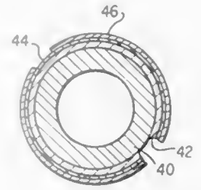
ENGRAVED MICRO-CERAMIC-COATED CYLINDER AND COATING PROCESS THEREFOR

Andrew M. Baran, Richmond, Va., assignor to Inta-Roto Gravure, Inc., Richmond, Va.

Filed Mar. 14, 1989, Ser. No. 322,948

Int. Cl.[4] B22F *7/04*

U.S. Cl. 29—121.2 32 Claims



1. An engraved cylinder for use as a carrier for transfer and application of coating liquids, comprising:

a base cylinder for providing a supporting structure for cylindrical shell strata disposed thereupon;

a substrate disposed upon said base cylinder, said substrate being suited for having cells engraved therein;

said substrate having an engraved pattern of cells thereon to form an engraved substrate wherein each cell has a given cell volume;

a protective stratum deposited upon said engraved substrate, said protective stratum having an abraded outer surface; and,

a superstratum of a ceramic coating over the abraded surface of said protective stratum, said superstratum providing on said engraved cylinder a finished cell pattern of finished cells wherein each finished cell has a given finished-cell volume, said finished cell pattern conforming to said engraved pattern of cells, but wherein said finished-cell volumes are less than the cell volumes of the cells in said engraved pattern.

4,912,825

AUTOMOTIVE VALVE LIFTER AND PUSH ROD EXTRACTOR TOOL

Henry Policella, 108-A Oregon Ave., Bronxville, N.Y. 10708

Filed Jan. 23, 1989, Ser. No. 300,312

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—214 8 Claims

1. An automotive valve lifter and push rod extractor tool for engines which comprises:

(a) a mounting bar;

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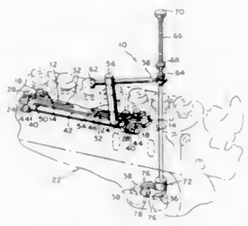
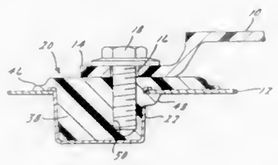
(b) means for removably securing said mounting bar to said engine;
(c) a second bar;
(d) means for pivotally securing said second bar to said mounting bar;
(e) a post;
(f) means for fixedly adjusting the position of said post on said second bar;
(g) a mounting sleeve;
(h) means for rotatively securing said mounting sleeve on said post;
(i) a first rod;



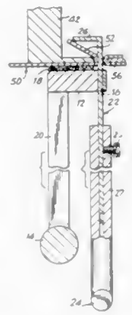
(j) means for rotatively and slideably coupling said first rod to said mounting sleeve;
(k) a second rod;
(l) means for slideably coupling said second rod to said first rod;
(m) a clamp socket;
(n) means for fixedly securing said clamp socket to said second rod;
(o) means for temporally securing said clamp socket to and engine component to be extracted; and
(p) means for applying a pulling force to said second rod whereby said engine component is extracted.

4,912,826
APPARATUS FOR ASSEMBLING BODY PANELS
James R. Dixon, Dexter; Derek F. Gentle, Birmingham; Adam M. Janotik, Grosse Ile; Lawrence P. Kazyak, Northville; Tahir M. Mansour, Livonia; Emmanuel P. Papadakis, Birmingham, and Gordon G. Strosberg, Southfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Division of Ser. No. 59,095, Jun. 8, 1987, abandoned. This application Sep. 26, 1988, Ser. No. 248,656
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—281.1 **5 Claims**



1. An apparatus for mounting a body panel on a subframe of an automotive vehicle, the apparatus comprising in combination:
a plastic body panel;
a metallic subframe;
a plurality of spaced square apertures formed through said subframe;
a plurality of apertures formed through portions of said plastic body panels positioned to be registerable with said subframe apertures;
a plurality of flanged circular cup members insertably engaged in each of said subframe apertures; and
a quantity of heat curable plastic/adhesive, heat cured in situ in each of said cup members and adhesively engaging said cup members and said metallic subframe and having a flat mounting surface spaced outwardly from said cup members to engage said plastic body panels and positioned in certain spaced relationship with respect to said subframe.

4,912,827
METHOD FOR REPLACING A DOOR PANEL
Frank R. Kohut, 107 Columbus St., Bloomfield, N.J. 07003
Filed Sep. 23, 1988, Ser. No. 248,452
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—402.13 **5 Claims**

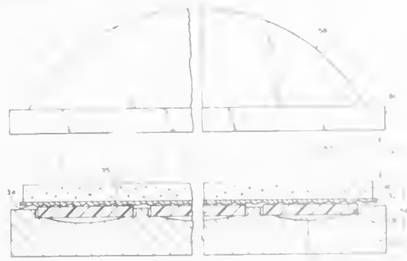


1. A method for replacing a damaged automobile door panel secured to an automobile door frame that is in turn secured to an automobile frame without removing the door frame from the automobile frame, the door frame including a handle, a lock cylinder and a mirror and comprising the steps of removing the mirror, cutting out an inner section of the damaged door panel so that a border remains around the front, rear, top and bottom of the door frame, removing the cut out inner section, removing the handle and the lock cylinder from the door frame, making a plurality of relief cuts in the border at the front bottom and rear of the border, peeling away the border from the door frame, placing a new panel around a front edge of the door frame holding a back end of the new panel out from the door frame, pushing the panel in and around the door frame, crimping a back edge and a bottom edge of the new panel with a hammer and dolly block, crimping the front edge of the new door panel about and door frame by sliding a front edge crimping tool between the door and rear of the fender, and welding the remaining edge of the new door panel.

4,912,828
METHOD OF MANUFACTURING BELT AND BUCKLE ASSEMBLY
Michael Chernuchin, New York, N.Y., and Richard Satin, Swampscott, Mass., assignors to Fashion Technologies, Inc., Waltham, Mass.
Filed Nov. 28, 1988, Ser. No. 276,677
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—434 **10 Claims**

1. A method of manufacturing molded plastic belts designed to simulate the appearance of leather belts, comprising the steps of:
(A) in a single mold, molding a plurality of belt straps front face down from a moldable plastic material while removably securing to the exposed back faces of the belt straps a sheet of release material;

(B) using the release sheet as a carrier for the removal of the plurality of belt straps from the mold and for transport of the plurality of belt straps through a finishing system and performing finishing operations on the belt straps with the finishing system; and
(C) separating the release sheet and the plurality of belt straps and assembling the separated belt straps with belt accessories.
7. A method of manufacturing molded plastic belt buckles designed to simulate the appearance of leather belt buckles, comprising the steps of:

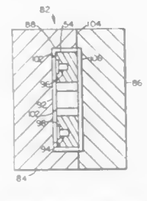


(A) in a single mold, molding a plurality of belt buckles front face down from a moldable plastic material while removably securing to the exposed back faces of the belt buckles a sheet of release material;
(B) using the release sheet as a carrier for the removal of the plurality of belt buckles from the mold and for transport of the plurality of belt buckles through a finishing system and performing finishing operations on the belt buckles with the finishing system;
(C) separating the release sheet and the plurality of belt buckles; and
(D) assembling each separated belt buckle with a belt strap to form a belt.

4,912,829
DRAPERY TIE
Donna M. Hickey, 318 Orchard La., Columbus, Ohio 43214
Continuation of Ser. No. 133,729, Dec. 16, 1987, abandoned. This application Feb. 6, 1989, Ser. No. 307,204
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—453 **2 Claims**

1. In a process wherein wall mounted draperies are installed within a room structure, the improvement comprising:
attaching drapery fabric having a design pattern thereon to a wall structure;
providing a tieback for said drapery fabric, said tieback comprising a length of fabric
providing a tieback fastening means comprising an entarged end structure,
a stud for attaching said enlarged end structure to said wall structure;
a clamp ring having a radial flange and an axial flange for snap fittingly engaging said enlarged end for securing a fabric thereto, said clamp ring radial flange defining an orifice therethrough to display said fabric;
removably securing a covering fabric having a design pattern similar to the fabric design pattern of said drapery between said clamp ring and said enlarged end structure by snap fitting said axial flange of said clamp ring over said covering fabric and onto said enlarged end structure; and attaching said stud to said wall, said tieback and said enlarged end structure.

4,912,830
TARGET
Zeljko Vesligaj, 145 Richard Path, Nissequogue, N.Y. 11780
Division of Ser. No. 225,482, Jul. 28, 1988. This application Apr. 3, 1989, Ser. No. 331,824
Int. Cl.[4] B23P *25/00*
U.S. Cl. 29—458 **2 Claims**

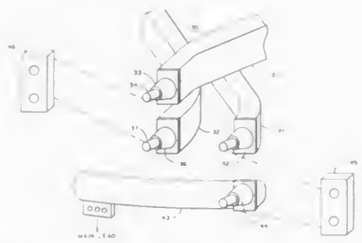


1. A method of manufacturing a plastic sheathed golf head comprising the steps of mounting within a cavity of a first mold a metal weight consisting of a pair of spaced flanks joined by a thin section, each of said flanks having a countersunk hole facing the bottom of said cavity, the bottom surface of said cavity in said first mold having a projection extending into each said countersunk hole, thereby supporting said weight spaced from the walls of said cavity, closing said cavity with a second mold, thereby forming a space between said weight and a bottom surface of said second mold, injecting under high pressure a plastic material, thereby filling the spaces surrounding said weight, cooling said plastic material separating and molds after cooling, removing said molds and each said projection, thereby receiving each projection from its respective hole, and inserting into each of said countersunk holes a cap forming an outer surface of said golf head to complete said golf head.

4,912,831
METHOD FOR ASSEMBLING BOLTED STATOR COILS
Andre J. Levino, Irwin, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Continuation of Ser. No. 280,868, Dec. 7, 1988, abandoned, which is a division of Ser. No. 2,063, Jan. 9, 1987, Pat. No. 4,806,807. This application Jun. 13, 1989, Ser. No. 366,337
Int. Cl.[4] H02K *15/06*
U.S. Cl. 29—596 **9 Claims**

1. A method of building stator coils of an electrical generator, the coils having connected coil section ends, comprising
placing coil sections in the stator,
measuring the spacing and alignments of a pair of coil section ends which are to be connected,
separately machining a connector element with openings having said measured spacing and alignments, said ma-

chining being carried out while other coil sections are being placed, and



clamping said connector element to said coil section ends, said ends being received in said openings.

4,912,832

METHOD FOR MAKING A TIMEPIECE STEPPING MOTOR

Joseph Egger, Pforzheim, and Fritz Brenk, Kampfelbach/Bilfingen, both of Fed. Rep. of Germany, assignors to Timex Corporation, Waterbury, Conn.

Continuation of Ser. No. 281,165, Dec. 8, 1988, abandoned. This application May 22, 1989, Ser. No. 355,865
Int. Cl.[4] H02K *15/00*
U.S. Cl. 29—596 5 Claims

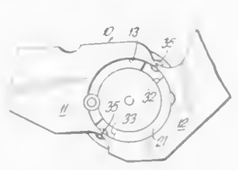
1. Method for making a timepiece stePping motor comprising:
- providing a flat one-piece stator member defining an opening for a rotor and having a pair of diametrically opposed narrow sections on either side of said opening,
- providing a movement frame of plastic material having stator locating means and defining a pair of holes larger than said narrow sections extending through said movement frame,
- locating and attaching said stator to said frame so that said narrow sections span said holes,
- cutting said narrow sections with a laser to sever the stator into two members, and to define gaps therebetween and,
- attaching a coil core assembly member to said stator members and in magnetic circuit therewith.

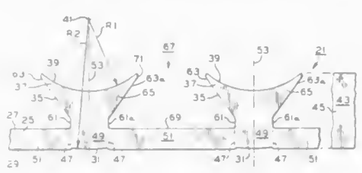
4,912,833

METHOD OF FORMING AN EDGEWISE WOUND CORE AND METHOD OF OPERATING APPARATUS

Harold L. Fritzsche, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 79,379, Jul. 30, 1987, Pat. No. 4,816,711, which is a division of Ser. No. 782,486, Oct. 1, 1985, Pat. No. 4,688,413, which is a division of Ser. No. 660,211, Oct. 12, 1984, Pat. No. 4,613,780. This application Oct. 31, 1988, Ser. No. 264,523
Int. Cl.[4] H02K *15/02*
U.S. Cl. 29—596 51 Claims





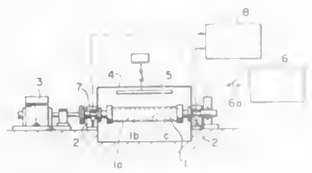
1. A method of forming an edgewise wound core from a lanced strip of generally thin ferromagnetic material, the lanced strip including a yoke section extending generally lengthwise thereof and having a pair of generally opposite edges, a set of spaced apart segments in the yoke section between the opposite edges thereof, a set of junctures in the yoke section between the opposite edges thereof and integrally interconnected between adjacent segments, a set of pitch axes predeterminately positioned generally perpendicular to the opposite edges and equally spaced apart generally lengthwise of the lanced strip, a set of salient pole pieces integrally interconnected with said junctures generally at one of the opposite edges on the yoke section and extending generally laterally therefrom, the salient pole pieces and the junctures being aligned generally about the pitch axes, respectively, the method comprising the steps of:
- moving the lanced strip generally along its length and passing at least the yoke section of the lanced strip through a preselected edgewise deformation path therefor;
- successively constraining at least a part of the one opposite edge on successive segments in the yoke section between adjacent salient pole pieces and at least a part of the other of the opposite edges on the successive segments generally opposite the at least part of the one opposite edge thereon during the passing step, respectively;
- deforming successively and generally edgewise at least a part of the successive segments bounded by the constrained at least part of the one and other opposite edges and maintaining the original lanced configurations of the junctures and the salient pole pieces between the deformed successive segments upon the passage of at least the yoke section of the lanced strip through the preselected edgewise deformation path therefor, respectively;
- effecting the deformation of the lanced strip into a plurality of generally helical convolutions thereof and repositioning the pitch axes to extend generally radially with respect to the helical convolutions of the lanced strip and with the junctures and the salient pole pieces in their original lanced configurations extending in the aligned relation thereof about the repositioned pitch axes in response to the deforming step, respectively;
- accumulating the helical convolutions of the deformed lanced strip in a generally annular stack thereof, respectively;
- disposing the yoke section of the deformed lanced strip in the helical convolutions thereof generally circumferentially about the annular stack and arranging the other opposite edge on the yoke section of the lanced strip in the helical convolutions thereof to form a generally circumferential surface extending about the yoke section across the annular stack during the accumulation step, respectively;
- arranging the deformed segments and the junctures in their original lanced configurations in the yoke section of the deformed lanced strip in the helical convolutions thereof so as to extend generally in sets of row formations thereof about the annular stack and generally axially thereacross and associating the salient pole pieces in their original lanced configurations and aligned relation about the repositioned pitch axes so as to extend in sets of row formations thereof generally axially across the annular stack during the disposing step, respectively;
- severing one of the helical convolutions of the deformed lanced strip at least generally as the annular stock attains a preselected stack height therefor; and
- aligning the sets of the deformed segments, the junctures and the teeth in their original lanced configurations into the row formations thereof generally axially across the annular stack, respectively, thereby to define the edgewise wound core.

4,912,834

METHOD OF ADJUSTING THERMAL BALANCE OF ROTOR

Takashi Watanabe; Ryoichi Shiobara; Masayuki Furuyama, all of Hitachi, and Masao Ohi, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 30, 1988, Ser. No. 238,197
Claims priority, application Japan, Sep. 4, 1987, 62-220169
Int. Cl.[4] H02K *15/02*
U.S. Cl. 29—598 5 Claims



1. A method of adjusting a thermal balance of a rotor provided therein with a heat generating section and a coolant passageway for cooling the heat generating section, said method comprising the steps of
- detecting a difference in shaft-vibration component of the rotor rotating at a predetermined speed between a no-load condition of the rotor and a condition in which the rotor is heated only from the outside of the rotor and, detecting a difference in shaft-vibration component of the rotor rotating at a predetermined speed between a no-load condition of the rotor and a condition in which the rotor is heated only from the inside of the rotor;
- converting the detected differences in shaft-vibration component respectively to differences in shaft-vibration component under a temperature at an actual load condition in accordance with a difference in temperature between the no-load condition and the actual load condition;
- adding the converted differences in shaft-vibration component to each other in a vector manner to obtain a difference in shat-vibration component at the actual load condition; and
- adjusting a flow rate of the coolant within said rotor in response to the vector-added difference in shaft-vibration component so that the vector-added difference in shaft vibration componen t is reduced toward zero.

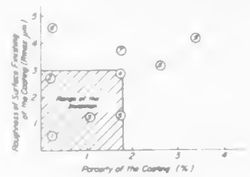
4,912,835

CERMET SPRAYED COATING ROLL WITH SELECTED POROSITY AND SURFACE ROUGHNESS

Yoshio Harada, and Kazumi Tani, both of Hyogo, Japan, assignors to Tocalo Co., Ltd., Kobe, Japan

Filed Sep. 27, 1988, Ser. No. 249,829
Claims priority, application Japan, Sep. 30, 1987, 62-243616
Int. Cl.[4] B21B *27/02*; B05D *1/10*
U.S. Cl. 29—132 5 Claims

1. A roll for use in a rolling process of non-ferrous metals, comprising a roll body having a surface covered with a sprayed coating of cermet, said sprayed coating of cermet



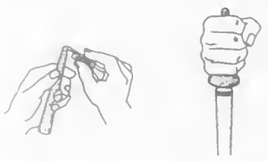
having a porosity of less than 1.8% and having a sprayed coating surface roughness Rmax of less than 3.0 μm.

4,912,836

METHOD OF INSTALLING A SPORTS EQUIPMENT GRIP

Garnie C. Avetoom, 1633 Highland Dr., Newport Beach, Calif. 92660

PCT No. PCT/US88/00331, § 371 Date Sep. 30, 1988, § 102(e) Date Sep. 30, 1988, PCT Pub. No. WO88/05674, PCT Pub. Date Aug. 11, 1988
Continuation-in-part of Ser. No. 8,758, Jan. 30, 1987, abandoned. This PCT application Jan. 29, 1988, Ser. No. 283,527
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—450 5 Claims



1. A method of installing a sports equipment grip over a hardened or worn grip, comprising:
- a. providing an elongated, thin walled, conically shaped, tubular grip closed at its broader end and open at its narrower end, said tubular grip being formed of a latex rubber composition and having an inner wall surface and an outer wall surface;
- b. lubricating said inner wall surface;
- c. clamping said open end of said tubular grip;
- d. folding over said clamped end and a portion of said tubular grip; and,
- e. continuing to fold portions of said tubular grip until said closed end inflates;
- f. pushing inflated end over at least a portion of said hardened or worn grip; and,
- g. releasing said trapped air by loosening the grasped open narrower end and sliding said tubular grip over said hardened or worn grip, said tubular grip rolling over itself to invert said inner and outer wall surfaces.

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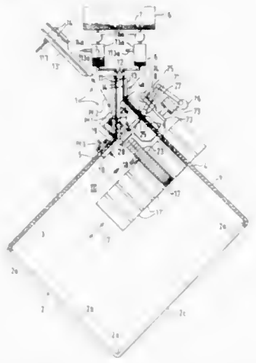
4,912,837

METHOD OF AND APPARATUS FOR MAKING SPACER FRAMES FOR USE IN MULTIPLE-PANE WINDOWS

Franz Bayer, Elzach, Fed. Rep. of Germany, assignor to Franz Xaver Bayer Isolierglasfabrik KG, Elzach, Fed. Rep. of Germany

Filed Dec. 5, 1988, Ser. No. 280,401
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1987, 3740922
Int. Cl.[4] B23P *11/02, 23/04, 25/00*
U.S. Cl. 29—451 58 Claims



1. A method of making a spacer frame for use between the panes of a multiple-pane window, comprising the steps of transforming an elongated hollow tubular blank of ductile material into a polygonal body with a plurality of corners and mutually inclined first and second terminal portions; introducing a flowable desiccant only into at least one of the terminal portions; thereupon converting the first terminal portion into a substantially L-shaped frame member having a first section extending from one of the corners, a second section abutting or adjacent said second terminal portion, and a corner between said sections; and establishing a seal between said second terminal portion and said second section.

9 Apparatus for making a spacer frame for use between the panes of a multiple-pane window from a hollow polygonal body having a plurality of corners and mutually inclined first and second terminal portions each of which is adjacent a corner, comprising means for introducing a flowable desiccant into at least one of the terminal portions so as to only partially fill the at least one terminal portion; means for converting the first terminal portion into a substantially L-shaped frame member having a first section adjacent the respective corner, a second section abutting or adjacent the second terminal portion, and a corner between the first and second sections; and means for establishing a seal between the second terminal portion and the second section.

4,912,838

METHOD OF MANUFACTURING ELECTRODE FOR ELECTROMAGNETIC FLOWMETER

Tsutomu Goto; Toshihide Inami, both of Tokyo, and Masayuki Nemoto, Kanagawa, all of Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1988, Ser. No. 287,862
Claims priority, application Japan, Dec. 25, 1987, 62-327357; Dec. 25, 1987, 62-327358; Dec. 25, 1987, 62-327359; Feb. 8, 1988, 63-14607[U]
Int. Cl.[4] H01F *41/02*
U.S. Cl. 29—602.1 37 Claims

1. A method of manufacturing an electromagnetic flowmeter comprising the steps of:

filling a pair of diametrically opposite insertion holes with a paste, said insertion holes traversing radially a circumferential wall of a measuring pipe made of a ceramic material, said measuring pipe being sintered and dimensionally stable prior to filling with said paste;

heating and solidifying said paste to form electrode members, said electrode members being arranged from the outer surface of said measuring pipe to the inner surface thereof, said electrode members being integrated with said measuring pipe.

4,912,839

ELECTRONIC COMPONENT INSERTION MACHINE

Rodney P. Jackson, Auburn, N.H.; Robert J. Sooy, Marblehead, Mass.; Henry L. Wright, Ipswich, Mass.; William H. Mirley, Jr., North Reading, Mass., and Peter M. Kittredge, Everett, Mass., assignors to Emhart Industries Inc., Towson, Md.

Filed May 19, 1988, Ser. No. 193,343
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—741 3 Claims

1. An electronic component insertion machine for inserting DIP components into a supported circuit board comprising

a cross-beam extending over the supported circuit board,

mounting bracket means secured to the bottom of said cross-beam,

a feeder-inserter assembly including

a supporting plate,

feeder mechanism means secured to said supporting plate, said feeder mechanism means including a plurality of pneumatically operated cylinders and sensor means for sensing the position of at least some of said cylinders,

inserter mechanism means secured to said supporting plate, said inserter mechanism means including a plurality of pneumatically operated cylinders and sensor means for sensing the position of at least some of said cylinders,

valve stack means secured to said supporting plate for pneumatically operating said feeder and inserter cylinders, and

distribution board means secured to said supporting plate for electrically operating said valve stack means and for receiving signals from said sensor means whereby said feeder inserter assembly can be operated either when secured to said machine or at a remote location, and

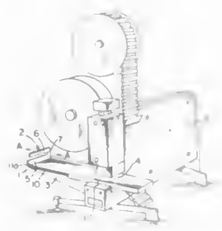
means for releasably securing said supporting plate, and hence, said feeder inserter assembly to said mounting bracket means.

4,912,840

MEASUREMENT APPARATUS FOR USE WITH A CONNECTOR ASSEMBLY APPARATUS

Howard R. Pearce, London, England, assignor to Thomas & Betts Corporation, Bridgewater, N.J.

Filed Sep. 29, 1986, Ser. No. 913,171
Claims priority, application United Kingdom, Oct. 4, 1985, 8524485
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—749 3 Claims



1. In a connector assembly apparatus, a measurement apparatus for accurately positioning a connected on a cable relative to a previously mounted connector, the apparatus comprising a base member, a slotted plate movably mounted perpendicularly with respect to said base member and being adapted for displacement relative to a connector assembly station , the slot being sized to receive the cable but having a depth less than that of the mounted connector so that the cable can pass freely through the slot until the mounted connector is positioned to abut the slotted plate.

4,912,841

DENSE WIRE BUNDLE EXTRACTING TOOL

Rocco Noschese, Wilton, Conn., assignor to Burndy Corporation, Norwalk, Coun.

Filed Oct. 6, 1988, Ser. No. 254,458
Int. Cl.[4] H01R *43/22*
U.S. Cl. 29—764 9 Claims

1. A tool for extracting one lead including a cable and its associated contact from a dense grouping of leads connected to a receptacle, each contact being held in position in an associated bore of the receptacle by means of a locking tab integral with the receptacle and engaged with an annular shoulder on the contact to prevent its inadvertent removal, said tool comprising:

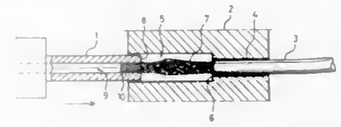
extraction means including jaw means movable between an open position removed from the cable and a closed position, said jaw means, when in the closed position, having an outer diameter at least substantially equal to that of the contact at its annular shoulder and an inner diameter slightly larger than that of the cable and of the contact adjacent its annular shoulder, said jaw means, when in the closed position, being slidably receivable on the cable for movement therealong, whereby upon movement of said jaw means in the closed position along the cable and into engagement with the contact, the locking tab is caused to be disengaged from the annular shoulder enabling unitary withdrawal of the lead and said tool from the receptacle.

4,912,842

METHOD AND DEVICE TO SHAPE A BRAIDED SHEATH IN A CABLE CONSISTING OF AN OUTER COVERING, A BRAIDED SHEATH AND CONDUCTORS

Sven S. Siljekvist, Saltsjö-Boo; Alois A. Bühler, Skärholmen; Kjell O. Hansson, Sollentuna, and Karl B. Uvelius, Malmö, all of Sweden, assignors to Nokia Data Systems AB, Stockholm, Sweden

Continuation of Ser. No. 124,113, Nov. 2, 1987, abandoned. This application Jun. 12, 1989, Ser. No. 364,584
Claims priority, application Sweden, Mar. 11, 1986, 8601134
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—825 4 Claims



1 In a cable consisting of an outer covering, a braided sheath and conductors, and proximate the end of which the outer covering is removed, a method of compressing a portion of said braided sheath thus exposed into a collar shape portion, comprising the steps of:

inserting said end of the cable into a through-hole in a die having a shoulder that divides said through-hole into a first space that only permits passage of the cable end and into a second space that in comparison with said first space is enlarged and surrounds said exposed braided sheath; and

moving a pressure means into said second space, the conductor at the same time gliding into a hole in the pressure means, said pressure means being arranged to press the braided sheath against said shoulder until the braided sheath is compressed into a compact collar-shaped portion.

2. In a cable consisting of an outer covering, a braided sheath and conductors, and proximate the end of which the outer covering is removed, a device for compressing a portion of said braided sheath thus being exposed into a collar-shaped portion, comprising:

a die with a through-hole having in a first part of its length a first space with an inner configuration corresponding to the outer configuration of the cable for enabling passage of the cable, and in an adjacent second part of its length having a second space with an inner configuration greater than the inner configuration of said first space; and

a punch constituting a pressure means with an outer configuration such that it can glide into said second space, said punch having a central hole in which conductors liberated from the sheath can glide, and said punch on its movement into said second space pressing the sheath against a stepped shoulder in the passage between said first space and said second space.

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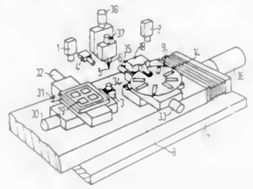
4,912,843
METHOD FOR REPAIRING INTERCONNECT INTERRUPTIONS

Guenter Dederer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 23, 1989, Ser. No. 327,994
Claims priority, application Fed. Rep. of Germany, May 26, 1988, 3817899
Int. Cl.[4] H05K *3/06*
U.S. Cl. 29—846 15 Claims

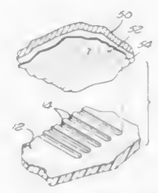


1. A method for repairing interconnect interruptions with congruent preforms, whereby these preforms are joined to the interconnect at both sides of the interconnect interruptions with resistance heating, comprising the steps of:
- viewing each of the following with at least one black/white video camera of first, second and third black/white cameras, respectively;
- a location of the interconnect interruption and an environment thereof,
- a preform congruent with the interconnect interruption and,
- a positioning of the preform with respect to the interconnect interruption;
- monitoring the congruency of the preform and interconnect at the interconnect interruption and the environment thereof by comparing the images of the first and second video cameras; positioning of the preform relative to the interconnect interruption by comparing the images of the first and third video cameras;
- comparing the images of the first, second and third black/-white video cameras on a color monitor to whose three color inputs have connected the black/white video cameras in alternation between the first and second cameras or the first and third cameras.

4,912,844
METHODS OF PRODUCING PRINTED CIRCUIT BOARDS

Frederick Parker, San Diego, Calif., assignor to Dimensional Circuits Corporation, San Diego, Calif.

Filed Aug. 10, 1988, Ser. No. 230,460
Int. Cl.[4] H05K *3/02, 3/04*
U.S. Cl. 29—848 19 Claims

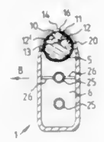


1. In a method of producing a printed circuit board, the steps of:
- providing a board from a material having properties of becoming deformed at local positions when subjected to heat and to pressure at such local positions,
- providing a punch with raised portions shaped to produce grooves and cavities in the printed circuit board at the local positions,
- heating at least the raised portions of the punch,
- applying the punch with the heated raised portions against the printed circuit board to produce the grooves and cavities, which are deeper than the grooves in the printed circuit board at the local positions,
- disposing electrical components in the cavities in the printed circuit board, and
- providing a conductive material in the grooves as leads communicating electrically with the electrical components in the cavities in the printed circuit board.

4,912,845
SHAVER

Shoichi Inoue, 3-12-23 Kitakokubu, Ichikawa-shi, Chiba-ken, Japan

Filed Feb. 17, 1988, Ser. No. 156,714
Int. Cl.[4] B26B *19/14*
U.S. Cl. 30—43.4 7 Claims



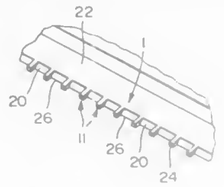
1. A non-electric, manually-operable shaver, comprising
- a manually grippable holder, including a housing having two opposed sidewalls each having an eye at an end thereof,
- a carrier non-rotatably secured in the holder, the carrier being generally cylindrical in shape and defining a longitudinal groove therein, the carrier being mounted in the eyes of the housing and the groove communicates with the eyes to allow shavings to be taken out of the groove through the eyes,
- a single stationary blade fixedly supported by the carrier and having a longitudinally extending cutting edge adjacent to and facing the groove,
- a cylindrical mesh surrounding the blade and carrier and mounted to rotate around the blade and carrier so as to pass first over the groove and then over the blade in order to provide a cutting action between the mesh and the blade adjacent to the longitudinal groove, in which shaver the mesh is pre-formed from a flat sheet of screen material which is rolled to form a cylinder, with the ends of the rolled sheet overlapping by a small circumferential amount and securely fastened together to form a seam and the cylindrical screen being slid axially over the blade and carrier.

4,912,846
DISPOSABLE RAZOR

Ying Ming Yu, 4 Fl., No. 123, Sec. 1, Shin-Sheng S.Rd., Taipei, Taiwan

Filed Mar. 18, 1988, Ser. No. 169,947
Int. Cl.[4] B26B *21/54*
U.S. Cl. 30—81 1 Claim

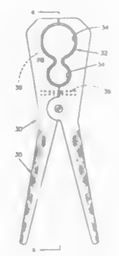
1. A safety razor blade comprising
- a blade body having a substantially planar upper surface with an elongate forward edge portion,
- a row of blunt and smooth convex protrusions spaced along the forward edge portion in a comb-like configuration, the protrusions having upper surfaces coplanar with said upper surface of the blade body, and
- cutting elements located between the protrusions, each cutting element having an upper surface tapering downwardly from said upper surface of the blade body and from said upper surface of said protrusions to a cutting edge so that said upper surface of said cutting elements extends transverse to said upper surface of said blade body and extends transverse to said upper surface of said protrusions, and the protrusions extending above and beyond the respective cutting edges so that during shaving, the protrusions first contact the human skin and the skin enters the space between the protrusions to contact the cutting elements located therebetween, no matter how much force is exerted on the skin by the use of the razor



4,912,847
CUTTING TOOL FOR 'ENTX'-TYPE PLASTIC CONDUIT

William T. Bradshaw, 4391 Parkwest Oval, Cleveland, Ohio 44135

Filed Dec. 5, 1988, Ser. No. 280,238
Int. Cl.[4] B21F *13/00*
U.S. Cl. 30—91.2 9 Claims

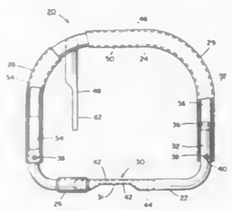


1. A cutting tool for cutting the shell of wire-filled corrugated flexible plastic conduit, the corrugated shell of said conduit having a major outside radius and a minor outside radius and corresponding major inside radius and minor inside radius, which inside radii and outside radii each alternate with a regular period of repetition along the axial direction of said conduit, said tool comprising a first handled jaw and a second handled jaw, said handled jaws pivotally connected and each having an anvil portion and a handle portion, at least the first one of said anvils having in the face thereof that opposes the other anvil a cylindrical concavity to receive said conduit and to restrict motion of said conduit transverse to the axis thereof when said conduit is placed against said first anvil, said first anvil having a knife blade mounted therein such that said blade intersects said concavity normal to the axis thereof with sufficient blade exposure within said concavity to allow said blade to penetrate to a poin within said major inside radius but outside of said minor inside radius of said corrugated shell when said conduit is fully engaged in said concavity, said first anvil also comprising an indexing means displaced from said knife blade by a distance sufficient for said indexing means to engage said corrugated shell at an axial position proximal said minor outside radius thereof while said knife blade engages said corrugated shell at said major outside radius thereof, whereby a conduit supported and properly indexed in said anvils can be cut readily by said knife blade upon squeezing said anvils together while swinging said tool relative to said conduit, but the cut will be always be at an axial location coinciding with said major outside radius as dictated by said indexing means, and only to a limited depth whereby said shell is cut without injury to the wires therein.

4,912,848
POWER TOOL HANDLE

Edward J. Bidmead, Charlotte, N.C., assignor to Textron, Inc., Providence, R.I.

Filed Jan. 9, 1989, Ser. No. 295,115
Int. Cl.[4] B27B *17/02*
U.S. Cl. 30—383 16 Claims



1. A handle for use with an engine-driven hand-held power tool, the handle comprising:
- a first frame member having a center section and two extending side sections forming a general U-shape, said center section being fixedly and stationarily connectable to a power tool;
- a second frame member having a first portion and a second portion, said first portion comprising a center section and two extending side sections forming a general U-shape, said second portion extending away from said first portion;
- means for directly connecting said first member side sections with said second member side sections such that said first member general U-shape and said second member first portion general U-shape form a closed loop handle that can substantially surround a power tool body; and
- at least two handle grips being comprised of a slip resistant vibration absorbing material, said handle grips having a generally tubular shape and being slid onto said second member side sections prior to connection of said first and second members, said handle grips substantially covering said first portion whereby a closed loop handle is provided that is relatively easy to assembly, but which can provide an operator with various grasping locations, added safety and allow for rigid control of a power tool.

4,912,849
SKETCHING AND TRACING INSTRUMENT

Patrick MacCarthy, 5263 Arbutus St., Arvada, Colo. 80002

Filed Jun. 10, 1988, Ser. No. 204,850
Int. Cl.[4] G09F *11/18*
U.S. Cl. 33—1 AA 25 Claims

1. A tracing instrument for producing symmetrical sketches from a symmetrical or non-symmetrical seed drawing, comprising:
- a transparent or translucent base plate;
- an illuminating means for projecting light through said base plate;
- a transparent top plate disposed on an opposite side of said base plate from said illuminating means, and being spaced apart from said base plate such that a narrow space is formed therebetween, wherein said top plate forms a surface to support a tracing paper or the like for tracing thereon;

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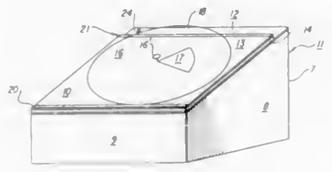
a mounting piece having at least a window therein and being insertable in said narrow space between said base plate and said top plate, wherein the seed drawing is positioned at said window in fixed relationship to said mounting piece, such that light from said illuminating means passes



through said window and seed drawing to form an image on the tracing paper for tracing; and

means for shifting said mounting piece together with said seed drawing positioned at said window with respect to said tracing paper such that said image is projected onto different portions of the paper.

4,912,850

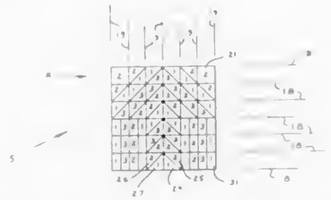
METHOD FOR MAKING DECORATIVE ARTICLES

Juanita Gray, 1258 Dallas St., No. 301, Aurora, Colo. 80010

Filed Aug. 10, 1988, Ser. No. 230,514

Int. Cl.[4] G09B *29/00;* **A41H** *3/00*

U.S. Cl. 33—1 G **9 Claims**



1. Method for making decorative and pictorial mosaic-like articles of art using a plurality of regularly shaped planar colored pieces of material, each of said pieces having either the shape of a square, a triangle or a rectangle, with each of said triangular pieces having the configuration of a triangle produced by a diagonal joining two corners of said square piece, and each of said rectangular pieces having the configuration produced by bisecting said square piece, and said method also using a pattern comprising a coded mosaic-like design having superimposed thereon a grid pattern of intersecting transverse and longitudinal lines which create an array of rows of equally sized squares, and said pattern also having superimposed thereon lines that diagonally bisect selected ones of said grid squares to form triangles and which bisect other selected grid squares to form rectangles, and with a color code number being applied to each unbisected squares and to each of said grid triangles and rectangles, said method comprising the steps of:

(a) determining, in view of said coded pattern, the amount of square, rectangular and triangular pieces of material that will comprise the finished article of art;

(b) fabricating said determined pieces, said pieces having colors according to said color code numbers;

(c) arranging said pieces in an array of rows corresponding to said array of rows shown on said pattern; and

(d) affixing in place said arranged pieces.

4,912,851

LEVEL/PLUMB INDICATOR WITH TILT COMPENSATION

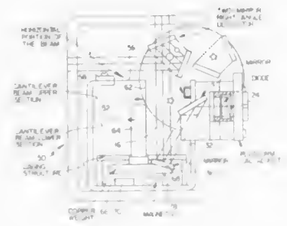
Joseph F. Rando, Los Altos Hills, and Henry L. Schwartz, Los Gatos, both of Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 179,510, Apr. 8, 1988. This application Jul. 6, 1988, Ser. No. 215,678

The portion of the term of this patent subsequent to Aug. 1, 2006, has been disclaimed.

Int. Cl.[4] G02B *7/14;* **G01B** *11/26*

U.S. Cl. 33—227 **19 Claims**



1. A device for projecting a plumb line or an alignment line, comprising,

a housing capable of being placed on a generally horizontal surface,

laser diode means for emitting a visible laser beam, mounted within the housing,

battery means contained within the housing, for powering the laser diode means,

optical means for receiving the light from the laser diode means and delivering a collimated light beam out of the housing, generally vertically upwardly,

compensator means associated with the laser diode means and the optical means, for correcting for small tilt angles of the housing placed on said generally horizontal surface and for assuring that the beam from the optical means is oriented substantially vertically in spite of such small tilt angles, and

a reference marker means associated with the housing, visible to a user when the housing rests on said surface, for aligning the vertical light beam with a desired position on said surface.

4,912,852

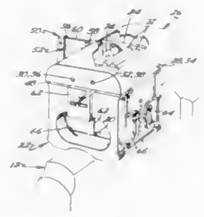
VIEWING APPARATUS

Ronald J. Sanders, P.O. Box 658, Floodwood, Minn. 55736

Division of Ser. No. 855,959, Apr. 25, 1986, Pat. No. 4,734,990. This application Mar. 24, 1988, Ser. No. 172,480

Int. Cl.[4] F41G *1/32*

U.S. Cl. 33—241 **11 Claims**



1. Viewing apparatus for use with weaponry for sighting distant targets comprising, in combination: an enclosed and see

through opening, with the enclosed and see through opening being in close proximity to the eye when the weapon is in a firing position for directing viewing of the distant target therethrough and separating the distant target from its immediate surroundings; means located within the enclosed and see through opening for sighting the distant targets along a single sight line for aiming the weaponry at the target, with the sighting means being at least partially coated with fluorescent material within the enclosed and see through opening; and means located within the enclosed and see through opening and spaced from the sighting means for providing light directed to the fluorescent coating of the sighting means.

4,912,853

RETICLE PLATE AND METHOD FOR ESTABLISHMENT OF A NORTH-ORIENTED OR SOUTH-ORIENTED LINE BY CIRCUMPOLAR ORIENTATION

Michael M. McDonnell, Woodbridge, and Donald P. Dere, Lorton, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 17, 1981, Ser. No. 322,308

Int. Cl.[4] G01B *3/12*

U.S. Cl. 33—228 **10 Claims**

7. A method for location of a direction having a predetermined relationship to selected visual objects using an optical aiming reticle including intersecting hairline elements in a plurality of circles having the intersection of the hairline elements as a common center, each circle being disposed on the reticle in a location alignable with one of the visible objects, comprising:

orientation of the reticle generally in the direction to be established;

aligning each one of the circles with one each of the visible objects to cause the objects to be simultaneously disposed on the circumference of the respective circles; and,

marking the direction sought as being coincident with the intersection of the hairline elements.

4,912,854

CROSS VIAL LIQUID BUBBLE ILLUMINATED LEVEL

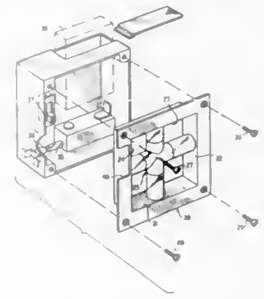
Joseph P. Weadon, 4303 Earline Ave., Columbus, Ga. 31904

Filed Oct. 19, 1988, Ser. No. 259,589

Int. Cl.[4] G01C *9/26, 9/32, 9/34*

U.S. Cl. 33—348.2 **3 Claims**

1. For use with a leveling beam having a web and spaced apart parallel leveling flanges extending off said web at right angles thereto, a modular leveling box comprising four walls each at 90° to one another, the inside surfaces of said walls having a flat non-reflective white surface together with a white back wall and having an opening viewing front defining a viewing chamber, a cross bubble vial having a vertical and horizontal leg at 90° to each other disposed in said viewing chamber defined by said box, the legs of said vial being at 90° to each other and being disposed in said box with each leg parallel to their respective box walls adjacent the walls to which a leg is attached, said legs abutting said inside surfaces of said walls of said modular leveling box at 90°, said cross bubble vial being spaced from said while backwall of said modular



leveling box, beam mount means for said box having a level measuring surface of a length greater than the length of said box to measure the level of planes having a length greater than the length of said modular box, and illumination means for maintaining the light level within the viewing chamber at a light level above ambient to take readings without glare or reflection from outside elements,

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4,912,855

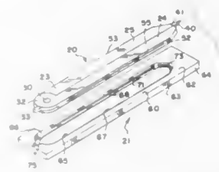
INSTRUMENT AND CASE

Herbert A. Tatelbame, 6724 N. Kimball Ave., Lincolnwood, Ill. 60645

Filed Nov. 30, 1988, Ser. No. 277,771

Int. Cl.[4] G01B *3/16*

U.S. Cl. 33—558.01 **16 Claims**



1. The combination of an instrument and case comprising:

an instrument having legs pivotally connected at one end with the opposite ends of said legs being selectively movable between a closed position adjacent each other and an open position spaced from each other;

a relatively flat case having an upper surface defining an opening with a side wall conforming generally to the shape of the instrument such that the instrument may be placed therein, at least a portion of said opening extending through the entire thickness of the case between its upper and lower surfaces;

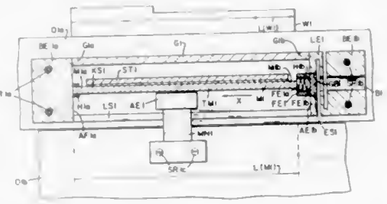
one of the instrument and said side wall having protruding attaching means extending therefrom; and,

the other of the instrument and said side wall having retention means for engaging said attaching means, whereby the instrument may be forcefully positioned in the case opening by manual action so that said attaching means embraces said retention means to releasably hold the instrument in the case and may be removed from the case opening by manual action against an exposed part of the instrument.

4,912,856
POSITION MEASURING DEVICE

Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jun. 10, 1988, Ser. No. 205,452
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1987, 3719409
Int. Cl.[4] G01B 11/04
U.S. Cl. 33—702 10 Claims

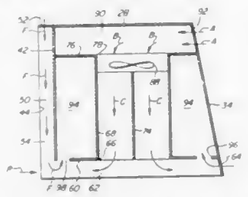


1. In a position measuring device for measuring the relative positions of a first and a second object, wherein the first and second objects to be measured are machine components of a processing or working machine or a measuring machine for tools, the position measuring device including a scale with a graduation connected to the first object, the graduation being scanned by a scanning unit connected to the second object, the scale being arranged on a scale carrier so as to be slightly displaceable in a measuring direction, the scale carrier being connected with both ends thereof to fastening elements which are rigidly connected to the first object, a workpiece being mounted on the first object, the improvement comprising the scale carrier being connected at least at one end thereof to one of the fastening elements with a translatory degree of freedom in measuring direction when the scale, the scale carrier and the workpiece have different thermal expansion, a spring element for biasing the scale at least at one end thereof, the spring element being connected to the translatory movable end of the scale carrier, the spring constant of the spring element being selected so that when temperature changes occur the relative change in length of the scale is equal to the relative change in length of the workpiece.

4,912,857
COOLING AND EXHAUST UNIT FOR SOLDER REFLOW SYSTEM

Francois Parent, Montreal; Carlos Deambrosio, Candiac, and John Gileta, Chateauguay, all of Canada, assignors to Electrovert Ltd., Toronto, Canada

Continuation of Ser. No. 258,566, Oct. 17, 1988, abandoned. This application Jul. 12, 1989, Ser. No. 378,856
Int. Cl.[4] F26B 25/08
U.S. Cl. 34—148 8 Claims



1. A combined cooling and exhaust apparatus for use with a soldering machine having a process section operating at high temperature and a conveyor for carrying products to be soldered through the process section where soldering takes place, the cooling and exhaust apparatus being mountable on the soldering machine above the conveyor at a location where the conveyor exits the process section and comprising within a housing first means for directing cooling air downwardly on to the conveyor at a location between a forward end and a rear end of the apparatus, means for exhausting air and fumes from the apparatus and including a first exhaust inlet proximate the forward end and a second exhaust inlet proximate the rear end, and second means for directing cooling air downwardly to the conveyor at a location between the first exhaust inlet and the exist end of the process section, whereby suction of process air from the process section into the cooling and exhausting apparatus is reduced by said second means.

4,912,858
FOOTWEAR

Hideto Mochizuki, 79, Fukadadai, Yokosuka-si, Kanagawa 238, Japan, assignor to Hideto Mochizuki, Fanagawa and Michiel Ohkubo, Shizuoka, both of, Japan

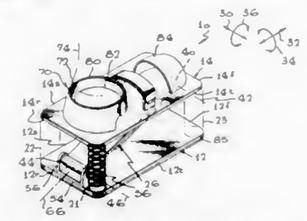
PCT No. PCT/JP87/00437, § 371 Date Feb. 27, 1989, § 102(e) Date Feb. 27, 1989, PCT Pub. No. WO89/00016, PCT Pub. Date Jan. 12, 1989
PCT Filed Jun. 29, 1987, Ser. No. 320,308
Int. Cl.[4] A43B 7/06
U.S. Cl. 36—3 B 3 Claims

1. Footwear having a sole consisting of at least an upper member and a lower member which are bonded together, said upper member being formed with a plurality of holes penetrating it in the thickness direction, said lower member having its upper surface formed with grooves each having a stem portion communicating with a corresponding one of said holes and an end portion open on the side of said lower member, said end portion of said grooves being deeper than said stem portion, the top of said upper member communicating with the side of said lower member through ventilation holes consisting of said holes and grooves.

4,912,859
SPRING SHOE

Gary Ritts, 2340 N. Cahuenga Blvd., Los Angeles, Calif. 90068

Filed Jan. 23, 1989, Ser. No. 300,493
Int. Cl.[4] A43B 3/10, 13/18
U.S. Cl. 36—7.8 6 Claims



1. A spring shoe apparatus comprising:
a bottom plate having opposite first and second end portions spaced apart along a longitudinal direction;
a top plate lying over said bottom plate and spaced therefrom, said top plate having a foot engaging device that holds to a wearer's foot, said top plate having opposite first and second end portions lying respectively over and spaced from said first and second end portions of said bottom plate;
spring means coupling said top and bottom plates and resiliently biasing apart both their first end portions and their second end portions;
a cross bar having a first end coupled to said first end portion of said top plate to pivot about a first axis on said top plate, and having a second end coupled to said second end portion of said bottom plate to pivot about a second axis on said bottom plate, said first and second axes extending substantially perpendicular to said longitudinal direction and parallel to each other, said cross bar being rigid to resist twisting and sideward bending.

4,912,860
DUAL-HEIGHT WADER

Robert W. Keller, 10760 Bill Point Dr., Bainbridge Island, Wash. 98110

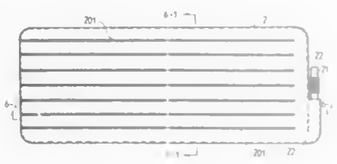
Filed May 30, 1989, Ser. No. 358,635
Int. Cl.[4] A43B 1/10; A41D 13/02
U.S. Cl. 36—4 20 Claims

1. A waterproof wader system, adjustable as to provide varying degrees of user body protection, comprising:
a first portion comprising a waist-high wader; and
a second extendable chest protective portion connected to said first portion, said second portion adapted to be worn in both a first lowered position folded inside said first portion and a second extended position extending upwardly from said first portion over a user's upper chest area.

4,912,861
REMOVABLE PRESSURE-ADJUSTABLE SHOCK-ABSORBING CUSHION DEVICE WITH AN INFLATION PUMP FOR SPORTS GOODS

Ing-Chung Huang, No. 15 REh-Her 1st Street, Kaohsiung, Taiwan

Filed Apr. 11, 1988, Ser. No. 180,288
Int. Cl.[4] A43B 13/20
U.S. Cl. 36—29 10 Claims

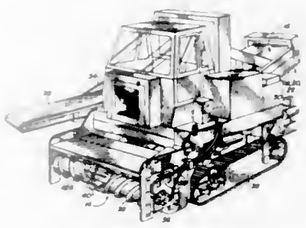


1. A removable, pressure-adjustable, shock-absorbing cushion device for sports goods, comprising:
(a) a pressurizable cushion having generally planar upper and lower sheets of synthetic plastic material, said sheets being superimposed and bounding an interior space, said sheets extending lengthwise along a longitudinal direction and widthwise along a transverse direction generally perpendicular to the longitudinal direction, said sheets having a common peripheral edge and an inlet extending through the peripheral edge;
(b) a plurality of upper recesses formed in the upper sheet, each upper recess having an open upper end generally located in the plane of the upper sheet, and a pair of upper side walls extending away from a respective upper end toward the lower sheet and terminating in a closed upper end;
(c) a plurality of lower recesses formed in the lower sheet, each lower recess having an open lower end generally located in the plane of the lower sheet, and a pair of lower side walls extending away from a respective lower end toward the upper sheet and terminating in a closed lower end;
(d) each upper recess being aligned and symmetrical with a respective lower recess, and each closed upper end of a respective upper recess being integral with each closed lower end of a respective lower recess to form a common closed end for each pair of aligned upper and lower recesses, said common closed end being located between the upper and lower sheets and connecting the upper and lower sheets together at each said common closed end; and
(e) means at the inlet for admitting a fluid under pressure into the entire interior space of the cushion to space the upper and lower sheets apart from each other, said spaced-apart upper and lower sheets still generally lying in respective planes and being free of upstanding projections.

4,912,862
BACKFILL MACHINE

William B. Bishop, P.O. Box 517, Flagstaff, Ariz. 86002, and Francis G. Davies, 8400 N. Highway 89, Flagstaff, Ariz. 86004

Filed Jan. 9, 1989, Ser. No. 294,359
Int. Cl.[4] E02F 1/00
U.S. Cl. 37—142.5 12 Claims



1. A machine for backfilling an excavated trench, the backfilling machine being adapted for continuous mobile operation over a berm containing raw materials, the berm being adjacent the excavated trench, the backfilling machine comprising:
means for picking up at least a portion of the raw materials from the berm;
means for producing at least one grade of fine material from the raw material;
first means for transporting the raw material from said means for picking up the raw material to said means for producing at least one grade of fine material; and
second means for transporting said at least one grade of fine material from said means for producing at least one grade of fine material to a position in the trench at a point which is longitudinally forward of said means for picking up and

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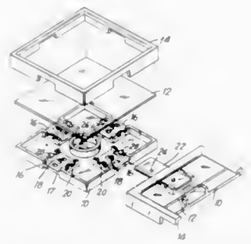
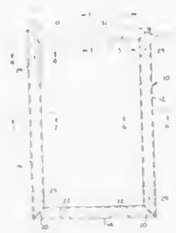
longitudinally forward of said means for producing said at least one grade of fine material.

4,912,863
MODULAR PICTURE FRAME SYSTEM
Fitzgerald Harvey, 109-32 208th St., Queens Village, N.Y. 11429
Filed Sep. 30, 1988, Ser. No. 252,563
Int. Cl.[4] G09F *1/12*
U.S. Cl. 40—152 14 Claims



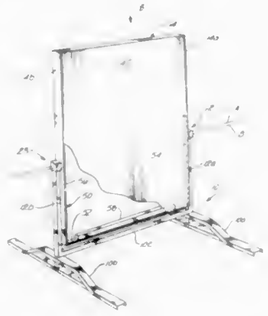
1. A modular picture frame for use in conjunction with at least one other said modular picture frame to provide an assemblage of said frames, said modular picture frame comprising:
a base member formed from a substantially rigid material, said base member having a symmetrical array of slots, each slot opening into the periphery of said base member and being for the reception of a connection bar, said slots being so located that each said slot can be aligned with a said slot in a corresponding base of said other picture frame;
said slots each being sized and formed to receive one end of a rigid eleongate connection bar and including a holding and positioning pin for a reception in a corresponding aperture in an end of a said connecting bar, each said slot being provided with resilient snap lugs adapted to snap over a said end of a said connecting bar to secure said connecting bar within said slot and engaged over and located by said holding and positioning pin; and ,
a frame member positionable over said base member and securable thereto to hold and secure a picture positioned over said base and within said frame member.

4,912,864
MAGNETIZED PICTURE FRAME
Ruth A. Price, 598 Lake Meade Dr., East Berlin, Pa. 17316
Filed Dec. 12, 1988, Ser. No. 283,452
Int. Cl.[4] A47G *1/06;* G09F *1/12*
U.S. Cl. 40—155 4 Claims



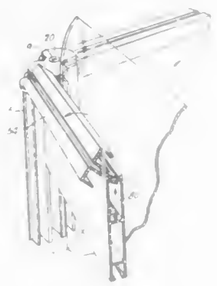
1. A rectangular frame for displaying a sheet of informational material on an outer surface of a refrigerator or other steel surface:
said frame being comprised of four tubes extending right angularly from one another in planar alignment; the ends of each tube being cut on the bias at a forty five degree angle to form miter joints at the frame corners;
full length slots in the inner facing surfaces of the tubes for accommodating edge areas of a sheet of material;
an elongated slot (**32**) in the outer surface of one of the tubes permitting insertion of a sheet into the frame;
L-shaped tube connectors (**22**) inserted into the ends of the meeting tubes at the four miter joints;
each tube connector having two legs (**24** and **26**) extending at right angles to each other, and a slot (**27**) extending completely through one leg and partway through the other leg;
the slots in the L-shaped connectors being aligned with the slots in the inner facing surfaces of the tubes and said elongated slot in the outer surface of one of the tubes so that when a sheet of material is inserted through the elongated slot edge areas of the sheet will extend through the slots in the facing surfaces of the tubes into the slots in the L-shaped connectors.

4,912,865
MULTI-AXIS PIVOTING DISPLAY SIGN
Steven J. Ellsworth, Walnut; Richard N. Philippi, Garden Grove, and James E. Ahrens, Hacienda Heights, all of Calif., assignors to Couch & Philippi, Inc., Stanton, Calif.
Filed Oct. 19, 1988, Ser. No. 260,306
Int. Cl.[4] G09F *7/00*
U.S. Cl. 40—602 12 Claims



1. A display sign comprising:
(a) a normally vertical display panel having first and second sides and at least one exposed face, between the sides, for information;
(b) a base for supporting the display panel;
(c) first and second side supports mounted on said base and positioned adjacent corresponding said first and second sides, respectively; and
(d) first and second horizontally spaced apart pivots for supporting the display panel from the first side support and first and second horizontally spaced apart pivots for supporting the display panel from the second side support, the display panel rotating about a first axis of rotation through the first pivots as the sign panel is forced to move in a first direction and the display panel rotating about a second axis of rotation through the second pivots, as the display panel is forced to move in a second direction.

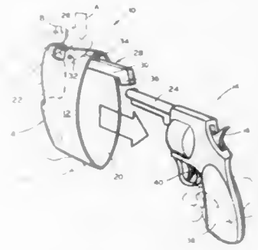
4,912,866
DISPLAY FRAME
Brian C. Bannister, North Mymms, and James N. Morgan, London, both of England, assignors to Marler Haley Exposystems Limited, Hatfield, England
Filed May 18, 1988, Ser. No. 195,727
Claims priority, application United Kingdom, May 22, 1987, 8712171
Int. Cl.[4] G09F *7/00*
U.S. Cl. 40—605 6 Claims



1. In a display panel comprising two spaced-apart uprights connected by upper and lower cross-members, the uprights providing on at least one side thereof opposed channels to receive opposite edges of a rectangular sheet fitted between the uprights across the cross members, the lower cross-member providing, or carrying a member providing, an upwardly open channel to receive the lower edge of such a sheet, the improvement comprising: a displaceable retaining member, having a central formation, with the upper cross member providing a central upwardly open channel to receive the central formation of said displaceable retaining member, extending upwardly from said channel and affording, outside said central channel, a downwardly open channel to receive the upper edge of such a sheet and the adjacent side wall of said central channel of the upper cross member, the side walls of said central channel having inwardly directed flanges along their upper edges and said central formation of said displaceable retaining member being so dimensioned as to be held captive in said central channel of said upper cross member by said inwardly directed flanges but to allow lateral tilting of said displaceable retaining member in the upper region of said upwardly open channel, so as to have clearance, in the tilted position, for insertion of such a rectangular sheet to have its edges retained in said channels of the uprights, the retaining member being thereafter returnable to an upright position for lowering into said central channel to extend said channel of the retaining member over the upper edge of said sheet.

4,912,867
FIREARM SAFETY APPARATUS AND METHOD OF USING SAME
Paul R. Dukes, Jr., 520 W. Harrison St., Maumee, Ohio 43537
Filed Aug. 31, 1989, Ser. No. 401,061
Int. Cl.[4] F41C *27/00*
U.S. Cl. 42—70.11 7 Claims

1. A firearm safety apparatus comprising:
(a) a main portion including a sleeve having rear and front ends, the rear end being open to receive the trigger assembly of an associated firearm, said sleeve being formed of a flexible material capable of being flexed from a normal position to a flexed position to receive an associated firearm and to return to the normal position after being flexed; and



(b) spring urged lever means rotatably mounted within said sleeve to effectively lock the hammer of the associated firearm in an uncocked position.

4,912,868
MUZZLE LOADING CONVERSION UNIT FOR SHOTGUNS
Earl E. Thompson, 33 Navajo Rd., Brunswick, Ga. 31520
Filed May 11, 1989, Ser. No. 350,448
Int. Cl.[4] F41C *21/22*
U.S. Cl. 42—77 7 Claims

7. The method of converting a slide action semiautomatic shotgun with a quick change barrel and having a magazine with a magazine follower and end cap to a muzzle loading rifle consisting of the steps of mounting a rifle barrel in exactly the same place as the shotgun barrel, providing an aperture in the magazine cap, providing a threaded stud on the magazine follower, providing underlug structure on the rifle barrel in alignment with the magazine cap and follower and inserting a ramrod through the underlug structure, the aperture in the magazine end cap and threading the ramrod to the stud on the follower.

4,912,869
NET GUN
Peter Govett, Castle Hill, Australia, assignor to Tetra Industries Pty. Limited, Sefton, Australia
Filed Nov. 2, 1988, Ser. No. 265,995
Claims priority, application Australia, Nov. 2, 1987, PI5184
Int. Cl.[4] F41B *15/00*
U.S. Cl. 42—105 7 Claims

1. A net gun comprising a stock, an action, a firing chamber,

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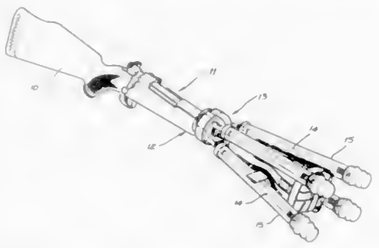
a manifold and a plurality of barrels connected to the manifold, each of said barrels being adapted to receive a projectile which



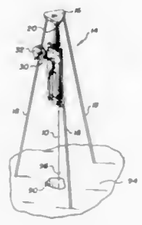
has an inner bore that is a close fit over an external diameter of the barrel.

4,912,870

ICE FISHING APPARATUS WITH SELF HOOK SETTING MEANS

Vincent R. Smoluk, 2690 Garcia Street, Merritt, British Columbia, Canada

Filed May 24, 1988, Ser. No. 197,928
Int. Cl.[4] A01K *97/01*
U.S. Cl. 43—15 8 Claims



1. An apparatus to strike a fishing line comprising:

a base;

means to mount a reel for fishing line on the base;

guides on the base for a fishing line; and

means to impart a rapid upward motion to the line, said means comprising a frame, pivotally mounted on the base at an upper edge of the frame and pivotable from a captive to a free position;

a spiral at a lower edge of the frame to engage a fishing line so that, as the frame moves from the captive to the free position, the line is moved upwardly;

a catch to hold the frame in a captive position, the catch extending from a pivotal mount for the catch, across the frame to a trigger pivotably mounted on the base, adjacent an upper edge of the frame, and having an opening to engage the catch;

means to attach fishing line to the trigger whereby a pull on the line pivots the trigger to release the catch to release the frame to strike the line; and

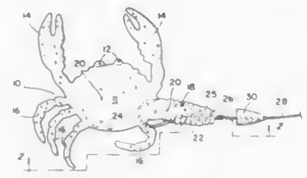
means to vary the force needed to release the trigger comprising a threaded member extending downwardly to attach to the trigger at a point on the opposite side of the pivotal mount from the catch, whereby extension and retraction of the threaded member moves the trigger relative to the catch.

4,912,871

CRAB LURE

Todd M. Brady, 305 E. 88th St., Lafourche, Galliano, La. 70354

Filed Jan. 6, 1989, Ser. No. 294,009
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.26 13 Claims



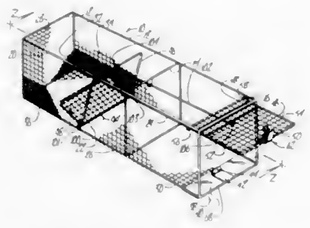
1. An artificial crab lure for use with a hook, said crab lure comprising a unitary and integral crab body defined by a center body portion, a plurality of outer extremities including legs, and a shank projecting outwardly from the center body portion, said crab body being formed entirely of a solid molding of a soft resilient material, said crab body being characterized in that said outer extremities and said shank are capable of up and down, side to side, and rotational movements with respect to said center body portion, said shak being cylindrical in shape and having a thickness which is greater than the thickness of said legs, whereby said shank is adapted to have a hook passed longitudinally within said shank, such that a substantial portion of said hook is embedded in said shank for securing said crab body with respect to a fishing line, said crab body simulating the movement of a living crab when pulled in water by means of said line.

4,912,872

LIVE ANIMAL TRAP

Patrick Wynn, Albia, and Roger Hopkins, Moravia, both of Iowa, assignors to Kness Manufacturing Co., Inc., Albia, Iowa

Continuation of Ser. No. 242,637, Sep. 12, 1988, abandoned. This application Sep. 6, 1989, Ser. No. 403,643
Int. Cl.[4] A01M *23/02*
U.S. Cl. 43—61 6 Claims



1. An animal trap comprising:

a housing having forward and rear ends and including a top wall, a bottom wall, opposite side walls, a rear wall at said rear end thereof, and a door opening at said forward end thereof;

a door having a top edge, a bottom edge, and opposite side edges, said top edge being hinged to said top wall adjacent said forward end of said housing for pivotal movement about a horizontal door axis from an open position wherein said door extends above and forwardly from said door opening and is out of covering relation over said door opening for permitting access of an animal into the interior of said housing, to a closed position in covering relation over said door opening to prevent an animal within said housing from exiting through said door opening, the location of said door when said door is in said open position being such that said door will swing downwardly and rearwardly by gravity from said open to said closed position;

a trip treadle pivotally mounted within said housing adjacent said rearward end thereof for pivotal movement about a horizontal treadle axis from a set position to a sprung position, said treadle being responsive to the weight of said animal thereon to move from said set position to said spring position;

linkage means having a rear linkage end connected to said trip treadle and a forward linkage end adjacent said door, said forward linkage end being in supporting engagement with said door and holding said door in said open position when said treadle is in said set position, said forward linkage end moving out of supporting engagement with said door in response to movement of said treadle to said sprung position whereby said door will fall by gravity from said open to said closed positions;

a latch stop connected to said bottom wall and positioned in spaced relation forwardly of said bottom edge of said door when said door is in said closed position;

a latch link having a rear latch link end pivotally mounted to said door about a horizontal latch axis adjacent said bottom edge of said door, and having a forward latch link end extending forwardly from said bottom edge of said door and retentively engaging said latch stop when said door is in said closed position;

a latch handle having a lower end connected to said forward end of said latch link and having an upper end extending upwardly therefrom, said upper end of said latch handle having an opening extending therethrough;

a spring pin having a rear end pivotally connected to said door for pivotal movement about a spring pin axis spaced above said latch axis and having a forward end extending through said eyelet of said handle;

spring means compressed between said rear end of said spring pin and said handle whereby said forward end of said latch link is pivotally movable about said latch axis against the bias of said spring means for movement from a latched position wherein said forward end of said latch link retentively engages said latch stop for holding said door in said closed position to an unlatched position out of engagement with said latch stop for freeing said door to move to said open position.

4,912,873

REMOVAL OF POLAR IMPURITIES FROM DIESEL AND JET FUEL

Zaida Diaz, Houston, and James H. Miller, Katy, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 17, 1989, Ser. No. 310,989
Int. Cl.[4] C10L *1/22*
U.S. Cl. 44—57 3 Claims

1. A process for the removal of polar impurities in diesel or jet fuel comprising treating the diesel or jet fuel with a non-ionic macroreticular cross-linked acrylic aliphatic ester resin to effect removal of the polar impurities.

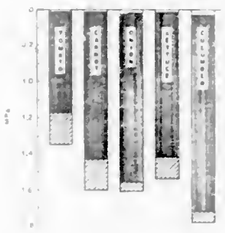
4,912,874

SOLID MATRIX PRIMING OF SEEDS

Alan G. Taylor, 532 Nursery Ave., Geneva, N.Y. 14456

Filed Apr. 3, 1987, Ser. No. 34,812
Int. Cl.[4] A01G *7/00*
U.S. Cl. 47—58 10 Claims

1. A method of osmoconditioning seeds which comprises admixing with continuous aeration of seeds, a particulate solid matrix material and a seed osmoconditioning amount of water, for a time and at a temperature sufficient to cause the seeds to imbibe sufficient water to enhance resultant plant vigor but insufficient to cause seed sprouting; in said mixture having a water potential psi between about −0.5 to about −2.0 megapascals at equilibrium with said seeds; said particulate solid matrix material being nonpathogenic to the seeds and being friable when admixed with said seeds and said osmoconditioning amount of water so that said particulate solid matrix material can be mechanically separated from the seeds after the treatment without harm to the seeds.

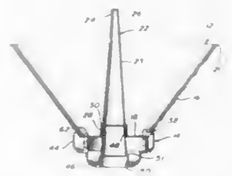


4,912,875

FLOWER POT AND SAUCER

Pierre Tardif, Longueuil Quebec, Canada, assignor to Plastique DCN Inc., Warwick, Canada

Filed Feb. 27, 1989, Ser. No. 315,929
Int. Cl.[4] A01G *9/02*
U.S. Cl. 47—66 20 Claims



1. A plant assembly including a pot and a saucer adapted to be nested together in similarly constructed assemblies, said pot and saucer including means cooperating to mount said saucer to the lower part of said pot;

said pot consisting of an inverted frusto-conical body having a bottom wall, an upper open end and an elongated hollow suspension member extending upwardly from and being contiguous with the bottom wall; said suspension member having a conically-shaped side wall with a first area in the lower region thereof that is enlarged with respect to the inherent dimensions of said suspension member side wall;

said saucer consisting of a cylindrical body having a bottom portion and a hollow frusto-conical central portion extending upwardly from and contiguous with said bottom portion; said central portion being so configured as to fit partially within said first enlarged area of said suspension member and having a second enlarged area in the lower region thereof so configured as to fit over said first enlarged area of the suspension member of a lower similarly constructed plant assembly nested therebeneath; and

said first enlarged area defining a support for an upper similarly constructed plant assembly.

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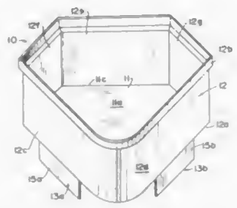
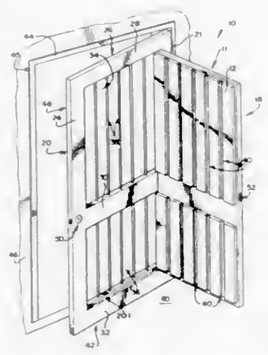
4,912,876
PARTITION WALL PLANTER
Alyce Ginsberg, 91 Post La., Bernardsville, N.J. 07924
Filed Jul. 6, 1988, Ser. No. 215,565
Int. Cl.[4] A01G 9/02
U.S. Cl. 47—66 9 Claims



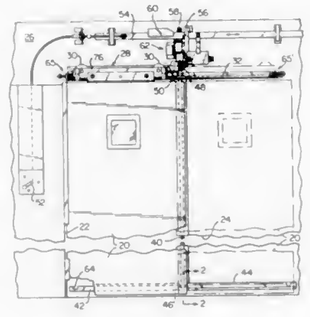
1. A planter to be disposed at the top of a partial height wall partition having a partition wall frame, decorative panels connected to the partition wall frame in a substantially vertical position and an upper horizontal surface on the decorative panel and partition wall frame, said planter comprising, a bottom defining a bottom surface, a peripheral sidewall cooperating with said bottom to provide a plant receptacle, and support means adapted to orient and support said planter on the upper horizontal surface of a partial height wall partition, said support means being constructed and arranged to be concealedly secured between the decorative panels and the partition wall frame of a partial height wall partition, said support means being spaced from said peripheral sidewall, so that said bottom surface of said planter substantially covers the upper horizontal surface of the decorative panel when said planter is disposed on a partial height wall partition and said support means having two downwardly depending support flanges in orthogonal relationship to one another for securement between corresponding orthogonally opposed decorative panels and the partition.

4,912,877
SECURITY DOOR
Nicolaas J. H. Strydom, No 1 Salamanca, Roolgras Street, Waterkloof Glen, Pretoria, Transvaal, South Africa
Filed Feb. 17, 1989, Ser. No. 312,112
Claims priority, application South Africa, Feb. 19, 1988, 88/1186
Int. Cl.[4] E06B 7/28
U.S. Cl. 49—171 7 Claims



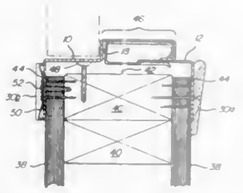
1. A security door for closing a doorway into an area protected by the door on the inside of the doorway, the door comprising
an outer frame for closing off the doorway;
door hinge means connected to the outer frame for hingedly mounting the outer frame in the doorway, whereby the door can be pivoted between open and closed conditions;
an opening through the outer frame for permitting ventilation and viewing between the area protected by the door and the area outside of the doorway;
a plurality of security bars mounted on the outer frame and extending across the opening to close off the opening to human entry through the opening while permitting said ventilation and viewing;
a closure member for closing off the opening to prevent said ventilation and viewing;
closure member hinge means connected to the closure member whereby the closure member is pivotally mounted on the outer frame and which permits the closure member to be pivoted into the area protected by the door from a closed condition in which it closes off the opening to assume an open condition in which it permits said ventilation and viewing, and to be pivoted from said open condition into said closed condition;
an insert for the opening which insert is provided by the closure member and which insert projects into the opening in the outer frame and occupies said opening when the closure member is in its closed condition;
a plurality of recesses in the form of elongate grooves in the insert for respectively receiving the security bars when the closure member is in its closed condition with the bars at least partially enclosed and concealed therein;
lockable door latch means for locking the outer frame in its closed condition to the doorway; and
lockable closure member latch means for locking the closure member in its closed condition to the outer frame.

4,912,878
COMBINED DISPLACING AND CUSHIONING MEANS FOR DETENTION CELL DOORS
Leroy Bentley, Covington, Ky., assignor to Stewart Decatur Security Systems, Inc., Erlanger, Ky.
Filed Nov. 17, 1988, Ser. No. 272,737
Int. Cl.[4] E05F 1/00
U.S. Cl. 49—379 6 Claims



1. In a mounting assembly for a sliding door, said assembly comprising
a trolley from which the door is suspended,
a fixed, horizontal rail on which the trolley is mounted for displacement between extreme positions, respectively being an open and a closed position of the door, and
means for releasably locking the door in its closed position, stop means, at opposite ends of said rail, respectively limiting trolley movement to the open and closed positions of the door,
each stop means comprising a spring which is compressed during the final portion of trolley movement to an extreme position thereby absorbing shock in arresting trolley and door movement, and the means limiting movement to the closed position of the door, further providing a force for displacing the door to an ajar position when the door is released from being locked in its closed position.

4,912,879
ADJUSTABLE DOOR FRAME ASSEMBLY
Gary Mozuras, Mt. Clemens; Dennis Perliski, Sterling Heights, and Robert Carnick, Warren, all of Mich., assignors to Copco Door Company, Warren, Mich.
Filed Oct. 5, 1987, Ser. No. 104,780
Int. Cl.[4] E06B 1/60
U.S. Cl. 49—505 18 Claims



1. A frame assembly adapted to be fitted into an opening in a wall, said assembly including:
a frame member elongated along a longitudinal axis thereof and having a generally planar interior surface adapted to be supported by, and cover a portion of the interior periphery of the opening, and an exterior surface disposed distal said interior periphery, the frame member further including a hat portion defining a raised channel extending along the longitudinal axis of the member, said channel being substantially closed proximate the exterior surface and including a turned under portion defining a jamb hook, the remainder of the channel proximate the interior surface being substantially open;
said frame member further including a plurality of coined holes, said holes including screw threads formed therein and configured to engageably receive a screw threaded attachment member, said coined holes and screw threaded member cooperating to fasten the frame member to the interior periphery of the opening in a spaced apart relationship whereby shimless installation is achieved;
at least one clip including a hook portion and a tongue portion, said clip configured so that the hook portion is retainably received in the jamb hook so that the clip is retained and supported by the frame member without affixation to the interior periphery of the opening; and
a generally planar trim piece of substantially the same length as the frame member, said trim piece having a first portion adapted to be slidably retained by the tongue portion of said clip acting in cooperation with said jamb hook and a second portion adapted to cover at least a portion of the interior periphery of said opening not covered by the frame member, whereby sliding of the trim piece in the clip permits the frame assembly to be expanded to accommodate differing interior peripheries associated with various thicknesses of wall.

4,912,880
COMPUTERIZED TRACING/EDGING SYSTEM
Fred A. Haddock, and Kimber W. Rarick, both of Muskogee, Okla., assignors to Cobain Optical Industries, Inc., Muskogee, Okla.
Continuation of Ser. No. 805,516, Dec. 6, 1985, abandoned. This application Feb. 11, 1988, Ser. No. 157,160
Int. Cl.[4] B24B 7/00
U.S. Cl. 51—101 LG 43 Claims

1. A computerized multi-processor system for the tracing and automated edging of an ophthalmic lens, comprising:
tracing means for performing a tracing operation with respect to any one of a frame, a pattern and a lens to derive data relating to the dimensions thereof;
storing means for storing said data relating to the dimensions of said any one of said frame, said pattern and said lens;
accessing means for accessing said storing means so as to read out said data relating to the dimensions of said any one of said frame, said pattern and said lens;
processing means for processing said data read from said storing means by said accessing means so as derive control signals for the edging of said ophthalmic lens; and
edging means responsive to said control signals from said processing means for edging said ophthalmic lens so as to provide said ophthalmic lens with dimensions corresponding to the dimensions of said any one of said frame, said pattern and said lens;
wherein said tracing means comprises a tracing sub-system, said tracing sub-system including a tracing processor for generating tracing control signals to control said tracing operation and for receiving data corresponding to the dimensions of said any one of said frame, said pattern and said lens as the dimensions of said any one of said frame, said pattern and said lens are traced during the tracing operation; and
wherein said storing means comprises a storing sub-system, said storing sub-system including a storing processor separate from said tracing processor for receiving and storing the data corresponding to the dimensions of said any one of said frame, said pattern and said lens;
said system further comprising interface means between said tracing sub-system and said storing sub-system for conveying data in at least one direction between said tracing sub-system and said storing sub-system;
whereby said tracing sub-system and said storing sub-system are able to operate independently or to operate, via said interface means, in a related manner.

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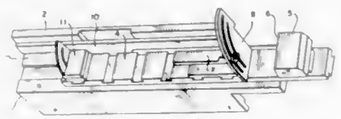
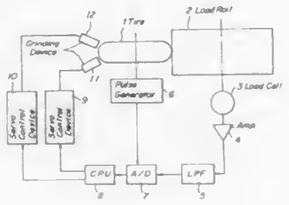
4,912,881
MULTIPLE ANGLE DRESSING DEVICE FOR TOOLS AND STOCK
Philip N. McDougall, 509 - 825 Granville St., Vancouver, B.C., V6Z 1K9, Canada
Filed Jun. 20, 1988, Ser. No. 208,595
Int. Cl.[4] B24B 7/02
U.S. Cl. 51—157 11 Claims



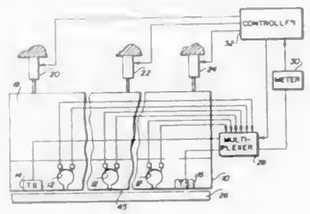
1. A device adapted to dress tools, stock, and other objects, comprising:
(a) a frame having an abrasive means detachably mounted therein;
(b) a supporting platform slidably mounted therein, adapted to support an object to be dressed at a constant angle in relation to the abrasive means;
(c) a pushing member attached to the said slidable platform, comprising a handle adapted to enable the user to push the member against the object to be dressed and thereby slide the object supported by the platform along the frame in contact with the abrasive means;
in which the position of the abrasive means in the frame is adjustable by means of at least one projecting member on the back of the abrasive means, received in a slot on the frame and held in a selected position by gripping means.

4,912,882
METHOD OF REDUCING LATERAL FORCE VARIATION OF TIRE
Hisao Makino, Kodaira, and Akira Ishibashi, Tanashi, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Aug. 16, 1988, Ser. No. 232,832
Claims priority, application Japan, Aug. 20, 1987, 62-204975; Jul. 12, 1988, 63-171900
Int. Cl.[4] B24B 49/16
U.S. Cl. 51—165 R 10 Claims



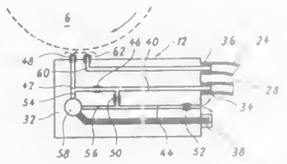
1. A method of reducing the lateral force variation of a tire comprising the steps of:
rotating the tire at a constant velocity;
detecting a lateral force of the tire over one revolution of the tire to derive a measured waveform of the lateral force of the tire;
Fourier transforming the measured waveform of the lateral force to derive a Fourier series of the measured waveform of the lateral force of the tire;
correcting the Fourier series of the measured waveform of the lateral force of the tire by taking into account a first-order time lag of the tire to derive a factor waveform in the causation of the lateral force of the tire; and
determining a grinding amount and a grinding position from the factor waveform in the causation of the lateral force of the tire; and
grinding the tire to cut off rubber from shoulders of the tire in accordance with the grinding amount and grinding position.

4,912,883
LAPPING CONTROL SYSTEM FOR MAGNETIC TRANSDUCERS
Mike Y. Chang, San Jose; Mark A. Church, Los Gatos, and Michael P. Salo, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 13, 1989, Ser. No. 310,410
Int. Cl.[4] B24B 49/00
U.S. Cl. 51—165 R 17 Claims



1. A lapping control system for accurately obtaining a desired throat height of each of a plurality of batch fabricated thin film magnetic transducers comprising:
a row of product thin film magnetic transducers formed on a substrate, said row comprising a height defining edge and at least two spaced test structures, each of said test structures comprising a combination of at least two elements each offset a predetermined amount from said height defining edge of said row, said first of said at least two elements comprising a switch structure and the second of at least two elements comprising either another switch structure or a test thin film magnetic transducer;
means for mounting said row of product thin film magnetic transducers in a position to lap said height defining edge of each of said thin film magnetic transducers and said test structures;
means for producing a current flow through at least one of said thin film magnetic transducers, and means for measuring the saturation current of said thin film magnetic transducers during lapping of said height defining edge;
means for recording the value of saturation current for at least one thin film magnetic transducer each time a switch for the associated test structure is opened so that a correlation between throat height and saturation current of said thin film magnetic transducers can be determined based on the measured values and the known offset position of said switches of said test structure; and
means responsive to the measured saturation current for controlling the degree of lapping for said row and for terminating said lapping process when a predetermined throat height is reached for said product thin film magnetic transducers based on the correlation established between saturation current and throat height during lapping.

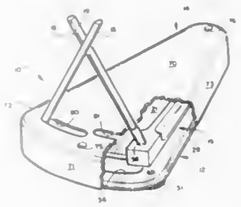
4,912,884
AUTOMATIC CALIBRATION EQUIPMENT FOR PLANAR GRINDING MACHINES
Hans Sigg, Neuchâtel, Switzerland, assignor to Meseltron S.A., Switzerland
Filed Oct. 31, 1988, Ser. No. 264,565
Claims priority, application France, Nov. 2, 1987, 87 15263
Int. Cl.[4] B24B 49/00
U.S. Cl. 51—165.75 9 Claims



1. In a planar grinding machine comprising a horizontal table for carrying workpieces and a grinding wheel arranged above this table, the grinding wheel having a grinding surface for machining said workpieces and being movable between an operative position for machining the workpieces and a retracted position, automatic calibration equipment comprising a measuring head fixed to the table for producing during machining of the workpieces an output signal that passes through an extreme value each time the grinding wheel passes above the measuring head, said extreme value being a function of the distance which separates the grinding wheel from the table at that instant, means for memorizing values which correspond to at least some of the successive values taken by the output signal of the measuring head and means for producing signals controlling movement of the grinding wheel between its operative position and retracted position when the memorized values correspond to reference values, wherein the measuring head comprises a pneumatic circuit having a first branch provided with an inlet nozzle and a measurement outlet nozzle oriented to blow a jet of air which impinges against said grinding surface of the grinding wheel when the grinding wheel is in its operative position and passes above the measuring head and a second branch provided with an inlet nozzle and a reference outlet nozzle, means for delivering compressed air at regulated pressure to the inlets of the first and second branches, and means for detecting a difference between the pressures in said first and second branches and producing said output signal, the area of an imaginary annular surface extending between said grinding surface and a rim of said measurement outlet nozzle being substantially constant for only a short time because of the speed of said grinding wheel passage, the first branch having an internal volume sufficiently small relative to the area of said imaginary annular surface and the speed of said grinding wheel passage that said impingement of the jet of air from the measurement nozzle against said grinding surface of the grinding wheel provides an equalized pressure in the first branch representative of the distance which separates the grinding wheel from the table, and the reference outlet of the second branch being arranged to allow air to escape freely to provide a reference pressure in the second branch.

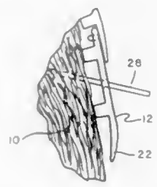
4,912,885
KNIFE SHARPENER
Mario J. Bonapace, 7396 Broadway, Lemon Grove, Calif. 92045
Filed Nov. 10, 1988, Ser. No. 269,361
Int. Cl.[4] B24B 3/36, 3/54
U.S. Cl. 51—211 R 7 Claims

1. A knife sharpener comprising:
a base having a top surface and a bottom surface;
a pair of leg assemblies each having an elongated leg member having a longitudinally extending axis, said leg members having a pivot end and a free motion end, said leg members having a top surface, laterally spaced side surfaces and a bottom surface, a vertically oriented aperture in said pivot end with a pivot pin passing downwardly therethrough, and having its bottom end secured in the top surface of said base, the pivot ends of said respective leg assemblies being secured to said base at a position adjacent each other so their free motion ends can pivot toward and away from each other, when said free motion ends have been pivoted toward each other until their respective side surfaces contact each other the respective longitudinal axes of said leg members will be substantially parallel to each other, when said free motion ends are separated from each the longitudinal axes of said leg members intersect each other;



spring means connected to said leg assemblies for maintaining a pressure that will force the free motion ends of said respective leg members apart from each other;
means for controlling how far apart the free motion ends of said leg members may travel; and
a pair of rod members each having a longitudinally extending axis, said rod members being formed of abrasive material having their respective bottom ends detachably supported in apertures formed in the top surface of the free motion ends of said respective leg members, said respective apertures being angularly oriented toward each other so that said rod members cross paths with each other, the longitudinal axes of said rod members extend laterally with respect to the top surface of said leg members.

4,912,886
PROTECTION DEVICE
Dennis R. Jannin, Rte. 5, Perryville, Mo. 63775
Filed Jun. 12, 1989, Ser. No. 364,856
Int. Cl.[4] E04B 1/34
U.S. Cl. 52—3 12 Claims



1 A protection device adapted to protect products subject to weather deterioration comprising a series of at least two overlapping elongated slats, said elongated slats having projection means on a side adapted to be adjacent said products to insure that said protection device will retain air passage between said protection device and said products being protected when said protection device is in place to protect said products, and having a flap along one edge of each of said elongated slats adapted to overlap an abutting slat, said elongated slats having means for holding adjacent elongated slats in movable relationship with each other and means for connecting to-

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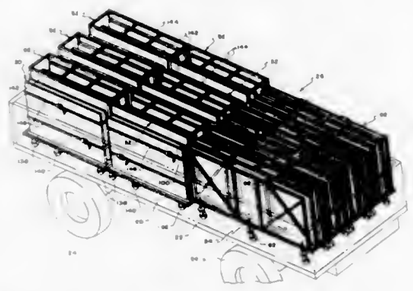
gether a series of said elongated slats to form said protection device.

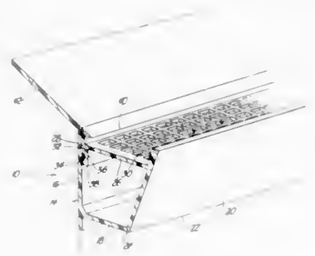
4,912,887
PORTABLE STAGE APPARATUS
Brian J. Sullivan, 375 Doolin La., Newbury Park, Calif. 91320
Filed Dec. 27, 1988, Ser. No. 290,565
Int. Cl.[4] E04H *3/10*
U.S. Cl. 52—7 15 Claims

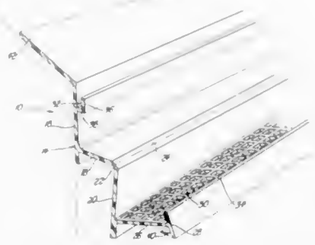


1. A portable stage apparatus comprising:
an open frame assembly, said open frame assembly comprising a plurality of side panels, each said side panel being narrow and substantially planar defining a main plane, each said side panel being of a polygonal configuration within said main plane, each said side panel having a bottom edge and a top edge each of which are connected between a pair of said edges, said side panels being hingedly connected together at said side edges, said open frame assembly being movable between a stowage position and a use position, said stowage position being when all said side panels are located in juxtaposition, said use position being when said side panels are extended and connected together in an enclosing arrangement defining an enclosed area;
a plurality of floor panels, said floor panels being mounted on said top edges of said side panels when said open frame assembly is in said use position, said floor panels being separate from each other and disconnected from said open frame assembly when said open frame assembly is in said stowage position, each said floor panel having a substantially flat upper surface; and
first locking means for securing together to a said side panel a pair of said floor panels located in an edge abutting relationship with said upper surfaces being in horizontal alignment.

4,912,888
GUTTER CONSTRUCTION
Charles L. Martin, 1213 Royal, Royal Oak, Mich. 48073
Filed Mar. 28, 1988, Ser. No. 172,761
Int. Cl.[4] G04D *13/06*
U.S. Cl. 52—12 17 Claims

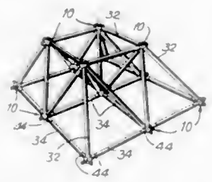
1. A gutter device (**10**) adapted to extend along the edge of a roof (**12**) comprising: a rigid elongated trough portion (**14**) supported in a water channeling position for channeling water longitudinally of said device (**10**), said trough portion (**14**) including a planar back wall (**16**) adapted for mounting adjacent the roof edge, a generally horizontal bottom wall (**18**) extending outwardly from said back wall (**16**) in a fixed cantilevered fashion, a front wall (**20**) adjoining said bottom wall (**18**) to define an intersection (**22**) spaced outwardly from and extending parallel with said back wall (**16**), said front wall (**20**) extending upwardly from said intersection (**22**), a perforated top wall (**26**) disposed between said front wall (**20**) and said back wall (**16**) and spaced upwardly from said bottom wall (**18**); a hinge means (**24**) disposed on said trough portion (**14**) extending longitudinally of said device (**10**) for allowing said top wall and front wall to rotate into an open position out of the water channeling position as a rotating unit and to freely remain in said open position; said device (**10**) characterized by





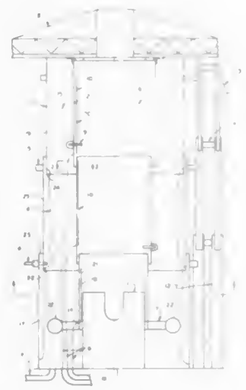
said hinge means (**24**) defining a hinge axis spaced outwardly from said back wall (**16**) a fixed distance; and locking means (**32**) disposed on said planar back wall (**16**) and extending outwardly therefrom for connecting to said unit for maintaining said trough portion (**14**) in said water channeling position.

4,912,889
ILLUMINATED FRAMEWORK STRUCTURES
Pacifico A. Palumbo, Forest Hills, N.Y., assignor to Neon Modular Systems, Inc., New York, N.Y.
Filed Dec. 2, 1988, Ser. No. 279,347
Int. Cl.[4] E04B *1/58;* A47G *29/00*
U.S. Cl. 52—28 7 Claims



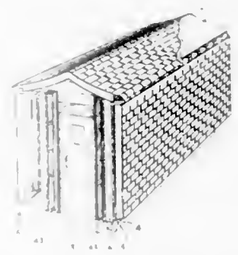
7. A framework structure comprising:
(1) a plurality of connectors, wherein each connector of said plurality of connectors comprises:
(a) a main body having a central axis;
(b) a first group of at least four projections extending outwardly from each said main body, and first group of at least four projections being equi-angularly spaced about said central axis, each projection of said first group of at least four projections extending from said main body in a plane normal to said central axis;
(c) a second group of at least four projections extending outwardly from each said main body, said second group of at least four projections being equi-angularly spaced about said central axis, each projection of said second group of at least four projections extending at a predetermined angle of between fifteen and seventy-five degrees to said plane, each projection of said first and second groups of at least four projections being of substantially identical non-circular cross-section;
(d) an annular groove formed in each said main body, said annular grove being disposed on the opposite side of said plane from said second group at least four projections such that said annular groove selectively receives an end of a tubular member for interconnection of said main body with said tubular member; and
(2) a plurality of elongate members for connecting together said plurality of connectors to form said framework structure, each elongate member of said plurality of elongate members having substantially cylindrical tubular ends selectively interconnectable with said projections of said first and second groups of at least four projections, and substantially cylindrical tubular ends being formed of a deformable material such as to form an interference fit between said substantially cylindrical tubular ends and said projections of said first and second groups of at least four projections, at least one of said elongate members including a elongate illumination device.

4,912,890
AIR/WATER CRANES
Ralph H. Hoyeck, 80 Sommerville Ave., Westmount, Québec H3Z 1J5, Canada
Continuation-in-part of Ser. No. 824,509, Jan. 31, 1986, abandoned. This application Dec. 16, 1987, Ser. No. 133,796
Int. Cl.[4] E04H *12/18;* B66F *11/04*
U.S. Cl. 52—30 14 Claims



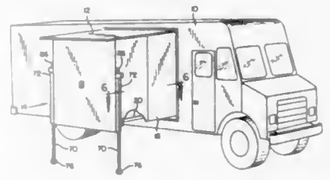
1. A hoisting device to lift from base level and support a top platform comprising an upright container for containing a liquid, a buoyant body floating in said liquid and used to support a load, guiding means to guide said body in up-and-down movement in said container, means to progressively pressure feed and discharge liquid into and from said container, and means to progressively feed and discharge gas into and from said buoyant body, both said container and said buoyant body acting simultaneously through buoyancy and hydraulic pressure to lift and support said top platform, wherein both said container and said buoyant body consist of an outer and of an inner collapsible, telescopic column, respectively, wherein the inner column is made of a plurality of upright, hollow, capped elongated body sections being open at their bottom and capping one another, the body section of largest cross-section being at the top of the inner column.

4,912,891
FOLDING BUILDING STRUCTURE
Fernand Bertrand, 12 Pennington Lane, Gloucester, Ontario, Canada K1B 4X7
Filed Jan. 30, 1989, Ser. No. 302,954
Claims priority, application Canada, Mar. 17, 1988, 561749
Int. Cl.[4] E04B *1/346*
U.S. Cl. 52—66 15 Claims



1. In a building structure having foldable wall and roof parts, a core stcuctuce for supporting the foldable parts of said building structure and providing folding clearance for said parts, said core structure comprising:
a substantially rigid roof structure and a substantially rigid floor structure in vertical spaced apart relationship, said roof structure comprising an exterior roof surface and an interior ceiling surface said structure being supported by a roof truss means of substantially the same length as said roof structure, said roof truss means being supported by elongated support members which pass through said floor structure and are vertically movable but laterally constrained by said floor structure whereby said roof structure is supported in a vertically displaceable but horizontally fixed relationship to said floor structure.

4,912,892
UNITIZED MODULE FOR ROOM ADDITION
Bruce A. Jurgensen, Forest Grove, Oreg., assignor to Zantel, Inc., Forest Grove, Oreg.
Filed Nov. 23, 1988, Ser. No. 276,214
Int. Cl.[4] E04B *1/344*
U.S. Cl. 52—69 5 Claims



1. A unitized module housing a collapsible-expandable room addition adapted to fit the wall of an existing core structure, comprising;
a frame having configured upper, lower and side beams defining the top, bottom and sides of the frame, and further having a determined front-to-back dimension and

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thereby an inner side of the frame and an outer side of the frame, said frame adapted to fit a cut out in the wall of the core structure with the frame's outer side substantially co-planer with the wall, and attachment means for securing the frame to the wall whereby the frame becomes an inset of the wall,

a plurality of add on wall members including a wall/roof, a floor, a side wall and a pair of end walls, said add on wall members having a collapsed condition where the wall members are vertically stacked and as vertically stacked are fitted within the confines of the surrounding beams of the frame, said wall/roof pivotally attached at its upper edge to the frame to pivot on a horizontal axis adjacent the upper beam and on the outer side of the frame, said floor pivotally attached at its lower edge to the frame to pivot on a horizontal axis adjacent the lower beam and on the inner side of the frame, said end walls pivotally attached to the frame at a side edge of each end wall to pivot on a vertical axis adjacent to the respective side beams and intermediate the inside and outside of the frame,

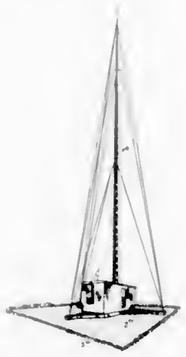
and a plurality of motor means for controlling pivotal movement of the wall/roof, floor and end walls, said motor means pivotally mounted to the frame, said configured beams being compatible with the mounting of the motor means whereby, in the collapsed condition, the motor means are substantially housed within the confines of the frame.

4,912,893

TRANSPORTABLE CMR CELL SITE

Harmon R. Miller, 16631 Crommarty Ct., Houston, Tex. 77084; William J. Smith, 4403 Leeland, Houston, Tex. 77023, and Hollie M. Stanley, Jr., 6635 Guiston, Ste. 210, Houston, Tex. 77081

Filed Dec. 21, 1987, Ser. No. 135,871
Int. Cl.[4] E04H *1/00*
U.S. Cl. 52—79.1 33 Claims



1. A transportable CMR cell site that comprises:

a foundation that includes a rectangular center structure having a rear section and a side section and includes a nose structure extending at and attached to a front of the rectangular center structure;

a CMR equipment edifice having four walls, a floor and a roof and resting on the center structure of the foundation;

a plurality of antenna tower sections attached to a wall of the CMR equipment edifice;

a crossmember section attached to a wall of the edifice in proximity with a portion of the rectangular center structure of the foundation; and

a leg section pivotably attached to said rear section of the rectangular center structure of the foundation and folded into proximity with said side section of the rectangular center structure of the foundation.

4,912,894

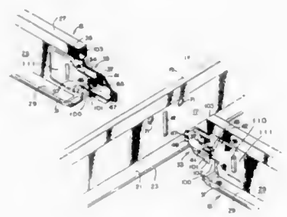
INTERLOCKING CROSS TEE

William Platt, Collingdale, Pa., assignor to National Rolling Mills, Inc., Malvern, Pa.

Continuation-in-part of Ser. No. 93,853, Sep. 8, 1987, Pat. No. 4,827,681, which is a continuation-in-part of Ser. No. 935,762, Nov. 28, 1986, Pat. No. 4,785,603. This application May 4, 1989, Ser. No. 346,962

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.[4] E04C *2/42*
U.S. Cl. 52—98 2 Claims



1. In a suspended ceiling grid structure, a cross tee (15) having an inverted T cross section comprising

an elongated central web (25) with a bulb (27) at the top and with a pair of oppositely disposed flanges (29) extending outwardly from the bottom of the web (25) and adapted to support ceiling tiles,

a connecting tongue (33) extending from an end of the web (25),

the tongue (33) being offset from the center of the web by approximately one-half the thickness of the web (25),

locking means (37) formed in the tongue (33) for locking said cross tee (15) to a slot (18) provided in a main beam (13) to which the cross tee (15) is connected in the ceiling grid,

an interlocking means (47, 110) formed in the tongue (33) and web (25) for interlocking the cross tee (15) with interlocking means of a similarly constructed but oppositely disposed cross tee (15) when the cross tees (15) are inserted into the slot (18) from opposite directions, and

shear means (101,102) on the tongue (33) that stop the cross tee (15) from further entering the slot (18) at normal room temperatures, and shears or bends during a fire, comprising

(A) a tab portion (102) extending transversely of the tongue (33), and

(B) a notch portion (101) adjacent the tab portion (192) on the side away from the end of the tongue (33) whereby, the cross tee (15) is permitted to expand during a fire,

wherein

the tab portion (102) shears or bends into the notch portion (101),

the improvement comprising

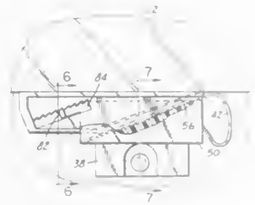
a belt loop (110) in the interlocking means (47, 110) that keeps the tongues (33) in overlapped and interlocked relationship under normal conditions, and that permits the tongues (33) to slide in an overlapped relationship so that the cross tees (15) can expand longitudinally during a fire.

4,912,895

ADJUSTABLE SPACER

Charles F. Harris, Jr., Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1987, Ser. No. 138,105
Int. Cl.[4] B60J *1/02, 1/18*
U.S. Cl. 52—208 4 Claims



1. An adjustable spacer for positioning a window in an automotive vehicle body comprising:

a mounting member secured to the body;

an adjusting member engageable in wedging fashion with the mounting member, received in snap-fit relationship in the mounting member upon insertion therein in a direction normal to the wedging movement and having a flat surface slidingly abuttingly engaging a peripheral edge of the window whereby relative linear movement parallel to the window peripheral edge between the mounting member and the adjusting member in a wedging direction varies the position of the window with respect to the body; and

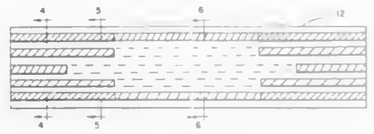
a strap member flexibly interconnecting the mounting member and the adjusting member.

4,912,896

BEAM/FLOORING SYSTEM

Mohammad H. Shamsai, 16 Pengam Street, Kuraby, Queensland, Australia (4112)

Filed Jul. 8, 1988, Ser. No. 216,549
Claims priority, application Australia, Jul. 15, 1987, PI3126
Int. Cl.[4] E04C *3/10*
U.S. Cl. 52—223 R 10 Claims



1. A pre-cast, prestressed hollow core beam unit for use in a two-way building system and adapted to be supported in continuous spanning relationship on two or more building supports, comprising:

an elongate, continuous body of pre-cast, prestressed concrete having a relatively wide and flat top surface and a plurality of hollow cores extending longitudinally throughout the length of the beam, said hollow cores being selectively openable through the top surface of the beam unit to vary the design characteristics of the beam unit depending upon the intended use, and at least one portion of at least one of the hollow cores being open through the top surface;

pre-stressed reinforcing means extending longitudinally in a bottom portion of the beam unit;

floor panel support means along at least one side of the beam unit for supporting at least one floor panel extending transversely from the beam unit; and

building reinforcing material secured within said at least one open portion of the beam unit and extending above the top surface of the beam unit to be received in and bonded to a layer of cement or like building material laid over the beam unit and any floor panels supported thereon, thus forming a composite action, continuous, monolithic, unitary beam structure extending continuously between said building supports.

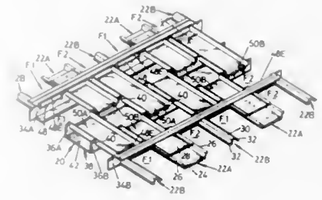
4,912,897

FLOORING SYSTEMS WITH SEGREGATED SERVICE FEEDS

Harold J. W. Payne, Chester, England, assignor to Bally Engineered Structures, Inc., Bally, Pa.

PCT No. PCT/US86/00570, § 371 Date Jun. 19, 1986, § 102(e) Date Jun. 19, 1986, PCT Pub. No. WO86/05832, PCT Pub. Date Oct. 9, 1986

PCT Filed Mar. 19, 1986, Ser. No. 890,184
Int. Cl.[4] E04B *5/48*
U.S. Cl. 52—220 7 Claims



1. A flooring system for supporting a new floor surface spaced above an existing base or substrate and for providing segregated service feeds above the existing base or substrate, the flooring system comprising service feed segregation ducting defined by spaced parallel sides extending in a first direction and discrete elongate parallel flooring panel supports extending in a second direction from the sides of the service feed segregation ducting, the spaced parallel sides of the service feed segregation ducting having upper parts provided with apertures communicating with selected extending flooring panel supports, at least one medial divider parallel to the sides of the service feed segregation ducting, the divider having an upper part provided with apertures corresponding to the apertures in the sides of the service feed segregation ducting, and trough- or tray-like elements extending selectively between said apertures of the sides of the services feed segregation ducting and the divider and leaving room below for passage of service feeds through the service feed segregation ducting, the flooring panel supports and the segregation ducting affording mutually communicating segregated accommodation for service feeds in and between the first and second directions.

4,912,898

GLASS BUTT JOINTS FOR CURTAIN WALL CONSTRUCTION

Thomas G. Holmes, 2732 N. West St., River Grove, Ill. 60171

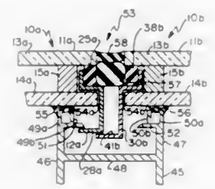
Filed Dec. 31, 1987, Ser. No. 140,738
Int. Cl.[4] E04C *2/46*
U.S. Cl. 52—235 2 Claims

1. An insulating panel unit comprising:

(a) at least two parallel glass sheets separated by at least one peripheral spacer, said sheets and spacer held together by sealing means thereby forming an insulating unit, said unit having at least two opposing sides with each of said sides having a peripheral edge of outwardly opening U-shape; and

(b) hook means attached within each of said opening U-shaped peripheral sides, each of said hook means comprising a panel attachment member sealed within said U-

shaped peripheral edge and an extension member connecting said panel attachment member to a framework hook member, wherein each of said framework hook members extends in parallel spaced-apart relationship to the plane



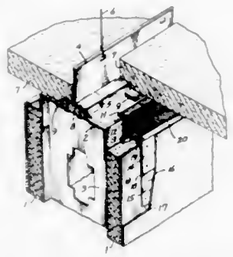
of said sheets of glass, and said hook members are located distal from said sheet of glass with each hook member extending from its respectively connected extension member in the same direction as the hook member connected to said opposing U-shaped peripheral side of said panel.

4,912,899

DRYWALL EDGE REVEAL TRIM STRIP

John C. Plasker, 15631 NE. 107th Ct., Redmond, Wash. 98052, and Jerry L. Ward, 4705 Acorn Ave., Sioux Falls, S. Dak. 57105

Filed Mar. 30, 1989, Ser. No. 330,679
Int. Cl.[4] E04B *2/74*
U.S. Cl. 57—241 3 Claims



1. An edge reveal trim strip for a static building construction having a partition including supporting structure with a top plate and an upright wall panel installed on such supporting structure, such panel including a top edge spaced below the top of such top plate, said strip comprising an elongated length of rigid material of generally M cross section including a top leg having a portion for resting on the top plate, a second leg having a portion for extending alongside the top plate, a third leg for extending outward over the top edge of the panel and a fourth leg for extending downward alongside the panel.

4,912,900

PERIMETER SECUREMENT ASSEMBLY FOR ROOF DECK COVERING

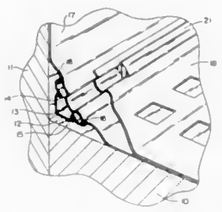
Robert C. Yeamans, 2777 Northwest Boulevard, Columbus, Ohio 43221

Filed Jan. 6, 1989, Ser. No. 294,038
Int. Cl.[4] E04D *13/15*
U.S. Cl. 52—273 7 Claims

1. In a roof deck covering comprising a waterproofing membrane positioned on the surface of said roof deck,

a perimeter securement assembly for a roof deck covering for securely fastening said waterproofing membrane to the periphery of said roof deck comprising,

a base member capable of being firmly attached to said roof deck and designed to extend along and adjacent to the edge of said roof deck and including an essentially flat first portion designed to be substantially parallel to the surface of said roof deck, a first means on said first portion for enabling said first portion to be attached to said roof deck, and an essentially flat second portion connected to said first portion and extending essentially at right angles to said first portion and adjacent the edge thereof, a second means on said second portion for enabling said second portion to be attached to a vertical wall adjacent to said



roof deck, said first portion of said base member being provided with a first element extending in a direction toward said second portion of said base member, and said second portion of said base member being provided with a second element extending in a direction towards said first portion of said base member,

a resilient means of a shape conforming to that portion of said base member between said first and second elements and adapted to press said waterproofing membrane securely against said base member between said first and second elements.

4,912,901

COLUMN SHAPED JACKET

Frederick L. Jerry, 21331 Kipling St., Oak Park, Mich. 48237

Filed Jan. 7, 1988, Ser. No. 141,554
Int. Cl.[4] E04C *3/30*
U.S. Cl. 52—301 4 Claims

1. A decorative column jacket assembly for covering a support post, said jacket assembly comprising: a base having a recessed area disposed therein for receiving a lower end of said post, a capital member having a recessed area disposed therein for receiving an upper end of said post; a first framework assembly disposed on one side of said post and a second framework assembly disposed on the other side of said post; each of said framework assemblies comprising a plurality of vertically spaced, semi-circular shaped, adapter members, said adapter members including a substantially flat end having a notch disposed therein for receiving said post and a plurality of circumferentially spaced notches for receiving a plurality of

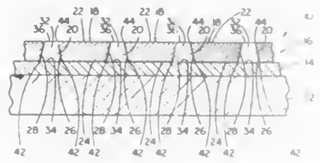
support stringers, which space and support said adapter members; and first and second semi-circular cover members, each of said cover members being disposed over each of said respective framework assemblies and are attached to said base and said capital.

4,912,902

SIMULATED BRICK COVERING AND WALL CONSTRUCTION

Elvin W. Weaver, R.D. #3, Box 353, Ephrata, Pa. 17522

Filed Jul. 14, 1986, Ser. No. 885,504
Int. Cl.[4] B44F *7/00*
U.S. Cl. 52—314 7 Claims



1. A wall covering for simulating a brick wall construction, comprising:

(a) a plurality of boards;

(b) each of said boards being elongated and having a pair of opposite front and rear surfaces and a pair of laterally-spaced longitudinal opposite side surfaces extending between and interconnecting said front and rear surfaces;

(c) said longitudinal side surfaces extending in opposite inclined relationship between and being connected to said front and rear surfaces so as to provide said board in cross-section with a configuration in which the width of said front surface between said longitudinal side surfaces is greater then the width of said rear surface;

(d) each of said boards having a plurality of grooves defined in its front surface in spaced apart relationship and extending between its side surfaces such that said front surface simulates the appearance of a row of spaced bricks, each groove at its opposite ends opening at said inclined side surfaces of said board and having a bottom displaced between rear and front edges of said side surfaces at which the latter interconnect with said front and rear surfaces;

(e) said boards of such configuration in cross-section thereby adapted to be arranged in side-by-side spaced apart relationship to simulate a brick wall in which respective side surfaces of adjacent ones of said spaced apart boards define gaps which simulate the spaces between rows of spaced bricks in the brick wall, said boards of such configuration in cross-section also thereby adapted to be spaced apart at different distances so as to define said gaps with different widths in order to cover wall areas of different dimensions without the necessity of trimming any of said boards longitudinally.

4,912,903

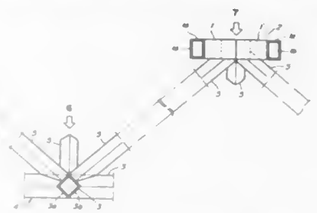
SPACE FRAME USING SQUARE STEEL TUBULAR MEMBERS

Kimihiko Mogami; Michihiko Otta; Kouki Hatasaka; Noriaki Numakura; Mamoru Kimura; Akira Okada, and Norihisa Okuno, all of Toyo, Japan, assignors to Takenaka Corporation, Osaka, Japan

Filed Feb. 17, 1989, Ser. No. 311,946
Claims priority, application Japan, Aug. 16, 1988, 63-203565
Int. Cl.[4] E04C *3/04*
U.S. Cl. 52—648 1 Claim

1. In a space frame in which an upper frame body and a lower frame body, each constructed by joining bar members perpendicularly with each other to form a crossing pattern in a plane to define cross points of the bar members, are arranged in a configuration such that projections of the bar members of either of the upper and lower frame bodies on the plane of the other frame body make angles of 45 degrees with respect to the bar members of said other frame body; and the upper and lower bodies are united by joining diagonal members forming a shape of an upended pyramid between respective cross points of the bar members of the upper frame body and the lower frame body, the improvement comprising:

(a) the bar members of the upper frame body are square steel tubular members having two perpendicular sides respectively parallel and perpendicular to the plane of the upper frame body, said tubular members being connected to one another by welds;



(b) the bar members of the lower frame body are square steel tubular members having two perpendicular sides making an angle of 45 degrees to the plane of the lower frame body, said tubular members being connected to one another by welds; and

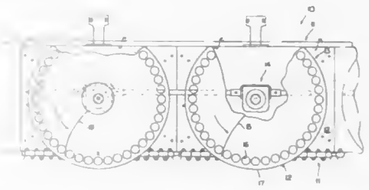
(c) the diagonal members are joined between respective cross points of the upper and lower frame bodies by fillet welds each having a relatively long weld line.

4,912,904

COCKTAIL FILLING APPARATUS

Walter F. Davis, Denair, and Wayne D. Rickey, Turlock, both of Calif., assignors to Tri/Valley Growers, San Francisco and P & F Machine, Turlock, both of, Calif.

Filed Jun. 24, 1988, Ser. No. 210,822
Int. Cl.[4] B65B *1/10, 39/14*
U.S. Cl. 53—155 7 Claims



1. A modular apparatus for depositing discrete articles into a continuously moving line of containers, said apparatus comprising at least two modules, each such module comprising:

(a) a cylindrical receptacle having a bottom and a confining side wall, the bottom having formed in it adjacent the confining wall a multiplicity of holes arranged in a circle concentric to the receptacle

(b) means for rotating the receptacle (a) about its cylinder axis to bring each hole, in its turn, to a delivery position, said means including a receptacle drive shaft supporting said receptacle (a) for such rotary motion,

(c) a stationary plate underlying the receptacle (a) and which is imperforate except for a hole at said delivery position

(d) a horizontal container transport shaft beneath said receptacle and helical means carried by such shaft to cradle

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containers and move them continuously in a line underlying said receptacle (a), said container transport shaft of each module being connectable to and disconnectable from the container transport shaft of an adjacent module or modules and

(e) a receptacle drive beneath said receptacle in the form of a horizontal shaft, a gear assembly having input means for connecting to said horizontal shaft and having a first output means connectable to the horizontal input shaft of an adjacent module and a second output means connected to said receptacle drive shaft

whereby a number of such modules may be connected in tandem for continuously delivering an assortment of discrete articles to a continuously moving line of containers and a module may be added or subtracted from the apparatus at will.

4,912,905

CONTACT PRESSURE ELEMENT FOR METAL FOIL BLANKS LAID AROUND THE NECK AND HEAD OF BOTTLES IN A LABELLING MACHINE

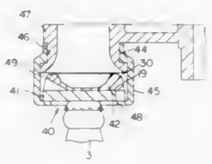
Rudolf Zodrow, Düsseldorf; Josef Tomashauser, Willich, and Rainer Buchholz, Düsseldorf, all of Fed. Rep. of Germany, assignors to Eti-Tec Maschineban GmbH, Erkrath, Fed. Rep. of Germany

Filed May 16, 1988, Ser. No. 194,633

Claims priority, application Fed. Rep. of Germany, May 19, 1987, 3716713; Jun. 20, 1987, 3720529; Aug. 29, 1987, 3728958

Int. Cl.[4] B65B *7/28*

U.S. Cl. 53—345 9 Claims



1. A contact pressure element for metal foil blanks laid around the neck and top of bottles (3) in a labelling machine, the contact pressure element being movable axially towards the end face of the bottle top and having an internally bell-shaped casing (21, 47, 57) and a resiliently deformable plate (2, 14, 40, 50), which is disposed in front of the opening in the casing (1, 21, 47, 57) facing the end face of the bottle (3) and bears on the rear side against the edge of the casing (1, 21, 47, 57), characterized in that at least the rear side of the peripheral edge of the plate (2, 14, 40, 50) is formed with an annular bead (8, 24, 30, 60), and the plate (2, 14) is made of a resilient foamed plastic on its front side adjacent to the end face of the bottle top, the plate remote from the end face of the bottle top having ribs (33) which extend radially of the peripheral edge, in the undeformed condition enclose gaps (34) and in the deformed condition bear without overlap against the top and neck zone of the bottle (3).

4,912,906

AUTOMATIC BAG SYSTEM FOR SUPERMARKET CHECK-OUT COUNTER

Frank T. Toner, 2138 Andrea Dr., Bensalem, Pa. 19020

Filed May 15, 1989, Ser. No. 351,655

Int. Cl.[4] B65B *47/04, 11/16, 11/54, 67/00*

U.S. Cl. 53—463 17 Claims

1. An automatic bag system for use in conjunction with a supermarket check-out counter of the type comprising a clerk check-out station having a left side and a right side comprising

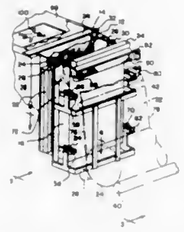
a loading compartment affixed to the counter adjacent to the clerk check-out station, the loading compartment comprising an open top and enclosing walls,

the walls being provided with a pair of transversely opposed, vertical slots;

a length of sheet plastic material adapted to overlie the open top of the loading compartment, the system further comprising clamping means to secure a portion of the sheet plastic material relative to the loading compartment;

guide means positioned adjacent to the vertical slots to guide edge portions of the plastic material into the vertical slots as the loading compartment is loaded,

the guide means and the vertical slots being adapted to form edge portions of the plastic sheet into left and right vertical seams, as the loading compartment is loaded, the said seams extending outwardly of the loading compartment;



left and right heating and sealing elements affixed exteriorly of the loading compartment immediately forwardly of the vertical slots, the heating and sealing elements being positioned to be rearwardly covered by the left and right vertical seams as the vertical seams are formed by the guide means; and

a pressing assembly reciprocally movable toward and away from the loading compartment,

the pressing assembly comprising first and second pressing plates, the first and second pressing plates being positioned to respectively press against the left and right heating and sealing elements when the pressing assembly is urged toward the loading compartment;

whereby energization or the heating and sealing elements will cause the left and right vertical seams to be heat sealed when the first and second pressing plates press the plastic material at the left and right seams against the heating and sealing elements.

4,912,907

AUTOMATED POUCH FILLER

Jin-Liou Fang, San Jose, and Dayne I. Shigematsu, Simi Valley, both of Calif., assignors to Nestec, S.A., Vevey, Switzerland

Continuation-in-part of Ser. No. 301,222, Nov. 11, 1981, Pat. No. 4,736,572. This application Mar. 16, 1988, Ser. No. 168,807

The portion of the term of this patent subsequent to Apr. 12, 2005, has been disclaimed.

Int. Cl.[4] B65B *31/06, 43/26*

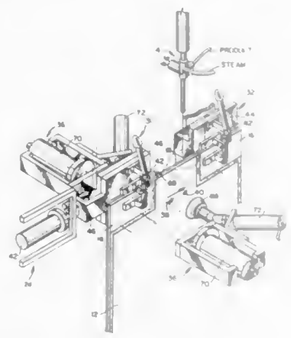
U.S. Cl. 53—512 2 Claims

1. In a rotatable, multi-station apparatus for opening, filling and sealing flexible walled bags, having a rigid rotating assembly which includes a bag clamping station, at least one bag filling station, a bag sealing station, and a bag discharge station, means for sequentially rotating a bag through said stations, and a bag clamping apparatus mounted on the assembly for rotation with said assembly and operable to support the edge portion of one bag during rotation through said stations wherein the bag clamp apparatus comprises

a fixed clamp coupled with the rigid rotating assembly operable to secure one corner of the bag,

a moveable clamp coupled with the rigid rotating assembly operable to secure an opposing corner of the bag, said one and opposing corners being adjacent with an unsealed edge of the bag being defined therebetween, said moveable clamp being slidably mounted for reciprocatory movement toward and away from said fixed clamp and comprising a fixed plate coupled with the rigid rotating assembly, a moveable plate slidably mounted on said fixed plate, clamping means for securing said opposing corner of the bag to the moveable plate,

actuator means operatively associated with said moveable clamp for slidably displacing the moveable clamp toward said fixed clamp to open said edge of the bag to facilitate filling, and



resilient means operatively associated with said moveable clamp to bias the moveable clamp away from the fixed clamp, whereby said bag edge is maintained taut and under sufficient tension during sealing to form flat unwrinkled opposing surfaces along said bag edge during sealing, and compression means carried on said moveable plate in communication with said actuator means and said resilient means whereby activation of the activator means compresses the resilient means and moves the slidable clamp towards the fixed clamp.

4,912,908

BAND TIGHTENING APPARATUS IN A STRAPPING MACHINE

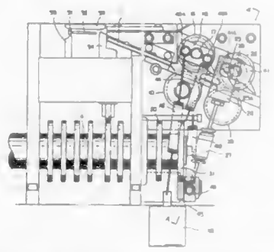
Yasunori Sakaki, Tokyo, Japan, assignor to Strapack Corporation, Tokyo, Japan

Filed May 20, 1988, Ser. No. 196,470

Claims priority, application Japan, Jan. 4, 1987, 62-86222[U]

Int. Cl.[4] B65B *13/22, 13/06*

U.S. Cl. 53—589 13 Claims



1. In a strapping machine for applying a band around an article, said machine comprising a forward-rotation drive roller and an opposing forward-rotation touch roller defining therebetween a band-feeding nip, a reverse-rotation drive roller and an opposing reverse-rotation touch roller defining therebetween a band-retracting nip for tightening a previously-fed band around the article, band-handling means for gripping, fusing, and cutting a band which has been tightened around an article, an eccentric shaft upon which said reverse-rotation touch roller is mounted, a shaft case connected to said eccentric shaft, an arm mounted for displacement, spring means connecting said arm to said shaft case, and a rotary cam shaft carrying a cam arranged to contact and displace said arm in a direction producing displacement of said shaft case and concurrent rotation of said eccentric shaft for moving said reverse-rotation touch roller toward said reverse-rotation drive roller, the improvement comprising an eccentric shaft rod rotatably mounted on said eccentric shaft and rotatably connected to said shaft case such that rotation of said eccentric shaft rod relative to said shaft case varies the magnitude of force applied to said reverse-rotation roller in response to displacement of said arm by said cam, and manually actuable means operably connected to said eccentric shaft rod for rotating the latter.

4,912,909

DIRECT MAIL ARTICLE WITH MAILABLE REPLY CARD

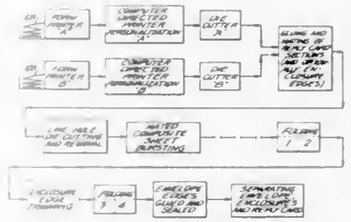
John W. Steaner, Orange, Conn., assignor to Kurt H. Volk, Inc., Milford, Conn.

PCT No. PCT/US88/00720, § 371 Date Jun. 6, 1988, § 102(e) Date Jun. 6, 1988

PCT Filed Mar. 4, 1988, Ser. No. 234,997

Int. Cl.[4] B65B *11/48*

U.S. Cl. 53—429 32 Claims



1. A method of forming a direct mail article (75) having a plurality of enclosure sheets (30, 40, 50) and a composite postcard reply device (33), comprising the steps of:

a. mating in a superposed aligned configuration a first composite sheet (14) comprising:

i. an envelope sheet (20) defining a flap (26) and a front panel (22) joined to a rear panel (24) along a transverse envelope panel fold line (19);

ii. a first enclosure sheet (30) joined to the rear panel (24) along a first transverse fold line (18); and

iii. a postcard reply device front section (32*a*) for forming the composite postcard reply device (33), the reply device front section (32*a*) being joined to the first enclosure sheet (30) along a second transverse fold line (16); and

a second composite sheet (14') comprising integral second (40) and third (50) enclosure sheets joined along a first transverse fold line (18') and a postcard reply device rear section (32*b*) joined to the third enclosure sheet (50) along a second transverse fold line (16'), the first and second transverse fold lines (18', 16') of the second composite sheet (14') being superposed over the first and second transverse fold lines (18, 16) of the first composite sheet;

b. bonding the front and rear postcard reply sections (32*a*, 32*b*) together to form the composite postcard reply device (33) and thereby maintain the mated configuration of the composite sheets (14, 14');

c. folding the bonded postcard reply device (33) and attached enclosure sheets (30, 50) to position them between

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the front and rear panels (22, 24) of the envelope sheet (20) so that the bonded postcard reply device (33) and enclosure sheets (30, 40, 50) are in an overlying configuration;

d. bonding the longitudinal edges of the front and rear envelope panels (22, 24) to form an envelope pocket containing the bonded postcard reply device (33) and enclosure sheets (30, 40, 50); and

e. while the envelope flap (26) is open, separating the bonded postcard reply device (33) from the first (30) and third enclosure (50) sheets, the second (40) and third (50) enclosure sheets from one another, and the first enclosure sheet (30) from the envelope sheet (20).

4,912,910

PACKAGE STRUCTURE FOR STORING ARTICLES AND A METHOD AND APPARATUS FOR ACCOMPLISHING THE SAME

Byron L. Lowe, and Robert T. Lewis, both of Macon, Ga., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jan. 23, 1989, Ser. No. 300,657
Int. Cl.[4] B65B *19/20*
U.S. Cl. 53—429 25 Claims

1. A method of snugly assembling a packaged member into an open-ended container having at least one internal dimension thereof greater than a co-extending external dimension of said packaged member comprising:

passing a sheet of material of preselected thickness and width from a supply zone to a forming zone;

shaping said sheet of material in said forming zone to a preselected breadth equivalent to the difference between said differing internal and external co-extending dimensions and to appropriate preselected perimeter to provide a shaped spacer sheet dimensioned to permit insertion thereof into said open-end container;

passing said shaped spacer sheet from said forming zone to an assembly zone to assemble said spacer sheet in stacked relation with said package member so that the overall external dimensions of said assembled packaged member and shaped sheet are such that said assembly can be inserted into said open-ended container in snug relation with the internal walls thereof; and,

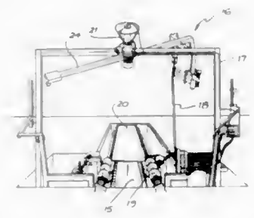
inserting said assembled package member and stacked shaped sheet into said open-ended container.

4,912,911

MACHINE FOR STRETCH WRAPPING OF LARGE REELS OF PAPER AND OTHER MATERIALS

Francis I. Down, New South Wales, Australia, assignor to G.D. Engineering Pty. Limited, Merrylands, Australia

PCT No. PCT/AU86/00303, § 371 Date Jun. 10, 1988, § 102(e) Date Jun. 10, 1988, PCT Pub. No. WO88/02723, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 13, 1986, Ser. No. 239,958
Int. Cl.[4] B65B *11/04*
U.S. Cl. 53—465 7 Claims



7. A method of wrapping an object having a central core, said method including the steps of

applying a wrapping material from a wrapping head in a plane inclined to the axis of the reel;

rotating the reel about its axis so that the wrapping material covers the external surface and ends of the reel except for the central core;

tilting said wrapping head so that endwise wrapping takes place in a plane at an angle of tilt to the axis of rotation of said object;

determining the length of the reel;

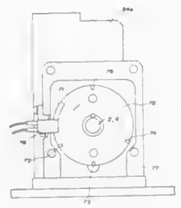
translating the measured length into said angle of tilt of the wrapping plane.

4,912,912

CONTROL APPARATUS IN STRAPPING MACHINE

Tsutomu Tagomori, Yokohama, Japan, assignor to Strapack Corporation, Tokyo, Japan

Filed May 20, 1988, Ser. No. 196,471
Claims priority, application Japan, May 30, 1987, 62-133532
Int. Cl.[4] B65B *13/22, 13/06, 13/32*
U.S. Cl. 53—589 6 Claims



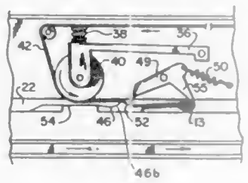
1. In a strapping machine for applying a band around an article, said machine including first motor-driven roller means for advancing a band, second motor driven roller means for retracting the advanced band to apply the band against an article, gripping means for gripping a leading end of the advanced band during such retraction of the band, fusing means for fusing the retracted band, cutting means for cutting the fused band, a motor-driven cam shaft, a plurality of cams on said cam shaft for actuating said gripping, fusing and cutting means in response to rotation of said cam shaft, sensor-actuating means operably connected to be rotated with said cam shaft, and sensor means disposed adjacent said sensor-actuating means and arranged to be actuated thereby, said sensor means operably connected to an electronic control circuit for controlling rotation of said motor-driven cam shaft, the improvement wherein said sensor-actuating means comprises a single disk operably connected to be rotated with said motor-driven cam shaft, said disk including a plurality of circumferentially spaced substantially coplanar sensor-actuating structures, said sensor means comprising a sensor located at a fixed sensing position relative to said disk and arranged to be sequentially actuated by said sensor-actuating structures as said sensor-actuating structures reach said sensing position.

4,912,913

BAG SEALING MACHINE

Gregory E. Rundle, Richmond, Canada, assignor to Bemis Company, Inc., Minneapolis, Minn.

Division of Ser. No. 103,652, Oct. 3, 1987, Pat. No. 4,813,207.
This application Dec. 13, 1988, Ser. No. 283,721
Int. Cl.[4] B65B *51/06, 51/08*
U.S. Cl. 53—583 3 Claims



1. Bag tying apparatus comprising

means for conveying filled bags one after another in a generally horizontal generally linear path with the mouth end of each bag extending upwardly and gathered for being tied with tape having a pressure-sensitive adhesive on one face thereof,

guide means extending above the conveyor means defining a generally straight guide slot for guiding the upwardly extending gathered mouth of each successive bag, the gathered mouth travelling in downstream direction in the slot,

a leaf spring secured adjacent one end thereof to said guide means at one side of said slot extending in downstream direction from its said one end and having a first portion angled toward the other side of the slot for laterally compressing the bag mouth as it travels downstream in the slot between said first portion and said other side of the slot, a second generally straight portion extending downstream from said first portion generally in a vertical plane between the planes of the sides of the slot, and a third portion extending downstream from said second portion constituting a free end portion of the leaf spring curved to extend over the other side of the slot,

a wheel mounted on said guide means at said other side of the slot with its axis generally vertical and with the wheel movable in a generally horizontal plane toward and away from said second portion of said leaf spring,

means biasing said wheel for movement in said generally horizontal plane in the direction toward said second portion of said leaf spring, for compressing the gathered bag mouth against said second portion of said leaf spring,

a back-up for said second portion of said leaf spring on said one side of said slot,

means for guiding a tape from a continuous supply thereof for travel around the wheel and thence in downstream direction from the wheel along said second and third portions of said leaf spring with the adhesive face of the tape facing outwardly away from the wheel,

whereby on passage of a gathered bag mouth in downstream direction between the tape passing around the periphery of the wheel and said leaf spring the gathered bag mouth is further compressed and the tape is looped around the compressed gathered bag mouth, adhered thereto and has portions thereof in face-to-face relation and adhered together by the adhesive thereon,

and a knife carried by the guide means movable generally in said horizontal plane away from a retracted position spaced from the slot across the slot adjacent the end of said free end portion of said leaf spring to cut the tape as the gathered bag mouth with the loop thereon passes by said free end portion of the leaf spring,

said knife having means extending across the slot engageable by said gathered bag mouth with the loop thereon as the mouth travels downstream from said free end portion of the leaf spring to move the knife from its retracted position across the slot to cut the tape and allowing the tied bag mouth to pass on by for exit from said slot,

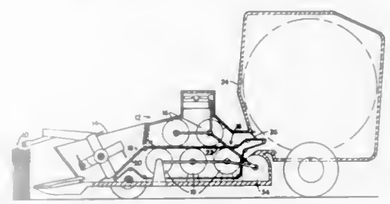
said slot being open at its upstream end for entry therein of the mouth of each bag and open at its downstream end for exit therefrom of the tied bag mouth of each bag as the bag is conveyed downstream by said conveying means.

4,912,914

METHOD AND APPARATUS FOR DRYING FORAGE CROPS

Steve G. Wingard, 419 Lyndhurst Rd., Columbia, S.C. 29212

Filed Aug. 29, 1988, Ser. No. 237,543
Int. Cl.[4] A01D *43/00*; F26B *23/08*
U.S. Cl. 56—1 13 Claims



1. A machine for harvesting a standing crop and removing excess moisture carried by said crop above a desired range of residual moisture so that said crop resists rotting, molding, shatterinng and spontaneous combustion while stored in bales, said machine comprising:

a means for cutting said standing crop as said machine moves at a speed in a first direction so that a continuous flow of cuttings issues from said cutting means in a direction opposite said first direction;

a plurality of induction jacket rollers between which induction jacket rollers said flow of cuttings passes;

said plurality of induction jacket rollers squeezing said flow of cuttings so that some of said excess moisture is squeezed therefrom;

said plurality of induction jacket rollers heated to a temperature for evaporating any remaining excess moisture in said flow of cuttings above said desired level of residual moisture as said flow of cuttings passes between said rollers so that substantially all of said excess moisture is removed and said flow of cuttings may be baled immediately upon issuing therefrom;

a first conveying means for conveying said flow of cuttings from said cutting means to said plurality of heated induction jacket rollers;

a means for detecting said level of excess moisture carried by said flow of cuttings and generating a signal corresponding to said level; and

a controlling means for receiving said signal, comparing said

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signal to a reference, determining a difference between said signal and said reference, and adjusting said level of moisture in said flow of cuttings conveyed from said induction jacket rollers so that said difference is reduced;

said controlling means adjusting said level of moisture in said flow of cuttings by commanding a change in said heat energy applied to said flow of cuttings by said plurality of induction jacket rollers.

4,912,915

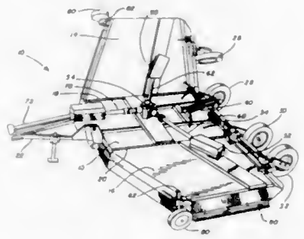
ROTARY CUTTER IMPLEMENTS

Edward H. Smit, Sheffield, Iowa, assignor to Sukup Manufacturing Company, Sheffield, Iowa

Continuation-in-part of Ser. No. 278,103, Nov. 30, 1988, abandoned. This application Jun. 26, 1989, Ser. No. 371,415

Int. Cl.[4] A01D *34/66, 34/74, 34/86*

U.S. Cl. 56—6 14 Claims



1. A rotary cutter implement for cutting crop materials as said implement traverses the ground, said implement including a housing and a support skid at each lateral side thereof, each of said skids being oriented parallel to the direction of normal travel of said implement, rotary cutter elements for cutting crop materials beneath said housing, each of said skids having a lower support surface disposed below the plane of the normal cutting action of said cutter elements, and a wheel disposed at the forward end of each of said skids and extending downward below the plane of the lower surface of the respective skid for supporting said section, each of said wheels being positioned relative to the respective skid such that the normal track of said wheel overlaps or is closely adjacent the forward profile of said respective skid whereby said wheel limits trash build-up ahead of said skid.

4,912,916

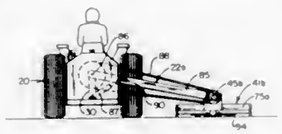
BOOM MOWER ATTACHMENT FOR TRACTOR ADJUSTABLE FOR CUTTING AT EITHER SIDE THEREOF

Ralph L. Parsons, Jr., 1795 Olmstead Rd., West Jefferson, Ohio 43162

Continuation-in-part of Ser. No. 156,816, Feb. 17, 1988, Pat. No. 4,887,417. This application Aug. 4, 1988, Ser. No. 228,232

Int. Cl.[4] A01D *34/86*

U.S. Cl. 56—15.2 23 Claims



1. A boom attachment for supporting a work unit comprising a support, a boom pivoted by a pivot at its inner end to said support for swinging movement,

a work unit supported on the outer end of said boom,

means for swinging said boom about said support pivot, said swinging means comprising a cylinder and piston unit connected at a laterally outwardly extending pivot to said support and a laterally outwardly extending pivot to said boom intermediate its inner and outer ends so it will be disposed along the side of the boom in a plane spaced from that of the boom and will not interfere with movement of the boom about its said pivot to said support;

means for braking the swinging of the boom at its uppermost point of swing.

4,912,917

MULCHER

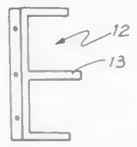
Edward du Moulin, 16 Frazer Street, Collaroy, New South Wales, 2097, Australia

Filed May 6, 1987, Ser. No. 47,372

Claims priority, application Australia, May 9, 1986, RH5816; Dec. 10, 1986, RH9424

Int. Cl.[4] A01D *34/63*

U.S. Cl. 56—16.9 2 Claims



1. A mulching attachment for a rotary motor lawnmower, said attachment comprising a base plate upon an upper surface of which a rotary motor lawnmower is removably mountable; and including a feed hopper attached thereto and being adapted to receive vegetable matter to be converted into mulch; said feed hopper being in communication with said upper surface of the base plate via a feed passage which is so formed and mounted relative to said base plate that on operation of said lawnmower a vibratory moment is imparted from the mower and the base plate to said feed passage, such as to minimize or avoid clogging and blocking thereof by vegetable matter passing therethrough; the arrangement being such that vegetable matter fed into said hopper through at least one feed inlet therein, passes through said feed passage to enter a cutting region of said mower, to be thereafter comminuted into mulch and discharged through existing discharge chute means of said mower; wherein a pair of laterally spaced apart swingable arms are pivotally mounted to said base plate, one on each side thereof and both extending downwardly below an underside of said base plate; wheels being mounted at lower ends of said arms; lever means being connected to or formed with at least one of said arms; said lever means being operable to move said arms and wheels into juxtaposition with the underside of said base plate, in which position said base plate is on or adjacent a ground surface; such as to allow for the placement and/or removal of a motor lawnmower thereon said lever means being further operable to move said base plate into a position in which it is supported substantially above the ground at a predetermined or desired angle relative thereto, by said arms and wheels; means being provided to releasably locate said lever means and base plate in such a position in which said base plate is located substantially above and angled relative to the ground.

4,912,918

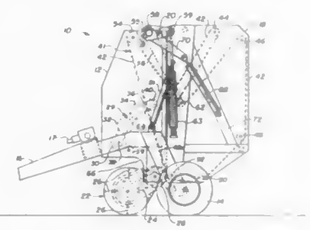
APRON TENSIONING METHOD FOR ROUND BALERS

Richard E. Jennings, Manheim; Robert A. Wagstaff, Lancaster, and H. Nevin Lausch, Denver, all of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Oct. 11, 1988, Ser. No. 255,680

Int. Cl.[4] A01D *39/00*

U.S. Cl. 56—341 1 Claim



1. In a round baler having a main frame, a tailgate pivotally connected to said main frame, a sledge assembly including a plurality of rollers mounted on said main frame for movement between a bale starting position and a full bale position, an apron supported on take up means mounted in said main frame, said apron having an expandable inner course cooperating with the rollers of said sledge assembly to define a bale starting chamber when said sledge assembly is in said bale starting position, said take up means being movable from an inner position toward an outer position as the inner course of said apron expands, a method comprising the steps of:

forming a core of a bale in said bale starting chamber while providing a primary source of tension in said apron by extending hydraulic means which is connected between said take up means and said tailgate; and

completing formation of said bale while providing a secondary source of tension in said apron, in addition to said primary source of tension, by extending spring means which is connected between said take up means and said tailgate.

4,912,919

ROVING STOP MOTION FOR A SPINNING MACHINE DRAFTING SYSTEM

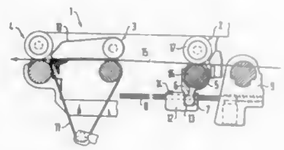
Manfred Lattner, Ebersbach-Sulpach, and Helmut Nickolay, Goppingen, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Fed. Rep. of Germany

Filed Apr. 19, 1988, Ser. No. 183,593

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1987, 3714548

Int. Cl.[4] D01H *13/18, 13/14*

U.S. Cl. 57—84 3 Claims



1. Roving stop motion means for a spinning machine having roving drafting means including; a pair of roving feed rollers defining a nip therebetween for transporting a traveling roving, said roving stop motion means comprising an actuating rod, drive means including a lever arm operably associated with said actuating rod, and a clamping member operably associated with said lever arm, said actuating rod being responsive to roving breakage for driving said clamping member by said lever arm to enter the nip between said feed rollers for separating said feed rollers and pressing the roving against one said roller, the improvement comprising carriage means mounted on said actuating rod for selective positioning and locking at differing locations along said actuating rod, said drive means being arranged on said carriage means asymmetrically with respect to the longitudinal extent of said actuating rod, and said carriage means being arranged on said actuating rod for selective repositioning and locking thereon in opposed dispositions turned 180 degrees to one another with respect to the longitudinal extent of said actuating rod.

4,912,920

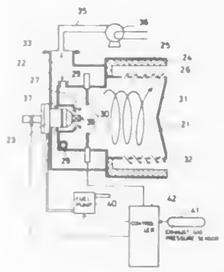
ULTRASONIC BURNER SYSTEM FOR REGENERATING A FILTER

Hideo Hirabayashi, Tokyo, Japan, assignor to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1989, Ser. No. 305,136

Int. Cl.[4] F01N *3/10*

U.S. Cl. 60—303 1 Claim



1. An ultrasonic burner system comprising:

a filter trap disposed in an exhaust line of a diesel engine; and

an ultrasonic burner for passing a combustion gas through said filter trap to burn unburnt substances on said filter trap,

said ultrasonic burner includes

a combustion chamber,

an ultrasonic atomizer disposed on one side of said combustion chamber and capable of atomizing a fuel into fine droplets,

an air/fuel mixture guiding port formed in a periphery of said ultrasonic atomizer, and

at least one air swirling nozzle provided tangentially to an outer periphery of said combustion chamber;

wherein a higher combustion temperature is developed in a peripheral region of said combustion chamber than in a core region of said combustion chamber.

4,912,921

LOW SPEED SPOOL EMERGENCY POWER EXTRACTION SYSTEM

John N. Rice, and Jarvis J. M. Yeh, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 14, 1988, Ser. No. 167,715

Int. Cl.[4] F02C *3/10*

U.S. Cl. 60—39.04 25 Claims

23. A method of providing emergency on board power to a jet aircraft having at least one gas turbine, said at least one gas turbine having a high speed spool and a low speed spool at an altitude above which an air aspirated auxiliary power unit is not operative to provide power to on board aircraft power generating units comprising:

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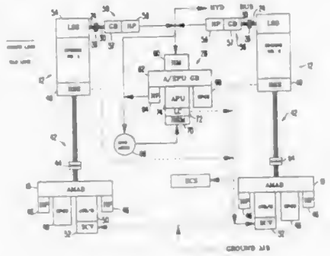
(a) sensing a condition requiring the generation of emergency on board power when the jet aircraft is above the altitude; and

(b) activating a power takeoff from the low speed spool to apply power from the low speed spool to the power gen-



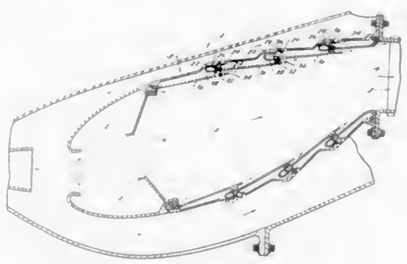
erating units to generate the emergency on board power by selectively coupling the power takeoff to an auxiliary power unit and an emergency power generating means for joint or independent drive of an emergency power supply means for the aircraft.

4,912,922

COMBUSTION CHAMBER CONSTRUCTION

Harvey M. Maclin, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 19, 1972, Ser. No. 316,441
Int. Cl.[4] F23R *3/60*
U.S. Cl. 60—39.32 **5 Claims**



1. A combustion chamber for use in a gas turbine engine, the chamber comprising:

an inlet for receiving air and fuel to be burned;

an outlet for expelling products of combustion;

high strength structural frame means disposed between the inlet and outlet for supporting mechanical forces associated with the chamber;

liner means structurally independent of said frame and cooperating with the frame to define a combustion zone, said liner means including a plurality of continuous annular rings adjacent to each other;

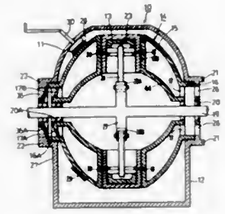
means for positioning at least one of said rings including flexible means carried by said ring and retaining means for cooperating with said flexible means to retain said ring substantially within a predetermined position with respect to

4,912,923

DOUBLE-ROTOR ROTARY ENGINE AND TURBINE

Abraham S. Lin, 11637 Grand NE., Albuquerque, N. Mex. 87123

Continuation of Ser. No. 24,451, Feb. 24, 1987, abandoned. This application Nov. 17, 1988, Ser. No. 273,147
Int. Cl.[4] F02C *5/08*
U.S. Cl. 60—39.34 **9 Claims**



1. A double-rotor rotary engine comprising:

(a) a base;

(b) a housing rotatably mounted to the base and forming a radial cylinder;

(c) an output shaft rotatably mounted concentric with the housing and having an arm rigidly extending therefrom within the housing;

(d) a piston slidingly engaging the cylinder and forming a combustion chamber with the cylinder, the piston being operatively connected to the arm for movement within the cylinder in response to relative rotational movement between the housing and the output shaft;

(e) means for admitting a fuel-air mixture into the cylinder;

(f) means for releasing combustion products from the cylinder following operation of the expanding means;

(g) turbine means operatively connected between the base and the housing, the turbine means providing a torque reaction against the housing in response to flow of the combustion products from the releasing means; and

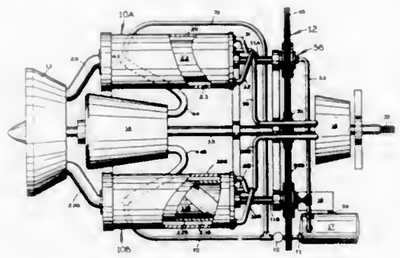
(h) stop means on the shaft for limiting the relative movement between the shaft and the housing, between a first position wherein the piston is radially extended within the cylinder and a second position wherein the piston is retracted toward the shaft.

4,912,924

ROTARY INTERNAL COMBUSTION ENGINE AND POWER PLANT

James K. Stockwell, 6040 S.W. 9th St., Plantation, Fla. 33317

Filed Sep. 30, 1988, Ser. No. 251,340
Int. Cl.[4] F02C *3/16*
U.S. Cl. 60—39.45 **14 Claims**



1. An internal combustion engine comprising:

a cylinder;

a rotor rotatable inside said cylinder, said rotor being a

generally cylindrical body with two separate spiral grooves in its periphery, said grooves being spaced apart circumferentially of the rotor at every point along its length, said body presenting spiral lobes on its periphery outside said grooves in close proximity to the inside of said cylinder;

means located near one end of the cylinder at a first location circumferentially of the cylinder for introducing a combustible fuel mixture into said cylinder;

means for firing said fuel mixture in said spiral grooves in the rotor to produce rotation of said rotor in said cylinder, said means for firing being located near said one end of the cylinder at a second location spaced circumferentially of the cylinder from said first location;

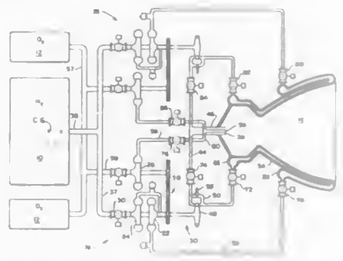
and means for passing the products of combustion from said cylinder, said means for passing the products of combustion from the cylinder being an opening at the opposite end of the cylinder which is positioned to register with one of said spiral grooves in the rotor when the other of said spiral grooves registers with said means for introducing the fuel mixture into the cylinder.

4,912,925

ROCKET ENGINE WITH REDUNDANT CAPABILITIES

Robert R. Foust, Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 4, 1985, Ser. No. 784,625
Int. Cl.[4] F02K *9/44*
U.S. Cl. 60—259 **3 Claims**



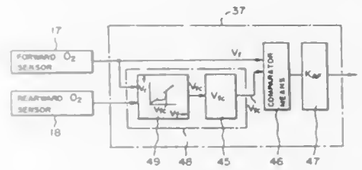
1. For a space craft vehicle a redundant system including a rocket engine for providing propulsion force, said rocket engine having an injector for feeding oxygen and hydrogen into a thrust producer means consisting of a single thrust chamber, a source of liquid hydrogen and a source of liquid oxygen connected to said injector and being located relative to said thrust chamber so that the center of gravity of said sources is in a predetermined location for each volumetric condition of said sources and bears a given and fixed relationship to the thrust chamber, said rocket engine comprising at least a pair of generally identical independent systems wherein each of said systems includes fluid connection means for conducting oxygen from said source to said oxygen injector and for conducting hydrogen from said source through indirect heat exchange relationship with said thrust chamber and then to said hydrogen injector, turbopump means for flowing the oxygen and hydrogen through said fluid connecting means, said sources being disposed relative to said thrust chamber so that the center of gravity remains substantially in coincidence with the centerline of said thrust chamber as the oxygen and hydrogen is used up.

4,912,926

AIR/FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Shiro Kumagai, Kyoto; Reijiro Komagome, Joyo; Yoshiaki Kodama, and Tateo Kume, both of Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1988, Ser. No. 190,259
Claims priority, application Japan, May 11, 1987, 62-113982; May 12, 1987, 62-115229
Int. Cl.[4] F02D *41/14*
U.S. Cl. 60—276 **14 Claims**



1. An air/fuel ratio control system for an internal combustion engine, comprising:

a first oxygen density sensor arranged on an upstream side of a catalytic converter so as to detect the density of oxygen in exhaust gas, said catalytic converter being provided in an exhaust system of the internal combustion engine and adapted to clean the exhaust gas;

a second oxygen density sensor arranged inside the catalytic converter or on a downstream side of the catalytic converter so as to detect the density of oxygen in the exhaust gas;

an air/fuel ratio control means for controlling the air/fuel ratio of the internal combustion engine on the basis of results of comparison between a detection value from one of the first and second oxygen density sensors and a predetermined standard value; and

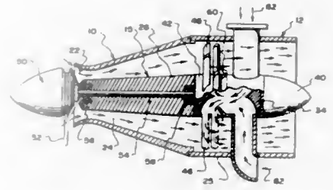
a standard-value changing means for changing the standard value on the basis of outputs from the first and second oxygen density sensors.

4,912,927

ENGINE EXHAUST CONTROL SYSTEM AND METHOD

Webster G. Billington, 1003 Wilshire Blvd., #203, Santa Monica, Calif. 90401

Filed Aug. 25, 1988, Ser. No. 236,703
Int. Cl.[4] F02B *35/00*
U.S. Cl. 60—315 **12 Claims**



1. An exhaust gas control apparatus for an internal combustion engine comprising;

a rotary fan blade assembly having a hollow hub and plurality of hollow blades, each having a plurality of apertures in a trailing edge;

drive means for driving said rotary fan blade assembly;

feed means feeding exhaust gases from said engine into said hollow hub and hollow blades;

air intake means for feeding intake air to said rotary fan blade assembly from a direction opposite to the direction of flow of said exhaust gases into said hollow hub of said rotary fan blade assembly;

exhaust means for exhausting a mixture of air and said exhaust gases;

whereby the flow of exhaust gases through said rotary fan blade assembly and out through said exhaust means reduces back-pressure, exhaust noise, exhaust temperature and exhaust pollutants.

4,912,928

EXHAUST HEAT EXCHANGER SYSTEM

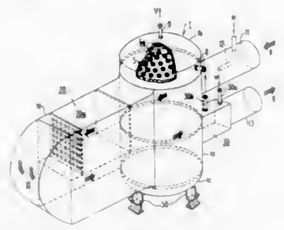
Shozo Kaneko; Susumu Sato; Tadashi Gengo; Jiro Takada; Joji Ichinari; Misao Yamamura, and Shuya Nagayama, all of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1988, Ser. No. 221,418

Claims priority, application Japan, Sep. 11, 1987, 62-226605

Int. Cl.[4] F01N *3/28*

U.S. Cl. 60—298 **6 Claims**



1. A system for recovering heat from and removing harmful components from an exhaust gas from a prime mover combustion engine, said system comprising:

a single casing containing therein a high-temperature side heat exchanger section and a low-temperature side heat exchanger section, said high-temperature side heat exchanger section having an exhaust gas inlet to receive exhaust gas from said prime mover combustion engine and an exhaust gas outlet, and said low-temperature side heat exchanger section having an exhaust gas inlet and an exhaust gas outlet;

a bent duct connecting said exhaust gas outlet of said high-temperature side heat exchanger section with said exhaust gas inlet of said low-temperature side heat exchanger; and

an exhaust gas purifying catalyst located within said bent duct;

whereby exhaust gas received in said high-temperature side heat exchanger section is cooled therein, then is passed through said catalyst in said bent duct and has harmful components removed therefrom, and then is passed through said low-temperature side heat exchanger section and is further cooled therein.

4,912,929

VARIABLE GAS SPRING FOR MATCHING POWER OUTPUT FROM FPSE TO LOAD OF REFRIGERANT COMPRESSOR

Gong Chen, and William T. Beale, both of Athens, Ohio, assignors to Sunpower, Inc., Athens, Ohio

Filed Aug. 3, 1989, Ser. No. 389,162

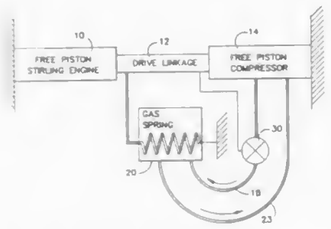
Int. Cl.[4] F02G *1/06*

U.S. Cl. 60—520 **8 Claims**

1. In heat pump of the type having a free piston Stirling engine connected by a drive linkage to a compressor for compressing gas from a low pressure portion of an apparatus and discharging it into a high pressure portion of the apparatus, an improved power load matching apparatus comprising:

(a) a gas spring connected to the drive linkage to apply spring force parallel to the axis of drive linkage reciprocation;

(b) an inlet gas passageway means in communication between the high pressure portion of the apparatus and the



gas spring for at times supplying gas into the gas spring; and

(c) valve means interposed in the inlet gas passageway means and linked to the drive linkage for opening the valve to permit gas to flow into the gas spring when the drive linkage amplitude of reciprocation exceeds a selected limit.

4,912,930

HIGH PERFORMANCE EXHAUST SYSTEM FOR INTERNAL COMBUSTION ENGINE

Hideaki Ueda, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

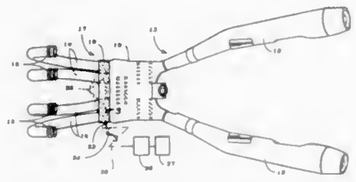
Continuation of Ser. No. 935,342, Nov. 26, 1986, abandoned.

This application Dec. 12, 1988, Ser. No. 285,318

Claims priority, application Japan, Nov. 26, 1985, 60-263753

Int. Cl.[4] F02B *27/02*

U.S. Cl. 60—313 **5 Claims**



1. In an internal combustion engine having a plurality of combustion chambers, an exhaust port for each of said combustion chambers for discharging exhaust gases from said combustion chambers, a plurality of exhaust pipes each extending from a respective inlet end at a respective one of said exhaust ports for conveying exhaust gases therefrom to a respective outlet end, and an expansion chamber into which said exhaust pipe outlet ends discharge, the improvement comprising valve means adjustably positioned directly at said exhaust pipe outlet ends for restricting the transmission of exhaust pulses from said expansion chamber back to said exhaust ports through the full length of said exhaust pipes, and means for adjusting the position of said valve means in response to an engine condition.

4,912,931

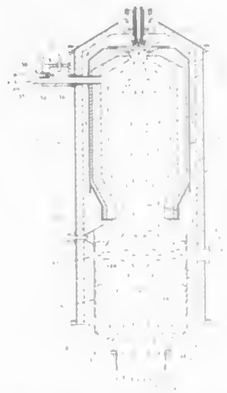
STAGED LOW NO_x GAS TURBINE COMBUSTOR

Narendra D. Joshi, Phoenix, Ariz.; Frederick E. Moreno, Los Altos, Calif., and Creighton D. Hartman, San Francisco, Calif., assignors to PruTech II, San Jose, Calif.

Filed Oct. 16, 1987, Ser. No. 109,118

Int. Cl.[4] F23R *3/46*

U.S. Cl. 60—732 **5 Claims**



1. In a staged gas turbine combustor having a primary combustion chamber for containing a fuel-rich combustion zone followed by a secondary combustion chamber for containing a secondary combustion zone for combusting the unburned combustion products exhausting from said primary combustion chamber:

liner means for lining the interior wall of said primary combustion chamber with a layer of porous fibrous refractory thermally insulative material; and

coating means infiltrated into said lining material from the interior wall thereof for coating the fibers of said fibrous lining material with a coating of refractory coating material so as to produce a radial gradient in the density of the resultant coated fibrous lining with decreasing density taken in the radial direction from the interior surface thereof toward the outer surface thereof, whereby the interior region of the infiltrated and coated refractory lining is rendered resistant to erosion by combustion products within the primary combustion chamber of the gas turbine combustor.

4,912,932

UNLOADER VALVE FOR CRYOGENIC REFRIGERATOR

Stephen F. Malaker, Mountainside, and Chester B. Pawelski, South Somerville, both of N.J., assignors to Cryodynamics, Inc., Mountainside, N.J.

Filed Sep. 14, 1987, Ser. No. 96,721

Int. Cl.[4] F25B *9/00*

U.S. Cl. 62—6 **9 Claims**

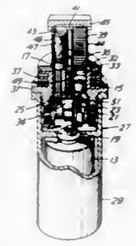
1. A closed cycle modified Stirling cycle refrigerator having a first piston for compressing a working gas in a cylinder and a second piston for expanding the compressed gas, comprising:

powered means for driving said pistons;

channel means communicating with said cylinder on either side of said first piston for bypassing said first piston in said cylinder;

a valve for blocking said channel means when closed;

means for closing said valve and for passively retaining said valve in the closed position; and



control means operable when said powered means is turned off for opening said valve for a time sufficient to prevent said pistons from being driven spontaneously in reverse.

4,912,933

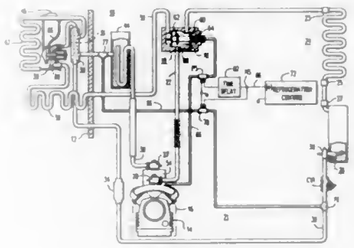
TRANSPORT REFRIGERATION SYSTEM HAVING MEANS FOR ENHANCING THE CAPACITY OF A HEATING CYCLE

David J. Reuken, Minneapolis, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Apr. 14, 1989, Ser. No. 338,919

Int. Cl.[4] F25B *13/00*

U.S. Cl. 62—81 **8 Claims**



1. In a transport refrigeration system which holds a set point temperature via heating and cooling cycles, a refrigerant circuit which includes a compressor, condenser, receiver, evaporator, and accumulator, mode selector valve means having heating and cooling positions, and control means for providing a heat signal when the need for a heating cycle is detected, the improvement comprising:

means responsive to said heat signal for connecting the receiver and accumulator in direct fluid flow communication,

and time delay means responsive to said heat signal which operates said mode selector valve means from the cooling position to the heating position after a predetermined time delay,

whereby a condenser flushing mode occurs prior to each heating cycle, which forces liquid refrigerant trapped in the condenser to flow to the accumulator via the receiver, to enhance the heating capacity of the system.

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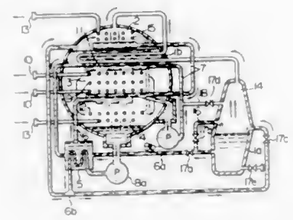
4,912,934

HERMETICALLY CLOSED CIRCULATION TYPE, VAPOR ABSORPTION REFRIGERATOR

Masahiko Itoh, Hitachiota; Heihatiro Midorikawa; Kazutoshi Itoh, both of Hitachi; Yasumasa Furutani, Katsuta, and Michihiko Aizawa, Ushiku, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 5, 1988, Ser. No. 253,574
Claims priority, application Japan, Oct. 5, 1987, 62-249835
Int. Cl.[4] F25B *15/00*
U.S. Cl. 62—112 17 Claims



1. A process for forming an anti-corrosive film on the inside wall of a high temperature regenerator of a hermetically closed circulation type, vapor absorption refrigerator comprising a high temperature regenerator, a low temperature regenerator, a condenser, an evaporator, an absorber and heat exchangers in a hermetically closed circulation system as essential constituent members composed of iron-based materials, which comprises providing a solution recycle line and a cooling medium supply line to the high temperature regenerator, sealing an aqueous solution containing molybdate ions and having a pH of 7.5 to 11 as a film-forming solution into the high temperature regenerator in advance to a refrigerating operation, recycling the film-forming solution in the high temperature regenerator through the solution recycle line while heating the high temperature refrigerator and supplying a cooling medium to the high temperature regenerator in an amount to balance the amount of water vapor evaporated from the film-making solution through the cooling medium supply line, thereby subjecting the high temperature regenerator to a film-forming operation and forming an anti-corrosive film on the inside wall of the high temperature regenerator, then closing the solution recycle line and the cooling medium supply line and withdrawing the film-forming solution from the high temperature regenerator.

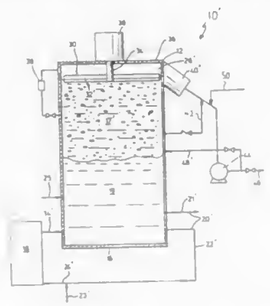
4,912,935

ICE STORAGE AND DISTRIBUTION UNIT

Vladimir L. Goldstein, Toronto, Canada, assignor to Sunwell Engineering Company Ltd., Woodbridge, Canada

Continuation-in-part of Ser. No. 97,890, Sep. 17, 1987, abandoned, which is a continuation-in-part of Ser. No. 74,834, Jul. 17, 1987, abandoned. This application Jun. 23, 1988, Ser. No. 225,711
Int. Cl.[4] C02F *1/22*
U.S. Cl. 62—123 29 Claims

1. An ice storage and distribution unit comprising:
an ice making machine for producing a slurry of ice particles in solution;
an ice storage and separation vessel for storing a slurry of ice in solution and separating the ice from the solution;
an ice slurry inlet for introducing a slurry of ice in solution from said ice making machine into said vessel, said slurry separating into a bed of ice and a liquid beth of solution in said vessel;
an agitator disposed in said vessels for agitating said ice bed;
an ice outlet for discharging said agitated ice from said vessel;
level detecting means associated with said vessel for monitoring the level of said bed of ice therein;
a makeup liquid inlet in communication with said vessel; and



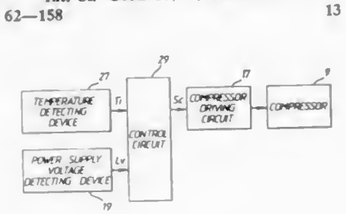
valve means responsive to said level detecting means and being associated with said makeup liquid inlet, said valve means being operable to control liquid flow into said vessel from said makeup liquid inlet to maintain said bed of ice at a predetermined level.

4,912,936

REFRIGERATION CONTROL SYSTEM AND METHOD

Kazuo Denpou, Ibaraki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 31, 1988, Ser. No. 176,320
Claims priority, application Japan, Apr. 11, 1987, 62-89279; Apr. 11, 1987, 62-89280
Int. Cl.[4] G05D *23/32*; H02H *7/00*
U.S. Cl. 62—158 13 Claims



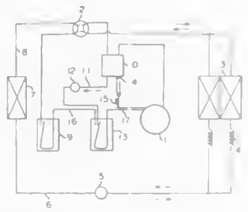
1. A controller for a refrigerating device including a compressor, comprising:
means for detecting a temperature in a compartment of the refrigerating device;
means for detecting a voltage of a power supply feeding power to the compressor;
processing means for: (1) comparing the temperature detected by the temperature detecting means with a set temperature, (2) comparing the power supply voltage detected by the voltage detecting means with a reference voltage,
(3) generating a drive signal when the detected temperature is higher than the set temperature and the power supply voltage is no lower than the reference voltage, (4) determining whether the compressor has started successfully, (5) halting the drive signal when the processing means senses that the compressor has not started successfully and (6) increasing the reference voltage by and additional amount from the previously increased reference voltage each time the drive signal is halted in response to the halting function; and
means for driving the compressor in response to the drive signal.

4,912,937

AIR CONDITIONING APPARATUS

Takashi Nakamura; Kouji Ishikawa; Yoshinobu Igarashi, and Hidekazu Tani, all of Wakayama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1989, Ser. No. 325,143
Claims priority, application Japan, Apr. 25, 1988, 63-101726; Apr. 25, 1988, 63-101727; Apr. 25, 1988, 63-101733; Apr. 26, 1988, 63-104720; May 18, 1988, 63-122380
Int. Cl.[4] F25B *13/00*
U.S. Cl. 62—160 18 Claims



1. An air conditioning apparatus comprising:
a switching valve for switching the flowing direction of a refrigerant discharged from a compressor to carry out either cooling operation, heating operation or defrosting operation;
an outdoor heat exchanger for receiving the refrigerant supplied by the compressor through the switching valve to make the refrigerant heat exchange with air to be heat exchanged;
an indoor heat exchanger for making the refrigerant heat exchange with a fluid to be heat exchanged;
an oil separator which is arranged in a discharging side refrigerant pipe connecting the switching valve and the discharge port of the compressor to separate the refrigerant and a refrigerating machine oil which are discharged from the compressor;
a first and second accumulators which are connected in series in an intake side refrigerant pipe connecting the switching valve and the intake port of the compressor;
a first bypass passage for connecting the oil separator and the second accumulator through a solenoid valve; and
a second bypass passage for connecting the oil separator and the intake port of the compressor through a metering device.

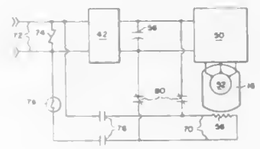
4,912,938

DC VOLTAGE BLEEDER FOR A VARIABLE SPEED AIR CONDITIONER

Louis E. Sulfstede, and C. Lee Stamp, Jr., both of Tyler, Tex., assignors to American Standard Inc., New York, N.Y.

Filed Jul. 28, 1989, Ser. No. 387,190
Int. Cl.[4] F25B *31/00*
U.S. Cl. 62—192 16 Claims

1. An air conditioning system comprising:
a compressor, said compressor including a DC motor disposed in a hermetic shell, said shell defining a sump in which oil collects;
means for providing AC power to said system;
a resistance heater, said heater being powered by AC power provided to said system by said means for providing AC power, for heating the oil which collects in said sump;
means, including a DC capacitor, for supplying DC power to drive said DC motor; and
means for disconnecting said heater from said means for providing AC power to said system and for connecting said DC capacitor across said heater so as to cause said



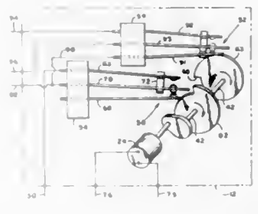
DC capacitor to discharge to said heater when AC power to said system is interrupted.

4,912,939

MAKING ICE IN A REFRIGERATOR

George Obermann, Niles, and David Troscinski, Woodridge, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 28, 1989, Ser. No. 316,848
Int. Cl.[4] F25C *1/04*
U.S. Cl. 62—233 2 Claims



2. An icemaker for a refrigerator comprising:
(a) an electrically operated fill valve adapted for connection to a water line and operative upon electrical energization to provide controlled flow to an ice mold;
(b) a rotable cam means having a first and second cam track, each track having a step thereon;
(c) motor means, including speed reducing means, operable to advance said first and second cam track at a timed rate;
(d) valve switch means having,
(i) upper and lower resiliently movable contact blades disposed in spaced arrangement;
(ii) an intermediate resiliently movable contact blade disposed between said upper and lower contact blades,
(iii) spacer means attached to one of said upper and lower contact blades, and operative to maintain a predetermined spacing therebetween; said lower and intermediate contact blades operative to drop on said first cam track step respectively in sequence for closing and opening said normally open positions of said upper and intermediate contact blades for timed energization of said fill valve; and
(e) hold switch means having,
(i) upper and lower resiliently movable contact blades disposed in spaced management,
(ii) an intermediate resiliently movable contact blade disposed between said upper and lower contact blades
(iii) spacer means attached to one of said upper and lower contact blades and operative to maintain a predetermined minimum spacing therebetween; said lower and intermediate blades operative to drop on said second cam track step in sequence respectively for closing and

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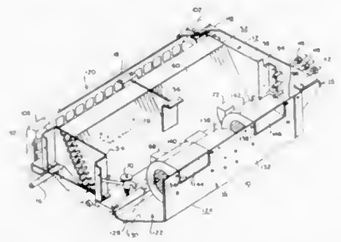
opening said upper and intermediate contact blades for maintaining current to said motor means.

4,912,940

REFRIGERANT EVAPORATOR SUITABLE FOR REMOTE MOUNTING

Lowell M. Anderson, Bloomington; Leland L. Howland, Belle Plaine, and Ambrose Tao, Burnsville, all of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed May 15, 1989, Ser. No. 351,499
Int. Cl.[4] B60H *3/04*
U.S. Cl. 62—239 7 Claims



1. A refrigerant evaporator assembly suitable for remote mounting to a ceiling of a trailer compartment having a served space to be conditioned, comprising:

an evaporator module having a metallic base member, an evaporator coil, a refrigerant circuit having refrigeration components, and an electrical circuit having electrical components,

said base member having first and second axial ends, first and second sides, and upper and lower surfaces,

said evaporator coil extending substantially from one axial end of the base to the other, and having headers fixed to the upper surface of said base member which orient the evaporator coil towards a predetermined side of the base member as it extends upwardly from a location on the base member intermediate the first and second sides,

a cover module including a metallic cover member having first and second axial ends which define an inverted U-shaped configuration having a bight portion and first and second depending leg portions,

said cover module being fixed to said evaporator module, such that said depending leg portions of the metallic cover member are respectively located at the first and second axial ends of said base member,

said evaporator and cover modules defining a substantially tubular housing having first and second open ends, wherein the first open end is defined by the first side of the base member and by the first side of the metallic cover member, and the second open end is defined by the second side of the base member and the second side of the metallic cover member,

a grille removably fixed to the first open end of the tubular housing,

and an evaporator blower module removably fixed to the second open end of said tubular housing,

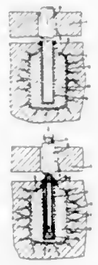
whereby the blower module and the refrigeration circuit and electrical circuit components mounted within the tubular housing may be serviced by removal of the blower module, and the grille may be removed for servicing electrical circuit components mounted within the tubular housing, without removing the tubular housing from a ceiling of a trailer compartment.

4,912,941

METHOD AND APPARATUS FOR EXTRACTING AND UTILIZING GEOTHERMAL ENERGY

Hans F. Büchi, Rotfluhstrasse 47, 8702 Zollikon, Switzerland

... Filed Feb. 8, 1988, Ser. No. 153,247
Claims priority, application Switzerland, Jul. 22, 1987, 2785/87
Int. Cl.[4] F25D *23/12*
U.S. Cl. 62—260 3 Claims



1. A method of extracting thermal energy from the earth's interior for use on the surface, comprising the steps of:

(a) drilling a bore hole downwardly into the earth;

(b) forming penetrating passages outwardly from the bore hole in addition to existing penetrating passages by fracturing rocks surrounding the bore hole with fracturing means in the bore hole;

(c) flushing out existing penetrating passages and those formed by fracturing with fluid means under pressure;

(d) redrilling the bore hole and forming additional penetrating passages by fracturing rocks surrounding the drill hole with fracturing means in the bore hole;

(e) flushing out existing and newly formed penetrating passages again;

(f) forcing a substance into the penetrating passages in the form of a slurry comprising a carrier liquid, binding material and particulate material which is highly conductive of heat;

(g) permitting the slurry to harden in the passages;

(h) inserting outer pipe into the bore hole and grouting the pipe to the hardened slurry in said passages and to the rocks surrounding it with a grout containing highly conductive, particulate material;

(i) enlarging a bottom zone of the bore hole by underreaming or by blasting;

(j) inserting inner pipe into said outer pipe to a depth near the bottom of said bottom zone; and

(k) conveying a heat transmission medium down one passage inside at least one of said pipes and up another passage inside at least one of said pipe so that the medium picks up heat in the bottom region of said hole and brings it up to the surface of the earth.

4,912,942

REFRIGERATOR CABINET AND DOOR CONSTRUCTION

Glenn E. Katterhenry; Raymond G. Simons, both of Evansville, and John P. Keil, Ohio Township, Warrick County, all of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 21, 1989, Ser. No. 312,722
Int. Cl.[4] F25D *23/12*
U.S. Cl. 62—338 14 Claims

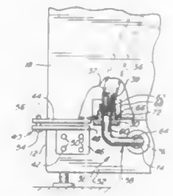
10. A refrigeration apparatus construction, comprising:

a cabinet housing an ice making apparatus, a source of refrigerated liquid, and an electrical control circuit;

a door hingedly mounted to said cabinet, the door including an electrically controlled ice and liquid dispensing apparatus positioned proximate said ice making apparatus;

a liquid conduit connecting said dispensing apparatus to said liquid source;

a plurality of electrical conductors connecting said dispensing apparatus to said electrical control circuit;



a crossover tube slidably received in an opening in said cabinet; and

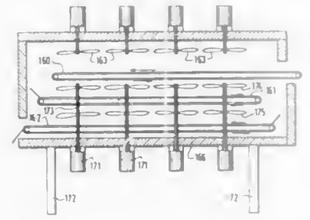
means for pivotally mounting said tube to said door, wherein said tube carries said liquid conduit and said conductors from said door to said cabinet.

4,912,943

METHOD AND APPARATUS FOR ENHANCING PRODUCTION CAPACITY AND FLEXIBILITY OF A MULTI-TIER REFRIGERATION TUNNEL

Jean-Luc Hubert, Willowbrook, and Miles S. Bajcar, Palo Hills, both of Ill., assignors to Liquid Air Corporation, Walnut Creek, Calif.

Filed Dec. 14, 1988, Ser. No. 284,421
Int. Cl.[4] F25D *17/02*
U.S. Cl. 62—374 35 Claims



35. A multi-tier refrigeration tunnel as recited in claim 34 wherein said second means comprises a plurality of fan motors, each one of said plurality of fan motors being mounted on the outside of said bottom panel and being operatively connected to a corresponding one of said plurality of vertical shafts.

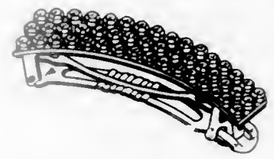
4,912,944

MAGNETIC JEWELRY

Dana B. Crosley, 6 Chatham Pl., and Jessica L. Cohn, 20 Allan Dr., both of White Plains, N.Y. 10605

Filed Dec. 28, 1988, Ser. No. 291,179
Int. Cl.[4] A44C *17/02*
U.S. Cl. 63—29.2 10 Claims

1. An article of jewelry comprising a base element adapted to be worn on the person, and a substrate element having opposite surfaces, one of the opposite surfaces bearing ornamentation, the other of the opposite surfaces being unornamented, the base element and the substrate element having magnetically attractable properties and at least one of said elements having the properties of a permanent magnet, the base element having a curved outer support surface adapted to receive the substrate element in engagement with the unornamented surface thereof, whereby the unornamented surface of the substrate element is held in removable engagement with the support surface of the base element by the force of magnetic attraction between the base element and the substrate



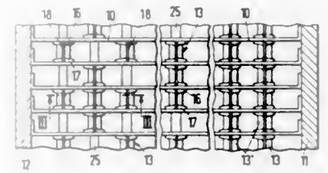
element, the base element being formed of a relatively rigid ferrous material and the substrate element being formed of a flexible magnetized sheet means for matching the curvature of said base element support surface.

4,912,945

DEVICE FOR THROUGH-FLOW TREATMENT OF FABRIC, PAPER, OR THE LIKE

Gerold Fleissner, Chur, Switzerland, assignor to Fleissner Maschinenfabrik AG, Rebstein, Switzerland

Filed May 23, 1989, Ser. No. 355,357
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1988, 3821330
Int. Cl.[4] D06B *5/08*
U.S. Cl. 68—5 D 6 Claims



1 An apparatus for the flow-through treatment of textile material, nonwovens, or paper, with a gaseous or liquid treatment medium comprising a permeable drum subjected to throughflow of the treatment medium from the outside toward the inside, said drum being under a suction draft and having end plates at end faces and serving as a conveying element and said drum being covered on its periphery with a screen-type cover, sheet metal strips extending in the axial direction of the drum and being arranged between the end plates of the drum, an extension in width of said sheet metal strips running substantially in the radial direction, and connecting elements which connect the sheet metal strips being provided in the peripheral direction between the sheet metal strips;

(a) said connecting elements each being a one-piece element;

(b) said connecting elements each having a width corresponding to the desired spacing of the directly adjacent sheet metal strips;

(c) said connecting elements being firmly connected on both sides with the adjoining sheet metal strips; and

(d) each connecting element being provided, over its length (in the peripheral direction of the drum), with a transverse bore through which an elongated threaded member is be passed and is connected by means of a nut with adjacent sheet metal strips, characterized in that the elongated threaded member is free of a screwhead and the neighboring nut between two adjacent sheet metal strips is an elongated one-piece internally threaded element to allow engagement with two aligned elongated threaded members.

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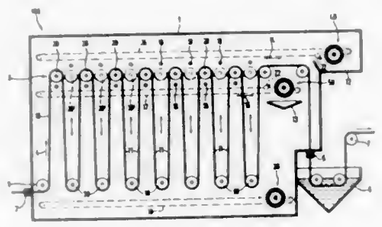
4,912,946

STEAMER

Walter Keller, Willich, Fed. Rep. of Germany, assignor to Eduard Küsters Maschinenfabrik GmbH & Co KG, Krefeld, Fed. Rep. of Germany

Filed Oct. 21, 1988, Ser. No. 260,939
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1987, 3736017
Int. Cl.[4] D06B *23/30*
U.S. Cl. 68—5 D 19 Claims



14. A steaming apparatus for textile webs having a housing containing at least one row of mutually parallel guide rollers around which a textile web is passed, a cleaning device associated with said at least one row to clean the periphery of the guide rollers, said cleaning device comprising:

a cleaning element supported for movement along said at least one row of guide rollers over the length of the guide rollers in a direction transverse to the longitudinal axes of the mutually parallel guide rollers, said cleaning element being mounted for rotation such that the cleaning element rotates about an axis parallel to the longitudinal axes of the guide rollers and is movable by a drive chain along a path in which the periphery of the cleaning element abuts against the guide rollers; and

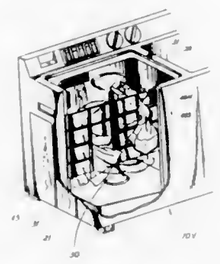
a nozzle arrangement supported for movement with the cleaning element along said at least one row of guide rollers.

4,912,947

WASHING MACHINE HAVING IMPROVED STRUCTURE SIMULATING ACTION OF HAND LAUNDRIES

Wen-Tzong Dai, No. 15, alley 16, section 2, Chung-san N. Rd., Taipei, Taiwan

Filed Sep. 25, 1987, Ser. No. 101,950
Int. Cl.[4] D06F *15/00*
U.S. Cl. 68—23.7 17 Claims



1. A washing machine having an improved structure that simulates the action of hand laundries comprising:

a water tank having a tank wall with an inner side and an outer side, said inner side of said tank wall being provided with a plurality of slots;

a shaft mounted at the center of the tank for rotatable movement relative to said tank, said shaft being provided with a plurality of slots;

at least a first pair of flexible washing boards

diametrically mounted on said shaft so as to extend outwardly toward said tank wall inner side;

at least a second pair of flexible washing boards

mounted on the inner side wall of the tank so as to extend inwardly toward said shaft;

and characterized by each said board of said first and second pairs being generally rectangular and having a root side and a tip side with the root side being thicker than the tip side so that the board has a wedge shape, said root side of said board having a protruded shoulder portion to be inserted into corresponding ones of said slots provided alongside said shaft

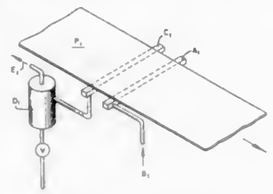
and the inner wall of the tank, the relative movement between the shaft and the tank wall causing the tip sides of said first pair of boards to be able to pass proximately to the tip sides of said second pair of boards so as to simulate kneading and rubbing action of hand laundries.

4,912,948

VACUUM GUIDE USED IN FLEXIBLE SHEET MATERIAL TREATMENT

Russell L. Brown, Charleston, and Charles J. Cunningham, Elkview, both of W. Va., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Mar. 22, 1985, Ser. No. 715,170
Int. Cl.[4] D06B *1/08*
U.S. Cl. 68—205 R. 7 Claims



1. An apparatus for treating moving flexible sheet material comprising:

(1) a vacuum guide having a surface for holding flexible sheet material with one or more openings in the surface, which openings extend to a chamber connected to vacuum generation means;

(2) a short-dwell, fluid applicator adjacent to the vacuum guide, which fluid applicator comprises in combination;

(a) a base;

(b) an upstream lip and a parallel downstrip lip both extending angularly from the base;

(c) a fluid application chamber extending between interior walls of each lip and closed at each end by end walls;

(d) one or more openings in the base providing movement of a uniform distribution of foam into the chamber from foam generation means;

(e) top inside and outside edges of the upstream lip;

(f) a top outside edge of the downstream lip;

(g) a rim between the top outside edge and the interior wall of the downstream lip;

(h) an upstream lip relief angle A formed by the inside edge and the interior wall of the upstream lip;

(i) a downstream lip relief angle B formed by the outside edge and the interior wall of the downstream lip;

(j) an orifice extending between the top inside edge of the upstream lip and the rim of the downstream lip effecting application of the foam to a substrate passing across the orifice; wherein,

(k) angle A is greater than or equal to 90°;

(l) angle B is less than 90°; and

(m) the upstream lip extends farther from the base than the downstream lip;

the applicator having a pair of lips extending in line with or a plane defined by the guide surface, with the fluid application chamber extending between the lips;

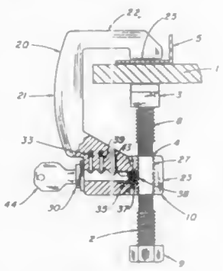
whereby the applicator is aligned with the vacuum guide sufficient to provide contact along the entire width of the applicator lips with a cross section of flexible sheet material passing to or from the guide surface across the applicator lips.

4,912,949

LOCK CLAMP

Arvid M. Bowers, Rt. 2, Box 5146, Twin Falls, Id. 83301

Filed Feb. 3, 1986, Ser. No. 825,252
Int. Cl.[4] E05B *73/00*; B25B *5/10*
U.S. Cl. 70—19 4 Claims



1. A lock clamp comprising:

a substantially C-shaped clamp having a body portion, an upper arm, and a vertically spaced lower arm, said upper arm provided with a workpiece engagement means and said lower arm provided with a vertical threaded aperture;

a clamp screw threadably and rotatably engaging said threaded aperture, said clamp screw provided on its shaft with at least one planar side portion; and

lock means, said lock means including a housing lock and key, said lock affixed to said lower arm of said clamp, said lock including a threaded bore transversely disposed to said threaded aperture of said clamp, a threaded lock screw rotatably engaging said lock bore, said lock screw provided with a planar end for engaging one of said planar side portions of said clamp screw and said lock screw provided with key engagement means whereby said lock screw may be rotated by said key upon insertion of said key into the lock to cause abutment between the planar surfaces of said lock screw and said clamp screw to prevent rotation of said clamp screw upon removal of said key and to thereby prevent removal of the lock clamp from a workpiece.

4,912,950

LOCKABLE BUCKLE

William G. Crowle, Deerfield, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.

Filed Oct. 3, 1988, Ser. No. 252,149
Int. Cl.[4] E05C *19/06*
U.S. Cl. 70—58 17 Claims

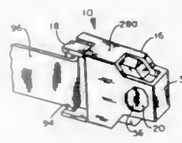
1. A lockable buckle, comprising:

body means including opposed locking slots:

latch means including a pair of resilient arms, each resilient arm having a raised tab portion for releasably engaging said opposed locking slots of said body means;

aperture means having a configuration defined by a plurality of substantially flat sidewall portions of said body means; and

rotary locking means rotatably disposed within said body means between a first unlocked position and a second locked position and including a base portion having a predetermined width dimension and a predetermined length dimension which is greater than said predetermined width dimension, and a raised portion having a multi-sided configuration corresponding to said configuration of said aperture means defined within said body means so as to operatively cooperate with said aperture means in defining said first unlocked position and said



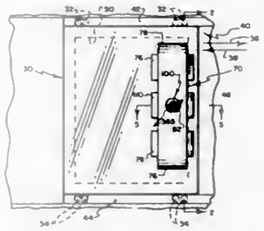
second locked position such that when said rotary locking means is disposed at said first unlocked position, said base portion of said rotary locking means will have its width dimension interposed between said resilient arms of said latch means so as to permit disengagement of said tab portions of said latch means from said locking slots of said body means while when said rotary locking means is disposed at said second locked position, said base portion of said rotary locking means will have its length dimension interposed between said resilient arms of said latch means so as to prevent disengagement of said tab portions of said latch means for said locking slots of said body means.

4,912,951

SLIDING DOOR LOCK

Lee S. Weinerman, Medina, and Joel T. Vargus, Middleburg Heights, both of Ohio, assignors to The Eastern Company, Cleveland, Ohio

Filed Feb. 1, 1989, Ser. No. 304,957
Int. Cl.[4] E05B *65/08*
U.S. Cl. 70—99 34 Claims



1. A latch for mounting on front and rear faces of a closure that is movable from side-to-side with respect to structure located behind the closure, and with the latch having a latch bolt formation that is projectable behind the closure to releasably engage structure located behind the closure to releasably retain the closure in a closed position, comprising:

(a) front housing means including a front housing member for mounting on a front face of a closure adjacent an opening that is formed through the closure;

(b) rear housing means including a rear housing member for

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mounting on a rear face of the closure adjacent the opening;

(c) compartment formation means defined by

facing portions of the front housing member and by forwardly facing portions of the rear housing member, for cooperating with the opening that is formed through the closure to provide a compartment for housing a latch bolt member;

(d) aligned opening means including a front opening formed substantially centrally through the front housing member and communicating with the compartment, and a rear opening formed substantially centrally through the rear housing member and communicating with the compartment, with the front and rear openings being aligned along an imaginary axis that extends forwardly and rearwardly with respect to the closure, and with the rear opening being of elongate configuration;

(e) a latch bolt opening formed through the rear housing member and communicating with the compartment at a location spaced from the axis of the aligned front and rear openings;

(f) latch bolt means including a latch bolt member having an elongate body for being positioned within the compartment, and having rearwardly projecting means including a latch bolt formation for extending through the latch bolt opening to project rearwardly from the rear housing member, with the body of the latch bolt member being movable forwardly and rearwardly within the compartment to selectively position the latch bolt member in a "latched" position wherein the latch bolt formation is relatively "projected" with respect to the rear housing member, and an "unlatched" position wherein the latch bolt formation is relatively "retracted" with respect to the rear housing member;

(g) push button means connected to the latch bolt member for moving forwardly and rearwardly therewith relative to the front and rear housing members, including a button member having a stem that projects forwardly from the latch bolt member and through the front opening to provide structure that is accessible from the front of the latch for moving the latch bolt member relatively forwardly and rearwardly with respect to the front and rear housing members;

(h) biasing means for biasing the latch bolt member and the button member forwardly with respect to the front and rear housing members;

(i) latching member means connected to the latch bolt member for forward and rearward movements therewith, including a latching member having elongate latching formation means configured (1) to be movable through the rear opening when the latching formation means is in an unlatching position wherein the latching formation means is aligned with the elongate rear opening, and (2) to block forward movement of the latching member when the elongate latching formation is in a latching position wherein the latching formation means extends behind and overlies portions of the rear housing member that reside adjacent the rear opening so as to be out of alignment with the rear opening;

(j) rotary positioning means connected to the button member and being accessible from the front of the latch for rotating the latching member means between its unlatching position of alignment with the rear opening and its latching position of non-alignment with the rear opening;

(k) whereby the latch can be operated:

(i) to "latch" the closure on which it is mounted in a closed position by causing the latch bolt formation to engage structure located behind the closure to prevent movement of the closure out of its closed position, as by moving the button member together with the latch bolt member and the latching member rearwardly in opposition to the action of the biasing means to a position wherein the latching formation means can be rotated from its unlatching position of alignment with the rear opening to its latching position of non-alignment with the rear opening; and,

(ii) to "unlatch" the closure by counterrotating the latching member to align the latching formation means with the rear opening, and by moving the button member together with the latch bolt and the latching member forwardly to a position wherein the latch bolt formation disengages said structure and thereby permits the closure to be moved out of its closed position.

4,912,952

MOTOR VEHICLE THEFT PREVENTION DEVICE

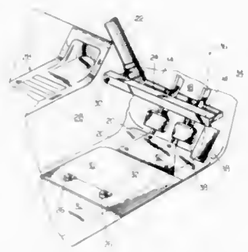
Brian Magrobi, and Judd M. Magrobi, both of Johannesburg, South Africa, assignors to Corporation Beta Y Zeta SA, San Jose, Costa Rica

Filed Oct. 9, 1987, Ser. No. 107,046

Claims priority, application South Africa, Oct. 9, 1986, 86/7701; May 19, 1987, 87/3589

Int. Cl.⁴ B60R *25/00*

U.S. Cl. 70—199 5 Claims



1. A locking device for a motor vehicle including floor mounted control pedals, the locking device comprising an open frame, which is adapted for securement to one or more of the floor, a steering column and a bulkhead of the motor vehicle, the frame including base and lintel parts located, respectively, below and above a framed opening and the device including a panel which, on one side thereof, is provided with locking means adapted releasably to engage complementary locking means on the lintel, the other side of the panel being hingedly mounted on the base for pivotable movement between an open position, in which the framed opening is open to enable operator access to the control pedals, and a closed position, in which the framed opening is closed by the panel and the locking means on the panel and the lintel are engaged, to deny operator access to the control pedals.

4,912,953

RE-KEYABLE CYLINDER LOCK

Gerald C. Wobig, Sikeston, Mo., assignor to National Lock Corporation, Sikeston, Mo.

Filed Sep. 29, 1988, Ser. No. 250,851

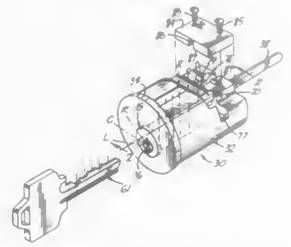
Int. Cl.⁴ E05B *25/00*

U.S. Cl. 70—383 9 Claims

1. A lock operated by a first user key and changed over by a change key to prevent operation of said lock by said first user key and to enable operation of said lock by a second user key having bitting different from the bitting of the first user key, said lock comprising

a cylinder, a series of driver chambers located in and spaced axially along said cylinder, drive pins located in said chambers and movable radially therein, an elongated plug supported to rotate in said cylinder and to receive any one of said keys, a series of tumbler chambers located in and spaced axially along said plug and alined angularly and axially with said driver chambers, tumbler pins located in said tumbler chambers and movable radially therein, the

interface between each tumbler pin and each aligned pin in said cylinder being spaced radially from a shear line between said plug and said cylinder and preventing rotation of said plug in said cylinder, the interface between at least a part of said tumbler pins and at least a part of said alined pins in said cylinder being located radially on said shear line when said first user key or said change key is inserted into said plug whereby said plug may be rotated within said cylinder by either of such keys, an additional driver chamber spaced transversely from one of said driver chambers, an additional drive pin located in said additional driver chamber and having a length different from the length of the drive pin in said one driver chamber, responsive means being responsive to rotation of said



plug by said change key to shift said one driver chamber and the drive pin therein transversely out of alinement with the associated one of said tumbler chambers and to shift said additional driver chamber and the drive pin therein transversely into alinement with such tumbler chamber thereby to prevent operation of said lock by said first user key and to convert said lock for operation by said second user key, and a shuttle movable transversely of said cylinder and containing said one driver chamber and said additional driver chamber, said responsive means comprising a rotary member and further comprising a member for converting turning of said rotary member into transverse movement of said shuttle, and means for selectively coupling said rotary member for rotation with said plug.

4,912,954

METHOD OF ROLLING STRIP IN A ROLLING MILL AND A CONTROL SYSTEM THEREFOR

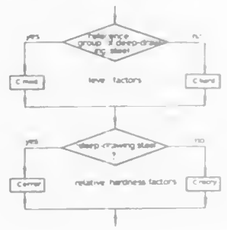
Henk Vegter; Adrianus J. Van Den Hoogen, both of Alkmaar, and Gerrit J. Heesen, Heemskerk, all of Netherlands, assignors to Hoogovens Groep B.V., Ijmuiden, Netherlands

Filed Mar. 28, 1988, Ser. No. 174,405

Claims priority, application Netherlands, Apr. 2, 1987, 8700776

Int. Cl.⁴ B21B *37/14*

U.S. Cl. 72—8 8 Claims



8. Control system for operating a rolling mill train which has at least one roll stand, transducers on each roll stand, adjusting means on each roll stand, and strip thickness measuring means, the control system comprising data input means, a data processing unit, a memory and data output means, wherein the data input means is connected to said transducers on the roll stands and to said a strip thickness measuring means, and the data output means is connected to said adjusting means of the roll stands, the memory being provided with a program adapted to cause the processing unit, by using data from the data input means to generate further data and to supply it to the data output means so as to cause adjustment of the roll stands.

4,912,955

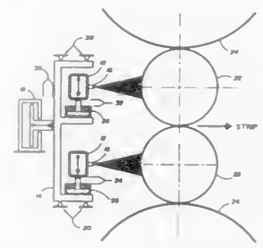
SPRAY SYSTEM FOR ROLLING MILL

Thomas B. Stines, Huntingdon, Tenn., assignor to Norandal USA Inc., Huntingdon, Tenn.

Filed Dec. 5, 1988, Ser. No. 279,772

Int. Cl.⁴ B21B *27/10*

U.S. Cl. 72—45 3 Claims



1. A spray system for use in a rolling mill comprising two superposed work rolls between which is defined a bit through which passes a metal strip to be rolled, said spray system comprising:

(a) a carriage assembly mounted on linear bearings for movement along an X-axis parallel to an horizontal line passing through the bite of the two superposed work rolls;

(b) two spray manifolds mounted on said carriage assembly along a Y-axis parallel to a vertical centerline passing through the work rolls, each manifold containing at least one spray nozzle for setting a predetermined spray pattern on each work roll;

(c) a carriage traverse mechanism for adjusting the traverse position of the carriage assembly along said X-axis; and

(d) two manifold lift mechanisms mounted on the carriage assembly to independently adjust the position of each spray manifold along said Y-axis.

4,912,956

PROCESS AND APPARATUS FOR ROLLING A METAL SHEET OR STRIP

Paul Matricon, La Garenne Colombes, and Marc Valeace, Courbevoie, both of France, assignors to CLECIM, Courbevoie, France

Filed Apr. 11, 1988, Ser. No. 179,948

Claims priority, application France, Apr. 9, 1987, 87 05031

Int. Cl.⁴ B71B *31/16*

U.S. Cl. 72—243 9 Claims

1. Process for the rolling of a metal product in a rolling mill comprising

a stand (6) having two columns (61);

at least four rolls (1, 2, 3, 4) mounted inside said stand for rotation about parallel axes which are disposed in a pressure application plane (P), each on a shaft (11, 21, 31, 41) carried at its two ends respectively by support means (12, 22, 32, 42);

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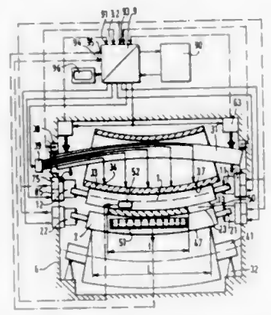
said rolls comprising two work rolls (1, 2) delimiting an elongate space (50) for passage of said product (5), a variable camber backup roll (3) which cooperates with a first (1) of said work rolls and a coacting roll (4) which cooperates with a second (2) of said work rolls;
at least the support means (11, 12) of said work rolls (1, 2) being each constituted by a chock (7) sliding along the corresponding columns (61) of said stand (6);
said variable camber backup roll (3) having a deformable cylindrical casing (33) which is mounted on a central shaft (31) and whose profile (37) can be adjusted by the application of thrust loads between said central shaft (31) and an inner face of said casing (33);
means (63) for applying a pressure load to ends of said shaft (31) of said backup roll (3);
means for cambering said two work rolls (1, 2) by applying bending loads to ends of the shaft of each said work roll;
said means (8) for cambering comprising positive and negative hydraulic camber devices (81, 82) respectively cooperating with each said chock (70 of each said work roll (1, 2), said hydraulic camber devices (81, 82) being supplied



separately at individually adjustable pressure for positioning said chocks (7) independently of one another;
said process comprising the steps of
(a) allowing said coacting roll (4) to deform freely under the action of the pressure load to form a line of support (47) which is concave in the direction of said product (5);
(b) adjusting the profile of said deformable casing (33) of said backup roll (3) in such a manner as to form a line of support (37) which is convex in the direction of said product (5) and is substantially parallel to the line of support (47) of said coacting roll (4);
(c) individually adjusting the camber of each said work roll (1, 2) in such a manner as to maintain a constant thickness of the roll pass over the entire width of said product (5);
(d) producing at an exit of said rolling mill a product (5) having an incurved transverse profile with a constant thickness; and
(e) straightening said incurved product (5) to obtain a flat product.

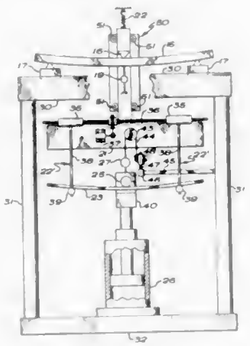
4,912,957

SMART STRAIGHTENING PRESS

Paul S. Petersen, Minnetonka, and Virgil C. Hed, Edina, both of Minn., assignors to Dayton Rogers Manufacturing Company, Minneapolis, Minn.

Filed Apr. 28, 1989, Ser. No. 345,009
Int. Cl.[4] B21D *3/10*
U.S. Cl. 72—389 **15 Claims**

10. A straightening press for a workpiece which comprises:
a stationary work table;
adjustable workpiece supports positioned on said work table, said workpiece supports allowing workpiece deflection toward said work table;
anvil means positioned to engage a workpiece supported by said workpiece supports and moveable to deflect a workpiece toward said work table;
reference spring means;
reference spring means support means;
floating bridge means carrying and moveable with said anvil means and said reference spring means support means;
ram means engageable with said reference spring means and moveable to deflect said reference spring means;



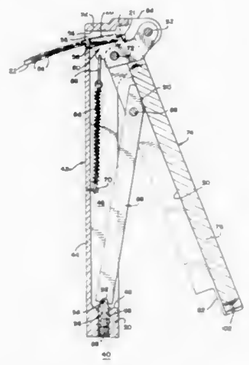
means for detecting the deflection of the workpiece; and
means responsive to the relative movement between the ram means and floating bridge means for detecting plastic yield of said workpiece;
wherein workpiece deformation is initially established by said deflection detecting means, said ram means is moved to deflect said reference spring means and said workpiece, via said floating bridge means, until plastic yield of said workpiece is detected and further deflection of said workpiece is monitored via said deflection detecting means.

4,912,958

HAND TOOL FOR PRESSING WIRE CONNECTORS

Edward H. Yonkers, Evanston, Ill., assignor to Electro-Appliance Co., Inc., Chicago, Ill.

Filed Apr. 19, 1989, Ser. No. 340,374
Int. Cl.[4] B21D *7/06*
U.S. Cl. 72—410 **14 Claims**



1. An improved hand tool for repeatedly compressing successive telephone wire connectors to a precise geometric configuration in order to establish a high quality electrical connection between a plurality of insulated wires extended into an open end of said connectors, said connectors being of a type including a deformable hollow metal body having opposed surfaces with a plurality of integral, inwardly directed gripping elements for penetrating insulating jackets of said wires and engaging central conductors thereof with progressively less penetration toward said open end; said improved hand tool comprising:
an elongated body having a mouth open on one side of said body for receiving one of said connectors inserted into said mouth and engaged on one side by a fixed jaw surface formed adjacent an end of said body extending transversely across a longitudinal axis thereof, said one side of said body comprising a fixed handle portion of said tool extending between said fixed jaw surface and a remote pivot point along said longitudinal axis adjacent an opposite end of said body;
a movable jaw pivotally mounted on said body for rotation about a first pivot laterally offset from said longitudinal axis and in line with the fixed jaw surface and having a movable jaw surface opposite said fixed jaw surface of said mouth, and movable jaw surface extending transversely across said longitudinal axis between said fixed jaw surface and said remote pivot point for movement toward and away from said fixed jaw surface of said mouth for compressing said metal body of said connector inserted into said mouth from said open side into a precise tapered configuration of predetermined dimensions thereby establishing a strong electrical and mechanical connection between said central conductors of said wires inserted into said connector;
an operating handle having one end portion pivotally secured to said movable jaw about a second pivot spaced from said first pivot toward said longitudinal axis and having an opposite end portion manually movable toward and away from said opposite end of said body for pivoting said movable jaw between precise open and closed positions relative to said fixed jaw surface of said mouth;
an elongate thrust member pivotally interconnected between said operating handle and said remote pivot on said fixed handle portion of said body, said thrust member having one end pivotally connected to said operating handle about a third pivot thereon spaced between said second pivot and said opposite end portion of said operating handle, said thrust member including an opposite end pivotally mounted on said remote pivot on said body; and
said operating handle being relatively pivoted with respect to said movable jaw upon movement of said handle from a jaw open position toward a jaw closed position providing a rapidly increasing ratio of handle movement to jaw closing movement of said movable jaw for compressing said connector with a maximum force generally aligned with said longitudinal axis of said tool as said third pivot approaches said longitudinal axis.

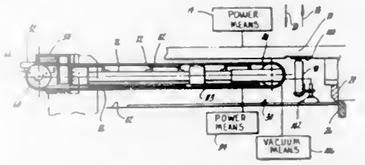
4,912,959

OVERHEAD MAGNETIC BLANK UNLOADING CONVEYOR

Irvin D. Bond, 1027 Allen Rd., Clarkston, Mich. 48016

Filed Oct. 26, 1988, Ser. No. 262,739
Int. Cl.[4] B21D *45/00*
U.S. Cl. 72—426 **16 Claims**

1. In a press apparatus having a lower die shoe, and an upper die shoe moveable with respect to the lower die shoe in a power stroke, and a magnetically-attractive workpiece movable to a pick-up position between said upper die shoe and said lower die shoe, the combination comprising:
a first belt conveyor means including an elongated conveyor belt having a first end disposed between said upper die shoe and said lower die shoe inside the press apparatus adjacent said pick-up position at such times as the upper die shoe is moving toward said conveyor belt first end in power stroke, and a second end supported in a transfer position outside the press and remote from the first end, and means for moving the first end of the belt from the pick-up position to said transfer position;
first means carried on the upper die shoe operative to engage the workpiece as the upper die shoe is moving toward the lower die shoe, and moving the workpiece toward the belt



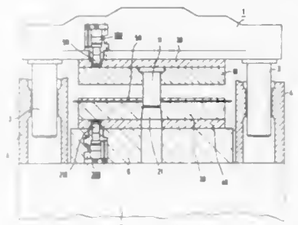
as the upper die shoe is moving away from the lower die shoe; and
magnetic means mounted on the belt conveyor means for retaining the workpiece in engagement with the belt as it is being moved from said pick-up position to said transfer position, to remove the workpiece from the press apparatus.

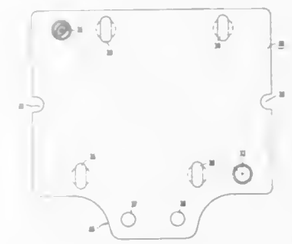
4,912,960

AUTOMATIC PRECISION STAMPING PRESS AND METHOD FOR CHANGING TOOLS

Joseph Kroener, Schwabach; Thomas Hartwig, Erlangen, both of Fed. Rep. of Germany, and Helmut Messner, Arbon, Switzerland, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 9, 1988, Ser. No. 204,510
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1987, 3719370
Int. Cl.[4] B21D *37/14*
U.S. Cl. 72—462 **12 Claims**





1. An automatic precision stamping press comprising:
a press plunger;
a press table;

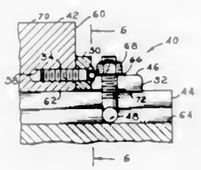
an exchangeable guideless tool having separate tool halves with an upper tool fastenable to said press table;
guiding columns and corresponding guiding sleeves for accurately guiding outside said tool halves the press plunger and the press table;
separate mounting plates, said tool halves being respectively fastened to one of said mounting plates, said mounting plates having diagonals extending between corners of said mounting plates;
positioning devices engaged with said mounting plates, with exactly two positioning devices for each mounting plate operating to respectively position said upper tool part at said press plunger, and said lower tool part at said press table;
wherein said positioning devices are hydraulic clamping plugs that are arranged on a diagonal of each of said mounting plates; and
wherein a first one of the two hydraulic clamping plugs for each said mounting plate includes means for permitting mobility of the mounting plates extending in a direction of the diagonal of said mounting plates.

4,912,961

STRUCTURE FOR SECURING A DIE TO A BOLSTER PLATE

Donald H. Brown, 19725 Somers, New Boston, Mich. 48164

Filed Nov. 5, 1987, Ser. No. 117,043
Int. Cl.[4] B21D *37/14*
U.S. Cl. 72—462 **14 Claims**



9. In combination, a bolster plate, a separate clamp for securing a die to a bolster plate comprising an L shaped member having a shorter leg and a longer leg, the longer leg of which is bifurcated, separate means securing one end of the clamp to the die including a countersunk opening extending through the shorter leg of the clamp having an axis of generation extending parallel to the longer leg of the clamp and a bolt extending through the one end of the clamp and into the die and means for releasably securing the clamp to the bolster plate including a T bolt extending within the T slot and through the longer end of clamp and a nut secured to the T bolt on the side of the longer end of the clamp opposite the bolster plate.

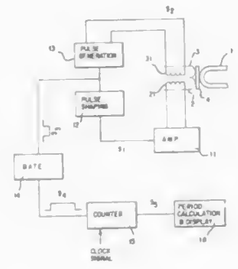
4,912,962

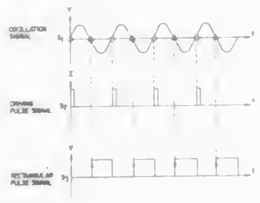
METHOD OF DETECTION OF OSCILLATION PERIOD FOR OSCILLATORY DENSIMETER

Kenji Kawaguchi, Kyoto, Japan, assignor to Kyoto Electronics Manufacturing Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 143,252, Dec. 29, 1987, abandoned.
This application Mar. 21, 1989, Ser. No. 326,507
Claims priority, application Japan, Dec. 29, 1986, 61-312914
Int. Cl.[4] G01N *9/00*
U.S. Cl. 73—32 A **10 Claims**

1. A method of detecting an oscillation period of an oscillating tube filled with a liquid for which density is to be measured with an oscillatory densimeter, comprising the steps of:
(a) detecting an oscillation signal indicative of oscillation of the oscillating tube, said oscillation varying as a function of density of the liquid in the tube;
(b) generating a driving pulse signal in synchronization with said oscillation signal, which driving pulse signal increases in the same direction of the oscillation signal when the magnitude of said oscillation signal is substantially zero and which driving pulse signal is shorter than the period of a half-cycle of the oscillation signal;





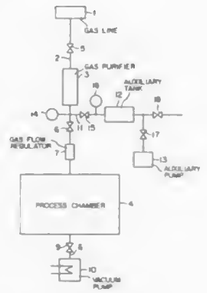
(c) driving the oscillating tube by means of said driving pulse signal, wherein the pulse duration of said driving pulse signal is substantially constant regardless of the oscillation period of the oscillating tube; and
(d) measuring the oscillation period of the oscillation tube.

4,912,963

METHOD AND AN APPARATUS FOR EVALUATING THE GAS PURIFYING ABILITY OF A GAS PURIFIER

Kazuya Mori; Tohru Watanabe, and Katsuya Okumura, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 22, 1989, Ser. No. 313,529
Claims priority, application Japan, Feb. 22, 1988, 63-39036
Int. Cl.[4] G01N *15/00*
U.S. Cl. 73—38 **4 Claims**



1. A method of evaluating the gas purifying ability of a gas purifier comprising the steps of:

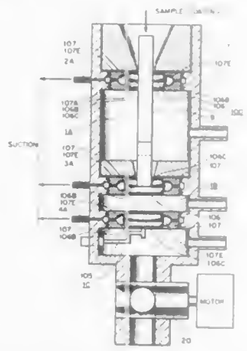
sealing the gas purifier while reducing the inner gas pressure thereof;
releasing into the gas purifier a purification evaluation gas, the purification evaluation gas being contained within a tank at a higher inner gas pressure than the inner gas pressure of the gas purifier. the gas flow from the tank to the gas purifier being controlled by a valve located therebetween; and
measuring the amount of purification evaluation gas released within the gas purifier by measuring the inner gas pressure of the tank.

4,912,964

SAMPLE SUPPORTING DEVICE HAVING SMALL CONTACT REGION WITH SAMPLE SUITABLE FOR VENTILATION-CHARACTERISTICS MEASURING APPARATUS

Kazuyuki Ohtsuki, Hiratsuka; Yoshiaki Kawamura, Hadano, and Yasuo Katougi, Odawara, all of Japan, assignors to Japan Tobacco, Inc., Tokyo, Japan

Continuation of Ser. No. 168,272, Mar. 15, 1988, abandoned.
This application Sep. 8, 1989, Ser. No. 404,922
Claims priority, application Japan, Apr. 16, 1987, 62-91931
Int. Cl.[4] G01N *15/08*
U.S. Cl. 73—38 **9 Claims**



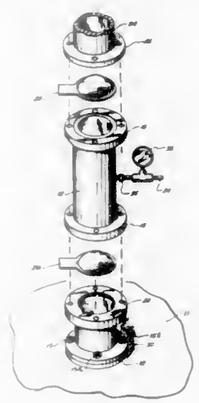
1. A sample supporting device for a ventilation measurement apparatus comprising:
a hollow cylindrical body substantially vertically positioned and having an inner wall defining an empty chamber communicated with a suction path; said empty chamber being used for measuring ventilation-characteristics of a cylindrical sample; said sample being guided into said chamber from above, positioned within said empty chamber during ventilation-characteristics measurement, and released downwardly after the ventilation-characteristics measurement;
a holding ring member mounted to said inner wall of said hollow cylindrical body coaxially therewith and having an inner wall in which a circumferential groove is formed, said groove being communicated with said suction path; and
a sample supporting member positioned in said bolding ring member for supporting a cylindrical sample in airtight relation within said empty chamber, said sample supporting member closing said groove and defining an annular suction chamber between said circumferential groove and said sample supporting member; wherein said sample supporting member includes:
a flexible peripheral portion having a shape of a cylinder when not sucked into said annular suction chamber and becoming protuberant when sucked into said annular suction chamber;
a filmy disk-shaped separating wall integrally formed with and coaxially provided on an inner wall of said flexible peripheral portion, said separating wall having elasticity in a radial direction thereof and flexibility in a direction in which said sample is moved; and
a sample supporting hole formed in said filmy disk-shaped separating wall concentrically therewith, said sample supporting hole having a first diameter smaller than that of said sample when said flexible peripheral portion is not sucked into said annular suction chamber and a second diameter larger than that of said sample when said flexible peripheral portion is sucked into said annular suction chamber;
whereby while suction pressure is applied to said suction chamber through said suction path said diameter of said sample supporting member hole is said second diameter so that the sample is guided into said measuring chamber through the sample supporting hole and said diameter of said sample supporting member hole is said first diameter when no suction pressure is applied to said suction path so that said sample is supported with a minimum contact area in said sample supporting hole.

4,912,965

RUPTURE DISC MONITOR

Phillip R. Beaver, and Clifford S. Durand, III, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Mar. 31, 1989, Ser. No. 331,182
Int. Cl.[4] G01M *3/26*
U.S. Cl. 73—40 **10 Claims**



5. An apparatus for detecting gas permeability in a main rupture disc which is in gaseous communication with a vessel, said apparatus comprising:
(a) a chamber which is fittable over and in a gas-tight manner with said main rupture disc's outside surface;
(b) means for obtaining, when said chamber is fitted as described in (a), a gaseous pressure within said chamber which,
(i) is greater than the normal operating pressure within said vessel, and
(ii) which is equal to the difference between a selected set pressure and a selected burst pressure for said main rupture disc; and
(c) means for monitoring said chamber pressure for a decrease thereof
wherein said chamber is in gaseous communication with a chamber rupture disc which has a burst pressure which, when added to the burst pressure of said main rupture disc, provides a sum which is substantially equal to the set pressure and which

will allow for the obtainment of said gaseous pressure in said chamber without rupture of the chamber rupture disc.

4,912,966

TOTAL CONTAINMENT MEANS FOR STORAGE TANK SYSTEMS

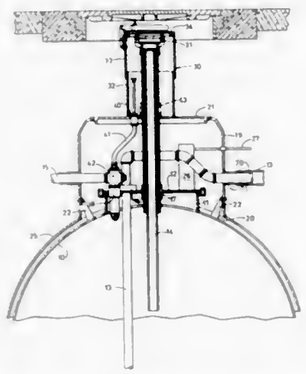
Bruce R. Sharp, 22375 Edgewater Dr. Unit 241, Charlotte Harbor, Fla. 33980

Continuation-in-part of Ser. No. 66,691, Jun. 26, 1987, abandoned, which is a continuation-in-part of Ser. No. 820,027, Aug. 19, 1987, Pat. No. 4,685,327, which is a continuation-in-part of Ser. No. 740,869, Jun. 3, 1985, Pat. No. 4,607,522, which is a continuation-in-part of Ser. No. 544,013, Oct. 21, 1983, Pat. No. 4,523,454, which is a continuation-in-part of Ser. No. 580,800, Feb. 16, 1984, Pat. No. 4,524,609, which is a continuation-in-part of Ser. No. 544,012, Oct. 21, 1983, abandoned, and a continuation-in-part of Ser. No. 745,540, Jun. 17, 1985, abandoned. This application Dec. 8, 1988, Ser. No. 281,816

The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.

Int. Cl.[4] G01M *3/32*

U.S. Cl. 73—49.2 13 Claims



1. A storage tank system having secondary containment means comprised of:

(a) a rigid inner tank for storing liquid;

(b) access lines for filling and dispensing liquid to and from the interior of the tank, said access lines extending through a wall of the tank to the interior thereof;

(c) a sleeve attached to the inner tank, said sleeve having a cover to form an enclosed sleeve area through which the access lines pass and passage means near its base; and

(d) a jacket encasing the inner tank and extending at least to the sleeve so that a closed space exists between the inner tank and jacket and wherein the closed space is in communication with the sleeve area by the passage means so that any leakage which occurs through the inner tank will be contained by the jacket and sleeve.

4,912,967

DEVICE FOR DETECTING A BAD ROAD FROM A MOVING VEHICLE

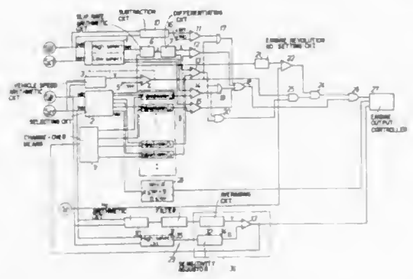
Shuji Shiraishi; Takashi Nishihara; Hironobu Kiryu, and Naoki Omomo, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 15, 1988, Ser. No. 181,948

Claims priority, application Japan, Apr. 17, 1987, 62-94391; Oct. 2, 1987, 62-250166

Int. Cl.[4] G01B *5/28*

U.S. Cl. 73—105 9 Claims



1. A device for detecting irregular road from a moving vehicle, comprising:

a plurality of wheel speed detectors for detecting corresponding wheel speeds of a plurality of wheels of the vehicle;

an arithmetic circuit for calculating the difference between wheel speeds detected by the individual wheel speed detectors;

a filter receiving an output from said arithmetic circuit and passing components in a predetermined frequency band to an output; and

a determination circuit means, receiving said filter output, for determining if the vehicle is travelling on a bad or bumpy road, in response to the filter output, and outputting a signal indicative thereof.

4,912,968

METHOD FOR ADJUSTING A TRAVEL TRANSDUCER

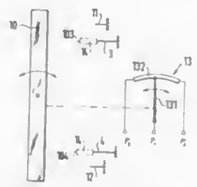
Heinz Northdurft, Stuttgart; Karl-Friedrich Ruesseler; Wolfgang Braun, both of Ditzingen, and Wolfram von Huelsen, Tuebingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 22, 1989, Ser. No. 327,441

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1988, 3810853

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—119 A 10 Claims



1. A method for adjusting a travel transducer (13) of a fuel injection pump which emits control signals to an electric control unit in accordance with the positions of a control element (10) which controls fuel injection quantities in a fuel supply system for internal combustion engines, which comprises mounting an operational fuel injection pump on an operation test bench, moving the control element (10) to approach at least two operating points which correspond to different fuel injection quantities in a fuel injection pump performance graph for injecting a set fuel quantity corresponding to a particular rpm, indicating positions of the control element (10) in accordance with said at least two operating points, transmitting said indicated positions to a movable part (132) of said tavel transducer; deriving electrical control signals from a supply voltage picked up by the travel transducer (13) at said at least two points; comparing the control signals with set-point signals predetermined by two operating points; and correcting a basic setting of the travel transducer (13) as a function of a signal deviation between said set-point signals and said derived signals in the fuel injection quantity control device to obtain a basic setting.

4,912,969

METHOD OF TESTING A SET OF WHEEL SPEED SENSORS FORMING PARTS OF AN ANTI-LOCK BRAKE CONTROL SYSTEM

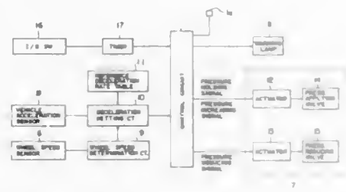
Seiichi Ishizeki, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1989, Ser. No. 304,184

Claims priority, application Japan, Feb. 3, 1988, 63-23527

Int. Cl.[4] G01L *5/28*

U.S. Cl. 73—121 7 Claims



1. A method of testing a set of wheel speed sensors which are mounted on a motor vehicle to provide wheel speed signal indicative of the rotational speed of the wheels of the vehicle, the wheel speed sensors forming part of an anti-lock brake control system for the vehicle, the anti-lock brake control system including a control circuit reyling on the wheel speed signals from the sensors for automatically controlling the degree of rotational anti-lock during braking, the control circuit having a sensor check terminal for receiving a check signal of the sensors, and a warning device responsive to the check signal through the control circuit, said method comprising:

(a) connecting the sensor check terminal and the warning device to the control circuit, the warning device being normally held in a first state and being actuatable to a second state;

(b) applying a check signal to the sensor check terminal and so causing the control circuit to actuate the warning device from the first to the second state, the control circuit being initiated into a sensor check mode in response to the check signal;

(c) successively rotating the wheels of the motor vehicle in a predetermined sequence and at a predetermined speed;

(d) causing the control circuit to deactuate the warning device from the second state to the first state when the wheel speed signals are input to the control circuit from all the wheel speed sensors in the predetermined sequence as a result of the sequential rotation of the vehicle wheels, and holding the warning device in the second state if one or more of the wheel speed signals are not input or if the wheel speed signals are input in other than the predefined sequence.

4,912,970

DIAGNOSTIC TESTING DEVICE

Gerald P. Glowicz, 2049 Collet La., Flossmoor, Ill. 60422

Filed May 6, 1988, Ser. No. 191,269

Int. Cl.[4] G01M *17/02*

U.S. Cl. 73—146 38 Claims

1. A diagnostic device useful for diagnosing and testing chassis, mechanical, tire and tire tread problems in vehicles including:

a support having a horizontal upper surface;

a platform having an upper side and a lower side, and said lower side of said platform being glidably connected to said upper surface of said support so as to allow said platform to glide horizontally in any direction;

a pair of support rollers rotatably connected to said platform so as to provide rolling surfaces to contact said tire tread and which allow a tire to cycle when placed upon said rollers wherein each of said support rollers has an axis and wherein each axis of said support roller is parallel to said axis of said other support roller;

wherein said support rollers will adjust to a tire when the tire is cycled;

a pair of side retention rollers attached to said upper side of said platform so as to restrict a tire from traveling off said pair of support rollers when a tire is cycled forward; and,

wherein a tire can be steered while cycling and said support rollers allow self alignment of said platform to a cycling tire and the tire will avoid traveling off said support rollers.

4,912,971

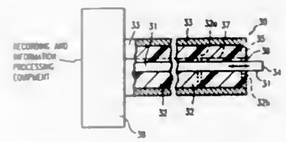
SYSTEM FOR RECOVERY OF PETROLEUM FROM PETROLEUM IMPREGNATED MEDIA

Calhoun G. Jeambey, Denver, Colo., assignor to Edwards Development Corp., Balboa Island, Calif.

Division of Ser. No. 55,412, May 27, 1987, Pat. No. 4,817,711. This application Jan. 10, 1989, Ser. No. 295,562

Int. Cl.[4] E21B *49/00*

U.S. Cl. 73—151 2 Claims



1. Probe apparatus for in situ sensing of changes in the dielectric constant of exgtractable carbonaceous values in underground petroleum impregnated porous media during the subjecting thereof in situ to microwave radiation, comprising an open ended coaxial transmission line having an in situ probe end and a remote end, and including a conductive probe as core conductor insulated electrically from its counterpart coaxial conductive jacket as peripheral conductor and arranged for remately adjustable axial movement relative to the jacket for extending the adjacent end portion of the probe a selective distance beyond the in situ probe end of the line to provide an adjustable length exposed probe end portion for embedding in such porous media, and indicating means ar-

VOL 1113 ISS 1 AP 3 1990 UMI

ranged at the remote end of the line for indicating the sensed changes in such dielectric constant.

4,912,972

METHOD AND APPARATUS FOR DETERMINING THE LENGTH OF A FLEXIBLE WEB OR STRING MATERIAL

Johan C. Gregersen, Bagsvaerd, and Johan Dovmark, Hellerup, both of Denmark, assignors to Jens Reumert, London, United Kingdom

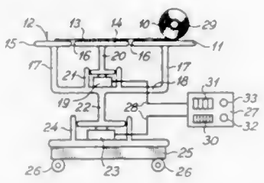
PCT No. PCT/DK88/00020, § 371 Date Dec. 8, 1988, § 102(e) Date Dec. 8, 1988, PCT Pub. No. WO88/06272, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 12, 1988, Ser. No. 258,999

Claims priority, application Denmark, Feb. 12, 1987, 712/87

Int. Cl.[4] G01B *5/02*

U.S. Cl. 73—159 17 Claims



1. A method of determining the length of a flexible web or string material forming a wound body, said method comprising:

determining a first measure of the total weight of said wound web or string material,

determining a second measure of the weight of a predetermined length of a free end portion of the wound web or string material while said predetermined length is connected to the wound body, and

calculating the total length of the flexible web or string material on the basis of said predetermined length and said first and second weight measure.

7. An apparatus for determining the length of a flexible web or string material forming a wound body, said apparatus comprising

first weighing means including a first supporting surface for supporting said wound body and for determining a first weight measure therefor,

second weighing means including a second supporting surface for supporting a predetermined length of a free end portion of said wound web or string material and for determining a second weight measure of said predetermined length, said first and second supporting surfaces extending substantially horizontally and in substantially the same plane and being separated by a narrow first gap extending transversely to said predetermined length of said free end portion of said wound material

means for calculating the length of the web or string material on the basis of said first and second weight measures.

4,912,973

MULTIPLE POINT VELOCITY PROBE

Les Milewski, Clearwater, and Ivan Doskocil, Palm Harbor, both of Fla., assignors to Metal Industries, Clearwater, Fla.

Filed Oct. 14, 1988, Ser. No. 257,704

Int. Cl.[4] G01F *1/46, 5/00*

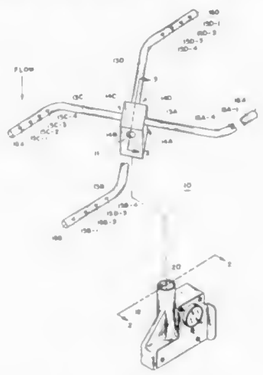
U.S. Cl. 73—202 12 Claims

1. A sensor for determining the velocity of fluid movement, said sensor comprising:

a manifold through which samples of said fluid can flow;

receiving means for receiving samples of fluids and for communicating received fluid samples to said manifold;

said receiving means including a plurality of inlet apertures arranged into groups with each said group of inlet apertures receiving said fluid samples and communicating said fluid samples to said manifold via an individual one of said receiving means and wherein the total cross-sectional area of said group of inlet apertures associated with each said receiving means is equal to or slightly less than the total cross-sectional area of each said receiving means;



means within said manifold for combining fluid samples received by said inlet apertures and communicated to said manifold for providing a uniform fluid flow from said receiving means; and

means for allowing said combined fluid samples to flow through said manifold to a velocity measuring device.

4,912,974

THERMAL FLOW SENSOR

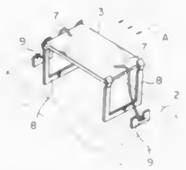
Masanori Inada; Hichiro Ohtani, and Tomoya Yamakawa, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1988, Ser. No. 280,921

Claims priority, application Japan, Dec. 8, 1987, 62-311387; Dec. 26, 1987, 62-197813

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204.25 2 Claims



1. A thermal flow sensor comprising:

a flat plate-shaped thermosensitive resistor;

means for supporting said thermosensitive resistor upon a supporting substrate in a flow path of a fluid, said supporting means comprising a pair of U-shaped members, each of said U-shaped members having a pair of slender legs supporting said thermosensitive resistor at ends thereof and a base portion fixed to said supporting substrate, said ends of said legs having a width much less than a length of the sides of said thermosensitive resistor;

a fluid temperature sensor provided on said supporting means;

a bridge circuit including said thermosensitive resistor, said fluid temperature sensor, and a plurality of resistors;

a pair of slender leads connecting said thermosensitive resistor to said bridge circuit;

a control circuit for maintaining a balanced state of said bridge circuit; and

a signal outputting portion for outputting a flow rate signal which is obtained from said bridge circuit when said bridge circuit is in a balanced state.

4,912,975

DIRECT-HEATED FLOW MEASURING APPARATUS HAVING IMPROVED RESPONSE CHARACTERISTICS

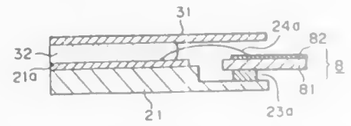
Minoru Obta, Okazaki; Kazuhiko Miura, Aichi; Seizi Huzino, Anjo; Kenji Kanehara, Aichi, and Tadashi Hattori, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Division of Ser. No. 163,164, Feb. 25, 1988, which is a continuation of Ser. No. 828,452, Feb. 1, 1986, abandoned. This application Jan. 25, 1989, Ser. No. 301,522

Claims priority, application Japan, Feb. 14, 1985, 60-25232; Feb. 19, 1985, 60-29286; Feb. 25, 1985, 60-34413

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204.26 14 Claims



1. Flow rate measuring apparatus for measuring the flow rate within an intake air passage of an internal combustion engine, comprising:

a substrate;

a supporting plate, fixed to said intake air passage, for supporting at least one end of said substrate in the longitudinal direction thereof;

a film resistance pattern having a first resistance portion having a high resistance located partially on a portion of said substrate apart from said end thereof, and a second resistance portion having a low resistance located on said substrate, said second resistance portion being connected to said first resistance portion and extending to a portion of said substrate near to said end thereof;

an adiabatic member, disposed between said substrate and said supporting plate, said adiabatic member being partially in contact with only one part of a surface of said substrate opposing said supporting plate and only one part of a surface of said supporting member opposing said substrate;

electric conductive means, provided on said supporting plate and extending to a portion thereof near to said end of said substrate, for leading electric power to said film resistance pattern;

at least one electric conductive wire, linked by wire bonding between a portion of said second resistance portion of said film resistance pattern and a portion of said electric conductive means, for electrically connecting said film resistance pattern to said electric conductive means, said electric conductive wire being in contact with only said portion of said second resistance portion and only said portion of said electric conductive means;

covering means for covering said portion of said second resistance portion, said portion of said electric conductive means, and said electric conductive wire by sandwiching same between said substrate and said supporting plate, to protect said portion of said second resistance portion, said portion of said electric conductive means, and said electric conductive wire, an air gap being maintained between said covering means and said substrate and said supporting plate to thereby prevent contact between said covering means and said electric conductive wire; and

electric power control means, connected via said electric conductive means and said electric conductive wire to said film resistance pattern, for controlling the heat generated by said first resistance portion of said film resistance pattern.

4,912,976

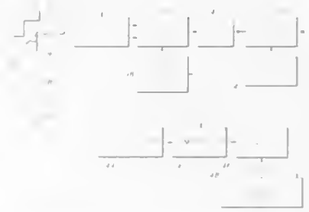
LIQUID LEVEL SENSING APPARATUS

Donald P. Labriola, II, La Verne, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 26, 1987, Ser. No. 67,183

Int. Cl.[4] B65B *1/04;* G01R *27/26*

U.S. Cl. 73—290 R 23 Claims



1. A liquid level sensing apparatus comprising:

a conductive sensing member;

a reactive element disposed on the member;

oscillator means having an output and a tuned circuit including at least a portion of the member and the reactive element, the tuned circuit controlling the frequency of the oscillator means output; and

detecting means responsive to the output of the oscillator means for detecting the oscillator means output frequency and generating a predetermined output when the detecting means detects a shift in the oscillator means output frequency indicating contact between the member and a liquid.

4,912,977

DEVICE FOR POSITION DETERMINATION OF TRANSITION ZONES BETWEEN AT LEAST TWO DIFFERENT ENCLOSING MEDIA

Bjorn R. Hope, Kampenveien 20, N-1350 Lommedalen, Norway

PCT No. PCT/NO88/00051, § 371 Date Feb. 6, 1989, § 102(e) Date Feb. 6, 1989, PCT Pub. No. WO88/09918, PCT Pub. Date Dec. 15, 1988

PCT Filed Jun. 8, 1988, Ser. No. 313,135

Claims priority, application Norway, Jun. 9, 1987, 872400

Int. Cl.[4] G01F *23/22;* G01P *5/10, 13/00*

U.S. Cl. 73—295 47 Claims

1. A device for measuring and monitoring temperature at a plurality of levels in a tank containing at least one stratum of at least one fluid, comprising:

a generally vertically-disposed wall having one side arranged to be in thermal contact, in use, with said at least one stratum of said at least one fluid in said tank, and having an opposite side;

a thermal reference element arranged to be maintained, in use, at a selected reference temperature, said thermal reference element being disposed in spaced relation to said opposite side of said wall so that, in use, said wall stands between said thermal reference element and said at least one stratum of said at least one fluid in said tank, and a space is thereby defined between said wall and said thermal reference element;

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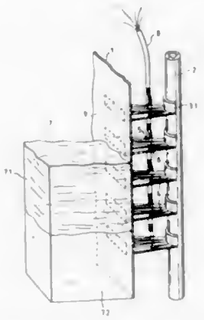
a plurality of thermal conductor elements, said thermal conductor elements being arranged as a series of vertically-spaced thermal conductor elements;

each said thermal conductor element having one part thereof spaced from another part thereof by an intermediate part thereof;

each said thermal conductor element having said one part thereof disposed in thermal contact with said opposite side of said wall, at a respective one of said plurality of levels and having said other part thereof disposed in thermal contact with said thermal reference element;

each said thermal conductor element having provided thereon at least one temperature sensor means, each said temperatures sensor means comprising an alternating series of at least two different temperature sensor elements joined to one another in series to provide a plurality of



junctions including a first set of junctions disposed nearer said wall and a second set of junctions, disposed nearer said thermal reference element;

a signal processor;

electrical connector means operatively connecting each said temperature sensor means to said signal processor, whereby, in use, electrical signals indicative of temperatures of said opposite side of said wall at said levels are provided to said signal processor for processing; and

said signal processor being arranged to process said signals, in use, to produce an indication of temperatures of said at least one fluid in said tank, and, in instances where said at least one fluid includes a plurality of fluids arranged in respective strata having at least one respective interface, an indication of spatial disposition of said at least one interface.

4,912,978

APPARATUS FOR DETERMINING THE OSCILLATION PARAMETERS OF A BAND

Alexander Solmos, Muggensturm, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Oct. 3, 1988, Ser. No. 252,536

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1988, 3733345

Int. Cl.[4] G01N *29/00*

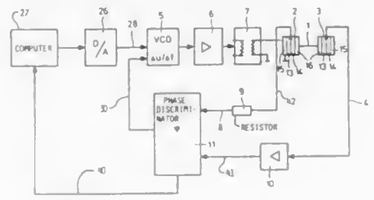
U.S. Cl. 73—579 **14 Claims**

1. An apparatus for determining the natural frequencies of a longitudinally oscillating band, comprising:

transmitter means connected to the band for generating longitudinal oscillations in the band; and

receiver means connected to the band for detecting longitudinal oscillations of the band;

at least one of said transmitter means and said receiver means having oscillator means with two ends along its longitudinal axis, and end masses connected at each end of said oscillator means, said band being coupled to a frontal face of one of said end masses by a spring-biased roller which



is stably received within a groove disposed in said frontal face of said one of said end masses.

4,912,979

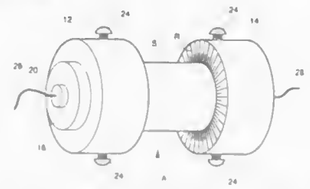
METHOD AND APPARATUS FOR DETECTING AND MEASURING ELASTIC ANISOTROPY

Carl H. Sondergeld, Broken Arrow; Chandra S. Rai, Tulsa, and Richard M. Alford, Broken Arrow, all of Okla., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 108,847, Oct. 14, 1987, abandoned. This application Feb. 14, 1989, Ser. No. 310,485

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—594 **29 Claims**



1. A method for detecting and measuring elastic anisotropy in samples of the earth's formations, comprising the steps of:

(a) recording a dyad of time series signals representative of the sample's response to imparted shear waves; and

(b) processing the dyad of time series signals as a group to detect and measure elastic anisotropy in the sample.

4,912,980

MODULAR TEST FIXTURE FOR VIBRATION AND SHOCK TESTING

Daniel L. Baughn, San Dimas, Calif., assignor to Team Corporation, South El Monte, Calif.

Filed Dec. 5, 1988, Ser. No. 280,230

Int. Cl.[4] G01N *29/00*

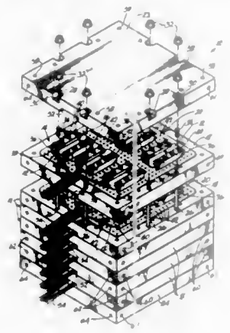
U.S. Cl. 73—663 **45 Claims**

1. A modular test fixture for use in testing of vibration and shock for printed circuit cards, or other components, comprising:

a plurality of separate generally planar card-mounting plates, each card-mounting plate having a mounting surface within the confines of an outer boundary of the card-mounting plate, and means on the mounting surface for rigidly securing a preselected number of circuit cards of varying sizes to the mounting surface for holding the circuit cards generally within the plane and within the outer boundary of the card-mounting plates;

the card-mounting plates with said circuit cards secured thereto being stackable, one upon the other, to form a multi-layer fixture containing circuit cards at different levels within the fixture;

means for rigidly securing the stacked cardmounting plates together as a rigid unit sufficient for vibration and shock testing of the circuit cards securing to the card-mounting plates; and



means for connecting the resulting fixture to an external shaker for imparting shock and vibration to the fixture for use in testing the circuit cards mounted within the fixture.

4,912,981

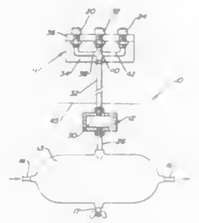
SENSOR PROTECTION FOR A COMPRESSED AIR TANK

James A. King, Schofield, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Feb. 6, 1989, Ser. No. 306,610

Int. Cl.[4] G01L *9/00*

U.S. Cl. 73—706 **4 Claims**



1. A device for monitoring the pressure within a high-pressure tank that contains compressed gas, comprising:

a pressure sensor unit that is operably connected to receive a portion of the compressed gas from the tank and monitor the pressure within the high-pressure tank;

a fluid line interconnecting the high-pressure tank and said sensor unit;

a vapor separation unit ;mounted in said fluid line;

said sensor unit being mounted directly above said tank; and

said fluid line and said separation unit being mounted between said sensor unit and said tank; and

said separation unit comprises a porous plug that acts to cool and filter vapor from the compressed gas and said plug is formed of a sintered bronze material and is honeycombed.

4,912,982

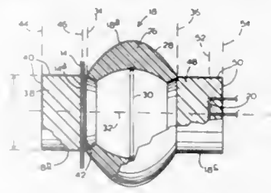
NON-PERTURBING CAVITY METHOD AND APPARATUS FOR MEASURING CERTAIN PARAMETERS OF FLUID WITHIN A CONDUIT

Tex Yukl, Baker, Oreg., assignor to Spatial Dynamics, Ltd., Baker, Oreg.

Filed Oct. 11, 1988, Ser. No. 256,308

Int. Cl.[4] G01F *1/708;* **G01N** *22/00;* **G01R** *27/04*

U.S. Cl. 73—861.05 **8 Claims**



1. A method of measuring certain parameters of a fluid within a conduit, including such parameters as dielectric constant and flow rate, the method being non-perturbing to the fluid, comprising the steps of:

positioning a defined length of the conduit within a resonant cavity, the cavity including a bidirectionally radiating lens therein having a pair of foci on opposite sides of the lens,

directing electromagnetic energy from the bidirectionally radiating lens toward one focus thereof on one side of the lens including directing the electromagnetic energy into the defined length of conduit, and

observing voltage-amplitude conditions over time on the opposite side of the lens at at least one monitoring site within the resonant cavity adjacent the other focus of the lens, whereby dielectric constant and flow-rate conditions of fluid within the defined length of the conduit can be selectively derived.

4,912,983

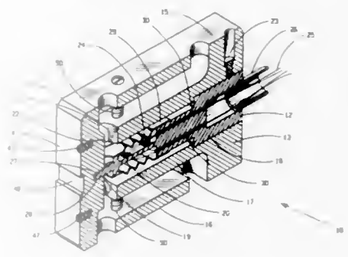
SEALED TENSIOMETER

Ronald A. Walter, Wilmington, Del., and Brian D. Richards, Columbus, Ohio, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 20, 1989, Ser. No. 326,552

Int. Cl.[4] G01L *1/22, 5/10*

U.S. Cl. 73—862.65 **4 Claims**



1. A force measuring device comprising:

(a) body comprising:

a mounting end;

a moving end;

upper and lower flexing walls, each having a front end and a back end, with: (i) each front end fixed to the mounting end of the body, (ii) each back end fixed to the moving end of the body, and (iii) the walls spaced apart and parallel with each other;

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an inflexible hollow core fixed to the mounting end and extending into the body, between the spaced apart walls, and not touching the moving end;

(b) a strain gage cartridge comprising:

a mounting section, a stud section, and a strain measuring section, wherein the mounting section is inflexibly affixed in the hollow core of the body, the stud section is affixed to the moving end in a way to prevent relative transverse movement, and the strain measuring section is joined, at one end, with the mounting section and, at the other end, with the stud section;

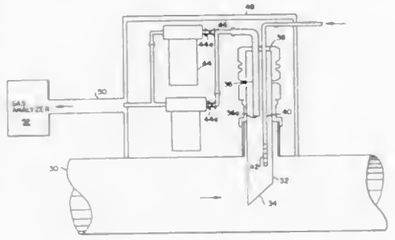
(c) overload stops mounted in the upper and lower walls extending inward toward, but not touching, the hollow core.

4,912,984

QUICKLY INSTALLED LOAD MEASURING APPARATUS AND ASSOCIATED SYSTEM

John A. McMennamy; Bruce T. Boone, both of Cobb County, and James H. Jenkins, Gwinnett County, all of Ga., assignors to Movats Incorporated, Marietta, Ga.

Filed Mar. 15, 1988, Ser. No. 168,161
Int. Cl.[4] G01L 1/22, 1/26
U.S. Cl. 73—862.65 25 Claims



1. A load measuring apparatus for measuring the load delivered by a shaft which shaft moves relative to a shaft housing, said apparatus comprising:

a body member for attachment to the shaft housing, said body member including, at least:

an inner cylindrical wall defining a cylindrical passage extending axially through said body member;

a bousing mount portion whereby said body member is attachable to the shaft housing;

an interface portion; and

a test region defining a cylindrical region of said body member between said housing mount portion and said interface portion, said test region being deformable by forces acting on said body member;

a plug segment occupying at least a portion of said cylindrical passage in said body member;

plug supporting means for supporting said plug segment rigidly within said passage of said body member, said plug supporting means being so designed as to release its support of said plug segment when force on said plug segment exceeds a predetermined threshold force;

a shaft engaging element extending from said plug segment into said passage of said body member for engagement with the shaft; and

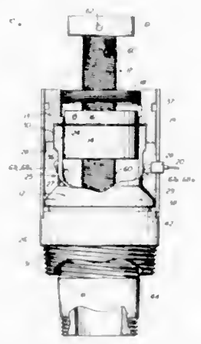
strain means for detecting deformation at said test region and for converting detected deformation to a signal representative of the force acting on said body member.

4,912,985

GAS SAMPLING SYSTEM FOR REACTIVE GAS-SOLID MIXTURES

Edward D. Daum; William Downs, both of Alliance; Bryan J. Jankura, Mogadore, and John M. McCoury, Jr., Mineral City, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 235,358, Aug. 23, 1988, Pat. No. 4,856,352. This application May 5, 1989, Ser. No. 348,227
Int. Cl.[4] G01N 1/22
U.S. Cl. 73—863.25 3 Claims



1. A method for sampling a gas containing a reactive particulate solid phase flowing through a duct and for communicating a representative sample to a gas analyzer, comprising the steps of:

situating a vertically orientated sample probe sheath so that it extends into the sample gas duct, the sample probe sheath having an angular opening at one end with the opening in the opposite direction of the gas flow;

establishing a primary separation zone by providing a gas sampling probe partially extending into the sample probe sheath;

situating a calibration probe which is connected to a calibration gas line to extend into the sample probe sheath substantially parallel to the gas sampling probe, the calibration probe extending further in the sample probe sheath than the gas sampling probe to allow for purging the sample probe sheath with a calibration gas;

aspirating the sample gas containing a reactive particulate solid phase into the primary separation zone;

drawing the sample into the sample probe;

delivering a representative sample through at least two filters to the gas analyzer, each of the filters being outside of the gas sample duct connected in parallel with respect to each other between the gas sampling probe and the gas analyzer with each of the filters further having a valve to allow for diverting sample gas flow for replacement of the filter; and

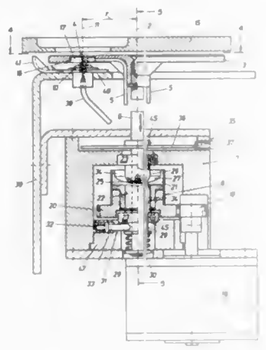
maintaining a temperature range around a part of the gas sampling apparatus for minimizing reactions between the gas and solids, the maintained part being the sample probe sheath, the calibration probe, and the gas sampling probe outside of the gas duct, and the filters.

4,912,986

DEVICE FOR THE SELECTIVE CHARGING OF AN ANALYSING APPARATUS

Hermann Marsoner, Steinberg; Erich Kleinhappl, Kumberg, and Klaus Putz, Kindberg, all of Austria, assignors to AVL AG, Austria

PCT No. PCT/AT88/00015, § 371 Date Nov. 28, 1988, § 102(e) Date Nov. 28, 1988, PCT Pub. No. WO88/07675, PCT Pub. Date Oct. 6, 1988
PCT Filed Mar. 29, 1988, Ser. No. 278,922
Claims priority, application Austria, Apr. 3, 1987, 828/87
Int. Cl.[4] G01N 1/00
U.S. Cl. 73—864.81 6 Claims



1. A device for selectively charging an analyzing apparatus with a fluid sample medium, and at least one reference medium and one cleansing medium, comprising a sample inlet opening and a feeder unit with fittings for said reference and cleansing media to be introduced, wherein said feeder unit is configured as a distributor disk, which is mounted on a carrier shaft connected to a driving unit, the axis of said shaft is parallel to the center axis of said sample inlet opening at a distance r, at which distance r feed elements are located on said distributor disk, said feed elements being connected with said fittings, and wherein each of said feed elements is positionable above said sample inlet opening by a control unit effecting a rotatory motion of said feeder unit, so that said feed element positioned above said sample inlet opening is insertable into said sample inlet opening by means of a lifting device acting parallel to said center axis of said sample inlet opening, and wherein said distributor disk has a recess in a sample feed position.

4,912,987

MEASUREMENT OF SIZES OF FALLING PARTICLES

Hirokatsu Yashiro; Jiro Ohno, both of Kawasaki; Yoshiteru Matsuo, Kimitsu; Hiroshi Nishikawa, Kimitsu; Katsuhiko Yui, Kimitsu, and Hirotoshi Kawamura, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

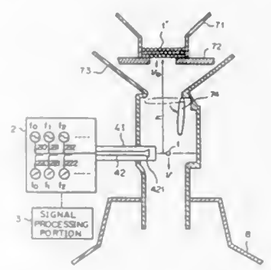
Division of Ser. No. 95,967, Sep. 14, 1987, Pat. No. 4,843,894, which is a continuation-in-part of Ser. No. 851,148, Apr. 11, 1986, abandoned. This application Mar. 2, 1989, Ser. No. 317,973
Claims priority, application Japan, Apr. 11, 1985, 60-77343; Dec. 19, 1985, 60-284445
The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.
Int. Cl.[4] G01N 15/02
U.S. Cl. 73—865.5 8 Claims

1. An apparatus for measuring sizes of particles in the falling state comprising:

electromagnetic wave transmission and reception means for transmitting electromagnetic waves having different frequencies onto particles in the falling state at a predetermined angle with respect to the particle falling direction and receiving the electromagnetic waves having different frequencies reflected from said particles in the falling state;

detection means for detecting the intensities of said received electromagnetic waves having different frequencies and outputting signals; and

signal processing means for processing said signals to derive



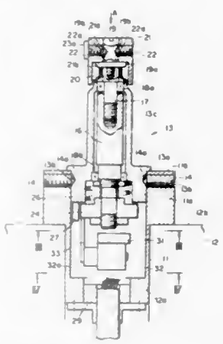
data on the distribution of sizes of said particles and an average size of said particles, said signal processing means deriving the data based on the fact that said detected intensities are related to the sizes of said particles, the frequencies of said electromagnetic waves and the vertical gaps between said particles which are dependent on the particle sizes, an initial velocity of a respective one of the particles and a velocity of the respective particle in the falling state.

4,912,988

TOUCH SENSOR

Akira Matsubashi, Koganei, Japan, assignor to Metrol Co., Ltd., Tokyo, Japan

Filed Jul. 5, 1988, Ser. No. 215,130
Claims priority, application Japan, Apr. 14, 1988, 62-95527
Int. Cl.[4] G01B 7/00
U.S. Cl. 73—865.8 4 Claims



1. A touch sensor comprising:

a housing;

a rotatable shaft projecting from one side of said housing;

a spring means for biasing said rotatable shaft around a longitudinal axis thereof toward a first direction;

at least one probe provided on a distal end of said shaft, said at least one probe to rotate said shaft against a biasing

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force of said spring means when an object to be detected is brought into contact therewith;

a contact means disposed in said housing for issuing a trigger signal as said contact means starts to work by the rotation of said shaft, said contact means including

a movable contact positioned within said housing and operatively moved by rotation of said shaft, and

a fixed contact positioned in said housing and releasably contacting with said movable contact; and

a driving means directly attached to said shaft for moving said movable contact in response to rotation of said shaft.

4,912,989

SHOCK ABSORBING IMMERSION PROBE

John E. Cassidy, Churchville, Pa., assignor to Electro-Nite International, Antwerp, Belgium

Filed Oct. 27, 1988, Ser. No. 263,568

Int. Cl.[4] G01K *1/12*

U.S. Cl. 73—866.5 13 Claims

1. In an immersion probe for detecting characteristics of a molten metal, including a probe body having a first end portion for immersion into a molten metal bath, and a second end portion coupleable with support means, the probe body having means for detecting characteristics of the molten metal, wherein the improvement comprises shock absorbing means comprised of a compressible material proximate the first end portion of the probe body for absorbing impact loads imposed upon the first end portion of the probe to protect the means for detecting from impact damage when the probe is dropped prior to insertion into the molten metal.

4,912,990

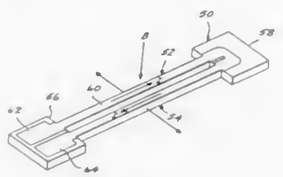
MAGNETICALLY DRIVEN VIBRATING BEAM FORCE TRANSDUCER

Brian L. Norling, Mill Creek, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Feb. 27, 1989, Ser. No. 315,964

Int. Cl.[4] G01L *1/10*

U.S. Cl. 73—862.59 11 Claims



1. In a vibrating beam force transducer, of the type comprising first and second beams having respective first and second longitudinal axes that are parallel to one another and drive means electrically coupled to the beams for causing the beams to oscillate at a resonant frequency that is a function of a force applied along the longitudinal axes, the improvement wherein the drive means provides an electrical current to the beams, and wherein the transducer comprises conduction means physically coupled to the beams for receiving the electrical current and conducting the electrical current along a current path that includes first and second axial components parallel to the first and second longitudinal axes, the first axial component being opposite in direction to the second axial component, and magnetic means for creating a magnetic field that intersects said axial components, whereby the electrical current flowing along said current path interacts with the magnetic field so as to produce forces on the beams that cause the beams to oscillate at said resonant frequency.

4,912,991

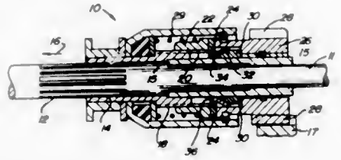
THRUST RING FOR A STARTER CLUTCH

Paul F. Giometti, Horseheads, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed May 11, 1989, Ser. No. 350,711

Int. Cl.[4] F02N *11/00*

U.S. Cl. 74—6 13 Claims



1. A starter clutch for an internal combustion engine comprising:

a rotary sleeve having external helical splines and an axis of rotation;

an annular drive member circumscribing said rotary sleeve, said drive member having internal helical splines mating with said external helical splines on said rotary sleeve;

an annular driven member rotatably connected to said rotary sleeve concentric with said drive member, each of said drive and driven members having complementary mutually-engageable ratchet teeth for transmitting torque therebetween;

a plurality of centrifugal flyweights arranged within said driven member, said plurality of flyweights being radially displaceable as a function of the rotational speed of said driven member; each said centrifugal flyweight of said plurality of centrifugal flyweights having a cam surface facing said drive member;

a radial thrust washer circumscribing said rotary sleeve within a space circumscribed by said ratchet teeth provided on said drive member; and

a thrust ring interposed between said plurality of centrifugal flyweights and said thrust washer, said thrust ring having a V-shaped cross-section having a first leg engaging said radial thrust washer and a second leg engaging said cam surfaces provided on said plurality of centrifugal flyweights.

4,912,992

STARTING DEVICE WITH PLANETARY REDUCTION GEAR

Takashi Kinoshita, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

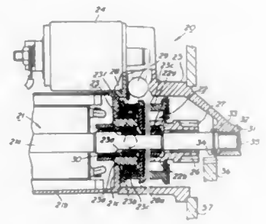
PCT No. PCT/JP88/00228, § 371 Date Dec. 29, 1988, § 102(e) Date Dec. 29, 1988, PCT Pub. No. WO88/06683, PCT Pub. Date Sep. 7, 1988

PCT Filed Mar. 1, 1988, Ser. No. 269,832

Claims priority, application Japan, Mar. 4, 1987, 62-49677

Int. Cl.[4] F02N *15/02, 15/06*

U.S. Cl. 74—7 A 4 Claims



1. A starting device with planetary reduction gear, comprising: a motor which produces a rotating force to start an engine; a planetary reduction gear having a plurality of planet pinions which mesh with a sun gear formed on an armature rotating shaft of said motor, and are carried on fixed shafts, and an internal gear which meshes with said planet pinions and is rotatably supported; an overrunning clutch device that a pinion which is axially slidably supported and slides into mesh with a ring gear of the engine is formed on an inner clutch; an electromagnetic switch device disposed on the side of said motor to slide said overrunning clutch device and to supply power to said motor; a cylindrical holder section disposed on the outer periphery of said internal gear of said planetary reduction gear and in mesh with said internal gear through helical splines, that is, a cylindrical holder section formed on an outer clutch of said overrunning clutch device; and a shift lever engaged at one end with the outer periphery of said holder and at the other end with a plunger of said electromagnetic switch device.

4,912,993

ENGINE STARTER

Keiichi Konishi, and Akira Takami, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

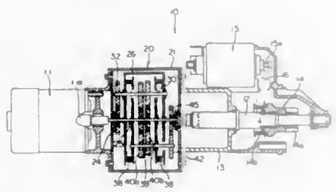
PCT No. PCT/JP88/00121, § 371 Date Oct. 6, 1988, § 102(e) Date Oct. 6, 1988, PCT Pub. No. WO88/06238, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 9, 1988, Ser. No. 294,996

Claims priority, application Japan, Feb. 10, 1987, 62-28626

Int. Cl.[4] F02N *15/00*

U.S. Cl. 74—7 E 10 Claims



1. A starter comprising a speed changing mechanism connected to an electric motor to receive rotational force therefrom;

a pinion gear connected to said speed changing mechanism to receive rotational force of the electric motor therefrom; and

means for bringing said pinion gear into or out of engagement with a ring gear of an engine wherein said speed changing mechanism comprises a geared stepless speed changer including speed reduction ratio control means operating in response to a load change and wherein said speed reduction ratio control means includes an input shaft, an output shaft, and input and output frames rotatable relative to each other about the input shaft, a ratio of output angular velocity of the output shaft to input angular velocity of the input shaft being related to an angle of rotation between the input and output frames.

4,912,994

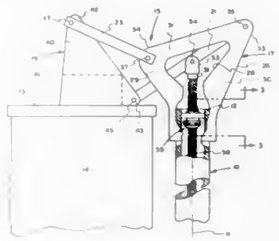
LINKAGE DEVICE

John E. Roberts, Los Altos, Calif., assignor to GTE Government Systems Corporation, Stamford, Conn.

Filed Mar. 6, 1989, Ser. No. 319,373

Int. Cl.[4] F16H *21/44*

U.S. Cl. 74—96 10 Claims



7. A linkage device connecting one end of a first member having a longitudinal axis to an end of a second member and adapted to move said second member between a first position offset to one side of said first member and a second position in substantial longitudinal alignment with said first member, said device comprising:

a first frame secured to and projecting outwardly from said one end of said first member, said first frame having first and second parts respectively remote from and nearer to said first member;

a second frame secured to and projecting outwardly from said end of the second member, said second frame having first and second parts respectively remote from and nearer to said second member;

first bar means having a first pivotal connection to said first frame at said first part thereof; said first bar means having a second pivotal connection to said second frame at said second part of the latter;

second bar means having a third pivotal connection to said second frame at said first part thereof, said second bar means having a fourth pivotal connection to said first frame at said second part of the latter; and

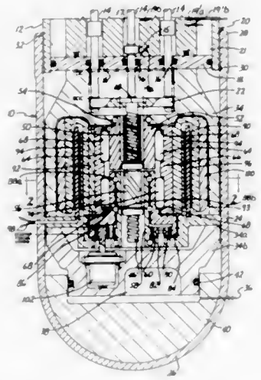
means for rotating said first bar means about said first pivotal connection whereby to rotate said second member approximately 180° about said one end of said first member between said first and said second positions.

4,912,995

THRUST TO TORQUE CONVERTER, PARTICULARLY FOR COUPLING A RECIPROCATING SHAFT TO A ROTARY ELECTRICAL GENERATOR OR THE LIKE

John L. Otters, 11317 Miller Rd., Whittier, Calif. 90604

Filed Oct. 24, 1988, Ser. No. 261,097
Int. Cl.[4] F16H *29/12*
U.S. Cl. 74—127 20 Claims



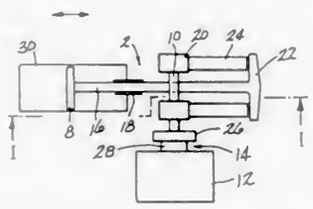
1. A mechanical linear-to-rotary motion converter comprising:
a housing;
a ball bearing input screw reciprocably mounted to said housing
a rotor;
a first ball bearing nut coupling said input screw through a first overrunning clutch for turning said rotor in a given sense of rotation for a first direction of movement of said screw;
a second ball bearing nut coupling said input screw through a reversing gear arrangement and a second overrunning clutch for turning said rotor in a given sense of rotation for an opposite direction of movement of said shaft;
said first and second ball bearing nuts alternately driving said rotor for continuous rotation in said given sense responsive to linear reciprocating motion of said input shaft.

4,912,996

MOTION CONVERTING MEANS

Götz Heidelberg, Am Hügel 16, D-8130 Starnberg-Percha, Fed. Rep. of Germany

Filed Jun. 3, 1988, Ser. No. 202,213
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1987, 3718614
Int. Cl.[4] F02B *63/04, 75/32;* H02K *7/06*
U.S. Cl. 74—137 23 Claims



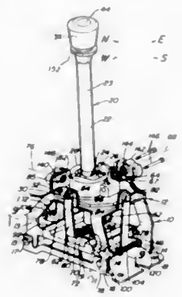
1. A means for converting the reciprocating motion of a piston of a combustion engine into a rotary motion of at least one shaft, comprising
(a) a winding on and winding off area on the shaft;
(b) a flexible band attached at one end to the winding on and off area;
(c) a rod like extension of the piston which is engaged with the flexible band in such a way that the band is wound tractively off the winding on and off area by the working stroke of the piston;
(d) means for ensuring that the shaft continues rotating after the end of the working stroke thereby rewinding the band on said winding on and off area and causing the band to pull back the piston.

4,912,997

ELECTRIC SHIFT SELECTOR MECHANISM FOR TRANSMISSION

Robert G. Malcolm, Pontiac; Joseph F. Goulart, Union Lake, and Gregg T. Black, Livonia, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Jun. 2, 1989, Ser. No. 360,818
Int. Cl.[4] B60K *41/22, 20/04, 20/16*
U.S. Cl. 74—335 10 Claims



1. A selector mechanism capable of being operatively linked by electrical signals with a control system for remotely controlling a vehicle transmission, the shifter mechanism comprising:
a support;
a driver operated shift lever, including a handle portion on its upper end, mounted on said support at an intermediate portion of said lever for movement about longitudinal and transverse pivot axes intersecting at a common point coincident with the principal axis of said shift lever;
a north-south rocker member pivotally mounted on said support for swinging movement in a longitudinal direction about said transverse pivot axis, said north-south rocker member having transversely extending support means thereon;
an east-west rocker member pivotally mounted on said support for swinging movement in a transverse direction about said longitudinal pivot axis, said east-west rocker member having longitudinally extending support means thereon positioned in spaced subjacent relation to said north-south support means, said east-west rocker member support means having a longitudinally extending camming track thereon;
position sensor means associated with each said transverse and longitudinal pivot axis to provide an electrical signal in accordance with the rotary angular position of each said respective north-south and east-west rocker member;
a receiving element on the lower end of said lever supporting a selector stem portion for reciprocal travel on the principal axis of said lever, said receiving element including biasing means for biasing a cam follower on the lower free end of said stem portion axially away from said common point;
a gate limiting plate mounted on said support intermediate said north-south rocker member support means and said east-west rocker member support means, said gate limiting plate formed with a plurality of longitudinally extending shift slots interconnected by a crossover select slot, whereby said slots define a predetermined shift pattern for said lever;
each said shift slot and said common point defining a longitudinal shift plane along which a transmission speed ratio being identified at the shift slot fore and aft ends by said transverse axis position sensor means;
said selector stem restricted to transverse movement by said north-south rocker support means for predetermined longitudinal movement in a selected one of said gate limiter plate shift slots while said cam follower is adapted for longitudinal travel in said camming track; and
said biasing means operative to urge said cam follower into constant pressure contact with said camming track a said shift lever is manipulated through said gate limiting plate shift pattern, said camming track being formed with a predetermined contour operative to preload said cam follower such that it is releasably captured at predetermined gate pattern locations corresponding to said identified fore and aft shift slot ends.

4,912,998

GEAR ARRANGEMENT

Tadashi Sugano, Saitama, and Kazuyuki Nishima, Wako, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 37,291, Apr. 10, 1987, abandoned. This application Oct. 11, 1988, Ser. No. 256,160
Claims priority, application Japan, Apr. 11, 1986, 61-53583
Int. Cl.[4] F16H *55/18*
U.S. Cl. 74—409 7 Claims

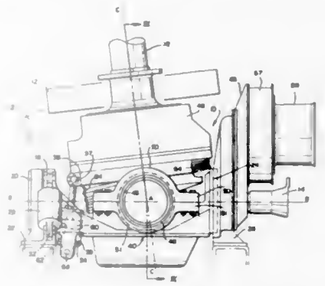
1. A gear arrangement of first and second gears; one of said first and second gears comprising a shaft portion rotatably fitted around a support shaft, a teeth portion having teeth of a first tooth thickness on an outer circumference of said one of said first and second gears, and an elastic body interposed between an inner circumference of said teeth portion and an outer circumference of said shaft portion; an other of said first and second gears having teeth of a second tooth thickness, said first tooth thickness and said second tooth thickness being unequal; said first and second gears meshing with each other in a non-backlash condition whereby said teeth portion is pushed by said second gear to radially move with respect to said shaft portion and compress said elastic body; and said teeth portion is operatively coupled to said support shaft.

4,912,999

SYSTEM FOR PIVOTABLY SUPPORTING AND TRANSMITTING POWER THROUGH A HELICOPTER TRANSMISSION AND ROTOR

Robert S. Franks, Laurel Springs, N.J., and Vincent J. Perillo, Havertown, Pa., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1987, Ser. No. 103,003
Int. Cl.[4] B64C *27/06*
U.S. Cl. 74—417 25 Claims



1. In a helicopter defining a roll axis, a pitch axis and a yaw axis and having a rigid airframe, a rotor mounted to the airframe, and a transmission mounted to the airframe for transmitting power to the rotor, the improvement comprising:
roll support means including a fixed connection to the airframe and a first pivot means having its axis substantially aligned with the roll axis;
a roll housing supported on the roll support means for pivotal rotation about the roll axis including a second pivot means having its axis substantially aligned with the pitch axis
a pitch housing supported on the roll housing at the second pivot means for pivotal rotation about the pitch axis;
roll damper means connecting the roll housing to the airframe for restraining pivotal rotation of the roll housing;
pitch damper means connecting the pitch housing to the airframe for restraining pivotal rotation of the pitch housing;
a lower ring gear rotatably supported on the roll housing having gear teeth adapted for engagement;
a first side pinion in continuous meshing engagement with the lower ring gear;
an upper ring gear rotatably supported on the pitch housing in continuous meshing engagement with the side pinion; and
a second side pinion in continuous meshing engagement with the lower ring gear and the upper ring gear.

4,913,000

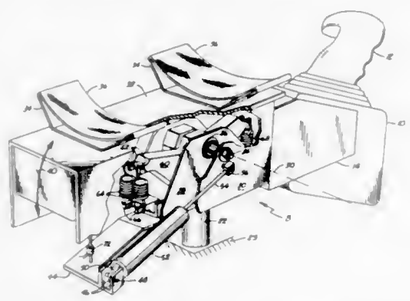
THREE AND FOUR DEGREE OF FREEDOM HAND CONTROLLERS

Charles E. Wyllie, Largo, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 13, 1988, Ser. No. 181,062
Int. Cl.[4] G05G *1/00, 1/04;* B64C *13/04*
U.S. Cl. 74—523 20 Claims

1. Apparatus for use with a wrist motion hand controller comprising:
stationary means;
arm support means fixedly connected to the hand controller and mounted for movement with respect to the stationary means; and

relative movement responsive means connected to the stationary means and to the arm support means to produce an



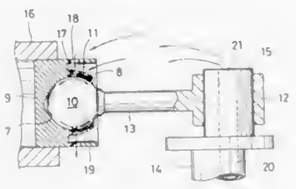
output indicative of movement between the arm support means and the stationary means.

4,913,001

PISTON ASSEMBLY FOR COMPRESSORS

Ryuji Watanabe; Kiyoshi Tanaka, both of Oizumi, and Hirokazu Kawakami, Ota, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Feb. 15, 1989, Ser. No. 311,156
Claims priority, application Japan, Feb. 18, 1988, 63-20462[U]
Int. Cl.[4] G05G *1/00*; F01B *31/10*
U.S. Cl. 74—579 E 6 Claims



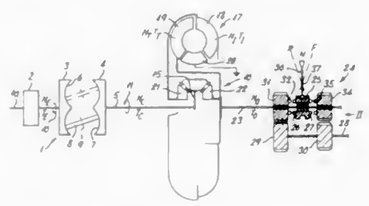
1. A piston assembly for compressors having a piston connected to a crankshaft by a connecting rod having a ball at its one end, a rear portion of the ball being joined to the piston by clamping a clamp portion provided on the piston, a front portion of the ball being in contact with a ball seat formed in the inner portion of the piston, the crank-shaft being formed at its upper end with an oil outlet for scattering an oil ejected therefrom, the piston assembly characterized by: a plurality of holes formed in the piston clamp portion, the piston having a skirt portion formed with a plurality of holes opposed to the respective holes in the clamp portion, and, a synthetic resin ring, interposed between the clamp portion and the ball, the ring having an end portion extending across the holes formed in the clamp portion.

4,913,002

AUTOMATIC CONTINUOUSLY VARIABLE TRANSMISSION OF THE TOROIDAL-RACE ROLLING-TRACTION TYPE

Thomas G. Fellows, 1 Greenbrook Ave., Hadley Wood, Barnet, Hertfordshire, United Kingdom EN4 0LS

Continuation-in-part of Ser. No. 904,970, Sep. 8, 1986, abandoned. This application Sep. 10, 1987, Ser. No. 94,865
Claims priority, application United Kingdom, Sep. 13, 1985, 8522682
Int. Cl.[4] F16H *47/08, 37/06*
U.S. Cl. 475—52 6 Claims



1. A transmission system comprising:

a prime mover;

a continuously-variable ratio-varying unit (ratio unit);

said ratio unit comprising a rotary input member adapted to rotate in a single first direction only and presenting an input race of fixed geometry and part-toroidal shape, a coaxial rotary output member adapted to rotate in a second and opposite direction only and presenting an output race of fixed geometry and part-toroidal shape, the said shapes of said input and output races conforming to the outline of a single imaginary torus of circular cross section, and at least one roller rotatable about its axis and arranged to transmit traction at all times from said input race to said output race, said axis of said at least one roller being tiltable whereby to change the orientation of said at least one roller and thereby change the ratio transmitted by said transmission;

a direct connection, without means of reversal of direction, between said prime mover and said rotary input member of said ratio unit;

an epicyclic combination comprising at least a first element, a second planet carrier element and a third element arranged in successive engagement;

a hydrokinetic element comprising at least an impeller element and a turbine element;

said epicyclic combination and said hydrokinetic element being located in succession between said ratio unit and said a final drive output;

a connection between one of said epicyclic combination elements and said impeller element;

a connection between said ratio unit and another of said epicyclic combination elements, and a connection of the remaining one of said epicyclic combination elements both to said turbine element and to said final drive output, and

a reversing mechanism, located between said hydrokinetic element and said final drive output.

4,913,003

STEPLESS TRANSMISSION

Pentti J. Tervola, 3663 Lakewood Rd., Lake Worth, Fla. 33461

Continuation-in-part of Ser. No. 909,009, Sep. 18, 1986, abandoned. This application Jan. 30, 1989, Ser. No. 303,079
Int. Cl.[4] F16H *37/06*
U.S. Cl. 475—121 20 Claims

1. A stepless transmission for continuously varying the speed

and direction, including neutral, of a rotary output with a single variator means comprising:

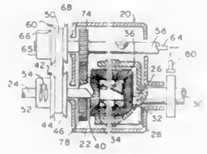
(a) a rotatable variator shaft means having a first gear means;

(b) a rotatable input shaft means having a ring gear means;

(c) a rotatable output shaft means having a planetary gear carrier means;

(d) sun gear means, rotatably mounted on said output shaft means, said sun gear means having a second gear means fixedly connected thereto, said second gear means operatively connected to said first gear means for driving said variator shaft means with a ratio of rotation of said sun gear means to said variator shaft means of less than one, said second gear means driving said variator shaft means in the same direction as said input shaft means;

(e) planetary gear means rotatably carried by said planetary gear carrier means, said planetary gear means operatively



connected to both said ring gear means and said sun gear means, wherein the rate of rotation of said output shaft is related to the difference between the rates of rotation of said ring gear means and said sun gear means; and

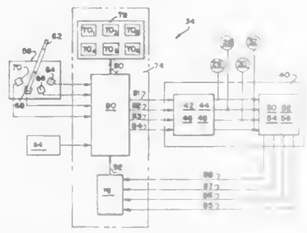
(f) variator means for variably controlling the rate of rotation of said variator shaft means relative to the rate of rotation of said input shaft means in a continuous fashion, said variator means operatively connecting said input shaft means to said variator shaft means, wherein changes in variator shaft means rotation rate result in a change in rate of rotation of said sun gear means such that said variator means limit the speed of said variator shaft means to oppose the torque applied to said variator shaft means by said sun gear means to thereby control output shaft means speed and direction, said variator means serving as a speed limiting mechanism operant on said sun gear means through said first and second gear means.

4,913,004

ELECTRONIC POWERSHIFT CONTROL SYSTEM FOR AN IMPLEMENT TRANSMISSION

Dale W. Panoushek, Lemont; Ernest A. Kreitzberg, Willow Springs, and Frank F. DiMaggio, Arlington Heights, all of Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Oct. 11, 1988, Ser. No. 255,643
Int. Cl.[4] B60K *41/02*
U.S. Cl. 74—861 7 Claims



1. An electronic powershift control system for off-highway equipment having a manually shiftable transmission with multiple gear ratios in each of a plurality of different ranges, said transmission including an electrically controlled hydraulic clutch associated with a specified gear ratio condition within each range, said control system comprising.

shiftable means for selecting a specified gear ratio condition through movement of a manually shiftable lever as the off-highway equipment is operated, said shiftable means further including means for providing a gear selection signal indicative of the specified gear ratio condition selected for the transmission as through shifting movement of the lever; and

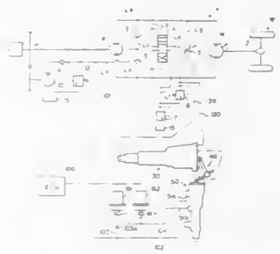
control circuitry means operatively connected with said shiftable means and each electrically controlled hydraulic clutch for shifting the transmission from a current gear ratio condition to a specified gear ratio condition only in response to manual movement of said lever, said control circuitry means being configured to receive a gear selection signal from said shiftable means and in response thereto provide outputs to disengage the hydraulic clutch for the current gear ratio condition and engage the hydraulic clutch for the specified gear ratio condition, said control circuitry means effecting disengagement and engagement of the hydraulic clutches over a measurable time period, and wherein said control circuitry means uses a closed-loop control technique which compares the measurable time period between disengagement and engagement of the hydraulic clutches against a reference time period and adjusts said measurable time period in accordance with the comparison by effecting when the hydraulic clutch associated with the current gear ratio condition begins disengaging to improve shift quality in a subsequent shift to said specified gear ratio condition from said current gear ratio coodition.

4,913,005

METHOD OF CONTROLLING SPEED REDUCTION RATIO FOR A CONTINUOUSLY VARIABLE SPEED TRANSMISSION

Yoshikazu Ishikawa; Kouji Yamaguchi, both of Saitama, and Koji Sasajima, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1988, Ser. No. 259,867
Claims priority, application Japan, Oct. 20, 1987, 62-264839
Int. Cl.[4] B60K *47/12*
U.S. Cl. 74—866 8 Claims



1 A method of controlling a speed reduction ratio of a continuously variable speed transmission by continuously varying the speed reduction ratio in a range between a maximum speed reduction ratio and a minimum speed reduction ratio, said method comprising the steps of:

setting a top limit speed reduction ratio corresponding to a speed of a vehicle and being higher than said minimum speed reduction ratio in a low vehicle speed range; and

controlling the speed reduction ratio in a range between said maximum speed reduction ratio and said top limit speed reduction ratio in said low vehicle speed range.

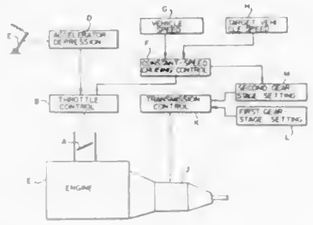
VOL 1113 ISS 1 AP 3 1990 UMI

4,913,006

AUTOMATIC TRANSMISSION CONTROL SYSTEM FOR A VEHICLE HAVING CONSTANT-SPEED CRUISING CONTROL SYSTEM

Toshiaki Tsuyama; Kazutoshi Nobumoto; Kaoru Sotoyama; Toshihiro Matsuoka, and Eizi Nishimura, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 28, 1988, Ser. No. 264,141
Claims priority, application Japan, Oct. 29, 1987, 62-274535
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—866 13 Claims



1. An automatic transmission control system for controlling an automatic transmission for use in a vehicle provided with an electronic throttle control system which electrically controls a throttle valve to control the engine output according to the amount of depression of an accelerator pedal and a constant speed cruising control system which controls the throttle valve separately from the accelerator pedal to make the vehicle cruise at a desired constant speed, the accelerator pedal being operatively separated from the throttle valve during operation of the constant speed cruising control system, characterized by having

a first gear-stage setting means which designates a gear stage of the automatic transmission on the basis of a first gear-shifting pattern, which applies when the constant-speed cruising control is not performed, and in which the gear stages of the automatic transmission are selected in response to the detected amount of depression of the accelerator pedal and a vehicle speed or a value corresponding to the vehicle speed, a second gear-stage setting means which designates a gear stage of the automatic transmission on the basis of a second gear-shifting pattern, which applies when the constant-speed cruising control is performed in which the gear stages of the automatic transmission are selected in response to the vehicle speed or a value coresponding to the vehicle speed, and a variable independent of the detected amount of depression of the accelerator pedal.

4,913,007

RIGHT ANGLE EXTENSION TOOL

Randall W. Reynolds, 5710 E. 30 Pl., Tulsa, Okla. 74114

Continuation-in-part of Ser. No. 309,811, Feb. 2, 1989. This application Oct. 6, 1989, Ser. No. 418,282
Int. Cl.[4] B25B *17/00*
U.S. Cl. 81—57.29 6 Claims

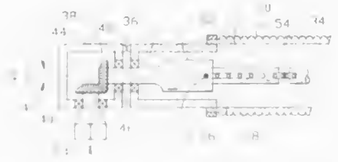
1. A right angle extension tool for interconnection with a socket wrench, comprising:

an elongated cylinder including means for permitting flexure thereof;

a shaft disposed within the elongated cylinder and having a first end extending out from the elongated cylinder, the shaft including means for permitting flexure thereof;

wherein at least one portion of the flexible elongated cylinder includes means for permitting compression and expansion thereof, and the shaft comprises an inner shaft reciprocally received within an outer shaft to permit longitudinal extension thereof;

a socket box connected to the first end of the shaft for interconnection with a socket wrench;



right angle drive means connected to a second end of the shaft independently from the shaft; and

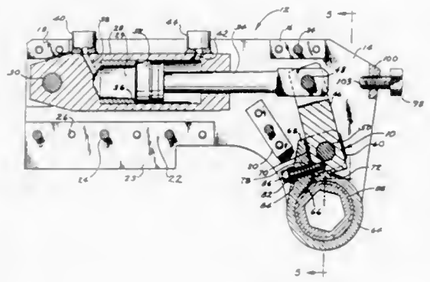
a socket pin connected to an outwardly extending shaft of the right angle drive means.

4,913,008

TORQUING APPARATUS

Robert F. Snyder, Hamden, Conn., assignor to Raymond Engineering Inc., Middletown, Conn.

Continuation-in-part of Ser. No. 117,703, Nov. 5, 1987, abandoned. This application Mar. 2, 1989, Ser. No. 318,629
Int. Cl.[4] B25B *13/46*
U.S. Cl. 81—57.39 43 Claims



1. A torquing apparatus including:

split ring means for mounting on an item to which a torque load is to be applied, said split ring means having a gap therein and having a generally cylindrical inner opening;

adjustable load biasing means to establish an initial adjustable gripping engagement between said split ring means and the item to be torqued to prevent slippage in a first direction between said split ring means and the item to be torqued;

lever means connected to said split ring means to deliver a torque load through said split ring means to the item to be torqued;

grip enhancing means to increase the gripping engagement between said split ring means and the item to be torqued upon the delivery of increased torque to the item to be torqued; and

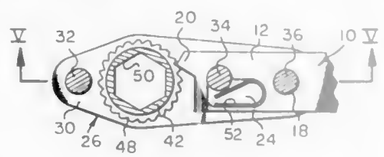
release means to release the gripping engagement between said split ring means and the item to be torqued to permit slippage in a second direction between said split ring means and the item to be torqued, said second direction being opposite to said first direction.

4,913,009

RATCHET WRENCH

Axel E. Andersen-Vie, Jackson, Mich., assignor to Jackson Assembly Enterprises, Inc., Lansing, Mich.

Filed Aug. 29, 1988, Ser. No. 237,320
Int. Cl.[4] C25B *13/00*
U.S. Cl. 81—58.5 3 Claims



1. A ratchet wrench characterized by its use of flat stamped components comprising, in combination, an elongated handle having first and second ends, a detent defined upon said first end, a pivot defined upon said handle adjacent said first end having an axis transverse to the length of said handle, a head mounted on said pivot for pivotal movement relative to said handle between first and second positions defined by a pair of substantially identically configured spaced, parallel plates, said handle and plates being formed of flat stamped material, a torque transfer member extending between and rotatably mounted upon said plates about an axis substantially parallel to the axis of said pivot, a plurality of ratchet teeth defined on said member intermediate said plates and concentric to said member axis, said plates being open at their periphery to provide access to said teeth throughout the circumference of said member, said detent engaging said teeth at said head first pivotal position to lock said member relative to said handle and disengaging from said teeth at said head second pivotal position to permit free rotation of said member relative to said head, stop means interposed between said handle first end and said head limiting relative rotation of said head on said handle pivot, said stop means including a first element fixed upon said handle first end and a second element fixed upon said head, one of said stop means elements comprising a pin and the other of said elements comprising an opening receiving said pin, said pin being mounted on said head extending between said plates and located intermediate said torque transfer member and said pivot, said opening comprising a slot defined in said handle adjacent said first end intermediate said detent and said pivot, a spring mounted in said slot interposed between said handle and said pin biasing said head toward said first position, fasteners maintaining said plates in spaced parallel relationship, aligned bearing openings defined in said plates, said torque transfer member being rotatably received within said bearing openings, said plates each including an outer end portion extension extending on the opposite side of said torque transfer member with respect to said pivot, one of said fasteners extending through both of said of said plates' extensions and interconnecting said plates' outer end portions extensions to prevent separation thereof.

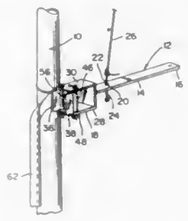
4,913,010

BELT-TYPE PIPE WRENCH

Hubert M. Doss, 803 N. Madison, Magnolia, Ark. 71753

Filed Feb. 8, 1989, Ser. No. 308,879
Int. Cl.[4] B25B *13/52*
U.S. Cl. 81—64 8 Claims

1. In combination with an elongated member to be angularly displaced about an axis generally paralleling said elongated member, a wrench for gripping and applying rotary torque to said elongated member at a location spaced intermediate the opposite ends of said elongated member, said wrench including an elongated lever defining a first work engaging end and a second handle end and defining a medial plane in which said lever is adapted to be angularly displaced about an axis spaced outward of said first work engaging end and disposed normal to said plane, said lever including laterally spaced longitudinally extending first and second opposite sides facing in opposite directions in said plane, said first work engaging end defining first and second elongated, laterally spaced apart abutment portions facing outward of said first work engaging end, closely opposing peripherally spaced portions of said elongated member and disposed generally normal to said plane adjacent said first and second opposite sides, respectively, of said lever, said first work engaging end defining a recess between said abutment portions opening outwardly of said first work engaging end, an elongated strap, said lever including first and second post means disposed generally normal to said plane and spaced apart transversely of said lever adjacent said first side and said second side, respectively, and spaced toward said second end from said abutment portions, one end of said strap having a closed loop formed therein through which said second post means extends and extending from said second post means towards and over the outer side of said first post means facing outwardly of said lever first side and thereafter



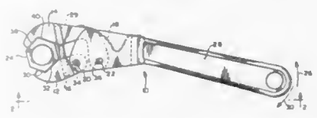
about said elongated member and between the latter and said second abutment portion, across said recess, toward and over the outer side of said first abutment portion facing outwardly of said lever first side, over the outer side of said first post means between the latter and said one end of said strap, about said first post means and thereafter back toward and over said outer side of said first abutment portion in contact therewith and thereafter from said first abutment portion back across said recess and said second abutment portion between the latter and the portion of said strap extending about said elongated member, said portion of said strap extending about said elongated member being tightly encircled thereabout with the portions of said strap passing over said first abutment portion between the latter and said elongated member tightly compressed relative to each other and said first abutment portion as said second lever end is swung in said plane in the direction in which said second side of said lever faces while said second abutment portion is at least slightly spaced from the portions of said strap disposed between said second abutment portion and said elongated member.

4,913,011

SELF-ADJUSTABLE RATCHET WRENCH

James W. Ma, 98 Fleetwood Dr., Glendale Heights, Ill. 60139

Filed Jun. 29, 1988, Ser. No. 213,150
Int. Cl.[4] B25B *13/00*
U.S. Cl. 81—90.1 2 Claims



1. A self-ratcheting, self-adjusting wrench comprising a wrench handle having a distal end for torquing by a wrench

user, and a proximal end having a first pivoting means for pivotally receiving a first jaw element and a second pivoting means for pivotally receiving a second jaw element,

a first jaw element having a first, flat torquing surface and a second, flat torquing surface forming an internal substantially 120° angle at the intersection of said first flat torquing surface and said second flat torquing surface, first pivot-engaging means for engaging said first pivoting means of said handle for axially pivoting the first jaw element about a first axis,

a second jaw element having a third flat torquing surface and a fourth flat torquing surface forming an internal substantially 120° angle at the intersection of said third flat torquing surface and said fourth flat torquing surface, and second pivot-engaging means for engaging said second pivoting means for axially pivoting the second jaw element about a second axis which is substantially parallel to said first axis,

guiding pin means for maintaining said first jaw element and said second jaw element in substantially parallel alignment such that upon relative separation thereof by pivoting of the first jaw element about said first pivoting means, and concomitant pivoting of said second jaw element about said second pivoting means, said first flat torquing surface of the first jaw element is maintained substantially parallel to the fourth flat torquing surface of the second jaw element and said second flat torquing surface is maintained substantially parallel to said third flat torquing surface to permit engagement of a hexagonally shaped screw fastener therebetween, said guiding pin means comprising a guiding pin which has one end anchored into one of said jaw elements and which slides along a guiding hole or slot in the other of said jaw elements wherein said first and second axes are located on the same side of an action line which is the perpendicular bisector of a line joining the intersection of the first and second surfaces and the intersection of the third and fourth surfaces to create an override leverage to increase or decrease the closing force between the jaws when force is applied to the handle, and

spring means for exerting a closing force to urge the first jaw element and the second jaw element toward each other, wherein said first jaw element and said second jaw element are guided to move linearly in parallel relation to each other by means of said guiding pin which has one end anchored into one said jaw elements and slides along through a guiding hole or slot in the other of said jaw elements, and wherein said jaw elements are hinged at said first and second axes.

4,913,012

HIGH-PRECISION PUNCH AND DIE METHOD

Paul W. T. Moran, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 29, 1988, Ser. No. 277,365

The portion of the term of this patent subsequent to Apr. 3, 2007, has been disclaimed.

Int. Cl.[4] B26D *3/14*; B26F *1/12*

U.S. Cl. 83—13 7 Claims

1. A high-precision punch and die method comprising the steps of:

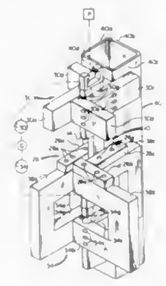
(a) providing a rigid mounting frame structure;

(b) mounting on said frame structure a pair of pneumostatic bearings in registered spaced-apart relation to each other, said bearings each having a plurality of bearing journal segments provided with a pneumostatic bearing surface and adjustably mountable on said structure, said bearing mounting step including adjustably mounting said journal segments of both bearings on said structure;

(c) mounting on said frame structure a segmented die in registered spaced-apart relation to said bearings, said die having a plurality of die segments provided with a cutting edge and adjustably mountable on said structure, said die mounting step including adjustably mounting said die segments on said structure;

(d) adjusting said journal segments and said die segments so as to achieve required sizing and alignment of said bearings and said die;

(e) positioning in said bearings a punch adapted for guided movement through said bearings and said die, said punch having integral pneumostatic bearing surfaces and at least one cutting edge, said punch positioning step including positioning said punch between said journal segments of each bearing so that said bearing surface on each journal



segment is in close face-to-face relation to an opposing one of said bearing surfaces on said punch, and so that said at least one cutting edge on said punch is disposed in coactable relation to said cutting edge on each of said die segments;

(f) controllably supplying a pressurized gas to said bearing surface on each of said journal segments to provide required constraint and guidance to said punch; and

(g) effecting movement of said punch through said bearings and said die so as to move said at least one cutting edge on said punch into coacting relation with said cutting edge on each of said die segments.

4,913,013

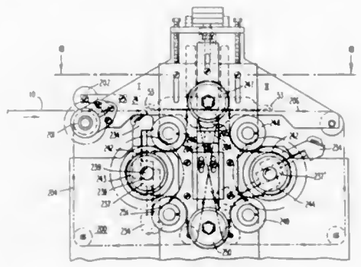
ROTARY CUTTING APPARATUS

Paul V. Osborn, Webster, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 38,079, Apr. 14, 1987, abandoned. This application Sep. 16, 1988, Ser. No. 245,595

Int. Cl.[4] B26D *1/56*

U.S. Cl. 83—37 8 Claims



1. A method of cutting a moving plastic film web at spaced locations comprising the steps of:

supporting the moving plastic film web on a conveyor and moving the plastic film web and the conveyor through a first cutting station;

providing at the first cutting station a plurality of dies having cutting edges positioned on one side of the plastic film web;

providing a corresponding plurality of rollers at the first cutting station and positioned on the opposite side of the plastic film web, the dies and the rollers being spaced transversely of the plastic film web at the first cutting station;

rotating the cutting edges of the dies about a common axis of rotation in parallel circular arcs intersecting the rollers to cyclicly contact the rollers with the cutting edges for concurrently making a plurality of spaced cuts across the plastic film web;

providing a second cutting station spaced from the first cutting station along the path of movement of the plastic film web;

supporting and moving the plastic film web on a second conveyor from the first cutting station through the second cutting station;

providing at the second cutting station a plurality of dies having cutting edges positioned on one side of the plastic film web;

providing a corresponding plurality of rollers at the second cutting station and positioned on the opposite side of the plastic film web, the dies and the rollers being spaced transversely of the plastic film web at the second cutting station; and

rotating the cutting edges of the dies at the second cutting station about a common axis of rotation in parallel circular arcs intersecting the rollers at the second cutting station to cyclicly contact the rollers with the cutting edges for concurrently making a second plurality of spaced cuts across the plastic film web staggered and in line with the first plurality of spaced cuts previously made at the first cutting station.

4,913,014

BAND-SAWING MACHINE

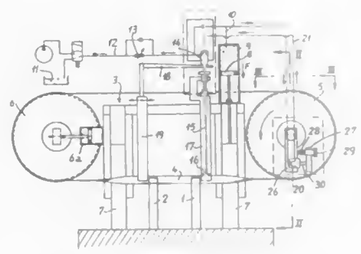
Patrick Missler, 12, Rue de Tournehem, F-91450 Etioles, France

Filed Oct. 17, 1988, Ser. No. 258,666

Claims priority, application France, Oct. 20, 1987, 87 14438

Int. Cl.[4] B23D *53/00*

U.S. Cl. 83—72 2 Claims



1. A band-sawing machine of the type comprising:

at the location contemplated for the workpiece to be sawn, an assembly movable toward said workpiece, which comprises a saw-band and drive means comprising a rotary flywheel for driving said band, and a hydraulic circuit comprising self-regulating means for limiting automatically the fluid flow in said hydraulic circuit thereby to decrease the velocity of movement of said movable assembly,

said rotary flywheel (5) driving said saw-band (4) being driven by a member (26) coupled to a power shaft (23) of said drive means, a spring (28) disposed between said driving member (26) and said rotary flywheel (5),

said self-regulating means comprising a valve (20) adapted progressively to decrease the fluid flow in said hydraulic circuit controlling the movements of said movable assembly (3),

said valve being mounted between said rotary flywheel (5) and said driving member (26) driving said flywheel, said valve being progressively obturated when the tension imposed on said saw-band (4) by said rotary flywheel (5) increases and said spring (28) is consequently compressed.

4,913,015

SOFT MATERIAL CUTTING APPARATUS

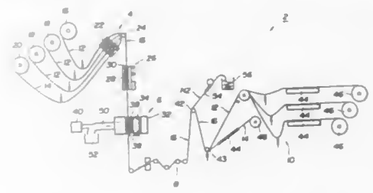
Hideo Tone, Saitama, Japan, assignor to Kokusai Kogyo Kabushiki Kaisha, Saitama, Japan

Filed Sep. 23, 1988, Ser. No. 248,810

Claims priority, application Japan, Sep. 26, 1987, 62-242349; Sep. 26, 1987, 62-146698[U]

Int. Cl.[4] B26D *7/00*

U.S. Cl. 83—100 5 Claims



1. An apparatus for creating substantially continuous cutting lines longitudinally along an elongate sheet-like soft member, comprising:

cutting means including a pair of horizontally opposed cutting heads adapted to have the sheetlike member positioned therebetween, and drive means for effective relative movement of the cutting heads toward and away from one another for engagement with the sheetlike member when they are relatively moved toward one another;

one of said cutting heads including thereon a pair of vertically elongated and horizontally sidewardly spaced cutting blades, each said cutting blade being of predetermined length, said cutting blades defining a basic non-linear cut pattern;

means for vertically moving said sheetlike member in an intermittent step-like manner such that said sheetlike member is repeatedly moved through a predetermined incremental vertical distance which substantially corresponds to the vertical length of said blades; and

said drive means activating said cutting blades to effect cutting of the soft elongate member following each intermittent advance of the member so that sequentially formed pair of sidewardly spaced cutting lines of predetermined length are continuously joined to form a pair of sidewardly spaced, longitudinally extending continuous cutting lines which extend along substantially the entire length of the soft elongate member, wherein the basic non-linear cut pattern is repeated, each of said cutting blades having a blade portion at one vertical free end thereof which extends at a substantial angle relative to a blade portion at the other vertical free end so that succeeding predetermined length cutting lines intersect.

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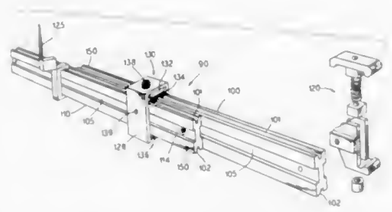
4,913,016

WASTE STRIPPING TOOL FOR USE IN A MACHINE USED FOR CUTTING SHEET-LIKE ITEMS

Peter Frei, Sullens, Switzerland, assignor to Bobst SA, Switzerland

Filed Jan. 19, 1989, Ser. No. 300,093
Claims priority, application Switzerland, Jan. 20, 1988, 00192/88
Int. Cl.[4] B26D *7/18*
U.S. Cl. 83—103 6 Claims



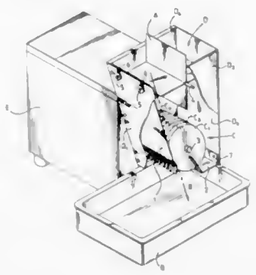
1. In a waste stripping tool used in a machine designed for cutting sheet material, said stripping tool including a frame within which are fitted crossbars to extend orthogonally between two opposite frame members of said frame, said crossbars having stripping elements mounted thereon, the improvement comprising each crossbar being an adjustable crossbar assembly having two ends and including two crossbar members being linked together lengthwise side-by-side in such a way that the length of the crossbar assembly corresponds to the distance separating the two opposite frame members between which it is secured, said assembly at each end having means for securing the assembly to said frame members.

4,913,017

MEAT CUTTING DEVICE

Jari Akrenius, Helsinki, Finland, assignor to Feodo Ky, Klaukkala, Finland

Filed Apr. 1, 1988, Ser. No. 177,471
Claims priority, application Finland, Apr. 13, 1987, 871605
Int. Cl.[4] B02C *18/06;* **B26D** *1/15, 1/20*
U.S. Cl. 83—121 13 Claims



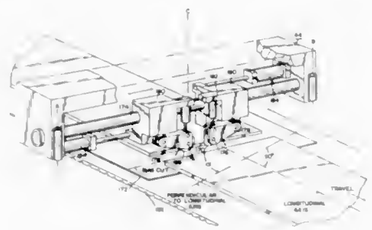
1. A meat cutting device comprising:
a body part;
a cutting means carried by said body part arranged for cutting meat;
said body part including a feeding chute defining an inclined path for carrying the meat towards said cutting means;
said feeding chute having a front wall, a rear wall and two side walls;
said cutting means including a rotatably mounted blade assembly formed by a plurality of spaced disc-shaped cutting knives having circular cutting edges for receiving the meat from the chute;
whereby the meat is drawn automatically towards the cutting knives and through the spaces between the knives in order to produce cleanly through-cut slices or the like of the meat.

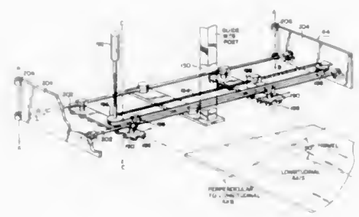
4,913,018

APPARATUS TO CUT AND ALIGN MATERIAL IN A TIRE BUILDING MACHINE

David W. Bailey, Waterloo, Canada, assignor to The Uniroyal Goodrich Tire Company, Akron, Ohio

Filed May 26, 1988, Ser. No. 198,889
Int. Cl.[4] B26D *5/20, 7/06*
U.S. Cl. 83—155 6 Claims





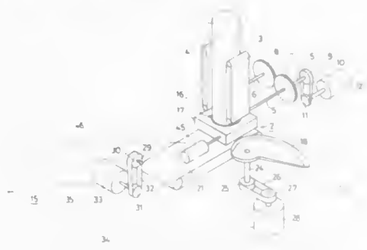
1. Apparatus to cut breaker material as it is conveyed from a roll to a rotatable drum and to align the cut breaker material comprising:
conveyor means for moving the breaker material along a path of travel from the roll to the drum with the longitudinal centerline of the material overlying the longitudinal centerline of the conveyor means;
cutter means located along the path of travel for cutting the material fed from the roll into strips of a predetermined length with the cut being at an angle with respect to the longitudinal centerline of the material to thereby produce an acute angle having a tip of material at the leading edge of each strip of cut material and with the centerline of the strip of cut material being offset from the centerline of the conveyor through the action of the cutter means;
freely rotatable edge alignment means located along the path of travel following the cutter means for returning the tip of the cut material into proper alignment position with the centerline of the strip of cut material overlying the centerline of the conveyor and with the opposed side edges of the cut material being at a predetermined, equal distance from the longitudinal centerline of the conveyor means;
motor means for moving the edge alignment means toward and away from the longitudinal centerline of the conveyor means; and
control means for controlling the movement of the conveyor means, for actuating the cutter means and for energizing the motor means for aligning the cut material.

4,913,019

HAM LOAF SIZE SENSING MEANS IN A HAM SLICING MACHINE

Hiroshi Hayashi, Wakayama, Japan, assignor to Ryowa Ltd., Japan

Filed Jul. 19, 1989, Ser. No. 382,774
Claims priority, application Japan, Jul. 29, 1988, 63-191389
Int. Cl.[4] B26D *5/00, 5/20, 7/06*
U.S. Cl. 83—367 3 Claims



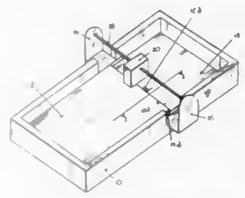
1. In a ham loaf slicing machine including a pair of loaf feed conveyors for continuously advancing a ham loaf into a slicing station while holding the loaf therebetween, a collar having an aperture for receiving a lower end portion of the ham loaf advanced by the loaf feed conveyors to hold the loaf therein at the entrance to the slicing station, and a rotary cutter supported for cyclical orbital movement into and out of the slicing station at a level right under the collar and in a direction transverse to a food loaf path, ham loaf size sensing means for controlling the speed of the loaf feed conveyors according to variations in the thickness of the loaf comprising:
(1) an annular groove cut in an inner wall portion of said collar defining said aperture for supporting a flexible strap-like member therein along the circumference of the aperture, said collar being formed with a draw-out passage for said strap-like member which extends tangentially from said annular groove and outwardly of said collar;
(2) said flexible strap-like member being disposed in said annular groove to define a ring-shaped measuring portion, one end of said strap-like member being fixed at a suitable place in said annular groove, the other end thereof being positioned outside said collar past the draw-out passage;
(3) a displacement regulating means for said ring-shaped measuring portion, provided on said strap-like member to restrict projection of said ring-shaped measuring portion from said annular groove within given limits in which said measuring portion is restrained from slipping out of said annular groove, said ring-shaped measuring portion being displaceable in said annular groove and between a retracted position in which it is settled in the annular groove and an outermost projected position to which it is allowed to project from the annular groove by said displacement regulating means;
(4) a biasing means connected to said strap-like member for biasing the ring-shaped measuring portion in the annular groove outwardly from said groove to thereby cause said measuring portion to encompass the ham loaf under a predetermined pressure as the ham loaf passes through the aperture of the collar; and
(5) a sensor mounted to said strap-like member for sensing linear movements of the strap-like member at said other end in longitudinal directions thereof which are indicative of variations in thickness of the ham loaf passing through said aperture of the collar.

4,913,020

ILLUMINATED FILM CUTTER AND BASE

Gary A. Hoenabeen, and John R. Matteon, both of Minneapolis, Minn., assignors to Image Innovations, Inc., Edina, Minn.

Filed Jan. 23, 1989, Ser. No. 300,593
Int. Cl.[4] B26D *1/18*
U.S. Cl. 83—471.2 7 Claims



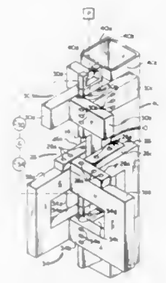
1 An illuminated film cutter and base unit comprising,
a rigid frame structure,
a translucent supply side supporting platform removably mounted to said frame structure for supporting a transparent filmstrip to be trimmed and having an integrally formed translucent cutting edge between top and bottom surfaces of said supply side supporting platform for forming a precise cut line for a filmstrip positioned thereon,
said supply side supporting platform and frame structure being adapted to overly an illuminating light source to facilitate viewing and positioning of the filmstrip on the platform,
a circular film cutter mounted on said frame structure and disposed in precise alignment with the cutting edge of said supply side supporting platform and having a peripheral edge extending below the top surface of said supply side supporting platform for cutting a filmstrip along the cutting edge of the supply side supporting platform, and including an illuminating light source attached to the frame structure in underlying relation to the supply side supporting platform.

4,913,021

HIGH-PRECISION PUNCH AND DIE APPARATUS

Paul W. T. Moran, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 29, 1988, Ser. No. 277,584
The portion of the term of this patent subsequent to Apr. 3, 2007, has been disclaimed.
Int. Cl.[4] B26D *3/14;* **B26F** *1/12*
U.S. Cl. 83—641 13 Claims



1 A high-precision punch and die apparatus comprising:
(a) a stationary frame;

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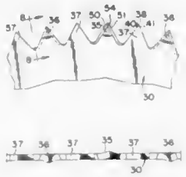
(b) a punch adapted for movement relative to said frame, said punch having integral pneumostatic bearing surfaces and at least one cutting edge;
(c) a die adjustably mounted to said frame to receive said punch therethrough, said die having at least one cutting edge adapted to coact with said at least one cutting edge on said punch;
(d) a pair of pneumostatic bearings for constraining and guiding movement of said punch through said die, each of said bearings having a segmented journal including a plurality of journal segments provided with a pneumostatic bearing surface, said journal segments being adjustably mounted, with respect to said frame, to receive said punch therebetween so that said bearing surface on each of said journal segments is in closely spaced relation to an opposing one of said bearing surfaces on said punch;
(e) means for controllably supplying a pressurized gas to said bearing surface on each of said journal segments to facilitate said constraining and guiding of said movement of said punch through said die; and
(f) means for effecting said movement of said punch through said die so as to move said at least one cutting edge on said punch into coacting relation with said at least one cutting edge on said die.

4,913,022

CIRCULAR SAW BLADE

Anthony K. Kukliaski, 426 Penn Rd., Norristown, Pa. 19401

Continuation-in-part of Ser. No. 196,811, May 19, 1988, Pat. No. 4,802,396. This application Dec. 13, 1988, Ser. No. 283,720
Int. Cl.[4] B27B *33/08*
U.S. Cl. 83—849 1 Claim



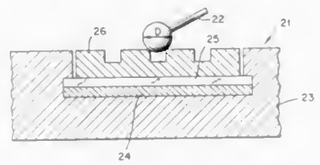
1. For cutting a kerf in wood composed of fibers, a circular saw metal blade capable of selectively rotating in opposite angular directions, in the form of a circular disk having a center mounting opening, and teeth extending generally in the plane of the disk outwardly from the center and continuously along the perimeter of the disk, the improvement comprising:
a tooth combination of
(1) first and second shear teeth for shearing fibers at the side of the kerf, and
(2) cleaving teeth for partially cleaving fibers cut on one side of the kerf,
wherein
(1) a single cleaving tooth alternates with a single shear tooth so that there is a first and second shear tooth adjacent each cleaving tooth;
(2) the shear teeth
(a) are beveled to shear edges which intersect to form a point, and
(b) have a set out of the plane of the disk, with the first shear tooth adjacent each cleaving tooth having an opposite set from the second shear tooth;
(3) the cleaving teeth lie in the plane of the disk; and
(4) the individual teeth when viewed in a direction normal to the plane of the disk are in the form of an isosceles triangle and are symmetrical about a line normal to the base of the triangle from its apex, so that the same sawing action occurs with respect to both possible angular directions of rotation of the blade;
whereby, when the saw blade rotates in either angular direction, a sawing action occurs,
wherein
(1) the shear edge on the side of the first shear tooth in the direction of travel first cuts wood fibers at the side of the kerf of the set;
(2) the cleaving tooth adjacent the first shear tooth partially cleaves the said first cut fibers from the wood, the said cut fibers remaining intact at the side of the kerf opposite the cut made by the first shear tooth, and
(3) the shear edge on the side of the second shear tooth in the direction of travel cuts the said partially cleaved fibers at the side of the kerf opposite the first cut.

4,913,023

BAR FOR USE IN ELECTRONIC PERCUSSION SYSTEM

Masaaki Mizuguchi, and Hirohisa Kuroyanagi, both of Shizuoka, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Nov. 3, 1987, Ser. No. 116,235
Claims priority, application Japan, Nov. 4, 1986, 61-262424
Int. Cl.[4] G10H *3/14*
U.S. Cl. 84—723 8 Claims



1. A bar incorporated in an electronic percussion system for providing a timing to produce a synthetic tone, comprising:
(a) a supporting block having a surface portion;
(b) a top member having a first surface portion extending in first and second directions perpendicular to each other and a second surface portion located at the reverse side of the first surface portion, a force acting on said first surface portion when a striker makes a strike on the first surface portion; and
(c) a force sensitive unit intervening between the surface portion of said supporting block and the second surface portion of said top member and converting said force acting on said first surface portion into an electric signal, wherein said first surface portion is formed with a rugged surface with respect to a plane defined by said first and second directions, said rugged surface extending at least said first and second directions, said rugged surface causing said striker to intermittently strike said first surface portion when said striker moves in a direction parallel to the plane defined by said first and second directions.

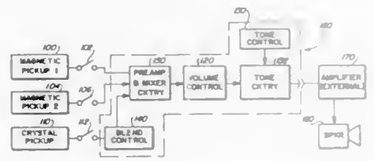
4,913,024

ELECTRIC GUITAR APPARATUS HAVING MAGNETIC AND CRYSTAL PICKUPS

Ronald S. Carriveau, 2029 W. Elm, Phoenix, Ariz. 85015

Continuation-in-part of Ser. No. 11,288, Feb. 5, 1987, abandoned. This application Oct. 13, 1988, Ser. No. 257,339
Int. Cl.[4] G10H *3/18*
U.S. Cl. 84—726 15 Claims

1. Electric guitar apparatus including a body, a neck, and strings vibrating in response to being played, comprising, in combination:
wooden body means for defining the body of the guitar apparatus, including a sound chamber defined by relatively thick side and end walls about the sound chamber and a relatively thick bottom to the sound chamber;
a top covering the body means and the sound chamber, the relatively thick side and end walls and the relatively thick bottom and the top substantially preventing vibration of the body means as air within the sound chamber vibrates in response to vibration of the strings;
bridge means secured to the top and disposed over the sound chamber for securing the strings to the top;
means for securing the strings to the bridge means;
a recess in the bridge means beneath the strings;
crystal pickup means disposed in the recess for providing a first output from vibration of the strings;
a saddle secured to the bridge means and disposed over the crystal pickup means for supporting the strings on the bridge means;
magnetic pickup means for providing a second output from the vibration of the strings, secured to the top and over which the strings extend; and



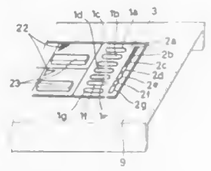
circuit means for controlling the outputs from the crystal pickup means and the magnetic pickup means, including
first switch means for controlling the output from the magnetic pickup means,
second switch means for controlling the output from the crystal pickup means,
blend means for blending the output from the crystal pickup means with the output from the magnetic pickup means, and
preamplifier means for amplifying the blended outputs from the magnetic pickup means and the crystal pickup means for providing a third output from the electric guitar apparatus which combines the first and second outputs from the crystal pickup means and the magnetic pickup means, respectively.

4,913,025

APPARATUS FOR CONTROLLING SOUND VOLUME OF ELECTRONIC MUSICAL INSTRUMENT

Yoshinobu Nakano, Hamamatsu, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Shizuoka, Japan

Filed Feb. 2, 1988, Ser. No. 151,518
Int. Cl.[4] G10H *1/46*
U.S. Cl. 84—711 8 Claims



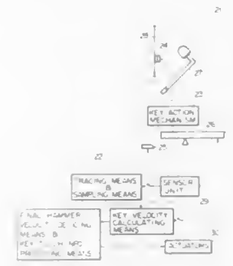
1. In an apparatus for controlling the sound volume of an electronic musical instrument in which the amplitude of a sound signal is controlled by a volume control signal obtained through operation of at least one depressible volume selection switch, and a volume indicator device that corresponds to the sound volume is then acutated thereby, the improvement which comprises:
first and second depressible volume selection switches which are arranged adjacent to each other in an apparatus body, each of said volume selection switches having an operation member with an upper end being so formed as to have an arcuate surface and so disposed as to be slightly protruding beyond a surface of said apparatus body;
means for producing a first volume control signal that corresponds to a first sound volume in response to depression of said first volume selection switch alone;
means for producing a second volume control signal that corresponds to a second sound volume different than said first sound volume in response to depression of said second volume selection switch alone; and
means for producing a third volume control signal, in response to simultaneous depression of said first and second volume selection switches, that corresponds to a sound volume intermediate said first and second sound volumes.

4,913,026

AUTOMATIC PLAYER PIANO WITH TOUCH STRENGTH ESTIMATOR

Yasutoshi Kaneko, and Takasi Tamaki, both of Shizuoka, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Jan. 27, 1989, Ser. No. 302,381
Claims priority, application Japan, Jan. 29, 1988, 63-11860[U]; Mar. 22, 1988, 63-67835
Int. Cl.[4] G10F *1/02*; G10G *3/04*
U.S. Cl. 84—21 11 Claims



1. An automatic player piano operable in a recording mode of operation and a playback mode of operation, comprising:
(a) a mechanical piano having
(a-1) a keyboard mounted on a key bed and provided with a plurality of keys respectively depressed with forces by a player,
(a-2) a key action mechanism coupled to said keyboard for transmitting the forces exerted on said keys,
(a-3) a hammer mechanism provided with a plurality of hammer assemblies, said hammer assemblies being coupled to said key action mechanism and driven for rotations with the forces transmitted by said key action mechanism, and
(a-4) a plurality of music wires respectively struck with said hammer assemblies for producing sounds; and
(b) an automatic player system having
(b-1) a controller operative to memorize pieces of key touch information respectively representative of grades of intensity assigned to said sounds in said recording mode of operation and retrieve the pieces of the key touch information in said playback mode of operation,
(b-2) a plurality of actuators provided in association with said keyboard and responsive to the pieces of said key touch information for causing said keys to move, and
(b-3) a sensor unit provided between said key bed and said keyboard and operative to detect key motions of said keys for producing the pieces of said key touch information in said recording mode of operation, in which each of the pieces of said key touch information is estimated on the basis of each of said key motions.

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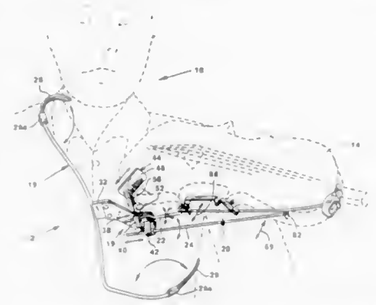
4,913,027

VIOLIN HOLDER

Mark Twohy, 271 Laussat St., San Francisco, Calif. 94117

Continuation-in-part of Ser. No. 139,742, Dec. 30, 1987, abandoned. This application Sep. 6, 1988, Ser. No. 240,210
Int. Cl.[4] G10D *3/18*
U.S. Cl. 84—280 20 Claims



1. A support for a shoulder-engagable musical instrument such as a violin or viola, for supporting the instrument on a musician's body and avoiding the need for gripping the instrument between the musician's shoulder and chin, comprising,

body harness means for fitting onto the body of the musician user and for engaging the back, one shoulder, the front and a portion of the abdomen of the musician, around a side of the abdomen opposite said one shoulder;

instrument clip means for securing to the back side of the instrument, the instrument clip means including two support connection means; and

adjuster bracket means for connecting to the body harness means at the front of the musician and including instrument support means having end means for connection to said support connection means on the instrument clip means, and further including adjustment means for adjustment of the position and orientation of the instrument support means to afford a full range of adjustment of the instrument in positions adjacent to the musician's other shoulder,

the musical instrument support thereby stably supporting the instrument on the musician in position to be played, without engagement of the chin with either the instrument support or the instrument.

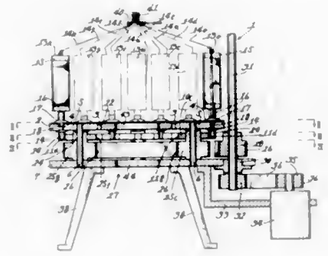
4,913,028

BRAIDING MACHINE WITH SYNCHRO BELT SYSTEM

Hayasaka Yoshiya, Hamamatsu, Japan, assignor to Kokubu Inc., Hamamatsu, Japan

Filed Nov. 17, 1988, Ser. No. 272,382
Claims priority, application Japan, Jul. 23, 1988, 63-98169[U]
Int. Cl.[4] D04C *3/06, 3/20*
U.S. Cl. 87—44 3 Claims

1. A braiding machine comprising a plate formed with two endless carrier ways configured to provide a ring of substantially circular loops, each loop being interconnected to an adjacent loop in a Figure-8 configuration, bobbin carriers mounted in the carrier ways, and a drive system for moving the bobbin carriers around the ring successively from loop to loop with selected carriers being moved in opposite directions around the ring, the drive system comprising a rotary drive dog for each loop, the drive dog being mounted for rotation substantially coaxially with respect to the loop in a plane adjacent a plane containing said plate, the drive dogs having respective peripheral drive recesses and the carriers having respective projecting lugs for receipt in said recesses and transfer between the recesses of successive drive dogs, a drive pulley mounted for rotation with each drive dog and an endless drive belt wound around the pulleys for rotating the pulleys and drive dogs by movement of the belt, the belt being wound in opposing drive direction about adjacent pulleys for



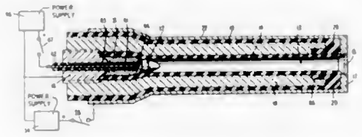
driving the adjacent drive dogs in opposite directions respectively, the drive system further including drive means for moving the belt.

4,913,029

METHOD AND APPARATUS FOR ACCELERATING A PROJECTILE THROUGH A CAPILLARY PASSAGE WITH INJECTOR ELECTRODE AND CARTRIDGE FOR PROJECTILE THEREFOR

Derek A. Tidman, Silver Spring, Md.; Yong C. Thio, Alexandria, Va., and Yeshayahu S. A. Goldstein, Gaithersburg, Md., assignors to GT-Devices, Alexandria, Va.

Filed Nov. 12, 1986, Ser. No. 929,366
The portion of the term of this patent subsequent to Mar. 13, 2007, has been disclaimed.
Int. Cl.[4] F41F *1/02*
U.S. Cl. 89—8 21 Claims



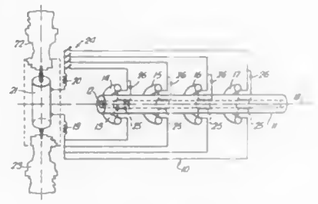
1. Apparatus for accelerating a projectile comprising a structure having a capillary passage with a dielectric wall containing ionizable material, first and second electrodes at spaced points along the length of the passage, the projectile being positioned in the passage, one end of the passage being closed and the other end being open so that the projectile can be projected through it, means for establishing a discharge along the length of the passage between the electrodes and through the projectile for ionizing the material from the wall in front and in back of the projectile to form a high pressure region behind the projectile to accelerate the projectile along the passage and through the open end of the passage, a mass of low atomic weight vaporizable substance in the passage behind the projectile, means for vaporizing the substance to establish a high pressure behind the projectile to accelerate the projectile toward the open end, the projectile being additionally accelerated by the high pressure in the region behind the projectile by the ionized material, and means separate from the establishing means for applying energy to the substance to evaporate it.

4,913,030

ELECTROMAGNETIC GUN

Graham A. Reynolds, Coventry, England, assignor to Rolls-Royce plc, London, England

Filed Feb. 20, 1987, Ser. No. 18,484
Claims priority, application United Kingdom, Mar. 14, 1986, 8606394
Int. Cl.[4] F41F *1/02*
U.S. Cl. 89—8 14 Claims



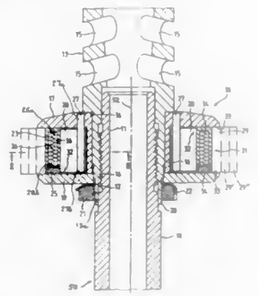
1. An electromagnetic gun comprising a barrel for containing and directing an electrically conductive projectile, at least one inductor means disposed adjacent to said barrel so that, when said inductor means is electrically actuated by connection to a power source, a magnetic field will be created within said barrel and so oriented so as to accelerate along a path including said barrel a said projectile located therein, at least one pair of parallel rail electrodes positioned along said path and downstream of at least a major portion of the magnetic field created by actuation of said inductor means, said rail electrodes being electrically connected in parallel with said inductor means and being positioned within said barrel and relative to said path of said projectile so that, upon passage of a said projectile, said rail electrodes will be electrically interconnected with said projectile to short circuit said inductor means.

4,913,031

VIBRATION DAMPING DEVICE FOR IMPROVING THE HIT ACCURACY OF A FIRING WEAPON

Werner Bossard, Zärich, and Thomas Pesek, Winterthur, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Buhrle, Zärich, Switzerland

Filed Jun. 15, 1989, Ser. No. 366,456
Claims priority, application Switzerland, Jun. 26, 1988, 02450/88
Int. Cl.[4] F41F *17/12*
U.S. Cl. 89—14.3 8 Claims



1. The combination with a firing weapon having a weapon barrel possessing a lengthwise axis and a weapon barrel muzzle, of a weapon barrel damping device provided at the weapon barrel muzzle for preventing substantially radially directed bending vibrations of the weapon barrel, which weapon barrel is secured at only one end thereof, during firing of projectiles from the weapon barrel, said weapon barrel damping device comprising:

an inertia body operatively connected with the weapon barrel muzzle for relative radial displacement between the weapon barrel and said inertia body under the action of the bending vibrations;

said inertia body possessing a substantially ring-shaped configuration and being arranged substantially coaxially with respect to the lengthwise axis of the weapon barrel;

resilient means operatively interconnecting the inertia body and said weapon barrel and urging said inertia body into said substantially coaxial position; and

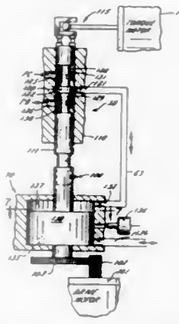
said resilient means substantially readily counteracting said relative radial displacement between said inertia body and said weapon barrel in order to thereby at least damp said bending vibrations.

4,913,032

MULTIPLEXED HYDRAULIC CONTROL SYSTEMS

Donald F. Wernberg, Rockford, Ill., assignor to Woodward Governor Company, Rockford, Ill.

Filed Dec. 19, 1988, Ser. No. 286,040
Int. Cl.[4] F15B *13/16*
U.S. Cl. 91—361 21 Claims



1. A time division multiplexed (TDM) hydraulic control system having a plurality of channels for individually controlling the positions of a plurality of hydraulic actuators in the respective channels in accordance with an associated plurality of electrical control signals, the TDM control system comprising the combination of:

a pilot valve having a valve spool linearly positionable within a valve body, the body having substantially full annular porting controllably opened or closed by a metering land on the spool, linear actuator means associated with the spool for positioning the metering land to control the output flow rate of the pilot valve;

control means including electrical multiplexer means for sequentially feeding electrical control signals to the pilot valve, the electrical control signals being related to the plurality of hydraulic channels to be controlled;

a rotating commutator valve having a plurality of outputs, one for each channel, the commutator valve having an input for receiving the output of the pilot valve, means for causing the commutator valve to rotate for sequentially distributing the pilot valve output to the commutator valve outputs;

means connecting the commutator valve outputs to the actuators for controlling the positions thereof; and

the commutator valve having a port area for each channel which is greater than the maximum port area of the pilot valve.

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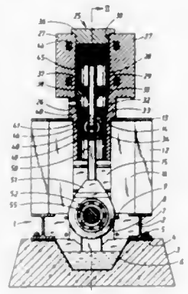
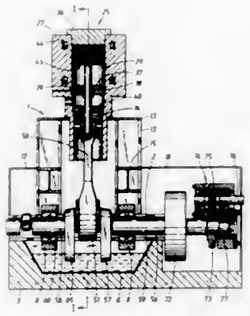
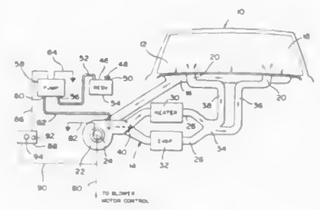
4,913,033
STEAM ENGINE
Martin Bernas, Vattenverksgatan 2D, S-57100 Nässjö , Sweden
Continuation of Ser. No. 103,592, Oct. 1, 1987, abandoned. This application Jan. 9, 1989, Ser. No. 296,347
Int. Cl.[4] F01B *1/02*
U.S. Cl. 92—73 19 Claims





1. A steam engine comprising:
a crankshaft having crank webs supporting a crankpin;
a plurality of crankshaft bearings supporting said crankshaft for rotation around a generally horizontal axis;
a pair of horizontally lying beams extending generally parallel to, and on opposite sides of the crankshaft, a plurality of bearing support members, each bearing support member extending generally perpendicularly to the axis of rotation and supported by the horizontally lying beams, the bearing support members supporting the crankshaft bearings;
a plurality of vertically standing beams extending upwardly from said horizontally lying beams;
a horizontally lying plate, having an upper side and including a hole, said horizontally lying plate being supported by said vertically standing beams;
a cylinder including a lower portion adapted to extend downwardly through said hole and including a flange surface adapted to rest against said upper side of said plate when said lower portion of said cylinder extends downwardly through said hole;
a piston reciprocable within said cylinder; and
means including a piston rod and a connecting rod for rotating said crankshaft in response to reciprocation of said piston within said cylinder.

4,913,034
AIR HANDLING SYSTEM WITH DEODORIZER INJECTION
Joseph E. J. Ripple, 8140 NW. 13th St., Pembroke, Fla. 32503, and Daniel E. Kelly, 2727 NW. 167th St., Miami, Fla. 33054
Filed Jan. 3, 1989, Ser. No. 293,189
Int. Cl.[4] B60H *1/32*
U.S. Cl. 98—2.11 4 Claims

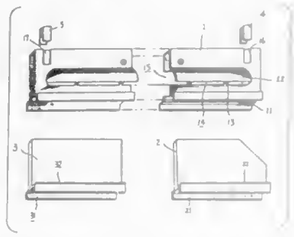


1. In combination an automotive vehicle including an engine compartment, an air handling duct structure incorporating inlet and outlet ends and heat exchange means serially disposed within said duct structure intermediate said ends as well as blower means serially disposed in said duct structure at a location therealong intermediate said inlet end and said heat exchange means, a liquid injection system for said duct structure, said duct structure including an exposed upper wall portion thereof within said engine compartment and in part defining said duct structure location and to which ready access may be had from the exterior of said duct structure, an elongated liquid injection tube having inlet and outlet ends, said exposed wall portion having an opening formed therethrough, said outlet end of said injection tube being projected downwardly through said opening into the interior of said duct structure at said location, means sealing said tube relative to said exposed upper wall portion about said opening, said outlet end of said tube being generally vertically disposed and spaced below said upper wall portion, said outlet end including liquid discharge means for discharging liquid supplied to said inlet end from said outlet end of said tube to the exterior thereof, and liquid under pressure supply means for supplying a deodorizer liquid under pressure to said inlet end, said supply means including actuator means therefor operative to momentarily actuate said supply means, said liquid discharge means including radial openings formed in said outlet end of said tube, said outlet end of said tube including a liquid absorbent wrap disposed thereover and projectable downwardly through said opening with said outlet end of said tube, said wrap being operable to absorb liquid discharged from said radial bores and to enable the absorbed liquid to be evaporated therefrom.

4,913,035
APPARATUS FOR MIST PREVENTION IN CAR WINDSHIELDS
Gabri C. B. Duh, No. 267, Lane 376, Sec. 1, Kwang-fu Rd., Hsinchu, Taiwan
Filed Aug. 16, 1989, Ser. No. 394,754
Int. Cl.[4] B60H *1/26*
U.S. Cl. 98—2.13 2 Claims

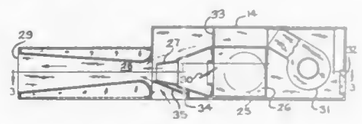
1. An apparatus for preventing mist on the windshield of a car which has a window with an edge, comprising:
a U-shaped body having a pair of side walls defining an interior space, opposite ends, a closed edge between the side walls and an open edge between the side walls, the U-shaped body including a U-shaped portion connected to the open edge, the U-shaped body including tooth profiles thereon at least adjacent the opposite ends of the U-shaped body, the U-shaped body including a curved shield connected to one of the side walls, a plurality of reinforced ribs connected to the shield, the one side wall having

ventage openings therethrough positioned under the curved shield, the opposite side wall having a gap therethrough for the passage of air across the side walls through the gap and through the ventage openings, the U-shaped body including a pair of recesses adjacent the opposite ends of the U-shaped body;
a pair of end pieces, each end piece having a portion for insertion into the interior space of the U-shaped body adjacent one opposite end thereof, each end piece having



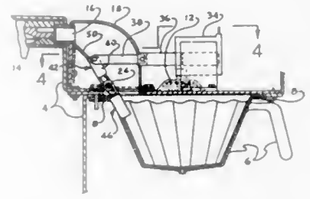
a U-shaped profile at one edge thereof shaped to be received in the U-shaped portion of the U-shaped body, the U-shaped profile of each end piece having a tooth-rack for engaging the tooth profiles of the U-shaped portion of the U-shaped body for engaging the end pieces at the opposite ends of the U-shaped body; and
a pair of connectors each engaged over one of the recesses of the U-shaped body for holding the end pieces to the U-shaped body.

4,913,036
MIXING BOX
Gersbon Meckler, 1703 Channel Tower Dr., Monmouth Beach, N.J. 07750
Division of Ser. No. 19,149, Aug. 20, 1987, Pat. No. 4,858,519, which is a continuation of Ser. No. 314,872, Oct. 26, 1981, Pat. No. 4,657,178. This application Jan. 23, 1989, Ser. No. 300,127
The portion of the term of this patent subsequent to Apr. 14, 2004, has been disclaimed.
Int. Cl.[4] F24F *13/04*
U.S. Cl. 98—38.4 3 Claims



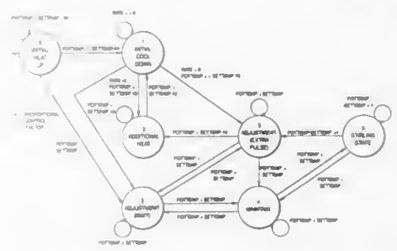
1. In a mixing box having an inlet end, an outlet end, an inouction nozzle intermediate the inlet and outlet ends of the box, a substantially closed first passage and a primary air inlet, wherein primary air flows into the primary air inlet, and then through the induction nozzle and the outlet end of the box, the induction nozzle being operable, when primary air flows through the passage, to induce a flow of air through a first opening for mixture with primary air and delivery therewith through the outlet end of the mixing box, means for controlling the rate of flow of primary air through the passage, and a fan operable to induce a flow of air through a second opening and to deliver such air through the outlet end of the mixing box, the improvement wherein the mixing box forms a closed second passage for the flow of air from the second opening to the suction side of the fan, includes a control operable to energize and de-energize the fan, and includes a heat transfer device positioned for heat transfer with air which is induced to flow through the second opening before that air is delivered through the outlet end of the mixing box.

4,913,037
MOISTURE PROTECTION SYSTEM FOR THE PARTICULATE FOOD DELIVERY APPARATUS OF BEVERAGE PREPARING MEANS
Brian D. Newman, Louisville, Ky., assignor to Grindmaster Corporation, Louisville, Ky.
Filed Jan. 6, 1989, Ser. No. 362,311
Int. Cl.[4] A47J *31/00*
U.S. Cl. 99—286 20 Claims



1. A moisture protection system for an apparatus which delivers a dry particulate food product to a liquid beverage preparing means, said system comprising
support means defining an opening therethrough adapted for communication with a beverage preparing device,
sealing means tiltably connected to said support means for effectively preventing the escape of moisture from said beverage preparing device through said opening when in a first position and for permitting said beverage preparing device to communicate with said opening when in a second position,
biasing means tending to maintain said sealing means in said first position,
means operatively connected to said sealing means for tilting said sealing means from said first to said second position in opposition to said biasing means when activated and for permitting said biasing means to return said sealing means to said first position when de-activated, and
guide means connected to said support means for guiding a dry particulate food product introduced therein through said opening to a beverage preparing device when said sealing means is in said second position.

4,913,038
DEEP FAT FRYER WITH COMPUTERIZED CONTROL SYSTEM
Douglas M. Burkett, Middletown; Gary L. Mercer, Alexandria, and Robert W. Stirling, Englewood, all of Ohio, assignors to Henny Penny Corporation, Eaton, Ohio
Filed Aug. 3, 1988, Ser. No. 227,886
Int. Cl.[4] A47J *27/62*
U.S. Cl. 99—331 38 Claims



1. A controller for use with a cooking system wherein said cooking system comprises a cooking vessel for holding a cook-

VOL 1113 ISS 1 AP 3 1990 UMI

ing medium and for receiving a plurality of types of food products, a heating element for heating the cooking medium and temperature sensor means for sensing the temperature of the cooking medium, said controller comprising:

heating element control means for controlling the operation of said heating element to enable said heating element to be in one of a plurality of modes including at least a pulsed mode and a full on mode;

temperature selector means for selecting a first selected temperature;

proportional control factor selector means operable by a user of said controller for selecting a proportional control factor independently of said first selected temperature, said proportional control factor selector means further establishing a second selected temperature a number of degrees below said first selected temperature corresponding to said proportional control factor;

wherein said heating element control means is responsive to said proportional control factor selector means for selectively controlling the operation of said heating element

(a) in said full on mode when said sensed temperature is below said second selected temperature, and

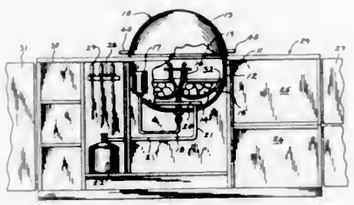
(b) in said pulsed mode when said sensed temperature is below said first selected temperature and above said second selected temperature.

4,913,039

STEAM GENERATOR COOKER

Cecil Sutphen, 2424 N. Grant Blvd., Milwaukee, Wis. 53210

Filed Jun. 30, 1988, Ser. No. 213,829
Int. Cl.[4] A47J *37/04, 37/07*
U.S. Cl. 99—339 12 Claims



1. A cooking apparatus which is capable of barbecuing and steaming food comprising:

enclosure means for housing and supporting a source of heat and a grid for cooking said food, said source of heat and said grid spaced in a manner to afford a browning of said food by said source of heat;

support means for said heat source disposed inside said enclosure means; and

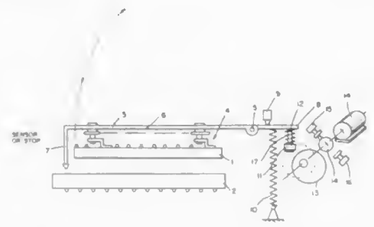
a pressure regulated steam generating chamber for holding a quantity of water, said steam generating chamber and said support means for said fuel constructed and arranged in a manner so that said fuel can surround said steam generating chamber and heat said water into steam and both said steam generator and said heat source positioned in an independent and direct flow path to said food.

4,913,040

APPARATUS FOR COOKING FOOD

Victor Sherman, 13-10 34 Ave., Lic, N.Y.; Wladimir Kowalenko, 24 Whitney Clr., Glen Cove, N.Y.; Ilya Zborovsky, 6 Schoolhouse Way, Dix Hills, N.Y., and William Sanchez, 35-69 169 Ave., Flushing, N.Y.

Filed Jul. 19, 1988, Ser. No. 221,111
Int. Cl.[4] A47J *37/06, 43/18*
U.S. Cl. 99—372 16 Claims



1. A cookingapparatus for cooking food, comprising

at least two plates arranged to confine an initial food material therebetween and to cook the same, said plates including a lower stationary plate and an upper pivotable plate;

heating means arranged to heat said plates;

manual means for moving said upper plate manually toward said lower plate so as to bring said upper plate close to said lower plate;

drive means for driving said upper plate over a short and powerful stroke after said bringing toward said lower plate to apply not only heat but also pressure to the initial food material for cooking; and

sensing means for sensing a moment when said upper plate has been brought close to said lower plate and at said moment activating said drive means for driving said upper plate after said bringing toward said lower plate over said short and powerful stroke to apply not only heat but also pressure to the initial food material for cooking.

4,913,041

DEEP FAT FRYING APPARATUS

Bruce E. Taber, and James T. Grob, both of Shreveport, La., assignors to The Frymaster Corporation, Shreveport, La.

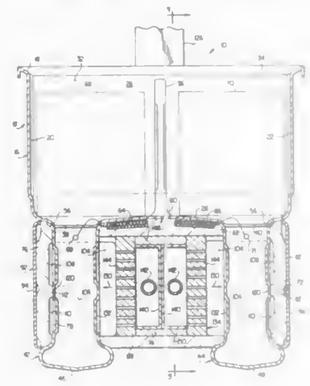
Filed Nov. 5, 1987, Ser. No. 118,755
Int. Cl.[4] A47J *37/12, 27/00*
U.S. Cl. 99—403 43 Claims

1. Deep fat frying apparatus comprising:

a frypot adapted to hold a quantity of cooking oil and having a wall surface portion through which heat may be transferred to heat the oil;

a solid insulating material structure positioned against said wall surface portion and having an insulating material side surface portion which directly defines with said wall surface portion a heating flow passage adapted to receive a heated gas and flow the heated gas along said wall surface portion;

retaining means for holding said solid insulating material structure against said wall surface portion; and



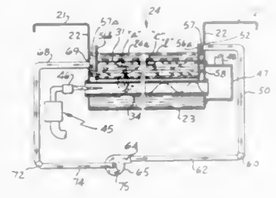
gas generating means for flowing heated gas into said heating flow passage.

4,913,042

DEEP FAT FRYER

Michael E. Miller, Bellevue, Ohio, assignor to Stein, Inc., Sandusky, Ohio

Filed Aug. 21, 1989, Ser. No. 396,942
Int. Cl.[4] A47J *37/12*
U.S. Cl. 99—404 15 Claims



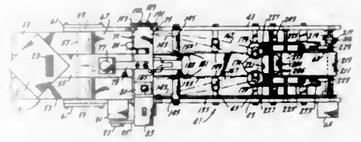
1. In a deep fat fryer having frying oil in a reservoir and means for heating said oil to a frying temperature, and conveying means for supporting and moving food products longitudinally through the reservoir and oil to cause cooking or frying of the product; an oil circulation system for nullifying any temperature differential and resultant transverse oil flow in the oil extending transversely across the reservoir between a hot oil side of the reservoir and a relatively cooler oil side thereof and caused by said heating means comprising conduit means connectable between the hot side and relatively cooler side of the reservoir and means for generating a counter balancing oil flow through said conduit means and through said reservoir from said relatively cooler side to said hot side of said reservoir.

4,913,043

METHOD AND APPARATUS FOR FORMING EGG ROLLS

Yau T. Cheung, 2348 S. Canal St., Chicago, Ill. 60616

Filed Mar. 4, 1988, Ser. No. 164,277
Int. Cl.[4] A21C *9/06*
U.S. Cl. 99—450.6 7 Claims



1. An apparatus for forming a food item such as a traditionally shaped egg roll, including:

a conveyor belt means for receiving and supporting a square sheet of dough and a cylindrical egg roll filling and moving them on the conveyor belt means with one corner of the sheet of dough pointed in the direction of movement of the conveyor belt means,

means to engage the leading corner of the sheet of dough and to reversely fold it around the cylindrical egg roll filling,

means to crease the dough along its length of movement immediately outwardly of the ends of the cylindrical egg roll filling,

means to fold the opposite corners of the square sheet of dough which extend transversely to the direction of movement of the conveyor belt means about the creases, inwardly over the cylindrical egg roll filling and disc means to press said opposite corners of the sheet of dough downwardly toward each other,

means to transversely crease the folded dough rearwardly of the cylindrical egg roll filling, and

means to roll the cylindrical egg roll filling in the direction opposite to the direction of movement of the conveyor belt means to fold the side and trailing corners of the sheet of dough into the traditional cylindrical egg roll shape,

said means to transversely crease the folded dough rearwardly of the cylindrical egg roll filling including a freely rotatable paddle having blades, with the paddle being rotated by engagement with the partially folded dough and cylindrical egg roll filling and one of the blades of the paddle contacting the dough rearwardly of the cylindrical egg roll filling to crease the folded dough.

4,913,044

APPARATUS FOR CUTTING A WORK OBJECT

George F. Heath, Visalia, Calif., assignor to Lindsay Olive Growers, Lindsay, Calif.

Filed Feb. 10, 1988, Ser. No. 154,587
Int. Cl.[4] A23N *4/08*
U.S. Cl. 99—494 23 Claims

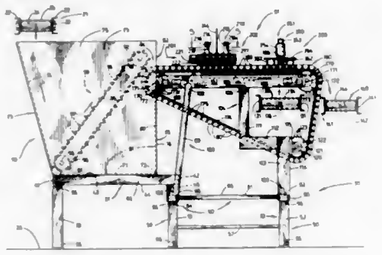
1. An apparatus for cutting olives to be pitted, the apparatus comprising:

an orientation conveyor mounted on the apparatus for conveying olives through at least one work station and operable selectively to position said olives in the work station during the cutting operation and having a plurality of upstanding pockets which are operable to position the olives in predetermined attitudes in a pattern in said work station;

a water manifold borne by the apparatus and positioned at the work station, the water manifold operable to move along a predetermined path of travel and deliver a stream of high pressure fluid in the work station to cut the work object; and

control means mounted on the apparatus for coordinating the operation of the water manifold and the orientation

conveyor and adapted periodically to stop the orientation conveyor whereby the olives are positioned in substantially fixed relation in the work station during selected



intervals of time and the water manifold is directed along a path of travel and substantially simultaneously delivers the high pressure fluid to cut the olives.

4,913,045

POLISHED-RICE HUMIDIFYING APPARATUS AND RICE MILLING SYSTEM

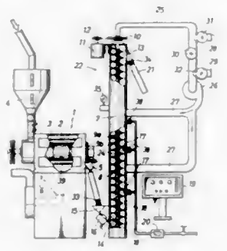
Toshihiko Satake, Higashihiroshima, Japan, assignor to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1989, Ser. No. 326,009

Claims priority, application Japan, Mar. 23, 1988, 63-70386; Apr. 18, 1988, 63-96474

Int. Cl.[4] B04B *9/14*

U.S. Cl. 99—519 **19 Claims**



1. An apparatus for humidifying polished rice, comprising:

screw conveyor means comprising a conveyor shaft and a screw fixedly mounted on said conveyor shaft and extending about the same, said conveyor shaft being hollow and having an open end, said conveyor shaft having in a peripheral wall thereof a plurality of ventilation openings through which insides and outsides of said conveyor shaft communicate with each other, said screw conveyor means having around said screw a tubular housing defining a predetermined transport path for the polished rice, for conveying the polished rice, while steering the same, along said transport path;

humidifying means arranged in association with said transport path for adding moisture to the polished rice conveyed along said transport path, by such an amount of moisture as not to form cracks in the polished rice, thereby humidifying the same; and

air-flow means arranged in association with said transport path for causing air to flow along said transport path, to remove excess moisture from the polished rice humidified by said humidifying means, said air-flow means including a blower means having a suction port and a discharge port, either one of said ports being connected to said open end of said conveyor shaft.

4,913,046

BREAD TOASTER WITH TEMPERATURE SENSOR

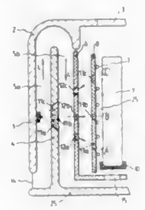
Georg Möthrath, Hasselroth, and Stefan Schamberg, Oberursel, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Continuation of Ser. No. 170,319, Mar. 18, 1988, abandoned. This application Aug. 29, 1989, Ser. No. 403,076

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1987, 3709571

Int. Cl.[4] A47J *27/62*

U.S. Cl. 99—331 **13 Claims**



1. A bread toaster comprising

structure defining a toasting chamber for receiving a bread product item to be toasted, said toasting chamber defining structure including an electrically insulating partition wall,

heating means disposed on the side of said electrically insulating partition wall facing said toasting chamber,

an outer casing surrounding said toasting chamber defining structure, a supplementary partition wall disposed between said outer casing and said electrically insulating partition wall, and

a sensing element disposed on the side of said supplementary partition wall remote from said toasting chamber, said partition walls including a series of apertures therein that define a radiation guide channel extending between said toasting chamber and said sensing element, edge areas of said apertures being coated with a layer of material having a low emissivity.

4,913,047

ELECTRIC SAUSAGE COOKER

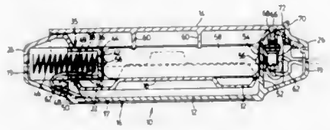
Allan L. Burley, Omenee, Canada, assignor to ADP Technology Inc., Toronto, Canada

Filed Oct. 12, 1988, Ser. No. 256,556

Claims priority, application United Kingdom, Oct. 22, 1987, 8724771

Int. Cl.[4] A47J *43/18*

U.S. Cl. 99—441 **4 Claims**



1. An electric cooker for sausages and the like, comprising:

a base portion which includes support means for supporting at least one sausage-like item so that the latter is restrained against lateral deflection when axially compressed, said support means being electrically non-conduction, said support means being shaped to define at least one rounded trough into which a sausage-like item can be placed,

first electrically conductive contact means adjacent one end of said at least one sausage-like item,

second electrically conductive contact means adjacent the other end of said at least one sausage-like item,

one of said contact means being movable toward and away from the other, to allow the contact means to simultaneously contact the respective ends of a sausage-like item in the support means,

each said conductive contact means being a metallic plate having at least one raised protuberance substantially in axial alignment with said at least one trough,

a carriage adapted to reciprocate in a direction aligned with said at least one trough, the movable plate being mounted on said carriage,

electrical means for passing electrical current between the two plates through said at least one sausage-like item, thereby heating the item due to the item's internal resistance,

an on-off switch connected with said electrical means such that when the switch is off no electrical current can flow between the two plates, and such that when the switch is on current can flow between the two plates;

a lid hinged to the base portion and adapted to swing between an open position and a closed position, the lid being operatively connected with said switch and with one of said plates such that 1) when the lid is in the open position, a sausage-like item may be inserted into or removed from the support means and said switch is off, and 2) when the lid is in the closed position, physical access to a sausage in the support means is prevented and the switch is on, and

resilient means biasing the carriage toward the non-movable plate, the lid being operatively connected with said carriage by cam and follower means such that, as the lid moves from its open toward its closed position, the carriage is permitted to move toward the non-movable plate under the urging of the spring means, to achieve a final position dependent upon the length of the sausage-like item, and as the lid moves from its closed toward its open position, the carriage is retracted away from the non-movable plate against the urging of said spring means, said electrical means being adapted to draw power from a conventional alternating current source, the electric cooker further including an indicator light circuit comprising a neon bulb, a conductive probe and a protective resistance all wired in series and connected to one side of the alternating current source, the conductive probe being adapted to penetrate into a sausage-like item in the support means to make electrical contact with said item, the circuit being completed to one of said plates by a portion of said last-mentioned sausage-like item, whereby when current is first applied to the sausage-like item, the internal resistance of the latter is low enough to ensure that the voltage drop across the bulb will be high enough to fire the bulb, and when the sausage-like item is cooked, the internal resistance thereof rises to the level necessary to lower the voltage across the bulb below the firing threshold, whereby the bulb turns off when the cooking is completed.

4,913,048

METHOD AND APPARATUS FOR PRINTING WITH A LITHOGRAPHIC SLEEVE

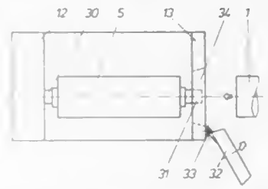
Udo Tittgemeyer, Arnsberg, Fed. Rep. of Germany, assignor to Tittgemeyer Engineering, Arnsberg, Fed. Rep. of Germany

Continuation of Ser. No. 940,436, Dec. 11, 1986, abandoned. This application Jan. 3, 1989, Ser. No. 293,589

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1985, 3543704

Int. Cl.[4] B41F *7/20*

U.S. Cl. 101—141 **23 Claims**



1 A method for offset printing comprising:

releasably mounting a sleeve-shaped print form to a cylindrical rotating body, said sleeve-shaped print form comprising a first material layer for absorbing water and a second material layer for absorbing ink, by frictionally fitting and radially supporting an inner surface of said sleeve-shaped print form to an outer surface of said rotating body along a longitudinal extent of said print form;

contacting said sleeve-shaped print form with an ink;

printing a carrier material with ink from said second material layer;

completing the printing of said carrier material;

unilaterally releasing a single end of said rotating body from a frame-mounted bearing;

removing said print form from said rotating body by axially pulling said print form past said end of said rotating body connected to a releasable bearing;

replacing said print form with a second sleeve-shaped print form by axially inserting said second print form over said end of said rotating body;

engaging said rotating body through said releasable bearing with said frame; and

printing a carrier material.

4,913,049

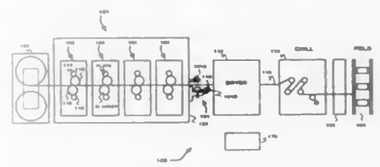
BERNOULLI-EFFECT WEB STABILIZER

Jeffrey W. Sainio, Hartland, Wis., assignor to Quad/Tech, Inc., Pewaukee, Wis.

Filed Apr. 19, 1989, Ser. No. 340,498

Int. Cl.[4] B41M *1/14*

U.S. Cl. 101—211 **20 Claims**



1. A method of maintaining registration control of a multicolor, web-fed printing press, comprising the steps of:

guiding a web through a series of print cylinders having respective correction motors associated therewith, to apply a printed image to the web;

directing compressed air at the surface of the web to stabilize

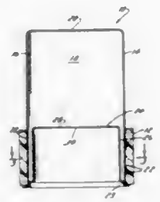
the web such that web flutter is confined to a predetermined depth-of-field;
scanning said image with an optical scanner capable of scanning within said depth-of-field, said scanner being configured to produce output signals in accordance with said image;
thereafter drying said image; and
transmitting said output signals to said motors.

4,913,050

SELF-METERING GRAVITY FED INK DISPENSING ROLLER

Robert Beaver, Ft. Wayne, Ind.; Arthur L. Piepmeier, Cookeville, and Charles Nunally, Jr., Baxter, both of Tenn., assignors to Porelon, Inc., Cookeville, Tenn.

Continuation-in-part of Ser. No. 102,866, Sep. 30, 1987. This application Sep. 22, 1988, Ser. No. 247,903
Int. Cl.[4] B41F *31/14*
U.S. Cl. 101—348 13 Claims



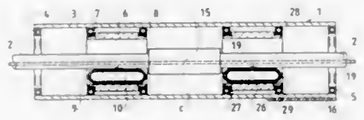
1. An ink dispensing roll, comprising:
(a) a first hollow and substantially cylindrical member with a plurality of holes extending therethrough only in a defined region located near one end of said first member;
(b) a second substantially cylindrical member defining with said first member an annularly shaped cavity volume extending along the entire width of said defined region and terminating substantially at the end of said region and directed away from said one end of said first member;
(c) said first member also defining a reservoir volume for ink positioned in fluid communication with said cavity volume, said reservoir volume being substantially greater than said cavity volume; and
(d) ink impregnable means secured to and around the outer surface of said first cylindrical member only over said defined region for absorbing ink flowing through said holes from said cavity volume into the interior of said ink impregnable means and for dispensing ink from an exterior surface of said ink impregnable means upon contact with an ink receiving surface.

4,913,051

ROLL FOR USE IN ROTARY PRINTING PRESSES AND THE LIKE

Bruno Molinatto, Montalto Dora, Italy, assignor to Componenti Grafici S.r.L., Lomellina, Italy

Filed Aug. 9, 1988, Ser. No. 230,184
Int. Cl.[4] B41F *13/10*
U.S. Cl. 101—376 20 Claims



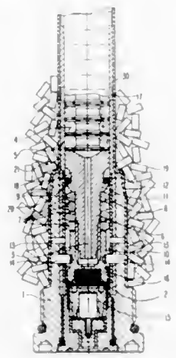
1. A roll, particularly for use in rotary printing presses to define with a printing cylinder a nip for a running web of paper or the like, comprising an elongated carrier; a deformable hollow cylindrical shell spacedly surrounding said carrier, at least a portion of said shell containing a plurality of different materials, and said portion of said shell including an epoxy resin which is reinforced by carbon filaments; and means for deforming said shell, including at least one pneumatic deforming unit disposed in said shell to react against said carrier and to bear against the shell from within.

4,913,052

PROPELLANT CHARGE IGNITER WITH A SEPARATING CHARGE, WHICH IS INITIATED BY A PROPELLANT CHARGE POWDER

Alfred Hoerr, Zirndorf; Horst Penner, Fuerth; Uwe Brede, Fuerth, and Heinz Riess, Fuerth, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Aug. 29, 1989, Ser. No. 399,949
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1988, 3829657
Int. Cl.[4] F42C *19/08*
U.S. Cl. 102—202 15 Claims



1. A propellant charge igniter which comprises a bottom piece, an initiator piece head section surrounding an initiator charge located within the bottom piece, a flash-conducting tube following the initiator charge, with a flash-conducting tube head being positioned next to a propagation charge surrounded by a combustible tube with blowout bores, a cavity containing a separating charge located between the flash-conducting tube and a metallic casing extending below the combustible tube and located with the bottom piece, the cavity extending beyond a top edge of the metallic casing and a top edge of the bottom piece, separation of the combustible tube taking place by gases resulting from deflagration of the separating charge directly above the top edge of the bottom piece, at least one priming bore establishing a connection between the cavity containing the separating charge and a zone located outside of the propellant charge igniter, and a seal acting like a valve at the flash-conducting tube head toward the casing, said seal, on the one hand, preventing direct entrance of gases of the propagation charge into the cavity and, on the other hand, permitting exiting of the gases of the separating charge through the combustible tube above the top edge of the bottom piece

4,913,053

METHOD OF INCREASING THE DETONATION VELOCITY OF DETONATING FUSE

William A. McPhee, Jersey Village, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 914,836, Oct. 2, 1986, abandoned. This application Apr. 18, 1988, Ser. No. 182,340
Int. Cl.[4] C06C *5/04*
U.S. Cl. 102—275.8 6 Claims

2. A method for increasing a detonation velocity of an explosive detonating cord having a core and a sheath, comprising the steps of:
compacting said core and sheath under a pressure between 10,000 and 20,000 pounds per square inch for 30 to 60 minutes; and
shrinking said sheath about said core by heating said explosive detonating cord to a temperature between 225 and 250 degrees Fahrenheit for 30 to 60 minutes.

4,913,054

PROJECTILE DELIVERY APPARATUS

Donald W. Petersen, Tehachapi, Calif., assignor to Dynafore Corporation, Tehachapi, Calif.

Filed Jun. 8, 1987, Ser. No. 59,554
Int. Cl.[4] F42B *11/00*
U.S. Cl. 102—439 3 Claims

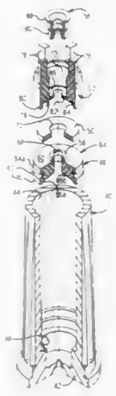
1. A projectile apparatus which enhances the penetration characteristics of a projectile, the apparatus propelled from a firearm at a preselected target, comprising:
a centrally disposed projectile having a predetermined launch weight and a plurality of smaller projectiles surrounding said centrally disposed projectile;
a friable capsule having a longitudinal axis and an internal chamber, the internal chamber disposed in substantial coaxial alignment with the longitudinal axis and receiving the projectiles to be delivered secured internally of the chamber in a predetermined pattern, the friable capsule enclosing the projectiles for traversing the distance from the firearm to the target and retaining the launch weight of the projectiles intact; and
an epoxy filler material mounting the plurality of projectiles in a fixed position in the internal chamber and further controlling the dispersion pattern and the depth of penetration of the smaller projectiles when the friable capsule releases the projectiles upon impact with the target, and wherein impact of the friable capsule with the target generates heat, and wherein the friable capsule and the filler material become rapidly pliable upon exposure to the heat generated by said impact whereby the pliable capsule and filler material preserve the heat energy localized at the point of impact while releasing the projectiles from the capsule to achieve enhanced penetration of the target by passing the projectiles through the weakened point of impact of the target.

4,913,055

CARTRIDGE FOR EXPLOSIVELY OPERATED INDUSTRIAL TOOLS

Kazuhiro Goto, Markham; Ross L. Mair, Barrie; Reid McBain, Agincourt, all of Canada; Douglas J. Leiby, Enola, Pa., and Mitchell G. Carpenter, Ancaster, Canada, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 16, 1989, Ser. No. 394,605
Int. Cl.[4] F42B *5/26*
U.S. Cl. 102—470 8 Claims



1. An improved cartridge for use with explosively operated industrial tools, said cartridge comprising:
an elongated shell open at one end and closed at a base end, said shell having a chamber adjacent said base end;
powder deposed in said chamber;
a gas check of plastics material and having an outwardly open aperture in one end and a rigid washer between said aperture and another end, said gas check positioned in said shell adjacent said powder with said aperture facing the open end; and
a primer positioned in said aperture.

VOL 1113 ISS 1 AP 3 1990 UMI

4,913,056

CARTRIDGE

Peter Matysik, Springe, and Heinz Wiechmann, Garbsen, both of Fed. Rep. of Germany, assignors to Wilhelm Brenneke KG Fabrikation Von Jagdgeschossen, Langenhagen, Fed. Rep. of Germany

Filed May 5, 1989, Ser. No. 350,301

Claims priority, application Fed. Rep. of Germany, May 7, 1988, 3815738

Int. Cl.[4] F42B *5/02*

U.S. Cl. 102—439 7 Claims

1. A cartridge having a cartridge case, a gun barrel projectile disposed in said case, and a propelling charge in said case behind said projectile, said gun barrel projectile comprising: a lead head provided with a tip; a body of resilient material; and means on said head and said body defining an exactly fitting plug-in connection joining said body to said head, said body comprising a forward end part adjacent said head and delimited by a rear end area; a rearward end part in the form of a flat-topped piston remote from said head; a rod-like central part between said forward and rearward end parts, said rod-like central part merging into said rear end area of said forward end part; and means connecting said rearward end part to said rod-like central part so as to define a predetermined breakage point designed to rupture on firing said cartridge to allow said rearward end part to move forwardly along said rod-like central part towards said forward end part, said rod-like central part being provided with a projection which acts as a support for said rearward end part during flight of said projectile after said cartridge has been fired, the distance between said rear end area of said forward end part and said projection being equal to the thickness of said rearward end part.

4,913,057

ARMOR PIERCING SHELL

Hans-Erik Kropp; Hans Gustafsson, and Kenneth Andersson, all of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Continuation of Ser. No. 177,431, Apr. 4, 1988, abandoned. This application Aug. 31, 1989, Ser. No. 401,543

Claims priority, application Sweden, Apr. 3, 1987, 8701397

Int. Cl.[4] F42B *13/10*

U.S. Cl. 102—476 3 Claims

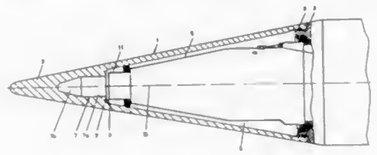
1. An armor-piercing explosive shell comprising in combination:

a rear portion containing a hollow charge;

a front portion connected to said rear portion and comprising a substantially cone-shaped outer casing defining an interior cavity, said outer casing including a forwardmost part and a rearward part, said forwardmost part having a wall with a thickness which is substantially greater than the thickness of the wall of said rearward portion, said forwardmost part providing a reinforced tip for mechanical penetration of active armor;

said outer casing including an inwardly-projecting annular shoulder formed in said wall between said forwardmost part and said rearward part;

said interior cavity rearwardly of said annular shoulder containing an electrical contact member which is of generally frusto-conical shape over at least a portion of its length and has an outer surface closely spaced from said



casing and a front part positioned just rearwardly of said annular shoulder which provides an electrical contact surface for said front part of said electrical contact member; and

means effective only when said outer casing is deformed to a sufficient extend rearwardly of its forwardmost end by its impingement upon a target to result in electrical contact being made between said outer casing and said electrical contact member through said annular shoulder to detonate said hollow charge.

4,913,058

CONTINUOUS BALLAST-TAMPING MACHINE WITH INDEPENDENT TAMPING HEADS FOR RAILWAY LINES

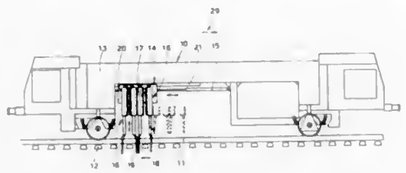
Flavio Mancini, Brescia, Italy, assignor to ITI/CLM Impianti Tecnici Industriali and Danieli & C. Officine Meccaniche SpA, both of Buttrio, Italy

Filed Oct. 19, 1988, Ser. No. 259,806

Claims priority, application Italy, Nov. 3, 1987, 83484 A/87

Int. Cl.[4] E01B *27/12*

U.S. Cl. 104—12 7 Claims



1. Continuous ballast-tamping machine which comprises a machine structure able to run with a straight, uniform motion along a railway line, a tamping structure movably connected to said machine structure and adapted to move lengthwise along the machine structure with a straight, alternating movement owing to the action of an actuation means, the tamping structure being for consoidating ballast in accordance with sleepers that bear the railway line, the tamping structure comprising:

a plurality of tamping heads; and

independent vibrating means for vibrating pairs of said tamping heads;

wherein each said tamping head comprises a tine-holder, a support and guide element and a vertical actuation means;

wherein said tine-holder is movably connected to said support and guide element;

wherein said tine holder is adapted to move vertically in relation to said support and guide element; and

wherein each said tine holder is vertically movable in relation to each said support and guide element by each said vertical actuation means so that each said tine-holder can be positioned vertically in an independent manner in relation to the railway line.

4,913,059

LEVITATION, PROPULSION AND GUIDANCE MECHANISM FOR INDUCTIVE REPULSION-TYPE MAGNETICALLY LEVITATED RAILWAY

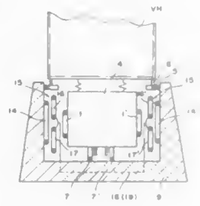
Junji Fujie, Hino; Hiroshi Nakashima, Hachioji, and Shunsuke Fujiwara, Tokyo, all of Japan, assignors to Railway Technical Research Institute, Tokyo, Japan

Filed Feb. 13, 1985, Ser. No. 309,637

Claims priority, application Japan, Feb. 25, 1988, 63-40726; May 27, 1988, 63-128161

Int. Cl.[4] B60L *13/10*

U.S. Cl. 104—282 5 Claims



1. A levitation, propulsion and guidance mechanism for an inductive repulsion-type magnetically levitated railway having a vehicle with a truck and a track bed along which said truck runs, comprising:

(a) superconducting coils fixedly arranged vertically on both sides of said truck at predetermined intervals therealong in a direction of travel of said vehicle;

(b) propulsion coils arranged on opposed walls of said track bed at predetermined intervals therealong in the direction of travel of said vehicle;

(c) a propulsion power supply connected to said propulsion conductor -coils;

(d) levitation-guidance conductor coils, each of which includes null-flux connected upper and lower conductor coils arranged on sides of said propulsion conductor coils facing said superconducting coils and positioned to have vertical symmetry, said levitation guidance conductor coils being arranged at said opposed walls of said track at predetermined intervals therealong in the direction of travel of said vehicle; and

(e) connecting wires for null-flux connecting said levitation-guidance conductor coils to each other.

4,913,060

RUNNING GEAR FOR ELECTRIC ROLLING STOCK

Yasuhiro Sekine; Haruhisa Fujita, and Sadafumi Ikeda, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 15, 1988, Ser. No. 182,205

Claims priority, application Japan, May 14, 1987, 62-115772

Int. Cl.[4] B61C *9/50*

U.S. Cl. 105—96 5 Claims

1. A running gear for an electric rolling stock comprising:

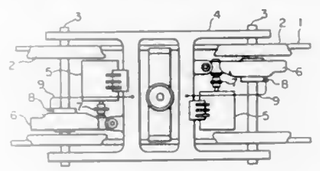
at least one pair of axles having wheels capable of running on tracks;

a bogie transom supported above the tracks by said axles;

traction motors supported by said bogie transom;

reduction devices which reduce the rotational speed of output shafts of said traction motors and which transmit a reduced rotational speed to said axles; and

gear couplings which transmit the rotation of the output shafts of said traction motors to input shafts of said reduction devices, said gear couplings comprising a first container which has a first flange, a second container which has a second flange disposed in opposition to said first flange of said first container and which surrounds a gear portion in cooperation with said first flange, through holes formed through said first and second flanges, hollow bushes which have at one end portions thereof flanges registering with one of said first and second flanges and which have the other end portions thereof extended through portions of said through holes which correspond



to at least one of said first and second flanges, and joining devices penetrating said through holes through said bushes and interposing between said first and second flanges so as to join said first and second containers,

wherein when said traction motors are driven, return current flows from the tracks to said axles and said bogie transom,

said gear couplings each having electrically resistive elements which prevent any return current from flowing through said coupling devices.

4,913,061

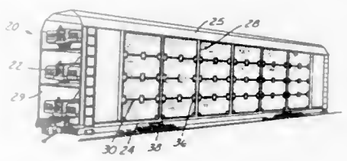
AUTO RACK SIDE PANEL SUPPORT SYSTEM

Bernard J. Youngblood, 477 Allard Rd., Grosse Pointe Farms, Mich. 48236

Filed Sep. 27, 1988, Ser. No. 250,012

Int. Cl.[4] B61D *17/00*

U.S. Cl. 105—378 5 Claims



1. An auto rack for transporting automobiles which comprises:

a main frame including at least one generally horizontally extending member being capable of supporting automobiles and several bar members extending vertically upward from said horizontally extending member;

panel sections covering the area between the bar members and the horizontally extending member;

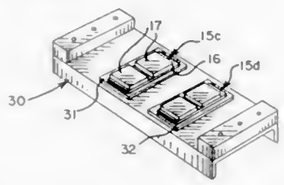
bracket members to connect the panel sections to the horizontally extending member and the bar members, the bracket members being in contact with the panel sections; and

the portions of said bracket members that contact the panel sections being coated by a synthetic coating to provide surface to surface contact between the panel sections and the coated bracket members thereby retarding corrosion which could occur between the panel sections and the bracket members if the bracket members were not coated by the synthetic coating.

4,913,062
SEGMENTED SLIDING SILL WEAR PLATE

Michael K. Burke, Wheaton, Ill., assignor to Zeftek, Inc., Batavia, Ill.

Continuation of Ser. No. 77,682, Jul. 24, 1987, Pat. No. 4,784,068. This application Jul. 25, 1988, Ser. No. 223,783
The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.
Int. Cl.[4] B61F *1/02*
U.S. Cl. 105—418 9 Claims



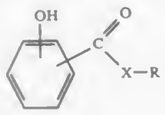
1. In an assembly including a stationary member and a movable member slidably supported on said stationary member and a wear plate means between the members, the improvement in said wear plate means which comprises, a flat metal base plate, a plurality of spaced pads of self-lubricating, high compressive strength plastic material molded and bonded to said plate, said pads having coplanar wear surfaces, said plastic material having a substantially higher coefficient of expansion than said metal base plate, means securing said base plate to said stationary member such that the plastic pads contact the movable member, and said pads sized to substantially eliminate internal stresses when subjected to a wide range of ambient temperature conditions experienced in normal operation to thereby prevent bowing of said wear plate and delamination of said plastic pads.

4,913,063
THERMOSTABLE IRON OXIDE PIGMENTS, PROCESSES FOR THEIR PREPARATION AND THEIR USE

Friedrich Jonas, Aachen; Peter R. Schick, and Jürgen Wiese, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiensegellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Jul. 25, 1988, Ser. No. 223,383
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1987, 3726048
Int. Cl.[4] C09C *1/24*
U.S. Cl. 106—413 10 Claims

1. Iron oxide pigments having an iron (II) content of at least 5% by weight calculated as FeO which have been treated with a phenolic compound of the formula

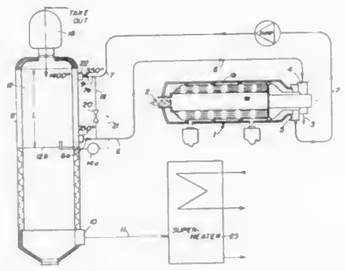


wherein
X is O or NH, and
R is straight chained or branched alkyl with 1 to 30 carbon atoms, alkenyl with 2 to 30 carbon atoms, cycloalkyl with 5 to 12 carbon atoms, or hydrogen.

4,913,064
DEVICE FOR INCINERATING WASTE MATERIAL

Frohmut Vollhardt, Oberhausen, Fed. Rep. of Germany, assignor to MAN Gutehoffnungsbuette GmbH, Oberhausen, Fed. Rep. of Germany

Filed Feb. 1, 1989, Ser. No. 305,279
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1988, 3803096; Feb. 17, 1988, 3804853
Int. Cl.[4] F23G *5/12*; D06F *75/00*
U.S. Cl. 110—229 6 Claims

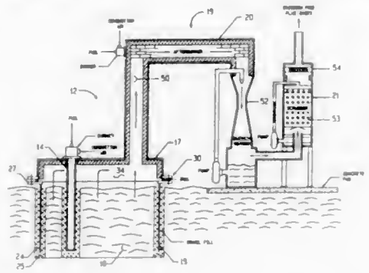


1. An apparatus for the low-temperature carbonization of waste materials, comprising a low-temperature carbonization device comprising an incinerator housing, heating gas circulating means for feeding a heating gas into closed heating engagement with said incinerator housing so as to carbonize the waste material, a secondary incinerator with a heat exchanger having a chamber connected to said heating gas circulating means so that the heating gas of said low-temperature carbonization device is led in a closed loop cycle through said low-temperature carbonization device and said heat exchanger, said heat exchanger having a wall means with a temperature maintaining lining which provides a temperature of the heating gas in said heat exchanger of at least 1200° C. for a duration of at least 1 to 5 sec.

4,913,065
IN SITU THERMAL WASTE DISPOSAL SYSTEM

Klaus H. Hemsath, Toledo, Ohio, assignor to Indugas, Inc., Toledo, Ohio

Filed Mar. 27, 1989, Ser. No. 329,423
Int. Cl.[4] F23D *3/00*
U.S. Cl. 110—239 26 Claims

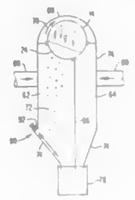


22. An in the ground, in situ system for thermally volatilizing the toxic and/or hazardous waster substances contained within a site without significantly disturbing the physical condition of said site comprising:
(a) means extending within said site about its periphery and above said site to sealingly encapsulate said site from the atmosphere;
(b) a plurality of tubes extending into said site for a fixed depth at which the site is to be minimally cleansed and spaced from one another in a regularly repeating geometric array;
(c) means for heating said tubes from the bottom up to pyrolyze said toxic and/or hazardous substances; and
(d) means for incinerating said volatiles after they exit from the surface of said site.

4,913,066
ROTARY COMBUSTOR HAVING A MATERIAL REMOVAL DEVICE

Richard R. Harloff, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 17, 1989, Ser. No. 339,050
Int. Cl.[4] A47J *36/00*, *36/24*
U.S. Cl. 110—246 7 Claims

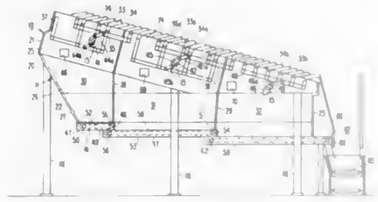


1. A rotary combustor comprising:
a combustion barrel;
a windbox disposed underneath said combustion barrel; and
means for removing material from an inside surface of said windbox, said means comprising:
a scraper mounted inside said windbox for movement along said surface; and
drive means for moving said scraper along said surface.

4,913,067
STOKER CONSTRUCTION

Matthew J. Gaskin, Williston Park; Stanley W. Kroon, Long Island City, and Thomas Tsaveras, Elmont, all of N.Y., assignors to Morse Boulger, Inc., Long Island, N.Y.

Continuation of Ser. No. 134,812, Dec. 18, 1987, abandoned.
This application Aug. 11, 1989, Ser. No. 394,255
Int. Cl.[4] F23H *7/08*, *7/14*
U.S. Cl. 110—281 10 Claims

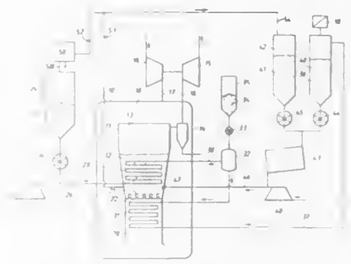


1. A stoker comprising a housing having side walls and at least one upright partition wall cooperating with said side walls to provide at least first and second plenum chambers, at least one reciprocating type grate unit disposed at and substantially forming a closure of an upper end of said housing and at least one residue removal means disposed at and substantially forming a closure of a lower end of said grate unit whereby said plenum chambers are substantially isolated from each other and the exterior of said housing, said upright partition wall having a flap gate disposed at a lower end thereof and adjacent said residue removal means for allowing passage therethrough of residue advanced by said residue removal means.

4,913,068
METHOD FOR IMPROVING UTILIZATION OF SULPHUR-ABSORBENT CONTAINING CALCIUM IN A POWER PLANT AND EQUIPMENT FOR PERFORMING THE METHOD

Roine Bränström, Finspong, Sweden, assignor to ABB Stal AB, Sweden

Filed Sep. 27, 1988, Ser. No. 250,006
Claims priority, application Sweden, Sep. 30, 1987, 87037636
Int. Cl.[4] F23B *7/00*
U.S. Cl. 110—342 16 Claims



1. A method for improving utilization of sulphur-absorbent containing calcium, in a power plant burning fuel in a fluidized bed (12) of particulate material in a combustion chamber (11), characterized in that when fresh absorbent is prepared it is crushed, the crushed material being divided into a fine and a coarse fraction, the coarse fraction being supplied to the bed and the fine fraction being calcinated and used as drying agent for crushed coal (41) and being introduced into the bed together with the fuel.

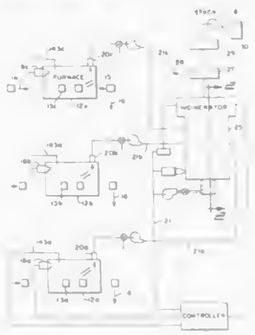
4,913,069
BATCH PYROLYSIS SYSTEM

Thomas J. Schultz, Maumee; Klaus H. Hemsath, Toledo; Franklin G. Rinker, Perrysburg, and Jay K. Shah, Sylvania, all of Ohio, assignors to Surface Combustion, Inc., Maumee, Ohio

Filed Mar. 17, 1989, Ser. No. 324,738
Int. Cl.[4] F23G *5/12*
U.S. Cl. 110—346 10 Claims

1. A process for operating a pyrolysis type thermal decomposition system comprising the steps of:
(a) providing a plurality of batch type furnaces,
(b) heating waste type materials in a controlled manner in each furnace where said materials produce fumes exhausted through a fume outlet on each furnace as said waste materials are decomposed by thermal reaction;
(c) providing one afterburner connected to the gas outlet of all of the furnaces for incinerating the fumes produced by

said plurality of furnaces when said waste materials are heated in said furnace; and



(d) operating said furnaces in a sequentially staged, overlapping manner to produce a generally constant supply of fumes to said afterburner.

4,913,070

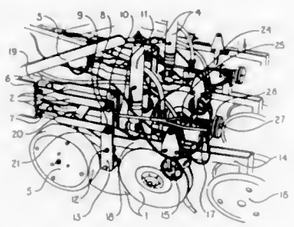
GROUND CONTACT IMPLEMENT SOIL PENETRATION DEPTH CONTROL

John E. Morrison, Jr., Temple, Tex., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation of Ser. No. 179,453, Apr. 8, 1988, abandoned. This application Mar. 6, 1989, Ser. No. 319,795

Int. Cl.[4] A01B *63/111*; A01C *5/06*

U.S. Cl. 111—135 18 Claims



1. An apparatus comprising:

a frame;

at least one depth gauging wheel;

mounting means connecting said at least one depth gauging wheel to said frame so that said at least one depth gauging wheel is both translocationally movable with respect to said frame and rotatable;

at least one ground contact implement connected to said frame;

adjustable downpressure means connected to said frame for varying the position of said at least one ground contact implement with respect to said at least one depth gauging wheel in response to changes in downpressure;

control means, operably connected to said mounting means and said frame and said adjustable downpressure means, for detecting translocational movement of said at least one depth gauging wheel and mounting means with respect to said frame and for adjusting downpressure exerted by said adjustable downpressure means in response to said detected translocational movement of said at least one depth gauging wheel and mounting means with respect to said frame so as to maintain a substantially constant difference in relative elevations of said at least one ground contact implement and said at least one depth gauging wheel;

wherein said mounting means includes a subframe connected to said at least one depth gauging wheel and pivotably connected directly to said frame;

a subframe strut, figidly connected to said subframe and connected to said control means;

a connecting link, rigidly connected to said frame, and connected to said control means; and

further comprising a spring flexibly linking said subframe strut to said connecting link.

4,913,071

AUTOMATIC FEEDING DEVICE FOR SEWING MACHINE HAVING A CYLINDER, AN ARM RECIPROCATED BY THE CYLINDER AND A FEEDER CONNECTED TO THE ARM

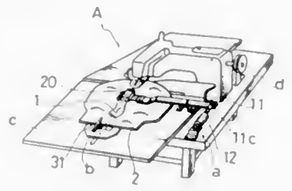
Kiyoshi Kawasaki, Akishima, Japan, assignor to Tachi-S Co., Ltd., Akishima, Japan

Filed Jan. 11, 1989, Ser. No. 295,797

Claims priority, application Japan, May 31, 1988, 63-72098[U]

Int. Cl.[4] D05B *27/00, 33/02*

U.S. Cl. 112—152 8 Claims



1. An automatic feeding device for use in a sewing machine, comprising:

a cylinder fixed on a table of the sewing machine;

an arm having a base end part connected to said cylinder so that said arm is movable towards and away from a sewing portion of the sewing machine by means of said cylinder causing automatic feeding of a base cloth; and

a feeder provided at a free end part of said arm, said feeder being so adapted that the base cloth is inserted therethrough and including:

(a) a clearance defined in said feeder, said clearance being of a dimensions sufficient for said base cloth to pass therethrough;

(b) a forward retaining means provided at a forward end of said feeder; said forward retaining means being adapted to bend and retain said base cloth;

(c) a rearward retaining means provided at a rearward end of said feeder opposite the forward end; said rearward retaining means being adapted to bend and retain said base cloth; and

(d) a plurality of stopper pins provided within said feeder such that they are disposed between said forward and rearward retaining means and oriented in a direction wherein said base cloth is fed for sewing by said sewing machine; and

wherein said base cloth is prevented against reverse movement and retained unmoved within said feeder while said feeder is being transferred by means of said cylinder.

4,913,072

EMBROIDERY LACE MACHINE

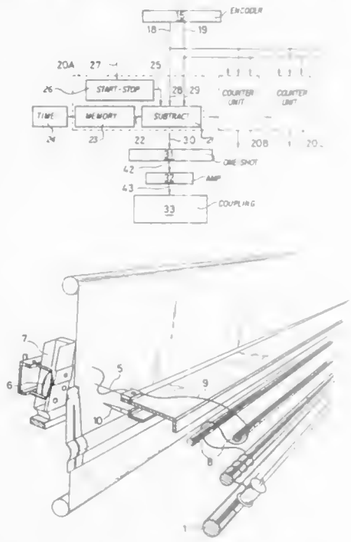
Koichiro Ohkawa, Higashimurayama; Itaru Nagoshi, Kawagoe, and Shunji Hiranuma, Hanno, all of Japan, assignors to Hiraoka Kogyo Co., Ltd., Hanno, Japan

Filed Nov. 5, 1987, Ser. No. 116,841

Claims priority, application Japan, Nov. 6, 1986, 61-262745

Int. Cl.[4] D05C *11/06*

U.S. Cl. 112—84 9 Claims



1. An embroidery lace machine comprising:

a plurality of different types of mechanisms including at least a needle, a shuttle, a shuttle box, a thread carrier and a borer, each mechanism being brought into and out of operation by connection to and disconnection from a main driving shaft of the embroidery lace machine at predetermined times during rotation of the main driving shaft;

a signal generating means for generating a reference pulse each time the main driving shaft is in a reference rotational position and for generating a train of angular position pulses indicating rotational displacement of the main driving shaft from the reference position; and

counting means for counting a number of angular position pulses following the reference pulse and for generating a timing control signal to separately actuate operation of each mechanism when the number of angular position pulses counted by the counting means coincides with a respective preset count associated with that mechanism.

4,913,073

CLOTH PRESSER IN A SEWING MACHINE STITCHING IN ZIGZAG AND PROVIDED WITH THREAD END HOLDER

Norio Komori, Tochigi, Japan, assignor to SSMC Inc., Fairfield, N.J.

Filed May 22, 1989, Ser. No. 354,955

Claims priority, application Japan, Jun. 21, 1988, 63-81858

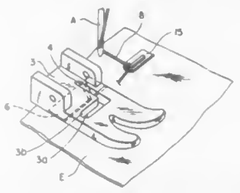
Int. Cl.[4] D05B *29/12, 65/00*

U.S. Cl. 112—235 3 Claims

1. A cloth presser adapted for use in a sewing machine stitching in zigzag and comprising:

a cloth presser supporting having upper and lower ends;

a cloth presser bottom plate adapted to be moved in a cloth feeding direction, the plate having front and rear ends and being pivotally mounted on the lower end of the supporter in a region adjacent the rear end of the plate, the plate having an L shaped slot, one leg of the slot being disposed intermediate the front and rear ends and disposed at right angles to said direction, the other leg of the slot extending rearwardly from the said one leg at right angles thereto, the one leg being designated as a needle location groove, the other leg being designated as a needle thread guide, the region at which the side wall of the one leg remote from the front end of the plate intersects the corresponding side wall of the other leg defining a corner, said plate also being provided with a flat knife receiving groove adjacent the rear end of the plate, said knife groove extending parallel to but spaced rearwardly from the needle location groove, said knife groove having a selected depth;



a thread holder for holding an end of a thread which has been previously passed through a hole in a needle at a vertical separation with respect to the plate such that said thread when extended between the thread end held by the holder and the first zigzag stitch of said thread does not extend over the corner; and

a flat knife disposed in said groove and secured to said plate, the thickness of the knife being equal to the depth of said knife groove.

4,913,074

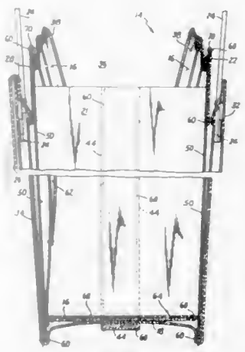
METHOD OF MANUFACTURING REINFORCED LEATHER PORTFOLIO

Frank Saliba, 115 W. 30th St., New York, N.Y. 10001

Division of Ser. No. 93,554, Sep. 8, 1987, Pat. No. 4,830,153. This application Jun. 8, 1988, Ser. No. 203,925

Int. Cl.[4] A45G *13/36*

U.S. Cl. 112—262.1 6 Claims



1. In a method of sewing a portfolio having generally rectangular left and right side panels, rectangular end panels between said left and right side panels, a rectangular bottom panel and a center compartment formed between said left and right side panels which is provided with fastening means for closing and opening said center compartment and locking means for securing the center compartment against unauthorized entry and taking of the contents, that improvement consisting of:

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providing a unitary three part assembly of said rectangular bottom and the two rectangular end panels by sewing two end panels to the ends of the bottom panel;

the ends of said end panels which are sewn to said bottom panel extending inwardly from the corner formed when the end panels are erected for joining to the edges of said right and left side panels thereby providing a transverse joining seam which is inwardly displaced from the bottom corners of the portfolio;

the two rectangular end panels having a top width which is substantially greater than the bottom width in an amount of at least 10% and up to 25% wider at the top than at the bottom;

sewing a reinforcing strip to the outside of said end panels extending from the top of said end panels along the bottom whereby said reinforcement strip along the bottom extends to the top ends of the portfolio; and

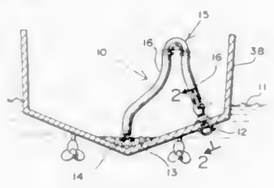
said reinforcing strip having at least the thickness of said bottom and end panels and being up to about two and one-half times as thick and being located at the center of said ends and sides to take up a distance of at least about 10% up to 35% of the width of the bottom and ends thereby providing an outer reinforcement of said sides and bottom, and sewing said three part assembly of ends and bottom to the left and right side panels of the portfolio to provide a strengthened bottom and wide opening top.

4,913,075

PUMPLESS BILGE WATER DRAINING SYSTEM AND METHOD

James A. Rohr, Jr., 4942 SW. 90 Ter., Cooper City, Fla. 33328

Filed Mar. 28, 1988, Ser. No. 173,106
Int. Cl.[4] B63B *13/02*
U.S. Cl. 114—185 10 Claims



1. A pumpless bilge draining apparatus comprising, in combination:

a thru-hull;

a valve;

a means for attaching said thru-hull to said valve;

a tail piece;

a vented air loop having a vent hole;

a pick-up;

a means for attaching said vented air loop to said pick-up and said valve, said attaching means comprising a first hose, said first hose being attached at one end to the top of said pick-up and attached at the other end to the vented air loop; and a second hose, said second hose being attached at one end to the free end of said vented air loop and at the other end to said tail piece, said tail piece being threadedly attached to the upper end of said valve, and

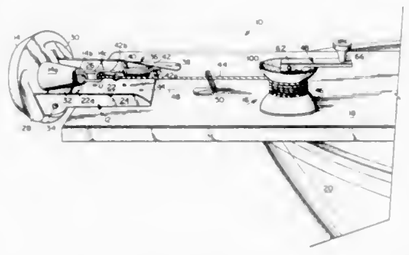
a means for attaching said apparatus to a vessel, said means comprising a mounting plate securing said vented air loop in a position above the load waterline, a bracket securing said pick-up such that said bracket is perpendicular to said pick-up and is clamped to an unbarbed portion of said pick-up shank and mounted to a vessel and secured by a nut and bolt assembly, and a flange nut securing said thru-hull to said vessel bottom.

4,913,076

ANCHOR DAVIT ASSEMBLIES

Don S. Norton, Clinton, Miss., assignor to Brell Mar Products, Inc., Jackson, Miss.

Filed Jun. 21, 1988, Ser. No. 215,995
Int. Cl.[4] B63B *21/22*
U.S. Cl. 114—210 31 Claims



9. In an anchor davit assembly of the type including an anchor support bracket for supporting an anchor in a stowed position, the improvement wherein said anchor support bracket includes:

support means which defines a forward support surface against which a portion of said anchor bears when in said stowed position thereof; and

releasable locking means operatively associated with said support means for releasably locking said anchor to said anchor support bracket and for urging said anchor poriton into bearing contact against said forward support surface of said support means, said locking means including;

a lever;

connection means for pivotally connecting said lever to said anchor support bracket so as to permit pivotal movements to said lever between locked and unlocked positions, and

biasing means having one end connected to said lever rearwardly of said connection means and another end adapted to being removably interconnected to said anchor rearwardly of said forward support surface of said support means, said biasing means for (i) resiliently urging said anchor rearwardly to cause said anchor portion to be brought into bearing contact against said forward support surface of said support means of said anchor support bracket when said lever is in said locked position, and (ii) encouraging said lever to pivot in a direction towards said locked position.

4,913,077

DISMOUNTABLE SAIL BOARD WHICH CAN BE USED AS A CRAFT THAT IS ALSO DISMOUNTABLE

Claude Bectarte, 6, Avenue de la Mer, 83700 Saint-Raphael, France

Filed May 25, 1988, Ser. No. 199,403
Int. Cl.[4] B63B *7/00*
U.S. Cl. 114—354 14 Claims

1. A disassemblable sail board for at least one passenger, adapted to be transformed into a craft, comprised of floats (1, 2, 3), fitted into a frame comprised of flexedly assembled,

spindle-shaped spars (5, 6), said sail board having a framework (16 to 23) covered by a removable envelope (31).

4,913,078

CONVERTIBLE BANK ANCHOR AND MOORING DEVICE WITH LOCKING MEANS FOR WATERCRAFT

Howard Haverly, 9311 Independence School Rd., Fern Creek, Ky. 40291

Filed Aug. 14, 1987, Ser. No. 85,381
Int. Cl.[4] B63B *21/54*
U.S. Cl. 114—221 R 4 Claims

1. A bank anchor for watercraft comprising an elongated tube having a ball and socket coupling means at one end and an inverted hook member at the opposite end for engagement with a tree bough or trunk on shore, wherein said hook member is a wire member having two free ends, wherein said hook member is supported in a loose fitting sleeve that has a longitudinal swivel connection to the tube, and wherein a key locking means is associated with the socket of said coupling means to prevent the unauthorized disengagement thereof.

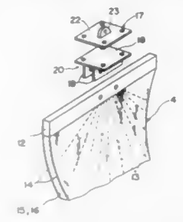
4,913,079

YACHT

Yoshinori Nishino, Yamatotakada, Japan, assignor to Nippon Basic Technology Laboratory Co., Ltd., Japan

Filed Nov. 10, 1988, Ser. No. 269,798
Int. Cl.[4] B63B *3/26*
U.S. Cl. 114—357 3 Claims

1. A yacht having a body, said body comprising an outer skin and an inner skin, both skins being formed of a resin material incorporating reinforcement fibers therein, half-ring plate shaped reinforcement plate means disposed between the two skins, and a foamed synthetic resin material filled between the skins, said reinforcement plate comprising rigid members positioned on two upper ends of the reinforcement plate means, a pair of resin-made thin layers having reinforcement fibers put over and extending from the rigid members and incorporated



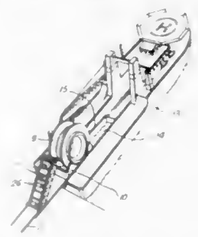
therein, and a foamed synthetic resin material filled between the resin-made thin layers, said rigid members having a rope securing fitment fixed thereto.

4,913,080

METHOD FOR PRODUCTION AND LAYING A PIPELINE OR A CABLE UNDER WATER

Bjorn Kindem, Fredrikstad; Harry Albertsen, Oslo, and Ragnar Bognaes, Moss, all of Norway, assignors to Kverner Subsea Contracting A/S, Lysaker, Norway

Filed Jul. 14, 1988, Ser. No. 219,085
Claims priority, application Norway, Jul. 27, 1987, 873135
Int. Cl.[4] B63B *35/02*
U.S. Cl. 114—258 12 Claims



1. A method for producing a conduit and laying same under water, using a drum mounted on a drum carrier, a pier which leaves a portion of the drum carrier exposed from below when positioned at the end of the pier, a laying ramp, and a vessel having supporting means for carrying the dram carrier and the laying ramp and being capable of adjusting the height of the supporting means relative to the height of the pier, the method comprising the steps of:

(a) transporting a drum on which a conduit is wound and a drum carrier to the end of the pier;

(b) positioning the supporting means beneath an exposed portion of the drum carrier;

(c) raising the height of the supporting means so as to lift the drum and drum carrier off the pier; and

(d) moving the drum and drum carrier to the desired position on the vessel so that the conduit can be dispensed off the drum when the vessel is in motion.

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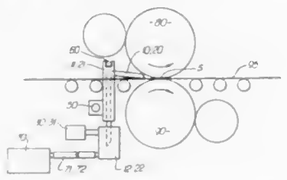
4,913,081

APPARATUS FOR ASPIRATING COATING MATERIAL FROM THE APPLICATOR GAP BETWEEN TWO APPLICATOR ROLLERS

Andreas Frick, Freudenstadt, Fed. Rep. of Germany, assignor to Robert Burkle GmbH & Co., Freudenstadt, Fed. Rep. of Germany

Filed Apr. 25, 1989, Ser. No. 344,067
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1988, 8805475
Int. Cl.[4] C23C *14/00*
U.S. Cl. 118—50 8 Claims



1. A suction device for use in apparatus which applies coating material to a substrate, the apparatus including two rollers which are pressed toward one another in a manner to permit a substrate to pass between the rollers while coating material is applied by at least one of the rollers to a surface of the substrate, at least one of the rollers having an elastically deformable peripheral surface such that when a substrate is present between the rollers a gap is created between the rollers at locations adjacent the edges of the substrate, said device comprising:

two suction tubes each having an intake end and an outlet end;

means supporting said tubes for displacement parallel to the path of a substrate during passage between the rollers in order to position said intake end of each said tube at a respective one of the gaps created between the rollers;

means connected for applying a suction pressure to said outlet ends of said tubes; and

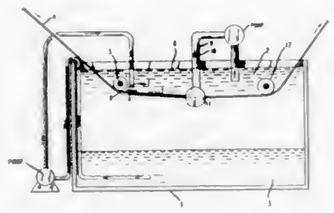
means connected for collecting coating material which is drawn through said tubes.

4,913,082

PROCESS FOR SURFACE MODIFICATION OF POLYMER ARTICLES

Joseph Silbermann, Old Bridge, and Michael T. Burchill, Cranbury, both of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Division of Ser. No. 945,595, Dec. 23, 1986, Pat. No. 770,905. This application Aug. 3, 1988, Ser. No. 227,943
Int. Cl.[4] B05C *3/12*
U.S. Cl. 118—419 14 Claims



1. An apparatus for incorporating at least one ultraviolet light stabilizer into the surface region of an article fabricated from polyvinyl chloride which comprises:

(a) tank;

(b) means for continuously transported the article through an aqueous media;

(c) applying means for applying a solution of said ultraviolet light stabilizer in a solvent into the surface of the article, said aqueous media being non-aggressive towards the article and immiscible with the solvent; and

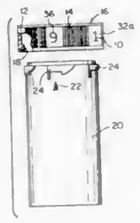
(d) displacing means downstream of said applying means to displace any residual solution remaining on the treated surface wherein means for transporting, applying and displacing are positioned in said tank.

4,913,083

METHOD FOR REMINDING A PERSON WHEN TO TAKE MEDICATION

James Valvo, and Paul Valvo, both of 40 Washington St., Babylon, N.Y. 11702

Filed Oct. 24, 1988, Ser. No. 261,343
Int. Cl.[4] G01D *13/04*; G09F *9/40*; B65D *85/56*
U.S. Cl. 116—308 6 Claims



1. A method for reminding a person when to take medication, comprising the steps of:

(a) putting a series of indicia upon a plurality of flat areas about circumference of a safety cap , said series of indicia being in line with interior stops on said safety cap, said indicia corresponding to times medication is required to be taken;

(b) placing said safety cap upon a single compartment safety bottle in such a manner that one of said flat areas line up with an indicator below one of a plurality of exterior stops on said single compartment safety bottle, and using indicia fixed to said safety cap to identify time of use, said safety cap being removed and reset to change the indicia since said exterior stop has a ramp terminating at a recess in which a hook of said interior stop locks into, said exterior stops engaging with said interior stops on said safety cap so as to show a person first time medication is to be taken and prevent unwanted rotational and longitudinal movement of said safety cap relative to said single compartment safety bottle so that the setting of said indicia is not accidentally changed;

(c) removing said safety cap from said single compartment safety bottle; and

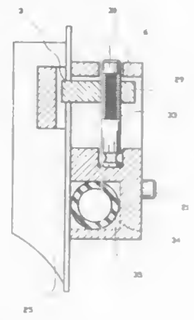
(d) replacing said safety cap upon said single compartment safety bottle in such a manner that each next in sequence of said flat areas line up with said indicator so as to show the person each next time medication is to be taken.

4,913,084

APPARATUS USEFUL IN DEVICES FOR CONTROLLING THE THICKNESS OF COATING APPLIED TO A SUBSTRATE

Ronald P. Seymour, 3503 N Euclid Ave., Bay City, Mich. 48706

Filed Apr. 19, 1989, Ser. No. 340,277
Int. Cl.[4] B05C *1/04*
U.S. Cl. 118—123 10 Claims



1. An apparatus useful in devices for controlling the thickness of coatings applied to a substrate, the apparatus comprising in combination:

a thin flexible blade having a lower working edge and an upper blunt edge and a front and a back planar surface;

a blade holder;

a blade retainer detachedly fixed to the blade holder with the flexible blade slidably mounted therebetween;

a pneumatically controlled blade adjuster situated in the lower portion of the blade holder and in direct contact with the back planar surface of the flexible blade but not attached thereto;

a means to control said pneumatically controlled blade adjuster;

a mechanical blade adjuster within said blade holder for adjusting the vertical height of the flexible blade relative to the blade holder;

at least two vertical dams mounted on the blade holder, which dams directly contact the front planar surface of the flexible blade and which move in concert therewith and,

means for rotatably mounting said apparatus in a coating device.

4,913,085

COATING BOOTH FOR APPLYING A COATING POWDER TO THE SURFACE OF WORKPIECES

Gerhard F. Vöhringer, and Armin Reiser, both of Friedrichshafen, Fed. Rep. of Germany, assignors to ESB Elektorstatische Sprüh-und Beschichtungsanlagen G.F. Vohringer GmbH, Meersburg, Fed. Rep. of Germany

Continuation of Ser. No. 920,985, Sep. 2, 1986, Pat. No. 4,770,118. This application Aug. 2, 1988, Ser. No. 227,317
Claims priority, application Fed. Rep. of Germany, Jan. 1, 1985, 3500005
Int. Cl.[4] B05B *15/12*
U.S. Cl. 118—312 22 Claims

1. Coating booth for applying a coating powder to the surface of a workpiece, the powder being directed to the workpiece via an air stream comprising:

a coating zone having a floor;

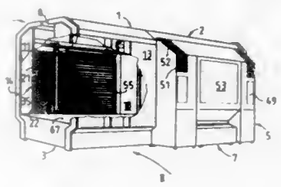
a clean-gas zone;

a rear wall between said coating zone and clean-gas zone;

a filter assembly mounted in said rear wall and disposed between said coating zone and clean-gas zone;

a suction device for exhausting air in the booth from said coating zone through said filter assembly and said clean-gas zone, said clean-gas zone being downstream of said coating zone and filter assembly with respect to the flow of air;

said filter assembly comprising a rigid framework and a plurality of filter elements removably and substantially vertically mounted in said framework, each filter element comprising a surface membrane filter having an air-permeable support layer and a surface membrane of flexible and



elastically deformable material attached to at least the upstream side of said layer, said surface membrane having a plurality of elongated perforations therein;

cleaning means in said clean-gas zone for periodically cleaning said filter elements during the coating operation by pressure impulse;

a powder container below the floor of said coating zone; and

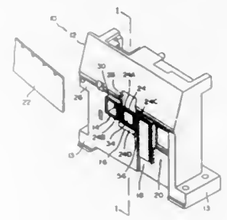
clearing means in said coating zone for clearing excess powder from the floor of the coating zone by moving said excess powder to said powder container.

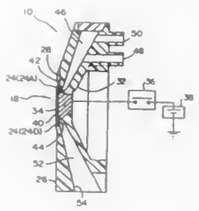
4,913,086

DEVELOPING APPARATUS

Akira Yoda, and Yoshimitsu Sato, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 28, 1988, Ser. No. 290,939
Claims priority, application Japan, Dec. 28, 1987, 62-335051
Int. Cl.[4] G03G *15/10*
U.S. Cl. 118—647 16 Claims





1. A developing apparatus for bringing a film formed an electrostatic latent image into contact with a frame portion

defining a developing chamber and opposing said film to a developing electrode provided in said developing chamber, and for developing said film under a liquid developer supplied to said developing chamber while applying a bias voltage to said developing electrode, said developing apparatus comprising:

an application means for applying said bias voltage to said developing electrode; and

an interrupting means for interrupting the application of said voltage to said developing electrode at a predetermined time interval while contacting said film with said frame portion.

4,913,087

DEVELOPING DEVICE OF A COPIER

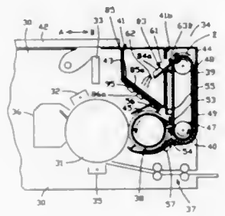
Sinsuke Saita, and Shunju Anzai, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 13, 1988, Ser. No. 218,562

Claims priority, application Japan, Jul. 16, 1987, 62-178467; Jul. 25, 1987, 62-185772; Aug. 26, 1987, 62-213778; Aug. 26, 1987, 62-213779; Aug. 26, 1987, 62-213780

Int. Cl.[4] G03G *15/08H4*

U.S. Cl. 118—653 **17 Claims**



5. A developing device of a copier comprising

a housing containing therein a developer roller and transporting means for transporting developing agent, and

a cartridge which is detachably attached to said housing, said cartridge being formed with an outlet through which developing agent can be supplied to said developer roller and an inlet through which developing agent can be collected from said housing, a circulation route for developing agent being formed through said housing and the interior of said cartridge having opening means for opening and closing said inlet and outlet.

4,913,088

APPARATUS FOR DEVELOPER TRANSFER UNDER ELECTRICAL BIAS

Junichiro Kanbe; Tsutomu Toyono, both of Tokyo; Nagao Hosono, Chofu, and Tohru Takahashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 745,994, Jun. 17, 1985, abandoned, which is a continuation of Ser. No. 492,440, May 6, 1983, abandoned, which is a division of Ser. No. 264,516, May 18, 1981, Pat. No. 4,395,476, which is a continuation of Ser. No. 58,434, Jul. 18, 1979, abandoned. This application Mar. 4, 1987, Ser. No. 22,598

Claims priority, application Japan, Jul. 28, 1978, 53-92105; Jul. 28, 1978, 53-92106; Jul. 28, 1978, 53-92107; Apr. 28, 1979, 54-52641; Jun. 1, 1979, 54-68564

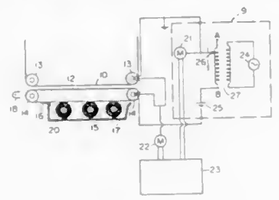
The portion of the term of this patent subsequent to Sep. 25, 2001, has been disclaimed.

Int. Cl.[4] G03G *15/08*

U.S. Cl. 118—651 **8 Claims**

1. A developing device for developing a latent image on a movable image bearing member, comprising:

a developer carrying means movable by a first region in which said developer carrying means is close to the image bearing member and by a second region in which said developer carrying means is spaced farther from the image bearing member than it is in the first region, the second region being disposed downstream of the first region with respect to a direction of movement of the image bearing member; and



means for forming an alternating electric field to supply electrically charged toner from the developer carrying means to the image bearing member adjacent the first region and to remove excessive charged toner, once deposited on the image bearing member, therefrom in the second region.

4,913,089

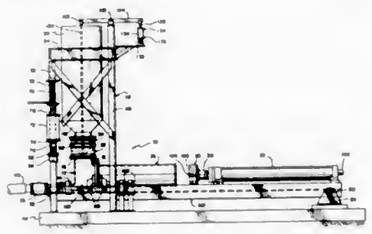
CONCRETE INJECTOR PUMP AND PROCESS FOR LINING PIPE

Tom G. Atkins; Don E. Gray, both of Birmingham, and George H. Styles, Kimberly, all of Ala., assignors to American Cast Iron Pipe Company, Birmingham, Ala.

Filed Jul. 29, 1988, Ser. No. 225,779

Int. Cl.[4] B05C *1/02, 7/02*

U.S. Cl. 118—680 **15 Claims**



1. A pump for a viscous slurry comprising an enclosure enclosing a chamber having an outlet and first and second inlets; a hopper for the slurry; a fill valve disposed between the first inlet and the hopper, the fill valve comprising a valve housing providing a passageway between the hopper and the first inlet and enclosing a moveable check valve element for opening and closing the passageway, the valve housing being split and separable into parts to afford access to the valve element; an injector tube connected to the second inlet, the injector tube having a moveable plunger disposed therein; and means for moving the plunger in a first direction to draw into the tube and into the chamber through the fill valve a quantity of the slurry and for moving the plunger in a second direction to eject the slurry from the outlet.

4,913,090

CHEMICAL VAPOR DEPOSITION APPARATUS HAVING COOLING HEADS ADJACENT TO GAS DISPERSING HEADS IN A SINGLE CHAMBER

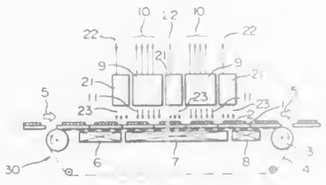
Shigeru Harada; Masanori Obata; Eisuke Tanaka, and Kenji Kishibe, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 20, 1988, Ser. No. 246,742

Claims priority, application Japan, Oct. 2, 1987, 62-250356

Int. Cl.[4] C23C *16/44*

U.S. Cl. 118—724 **5 Claims**



1. An apparatus for depositing a film on a moving substrate comprising:

a single chamber in which a film may be deposited in successive layers on a surface of a substrate by successive chemical vapor depositions;

means for conveying a plurality of substrates through said single chamber during deposition of layers on the substrates;

means for heating the substrates in said single chamber during deposition of the layers and conveying of the substrates;

a plurality of spaced-apart gas dispersing heads disposed in said single chamber for respectively supplying reaction gases to the surface of a substrate being conveyed through said single chamber for deposition of the respective layers of the film on the surface by chemical vapor deposition; and

a cooling head disposed between each adjacent pair of said spaced-apart gas dispersing heads in said single chamber for supplying a non-reactive cooling gas to the surface of a substrate being conveyed through said single chamber to maintain the temperature of the substrate substantially constant between each adjacent pair of gas dispersing heads.

4,913,091

DISPOSABLE LITTER BOX AND PACKAGE

James A. O'Connor, 8 Russett La., Ulster Park, N.Y. 12487, assignor to James A. O'Connor, Ulster Park, N.Y.

Filed May 11, 1988, Ser. No. 192,730

Int. Cl.[4] A01K *29/00*

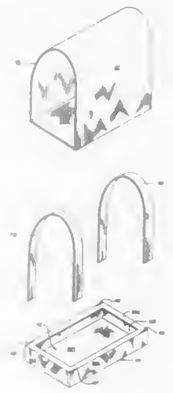
U.S. Cl. 119—1 **13 Claims**

1. A disposable pet litter apparatus comprising:

a container having a substantially rectangular bottom panel, two oppositely disposed substantially upright peripheral side walls, oppositely disposed substantially upright peripheral front and rear walls, a substantially rectangular top wall with a smaller substantially rectangular generally centrally disposed opening in said top wall, and apertures in said top wall of said container near its corners;

a moisture resistant, resilient, flexible bag held adjacent the inner walls of said container by an adhesive;

detachable support members connected to said apertures, said support members extending through said apertures in said top wall and being retained against the inner walls of said container by said resilient, flexible bag, said container and support members forming a frame structure; and,



a moisture resistant, resilient, flexible external bag cover having an opening at one end thereof and encircling said frame structure.

4,913,092

METHOD OF RAISING PRECOCIAL BIRDS UTILIZING FILIAL IMPRINTING, ENVIRONMENTAL ENRICHMENT, AND MUSIC

Gadi Gvaryahu, and Danis L. Cunningham, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jun. 4, 1987, Ser. No. 58,116

Int. Cl.[4] A01K *31/00*

U.S. Cl. 119—1 **5 Claims**

1. A method for raising young precocial birds comprising the steps of:

disposing a flock of young precocial birds in a pen with at least one filial imprinting object;

playing soft, soothing music to the flock of young precocial birds in the pen; and,

enriching the environment of the flock of young precocial birds by disposing at least one soft textured object in the pen;

whereby, the flock's feeding habits and general behavior are improved.

4,913,093

INTENSIVE AQUACULTURE SYSTEM

Steven VanGorder, Breinigsville, Pa., assignor to Fresh-Culture Systems, Inc., Northampton, Pa.

Filed Mar. 4, 1988, Ser. No. 164,400

Int. Cl.[4] A01K *61/00*

U.S. Cl. 119—3 **5 Claims**

1. A method of culturing fish in a plurality of tanks, each tank comprising a relatively independent growing environment for said fish and each tank having a maximum capacity (the tank capacity) for providing nutrients, aeration and waste removal for fish in each said tank, said fish forming a population having a growth cycle characterized by an increasing capacity (the fish capacity) to consume both nutrients and oxygen and to produce waste as said fish grow, wherein the method comprises:

(a) introducing a first fish population of fingerlings into a first tank;

(b) periodically subdividing the first fish population into a multiple thereof and introducing each subdivided fish population into a separate tank of a corresponding number

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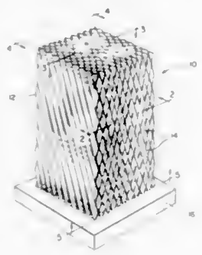
of additional tanks as the fish capacity of the first fish population becomes equal to or somewhat greater than the tank capacity of the first tank;
(c) periodically further subdividing each subdivided fish population into a multiple thereof as the fish capacity of each subdivided fish population becomes equal to or somewhat greater than the tank capacity of each corresponding tank; and
(d) repeating step (c) until the fish in each subdivided fish population have reached a desired size.

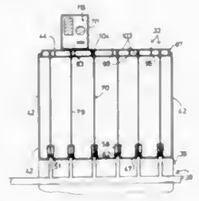
4,913,094
ARTIFICIAL REEF SYSTEM
Barton G. Jones, P.O. Box 264, 472 W. Fourth St., Dubuque, Iowa 52001; Ray E. Greene, 3650 Ashford Dunwood Rd., Apt. 10-0, Atlanta, Ga. 30319, and Eldon C. Blancher, II, 1717 Old Shell Rd., Mobile, Ala. 36604
Filed Aug. 8, 1988, Ser. No. 229,471
Int. Cl.[4] A01K *61/00*
U.S. Cl. 119—3 12 Claims



1. An artificial reef module for substantially permanent submergence underwater and for providing forage and shelter for small fish and crustaceans, said module comprising:
a feeding and shelter column formed of a plurality of semi-rigid, corrugated planar sheets, each sheet having a predetermined surface area for allowing settlement, attachment and growth of microorganisms during complete submergence of said column, said sheets being superposed and attached together along their length with the respective corrugations of adjacent corrugated sheets extending transverse to each other so that a plurality of partially enclosed spaces are created between adjacent sheets to provide a habitat and protection for small fish and crustaceans; and
anchoring means attached to one end of said column for substantially permanent securing said column to the floor of a body of water in a substantial vertical orientation.

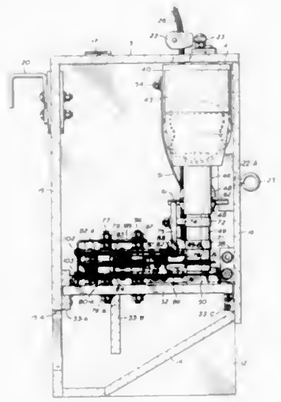
4,913,095
FLUSHING SYSTEM FOR HOG HOUSES
Kenneth Morrow, and Kelly Casey, both of Clarksville, Ark., assignors to Tri-Systems, Inc., Clarksville, Ark.
Filed Jan. 17, 1989, Ser. No. 297,655
Int. Cl.[4] A01K *1/01*
U.S. Cl. 119—28 17 Claims

1. A reservoir system for storing and selectively outputting water for selectively flushing and cleaning the subfloor of stables, pens and the like, said reservoir system comprising:
rigid tank means for containing a large volume of water, said tank means having a top, a bottom, a plurality of side walls, and a plurality of output orifices defined in said bottom;
valve means for selectively outputting water stored within said tank means through said output orifices, said valve means comprising:
piston means for selectively controlling the release of water, said piston means operable to block and unblock said output orifices;



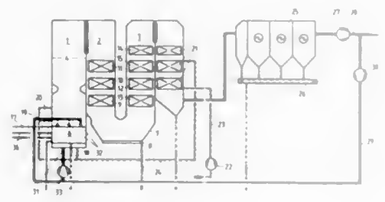
valve guide means associated with said output orifices for controlling piston means movement relative to said output orifices; and,
means for selectively actuating said valve means.

4,913,096
ANIMAL FEEDER
Stacy A. LeBlanc, and William E. LeBlanc, both of 601 Misty La., Friendswood, Tex. 77546
Filed Nov. 5, 1987, Ser. No. 116,896
Int. Cl.[4] A01K *5/00*
U.S. Cl. 119—53.5 5 Claims



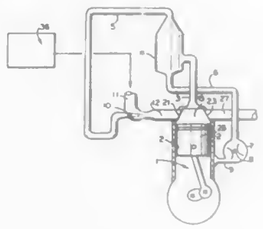
1.
An animal feeder having a food distribution mechanism, said feeder comprising:
a housing means for supporting said food distribution mechanism;
said food distribution mechanism including:
a food reservoir;
a means for dispensing food particles from said reservoir, said dispensing means including:
a means for transmitting a force exerted by a user to a force translating means,
a means for translating said user exerted force into rotational movement of a control mechanism comprising a plurality of toothed gears, and
a spring-biased lever means, activated by said gears comprising said control mechanism, for regulating the exit of food particles from said food reservoir and for restricting the quantity of such particles exiting said reservoir as a result of said user exerted force; said lever means including (1) a first lever being normally positioned in an exit-blocking position, and movable, under a force exerted thereupon by one of said toothed gears, to a non exit-blocking position, (2) a second lever adapted to regulate the quantity of food exiting said reservoir, said second lever being movable as a function of the movement of said first lever, and (3) a third lever movable under a force exerted thereon by another of said toothed gears from a non food agitating position to a food agitating position.

4,913,097
STEAM GENERATOR THAT BURNS BROWN COAL WITH CINDERS THAT VARY IN COMPOSITION
Rudi Derksen; Hans G. Jarmuzewski; Karl-Heinz Maintok, and Heinz Langner, all of Oberhausen, Fed. Rep. of Germany, assignors to Deutsche Babcock Werke Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany
Filed Apr. 4, 1989, Ser. No. 333,104
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1988, 3814314
Int. Cl.[4] F22B *1/00*
U.S. Cl. 122—4 D 2 Claims



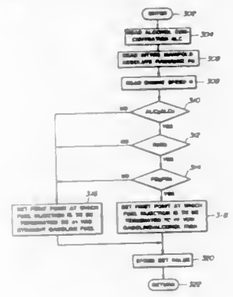
1. A steam generator for burning brown coal with cinders varying in composition, comprising: a fluidized bed located in a first flue having an empty space; second and third flues communicating with said first flue; superheaters and economizers in form of flue surfaces located in said second and third flues; a cool end on said steam generator; a fuel gas recirculation line extending from said cool end to said fluidized bed and to said first flue;

4,913,098
WASTE MEAT STEAM PERCHARGER
Robert G. Battaglini, 111 Woodview La., Media, Pa. 19063
Filed Mar. 10, 1988, Ser. No. 166,468
Int. Cl.[4] F02D *19/00*
U.S. Cl. 123—25 P 27 Claims



1. A steam supercharger for an internal combustion engine comprising:
a. an intake pipe;
b. a means for generating steam;
c. a first inlet means for providing a mixture of combustible reactants to said intake pipe; and
d. a second inlet means for injecting said steam into said intake pipe
wherein the intake pipe supplies to the combustion chamber of the internal combustion engine the steam and combustible reactants combined in the intake pipe.

4,913,099
FUEL INJECTION CONTROL APPARATUS
Tadaki Ota, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Mar. 27, 1989, Ser. No. 329,223
Claims priority, application Japan, Mar. 29, 1988, 63-73447
Int. Cl.[4] F02D *41/04*
U.S. Cl. 123—478 4 Claims



1. An apparatus for controlling fuel delivery to an internal combustion engine having a plurality of cylinders each having an individual fuel injector, comprising:
means sensitive to an alcohol concentration of the fuel to be delivered to the engine for producing an alcohol concentration signal indicative of a sensed alcohol concentration;
means sensitivie to engine speed for producing an engine speed signal indicative of a sensed engine speed;
means sensitive to engine load for producing an engine load signal indicative of a sensed engine load;
a control unit responsive to the alcohol concentration signal, the engine speed signal and the engine load signal for controlling the duration of fuel injection from each of the fuel injectors to the corresponding cylinder, the control unit including means for calculating a first time at which fuel injection to the corresponding cylinder is terminated, means for calculating a second time at which fuel injection to the corresponding cylinder is initiated to ensure that the fuel injection will be terminated at the first time, and means for varying the first time according to the alcohol concentration; and
means coupled to the control unit for initiating fuel injection to the corresponding cylinder at the second time and terminating the fuel injection to the corresponding cylinder at the first time.

4,913,100
DOUBLE PISTON ENGINE
Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan
Continuation-in-part of Ser. No. 196,649, May 20, 1988, Pat. No. 4,864,979. This application Dec. 19, 1988, Ser. No. 286,565
Int. Cl.[4] F02B *41/00*
U.S. Cl. 123—26 9 Claims

1. In a double piston engine, comprising, in combination,
a piston assembly reciprocably provided in a cylinder which has covers, whereby two individual working chambers are formed, which peridically one after the other

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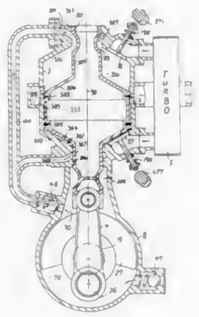
increase and decrease their volumes and wherein inlet means and outlet means are provided to said chambers, and an improvement,

comprising separate individual inlet means for a cleaning flow,

separate individual inlet means for a loading flow of pressure in excess of atmospheric pressure,

wherein actuating means are provided to close the inlet means for said cleaning flow while additional opening means are provided to the inlet means for said loading flow, with said additional opening means responsive to the rotary angle of a crankshaft and for opening said inlet means for said loading flow timely soon after the closing of said inlet means for loading flow for said cleaning flows, and;

wherein two chambers, separated by a stationary body, are formed inside of a medial and hollow portion of said piston of said engine to be communicated individually to two of said inlet means.



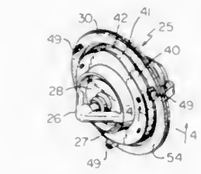
4,913,101

VEHICLE COOLING SYSTEM SUBASSEMBLY, PARTS THEREFOR AND METHODS OF MAKING THE SAME

Boyd P. Sliger, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Mar. 28, 1989, Ser. No. 329,571
Int. Cl.[4] F01P 7/16
U.S. Cl. 123—41.1 38 Claims

1. In a vehicle cooling system subassembly comprising an outlet housing having an opening therein, and a vehicle type thermostat disposed in said opening of said outlet housing and having a housing means provided with a valve seat that is controlled by a movable valve member which is interconnected to a temperature responsive device that is carried by said housing means, said outlet housing having positioning means thereon, said thermostat housing means having positioning means thereon engaging said positioning means of said outlet housing to rotationally orient said thermostat in said opening of said outlet housing in a desired rotational position thereof, the improvement wherein said outlet housing has slot means therein and wherein said thermostat housing means has tab means extending outwardly therefrom and wedgingly disposed in said slot means to hold said thermostat in said opening of said outlet housing in said desired rotational position thereof.

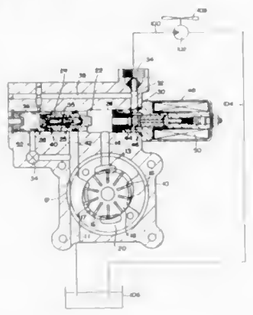


4,913,102

CONTROL DEVICE FOR HYDRAULICALLY DRIVEN COOLING FAN OF VEHICLE ENGINE HAVING RELIEF PASSAGE FOR COLD START

Seiji Ohmura, and Yuji Itoh, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 29, 1989, Ser. No. 330,307
Claims priority, application Japan, Apr. 6, 1988, 63-84341
Int. Cl.[4] F01P 7/02
U.S. Cl. 123—41.12 4 Claims



1. A control device for a hydraulically operated cooling fan of an internal combustion engine in a vehicle having a hydraulic motor for driving said fan and a hydraulic pump for delivering a flow of a hydraulic operating fluid at an elevated pressure for driving said hydraulic motor, comprising: a flow constriction means provided in a passage for conducting said operating fluid from said pump to said motor, a first pressure chamber connected with said passage at an upstream side of said flow constriction means along the direction of flow of said operating fluid through said passage, a second pressure chamber connected with said passage at a downstream side of said flow constriction means opposite to said upstream side, a pressure control means responsive to a pressure difference of said operating fluid across said flow constriction means so as to leak selectively part of said operating fluid out of said passage at said upstream side of said flow constriction means when said pressure difference exceeds a predetermined value, a flow control means for variably modifying either the cross sectional

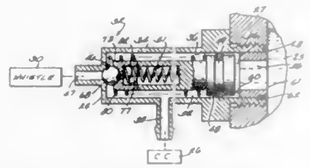
opening area of said flow constriction means or the transmittance of the pressure of said operating fluid at the downstream side of said flow constriction means to said second pressure chamber by selectively partly leaking the pressure to be transmitted according to requirement for the draft provided by said fan, and a cold start control means which opens said second pressure chamber to a pressure relief passage when the engine is started at cold state.

4,913,103

MARINE PROPULSION DEVICE LOW LIQUID PRESSURE WARNING SYSTEM

Gaylord M. Borst, Highland Park, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 24, 1988, Ser. No. 261,672
Int. Cl.[4] F02B 77/08
U.S. Cl. 123—41.15 15 Claims



1. A marine propulsion device comprising a propulsion unit including a propeller shaft adapted to support a propeller, and an internal combustion engine drivingly connected to said propeller shaft and including a cooling jacket adapted to contain coolant under pressure, means for providing gas at a pressure different from atmospheric pressure, pneumatic warning means for producing a warning signal in response to communicationbetween said gas providing means and said warning means, valve means movable between a first position permitting communication between said gas providing means and said warning means when the pressure of said coolant is below a specified value and a second position preventing communication between said gas providing means and said warning means when the pressure of said coolant is above said specified value, and a spring biasing said valve means toward said first position.

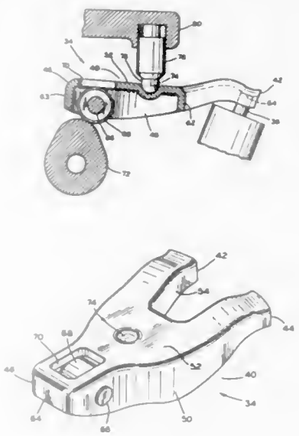
4,913,104

ROCKER ARM FOR OPERATING TWO VALVES

Jesse V. Mills, Toledo, Ohio, assignor to Henley Manufacturing Corporation, Hampton, N.H.

Filed Nov. 30, 1988, Ser. No. 278,258
Int. Cl.[4] F01L 1/18
U.S. Cl. 123—90.4 4 Claims

1. A rocker arm for simultaneously operating two valves of a cylinder of an internal combustion engine, said rocker arm comprising a body of generally Y-shaped configuration as viewed from above and having main side walls connected by a main web, an axle extending between the side walls of said body, a roller rotatably mounted on said axle and positioned to contact a cam, an extremity of said body having two end portions which are spaced apart, with each of said two end portions having an inner side wall and a web extending between said inner side wall and one of said main side walls, a structurally-integral transverse wall connecting ends of said inner walls, each of said two end portions being shaped to engage an end of a valve stem of one of said valves, and said main web having means spaced from said roller for engaging a pivot post.

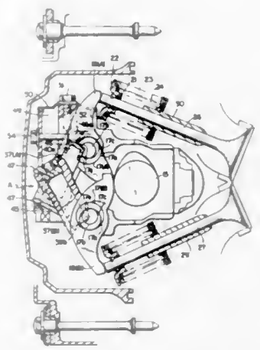


4,913,105

HYDRAULIC LASH ADJUSTER

Hiroshi Kawasaki, Tokorosawa, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 526,776, Aug. 26, 1983, abandoned.
This application Mar. 8, 1985, Ser. No. 709,838
Claims priority, application Japan, Aug. 27, 1982, 57-148574
Int. Cl.[4] F01L 1/24
U.S. Cl. 123—90.46 1 Claim



1. A hydraulic lash adjuster for an internal combustion engine having a cam holder and a rocker arm shaft, said rocker arm shaft having a cylindrically-cut engagement cavity, said cam holder having a cylindrical hole bored therein with one end opening toward said rocker arm shaft and the other end closed by a cover member, said hole having an inner diameter; said lash adjuster comprising: a body received entirely in said

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cylindrical hole and having a blind longitudinal bore and an outer diameter substantially the same as said inner diameter;

a plunger slidably fitted in said bore having an end extending therefrom, said plunger defining a high pressure chamber in the blind end of the bore, said plunger having a hollow core and an opening in its end facing the high pressure chamber defining a valve seat;

a check ball abutting said valve seat;

a ball cage attached to said plunger;

a spring means in the high pressure chamber biasing the plunger;

a means in said body and said plunger for communicating a supply of oil to the hollow core; and

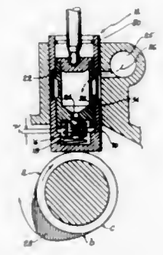
a cylindrical cap removeably fitted on the end of the plunger extending from the bore, said cap having practically the same outer diameter as the body and a flat top which engages said engagement cavity in said rocker arm shaft.

4,913,106

VARIABLE DURATION VALVE LIFTER IMPROVEMENTS

Jack L. Rhoads, P.O. Box 830, Taylor, Ariz. 85939

Filed Aug. 28, 1989, Ser. No. 398,883
Int. Cl.[4] F01L *1/16, 1/24*
U.S. Cl. 123—90.49 11 Claims



1. An engine valve train which includes a valve, a cam of a cam shaft, a bleed-down variable duration hydraulic lifter riding on said cam, and connecting linkage operative between said lifter and said valve, said lifter having an outer cylindrical body riding on said cam and an inner plunger axially slidable within said cylinder body and defining an oil chamber therebetween, said outer cylindrical body defining a seat defining the lowermost position for said plunger, said valve train being characterized by said connecting linkage being of effective length dimension such that at least at low engine operating speeds below on the order of 1000 RPM, said plunger seats in said seat prior to said valve seating.

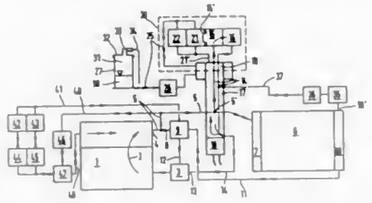
4,913,107

LIQUID-COOLING CIRCULATION SYSTEM FOR POWER AND WORKING MACHINES, ESPECIALLY INTERNAL COMBUSTION ENGINES

Erwin Schweiger, Dachau, Fed. Rep. of Germany, assignor to BMW, Munich, Fed. Rep. of Germany

PCT No. PCT/EP88/00435, § 371 Date Jan. 18, 1989, § 102(e) Date Jan. 18, 1989, PCT Pub. No. WO88/09429, PCT Pub. Date Dec. 1, 1988
PCT Filed May 18, 1988, Ser. No. 302,745
Claims priority, application Fed. Rep. of Germany, May 18, 1987, 3716555
Int. Cl.[4] F01P *3/22*
U.S. Cl. 123—41.54 43 Claims

1. A liquid-cooling circulation system for power-and working-machines, especially internal combustion engines, comprising radiator means, radiator inflow and return-flow means operatively connected with the radiator means, a by-pass vent line means extending from a high point in the radiator inflow means to the radiator return-flow means, air-separating tank means in said by-pass vent line means, said air-separating tank means including at its high point a fill inlet means having a fill opening ane a closure cover means, an atmospheric expansion tank means, the high point of the air separating tank means being operatively connected with the bottom area of the expansion tank means by way of an excess pressure valve means and a vacuum valve means in the cover means, at least one excess pressure valve means limiting the pressure in the air-separating tank means and in the radiator inflow means by means of a control line, the air-separating tank means being arranged substantially at the high point of the radiator inflow means, the fill inlet means being provided with connecting openings to the high points of the radiator inflow means as also of the air-separating tank means, the closure cover means, in addition to closing the fill opening of the fill inlet means, also closing the connecting openings with respect to each other, a



throttled line-connection extending from the high point of the radiator inflow means to the bottom-near area of the air-separating tank means as part of the by-pass vent line means, the closure cover means including a direct line connection as control line between the connecting opening from the fill inlet means and radiator inflow means, on the one hand, and the excess pressure valve means limiting the pressure in the radiator inflow means, respectively, its adjusting motor means, on the other, and a temperature-controlled vent valve means arranged in the line connection from the high point of the air-separating tank means to the expansion tank means, said temperature-controlled vent valve means having a closing shifting temperature that lies below the thermostatically regulated normal operating temperature of the cooling medium and commencing with which the thermal expansion-, elasticity-and pump operation-conditioned cooling medium-pressure curve at the suction side of the cooling medium pump means assures the cavitation-free operation thereof.

4,913,108

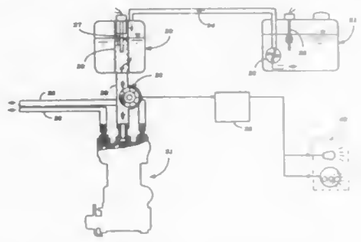
SEPARATE LUBRICATING SYSTEM OF ENGINES

Masafumi Sougawa, and Isao Kanno, both of Hamamatsu, Japan, assignors to Sansbin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 6, 1988, Ser. No. 254,417
Claims priority, application Japan, Oct. 8, 1987, 62-252347
Int. Cl.[4] F01M *1/00*
U.S. Cl. 123—196 S 28 Claims

1. A non-return lubricating system for a two-cycle internal combustion engine, a lubricant system for delivering lubricant from said reservoir to said engine for its lubrication and consumption therein without return to said lubricant reservoir,

means for measuring the amount of lubricant flowing through said system, and means for providing a signal in the event the



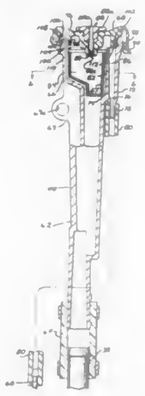
amount of lubricant flow measured is less than a predetermined amount.

4,913,109

MARINE OUTBOARD DRIVE WITH OIL TANK FILL TUBE

Gordon C. Slattery, Omro, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jan. 2, 1989, Ser. No. 360,272
Int. Cl.[4] F01M *1/00*
U.S. Cl. 123—196 R 24 Claims



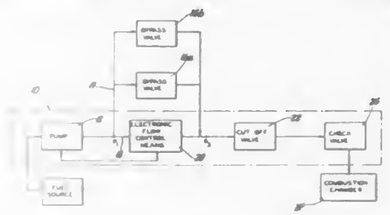
1. A marine outboard drive unit having a two-cycle internal combustion engine, an oil storage tank mounted to said outboard drive unit and storing lubricating oil for said engine, a fill tube mounted to said outboard drive unit and comprising a lower tubular portion extending downwardly and communicating with said oil tank, an enlarged upper cup portion of greater diameter than said lower tubular portion to facilitate pouring of oil into said cup portion to flow downwardly through said lower tubular portion into said tank to fill the latter, and a cap closing said cup portion.

4,913,110

BYPASS ELECTRONIC EMERGENCY FUEL SYSTEM

George Malaik, New Castle County, Del.; Bruce Amrein; Curtis L. McCoy, Both of Herford County, Md.; James A. Martin, Lancaster County, Pa., and Robert C. Bruckech, Harford County, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 1, 1989, Ser. No. 348,752
Int. Cl.[4] F02B *77/00*
U.S. Cl. 123—198 D 11 Claims



1. A system for supplying fuel to the engine of a combat vehicle having a manually operable transmission and a shift lever for shifting gears in the transmission, comprising:

a source of fluid fuel;

a constant pressure pump hydraulically connected to the source of fluid fuel;

electronically controlled means for regulating the flow of fuel from the pump to the engine;

a plurality of electrically operated bypass valves hydraulically in parallel with one another and with the regulating means;

an electrical power source for energizing the bypass valves;

an interrupter switch electrically connected between the power source and the bypass valves;

an interrupter coil to open the interrupter switch when the interrupter coil is energized;

a lever switch controlled by the transmission lever connected between the power source and the interrupter coil;

a master switch electrically connected between the interrupter switch and the bypass valves;

a master coil in series with the master switch to magnetically maintain the master switch in its closed position when the master coil is energized;

a plurality of manually actuated valve control switches electrically in parallel with one another and in series with the master switch, one of the electrically operated bypass valves being connected in series with a corresponding valve control switch.

4,913,111

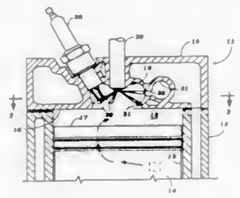
TURBULENCE GENERATOR FOR TWO-STROKER SPARK-ASSISTED DIESEL ENGINES

Susumu Ariga, San Antonio, Tex., assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 54,776, May 27, 1987, abandoned, which is a division of Ser. No. 846,985, Apr. 1, 1986, Pat. No. 4,686,941. This application Jun. 27, 1988, Ser. No. 212,139
Int. Cl.[4] F02B *19/12*
U.S. Cl. 123—256 12 Claims

1. A combustion chamber for an internal combustion engine comprising a main chamber portion, an energy cell portion of substantially smaller volume than said main chamber portion and communicating with said main chamber portion through a restricted orifice, a single fuel injection nozzle delivering a fuel charge into said main chamber portion in a direction away from said energy cell and another fuel charge directed toward and into said energy cell portion, and means for initiating combustion in said combustion chamber in said main chamber portion prior to combustion said energy cell for increasing the

pressure in said energy cell portion prior to combustion therein for subsequently effecting combustion therein to effect a high velocity flow from said energy cell into said main chamber



portion during the expansion stroke through said orifice to generate turbulence therein after combustion in the main chamber portion has begun.

4,913,112

POWER TOOL

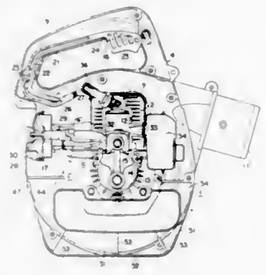
Giichi Iida, Tokyo, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Jan. 6, 1989, Ser. No. 294,298

Claims priority, application Japan, Jan. 8, 1988, 63-559[U]; Jan. 8, 1988, 63-560[U]; Jan. 14, 1988, 63-3264[U]

Int. Cl.[4] F02B *77/00*

U.S. Cl. 123—198 E 3 Claims



1. A power tool in which a body provided with an internal combusion engine is covered with a cover and a handle is formed on an upper portion of said cover, said power tool comprising:

a throttle lever pivotally provided at a rear end portion of said handle and extending inside said handle toward a front end portion of said handle;

a finger engaging portion formed at said front end portion of said throttle lever in such a manner as to project from said handle to the outside;

wherein a rear-end portion of said throttle lever is connected with a throttle valve of said internal combusion engine by means of a connecting member, and, when said throttle valve is at an idling position, said finger engaging portion of said throttle lever is held at a position where said finger engaging portion projects from said handle to the outside.

4,913,113

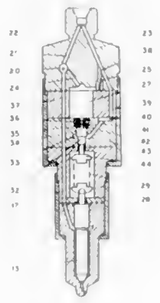
INTERNAL COMBUSTION ENGINE WITH FUEL TOLERANCE AND LOW EMISSIONS

George S. Baranescu, 5316 Howard Ave., Western Springs, Ill. 60558

Filed Jan. 9, 1989, Ser. No. 294,762

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—300 11 Claims



1. An internal combustion engine including at least one cylinder, said internal combustion engine including an injection pump connected to injectors and to a fuel tank, each injector including a high pressure channel through which fuel penetrates into the injector, and a nozzle provided with a chamber and a deliver channel which is opened and closed by a valve actuated by a nozzle spring, each injector including also a drain, the combustion chamber of each cylinder being also provided with a spark plug connected to a spark ignition system and with a glow plug connected to a source electricity, the internal combustion engine including also means for fuel heating prior to fuel injection, said internal combustion engine being characterized by the capacity to divide the fuel charge of each cycle in two or three portions of different amount, according to the requirements of engine operation, and to inject these portions in a selected order and at selected timings using only one injection pump, the portions of the fuel charge including a main portion, which is injected preceeded, and, when the engine requires so, followed by small fuel portions, the small portions of the fuel charge being accumulated in the injector, the accumulation occurring during the injection of the larger portion of the fuel charge achieved by the injection pump, the accumulated fuel being injected by fuel expansion, the small portion of the fuel charge which is injected before the large portion of the fuel charge vaporizes and mixes with air in the combustion chamber, and then the fuel-air mixture is spark ignited, the larger portion of the fuel charge being injected into the burning gases generated during the combustion of the small portion of the fuel charge previously injected, the second small portion of fuel being injected, when necessary, after the injection of the large portion of the fuel charge, the accumulation, injection, and the control of the small portions of the fuel charge being achieved by providing the injector with means including an accumulator connected with high pressure channel and with the nozzle chamber, means which prevents the discharge of the accumulator into high pressure channel, means which control the timing of the discharges of accumulator towards the nozzle chamber, means which control the amounts of fuel discharged from the accumulator towards the nozzle chamber.

4,913,114

GOVERNING APPARATUS FOR THE IDLING RPM OF AN INTERNAL COMBUSTION ENGINE

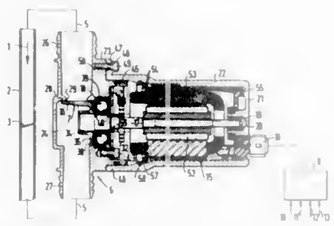
Harald Kalippke, Benningen; Richard Gerber, Stuttgart; Harald Sailer, Markgroeningen, and Wolfgang Standenmaier, Weinstadt, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 15, 1989, Ser. No. 323,659

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1988, 8805211[U]

Int. Cl.[4] F02M *23/04*; F02D *41/16*

U.S. Cl. 123—339 4 Claims



1. An apparatus for assisting governing the idling rpm of an internal combustion engine, having a control motor including a rotary armature which is connected to a shaft a rotary slide valve connected to one end of said shaft, said rotary slide valve controls a cross section of a bypass line around a throttle device disposed in an air intake tube of the engine, a housing embodied by a cup-shaped housing part and a lid-shaped housing part, said lid-shaped housing part is formed as an integral part of the bypass line that includes the cross section which is to be controlled by said rotary slide valve and which is penetrated by said rotar slide valve, said control motor includes at least one winding disposed in the cup-shaped housing part which is excited to rotate said armature and therewith said rotary slide valve, a first roller bearing (18), connected to the shaft (17) juxtaposed said rotary slide valve (7) and having roller bodies covering disks (40) covering opposite ends of said roller bodies, said first roller bearing being supported in a bearing bore in the lid-shaped housing part (23), and a second roller bearing (19) supported on said shaft (17) in a housing bottom (21) of the cup-shaped housing part (22).

4,913,115

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES, ESPECIALLY DIESEL ENGINES

Karl Konrath, Freiberg/Neckar; Claus Koester, Ditzingen; Manfred Schwarz, Gerlingen; Klaus Krieger, Affalterbach; Helmut Tschoeke, Ostfildern, and Ulrich Stratemeier, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

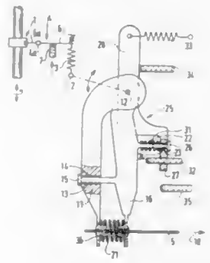
Filed Apr. 7, 1989, Ser. No. 334,425

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1988, 3818574

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—373 21 Claims

1. A fuel injection pump for internal combustion engines, having a pump piston that draws fuel from a fuel-filled pump interior that is at feed pressure and pumps it at high pressure to injection nozzles of the engine, which comprises a quantity adjusting device adjustable by n governor relative to the pump piston which determines the fuel injection quantity pumped per pump piston stroke, said governor being coupled to an intermediate lever (16), a spacer stop (14) on said intermediate lever (16), an arbitrarily actuatable adjusting element (11), a prestressed first coupling spring (21) positioned between said intermediate lever and said adjusting element (11) which forces said adjusting element into contact with said spacer stop (14) on the intermediate lever (16), at least one drag element, said adjusting element (11) coupled via said intermediate lever (16) with said at least one drag element (25) by mean of said prestressed first coupling spring and a prestressed second coupling spring (31); an idling stop (34), said at least one drag element (25) holdable on said idling stop (34) by a prestressed restoring



spring (33); and said adjusting element (11), said intermediate lever (16) and said at least one drag element (25) movable relative to one another and holdable by means of said first and second prestressed coupling springs (21, 31) on spacer stops (14, 22) which define spacings of said element relative to one another; and the proximity of these elements relative to one another definable by means of proximity stops (32, 36).

4,913,116

IGNITION TIMING CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

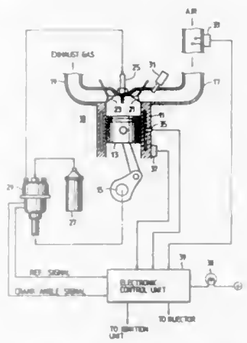
Kozo Katogi, Hitachi, and Asahiko Otani, Tondabayashi, both of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Ibaraki, both of, Japan

Filed Mar. 7, 1989, Ser. No. 319,726

Claims priority, application Japan, Mar. 10, 1988, 63-54809

Int. Cl.[4] F02P *5/15*

U.S. Cl. 123—425 7 Claims



1. An ignition timing control apparatus for an internal combustion engine, comprising:

ignition unit means for supplying an ignition signal to the engine at a predetermined ignition timing;

knocking sensor means, attached to the engine, for detecting the vibration of the engine and producing a knocking detection signal indicating the degree of occurring knocking;

control unit means including a processor, which has plural tables for providing basic ignition timings and is programed so as to execute the following steps:

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selecting one of the plural tables on the basis of the knocking detection signal; and

determining, in accordance with the selected ignition timing table, an actual ignition timing to be supplied for said ignition unit as the predetermined ignition timing,

characterized in that

the plural ignition timing tables includes a first ignition timing table providing a basic ignition timing for high-octane fuel and a second ignition timing table providing a basic ignition timing for low-octane fuel, and

when one of the first and second ignition timing tables is switched over to the other ignition timing table, the processor included in said control unit means further executes the processing of the following steps:

setting the other ignition timing table;

obtaining a difference between the basic ignition timings according to the first and second ignition timing tables;

reducing the difference with time at a predetermined constant rate;

correcting the basic ignition timing according to the one ignition timing table by the reducing difference so that when the reducing difference becomes zero, the actual ignition timing becomes equal to the basic ignition timing according to the other ignition timing table;

comparing the reducing difference with a certain threshold provided in advance; and

determining whether the one ignition timing table is to be maintained or switched over to the other ignition timing table in accordance with the comparison result of the preceding step.

4,913,117

CONTROL APPARATUS OF AN INTERNAL COMBUSTION ENGINE

Toru Hashimoto; Akira Takahashi, both of Kyoto, and Mamoru Sugiura, Kameoka, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1988, Ser. No. 225,306

Claims priority, application Japan, Aug. 5, 1987, 62-194313

Int. Cl.[4] F02D *41/04*; F02P *5/15*

U.S. Cl. 123—425 21 Claims

1. A control apparatus of an internal combustion engine which has air-fuel ratio control means for controlling the operation of an air-fuel ratio adjusting device for adjusting the air-fuel ratio of an air-fuel mixture to be supplied to the engine, and ignition timing control means for controlling the operation of an ignition device for igniting the air-fuel mixture supplied to the engine, comprising:

knock detecting means for detecting a knocking state of the engine, said knock detecting means delivering a knock signal corresponding to the detected knocking state when the knocking state is detected thereby; and

correction data calculating means for calculating a value of first correction data tending to change to a high degree, thereby preventing said knocking state, and a value of second correction data tending to change to a low degree, thereby preventing said knocking state, in response to said knock signal delivered from said knock detecting means;

the value of said first correction data being calculated so as to change in a first direction when said knock signal is delivered, and to change in a second direction opposite to said first direction when said knock signal is not delivered;

the value of said second correction data being calculated so as to change in a third direction when the value of said first correction data changes in said first direction to get beyond a preset value or range, and to change in a fourth direction opposite to said third direction when the value of said first correction data changes in said second direction;

said ignition timing control means including means for setting the ignition timing on the delay side when the value of said first correction data changes in said first direction, for setting the ignition timing on the advance side when the value of said first correction data changes in said second direction, for setting the ignition timing on the delay side when the value of said second correction data changes in said third direction, and for setting the ignition timing on the advance side when the value of said second correction data changes in said fourth direction; and

said air-fuel ratio control means including means for adjusting the air-fuel ratio to a value on the fuel-rich side when the value of said first correction data changes in said first direction, and for adjusting the air-fuel ratio to a value on the fuel-lean side when the value of said first correction data changes in said second direction.

4,913,118

FUEL INJECTION CONTROL SYSTEM FOR AN AUTOMOTIVE ENGINE

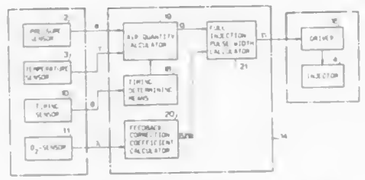
Hideo Watanabe, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1989, Ser. No. 330,592

Claims priority, application Japan, Apr. 1, 1988, 63-81803

Int. Cl.[4] F02D *41/18*

U.S. Cl. 123—435 3 Claims



1. A system for controlling fuel injection for an automotive engine having at least one fuel injector, comprising:

a pressure sensor for sensing pressure in each cylinder of said engine and for producing a pressure signal;

a temperature sensor for sensing temperature of a cylinder of said engine and for producing a temperature signal;

a timing sensor for sensing a predetermined crank angle with respect to each cylinder and for producing a timing signal at the crank angle;

first calculator means responsive to the pressure signal, the temperature signal and the timing signal for calculating quantity of intake air at the time of the timing signal;

second calculator means for calculating a fuel injection pulse width based on the calculated quantity of intake air; and

driver means for actuating said fuel injector in accordance with said fuel injection pulse width.

4,913,119

FUEL DELIVERY RAIL ASSEMBLY

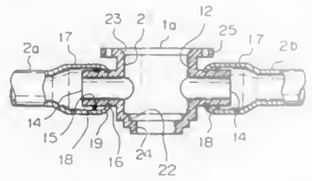
Masayoshi Usui, Numazu, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Shizuoka, Japan

Filed Aug. 1, 1989, Ser. No. 387,962

Claims priority, application Japan, Aug. 3, 1988, 63-102437[U]

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—456 3 Claims



1. A fuel delivery rail assembly for an internal combustion engine comprising;

a plurality of sockets made from plastic materials,

a plurality of rail sections made from metallic materials extending from said sockets,

each of said sockets having a tubular body and a pair of extension pipes extending outwardly from the body toward opposite directions, interior surfaces of said tubular body being so formed as to receive a fuel injector,

at least one end of each rail section being overlapped above or below said extension pipe with a seal member therebetween, and

means for combining said rail sections and said extension pipes.

4,913,120

AIR-FUEL RATIO FEEDBACK CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

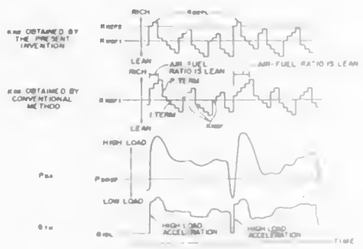
Sachito Fujimoto, and Shuichi Hosoi, both of Wako, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Mar. 9, 1989, Ser. No. 321,261

Claims priority, application Japan, Mar. 18, 1988, 63-65323

Int. Cl.[4] F02D *41/14*

U.S. Cl. 123—489 7 Claims



1. A method of effecting feedback control of the air-fuel ratio of an air-fuel mixture being supplied to an internal combustion engine having an exhaust system, and a sensor arranged in said exhaust system for sensing the concentration of an ingredient in exhaust gases from said engine, wherein when said engine is operating in a feedback control region, the air-fuel ratio of said mixture is controlled by the use of a correction coefficient varying in response to an output of said sensor, the method comprising the steps of:

(1) detecting a rate of change in the value of an operating parameter of said engine;

(2) determining whether or not said engine is operating in a predetermined operating region which is a high load operating region within said feedback control region, and in which the rate of change in the value of said operating parameter is larger than a predetermined value;

(3) calculating an average value of values of said correction coefficient assumed during operation of said engine in said predetermined operating region, and storing the calculated average value when said engine is in said predetermined operating region; and

(4) effecting the feedback control of the air-fuel ratio by the use of said average value in place of said correction coefficient, when said engine has shifted to said predetermined operating region.

4,913,121

FUEL CONTROLLER

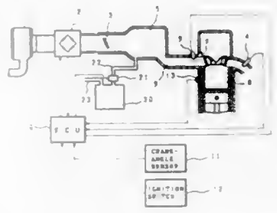
Setsuhiro Shimomura, and Yukinobu Nishimura, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1989, Ser. No. 322,949

Claims priority, application Japan, Mar. 23, 1988, 63-71459

Int. Cl.[4] F02D *41/14*; F02M *25/08*

U.S. Cl. 123—489 7 Claims



1. A fuel controller comprising:

a means for supplying fuel to an internal combustion engine in accordance with operation of a fuel control valve;

an air-flow sensor, being disposed in an air intake passage of said engine, for detecting a volume of air intake;

an air-fuel ratio sensor, being installed to an exhaust tube of said engine, for detecting an air-fuel ratio; and

a controlling means, for computing a basic value of volume of fuel needed for said engine in accordance with a signal outputted from said air-flow sensor, controlling the operation of said control valve in response to the computed basic value, and executing negative feedback correction of said basic value in accordance with a signal outputted from said air-fuel ratio sensor so that air-fuel ratio can achieve a desired value,

said controlling means having a memory for storing volume of negative feedback correction executed when said signal outputted from said air-flow sensor approximates a predetermined value, and a means for correcting said basic value in accordance with a content stored in said memory, said predetermined value being a value slightly less than an air-flow volume at a presence-absence boundary of said negative feedback correction.

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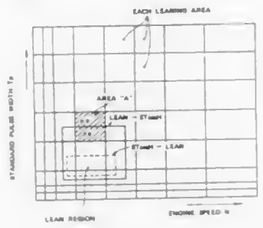
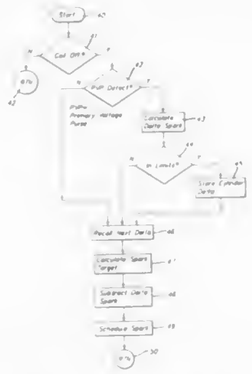
4,913,122
AIR-FUEL RATIO CONTROL SYSTEM
Masaaki Uchida, and Shisei Kai, both of Yokosuka, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan
Filed Jan. 11, 1988, Ser. No. 141,732
Claims priority, application Japan, Jan. 14, 1987, 62-7771
Int. Cl.[4] F02D 41/14
U.S. Cl. 123—489 11 Claims



1. An air-fuel ratio control system for an engine, comprising:
means for detecting air-fuel ratio of air-fuel mixture to be inducted to the engine;
means for detecting operating condition of the engine;
means for calculating an air-fuel ratio correction coefficient in accordance with said detected air-fuel ratio;
means for accomplishing feedback control of the air-fuel ratio into a stoichiometric value in accordance with said air-fuel ratio correction coefficient;
means for forming a plurality of learning areas defined respectively by engine operating conditions, learning being able to be made in each learning area, at least a part of each learning area being under said feedback control and at least one of said learning areas having a part which is never under feedback control;
means for calculating a learning coefficient for said learning area corresponding to said detected engine operating condition, in accordance with said air-fuel ratio correction coefficient under said feedback control, said learning coefficient being memorized in said at least a part of each learning area; and
means for accomplishing feedforward cootrol of the air-fuel ratio into a lean value which is leaner than said stoichiometric value, in accordance with said learning coefficient.

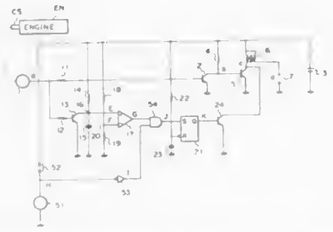
4,913,123
IGNITION TIMING SYSTEM WITH FEEDBACK CORRECTION
Charles J. DeBiasi, Allen Park, and Wesley D. Boyer, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Mar. 23, 1989, Ser. No. 327,886
Int. Cl.[4] F02D 5/15
U.S. Cl. 123—609 12 Claims

1. A method of controlling spark timing of an ignition coil, with a primary and secondary winding, in an ignition system for an internal combustion engine including the steps of:
generating a dwell signal to control current flow in the primary winding of the ignition coil and to schedule spark timing;
applying electrical energy to the ignition coil of the ignition system;
detecting the back EMF generated by the primary winding of the ignition coil in response to current change in the secondary winding of the ignition coil;
using the detected back EMF as a feedback input to the ignition system; and



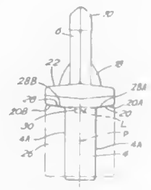
offsetting the scheduled spark timing as a function of the detected back EMF to compensate for system delays.

4,913,124
IGNITION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE
Atsushi Hashizume, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 13, 1989, Ser. No. 337,796
Claims priority, application Japan, Apr. 13, 1988, 63-92144
Int. Cl.[4] F02P 11/02
U.S. Cl. 123—631 19 Claims



1. An ignition apparatus for an internal combustion engine started by rotating a rotary member in one direction upon the driving of a starter, having an ignition coil and an ignition plug connected to the ignition coil for the generation of ignition sparks at predetermined intervals of time, said ignition apparatus comprising:
an angle sensing means for sensing first and second angular positions of said rotary members, the output of said sensing means being changed between first and second levels every time each of the angular position is sensed;
an ignition control means coupled to said angle sensing means and said ignition coil and operable to energize said ignition coil during the period of time when the output of said angle sensing means is at said first level and to de-energize said ignition coil to generate a spark at said ignition plug at the time when the output of said angle sensing means goes from said first level to said second level;
a monitoring means for monitoring whether or not a current is flowing through said starter and adapted to generate an output when the current is cup off;
a measuring means coupled to said angle sensing means for measuring the period during which the output of said angle sensing means is held at said first level and adapted to generate an output when said period exceeds a predetermined length of time; and
an ignition preventing means responsive to the outputs of said monitoring means and said measuring means and adapted to control said ignition coil so that no ignition spark is generated at said ignition plug, thereby preventing the generation of any spark at said plug when said rotary member rotates reversely.

4,913,125
CUTTER PICKS
Derek J. Bunting, Sapcote, and Alexander B. Graham, Hinckley, both of England, assignors to Sandvik AB, Sandviken, Sweden
Filed Jul. 19, 1988, Ser. No. 221,408
Claims priority, application United Kingdom, Jul. 20, 1987, 8717116
Int. Cl.[4] B28D 1/26
U.S. Cl. 125—43 9 Claims



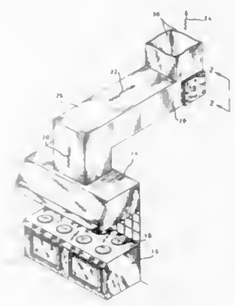
1. A cutter pick for assembly with a pick holder by means of a spigot and socket connection of non-circular cross section, said cutter pick including a head projecting in an outward direction and a cutting tip formed at a front end of said head, said cutting tip being bisected by a center plane of said cutter pick, said cutter pick including a face which faces in an inward direction generally opposite said outward direction, said face including laterally opposite surfaces inclined relative to one another to define an imaginary line of intersection lying substantially in said center plane, said surfaces adapted to engage corresponding surfaces of a pick holder for centering said cutter pick in the lateral direction.

4,913,126
OUTDOOR STOVE/HEATER
Thomas G. McCall, 5025 Genesee Rd., Lapeer, Mich. 48446
Filed Feb. 7, 1989, Ser. No. 307,043
Int. Cl.[4] A61F 7/00
U.S. Cl. 126—204 10 Claims

1. A portable heater for an outdoorsman, said heater comprising;
a container having a body, extending between a closed bottom and a rim defining an open top said body having a plurality of apertures for permitting the passage of air adjacent said bottom portion of said container;
a bottom plate for supporting combustible material adapted to be received within said container; and a seat top extending partially over said open top of said container, said seat top having a seat portion and a flange extending downwardly therefrom, to extend about said container to close off said open top such that flames and smoke are prevented from escaping, said seat top further having a peripheral edge, said peripheral edge extending across said open top to define an opening between said rim and said peripheral edge extending coaxially with a longitudinal axis of said container whereby heat is permitted to escape from said container for warming the upper extremities of said outdoorsman, said seat portion being formed of heat

conductive material for conducting heat to said outsdoorsman when in a seated position on said seat top.

4,913,127
FIRE RESISTANT DUCT ACCESS DOOR FOR COOKING EQUIPMENT EXHAUST SYSTEMS
David E. Dugger, 313 Woodland Trace Dr., Knoxville, Tenn. 37022
Filed Mar. 21, 1989, Ser. No. 326,887
Int. Cl.[4] F24C 15/20
U.S. Cl. 126—299 R 12 Claims



1. An access door to assist in cleaning grease from duct runs in exhaust systems for kitchen cooking equipment, comprising:
a collar mounted at a selected location in a run of duct to provide an opening in said duct for cleaning grease from its interior surfaces;
a fire proof cover releasably secured to said collar for closing said collar opening;
securing means for releasably securing said cover to said collar; and
high temperature seal means especially fabricated to be impervious to the temperature and effects of burning grease, mounted between said collar and said cover to assist in preventing flames and said grease from escaping said duct through said collar opening when said cover is mounted thereon.

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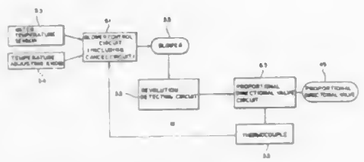
4,913,128

BURNER APPARATUS

Ikuro Adachi, Aichi, Japan, assignor to Rinnai Corporation, Aichi, Japan

Continuation of Ser. No. 36,216, Apr. 9, 1987, abandoned. This application Mar. 23, 1989, Ser. No. 328,810
Claims priority, application Japan, Apr. 23, 1986, 61-94356
Int. Cl.[4] F24H 1/00; F24N 5/10
U.S. Cl. 126—351 3 Claims



1. A burner apparatus comprising:
a housing;
a burner plate within said housing on which fuel gas is ignited;
a fuel supply which is in communication with said burner plate and is regulated by a proportional directional valve;
an air supply which is in communication with said burner plate and is regulated by a blower;
a temperature adjusting knob which provides output to a blower control circuit;
a thermal sensor which detects combustion on the burner plate and generates on output voltage proportional to the combustion;
a heat determining means remotely located from the burner plate which indirectly determines heat generation of the burner plate by measuring the heat imparted to at least a portion of a medium being heated by the burner plate and generates an output voltage to a blower control circuit;
a blower control circuit, which receives input signals from the thermal sensor, the heat determining means and the temperature adjusting knob, and which controls the blower in response to the input signals and including a cancel circuit which is incorporated into the blower control circuit to cancel the output from the thermal sensor for a predetermined period of time during initial ignition;
a revolution detecting circuit which determines revolutions of the blower and generates an output voltage; and
a proportional directional valve control circuit which controls supply of fuel to the apparatus by regulating the proportional directional valve in response to the output voltages received from the revolution detecting circuit and the thermal sensor.

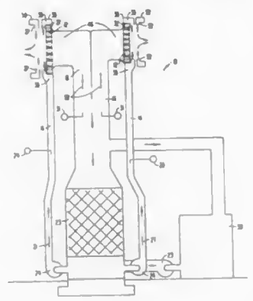
4,913,129

SOLAR RECEIVER HAVING WIND LOSS PROTECTION

Bruce D. Kelly, Napa, and Robert L. Leasley, Sonoma, both of Calif., assignors to Bechtel Group, Inc., San Francisco, Calif.

Filed May 22, 1989, Ser. No. 355,717
Int. Cl.[4] F24J 2/02
U.S. Cl. 126—451 22 Claims

1. A system for introducing an airstream to be heated to an air permeable heating surface, said system comprising:
means for flowing the airstream in a converging pattern adjacent to the surface; and
means for flowing a protective airstream adjacent to the airstream to be heated in a converging pattern similar to that of the airstream to be heated, said protective airstream being located on a side of the airstream to e heated opposite to that of the heating surface, whereby the airstream to be heated flows inwardly through the surface



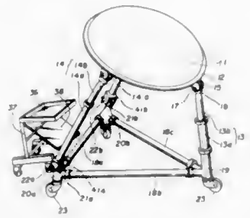
while the protective airstream flows outwardly away from the surface.

4,913,130

SOLAR COOKER ASSEMBLY

Jitsuo Inagaki, Aichi, and Sinji Sawata, Tokyo, both of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan, a part interest

Filed Apr. 19, 1989, Ser. No. 340,530
Claims priority, application Japan, Apr. 21, 1988, 53-96832
Int. Cl.[4] F24J 2/38
U.S. Cl. 126—424 5 Claims



1. A solar cooker assembly comprising a circular and convex Fresnel lens having its convex side facing either upward or downward, a protective frame unit rigidly fitted to the periphery of said Fresnel lens, a support unit for swingably supporting said Fresnel lens so that the elevation and the azimuth of the lens can be freely chosen without restriction, said support unit comprising three support pillars which are held standing at corresponding respective corners of a triangular base formed by combining three rods, each of the support pillars being constituted by a plurality of pillar members vertically and telescopically engaged with each other, and a cooking unit located at the focal point of said Fresnel lens.

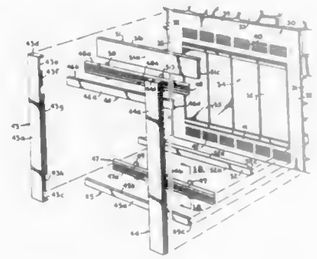
4,913,131

FACADE/FACING FOR ZERO CLEARANCE FIREPLACE

Joseph A. Petersen, P.O. Box 16124, Shawnee Mission, Kans. 66203

Filed Feb. 6, 1987, Ser. No. 12,073
Int. Cl.[4] F24C 15/00, 15/06
U.S. Cl. 126—544 13 Claims

1. A decorative facade or facing for the front wall of a zero clearance fireplace, said zero clearance fireplace front wall normally received and standing in a vertical plane and including a substantially rectangular, vertical, sheet metal fronting, said fronting made up of one top, two side and one bottom front wall portions and having substantially parallel, normally horizontal, outboard top and bottom edges and substantially parallel, normally vertical, outboard, front side edges on the respective wall portions,
(1) the top wall, side wall and bottom front wall portions of said zero clearance fireplace front wall all having the outboard edge portions thereof running rearwardly from said zero clearance fireplace front wall at substantial right angles thereto,
(2) a firebox provided in said zero clearance fireplace having normally substantially vertical side walls and normally substantially horizontal top and bottom walls, each of said side, top and bottom walls having a front edge thereof,
(3) the front edges of the firebox side, top and bottom walls opening out of the zero clearance fireplace front wall as a substantially rectangular opening,
(4) there being two elongate, laterally spaced apart, substantially rectangular, vertically extending side panels of the zero clearance fireplace front wall positioned laterally of said firebox front opening, one on each side thereof,
(5) there further being two elongate, vertically spaced apart, horizontally extending, substantially rectangular top and bottom panels of the zero clearance fireplace front wall having side, top and bottom edges positioned respectively above and below the top and bottom front edges of said firebox and connecting, at their said side edges, with said fireplace front wall rectangular side panels;
(6) said facade comprising, in combination,



(a) a pair of opposed, first and second, vertical facade side panel members adapted to fit over and lie against the said zero clearance fireplace front wall side panels,
(7) each said facade side panel member made up of:
(a) a rectangular front sheet adapted to overlie one of said zero clearance fireplace front wall side panels,
(b) said facade side panel front sheets each having top, bottom and outer side elongate edge members extending rearwardly therefrom at substantial right angles to said front sheet, said top, bottom and outer side edge members, respectively, fitting over the said outer front edge portion of the zero clearance fireplace top wall, under the said outer, front, bottom edge portion of the fireplace bottom wall and vertically along the said outer side edge portions of a zero clearance fireplace side wall portion, said elongate edge members fixed to the top, bottom and outer side edges of said facade side panel front sheet,
(c) there being an elongate, rearwardly directed, inner inboard side flange member provided on each facade side panel member positioned at substantial right angles to the front sheet thereof and opposed to the said side elongate edge member on said facade side sheet,
(d) each said inner inboard flange member so positioned and so sized as to fit into the firebox at one side wall thereof, and also fit against a firebox side wall along the substantial height of the firebox adjacent the front edge thereof and spaced downwardly and upwardly from the top and bottom edges of the facade side first and second panels, the height of said inner side flange member being equal to the firebox height and less than the height of said side panel,
(e) first lower and second upper, opposed opening gaps below and above each of said inner side flange members, the upper opposed gaps each being the substantial height of the top horizontal panel of the zero clearance fireplace front wall and the lower opposed gaps being the substantial height of the lower horizontal panel of said fireplace front wall,
(8) an elongate, upper, horizontally extending, overlying, substantially rectangular third facade panel having top and bottom horizontal rearwardly extending flanges fixed to the top and bottom thereof, such flanges extending at substantial right angles to said third facade panel rearwardly thereof and of such length as to be insertable at the side ends thereof into the second, upper, opposed, inboard gaps of the facade side panel members and at least partially under said facade side panel front sheets, said upper horizontal panel so sized as to fully cover the fireplace front wall top horizontal panel,
(9) the said upper and lower horizontal edges of said facade third panel inboard flange members operative at least to space the third facade panel at least somewhat away from the zero clearance fireplace front top wall and abutting thereagainst,
(10) an elongate, lower, horizontally extending, overlying, substantially rectangular fourth facade panel having top and bottom edge rearwardly extending flanges fixed to the respective top and bottom edges thereof and extending at substantial right angles to said fourth facade panel means,
(11) said fourth facade panel being insertible at the ends thereof in the lower, first, opposed gaps of the facade side panel members and so sized as to cover the fireplace front wall bottom horizontal panel and extend into said first gaps,
(12) the said top and bottom flanges of said lower fourth facade panel means at least abutting against the bottom front face of the zero clearance fireplace front wall whereby to space said panel somewhat from said front wall.

4,913,132

MYRINGOTOMY INSTRUMENT

Noble Gabriel, 7 Derringer Rd., Chelmsford, Mass. 01824

Continuation of Ser. No. 890,485, Jul. 25, 1986, abandoned. This application Oct. 6, 1988, Ser. No. 254,312
Int. Cl.[4] A61B 1/22
U.S. Cl. 128—9 5 Claims

1. A hand-held myringotomy instrument comprising:
an otoscope comprising a housing having a proximal end and a distal end, an optical lens system having an ocular lens at the proximal end and having an optical axis, and a speculum at the distal end, whereby an observer may view through the ocular lens from the proximal end along the optical axis a desired area near and beyond the distal end;
a tube rigidly connected to the housing;
a laser beam source for providing a laser beam along a beam path within the tube;
a lens system for focusing the laser beam at a focal point a certain distance from the laser lens system;
means for moving the entire laser lens system along the laser beam axis of the laser beam to move the laser beam focal point along the laser beam path;
a laser beam reflector in the otoscope interposed diagonally in the laser beam path axis and diagonally in the optical lens axis to redirect by reflection the laser beam coincidentally with the otoscope lens system optical axis toward the otoscope distal end, the laser beam leans system focusing the laser beam at a point beyond the otoscope distal end;
whereby an operator may observe from the proximal end the area at which the laser beam is directed near the distal end

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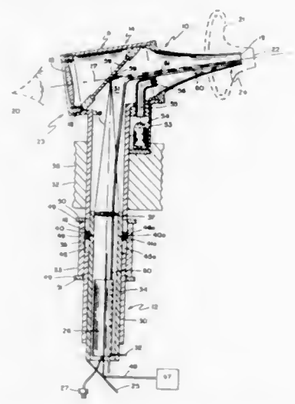
of the otoscope and by said moving means adjust the point of focus along the laser beam axis.

said means for moving the laser beam lens system comprising an inner sleeve carrying the laser beam leans system inside the tube;

an outer sleeve about the tube internally threaded and restricted to rotation about the tube;



a traveling element fastened to the inner tube and externally threaded to mesh with the outer sleeve internal threads;

the tube having a longitudinal slot within which the elements projects, and said slot restricting the element to axial motion along the tube, whereby rotation of the outer sleeve moves the element axially, and the attached inner sleeve axially thereby to move axially the laser beam lens system carrier by the inner sleeve.

4,913,133

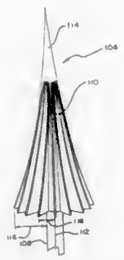
HAND HELD PERIODONTIC TOOL

Edward Tichy, No. 21, Rte. 132, Woodbury, Conn. 06798

Continuation-in-part of Ser. No. 212,569, Jun. 28, 1988. This application Sep. 2, 1988, Ser. No. 241,011

Int. Cl.[4] A61C *3/00*; A61H *7/00*

U.S. Cl. 128—62 A 18 Claims



1. A hand held periodontic tool comprising:

a substantially tubular handle having a primary axis and upper and lower ends;

an elongated shank projecting from the upper end of the handle along a secondary axis which is angled obliquely to the primary axis, and having a free end;

a tip member located on the free end of the shank and including a flexible tip for contacting the teeth and gum in the mouth, wherein the tip is made of a non-fibrous material in the form of a spire having a longitudinal axis, the spire including a lower portion formed by parallel, spaced apart longitudinal ribs and a solid, cone shaped upper nose portion terminating in a point on the spire axis.

4,913,134

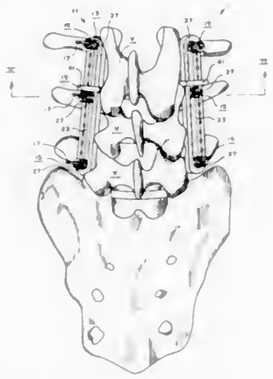
SPINAL FIXATION SYSTEM

Eduardo R. Luque, Cancaza de Las Aeolias, Mexico, assignor to Biotechnology, Inc., Memphis, Tenn.

Division of Ser. No. 77,440, Jul. 24, 1987. This application Jul. 29, 1988, Ser. No. 226,373

Int. Cl.[4] A61F *5/00*

U.S. Cl. 128—69 4 Claims



1. A spinal fixation system for fixing vertebrae; said system comprising:

(a) a substantially rigid, elongated plate means for being placed over the vertebrae, said plate means having one or more opengings therethrough, said plate means having an elongated slot therethrough;

(b) a plurality of screw means for extending through said one or more openings in said plate means and into the vertebrae for attaching said plate means to the vertebrae, each of said screw means having an aperture extending along the longitudinal axis thereof;

(c) a plurality of elongated guide wire means for being inserted into the vertebrae directly through the cancellous portions of the vertebrae and for guiding the placement of said plate means over the vertebrae and said screw means through said one or more openings in said plate means and into the vertebrae, at least one end of each of said guide wire means being substantially blunt to help preclude penetration of the anterior cortex of the vertebrae by said guide wire means; and

(d) a plate ring means for encircling said plate means and for preventing said plate means from spreading apart when said screw means are snugged down.

4,913,135

CERVICAL BRACE

Leslie G. Mattingly, 10761 E. Laurel La., Scottsdale, Ariz. 85259

Continuation-in-part of Ser. No. 942,367, Dec. 16, 1986, Pat. No. 4,807,605. This application Jan. 30, 1989, Ser. No. 303,111

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[4] A61F *5/04, 5/02*

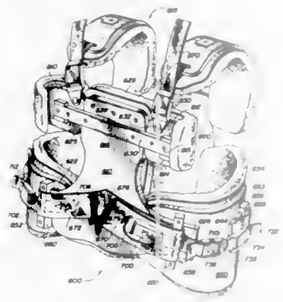
U.S. Cl. 128—78 13 Claims

9. A cervical brace for stabilizing and immobilizing the head and cervical spine of a patient comprising:

(a) an anterior belt portion adapted to extend around the lower costal area of the ribs and terminating at either side of the wearer;

(b) a posterior belt portion adapted to extend around the lower thoracic lumbar area of the user and terminating at either side of the user;

(c) means to apply a closing force generally perpendicular with respect to the sagittal plane comprising fastener



means adjustably connecting said anterior belt portion and said posterior belt portion at the side of the wearer;

(d) front bracket means extending upwardly from said anterior belt in the region of the sternum and adapted to adjustably receive a support therein; and

(e) rear bracket means extending upwardly from said posterior belt in the lumbar spinal area for receiving a support therein.

4,913,136

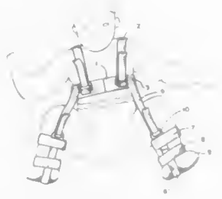
HARNESS FOR THE TREATMENT OF CONGENITAL HIP DISLOCATION IN INFANTS

Andrew K. Chong, and Catherine S. Chong, both of 1632 Hemstock Ave., Wheaton, Ill. 60187

Filed Aug. 2, 1988, Ser. No. 227,603

Int. Cl.[4] A61F *3/00*

U.S. Cl. 128—80 A 2 Claims



1. A harness for the treatment of congenital hip dislocation in infants, comprising

a chest halter including a belt around the chest, said belt being held in place by two shoulder straps connected to said belt and

two foot attachments, a posterior and an anterior leg strap connected to each of said foot attachments including adjustment means in each of said leg straps, said adjustment means being located at the point of connection of said leg straps to said foot attachments, each of said foot attachments including a stirrup and a toe-cover attached to the front of each stirrup to prevent foot slippage.

4,913,137

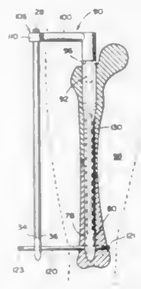
INTRAMEDULLARY ROD SYSTEM

Samir N. Azer, Alexandria, Va.; Naser N. Salman, Rockville, Md., and William R. Krause, Richmond, Va., assignors to Orthopedic Designs, Inc., Alexandria, Va.

Filed Feb. 9, 1988, Ser. No. 153,913

Int. Cl.[4] A61F *5/04, 2/00*

U.S. Cl. 606—64 10 Claims



1. An intramedullary rod system comprising:

a guide rod for insertion into a medullary canal,

an intramedullary rod for insertion into the medullary canal around said guide rod,

an interior surface of said intramedullary rod being shaped and fitted complementary to an exterior surface of said guide rod and preventing rotation of said intramedullary rod with respect to said guide rod, and

alignment means for aligning said guide rod parallel to and spaced from said intramedullary rod after said guide rod has been withdrawn from inside said intramedullary rod, said guide rod and said intramedullary rod being aligned with respect to each other to position and axis of distal openings in said guide rod along an axis of distal openings in said intramedullary rod.

4,913,138

ADHESIVE BANDAGE FOR PERSONAL USE

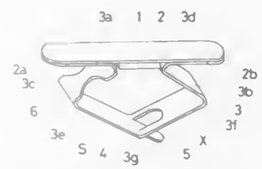
Haruo Yoshida, Onoe-danchi 1-2, Onoe-cho, Nagoya-shi, Aichi-ken, and Shoichi Kume, 150-2, Ninowari, Kabuoto-cho, Tsushima-shi, Aichi-ken, both of Japan

Filed Nov. 1, 1988, Ser. No. 265,556

Claims priority, application Japan, Nov. 7, 1987, 62-170552[U]

Int. Cl.[4] A61L *15/00*

U.S. Cl. 128—155 7 Claims



1. An adhesive bandage used personally to cover a minor injury on a human body, especially on a finger or a toe thereof, which is particularly suitable for application with only one hand and which comprises

(i) a backing strip having an adhesive inside,

(ii) a pad fixed to a substantially central portion of the inside of the backing strip for directly covering a minor injury,

(iii) a protecting means for protecting both the pad and the

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inside of the backing strip, said protecting means being removably attached, at its opposed end portions, to two sides of the inside of the backing strip opposed to each other with the pad between,

(iv) said protecting means having a central, greater part not attached to any portion of the backing strip not to the pad, but folded flatwise so as to make the entire bandage a relatively flat product for convenience of sale of the bandage to customers as a compact product,

(v) said central greater part of said protecting means being capable of being unfolded and a having a sufficient length to provide, together with the backing strip, a substantially completely enclosed, ample space through which a finger or a toe with a minor injury to be covered can be inserted when said central greater part is in the state of being unfolded, and

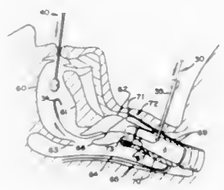
(vi) the backing strip being capable of being applied on the injury to cover the injury exactly with the pad, and said protecting means being capable of being pulled in different directions in a successive manner after the insertion of an injured finger or toe through said space and the covering of its injury with the pad, thereby attaching said opposed two sides of the inside of the backing strip to an area of the finger or toe other than its area of the injury while simultaneously removing said opposed end portions of said protecting means from said opposed two sides of the inside of the backing strip.

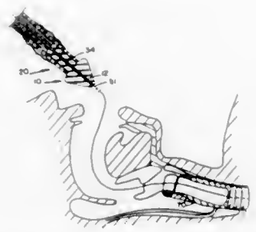
4,913,139

METHOD OF TRANSLARYNGEAL RETROGRADE TRACHEAL INTUBATION

Donald H. Ballew, 402 S. 12th Ave., Yakima, Wash. 98902

Filed Feb. 9, 1989, Ser. No. 308,850
Int. Cl.[4] A61M *15/00*
U.S. Cl. 128—200.11 **5 Claims**





1. A method of guided retrograde endotracheal intubation comprising the steps of:

(a) percutaneous translaryngeal insertion of a guide wire into a trachea, said guide wire having a superior, flexible configured tip;

(b) superior advancement of said guide wire and retrieval of said superior flexible tip in an oral pharynx;

(c) threading said superior flexible tip into and through an endotracheal tube assembly, said tube assembly having therein and inflated introducer so arranged and structured that a flexible tip of said introducer protrudes at the forward end of said tube assembly, said introducer having disposed longitudinally within it a guide tube for receiving said superior flexible tip and said guide wire;

(d) guiding said tube assembly inferiorly along said guide wire so that said tip of said introducer passes inferiorly through the oral pharynx, through a glottal opening and between the vocal chords; and

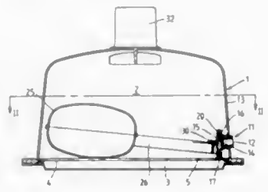
(e) inflating a cuff on said tube assembly to seal the airway of said trachea, deflating said introducer, and withdrawing said introducer and said guide wire superiorally from said tube assembly.

4,913,140

FLOAT-CONTROLLED HUMIDIFIER

Ilija Orec, and Erwin J. Meyer, both of Auckland, New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand

Filed Aug. 17, 1988, Ser. No. 233,078
Claims priority, application New Zealand, Sep. 7, 1987, 221689
Int. Cl.[4] A61M *11/04, 15/00*
U.S. Cl. 128—203.16 **11 Claims**



1. Apparatus for humidifying gases comprising:

a gas chamber having an inlet and an outlet to enable gases to be passed through said chamber;

a water compartment below and interconnected with said gas chamber;

a microporous wall between and common to said gas chamber and water compartment, said microporous wall being permeable to water vapor but substantially impermeable to liquid water;

at least one float in said gas chamber;

a water inlet means;

a water conduit leading from said inlet means to said water compartment; and

at least one water control valve comprising a movable valve member connected to said at least one float for operation thereby and a valve seat on said water conduit between said water inlet means and compartment, so that when more than a predetermined amount of water enters said gas chamber from said water compartment, said at least one float is raised by said water and actuates said movable valve member relative to and into closing engagement with said valve seat to prevent further entry of water into said water compartment.

4,913,141

APPARATUS AND METHOD FOR PLACEMENT OF A STENT WITHIN A SUBJECT VESSEL

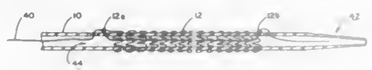
Richard A. Hillstead, Hollywood, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Oct. 25, 1988, Ser. No. 262,831
Int. Cl.[4] A61B *17/00*
U.S. Cl. 606—108 **10 Claims**

10. Apparatus for implanting a flexible, generally cylindrical, expandable stent within a blood vessel comprising:

an elongated catheter having a wall which defines a catheter passageway from a proximal end to a distal end of said catheter; said catheter having a stent delivery portion proximal of said distal end defined by spaced apart openings which extend through the catheter wall; and

a flexible elongated stent retaining means for insertion into the catheter passageway to extend from the proximal end



of the catheter to the openings in the delivery portion of the catheter where the stent retaining means passes through the catheter wall via said openings to engage said stent and couple the stent to the catheter as the stent is maneuvered within the blood vessel;

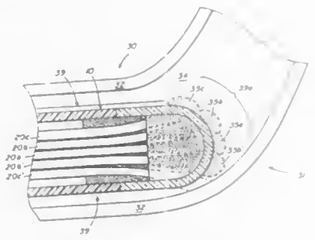
said flexible elongated stent retaining means being retractable to release said stent once the stent is properly positioned within the blood vessel.

4,913,142

CATHETER FOR LASER ANGIOSURGERY

Carter Kittrell, Cambridge, Mass.; Robert M. Cothren, Jr., Beatrice, Nebr., and Michael S. Feld, Waban, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 615,239, Mar. 22, 1985, abandoned. This application May 26, 1987, Ser. No. 58,675
Int. Cl.[4] A61B *17/36*
U.S. Cl. 606—7 **21 Claims**



1. A laser catheter for insertion into bodily cavities, ducts, vessels or arteries for precise delivery of light to treat tissue in said cavities, ducts, vessels or arteries comprising:

(a) a catheter with a proximal and distal end;

(b) a rigid optical shield on the distal end of the catheter forming an optically transparent enclosure over the end of the catheter to transmit laser radiation and displace bodily fluid such that direct contact can be made by a distal surface of the shield with such tissue;

(c) fiber optic means disposed within the catheter including a multiplicity of optical fibers the distal ends of which are bound together in an array and positioned at a fixed distance from the distal surface of the shield such that when selectively coupled at their proximal ends to a laser beam, a light spot pattern is formed on said shield capable of covering a substantial region of the distal surface of the shield with spots of controlled size to apply a predetermined dose of radiation on the distal surface of the shield for transmission to said tissue; and

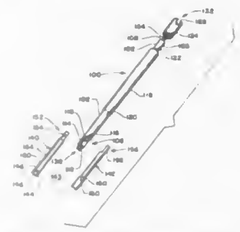
(d) selector means at the proximal end of the catheter for selecting which fibers are coupled to said laser beam in order to provide said light spot pattern.

4,913,143

TREPHINE ASSEMBLY

Clarence M. Oloff, and Harry T. Moore, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 28, 1986, Ser. No. 867,728
Int. Cl.[4] A61F *17/32*
U.S. Cl. 606—170 **15 Claims**



1. Trephine sample collecting apparatus comprising:

a arbor shaft member;

a hollow sleeve member telescopically received over said arbor shaft member;

a circumferentially segmented cutter bit engageable in torque transmitting relationship with an end portion of one of said arbor shaft and sleeve member and in axial position fixing relationship with one of said arbor shaft and sleeve member and retained in said relationships in response to predetermined relative positioning of said arbor shaft and sleeve member; and

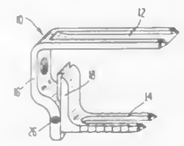
driving chuck means for rotationally engaging one of said arbor shaft and sleeve member at the cutter bit opposite end thereof and for simultaneously clamping said members in said predetermined relative position.

4,913,144

ADJUSTABLE STAPLE

Nilli Del Medico, Orbassano, Italy, assignor to D.A.O. s.r.l., Turin, Italy

Filed Feb. 9, 1989, Ser. No. 309,324
Claims priority, application Italy, Aug. 3, 1988, 53347/88[U]
Int. Cl.[4] A61B *17/04;* **A61F** *5/04;* **F16B** *15/00*
U.S. Cl. 606—75 **3 Claims**

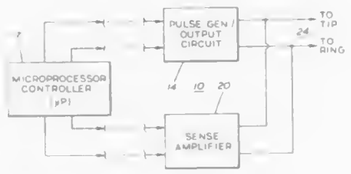


1. An adjustable staple to be used in bone surgery, comprising a horizontally laying U-shaped member having upper and lower tabs wherein the upper tab of the U-shaped member forms an upper arm of the staple, the lower tab forming a lower arm of the staple, and having a connecting segment between the tabs oriented substantially orthogonally to the two arms, including means facilitating movement of the lower arm of the staple, parallel to itself, and relative to the upper fixed arm, and means facilitating fastening of the lower arm in any selected position along said movement; said means facilitating movement further including a dovetail joint between a first portion of the connecting segment orthogonal to the upper arm and a second portion of the connecting segment orthogonal to the lower arm; said movement of the portion being capable of being manually carried out.

4,913,145
CARDIAC PACEMAKER WITH SWITCHED CAPACITOR AMPLIFIERS

Lawrence J. Stotts, Lake Jackson, Tex., assignor to Intermedics, Inc., Angleton, Tex.

Filed May 16, 1988, Ser. No. 194,174
Int. Cl.[4] A61N 1/00
U.S. Cl. 128—419 PG 13 Claims

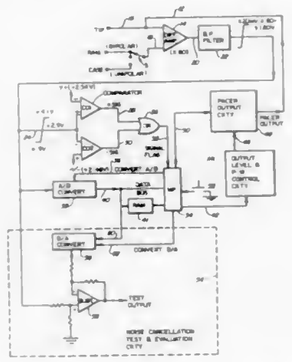


1. In a cardiac pacemaker,
means for detecting a signal representative of cardiac activity,
means for amplyifying the detected signal,
means responsive to the detected signal for selectively varying the amplification gain thereof, the said gain varying means comprising a plurality of switched capacitors,
means further responsive to the detected signal for passing frequency components of said signal lying in a selectively variable pass band, and
means responsive to the filtered and gain adjusted signal for comparison of a magnitude thereof to predetermined target levels for determination of heart rate, said comparison means including
a pair of signal comparators, and
means for generating at least two target levels for each said comparators, for comparison of the magnitude of the detected signal.

4,913,146
CARDIAC SENSE AMPLIFIER WITH PATTERN RECOGNITION CAPABILITIES

Robert DeCote, Jr., Miami, Fla., assignor to Telectronics Pacing Systems Inc., Englewood, Colo.

Filed Oct. 13, 1987, Ser. No. 108,777
Int. Cl.[4] A61N 1/00
U.S. Cl. 128—419 PG 2 Claims

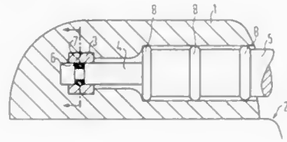


1. A cardiac sense amplifier network comprising:
means responsive to incoming electrical signals containing cardiac signals and noise signals for amplifying said electrical signals;
filter means for filtering said amplified electrical signals;
comparator means for comparing said filtered electrical signals with first and second reference voltages and for producing a flag signal indicative of when said filtered electrical signals exceed said first or second reference voltages;
said comparator means comprising a first comparator, a second comparator, and an OR logic gate;
digital data processing means being responsive to said flag signal for initializing said processor means and for generating a control signal;
analog-to-digital converting means responsive to said control signal for converting said filtered electrical signals to digital data signals corresponding to said cardiac signals and said noise signals; and
storage means for storing data representative of noise signals and for storing program instructions for causing said processing means to subtract said noise signals from said digital data signals in order to obtain said cardiac signals which are free of noise.

4,913,147
HEART PACEMAKER SYSTEM WITH SHAPE-MEMORY METAL COMPONENTS

Ulf Fahlstrom, Stockholm, and Jakub Hirschberg, Taeby, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 23, 1987, Ser. No. 100,250
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1986, 3632186
Int. Cl.[4] A61N 1/36
U.S. Cl. 128—419 P 13 Claims

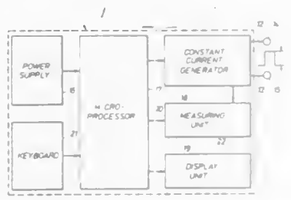


1. A heart pacemaker system comprising:
a pacemaker;
an electrode line having a proximal end connected to said pacemaker and a distal end, said proximal and distal ends defining a longitudinal direction therebetween;
fixing means disposed at said distal end of said electrode line for interacting with a wall of the heart of a patient to assist in retention of said distal end of said electrode line against said wall of the heart of a patient, said electrode line having an outer radial diameter adapted for permitting insertion of said electrode line through a vein of said patient; and
a component consisting of shape-memory metal separate from but in contact with said fixing means which assumes a first shape at a first temperature which maintains said fixing means substantially at said outer radial diameter of said electrode line, and which assumes a second shape at a second temperature causing said fixing means at said distal end to project radially beyond said outer diameter, said second shape differing from said first shape only by being radially larger than said first shape.

4,913,148
METHOD FOR THE TREATMENT OF HERPES SIMPLEX AND HERPES ZOSTER

Franz Diethelm, Triesen, Liechtenstein, assignor to Hepex Limited, Triesen, Liechtenstein

Continuation of Ser. No. 774,446, Sep. 10, 1985, abandoned. This application Nov. 16, 1988, Ser. No. 275,634
Claims priority, application Austria, Jul. 31, 1985, 2257/85
Int. Cl.[4] A61N 1/32
U.S. Cl. 128—421 8 Claims

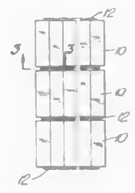


1. A method for the treatment, by accelerating the healing process, of acute herpes simplex and acute herpes zoster, and by the reduction of post-herpetic neuralgia, subsequent to determining a dermatome on a body, said dermatome including an area affected by herpes and comprising a corresponding sensory segmental nerve, comprising:
applying two conducting electrodes to the surface of said dermatome including an anode directly on the spinal ganglion of the most proximal portion of said corresponding nerve, and a cathode on the distal part of said dermatome;
supplying said two conducting electrodes with current from a source of electrical current having a constant frequency of about 30 Hz and in the shape of monopolar pulses of an approximately square wave-form having a duration of about 0.2 msec., and adjusting the current intensity in accordance with the respective skin resistance, whereby the healing process of herpes affections is accelerated, and occurrences of herpes and post-herpetic neuralgia are reduced.

4,913,149
MANIPULATABLE FABRIC

Margaret D. Rourick-Hamczyk, 342 E. 85th St., New York, N.Y. 10028

Continuation of Ser. No. 4,865, Jan. 20, 1987, abandoned. This application Aug. 5, 1988, Ser. No. 228,703
Int. Cl.[4] A63H 33/00
U.S. Cl. 446—486 2 Claims

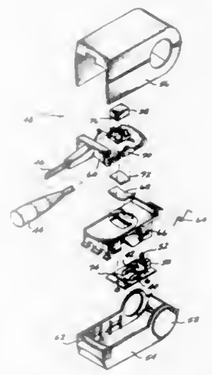


1. An manipulatable fabric comprising a plurality of block shaped members interconnected by elastic thread, said members having flattened abutting surfaces and abut one another in side by side relationship and face on another in close end to end relationship being separated at the ends by elastic thread, said members being arranged interconnected rows, each member having an axial channel for receiving thread, the members in each row being disposed so that the thread channels are arranged parallel to one another with the elastic being woven through a channel and along the end of one member and its adjoining member to the channel of the adjoining member and so on to hold the assemblage in a cohesive readily manipulatable whole, said assemblage being foldable into a variety of shapes.

4,913,150
METHOD AND APPARATUS FOR THE AUTOMATIC CALIBRATION OF SIGNALS EMPLOYED IN OXIMETRY

Peter W. Cheung, Mercer Island; Karl F. Ganglitz, Kirkland; Scott W. Hunsaker, Seattle; Stephen J. Prosser, Lynnwood; Darrell O. Wagner, Monroe, and Robert E. Smith, Edmonds, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.

Filed Aug. 18, 1986, Ser. No. 897,663
Int. Cl.[4] A61B 5/00
U.S. Cl. 128—633 17 Claims



1. An apparatus for receiving and processing signals produced by light detection means in response to the illumination of tissue having arterial blood flowing therein by light from first and second sources at separate temperature-dependent wavelengths, said signals containing information about the oxygen saturation of said arterial blood, said apparatus comprising:
temperature indication means for producing an indication of the temperature of said first and second light sources; and
processing means, responsive to said detection means signals and said indication of the temperature of said first and second light sources, for producing an indication of the oxygen saturation of said arterial blood flowing in said tissue that is compensated for the effect of temperature on the wavelengths of said first and second sources.

4,913,151
TOOL FOR PLACEMENT OF A MONITORING PROBE IN THE SCALP OF A FETUS

Norio Harui, 4902-46th Ave. South, Seattle, Wash. 98118, and Howard M. Hochberg, 14474-156th Ave. NE., Woodinville, Wash. 98072

Filed Jan. 5, 1989, Ser. No. 293,941
Int. Cl.[4] A61B 5/00, 5/02
U.S. Cl. 128—634 24 Claims

1. An article for securely attaching a monitoring device to the scalp of a fetus, comprising:
a probe including a spiral needle element and connections extending therefrom;

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a drive element having a forward end supporting the probe and a rear end, the drive element being flexible along its length and containing therewithin said connections for the probe, the drive element including means in the vicinity of the rear end thereof for rotating the drive element and hence the probe;

a rigid applicator tool receiving the drive element and the probe, the applicator tool having a longitudinal slot along one side thereof of sufficient width to accommodate passage of the drive element therewithin.

4,913,152

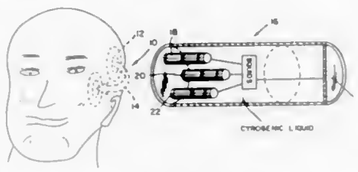
MAGNETOENCEPHALOGRAPH (MEG) USING A MULTI-AXIS MAGNETIC GRADIOMETER FOR LOCALIZATION AND TRACKING OF NEUROMAGNETIC SIGNALS

Harvey W. Ko, Columbia; Joseph P. Skura, Ellicott City, and Harry A. C. Eaton, Columbia, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Continuation of Ser. No. 187,620, Apr. 28, 1988, abandoned. This application Aug. 1, 1989, Ser. No. 390,495

Int. Cl.[4] A61B *5/05*

U.S. Cl. 128—653 R 7 Claims



1. A method for locating sources of magnetic signals emanating from a patient, comprising the steps of:

positioning a first bundle of at least three single-axis magnetometers near a patient with the magnetometers oriented to measure the same vector component (z) of the biomagnetic field but with the magnetometers laterally displaced from each other;

differencing signals obtained from sets of two magnetometers to calculate lateral spatial gradients of the measured biomagnetic field; and,

calculating a two-dimensional location for the source of the biomagnetic field by analyzing the lateral spatial gradients.

4,913,153

PERSONAL DOSIMETER

Mark J. Hagmann, Miami, and Tadeusz M. Babij, Fort Lauderdale, both of Fla., assignors to Florida International University, Miami, Fla.

Filed Nov. 13, 1987, Ser. No. 120,076

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—653 R 19 Claims

1. A detector for noninvasively determining the specific absorption rate of high frequency electromagnetic energy in an animal body subjected to such radiation by measuring electric current flowing through said body as a manifestation of said specific absorption rate, said detector comprising:

means for detecting current, including a helical coil of electrical conductor material having two ends and a lead extending from each end and a shield surrounding said coil;

flexible means for containing said current detector means and for being affixed around a portion of the body so that

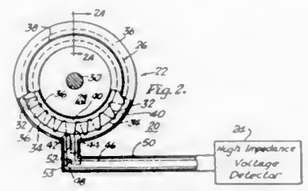


Fig. 2.

said two ends are substantially juxtaposed to one another to form a closed loop coil around said body portion; and

means coupled to said leads for detecting a voltage induced in said coil by the current flowing through said body;

wherein said electrical conductor material is of a high resistivity material; and

wherein the ratio of volume resistivity to the thickness of the electrical conductor material is in the range of 1000 to 1,000,000 ohms.

4,913,154

MEDICAL EXAMINATION INSTALLATION WITH IMPROVED IMAGE CONTRAST

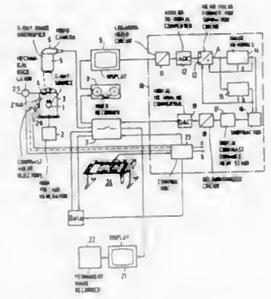
Helmut Ermert, Roettenbach; Manfred Pfeiler, and Karl Barth, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 26, 1988, Ser. No. 249,516

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1987, 3739229

Int. Cl.[4] A61B *6/00*

U.S. Cl. 128—654 8 Claims



1. A medical installation for examining a patient comprising:

means adapted for subjecting at least a portion of said patient to an examination field during an exposure time;

means for detecting said examination field attenuated by said patient;

means connected to said means for detecting for generating a visual image of said portion of said patient; and

means for intermittently injecting contrast agent into said patient at least during said exposure time at a selected frequency.

4,913,155

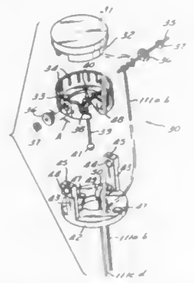
ULTRASONIC TRANSDUCER PROBE ASSEMBLY

Julian Dow, San Clemente, and Paul Meyers, San Juan Capistrano, both of Calif., assignors to Capistrano Labs, Inc., San Clemente, Calif.

Continuation of Ser. No. 47,479, May 11, 1987, abandoned. This application Oct. 24, 1988, Ser. No. 267,110

Int. Cl.[4] A61B *8/00*

U.S. Cl. 128—660.1 7 Claims



1. In an ultrasonic transducer probe assembly having a transducer mechanically actuable for pivoting and a linear motor imparting linear reciprocating motion, an improvement to the mechanical linkage by which a reciprocating element of the linear motor imparts pivoting motion to the transducer, the improved mechanical linkage comprising:

a crankshaft, extending between a point of connection to the reciprocating element of the linear motor and a point of connection to the pivotable transducer located off a pivot axis thereof, in order that a linear reciprocating force of the element may be axially transmitted along the crankshaft to impart pivoting motion to the transducer said crankshaft including means for allowing three dimensional motion of said crankshaft with respect to at least one of said points of connection, whereby the crankshaft is incapable of transmitting torque between the reciprocating element and the pivotable transducer.

4,913,156

LITHOTRIPSY SYSTEM HAVING AN ULTRASONIC CALCULI LOCATOR

Dan Inbar, Haifa; Daniel I. Barnea, Tel Aviv, and Abraham Bruck, Haifa, all of Israel, assignors to Elscint Ltd., Haifa, Israel

Continuation of Ser. No. 268,621, Nov. 2, 1988, abandoned, which is a continuation of Ser. No. 737,532, May 24, 1985, abandoned. This application Sep. 5, 1989, Ser. No. 403,067

Int. Cl.[4] A61B *17/22, 8/00*

U.S. Cl. 128—660.03 7 Claims

1. A calculi locator in combination with a spark gap shock wave generator for shattering calculi in body organs of a patient, said shock wave generator comprising:

spark gap terminals located at a source focal point in an ellipsoidal reflector for producing shock waves that are reflectively focused at a target focal point spaced apart from said spark gap terminals; said calculi locator comprising:

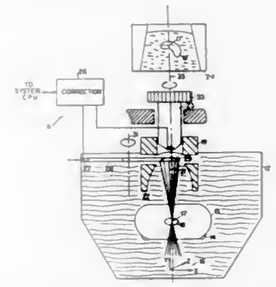
ultrasound transducer scanning means providing ultrasound transmitter signals and receiving echo signals,

means for using said echo signals for obtaining an image location of calculi in a patient for use in positioning the calculi at the target focal point,

means for positioning said ultrasound transducer scanning means outside of said ellipsoidal reflector along the longitudinal axis of the ellipsoidal reflector on the side of said spark gap terminals away from said patient so that shock waves produced by the shock wave generator and said ultrasound signals pass through the same acoustic window;

a portion of said ellipsoidal reflector that traverses the longitudinal axis and that is in front of said transducer scanning means being movable away from the front of said transducer scanning means;

aperture means being movable into the place of the movable portion of said ellipsoidal reflector in front of said transducer scanning means when said transducer scanning means is transmitting or receiving,



ultrasound image means for assuring coincidence of the true location of the calculi and the image location to correctly place the calculi at the shock wave generator target focal point, and

means for selectively placing said aperture means or said movable portion of the ellipsoidal reflector, respectively, in front of said transducer scanning means to minimize interference with said transmitting and receiving when the transducer scanning means is operative or to maximize shock waves received at the target focal point when said shock wave generator is operative.

4,913,157

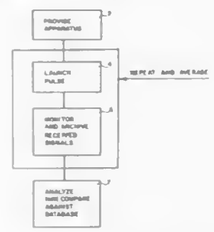
ULTRASOUND METHOD AND APPARATUS FOR EVALUATING, IN VIVO, BONE CONDITIONS

George W. Pratt, Jr., Wayland, Mass., and Paul Duchnowski, Staten Island, N.Y., assignors to Analog Devices, Inc., Norwood, Mass.

Filed Jun. 3, 1986, Ser. No. 870,175

Int. Cl.[4] A61B *8/00*

U.S. Cl. 128—661.03 88 Claims



1. A method of assessing the condition of a bony member of a patient comprising the steps of:

a. launching into the patient an ultrasound signal having at least one component at a frequency greater than a first predetermined frequency and at least one other component at a frequency less than a second predetermined frequency, such signal being launched into a first position

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proximate the surface of a bony member which may be surrounded by minimal soft tissue;

b. proximate a second position on the surface of said bony member, monitoring the ultrasound spectrum inclusive of said frequencies and generating electrical signals (termed "received signals") corresponding to the energy in said monitored ultrasound spectrum;

c. extracting from the received signals the components thereof at frequencies greater than the first predetermined frequency, thus providing a time-domain high frequency signal, and extracting the components thereof at frequencies less than the second predetermined frequency, thereby providing a time-domain low frequency signal; and

d. comparing the time-domain high frequency signal to the time-domain low frequency signal, to provide an indicator of the condition of the bony member.

4,913,158

ULTRASONIC PROBE FOR MEDICAL DIAGNOSTIC EXAMINATIONS

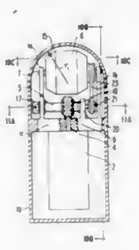
Koh Kikuchi, Ota; Yasuyuki Morita, Yokohama, and Yoshiyuki Sugiyama, Ayase, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 8,955, Jan. 30, 1987, abandoned. This application Jul. 19, 1988, Ser. No. 222,394

Claims priority, application Japan, Jan. 30, 1986, 61-18417; Feb. 18, 1986, 61-22741; Apr. 1, 1986, 61-74771; Jun. 6, 1986, 61-87077; Jul. 16, 1986, 61-198885; Jul. 18, 1986, 61-111023; Nov. 18, 1986, 61-177201

Int. Cl.[4] A61B *8/00*

U.S. Cl. 128—660.1 21 Claims



1. An ultrasonic probe comprising:

a motor having a driving shaft;

first and second supporting frames;

a rotary shaft rotatably supported between said first and second supporting frames in a direction perpendicular to the direction of said driving shaft of said motor, and first and second bearing means in said supporting frames in which said rotary shaft is supported:

a rotor shaft rotatably supported between said first and second supporting frames in a direction parallel to the direction of said rotary shaft, and third and fourth bearing means in said supporting frames in which said rotor shaft is supported;

a rotor having a surface and through the center of which rotor said rotor shaft extends and rotatable with said rotor shaft;

ultrasonic transducing means mounted on the surface of said rotor;

screw gear means mechanically coupling said driving motor and said rotary shaft for transmitting rotation of said driving shaft to said rotary shaft and reducing the speed of said rotary shaft from the speed of said driving rotor to a desired speed; and

transmitting means coupling said rotary shaft and said rotor shaft for transmitting rotation of said rotary shaft to said rotor shaft.

4,913,159

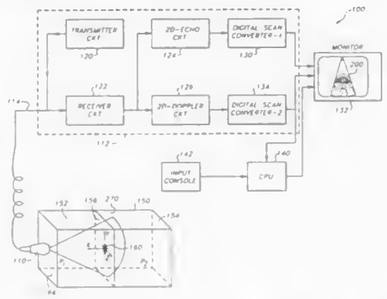
METHOD FOR DETERMINING BLOOD FLOW THROUGH A NARROWED ORIFICE USING COLOR DOPPLER ECHOCARDIOGRAPHY

Julius M. Gardin, Long Beach, Calif.; Toshio Ogawa, Tokyo, Japan; Toshinori Utsunomiya, Santa Ana, and Hoang A. Tang, Orange, both of Calif., assignors to Hitachi Medial Corp., Tokyo, Japan and The Regents of the University of California, Oakland, Calif.

Filed Mar. 17, 1989, Ser. No. 325,562

Int. Cl.[4] A61B *8/00*

U.S. Cl. 128—661.1 7 Claims



1. A method for determining a volume of flow through an orifice at a wall which separates a first chamber and a second chamber in an object, comprising the steps of:

transmitting ultrasonic beams to said first chamber from first and second locations proximal to said orifice and measuring at least first and second flow velocity distributions in said first chamber using the Doppler shift of ultrasonic waves reflected from particles in said flow;

defining an isovelocity surface on which a plurality of isovelocity points within said first and second flow velocity distributions indicate a specified velocity, said isovelocity surface defined by an elliptical model; and

estimating said volume of flow by calculating the area of said surface of said elliptical model and by multiplying said area by said specified velocity.

4,913,160

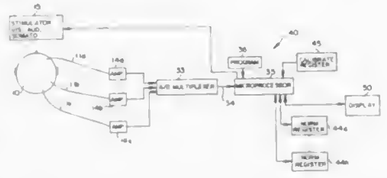
ELECTROENCEPHALOGRAPHIC SYSTEM AND METHOD USING FACTOR STRUCTURE OF THE EVOKED POTENTIALS

Erwin R. John, Mamaroneck, N.Y., assignor to New York University, New York, N.Y.

Continuation-in-part of Ser. No. 103,181, Sep. 30, 1987, abandoned. This applicatioo Mar. 21, 1988, Ser. No. 171,109

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—731 14 Claims



1. The method of analyzing the brain waves of a human subject to determine the presence, degree and type of evoked potential abnormality, the method consisting of the steps, in sequence, of:

removably securing a plurality of electrodes i to the scalp of the patient, automatically presenting a sequence of stimuli to the patient to evoke brainwave potentials (EP) at the electrodes;

detecting the said EP brainwaves, amplifying the detected brainwaves, converting the amplified brainwaves into digital form, averaging the digitized brainwaves to produce average evoked responses (AER) for analysis in a digital processing computer system having computer memory;

decomposing the average evoked responses (AER) by factor analysis, in which each AER from each electrode is compared to pre-formulated factor waveforms stored in the computer memory to determine the amount of voltage that each pre-formulated factor waveform contributes to said AER to thereby produce a factor score a_{ij}, quantifying the contribution of each factor j to the AER from any electrode i;

subjecting the results of the said factor score to Z-transform, wherein each of said factor scores is compared to norms stored in the computer memory to produce a factor Z-score, corresponding to a determination of waveshape normalcy and the degree of abnormality of each of said AER's and

displaying the said normalcy and degree of abnormality on a color-coded topographic map comprising a head diagram in which each area of the head represents an electrode location and the colors represent normalcy and the degree of abnormality reflected by the factor Z-score.

4,913,161

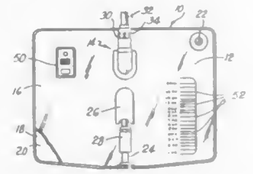
BAG-TILT INDICATOR ON URINE BAG

Frank Villari, Oak Park, and Brian H. Silver, Hoffman Estates, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Dec. 23, 1987, Ser. No. 137,275

Int. Cl.[4] A61M *1/00*

U.S. Cl. 128—766 12 Claims



1. A tilt bag indicating device for a urine collection bag which receives a volume of urine from a patient, comprising:

a container having a drainage tube and a chamber for receipt of urine, said chamber being defined by a back wall and a front wall joined at their common periphery;

a connector means for conducting fluid from the drainage tube to said chamber of the container;

an indicator means having dimensions substantially smaller than the container and arranged on the front wall of said container to define an indicator chamber to receive and trap urine therein, if said container is tipped on its side with urine therein;

an orifice disposed through said front wall adjacent said indicating means to permit fluid communication between the chamber of the container and said indicator chamber; and

a vent disposed through said indicating device establishing sensitivity of said indicating device during the tilting thereof.

4,913,162

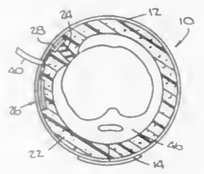
NOCTURNAL PENILE TUMESCENE AND RIGIDITY MONITOR

William N. Leang, and Larry J. Brick, both of Caledonia, Wis., assignors to Medical Engineering Corporation, Racine, Wis.

Filed May 27, 1988, Ser. No. 200,040

Int. Cl.[4] A61B *5/10*

U.S. Cl. 128—774 27 Claims



1. A nocturnal penile tumescence and rigidity sensor comprising:

a. a flexible, foldable member,

b. means for securing said foldable member around the penis in the form of a loop,

c. tumescence sensing means joined to said foldable member for sensing penile tumescence, said tumescence sensing means including foam material joined to said foldable member, said foam material projecting from said foldable member toward said penis when said foldable member is formed into said loop such that said foam material receives compressive forces due to penile tumescence under preselected conditions of penile tumescence, said tumescence sensing means including means responsive to compression of said foam material for providing an electrical output signal proportional to the amount of said compressive force imposed by said penis on said foam material under said condition of penile tumescence when said foldable member is formed into said loop, and

d. rigidity sensing means joined to said foldable member for sensing penile rigidity.

4,913,163

MEASUREMENT OF LAXITY OF ANTERIOR CRUCIATE LIGAMENT

Gregory J. Roger, 5 Kent Street, Collaroy, Australia (2097), and Mervin J. Cross, 26 Ridge Street, North Sydney, Australia (2060)

PCT No. PCT/AU87/00087, § 371 Date Nov. 5, 1987, § 102(e) Date Nov. 5, 1987, PCT Pub. No. WO87/05789, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 27, 1987, Ser. No. 153,269

Claims priority, application Australia, Mar. 27, 1986, PH5236; Aug. 8, 1986, PH7352

Int. Cl.[4] A61B *5/10*

U.S. Cl. 128—782 7 Claims

1. A device (10) for the measurement of laxity of the knee of a patient, comprising:

a frame (11);

first support means (12) mounted to the frame (11) for supporting the thigh of a patient;

second support means (13) mounted to the frame (11) for supporting and holding one of the foot, ankle or lower leg of the patient, said second support means (13) being mounted to said frame (11) through a support member (14, 15) provided with at least one force transducer (16) adapted to measure the force applied by the patient to the leg supported thereon in endeavoring to straighten the leg supported thereon as by tensioning the quadriceps muscle thereof; and

measurement means (24, 25, 26) for measuring movement of the tibial tuberosity of the said leg of the patient so sup-

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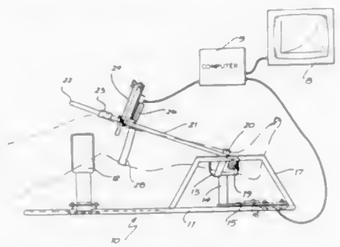
ported on said first and second support means, or of a portion of the patient's anatomy which moves with said tibial tuberosity, relative to the femur of said leg or a portion of said leg which moves with said femur;



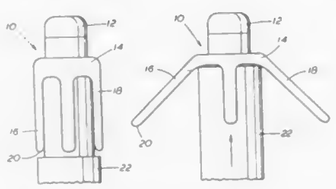
wherein said first and second support means (12, 13) are so located relative one another on said frame as to cause the said leg of the patient so supported thereby to be bent at the knee.

4,913,164

EXTENSIBLE PASSIVE FIXATION MECHANISM FOR LEAD ASSEMBLY OF AN IMPLANTABLE CARDIAC STIMULATOR

Donald R. Greene, Phoenix, Ariz., and James I. Bradshaw, Surfside, Tex., assignors to Intermedics, Inc., Angleton, Tex.

Filed Sep. 27, 1988, Ser. No. 249,977
Int. Cl.[4] A61N *1/05*
U.S. Cl. 128—785 20 Claims



1. A passive fixation mechanism for an endocardial lead with a distal and a proximal end and a stimulating electrode on said distal end comprising:

a plurality of flexible tine means each adapted to be fastened at one end to the distal end of the lead in the vicinity of the electrode for engaging tissue without penetration thereof, each of said tine means resiliently biased to lie in a position parallel to a distal surface of said lead with a respective free end thereof pointing away from the electrode but being sufficiently flexible to be moved outwardly to a position at an angle to and projecting from the distal surface of said lead from the respective fastened end thereof, and

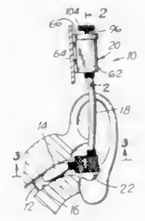
deploying means for selectively forcing each of the tine means outwardly to said angled position for engaging tissue at the respective free end thereof.

4,913,165

UNDERWATER EARDRUM PROTECTOR

Michael Fishgoyt, 654 Water St., Apt. 4A, New York, N.Y. 10002, assignor to Michael Fishgoyt, New York and Elena Helmur, Staten Island, both of, N.Y.

Filed Jul. 24, 1989, Ser. No. 384,405
Int. Cl.[4] A61F *11/02*
U.S. Cl. 128—865 32 Claims



1. An eardrum protector for use in water sports said protector comprising:

(a) inflatable bladder means, insertable in an ear canal of the person, for plugging the ear canal;

(b) tubing means for supplying a non-compressible fluid into said inflatable bladder means to inflate said inflatable bladder means; and

(c) pump means for supplying said non-compressible fluid to said tubing means, said pump means including:

(i) a cylinder,

(ii) means defining a variable volume chamber in said cylinder, said chamber being in fluid communication with said tubing means, and

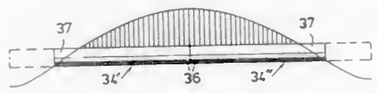
(iii) rod means for reducing the volume of said chamber so as to force said non-compressible fluid in said chamber through said tubing means and into said inflatable bladder means, said rod means being connected to said means defining the variable volume chamber in a freely rotatable manner and being threadedly connected with said cylinder.

4,913,166

METHOD FOR ADDING A FLAVORING SUBSTANCE TO A TOBACCO ROD AND APPARATUS FOR CARRYING OUT THE METHOD

Eje Christensson, Huddinge, and Erik Falke, Stockholm, both of Sweden, assignors to Svenska Tobaks AB, Stockholm, Sweden

Filed Aug. 15, 1988, Ser. No. 232,159
Claims priority, application Sweden, Sep. 11, 1987, 8703528
Int. Cl.[4] A24C *5/18*
U.S. Cl. 131—31 18 Claims



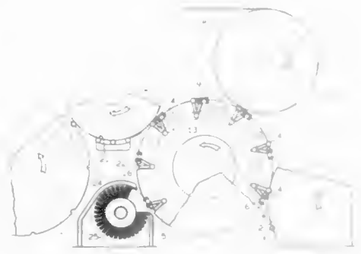
1. A method of supplying at least one flavouring substance to a moving tobacco rod (5) in the manufacture of cigarettes, by delivering a flow of flavouring substance to the tobacco rod (5) with the aid of a feed arrangement, characterized by controlling the flow of flavouring substance periodically between a flow of maximum value and a flow of minimum value, and applying the maximum flow to those parts (36) of the tobacco rod which each include the tip-end of a cigarette, and applying the minimum flow to the opposite end part (37) of the cigarette.

4,913,167

FILTER FITTING MACHINE

Mattei Riccardo, Bologna, Italy, assignor to G.D. Società per Azioni, Bologna, Italy

Filed Oct. 1, 1987, Ser. No. 103,896
Claims priority, application Italy, Oct. 17, 1986, 3544 A/86
Int. Cl.[4] A24C *1/32, 5/48, 5/58*
U.S. Cl. 131—94 3 Claims



1. A filter fitting machine comprising:

in inlet roller;

equidistant peripheral seats on said inlet roller, each of said seats being capable of receiving and retaining by suction a group consisting of two coaxial cigarette portions separated by a double filter;

a rolling unit comprising conveyor means, a rolling roller, and a rolling bed, said conveyor means comprising an advancement roller rotatable about an axis parallel to the axis of rotation of said inlet roller, said rolling roller being located substantially tangentially to said advancement roller and cooperating with said rolling bed for wrapping said band about an intermediate portion of each of said group;

support elements peripherally and equidistantly provided on said conveyor means and being capable of receiving one of said groups fed by said inlet roller and thereby advancing said received group along a determined path, said support elements each comprising a suction seat and an appendix positioned apart from said suction seat and extending outwardly from said advancement roller to support one end of said band;

feed means for feeding a gummed band into contact with each of said groups carried by said support elements;

retaining means associated with said support elements for retaining one each of said bands in contact with one each of said group, said retaining means comprising in each support element a suction element positioned between said suction seat and said appendix; and

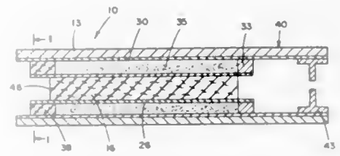
an air flow distributor means and a suction air source connected to said air flow distributor means, said air flow distributor means communicating with said suction elements, wherein said air flow distributor means are located along that portion of the path of said groups lying between the position in which said advancement roller is tangential to said feed means and the position in which said advancement roller is tangential to said rolling roller.

4,913,168

FLAVOR DELIVERY ARTICLE

Dennis L. Potter, Kernersville; Mark L. Raker, Clemmons; Henry T. Ridings, Lewisville; Andrew J. Sensabaugh, Jr., Winston-Salem; Amos E. Westmoreland, Winston-Salem; Donna K. Woods, Winston-Salem, and Chandra K. Banerjee, Pfafftown, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Nov. 30, 1988, Ser. No. 278,060
Int. Cl.[4] A24F *1/00*
U.S. Cl. 131—194 69 Claims



1. A flavor delivery article comprising:

(a) a flavor; and

(b) a physically separate, non-combustion heat source for heating the flavor, and including

(i) a first chemical agent capable of interacting exothermically with a second chemical agent, and a third chemical agent capable of interacting exothermically with the first chemical agent, and

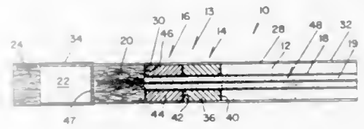
(ii) a dispersing agent for the first agent.

4,913,169

SMOKING ARTICLE

Lerol K. Templeton, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Mar. 17, 1989, Ser. No. 325,330
Int. Cl.[4] A24D *3/04*
U.S. Cl. 131—194 17 Claims



1. A smoking article comprising:

a generally cylindrical fuel rod;

a generally cylindrical thermal insulation section coaxially located at one end of the fuel rod;

a tube extending concentrically through the fuel rod and thermal insulation section;

a non-combustible air permeable substrate disposed within the tube;

an aerosol generating substance included in the substrate;

a tobacco plug coaxially located at the other end of the thermal insulation section opposite the fuel rod;

means defining a cooling chamber at the other end of the tobacco plug opposite the thermal insulation section; and,

heat conducting means extending through the substrate in the tube longitudinally of the tube and into the tobacco plug.

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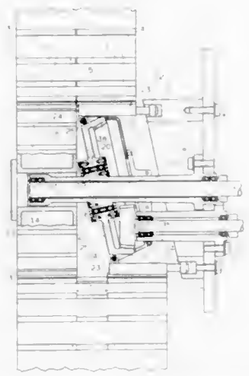
4,913,170
AXIAL CIGARETTE DISPLACING DEVICE
Igino Conti, Bologna, Italy, assignor to G.D Societa Per Azioni, Turin, Italy
Filed May 24, 1988, Ser. No. 198,003
Claims priority, application Italy, May 28, 1987, 3493 A/87
Int. Cl.[4] A24C *5/32*
U.S. Cl. 131—282 8 Claims



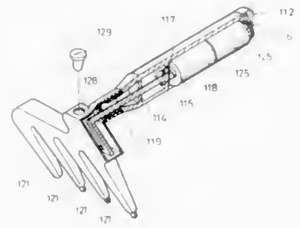
1. A device for axially displacing cigarettes (2) aranged side by side in two substantially parallel rows advancing in a direction (3, 4) substantially perpendicular to the axes of the cigarettes (2); the device (1) comprising an input roller (5) and an output roller (6 or 44) mounted for rotation about the parallel axes of said input and output rollers and designed to feed the cigarettes (2) in the direction along the routes of advancing rows of cigarettes which are substantially perpendicular to the axis of said cigarettes, and transfer means (9 or 39 or 45) for transferring both rows of cigarettes (3, 4) from the input roller (5) to the output roller (6 or 44); said transfer means comprising a transfer roller (21 or 40 or 46) mounted for rotation about an axis (18) inclined with respect to the axes of the input (5) and output (6 or 44) rollers for separating at least one of said rows of cigarettes to a given distance (D) in a direction parallel with said axis of the cigarettes (2); each of said transfer roller, input roller and output roller having peripheral seats (23 or 47) for accommodating said cigarettes, and one of said transfer, input and output rollers being an adapter roller, said adapter roller comprising the respective peripheral seats (23 or 47) for accommodating said cigarettes (2) in said one of said rows of said cigarettes (4), and a plurality of swing supports (24; 48), each swing support having a peripheral cigarette seat, mounted for swinging in a radial plane of the adapter roller and about an axis perpendicular to the rotation axis (18 or 8) of the adapter roller.

4,913,171
CIGARETTE AND METHOD OF MANUFACTURE
Leonard J. Lasko, 414 Texas St., San Francisco, Calif. 94107
Filed Nov. 25, 1987, Ser. No. 125,137
Int. Cl.[4] A24C *5/00*; A24F *1/00*
U.S. Cl. 131—360 8 Claims

1. An improved cigarette comprising:
an elongated paper cylinder having an outside surface and an inside surface, and an interior volume, said interior volume having a longitudinal axis;
a generally hollow central air tube portion having an inside surface and an outside surface, said air tube extending along said interior volume longitudinal axis and including a plurality of filter flap members extending generally radially inward from said air tube inside surface; and
a paper layer defining a diminishing-radius spiral extending from said paper cylinder inside surface to said central air tube outside surface, wherein a smoking substance is cap-

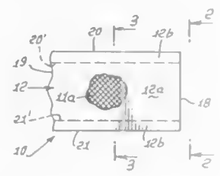
tured adjacent said paper layer and between said paper cylinder inside surface and said central air tube outside surface.

4,913,172
COMB STRUCTURE WITH OINTMENT
Fargo Chou, 306 Chung Cheng Rd., Yung-Ho City 23433, Taipei, Taiwan
Filed Dec. 19, 1988, Ser. No. 286,350
Int. Cl.[4] A45D *24/24*, *24/10*
U.S. Cl. 132—118 3 Claims



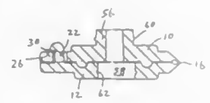
1. A comb structure for use on fur-bearing animals or fur-bearing animal skins, comprising a hollow tooth housing having a plural number of hollow teeth extending therefrom in a common tooth plane, and a handle-attachment surface facing away from the hollow teeth; each tooth having at least one liquid discharge opening therein the vicinity of the tip area of the tooth;
an elongated rigid hollow handle adjustably attached to the hollow housing for manual movement of the teeth through animal fur;
said handle having one end thereof overlying the attachment surface on the tooth housing;
said one end of the handle having a transverse hole extending therethrough, said housing having a threaded opening (18) aligned with said transverse hole;
a screw connector (20) extendable through said transverse hole into the threaded opening to connect the handle to the tooth housing; said screw connector forming the sole attachment connection between the handle and tooth housing;
said handle being rotationally adjustable around the screw connector axis for adjustment between a first position extending crosswise of the tooth plane in a rake-like "T" configuration, and a second position extending generally within the tooth plane in a "comb" configuration;
said handle and housing having communicating cavities therein for containment of a liquid ointment adapted for outflow through said liquid discharge openings.

4,913,173
HIGH EFFICIENCY WRAP PACKAGE, AND PROCESS, FOR NAILS
Yosh Hokama, Torrance, and Luis Romero, Lawndale, both of Calif., assignors to International Beauty Distributors, Inc., Gardena, Calif.
Continuation-in-part of Ser. No. 66,267, Jun. 25, 1987, Pat. No. 4,767,648. This application May 26, 1988, Ser. No. 199,054
Int. Cl.[4] A45D *29/00*
U.S. Cl. 132—73 22 Claims



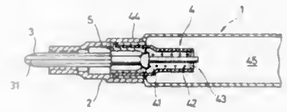
13. In apparatus for strengthening a nail, the combination that comprises:
(a) a flexible package that includes a fabric layer to be applied to the nail, and a flexible plastic overlay sheet,
(b) the overlay sheet including first and second portions, and the fabric layer including first and second parts, said second portion retained to said second part, and said first portion free of attachment to said first part,
(c) the package sized to be positioned with said first part of the fabric layer applied onto the nail in the presence of liquid adhesive, whereby rubbing of said first portion of the overlay sheet against and relative to said first part of the fabric layer effects smoothing of said first part of the fabric layer causing the adhesive to smoothly bond said first part of the fabric layer to the nail,
(d) the overlay sheet and the fabric layer having adjacent edges, and said second portion of the overlay sheet being attached to said second part of the fabric layer at local zones proximate said adjacent edges.

4,913,174
HAIR FASTENER
John M. Cusenza, Tarzana, Calif., assignor to Cusenza Partnership, Woodland Hills, Calif.
Filed Dec. 4, 1987, Ser. No. 128,778
Int. Cl.[4] A45D *8/00*
U.S. Cl. 132—278 12 Claims



1. A hair fastener for holding strands of hair, comprising:
a first snap portion having an inner grip surface and an outer surface;
a second snap portion having an inner grip surface and an outer surface;
means for securing the two portions together in a closed position in which the inner surfaces of the portions face and abut one another to thereby secure strands of hair between the inner surfaces of the portions; and
means integrally carried on the outer surface of the fastener for releasably coupling the fastener in a closed position directly to another similar fastener.

4,913,175
LIQUID-APPLYING TIP ASSEMBLY
Takehiko Yokosuka; Osami Yamauchi, and Hiroshi Kato, all of Aichi, Japan, assignors to Pilot Ink Co., Ltd., Aichi, Japan
Continuation of Ser. No. 886,849, Jul. 18, 1986, abandoned. This application Oct. 12, 1988, Ser. No. 256,262
Claims priority, application Japan, Jul. 19, 1985, 60-111713[U]; Nov. 27, 1985, 60-182439[U]; Nov. 27, 1985, 60-182440[U]
Int. Cl.[4] A45D *40/24*
U.S. Cl. 132—317 4 Claims



1. A liquid-applying member;
a hollow cylinder;
a liquid-applying member protruding forwardly from said cylinder;
a reservoir for a liquid disposed behind said liquid-applying member;
a valve mechanism having a valve disposed between said liquid-applying member and said reservoir, said valve operable by rearward motion of said liquid-applying member to allow a flow of said liquid from said reservoir to said liquid-applying member; and
a non-porous barrier disposed between said valve and said front portion of said hollow cylinder and having a central aperture through which said liquid-applying member passes, said aperture having a diameter slightly larger than an outside diameter of said liquid-applying member;
wherein said liquid-applying member comprises;
an axial core; and
a plurality of ribs in an axial direction of said core and extending radially from said core, a plurality of axial flow passages for said liquid being formed on the circumferential periphery of said axial core between said ribs along the entire length thereof, each of said plurality of ribs comprising, in cross section, a plurality of convex arcuate portions in contact with each other, and said liquid-applying member being made of thermoplastic resin,
wherein said barrier controls a flow of said liquid from said reservoir and slidably supports said liquid-applying member, in which said liquid-applying member is elastically deformed to change a writing width and to change a width of each of said plurality of axial flow passages by adjusting a writing pressure so that said liquid is dynamically held in said axial flow passage to be prevented from clogging therein.

4,913,176
DENTAL PICK
Richard G. DeNiro, 1118 E. Adams, Orange, Calif. 92667
Filed Sep. 12, 1988, Ser. No. 243,449
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—329 3 Claims

1. A dental instrument for removing food, plaque, and other debris from the interproximal spaces between teeth and subgingivally, said instrument comprising:
a handle portion for gripping and providing structural support to the device, said handle portion being hourglass shaped and including first and second enlarged bulbous gripping portions, for enabling the device to be grasped and used at two different operational lengths; and
an elongated neck portion, having a proximal end and a distal end and integrally connected to said handle portion, said neck portion adapted for insertion between adjacent

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teeth, said neck portion having a thickness substantially less than the thickness of said handle portion, said thickness of said neck portion also having a substantially con-

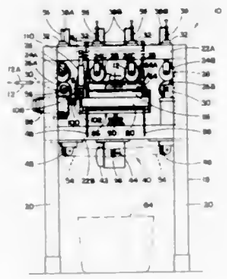
stant thickness in at least one longitudinal elevational plane, wherein at least a segment of said neck portion is sufficiently narrow to enable said segment to be positioned entirely subgingivally.

4,913,177

NUCLEAR FUEL ROD WIPING APPARATUS AND METHOD

Stuart L. Rieben, Mt. Lebanon Twp., Allegheny County, Pa., and Joseph J. Scherpenberg, Columbia, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 25, 1988, Ser. No. 275,842
Int. Cl.[4] B08B *9/02*
U.S. Cl. 134—9 **26 Claims**



1. An apparatus for wiping an exterior surface of a tube, said wiping apparatus comprising:

(a) means for moving a tube along a first path while concurrently rotating the tube about its own longitudinal axis; and

(b) means for moving a web of toweling along a second path generally across said first path and into contact with the tube moving along said first path so as to perform wiping of the exterior surface of the tube.

4,913,178

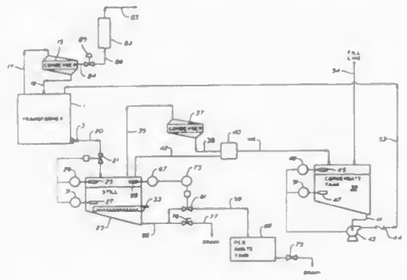
PROCESS AND APPARATUS FOR REMOVING PCB'S FROM ELECTRICAL APPARATUS

David E. Fowler, Gainesville, Fla., assignor to Quadrex HPS Inc., Gainesville, Fla.

Continuation of Ser. No. 37,640, Apr. 13, 1987, abandoned, which is a continuation of Ser. No. 631,909, Jul. 18, 1984, Pat. No. 4,685,972. This application Aug. 18, 1988, Ser. No. 235,838
The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.
Int. Cl.[4] B08B *3/08*
U.S. Cl. 134—12 **33 Claims**

1. A process for removing polychlorinated biphenyls from both an operating and non-operating electrical apparatus comprising:

(a) introducing a dielectric fluid in which polychlorinated biphenyls are soluble, to the electrical apparatus to that the polychlorinated biphenyls contained within the electrical apparatus form a solution with said dielectric fluid, said dielectric fluid being selected from the group consisting of trichlorotrifluoroethane, perchloroethylene and mixtures thereof;



(b) removing said solution from the electrical apparatus to a distilling means, said dielectric fluid being separable from the polychlorinated biphenyls by distillation;

(c) distilling said solution to thereby separate polychlorinated biphenyls from said dielectric fluid so that said dielectric fluid is reusable in substantially pure form;

(d) providing additional dielectric fluid back to the electrical apparatus through a conduit circuit connected to said distilling means and to the electrical apparatus so that the electrical apparatus remains operable during said introducing, removing and distilling steps.

4,913,179

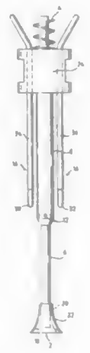
DEVICE FOR WASHING OFF THE INNER SURFACE OF A REACTION VESSEL AND/OR OF THE OUTER SURFACE OF A SPHEROIDAL REAGENT BODY

Wolf D. Engel, Pähl; Johann Karl, Weilheim, and Friedrich Stäbler, Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Dec. 23, 1988, Ser. No. 288,996
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1988, 3800379
Int. Cl.[4] B08B *3/04, 9/08*
U.S. Cl. 134—113 **7 Claims**

1. Device for washing off the inner surface of a reaction vessel and/or of the outer surface of at least one spheroidal reagent body present in the reaction vessel, said device comprising a small tube (6) connectable to a washing liquid suction device having a suction opening (2) and being pressable by means of a spring (4) in the direction of the bottom of the reaction vessel, a mantle (8) radially surrounding the small tube (6) at an axial distance from its suction opening (2), which mantle bounds between its inner surface and the outer surface of the small tube (6) a washing liquid inlet canal (10) connectable to a washing liquid supply device, holes (12) being provided in an end section of the mantle (8) facing the suction opening (2) for the exit of the washing liquid and two electrodes (14,16) arranged outside the mantle (8) at a distance from one another, axially further remote from the suction

opening (2) than the holes (12) in the mantle (8), said electrodes (14,16) being connectable to an electric liquid level sensor,



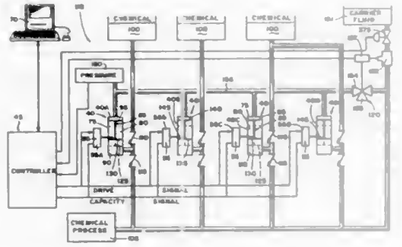
wherein the inner surface (18) of the suction opening (2) is funnel-shaped.

4,913,180

CONTROL SYSTEM AND METHOD FOR CHEMICAL INJECTORS

Herbert E. Anderson, Jr., Muskogee, Okla., assignor to BAHM, Inc., St. Louis, Mo.

Filed Nov. 3, 1988, Ser. No. 266,885
Int. Cl.[4] G05D *11/13*
U.S. Cl. 137—1 **33 Claims**



1. A control system for chemical injectors, comprising:

a plurality of driver means for controlling the volumetric injection capacity of the injectors, each said driver means being associated with an injector;

processor means for providing a feed set point signal defining an amount of chemical to be injected by one of the injectors and for providing a driver designation signal for designating the driver means associated with said one injector;

capacity signal means for generating a capacity signal defining the volumetric injection capacity of the said one injector; and

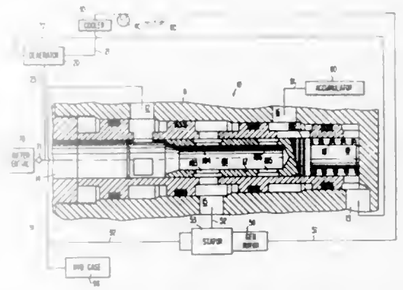
each said driver means, in response to the feed set point signal, its driver designation signal and the capacity signal, comparing the volumetric injection capacity of its associated injector to the amount of chemical to be injected thereby and generating a driver signal to adjust the volumetric injection capacity of its associated injector.

4,913,181

PRIORITY VALVE AND METHOD FOR USING SAME

Jerome A. Mortenson, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 8, 1988, Ser. No. 165,708
Int. Cl.[4] G05D *11/02*
U.S. Cl. 137—12 **15 Claims**



14. A method for prioritizing fluid flow to components in a system and controlling the fluid level in a sump for the fluid incorporated in the system comprising the steps of:

providing pressurized fluid from the sump to an inlet of a priority valve;

sequentially communicating the pressurized fluid to the components through the priority valve and then to an accumulator to control the flow level in the sump; and

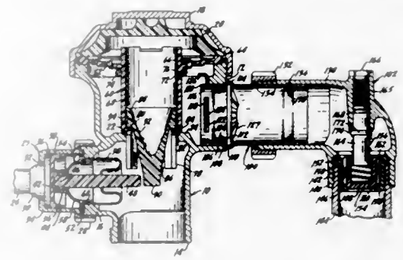
sequentially shutting off the fluid at the components in an order of priority in response to an interruption of pressurized fluid at the inlet, wherein the system includes a differential, a generator rotor, a generator stator, and a hydraulic case; and the step of sequentially communicating includes first supplying fluid to the differential, then to the hydraulic case and generator rotor, and then to the generator stator.

4,913,182

PLUMBING FIXTURE CHECK STOP

John F. Whiteside, Franklin Park, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Mar. 24, 1989, Ser. No. 328,325
Int. Cl.[4] F16K *15/02*
U.S. Cl. 137—614.2 **3 Claims**



1. A check stop for use at the inlet of a flush valve, including a conduit attached at its outlet end to the flush valve inlet, a sleeve attached at the inlet end of said conduit, a valve seat at said sleeve inlet, a valve member movable within said sleeve toward and away from said sleeve valve seat, said valve member having water passage means on the exterior thereof, said valve member being hollow, and a spring bottoming within

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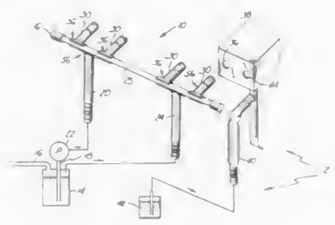
said hollow valve member and urging said valve member into a closure position with said sleeve inlet valve seat, a boss in said conduit, an opening in said boss, an adjustment member positioned in said boss opening and movable from outside said conduit, said adjustment member having an interior portion positioned within said spring and being movable toward and away from said valve member, said adjustment member having an outwardly-extending flange which, by contact with said boss, limits outward movement of said adjustment member, said flange providing a seat for said spring, water pressure on said valve member causing movement thereof away from said sleeve inlet in an amount determined by the position of said adjustment member, said water passage means connecting said sleeve inlet and the interior of said conduit when said valve member is moved away from said sleeve inlet valve seat.

4,913,183

THERMO PLASTIC CARBONATED WATER MANIFOLD AND METHOD OF MAKING SAME

James D. Vogel, Anoka, Minn., and Kenneth W. Schneider, Mason City, Iowa, assignors to Schneider Metal Manufacturing Co., Mason City, Iowa

Filed Apr. 12, 1988, Ser. No. 180,515
Int. Cl.[4] F16L *55/18*; B67D *5/56*
U.S. Cl. 137—15 20 Claims



1. A thermoplastic carbonated water distribution manifold for fluidly connecting a plurality of post-mix carbonated beverage dispensing valves to a singular source of carbonated water, comprising:

(a) an elongate thermoplastic tube having an elongate internal carbonated water plenum;

(b) inlet means secured to said tube for introducing carbonated water into the plenum;

(c) plugs closing the ends of the plenum;

(d) a plurality of radial apertures through the tube and into the plenum, said apertures being spaced from each other and being in a line along the length of the tube, said apertures having their axis in a common flat plane;

(e) a plurality of discrete elongate tubular thermoplastic water outlet fittings having their axis in said plane, each outlet fitting having means on one end for direct connection to the water inlet of a beverage dispensing valve, and a spud on the second and opposite end, each spud being in a respective aperture; and

(f) a sonic welding energy director on a diametric periphery of each spud, each energy director being sonically fused into the thermoplastic tube within the respective aperture.

15. A method of making a thermoplastic carbonated water distribution manifold comprising the steps of

(a) cutting an elongate extruded and rigid thermoplastic tube to a predetermined length;

(b) making a plurality of discrete and spaced apart apertures along the length of the tube and through said tube from outside to inside, said apertures having axis in a common single flat plane;

(c) providing a like plurality of rigid thermoplastic outlet fittings, each fitting having a tubular outlet end sealably connectible to the water inlet of a post-mix beverage dispensing valve and an inlet spud on an opposite end;

(d) inserting each inlet spud into a respective aperture; and

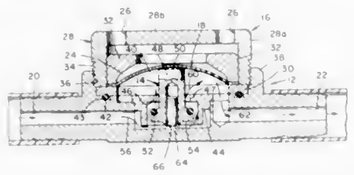
(e) sonic welding an energy director on each spud into a respective said aperture.

4,913,184

FLOW CONTROL DEVICE

Merton R. Fallon, 21730 MaryLee St. #33, Woodland Hills, Calif. 91367

Filed Aug. 31, 1989, Ser. No. 401,183
Int. Cl.[4] F16K *17/14*
U.S. Cl. 137—71 5 Claims



1. A flow control device for interconnection between a source of pressurized fluid and a container to be pressurized, comprising:

(a) a base assembly having an inlet adapted to communicate with the source of pressurized fluid and an outlet adapted to communicate with the container, said housing having an internal chamber in communication with said inlet and said outlet;

(b) a replacement unit adapted to be removably connected to said base assembly, said replacement unit comprising:

(i) a generally cup shaped cap having a skirt portion and a top wall, said top wall having a plurality of apertures therethrough;

(ii) a sub-body connected to said cap internally of said skirt portion;

(iii) a ring shaped base connected to said skirt portion of said cup; and

(iv) a rupture disc disposed intermediate said sub-body and said ring shaped base, said rupture disc being adapted to fail when a predetermined pressure is reached within said internal chamber of said base assembly; and

(c) valve means disposed in said base assembly in cooperative association with said rupture disc for blocking the flow of fluid from said inlet into said internal chamber when said rupture disc fails.

4,913,185

VALVE DEVICE USABLE FOR FEEDING STERILE FLUIDS

Vittorio Mattei, Modena, Italy, assignor to Tetra Dev-Co, Modena, Italy

Filed Mar. 15, 1989, Ser. No. 323,850
Claims priority, application Japan, Mar. 15, 1988, 63-63062
Int. Cl.[4] F16K *11/10*
U.S. Cl. 137—241 13 Claims

1. A valve device for use in a transfer line for sterile fluid production material that communicates fluid from a supply pipe for said sterile fluid production material by opening and closing the flow path for the operating line comprising:

a first valve operatively connected to said supply pipe;

a second valve operatively connected to a delivery pipe for at least communicating fluid to processing stages for the above-mentioned sterile fluid production material;

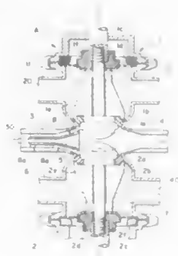
a first valve plug having a first central axis operatively mounted within said first valve and having a first valve head for engaging a first valve seat;

a second valve plug having a second central axis operatively mounted within said second valve and having a second valve head for engaging a second valve seat;

said first and second central axis being aligned in a first common axis;

said first valve head and said second valve head facing each other and being spaced from each other along said common axis to provide a gap therebetween,

a steam inlet pipe and a steam outlet pipe positioned substantially perpendicular to said common axis of said first and



second valves and having axes positioned along a second common axis in said gap located substantially midway between said facing first and second valve plugs of said first and second valves,

said steam inlet pipe and said steam outlet pipe being positioned to provide a flow of steam through said gap,

said first and second valve heads being movable between open and closed positions, and

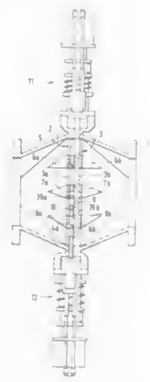
said first and second valve heads in their closed positions narrowing the flow path of steam in said gap.

4,913,186

SLIDE VALVE FOR FLUID-CARRYING LINES

Hermann Brennecke, Heidelberger Landstrasse 175, D-6100 Darmstadt-Eberstadt, and Horst Liere, Sandweg 4, D-6116 Eppertshausen, both of Fed. Rep. of Germany

Filed Jan. 31, 1989, Ser. No. 304,087
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1988, 3813794
Int. Cl.[4] F16K *3/316*
U.S. Cl. 137—601 20 Claims



1. A slide valve for fluid-carrying lines, having a stationary valve plate with a plurality of spaced ribs (4*a*, 4*b*) therein, said stationary valve plate comprises two identical halves (3*a*, 3*b*) rotated by 180°, and said spaced ribs (4*a*, 4*b*) are in alignment with one another in a flow direction, two juxtaposed separately movable sealing plates, guided in slots in said stationary valve plate, said stationary valve plate and said sealing plates each have a plurality of flow openings therein, said flow openings in said valve plate can be selectively opened and closed by moving said sealing plates relative to said flow openings in said stationary valve plate, said flow openings (5) of the stationary valve plate halves (3*a*, 3*b*) have approximately twice the cross-sectional area of said spaced ribs (4*a*, 4*b*) therein, and said sealing plates (9, 10) each close off approximately one-half the cross section of the flow openings (5) when in a closed position, wherein overlapping edges of said valve stationary plate are supported both against one another and with respect to said spaced ribs in said stationary valve plate, and said spaced ribs are reinforced transversely to the sliding motion of said sealing plates and parallel to the direction of fluid flow through the flow openings 5 of said stationary plate.

4,913,187

COMPRESSOR VALVE WITH FLAT SPRING

Derek Woollatt, Campbell, N.Y., and George J. Safford, Quincy, Ill., assignors to Dresser Industries, Dallas, Tex.

Division of Ser. No. 86,526, Aug. 17, 1987. This application Oct. 11, 1988, Ser. No. 258,125
The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.
Int. Cl.[4] F16K *15/10*
U.S. Cl. 137—516.13 3 Claims

1. A sealing apparatus for use in a compressor suction or pressure plate valve having a seat member with a plurality of fluid passage ports therethrough, said fluid passage ports being elongated, with the dimension of length being more than twice that of width and the sealing surfaces adjacent said ports being co-planar and lying in a first plane, said sealing apparatus comprising:

a. a movable plate member having a like plurality of sealing members lying essentially in a second plane, said first and said second planes being parallel, said like plurality of sealing members being adapted for juxtaposed sealing engagement with said plurality of fluid passage ports in said seat member,

b. a flat spring plate member having a central mounting region, said flat spring plate member having a plurality of normally essentially co-planar resilient flat spring fingers, and

c. at least two projections integrally formed on said sealing members and extending outwardly from said plate member in a direction away from said seat member for severally receiving at least two resilient flat spring members

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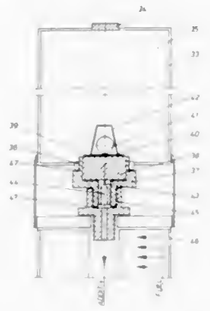
urging said plate member against and sealing said fluid passage ports.

4,913,188

PROCESS AND APPARATUS FOR SUPPLYING ADDITIVES AT CONTROLLED RATES

Kurt M. Seik, Maxhofstr. 37, D-8000 München 71, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 865,148, May 20, 1986. This application May 27, 1988, Ser. No. 199,853
Int. Cl.[4] F15D *1/02*
U.S. Cl. 137—544 4 Claims



1. An apparatus for supplying an additive at a very low, exactly controlled rate at atmospheric pressure to a fluid selected from the group consisting of light fuel oil, medium distillates, and hydraulic oil, which comprises

an additive supply space having a vent to the atmosphere;

a rate control element disposal between the additive supply space and an outlet to a fluid-conducting chamber, said rate control element being comprised of highly porous sintered material having pore sizes of from about 3 μm to 10 μm and being permeable to said additive, said outlet comprising a screw means for adjusting flow of said additive; and

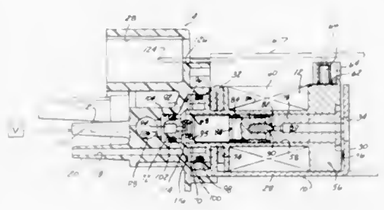
filter means adjacent to and upstream of said fluid-conducting chamber.

4,913,189

CLIMATE CONTROL SYSTEM CONTROL MODULE

Loren H. Kline, Oregon, Ohio; Eddie L. Johnson, Detroit, Mich.; John G. Berent, Madison Heights, Mich., and James T. McIntyre, Sterling Heights, Mich., assignors to Colt Industries Inc., New York, N.Y.

Filed Mar. 17, 1989, Ser. No. 324,766
Int. Cl.[4] F16K *11/00*
U.S. Cl. 137—560 5 Claims



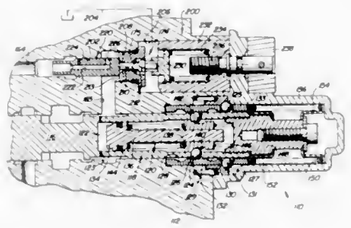
1. A multiple solenoid valve assembly comprising a plurality of like solenoid valves each comprising a solenoid bobbin/-valve housing having a central longitudinal axis, a solenoid coil wound about said bobbin in coaxial relationship to said axis, first electrical connector means at one end of said bobbin, first fluid connector means projecting coaxially from the other end of said bobbin, and means defining a circumferential groove in said bobbin between said connector means and the adjacent end of said coil, a mounting bracket comprising a single piece of sheet metal having a flat horizontal base having parallel front and rear edges, a first retaining web on said bracket integral with said base along said front edge and projecting vertically upwardly from said front edge, a second retaining web on said bracket integral with said base along said rear edge projecting vertically upwardly from said base in spaced opposed parallel relationship with said first web, means defining a plurality of upwardly opening recesses in said second web, each of said recesses being adapted to snugly engage the circumferential groove of one of said solenoid bobbins to fixedly locate one of said solenoid valves in an assembled position on said bracket with said one end of said valve seated against said first web and said first fluid connection means of said valve projecting rearwardly from said second web, a manifold including a plurality of second fluid connection means adapted to respectively sealingly mate with the first fluid connection means of said solenoid valves when said valves are assembled in said bracket, first electrical circuit board means including a plurality of second electrical connector means adapted to respectively mate with the first electrical connector means of said solenoid valves when said valves are assembled in said bracket, and mounting leg means integrally formed on said bracket for fixedly assembling said manitold and said circuit board means to said bracket with the respective fluid and electrical connector means of said manifold and said bracket mated with the fluid and electrical connector means of said valves.

4,913,190

DETENT MECHANISM FOR A CONTROL VALVE

Uwe H. Kugler, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Apr. 24, 1989, Ser. No. 342,845
Int. Cl.[4] F15B *13/04*
U.S. Cl. 137—624.27 7 Claims



1. A detent mechanism for a valve controlling fluid communication between a sump, a pressure source and a hydraulic function, the valve having a housing defining a valve bore therein and a main valve member movable in the bore to control fluid flow, the detent mechanism comprising:

a control chamber;

a detent means for moving to a first position releasably holding the main valve member in a plurality of spaced apart positions, and for moving to a second position and permitting the main valve member to freely move between said spaced apart positions, the detent means being movable in response to fluid pressure in the control chamber;

an operator-controlled valve for controlling fluid pressure in the control chamber, the operator-controlled valve comprising a housing having a valve bore therein, a first passage communicating the valve bore with a fluid pressure source, a second passage communicating the valve bore with a sump and a third passage communicating the valve bore with the control chamber, the operator-controlled valve also comprising an operator-controlled control valve member being movable in the valve bore to control communication between the first, second and third passages, the control value member being movable to a detent position wherein communication between the first and third passage is open and communication between the second and third passages is closed and to a non-detent position wherein communication between the second and third passages is open;

a resilient member coupled to the control valve member and biased to urge the control valve member to its detent position;

a pressure-responsive member exposed to fluid pressure from the fluid pressure source, the pressure-responsive member engaging the control valve member and moving the control valve member from its detent position to its non-detent position when the pressure of the fluid pressure source overcomes the bias of the resilient member; and

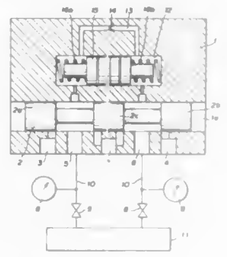
operator-controlled means for adjusting the bias of the resilient member.

4,913,191

DIRECTIONAL CONTROL VALVE

Hidenobu Ako, Ogaki, Japan, assignor to Teijin Seiki Co., Ltd., Osaka, Japan

Filed Mar. 20, 1989, Ser. No. 326,884
Claims priority, application Japan, Mar. 28, 1988, 63-73832
Int. Cl.[4] F15B *13/04*
U.S. Cl. 137—596 1 Claim



1. A four way directional control valve comprising a valve body having a sleeve formed therein, a spool slideable in the sleeve, two output ports, two pump ports and a tank port formed in said valve body, said ports and said spool arranged so that said output ports can operate at an output pressure or an exhaust pressure by operation of said spool, the directional control valve further comprising:

(a) a communicating passage formed in said valve body connecting said output ports with each other to permit a flow of fluid between said output ports;

(b) a fixed orifice disposed in said communicating passage;

(c) a control passage arranged in parallel with said communicating passage, in communication with said output ports; and

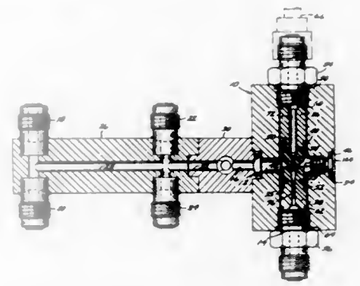
(d) a control spool disposed in said control passage, said control spool moveable in response to a differential pressure between said output ports to block said communicating passage to provide a maximum output pressure.

4,913,192

GAS FLOW CONTROL APPARATUS

Randall J. Vavra, Orange, Calif., assignor to Unit Instruments, Inc., Orange, Calif.

Filed Apr. 3, 1989, Ser. No. 332,572
Int. Cl.[4] B01F *5/04*
U.S. Cl. 137—889 12 Claims



1. Gas flow control apparatus comprising:

vacuum eductor means including a process gas inlet, a process gas outlet and a gas flow passageway therebetween;

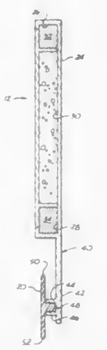
conduit means for carrying a process gas to the process gas inlet, the conduit means including a manifold for accepting and mixing a plurality of component gases to provide the process gas; and the vacuum eductor means being operative to establish a partial vacuum in the gas flow passageway on shut off of the process gas to establish a partial vacuum in the conduit means sufficiently high to reduce the concentration of the process gas in the conduit means and maintain it in a gasecus state.

4,913,193

LIGHT WEIGHT HEDDLE SUPPORT BAR

Gene E. Fanose, Greer, S.C., assignor to Steel Heddle Mfg. Co., Greenville, S.C.

Filed Feb. 14, 1989, Ser. No. 310,762
Int. Cl.[4] D03C *9/04*
U.S. Cl. 139—91 7 Claims



1. In a heddle frame assembly for a loom, said frame having upper and lower frame slats vertically spaced from each other by side frame members to form a generally rectangular frame, each of said slats having a heddle bar support portion and two ledges thereon which define a heddle rod support channel with locking ridges disposed on the inner walls of each of said

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ledges for engaging and holding a heddle bar, wherein said heddle bar comprises:

(a) a generally T-shaped profile extruded from a thermoplastic light weight material, shaped to predetermined dimensions;

(b) an upper heddle supporting surface on said profile for retaining and supporting heddles in said frame;

(c) a lower heddle supporting surface on said profile, spaced from said upper heddle supporting surface, for retaining and supporting said heddles in said frame;

(d) a heddle bar supporting rib disposed between said upper and said lower heddle supporting surfaces having a thickness for releasably engaging the inner walls of said support channel in an interference fit with said lock ridges for holding said heddle bar securely therein while permitting its removal therefrom; and

(e) said heddle bar being extruded from ultra-high molecular weight polyethylene.

4,913,194

LIGHT WEIGHT HEDDLE FRAME ASSEMBLY SLAT

Charles F. Kramer, Greenville, S.C., assignor to Steel Heddle Mfg. Co., Greenville, S.C.

Filed Nov. 18, 1988, Ser. No. 273,276

Int. Cl.[4] D03C *9/04*

U.S. Cl. 139—91 **14 Claims**

1. In a heddle frame assembly for a loom, having upper and lower frame slats, vertically spaced from each other by side members to form a generally rectangular frame, wherein each of said slats comprises:

(a) a hollow elongated upper portion having a plurality of cavities therein extending longitudinally of said slat;

(b) a heddle bar support portion, integral with, and extending from said hollow elongated upper portion and extending along the entire length of said heddle frame assembly;

(c) a heddle bar support channel defined by spaced upper and lower ledges, each of which are integral with, and extend from said heddle bar support portion in a generally horizontal plane, each of said ledges having locking ridges disposed on their adjacent surface for gripping and holding a heddle bar rib; and

(d) a heddle bar having surfaces for supporting heddles and a supporting rib having a thickness for engaging the adjacent surfaces of said upper and lower ledges in an interference fit with said locking ridges to releasably retain and support said heddle bar while permitting the replacement of said heddle bar.

4,913,195

GRIPPER LOOM

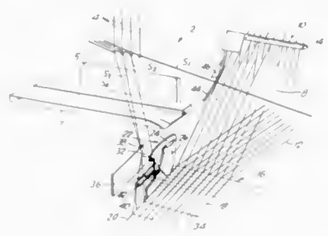
Francisco Spelch, Gipf-Oberfrick, Switzerland, assignor to Textilma AG, Hergiswil, Switzerland

Filed Oct. 5, 1988, Ser. No. 254,369

Claims priority, application Switzerland, Oct. 6, 1987, 03906/87

Int. Cl.[4] D03D *47/34*

U.S. Cl. 139—446 **12 Claims**



1. A gripper loom, comprising:

a gripper having an entrainment region for receiving a filling thread and being movable into and out of a shed formed by warp threads so as to insert the filling thread into said shed a filling thread supply;

filling thread feeding means for placing at least one filling thread into the entrainment region of the gripper;

a reed movable between the warp threads in the shed so as to beat-up the inserted filling thread into the fell of the fabric; and scissors arranged at an insertion side of the shed adjacent the fabric edge and the fell, said scissors being openable toward said reed and operable to receive and separate a previously inserted filling thread during renewed insertion of that thread into a shed, said scissors being closed during the beat-up movement of the reed so that a portion of the just inserted filling thread extending from the fabric edge and connected to the supply is moved above said scissors and beneath a catching hook located on the side of said scissors away from said reed

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4,913,196

FLUID INJECTION SYSTEM PUMPING METHODS

Harold R. Williams, Capistrano Beach, and Robert M. Spencer, San Juan Capistrano, both of Calif., assignors to Surgikos, Inc., Arlington, Tex.

Filed May 20, 1987, Ser. No. 52,620

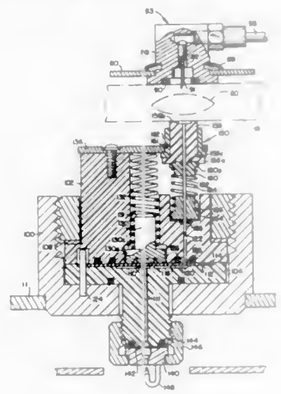
Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—1 **7 Claims**

1. A method of pumping a sterilizing liquid into an evacuated sterilizing chamber containing an article to be sterilized, comprising the steps of:

inserting into a pumping mechanism a prepackaged, unpressurized sealed cell containing a predetermined volume of sterilizing liquid said cell having a flexible wall;

connecting a fluid coupler to form a fluid outlet from the cell to said sterilizing chamber; and,



forcing liquid out of said cell through said outlet into said sterilizing chamber by applying pressure against said flexible wall of said cell to force said fluid out of said cell.

4,913,197

DEVICE AND PROCESS FOR PREPARING AND DISPENSING SPONTANEOUSLY FOAMING MATERIALS FOR FILLING A CONTAINER

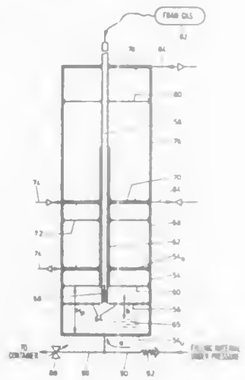
Richard Friedrich, Engen, Fed. Rep. of Germany, assignor to Hafesto AG, Zurich, Switzerland

Filed Feb. 25, 1988, Ser. No. 160,250

Claims priority, application Switzerland, Feb. 25, 1987, 719/87

Int. Cl.[4] B65B *3/04, 31/00*

U.S. Cl. 141—3 **13 Claims**



1. A process for preparing and dispensing a spontaneously foaming material for filling into a container, wherein the material filled in is pressurized, comprising the steps of

filling a liquid material and foam gas into a preparation container,

mixing said liquid filling material and said foam gas within said preparation container to form said spontaneously foaming material,

dispensing a metered quantity of said spontaneously foaming material formed within said preparation container from said preparation container to fill said quantity into said container, and

controlling pressure within said preparation container at least during said mixing and controlling pressure of said metered quantity of said spontaneously foaming material dispensed.

4,913,198

SYSTEM FOR AUTOMATIC DISPENSATION OF DYE SOLUTION

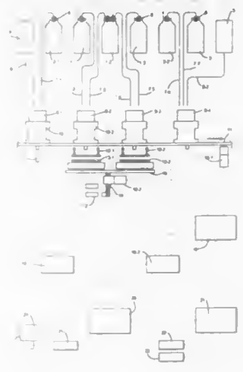
Takuro Hayahara, Toyonaka; Keijiro Kuratani; Takami Yukise, both of Okayama, and Hiroshi Inoue, Okayama, all of Japan, assignors to Japan Exlan Company, Ltd. and Excom Co., Ltd., both of Osaka, Japan

Filed Apr. 8, 1988, Ser. No. 179,217

Claims priority, application Japan, Oct. 5, 1987, 62-251844

Int. Cl.[4] B65B *3/28*

U.S. Cl. 141—83 **3 Claims**



1. In a system for automatic dispensing of a plurality of dye solution materials including stock dye solutions, dyeing auxiliaries, water and the like, the improvement comprising a system for the automatic dispensing of stock dye solutions, comprising:

transfer means for intermittently transferring receiving containers to and stopping the receiving containers at a succession of filling positions, at least two of which are stock dye solution filling positions;

a plurality of weighing means, one of each of said stock dye solution filling positions, for converting weight changes of the materials supplied to receiving containers at said stock dye solution filling positions to electric signals, and lifting and lowering means for the plurality of weighing means for simultaneously moving the weighing means up and down for raising the receiving containers off said transfer means, whereby only the weight of a receiving container is on each weighing means;

a plurality of material storage containers including at least one stock dye solution storage container;

a material supply means extending from each of said material supply containers to a respective one of said filling positions, said stock dye solution storage container having at least two material supply means extending therefrom to said at least two stock dye solution filling positions; and

control means connected to said material supply means, to said weighing means and to said transfer means for transferring a receiving container to the first stock dye solution filling position, lifting the weighing means at said first stock dye solution filling position for raising the receiving container off said transfer means, controlling the quanti-

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ties of material supplied from said material supply containers to the receiving container at the stock dye solution filling position according to the particular mixture of materials desired in the respective receiving container in response to the weight of the receiving container sensed, then lowering the weighing means to place the receiving container on the transfer means, moving the receiving container to the next filling position in the succession of filling positions while moving a further receiving container into the firstmentioned stock dye solution filling position, repeating the controlling step for the respective receiving containers, and,if desired, when a receiving container is in the second stock dye solution filling position, controlling said material supply means for supplying stock dye solution from said at least one stock dye solution container to both stock dye solution filling positions.

4,913,199

ARRANGEMENT FOR THE COMPLETE EMPTYING OF QUARTZ TANKS OR CRUCIBLES FILLED WITH A SILICON MELT FOLLOWING SILICON BAND DRAWING

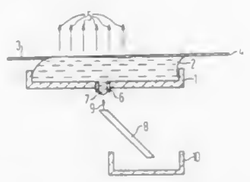
Richard Falckenberg, Wald; Gerhard Hoyler; Bernhard Freienstein, both of Munich, and Josef Grabmaier, Berg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 23, 1988, Ser. No. 288,855

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1988, 3806001

Int. Cl.[4] B01D *9/00*

U.S. Cl. 141—98 6 Claims



1. An apparatus for the complete emptying of flat quartz tanks or crucibles filled with a silicon melt, as utilized for the continuous, horizontal band drawing of silicon bands through the contacting of carrier members with the surface of the silicon melt comprising:

an open outlet nozzle, having an aperture, located in a floor of a tank, the outlet nozzle being so constructed and arranged that the silicon melt near the aperture of the outlet nozzle does not run out of the aperture during the drawing process due to a curvature pressure of the silicon melt's downwardly, convexly arced surface; and

a tube member having a channel for removing the silicon melt, the tube member is well-wettable by the silicon melt yet resistant to the silicon melt and is located at the nozzle aperture allowing the silicon melt to be collected in a vessel that is in fluid communication with the tube member.

4,913,200

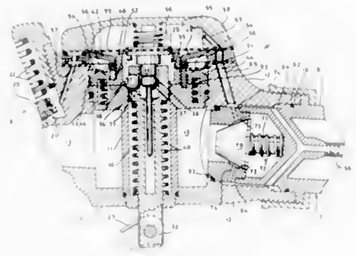
LIQUID DISPENSING NOZZLE WITH A PUMP PRESSURE RESPONSIVE AUTOMATIC SHUT-OFF MECHANISM

Walter M. Carow, Roane County, Tenn., assignor to Richards Industries, Inc., Rockwood, Tenn.

Filed Jan. 19, 1989, Ser. No. 298,675

Int. Cl.[4] B65B *3/28*

U.S. Cl. 141—217 8 Claims



1. A liquid dispensing nozzle for dispensing a liquid from a dispensing pump, said nozzle comprising:

a nozzle body provided with an internal passageway therethrough, said passageway defining an inlet port for being releasably connected in fluid communication to said dispensing pump, and an outlet port, said body further defining a main valve seat within said passageway, said body being provided with an actuator cavity and a pressure conduit for placing said actuator cavity in fluid communication with said passageway between said inlet port and main valve seat;

a main valve mounted within said body between said inlet port and said outlet port for selectively engaging said valve seat and opening and closing said passageway to the flow of said liquid;

latch means for selectively closing and prohibiting the opening of said main valve; and

automatic shut-off means for selectively releasing said latch means so as to close and prohibit the opening of said main valve when supply pressure from said dispensing pump falls below a preselected value, said automatic shut-off means including an actuator member movably mounted in said actuator cavity and operatively associated with said latch means, whereby selective movement of said actuator member from a first position toward a second position releases said latch means, said actuator member being provided with biasing means for biasing said actuator member toward said second position, said automatic shut-off means further including a pressure diaphragm transversely dividing said actuator cavity so as to define a pressure cavity in fluid communication with said conduit, said pressure diaphragm being movably responsive to changes in pressure within said pressure cavity, said pressure diaphragm selectively engaging said actuator member such that preselected movement of said pressure diaphragm in response to pressure within said pressure cavity reaching said preselected value moves said actuator member to said first position against the bias of said biasing means.

4,913,201

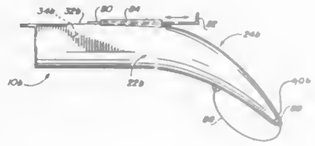
LIQUID FUEL FUNNEL

Ronald C. Lacero, 336 W. Andrix St., Monterey Park, Calif. 91754, and Nick V. Agnoletto, 5763 Amethyst St., Alta Loma, Calif. 91701

Filed Jan. 17, 1989, Ser. No. 297,013

Int. Cl.[4] B67C *11/00*

U.S. Cl. 141—334 2 Claims



1. An improved non-drip, unitary liquid fuel funnel, said funnel comprising an elongated, integral, one piece body having:

(a) a rear fuel-receiving generally horizontal portion having an open top and interconnected closed sides, a real wall and bottom defining a central fuel-receiving space from end to end thereof; and,

(b) a front, fuel-dispensing closed, generally tubular spout portion having an open front end portion integrally connected to said fuel-receiving portion and curving and tapering downwardly and forwardly from said fuel-receiving portion to an open front end portion, said spout portion having a central cavity extending from end to end thereof and communicating with said space and with said open front end of said funnel for dispensing fuel from said funnel,

(c) wherein the exterior of said spout portion of said funnel bears means adapted for releasably securing said funnel against a lip of a fuel-receiving container, such as a vehicle gasoline tank,

(d) wherein said releasable securing means comprises a bottom extension adapted to abut the bottom of said lip and a top flexible spring projecting rearwardly and at an acute angle upwardly from said spout portion and bearing a lip-abutting detent on the upper surface of said spring.

4,913,202

FILLING PACKAGING CONTAINERS

John D. Miller, Churchdown, and Peter D. Hardy, Wantage, both of United Kingdom, assignors to CMB Packaging (UK) Limited, Worcester, United Kingdom

PCT No. PCT/GB87/00711, § 371 Date Jul. 12, 1988, § 102(e) Date Jul. 12, 1988, PCT Pub. No. WO88/02722, PCT Pub. Date Apr. 21, 1988

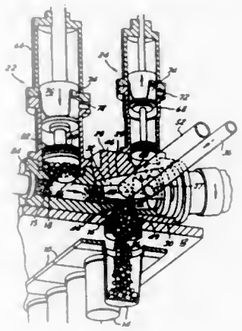
PCT Filed Oct. 8, 1987, Ser. No. 222,920

Claims priority, application United Kingdom, Oct. 14, 1986, 8624595

Int. Cl.[4] B65B *3/32, 55/02;* B67D *1/08*

U.S. Cl. 141—258 6 Claims

1. A machine for filling packaging containers with a flowable product wherein the product has first and second components, the machine comprising a control valve in the form of a plug valve having a body defining a bore having a frusto-conical valve seat, a frusto-conical plug having a frusto-conical surface, said valve seat having a frusto-conical surface complementary with said plug, a valve chamber for pressurized fluid being formed at the wider end of the plug, the chamber communicating with the bore, the plug being axially displaceable between a first position, in which its frusto-conical surface seals against the valve seat and in which it is rotatable to control flow through the valve, and a second position, in which it is withdrawn into the chamber to provide clearance between the surfaces of the plug and the seat but retaining clearance between its wider end and the surfaces of the chamber so that



all surfaces of the plug are exposed for cleaning and sterilization.

4,913,203

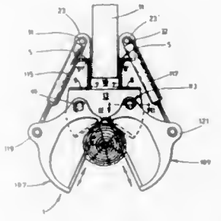
TREE HARVESTER

Michel Lessard, Lac St. Jean, Canada, assignor to Les Micanik Inc., Lac St Jean, Canada

Filed May 1, 1989, Ser. No. 345,181

Int. Cl.[4] A01G *23/08*

U.S. Cl. 144—34 E 11 Claims



1. In a tree shear comprising: a frame; a pair of shear blades mounted on said frame for pivotal movement relative to one another in scissors fashion, and power means for pivoting said blades, the improvement wherein:

said blades are mounted on said frame by pivot means including oscillation means for causing said blades to move back and forth in the planes thereof as said blades are pivoted by said power means wherein said oscillation means are eccentric means.

4,913,204

POWER BISCUIT JOINTER CUTTER

Gregory E. Moores, Reisterstown, and Scott D. Price, Pylesville, both of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Sep. 28, 1989, Ser. No. 413,939

Int. Cl.[4] B27M *1/00*

U.S. Cl. 144—136 C 38 Claims

1. A biscuit jointer cutter, comprising:

a housing containing a motor;

a shoe assembly containing a cutter blade rotatably driven by said motor;

said shoe assembly having an opening through which said

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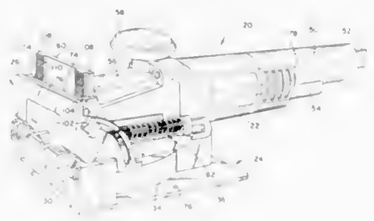
blade is protrudable in a forward direction and retractable in a rearward direction;

said housing and said shoe assembly being movable to and fro relative to each other to cause said blade to protrude through and be retracted back through said opening, said blade being so movable in a cutting plane;

a fence assembly comprising a guide plate secured to said shoe assembly, a carrier movably mounted on said guide plate for adjustment away from and towards said cutting



plane, and a fence pivotally mounted on said carrier to pivot about a pivotal axis;

said pivotal axis being located rearward of said opening in said rearward direction; and

said fence being pivotal between an extended position parallel to said cutting plane and a withdrawn position at right angles to said cutting plane, said fence in said withdrawn position not protruding in said forward direction beyond said opening.

4,913,205

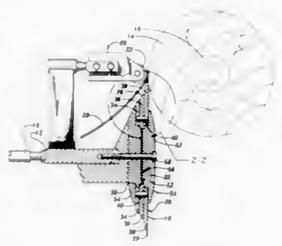
CONTINUOUSLY MOVING LATHE KNIFE

Leonard L. Hayes, 16820 S.W. Inverurie, Lake Oswego, Oreg. 97035

Continuation-in-part of Ser. No. 140,732, Jan. 4, 1988, Pat. No. 4,796,681. This application Jan. 9, 1989, Ser. No. 295,269

Int. Cl.[4] B27L *1/00*

U.S. Cl. 144—212 **15 Claims**



1. A machine for cutting veneer layers from a log, comprising,

a frame;

means for rotatably supporting and rotating a cylindrical elongated log on its longitudinal center axis;

a knife carriage on said frame;

a chain bar on the knife carriage;

a chain channel extending around said chain bar;

a continuous chain comprising a plurality of pivotally connected chain links movably extending through said channel, each chain link including a knife tip with a cutting edge; and

each knife tip having serrations therein for engaging the log, the serrations being angularly disposed with respect to the cutting edge of the knife tips and being adapted to frictionally engage the surface of the log, whereby upon rotation of said log, the frictional engagement between the log and serrations imparts longitudinal movement of the chain with respect to the log such that said chain rotates around said chain bar and within said channel to cut a layer of veneer from said log.

4,913,206

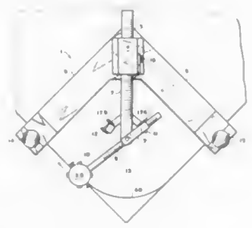
ROUTER GUIDE ASSEMBLY

Ilhan Altinbasak, 41-34 Frame Pl. Apt. 3H, Flushing, N.Y. 11355

Filed Jun. 5, 1989, Ser. No. 361,543

Int. Cl.[4] B27M *1/00*; B27C *5/10*

U.S. Cl. 144—371 **13 Claims**



13. A method for cutting a quarter circle from a workpiece comprising the steps of:

squaring a router guide assembly to said work piece, said router guide assembly comprising: a guide frame comprising a first locking means, a first arm and a second arm, said first arm positioned at a right angle to said second arm; a guide bar adjustably connected to said guide frame by said first locking means, wherein said first locking means permits longitudinal reciprocal movement of said guide bar; a radius bar; means for adjustably and pivotally connecting said radius bar to said guide bar, including a second locking means for adjustably restraining said radius bar, wherein said second locking means permits radial movement of said radius bar; a router stand connected to said radius bar; and a first stop and a second stop attached to said guide bar for controlling the sectoral movement of said radius bar;

moving said guide bar to a desired longitudinal position and putting said first locking means in the locked position;

moving said radius bar to a desired radial position and putting said second locking means in the locked position; and

moving said radius bar in a sectoral direction, whereby a router can make an arcuate cut along a predetermined cutting path on said workpiece.

4,913,207

PNEUMATIC RADIAL TIRES

Katsuyuki Harakon, Higashiyamato, and Ken Kijima, Kodaira, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

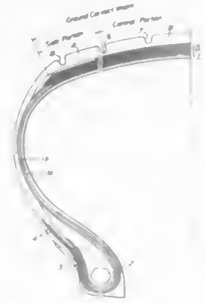
Filed Feb. 29, 1988, Ser. No. 161,895

Claims priority, application Japan, Mar. 5, 1987, 62-48911

Int. Cl.[4] B60C *11/08*

U.S. Cl. 152—209 R **5 Claims**

1. A pneumatic radial tire comprising: at least one carcass ply as a tire body reinforcement and at least two belt layers as a tread reinforcement, said tread being provided with a pair of main grooves extending circumferentially of the tread a central tread portion between said main grooves and side portions of said tread laterally outside each of said main grooves, each of said main grooves being located at a position from the nearest side end of the tread within a range of 15–40% of the total tread ground contact width ; and each of said tread side portions is composed of a tread rubber satisfying a requirement



that a modulus at 100° C. under 100% elongation of tread rubber that is lower by a range of 30–80% than that of tread rubber constituting said central tread portion of the tread between said main grooves.

4,913,208

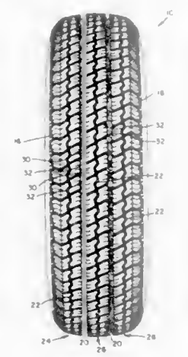
PNEUMATIC RADIAL-FLY TIRE HAVING BLOCK PATTERN TREAD

Norman D. Anderson, Uniontown, Ohio; Harold D. Fetty, Asheville, N.C., and Deborah K. Vaughn, Mogadore, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 21, 1988, Ser. No. 146,658

Int. Cl.[4] B60C *11/06*

U.S. Cl. 152—209 R **26 Claims**



1. A radial-ply having a mid-circumferential centerplane and a tread portion, said tread portion comprising:

two circumferentially extending straight grooves dividing said tread portion into three circumferentially extending portions;

each circumferentially extending portion having a first circumferentially extending zig-zag groove therein having a plurality of alternating first and second legs alternately inclined in opposite directions with respect to the circumferential direction, said first legs in said three portions being inclined in the same direction with respect to the circumferential direction;

a plurality of axially extending diagonal grooves interconnecting only with at least some of said first legs of said zig-zag grooves and dividing said circumferentially extending portions into blocks; and

said blocks of each portion being aligned axially such that a leading edge of one said block does not strike the pavement during a rotation of the tire at the same time as another leading edge of another block.

4,913,209

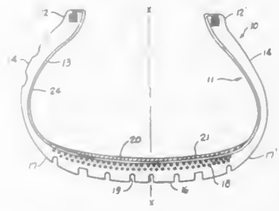
SEALANT PRODUCT, LAMINATE THEREOF, AND PNEUMATIC TIRE CONSTRUCTED THEREWITH

Sung W. Hong, Cheshire, and Philip J. Cangelosi, Waterbury, both of Conn., assignors to The Uniroyal Goodrich Tire Company, Akron, Ohio

Continuation-in-part of Ser. No. 44,628, May 1, 1987, abandoned, which is a division of Ser. No. 693,090, Jan. 21, 1985, Pat. No. 4,664,168. This application Aug. 3, 1987, Ser. No. 80,842

Int. Cl.[4] B60C *21/14, 5/12*

U.S. Cl. 152—504 **10 Claims**



1 A self-sealing pneumatic tire having an inner liner and a substantially fully cured generally flat, bare layer of puncture sealant in which all of a curative is used up to cure the sealant having high molecular weight to low molecular weight elastomers present in a weight ratio from greater than 1, to 10, and more processing aid than there is high molecular weight elastomer, so as to have before curing a peak Mooney viscosity at room temperature in the range from above 70 to about 110, said tire and sealant cured in a curing process, said cured sealant being adhered to at least a portion of said inner liner with edges of said sealant smoothly blended into the sidewalls of said tire without the sealant being restrained by any external restraining means, said cured sealant having its radially inward surface coated with a detackifier which is not a self-supporting film but remains on said surface after it is contacted with a curing bladder, said cured sealant having a peak Mooney viscosity at 150° F. in the range above 15 but below 30, which viscosity is high enough to negate flow of the sealant at a temperature up to 200° F. and vehicle speeds up to 70 mph, on which vehicle the tire is mounted, yet low enough to permit a puncturing object when withdrawn, to draw sufficient sealant into the puncture it causes, so as to seal the puncture.

4,913,210

CORD LOCK FOR WINDOW SHADES

Wendell B. Colson, Boulder, and Terry Akins, Louisville, both of Colo., assignors to Hunter Douglas Inc., Upper Saddle River, N.J.

Filed Feb. 6, 1989, Ser. No. 306,355

Int. Cl.[4] E06B *9/38*

U.S. Cl. 160—84.1 **28 Claims**

1. A window shade comprising an improved cord lock, said shade comprising a headrail, an extensible and collapsible shade member, and two or more cords extending from a lower end of said shade member to the upper end of said shade member and into said headrail, and guide means in said headrail for guiding said cords from their entry into said headrail to a cord lock at one end of said headrail,

said cord lock comprising first and second fixed angled

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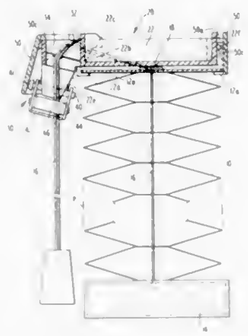
bearing surfaces, said cords running from said guide means over said first angled bearing surface and thence over said second angled bearing surface, said first angled bearing surface being angled with respect to the horizontal to direct said cords laterally outwardly of said shade



member, and said second angled bearing surface angled with respect to the horizontal in a sense opposite from said first angled bearing surface to direct said cords downwardly in front of said shade member, and locking means for engaging and securing said cord with respect to said headrail.

4,913,211

AUTOMOBILE WINDOW SHADE CONVERTIBLE TO HORIZONTAL EXPANSION OR VERTICAL EXPANSION

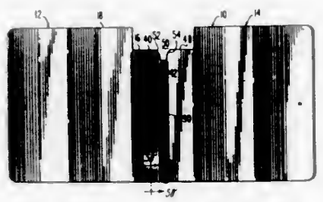
Ezra D. Eskandry, 1925 Brickell Ave., D901, Miami, Fla. 33131, and Eli Weinberg, 13367 SW. 46th La., Miami, Fla. 33175

Continuation-in-part of Ser. No. 266,068, Nov. 2, 1988, Pat. No. 4,838,335. This application May 11, 1989, Ser. No. 350,223

The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.

Int. Cl.[4] A47H *5/00*

U.S. Cl. 160—84.1 10 Claims



1. A foldable window shade for an automobile comprising:
- a first plurality of substantially rigid, planar elements joined together by hinges along adjoining edges such that said first plurality of elements form a first accordion fold portion;
- a second plurality of substantially rigid, planar elements joined together by hinges along adjoining edges such that said second plurality of elements form a second accordion fold portion;
- a further hinge linking one of said first plurality of elements and one of said second plurality of elements along adjacent edge portions of said first and second accordion fold portions.

4,913,212

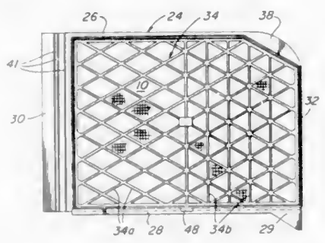
VEHICLE WINDOW SCREEN ASSEMBLY

Walter S. Clavier, 966 Sunset Ter., Dover, Del. 19901

Filed Aug. 29, 1988, Ser. No. 237,048

Int. Cl.[4] E06B *3/32*

U.S. Cl. 160—105 6 Claims



1. A screen assembly adaptable to a plurality of vehicle window openings of different widths, each of the openings having a windowpane slidable in tracks within the front and rear sides and the top thereof, the track portion around the upper rear corner of each opening being arcuate, comprising in combination

frame means having top, front and rear tenons, an arcuate upper rear corner formed to slide congruently in the corresponding adjacent tracks, and a bottom channel formed to straddle the top of the windowpane, said bottom channel having a depending extension adjacent to said rear tenon for occluding any opening over the rear corner of the windowpane, only said front tenon bearing a plurality of parallel guidelines of grooves or scores defining removable portions, the distance of each groove or score from the outer boundary of said rear tenon corresponding to the width of respective ones of the plurality of window openings for enabling the width of said frame means to be trimmed to conform to the width of a selected one of the plurality of window openings, said removable portion prior to being trimmed having an edge extending between said top tenon and said bottom channel and being located farther from the inner boundary of said frame means than said top and rear tenons and said bottom channel; and

a mesh screen secured around the perimeter thereof to said frame means.

4,913,213

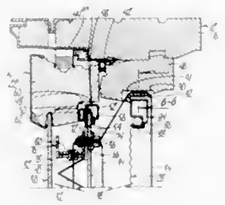
PLETED BLIND BETWEEN WINDOW PANES

James B. Schnelker, Pella, Iowa, assignor to Rolscreen Company, Pella, Iowa

Filed Dec. 21, 1987, Ser. No. 135,976

Int. Cl.[4] E06B *9/307*

U.S. Cl. 160—107 20 Claims



1. A sealed double glazing window having an interior side and an exterior side comprising:

two spaced panes of glass seated in a frame;
- a blind positioned within said space having a cord control means for raising and lowering said blind;
- one of said panes of glass having an aperture therethrough;
- a bolt having a hole through the center placed in said aperture;
- said cord control means extending through said hole of said bolt to the interior side of said window wherein said control means may be used to raise and lower said blind while maintaining the window seal.

4,913,214

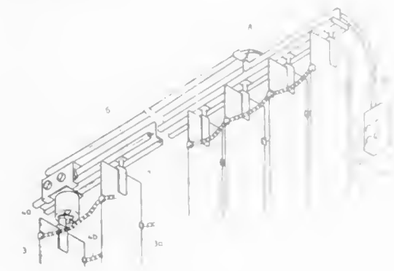
FULL AUTOMATIC AND VERTICAL TYPE LOUVER

Nien Ming, Rm. 4, 4F, wonderful Bldg., 101, Sec. 4, Jen-Ai Road, Taipei, Taiwan

Filed Oct. 11, 1988, Ser. No. 256,031

Int. Cl.[4] E06B *9/30*

U.S. Cl. 160—168.1 3 Claims



1. A louver mechanism comprising: a horizontal tack (5); a series of vertically-extending louver blades located below said track; means (7c) for attaching a first end one of said blades to the track so that said first end blade can rotate but cannot otherwise move;
- a carriage (108) movable along said track; a first reversible carriage-propulsion motor (102) mounted on said carriage for propelling said carriage back and forth along the track;
- a second reversible blade-operating motor (101) mounted on said carriage; an operating connection between said second motor and a second end one of said blades, whereby said second motor is enabled to rotate said second end blade around a vertical axis between open and closed positions;
- means connecting the intermediate louver blades (3a) to the track so that said intermediate blades can both rotate around their individual vertical axes and move bodily along the track;
- flexible connectors (4a and 4b) interconnecting said blades so that when said second end blade is rotated by the second motor the other blades will be similarly rotated;
- said flexible connectors being arranged so that when said carriage is moving along the track in one directions the blades will collapse against one another in near adjacency to said first end blades, and when said carriage is moving along the track in the other direction the blades will be drawn apart to attain a predetermined blade spacing;
- first limit switch means for de-energizing the carriage propulsion motor when the carrage reaches the desired end limits of its motion along the track.

4,913,215

BENDABLE MULTIPLE WINDOW

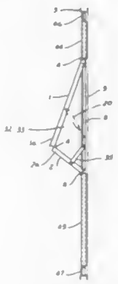
Enzo Demukai, Higashi-osaka, and Haruto Monobe, Wakayama, both of Japan, assignors to Nippon Door Check Mfg. Co., Ltd., Osaka, Japan

Filed Jun. 3, 1987, Ser. No. 57,804

Claims priority, application Japan, Jun. 5, 1986, 61-85533; Jun. 5, 1986, 61-85534; Jun. 5, 1986, 61-85535; Jun. 5, 1986, 61-85536; Aug. 12, 1986, 61-124512

Int. Cl.[4] E05D *15/26*

U.S. Cl. 160—207 1 Claim



1 A folding window assembly comprising:
- a window attaching framework installed in a building and having opposite lateral frames,
- a lower window and an upper window, said windows having adjacent portions foldably connected together and remote portions engaging said opposite lateral frames, said adjacent portions being free of said opposite lateral frames and projecting outwardly therefrom to form triangular openings when said remote portions of said windows are moved relatively toward one another,
- supporting means installed between at least one of said windows and the window attaching framework,
- locking means for holding at least one of said windows in a predetermined opened state,
- a third window foldably connected to the remote portion of one of said upper and lower windows, said third window being vertically movable along the opposite lateral frames of the window attaching framework while being disposed vertically, and
- a fourth window foldably connected to the remote portion of the other of said upper and lower windows, said fourth window being vertically movable along the opposite lateral frames of the window attaching framework while being disposed vertically.

4,913,216

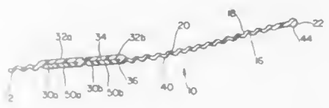
SLAT FOR A LOUVRE

Jacques Lemay, Quebec, Canada, assignor to Les Profiles d'Extrusion Plastival Inc., France

Filed Aug. 31, 1988, Ser. No. 238,845

Int. Cl.[4] B51D *23/00*

U.S. Cl. 160—236 14 Claims



1. A louver comprising:

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a plurality of slats, at least one of said slats comprising an elongated body portion having a longitudinal axis, a front surface and a back surface, and a left edge and a right edge, said front surface having formed therein a plurality of channels extending substantially the entire length of said body portion parallel to said longitudinal axis, and said back surface having formed thereon a plurality of ridges corresponding to said channels, and

a plurality of elongated insert strips, one of said insert strips being slidably engaged in each of said plurality of channels.

4,913,217

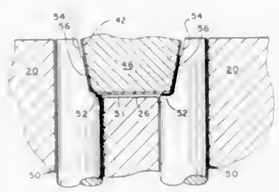
LOCATORS FOR EXPENDABLE CORE IN DIE CASTING DIE

Byron W. Koch, Toledo; John J. McGarigal, and R. Matthew Thomas, both of Sylvania, all of Ohio, assignors to Farley, Inc., Chicago, Ill.

Filed Jan. 23, 1989, Ser. No. 300,125

Int. Cl.[4] B22D *17/24*

U.S. Cl. 164—340 **30 Claims**



1. A locator for an expendable core in a die casting partable die, said die having a printout socket for a corresponding printout portion on said core, there being a continuous space of less than about five millimeters between the inner surface of said printout socket and the outer surface of said printout portion, means in said printout socket for locating said core, said means comprising: at least one pin means in said printout socket having two adjacent surfaces greater than 90° to each other for partly bridging a similar angle of said space and locating said core in said die simultaneously in at least two directions, one being in the direction of the parting of the die and the other being orthogonally thereto.

16. A die casting partable die having a cavity and an expendable core in said cavity, said die cavity having a printout socket for receiving a printout portion of said core, the improvement comprising:

(A) a pin projecting into said printout socket for locating said core, said pin having at its end two adjoining obtuse angular outer surfaces to each other for cooperation with two obtuse angled adjacent sides of said printout portion, and

(B) a clearance between said printout socket in said die and said printout portion of said core whereby molten metal can form a film over said printout portion of said core.

4,913,218

FEEDER SPRUE SYSTEM FOR A CASTING MOLD

Karl Seidinger, Volkartshausen, Fed. Rep. of Germany, assignor to Georg Fischer AG, Schaffhausen, Switzerland

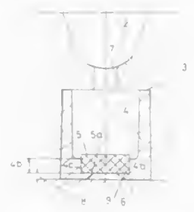
Filed Feb. 13, 1989, Ser. No. 310,320

Claims priority, application Switzerland, Feb. 12, 1988, 00527/88

Int. Cl.[4] B22C *9/08*

U.S. Cl. 164—358 **12 Claims**

1. A casting mold comprising a first casting mold half having a molten metal inlet and a sprue system and a second casting mold half having at least one mold cavity wherein said sprue system communicates said molten metal inlet with said at least one mold cavity, said sprue system comprises a sprue cup in said first casting mold half downstream of said molten metal inlet for receiving molten metal and a feeder located in said first casting mold half downstream of said sprue for delivering molten metal to said at least one mold cavity in said second casting mold half said feeder comprises a conduit portion and



a separate filter portion, said conduit portion having an inlet for receiving molten metal from said sprue cup and an outlet for passing said molten metal to said at least one mold cavity wherein said conduit is provided with a constriction upstream of said outlet and said filter portion is fitted in said constriction so as to insure all molten metal passes through the filter.

4,913,219

PROCESS AND DEVICE FOR CASTING THIN STRIP OR FOIL FROM THE MELT

Hans Gloor, Sandbockstrasse 19, Umiken, Switzerland (CH-5222)

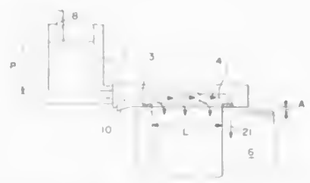
PCT No. PCT/CH87/00126, § 371 Date Jul. 28, 1988, § 102(e) Date Jul. 28, 1988, PCT Pub. No. WO88/02288, PCT Pub. Date Apr. 7, 1988

PCT Filed Sep. 29, 1987, Ser. No. 246,665

Claims priority, application Switzerland, Sep. 30, 1986, 3932/86

Int. Cl.[4] B22D *11/06*

U.S. Cl. 164—463 **27 Claims**



1. An apparatus for casting strip or foil from metal or metal oxide melts, comprising:

a cooling body moving in a first direction and having a casting surface; and

an essentially tubular casting nozzle located at a certain separation from said casting surface, said casting nozzle including a tube wall, a casting slit extending axially in said tube wall, and a lateral feed portion with means for coupling said casting nozzle to a reservoir of casting material melt and for feeding the casting material melt in a feed direction generally perpendicular to said first direction, said casting slit having a length substantially perpendicular to said first direction and corresponding to a strip width to be cast, said slit having a width converging in the feed direction along the length;

whereby the melt exits said casting slit in a flow-out direction and is diverted at a diversion angle to a strip removal direction.

25. A process for casting strip and foil from metal or metal oxide melts, comprising the steps of:

applying melt from a casting slit of a casting nozzle in a flow-out direction onto a casting surface of a moving cooling body;

diverting the melt in a gap between the casting nozzle and the casting surface from the flow-out direction to a strip removal direction;

freezing the melt essentially by cooling by the moving cooling body;

feeding the melt in the casting nozzle, up to a point of entry into the casting slit, in a feed direction essentially perpendicular to the flow-out direction, the melt being diverted within the casting nozzle adjacent the casting slit from the feed direction to the flow-out direction; and

conveying the melt at a velocity not greater than 0.8 meter per second in a section of a tubular body of the casting nozzle which is closed on all sides and upstream of the casting slit.

4,913,220

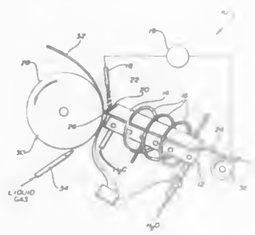
APPARATUS AND METHOD FOR SPILL CHILLING RAPIDLY SOLIDIFIED MATERIAL

James Dickson, Stirling, N.J., assignor to Dickson Enterprises, Inc., Sterling, N.J.

Continuation of Ser. No. 107,275, Oct. 9, 1987, abandoned. This application Dec. 27, 1988, Ser. No. 291,312

Int. Cl.[4] B22D *11/06, 27/02*

U.S. Cl. 164—463 **6 Claims**



1. A method for rapidly solidifying a material comprising:

(a) globally heating a feed stock;

(b) controlling the temperature of said feed stock to maintain a temperature of said feed stock at a temperature of between about 0.7 and 0.95 Tm;

(c) locally heating a region of said feed stock to provide a confined substantially horizontal molten pool;

(d) spilling molten material from said substantially horizontal pool onto a moving chill substrate;

(e) maintaining said molten pool by advancing said heated feed stock substantially horizontally.

4,913,221

LIQUID METAL PROCESSING

Steven Henderson, Marton, and Richard B. Smith, Gainsborough, both of England, assignors to British Steel plc, London, England

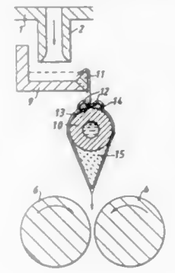
Filed Feb. 1, 1989, Ser. No. 304,652

Claims priority, application United Kingdom, Feb. 4, 1988, 8802456

Int. Cl.[4] B22D *11/10*

U.S. Cl. 164—489 **11 Claims**

11. A method of removing heat from molten metal comprising discharging molten metal from a storage vessel into an intermediate distribution vessel, causing the metal to flow freely from the intermediate distribution vessel with a gaseous media or vacuum over one half of a generally cylindrical-section water-cooled body disposed in the path of the metal stream such that any tendency for the metal to solidify during its passage is effective on the surface of said body against which the solidifying metal contracts into intimate contact therewith, and feeding the metal stream issuing from the downstream said of said body into a mould or the nip of a rolling mill for flow casting.



4,913,222

AIR/AIR HEAT EXCHANGER USING WATER AS HEAT EXCHANGE MEDIUM

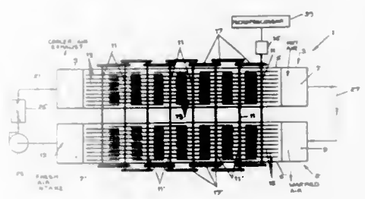
Ben Cowan, 46 Heath Road, Montreal, Quebec, Canada H3X 3L4

Filed Dec. 13, 1988, Ser. No. 283,903

Claims priority, application Canada, Dec. 24, 1987, 555396

Int. Cl.[4] F28D *19/00*

U.S. Cl. 165—7 **12 Claims**



1 A heat recovery unit comprising:

A—a first heat exchanger comprising:

a horizontally elongated tank partially filled with water, said tank having an air inlet at one end and an air outlet at the outer end;

at least two horizontal shafts extending transversally across the tank at substantially mid-height thereof, said shafts being parallel to each other and spaced apart over the length of said tank;

a set of spaced-apart metal discs coaxially mounted onto each shaft, each of said discs extending in a vertical plane and having such a diameter that at least one part of said each disc dips into the water in the tank; and

driving means for rotating the shafts together with the discs coaxially mounted thereto;

B—a second heat exchanger identical in structure to the first one;

C—means for passing hot air whose heat is to be recovered at least in part through the tank of the first heat exchanger;

D—means for passing cold air to be heated through the tank of the second heat exchanger, and

E—means for circulating water in closed cycle from the tank of the first heat exchanger to the tank of the second heat exchanger and vice-versa;

whereby heat is transferred from the hot air passing through the first heat exchanger to the cold air passing through the

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second heat exchanger via the circulating water, said circulating water acting as heat transfer medium.

4,913,223

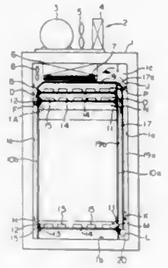
APPARATUS FOR DEFREEZING FROZEN FOODS

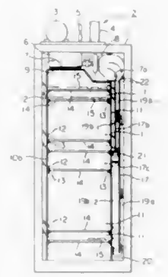
Shigeo Mizuno; Yuji Wakatuki, and Nobuya Suzuki, all of Toyoake, Japan, assignors to Hoshizaki Electric Co., Ltd., Aichi, Japan

Continuation-in-part of Ser. No. 132,553, Dec. 14, 1987, abandoned, and Ser. No. 13,421, Feb. 11, 1987, Pat. No. 4,812,622. This application Mar. 13, 1989, Ser. No. 322,395

Int. Cl.[4] **F25B** *29/00*; **H05B** *1/02*; **F24C** *15/32*

U.S. Cl. 165—61 **14 Claims**





1. An apparatus for defrosting frozen foods comprising:

a housing having a housing wall structure;

an enclosing wall structure located inside of and spaced from said housing and defining inside of said enclosing wall structure a storage space for storing frozen foods therein;

an access opening in said housing for allowing frozen foods to be put in and taken out of the storage space defined by said enclosing wall structure;

a plurality of hot-air inlet ports and a plurality of hot-air outlet ports in said enclosing wall structure for fluidly communicating the inside and the outside of the storage space defined by said enclosing wall structure;

a door attached to said housing for opening and closing said access opening;

heater means disposed at an upper part of said housing for heating the air within said housing;

ventilating means disposed within said housing for circulating the hot air resulting from the heating by said heater means throughout said storage space;

inlet passage defining means for defining a hot-air inlet passage in cooperation with said housing wall structure of said housing for introducing hot air supplied from said ventilating means into said hot-air inlet ports therethrough;

outlet passage defining means for defining a hot-air outlet passage in cooperation with said housing wall structure of said housing for introducing hot air discharged from said hot-air outlet ports therethrough to said heater means;

said inlet passage defining means including a first guide plate disposed between said enclosing wall structure defining the storage space and said housing wall structure, said first guide plate having a free upper end and a lower end having a first communication aperture therethrough, a partition wall mounted substantially transversely between said first guide plate and said enclosing wall structure defining the storage space in a substantially hermetic manner, said partition wall partitioning a vertical space between said first guide plate and said enclosing wall structure defining the storage space into upper and lower inlet passage sections, a second guide plate disposed within the upper passage section and connected to said enclosing wall structure defining the storage space at an upper end thereof in a substantially hermetic manner and having a lower end provided with a second communication aperture, and the upper inlet passage section being partitioned vertically by said second guide plate;

a down-draft passage for the hot air circulated by said ventilating means being defined between said first guide plate and said housing wall structure of said housing;

an up-draft passage for the hot air being defined below said partition wall and between said first guide plate and said enclosing wall structure defining the storage space, said up-draft passage being in communication with said down-draft passage through said first communication aperture;

an upper down-draft passage portion defined above said partition wall and between said first and second guide plates; and

an upper up-draft passage portion defined above said partition wall and between said second guide plate and said enclosing wall structure defining the storage space, said upper down-draft passage portion and said upper up-draft passage portion being in communication with each other through said second communication aperture for causing hot air circulated by said ventilating means to flow along said up-draft passage and said upper up-draft passage portion separately for being introduced into the storage space defined by said enclosing wall structure through said plurality of hot-air inlet ports successively.

4,913,224

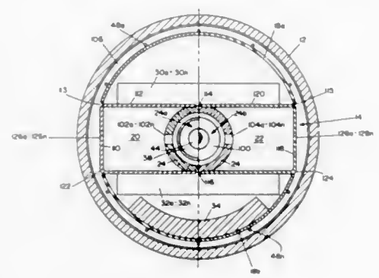
CHILL ROLL

Kenneth J. Moran, Appleton, Wis., assignor to W. R. Grace & Co.-Conn., Lexington, Mass.

Continuation of Ser. No. 203,075, Jun. 7, 1988, abandoned. This application Apr. 10, 1989, Ser. No. 335,842

Int. Cl.[4] **F28F** *5/02*

U.S. Cl. 165—89 **11 Claims**



1. Chill roll comprising:

a. cylindrical outer rotating chill roll;

b. cylindrical outer rotating opposing end roll journals supporting said chill roll and with a coolant inlet and a coolant outlet in said journals;

c. cylindrical inner stationary roll including opposing upper and lower cylindrical segments secured to a coolant supply header and a coolant return header, said headers secured about a center tube, supported on said end journals, and of a diameter less than that of said outer chill roll with an annular space therebetween;

d. plurality of holes in a coolant supply chamber in a first portion of said center tube and a like plurality of holes in a coolant return chamber in a second portion of said center tube; and,

e. plurality of holes in said coolant supply header and in said coolant return header whereby coolant flows through said end journal, sad coolant supply chamber, said coolant supply header, in said space between said rolls, said coolant return header, said coolant return chamber, and out said end journal, and said stationary inner roll distributes and collects coolant across the rotating outer roll thereby evenly enhancing heat transfer.

4,913,225

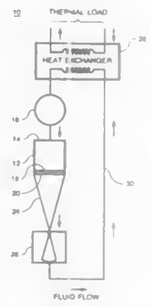
LIQUID SHEET RADIATOR APPARATUS

Donald L. Chubb, Olmsted Falls, Ohio, assignor to The United States of America as represented by the Administrator National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 15, 1988, Ser. No. 244,377

Int. Cl.[4] **F8** *15/00*

U.S. Cl. 165—104.31 **6 Claims**



1. A liquid sheet radiator apparatus connected to reservoir containing a liquid working fluid that exposes a triangular sheet of said working fluid to the vacuum of space without containing walls comprising:

(a) a generator means including

a body having an axial bore therethrough for conveying said liquid working fluid,

a rear face on said body having an opening therethrough correspondingly aligned with said bore; and

a frontal face with an opening therethrough correspondingly aligned with said bore;

(b) a plate having a slit therein rigidly mounted on said frontal face, said slit having an opening therethrough and said opening being correspondingly aligned with said bore to provide a predetermined fluid flow pattern;

(c) a pump for forcibly passing a fluid from said reservoir through said generator means and said plate thereby producing said triangular liquid sheet;

(d) a collector registerably aligned with said frontal face and spaced therefrom for receiving said discharged liquid sheet which coalesces therein; and

(e) means for recirculating said fluid from said collector to said reservoir.

4,913,226

HEAT EXCHANGER AND ASSOCIATED METHOD

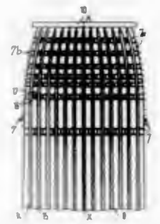
Klaus Hagemeister, Munich, and Alfred Hueber, Merching, both of Fed. Rep. of Germany, assignors to MTU Motoren- und Turbinen-Union GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 7, 1987, Ser. No. 106,113

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1986, 3635549

Int. Cl.[4] **F28D** *7/06*

U.S. Cl. 165—163 **17 Claims**



1. A heat exchanger comprising an inlet duct for admission of a first fluid to be heated, an outlet duct for discharge of said first fluid after heating thereof, said ducts being arranged in substantially parallel relation, a matrix assembly of a plurality of U-shaped heat exchanger tubes connected to said inlet and outlet ducts for receiving said first fluid from said inlet duct to convey said first fluid through said tubes for discharge into said outlet duct, said heat exchanger tubes extending transversely from said inlet and said outlet duct into the path of flow of a second fluid, said tubes of the matrix assembly forming first and second straight line matrix sections extending into a common curved bend matrix section in which reversal of flow of said first fluid is effected, said tubes of said first and second matrix sections each providing flow fields and respective through flow areas for said second fluid differing from the flow field and respective through flow areas of said tubes in said curved bend matrix section, said matrix assembly being divided into a plurality of separate groups adjacent to one another lengthwise of said ducts, each group of tubes having a central longitudinal plane extending perpendicularly to said ducts, said curved bend sections of said tubes in each group converging uniformly towards said central longitudinal plane, to locally reduce the flow areas between said tubes in said curved bend matrix section the curved bend sections of the tubes in each group on opposite sides of said central longitudinal plane being of opposite curvature.

4,913,227

EQUIPMENT FOR A DRILL PIPE STRING INCLUDING A SIDE ENTRY SUB, A SAFETY MEMBER FOR ANCHORING A CABLE ON A SUPPORT, AND A METHOD OF USING THE EQUIPMENT

Christian Wittrisch, Rueil Malmaison, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

Filed May 5, 1988, Ser. No. 190,752

Claims priority, application France, May 7, 1987, 87 06542; May 7, 1987, 87 06543

Int. Cl.[4] **E21B** *17/046, 23/02*

U.S. Cl. 166—117.5 **21 Claims**

1. A side entry sub for incorporation in a drill pipe string, said sub comprising a tubular body having an upper end and a lower end adapted to be connected with elements of the drill pipe string and having a side entry for allowing a cable to be passed therethrough; said sub further comprising means for

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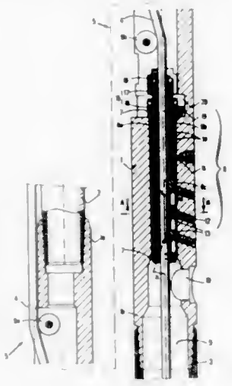
sealing about the cable upon entry of the cable into the tubular body and for isolating an inner zone inside the tubular body, said inner zone being situated below said means and being



adapted to be in fluid communication with a lower element of the drill pipe string and a side opening in said tubular body, said opening being in fluid communication with said inner zone and being adapted to be connected to a pumping installation.

4,913,228

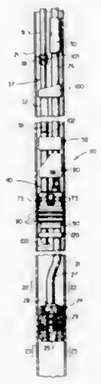
DUAL STRING TENSION-SET, TENSION-RELEASE WELL PACKER

John R. Setterberg, Jr., Victoria, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 802,528, Nov. 27, 1985, abandoned. This application Apr. 1, 1986, Ser. No. 846,929

Int. Cl.[4] E21B *33/122*

U.S. Cl. 166—118 **14 Claims**



1. A well packer for forming a downhole fluid barrier between a casing string and a pair of tubing strings disposed therein comprising:

a. a pair of parallel mandrel means with a longitudinal flow passageway extending through each mandrel means;

b. means for connecting each mandrel means to separate tubing strings to allow fluid communication through each mandrel means and its associated tubing string;

c. packing means carried on the exterior of the mandrel means whereby compression of the packing means causes radial expansion thereof to form the fluid barrier between the exterior of the mandrel means and the interior of the casing string;

d. anchoring means carried on the exterior of the mandrel means having a retracted position and an expanded position whereby the anchoring means is releasably engageable with the interior of the casing string to prevent undesired movement of the well packer relative to the casing string;

e. means for releasably securing the mandrel means to each other to prevent relative longitudinal movement therebetween until after the well packer is lowered to its desired downhole location;

f. means for moving the anchoring means to its expanded position and compressing the packing means in response to tension forces applied to one tubing string causing upward longitudinal movement of one mandrel means relative to the other mandrel means; and

g. means for moving the anchoring means to its retracted position and releasing compression of the packing means in response to tension forces applied to the other tubing string causing upward longitudinal movement of the other mandrel means relative to the one mandrel means.

4,913,229

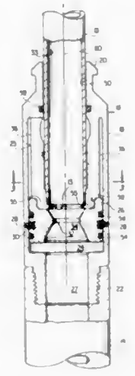
COUPLING FOR RELEASING TUBING STRINGS FROM DOWNHOLE TOOLS

David D. Hearn, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 13, 1988, Ser. No. 193,963

Int. Cl.[4] E21B *33/16*; F16L *37/08*

U.S. Cl. 166—156 **15 Claims**



1. A releasable connector for connecting an elongated tube member to a downhole tool comprising:

a connector body including means defining a bore for receiving the distal end of a generally cylindrical tube member;

means supported on said body and engagable with an end of said tube member and forming a releasable connection between said connector and said tube member whereby said tube member may be withdrawn from said body in a condition such that the end of said tube member retrievable from said connector is not significantly greater in diameter than the outer diameter of another portion of said tube member; and

retaining means operable to retain said means forming said connection in a position to retain said tube member connected to said connector, said retaining means including piston means disposed in said body and including passage means formed in said piston means for receiving a closure

member to provide for increasing the fluid pressure acting on said piston means to permit said means forming said connection to release said tube member from said connector whereby said tube member may be withdrawn from said body.

4,913,230

SUCKER ROD CENTRALIZER

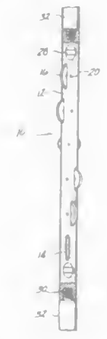
Olegario Rivas, Dtto. Sucre Edo Miranda, and Alejandro Newski, Los Teques Edo. Miranda, both of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Continuation of Ser. No. 93,929, Sep. 21, 1987, Pat. No. 4,871,020. This application Jun. 12, 1989, Ser. No. 364,130

The portion of the term of this patent subsequent to Jan. 3, 2006, has been disclaimed.

Int. Cl.[4] E21B *17/10*

U.S. Cl. 166—241 **7 Claims**



1. A device for centralizing at least one sucker rod within a production pipe downhole in a well and for reducing frictional forces between said pipe and said at least one sucker rod which comprises an elongate, substantially cylindrical body member having a longitudinal axis, a plurality of slots within said member and a rotatable member mounted within each slot; each of said plurality of slots has its major dimension along a first axis parallel to the longitudinal axis of said body member and is oriented with respect to the other slot so as to form a helicoidal array for maximizing the total surface contact area between the rotatable members and the pipe and for decreasing the forces acting on each rotatable member wherein each rotatable member rotates within said slot about a second axis substantially transverse to said first axis wherein the hardness of the material from which said rotatable members are formed have a hardness of from at least about 50 to about 150 Brinnel Hardness less than the hardness of the material from which the production tube is made wherein the relative hardness is maintained over time at the service temperatures encountered downhole in the well, that is, at temperatures of ≧300° F.

4,913,231

TOOL FOR TREATING SUBTERRANEAN WELLS

Laurent Muller, Sugar Land, and Ervin Randermann, Beasley, both of Tex., assignors to Dowell Schlumberger, Tulsa, Okla.

Filed Dec. 9, 1988, Ser. No. 282,437

Int. Cl.[4] E21B *47/00*

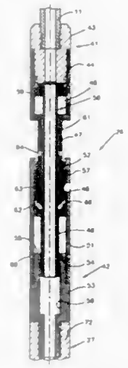
U.S. Cl. 166—250 **26 Claims**

1. A tool for treating subterranean wells, comprising an elongated body assembly adapted to be connected at one end to a support tube, inflatable packer means mounted on said body assembly movable between a deflated position allowing the tool to be moved along the well and an inflated position for sealing with the surface of the well to isolate one portion of the well surface from other portions of the well surface, and valve means in said body assembly operable without rotation of said support tube to control said tool by moving sequentially

(a) to a first position for inflating said packer means;

(b) to a second position for circulating fluid to permit the flow of treatment fluid to said tool;

(c) to a third position for injection said treatment fluid into said one portion of said well; and



(d) to a position for deflating said packers at the completion of said injection of said treatment fluid,

said valve means providing time delay means requiring a predetermined period of time for said valve means to move to said first position.

4,913,232

METHOD OF ISOLATING PRODUCTION ZONES IN A WELL, AND APPARATUS FOR IMPLEMENTING THE METHOD

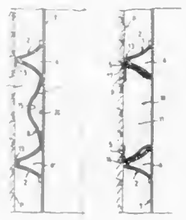
André Cheymol, Dange; Alain Basse, Pau; Francois C. Gueuret, Voisins Le Bretonneux, and Gilbert C. Blu, Paris, all of France, assignors to Hutchinson and Merip Oil Tools International, France

Filed Jan. 18, 1989, Ser. No. 298,659

Claims priority, application France, Jan. 20, 1988, 88 00595

Int. Cl.[4] E21B *33/134, 33/16*

U.S. Cl. 166—285 **19 Claims**



11. A method of making a sealing ring in an annular space lying between a portion of an inside wall of a well and a corresponding opposite portion of an outside wall of a casing inside the well, said method comprising:

delimiting said annular space by inflating each of two chambers defined by first and second deformable, annular elastomeric confinement membranes and said outside wall;

thereafter injecting under pressure a substance into a chamber defined by a deformable, annular elastomeric separa-

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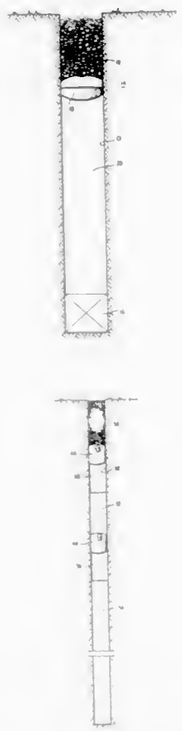
tor membrane disposed between said confinement membranes wherein a sealing ring is provided in said space; and substantially simultaneously ejecting fluids normally present from said space while maintaining the injected filler substance separate therefrom.

4,913,233

METHODS OF FIELD BLASTING OF EARTH FORMATIONS USING INFLATABLE DEVICES FOR SUSPENDING EXPLOSIVES IN BOREHOLES

Daniel F. Fitzgibbon, Jr., Rte. 3, Van Dyke Mill Rd., Taylorsville, Ky. 40071

Division of Ser. No. 166,542, Mar. 10, 1988. This application Nov. 28, 1988, Ser. No. 276,651
Int. Cl.[4] E21B *33/127*
U.S. Cl. 166—285 17 Claims



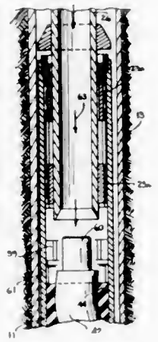
9. A method for production blasting of an earth formation to remove earth from the formation, comprising the steps of:
drilling production holes in the formation in a desired pattern;
disposing explosive material within the holes;
disposing inflatable bag-like devices within at least certain of the holes;
inflating the devices to seal or plug the holes;
disposing material above each device to suspend the material within the hole through the support provided by the device; and,
detonating the explosive material within the holes in a desired sequence

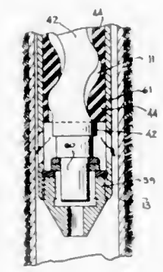
4,913,234

FLUDI DRIVEN SCREW TYPE SONIC OSCILLATOR-AMPLIFIER SYSTEM FOR USE IN FREEING A STUCK PIPE

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Continuation-in-part of Ser. No. 78,282, Jul. 27, 1987, Pat. No. 4,824,258. This application Jan. 19, 1989, Ser. No. 299,392
The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.
Int. Cl.[4] E21B *31/16*
U.S. Cl. 166—301 9 Claims





1. A system for providing sonic vibrational energy to effect the freeing of a section of well pipe stuck in a well bore comprising:
an orbital oscillator including a housing;
an elongated screw shaped stator mounted in said housing and an elongated screw shaped rotor mounted for precessionally rolling rotation freely in said stator;
means for suspending said oscillator for rotation within said section of pipe about the longitudinal axis of the drill pipe in close proximity to the stuck portion thereof; and
drive means for rotatably driving said rotor to effect orbital lateral sonic vibration of said housing such that said housing precesses laterally around the inner wall of said pipe, thereby generating lateral quadrature vibrational forces in said pipe to effect the freeing thereof from said well bore.

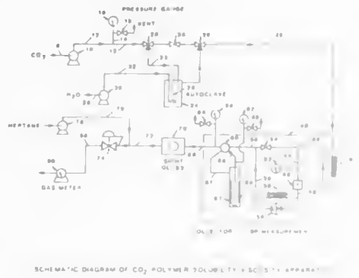
8. A method for freeing a section of pipe stuck in a bore hole comprising the steps of:
suspending an orbital oscillator having a housing and a rotor within said pipe for rotation of the housing around the inner wall of said pipe;
lowering said oscillator within said drill string to the vicinity where the drill string is stuck; and
driving the rotor of said oscillator so as to generate lateral quadrature vibrational energy within said housing and to effect precessional rotation of said housing around the inner wall of the drill string, thereby shaking the drill string loose from the well bore.

4,913,235

ENHANCED OIL RECOVERY USING CO_2 FLOODING

Thomas V. Harris, Benicia; Cyrus A. Irani, Hacienda Heights, both of Calif., and Wayne F. Pretzer, Wheaton, Ill., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 58,690, Jun. 3, 1987, abandoned, which is a continuation of Ser. No. 910,041, Sep. 22, 1986, abandoned, which is a continuation of Ser. No. 749,479, Jun. 27, 1985, abandoned. This application Jul. 14, 1987, Ser. No. 73,791
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—273 48 Claims



SCHEMATIC DIAGRAM OF CO_2 POLYMER SOLUBILITY & SCISSITY APPARATUS

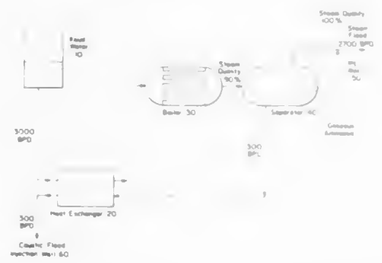
1. In a method for recovering oil from an underground oil-bearing earth formation penetrated by an injection well and a producing well, in which method CO_2 is injected into said formation to displace oil towards said producing well from which oil is produced to the surface, the improvement comprising injecting into said formation CO_2, the viscosity of which is increased at least three-fold by the presence of a sufficient amount of a polymer and a sufficient amount of a cosolvent to form a solution of said polymer in said CO_2.

4,913,236

METHOD FOR INHIBITING SILICA DISSOLUTION USING PHASE SEPARATION DURING OIL WELL STEAM INJECTION

Marion G. Reed, Hacienda Heights, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 164,923, Mar. 7, 1988, abandoned. This application Feb. 3, 1989, Ser. No. 307,222
Int. Cl.[4] E21B *43/24*
U.S. Cl. 166—303 16 Claims



1. A method for inhibiting silica dissolution in the vicinity of a well penetrating a hydrocarbon-containing formation, comprising:
(a) adding an amount of a chemical compound to a wet steam which forms an alkaline component in the vapor phase of said wet steam effective to inhibit corrosion in the vicinity of the vapor phase condensate;
(b) separating in a separation vessel said wet steam into a liquid phase and said vapor phase;
(c) removing an amount of said liquid phase from said separation vessel effective to reduce silica dissolution in the vicinity of said liquid phase; and
(d) injecting said wet steam into said formation.

4,913,237

REMEDIAL TREATMENT FOR COAL DEGAS WELLS

G. Michael Kutas, Farmington, N. Mex., assignor to Amoco Corporation, Chicago, Ill.

Filed Feb. 14, 1989, Ser. No. 310,440
Int. Cl.[4] E21B *37/00, 43/26*
U.S. Cl. 166—308 11 Claims

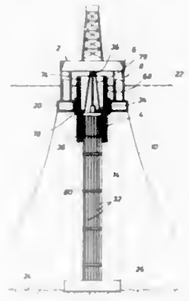
1. A remedial treatment for enhancing the production of gas and/or water from a coal degasification well penetrating one or more coal seams in a subterranean formation and having a communication channel extending from the well into at least one of the coal seams, wherein the communication channel was created by hydraulically fracturing the coal seam, said treatment comprising the steps of:
(a) injecting an aqueous foam treating fluid through the wellbore and into the communication channel; and
(b) flowing back the treating fluid through an open choke.

4,913,238

FLOATING/TENSIONED PRODUCTION SYSTEM WITH CAISSON

Mark A. Danazcko; Robert E. Haring, and Roger W. Huffaker, all of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Apr. 18, 1989, Ser. No. 340,181
Int. Cl.[4] E21B *7/128, 43/01;* B63B *35/44*
U.S. Cl. 166—350 52 Claims



1. A drilling and production system for use at a drill site beneath a body of water having a surface, said drilling and production system comprising:
a semisubmersible platform having production facilities thereon and comprising a working deck with a bottom surface and being moored generally above said drill site;
a tension leg platform having a production deck supported by at least one buoyancy member, and at least one riser extending upwardly from said drill site to at least one wellhead located on said production deck, said tension leg platform being anchored by at least one tether at said drill site in such a manner that said production deck is sup-

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ported below said surface of said body of water and generally beneath said working deck;

a caisson being configured and arranged to provide a substantially water-free working area on said production deck;

a means to compensate for relative movement between said semisubmersible platform and said tension leg platform; and

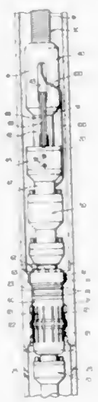
at least one flexible flowline for directing produced fluid from said wellhead on said production deck to said production facilities.

4,913,239

SUBMERSIBLE WELL PUMP AND WELL COMPLETION SYSTEM

Russell I. Bayh, III, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed May 26, 1989, Ser. No. 357,188
Int. Cl.[4] E21B *19/02, 34/10, 43/12*
U.S. Cl. 166—385 10 Claims



1 A well completion system for a downhole submersible pump and motor comprising:

a. a production tubing string with a landing nipple forming an integral part thereof and defining in part a downhole location for releasably anchoring a submersible pump and related components within the production tubing string;

b. a power cable having electrical conductors and fluid conductors to supply both electricity and treating fluid from the well surface to the submersible pump and related components; and

c. a fluid flow path extending through the submersible pump motor and its related components to receive treating fluid from the power cable.

6. The method of installing and operating a downhole submersible pump and motor comprising:

a. attaching the submersible pump with its motor and related components to a power cable having electrical conductors and a fluid conductor to supply both electricity and treating fluid from the well surface to the submersible pump motor and related components;

b. lowering the submersible pump, motor and related components by the power cable through a production tubing string to a landing nipple which defines in part a downhole location for releasably anchoring the submersible pump and related components within the production tubing string; and

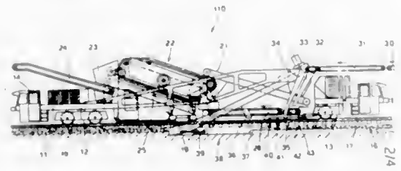
c. injecting treating fluid from the well surface through the power cable to a fluid flow path extending through the submersible pump motor and its related components.

4,913,240

MACHINE TO CLEAN AND REHABILIATATE RAILWAY BALLAST AND RAILWAY ROAD BEDS

Flavio Mancini, Brescia, Italy, assignor to Danieli & C. Officing Mecanich SpA and ITI/CLM Impianti Tecnica industrili SpA, both of Buttrio, Italy

Filed Jul. 12, 1988, Ser. No. 217,967
Claims priority, application Japan, Jul. 22, 1987, 83409 A/87
Int. Cl.[4] E01B *27/00*
U.S. Cl. 171—16 7 Claims



1. Machine to clean and rehabilitate railway ballast from a railroad bed, comprising:

(A) excavating means for removing ballast material from the railroad bed whereby an excavation is formed;

(B) cleaning means for cleaning the ballast material excavated by the excavating means;

(C) rehabilitation means, said rehabilitation means comprising:

(1) transport means for receiving and transporting ballast material, and

(2) distribution means for receiving ballast material from the transport means and distributing ballast material within the machine; and

(D) first backfill means for replacing the ballast material removed by the excavating means in the excavation;

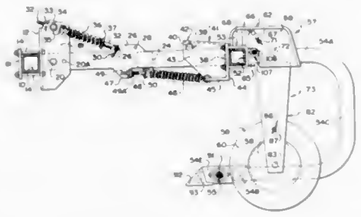
wherein the first backfill means receives ballast material from one of the cleaning means and the distribution means for backfilling the excavation with ballast material.

4,913,241

ROD WEEDER ATTACHMENT FOR AN AGRICULTURAL IMPLEMENT

Duane Haukaas, Box 8, Morlach, Saskatchewan, Canada (S0H 3E0)

Filed Jan. 23, 1989, Ser. No. 298,932
Int. Cl.[4] A01B *39/19*
U.S. Cl. 172—44 13 Claims



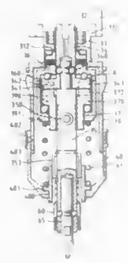
1. A tillage attachment device for mounting on an agricultural implement of the type comprising a tool bar, ground wheels for supporting the tool bar for movement across the ground and means for causing the tool bar to move in a direction transverse to its length, the device comprising clamp means for attachment of the device to the tool bar, pivot arm means mounted on said clamp means so as to extend rearwardly therefrom including a first portion extending from said clamp means so as to be pivotal about a horizontal axis at right angles to said arm means and a second rearward portion connected to the first portion at a rearward end thereof so as to extend downwardly therefrom, spring biasing means connected between said clamp means and said first portion of said pivot arm means for biasing said arm means downwardly around said axis, a ground engaging wheel having an axle mounted on said second portion of said arm means remote from said clamp means such that the ground wheel runs on the ground rearwardly of and following said tool bar, said ground wheel having a ground engaging periphery arranged to maintain said axle at a predetermined spacing from the ground, strut means rigidly mounted upon and extending transversely to said first portion of said arm means, two horizontally spaced rigid shank means each rigidly mounted on said strut means and extending downwardly therefrom for engagement with the ground, a rod extending between said shank means at respective lower ends thereof, the position of the rod relative to the ground being controlled by the height of the first portion of the arm means above the ground, bearing means mounting said rod on each of said shank means for rotation relative thereto about a longitudinal axis of said rod, drive means for communicating drive from said ground wheel to said rod for rotating said rod, means mounting the second portion of the arm means on the first portion for free pivotal movement about an axis parallel to said horizontal axis from a first forward position, in which the angle between the first and second positions is a minimum, in which the axle and ground wheel are at a forwardly most extent and in which the length of the shank means relative to the length of the second portion is arranged such that a lowest point of the periphery of the ground wheel is below a horizontal plane containing the rod, to a predetermined second rearward position in which said angle is increased such that the ground wheel is above said horizontal plane by a distance equal to a predetermined required working depth of the rod in the ground, limit means preventing movement of the second portion beyond said second position and means biasing said second portion toward said first position.

4,913,242

ELECTRIC SCREW DRIVER

Juey-Yuan Lo, Yungho, Taiwan, assignor to Top Driver Enterprise Co., Ltd., Yungho, Taiwan

Filed Aug. 7, 1989, Ser. No. 390,008
Int. Cl.[4] B25B *23/157*
U.S. Cl. 173—12 3 Claims



1. An electric screw driver including an elongated housing body holding a screw-driver head and a motor which drives the screw-driver head through a transmission mechanism having a longitudinal transmission shaft and a clutching mechanism which is cooperatively associated with said longitudinal transmission shaft,

said elongated housing body having a surrounding wall portion for receiving said clutching mechanism, said surrounding wall portion having a shoulder formation which defines a central hole, said clutching mechanism including a first clutch member which has a first disc portion at one side of said shoulder formation and a first hollow shank extending to the other side of said shoulder formation from said first disc portion through said central hole, said first disc portion having a first engaging means which projects from said first disc portion, a second clutch member which has a second disc portion facing said first disc portion and a second hollow shank which extends in a direction opposite to said first hollow shank, said second disc portion having second engaging means, said second hollow shank sleeved around said longitudinal shaft, a bearing housing a tubular portion around said second clutch member, said tubular portion having a distal bearing end extending toward said first disc portion, and an adjustment coil spring provided around said longitudinal transmission shaft and urges said bearing housing and said second clutch member to move toward said first clutch member,

wherein the improvements comprise:

a bearing cap provided adjacent said first clutch member, said bearing cap having an annular flange extending axially around said first disc portion, said annular flange having a distal bearing end, said bearing housing and said bearing cap confining a space for receiving said first and second disc portions, said distal bearing end of said bearing housing contacting said distal bearing end of said bearing cap when said bearing housing is moved toward said bearing cap by the force of said adjustment coil spring, said distal bearing end of said bearing cap stopping any further upward movement of said bearing housing and receiving all impacts caused by the force of said adjustment spring; and

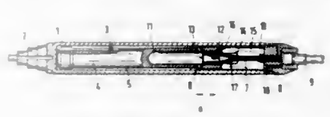
a shock absorbing means provided between said shoulder formation of said elongated housing body and said bearing cap, and including two resilient convex disc members, around said first hollow shank, which bulge in opposite directions, and a packing member provided around said first hollow shank between said shoulder formation and said resilient convex disc members.

4,913,243

PERCUSSION DRILL AND METHOD OF CONTROLLING SAME

Gustav Jeanz, Essen-Kettwig, Fed. Rep. of Germany, and Dietmar Jeanz, Strengelbach, Switzerland, assignors to Terra AG für Tiefbautechnik, Strengelbach

Filed Dec. 30, 1988, Ser. No. 292,461
Claims priority, application Switzerland, Dec. 30, 1987, 05107/87
Int. Cl.[4] E21B *4/14*
U.S. Cl. 175—57 14 Claims



1. A method for controlling a percussion drill with a percussion piston for producing holes in soil, with the control process including control phases of a reversible slide valve control arrangement; said method comprising the improvement therewith which includes the step of:

optimizing the control process for operating of said drill in a rearward direction of travel by incorporating a gentle braking phase effective upon the percussion piston during the rearward direction of travel thereof.

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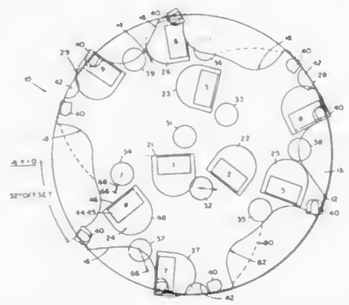
4,913,244

LARGE COMPACT CUTTER ROTARY DRILL BIT UTILIZING DIRECTED HYDRAULICS FOR EACH CUTTER

William R. Trujillo, West Jordan, Utah, assignor to Eastman Christensen Company, Salt Lake City, Utah

Continuation of Ser. No. 906,169, Sep. 11, 1986, abandoned. This application Oct. 31, 1988, Ser. No. 266,323
Int. Cl.[4] E21B *10/00*
U.S. Cl. 175—65 33 Claims



1. An improvement in a rotating bit for cutting chips from a plastic formation comprising:

a plurality of cutters, wherein at least one cutter has a large diamond cutting surface at least as large as a three quarter inch diameter circle, each cutter adapted to cut a chip from said formation; and

at least one nozzle means for directing a defined hydraulic flow only to said large cutter, said flow directed by said nozzle means applying a torque to said chip cut by said large cutter, said torque tending to twist said chip from said face of said cutter, said nozzle means associated with said cutter having a center placed in nonsymmetrical relationship to said lateral dimension of said associated cutter, wherein said nozzle directs said hydraulic flow to said cutter face of said large cutter at a position in the proximity of the center of gravity of said chip,

whereby said chips of said plastic formation are cut by the minimum tendency of said bit to ball.

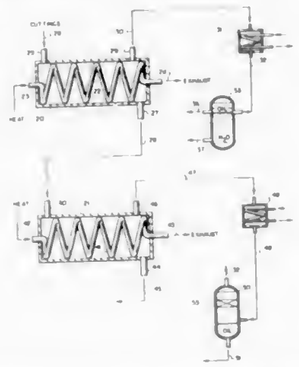
4,913,245

WELLBORE DRILLING CUTTINGS TREATMENT

James L. Skinner, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 677,658, Dec. 3, 1984, abandoned. This application Jan. 20, 1987, Ser. No. 6,290
Int. Cl.[4] E21B *21/06*
U.S. Cl. 175—66 4 Claims

1. Apparatus for treating a mixture of solid particles, water and a hydrocarbon oil such as produced in connection with an earth drilling operation wherein said drilling operation generates a substantial amount of a mixture of solid particles comprising drilling cuttings, water, and at least one hydrocarbon oil, said apparatus comprising: enclosed indirect type heat exchanger means operable for receiving said mixture of cuttings, water, and oil and for heating same to an elevated temperature of not more than about 212 degrees F. to 240 degrees F. and at autogenous pressure sufficient to vaporize essentially all of said water and at least a small amount of said oil to produce a mixture of heated cuttings and a vaporized mixture of water and oil, means operably connected to said heat exchanger means for recovering all of said vaporized mixture of water and oil separately from said heat exchanger means and from said cuttings, means connected to said heat exchanger means for receiving said cuttings and for heating said cuttings to a temperature of about 300 degrees F. to 725 degrees F. sufficient to remove essentially all the oil remaining with said cuttings thereby to produce dry, oil free cuttings and gaseous



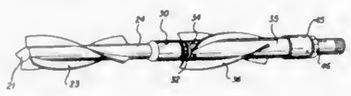
products of oil from said means for receiving said cuttings and means for receiving said gaseous products separately from said cuttings whereby said cuttings are in a condition acceptable for disposal.

4,913,246

ROTARY GAD FOR GROUND DRILL

Toshio Mukai, 20-24-2-chome Azukimochi, Hamamatsu-city, Shizuoka Prefecture, Japan

Filed Oct. 5, 1988, Ser. No. 253,798
Int. Cl.[4] E21B *10/44*
U.S. Cl. 175—323 4 Claims



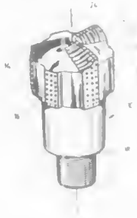
1. A rotary gad for a ground drill comprising an elongated front body having a front end and a rear end, front spiral blades disposed on the outside of said front body, said front body having an elongated front axial passage, a front core rod means disposed in said front axial passage, said front body being rotatable about said front core rod means, said front core rod means having a front end and a rear end, an elongated rear body having a front end and a rear end, said rear body being disposed in axial alignment with said front body, rear spiral blades disposed on the outside of said rear body, said rear spiral blades extending in a spiral direction opposite to the spiral direction of said front spiral blade, said rear body having an elongated rear axial passage axially aligned with said front axial passage, a rear core rod means disposed in said rear body, said rear body being rotatable about said rear core rod means, said rear core rod means having a front end and a rear end, said rear body having a front end portion, said rear end of said front core rod means extending into said front end portion of said rear body, a pushing section in said rear axial passage, said pushing section having a front side and a rear side, a rear ball element between said rear side of said pushing section and said front end of said rear core rod means, and a front ball element between said front side of said pushing section and said rear end of said front core rod means, and coupling means coupling said front and rear bodies to provide for rotation of said front and rear bodies in opposite directions about said front and rear core rod means.

4,913,247

DRILL BIT HAVING IMPROVED CUTTER CONFIGURATION

Mark L. Jones, Midvale, Utah, assignor to Eastman Christensen Company, Salt Lake City, Utah

Filed Jun. 9, 1988, Ser. No. 204,683
Int. Cl.[4] E21B *10/46, 10/48*
U.S. Cl. 175—329 20 Claims



10. A drill bit, comprising:

a body member; and

a plurality of cutter blades distributed on said body member, each cutter blade having a generally planar diamond cutting face, and having a height which increases generally continuously from the inner extent of said blade to the outer extent of said blade.

16. A method of constructing a drill bit, comprising:

establishing a body member; and

establishing at least one cutter blade on said body member, said cutter blade having a generally planar diamond cutting face with a generally parabolic shape, said parabolic shape established by upper and lower sides which diverge in relation to increased distance from the center of said body member, said cutter blade established by providing a volume of diamond to form a cutting face of said blade, said volume established in varying quantities along the length of said blade generally in response to distance from the center of said bit.

4,913,248

PORTABLE WEIGHING SCALE

Avi Zakai, Rishon Le-Zion, Israel, assignor to Aran Engineering Development Ltd., Kfar Shmaryahu, Israel

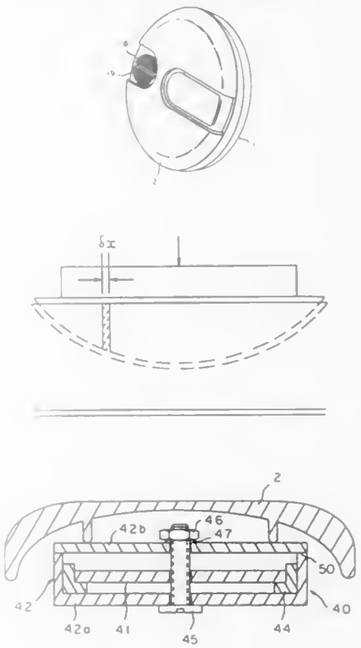
Filed May 15, 1989, Ser. No. 351,501
Claims priority, application Israel, May 17, 1988, 86407; Feb. 6, 1989, 89184
Int. Cl.[4] G01G *3/14*; G01L *1/14*
U.S. Cl. 177—210 C 13 Claims

1. In a weighing scale:

a capacitive load cell comprising a pair of spaced apart electrically conductive plates, at least one of which is capable of resilient deformation, said plates being insulated with respect to each other, and

a load transmission element adapted to bear on the capacitive load cell so that in response to a load applied to the load transmission element the plates are resiliently displaced towards each other thereby increasing their capacitance;

said capacitive load cell and load transmission element being so dimensioned that the change in capacitance of the capacitive load cell is substantially uniform regardless of



where on the load transmission element the load is applied.

4,913,249

AUXILIARY POWER STEERING MECHANISM, ESPECIALLY FOR MOTOR VEHICLES

Armin Lang, Schwäbisch Gmünd, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP87/00380, § 371 Date Dec. 28, 1988, § 102(e) Date Dec. 28, 1988, PCT Pub. No. WO88/00545, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 14, 1987, Ser. No. 294,509
Claims priority, application Luxembourg, Jul. 19, 1986, 426
Int. Cl.[4] B62D *5/04*
U.S. Cl. 180—79.1 8 Claims

1 An auxiliary power steering mechanism for motor vehicles having an electric motor (11) assisting a hand-operated steering means (5) of a steering gear (1), a first torque-measuring means (8) for measuring a torque applied to said steering means (5) and producing two output signals X1 and X2, a control circuit (9) having an electronic control means (10) for controlling said electric motor (11) according to a first output signal (X1) from said first torque-measuring means (8), the improvement comprising

a redundant safety circuit (14) including a safety means (15) and a switching means (16) for controlling a disconnecting means (13, 27) for activating and deactivating said electric motor (11) steering assist according to a second output signal (X2) from said torque-measuring means (8),

a second torque-measuring means (17) for measuring the torque of said electric motor (11) disposed in the drive

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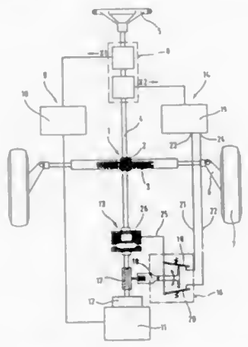
train between said electric motor (11) and said steering gear (1), and



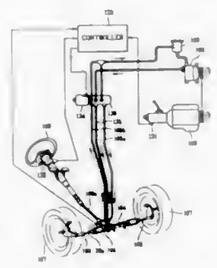
said switching means (16) of said safety circuit (14) operating said disconnecting means (13, 27) when the respective torques measured by said first and second torque-measuring means (8, 17) have different directions.

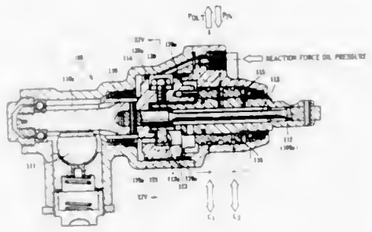
4,913,250

CONTROL APPARATUS OF POWER STEERING DEVICE

Yasuyoshi Emori, and Kouichi Ishizaka, both of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed May 27, 1988, Ser. No. 200,033
Claims priority, application Japan, May 29, 1987, 62-134038
Int. Cl.[4] B62D *5/06, 6/02, 6/04*
U.S. Cl. 180—79.1 3 Claims





1. A control apparatus of a power steering device comprising:

a pressure sensitive detection means for detecting a road surface resistance and converting said road surface resistance into a first electrical signal supplied to a first electrical coupling means;

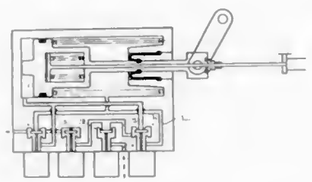
a steering reaction force control device electrically coupled to said power steering device by a second electrical coupling means, and to said pressure sensitive detection means by said first electrical coupling means, wherein said steering reaction force control device compares said first electrical signal to a reference signal of said steering reaction force control device and generates a second electrical signal of corresponding magnitude such that said second electrical signal is supplied to said power steering device for generating a corresponding steering reaction force.

4,913,251

CONTROL DEVICE

Glyn P. R. Farr, Leek Wootton, England, assignor to Lucas Industries public limited company, Birmingham, United Kingdom

Filed Nov. 7, 1988, Ser. No. 267,893
Claims priority, application United Kingdom, Nov. 5, 1987, 8725934; Nov. 11, 1987, 8726392
Int. Cl.[4] B60K *31/06*
U.S. Cl. 180—175 8 Claims



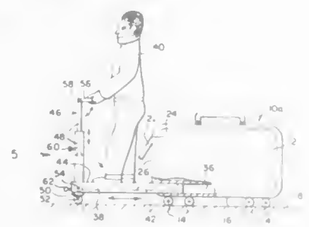
1. A control device for controlling the operation of a fuel control member of a vehicle engine, comprising a hollow housing, a fluid pressure operable member movable in the housing and dividing the interior of the housing into first and second chambers on opposite sides of the fluid pressure operable member, biassing means for biassing the fluid pressure operable member in one direction, coupling means connected to said fluid pressure operable member and extending to the exterior of the housing, said coupling means coupling the fluid pressure operable member to said fuel contrel member, a first inlet on the housing for connection to a vacuum or pressure source, a second inlet open to the atmosphere, first and second operation control valves movable substantially simultaneously to respective first and second positions to connect said chambers alternately to said first inlet, and first and second adjustment valves controlling communication between the inlets respectively and said chambers, the arrangement being such that when the said first adjustment valve is open and the second adjustment valve closed, the pressure in the said chambers will be substantially equal to allow the fluid pressure operable member to be adjusted in the housing, and when said first adjustment valve is closed and said second adjustment valve is opened, the fluid pressure in said second chamber will differ from that in said first chamber to cause movement of the fluid pressure operable member, wherein when the first and second control valves are in said first position the operation of the said adjustment valves controls the pressure in said first chamber to cause movement of the fluid pressure operable member in the direction to reduce the torque developed by the engine, and when the first and second control valves are in said second position, operation of said adjustment valves controlling the pressure in said first chamber to cause movement of the fluid pressure operable member to maintain a constant vehicle speed, the actual pressure in the said chamber being controllable by operation of said adjustment valves.

4,913,252

MOTORIZED LUGGAGE

B. Dean Bartley, Box 256, Tahoka, Tex. 79373, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007

Filed Nov. 21, 1988, Ser. No. 274,004
Int. Cl.[4] B62D *61/00*
U.S. Cl. 180—208 2 Claims



1. An article of motorized luggage comprising:

(a) a container body with a bottom for holding various items therein;

(b) a plurality of wheels, individually rotatably journaled to said bottom of said container body for allowing said container body to travel along the ground;

(c) means within said container body for driving at least one of said wheels to make said luggage a self-powered unit;

(d) an upwardly pivoting lever pivoted on a side of said container body for activating said driving means and for maneuvering said container body when said luggage travels along the ground; wherein said driving means includes

(e) a motor for supplying rotary motion;

(f) a battery for supplying electric current to said motor;

(g) a switch electrically connected between said motor and said battery, said switch located adjacent said lever whereby pivoting of said lever upwardly will turn said switch on;

(h) a bevel gear assembly to carry rotary motion from said motor to said at least one of said wheels when said switch is turned on by said lever;

(i) a horizontal track carried within said bottom of said container body;

(j) a platform substantially slideable within said track for transporting a person standing thereupon, said platform having a slot within a top surface thereof and

(k) means on a front end of said platform held and manually operated by the person for allowing said platform to travel and be steered along the ground;

(l) said steering means comprising an upright handle bar post rotatably mounted at its lower end to said front end of said platform;

(m) said steering means further comprising a horizontal steering bar carried under the front end of said platform and centrally connected to and rotated by said upright handle bar post; and

(n) a pair of spaced apart front wheel assemblies, individually rotatably journaled to underside at each end of said steering bar for allowing said platform to travel and be steered along the ground.

4,913,253

MOTOR DRIVEN TUG VEHICLE

John M. Bowling, Orville, Ohio, assignor to Rayco Manufacturing, Inc., Wooster, Ohio

Filed Dec. 1, 1988, Ser. No. 278,456
Int. Cl.[4] B62D *61/08*
U.S. Cl. 180—210 5 Claims

1. A tug vehicle which comprises:

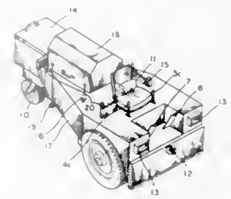
a generally triangularly shaped frame,

a pair of independently driven, essentially parallel wheels generally mounted at two corners of the frame,

a dolly wheel at the other corner of the frame,

control seat means located generally between the drive wheels,

a power supply operatively connected to power said independently driven wheels,



two independent control means for distributing the output from said power supply, one said independent control means is located on each side of the control seat means to selectively effect forward or reverse rotation of the drive wheels to control the movement of the tug vehicle, and

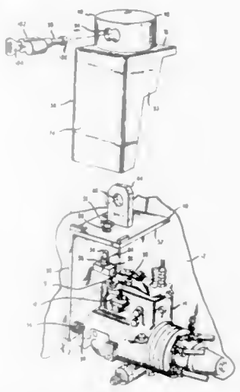
a hitch located essentially midway between the independently driven wheels and which is exposed to the line of view of the operator.

4,913,254

VEHICLE ANTI-THEFT DEVICE

Felix Castro, West Palm Beach; Shelby Jarrell, Palm Beach Gardens, and Oscar Oliva, West Palm Beach, all of Fla., assignors to Fuelock, Inc., West Palm Beach, Fla.

Continuation-in-part of Ser. No. 81,888, Aug. 10, 1987, Pat. No. 4,842,092. This application Mar. 3, 1989, Ser. No. 319,146
Int. Cl.[4] B60R *25/00*
U.S. Cl. 180—287 10 Claims



1 An anti-theft device for vehicles and equipment powered by engines having fuel delivery systems controlled at least in part by electrical systems, comprising:

a lock switch provided in said electrical system and adapted to reversably alter said electrical system to prevent operation of said fuel delivery system, and thereby to prevent operation of said engine;

a first lock structure secured to a fixed portion of the vehicle or equipment;

a lock housing adapted to substantially cover and enclose

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said lock switch to prevent access to and manipulation of said lock switch, said lock housing having a second lock structure comprising a lock mechanism and being adapted to engage said first lock structure to secure said lock housing in position over said lock switch and to prevent unauthorized removal of said lock housing and manipulation of said lock switch, said second lock structure being releasable from said first lock structure by operation of said lock mechanism.

4,913,255

SHOCK ABSORBER FOR MOTORCYCLE

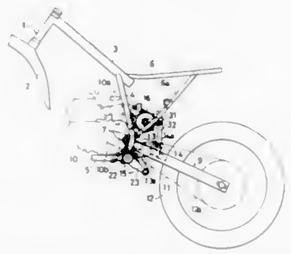
Shinji Takayanagi, Tokyo, and Kenji Uehara, Kiyose, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1988, Ser. No. 256,946

Claims priority, application Japan, Oct. 14, 1987, 62-257369; Oct. 14, 1987, 62-257370; Oct. 14, 1987, 62-257371; Oct. 14, 1987, 62-257372; Mar. 22, 1988, 63-68568

Int. Cl.[4] B62D *61/02*

U.S. Cl. 180—227 **9 Claims**



1. A shock absorber for a motorcycle comprising a swing arm connected to a frame through a pivotal axis; a rotary supporting spring operably connected to the frame; and a hydraulic damper operably connected between the frame and the swing arm, each of the supporting spring and hydraulic damper having a base portion and an operating end portion, wherein the supporting spring and the hydraulic damper are separately disposed to thereby locate the hydraulic damper above the swing arm and the supporting spring below the swing arm, the axes of the supporting spring and the hydraulic damper being parallel to the pivotal axis; and a link means for connecting the operating end portions of the supporting spring and hydraulic damper to the swing arm, wherein the base portions of the supporting spring and hydraulic damper are connected to the frame, wherein the supporting spring and the hydraulic damper are both disposed near the pivotal axis of the swing arm, and wherein the damper is disposed rearward of the supporting spring.

4,913,256

MOTORCYCLE

Tsutomu Sakuma, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1987, Ser. No. 55,463

Claims priority, application Japan, May 30, 1986, 61-124775; Jun. 25, 1986, 61-97069[U]

Int. Cl.[4] B60K *11/04*

U.S. Cl. 180—229 **11 Claims**

1. A motorcycle comprising:

a substantially longitudinal frame having at least a head pipe, a main pipe extending rearwardly from the head pipe, and a joint plate depending from the rear end of the main pipe;

front and rear wheels rotatably supported on said frame;

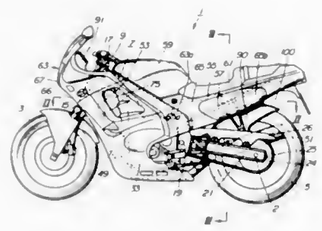
a rear fork supporting said rear wheel and vertically swingably mounted on said joint plate by a pivot shaft;

a rider's seat disposed near the rear wheel;

an engine mounted on said frame under said main pipe and disposed forwardly of said rider's seat and said joint plate;

a rear fender disposed in a the vicinity of an upper portion and opposite side portions of said rear wheel and covering said portions of the rear wheel; and

a fairing device having a ram air inlet portion defined between said head pipe and said front wheel and extending



from a position in front of said head pipe in covering relation to said engine toward a position above the rear wheel where the fairing device covers said rear fender in surrounding relation thereto, said fairing device cooperating with said rear fender in providing a discharge duct therebetween, said discharge duct defining a discharge air passage therein and having an air discharge port defined in a rear open end portion thereof.

4,913,257

ELECTRICALLY DRIVEN WHEELCHAIR WITH WORKTOP AND CONTROL UNIT

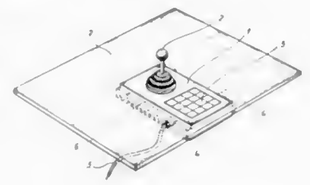
Henricus T. J. Janssen, Oldenzaal, Netherlands, assignor to Huka Developments B.V., Oldenzaal, Netherlands

Filed Oct. 24, 1988, Ser. No. 261,727

Claims priority, application Netherlands, Oct. 29, 1987, 8702583

Int. Cl.[4] A61G *5/04*

U.S. Cl. 180—333 **1 Claim**



1. An electrically driven wheelchair comprising

a horizontal work top,

an opening in said work top at one side thereof,

a smooth-bottomed control unit disposed in said opening having a control handle,

said control handle projecting above the surface of said control unit at a point opposite said one side of the work top when the control unit is in operative position,

a pair of elongated slots disposed at opposed sides of said opening,

a pair of pins mounted on the control unit which pins extend into and slide in said slots,

an umbilical cord connecting through one of said pins to said control unit,

whereby said control unit can be inverted 180° by rotation about said pins to position said smooth bottom in the plane of said work top with said control handle projecting below the surface thereof adjacent said one side of said work top.

4,913,258

ELECTRIC VEHICLE

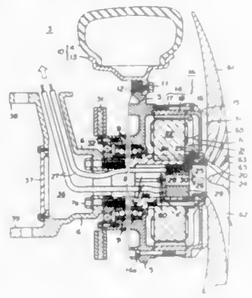
Hiroshi Sakurai, Yokohama; Masao Ono, Meguro, and Atsushi Mamiya, Kawasaki, all of Japan, assignors to Nippon Steel Corporation and Tokyo R and D Co., Ltd., both of Tokyo, Japan

Filed Oct. 25, 1988, Ser. No. 262,026

Claims priority, application Japan, Mar. 29, 1988, 63-73181

Int. Cl.[4] B60K *7/00*

U.S. Cl. 180—242 **5 Claims**



1. An outer-rotor type motor wheel, comprising: a knuckle, a hub coaxially interlocked with said knuckle, a wheel disc rotatably attached to the periphery of said hub, a wheel secured to the periphery of said wheel disc, a rotor fastened to an outer side of said wheel disc from the direction of said outer side, and a stator coaxial to and spaced from said rotor by a small gap and fastened to said hub from said direction of said outer side.

4,913,259

COMPRESSIBLE EAR TIP

Thomas J. Packard, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 252,511, Sep. 30, 1988, Pat. No. 4,852,684, which is a continuation-in-part of Ser. No. 133,522, Dec. 16, 1987, abandoned. This application May 30, 1989, Ser. No. 357,779

Int. Cl.[4] A61B *7/02*

U.S. Cl. 181—131 **11 Claims**

1. A stethoscope having dual sound-transmitting tubes, each terminating in an ear tip adapted to deliver sound to a human ear, which ear tip comprises:

(a) a first section adapted to couple with a sound-transmitting device, and

(b) a second section connected to and in open communication with the first section, the second section comprising (1) walls defining a bulbous second section having a region of greatest outside diameter and a convex inner surface, which inner surface defines a hollow inner chamber having an inside diameter and a length, and (2) a outlet port adapted for open communication with the ear canal;

wherein

the second section presents a surface for contact with the ear;

the walls have a hardness in a range between (1) a lower limit above the hardness which will allow loss of open communication between the ear and the sound-transmitting device when the ear tip is in place in the ear, and (2) an upper limit of about 90 Shore A;

the second section is deformable under an axial force in a range between about 8 ounces and 12 ounces from a relaxed state to a compressed state, in which compressed state the ear-contacting surface is of substantially greater area than in the relaxed state;

the second section is adapted to conform in the compressed state to the external acoustic meatus of the ear;

the greatest outside diameter of the second section is at least about 0.40 inches; and

the ear tip exhibits a compression diameter increase of at least about 10% under an axial force of 12 ounces.

4,913,260

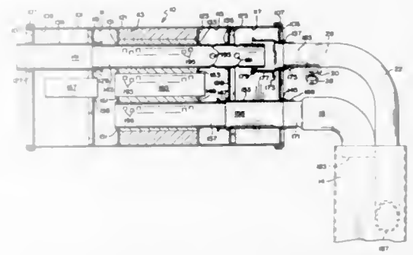
GAS SILENCING SYSTEM WITH CONTROLLING SOUND ATTENUATION

Blaise M. Fallon, Saint-Dizier, France, assignor to Tenneco Inc., Lincolnshire, Ill.

Filed Jan. 11, 1988, Ser. No. 142,490

Int. Cl.[4] F01N *1/08*

U.S. Cl. 181—254 **30 Claims**



1 A gas silencing system for selectively attenuating sound in flowing gas such as in an exhaust system of a vehicle having an internal combustion engine, said gas silencing system having a gas inlet and a gas outlet, said system comprising:

a housing operable to receive gas from said gas inlet of said gas silencing system;

first gas flow means for receiving said gas and providing a first flow path through said gas silencing system, said first gas flow means being operable to receive gas entering said gas inlet of said gas silencing system and deliver gas to said gas outlet of said gas silencing system;

second gas flow means for receiving said gas and providing a second flow path through said gas silencing system, said second gas flow means being operable to receive gas entering said inlet of said gas silencing system and deliver gas to said gas outlet of said gas silencing system;

regulating means including powered means for selectively

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regulating and modulating over a range of flow the relative flow of gas through said first and second flow paths of said first and second gas flow means, said regulating means being responsive to a modulated pressure signal;

means for detecting and displaying sound levels of gas leaving the gas silencing system; and

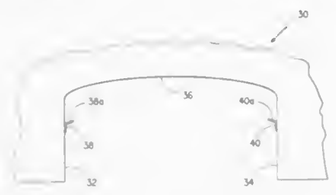
whereby said modulated pressure signal is able to selectively control the relative flow of said gas through said first and second gas flow means to thereby control the sound generated by said gas silencing system caused by gas flowing between said gas inlet and said gas outlet of said gas silencing system.

4,913,261

ACOUSTICAL ABSORBER

Stephen P. Scheinberg, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 5, 1989, Ser. No. 361,410
Int. Cl.[4] E04B *1/82*
U.S. Cl. 181—287 10 Claims



1. A removable and replaceable acoustical absorber for mounting in an elongated rigid structure having a generally U-shaped section having a rigid back and side walls comprising: a pair of angles fixed at directly opposed locations on said side walls within said section with flanges facing each other, and an elongated resilient flexible acoustical absorber having two side edges, said absorber having notches along each of said side edges, each notch having a surface to mate with said flanges, so that the absorber may be inserted by first mating one of said notches with one of said flanges and then compressing the other notched side edge while applying force between the edges to position the other side notch with the other of said flanges and compress said absorber against the back wall of the U-shaped section whereby a returning force acts on said absorber to cause said absorber to conform to said section.

4,913,262

MECHANICAL CONNECTION ELEMENT

Martin DeBlois, L'Islet sur Mer, Canada, assignor to Les Industries Amisco Ltee, L'Islet, Canada

Filed Nov. 14, 1988, Ser. No. 270,801
Int. Cl.[4] E06C *1/36*
U.S. Cl. 182—97 15 Claims

1 A mechanical connection element for removable and essentially perpendicular connection to a generally cross-sectionally rectangular bar having two long sides and two short sides, said element comprising a substantially rigid body having a cylindrical through cavity able to accommodate said bar by frictional contact thereof with an interior surface of said cavity, said cavity communicating with an exterior surface of said body by a radial, laterally open channel having sides spaced at least slightly more than said short side but less than said long side to allow entrance of said bar into said cavity such that after said entrance, said bar is rotatable to an orientation from which perpendicular exit of said bar from said cavity is prevented;

wherein said channel occupies less than a 45° arc of said cavity; and

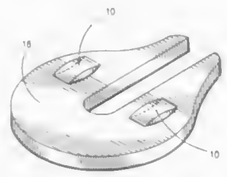
wherein said cavity has flat surfaces extending tangentially towards said channel from points about 45° either side of a radius bisecting said channel.

4,913,263

GREASE PACKET FOR FIFTH WHEELS

Dennis D. Spiers, 2196 North 450 East, Ogden, Utah 84414

Filed Oct. 31, 1988, Ser. No. 264,843
Int. Cl.[4] F01M *11/04*; B65D *25/08*
U.S. Cl. 184—105.1 24 Claims



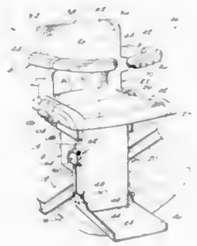
1. A device for lubricating sliding mating surfaces consisting of a sealed thin plastic envelope of lubricating material, rupturable under pressure, and containing a predetermined amount of a lubricating agent, said lubricative material being polytetrafloroethylene.

4,913,264

STAIRWAY CHAIRLIFT MECHANISM

David R. Voves, Racine; John F. Prendergast, Sr., Franklin, and Thomas J. Green, West Bend, all of Wis., assignors to The Cheney Company, New Berlin, Wis.

Filed Feb. 2, 1988, Ser. No. 151,481
Int. Cl.[4] B66B *9/08*
U.S. Cl. 187—12 23 Claims



1. A stairway chairlift comprising:

a motorized chair unit movable along a wall of a stairway;

a seat having a rearward edge portion;

means for pivotably mounting said seat to said motorized chair unit for pivoting movement around a substantially vertical axis between a first position wherein said rearward edge portion of said seat is positioned adjacent and substantially parallel to the stairway wall, and a second position wherein said rearward edge portion of said seat is positioned substantially transverse to the stairway wall; and

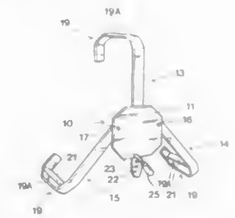
means responsive to pivoting movement of said seat around said substantially vertical axis for moving said seat outwardly away from the stairway wall in response to pivoting movement of said seat from said first position to said second position and for moving said seat inwardly toward the stairway wall in response to pivoting movement of said seat from said second position to said first position, said means for moving said seat outwardly including an elongated guide mounted on said motorized chair unit, said elongated guide being substantially parallel to the stairway wall, and a follower which is mounted to said rearward edge of said seat and which travels along said guide as said seat rotates between said first and said second positions.

4,913,265

VEHICLE IMMOBILIZING DEVICE

Nigel W. Richards, 1-3 School Street, Wolston, Nr. Coventry, West Midlands, England

Continuation of Ser. No. 125,250, Nov. 25, 1987, abandoned.
This application Jul. 21, 1989, Ser. No. 384,863
Claims priority, application United Kingdom, Nov. 25, 1986, 8628183
Int. Cl.[4] B60R *25/00*
U.S. Cl. 188—32 5 Claims



1. A vehicle immobilising device comprising a frame for locking onto a ground engaging wheel, the frame including:

first, second and third arms each movable between an operative position and inoperative positions and each having a wheel-embracing outer end,

said inoperative positions including an inoperative stowed position and an inoperative fitting position,

a carrier for the arms,

and locking means for locking the arms in an operative position,

the first arm being movable longitudinally of its length inwardly and outwardly of the carrier between said operative and inoperative positions, and the first arm being lockable by said locking means in the operative position relative to the carrier,

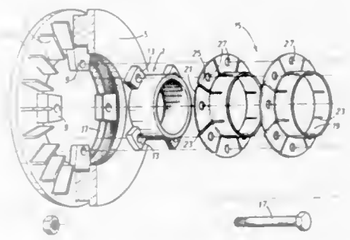
the second and third arms each being pivotally mounted on the carrier to move between their operative position and their inoperative positions; in the operative position the second and third arms subtending an acute angle to one another from their inner ends adjacent the carrier whereby their outer ends are spaced apart and can embrace the outer part of an associated wheel to each side of a ground-engaging part of the wheel and the inner ends of the second and third arms abutting said first arm; in said inoperative fitting position the second and third arms being movable such that the outer ends can be located over the wheel to each side of the wheel, the outer ends being further spaced apart from one another in said inoperative fitting position than in said operative position and when located over the wheel the second and third arms being movable from said inoperative stowed position through said inoperative fitting position for placement over said wheel to said operative position.

4,913,266

DISC BRAKES

David F. Russell, Mickle Trafford; Simon B. Dobson, Birkenhead, and Alexander J. Williams, Crosby, all of England, assignors to Lucas Industries public limited company, Birmingham, England

Filed Sep. 23, 1988, Ser. No. 248,443
Claims priority, application United Kingdom, Sep. 23, 1987, 8722349
Int. Cl.[4] F16D *65/12*
U.S. Cl. 188—18 A 8 Claims



1. A disc for a disc brake comprising an annular disc member coaxially arranged with respect to a hub member, said disc member and said hub member being interconnected by at least one resilient member which is designed to flex generally radially but nor circumferentially, of said hub and disc members, said annular disc member having a number of circumferentially spaced apart radially inwardly projecting lugs formed on the inner periphery of the disc member, and the hub member having a like number of radially outwardly projecting lugs, each of which lugs on said hub member being located between two adjacent lugs of the annular disc member, with said resilient member interconnecting said lugs on said members, each of said resilient members including interconnected circumferentially spaced, parts equal in number and spacing to the lugs on said hub member and said annular disc member, each part having an aperture through which a bolt is passed to secure adjacent parts alternately, one to a lug on said hub member and one to a lug on said disc member.

4,913,267

VEHICLE DISC BRAKES OF THE LIQUID COOLED TYPE

Roy Campbell, Worcestershire, England; Anthony G. Price, and Andrew P. Green, both of Gwent, Wales, assignors to Lucas Industries Limited Company, England

Filed Jul. 28, 1988, Ser. No. 225,303
Claims priority, application United Kingdom, Jul. 28, 1987, 8717875; Sep. 21, 1987, 8722295
Int. Cl.[4] F16D *65/853*
U.S. Cl. 188—218 XL 19 Claims

1. A rotatable braking member for a brake of the liquid-cooled type comprising a rotatable disc having an annular braking surface adapted for engagement with a relatively stationary braking surface of a brake in which said member is to be fitted, said annular braking surface having an inner peripheral edge and an outer peripheral edge, and the disc incorporates a plurality of angularly spaced liquid supply grooves in the form of slots which extend completely through the material of the disc, each said slot having a redial arm portion and a circumferential arm portion extending substantially perpendicularly to said radial arm portion, said radial arm portions extending radially outwards from respective circumferential

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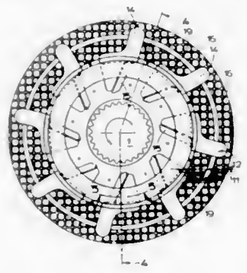
arm portions of said slots which are disposed at a position inward of said inner peripheral edge of said annular braking surface, and wherein said circumferential arm portion of each



said slot is of a circumferential length greater than any portion of the circumferential width of said associated radial arm portion.

4,913,268

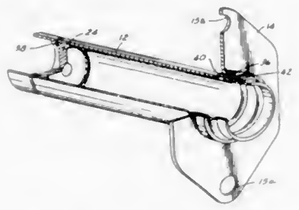
WELDLESS AUTOMOTIVE SHOCK ABSORBER

William A. Parker, Manchester; Thomas E. Bartos, Woodhaven, and Ronald M. Cowen, Dundee, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 5, 1986, Ser. No. 938,186

Int. Cl.[4] F16F *9/00*; B21D *39/00*; B60R *19/32, 19/04*

U.S. Cl. 188—322.19 **14 Claims**



1. A weldless shock absorber for an automotive vehicle comprising:

a cylinder having an energy absorbing means disposed therein; and

a mounting bracket affixed to said cylinder, by means of at least two structures formed integrally from said cylinder, for attaching said cylinder to said vehicle, wherein each of said structures formed integrally from said cylinder comprises an annular ring extending radially outwardly from the outer diameter of said cylinder.

4,913,269

METHOD FOR SMOOTHING SKIP UP-SHIFTS IN AUTOMATIC/SEMI-AUTOMATIC MECHANICAL TRANSMISSION SYSTEM

Michael W. Dunkley, Preston, and John E. Stainton, Chorley, both of England, assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 3, 1989, Ser. No. 292,705

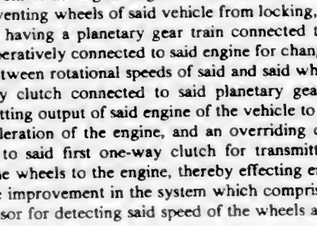
Claims priority, application United Kingdom, Feb. 2, 1988, 8802284

Int. Cl.[4] B60K *41/22, 41/28*

U.S. Cl. 192—3.63 **6 Claims**

1. A method for controlling an automated mechanical change gear transmission section (**10**) comprising a fuel throttle controlled engine (**14**), a multi-speed change gear mechanical transmission (**12**), a master friction clutch (**16**) interposed the engine and the transmission, and a central processing unit (**38**) for receiving inputs and for processing same according to predetermined logic rules to issue command output signals to non-manually controlled operators including a clutch operator 30 and a transmission operator (**34**),

said command outputs including commands for disengagement of the master friction clutch, and commands for skip up-shifts for engagement of a new transmission ratio (E) displaced from the previously engaged transmission ratio



(PE) by N ratios wherein N equals one less than the numerical value of the previously engaged speed ratio (PE) subtracted from the numerical value of the speed ratio to be engaged (E);

said method characterized by:

sensing engagement of the selected gear ratio (E) in the transmission;

delaying re-engagement of the master clutch for a period of time (T) wherein the value of the period of time (T) is a function of a constant (K) multiplied by the value of N.

4,913,270

CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION OF A MOTOR VEHICLE WITH AN ANTILOCK BRAKE SYSTEM

Hideki Ishido; Hiroshi Tsukagoshi; Katsumasa Igarashi; Takayuki Ushijima, all of Oota; Ryuzo Sakakiyama, and Mitsuo Umezawa, both of Tokyo, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 205,997, Jun. 13, 1988, abandoned. This application Aug. 4, 1989, Ser. No. 390,027

Claims priority, application Japan, Jun. 19, 1987, 62-153061

Int. Cl.[4] B60K *41/26*

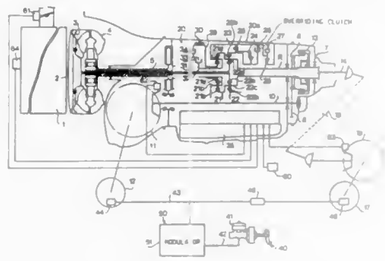
U.S. Cl. 192—4 A **1 Claim**

1. In a control system for an automatic transmission of a motor vehicle having an engine and an antilock brake system for preventing wheels of said vehicle from locking, said transmission having a planetary gear train connected to an input shaft operatively connected to said engine for changing a gear ratio between rotational speeds of said and said wheels, a first one-way clutch connected to said planetary gear train for transmitting output of said engine of the vehicle to the wheels at acceleration of the engine, and an overriding clutch connected to said first one-way clutch for transmitting torque from the wheels to the engine, thereby effecting engine braking, the improvement in the system which comprises:

a sensor for detecting said speed of the wheels and producing a rapid deceleration signal and a normal deceleration signal, respectively;

detector means for detecting operation of the antiblock brake system and for producing an antilock brake signal;

releasing means responsive to the rapid deceleration signal and the antilock brake signal for releasing said overriding clutch to render the engine braking ineffective; and



engaging means responsive to said normal deceleration signal for engaging said overriding clutch to effect the engine braking after rapid deceleration so as to provide an effective antilock brake operation and to prevent increase of stopping distance of the vehicle.

4,913,271

ONE-WAY CLUTCH

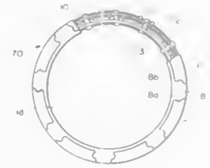
Yoshio Kinoshita, Ayase, and Norio Komatsubara, Fujisawa, both of Japan, assignors to NSK Warner K.K., Tokyo, Japan

Filed Oct. 7, 1988, Ser. No. 254,816

Claims priority, application Japan, Oct. 13, 1987, 62-155543[U]

Int. Cl.[4] F16D *41/07*

U.S. Cl. 192—41 R **19 Claims**



1. A one-way clutch comprising:

first and second rotational members radially spaced aprat from each other and concentrically disposed for relative rotation and having axially extending annular track surfaces;

a torque transmitting member disposed between said first and second rotational members for transmitting a torque between said track surfaces;

a pair of retainers for retaining said torque transmitting member in a circumferential direction of said track surfaces; and

a substantially annular bearing member holding said first and second rotational members concentric, an axial end surface portion of said bearing member facing away from said torque transmitting member being formed with recessed lubricating oil supply area means for receiving lubricating oil supplied to said one-way clutch and thereby facilitating lubrication of said end surface portion.

4,913,272

SPINDLE PRESS

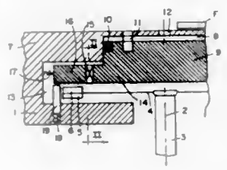
Helmut Diechler, Droste-Hulshoff Str. 9, 404 Neub, Fed. Rep. of Germany

Continuation of Ser. No. 105,958, Oct. 17, 1987, abandoned, which is a continuation of Ser. No. 818,961, Jan. 9, 1986, abandoned, which is a continuation of Ser. No. 564,148, Dec. 22, 1983, abandoned, which is a continuation of Ser. No. 196,704, Oct. 14, 1980, abandoned. This application Mar. 13, 1989, Ser. No. 323,063

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1979, 2941200

Int. Cl.[4] F16D *43/286*

U.S. Cl. 192—56 F **14 Claims**



1. A clutch for a spindle press having a flywheel and spindle, comprising,

a driven flywheel and the flywheel always rotates in the same direction,

a rotational axis of the flywheel,

wherein the axis is simultaneously an axis of the spindle,

a thrust plate mounted on an end of the spindle and being rotatable within a space provided in the flywheel,

friction pads connected to opposite sides of the thrust plate at upper and lower surfaces of the thrust plate,

a piston slideable received in a cylindrical chamber formed in the flywheel and being axially movable above the thrust plate,

a housing which encloses the cylindrical chamber for the piston,

means for preventing relative rotation between the piston and the flywheel,

wherein the piston has a flange extending radially outwardly from an end of the piston facing the thrust plate,

a spacer connected to the flange and extending outwardly therefrom through connector means for allowing axial displacement and limited relative rotational movement of the spacer,

two friction surfaces opposite the friction pads, one friction surface being an interior surface of the flywheel and the other being a lower surface of the spacer,

wherein the piston is drivable under fluid pressure downwardly to engagement of the friction pads with the friction surfaces, and

wherein torque transferrable between the piston and spacer through the connector means is smaller than torque transferrable between the friction pads and friction surfaces, whereby a spindle delay results in relative axial movement between the spacer and piston to effect instantaneous clutch release.

4,913,273

FLUID SHEAR COUPLING APPARATUS HAVING A MODULATING VALVE WITH A MOVABLE APERTURE

Gerald E. Mader, Indianapolis, Ind., assignor to Household Manufacturing, Inc., Prospect Heights, Ill.

Filed Sep. 19, 1988, Ser. No. 246,326

Int. Cl.[4] F16D *43/25*

U.S. Cl. 192—58 B **25 Claims**

1. A fluid shear coupling apparatus comprising:

a driving member including a rotor and a shaft connected to

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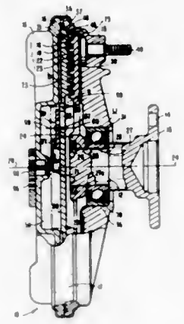
said rotor and adapted and configured for transmitting rotational drive from an external drive source to said rotor, said rotor having a first shear surface;

a driven member including a second shear surface configured and positioned complementary to said first shear surface of said rotor and defining therewith a fluid shear chamber cooperable with a shear fluid received therein for transmitting torque between said driving member and said driven member;

bearing mount means for mounting said driven member to said driving member for relative rotation between said driven member and said driving member about a common axis;

a shear fluid reservoir defined by said driven member;

a separator wall between said shear fluid reservoir and said fluid shear chamber, said separator wall having a fluid input aperture communicating said shear fluid reservoir



with said fluid shear chamber at a first location radially inward of said first and second complementary fluid shear surfaces;

fluid return means for returning shear fluid from said fluid shear chamber at a second location radially outward of said first and second complementary fluid shear surfaces to said shear fluid reservoir;

a movable valve member located along said separator wall over said fluid input aperture, said valve member having a valve aperture therein, said valve aperture overlapping said fluid input aperture; and

means for moving said valve member with respect to said separator wall, wherein said valve member is pivotally mounted with respect to said separator wall with said means for moving said valve member being operative to radially displace said valve aperture relative to said common axis.

4,913,274

ELECTROMAGNETICALLY CONTROLLED SPRING CLUTCH MECHANISM

Kozo Nishimura, Akashi, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 74,397, Jul. 16, 1987, Pat. No. 4,825,988. This application Nov. 9, 1988, Ser. No. 268,954

Claims priority, application Japan, Jul. 31, 1986, 61-178822

Int. Cl.[4] F16D *27/10, 27/12*

U.S. Cl. 192—84 T 6 Claims

1. An electromagnetically controlled spring clutch mechanism comprising

a rotatably mounted output rotating element,

an input rotating element rotatable relative to the output rotating element and adapted to rotate in a predetermined direction and in a direction opposite to the predetermined direction,

inside transmission means and outside transmission means interposed between the input rotating element and the output rotating element,

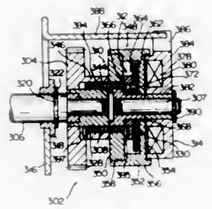
the inside transmission means comprising a first inside member adapted to rotate as a unit with the input rotating element and a second inside member adapted to rotate as a unit with the output rotating element,

the outside transmission means comprising a first outside member adapted to rotate as a unit with the input rotating element and a second outside member adapted to rotate as a unit with the output rotating element,

coil spring means disposed between the inside transmission means and the outside transmission means and extending astride the first and second inside members of the inside transmission means outwardly of outer circumferential surfaces of the first and second inside members and astride the first and second outside members of the outside transmission means inwardly of inner circumferential surfaces of the first and second outside members, and

electromagnetic means for producing a difference in rotating speed between one and another end of the coil spring means; wherein

when the electromagnetic means is energized during the rotation of the input rotating element in said predetermined direction, a difference in the rotating speed in a direction to contract the coil spring means is created between the one end and the other end of the coil spring



means to connect the first and second inside members drivingly via the coil spring means and thereby transmit the rotating force of the input rotating element in said predetermined direction to the output rotating element via the inside transmission means, and

when the electromagnetic means is energized during rotation of the input rotating element in said opposite direction, a difference in the rotating speed is created between the one and the other end of the coil spring means in a direction to expand the coil spring means to connect the first and second outside members drivingly via the coil spring means and thereby transmit the rotating force of the input rotating element in said opposite direction to the output rotating element via the outside transmission means,

a rotor adapted to rotate as a unit with the output rotating element and an armature assembly rotatable relative to the output rotating element; said armature assembly including an armature positioned opposite to one surface of the rotor, a supporting rotating member mounted rotatably on the output rotating element, and a biasing spring member interposed between the supporting rotating member and the armature and adapted to bias the armature elastically in a direction away from said one surface of the rotor; said electromagnetic means, when energized, magnetically attracting the armature to said one surface of the rotor.

4,913,275

CLUTCH DISK APPARATUS

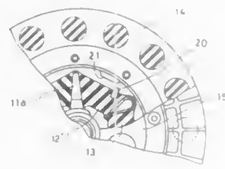
Tadamasa Kobayashi, Okazaki, and Ryoichi Kudo, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 30, 1988, Ser. No. 277,704

Claims priority, application Japan, Nov. 30, 1987, 62-300097

Int. Cl.[4] F16D *3/14, 47/02*

U.S. Cl. 192—106.1 5 Claims



1. In an automotive vehicle clutch disc apparatus having a clutch hub provided with arm portions and a two piece outer housing comprising:

(a) a clutch hub connected to a manual transmission;

(b) a stopper connected integrally with said clutch hub;

(c) a resilient element extending outwardly and circumferentially enclosing said clutch hub and including a projection connected to said resilient element so as to constitute a unitary body and a cam element connected to said housing for contacting said projection;

(d) said stopper having a plurality of lugs;

(e) said housing having a plurality of openings;

(f) said lugs operatively connected to said openings; and

(g) said clutch hub equipped with said resilient element provided with an initial deformation when assembled into said housing.

4,913,276

CLUTCH RELEASING APPARATUS

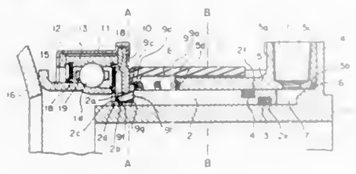
Yoshitaka Hayashi, and Toshiharu Honda, both of Fujisawa, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1988, Ser. No. 207,784

Claims priority, application Japan, Jun. 27, 1987, 62-158815

Int. Cl.[4] F16D *25/08*

U.S. Cl. 192—85 CA 12 Claims



1. Clutch releasing apparatus comprising:

a clutch release bearing assembly including a clutch release bearing having an outer race, an inner race, and rolling elements arranged between said outer and inner races, and bearing holding means having a supporting member and a case holding said bearing, and

bearing supporting means for supporting said clutch release bearing assembly about an axis of a transmission input shaft for guided movement in coaxial relationship with the input shaft to effect a clutch releasing operation,

said bearing supporting means comprising a spring, hydraulic operating means having a hydraulic cylinder and a piston received in said cylinder for movement relative thereto along said axis, and a support sleeve supporting said bearing assembly for movement with said piston, said support sleeve having a first cylindrical portion of relatively large diameter axially displaceably fitted on said cylinder and covering said cylinder to block foreign matter from entering the bearing supporting means from between said cylinder and said sleeve, a second cylindrical portion of relatively small diameter fitted to an end of said piston and having said supporting member of said holding means fitted thereon for movement with said sleeve and said piston, and a sidewall portion joining said first and second portions of said sleeve, said spring being disposed within said sleeve between said sidewall portion and an end of said cylinder.

at least one of said supporting member and said second portion of said sleeve having separation preventing means for allowing said supporting member to be fitted over said second portion of said sleeve with a relatively small force, but necessitating a relatively large predetermined force to effect separation of said supporting member from said second portion of said sleeve.

4,913,277

TRANSPORT DEVICE FOR REDIRECTING PIECE GOODS IN ONE PLANE

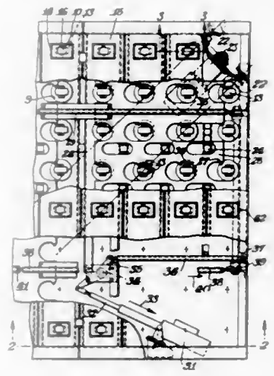
Karl H. Zörgiebel, Reichelsheim; Konrad Ackermann, Reichelsheim, and Ernst Strassner, Bad Konig, all of Fed. Rep. of Germany, assignors to Carl Schenck AG, Fed. Rep. of Germany

Filed Sep. 13, 1988, Ser. No. 243,910

Claims priority, application European Pat. Off., Oct. 12, 1987, 87114856.5

Int. Cl.[4] B65G *47/46*

U.S. Cl. 198—369 6 Claims



1. A transport device for redirecting piece goods in the same plane as the goods are transported along a planar path of travel, the device comprising carrier members, a plurality of transport roller housings each rotatably supported by the carrier members for rotation about a substantially vertical axis, a transport roller connected to each housing for rotation about a substantially horizontal axis, a friction pulley in engagement with the transport roller connected to each housing for rotation about a substantially horizontal axis parallel to the axis of rotation of the transport roller, a drive shaft positioned below the friction pulley, a motor connected to rotate the drive shaft, tranamission means between the drive shaft and the friction pulley for rotating the pulley and the transport roller in engagement therewith when the drive shaft rotates, and an adjusting mechanism for rotating the transport roller housings about their vertical axes whereby the direction of rotation of the transport rollers is changed and the piece goods supported

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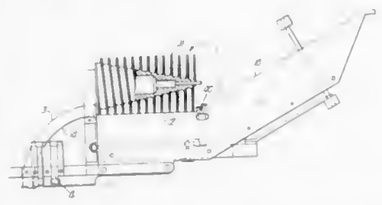
thereby are redirected without changing the elevation thereof, and wherein the carrier members comprise a plurality of inverted U-shaped carriers parallel to one another and extending the width of the transport device, each U-shaped carrier having opposed leg surfaces and an interconnecting link surface, spaced apart openings in the interconnecting link surface each constructed and arranged to receive one of the transport roller housings, and annular flange on each housing facing an annular flange surrounding each opening in the interconnecting link surface, and ball bearings between the flanges to facilitate rotation of the housing about their vertical axes by the adjusting mechanism.

4,913,278

APPARATUS FOR FEEDING SYRINGES INTO A CARTONING MACHINE WITH SLOTS

Emmanuel Bourgeois, Glen, France, assignor to Rhone-Poulenc Sante Propharm, Paris, France

Filed Dec. 6, 1988, Ser. No. 280,585
Claims priority, application France, Dec. 7, 1987, 87 16956
Int. Cl.[4] B65G *33/04*
U.S. Cl. 198—464.4 6 Claims



1. Apparatus for feeding syringes into a cartoning machine with slots, which syringes include an elongate body of a given length and diameter, an outwardly projecting collar of a larger diameter at one end of the body and a plunger of a given length which is movable within said body and extends out of said one end, said apparatus comprising a guide formed of two parallel surfaces, the spacing of which is greater than that of said given diameter, but smaller than the diameter of the collar, said guide including a downwardly inclined feed section, a central substantially horizontal section and a downwardly inclined discharge section, a helical feed worm mounted for rotation on an axis parallel to said central section of the guide, flights of said worm positioned immediately adjacent to said parallel surfaces of said central section of said guide, whereby rotation of the worm pushes syringes along said central section of the guide from the feed section to the discharge section thereof, said flights forming the thread of the worm, the depth of said thread decreasing from the feed section end to the discharge section end, effective to force the plunger of a syringe fully into the body of the syringe, as it reaches the discharge section and an ejector adapted to retain a syringe at the lower end of the discharge section, until it is forced out by a subsequently fed syringe.

4,913,279

SELF CLEANING CONVEYOR ROLLER

George M. Tonissen, P.O. Box 405, Lincoln City, Oreg. 97367

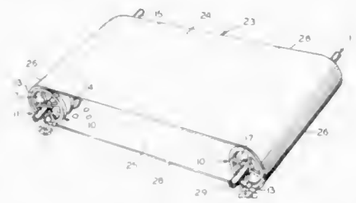
Continuation-in-part of Ser. No. 19,527, Feb. 26, 1987, abandoned. This application Jun. 10, 1988, Ser. No. 204,981
Int. Cl.[4] B65G *45/00*
U.S. Cl. 198—498 3 Claims

1. A self-cleaning conveyor belt roller, comprising, in combination,

a plurality of spaced-apart, circular belt support plates with openings, affixed on a shaft;

a solid circular central plate affixed on said shaft between said support plates; and

a plurality of plates, affixed on said shaft between said support plates where each plate has a spiral flight portion extending around said shaft, joined together to form a



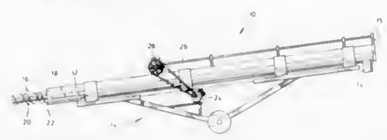
continuous spiral such that the direction of the spiral on one side of said solid circular central plate is opposite from the other side of said solid circular central plate so debris are carried away from said solid circular central plate and toward said circular belt support plates for elimination through said openings of said circular belt support plates.

4,913,280

AUGER FOR PARTICULATE MATERIALS

Andrew D. Whyman, Oakville, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada

Filed Dec. 20, 1988, Ser. No. 286,783
Int. Cl.[4] B65G *33/26*
U.S. Cl. 198—659 12 Claims



1. An auger assembly for transporting particulate material, said auger assembly comprising:

a housing;

a frame to support said housing;

an auger rotatably mounted in said housing, said auger comprising a thermoplastic material helically wrapped around a metal shaft, said thermoplastic material having a planar portion in contact with said metal shaft and a radially extending flight portion, wherein opposing longitudinal edges of said thermoplastic material overlap and are fused together; and

a motor connected to said shaft to rotate said auger.

4,913,281

ADJUSTABLE SELF-ALIGNING SPRING SYSTEM FOR VIBRATORY MATERIAL FEEDERS

A. Rudolph Muller, Seon, Switzerland, assignor to K-Tron International, Inc., Pitman, N.J.

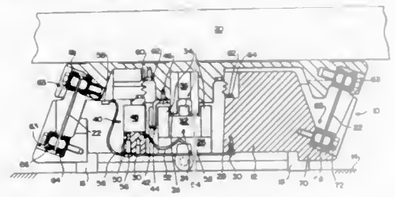
Filed May 8, 1989, Ser. No. 350,152
Int. Cl.[4] B65G *27/08*
U.S. Cl. 198—763 6 Claims

1. A spring mount assembly for a vibratory material feeder comprising an actuator for vibrating a material tray, the actuator comprising a base and a tray support which are mechanically coupled together by spring means, said spring mount assembly comprising:

a pair of first and second bearings each having a spring-abutting surface for a spring disposed therebetween, an arcuate surface, and at least one hole therethrough;

a pair of first and second bearing blocks each having an arcuate surface for mating with the arcuate surface of a corresponding one of said first and second bearings, and a corresponding at least one hole therethrough, said first bearing block having a further surface for abutting an actuator mounting surface on the actuator base or tray support;

a corresponding at least one fastener having a shaft extending through said at least one hole of each of said first and second bearings and bearing blocks for engagement with



the actuator base or tray support such that said first and second bearings are fixedly secured between said first and second bearing blocks when a spring is disposed between said first and second bearings, said first bearing block abutting surface abuts the actuator mounting surface, and said fastener is in a tightened condition;

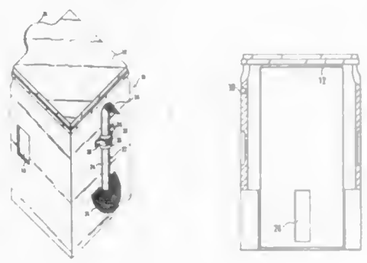
said at least one hole of each of said first and second bearings being larger than said fastener shaft, such that said first and second bearings are pivotable relative to said first and second bearing blocks when said at least one fastener is in an untightened condition.

4,913,282

KIT FOR THE HYGIENE OF REMOVABLE DENTAL PROSTHESES

Richard Didier, "Fort Charles", 1, rue des Glacis, L-1628 Luxembourg, Luxembourg

Filed Mar. 13, 1989, Ser. No. 322,442
Claims priority, application France, Oct. 14, 1988, 88 13598
Int. Cl.[4] A61C *19/10*
U.S. Cl. 206—83 13 Claims



1. A kit for the hygiene of removable dental prostheses comprising:

a container with hermetic sealing which can contain at least one prosthesis, said container including an inner surface, said container being adapted to contain a sterilizing liquid;

a removable false bottom in said container, said false bottom being adapted to support the prosthesis above a level of a solution of sterilizing liquid;

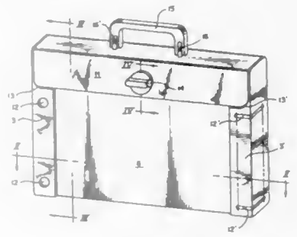
and a porous lining covering at least a portion of said inner surface of said container and said false bottom.

4,913,283

CASE FOR DRAWING BOARDS

Karl-Hermann Stühn, Kirchen, Fed. Rep. of Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed Mar. 30, 1988, Ser. No. 175,007
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 8704754
Int. Cl.[4] A45C *3/02, 11/36*
U.S. Cl. 206—224 11 Claims



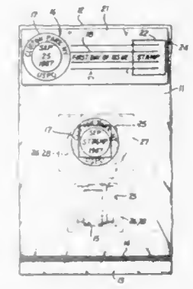
1. A case for holding writing, drawing and hobby tools, and in particular individual writing or drawing boards, of the type comprising one or more corrugated panels comprised of a plastic material to define a front surface, a rear surface, a bottom surface and a lid thereof, a handle and a pair of opposed, vertically extending side supports (3, 3') that are plastic extrusions and have insertion means for engaging with an edge of a corrugated panel (5, 6) that is inserted into the side supports (3, 3'), so as to define moisture-proof front and rear surfaces to said case, wherein said insertion means further comprises inserting pockets (1, 4) and barbs (1', 4') that are formed internally within the inserting pockets (1, 4), so as to engage with edges of said corrugated panels and wherein further, at least one supporting bar (8, 8') extends partially inwardly from a side support so as to form a space within the case that has a portion which is upwardly open and parallel to the front and rear case surfaces.

4,913,284

METHOD AND PACKAGE FOR AUTHENTICATION OF FIRST DAY OF ISSUE ROLLS OF POSTAGE STAMPS

Antonio A. Versaci, 2528 Peters La., Schenectady, N.Y. 12309

Filed Sep. 8, 1988, Ser. No. 241,704
Int. Cl.[4] B65D *67/00*
U.S. Cl. 206—232 19 Claims



16. The First Day of Issue authenticated roll of stamps package recited in claim 15 wherein there are a plurality of rolls of stamps of the same issue day inserted into the outer container prior to sealing it closed and authenticated.

4,913,285

WATER-AND-DUST-PROOF PUSH-BUTTON SWITCH HOUSING DUMMY TERMINAL FOR AIR VENTING

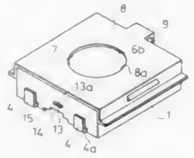
Jyoji Tsutsumi, and Yoichi Hattori, both of Iwaki, Japan, assignors to Alps Electronic Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 119,812, Nov. 12, 1987, abandoned. This application Dec. 5, 1988, Ser. No. 281,950

Claims priority, application Japan, Mar. 9, 1987, 62-34286; Jul. 28, 1987, 62-114594

Int. Cl.[4] H01H *9/02*

U.S. Cl. 200—306 5 Claims



1. In a push button switch having a water- and dust-proof construction comprising an insulating case with an open top and closed bottom and sidewalls, a flexible sealing member for sealing the open top of the insulating case, a movable stem having an inner side and having an outer side in constraining contact with the inner surface of said flexible sealing member, a first electrical contact fixed on said bottom wall of said insulating case, a pair of electrical terminals having ends extending through a side or bottom wall of said insulating case to be soldered to an external printed circuit board, a movable second electrical contact disposed on said pair of electrical terminals and in constraining contact with the inner side of said stem and movable upon application of an external depressing force thereto from outside said insulating case to close an electrical circuit when said movable electrical contact contacts said first electrical contact;

the improvement comprising:

a dummy terminal extending through one side wall and forming a fine air gap through one said wall leading from the outside into the inside of said insulating case, said dummy terminal being positioned in said one side wall and spaced from said electrical terminals so that solder applied to said pair of electrical terminals does not reach said dummy terminal, whereby said fine air gap allows communication of air into the insulating case to equalize the air pressure between the inside and the outside of the insulating case while dust and water may not enter the case.

4,913,286

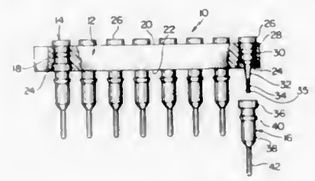
SOCKET TERMINAL CARRIER ASSEMBLY

John O. Tate, Carney St., Uxbridge, Mass. 01569

Continuation-in-part of Ser. No. 298,483, Jan. 18, 1989, abandoned. This application Jun. 23, 1989, Ser. No. 371,701

Int. Cl.[4] B65D *73/02*

U.S. Cl. 206—329 11 Claims



1. A socket terminal carrier assembly for assembling a plurality of socket terminals in a predetermined array on a circuit board comprising a substantially rigid carrier board having first and second sides and having a plurality of apertures therethrough, said apertures being disposed in said predetermined array and a plurality of carrier pins received and secured in said apertures, said carrier pins having terminal end portions which terminate in enlarged terminal end elements, said carrier pins being positioned on said carrier board so that the terminal end portions thereof project outwardly from the second side of said carrier board, and a plurality of socket terminals snap received in engagement on the terminal end portions of said carrier pins so that they are releasably retained thereon by said terminal end elements and so that said socket terminals are disposed in said predetermined array.

4,913,287

TAPE CARTRIDGE CONTAINER

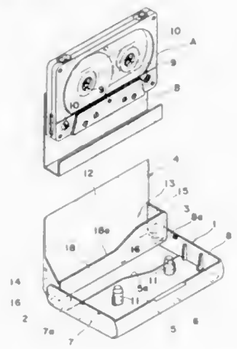
Sinichi Kagano, Kyoto, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Filed Feb. 17, 1989, Ser. No. 311,853

Claims priority, application Japan, Feb. 19, 1988, 63-21431[U]

Int. Cl.[4] B65D *85/67*

U.S. Cl. 206—387 4 Claims



1. A tape cartridge container for removably containing at least one tape cartridge which comprises a body formed of a bottom wall having a front wall and left and right walls projecting from three edges of said bottom wall and a lid formed of a top wall having a pocket consisting of two side walls and a bottom wall provided at a back portion of an inner surface of said lid for removably accommodating and supporting a back portion of said tape cartridge which is inserted from a front of the pocket,

said lid being rotatably supported on said body in such a manner that a back portion of said lid is supported by pivoting axes between a pair of left and right walls extending backward from said left and right walls of said body beyond a back edge of said bottom wall of the said body,

said back edge of said bottom wall of said body being faced to a front edge of said bottom wall of said pocket,

both of said bottom walls of said body and said pocket of said lid being shaped so that when said lid is closed said back edge of said bottom wall of said body and said front edge of said bottom wall of said pocket are faced so as to define an interface, at least an intermediate portion of said interface, from the left to the right direction, being slanted with respect to a line S between said pivoting axes and

wherein lengths l1 and l2 representing the left half portion and right half portion of said bottom walls of each of said body and pocket of said lid respectively in a front to rear direction are different.

4,913,288

CONTAINER FOR DENTAL X-RAY FILM PACKAGE

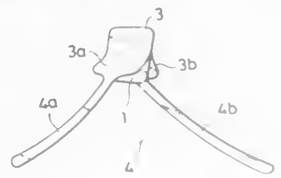
Hiroyuki Tanaka, Yokohama, Japan, assignor to Nix Company Ltd., Tokyo, Japan

Filed Aug. 11, 1988, Ser. No. 233,121

Claims priority, application Japan, Nov. 16, 1987, 62-173853; Dec. 17, 1987, 62-190779

Int. Cl.[4] B65D *85/48*

U.S. Cl. 206—455 20 Claims



1. A container for a dental X-ray film package, comprising a containing element formed from flexible sheet material for containing a dental X-ray film package therein, and a gripping element formed from at least one flexible sheet and extending from said containing element at a contiguous edge portion, said gripping element extending outwardly from an oral cavity of a patient when said containing element is inserted in the oral cavity.

4,913,289

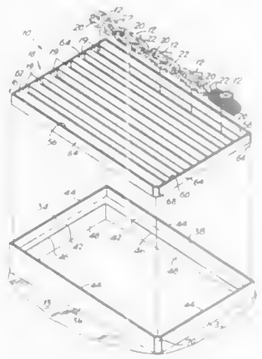
UNITARY WATCH DISPLAY SYSTEM

Robert J. Feiler, 517 West 29th St., New York, N.Y. 10001

Filed Aug. 12, 1988, Ser. No. 231,359

Int. Cl.[4] B65D *1/34*

U.S. Cl. 206—566 19 Claims



1. A display system for showing watches on a shelf to customers, including, in combination,

a support structure,

said support structure including first platform means for positioning a plurality of watch collars mounting watches over a substantial area of said first platform means,

said support structure further including second platform means opposed to said first platform means for supporting a plurality of independent watch displays mounting watch collars mounting watches on selected areas of said second platform means, said second platform means being parallel to said first platform means.

said support structure further including a continuous side wall joining said first and second platforms means, and

a fabric covering said support structure including said first and second platform means and said continuous side wall,

said support structure being movable between first and second watch display positions, said first watch display position being when said first platform means is oriented facing upward for viewing and said second platform means is oriented facing downward, and said second watch display position being when said second platform means is oriented facing upward for viewing and said first platform means is oriented facing downward

said first platform means including a first platform defining a plurality of parallel channels in which are positioned said plurality of watch collars with watches, said first platform having a first platform area, said plurality of parallel channels being located substantially entirely over said first platform area, said fabric covering said first platform and said plurality of parallel channels,

said second platform means including a second platform opposed to said first platform, said second platform including a substantially flat surface, said plurality of independent watch displays being positioned on selected platform areas of said flat surface, said fabric covering said flat surface.

4,913,290

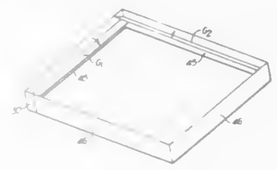
COLLAR FOR PALLETIZED LOAD

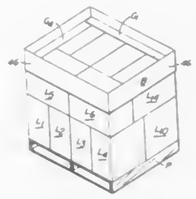
Peter F. deGroot, Monterey, Calif., assignor to Bud Antle, Inc., Salinas, Calif.

Filed Jan. 26, 1989, Ser. No. 303,352

Int. Cl.[4] B65D *19/00*

U.S. Cl. 206—597 5 Claims





1. In combination with a loading pallet and cartons stacked on said pallet in rectilinear section to define four corners to said loaded pallet, said cartons defining a substantially parallel interface between said pallet and a partial height of said pallet, a collar for reinforcing said cartons against columnar collapse during and after palletizing said pallet, said collar comprising:

a collar fabricated from semi-rigid foldable material, said collar having a periphery, said periphery being equal in parametric length to the corresponding sides and widths of said cartons as stacked in a rectilinear sectioned stack on said pallet;

said collar defining linear sides, said linear sides being joined at four parallel folds across said collar, said folds enabling said collar to fold from a first disposition wherein said collar linear sides overlie one another to a second dispo-

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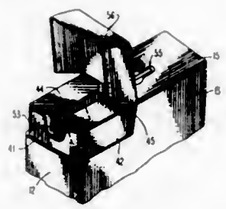
sition where said collar sides register to each of the four linear sides of said cartons stacked on said pallet;
a gusset attached to each linear side, said gusset foldable from a first disposition parallel to the linear side of said collar to a second disposition protruding at right angles from said collar to and towards the interior of said collar whereby said gusset reinforces the linear sides on said collar and can be trapped between said parallel interface of said stacked boxes;
each said gusset as folded to said second disposition extending only a partial distance across said collar to an opposite gusset.

4,913,291
SEPARABLE ARTICLE CARRIER
Richard L. Schuster, Monroe, La., assignor to Manville Corporation, Denver, Colo.
Filed Dec. 29, 1988, Ser. No. 291,722
Int. Cl.[4] B65D *5/54*
U.S. Cl. 206—602 2 Claims

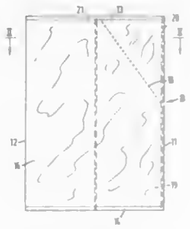
1. A separable article carrier, comprising:
top and bottom panels connected along the length of the carrier to side panels;
one of the top and bottom panels containing a weakened area extending along the length thereof;
the other of the top and bottom panels being comprised of first and second panel sections;
a first partition connected to the first panel section along a first fold line intermediate the side panels, the first fold line extending throughout the length of the first panel section;
a second partition connected to the second panel section along a second fold line intermediate the side panels, the second fold line extending throughout the length of the second panel section;
the first and second fold lines and the first and second partitions being adjacent each other;
means connecting the first and second partitions to said one panel in the interior of the carrier in generally parallel relationship to the side panels and an opposite sides of the weakened area of said one panel;
end panels connected to the top and bottom panels along the width of the carrier;
each end panel being comprised of two end flaps, one end flap of each end panel being connected to said one panel and the other end flap of each end panel being connected to said other panel, the flaps being connected to each other;
said one end flap including a weakened area extending from the weakened area of said one panel completely across said one flap, the weakened area of said one flap being substantially parallel to the adjacent first and second partitions;
said other end flap being comprised of first and second independent flap sections having adjacent edges substantially aligned with the weakened area of said one end flap;
a relatively narrow tab on one of the first and second flap sections near an outer edge thereof and extending across the adjacent edges of the first and second independent flap sections, the tab being connected to the other of the first and second flap sections; and
the tab including a weakened area aligned with the weakened area of said one end flap;
whereby the carrier can be separated along the weakened areas thereof into two smaller carriers, each of the first and second partitions thereby forming a side panel of one of the two smaller carriers.

4,913,292
FLIP-TOP DISPENSING CONTAINER
David L. Field, Cincinnati, Ohio, assignor to Westvaco Corporation, New York, N.Y.
Filed Mar. 22, 1989, Ser. No. 327,238
Int. Cl.[4] B65D *5/70, 5/74*
U.S. Cl. 206—611 5 Claims



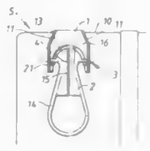
1. A dispensing container having a hinged, flip-top lid comprising:
an outer container portion comprising a plurality of wall panels foldably connected together along parallel fold lines and including at least one glue flap foldably attached to one wall panel and adhered to another wall panel;
(b) an inner container portion comprising a plurality of wall panels foldably connected together along parallel fold lines and arranged to fit snugly within said outer container portion:
(c) top and bottom closure flaps foldably attached to the ends of said outer container wall panels for forming top and bottom closures for said outer container;
(d) a hinged flip-top lid formed at the top end of said outer container, said lid comprising a top panel consisting of a part of the top closure of said outer container hingedly connected to the remaining part of said top closure, and three depending wall panels formed from contiguous parts of three connected walls of said outer container, said lid wall panels being detachable from the walls of said outer container along a tear line located in said outer container walls below the top closure of said outer container and a pair of cut lines located in two opposed walls of said three connected walls, said tear line and cut lines intersecting one another at corresponding points in the outer container side walls; and,
(e) a pour spout formed by contiguous parts of three connected walls of said inner container portion located at the top-end of said inner container portion beneath said flip-top lid.

4,913,293
CONTAINER OF FLEXIBLE MATERIAL
Bernard Sanders, Mont Clos, Old Beaumont Hill, St. Peter, Jersey, Channel Islands, Channel Islands
Filed Nov. 15, 1988, Ser. No. 271,280
Claims priority, application United Kingdom, Nov. 20, 1987, 8727196
Int. Cl.[4] B65D *33/16*
U.S. Cl. 206—620 4 Claims



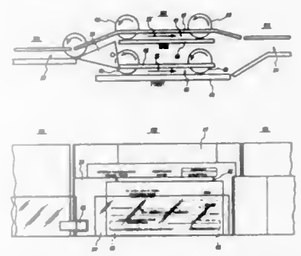
1. A reclosable container formed from a tube of flexible material having a back seal extending parallel to a longitudinal axis of said tube, said container comprising a wall having an inner surface, an upper transverse seal, a lower transverse seal, an opening location means and an internal member extending the length of the container adjacent said inner surface and adjacent said opening means wherein said opening means extends in a direction oblique to said axis.

4,913,294
OPENING ARRANGEMENT FOR PACKING CONTAINERS
Peter Giacomelli, Lund, Sweden, assignor to Aktiebolaget Profor, Lund, Sweden
Filed Oct. 20, 1988, Ser. No. 260,074
Int. Cl.[4] B65D *5/54*
U.S. Cl. 206—621.6 6 Claims



1. A packing container of the type having a flexible wall of packaging material comprising an opening arrangement, means securing the opening arrangement on an exterior surface of said flexible wall, said opening arrangement having at least two lever arms extending an opposite sides of a hinge, one of said at least two lever arms being a handling part and the other of said at least two lever arms being a penetrating part, and said wall having a weakening line, whereby raising the handling part from said wall presses the penetrating part into the wall to sever the wall along the weakening line to form a pouring opening, said arrangement including a pouring edge part adjacent said weakening line and means for reclosure supported by the pouring edge part and adapted for positive engagement with the handling part.

4,913,295
APPARATUS FOR PROCESSING REMITTANCE AND REMITTANCE ADVICE DOCUMENTS
Gary J. Murphy, Frederick, Md.; Roy E. Dempster, Jr., Richardson, Tex.; Michael R. Barnes, and Michael J. Murphy, both of Frederick, Md., assignors to BancTec, Inc., Dallas, Tex.
Division of Ser. No. 720,886, Apr. 8, 1985, Pat. No. 4,722,444.
This application Oct. 26, 1987, Ser. No. 112,939
The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.
Int. Cl.[4] B07C *3/02*
U.S. Cl. 209—583 7 Claims



1. Apparatus for processing remittance documents and remittance advice documents, comprising:
(a) a document presentation station,
(b) transport means for transporting both said remittance documents and said remittance advice documents to and through said document presentation station,
(c) means disposed at said document presentation station defining first and second parallel transport paths,
(d) reader means for automatically reading information disposed on the face of said documents for determining which of said documents are remittance documents requiring operator intervention and which of said documents are remittance advice documents not requiring operator intervention; and
(e) diverter means responsive to the information read by said reader means for always directing said remittance documents requiring operator intervention to said first transport path and for always directing said remittance advice documents not requiring operator intervention to said second transport path.

4,913,296
STORING AND DISPENSING SYSTEM
Bernard T. Cournoyer, Holden, and Frederick J. Moriarty, Worcester, both of Mass., assignors to Applied Power Inc., Milwaukee, Wis.
Filed Mar. 30, 1988, Ser. No. 175,114
Int. Cl.[4] A47B *81/06*
U.S. Cl. 211—41 12 Claims

1. A storing and dispensing system for substantially, rectangular objects comprising:
a plurality of trays, one above another,
horizontally extending support means beneath each tray,
the support means being substantially U-shaped, upwardly opening channel members arranged one above another,
means for releasably securing one tray to each support means,
each tray having a front portion, a rear guide and a bottom portion,
dividers projecting upwardly from the bottom portion of the tray to form a plurality of cells,
the bottom portion extending rearwardly from the front portion and terminating at a location spaced from the rear guide to create a supporting surface contiguous with the

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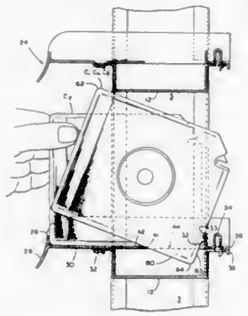
front portion and to further create a gap extending between the terminus of the bottom portion and the rear guide of each cell and located above the U-shaped channel member,



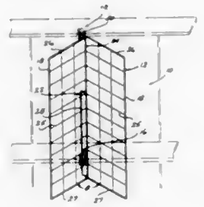
thereby to permit a corner portion of an object to be located on the supporting surface of a cell to be tilted through the gap and into the U-shaped channel members to gain better access to an object in an adjacent cell.

4,913,297

DISPLAY UNIT

Paul S. Wells, Mt. Vernon, Wash., assignor to Tyee Trading Corporation, Mount Vernon, Wash.

Filed Sep. 9, 1988, Ser. No. 242,781
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—96 5 Claims



1. An apparatus for displaying merchandise adjacent a pair of vertically spaced shelves, said apparatus comprising:

(a) a frame including:

a pair of nonparallel panels, said panels having a shared edge and interior panel surfaces, said interior panel surfaces forming an interior angle of less than 180 degrees, said interior surfaces including means for displaying merchandise adjacent said surfaces, and

(b) attachment means for securing said frame to a pair of vertically spaced shelves such that said frame is rotatable, relative to said shelves, about a vertical axis adjacent the shared edge to thereby allow access to said shelves, said attachment means including:

(i) first and second bracket means for connecting said frame to the outer edges of said shelves, and

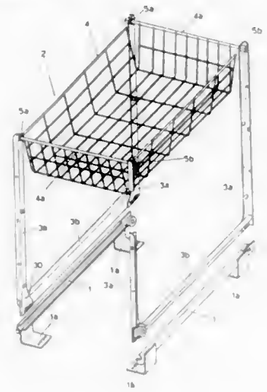
(ii) adjustment means for securing one of said bracket means to said frame at one of a plurality of continuous positions along said frame to thereby permit adjustment of the spacing between said bracket means.

4,913,298

EXTRACTABLE CARRIAGE FOR KITCHEN UNITS

Rossano Compagnucci, Via Flaminia 11, Osimo (AN), Italy

Continuation of Ser. No. 201,848, Jun. 3, 1988, abandoned. This application Aug. 3, 1989, Ser. No. 393,101
Claims priority, application Italy, Oct. 19, 1987, 17933 A/87
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—162 7 Claims



7. A slidable carriage for use with kitchen units made of modular components that may be used to construct a carriage having a given width comprising:

a pair of guiding tracks each having a length, a first end and a second end, means for anchoring each track to a surface;

a pair of counter rails, each having means for slidably engaging and cooperating with the entire length of the respective guiding tracks, each counter rail further having a first end and a second end;

two pairs of upright supporting members, each pair having a first member and a second member, each upright supporting member having an upper end and a lower end, the lower end of each first upright supporting member being pivotally attached at the first end of the respective counter rail and the lower end of each second upright supporting member being pivotally attached at the second end of the respective counter rail such that each supporting member is independently pivoted about the respective counter rails and the supporting members may be placed in an upright position, relative to the counter rail to form a foldable U-shaped frame;

a tray, and means for removably mounting the tray on the upper ends of the pairs of upright supporting members, such that when the tray is removed, the upright supporting members, may be folded downwardly towards one another about the pivot substantially 90° so that the supporting members may lie over and against the counter rail, for compact storage and shipment;

wherein the means for engaging each counter rail with the respective guiding track comprises a pair of roller bearings;

wherein the pair of guiding tracks are independent of each other, having no transverse connection therebetween such that the tracks may be spaced apart and mounted on a surface, the tray having a width, the space between the tracks being determined by the width of the tray, and when each counter rail and upright supporting members attached thereto is engaged in the respective tracks, and the upright supporting members are pivoted to the upright position, the independent U-shaped frames are formed on which the tray may be mounted;

further comprising the lower end of each supporting member having an elongated slot therein and a circular hole therein opposite to and aligned with the slot, a screw received in the slot and connected to the counter rail so that the upright supporting member may pivot thereabout; and

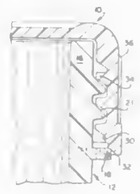
the first end and the second end of the counter rail each having a pair of spaced-apart pins protruding therefrom, the distance between the pins being equal to distance between the hole in the lower end of the supporting member and an imaginary hole located at the opposite end of the slot in the lower end of the supporting member such that when the screw is loosened, the upright supporting member may be pivoted to the fully upright position and the pins engage the slot and the opening and when the screw is tightened, the pins lock the upright supporting member to prevent movement.

4,913,299

BACK-OFF RESISTANT CLOSURE FOR A CONTAINER

Richard J. Petro, Mokena, Ill., assignor to Phoenix Closures, Inc., Naperville, Ill.

Filed Apr. 3, 1989, Ser. No. 332,623
Int. Cl.[4] B65D *41/04*
U.S. Cl. 215—330 2 Claims



1. A molded back-off resistant closure and container combination, the combination comprising:

a container having a neck with a plurality of radially outwardly projecting ratchet formations;

a closure having a generally planar top portion with an outer peripheral edge;

an annular skirt depending from said peripheral edge, said skirt having an inner face provided with integral threads and a lower edge provided with a plurality of open-bottom recesses, adjacent recesses being spaced apart by inwardly projecting, trapezoidal tooth formations, each said recess also being open and generally trapezoidal in shape on an inner side for facilitating the removal of said closure from a mold and for matingly engaging said ratchet formations of said container to prevent backing-off of said closure, said skirt having an outer face provided with a plurality of spaced, parallel, vertically positioned ribs.

4,913,300

CLOSURE WITH GUARANTEE RING FOR CONTAINERS

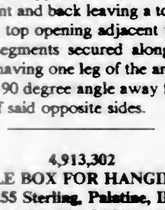
Walter Wiedmer, Ascona, and Ernst Wiedmer, Nüfels, both of Switzerland, assignors to Walter Wiedmar AG Plastikform, Nafels, Switzerland

PCT No. PCT/CH88/00017, § 371 Date Sep. 13, 1988, § 102(e) Date Sep. 13, 1988, PCT Pub. No. WO88/05754, PCT Pub. Date Aug. 11, 1988
PCT Filed Jan. 27, 1988, Ser. No. 264,944
Claims priority, application Switzerland, Jan. 30, 1987, 331/87
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—252 10 Claims

1. A closure for containers, said closure comprising:

a guarantee ring, said ring having a lower rim, an interior wall and hooks extending from the interior wall of the ring, said hooks having a tip;

at least one slide edge disposed on each hook, said wedge



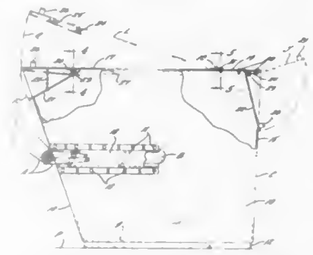
extending from the lower rim of the guarantee ring to the tip and permitting the guarantee ring of said closure to slip over a neck portion of the container, said wedge having a width that is substantially ¼ of a length of said hook.

4,913,301

REFUSE CONTAINER

Nathan L. Pickler, P.O. Box 528, Spencer, N.C. 28159

Filed Sep. 19, 1988, Ser. No. 245,579
Int. Cl.[4] B65D *25/00*
U.S. Cl. 220—1 T 19 Claims



1. An improved receptacle for refuse comprising:

(a) an open-top rigid container with flat bottom and extending upward therefrom, 2 tapered sides, a tapered front and tapered back;

(b) sleeves removeably secured to opposite sides positioned and sized to accommodate the standard pick up arms of the hydraulic pickup assembly of a dumpster vehicle;

(c) A removeable partial top secured intermediate between the top of a pair of opposite sides and extending intermediate the said front and back leaving a top opening adjacent the front and a top opening adjacent the back;

(d) Angle iron segments secured along the top edges of opposite sides having one leg of the angle iron protruding outwardly at a 90 degree angle away from and flush with the top edge of said opposite sides.

4,913,302

FOLDABLE BOX FOR HANGING FILES

Russ W. Stouter, 1255 Sterling, Palatine, Ill. 60067

Continuation-in-part of Ser. No. 76,881, Jul. 23, 1987, Pat. No. 4,775,069, which is a division of Ser. No. 872,829, Jun. 11, 1986, Pat. No. 4,693,387. This application May 31, 1988, Ser. No. 200,658
Int. Cl.[4] B65D *7/24*
U.S. Cl. 220—6 6 Claims

1. A collapsible box for holding hanging files, said box comprising:

four sides and a bottom panel interconnected to form a generally rectangular shape, a first two of said sides being

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hinged to fold onto the bottom panel to provide a compact structure form and to fold into an upright and erect box;
the other two of said sides being hinged to swing to a position parallel to said bottom panel when said box is in said compact structure form and to swing to a locking position when said box is in said erect form;
a pair of spaced parallel rail members in the box for supporting the files;
caster means attached to the bottom of said box by a plurality of plastic fastener means,

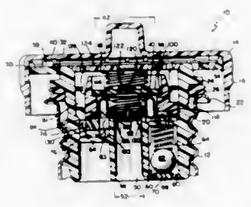
said spaced parallel rails being integrally formed near the top of said box and on confronting inner surface of at least an opposed two of said four sides, said integrally formed rail members projecting into said box far enough to receive end hooks of file hangers, and at least two of said four sides being hinged sufficiently far below said projecting integrally formed rails so that the other two of said four sides may swing to said position parallel said bottom panel and remain below said projecting rails.

4,913,303

LIQUID SPLASH CONTROL FUEL CAP

Robert S. Harris, Connersville, Ind., assignor to Stant Inc., Connersville, Ind.

Continuation-in-part of Ser. No. 62,852, Jun. 16, 1987, Pat. No. 4,787,529. This application Nov. 28, 1988, Ser. No. 276,691
The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.
Int. Cl.[4] B65D *51/16*
U.S. Cl. 220—204 13 Claims



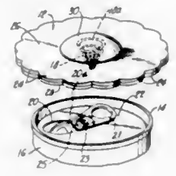
1. A fuel cap for use in a vehicle fuel system filler neck having a mouth, the cap comprising
closure means for engaging the filler neck to close the mouth of the filler neck, the closure means being formed to include means for conducting fuel vapor from the filler neck to the atmosphere upon engagement of the closure means and the filler neck, and
means in the conducting means for normally blocking flow of fuel vapor therethrough from the filler neck to the atmosphere, the blocking means including a pressure-relief valve movable between conducting means-opening positions and a conducting means-closing position, the closure means including means for selectively establishing fluid communication of fuel vapor in the filler neck with the pressure-relief valve to permit superatmospheric fuel vapor in the filler neck to exert a closure-inducing force on the pressure-relief valve sufficient to move the pressure-relief valve to its conducting means-closing position while said superatmospheric fuel vapor is extant in the conducting means.

4,913,304

COVER FOR POP TOP CAN

John L. Corey, 17700 S. Avalon Blvd. #55, Carson, Calif. 90746

Filed Jun. 5, 1989, Ser. No. 362,339
Int. Cl.[4] B65D *45/00*
U.S. Cl. 220—246 14 Claims



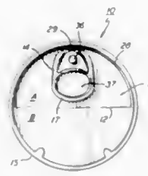
1. A container closure device for resealing containers of the type characterized by having a peripheral rim having a radially outwardly facing surface and an annular end edge surface transverse to said outwardly facing surface encompassing a recessed, end wall permanently secured to said rim and defining an off center aperture therein comprising:
a sealing means for sealably engaging the peripheral rim of the container so as to seal the container to atmosphere; and
an interlocking means operatively associated with said sealing means for holding said sealing means in sealable engagement with the peripheral rim of the container, said interlocking means being adapted for removable insertion into the aperture in the end wall of the container for engagement with the inner surface of the container end wall in a manner so as to hold said sealing means in sealing engagement with only said end edge surface of the peripheral rim of the container.

4,913,305

BEVERAGE CONTAINER WITH BIFURCATED DISPENSING LID

Hisao Hanafusa, 20 Confucuis Plz. 34F, New York, N.Y. 10002, and Nobu Fukui, 141 W. 26th St., New York, N.Y. 10001

Filed Feb. 27, 1989, Ser. No. 315,989
Int. Cl.[4] B65D *41/32*
U.S. Cl. 220—269 4 Claims



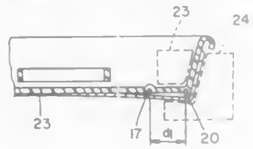
4. A beverage container for soda or beer beverage, comprising a tubular member for storing and dispensing said beverage, said tubular member having a lid having a substantially semi-circular removable sealed lid portion, and a pull tab for unsealing and tearing said lid portion from said tubular member, whereby approximately one-half of said lid is opened to access said beverage, and means defining a circumferential wall about said lid having projections for capturing and holding a torn and bent lid portion.

4,913,306

OPENABLE END CLOSURE FOR A PACKAGING CONTAINER

Lars-Erik Piltz, Dalby, Sweden, assignor to AB Akerlund & Rausing, Sweden

Filed Feb. 10, 1989, Ser. No. 310,609
Claims priority, application Sweden, Feb. 16, 1988, 8800517-8
Int. Cl.[4] B65D *41/50*
U.S. Cl. 220—270 9 Claims



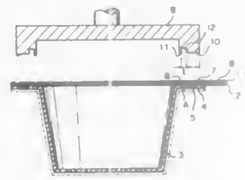
1. An openable end closure produced by injection moulded thermoplastic material comprising: a circumferential rim defining an outer periphery of said end closure, said rim being adapted for welding to a wall of a packaging container; a centrally arranged cover panel integrally attached thereto, said rim and said centrally arranged cover panel being joined in the proximity of at least a first circumferential tearing denotation spaced inwardly from said rim, said first circumferential tearing denotation defining an outer edge of a tearing extension; and a circumferential ledge disposed on a lower side of said end closure, said circumferential ledge being disposed between said first circumferential tearing denotation and said rim, and said circumferential ledge being of a size and shape adapted to maintain a flexible piece of material covering said lower side of said end closure at least a predetermined distance from said tearing extension.

4,913,307

EASILY OPENABLE PACKAGING CONTAINER AND METHOD FOR PRODUCING THE SAME

Yukio Takata, and Takeshi Shinohara, both of Himeji, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 102,648, Sep. 30, 1987, Pat. No. 4,801,041. This application Sep. 28, 1988, Ser. No. 250,063
Claims priority, application Japan, Sep. 30, 1986, 61-229594; Feb. 27, 1987, 62-42794; Sep. 29, 1987, 62-242717
Int. Cl.[4] B65D *41/32*
U.S. Cl. 220—276 9 Claims



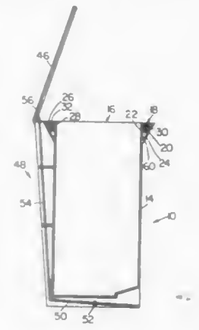
1. An easily openable packaging container produced by heat-sealing a container member with a lid member, the easily openable packaging container comprising:
(a) a container member including a recess portion and an integral flange portion surrounding the recess portion; and
(b) a multilayer lid member including an inner layer and a substrate layer adjacent to the inner layer, said substrate layer being peelable from the inner layer, the inner layer being a thermoplastic resin layer having a melting point or softening point lower than that of the material of the substrate layer, the inner layer being heat-sealed to the flange portion outside an inner edge of the flange portion and inside an outer edge of the flange portion, said inner layer having a first circular depression therein outside an outer edge of the heat-sealed portion and inside the outer edge of the flange portion and a second circular depression therein inside an inner edge of the heat-sealed portion and outside the inner edge of the flange portion, the first circular depression and the second circular depression being formed by pressing pressure, the first and second circular depressions being for cutting the inner layer when separating the multilayer lid member from the container member, thereby leaving a part of the inner layer between the first and second depressions bonded to the flange portion.

4,913,308

LINER RETAINER APPARATUS AND METHOD

Russell D. Culbertson, 3543 Greystone Dr., #1099, Austin, Tex. 78731

Filed Apr. 28, 1989, Ser. No. 345,093
Int. Cl.[4] B65D *25/16*
U.S. Cl. 220—404 32 Claims



1. A liner retainer for retaining the mouth of a flexible liner bag open and in position for receiving objects in the liner bag, the liner retainer comprising.
retainer channel means for receiving the mouth portion of the liner bag, the retainer channel means being connected to and extending along at least a portion of the perimeter of a deposit opening and an opposing sides of the opening;
retainer member means adpated to be received in the retainer channel means, over the mouth portion material of the liner bag received in the channel means, for retaining the mouth portion of the liner bag in the retainer channel means; and
an excess channel portion at the bottom of the retainer channel means, into which the retainer member means does not extend when the retainer member means is fully received in the retainer channel means, the excess channel portion being adapted to receive excess liner mouth material so that said excess material does not substantially interfere with the fit of the retainer member means in the retainer channel means.

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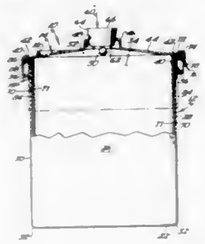
4,913,309

DISPOSAL CONTAINER AND TRANSPORT CASE FOR INFECTIOUS AND HAZARDOUS WASTE MATERIAL

James J. Fink, 700 N. Fifth St., Cannon Falls, Minn. 55009

Filed Jun. 16, 1988, Ser. No. 207,722
Int. Cl.[4] B65D *90/04*
U.S. Cl. 220—404 21 Claims



1. A disposal container for containing and transporting contaminated materials, said disposal container comprising:

a container body, said container body having a base and a plurality of upright walls extending upwardly from said base, said upright walls forming a pair of opposing sides and a pair of opposing ends of said container body, said body defining a receptacle region having a depth and a generally rectangular open top bounded by a rim, said rim having a projecting region extending a distance outwardly in a generally horizontal direction from said upright walls of said container body;

a first and a second liner, said liners being removably insertable within said receptacle region of said container body;

a lid member, said lid member being slidably and engagingly mountable on said container body such that at least a portion of said lid member extends over and above each part of said projecting region of said rim, and such that at least a portion of said lid member extends under said projecting region of said rim along said opposing sides, said lid member further defining a waste aperture extending entirely through said lid member and communicating with said receptacle region when said lid member is mounted on said container body, said waste aperture having a shape and being sized to receive the contaminated material therethrough; and

closure means for selectively closing said waste aperture.

4,913,310

STORAGE TANKS WITH SECONDARY CONTAINMENT

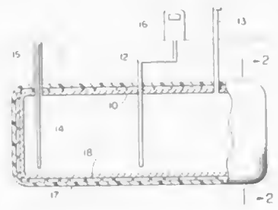
Bruce R. Sharp, 4090 Rose Hill Ave., Cincinnati, Ohio 45229

Division of Ser. No. 165,027, Mar. 7, 1988, Pat. No. 4,859,262, which is a continuation-in-part of Ser. No. 853,974, Apr. 21, 1986, which is a continuation-in-part of Ser. No. 824,680, Jan. 31, 1986, Pat. No. 4,653,312, which is a continuation-in-part of Ser. No. 745,540, Jun. 17, 1985, abandoned, and a continuation-in-part of Ser. No. 740,869, Jun. 3, 1985, Pat. No. 4,607,522, which is a continuation-in-part of Ser. No. 544,013, Oct. 21, 1983, Pat. No. 4,523,454, which is a continuation-in-part of Ser. No. 580,800, Feb. 16, 1984, Pat. No. 4,524,609, which is a continuation-in-part of Ser. No. 544,012, Oct. 21, 1983, abandoned. This application Jun. 12, 1989, Ser. No. 364,118
Int. Cl.[4] B65D *90/22*
U.S. Cl. 220—445 5 Claims

1. A storage tank system for liquids having secondary containment capability and sufficient integral structural strength to withstand external load forces, comprising:

(a) a rigid inner storage tank for storing the liquid; and

(b) a jacket made of a fibrous reinforced resinous material which completely encases the inner storage tank to form a closed space, said jacket having an irregular underside with resin protrusions extending to the inner storage tank to act as force transfer supports thereby causing the jacket to contact the rigid inner storage tank in a random pattern,



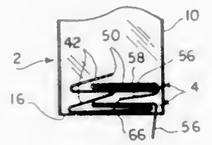
said system further characterized by the jacket being structurally independent from the inner storage tank, yet is in such close proximity to the inner storage tank that said jacket and inner storage tank reinforce one another to achieve the integral structural strength.

4,913,311

SOAP LEAF DISPENSING SYSTEM

Nancy C. Garcia, P.O. Box 6221, Laguna Niguel, Calif. 92677

Filed Sep. 28, 1988, Ser. No. 250,098
Int. Cl.[4] B65D *83/08*
U.S. Cl. 221—22 7 Claims



1. A dispensing system for planar articles of manufacture comprising;

a container having bottom, back, front and opposite side walls intersecting to provide an interior cavity therebetween, the intersection between said front and bottom walls provided with an opening,

a plurality of separate, detached packets stacked atop one another within said container cavity with a bottom most one of said packets juxtaposed said container bottom wall adjacent said opening,

each said packet comprising a unitary wrapper including a central, rectangular bottom panel having opposite side flaps joined to said bottom panel by respective side folds,

front and rear flaps joined to said bottom panel by respective front and rear folds intermediate said side folds, said front and rear flaps each having an outer edge opposite its respective said fold,

a tab extending from said front flap outer edge and joined thereby by an end fold, said tab having a top segment extending from said end fold and joined to a pull segment by an intermediate fold, said pull segment terminating in a distal free edge,

a planar article of manufacture disposed atop said packet bottom panel with said side flaps inwardly folded along said side folds and directly overlying said article of manufacture atop said bottom panel,

said front flap inwardly folded along said front fold and overlying said folded side flaps with said tab top segment folded along said end fold and overlying said folded front flap to position said intermediate fold juxtaposed said front fold whereby, said pull segment angularly extends beneath said intermediate fold,

said rear flap inwardly folded along said rear fold and overlying said folded front flap,

said bottom most one of said packets within said container cavity having said pull segment projecting through said opening,

said pull segments of all said stacked packets atop said bottom most packet inwardly folded along said intermediate fold to underlie its respective bottom panel and overlie said tab top segment of the next beneath said packet,

said outer edge of each said packet rear flap spaced from said free edge of said pull segment of the next above said packet, whereby

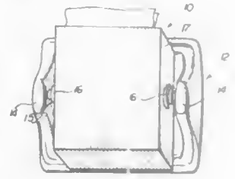
a user upon pulling said pull segment of said bottom most packet, progressively withdraws the bottom most packet through said container opening initially with said rear flap outer edge thereof thereafter passing over said free edge of said pull segment of the next above one said packet and thence said rear flap of said bottom most packet subsequently overlying said pull segment of the next above one said packet and becoming sandwiched between said pull segment and bottom panel of said next above packet, with continued withdrawal of the bottom most packet causing unfolding of said rear flap of said bottom most packet and deflection of said pull segment of the next above packet, leaving said pull segment of the next above packet extending through said container opening as said bottom most packet is fully withdrawn with its front and rear flaps unfolded whereafter, with unfolding of said side flaps of the withdrawn packet, the article of manufacture atop the bottom panel thereof may be removed for use.

4,913,312

SINGLE FOLD TOILET TISSUE DISPENSING CONTAINER

Sean L. Boutin, 121 SE. 3rd Ave., #C-608, Dania, Fla. 33004

Filed Apr. 13, 1988, Ser. No. 181,012
Int. Cl.[4] B65H *1/00*
U.S. Cl. 221—45 11 Claims



1. A dispensing assembly for individual folded sheets of toilet tissue designed to be removably mounted on a normally wall mounted toilet roll supporting structure, said assembly comprising:

a. a container including a base, surrounding sidewalls connected to said base and an endwall connected to said sidewalls and oppositely disposed relative to said base,

b. said base, sidewalls and endwalls collectively define boundaries of a hollow interior of said container being dimensioned and configured to contain a plurality of the individual tissues disposed in a stacked array,

c. exit means formed in said endwall in communicating relation with at least a next adjacent and outer endmost one of the plurality of tissues for removal thereof from said hollow interior,

d. A pair of mounting members, each mounted on an exterior of a different oppositely disposed one of said sidewalls in spaced, substantially coaxial relation to one another, said mounting members comprising a stepped outer configuration wherein each step of said stepped configuration comprises a greater traverse dimension than the preceding step, the outer configuration of each mounting member being readily adaptable for receiving sockets on the toilet roll supporting structure,

e. support means in transverse relation to said sidewalls engaging the stacked array of said plurality of tissues for at least partial support thereof,

f. said support means comprising a support platform disposed in supporting engagement with an inner most end of the stacked array;

g. biasing means disposed and inter-connected between said support platform and said container and disposed and structure for biasing a plurality of tissues and support platform in a direction towards said exit means,

h. securement means mounted on at least one sidewall of said container for support and securement of said biasing means to said container and extending inwardly into said hollow interior thereof,

i. anchor means formed and on said securement means and structure for fixed attachment of said securement means to said one sidewall, and

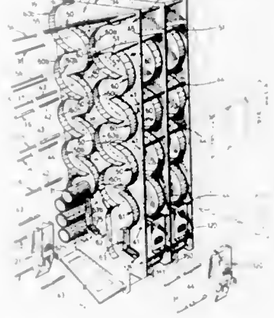
j. said securement means comprising a finger protruding into said hollow interior and having an enlarged head portion mounted on an inner extremity, said biasing means having one end supported on said finger in board of said enlarged head portion.

4,913,313

DUAL SERPENTINE TRACK MAGAZINE FOR COIN OPERATED CAN VENDORS

Donald C. Rockola, Chicago, Ill., assignor to Rock-Ola Manufacturing Corporation, Addison, Ill.

Filed Sep. 16, 1988, Ser. No. 245,451
Int. Cl.[4] G07F *11/34*
U.S. Cl. 221—131 10 Claims



1. In an automatic, coin controlled vending machine for dispensing cylindrical articles, a storage magazine for holding a plurality of such articles, comprising a plurality of operationally vertical, planar wall members; means for rigidly interjoining and spacing said wall members in parallel relation to form plural like dimensioned vertical columns therebetween; at least one pair of vertical, non-interferingly aligned, back-to-back separated serpentine tracks in each of said columns for storing a plurality of cylindrical articles therein and gravitationally feeding the same to a single vend mechanism at the lower ends thereof; each of said tracks comprising a pair of registeringly aligned laterally spaced like serpentine rail assemblies on opposingly adjacent said wall members of each column; each rail assembly comprising a plurality of identical, symmetrically formed, curvelinear rail sections, each having a substantially half circle curvelinear body portion, a pair of divergently related linear leg portions extending integrally from opposite

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ends of said body portion, and planar mounting portions extending transversely of one edge of said leg portions and adapted to be fastened in face-to-face contact with a said wall member.

4,913,314

OPENING ELEMENT FOR AN INSERT NOZZLE OF A SLIDE GATE VALVE APPARATUS AND A METHOD OF OPENING SAID APPARATUS

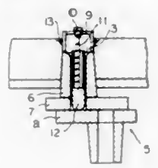
Takashi Otsuka; Masaru Terao; Masahiko Nose; Kenji Yamamoto, and Mototsugu Osada, all of Okayama, Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 286,828

Claims priority, application Japan, Dec. 23, 1987, 62-323786

Int. Cl.[4] B22D *41/08*

U.S. Cl. 222—590 9 Claims



9. A method of initially closing the melt passage of a slide gate valve mounted on a vessel for discharge of molten metal from the vessel, said slide gate valve having a fixed plate, a slide plate, and a melt passage openable and closable by sliding said slide plate, said method comprising:

mounting a refractory cap at the upper end of said melt passage to prevent the entry of molten metal from said vessel into said melt passage; positioning a dead weight in said melt passage above said slide plate, said dead weight being smaller in size than the opening of said melt passage whereby, on opening said slide gate valve, said dead weight is free to fall downwardly through said melt passage;

said dead weight and refractory cap being joined by a coupling member which, on opening said slide gate valve, allows the dead weight to fall a limited distance whereupon the falling dead weight exerts an impact load through said coupling member sufficient to open said refractory cap whereby molten metal is free to flow from said vessel and through said melt passage for discharging molten metal from said vessel.

4,913,315

DISPENSING APPARATUS FOR DISPENSING PIECES OF ICE, OR THE LIKE

Malcolm I. Wagner, Middleton, England, assignor to 501 ICE Optic Limited, Burnage, England

Continuation of Ser. No. 22,780, Mar. 6, 1987, abandoned. This application Nov. 23, 1988, Ser. No. 275,690

Claims priority, application United Kingdom, Mar. 15, 1986, 8606427

Int. Cl.[4] G01F *11/18*

U.S. Cl. 221—200 9 Claims

1. A dispenser comprising a housing defining a cavity to receive and store a plurality of pieces of ice, an outlet from the cavity, a dispensing structure movable within the cavity between a first location, wherein said dispensing structure communicates with the cavity to receive ice therefrom, and a second location wherein said dispensing structure communicates with the outlet to discharge ice therethrough, movement of the dispensing structure from the first location to the second location causing a piece of ice received in the cavity to be dispensed from the outlet, the first location being lower than the second location, a movable flap disposed within the cavity in closely spaced disposition relative to an opposing housing wall and arranged to provide a gap through which pieces of ice pass sequentially towards the dispensing structure, the cavity having an inclined floor thereto and the said flap being downwardly inclined toward the said floor in opposed relationship with respect to the inclination thereof and the dispensing structure including a platform which, in said first location, is contiguous with said floor, a chute extending downwardly from the housing and on which the dispensing structure is slideably

mounted, and manually engageable means cooperatively engaged with the dispensing structure and disposed outwardly of the chute, said manually engageable means serving, upon operation, to move the dispensing structure between said first and second locations, the dispensing structure further including a closure plate positioned for registration with the said outlet when the said structure is in the first location and to provide free access thereto when said structure is displaced from said location.

4,913,316

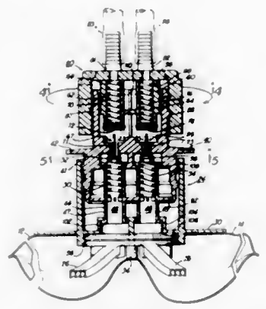
BINARY SYRUP SYSTEM BAG AND VALVE

Simon J. Richter, Marietta, Ga., assignor to The Coca - Cola Company, Atlanta, Ga.

Filed Jul. 27, 1988, Ser. No. 224,645

Int. Cl.[4] B65D *35/22*

U.S. Cl. 221—1 15 Claims



1. A binary bag for use as a container for two syrup components to be dispensed through a beverage dispenser comprising:

(a) a first and a second bag wall including a liquid-tight seam down the middle of said first and second bag walls thereby defining two chambers;

(b) a spout opening in said first bag walls directly in line with said seam, said seam being interrupted at said spout opening;

(c) a single spout, having a pair of separate liquid flow channels therethrough, disposed on said spout opening, with one of said flow channels in liquid communication with

one of said chambers and the other flow channel in liquid communication with the other of said chamber, said spout having a diametric member diametrically disposed thereon;

(d) means for sealing and said second bag wall on said diametric member of said spout; and

(e) means for selectively withdrawing the two syrup components simultaneously from said chambers.

4,913,317

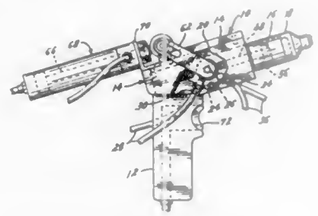
FOAM DISPENSING APPARATUS

Steven A. Wernicke, Wheaton, Ill., assignor to Foamtek, Inc., Batavia, Ill.

Filed Sep. 14, 1988, Ser. No. 244,812

Int. Cl.[4] B67D *5/60*

U.S. Cl. 222—1 12 Claims



1. A foam dispenser for converting a plurality of foam components into an expanded foam and having means for cleaning the dispenser with compressed gas after the foam is discharged therefrom comprising, in combination:

(a) a barrel having a plurality of passages formed therein which communicate with a center plug, the center plug having discrete passages for each of said foam components;

(b) a mixing chamber connected to the center plug, the mixing chamber being located outside the barrel;

(c) a nozzle connected to the mixing chamber and having a bore therethrough, one end of said bore communicates with the mixing chamber, while the other end provides an opening for discharging the expanded foam from the dispenser;

(d) a tube for carrying each foam component to the dispenser, each such tube having a corresponding tube for carrying the compressed gas to the dispenser;

(e) a rotary valve component for each pair of foam component and compressed gas tubes, each such valve having a single passageway formed therethrough with an inlet and an outlet, each valve being mounted for movement on the barrel so that the inlet of each valve is rotatable between positions nearly coterminous with the outlets of the foam component tubes and the compressed gas tubes, and the outlet of valve remains in communication with a passageway of the center plug; and

(f) means for moving all valves in unison between communication with the foam component carrying tubes and communication with the compressed gas carrying tubes so that after the foam components have been mixed and the expanded foam discharged from the dispenser, the dispenser can be cleaned with the compressed gas from the point where the foam components enter the dispenser to the point where the foam components enter the mixing chamber.

4,913,318

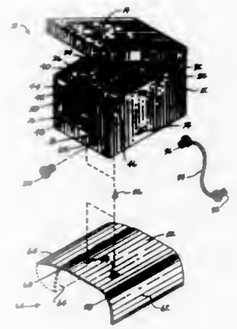
PORTABLE BEVERAGE DISPENSER

Thomas L. Forrester, 74 Spar Ct., Pleasant Hill, Calif. 94523

Filed Sep. 13, 1988, Ser. No. 243,825

Int. Cl.[4] B67D *5/62*

U.S. Cl. 222—129 6 Claims



1. A portable beverage dispenser, comprising:

a housing having a front wall, back wall, and side walls;

a pair of adjacent tanks in said housing divided by an insulated partition;

each of said tanks having a fill opening and cap means for closing said fill opening;

each of said tanks having a dispensing outlet with means for independently regulating flow of liquids from said tanks;

heating tubes attached to electrical heating elements for heating liquids in said tanks;

cooling tubes attached to thermoelectric cooling elements for cooling liquids in said tanks;

said heating and cooling elements independently connected to a rechargeable battery;

each pair of said heating and cooling elements being actuated by a three position switch;

connecting wires with automobile cigarette lighter plug members at each end for connecting said rechargeable battery to a conventional automobile cigarette lighter plug;

independent means for pressurizing each of said tanks, each independent means for pressurizing comprising a hand pump acting upon a pressure reservoir;

said adjacent tanks having parallel sides and common, generally parallel front and back walls and common, parallel top and bottom walls;

said outlets and means for regulating flow of liquids on said front wall adjacent to respective tanks;

said front wall having a recessed area and handle means slidably attached on sides of said recessed area such that said handle means traverses said recessed area with room between said handle means and said recessed area of said front wall, said room between said handle means and said front wall having a width and depth sufficient for the profile of a small portable radio;

radio speakers mounted adjacent outside side walls of said tanks; and

means for connecting a radio to said battery and to said speakers.

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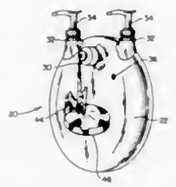
4,913,319

LIQUID DISPENSER AND RETRACTABLE SOAP HOLDER

William A. Root, 126 Anita Dr., Pickerington, Ohio 43147

Filed Nov. 30, 1988, Ser. No. 278,331
Int. Cl.[4] B67D 5/52
U.S. Cl. 222—135 4 Claims



1. A soap holder and liquid dispensing apparatus comprising, in combination, means forming an enclosure having a front and rear face, said front face including an outwardly protruding neck portion communicating with an interior portion of said enclosure and provided with a tapered horizontally facing opening, said rear face configured to be attached to a planar outer wall surface, said enclosure including at least one inner chamber formed between said front and rear faces for storing a liquid; a pump dispensing means mounted in communication with said chamber for selectively dispensing liquid from said chamber; means for retractably storing a predetermined length of flexible cable mounted within said enclosure and separated from said chamber, said flexible cable having a free end extendible through the horizontally facing opening in the front face of said enclosure and normally biased to return to a predetermined position closely adjacent to an outer side of said front face; connecting means fixed to said free end of said cable; a soap holder mounted to said connecting means, said holder formed of a flexible liquid permeable material and conformed to releasably surround a solid soap bar; whereby said soap holder may be extended away from said enclosure a distance determined by the length of said cable and automatically retracted when released to a position closely adjacent to said front face of said enclosure.

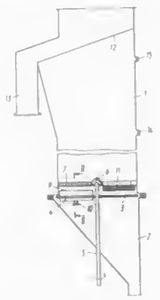
4,913,320

APPARATUS FOR METERING BULK MATERIALS

Stanislav B. Stazhevsky, ulitsa Derzhavina, 19, kv. 39; Evgeny I. Shemyakin, ulitsa Zolotodolinskaya, 8; Arestakes A. Kramadzhian, ulitsa Zheleznodorozhnaya, 8/1, kv. 329; Nikolai F. Stativko, ulitsa Dusi Kovalchuk, 18, kv. 61; Gennady N. Dyakov, ulitsa 1905 goda, 87, kv. 135; Genrikh K. Lev, ulitsa Leskova, 280, kv. 48; Vladimir K. Shanin, ulitsa Nikitina, 70, kv. 122, and Ruslan B. Schipkov, ulitsa Udarnaya, 31, kv. 14, all of Novosibirsk, U.S.S.R.

PCT No. PCT/SU87/00087, § 371 Date May 31, 1988, § 102(e) Date May 31, 1988, PCT Pub. No. WO88/01590, PCT Pub. Date Mar. 10, 1988
PCT Filed Aug. 25, 1987, Ser. No. 228,696
Claims priority, application U.S.S.R., Aug. 29, 1986, 4154081
Int. Cl.[4] B67D 5/64
U.S. Cl. 222—168 6 Claims

1. An apparatus for metering bulk materials comprising a vertically extending receiving hopper (1) having a guide funnel (2) in the bottom part thereof and at least one disk (3) with at least one discharge opening (4) extending along a substantial distance of a disk radius, the disk mounted for rotation about a vertical axis, between the hopper (1) and guide funnel (2); a cut-off member (9) arranged immediately above the discharge opening (4) of the disk (3), the cut-off member 89) is arranged vertically movable in relation to the disk and for horizontal



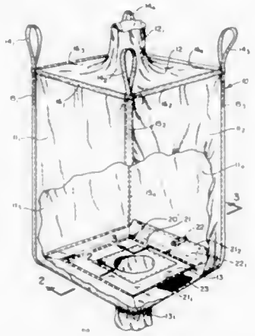
movement with the disk and has a surface extending in parallel with the surface of disk (3).

4,913,321

BULK PARTICULATE SOLIDS TRANSPORT BAG WITH GAS ASSIST UNLOADING FEATURE

Harry Abboud, 5845 Clematis Dr., Baton Rouge, La. 70808

Filed Aug. 8, 1988, Ser. No. 229,820
Int. Cl.[4] B65G 69/06
U.S. Cl. 222—195 10 Claims



1. In a flexible, fabric bag for transporting bulk particulate solids having gas impervious side and bottom walls, the bottom wall of which is provided with a discharge spout which can be opened for discharging particulate solids loaded therein, and the bag is expanded by said particulate solids and collapsed by discharge of said particulate solids,

the improvement comprising

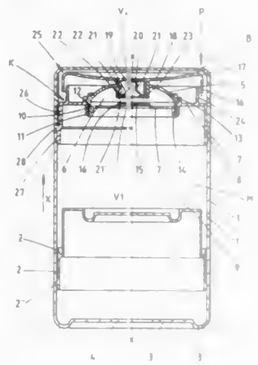
a gas distribution means of tubular shape providing a lateral passageway through which gas can be passed formed by a flexible material surrounding said particulate solids discharge spout, said distribution means contains a gas permeable upper face, gas impervious lower face, and a gas inlet into said tubular passageway, such that gas injected via said gas inlet into said tubular passageway and through said gas permeable upper face will aerate and render the particulate solids flowable for discharge through said discharge spout.

4,913,322

DISPENSER FOR PASTY COMPOSITIONS

Albert Stöffler, Düsseldorf, and Josef Hilgefort, Neuenkirchen, both of Fed. Rep. of Germany, assignors to Bramlage Gesellschaft mit beschränkter Haftung, Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 271,047
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1987, 3738548
Int. Cl.[4] B65D 37/00
U.S. Cl. 222—207 17 Claims



1. A dispenser for pasty compositions comprising

a housing with a piston therein, the housing and the piston defining a space for holding a pasty composition, the piston being displaceable only in a direction of emptying the housing of the pasty composition;

a pump element secured to the housing, said holding space lying between said piston and said pump element;

an actuating handle having a collar and lying on the outside of said housing, the handle being operatively connected to said pump element for actuating the pump element to be depressed in the direction of the piston; and wherein

said pump element comprises

an inlet valve and an outlet valve, the outlet valve being disposed in the actuating handle, the outlet valve comprising spring elements developed thereon and which extend into the inside of the dispenser, and a valve plate, the spring elements urging the outlet valve into its closed position; and wherein

said spring elements are formed as spring legs which are developed directly free-standing on the valve plate and rest against the collar of the actuating handle; and

during a depression of the actuating handle, the collar constrains the spring legs to undergo the same flexing independently of any tilting of the actuating handle.

4,913,323

STEPPED PISTON FOR PRESSURE OPERATED DISPENSING CONTAINER

Christian T. Scheindel, Randolph Center, Vt., assignor to Scheindel Associates, Inc., Randolph Center, Vt.

Continuation of Ser. No. 912,670, Sep. 29, 1986, abandoned, which is a continuation of Ser. No. 727,433, Apr. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 529,577, Sep. 6, 1983, abandoned. This application Jun. 5, 1989, Ser. No. 361,752
Int. Cl.[4] B67D 5/42
U.S. Cl. 222—386 7 Claims

1. A pressurized piston operated product dispensing container comprising:

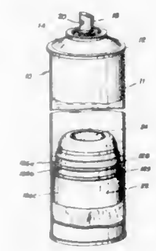
a cylindrical body, a bottom wall and a valved cap to provide a container,

an inverted cup shaped annular piston in said cylindrical body, said piston having an upper portion and a lower portion,

said upper portion of said piston comprising a barrier wall shaped to conform to the inner top surface of said container, said barrier wall dividing said container into an upper product containing chamber and a lower propellant containing chamber,

said lower portion of said piston depending from said upper portion and comprising a stepped annular sidewall having a plurality of annular sealing segments,

a first one of said annular sealing segments being an upper segment having an outer diameter less than the inner diameter of said cylindrical body to provide an upper annular gap between said sidewall and cylindrical body,



product loaded under pressure into said upper chamber of said container flowing at a relatively fast rate into said upper annular gap to stabilize said piston in said cylindrical body and to provide a seal between said upper sidewall segment and said cylindrical body,

a second one of said annular sealing segments being a lower segment having an outer diameter less than the inner diameter of said cylindrical body to provide a lower annular gap between said sidewall and said cylindrical body, said lower annular gap being smaller than said upper annular gap, product flowing from said upper annular gap into said lower annular gap at a relatively slower rate to provide a seal in said lower annular gap between said lower sidewall segment and said cylindrical body.

4,913,324

ROTARY VALVE FOR A METALLURGICAL VESSEL AND ROTOR AND STATOR THEREFOR

Ernst Lührsen, Bad Schwalbach; Ullrich Hintzen, Taunusstein-Watzhahn, and Raimund Brückner, Engenhahn, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Aug. 3, 1988, Ser. No. 227,880
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1987, 3725637; Feb. 18, 1988, 3805070; Jun. 10, 1988, 3819784
Int. Cl.[4] B22D 41/08
U.S. Cl. 222—598 43 Claims

1. A rotary valve for controlling the discharge of molten metal in a substantially downward direction from a metallurgical vessel, said valve comprising:

a refractory rotor rotatable about an axis aligned substantially horizontally, said rotor having an outer peripheral surface arranged symmetrically about said axis, and said rotor having therethrough a flow channel having inlet and outlet ports, at least said outlet port opening onto said outer surface;

a refractory stator having therein a recess defined by an inner surface complementary to said outer surface of said rotor, said stator having therethrough a discharge channel, said stator being positionable on or in a refractory lining of the metallurgical vessel at a location to be contacted by molten metal therein; and

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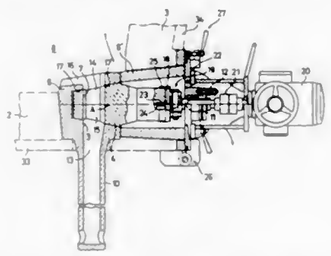
said rotor being at least partially fitted within said recess with said outer and inner surfaces of said rotor and stator, respectively, being complementarily positioned symmetrically about said axis, such that rotation of said rotor about said axis relative to said stator selectively brings said flow channel of said rotor into and out of alignment with said discharge channel of said stator.

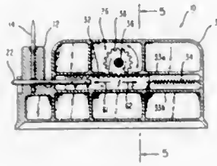


4,913,325

NEEDLE THREADING APPARATUS

Paulino A. Cacicedo, 5 Tisbury Ct., Scotch Plains, N.J. 07076

Filed Aug. 30, 1989, Ser. No. 400,777
Int. Cl.[4] D05B *87/02*
U.S. Cl. 223—99 6 Claims



1. Apparatus for threading a thread through the eye of a needle, comprising:

thread receiving means for receiving and holding a portion of said thread;

needle receiving means for receiving said needle and presenting said eye for threading, said needle receiving means provided with a first vertical tubular passageway and a second horizontal tubular passageway, said passageways coincident and said first passageway for receiving the rearward portion of said needle and said second passageway for presenting said eye of the needle for threading;

threading means for threading said portion of said thread through and out of said eye of said needle to thread said needle, said threading means including a threading finger and advancing and retracting means for advancing said threading finger from a normal position into a forward position and for retracting said threading finger from said forward position into said normal position, upon said threading finger being advanced from said normal position into said forward position said threading finger engaging said portion of said thread and threading said portion of said thread through said eye of said needle; and

said advancing and retracting means comprising:

(a) a gear rack having forward and rearward portions,

(b) a tension spring,

(c) a rotatably mounted shaft, a pinion gear mounted on said shaft and engaged with said gear rack, and

(d) a manually rotatable knob mounted on said shaft,

(e) said forward portion of said gear rack secured to said rearward portion of said threading finger and the rearward portion of said gear rack secured to said tension spring, said knob for being rotated manually to turn said shaft and thereby said pinion gear to cause said gear rack to advance and advance said threading finger from said normal position into said forward position, upon the advancement of said gear rack said tension spring being stretched and upon the release of said knob said tension spring retracting said gear track and returning said threading finger from said forward position to said normal position.

4,913,326

ARMBAND CARRIER FOR AUDIO DEVICES

Jack L. Echelson, 7807 Eagles Flight La., Ft. Myers, Fla. 33912

Filed Mar. 30, 1989, Ser. No. 330,757
Int. Cl.[4] A45C *11/00*
U.S. Cl. 224—222 2 Claims

1. A carrier assembly for carrying a portable audio device designed to be worn on the upper arm of an individual comprising

an arm encircling closed cylindrical elastic band and

an open-topped carrier made of non-stretchable fabric and having rectangular front and back faces, two rectangular sides and a rectangular bottom panel whose dimensions approximate those of the carrier's open top,

the two sides and front face of the carrier each having a midsection lying equidistant from the top and bottom of the carrier,

the carrier's back face being permanently joined to the outside of the cylindrical elastic band so that the open top and bottom panel of the carrier lie in planes parallel to the open top and bottom of the cylindrical elastic band, and

a one way stretchable elastic tape sewn in its stretched condition into the inside of the front half of the carrier horizontally across the midsection of the front face and the two sides of the carrier causing the fabric of the front half of the carrier to gather along its midsection when the elastic tape returns to its unstretched condition.

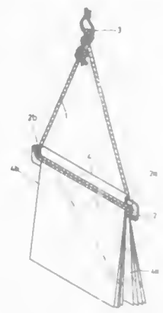
4,913,327

BURGLARPROOF DEVICE FOR CARRYING PERSONAL BANK NOTES

Shih-fu Wu, 2nd Floor, 108, Kweilin Road, Taipei, Taiwan

Filed Oct. 11, 1988, Ser. No. 256,032
Int. Cl.[4] A45F *5/00*
U.S. Cl. 224—247 2 Claims

1. A safety bank note holder for carrying personal bank notes, comprising a thin elastic long rectangular plate and a rope having two ends, said plate having a front face, a rear face, a first end formed with a first hole and a second end formed with a second hole, said rope being loosely tied to said plate in such a manner that one end of said rope is conducted through said first hole from said rear face to said front face of said plate, and drawn along said front face toward said second hole and conducted through said second hole back to said rear face, and then drawn along said rear face toward said first hole and again conducted through said first hole to said front face and then again drawn along said front face toward said second hole and again conducted through said second hole back to said rear face and tied with the other end of said two ends of said rope, forming a knot, whereby a single segment of said rope is formed on said rear face and a double segment of said rope is formed on said front face, permitting a bank note to be folded in two and ride on said plate with one half of the bank note inserted between said single segment and said rear face of said plate, and the other hald of the bank note inserted between said double segment and said front face of said plate so as to safely carry the bank note and easily draw out the bank note from said bank note holder for use.

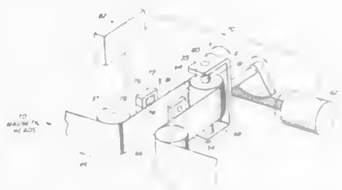


4,913,328

ACTIVE TAPE TRACKING SYSTEM WITH CROWN GUIDE ROLLERS FOR MAGNETIC RECORDER/PLAYERS

Gordon R. Schulz, Villa Park, Calif., assignor to Odetics, Inc., Anaheim, Calif.

Filed Jun. 5, 1987, Ser. No. 58,588
Int. Cl.[4] B65H *23/038, 23/32*
U.S. Cl. 226—21 13 Claims



1. A tape position tracking system for guiding and maintaining lateral position of a tape which is travelling along a predetermined path between a supply reel and a takeup reel, comprising at least one guide roller module each module comprising:

a plurality of guide rollers each rotatable on a shaft and at least one of which is a crown guide roller, the guide rollers forming a continuous tape path between the supply reel and the takeup reel wherein the tape is wrapped around the guide rollers,

frame means for supporting the crown guide roller for pivotal movement;

drive means coupled to the frame means for pivoting the crown guide roller;

means for sensing the lateral position of the tape; and

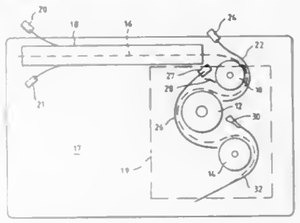
control means responsive to the sensing means for activating the drive means thereby to maintain the lateral position of the tape along the predetermined path.

4,913,329

CIGARETTE PAPER FEED

Michael J. Cahill, and Kevin R. Fincham, both of Coventry, Great Britain, assignors to Molins plc, Milton Keynes, England

Filed Feb. 24, 1988, Ser. No. 159,899
Claims priority, application United Kingdom, Feb. 27, 1987, 8704721
Int. Cl.[4] B65H *20/14; A24C 5/38*
U.S. Cl. 226—97 11 Claims



1. A web handling device through which the web is arranged to pass along a tortuous path extending around a number of rollers and including means for threading the web pneumatically comprising, in association with at least one of the rollers, a guide member having a guide surface which extends around part of the periphery of the roller in a spaced relationship so as to define a passage for the web, means for directing the web approximately tangentially towards the guide surface, an air mover mounted on or adjacent to the upstream end of the guide surface, and arranged to pass a moving film of air along the guide surface while the web is being threaded through the apparatus, so as to entrain the web and convey it around the roller, and a front cover plate being formed with air passages through which compressed air is supplied to at least one of the air movers .

8. An air mover for producing a film of air along a guide surface for conveying web or other sheet material along the guide surface, comprising a body having a surface which is to be secured to the guide surface, and a hollow portion forming a chamber to be supplied with compressed air, said surface which is to be secured to the guide surface having a cut-out portion forming a recessed surface defining with an opposed portion of the guide surface an outlet slot communicating with said hollow chamber and aligned with said guide surface for directing a film of air along the guide surface.

4,913,330

WEB FEEDING APPARATUS

Tomohiko Takahashi, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 21,595, Mar. 2, 1987, abandoned, which is a continuation of Ser. No. 594,019, Mar. 27, 1984, abandoned. This application Jun. 6, 1988, Ser. No. 203,502
Claims priority, application Japan, Mar. 31, 1983, 58-55951
Int. Cl.[4] B65H *23/26, 27/00*
U.S. Cl. 226—196 3 Claims

1. A thermal transfer recording apparatus for printing an image upon a sheet using a thermal transfer ribbon having elongated side edges and transverse rigidity, comprising

a thermal head;

a platen roller, the sheet and thermal transfer ribbon being clamped between the platen roller and the thermal head in a recording area, an area of said thermal transfer ribbon with said recording area defining a printing range of said ribbon;

ribbon feeding means for feeding the thermal transfer ribbon in a first direction from an upstream ribbon supplying side,

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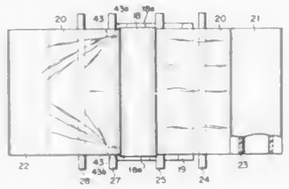
to a downstream ribbon winding side, along a path including the recording area;
a separation roller having a curved surface; and
a pair of fixed tension increasing rollers, each having a curved surface, disposed downstream of the platen roller,



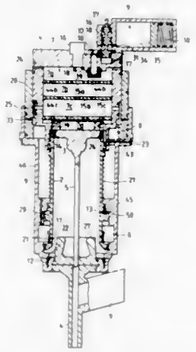
coaxially disposed with respect to said separation roller, and separated from each other in a direction normal to said first direction, to contact with the side edges of the ribbon outside the printing range, to increase tension on the ribbon at the side edges thereof, along said first direction.

4,913,331

INTERNAL-COMBUSTION PISTON DRIVING APPARATUS HAVING A DECOMPRESSION CHANNEL

Hiromu Utsumi, Katsuta; Yo Kawakami, Mito, and Shinki Obtsu, Ibaraki, all of Japan, assignors to Hitachi Koki Company, Ltd., Tokyo, Japan

Filed Oct. 21, 1988, Ser. No. 261,074
Int. Cl.[4] B25C *1/04, 1/08*
U.S. Cl. 227—10 8 Claims



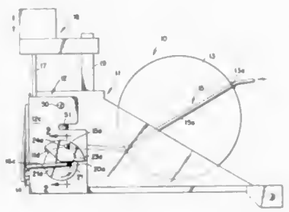
1. An internal-combustion piston driving apparatus comprising:
(a) a housing having an opening at one end thereof;
(b) a cylinder cover fixed to said housing;
(c) a cylinder fixed to said housing;
(d) a piston reciprocally slidably received in said cylinder, a combustion chamber being defined by said housing, said cylinder, and said piston;
(e) means for supplying fuel to said combustion chamber;
(f) an ignition device for igniting said fuel supplied into said combustion chamber;
(g) valve means for moving a valve between first and second position, said valve means being provided around said combustion chamber; and
(h) a decompression channel for establishing communication between said combustion chamber and atmosphere at a place above top dead point of said piston when said valve is in said second position, said decompression channel being closed when said valve is in said first position.

4,913,332

SHEATH RELEASE DEVICE FOR STAPLER

Paul Olesen, Bellmore, N.Y., assignor to Swingline Inc., Long Island City, N.Y.

Filed Jan. 23, 1989, Ser. No. 300,511
Int. Cl.[4] B27F *7/11*
U.S. Cl. 227—123 4 Claims



1. In a stapler having a U-shaped housing, a generally U-shaped sheath including side panels and an anvil, both being urged against the housing by a clamp spring having crossbars, and a cartridge, an anvil, and control means for normally positioning the spring to urge the anvil and sheath toward the housing and for releasing the spring comprising
a. a round aperture in each sheath side panel;
b. a rotatable member mounted in each aperture;
c. slot openings in the rotatable member for receiving the clamp spring crossbars;
d. configured recesses in the housing for accommodating and engaging the crossbars;
e. crank means attached to the rotatable members for causing the rotatable members to rotate to move the crossbars in such recesses to in turn move the remainder of the clamp spring toward and away from the sheath; whereby the anvil and sheath may be moved away from the stapler housing to assist in alleviating a staple jam.

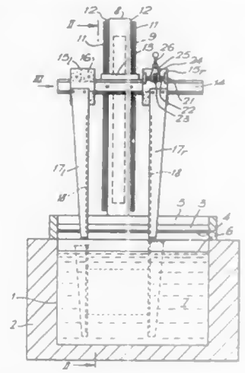
4,913,333

SOLDER LEVELLER

Peter P. A. Lymn, Lime Kiln Cottage, Buriton, Petersfield, Hampshire, United Kingdom GU31 5SJ

PCT No. PCT/GB87/00366, § 371 Date Nov. 25, 1988, § 102(e) Date Nov. 25, 1988, PCT Pub. No. WO87/07195, PCT Pub. Date Dec. 3, 1987
PCT Filed May 27, 1987, Ser. No. 282,338
Claims priority, application United Kingdom, May 29, 1986, 8613104
Int. Cl.[4] B05C *3/04*
U.S. Cl. 228—20 17 Claims

1. In a solder leveller having a solder bath, into which a board to be coated with solder is lowered in a substantially vertical disposition, means for gripping the board, inserting it into said solder bath and withdrawing it therefrom, means for levelling solder deposited on the board as it is withdrawn from said bath, and means for driving said board gripping means downwardly for insertion of a gripped board into said solder bath and upwardly for withdrawal of the board, the improvement wherein said gripping, insertion and withdrawal means comprises a pair of upright, laterally acting jaws adapted along an extended part of their length for holding a board at its opposite side edges; means for closing said jaws to grip the



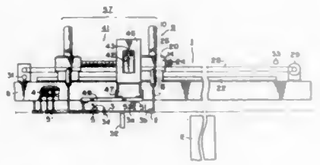
board; and means for supporting said jaws above said solder bath.

4,913,334

DEVICE FOR CORRECTING WARP OF PRINTED CIRCUIT BOARDS IN A CARRIERLESS SOLDERING APPARATUS

Kenshi Kondo, Tokyo, Japan, assignor to Nihon Den-Netsu Keiki Co., Ltd., Tokyo, Japan

Filed Jan. 18, 1989, Ser. No. 298,163
Claims priority, application Japan, Jan. 19, 1988, 63-7430; Jan. 19, 1988, 63-7431
Int. Cl.[4] B23K *37/04*
U.S. Cl. 228—47 6 Claims



1. A device for correcting warp of printed circuit boards in a carrierless soldering apparatus wherein the printed circuit boards are soldered while being held by holding claws of a conveying means, which comprises a sliding means involving a single or plural warp-correcting means, sliding plates for installing the warp-correcting means thereon, and a single or plural pairs of slide beds provided in parallel to the direction of movement of the printed circuit boards, and a driving means for reciprocating the sliding means in parallel to the direction of movement of the printed circuit boards

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4,913,335

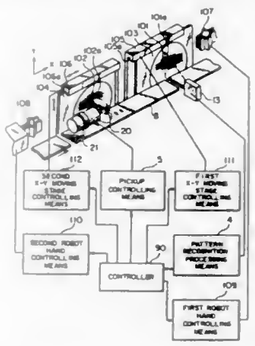
METHOD AND APPARATUS FOR DIE BONDING

Masaharu Yoshida, Fukuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 8, 1989, Ser. No. 320,513
Claims priority, application Japan, Sep. 1, 1988, 63-221102
Int. Cl.[4] H01L *21/60*
U.S. Cl. 228—103 15 Claims

3. A die bonding apparatus comprising:

conveying means for conveying lead frames in a second plane;
holding means for holding a semiconductor wafer in a first plane orthogonal to the second plane near the lead frames, the wafer including a multiplicity of mutually separated chips;
moving means for moving said holding means between first and second positions along a direction lying in the second plane;
a sensor for optically detecting the semiconductor chips



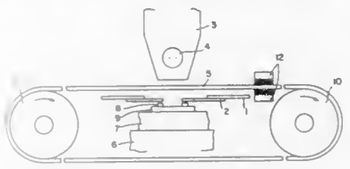
when said holding means is in the first position and for generating a sensor signal in response to the detection of each chip;
pattern recognition means for determining, in response to the sensor signal, whether each of the chips is non-defective or defective; and
semiconductor chip moving means for picking up each of the non-defective semiconductor chips from the wafer held by said holding means in the second position and for bonding each of the non-defective chips onto a respective lead frame.

4,913,336

METHOD OF TAPE BONDING

Noboto Yamazaki, Tokyo, Japan, assignor to Kabushiki Kaisha Shinkawa, Tokyo, Japan

Filed Jan. 31, 1989, Ser. No. 304,784
Claims priority, application Japan, Mar. 29, 1988, 63-73243
Int. Cl.[4] B23K *20/00, 20/16*
U.S. Cl. 228—106 2 Claims



1. A tape bonding method characterized in that leads provided on a carrier tape are bonded to bumps by means of a bonding tool with an intermediate member provided between said bonding tool and carrier tape, said intermediate member is an endless belt provided between a driving pulley and a driven pulley and brushes which remove foreign materials from said endless belt are provided on the upper and lower surfaces of the intermediate member.

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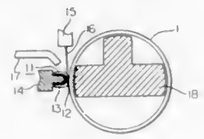
4,913,337

METHOD OF MANUFACTURING DYNAMOELECTRIC MACHINE FRAME

Tokru Gotoh, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 147,638, Jan. 25, 1988, abandoned, which is a continuation of Ser. No. 826,184, Feb. 5, 1986, abandoned. This application Aug. 11, 1989, Ser. No. 393,014
Claims priority, application Japan, Feb. 6, 1985, 60-21171
Int. Cl.[4] B23K *26/02, 26/14, 31/02*
U.S. Cl. 228—173.6 10 Claims



1. A method for manufacturing a dynamoelectric machine frame comprising the steps of:

forming a heat-dissipating fin having a joining and an upright portion from a metallic sheet, a width of the joining portion being at least twice the thickness of the metallic sheet;

placing the joining portion of the heat-dissipating fin formed in the step of forming on an outer peripheral surface of a cylindrical main frame body at a contact surface corresponding to the joining portion with a line of contact between the peripheral surface and the joining portion being a centerline of the joining portion;

irradiating a laser beam in a direction (a) substantially parallel to the contact surface between the joining portion of the heat-dissipating fin placed at the contact surface in the step of placing to be joined on the main frame body and the outer peripheral surface of the main frame body along said contact surface, (b) substantially tangential to the outer peripheral surface of the main frame body at the line of contact, and (c) substantially perpendicular to the line of contact to produce a molten surface substantially equal to the joining portion in width, thereby laser-welding said heat-dissipating fin to said main frame body at the contact surface;

blasting an inert gas selected from the group consisting of argon and a mixture of argon and helium as a weld shield gas around the weld, thereby substantially preventing the weld from oxidizing or nitriding; and

supplying filler metal into the molten surface as necessary to fill gaps or weld defects.

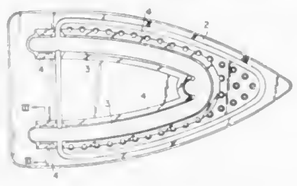
4,913,338

PROCESS FOR PRODUCING A HEATING PLATE AND HEATING ARTICLE RELATING TO THIS

Jean Hennuy, Villefranche/Saone, and Bernard Louison, St. Etienne, both of France, assignors to SEB S.A., Selongey, France

Filed Dec. 27, 1988, Ser. No. 291,449
Claims priority, application France, Dec. 30, 1987, 8718379
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—173.1 17 Claims

1. A process for producing a heating plate, in which a tubular heating element (1) is fastened to a plate (2, 20, 28) made of metal or metal alloy, wherein the plate (2, 20, 28)is made of rolled metal or metal alloy which has, at least in its central region, a sufficient thickness to make it non-deformable under the effect of the thermal stresses which it must undergo, this thickness of the central region forming a shoulder (3, 21, 29*a*,



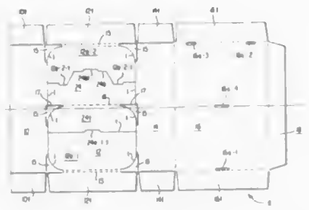
30*a*), against which the tubular heating element (1) is placed and fastened by soldering.

4,913,339

TRAY HOLDER FOR LITER BOTTLES

Jerome E. Elder, Blaine, Minn., assignor to International Paper Company, Purchase, N.Y.

Filed Aug. 18, 1989, Ser. No. 395,694
Int. Cl.[4] B65D *5/48*
U.S. Cl. 229—120.14 10 Claims



1. A one piece paperboard blank for a carton to package bottles, said blank comprising front (10), top (12), back (14) and bottom (16) panels foldable with respect to each other to form a box structure:

(a) some of said panels having at least some of pairs of side flaps (10*f*), (12*f*), (14*f*) and (16*f*) foldable to form outer carton and panels (20);

(b) said top panel having inner carton end portions (12*e*-1) and (12*e*-2) cut and scored so as to be foldable and separable from other portions of said top panel to form inner end carton panels (22) in the erected carton;

(c) said top panel also having a center panel portion (24) cut and scored so as to be foldable and separable from other portions of said top panel to form a vertical center panel in the erected carton with a bottom edge (24*b*) in proximity to the bottom panel and a top portion (24*t*) extending substantially above the top panel in the erected carton.

4,913,340

TRAY FOR CARRYING FOOD

Michael Ilitch, Bloomfield Hills, Mich., assignor to Little Caesar Enterprises, Inc., Farmington Hills, Mich.

Filed Oct. 17, 1988, Ser. No. 258,374
Int. Cl.[4] B65D *5/26, 5/30*
U.S. Cl. 229—143 13 Claims

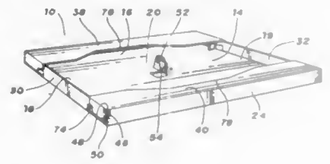
1. A tray for carrying food comprising:

a paperboard blank including a central panel of a rectangular shape having side and end portions and a mid portion located between the side and end portions, the blank including

a pair of side panels extending perpendicularly upwards from the central panel, each side panel having a foldable scoreline connection to the associated side portion of the central panel, and a pair of end panels extending perpendicularly upwards from the central panel, each end panel having a foldable scoreline connection to the associated end portion of the central panel, the side and end panels preventing food from slipping off the central panel when the tray is inclined,

a pair of horizontally extending roof panels, each roof panel having a foldable side scoreline connection to an associated side panel, each roof panel overlying one of the side portions of the central panel and one of the end panels in a horizontally spaced relationship to the other roof panel to provide rigidity to the tray and to allow moisture to escape from the food,

a pair of vertically spaced corners formed from associated



side, end, and roof panels, each pair of vertically spaced cube corners extending from a corner of the central panel to provide further rigidity to the tray and stability to a stack of multiple trays, while preventing contact between carryout food on each tray and the central panel of the next highest tray in the stack and

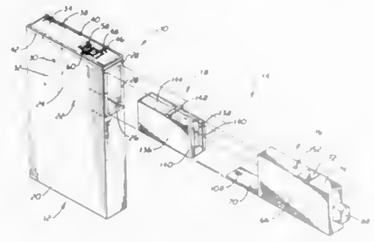
a pair of interlocking tabs located proximate the mid portion of the central panel which are positionable generally perpendicularly above the central panel extending upwardly therefrom a distance approximately equal to the height of each side and end panel to provide horizontal separation between food in the tray and a spaced vertical relationship between the food and the central panel of the next highest tray in a stack of trays.

4,913,341

CURRENCY STORAGE DEVICE

Theodore L. Bachman, 18418 Sterling Silver Cir., Lutz, Fla. 33549

Filed Jan. 3, 1989, Ser. No. 292,812
Int. Cl.[4] G07B *15/00*
U.S. Cl. 232—1 D 23 Claims



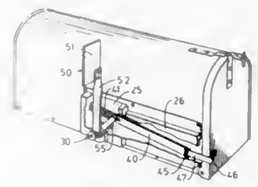
1. A currency storage device for stacking and storing paper currency and the like comprising a currency storage stand or pedestal having a currency drawer recess formed therein to selectively receive a currency drawer therein and a currency slot formed thereon to feed currency to said currency drawer, said currency drawer comprising an outer currency drawer housing having an inner currency storage tray removably disposed therein and a currency positioning means movable between a first and second position mounted thereto, said outer currency drawer housing including a currency receiving aperture and currency receiving zone to receive currency through said currency slot and said inner currency storage tray including a currency storage tray aperture disposed to selectively receive currency from said currency receiving zone when said currency positioning device is moved from said first position to second position and a currency alignment means to align currency in said currency receiving zone relative to said currency positioning means and said currency storage tray aperture.

4,913,342

STREET MAIL BOX SIGNAL DEVICE

Henry T. Fluck, 7735 Jolian Dr., Cincinnati, Ohio 45242

Filed Nov. 7, 1988, Ser. No. 267,813
Int. Cl.[4] B65D *91/00*
U.S. Cl. 232—35 13 Claims



1. A mail box signal device article adapted for ready installation to a street mail box to signal when the mail box's door has been opened, said article comprising:

(a) a housing for attachment to a side of the mail box;

(b) a hub assembly mounted on the housing, said assembly having an axle extending through a side wall of the housing with a first disc rotatably mounted on the axle within the housing and a second disc rotatably mounted on the axle outside of the housing such that the first and second discs rotate together, further wherein an arm is fixedly attached to the first disc, said arm having a lateral pin at one extremity;

(c) a slide link in operable association with the hub assembly, said slide link having an elongated slot near a first extremity through which the lateral pin found on the arm is slidably connected whereby movement of the slide link will cause the arm to move in an arcuate path and the discs to rotate;

(d) a bracket pivotably attached to a second extremity of the slide link, said bracket capable of attachment to the mail box door in a manner such that opening or closing the door will cause the bracket to move the slide link; and

(e) a signal means having a flag and staff, said staff fixedly attached to the second disc mounted on the axle outside of the housing, so as to move in an arcuate path when the mail box door is opened or closed.

4,913,343

ELECTRICAL INSULATOR FOR INSULATING A RAILWAY RAIL-FASTENING CLIP FROM A RETAINING MEMBER FOR IT

Lance Harkus, Carlingford, Australia, assignor to Pandrol Limited, London, Great Britain

Filed Oct. 19, 1988, Ser. No. 260,175
Claims priority, application Australia, Oct. 19, 1987, 7991487
Int. Cl.[4] E01B *9/30*
U.S. Cl. 238—351 15 Claims

13. An assembly comprising a concrete railway sleeper, a clip-retaining member, which comprises anchoring means incorporated in the concrete and also comprises a clip-retaining part projecting above the concrete and formed with an opening, and an insulating device lying in said opening, said device being suitable for electrically insulating a railway rail-

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fastening clip from the clip-retaining part and being a body of electrically insulating material having a passageway through it for reception of part of the clip, the shape of cross-section of at least part of the passageway being substantially the shape of a conventional athletics race track, with two substantially

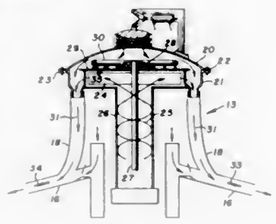
straight and substantially parallel sides and two substantially semi-circular ends, and in a particular orientation of the body substantially a flat external upper surface of the body is substantially horizontal and the substantially straight and parallel sides of the cross-section of the passageway are inclined to the horizontal.

4,913,344

WATER RINSE SYSTEM FOR PNEUMATIC SPREADERS

Norman A. Bauer, Watertown, Minn., assignor to Ag-Chem Equipment Co., Inc., Minneapolis, Minn.

Filed May 30, 1989. Ser. No. 358,707
Int. Cl.[4] B05B *15/02*
U.S. Cl. 239—112 2 Claims



1. In combination; a system for pneumatically spreading granular particles upon the ground wherein the system is mounted upon a self-propelled vehicle and including a distribution head means for metering and apportioning particulate solids from a source into a plurality of generally aliquot portions, a plurality of elongated hollow delivery booms of predetermined and differing lengths extending laterally outwardly of said vehicle from a proximal end to a distal discharge end, a source of compressed air for creating a flow of pressurized air through said hollow elongated booms, a plurality of tubular feed members, each extending between said distribution head and a selected one of said delivery booms, for creating a fluid communication link between each of said booms and said distribution head to accommodate delivery of each of said aliquot portions from the proximal end to the distal discharge end of a boom when operative and as water cleaning and rinsing means therefor, the combination being characterized in that:

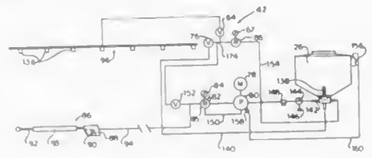
(a) said water cleaning and rinsing means comprising an annulus disposed within said distribution head means, and arranged to discharge a spray of water into said distribution head means for passage through said distribution head and into said tubular feed members for ultimate passage outwardly of said booms.

4,913,345

HIGH PRESSURE WASHER/FIELD SPOT SPRAYER

Gregory K. Setter, Russell, Canada, assignor to Setter Triple S Ltd., Russell, Canada

Filed Dec. 14, 1988, Ser. No. 284,306
Int. Cl.[4] B05B *9/03*
U.S. Cl. 239—127 23 Claims



1. A spraying apparatus comprising:

a tank for liquid to be sprayed;

a high pressure pump with an inlet connected to the tank to receive liquid therefrom;

a high pressure regulator connected to the pump to receive liquid therefrom at high pressure and to deliver liquid at a controlled high pressure;

high pressure spray means connected to the high pressure regulator to receive liquid at the controlled high pressure and selectively operable to deliver a high velocity spray of liquid;

high pressure valve means connected to the high pressure regulator to receive liquid at the controlled high pressure for selectively delivering the liquid therefrom;

a low pressure regulator connected to the high pressure valve means to receive liquid therefrom and for providing a supply of the liquid at a controlled low pressure; and

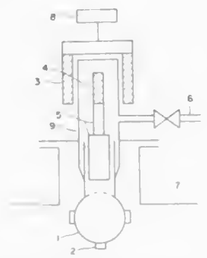
low pressure spray means connected to the low pressure regulator to receive liquid at the controlled low velocity spray.

4,913,346

ROTARY WASHING NOZZLE

Tatsumi Nakamura, and Yasunori Takeshige, both of Yokkaichi, Japan, assignors to Tosoh Corporation, Shin-nanyo, Japan

Filed Dec. 5, 1988, Ser. No. 279,562
Claims priority, application Japan, Dec. 25, 1987, 62-327379
Int. Cl.[4] B05C *5/00;* B05B *3/04, 3/12*
U.S. Cl. 239—225.1 2 Claims



1. A rotary washing nozzle comprising:

a rotational portion connected to a rotational shaft, said rotational portion comprising blowing nozzle means, said rotational shaft being responsive to fluid pressure for rotating said rotational shaft;

means for supplying washing fluid to said rotary washing nozzle; and

magnetic drive means for driving said rotational shaft;

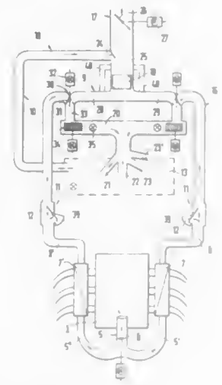
wherein the drive speed of said magnetic drive means can be adjusted independently of said washing fluid pressure.

4,913,347

AIR-CONDITIONING SYSTEM FOR AN AIR-COOLED MOTOR VEHICLE

Hermann Burst, Rutesheim; Walter Pross, Sindelfingen, and Horst Petri, Hemmingen, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Jul. 14, 1989, Ser. No. 379,961
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1988, 3824794
Int. Cl.[4] G05D *23/13*
U.S. Cl. 236—13 9 Claims



1. An air-conditioning system for a vehicle having a housing in which an evaporator, a chamber and at least one fan are arranged, the housing having outflow ducts with individually blockable defroster nozzles, center nozzles and leg area nozzles, through which heated air and/or cold air can selectively be introduced into the vehicle interior, the housing being connected with at least one heated-air duct containing an exhaust heat exchanger as well as with inflow ducts for fresh air and circulating air, wherein heated air and/or fresh air and/or circulating air or cooled air is jointly introduced into at least one fan and is swirled together and mixed in this fan and wherein the mixed air is guided subsequently by way of individual outflow ducts to the vehicle interior and wherein a blow-out sensor is arranged behind the fan for scanning the temperature deviation (ΔT) of the mixed air from the adjusted desired temperature and, as a function of the temperature deviation (ΔT), automatically correcting the position of a temperature mixing flap provided in front of the fan.

4,913,348

METHOD AND APPARATUS FOR CREATING CONTRASTING IMAGES AT SUBSTANTIALLY FULL CONTRAST VOLTAGE

Dan A. Hays, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 22, 1988, Ser. No. 288,319
Int. Cl.[4] G03G *15/08*
U.S. Cl. 430—45 6 Claims

1. The method of creating contrasting images in a single pass, said method including the steps of:

uniformly charging a charge retentive surface;

forming an electrostatic latent image pattern on said charge retentive surface, said pattern comprising multiple image areas and background areas said multiple image areas being at the same voltage level;

moving said multiple images past at least two developer structures containing at least two distinct developer materials;

electrically biasing one of said at least two developer structures as one of said multiple images passes thereby whereby one of said multiple images is developed with one of said at least two distinctive developers;

electrically biasing another of said at least two developer structures as another of said multiple images passes thereby whereby said another of said multiple images is developed with another of said at least two distinctive developers;

removing the electrical bias from said one of said at least two developer structures as said another of said multiple images passes thereby whereby development thereof is precluded; and

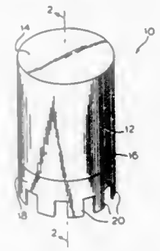
removing the electrical bias from said another of said at least two developer structures as said one of said multiple images passes thereby whereby development thereof is precluded.

4,913,349

DEVICE FOR DISPENSING VOLATILE FRAGRANCES

George A. Locko, Savannah, Ga., assignor to Union Camp Corporation, Wayne, N.J.

Continuation-in-part of Ser. No. 787,069, Oct. 15, 1985, abandoned. This application Dec. 5, 1988, Ser. No. 280,006
Int. Cl.[4] A61L *9/00*
U.S. Cl. 239—34 2 Claims



1 An article for dispensing a volatile fragrance composition to the atmosphere, which comprises;

A. an open-ended hollow body of a material which is substantially impermeable to said volatile composition;

B. a liquid volatile fragrance composition contained in the hollow of said body;

C. a silicone rubber closure having first and second surfaces, and a body between the surfaces, mounted in the open end of the hollow body and having the first surface in direct and full contact with the liquid volatile composition, and the second surface in contact with the atmosphere outside of said body, said closure being permeable to said composition in a liquid form, said closure being substantially impermeable to the volatile composition in a volatilized form;

D. A base attached to the open end of the hollow body, said base including means to allow circulation of air below the silicone rubber closure, in contact with the second surface of the closure; said body being penetrable by said composition in a liquid form, at a rate less than the rate of volatilization of the liquid volatile composition as it reaches the second surface of the hollow body under ambient temperature and pressure conditions.

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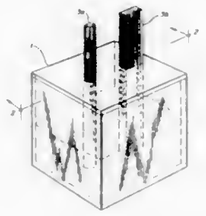
4,913,350

AIR FRESHENER DEVICE USING EXTERNAL CAPILLARIES

Kenneth L. Purzycki, Parsippany-Troy Hills, N.J., assignor to Givaudan Corporation, Clifton, N.J.

Filed Mar. 18, 1988, Ser. No. 169,664
Int. Cl.[4] A61L *9/00*
U.S. Cl. 239—44 12 Claims



1. A device for the evaporation of a multi-component liquid into the ambient air which comprises
(a) a container which maintains a supply of said multi-component liquid in isolation from said ambient air,
(b) said liquid to be evaporated,
(c) a non-porous, non-absorbing external capillary member extending from the interior of said container, through the container wall, to the outside of said container and having at least one external capillary cavity, said external capillary cavity having
(i) a portion in contact with said multi-component liquid in the container, and
(ii) a portion in contact with said ambient air such that the portion in contact with said liquid in the container and the portion in contact with said ambient air are connected to one another by the same external capillary cavity and,
wherein the length of the portion of said external capillary that is in between the portion that is in contact with the said liquid in the container and the portion that is in contact with said ambient air into which said liquid is to be dispensed is less than the height that said liquid will rise in said capillary cavity such that the ability to evaporate the multi-component liquid in a linear fashion is maintained throughout the evaporation of the liquid.

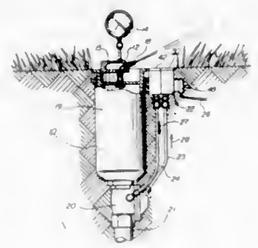
4,913,351

SPRINKLER SYSTEM HAVING INDIVIDUAL MULTI-MODE SPRINKLER HEADS WITH CONVENIENT PRESSURE READING AND ADJUSTMENT

Robert B. Costa, Covina, Calif., assignor to Thompson Manufacturing Company, Chino, Calif.

Filed Sep. 18, 1987, Ser. No. 98,297
Int. Cl.[4] B05B *12/00*
U.S. Cl. 239—74 1 Claim

1. A sprinkler having a spray nozzle connected to an internal chamber that receives pressurized water to be delivered out through the nozzle, in combination with an adjustable pressure control regulator adjusting the internal water pressure for said sprinkler, and wherein said activating means is manually operable, said combination comprising:
a valve adaptable for connecting the sprinkler to an underground water source, which source may vary in water pressure;
a manually operable activating means connected to said valve and being readily accessible at an exposed ground-level location for said sprinkler, when said sprinkler is installed in the ground, for activating said sprinkler and causing water from said water source to enter into said internal chamber and to spray out from said sprinkler through said sprinkler's nozzle;
a pressure reading gauge readable at an above-ground location for said installed sprinkler and connectable into said internal chamber of said sprinkler for indicating the internal water pressure for said sprinkler, said gauge being removable from said sprinkler, at which time said sprinkler can return to its standard sprinkler operation following a pressure reading and adjusting operation;
a pressure adjusting control means in fluid communication with said activating means, said valve, and said internal chamber;
said pressure adjusting control means being characterized by an adjustment means accessible at an exposed ground-



level location of said installed sprinkler for adjusting the water pressure within said internal chamber of said sprinkler, said pressure being indicated by said removable gauge while said sprinkler is spraying water out through said nozzle;
a remotely-controlled on/off control means connected in series fluid communication with both of said pressure adjustment means and said manually-operable activating means; said on/off control means being operable for turning the sprinkler on or off from a remote location; and
said pressure adjustment control means being operable for adjusting said internal pressure of the sprinkler when the sprinkler is "on" from either said manually operable activating means or said remotely-controlled control means.

4,913,352

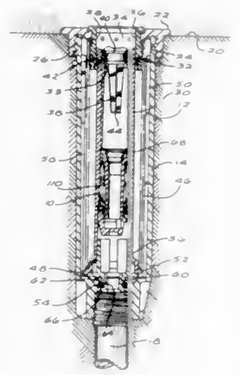
GRIT PROTECTED PRESSURE REGULATOR FOR POP-UP SPRINKLERS

Michael E. Witty, West Covina, and Steven Verbera, Azusa, both of Calif., assignors to Rain Bird Consumer Products Mfg. Corp., Glendora, Calif.

Filed Feb. 9, 1989, Ser. No. 308,659
Int. Cl.[4] B05B *15/10*
U.S. Cl. 239—104 10 Claims

1. In a pop-up sprinkler of the type including a tubular pop-up stem mounted within a housing for movement between an extended, operative position and a retracted, inoperative position, and having a pressure regulator mounted within the stem, the pressure regulator including a flow tube mounted for limited movement within the stem and having an open upper end and a lower end disposed adjacent a flow seat, the improvement comprising:

means disposed within said stem above said upper end of said flow tube for deflecting and directing particulate material



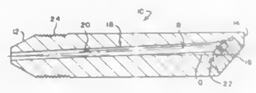
downwardly from said stem into said flow tube when said stem is in said inoperative position.

4,913,353

NOZZLE APPARATUS HAVING ANGLED ORIFICE

Terrance L. Myers, Columbus, Kans., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Mar. 13, 1989, Ser. No. 322,184
Int. Cl.[4] B24C *5/04*
U.S. Cl. 239—267 8 Claims



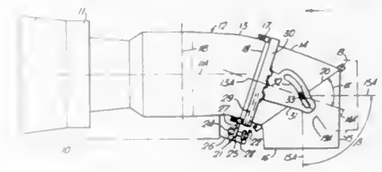
1. A nozzle tube apparatus, comprising:
a nozzle tube having a first and a second end, the tube having a centroidal axis extending therethrough and having a bore extending from the first end to the second end, the bore having a first constant diameter portion extending from the first end toward the second end and a second variable diameter recessed portion adjacent the second end, the first portion having a centroidal axis skewed from the centroidal axis of the tube, the first constant diameter portion of the bore being coincident with the centroidal axis of the tube adjacent the first end of the tube;
retainer means for retaining an orifice in the second portion, said retainer means having a variable diameter for mating equipment with the variable diameter of the second portion, the retainer means having a centroidal axis therethrough which intersects the centroidal axis of the tube at a first angle and intersects the centroidal axis of the bore at a second angle, greater than the first angle; and
the second portion includes a conical seat.

4,913,354

JET PIPE FOR JET PROPULSION IN AIRCRAFT

Clifford S. Woodward, Bristol, England, assignor to Rolls Royce plc, London, United Kingdom

Continuation of Ser. No. 313,839, Oct. 20, 1981, abandoned. This application Apr. 15, 1985, Ser. No. 754,902
Claims priority, application United Kingdom, Oct. 31, 1980, 8035125; Sep. 1, 1981, 8126489
Int. Cl.[4] B64C *15/04*
U.S. Cl. 239—265.35 6 Claims



1. Jet pipe for jet propulsion in aircraft, comprising:
a first, a second and a third duct, all connected in flow-series, the second duct being supported on the first duct for rotation relative thereto by a first bearing extending around the first and second ducts at a junction plane thereof, the third duct being supported on the second duct for rotation relative thereto by a second bearing extending around the second and third ducts at a junction plane thereof, at least the second bearing having an axis of rotation oblique to the axis of the second duct so that if the second and third ducts are rotated relative to each other, the direction of the axis of the third duct is varied relative to that of the first duct;
a single driving member supported for rotation on the first duct;
first transmission means connected between the driving member and an associated driven member being said second duct;
second transmission means connected between the driving member and an associated driven member being said third duct;
one of said transmissin means being adapted to drive its associated driven member in the same direction as the driving member, the other one of said transmission means being adapted to drive its associated driven member in a direction opposite to that of the driving member; and
said second transmission means including varying means for varying the transmission ratio of one of said second transmission means relative to that of the first transmission means so that the axis of the third duct remains in a given plane during variation in the direction of the axis of the third duct.

4,913,355

ELECTROMAGNETIC INJECTION VALVE FOR INTERNAL COMBUSTION ENGINES

Dieter Thoenessen, Viersen, Fed. Rep. of Germany, assignor to Pierburg GmbH, Neuss, Fed. Rep. of Germany

Filed Mar. 1, 1989, Ser. No. 317,535
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1988, 3810827
Int. Cl.[4] B05B *1/30*
U.S. Cl. 239—585 5 Claims

1. An electromagnetic injection valve for an internal combustion engine comprising an electrical coil, an iron rod in said coil, a movable valve closure member axially aligned with said rod, a spring engaging said rod and said valve closure member such that the valve closure member is movable between open and closed positions when the coil is actuated and deactuated, said rod including an end portion facing said movable valve closure member to form an air gap therewith in one of said

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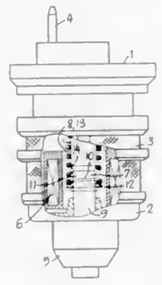
positions, said end portion having a stop surface for said valve closure member in the other of said positions, said iron rod being reduced in diameter in said end portion, a support ring of nonmagnetic material on said movable valve closure member, said spring having one end supported on said support ring and extending in the region of said air gap with clearance past said



valve closure member and said end portion of reduced diameter by an amount at least equal to the reduction in diameter of said end portion with respect to the remainder of said rod, said spring extending on said iron rod beyond the reduced diameter portion thereof to ride on said rod outside said end of reduced diameter, said spring being made of magnetic material.

4,913,356

LIQUID SEED APPLICATOR

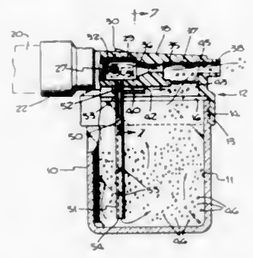
Theodore Gunlock, 16142 Royal Oak Rd., Encino, Calif. 91316

Continuation-in-part of Ser. No. 88,556, Aug. 24, 1987, Pat. No. 4,809,913. This application Jan. 12, 1989, Ser. No. 296,442

The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.

Int. Cl.[4] B05B *7/26*, *1/30*

U.S. Cl. 239—317 6 Claims



1. A liquid seed applicator comprising a container incorporating a reservoir with an opening at the top for accumulation of insoluble seed and liquid in the form of a mass of slurry, a cover and a releasable attachment between the cover and the container, said cover having an inlet for reception of liquid, an outlet for discharge of a mixture of liquid and seed and passage means having an interconnecting relationship with the inlet, the reservoir and the outlet, said passage means comprising an inlet chamber in communication with said inlet, a mixing chamber in communication with said inlet chamber, a first passage intermediate said inlet chamber and said mixing chamber, a second passage between said inlet chamber and said reservoir, and a third passage between said reservoir and said mixing chamber, said second passage having an outlet end adjacent to and oriented in a direction transverse with respect to the third passage, said third passage being adapted to release slurry from the reservoir to said mixing chamber and to the outlet for mixing with liquid from the first passage during passage of a combination of liquid and slurry to said mixing chamber and discharge from said outlet, and a passageway extending between said inlet chamber and the portion of said reservoir below said second passage to enable projection of a portion of said liquid into the reservoir at a level below the surface of the mass of slurry in said reservoir.

4,913,357

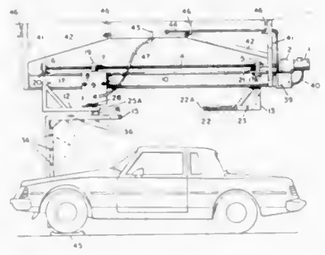
AUTOMATIC WASHING APPARATUS

Kenneth D. Bolyard; Leroy W. Rucks, both of Paris, Tex.; Ronald E. Abbott, R.R. 6, Box 436, 3715 Lamar Ave., and L. Ray Spencer, Rt. 1, Box 781, 3715 Lamar Ave., both of Paris, Tex. 75460, assignors to Ronald E. Abbott and L. Ray Spencer, both of Paris, Tex.

Continuation-in-part of Ser. No. 143,659, Jan. 13, 1988, abandoned, which is a continuation of Ser. No. 27,531, Mar. 18, 1987, abandoned. This application Nov. 29, 1988, Ser. No. 277,307

Int. Cl.[4] B60S *3/04*

U.S. Cl. 239—751 34 Claims



1. An automatic washing apparatus comprising a suspended straight track and a housing mounted for travel upon said track including means for driving said housing up and down said track, wherein said housing carries a rotatable element with means for 180° degree rotation fixed thereon, including means for disengagement from cooperating means for initiating 180° degree rotation; and cooperating means for initiating 180° degree rotation mounted alongside the track at a designated turning area, the means for 180° degree rotation being engageable with said cooperating means for initiating 180° degree rotation upon travel of the housing to the designated turning area, said engagement causing substantially 180° degree rotation of the rotatable element, whereupon said means for disengagement causes separation of the means for 180° degree rotation and the cooperating means for initiating 180° degree rotation to permit unrestricted travel of the housing along the track.

4,913,358

MIXER FOR PULP AND BLEACHING CHEMICALS

Johann Sbaschnigg; Richard Baumgarter, and Wilhelm Mausser, all of Graz, Austria, assignors to Maschinenfabrik Andritz Actiegesellshaft, Grax, Austria

Filed Jun. 8, 1988, Ser. No. 203,907

Claims priority, application Austria, Jun. 12, 1987, 1499/87

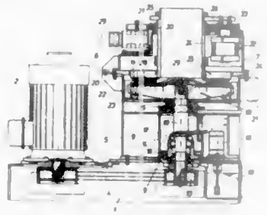
Int. Cl.[4] C02C *7/14*

U.S. Cl. 241—32 6 Claims

1. In a mixer for the refining of initially comminuted material and mixing with bleach chemicals for introducing mixed comminuted material and bleached chemicals into a bleaching tower, the mixer including a horizontal, ring-shaped mixing/refining aperture formed between a disk rotor as a lower part and a removable stator unit as an upper part, the improvement comprising:

the stator unit including a movable portion confronting the mixing aperture, the movable portion being adjustable to rapidly increase the vertical height of the mixing aperture responsive to oversize objects in the comminuted material, the movable portion including a central entry pipe for feeding comminuted material and chemicals into the mixer, the mixing aperture having a cross section which decreases radially outwardly, the central entry pipe discharging into the mixing aperture, the central entry pipe having a common axis with the disk rotor;

the stator unit further including a mechanical adjustment system including a high speed pneumatic system for rapidly raising the movable portion of the stator unit, the mechanical adjustment system including a mechanical adjustment drive for shifting the movable part including the entry pipe within the stator unit, the adjustment drive including a plurality of mechanical lifting and lowering devices and a pinion drive engaging a crown gear supported over a spherical cap bearing, the crown gear surrounding the central entry pipe, the crown gear driving the mechanical lifting and lowering devices, the lifting and lowering devices being arranged at the same distance from one another around the entry pipe, the lifting and lowering devices driving the axial movement of the movable portion of the stator unit.



4,913,359

PAPER MATERIAL REFINING APPARATUS

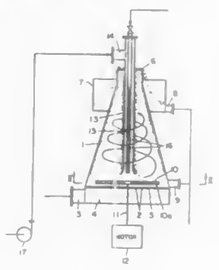
Hitoshi Satomi, Shizuoka, Japan, assignor to Kabushiki Kaisha Satomi Seisakusho, Shizuoka, Japan

Filed Mar. 20, 1989, Ser. No. 325,644

Claims priority, application Japan, Mar. 31, 1988, 63-79760

Int. Cl.[4] B02C *23/24*

U.S. Cl. 241—57 11 Claims



1. An apparatus for refining a starting paper material containing admixed foreign substances and ink material, said apparatus comprising:

a primary chamber means having one end opened as a port means;

a secondary chamber means disposed coaxially with and contiguously to said primary chamber means at the other end thereof on a downstream side;

a screen means interposed between and separating said primary chamber means and secondary chamber means, said screen means being provided with hole means through which a paper material passes from said primary chamber means towards said secondary chamber means;

an impeller disposed in said primary chamber means at the central portion thereof near said screen means and provided with pump-up vanes to be rotated by a driving means;

a pipe means inserted and extending into said primary chamber means through said port means for feeding said starting paper material into the primary chamber; and

a pipe means inserted into and coaxially with said starting material feeding pipe means for supplying air into said starting paper material.

4,913,360

SHEET HANDLING APPARATUS

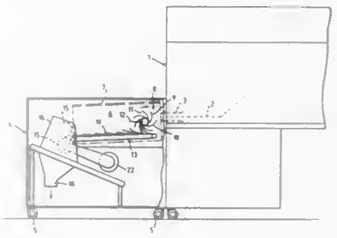
Martin Lane, and Thompson Colin L., both of Hampshire, England, assignors to De La Rue Systems Ltd., United Kingdom

Filed May 13, 1988, Ser. No. 193,921

Claims priority, application United Kingdom, May 15, 1987, 8711499

Int. Cl.[4] B02C *4/28*

U.S. Cl. 241—223 15 Claims



1. A sheet destruction system, comprising: sheet destruction apparatus;

a first feed system for feeding sheets along a first path at a first feed speed to said sheet destruction apparatus;

a second feed system upstream of said first system for feeding sheets along a second path at a second speed faster than said first speed; and

a buffer system between said first and second feed systems to transfer sheets from said second to said first system and to compensate for said difference in feed speeds;

wherein said first and second feed systems and said buffer system comprise means for transferring said sheets to said sheet destruction apparatus at random angles of skew.

4,913,361

APPARATUS AND METHOD FOR REDUCING AGGLOMERATES TO A PREDETERMINED PARTICLE SIZE

Augustus T. Reynolds, 3300 Woodwardia Dr., Charlotte, N.C. 28210

Filed Jun. 6, 1988, Ser. No. 202,683

Int. Cl.[4] B02C *19/12*

U.S. Cl. 241—259.2 8 Claims

1. An apparatus for reducing agglomerates to a predetermined particle size, comprising:

(a) a tank defining an uninterrupted cylindrical inner wall having a smooth surface for carrying thereon a coating of agglomerates, said tank having a material inlet and a material outlet;

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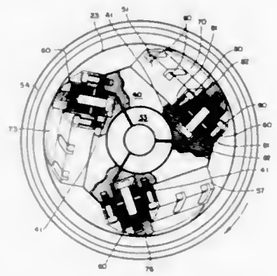
(b) a rotor rotatably mounted in said tank for relative concentric rotation therein;
(c) a plurality of elongate rotor blades carried on said rotor for rotation therewith, each blade defining a tangential forward surface for shearing contact with the layer of agglomerates coating the inner wall of said tank; and
(d) pressure responsive means for varying the distance between the tangential forward surface of said blades and the inner wall of said tank to thereby control the size to which the agglomerates are reduced, wherein each of said rotor blades is carried on its respective rotor by means of a rotor blade holder carried on said rotor, each of said rotor blade holders comprising an elongate body having an elongate slot therein adapted to receive one of said blades and hold said blade with the forward surface of said blade projecting outwardly toward the inner wall of said tank, wherein said pressure responsive means comprises:



(i) a source of hydraulic pressure;
(ii) at least one piston carried for restricted inward and outward movement in a suitable sized piston bore in said blade holder and responsive to pressure from said pressure source for outward movement of the blade towards said agglomerate coated wall and into contact with said agglomerate, and opposite inner movement of said blade away from said agglomerate coated wall; and
(iii) biasing means for normally urging said blade inwardly away from said agglomerate coated wall and comprising a retract bolt secured to said blade and slidably positioned in a suitably sized through-bore in said piston, an enlarged head on the end of said retract bolt remote from said blade and a retract spring carried by said bolt and normally urging said bolt, and the blade fixedly secured thereto away from contact with said inner wall.

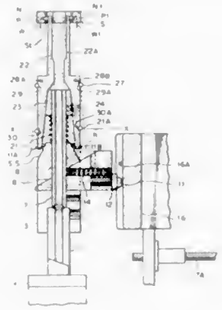
4,913,362

SWING MECHANISM FOR NOZZLE HOLDERS

Tetsuro Koizumi, Yokohama, Japan, assignor to Kamei Machine Project Co., Ltd., Japan

PCT No. PCT/JP87/00327, § 371 Date Dec. 10, 1987, § 102(e) Date Dec. 10, 1987, PCT Pub. No. WO88/05616, PCT Pub. Date Jul. 28, 1988
PCT Filed May 22, 1987, Ser. No. 134,462
Claims priority, application Japan, Jan. 20, 1987, 62-09088
Int. Cl.[4] H02K *15/85*
U.S. Cl. 242—1.1 R 6 Claims

1. A stator winding apparatus comprising:
a spindle operatively coupled to a driving source for rotation therewith,
a connector fixedly coupled to said spindle, said connector including a center rube projecting from said connector for rotation with said spindle,
a wedge-shaped slope cam having a transverse slot for accommodating said center tube and assembled for slidable displacement in a direction transverse to said center tube, said slope cam further having cam follower means projecting from one end thereof,
a concave cam disposed in pressure contact with said cam follower means,
a cone having an outer inclined face slidably assembled about said center tube in operative engagement with said slope cam, said cone being longitudinally slidable along said center tube in response to said slidable displacement of said slope cam,
a support member fixedly connected to an end of said center tube distal from said connector for rotation with said center tube,



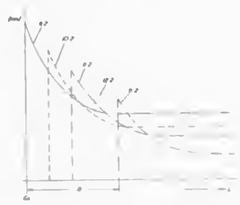
spring means arranged between said support member and said cone for biasing said cone away from said support member,
a plurality of nozzle holders pivotally coupled to said support member in operative engagement with said inclined face of said cone whereby said longitudinal slidable movement of said cone causes corresponding pivoting of said plurality of nozzle holders, and
means for holding said nozzle holders in assembled position on said support member.

4,913,363

METHOD FOR WINDING TEXTILE YARNS

Friedhelm Lenz, Wuppertal, Fed. Rep. of Germany, assignor to Barmag AG, Remscheid, Fed. Rep. of Germany

Filed Jan. 30, 1987, Ser. No. 9,252
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1986, 3602853; Mar. 18, 1986, 2608816; May 15, 1986, 3616362
Int. Cl.[4] B65H *54/32, 54/38*
U.S. Cl. 242—18.1 13 Claims



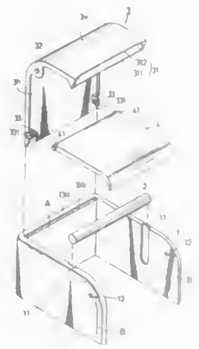
1. In a method of winding a textile yarn into a package in which the yarn is cross wound about the package while the yarn is guided onto the package by a traversing yarn guide so as to define oppositely directed yarn guide strokes of predetermined length, the improvement therein comprising controlling the traverse of the yarn guide at at least one end of the package in a series of stroke modification cycles, and including in each cycle the steps of progressively increasing the length of the strokes of the yarn guide and then progressively decreasing the same, such that the distance between the minimum and maximum stroke lengths defines a stroke reversal area at said at least one end of the package, and such that a plot of the location of the stroke end points vs. time defines a stroke modification curve of arcuate configuration, and controlling the configuration of the stroke modification curve such that the same amount of yarn is deposited at each point along the length of said stroke reversal area, so that a package having a cylindrical surface along said stroke reversal area is produced.

4,913,364

TOILET PAPER CASE WITH A ROTATABLE COVER PLATE

Dye-Chuang Hu, No. 172, Hsin-Hsing Rd., Pei-Tun Dist., Taichung City, Taiwan

Filed May 4, 1989, Ser. No. 347,502
Int. Cl.[4] B65H *19/00, 35/10*
U.S. Cl. 242—55.2 2 Claims



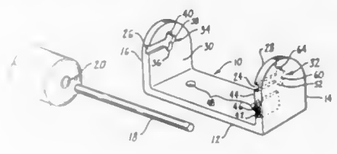
1. A toilet paper case comprising:
a U-shaped housing having a base mounting segment and two side segments and opened at a top side, a front side and a bottom side thereof, said base mounting segment having a high outer wall portion and a low inner wall portion integrally formed with and parallel to said outer wall portion, said side segments having opposed and open-ended vertical slide slots formed in upper end portions of inner surfaces thereof;
a toilet paper reel having two ends which are received slidably in said slide slots; and
a generally L-shaped cover plate having a generally horizontal portion and a generally vertical portion and hinged to front end portions of said side segments at a juncture between said generally horizontal portion and said generally vertical portion so as to cover said top side and said front side of said housing with said generally horizontal portion and said generally vertical portion, said generally horizontal portion of said cover plate having a rear end which rests on an upper end of said low wall portion so that said rear end cannot turn down, said generally vertical portion of said cover plate having a forked lower end portion which includes a serrated inner edge and a serrated outer edge, the serrated inner edge may be an edge with a series of sharp teeth, needles or bumps or a rough edge face which can limit the unreeling of the paper;
wherein, when said forked lower end of said cover plate is tipped to rotate so as to open said top side of said housing, said generally vertical portion of said cover plate automatically pushes said reel to slide upward along said slide slots so that a roll of toilet paper can be mounted on said reel; in a case where said cover plate is engaged with said low wall portion of said base mounting segment, an end portion of said toilet paper may be pulled downward out of said housing and then pulled forward so as to be cut with said forked lower end portion of said cover plate.

4,913,365

DISPENSER FOR ROLLED SHEET MATERIALS

John M. Shannon, 13845 Adams Dr., Warren, Mich. 48093

Filed Jun. 25, 1986, Ser. No. 878,348
Int. Cl.[4] B65H *75/18*
U.S. Cl. 242—55.2 4 Claims



1. A dispenser for sheet material rolled about an axis, said material having a spindle axially disposed along said axis exceeding in length said sheet material along said axis, comprising:
a base having a first and a second end;
a pair of projection members mounted to said base, one each at each said end of said base, each of said projection members being disposed at a ninety degree angle in relation to said base and in parallel relation to each other so that each of said projection members has a mutually facing side and each of said projection members in combination with said base form a "U" shape, each of said projection members further having on each said mutually facing side a slot running mutually substantially parallel and equidistant for guiding, without need of force except as may be required to overcome friction, insertion of said spindle between said projection members, said slot on each of said projection members terminating in a triplicated spindle support for retaining said spindle in a fixed relation to said base in any one of three predetermined orientations of said base, said triplicated spindle support on each said projection member having a first, a second and a third separate semi-circular shaped cut-out in non-overlapping relation to each other, each said separate semi-circular shaped cut-out having a radius of curvature substantially equal in length to one-half of said slot width, said slot ending in said first semi-circular shaped cut-out, said first semi-circular shaped cut-out concavely facing said slot, said second and said third semi-circular shaped cut outs being located adjacent said first semi-circular shaped cut-out, said second and third semi-circular shaped cut-outs concavely facing each other and said slot, said first, second and third semi-circular shaped cut-outs having a depth of cut forming in combination with said slot a guide for said spindle when said spindle is inserted between said projection members so that said spindle may be guided by said slot on each of said projection members until said spindle drops by action of gravity into one of said first, second and third semi-circular shaped cut-outs on each of said projection members.

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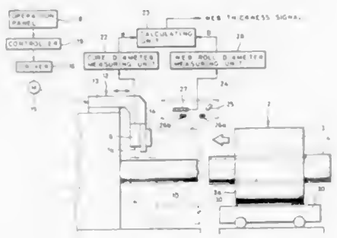
4,913,366
WEB UNWINDER WITH CORE DIAMETER MEASURING DEVICE

Hiromu Andou, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 2, 1988, Ser. No. 267,225
Claims priority, application Japan, Nov. 2, 1987, 62-168280[U]
Int. Cl.[4] B41J *29/48*; B65H *26/08*
U.S. Cl. 242—57 7 Claims

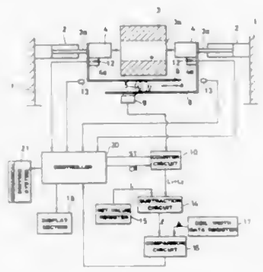


1. A web unwinder for rotatably holding a core of a web roll during unwinding of a web from a web roll on the core, comprising:
first detecting means for detecting a position of one end of the web roll in order to determine the position of the web roll;
an arm carrying in said first detecting means;
means mounting said arm for movement in a direction parallel to the rotary axis of the core; and
second detecting means for detecting a position of the surface of the core, said second detecting means being mounted on said arm.

4,913,367
COIL WIDTH DETECTING APPARATUS FOR COIL MATERIAL FEEDING UNIT

Yukio Hata, Ishikawa, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP88/00696, § 371 Date Mar. 9, 1989, § 102(e) Date Mar. 9, 1989, PCT Pub. No. WO89/00466, PCT Pub. Date Jan. 26, 1989
PCT Filed Jul. 13, 1988, Ser. No. 360,934
Claims priority, application Japan, Jul. 14, 1987, 62-173854
Int. Cl.[4] B65H *67/00, 19/12*; B21C *47/16*
U.S. Cl. 242—57 9 Claims

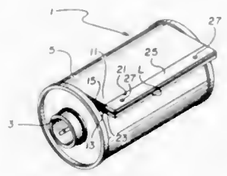


1. A coil width detecting apparatus usable for a coil material feeding unit comprising;
a coil material having a hole formed at the central part thereof,
an uncoiler mechanism including a pair of cylinder mechanisms adapted to move in the axial direction of said coil material so as to allow the coil material to be clamped from both sides by inserting into said hole of the coil material a pair of support shafts secured to the foremost ends of piston rods in said cylinder mechanisms,
a pair of racks secured to said support shafts to move in the same direction as that of movement of the support shafts in compliance with the movement of the latter,
a pinion interposed between said pair of racks to mesh with the latter,
rotational displacement detecting means for detecting the rotational displacement of said pinion during a period of movement of the support shafts from a predetermined position where they are displaced to the rearmost ends to a predetermined position where the coil material is held in a clamped state,
setting means for previously setting a distance between both the support shafts when the latter are located at the position where they are displaced to the rearmost ends, and
subtracting means for subtracting the value detected b said rotational displacement detecting means from the value set by said setting means to output a result derived from the subtraction as an actual coil width.

4,913,368
FILM CASSETTE

William C. Atkinson, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 14, 1989, Ser. No. 379,745
Int. Cl.[4] G03B *1/00, 17/26*; B65D *85/67*
U.S. Cl. 242—71.1 3 Claims



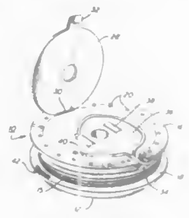
1. An improved film cassette wherein a filmstrip in roll form is stored within a cassette shell having a generally cylindrical shape and a relatively short pair of lip-like substantially parallel extensions, and a leader portion of said filmstrip projects from an exterior end of a film passage slit located between said lip-like extensions to permit the filmstrip to be drawn out of the cassette shell, and wherein the improvement comprises:
a tow bar secured to said leader portion normally in covering relation with the exterior end of said film passage slit to prevent the leader portion from being moved into said cassette shell, said tow bar being physically configured to appear integrated with said lip-like extensions as a completely conforming continuation of the extensions beyond the exterior end of the film passage slit.

3. An improved film cassette wherein a filmstrip in roll form is stored within a cassette shell having a generally cylindrical shape and a relatively short pair of lip-like substantially parallel extensions, and a leader portion of said filmstrip projects from an exterior end of a film passage slit located between said lip-like extensions to permit the filmstrip to be drawn out of said cassette shell, and wherein the improvement comprises:
a tow bar secured to said leader portion, said tow bar normally in covering relation with the exterior end of said film passage slit to prevent the leader portion from being moved into said cassette shell, said tow bar including a cavity for receiving said lip-like extensions at the exterior end of the film passage slit to form a light-trap to prevent ambient light from entering the slit at its exterior end.

4,913,369
REEL FOR BORESCOPE INSERTION TUBE

Raymond A. Lia, Auburn; Alan S. Knierim, and Timothy K. Wilson, both of Syracuse, all of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Jan. 2, 1990, Ser. No. 360,857
Int. Cl.[4] B65H *75/40, 49/00*
U.S. Cl. 242—96 8 Claims

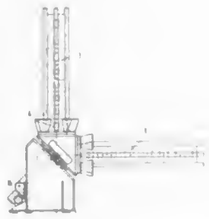


1. A borescope insertion tube storage and dispensing device comprising:
a base member;
a reel member rotatably mounted on said base, said real member consisting of upper and lower spaced apart flange members mounted on a plurality of standoffs defining an outer recess therebetween adapted to receive the insertion tube in coiled fashion and an inner cylindrical compartment;
a circular cover portion cut from the upper flange member and hingedly mounted therein providing, when in the open position, across to said inner cylindrical compartment within the center of said reel;
a cylindrical block of resilient foam material disposed within said inner compartment, having a plurality of cavities adapted to receive therein an interface module of a borescope insertion tube; and
handle means positioned adjacent the periphery of one of said flange members for carrying the storage and dispensing device.

4,913,370
COIL COLLECTING STATION FOR WIRE-ROD MILL TRAINS

Peter Müller, Neuss, and Dieter Figge, Essen, both of Fed. Rep. of Germany, assignors to Duetsche Voest-Alpine Industrieanlagenbau GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 2, 1988, Ser. No. 265,912
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1987, 3737418
Int. Cl.[4] B65H *49/00, 75/24*; B21C *47/24, 47/30*
U.S. Cl. 242—72 R 14 Claims



1. A wire coil collecting station comprising:
an underframe, a head mounted for pivotal movement on the underframe, at least two collecting pins fixed to the head at an oblique angle to each other, the pivotal movement of the head being such as to transfer the position of the collecting pins with respect to each other, each pin comprising:
a base fixed to the head,
pin diameter defining means coupled to the base for defining the diameter of the pin, and
a control shaft movable with respect to the base and coupled to the pin diameter defining means for controlling the pin diameter,
first gear means fixed to the control shafts of the collecting pins and engaging each other for causing outward displacement of the pin diameter defining means of a first pin simultaneously with an inward displacement of the pin diameter defining means of another pin, and
second gear means coupling the underframe to the control shaft of one of the pins for causing displacement of the pin diameter defining means of the at least two pins during movement of the head relative to the underframe.

4,913,371
AUTOMATIC RESET STRAP LOCK DEVICE

H. Russell Margetts, 3093 S. 2600 East, Salt Lake City, Utah 84109

Filed Sep. 12, 1988, Ser. No. 242,642
Int. Cl.[4] B65H *75/48*; F16D *63/00*
U.S. Cl. 242—107.4 B 4 Claims

1 An automatic strap lock comprising
a housing having a circular side wall with a top and bottom having an opening therethrough, a rear wall, a back plate and a removable front plate;
an axle shaft extending through the front and back plates;
a drum in the housing journalled on the axle shaft and having a face plate with a hub projecting therefrom;
a strap having one end fixed to the drum and another end extending through the opening through the bottom of the circular side wall;
a coil spring having one end fixed to the drum and another end fixed to the axle shaft;
lugs spaced around the interior of the side wall;
at least one elongate pawl pivotally mounted on a pivot pin to the face plate of the drum and pivotal into and out of engagement with the lugs said pawls each having an outside edge comprising an elongate edge thereof closest to the lugs and an inside elongate edge thereof closest to the axle shaft;
a spring loaded return member on each pawl, said member including a plate having a top surface and pivoted on the pivot pin of the pawl, a first finger extending from the plate to alongside the outside edge of the pawl, a second finger extending from the plate to alongside the inside edge of the pawl, and a spring having one end fixed to the pawl adjacent the pivot pin therefor and another end engaging the second finger of the plate, and a pin projecting from the top surface of the plate a spaced distance from the pivot pin for the pawl;
a circular inertia plate journalled on the hub of the drum and having angled slots therethrough to receive each pin

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projecting from the plate of the spring loaded return member; and

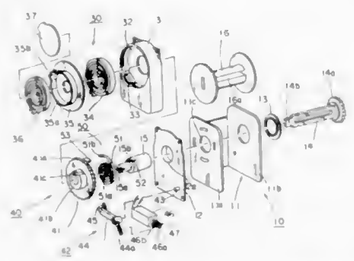
support means fixed to the top of the side wall for securing said lock to a structure.

4,913,372

SEAT BELT RETRACTOR

Juichiro Takada, No. 12-1, Shinmachi 3-Chome, Setagaya-Ku, Tokyo, Japan

Filed May 10, 1989, Ser. No. 350,005
Int. Cl.[4] B60R *22/44*
U.S. Cl. 242—107 1 Claim



1. A seat belt retractor having a belt reel rotatably supported in a frame by a reel shaft, a main winding spring coupled between the frame on the reel shaft and biassing the shaft in the belt-winding direction, a clutch wheel rotatably received on the reel shaft, an auxiliary winding spring coupled between the frame and the clutch wheel and biassing the clutch wheel in the belt-winding direction, clutch-operating means for preventing rotation of the clutch wheel in the belt-winding direction when the belt is connected to a buckle, and lost-motion coupling means interposed between clutch wheel and the reel shaft for coupling the clutch wheel to the reel shaft upon a selected amount of rotation of the reel shaft relative to the clutch wheel in the belt-unwinding direction while permitting rotation of the reel shaft relative to the clutch wheel in the belt-winding direction under the bias of the main spring when the ratchet wheel is prevented from rotating in the belt-winding direction, characterized in that the lost-motion coupling means is an elongated flexible coupling member spirally wound around a portion of the reel shaft and having one end connected to the reel shaft and the other end connected to the clutch wheel, the coupling member being wound in a direction to tighten when the reel shaft rotates in the belt-unwinding direction relative to the clutch wheel and to loosen when the reel shaft rotates in the belt-winding direction relative to the clutch wheel.

4,913,373

METHOD OF OPERATING AN AUTOMATIC WINDER IN CHANGING YARN LOT

Yutaka Ueda, Nara, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

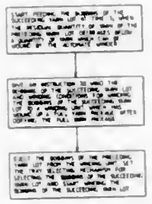
Filed Oct. 13, 1988, Ser. No. 256,962
Claims priority, application Japan, Oct. 19, 1987, 62-261540
Int. Cl.[4] B65H *67/06*
U.S. Cl. 242—35.5 A 18 Claims

1. A method of operating an automatic winder having a plurality of winding units each provided with a bobbin selecting mechanism, in changing yarn lot, comprising steps of:

feeding spinning bobbins of the succeeding lot to the automatic winder to wind the yarn of the preceding yarn lot and that of the succeeding yarn lot simultaneously on the automatic winder when the quantity of remaining yarn of the preceding lot in process is diminished below a quantity of yarn necessary for winding up full yarn packages on all the winding units of the automatic winder;

removing remaining bobbins of the preceding yarn lot from the winding unit when a full yarn package of the preceding yarn lot is finished on the same winding unit;

feeding the remaining bobbins removed from the winding unit to one of the other winding units in operation for winding the yarn of the preceding yarn lot to finish a full yarn package of the preceding yarn lot; and



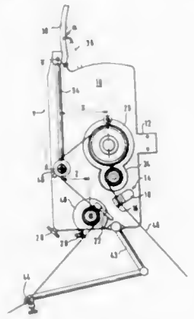
changing over the mode of operation of the yarn package selecting mechanism of the same winding unit which has finished winding the yarn of the preceding yarn lot and from which the remaining bobbin of the preceding yarn lot has been removed from a mode for selecting the bobbins of the preceding yarn lot to a mode for selecting the bobbin of the succeeding yarn lot to start winding the yarn of the succeeding yarn lot on the same winding unit.

4,913,374

PAYING OUT DEVICE

Marcel Gerest, Paris, France, assignor to Altic S.a.r.l., Paris, France

Filed Jun. 3, 1988, Ser. No. 202,078
Claims priority, application France, Jun. 5, 1987, 87 07893
Int. Cl.[4] B65H *59/16*
U.S. Cl. 242—155 R 2 Claims



1. A device for paying out a filament under tension, comprising:

a support panel having a first edge;

a wire clamp mounted on the support panel;

a brake pulley mounted on the support panel;

a dynamometer arm pivotably mounted on the support panel, said arm extending from a first end to a second end, said arm having a working position in which the arm extends substantially along the first edge of the panel;

a sliding pulley mounted on the first end of the arm;

a spring having a first end and a second end, said first end being attached to the arm at a point near the second end of the arm;

means for positioning the point at which the spring is attached to the arm;

means, attached to the second end of the spring and acting on the brake pulley for regulating the tension of the filament; and

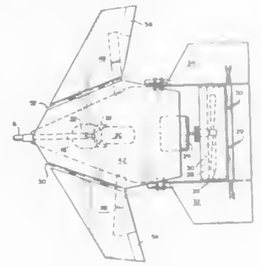
output pulley means mounted on the support panel such that the filament substantially forms a right angle in passing from the brake pulley through the sliding pulley to the output pulley when the dynamometer arm is in the working position.

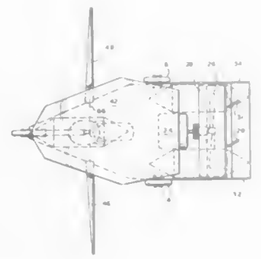
4,913,375

VEHICLE FOR USE ON LAND, AIR, OR WATER

Peter J. Fitzpatrick, 467 Kearny Ave., Kearny, N.J. 07032

Filed Aug. 9, 1988, Ser. No. 230,242
Int. Cl.[4] B64C *37/00, 35/02*
U.S. Cl. 244—7 12 Claims





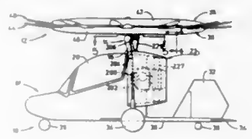
1. A vehicle comprising frame means, flotation means for providing buoyancy to said vehicle, wheel means attached to said frame means for engaging the ground when in a first position and for retracting to a second position, and wing means for providing aerodynamic lift, said wing means comprising a central portion fixed to said frame, two movable portions on respective opposed sides of said central portion, and pivot means for allowing said movable portions to be pivoted about respective first axes between first positions wherein said movable portions provide vertical lift to said vehicle and second positions wherein said movable portions are stored, and about respective second axes wherein said movable portions provide horizontal driving forces to said vehicle wherein said second axes are transverse to the longitudinal axis of the vehicle, are located toward the rear of said movable portions, and diverge from respective trailing edges of said movable portions.

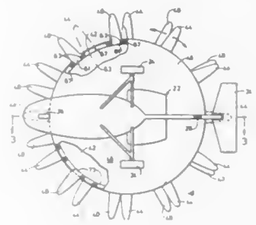
4,913,376

VTLH AUTOGYRO

Franklin E. Black, 1681 Yellowglen Dr., Cincinnati, Ohio 45255

Filed Oct. 21, 1988, Ser. No. 260,800
Int. Cl.[4] B64C *27/02*
U.S. Cl. 244—8 15 Claims





5. In an autogyro, the combination of:

a fusilage body,

a rotor pair comprising two rigid circular structures each profiled with a

a flat face and

a convex airfoil surface,

peripheral blade sets on said structures,

said structures being disposed with their faces so close together that their convex surfaces form a single aerodynamic wing,

means for mounting and gearing said rotor pair for counter-rotation on a common axis,

gimbal means securing said mounting means to said body, and

means in said body for controlling the tilt of said rotor pair relative to said body.

4,913,377

DEVICES WHICH MAY BE BORNE IN AIR AND ON DEVICES APPLICABLE THEREIN

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 909,435, Sep. 19, 1986, abandoned, and Ser. No. 829,637, Feb. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 483,977, Apr. 11, 1983, Pat. No. 4,571,157, which is a continuation-in-part of Ser. No. 308,202, Oct. 2, 1981, Pat. No. 4,452,411, said Ser. No. 909,435, is a division of Ser. No. 609,056, May 10, 1984, Pat. No. 4,613,098, which is a continuation-in-part of Ser. No. 308,202,.
This application Aug. 26, 1988, Ser. No. 236,873
Int. Cl.[4] B64C *27/08*
U.S. Cl. 244—17.11 11 Claims

1. An airborne craft, comprising, in combination, a body with at least two pairs of holding means with one holding means of the respective pair of holding means extending to the left from said body while the other holding means of the respective pair of holding means extends to the right from said body with one of said pairs constituting a front pair of holing means provided on the front portion of said body and another pair of said holding means, constituting a rear pair of holding means, provided on the rear of said body, individual propellers of equal size and air foil configuration relative to the surrounding air with said propellers revolvably borne on said holding means at least indirectly, a power plant provided on said craft,

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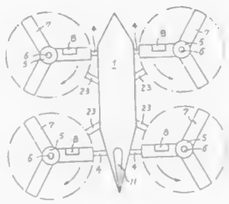
transmission means between said power plant and said individual propellers to revolve said propellers, a means to divide the power of said power plant into at least four equal individual fractions of power with the number of said fractions equal to the number of said propellers, individual transmission portions of said transmission means with said individual portions provided for the transfer of said individual fractions of power to the respective propellers, overrunning free wheeling arrangements between said transmission portions and said individual propellers,

wherein three blades are provided by each of said individual propellers with said blades angularly equally spaced from the center of the respective propeller,

wherein the propellers on the right side of said body are subjected to anti-clockwise revolution while the propellers on the left side of said body are subjected to clockwise revolution,



wherein individual flaps are provided on the radial inner and rear portions of said blades of said propellers with said flaps borne with their roots in pivot beds of said blades to permit said flaps to pivot from an angle substantially parallel to the chord of the respective blade to an angle inclined to said chord, and vice versa, and,

wherein a control means is provided on said craft to effect the inclination of the longitudinal axis of said craft relative to the horizon for inclining the front of said craft slightly downwards when said power plant fails,

whereby said propellers are forced to continue to revolve due to the air flows against the rears of said flaps during forward flight of said craft, while the location of said propellers relative to said body of said craft maintain the stable direction of said craft and the equal speed of revolution of said propellers in the surrounding air.

4,913,378

AIRPLANE WITH TRANSONIC/HYPERSONIC TO SHORT TAKE OFF AND LANDING (STOL) FLIGHT CAPABILITY

Galen E. Calvert, 5510 Lake White Ct., Fairfax, Va. 22032

Continuation-in-part of Ser. No. 854,475, Apr. 22, 1986, abandoned. This application Nov. 13, 1987, Ser. No. 119,954

Int. Cl.[4] B64C *3/38*

U.S. Cl. 244—46 **3 Claims**

1. An airplane comprising a fuselage having a nose portion a tail portion and an intermediate portion, control surfaces mounted on said tail portion, a fixed wing connected to said fuselage adjacent said tail portion and a second wing pivotally mounted to said intermediate portion,

said second wing having an assymmetric airfoil cross-section with a cargo space being located within said second wing, said airplane including means for rotating said second wing from a position where its longitudinal axis is normal to the longitudinal axis of said fuselage, and operates then as a STOL wing, to a position parallel to the fuselage for operation at high speeds, said fuselage being provided with a recess in its upper surfaces to accommodate said second wing in said parallel position in a faired manner with said fuselage, said fuselage is further provided with hatch means at the forward and aft ends of said recess to access corresponding hatch means or said second wing when in its parallel position to permit access of people and material between said fuselage and said second wing.

4,913,379

ROCKET FLIGHT DIRECTION CONTROL SYSTEM

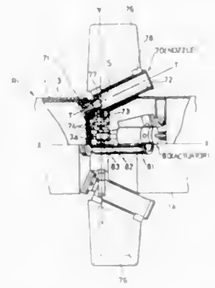
Naminosuke Kubota, Yokohama; Yutaka Yano, Tokyo; Yasumasa Takagi, Higashimatuyama; Kazuyoshi Ninomiya; Nobuo Shimoguti, both of Tokyo; Mituhiko Terashima; Tooru Nakano, both of Tokorozawa, and Hirohito Ohtsuka, Ohmiya, all of Japan, assignors to Japan as represented by Director General, Technical Research and Development Institute, Japan Defence Agency, Tokyo and Nissan Motor Co., Ltd., Yokohama, both of, Japan

Filed Feb. 23, 1989, Ser. No. 313,891

Claims priority, application Japan, Feb. 23, 1988, 63-38546; Feb. 23, 1988, 63-21793[U]

Int. Cl.[4] B64C *15/02*

U.S. Cl. 244—52 **6 Claims**



1. A rocket flight direction control system for a rocket including a rocket body and a combustion chamber, said rocket flight direction control system comprising:

(a) steering wing means, pivotally attached to said rocket body, for controlling rocket flight directions;

(b) deflectable nozzle means, deflectively attached to said rocket body, for jetting combustion gas from said combustion chamber to generate rocket thrust, said deflectable nozzle means comprising;

(1) a fixed divergent nozzle of the overexpansion type, fixedly coupled to said combustion chamber, for expanding combustion gas; and

(2) a movable nozzle, movably coupled to a rear end of said fixed divergent nozzle, for generating rocket thrust, an inner diameter of an outlet end of said fixed divergent nozzle being essentially equal to or slightly smaller than a diameter of an outlet end of said movable nozzle;

(c) control means, mounted in said rocket body, for generating steering control signals; and

(d) actuating means, coupled to said steering wing means, said deflectable nozzle means and said control means, for actuating said deflectable nozzle means in response to said steering control signals in synchronism with steering motion of said steering wing means.

4,913,380

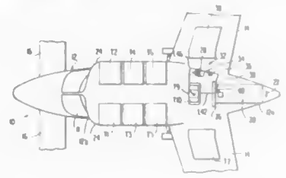
FUEL SYSTEM FOR CANARD AIRCRAFT

Billy G. Vardaman, Albany, Ga., and Corwin W. Meyer, Ocala, Fla., assignors to Omac, Inc., Albany, Ga.

Filed Oct. 13, 1988, Ser. No. 256,952

Int. Cl.[4] B64C *3/34;* **B64D** *37/04, 37/28*

U.S. Cl. 244—135 R **7 Claims**



1. A gravity feed fuel system for a high wing Canard aircraft including:

an elongated fuselage,

a high, main wing mounted to the top of said fuselage and having right and left wing sections projecting outwardly thereof to opposite sides of said fuselage,

said fuel system comprising.

a plurality of fore and aft, spaced strake fuel tanks mounted within the top of said fuselage forward of said main wing at a common level,

a wing tank within each main wing section at said common level, a common, central collector tank mounted between said wing tanks, in alignment with said fuselage tanks and at said common level, a fuel sump tank below said collector tank, means communicating said sump tank with the bottom of said collector tank to receive fuel directly from the collector tank,

main fuel supply line opening to the sump tank for feeding fuel to at least one aircraft engine mounted to said aircraft,

a primary gravity feed system comprising individual horizontal fuel lines leading from the bottom of each strake and wing tank to the central common fuel collector tank, each individual fuel line terminating at said fuel collector tank in a low pressure drop, normally open flapper check valve for preventing reverse flow from the collector tank back to the strake and wing tanks,

a secondary gravity feed system comprising horizontal interconnect fuel lines connected to and opening freely at opposite ends into the bottoms of adjacent strake tanks,

said individual fuel lines and said interconnect fuel lines being oversized to meet maximum fuel demands of the engine with some margin of safety, and a fuel transfer system comprising:

at least one boost pump in the main fuel supply line between said sump tank and said engine,

at least one jet pump in the strake tank most remote from said collector tank and a jet pump in an outboard portion of each wing tank,

a fuel return line from said engine for returning excess fuel at boost pump pressure,

means for connecting said fuel return line to said jet pump for causing the excess fuel at boost pump pressure to act as the motive flow for the jet pumps, inlets to the jet pumps for allowing fuel within said most remote strake tank and each wing tank to enter the jet pumps for aspiration thereby,

discharge lines from each jet pump to the collector tank, and wherein the jet pumps have a capacity such that each jet pump supplies fuel to the collector tank at a high proportion of the engine take-off fuel demand, whereby the collector is supplied with fuel by the fuel transfer system which is considerably in excess of the maximum engine demand, and wherein said fuel transfer system further comprises overflow return lines routed from the top of the common, central collector tank back to each fuel tank containing a jet pump, and wherein said overflow return lines terminate at each tank containing a jet pump in low pressure drop, normally open flapper check valve for preventing fuel cross flow between tanks.

4,913,381

AERODYNAMIC COMPONENTS HAVING LEADING EDGE DEVICES

Dennis G. Mabey, Bedford, England, assignor to The Secretary of State for Defence in her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

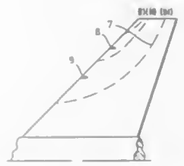
PCT No. PCT/GB87/00320, § 371 Date Jan. 12, 1989, § 102(e) Date Jan. 12, 1989, PCT Pub. No. WO87/06908, PCT Pub. Date Nov. 19, 1987

PCT Filed May 12, 1987, Ser. No. 299,942

Claims priority, application United Kingdom, May 12, 1986, 8611502

Int. Cl.[4] B64C *23/06*

U.S. Cl. 244—199 **16 Claims**



1. An aerodynamic component having an airfoil section said section having a profile and significant span said component having an expansion surface, said expansion surface including at least one groove, said groove comprised solely of a long narrow channel, said at least one groove having a width in the range of 0.05 to 1.0 percent of said span, said at least one groove extending rearwardly from a leading edge of the airfoil section and having a length in the range of 1 to 20 percent of a local chord length of the airfoil section.

4,913,382

MOUNTING MEANS FOR VEHICLE AUDIO DEVICE

Michael VanAcker, Warren, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Jul. 24, 1989, Ser. No. 383,493

Int. Cl.[4] G12B *9/00*

U.S. Cl. 248—27.1 **5 Claims**

1. Mounting means for securing the casing of an audio device to the instrument panel structure of a vehicle, the casing having an upper surface, an interior face, and an exterior face, the mounting means including a plate secured to the casing on the upper surface thereof, the plate having a pair of upwardly extending spaced apart tabs positioned adjacent to the interior face of the casing, each tab comprising a first upwardly extending portion and a second portion extending from the upper end of the first portion laterally of the casing, the instrument panel structure including a bracket comprising a first generally horizontally extending wall having a rearward edge, a second upwardly angled wall extending from said rearward edge, the bracket including a pair of longitudinally extending slots spaced apart the same distance as the spacing of the tabs, each slot including a first enlarged portion formed in the upwardly

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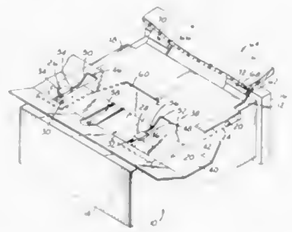
angled wall of the bracket to permit passage of an entire tab upon insertion of the casing into the instrument panel structure, each slot including a second narrow portion formed in the horizontally extending wall portion of the bracket to permit longitudinal passage of the first upwardly extending portion of a tab but not downward passage of the second portion of a tab after the tab has been inserted into the slot, at least one spring arm extending downwardly from the horizontally extending wall of the bracket into pressure contact with of the casing after the casing has been inserted into the instrumental panel



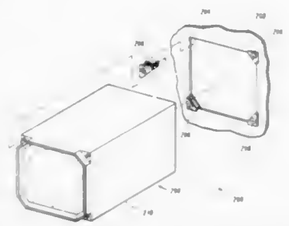
structure to thereby secure the casing firmly in place, the plate which is secured to the casing having an upwardly angled portion adjacent the exterior face of the casing, the instrument panel structure having a downwardly angled wall portion positioned to contact the upwardly angled portion of the plate upon insertion of the casing into the instrumental panel structure, and fastening means to fixedly secure the upwardly angled portion of the plate to the downwardly angled wall portion of the instrumental panel structure to thereby fixedly secure the casing in place.

4,913,383

ADVANCED AIRCRAFT INSTRUMENTATION APPARATUS

Richard T. Hill, Marion, and Roger W. Heidt, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 16, 1988, Ser. No. 272,155
Int. Cl.[4] G12B *9/00*
U.S. Cl. 248—27.1 **7 Claims**



1. An aircraft instrument panel, of the type having aircraft instruments mounted therein, which have octagonally shaped bezels, the panel comprising:

a. a planar panel member having a plurality of holes therein, for receiving aircraft instruments, at least one of said holes being rectangular in shape and thereby having four corners and being capable of receiving an aircraft instrument having a chassis with a rectangular cross-section, when the chassis is sectioned in a plane parallel to the planar panel member;

b. a plurality of corner adapter means for insertion in the four corners of said rectangular hole so that the rectangular hole is transformed into an octagonal hole;

c. each of said plurality of corner adapter means having a threaded hole therethrough for receiving a screw;

d. a plurality of screws for insertion through said threaded holes and extending into said aircraft instrument;

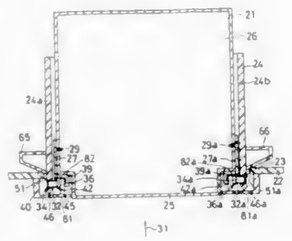
whereby, the rectangular hole in the aircraft instrument panel is transformable into an octagonal hole.

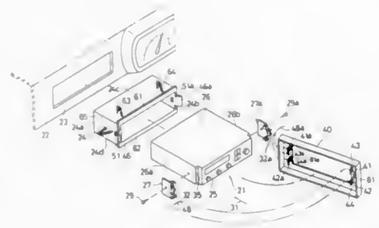
4,913,384

MOUNTING STRUCTURE FOR CART-MOUNT DEVICES

Shigeaki Inamura, Kobe, Japan, assignor to Fujitsu Ten Limited, Hyogo, Japan

Filed May 27, 1988, Ser. No. 200,123
Claims priority, application Japan, May 29, 1987, 62-85403[U]; May 29, 1987, 62-85404[U]
Int. Cl.[4] G12B *9/00*
U.S. Cl. 248—27.3 **4 Claims**





1. A mounting structure for mounting in an instrument panel of an automotive vehicle a car-mounted device, such as a radio or a tape player, having a main body and a front panel extending from the main body with a step therebetween, said mounting structure comprising:

a mounting tube to be inserted forwardly through a mounting hole in the instrument panel and retained therein, such that the car-mounted device can be inserted in an insertion direction forwardly into said mounting tube, said mounting tube having opposite side walls having therein respective detent holes;

a pair of mounting members to be attached to respective opposite sides of the main body of the car-mounted device;

each said mounting member having integral therewith at a position of juncture an elastic member extending in a direction generally along the height dimension of said mounting tube, said elastic member having a normal position and being deflectable therefrom against the elastic force thereof about said position of juncture in a plane perpendicular to said insertion direction, said elastic member having a detent pawl;

said elastic force of said elastic members urging said detent pawls away from said respective detent holes, such that when said mounting members are inserted with the car-mounted device into said mounting tube said detent pawls do not initially extend into said detent holes; and

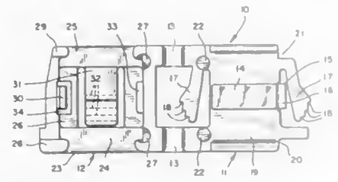
means for moving said elastic members against the elastic force thereof such that said detent pawls extend into said detent holes.

4,913,385

SELF-LOCKING STRAIN RELIEF BUSHING FOR VARIABLE PANEL THICKNESSES AND METHOD

Joseph P. Law, Scotch Plains, and Thomas M. Mullen, Jr., Dunellen, both of N.J., assignors to Heyco Molded Products, Inc., Kenilworth, N.J.

Filed May 10, 1989, Ser. No. 351,387
Int. Cl.[4] H02G *3/18*
U.S. Cl. 248—56 **72 Claims**



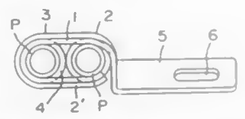
1. A one piece molded plastic strain relief bushing comprising a body, said body adapted to receive a cable therethrough, said body including a first portion and a second portion, said first portion and second portion joined by hinge means, one said portion including a key; a head; and gripping means, the other said portion including a head; a well; and gripping means, latch means in said well adapted to engage said first and second portions, said key adapted to hold a cable in said well when said latch means are engaged, and said portions' gripping means are adapted to engage the walls of an aperture between said gripping means and said head.

4,913,386

FIXING APPARATUS FOR FIXING TUBULAR MEMBERS ALLOWING FLUID TO PASS THERETHROUGH

Kenji Sugiyama, Numazu, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Shizuoka, Japan

Filed Dec. 7, 1988, Ser. No. 281,172
Claims priority, application Japan, Dec. 12, 1987, 62-189263[U]; Feb. 17, 1988, 63-19768[U]; Feb. 20, 1988, 63-21415[U]
Int. Cl.[4] F16L *3/22*
U.S. Cl. 248—68.1 **2 Claims**



1. A tubular member fixing apparatus for securing a plurality of tubes in fixed relationship to one another, said apparatus comprising:

a plurality of tubular members each having an outer peripheral surface provided with an annular projection projecting radially outwardly therefrom, said tubular members being disposed generally parallel to one another with the annular projection of each said tubular member being in abutting relationship with the annular projection of another of said tubular member; and

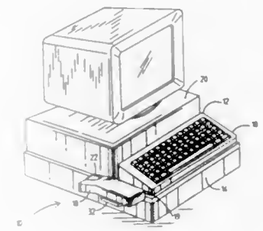
a generally U-shaped clamping member comprising a pair of opposed generally parallel clamp walls, an arcuate connecting wall extending unitarily between the clamp walls and a pair of arcuate end walls extending unitarily from the respective clamp walls toward one another, said clamp member comprising a continuous outwardly extending groove formed therein and extending along the clamp walls, the connecting wall and at least portions of the end walls, said groove conforming to the shape of the annular projections on the tubular members, portions of the groove formed on the clamp walls being in clamping engagement with portions of the annular projections on each side tubular members, portions of the groove on the connecting wall engaging portions of the annular projection on a first tubular members and portions of the groove on the end walls pressurizingly engaging portions of the annular projection on a second of the tubular member for fixedly clamping the annular projections of said tubular members in abutting relationship with one another and for preventing relative longitudinal movement of the tubular members relative to one another and relative to the clamping member.

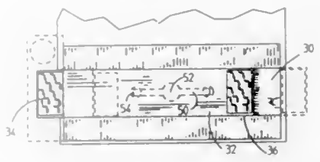
4,913,387

APPARATUS FOR REMOVABLY MOUNTING A COMPUTER INPUT DEVICE

William W. Tice, Nashua, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 17, 1989, Ser. No. 324,945
Int. Cl.[4] A47B *37/00*
U.S. Cl. 248—918 **12 Claims**





1. An apparatus for removably mounting a device for inputting data to a computer having a keyboard, said apparatus comprising:

a keyboard; an input device; and

a base for supporting said keyboard;

movable attaching means, coupled to said base and positioned adjacent to said keyboard, wherein, said attaching means can be moved to extend past either side of said keyboard, wherein said input device is attached on said either side of said keyboard.

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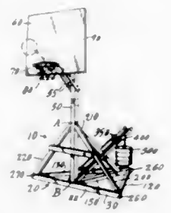
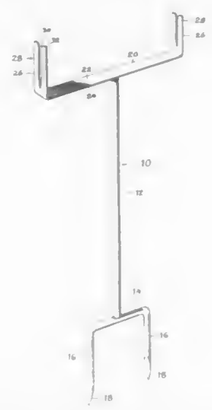
4,913,388
MOVABLE BASKETBALL BACKBOARD
Robert McCant, 1119 Montrose, Toledo, Ohio 43607
Filed Sep. 28, 1988, Ser. No. 250,359
Int. Cl.[4] A47G *29/00*
U.S. Cl. 248—125 3 Claims



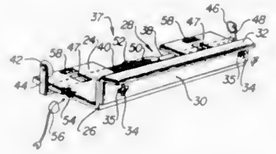
1. A movable upright support for a basketball backboard, comprising in combination:
(a) a base member having a frontal portion and a posterior portion adapted to rest flush against the ground, said base member comprisng a triangular structure adapted to rest flush against the floor, and said base member having a frontl portion and a posterior portion;
(b) a vertically upright spinal support member having a lower end and an upper end, integrally connected to said base member, with diagonal supports connecting a portion of said spinal support member with the frontal portion of said base member;
(c) a basketball backboard integrally affixed to the upper portion of said vertically upright spinal support member;
(d) balancing means affixed to the base member, said balancing means comprising a diagonally disposed member having a frontal portion and a posterior portion with said frontal portion of said diagonally disposed member being affixed to the lower end of said spinal support member, with the diagonally disposed member extending upwardly extending towards the posterior portion of said base member, with weight means affixed on the posterior portion of said base member.

direction therefrom, each clip comprising a metal strip having a serrated V-shaped notch extending inwardly



from the free end of the clip, the notches in the clips being aligned with each other.

4,913,390
PORTABLE ADJUSTABLE COMPUTER KEYBOARD SUPPORT AND HAND REST
Joseph J. Berke, 2063 Long Lake Shore Dr., West Bloomfield, Mich. 48033
Filed Sep. 21, 1988, Ser. No. 247,417
Int. Cl.[4] H05F *3/00*
U.S. Cl. 248—176 13 Claims

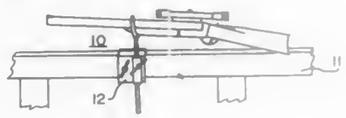


13. A computer keyboard support apparatus, comprising:
a computer keyboard having a width;
a wrist support member being generally parallel to said computer keyboard width, said wrist support being of a width approximately equal to said computer keyboard width, extending generally vertically upwardly and spaced horizontally from said computer keyboard by a first distance;
a releasable attachment assembly means for attaching said wrist support member to said computer keyboard so that said wrist support member will be portable with said computer keyboard and for providing adjustment of said first distance, said releasable attachment assembly securing said computer keyboard at a selected position with respect to said wrist support member.

4,913,389
UNITARY TARGET STAND
Coy McCracken, 8301 Tieton Dr., Yakima, Wash. 98908
Filed Jun. 5, 1989, Ser. No. 361,413
Int. Cl.[4] F41J *1/10*
U.S. Cl. 248—156 5 Claims

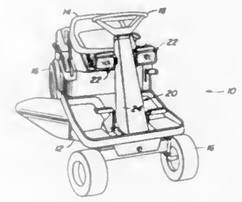
1. A one-piece device for holding shooting and archery targets, yard signs and the like comprising:
(a) an upright member;
(b) a ground-penetrating supporting means rigidly attached to the lower end of the upright member;
(c) a metal strip laid flat across the upper end of the upright member and rigidly affixed thereto; and
(d) a plurality of clips rigidly affixed to the strip and extending perpendicularly from the strip in a direction approximately parallel to the upright member and in the opposite

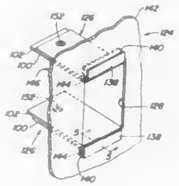
4,913,391
SPORTSMAN'S GUN REST AND OBJECT HOLDER
Kenneth W. Klipp, 7013 Willowtree Dr., Middletown, Md. 21769
Filed Aug. 29, 1988, Ser. No. 237,375
Int. Cl.[4] F41C *29/00*
U.S. Cl. 248—214 2 Claims



1. A portable device to hold and improve the aiming of sportsmens's equipments, comprising long barrel firearms, spotting telescopes and cameras, during operations from fixed observation stands in fields and woodlands comprising:
(a) a bracket having an open-ended cylindrical receptacle thereon, said bracket for attachment to an upright component of an existing stable structure of said observation stands placing the longitudinal axis of said receptacle in a vertical plane;
(b) means for clamping said bracket to said upright component of said observation stands;
(c) a holding cradle for said long barrel firearms for optional assembly within said cylindrical receptacle, said cradle comprising:
(1) an elongated cylindrical shaft of uniform diameter for snugly fitting within said cylindrical receptacle;
(2) a U-shaped yoke for symmetrical attachment to said cylindrical shaft; and
(3) a soft covering material surrounding said yoke as attached to said shaft for protecting the finishes of said firearms;
(d) a mounting adaptor for said spotting telescopes and cameras for optional assembly within said cylindrical receptacle, said mounting adaptor comprising:
(1) an elongated cylindrical shaft of uniform diameter for snugly fitting within said cylindrical receptacle;
(2) a base plate, for attachment thereto of car window mounts for spotting scopes and cameras, said base plate for permanent attachment to one end of said elongated shaft with the geometric plane of said base plate coincident with the extended longitudinal axis of said elongated shaft;
(e) an azimuth scanning ring having an inside diameter for snugly fitting upon the elongated shafts of said holding cradle and said mounting adaptor and an outer diameter at least as large as the outer diameter of said cylindrical receptacle, said ring for optional assembly on said elongated shafts between said cylindrical receptacle and said yoke and baseplate respectively;
(f) a thumb screw in a threaded radial cavity through said ring for tightening upon said elongated shafts of said cradle and said mounting adaptor, respectively, for height adjustments thereof with freedom to scan through azimuth angles; and
(g) a "Tee" handle screw in a threaded nut fixed upon a cavity through said cylindrical receptacle for tightening upon said elongated shafts of said cradle and said mounting adaptor, respectively, for securing a fixed azimuth angle and a fixed viewing height for said sportsman's equipment.

4,913,392
MOUNTING BRACKET
James A. Swartzendruber, West Bend, and Martin W. Arndt, Juneau, both of Wis., assignors to Deere & Company, Moline, Ill.
Filed May 5, 1989, Ser. No. 347,632
Int. Cl.[4] A47B *96/06*
U.S. Cl. 248—231.9 16 Claims





1. For use on a wall member with rigid inside and outside surfaces and an opening therebetween,
a mounting means comprising:
spaced apart first and second brackets receivable through the opening and each having first and second spaced apart members abutable respectively with the inside and outside surfaces of the wall, a leg member connected to and adjacent each pair of first and second members, the leg members projecting generally perpendicular to the wall when their respective first and second members are in abutment with the wall surfaces; and
means for interconnecting the two leg members and for maintaining their respective first and second spaced apart members in abutment with the wall surfaces.

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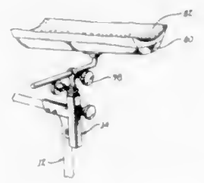
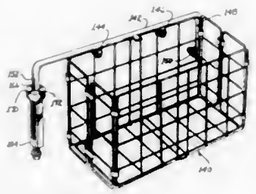
4,913,393

MOUNTING FOR ATTACHMENTS TO A WHEELCHAIR, A GERIATRIC CHAIR AND THE LIKE

Charles F. Wood, 8341 W. Foothill Dr., Peoria, Ariz. 85345

Division of Ser. No. 23,448, Mar. 9, 1987, Pat. No. 4,815,688.
This application Dec. 28, 1987, Ser. No. 138,134
Int. Cl.[4] A47G 29/00
U.S. Cl. 248—283 6 Claims





1. A mounting for supporting a basket upon a tubular frame which frame has a generally horizontal component and a generally vertical component, said mounting comprising in combination:

(a) means for engaging the tubular frame, said means for engaging including means for inhibiting rotation of said mounting about each of a horizontal axis and a vertical axis of said mounting, said means for inhibiting including first means for capturing at least a part of the horizontal component of the frame to inhibit rotation of said mounting about the vertical axis of said mounting, said first means for capturing having a longitudinal axis intersecting the vertical axis of said mounting and second means for capturing at least a part of the vertical component of the frame to inhibit rotation of said mounting about the horizontal axis of said mounting, said second means for capturing having a longitudinal axis parallel with the vertical axis of said mounting;

(b) a stanchion;

(c) vertically oriented tube means attached to said engaging means for receiving said stanchion;

(d) said tube means including means for vertically locating said stanchion relative to said tube means and for selectively retaining said stanchion at such location;

(e) an arm;

(f) means for securing the basket to said arm, said arm including a segment extending downwardly; and

(g) a passageway disposed in said stanchion for receiving said segment;

whereby, the basket is supported by said mounting through said stanchion.

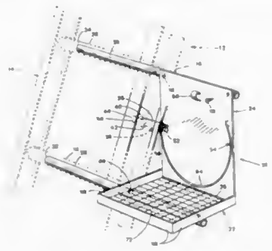
4,913,394

ARTICLE HOLDING TRAY ASSEMBLY FOR LADDER

Roy Schmid, 170 Autumn Dr., Southington, Conn. 06489

Filed Oct. 3, 1988, Ser. No. 252,156
Int. Cl.[4] E06C 7/14
U.S. Cl. 248—238 15 Claims

1. An article holding tray assembly for use on a ladder having parallel elongated left and right side pieces and lower and upper open-ended parallel rungs perpendicular to and joining said side pieces and spaced a predetermined distance from each other, said assembly comprising a tray member, a backing member connected to said tray member along a straight line, a lower tubular member parallel to said line and affixed to said tray member and projecting in a predetermined direction to a free end, an upper tubular member parallel to said line and affixed to said backing member and projecting in said predetermined direction to a free end, said lower and upper tubular members adapted for insertion, said free ends first, into said lower and upper rungs, respectively, with said tray and backing members substantially mutually at right angles, and a resilient clip member having a body portion capable of flexure and projecting in said predetermined direction from said backing member and a locking portion integral with said body portion and providing a locking surface spaced a predetermined distance from said backing member and facing in the direction opposite said predetermined direction, and a cam portion integral with said locking portion and providing a surface integral with said locking surface at its edge remote from said body portion and positioned to be engaged by the rear edge of a side piece of the ladder, thereby to flex said body portion to permit said locking portion to traverse the rear of the last-mentioned side piece and then snap forward to hold said assembly assembled with the ladder adjacent the said overlapped side piece, said tray member and said backing member being joined by a hinge defining said straight line and said tray member having a peripheral upturned flange therearound except along the side provided by said hinge, said lower tubular member being removably affixed to said tray member and re-affixable thereto projecting in the direction opposite said predetermined direction, said upper tubular member being removably affixed to said backing member and re-affixable thereto projecting in the direction opposite said predetermined direction, and said clip member being removably affixed to said backing member and re-affixable thereto with said body portion projecting in the direction opposite said predetermined direction.



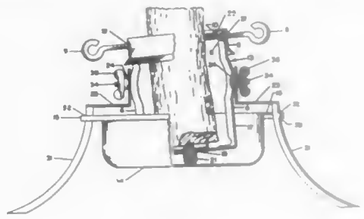
4,913,395

GIMBALL CHRISTMAS TREE STAND

Joseph A. Juhas, North St., Litchfield, Conn. 06759

Filed Jul. 5, 1989, Ser. No. 375,455
Int. Cl.[4] A47G 33/12
U.S. Cl. 248—516 3 Claims

1. A stand for supporting a christmas tree or similar elongate shaft in a vertical or selectively inclined attitude said stand comprising in combination a gimball assembly having an upper clamp ring receptive of a Christmas tree trunk or similar elongate shaft, said upper clamp ring being attached to the upper ends of two gimball brackets by means of threaded eye-bolts, each of said gimball brackets having a base and two vertical arms, each of said vertical arms having a channel cross section and having a linear upper and lower section separated by an convex arcuate midsection, the radius of curvature of said arcuate midsection being at least equal to the radius of the said upper clamp ring, said arcuate midsection of each of said gimball bracket arms having an elongate slot located at the center of said channel cross section and extending the full length of said arcuate midsection, the bases of said gimball brackets being held in contact and in cruciform orientation by an assembly fitting passing through an assembly aperture slot means in the base of each of said gimball brackets; a circular formed water storage pan having a radially extending upper flange, said flange having four equally circumferentially spaced rectangular apertures, said water storage pan being supported by four arcuate leg members having a channel cross section each of said leg members terminating in a support foot at the lower end and a right angled securing flange at the upper end, each of said leg members fitted into one of said rectangular apertures in said radially extending flange of said water storage pan, one each of said right angled securing flanges being attached by bolt and wing nut means to one each of the said arcuate midsections of said gimball bracket arms.

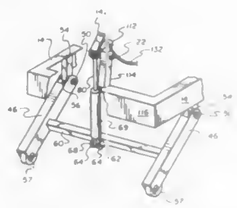


4,913,396

ADJUSTABLE INCLINE SYSTEM FOR EXERCISE EQUIPMENT

William T. Dalebout; S. Ty Measom, and Scott R. Watterson, all of Logan, Utah, assignors to Weslo, Inc., Logan, Utah

Filed Oct. 12, 1988, Ser. No. 256,486
Int. Cl.[4] F16M 11/00
U.S. Cl. 248—649 19 Claims



1. An adjustable incline system in combination with an exercise apparatus operable in different angular orientations, said combination comprising:

a support means pivotally mounted to an exercise apparatus for supporting said apparatus;

an adjustable pneumatic spring means mechanically associated with said support means and said apparatus for applying a force against said support means, thereby urging said support means outwardly away from said apparatus, thereby adjusting the incline of said apparatus, said pneumatic spring means including an actuation pin adapted for controlling said force exerted by said pneumatic spring means; and

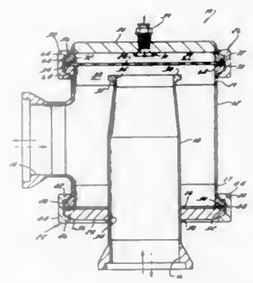
control means, mechanically associated with said pneumatic spring means, for operating said actuation pin, said control means including a control member, linkage means and an actuating lever member, said actuating lever member being actuated via said control member and said linkage means so as to mechanically engage said actuation pin, said actuating lever member being displaceable to effect a corresponding displacement of said actuation pin.

4,913,397

PRESSURE RESPONSIVE DIAPHRAGM CONTROL VALVE

Hervé X. Bronnert, 21495 Partridge Ct., Brookfield, Wis. 53005

Filed Jan. 19, 1989, Ser. No. 300,263
Int. Cl.[4] F16K 31/145
U.S. Cl. 251—61.1 6 Claims



1 A diaphragm valve comprising:

a tubular casing having an opening in one side;

a cylindrical pipe mounted in said casing in a coaxial relation to said casing and in a perpendicular relation to said opening;

said pipe forming a fluid flow path through said casing to said opening;

a valve seat formed on one end of said pipe;

a flexible diaphragm mounted in said casing in a spaced relation to said valve seat;

a cap mounted on said casing to form a pressure chamber on one side of said diaphragm, said casing including a ferrule around said one end of said casing and a groove in said ferrule coaxial with said casing, said cover including a ferrule having a groove corresponding to said groove in said casing ferrule and a ring seated in said groove in said ferrule in said cover whereby said ring will seat said diaphragm in said groove in said ferrule in said casing to form an aseptic seal between said casing and said diaphragm;

and means for admitting air under pressure into said chamber to move said diaphragm into engagement with said valve seat.

4,913,398

HIGH SPEED DUMPING VALVE APPARATUS

Theodore Ziaylek, Jr., 140 Riverview Dr., and Michael P. Ziaylek, 3 Brook La., both of Yardley, Pa. 19067

Filed Aug. 7, 1989, Ser. No. 390,310
Int. Cl.[4] F16K 25/00, 1/18, 31/53
U.S. Cl. 251—87 19 Claims

19. A high speed water dumping valve apparatus usable with a water reservoir comprising:

(a) a housing means defining a flow chamber therein adapted to receive water from a water reservoir and expel water outwardly therefrom, said housing means defining a water inlet means therein adapted to receive water from the water reservoir for entry into said flow chamber, said housing means further defining a water outlet means therein adapted to facilitate expelling of water from said flow chamber into the external environment area as desired, said water outlet means being positioned horizontally below said water inlet means to facilitate water flow

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through said flow chamber, said housing means defining a plurality of retainment apertures externally therein;

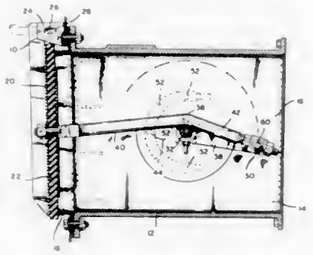
(b) a door means movable with respect to said water inlet means between an opened position allowing water flow through said water inlet means and a closed position extending across said water outlet means to prevent water flow therethrough;

(c) a resiliently flexible gasket sealing means positioned between said door means and said housing means about said water inlet means defined therein;

(d) a pivotal door securement means positioned at one end of said door means for pivotally mounting said door means with respect to said housing means, said pivotal door securement means including a mounting shaft member and a closed elongated receiving slot therefore to facilitate equalized seating along the length of said resilient gasket sealing means between said door means and said water inlet means to minimize leakage responsive to said door means being in the closed position extending across said water outlet means said elongated slot extending perpendicular to said door means to permit said securement means to move freely within said slot to facilitate an effective seal thereof against said housing adjacent said water inlet means when any irregularities exist between said door means and said housing adjacent said water inlet means;

(e) a door control means operatively secured with respect to said door means and movably mounted with respect to to control movement thereof and facilitate operative movement of said door means between the opened position allowing water flow through said water inlet means and the closed position extending across said water outlet means to prevent water flow therethrough, said door actuation means including a handle means secured with respect to said crankshaft means externally of said housing means to facilitate operative control thereof; and

(g) a stop means secured with respect to said crankshaft means externally of said housing and being adapted to selectively engage said retainment apertures defined in said housing to maintain said door means in position as desired, said stop means including a resiliently mounted ball handle means adapted to facilitate engagement of said stop means with respect to said retainment aperture means.



said housing means within said flow chamber thereof, said door control means comprising:

(1) a crankshaft means rotatably movably mounted in a generally horizontally extending direction with respect to said housing means within said flow chamber;

(2) a crank bracket means fixedly secured with respect to said crankshaft means to be movable therewith, said crank bracket means comprising a crank yoke;

(3) a drive bar means attached with respect to said door means and secured with respect to said crank bracket member to be movable therewith, said drive bar means including a first bar section and a second bar section being integral with respect to one another, said first bar section being attached with respect to said door means and said second bar section being secured with respect to said crank bracket member, said second bar member being obliquely oriented with respect to said first bar member to extend around said crankshaft means within said housing means responsive to said door means being in the closed position, said first bar section being pivotally secured with respect to said door means and said second bar section being pivotally secured with respect to said crank yoke, said crankshaft means and said crank bracket member being rotatable to urge said second shaft section of said drive bar means to a position over center with respect to said crankshaft means to facilitate retainment of said door means in the closed position as desired;

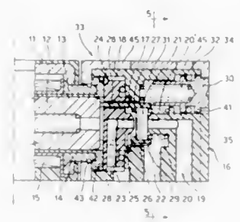
(f) a door actuation means attached to said crankshaft means

4,913,399

SOLENOID VALVE ASSEMBLY

Migliori Luciano, Via. F.111 Cervi, Residenza dei Cerchi, Milano 2, Segrate, Milan, Italy

Filed Apr. 5, 1989, Ser. No. 333,237
Claims priority, application Italy, Apr. 7, 1988, 21027/88[U]
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.03 5 Claims



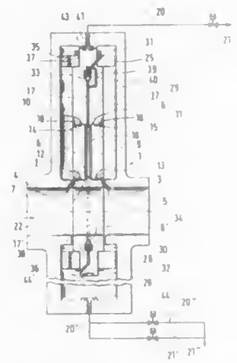
1. A solenoid valve assembly of the type comprising a valve unit a removable solenoid having an electromagnetic coil, a magnetic core member and a shidable plunger housed in a tube member protruding into the coil, said plunger being operatively connected with a closing valve member inside a chamber of the valve body; said valve unit comprising inlet and outlet ports opening into the valve chamber containing said closing member, said plunger acting on said closing member in opposition to a biasing spring to move said closing valve member between opposite valve seats at the activation and deactivation of the solenoid, and disengageable locking means to connect the solenoid to the valve unit comprising a valve body in plastic material and a protective case open at one side, said valve body being fitted into said case; said case having at least an elongated open slot on a lateral wall opposing to the solenoid, said tube member for the plunger being sealingly connected to the valve body and comprising a flanged end fitted between said lateral wall of the case and the valve body, said tube member passing through said open slot; guiding means for said tube member comprising a bush member protruding from the solenoid and locking means comprising a peripheral groove at one end of said bush member and a clip member on the valve unit engaging and disengaging said peripheral groove.

4,913,400

DOUBLE DISK GATE VALVE

Edelbert Tiefenthaler, Elgg, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 2, 1989, Ser. No. 305,802
Claims priority, application Switzerland, Feb. 4, 1988, 00384/88
Int. Cl.[4] F16K *25/00*
U.S. Cl. 251—175 8 Claims



1. A double disk gate valve comprising

a body having a coaxially disposed inlet port and outlet port, a first seat surface at one end of said inlet port, a second seat surface at one end of said outlet port facing said first seat surface, a first cylinder extending transversely of said ports and a second cylinder extending coaxially opposite said first cylinder;

a gate disposed between said ports for transverse movement therebetween, said gate having a pair of closure disks defining a space therebetween and movable between a closed position aligned with said ports and an open position spaced transversely from said ports;

a first piston mounted on said gate and slidably mounted in said first cylinder to define an inner chamber in communication with said inlet port and a outer chamber therein;

a first restrictor in said piston communicating said chambers with each other;

a second piston mounted on said gate and slidably mounted in said second cylinder to define an inner chamber in communication with said inlet port and an outer chamber therein;

a second restrictor in said second piston communicating said chambers of said second cylinder with each other;

means connecting said outer chambers to a pressure sink; and

means communicating said outer chambers with said space between said closure disks to deliver pressurized fluid thereto to press each said disk against a respective seat surface in said closed position.

4,913,401

VALVE APPARATUS

Patrick M. Handke, Monroeville, Pa., assignor to Respironics, Inc., Monroeville, Pa.

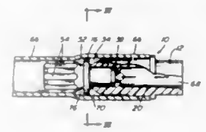
Filed Jan. 26, 1989, Ser. No. 302,187
Int. Cl.[4] F16K *7/02*
U.S. Cl. 251—342 11 Claims

1. A valve apparatus adapted for installation within a fluid conveying conduit comprising:

an elongated body means having a pair of axially spaced opposed ends and a flow passage means which extends therebetween and includes an external peripheral portion of said body means located axially intermediate said opposed ends;

a resiliently deformable ring means encompassing said body means with and inner peripheral portion thereof in peripheral sealing engagement with said external peripheral portion of said body means to close said fluid flow passage means;

said resiliently deformable ring means having an outer peripheral portion which is adapted to engage the interior periphery of such a fluid conveying conduit in continuous



circumferentially extending sealing engagement therewith; and

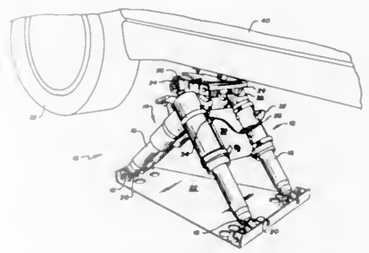
said resiliently deformable ring means being operable upon compressive deformation thereof in a direction generally radially inward with respect to the longitudinal axis of said body means to open said fluid flow passage means radially intermediate said inner peripheral portion thereof and said external peripheral portion of said body means to permit fluid flow through said valve within said fluid flow passage means.

4,913,402

AUTOMOTIVE FLOOR JACK

Howard P. McJunkin, Jr., 862 Alta Rd., Charleston, W. Va. 25314

Filed Feb. 13, 1989, Ser. No. 309,378
Int. Cl.[4] B66F *3/24*
U.S. Cl. 254—93 R 6 Claims



1. A portable jacking mechanism comprising:

a base plate member;

a top, lift plate element;

a first pair of hydraulic or pneumatic cylinder means mounted in side by side parallel relation, said cylinder means being spaced apart a predetermined distance, a bottom most end of each of said cylinder means being pivotally coupled to said bottom plate element, and an

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upper most end of each of said cylinder means being pivotally mounted to said top, lift plate;

means mounted to a movable portion of each of said cylinder means of said first pair and extending therebetween so as to maintain said cylinder means in fixed spaced apart relation; and

a second pair of hydraulic or pneumatic cylinder means mounted in side-by-side parallel reaction, said cylinder means of said second pair being mounted immediately adjacent to one another, a bottom most end of each of said cylinder means of said second pair being pivotally coupled to said base member at a point spaced from said mounting of said first pair of cylinder means, and an upper most end of said cylinder means of said second pair being pivotally mounted to said top, lift plate so that said cylinder means of said first pair straddle said cylinder means of said second pair, each of said cylinder means being mounted to said top, lift plate and said bottom plate so that each of said pairs of cylinder means defines a leg of a triangle and said base member defines the base of said triangle, said cylinder means being fluidly coupled together so as to be actuated by a common source of hydraulic fluid or compressed air.

4,913,403

RUNNER SYSTEM AND ARTICLE FOR THE CASTING OF METALS

Andrew M. Plowman, Brierley Hill, and David L. Jones, Birmingham, both of United Kingdom, assignors to Foseco International Limited, Birmingham, England

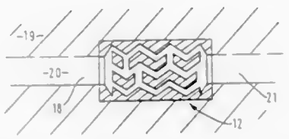
Division of Ser. No. 48,807, May 12, 1987, Pat. No. 4,756,355. This application Mar. 18, 1988, Ser. No. 170,333

Claims priority, application United Kingdom, May 22, 1986, 8612474; Feb. 20, 1987, 8704015

The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.

Int. Cl.[4] C21B *7/14*

U.S. Cl. 266—44 16 Claims



1. An integral preformed unitary article of refractory hollowware refractory to molten ferrous metals for use in a runner assembly for casting molten ferrous metals wherein the article is elongated, has an internal passageway having an inlet and an outlet, walls containing and completely enclosing said passageway, and a plurality of inner surfaces in said passageway between said inlet and said outlet adapted to increase the internal surface contact area of the passageway with the molten metal flowing therethrough, said increased internal surface contact area of said passageway being provided by a zigzag path arranged to effect multiple abrupt changes of direction of flow of the molten metal flowing through said passageway thereby to remove non-metallic inclusions from the molten metal by adherence to and deposition on said inner surfaces of the article.

4,913,404

CLOSURES FOR METALLURGICAL VESSEL POURING APERTURES

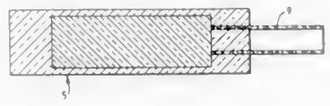
Mark O. Warman, Acklam, England, assignor to British Steel Corporation, London, England

Continuation of Ser. No. 101,066, Sep. 25, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 313,335

Claims priority, application United Kingdom, Sep. 26, 1986, 8623204

Int. Cl.[4] C21C *5/46*

U.S. Cl. 266—45 12 Claims



1. A closure member for a taphole or closure of a metal and slag containing vessel comprising a plug including a temperature reactive core swelling rapidly when subject to heat above approximately 330° C., and a skin wholly enveloping the core and being of a material softening under the effect of the heat within the range of approximately 800°–1000° C. and capable of stretching to accommodate the inner swelling core, whereby, in use, the closure member fits loosely into the taphole of a metal and slag containing vessel when initially inserted, thereby allowing placement of the closure member at any point along the inner length of the taphole, expands to fit the taphole upon exposure to heat to form a block thereto, said block resulting from the pressure exerted by said expanded closure member on the inner surface of said taphole.

4,913,405

LASER CUTTING NOZZLE, CUTTING HEAD COMPRISING SAID NOZZLE AND LASER CUTTING METHOD USING SAID ELEMENTS

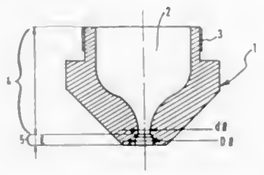
Philippe Van Der Have, Paris, and Christian Le Gall, Eragny-sur-Oise, both of France, assignors to L'air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Jan. 26, 1989, Ser. No. 301,704

Claims priority, application France, Feb. 3, 1988, 88 01240

Int. Cl.[4] B23K *26/14*

U.S. Cl. 266—48 5 Claims



1. Laser cutting nozzle comprising at least two subsequent coaxial sections, a first of said sections having an inlet and an outlet and an inside diameter which decreases from said inlet to said outlet, and having an inner envelope which is tangent at said outlet to a cylinder having a diameter d, the second section of said sections being cylindrical and having a diameter D and a length l, the ratio D/d being between 1.1 and 1.3 and the ratio l/d being between 0.35 and 1.

4,913,406

SHAFT FURNACE HAVING MEANS FOR CHARGING AND ADJUSTING A PRE-MIXTURE OF ORE AND COKE

Norio Fukushima, Tokyo; Yasunori Serizawa, Okayama; Kazuhiko Yoshida, Okayama; Shigeyasu Suzuki, Okayama; Masanobu Masukawa, Okayama, and Shoji Sakurai, Okayama, all of Japan, assignors to Kawasaki Steel Corp., Japan

Filed Aug. 25, 1987, Ser. No. 89,602

Claims priority, application Japan, Aug. 26, 1986, 61-198238; Aug. 26, 1986, 61-198239

Int. Cl.[4] C22B *7/24*

U.S. Cl. 266—92 15 Claims

1. A system for performing smelting operations comprising:

first means for supplying ore and coke for preparing a pre-mixture to charge in a shaft furnace;

second means for charging the pre-mixture of said ore and coke to said shaft furnace, said second means including a single chute to distribute the pre-mixture over varying radial cross-sections of said furnace;

third means for introducing a heating gas through tuyeres for heating the burden in said shaft furnace for obtaining molten pig metal; and

fourth means for adjusting the mixture ratio of said ore and coke so that the ore/coke mixture ratio in the central portion of the furnace is different from that in the circumferential portion of the furnace.

4,913,407

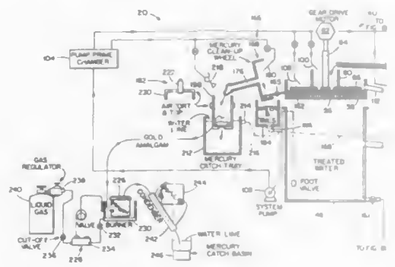
PRECIOUS METAL RECOVERY SYSTEM

Barton King, Dahlonega, Ga., assignor to International Mineral Resources, Inc., Ocean City, N.J.

Filed Jun. 15, 1988, Ser. No. 207,315

Int. Cl.[4] C22B *11/10, 11/12*

U.S. Cl. 266—148 30 Claims



1. A precious metal recovery system comprising:

a base;

a tub having a bottom and an upstanding sidewall adapted to contain liquid mercury;

a support platform for said tub mounted on said base;

leveling means for adjusting the position of said support platform on said base about mutually perpendicular axes;

a rotatable drive plate floatable on the mercury within said tub and having an upper surface, a lower surface, and an outer peripheral edge proximate to but spaced from said sidewall to thereby define an annular exit opening, said lower surface lying in a plane substantially parallel to said bottom of said tub, said drive plate having at least one ore receiving hole extending therethrough and a generally radially extending groove in said lower surface associated with each such hole;

an annular wall integral with and upstanding from said upper surface to define an ore feed chamber in communication with each ore receiving hole, said ore feed chamber adapted to receive therein precious metal containing ore;

first nozzle means for directing a spray of water into said ore feed chamber to thereby create a slurry of the core and the water;

drive means for rotating said drive plate about an axis substantially perpendicular to said lower surface, said drive means including means for accommodating different depths of mercury within said tub while maintaining said lower surface substantially parallel to said bottom; and

a receiving chamber defined by said annular wall, said upper surface of said drive plate, and said sidewall of said tub;

whereby, with rotation of said drive plate and with the aid of gravity, the ore and water slurry flows through each ore receiving hole and is drawn along the groove and dragged across the upper surface of the mercury, resulting in amalgamation of the precious metal, the resulting tails and water slurry, substantially devoid of the precious metal, being advanced through the annular exit opening between said outer peripheral edge and said sidewall and onto said upper surface in said receiving chamber.

4,913,408

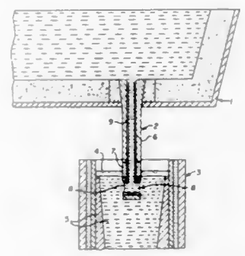
REFRACTORY LINER COMPOSITIONS

Dale B. Hoggard; Han K. Park, both of Pittsburgh, Pa., and Fiona C. R. Morrison, Northumberland, United Kingdom, assignors to Vesuvius Crucible Company, Pittsburgh, Pa.

Filed Sep. 6, 1988, Ser. No. 240,961

Int. Cl.[4] C21B *7/06;* C04B *35/54*

U.S. Cl. 266—280 11 Claims



9. A liner for resisting buildup of oxides during metal casting operations which comprises a refractory material consisting essentially of carbon and a composite selected from the group consisting of (a) zirconia and O'-sialon, and (b) zirconia and silicon oxynitride.

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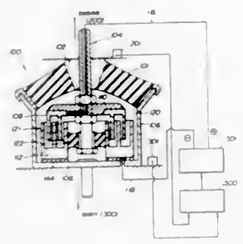
4,913,409

ELECTRONICALLY CONTROLLABLE VIBRATION DAMPER FOR USE WITH AUTOMOTIVE ENGINE OR THE LIKE

Kazuhiro Doi, Tokohama; Yasuhiko Fujiwara, Tsukui; Toshiro Abe, Mitaka, and Shinichi Matsui, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 1, 1988, Ser. No. 214,566
Claims priority, application Japan, Jul. 2, 1987, 62-165915
Int. Cl.[4] F16F 13/00; B60K 5/12
U.S. Cl. 267—140.1 10 Claims



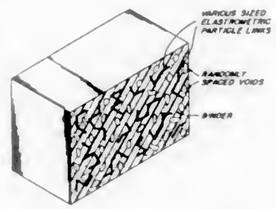
1. A vibration damping arrangement disposed between a base and a vibrating body, said damping arrangement comprising:
- a resilient member, said resilient member being operatively connected between said vibrating body and said base, said resilient member exerting a resilient force on said base when a relative displacement between said base and said vibrating body occurs;
- a housing associated with said resilient member;
- first and second electrode bodies disposed in said housing, said first and second electrode bodies being immersed in a fluid having electrorheopetic properties in a manner wherein the viscosity thereof changes with the application of voltage across said first and second electrode bodies, said first and second electrode bodies being arranged to be movable relative to one another and to define in combination with said electrorheopectic fluid, a variable damping device, said variable damping device exerting a damping force on said base, said damping force having a predetermined relationship to a relative velocity between said vibrating body and said base;
- a sensor arrangement for sensing a parameter which varies with the vibration of said vibrating body; and
- a control circuit being responsive to said sensor arrangement for determining the relative velocity and the relative displacement of said vibrating body with respect to said base, said control circuit being arranged to control the voltage applied to said first and second electrode bodies in a manner which sets the damping force to a low level when said relative velocity and relative displacement are in phase, sets the damping force to a high level when said relative displacement and relative velocity are out of phase and the relative displacement is greater than the relative velocity and, continuously decreases the damping force from said high level toward said low level when the relative velocity and relative displacement are out of phase and said relative displacement is less than said relative velocity.

4,913,410

PARTICLE FOR VIBRATION DAMPING

Robert L. Marshall, 1020 NE. 26th Ave., Pompano Beach, Fla. 33062

Continuation of Ser. No. 1,178, Jan. 7, 1987, abandoned. This application Sep. 22, 1988, Ser. No. 247,948
Int. Cl.[4] F16F 1/36, 9/30
U.S. Cl. 267—153 2 Claims



1. A composite for attenuating the transmission of vibrations from a machine to a support surface, consisting essentially of:
- elongate elastomeric particles selected from a group consisting of natural and synthetic rubbers; and
- a urethane-based polymer binding said particles together in various sized links in a configuration suitable for interposing between the machine and support surface, said polymer binder and particles forming voids randomly spaced among the interstices of said composite;

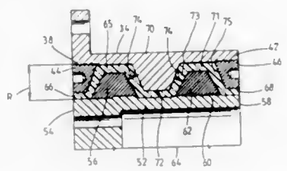
whereby the composite cooperates with the machine and the support to effect a substantial attenuation of vibrations therebetween.

4,913,411

HIGH-CAPACITY ELASTOMERIC COMBINATION JOURNAL-THRUST BEARING

Frederick E. Collins, Creswell, Oreg., and Gary L. Whightsil, Sr., Fort Worth, Tex., assignors to LTV Energy Products Co., Houston, Tex.

Continuation of Ser. No. 132,551, Dec. 14, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 314,244
Int. Cl.[4] F16F 1/38
U.S. Cl. 267—141.5 6 Claims



1. A bearing comprising:
- (a) an outer cylindrical member having a longitudinal axis and a bore extending longitudinally therethrough, said bore being defined by an annular wall;
- (b) an inner cylindrical member disposed co-axially within and radially spaced from the annular wall defining the outer cylindrical member bore;
- (c) the inner wall surface of the outer cylindrical member and the outer wall surface of the inner cylindrical member configured to define an annular space between the two cylindrical members, the annular space being serpentine in longitudinal section and defining at least one complete lobe having two longitudinally spaced, radially disposed arms which increase in longitudinal dimension with increasing radial dimension, and a longitudinally positioned arm interconnecting the radially disposed arms, and each of the radially disposed arms having a first longitudinal dimension adjacent the inner cylindrical member and a second longitudinal dimension adjacent the outer cylindrical member, the second longitudinal dimension being greater than the first longitudinal dimension;
- (d) an elastomer filling and encapsulated within the annular space,

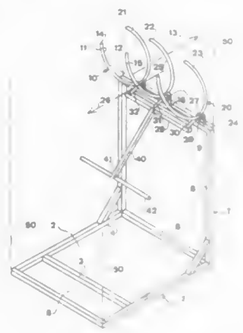
wherein as the radial distance from the longitudinal axis increases, the longitudinal thickness of the elastomer increases.

4,913,412

RACK

Henri Plouvier, 5, rue Moliere, F-59150 Wattrelos, France

PCT No. PCT/FR88/00108, § 371 Date Nov. 8, 1988, § 102(e) Date Nov. 8, 1988, PCT Pub. No. WO88/06957, PCT Pub. Date Sep. 22, 1988
PCT Filed Feb. 26, 1988, Ser. No. 286,924
Claims priority, application France, Mar. 9, 1987, 87 03155
Int. Cl.[4] B23Q 3/00
U.S. Cl. 269—159 6 Claims



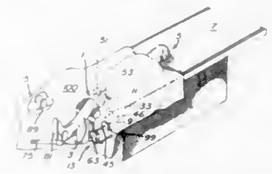
1. A rack, in particular for making up faggots, cutting logs, etc., comprising:
- a stand (1) defining a supporting polygon (5) suitable for taking position on the ground;
- a riser (7) fixed to said stand and occupying a plane substantially perpendicular thereto, said riser being situated substantially on one side of said stand:
- a first jaw (10), said first jaw being substantially in the form of a concave cylinder, with its concave side facing away from a vertical volume (50) extending over said stand and passing through said riser;
- means (9, 28) for fixedly mounting said first jaw on said riser;
- a second jaw (20), said second jaw being substantially in the form of a concave cylinder;
- means for mounting said second jaw facing said first jaw and said volume, and for rotation about an axis (24) relative to said first jaw (10) with said axis of rotation lying substantially in the intersection between the two cylindrical surfaces of said jaws, and the two jaws occupying positions relative to each other such that their concave faces face each other; and
- a lever (40, 42) fixed to said second jaw and contained within said vertical volume (50), whereby the rack is highly stable, both of the user's hands are free for cutting purposes reducing the danger of accidents, logs of various sizes and shapes may be readily cut up with ease and safety and faggots may be densely packed between said jaws.

4,913,413

UNIVERSAL LEG HOLDER

Simon Raab, Lorraine, Canada, assignor to Faro Medical Technologies Inc., Montreal, Canada

Filed Jun. 9, 1989, Ser. No. 364,199
Int. Cl.[4] A61G 13/00
U.S. Cl. 269—328 18 Claims



1. A free arm universal leg holder for supporting a leg of a patient lying on an operating table under surgical draping during surgical procedures on the supported leg;
- said leg holder comprising;
- a first support member for supporting the upper leg of said patient;
- first clamping means for clampingly mounting said first support member to said operating table such that the vertical distance between said first support member and said operating table is adjustable, said first support member being disposed under said surgical draping;
- a second support member for supporting the lower leg of said patient;
- second clamping means for clampingly mounting said second support member to said operating table, said second clamping means being disposed under said surgical draping;
- said second support member comprising a transdraping spear, said transdraping spear extending through said surgical draping into said second clamping means;
- whereby, a first part of said transdraping spear is under said surgical draping and a second part of said transdraping spear is in a sterile field outside said surgical draping;
- the remainder of said second support member being connected to the free end of the second part of said transdraping spear and being disposed in said sterile field;
- whereby said telescoping arm is pivotable about said horizontal axis;
- whereby, only said transdraping spear and the remainder of said second support member need to be sterilized before surgical use.

4,913,414

DAMPED SHEET REGISTRATION DRIVE

Michael W. Traxler, West Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 16, 1988, Ser. No. 232,836
Int. Cl.[4] B65H 31/36
U.S. Cl. 271—209 10 Claims

1. An apparatus in which a stack of sheets is aligned against a registration member on a tray, including:
- a roller adapted to advance successive sheets across the tray against the registration member to form a stack of sheets thereon;
- a plate having an aperture therein, said plate being mounted on said tray; and
- a leaf spring mounted on said plate and extending over at least a portion of the aperture therein, said leaf spring contacting said roller in a contact region and being

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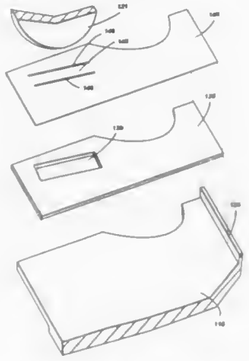
adapted to at least partially deflect into the aperture in said plate in response to movement of said roller with a sheet being interposed between said roller and said leaf spring when said roller advances the sheet.

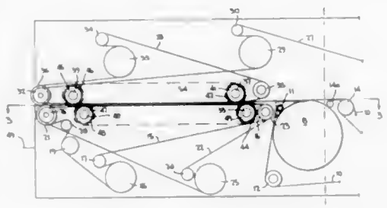


4,913,415

SHEET AND SHEET STACK DELIVERING APPARATUS

Friedrich Weber, Brensbach, Fed. Rep. of Germany, assignor to Maschinenfabrik Goebel GmbH, Darmstadt, Fed. Rep. of Germany

Filed Mar. 22, 1989, Ser. No. 327,030
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1988, 3809588
Int. Cl.[4] B65H 5/02
U.S. Cl. 271—272 3 Claims



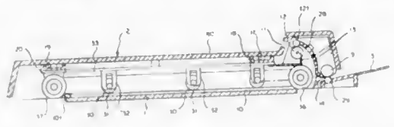
1. Apparatus for delivering a succession of sheets along a horizontal path from a sheet cutting station to a sheet collecting cylinder means at which stacks of said sheets are formed, and for delivering said stacks along said path from said cylinder means to a sheet stack depository station, comprising a frame having spaced side walls, first and second laterally adjacent tape conveyor means mounted on said frame between said side walls, said first conveyor means comprising a pair of opposing upper and lower tape conveyors, and said second conveyor means comprising a pair of opposing upper and lower tape conveyors for delivering the stacks moving between the tapes of said pairs from said cylinder means to said depository station, said first pair of tapes moving at a predetermined speed, and said second pair of tapes moving at a speed less than said predetermined speed for delivering the stacks at selective speeds, said first pair of tapes and said second pair of tapes having substantially equal horizontal stack delivery paths, and means for selectively pressing together said tapes of said first pair and said tapes of said second pair to effect the delivery of said stacks at said predetermined speed or at less than said predetemined speed.

4,913,416

AUTOMATIC DOCUMENT TRANSPORTATION DEVICE

Mitsuhiro Murata, Nara; Naofumi Okada, Tenri; Kazutoshi Yamamoto, Nara; Takuharu Tanimoto, and Tokuyasu Inoue, both of Hiroshima, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 160,183, Feb. 25, 1988, abandoned.
This application Jun. 15, 1989, Ser. No. 368,067
Claims priority, application Japan, Feb. 25, 1987, 62-27573[U]
Int. Cl.[4] B65H 29/58
U.S. Cl. 271—186 1 Claim



1. An automatic document transportation device comprising
a generally stationary first structure having a top surface,
a second structure containing document moving means,
a hinge means attached to both said first and second structures for allowing said second structure to open and close by rotating said second structure with respect to said first structure to thereby assume an open position and a closed position,
a document feeding route which is formed between said first and second structures and through which a document sheet is transported in an incoming direction to a scanning position defined on said top surface,
a discharge route through which a scanned document sheet is transported to be discharged in an outgoing direction which is in part opposite said incoming direction, said feeding route and said discharge route being connected to form a junction,
switching means for switching between said feeding route and said discharge route, said switching means including a guide piece which is rotatably supported by said second structure at said junction, said guide piece being freely rotatable to allow a document sheet to pass through said feeding route in said incoming direction when said document sheet is transported to said scanning position, said guide piece being prevented from rotating to allow a scanned document sheet moving in said outgoing direction to pass from said scanning position into said feeding route and causing said scanned document sheet to be transported through said discharge route when said scanned document sheet is transported in said outgoing direction from said scanning position, said table top having an indentation formed thereon at said junction such that a free edge of said guide piece falls into said indentation when said second structure assumes said closed position with respect to said first structure.

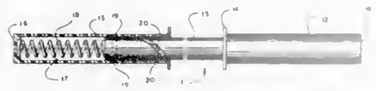
4,913,417

UPPER BODY EXERCISING DEVICE

Nicholas J. Francu, 406 Iveys Scenic Dr., Albany, Ga. 31707

Filed Dec. 5, 1988, Ser. No. 279,988
Int. Cl.[4] A63B 21/02, 5/00
U.S. Cl. 272—67 4 Claims

1. A torsional twist hand exercise device comprising first and second hand grips disposed in contiguous end-to-end relation on a common longitudinal central axis, said hand grips being operatively interconnected with one another so as to maintain said hand grips in contiguous relationship to permit both relative rotation and axial longitudinal movement between said hand grips,
a shaft extending along the common longitudinal central axis from the first hand grip, said shaft being affixed at one end to the first hand grip and being free at the other end thereof;
the second hand grip having a central longitudinally extending axial bore, said bore having a diameter greater than said first hand grip shaft, said axial bore having one closed end and one open end adapted to receive the first hand grip shaft in telescopic engagement,
spring means supported within the second hand grip axial bore, said spring means being located in juxtaposition between the closed end of the second hand grip and the free end of the first hand grip shaft,
rotational means located adjacent to the free end of said first hand grip shaft to cause relative rotation of the first and second hand grips when said grips are moved longitudinally with respect to one another,



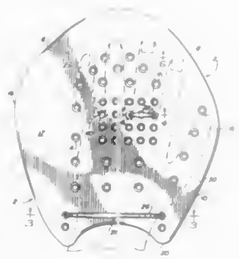
said rotational means comprising a track means integral with the first hand grip shaft, said track means extending a predetermined distance longitudinally along said first hand grip shaft,
follower means affixed to the second hand grip and being matingly engaged with said track means whereby when the hand grips are axially reciprocated relative to one another, the interaction of the follower means with the track means causes the hand grips to rotate about the common longitudinal central axis in opposing directions, and
said follower means comprising a pin extending through the diameter of the second hand grip and through the diameter of the hand grip shaft, and being in juxtaposition with the track means.

4,913,418

SWIM AND EXERCISE PADDLE IMPROVEMENT

Nancy J. Schlueter, Phoenix, and Ronald L. Johnson, Scottsdale, both of Ariz., assignors to Speedshop, Inc., Phoenix, Ariz.

Filed Nov. 25, 1968, Ser. No. 276,347
Int. Cl.[4] A63B 31/00, 21/00
U.S. Cl. 272—71 15 Claims



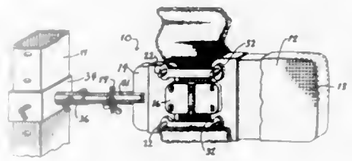
1. A swimmer's hand paddle comprising:
(a) a surface area substantially wider than the user's hand;
(b) means defining, by the orientation of the user's hand on said surface area, a thumb side of said area and a little finger side of said area;
(c) a perforated paddle section comprising a plurality of perforations on said surface area, approximately the size of the user's hand, displaced to the edge of said surface area on said thumb side;
(d) means for attaching the user's hand to the paddle over the area of said perforations, said attaching means positionally adjustable on said plurality of perforations
whereby the user's hand feels the flow of the water through said perforations, and the unperforated surface area provides a foil in the little finger side of the paddle.

4,913,419

STRIKING APPARATUS WITH VARIABLY RESISTANT RESILIENT JOINT

Patrick McAuliffe, 2350 S. Filbert St., Allentown, Pa. 18103

Filed Jan. 3, 1989, Ser. No. 292,893
Int. Cl.[4] A63B 69/00
U.S. Cl. 272—76 9 Claims



1. A striking apparatus with a resilient joint, comprising:
(a) a hinge member defining a resilient joint between a blow-receiving target and a stationary support, said hinge member including:
(i) two identical, resilient hinge leaves having generally rounded ends;
(ii) means to attach each said hinge leaf to the other in generally parallel juxtaposition to form a hinge with two pairs of ends, the hinge defining a perferential hinge axis;
(iii) means to retain planar objects between the pairs of ends of said hinge leaves;
(b) a generally planar base section, retained between one pair of ends of said hinge leaves, the blow receiving target being retained between the other pair of ends of said hinge leaves, opposite said base section;
(c) a support arm at one end of said base section;
(d) means for attaching the support arm to said stationary support.
(e) a plurality of extending posts located on the planar surfaces of the blow-receiving target and the base section proximate said hinge leaves, for receiving damper bands operable to restrict movement of said hinge means around said hinge axis.

4,913,420

STARTING BLOCK FOR RUNNERS

Charles W. Moye, Akron, Ohio, assignor to All Ohio Youth Athletic Club, Akron, Ohio

Continuation-in-part of Ser. No. 856,589, Apr. 25, 1986, Pat. No. 4,754,965. This application Jun. 1, 1988, Ser. No. 201,055
Int. Cl.[4] A63K 3/02
U.S. Cl. 272—105 20 Claims

1. Starting block apparatus for a runner to be used on a track having running lanes extending from a starting line to a finish line comprising, frame means for positioning in alignment with a running lane proximate to the starting line, means for maintaining said frame means at a selected location on the track, first pad means attached longitudinally of said frame means and having a substantially horizontal surface for supporting the front foot of a runner in a standing position, and second pad means selectively attachable longitudinally of said frame means and having an angularly upwardly extending surface for

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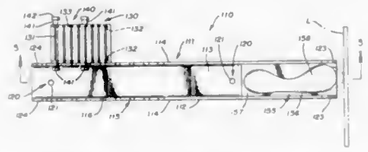
engagement by the rear foot of a runner in a standing position to assist in thrusting the runner across the starting line in a running lane toward the finish line, said first pad means being



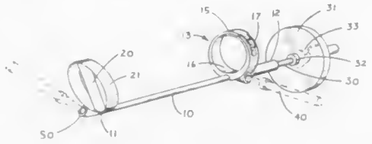
mounted on and in lateral alignment with said frame means and said second pad means extending laterally to one side of said frame means.

4,913,421

HAND HELD EXERCISE APPARATUS

Alan B. Bachman, 59 Richard Sweet Dr., Woodbridge, Conn. 06525

Filed Jan. 3, 1989, Ser. No. 292,835
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—117 **11 Claims**



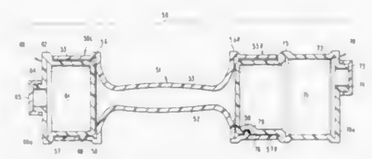
1. A hand held exercise apparatus which comprises: tubular attachment means having a first and second end portion; arm engagement means affixed to said tubular attachment means operative to restrain the arm in a position substantially parallel to the tubular attachment means; a hand grip affixed to the tubular attachment means adjacent the first end portion; and a weight supporting means on at least one of said first and second end portions of the tubular attachment means carried at an acute angle of less than 60° with respect to said tubular attachment means adapted for supporting at least one exercise weight, wherein said weight supporting means is located on the same side of the tubular attachment means as the arm engagement means.

4,913,422

BARBELL HAVING HOLLOW INTERLOCKING WEIGHTS

Connie Elmore; Jennifer C. Elmore; John-Michael Elmore, and Michael R. Elmore, all of 819 S. 4th St., Terre Haute, Ind. 47807

Filed Oct. 13, 1988, Ser. No. 257,207
Int. Cl.[4] A63B *13/00*
U.S. Cl. 272—123 **8 Claims**



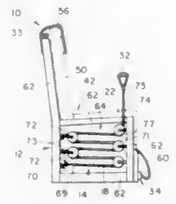
1. A dumbbell weight assembly comprising:
a tubular body having an outer wall defining an elongated handle and a sleeve at each end of said handle;
a number of hollow add-on weights, each of said add-on weights having an outer wall defining;
an interior chamber;
means for filling said interior chamber with an inert substance; and
an annular step sized to be slidably received within said sleeve; and
resiliently deformable means, between said sleeve and said annular step, for removably engaging one of said number of hollow add-on weights within said sleeve at either end of said handle when said annular step is slidably received within said sleeve.

4,913,423

EXERCISE FURNITURE

Mitchell R. Farran, 736 Bristol N.W., Walker, Mich. 59504, and Marc G.. Farran, 2252 Walker Ave., Walker, both of Mich. 49504

Filed Jun. 6, 1988, Ser. No. 202,408
Int. Cl.[4] A63B *21/00;* **A47C** *7/62*
U.S. Cl. 272—134 **31 Claims**



1. A furniture article for use in physical exercise, comprising:
a furniture article frame defining a seating article having a seat and at least one raised armrest;
an armrest exercise element mounted on said frame, said exercise element having means for coupling said armrest exercise element to a person using said furniture article, said armrest exercise element adapted to provide selective movement of said armrest coupling means generally away from said frame and generally toward said frame;
means for resisting movement of said armrest coupling means away from said frame;
means for selectively covering said frame and said resisting means so as to provide said furniture article with the appearance of a conventional furniture article used in residences and offices;
said armrest having an armrest aperture through which said armrest exercise element slidably extends from within said covering means to a region outside of said covering means, whereby said furniture provides a dual function of providing a user with the ability to selectively exercise at least one body region with said furniture article with said resisting means providing an exercise force, and also providing an aesthetically pleasing furniture article having an appearance typically associated with residences and offices.

4,913,424

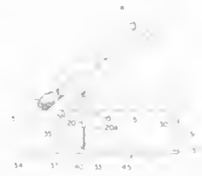
SLANT BOARD WITH AUTOMATIC FOOT RELEASE

Rene A. Pepin, P.O. Box 712, Trinidad, Colo. 81082

Continuation of Ser. No. 74,165, Jul. 6, 1987, abandoned. This application Feb. 2, 1989, Ser. No. 306,206
Int. Cl.[4] A63B *23/02*
U.S. Cl. 272—144 **4 Claims**

1. A slant board inversion table, comprising:
a frame;

a table top having an opening therein, said table top being pivotally connected with said frame for supporting a body;
tilting means for causing pivotal movement of said table top between a normal horizontal position and an inclined position;
a T-bar for securing a users feet on said table top which passes through said opening in said table, wherein the bottom of said T-bar contacts said frame when said table top is in said horizontal position thereby causing said T-bar to slide upwardly through said opening in said table top, said T-bar having an inclined surface; and
locking means for locking said T-bar when said table top is in said inclined position and for automatically unlocking said T-bar when said table top is in said horizontal position, wherein said locking means comprises: a slip tube located under said opening, part of said T-bar being located inside said slide tube; a ball bearing located between said inclined surface of said T-bar and an inner surface of said slip tube; a spring for biasing said ball bearing and wedging said ball bearing between said inclined surface of said T-bar and said inside surface of said slip tube to wedge said T-bar against said inner surface of said slip tube; and a ball bearing follower pin located inside of said T-bar, one end of said pin being in contact with said ball bearing and the other end of said pin being in contact with said frame when said table is in said normal horizontal position, wherein said pin pushes said ball bearing against the bias of said spring when said table is in said normal position to unwedge or disengage said ball bearing from between said inclined surface of said T-bar and said inner surface of said slip tube to allow said T-bar to slide upwardly through said opening in said table when the bottom of said T-bar contacts said frame.



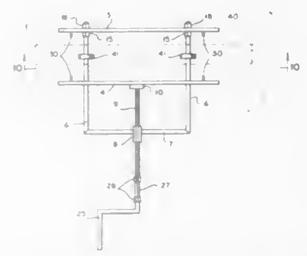
4,913,425

PORTABLE SAWBUCK

Gerald R. Anderson, 5680 Spokane Ranch Rd., East Helena, Mont. 59635

Filed Jan. 30, 1989, Ser. No. 303,304
Int. Cl.[4] B23Q *3/02*
U.S. Cl. 269—97 7 Claims

1. A sawbuck for use with vertical support members or sawhorses comprising:
(a) a clamp plate having a front, a back, and a perimeter, said clamp plate also being generally rectangular and having a plurality of holes placed around the perimeter;
(b) a center plate also having a front, a perimeter, and a back and being generally rectangular, said center plate also having a plurality of holes placed around the perimeter, said holes being aligned with the holesin the perimeter of said clamp plate;
(c) a plurality of bolts, said bolts also having nuts thereon, placed through the holesin the clamp and center plates, connecting said plates together in oppositely disposed planes, with the front of said center plate facing the clamp plate, said bolts having enough length to adjust the distance between the plates to enable the plates to act as a clmap when a vertical support member is placed between the plates and the nuts are securely tightened;
(d) two horizontal support members each having two ends, being oppositely disposed within the same horizontal plane, and being fixedly connected to the center plate at one end of said horizontal support members and extending outwardly from the back of said center plate in an opposite direction from the clamp;



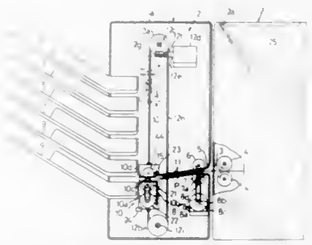
(e) a tie bar, fixedly attacbed to the second end of each of the horizontal support members such that said horizontal support members and said tie bar form a yoke;
(f) a vice plate also having a front a back and a perimeter, said vice plate also being generally rectangular, said vice plate being slidably attached to said yoke; and
(g) adjustment means fixedly attached to said yoke and said vice plate such that said vice plate can be moved with respect to said center plate, thereby forming a vice between the slidable vice plate and the back of the fixed center plate.

4,913,426

SORTER

Tamaki Kaneko, Fujisawa, Japan, assignor to O/A Technologies, Inc., Irvine, Calif.

Continuation of Ser. No. 159,416, Feb. 16, 1988, abandoned, which is a continuation of Ser. No. 943,689, Dec. 19, 1986, abandoned. This application May 17, 1989, Ser. No. 353,210
Claims priority, application Japan, Dec. 20, 1985, 60-287295; Dec. 20, 1985, 60-287296; Dec. 23, 1985, 60-196478[U]; Dec. 30, 1985, 60-298335; Dec. 30, 1985, 60-298336; Dec. 30, 1985, 60-298337; Jan. 17, 1986, 61-006317; Jan. 17, 1986, 61-006318; Feb. 17, 1986, 61-030748; Aug. 20, 1986, 61-194155; Oct. 23, 1986, 61-250750
Int. Cl.[4] B65H *39/10*
U.S. Cl. 271—296 **17 Claims**



1. A sorter comprising:
a plurality of receptacles vertically disposed at given intervals,

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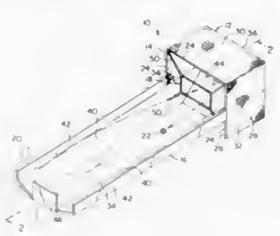
a lift member disposed close to said receptacles and movable up and down,
a lift drive means for raising and lowering said lift member,
a recorded sheet pinch means disposed on said lift member to momentarily hold recorded sheets discharged to the sorter,
a recorded sheet discharge means disposed on said lift member to transfer recorded sheets to the receptacles, and
drive means for driving one of said recorded sheet pinch means and said recorded sheet discharge means,
control means including means to control said lift drive means such that said lift member stands at a given home position to receive a recorded sheet and moves to a target position while holding the recorded sheet received using said recorded sheet pinch means, said control means further including means for controlling said recorded sheet discharge means to discharge the recorded sheet onto the target receptacle, and said control means yet further including means for returning said lift member to said home position from said target position,
wherein said drive means for one of said recorded sheet pinch means and said recorded sheet discharge means is disposed on said lift member, and wherein said lift drive means is not disposed on said lift means.

4,913,427

BASEBALL PITCHING TARGET WITH A BALL RETURN

Jackie L. Wilson, 138-35 223rd St., Laurelton, N.Y. 11413

Filed Sep. 12, 1988, Ser. No. 242,648
Int. Cl.[4] A63B *71/02*
U.S. Cl. 273—26 A 3 Claims



1. A baseball pitching target with a ball return, comprising:
(a) a boxshaped enclosure having an open front end and including a plurality of poles affixed together to form a frame structure, a piece of tough durable material covering said frame structure forming a top wall, a right side wall, a left side wall, and a rear wall for stopping the baseball;
(b) a return chute angularly elevated to extend away from said boxshaped enclosure and including an elongated flat floor having a rear end and a front end, a pair of side angular floors, each extending away at an opposite side of said elongated flat floor, a pair of side walls, each extending upwardly at an opposite side to one of said pair of side angular floors, a rear angular wall extending away from said rear end of said elongated flat floor and said pair of side angular floors, so that said rear angular wall extending under said top wall to bear against said rear wall of said boxshaped enclosure, a pair of spaced apart vertical legs disposed at said rear end of said elongated flat floor for angularly elevating said return chute, and a front wall extending upwardly at said front end of said elongated flat floor to stop the baseball when the baseball is rolling down the return chute, said front wall and said front end of said flat floor in said return chute further including a tongue and groove arrangement therebetween so that said front wall can be removed therefrom for allowing the baseball to roll out of said return chute for fielding practice;
(c) a target frame vertically suspended between said open front end of said boxshaped enclosure and said return chute, so that a person standing at said return chute can pitch a baseball through said target frame and the baseball being stopped by said boxshaped enclosure and falling into said return chute to be returned back to the person, said target frame further including four support members, each of which extending from one corner thereof for vertically suspending said target frame between said plurality of poles of said boxshaped enclosure and said pair of side angular floors of said return chute.

4,913,428

PORTABLE NET TIGHTENING POST ASSEMBLY

Earl J. Nauman, 1003 U.S. Rte. 52, Amboy, Ill. 61310

Continuation of Ser. No. 776,886, Sep. 17, 1985, abandoned. This application Jan. 9, 1989, Ser. No. 294,796
Int. Cl.[4] A63B *69/00*
U.S. Cl. 273—29 BC 20 Claims

1. A portable self-supporting post assembly comprising:
a substantially flat base plate having a top surface, a bottom surface and side edges, including an inside edge and an opposite outside edge, circumscribing said top and bottom surfaces;
a post joined to and extending upwardly from said top surface of said base plate at a location adjacent said inside edge which is substantially closer to said inside edge than said outside edge; and
at least one resilient prong having a lateral cross-section of substantially greater width than thickness, said prong having a free first end adapted to penetrate a support surface and a second end rigidly fastened to said base plate at a location displaced a finite distance in an outward direction along the plane of said base plate from the location of said post, said prong being oriented with its width generally transversal to said outward direction and extending longitudinally downwardly from said bottom surface of said base plate and curving smoothly outwardly along a substantial portion of its length so that said free first end thereof extends downwardly and away from the location of said post.

4,913,429

BOWLING BALL

John P. Fabanich, 4301 Colorado Ave., Sheffield Village, Ohio 44054

Filed Sep. 29, 1988, Ser. No. 250,923
Int. Cl.[4] A63B *37/06, 37/10*
U.S. Cl. 273—63 E 8 Claims

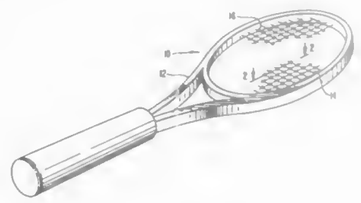
1. A bowling ball having a top side and positive side comprising:
a core including a main body including a plurality of weights having configurations which are irregular and different from each other, said weights generally lying in the same plane and on the outer surface of said core, and
an outer spherical shell member, said shell member completely encapsulating said core member, said core member not necessarily being located at the center of said outer shell, said location determined by the weight desired at the top of the ball.

4,913,430

TENNIS RACKET STRINGS HAVING ORTHOGONALLY DIRECTED PROTRUSIONS FOR ENHANCING THE GRIP WHEN IN CONTACT WITH A TENNIS BALL

Leo Lichtenstein, 1950 Tarpon Ct., Wesley Chapel, Fla. 34249

Filed Jan. 20, 1988, Ser. No. 145,988
Int. Cl.[4] A63B *51/10*
U.S. Cl. 273—73 D 2 Claims



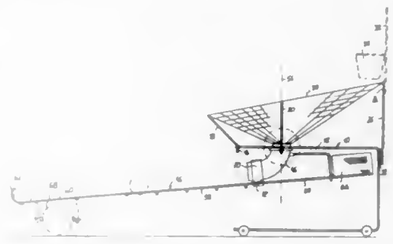
1. A racket comprising:
a frame;
a plurality of strings mounted on the frame to form a plane;
a plurality of strings interlaced to form a plurality of intersections in the plane;
a plurality of sets of metallic wires, each set of wires being comprised of four metallic wires respectively extending through individual quadrants formed by the intersection of strings and combined to from a pair of fixedly positioned twisted wire protrusions orthogonally extending along a common axis outwardly from both sides of the plane, wherein the twisted wire protrusions have end surfaces which are substantially parallel to the plane and the protrusions are resistant to deformation caused by contact with a ball during play; and wherein
the four metallic wires extend through the four quadrants to prevent movement of the strings against each other and provide the protrusions with a resistance to deformation and the end surfaces of the protrusions enhance spin control of a ball hit by the racket.

4,913,431

BASKETBALL RETRIEVAL AND RETURN DEVICE

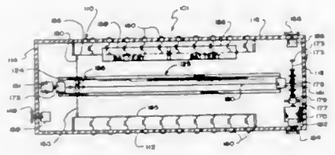
Benedikt Jakobs, Hassberg 1, D-8960 Kempten, Fed. Rep. of Germany

Filed Sep. 22, 1988, Ser. No. 247,902
Int. Cl.[4] A63B *69/00*
U.S. Cl. 273—1.5 A 12 Claims



1. A basketball retrieval and return device for use with a basketball having a basketball diameter, on a playing court with a basket and a shot position spaced from the basket, the device comprising:
a retriever in the shape of a funnel having front, rear and side walls defining an enlarged upward opening, the front, rear and side walls being inclined downwardly and inwardly to a downward opening having a vertical axis and a diameter which is greater than the basketball diameter;
a frame connected to the retriever for supporting the retriever around the vertical axis;
elongated guiding means arranged beneath the downward opening and pivotally supported on the frame for swinging movement about the vertical axis, the elongated guiding means having a front portion extending forwardly from the vertical axis to a discharge end which is adapted to be spaced above the playing court, the elongated guided means having a rear portion extending from the vertical axis in an opposite direction from the front portion, the guiding means comprising a straight, projecting running duct inclined downwardly from the downward opening of the retriever to the discharge end, the running duct having a longitudinal length which is at least twice as great as a vertical height of the retriever from the downward opening to the upward opening thereof, the running duct being adapted for extending to the shot position of the playing court when the vertical axis of the downward opening is positioned in front of the basket of the playing court; and
a counterweight connected to the rear portion of the guiding means, the counterweight having a weight selected for substantially counter balancing the elongated guiding means about the vertical axis whereby the running duct can be swung around the vertical axis by the application of a small pushing force against the discharge end of the guiding means.

4,913,432
ELECTROMECHANICAL REACTION-TIME GAME TOY
James M. Barra, 14802 Florida Ave., Apt. V-340, Tampa, Fla. 33613
Continuation-in-part of Ser. No. 90,856, Aug. 31, 1987, Pat. No. 4,789,155. This application Dec. 5, 1988, Ser. No. 279,819
Int. Cl.[4] A63B 67/00
U.S. Cl. 273—1 GC 21 Claims



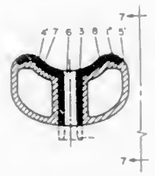
1. Competitive game toy, comprising
drive means including a motor traversing triggered indicator means along a given path,
light means located along such path and lighted sequentially as the indicator means passes therealong, and
stop means manually actuated to halt the indicator means therealong with an indicator light so lighted.

4,913,433
PROTECTIVE LINING FOR BOWLING ALLEY
Lucien Rochefort, Beauport, Canada, assignor to Mendes Inc., Caron, Canada
Filed Feb. 6, 1989, Ser. No. 306,408
Int. Cl.[4] A63D 1/00
U.S. Cl. 273—51 9 Claims

1. For use in a conventional make bowling alley having at least one elongated runway, at least one downwardly offset concave gutter sidewisely depending from said runway, and at least one upwardly offset partition bar sidewisely depending from the side edge of said gutter opposite said runway, a first wear-resistant semi-rigid protecting member for removably covering the upper portion of said partition bar, and a second wear-resistant flexible protecting member for removably covering the top face of said gutter; wherein each of said first and second protecting members further have guide means whereby should the ball inadvertently engage said gutter or said bar, said guide means will bias the bowling ball to travel in a path parallel to said elongated runway, said guide means furthermore prolonging the useful lifetime of said bowling alley.

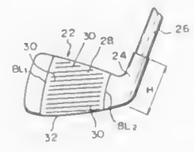
4,913,434
FRAME FOR A BALL GAME RACQUET
Josef Fischer, Ried im Innkreis, Austria, assignor to Fischer Gesellschaft m.b.H., Ried im Innkreis, Austria
Filed May 3, 1988, Ser. No. 189,843
Claims priority, application Austria, May 5, 1987, 1122/87
Int. Cl.[4] A63B 49/14
U.S. Cl. 273—73 C 4 Claims

1. A frame for a ball game racquet, in particular a tennis or squash racquet, comprising a solid central strip extending at least along a circumference of a racquet hitting area and having passages therein through which guts of the racquet are to be strung to define a plane of the hitting area, and two hollow profiles, made of duroplastic, fibre reinforced synthetic resin, which are not connected to each other in the area of the central strip but are connected to opposite sides of the central strip with respect to the plane of the hitting area defined by the guts when the guts are strung through the passages in the central strip, the passages through which the guts are strung being provided solely in the central strip, the central strip being made from a synthetic resin having a hardness value smaller than



that of the guts, the central strip extending from an inward side to at least an outward side of the frame, and the central strip comprising lateral extensions on outer peripheral portions of the frame, the extensions extending laterally in opposite directions adjacent to respective outer rims of the hollow profiles and merging therewith in an integrated manner.

4,913,435
GOLF CLUB AND A SET OF GOLF CLUBS
Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Co., Ltd., Tokyo, Japan
Filed Aug. 24, 1987, Ser. No. 88,452
Claims priority, application Japan, Aug. 29, 1986, 61-201762
Int. Cl.[4] A63B 69/36
U.S. Cl. 273—77 A 14 Claims

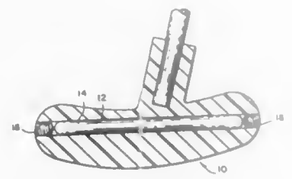


1. In an iron club having a shaft, a head having a toe profile provided at one end of said shaft, and a grip provided at the other end of said shaft, said iron club, comprising: indication means provided on said head for indicating a direction in which a player should move the iron club on a backswing when addressing a ball and for ensuring by a player that a downswing is on a straight line, wherein said indication means comprises a pair of boundary lines which define a scored zone formed on a face of said head, wherein said pair of boundary lines extending upwardly from a sole of said head and obliquely toward a heel side of said head to describe a pair of circular arcs in parallel so that said pair of boundary lines appear to substantially extend in parallel with a straight line when a player is addressing the ball and appear to accord with an orbit of a swing of said head along a straight line, wherein said toe profile of said head is formed in an oblique shape in parallel with said pair of boundary lines in such a manner that a weight distribution of a body of said head is toward the toe side thereof so that a moment of inertia of said head body, when swung, is further increased.

4,913,436
PUZZLES AND GAME BASED ON GEOMETRIC SHAPES
Shuo-Yen R. Li, 820 Long Hill Rd., Gillette, N.J. 07933
Filed Nov. 25, 1988, Ser. No. 276,290
Int. Cl.[4] A63F 9/10
U.S. Cl. 273—157 R 11 Claims

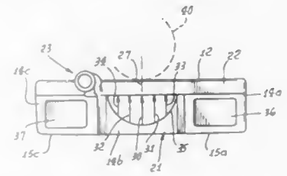
1. A puzzle comprising N initial configurations of identical geometric shape, with $N>3$, such that said shape is a regular polygon having equal length sides and equal vertex angles, and wherein said puzzle is solved by first assembling two of said initial configurations into a merged configuration having said shape to yield $(N-1)$ total number of remaining configurations, and then assembling two of said $(N-1)$ remaining configurations into another merged configuration having said shape to yield $(N-2)$ total number of configurations using an assembly method which is non-identical to the preceding assembly method, and continuing to assemble pairs from said configurations remaining after each merger using an assembly method which is non-identical to the immediately preceding assembly method, to obtain finally a single merged configuration having said shape and being composed of all of said initial configurations.

4,913,437
ILLUMINATED GOLF CLUB
Nelson F. Newcomb, and Nelson F. Newcomb, Jr., both of Windlehlo Rd., Mirror Lake, N.H. 03853
Filed Jun. 6, 1989, Ser. No. 361,913
Int. Cl.[4] A63B 53/04, 69/36
U.S. Cl. 273—162 R 19 Claims



18. A golf club comprising a shaft and a head provided with a striking face embodying a chemiluminescent module.

4,913,438
GOLF CLUB
Donald A. Anderson, 19281 Tobago La., Huntington Beach, Calif. 92646
Continuation of Ser. No. 7,097, Jan. 27, 1987, Pat. No. 4,762,324. This application Jul. 22, 1988, Ser. No. 222,896
The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.
Int. Cl.[4] A63B 53/04
U.S. Cl. 273—164 11 Claims



1. In a golf putter having a head defining a ball striking front face, a bottom surface, a top surface, a rear surface, a heel and a toe, the improvement comprising:
(a) the top surface having first, second and third regions respectively near the toe, mid-extent of the head and heel,
(b) each of the first and third regions having a recess sunk vertically therein,
(c) and metallic weights received in said region top surface so that the outlines of said recesses and weights are confined within said regions, the recesses having bottom walls spaced above the bottom surface of the head,
(d) the head defining a ledge proximate said second region, the ledge having a top surface extending generally at the levels of the lowermost portions of said weights, and including a main marker on the ledge directed toward the front face of the head, said marker being located at substantially the mid-point between said recesses,
(e) and the head defining a forward upright wall that extends between and forwardly of said first and third regions and above their levels, the putter having a hosel integral with said wall at a location above the top levels of said first and third regions,
(f) the weights characterized by bottom surfaces substantially in a horizontal plane defined by the ledge top surface.

4,913,439
GOLF PRACTICE NET APPARATUS
Carroll M. Ellington, Charlotte, N.C., assignor to Performance Golf Products, Inc., Charlotte, N.C.
Filed May 19, 1989, Ser. No. 353,958
Int. Cl.[4] A63B 69/36
U.S. Cl. 273—181 F 7 Claims

1. A golf practice net apparatus, comprising:
a cross-member having a pair of elongate arm portions movably interconnected to one another for selective movement between a deployed position in which said arm portions are oriented in general alignment to one another and a storage position in which said arm portions are oriented in adjacent, generally facing relation to one another;
a net secured to said cross-member for movement therewith between the deployed and storage positions;
a pair of upright support members, each support member having an elongate leg portion and a foot portion mounted at one end of said leg portion and extending generally transversely thereto, and each support member including means for connecting and disconnecting said net thereto,
a pair of leg extension members, one end of each extension member being connectible to and disconnectible from the leg portion of a respective one of said support members

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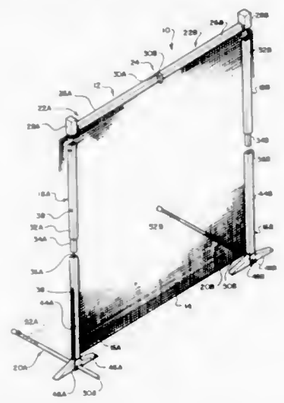
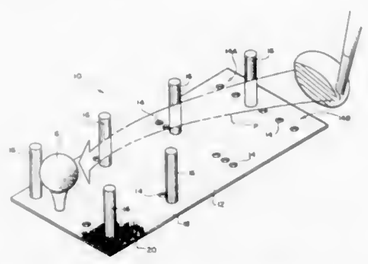
and the other end of each extension member being connectible to and disconnectible from a respective arm portion of said cross-member, each extension member having means for connecting and disconnecting said net thereto; and

a pair of elongate stabilizer members, each said stabilizer member being selectively connectible to a respective one of said support members for supporting the support member in a generally upright disposition and said cross-member in a generally horizontal disposition, and each said stabilizer member being selectively disconnectible from the respective support member,

whereby said support members, said cross-member, said net and said stabilizer members are assemblable together to deploy said net in a generally upright fully extended disposition for retarding the speed of a golf ball propelled thereagainst and are disassemblable into a relatively compact, hand carryable arrangement.



4,913,440
GOLF CLUB SWING TRAINING APPARATUS
Carroll M. Ellington, Charlotte, N.C., assignor to Performance Golf Products, Inc., Charlotte, N.C.
Filed Dec. 1, 1988, Ser. No. 278,660
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—186 R **10 Claims**



1. Apparatus for training a user to swing a golf club in a predetermined desired swing path, comprising a generally planar base for disposition on a generally flat practice surface in generally parallel facing relation thereto, said base including a linear central swing path area extending between forward and rearward ends of said base for disposition of said base during use with said central area essentially parallel to a user's stance along one lateral side of said base, said central area including a golf ball support, a golf ball supported thereon, a first set of said swing guide members arranged along the side of said central area opposite said one lateral side of said base in an oblique alignment with respect to said central area with the rearwardmost swing guide member more closely spaced to said central area than the forwardmost swing guide member, and a second set of said swing guide members arranged along the same side of said central area as said one lateral side of said base in a parallel alignment with respect to said central area, the forwardmost one of each said set of said swing guide members being located generally laterally adjacent said golf ball support, said first and second sets of swing guide members defining therebetween an oblique "inside-to-square" golf club swing path to said golf ball support.

4,913,441
LASER GOLF TRAINING DEVICE
Robert N. Freer, West Berlin, N.J., assignor to Laser Track, Inc., Blackwood, N.J.
Filed Aug. 5, 1988, Ser. No. 229,519
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—186 A **22 Claims**

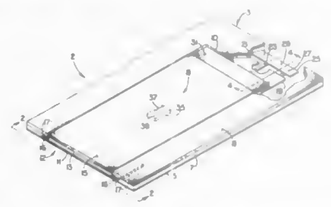
18. A golf training device adapted to be connected to a power source, said device comprising:

grip means for holding said device, said grip means being hollow and having a top and a bottom and a longitudinal axis therethrough; and

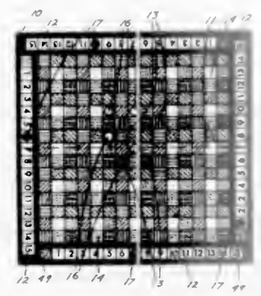
light generating means within said grip means for generating a collimated light beam and projecting said collimated light beam out of said grip means, said light generating means being adapted to be connected to said power source.

4,913,442
HORIZONTALLY-RESILIENT GOLF TEE MAT
Grant W. Walker, 4339 Lantzy Ct., Sacramento, Calif. 95825
Filed May 22, 1989, Ser. No. 355,199
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—195 A **12 Claims**

8. A golf practice device comprising a sliding pad which serves as a golf ball hitting surface, said sliding pad being mounted for sliding motion within a generally planar, U-shaped stance pad having an upper surface even with said hitting surface, said sliding pad being resiliently biased for nesting within said U and having a first end proximal to the apex of said U and a second distal end having a pair of tongues no longer than about a third of the length of said sliding pad which engage mating grooves in the adjacent portion of the stance pad.



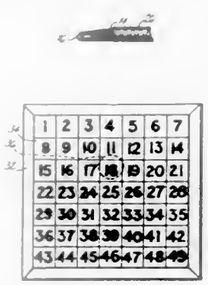
4,913,443
BOARD GAME OF TAG
Gene G. Carrey, Jr., 982 E. Lassen Ave. #39, Chico, Calif. 95926
Filed Oct. 11, 1988, Ser. No. 255,858
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—244 **1 Claim**



1. A board game with cooperative parts and instructions for playing a game of "tag" comprising:

a game play board centrally hinged and foldable into two sections which when folded produce two outwardly faced section surfaces forming a cover side and two inwardly faced section surfaces together forming a game playing side; said game playing side having a matrix of colored squares each square being colored with one of nine different colors; said matrix of colored squares being divided into groups: each group comprises a matrix of nine squares; each of the nine squares in each of said groups being distinguishably colored wherein each group has nine differently colored squares; and bordering along all four edges of said field there being white colored scoring strips squared and numbered 1 to 15 useful for scoring by two to four players, said scoring strips each having a colored starting square preceding said numbered squares at said number 1; said starting squares being four in number and each starting square being distinguishably colored with one of said nine different colors to match two similarly colored markers supplied each player with one said marker being a player's position marker for use on said playing field and the other said marker being a player's scoring marker for use on said scoring strip; said supplied markers being eight in number and moved according to supplied instructions; a plurality of colored playing cards drawn from four nine-card decks, one deck supplied to each said player; said nine cards in each player's deck each having a face side colored to correspond to one of said nine different colors, wherein said nine different colors are represented on each deck.

4,913,444
REVERSIBLE DART BOARD
Lee R. Hatt, 6516 Bikini Way, Sarasota, Fla. 34241
Filed Oct. 3, 1988, Ser. No. 252,673
Int. Cl.[4] F41J *3/00*
U.S. Cl. 273—408 **10 Claims**



10. A reversible dart board comprising:

a rectilinear frame having a back portion and a raised peripheral front portion secured to said back portion defining a target receiving space;

said back portion of said frame having four edges and each edge having an extension;

said raised peripheral portion is formed by folding said extensions parallel to the respective edges;

said extensions are folded two times;

said raised peripheral portion is adhesively secured to said back portion;

said back portion includes a cut-out area through which said target can be pushed, facilitating removal of said target from said frame;

a target sized to fit snugly within said target receiving space;

said target having an obverse target face divided into a first plurality of equal areas;

said target having a reverse target face divided into a second plurality of equal areas different from said first plurality of equal areas;

each area in said first plurality of equal areas containing a different number from a first sequence of numbers;

each area in said second plurality of equal areas containing a different number from a second sequence of numbers; and

both said frame and said target are fabricated of material suitable for releasably holding a dart point.

4,913,445
METHOD OF AND APPARATUS FOR ORIENTATING BOWLING PINS
James H. Paxton, 9324 River Rd., Spring Hill, Fla. 34608
Filed May 10, 1989, Ser. No. 349,764
Int. Cl.[4] A63D *5/09*
U.S. Cl. 273—43 D **10 Claims**

10. In an automatic bowling pin setting machine a pair of adjustable orientating rods mounted on a top surface of a pin wheel guard at each side of an exit from a pin wheel shielded by the guard, the rods being above an edge of a turnaround pan receiving pins from the pin wheel exit, each rod extending downwardly from the pin wheel guard to contact the head of

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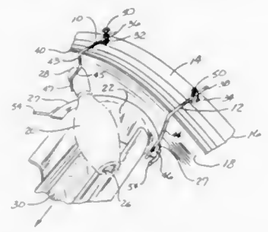
a bowling pin exiting from the pin wheel and causing the bowling pin to orient base end down when leaving the turn-



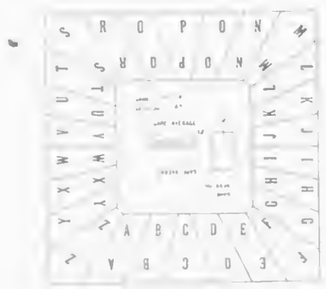
around pan to move along a distributor belt attached to the turnaround pan at an end distal from the pin wheel.

4,913,446

TRADING GAME AND METHOD FOR CONTINUING PLAYING

Martha Winkelman, 9195 Collins Ave., Apt. 6-6, Surfside, Fla. 33154

Filed Jul. 21, 1986, Ser. No. 887,908
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—240 **28 Claims**



4. A trading game for playing a plurality of game variations simulating the buying and selling of at least one of a plurality of tangible and intangible properties, said trading game comprising: a gameboard having a primary area segmented into a predetermined number of playing spaces providing accommodation for defining a plurality of playing activities conducted by players during a game, with each player participating in at least one of said plurality of playing activities per turn in accordance with predetermined instructions for play; each of said playing spaces in said primary area being distinguished from one another by one of a plurality of unique trading symbols printed thereon, each of said trading symbols representing at least one another by one of a plurality of properties;

means for setting value and repeatedly determining a current value related to said trading symbols on each game board;

a plurality of trading play pieces, each adapted to be selectively placed on any of of said playing spaces; said trading play pieces include "buy" trading play pieces and "sell" trading play pieces; means distinguishing said "buy" trading play pieces from said "sell" trading play pieces; said plurality of playing activities include the buying of properties by selectively placing a "buy" trading play piece on the playing space representing the selected property and the selling of properties by selectively placing a "sell" trading play piece on the playing space representing the selected property;

trading exchange means cooperating with said gameboard, said setting value means and said trading play pieces providing in combination scoring means for playing said game.

22. In a trading game a method of continuing playing comprising the steps of:

recording a player's playing activity and related game data during the play of a game using an adapted conveying instrument systematically carrying the recorded data results over to the succeeding said game; said recording of data includes each one of the elements affecting a player's score being achieved during the play of a plurality of succeeding said game;

updating the recorded data results carried over and combined with similar data being recorded during the succeeding said game using said adapted conveying instrument;

compiling the updated recorded data results being carried over to the succeeding said game systematically using said adapted conveying instrument linking together the completed game with the succeeding said game; said adapted conveying instrument having provisions for systematically recording, updating and compiling pertinent data comprising and affecting a player's score;

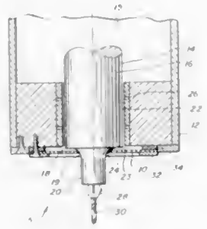
thereafter systematically repeating said recording, said updating and said compiling steps establishing a continuous game contest being played over an undetermined period of time by a varying number of players participating in the continuous game contest being established by the plurality of succeeding said game wherein during any of the succeeding games a player, independently from each other player, may score his/her gain or loss achieved during his/her participation in said continuous game contest.

4,913,447

DYNAMIC SEAL FOR ROTOR APPARATUS

Hans Jostlein, Naperville, Ill., assignor to Universities Research Association, Inc., Batavia, Ill.

Filed Mar. 21, 1989, Ser. No. 326,281
Int. Cl.[4] E21B *33/00*
U.S. Cl. 277—3 **8 Claims**



1. A rotor apparatus comprising:

a housing having a longitudinally extending bore formed therein;

a generally cylindrical rotor rotatable within said bore about a longitudinal axis, the exterior surface of said rotor having a shoulder along at least a portion thereof, said shoulder connecting a radially broad end and a radially narrow end of said rotor;

means providing a fluid stream directed longitudinally in the bearing space defined by said housing and said rotor exterior surface, the source of said fluid stream originating toward the radially broad end of said rotor;

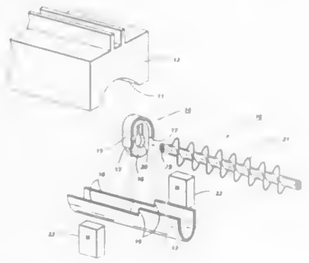
a seal plate fixedly secured to said housing, said seal plate having a generally circular hole formed therein, said seal plate formed of flexible material, the inner wall of said seal plate defining said hole normally abutting said shoulder when said fluid stream is inactivated, said inner wall displaced from said shoulder when said fluid stream is activated, whereby entry of foreign material into said bearing space is inhibited.

4,913,448

SEALING ARRANGEMENT

Anil G. Bhagwat, Hemel Hempstead; Robert A. Carter, Springmead, and Roger D. Masham, Ashwell, all of England, assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 10, 1988, Ser. No. 269,843
Claims priority, application United Kingdom, Jan. 20, 1988, 8801227
Int. Cl.[4] F16J *15/16, 15/54; G03B 27/00*
U.S. Cl. 277—12 **4 Claims**



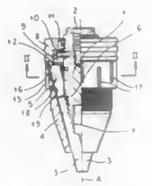
1. A sealing arrangement for a container of the type wherein an auger having vanes is disposed in the chamber thereof for moving particulate material stored therein, wherein the improvement includes a threaded sealing member adapted to engage the auger vanes and to be driven along the container on rotation of the auger, said sealing member being mounted slidingly in the container and being restrained from rotation about the auger so that on rotating the auger in a first direction said sealing member moves along the auger to a storage position located beyond the auger vanes.

4,913,449

DRILL CHUCK WITH BRAKE RING

Günter Röhm, Heinrich-Röhm-Str. 50, D-7927 Sontheim, Fed. Rep. of Germany

Filed Dec. 16, 1988, Ser. No. 285,715
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1988, 880032[U]
Int. Cl.[4] B23B *31/06*
U.S. Cl. 279—60 **11 Claims**



1. A chuck comprising:

a body element centered on an axis and adapted to be mounted on a drill spindle for rotation about the axis;

a tightening sleeve element carried on the body element and rotatable thereon about the axis, one of the elements being formed centered on the axis with an array of angularly equispaced guides inclined to the axis and the other element being formed centered on the axis with a screwthread formation;

respective jaws displaceable axially and radially of the axis in the guides relative to the axis and formed with teeth meshing with the screwthread, whereby rotation of the sleeve element relative to the body element in one rotational sense moves the jaws axially forward and radially together and opposite rotation moves them axially backward and radially apart;

a braking sleeve mounted rotatably on the tightening sleeve element and having an inner surface engageable with the tightening sleeve element, said braking sleeve being formed circumferentially in one piece; and

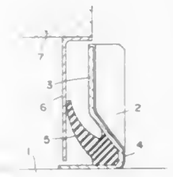
means for pressing the inner surface into engagement with the tightening sleeve element, said means being at least one axially open and radially throughgoing slot formed in the braking sleeve.

4,913,450

SEAL

Sture Asberg, Vastra Frolunda, Sweden, assignor to SKF Nova AB, Goteborg, Sweden

Continuation of Ser. No. 87,099, Aug. 19, 1987, abandoned. This application Jan. 1, 1989, Ser. No. 361,703
Claims priority, application Sweden, Sep. 15, 1986, 8603854
Int. Cl.[4] F16C *33/72*
U.S. Cl. 277—68 **2 Claims**



1. A seal for sealing the space between relatively rotatable members comprising an inner plate fixed to one of the members extending across the space to be sealed, a rigid strut member projecting across the space and spaced from the inner plate, a flexible seal interposed between the inner plate and strut member having a sealing lip engaging the inner plate at a point along an inner face of the plate and means defining a plurality of vanes emanating from an outer face of the strut member whereby deflection caused by axial forces acting on the outer face of the strut does not change the sealing relation between flexible seal and the inner plate.

4,913,451

VEHICULAR TOWING HITCH

Reginald O. Woodall, Corner of Mountain Pl. and High Mesa, P. O. Box 170, Alto, N. Mex. 88312

Filed Nov. 18, 1988, Ser. No. 272,915
Int. Cl.[4] B60D *1/14*
U.S. Cl. 280—478.1 **1 Claim**

1. A vehicular towing hitch assembly, removably attachable to a vehicular chassis comprising:

(A) a towing frame including at least one tie-bar and at least one interconnected draft-bar, said tie-bar and draft-bar together having detachable engagement with a coupling, said at least one draft-bar terminating in a tow plate stabilizer;

(B) at least one coupling engaging the chassis, and having a pass-through coupling well extending transversely to said coupling, said well defining a lengthwise void, an upper portion of said well being of rectangular cross-section and a lower portion of said well being of circular vertical cross-section, said at least one tie-bar having opposed

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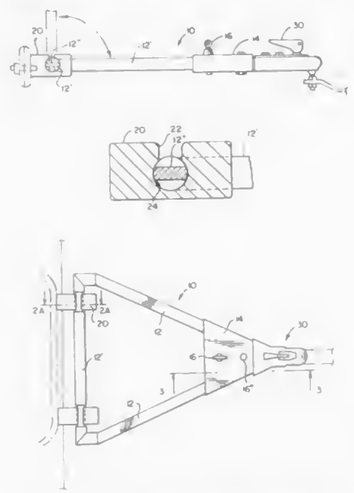
portions thereof diminished in vertical cross section to rotatably fit into respective upper and lower portions of said coupling well, whereby as the towing hitch is rotated to vertical, it may be slid into said upper portion of the well and upon rotation thereof to the horizontal said tie-bar will register with said lower portion of the well to secure said tie-bar into position for the travel mode of the towing hitch;



(C) a removable hitch tongue, slidably engaged by the tow plate stabilizer to alternately interconnect thereto in a fixed travel mode and to extend therefrom for moveable arcuate excursion in the hitching mode;

(D) a trailer hitch fixed to the free end of the tongue;

(E) snap lock means fully encased upwardly by a housing means on the tow plate stabilizer, engagable with the tongue to secure it against movement in the towing mode, said locking means comprising aligned pins at least one of which is retractable, relative to the tonque.

4,913,452

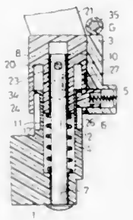
CASTER-SUPPORTING DEVICE FOR A BABY STROLLER

Hong-Fu Zan, No. 59, Alley 85, Lane 673, Chung Chen Road, Yi-Village, Jen Te Hsian, Tainan Hsien, Taiwan

Filed Jan. 5, 1989, Ser. No. 361,216

Int. Cl.[4] B62B *7/00*

U.S. Cl. 280—47.41 **4 Claims**



1. A baby stroller including a stroller body and a caster unit, said caster unit including a caster wheel, a caster axle, and a caster-supporting device for mounting said caster axle on said stroller body, said caster-supporting device comprising:

a rotating body provided for extension of said caster axle therethrough and including a fixed circular tube fixed thereon which is perpendicular to said caster axle and has two aligned locking holes formed through two opposed walls thereof;

a connector including an upper end insertion portion with a resilient retaining member disposed on an upper end portion thereof, a circular tubular groove formed in a lower end surface of said connector so as to engage with an upper end of said circular tube, a cylindrical hole formed in said lower end surface of said connector at center of said circular tubular groove, two pin holes formed through two opposite side walls of said connector in communication with an upper end portion of said cylindrical hole, a slideway formed in a side wall of said connector, an opening formed through a side wall of said connector in alignment with said locking holes of said rotating body, and a positioning hole formed through said side wall of said connector in communication with said slideway;

a sliding body including a slide plate secured thereto sliding within said slide slot in a direction parallel to said circular tube, a spring-biased locking element carried on said slide plate and engagable with one of said locking holes and said opening when said slide plate moves to a predetermined position, and two slide slots formed through said sliding body on two opposite sides of said connector, said locking element being normally engaged with said positioning hole, thereby allowing for relative rotation between said rotating body and said connector;

a sleeving secured to said stroller body and having a window formed in a wall thereof which is engaged with said retaining member so as to retain said insertion portion of said connector within said sleeving, said retaining member being capable of being pressed to disengage from said window;

a vertical pin extending, through said circular tube, into said cylindrical hole of said connector and having a pin hole formed transversely through an upper end portion thereof; and

a horizontal pin extending through said slide slots of said sliding body, said pin holes of said connector and said pin hole of said vertical pin and having two diameter-increased beads formed on two ends thereof so as to retain said horizontal pin within said slide slots of said sliding body;

whereby, said sliding body can be moved relative to said connector so as to engage both said locking holes and said opening with said locking element, thereby interlocking said rotating body and said connector against relative rotation therebetween.

4,913,453

SERVICE CAR FOR STORING AND MARKING AVAILABLE TOOLS

Günter Wagner, Nörtershausen, and Hans Pohlenz, Boppard, both of Fed. Rep. of Germany, assignors to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

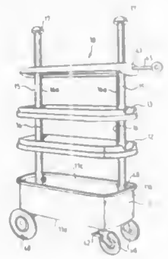
Filed Jun. 29, 1988, Ser. No. 212,893

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1987, 3723464

Int. Cl.[4] B62B *1/00*

U.S. Cl. 280—79.2 **24 Claims**

1. A service car for storing and making available tools, accessories and the like comprising: a travelling base (11), at least one column (15) extending upwards from said travelling base (11) and having at least one substantially vertically extending slot (22), at least one platform (12, 13) vertically movable along said at least one column (15), balancing means (18) disposed within said at least one column (15) being operatively connected with at least one lateral engagement arm (23) passing through and vertically moveable along said slot (22), said engagement arm (23) acting onto one of said platform (12, 13) and a cover member (43) opposite to the action of gravity.



wherein said engagement arm (23) is vertically movable along said slot (22) with one of said platform and cover member.

4,913,454

HOISTING AND TOWING BRACKET FOR VEHICLE

Walter D. Talley, III, Mount Clemens, and John A. DiGasbarro, Rochester Hills, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed May 22, 1989, Ser. No. 354,667

Int. Cl.[4] B62D *53/04*

U.S. Cl. 280—402 **2 Claims**

1. A one-piece hoisting and towing bracket for mounting on a vehicle body transversely extending cross member having a horizontal bottom wall and a vertical side wall defining a right-angle juncture, wherein the bracket comprising:

a U-shaped unitary sheet metal bracket symmetrical about a vertically disposed longitudinally extending plane, said bracket formed with a pair of upright leg portions having upper and lower ends such that their lower ends are integrally joined by a transverse extending bridge portion;

said bridge portion having a forwardly extending, horizontally positioned plate portion formed with a plurality of holes, each said hole receiving a bolt therethrough and extending through an associated aligned aperture in said cross member bottom wall whereby said plate portion is attached in a flush manner with the undersurface of said bottom wall;

a pair of horizontal slots in said cross beam member side wall, each said slot receiving an associated offset locking blade projecting upwardly from the upper end of each said leg portion thereby locating each said leg in flush contact with the rear face of said side wall and said plate portion upper face in flush contact with said bottom wall undersurface such that each plate portion hole is aligned with its associated bottom wall aperture;

said bridge portion being rearwardly offset a predetermined distance from a vertical plane that includes the rearward face of each said leg members, and said bridge portion having a predetermined transverse dimension defining a niche such that, in use, said niche adapted to capture a post portion of a hoisting and towing apparatus enabling the vehicle to be readily engaged by the apparatus.

4,913,455

DEVICE FOR FASTENING A BOOT TO A CROSS-COUNTRY SKI

Pascal Salsetti, and Francois Jodelet, both of Voiron, France, assignors to Skis Rossignol S.A., Voiron, France

Filed Feb. 28, 1989, Ser. No. 317,282

Claims priority, application France, Mar. 1, 1988, 88 03074

Int. Cl.[4] A63C *9/02*

U.S. Cl. 280—615 **9 Claims**

1. A device for fastening a boot to a cross-country ski having a stirrup with a central part and two branches articulated on a first pin extending transverse to the ski, and whose branches are shaped to allow fitting of a complementary front part located at the front end of the boot, said device comprising:

means for immobilizing a front end of the boot provided on the stirrup, the means for immobilizing comprising:

a locking lever mounted to pivot on the stirrup around a second pin extending transverse to the ski between a closed position in which a part of the lever rests upon the upper face of the front part of the boot and an opened position in which the lever allows free access to the stirrup;

a catch mounted to pivot on the locking lever around third pin means extending transverse to the ski, said catch including two fingers for engaging guide ramps formed along the front edges of the branches of said stirrup, said guide ramps having a profile such that when the catch is swung forward the locking lever is carried into the opened position and when the catch is swung backward the locking lever is carried into the closed position and means upon which the front part of the boot rests when received within the stirrup; and

elastic means placed between the stirrup and the lever and acting on the lever for biasing the lever towards the closed position, said elastic means extending in a plane passing approximately through the third pin means for articulation of the catch on the lever, the points of contact between the fingers of said catch and the guide ramps of said stirrup being located on both sides of said plane when said locking lever is in said respective opened and closed positions.

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4,913,456

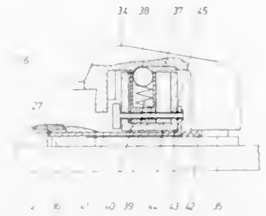
FRONT-PIECE FOR A SAFETY SKI-BINDING

Heinz Hornschemeyer, Oberammergau, and Anton Emert, Oberau, both of Fed. Rep. of Germany, assignors to Marker Deutschland GmbH, Escbenlohe, Fed. Rep. of Germany

Division of Ser. No. 871,065, Jun. 5, 1986, Pat. No. 4,735,435. This application Nov. 19, 1987, Ser. No. 122,461

Int. Cl.[4] A63C *9/08*

U.S. Cl. 280—630 5 Claims



1. A front piece for a safety ski-binding comprising:

a sole holder centrally disposed relative to the axis of a ski for supporting a ski-boot sole laterally and from the front, said sole holder being rotatable about a vertical pivot axis between a boot holding position and a boot release position, said sole holder being operable to release against a biasing force in the event that excessive side forces occur on said ski-boot sole;

biasing means acting on said sole holder exerting said biasing force thereon and defining a first release resistance acting on said ski boot, said biasing means acting on said sole holder along a second axis which is parallel to and spaced a predetermined distance from said pivot axis thereby defining a first moment arm about said pivot axis, said biasing means being movable relative to said pivot axis;

pedal means positioned to engage the ball of the skier's foot, said pedal means responsive to the normal force exerted by the skier's foot on said ski, said normal force creating a frictional force between said boot and said pedal means defining a second release resistance acting on said ski boot;

control means responsive to said pedal means for moving the position of said biasing means relative to said pivot axis, said control means operable to reduce the distance between said biasing means and said pivot axis when said normal force exerted on said pedal increases, thereby reducing the force moment arm about said pivot axis and reducing said first release resistance such that the total release resistance of said first and second release resistances acting on said boot are maintained approximately constant.

4,913,457

METHOD AND APPARATUS FOR OPTIMIZING THE DRIVING CHARACTERISTICS OF A VEHICLE

Hans W. Häfner, Aichach, and Reinhard Drews, Ahornweg, both of Fed. Rep. of Germany, assignors to Pfister GmbH and Bayrische Motoren Werke AG, Fed. Rep. of Germany

Filed Nov. 4, 1988, Ser. No. 267,329

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 3737760

Int. Cl.[4] B60G *17/00*

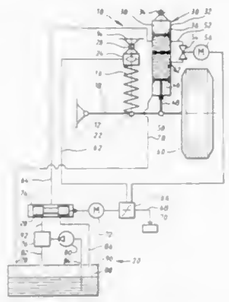
U.S. Cl. 280—707 24 Claims

1. A method for optimizing the driving characteristics of a vehicle, especially a motor vehicle, comprising the steps of:

providing a suspension spring/shock absorber for each of a plurality of wheels of said vehicle between the vehicle body and axles of said vehicle;

integrating a force measuring means in each of said suspension spring/shock absorber unit;

determining a momentary wheel load force acting on each of said wheels by means of said force measuring means and generating a corresponding signal; and



adjusting the damping characteristics of a shock absorber of said suspension spring/shock absorber unit in dependence on said signal generated by said force measuring means when said vehicle is in motion.

4,913,458

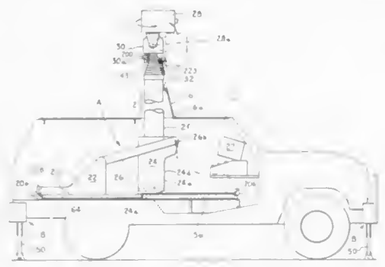
SURVEILLANCE VEHICLE CONTROL SYSTEM

Mark L. Hamilton, 5154 Camino Del Norte, Sierra Vista, Ariz. 85635

Continuation-in-part of Ser. No. 855,834, Apr. 24, 1986, Pat. No. 4,815,757. This application Jun. 16, 1988, Ser. No. 207,697

Int. Cl.[4] B60S *9/00*

U.S. Cl. 280—6.1 42 Claims



1. A control system for a rapid deployment surveillance vehicle having a vehicle cab with a roof door through which an instrument for surveillance and the like may be deployed from a concealed stowed position within said vehicle cab to an elevated position extended through a door opening of said roof door high above the vehicle; said vehicle being of the type having a telescoping mast which has a telescoped retracted position and a telescoped extended position; a ram for moving the retracted mast between a generally horizontal stowed position and vertical erect position; a mast operator for moving said mast between said telescoped retracted and extended positions; a leveling system having a plurality of jacks carried on said vehicle for establishing a prescribed level condition of said vehicle with respect to ground; said control system comprising:

(a) electrical ram switch means electrically connected to said ram control means having a ram up signal and ram down signal for switching said ram control means to move said mast;

(b) electrical mast switch means electrically connected to said mast control system having a mast extend signal and a mast retract signal for switching said mast control means to move said mast;

(c) ram detector means for electrically detecting a ram down condition of said ram in which said mast and instrument are in said stowed position and generating a ram down condition signal, said ram detector means detecting a ram up condition in which said mast and instrument are in said erect position and generating a ram up condition signal;

(d) door detector means for electrically detecting a door open condition of said roof door in which said roof door and said door opening are open and generating a door open signal;

(e) a ram control means for electrically controlling said ram to move said mast and instrument from said stowed position to said erect position in response to said ram up switch signal and said door open signal; and

(f) mast control means for electrically controlling said mast operator to extend said mast from said telescoped retracted position to said telescoped extended position in response to said ram up condition signal and said mast extend switch signal.

4,913,459

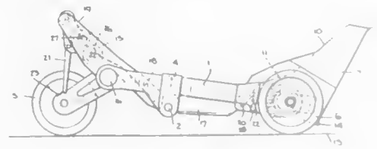
WHEEL TROLLEY

Jan Smeltink, Aw Venray, Netherlands, assignor to Quickwheel Holding, B.V., Rotterdam, Netherlands

Filed Jul. 20, 1988, Ser. No. 221,740

Int. Cl.[4] B62B *3/02, 3'12*

U.S. Cl. 280—641 11 Claims



1. A wheel trolley, for supporting a tire of a vehicle, comprising:

a frame; said frame having a front, a rear, and two sides;

wheels rotatably mounted to the front and rear of said frame;

self-locking and adjusting front and rear support members rotatably attached to the frame, said rear support member serving as a drive-ramp for a tire;

said front support member rotating into a first upright tire support position and said rear support member rotating into a second upright tire support position in response to contact with a tire being driven thereon; and

first and second locking means for locking the support members in place once a tire is driven onto said trolley and said support members have rotated into said first and second upright tire support positions.

4,913,460

TWO-WHEELED FOLDABLE GOLF TROLLEY

Alfred Klein, Weitersburg, Fed. Rep. of Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Filed Jan. 17, 1989, Ser. No. 297,709

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1988, 8800831

Int. Cl.[4] B62D *3/04*

U.S. Cl. 280—646 19 Claims

1. A two-wheeled foldable golf trolley comprising:

a main structure (1) having a lower end portion and an upper end portion,

a pair of coaxial wheels (3) located adjacent to said lower end portion,

a prolongation structure (2) pivotally mounted on said main structure (1) adjacent to the upper end portion thereof about a substantially horizontal pivot axis (6),

said prolongation structure (2) having a handle (7) adjacent to an end of said prolongation structure (2) which is remote from said pivot axis (6),

said prolongation structure (2) being pivotable between a first position (FIG. 1), namely a position of use, in which said prolongation structure (2) extends beyond said upper end portion of said main structure (1), and a second position (FIG. 2), namely a position of storage or transportation, in which said handle (7) is adjacent to said lower end portion of said main structure (1),

a gas spring (11) having a cylinder member (11*a*) and a piston rod member (11*b*) being pivotally connected by one (11*b*) of its members (11*a*, 11*b*) to one (1) of said main structure (1) and said prolongation structure (2), and being connected by the other (11*a*) of its members (11*a*, 11*b*) to the other one (2) of said main structure (1) and said prolongation structure (2), said gas spring (11) exerting a torque onto said prolongation structure (2) about said pivot axis (6) such as to bias said prolongation structure (2) towards one (FIG. 1) of said first and second positions (FIGS. 1 and 2).

4,913,461

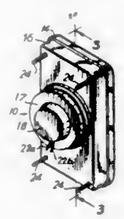
AIRBAG MODULE AND METHOD OF MAKING SAME

Jess Cuevas, Scottsale, Ariz., assignor to Talley Automotive Products, Inc., Mesa, Ariz.

Filed Dec. 27, 1988, Ser. No. 290,544

Int. Cl.[4] B60R *21/16*

U.S. Cl. 280—731 21 Claims



1. A motor vehicle airbag module which comprises:

(a) means for mounting a pyrotechnic inflator device within a passenger compartment of said motor vehicle, said inflator device being capable of producing a sufficient amount of a gaseous combustion product within a sufficient time to substantially deploy inflatable air cushion means operatively associated therewith within an interval between a primary collision of said vehicle with an object external thereto and a secondary collision between an operator of said vehicle and an interior portion thereof, said mounting means comprising an open pan having several stepped levels extending rearwardly thereon, each said level positioned directly over a next rearward one of said levels and

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having substantially the same depth at any point thereon, said levels correspondingly decreasing in relative volume from one located most forwardly to one located most rearwardly upon said mounting means;

(b) a pyrotechnic inflator device positioned within said mounting means, said inflator device comprising a housing formed of a diffuser member having a first open end and a -second closed end and a closure plate member sealing said open end thereof, said housing further comprising an arcuate surface extending along at least a portion of an outer periphery thereof, said arcuate surface configured and adapted to permit a locking engagement between said mounting means and said inflator device;

(c) means for retaining inflatable cushion means in contact relation with said inflator device, said retaining means installed within said mounting means in surrounding relation to said diffuser member and configured to correspond to a portion of said arcuate surface thereof; and

(d) inflatable air cushion means for preventing injury to an occupant of said vehicle caused due to contact with said interior of said vehicle upon the occurrence of said primary collision, said inflatable means comprising means located within a mouth portion thereof configured to facilitate locking engagement between said air cushion means and said retaining means upon assembly of said module,

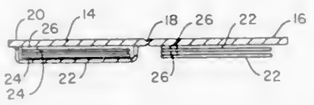
wherein at least a portion of said mounting means is lockingly engaged within a corresponding open channel extending along at least a portion of an outer surface of said retaining means forming a structural seal therebetween such that said inflator device, said inflatable air cushion means and said retaining means are all maintained together in lockup engagement with one another within said mounting means without the use of any additional locking means.

4,913,462

RECORD KEEPING FOLDER AND METHOD

Howard J. Parker, Rte. 4, Box 149, Greenville, Tenn. 37743

Filed Jan. 12, 1989, Ser. No. 296,015
Int. Cl.[4] B42D *11/00*
U.S. Cl. 281—15.1 14 Claims



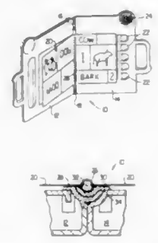
1. A record keeping portfolio comprising the combination of folder means and one or more record sheet means adapted for loose retention therein or adhesive attachment thereto, said folder means comprising a pair of hinged covers providing a pair of juxtaposed inner surfaces, the inner surface of one of said covers being provided with restraining means for removably holding one or more of said record sheet means on said one cover, the inner surface of the other of said covers being essentially smooth, each of said sheet means having an adhesive border on one side thereof along an edge portion, protective means covering said adhesive border, said protective means being peelable from said adhesive border to allow said sheet means to be adhesively attached to said inner surface of said other cover by pressing said adhesive border thereagainst.

4,913,463

HINGED CASE PROVIDING SECTIONAL COVER WITH ANTI-PINCH INTERLEAVING THROUGH

Steve H. Tlapek, Dallas; Patrick P. Hicks, Plano, and Julio E. Valella, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 27, 1988, Ser. No. 263,469
Int. Cl.[4] B42D *3/00*
U.S. Cl. 281—49 15 Claims



1. A book assembly comprising a case providing a sectional cover within which a substantially flat spirally bound book-like object is retained, said book assembly comprising:

a front cover having a first flat inner surface;

a back cover having a second flat inner surface;

said front and back covers having respective marginal edges arranged in juxtaposed relation to each other;

first and second hinge means having a common longitudinal axis and pivotably connecting said front and back covers along said juxtaposed marginal edges thereof to provide for pivoting movement of said front and back covers about said longitudinal axis relative to each other between open and closed positions of said case;

said first and second hinge means being respectively disposed at opposite ends of said juxtaposed marginal edges of said front and back covers and having a longitudinally extending space therebetween along a central portion of said juxtaposed marginal edges of said front and back covers;

a first elongated member along said marginal edge of said front cover proximally related to said back cover and forming a part of said front cover, said first elongated member being disposed in the space between said first and second hinge means and being arcuately curved along its extent to define a first trough;

a second elongated member along said marginal edge of said back cover proximally related to said front cover and forming a part of said back cover, said second elongated member being disposed in the space between said first and second hinge means and being arcuately curved along its extent to define a second trough;

said first and second flat inner surfaces of said front and back covers facing each other with said first and second elongated members having the respective first and second troughs thereof disposed in facing relationship to define a substantially cylindrical cavity between said first and second elongated members and extending in the space between said first and second hinge means in the closed position of the case;

a substantially flat book-like object having at least first and second pages;

spiral binder means connecting said pages of said substantially flat book-like object along a longitudinally extending marginal edge thereof, said spiral binder means being received within said cylindrical cavity between said first and second elongated members with said pages of said book-like object lying between said first and second flat inner surfaces of said front and back covers in the closed position of the case;

one of said first and second elongated members being slidably received within the trough of the other elongated member in overlapped interleaved relationship with respect thereto in response to relative pivoting movement of said front and back covers about said longitudinal axis of said first and second hinge means from the closed position of the case to the open position thereof; and

said one elongated member and the other elongated member being disposed in nested relationship with said first and second flat inner surfaces of said front and back covers lying in substantially coplanar relationship and with said spiral binder means of said book-like object lying in the uppermost trough of said elongated members when the case is in its open position;

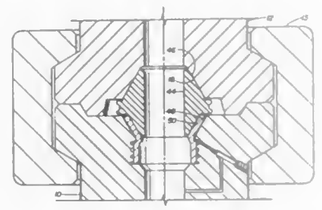
whereby the respective pages of said book-like object may be turned when the case is in its open position such that successive pages of said book-like object may be disposed in substantially flat relationship as respectively located above said first and second flat inner surfaces of said front and rear covers in a fully exposed state.

4,913,464

TUBULAR JOINT WITH SEAL

William M. Taylor, Houston, Tex., and William Hopson, Wakefield, England, assignors to Cameron Iron Works U.S.A., Inc., Houston, Tex.

Filed Apr. 15, 1988, Ser. No. 182,204
Claims priority, application European Pat. Off., Mar. 1, 1988, 88301769.1
Int. Cl.[4] F16L *55/18*
U.S. Cl. 285—15 15 Claims



1. A tubular joint comprising

a first tubular member having a central bore and a sealing surface tapering outwardly at one end of said member,

a second tubular member having a central bore and a sealing surface tapering outwardly at the end of said member facing said one end of said first tubular member,

a recess on the interior of at least one of said tubular members extending axially inward from the inner end of the sealing surface of such tubular member, said sealing surface on said at least one of said tubular members being damaged,

a seal ring having a cylindrical bore and outer sealing surfaces being tapered for sealing between the sealing surfaces of the two tubular members,

means for securing said first and second tubular members together with said seal ring in sealing engagement with their respective sealing surfaces, and

an insert sleeve having a tubular portion positioned within said recess in the tubular member with the internal recess and a frusto-conical portion extending outwardly both axially and radially into covering relationship to the sealing surface of said tubular member,

the insert sleeve being cold forged into tight sealing engagement within said recess and with the sealing surface of said tubular member,

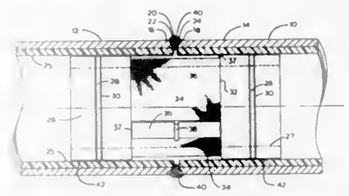
the inner surface of said frusto-conical portion of said insert sleeve having a taper mating with the taper of the seal ring whereby when said joint is held in tight engagement by said securing means said sealing ring sealingly engages the sealing surface of the tubular member which was not damaged and the sealing surface of said insert to provide a joint seal between said members.

4,913,465

COUPLED PIPE ASSEMBLY

William D. Abbena, and Casey J. Jones, both of Houston, Tex., assignors to Tuboscope Inc., Houston, Tex.

Filed Aug. 24, 1988, Ser. No. 235,457
Int. Cl.[4] F16L *13/02*
U.S. Cl. 285—22 4 Claims



1. A coupled pipe assembly comprising a pair of opposed, axially positioned pipes each having opposed beveled ends spaced apart to form a separated area therebetween, a corrosion-resistant lining on interior surfaces of said pipes, a sleeve of uniform, continuous diameter along the entire length thereof inserted axially within said pipes between said opposed beveled ends along a uniform continuous diameter portion of said pipes, said sleeve including a pair of O-ring seals each circumferentially mounted on said sleeve a distance from each end thereof and in sealing engagement with said interior surfaces said pipes, a circumferential relieved area in an exterior surface of said sleeve between said O-ring seals, a layer of heat-insulating material provided within said relieved area and having an outer surface terminating short of said exterior surface of said sleeve, a plurality of retainers for retaining said heat-insulating material within said relieved area of said sleeve, said retainers being connected to opposed edge surfaces of said relieved area in spaced-apart relation and each of said retainers having a lug radially extending into said separated area between said opposed, beveled pipe ends and in contact therewith, each said lug terminating short of exterior surfaces of said pipes, a continuous weld deposit produced in said separated area and bonded to each said lug and to the opposed beveled pipe ends to form a welded joint between said opposed ends of said pipes and a sealant provided between said exterior surface of said sleeve and said interior surfaces of said pipes.

4,913,466

INNER PIPE MEMBER FOR DUAL-WALL DRILL PIPE ASSEMBLY

Floyd W. Becker, Calgary, Canada, assignor to Drill Systems International Ltd., Calgary, Canada

Filed Jul. 20, 1988, Ser. No. 221,647
Claims priority, application Canada, Jul. 20, 1987, 542532
Int. Cl.[4] E21B *17/18*; F16L *35/00*
U.S. Cl. 285—24 17 Claims

1. An inner pipe member for a dual-wall drill pipe assembly employed in drilling in earth formations, said assembly including an inner pipe member and an outer pipe member, said outer pipe member having main bore extending axially therethrough, a first bore portion and a concentric second bore portion of smaller diameter than said first bore portion and axially spaced therefrom by a shoulder facing axially outwardly of one end of said main bore and a circumferential recess in said second bore portion, said inner pipe member comprising:

a tubular body portion adapted to be telescopically and

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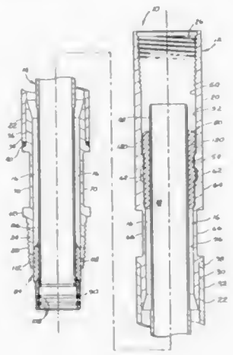
concentrically received in said main bore and define with said main bore an annular fluid passage;

first spacer means at the other end of said body portion for concentrically spacing said other end of said body portion from said one end of said outer pipe member, said first space means including:

surface means adapted to be received in sliding fit relation within at least one of said first and second bore portions for concentrically positioning said other end of said inner pipe member within said outer pipe member; and



a projection extending radially outwardly of said surface means and adapted to be received in said recess when said inner pipe member is operatively disposed within said outer pipe member, said projection having an outer surface slidable in said second bore portion in interference fit relation; and

second spacer means at one end of said body portion for concentrically spacing said one end of said body portion from the other end of said outer pipe member.

4,913,467

CONNECTOR FOR CONNECTING SMALL DIAMETER PIPE

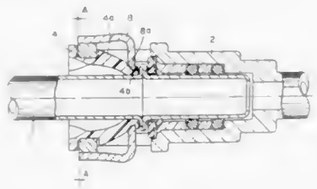
Katsushi Washizu, Shizuoka, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Shizuoka, Japan

Filed Mar. 1, 1989, Ser. No. 317,647

Claims priority, application Japan, Mar. 3, 1988, 63-28380[U]

Int. Cl.[4] F16L *39/00*

U.S. Cl. 285—39 7 Claims



6. The connector as set forth in claim 2, wherein said confirmative member includes branches each extending in the axial direction from said confirmative pawls.

4,913,468

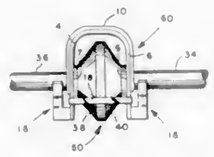
TUBE UNION REINFORCING CLIP

Hans R. Rattmann, Burlington, Canada, assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 13, 1989, Ser. No. 337,797

Int. Cl.[4] F16L *35/00*

U.S. Cl. 285—82 7 Claims



1. A clip for reinforcing an enlarged union between a pair of substantially axially aligned tubes against separation, said union having opposite sides respectively facing away from each other along each tube, and said clip comprising;

a pair of substantially parallel plate members integrally joined at one end and spaced-apart from each other sufficiently to receive the union therebetween with opposed facing surface thereof in predetermined proximity to the side of the union respectively facing theretowards,

a slot through each of the plate members, said slots substantially aligned with each other and respectively having a closed-end and an open-end adapted to receive thereinto the tube in registration therewith when the union is received between the plate members,

at least one resilient arm extending from each plate member, said arms respectively operative to engage the tubes upon receipt thereof in the slot open-ends and to yield sufficiently to enable the tubes to move therealong towards the respective closed-ends thereof and thence to resiliently urge the tubes against an edge of the plate member defining the closed-end of the slots, and

latching means operative to bridge across the union and releasably secure the plate members together such that they are able to engage the respective union side in proximity thereto and provide the reinforcement against axial separation between the tubes.

4,913,469

WELLHEAD SLIP AND SEAL ASSEMBLY

Benton F. Baugh, Houston, Tex.; assignor to Cameron Iron Works USA, Inc., Houston, Tex.

Filed Aug. 8, 1988, Ser. No. 229,321

The portion of the term of this patent subsequent to Dec. 13, 2005, has been disclaimed.

Int. Cl.[4] F21B *19/10;* F16L *21/00*

U.S. Cl. 285—146 9 Claims

1. A wellhead slip and seal assembly for supporting and sealing a string within a housing comprising

a seal ring having an inner flange with a downwardly facing shoulder and an outer groove,

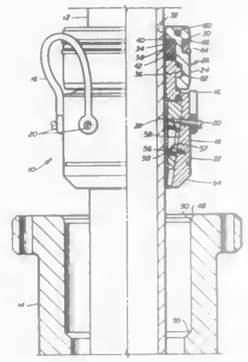
a first resilient sealing ring positioned within said outer groove and having an outer diameter larger than the housing in which it is to be positioned,

a second resilient sealing ring positioned adjacent said shoulder and having an inner diameter smaller than the outer diameter of the string to be received therein,

a slip bowl having a downward and inward tapering surface,

a plurality of slips having inwardly facing teeth and outer tapered surfaces mating with the slip bowl tapered surface, and

means on said seal ring and said slip bowl providing an interengagement for supporting said slipbbowl from said seal ring during the lowering of said assembly into the housing,



the upper end of said slip bowl being positioned below said second sealing ring.

4,913,470

AUTOMATICALLY ADJUSTABLE TUBE COUPLING FOR TUBES OF VARYING DIAMETERS

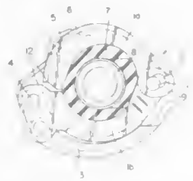
Karl Weinhold, Im Jagdfeld 23, 4040 Neuss 1, Fed. Rep. of Germany

Continuation of Ser. No. 172,741, Mar. 23, 1988, abandoned, which is a continuation of Ser. No. 87,985, Aug. 17, 1987, abandoned, which is a continuation of Ser. No. 860,141, May 6, 1986, abandoned. This application Dec. 5, 1988, Ser. No. 280,037

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1985, 3521857; Jan. 16, 1986, 3601093

Int. Cl.[4] F16L *33/12*

U.S. Cl. 285—243 4 Claims



1. In a tube coupling comprising two shell members, each having internal surfaces forming a collar and two ends portions, means including a joint bolt for pivotally connecting one end portion of each member and locking means including a lever pivotally connected to the other end portion of one member about a pivot axis and means engageable with the other member for moving the other end portions of the two members toward each other into a closed position wherein a joint line is defined which extends between the joint bolt and the other end portions, the improvement wherein the means pivotally connecting the one end portions comprises means forming an oblong pivot slot in the other member having a longitudinal axis extending towards the lever at an acute angle with respect to the joint line which defines an area including said pivot axis to permit displacement of the other end portions of the two members toward each other along the joint line and wherein the other end portions of the two members have means forming stop faces thereon disposed between the pivot axis of the locking means and the joint bolt and configured to contact each other during movement of the two members into the closed positions around tubes having a given diameter to effect automatic displacement of the other end portions of the two members toward each other along the joint line.

4,913,471

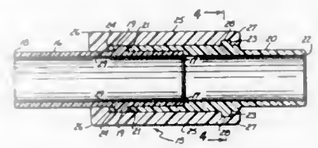
SWIVEL JOINT

Gerald L. Huneke, Ranch's Ranch, Lot 32, Zumbrota, Minn. 55992

Filed Nov. 10, 1987, Ser. No. 119,159

Int. Cl.[4] F16L *27/08*

U.S. Cl. 285—281 12 Claims



1. A swivel joint means for joining first and second conduit means so as to provide a passageway therebetween and yet permit one of said first conduit means to rotate with respect to said second conduit means, said swivel joint means comprising:

a tubular first conduit connection means adapted for having a first end thereof connected to said first conduit means and having a substantially circular outer periphery of its tube wall being of a selected outer diameter at a second end thereof, said first conduit connection means having a first outer seal establishment means about its outer wall periphery and located between said first and second ends thereof;

a tubular second conduit connection means having a first end thereof adapted for connection to said second conduit means and having a substantially circular inner periphery of its tube wall being of a selected inner diameter at a second end thereof, said inner diameter being of a sufficient size with respect to said first conduit connection means second end outer diameter for said first conduit connection means second end to be inserted within said second conduit connection means at said second end thereof and therein being capable of being rotated to thereby permit said first conduit connection means to rotate with respect to said second conduit connection means; and

a tubular lock means having an opening in each of first and second ends thereof and having a first inner seal engaging means about an inner periphery of its tube wall, said first conduit connection means extending through said lock means first end opening sufficiently to expose said first conduit connection means first end such that said first inner seal engaging means is against said first outer seal establishment means to form a seal between said first conduit connection means and said lock means which permits said first conduit connection means to rotate with respect to said lock means, said second conduit connection means extending through said lock means second end opening to expose said second conduit connection means second end with said lock means second end, through a holding means thereat, engaging and holding said second conduit connection means so that said first conduit connection means is kept inserted therein as aforesaid.

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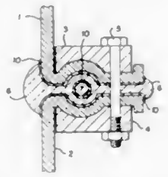
4,913,472

SEALED JOINT FOR A ROCKET EMPLOYING FUSED INORGANIC VITREOUS MATERIAL

Bhogaraju V. Janakirama-Rao, 2267 SW. 43rd Pl., Gainesville, Fla. 32608

Filed Aug. 21, 1986, Ser. No. 898,917
Int. Cl.[4] F16J 15/10, 15/12; F16L 19/02
U.S. Cl. 285—336 10 Claims



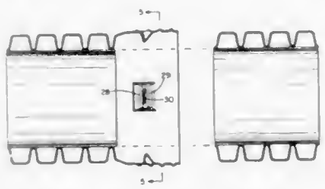
1. A sealed joint comprising at least two substantially identical axially extending tubular metal sections, each section having an end with a flange extending radially outward from and about the entire perimeter of the respective end, the sections being joined end to end with the flanges opposing each other, each flange having a continuous channel opened to and opposed to the channel in the opposing flange, each flange extending radially outwardly from the respective channel to form opposing surfaces and each flange extending radially outwardly from the respective channel in substantially a single plane, said opposing surfaces having thereat fastening means to join and seal the sections together, said flanges having therebetween a ring of solid metal rod embedded in leak-proof fused inorganic vitreous glass-ceramic material capable of withstanding high and low temperature extremes, said rod and the material thereabout located within the opposing channels, said material extending therefrom to seal the space between the ends of the tubular sections from the inner perimeter of the tubular sections and the inner perimeter of the flanges to the outer perimeter of the flanges to define with said flanges and said fastening means said sealed joint, said material with said rod forming an efficient thermal-gradient heat-sink mechanism in said sealed joint.

4,913,473

LARGE DIAMETER DOUBLE-WALLED PLASTIC PIPE

Eldon G. Bonnema, 107 Third St., Prinsburg, Minn. 56281, and James L. Fouss, 7514 Sheringham Ave., Baton Rouge, La. 70808

Filed Nov. 16, 1987, Ser. No. 120,824
Int. Cl.[4] F16L 25/00
U.S. Cl. 285—423 25 Claims



1. Double-walled large-diameter corrugated plastic pipe having inherent non-releasable coupling means readily accessible and releasable from the exterior when coupled to other pipe, said pipe comprising:

(a) a pipe having an inner wall with a cylindrical smooth inner surface and having a generally cylindrical corrugated outer wall with spaced apart successive annular ribs with annular valley defining portions therebetween;

(b) said walls being integrally formed of a member of a group comprising high density polyethylene, PVC and polypropylene and being sufficiently thick so as to be relatively inflexible, rigid but elastic throughout and extending from adjacent one end portion of the pipe throughout the remainder of the pipe;

(c) said end portion comprising:

(1) a generally cylindrical relatively inflexible, rigid but elastic through-out sleeve element integrally formed with said outer wall and of the same material and having an inner diameter exceeding only slightly the outer diameter of said ribs;

(2) a support collar having a smaller and a larger end and supporting said sleeve element upon the end of said outer wall of the remainder of the pipe and extending between said sleeve and said outer wall and being integrally formed therewith and having the smaller end thereof connected to said outer wall in supported relation and the larger end thereof connected to said sleeve element in supporting relation; and

(3) a plurality of circumferentially spaced latching members located intermediate the ends of said sleeve element and integrally formed therewith of the same material and each extending inwardly therefrom around its interior in the same transverse plane relative thereto, the radial distance from the inner end of said latching members to the axis of said sleeve element being less than the radius of said ribs;

(4) each of said latching members being comprised of a lever member supported at one of its ends at its fulcrum by said sleeve element and formed integrally therewith of the same material and extending in the plane thereof from its fulcrum toward the remainder of the pipe and being free at its other end and along each of its sides to permit same to pivot at its fulcrum along a circumferential line of said sleeve;

(5) each of said lever members carrying a latch element which depends inwardly therefrom and has a latching surface adjacent the free end of its associated lever member extending radially of said sleeve element and facing toward the remainder of the pipe;

(6) said latching members being constructed, arranged and located on said sleeve element so that the latching surfaces thereof extend into and engage in latching relation valley-defining portion of a similarly constructed pipe when the end of the remainder portion of such a pipe is thrust into the outer end of said sleeve element;

(7) each of said lever members also having a camming surface located outwardly of said latching surface and extending radially inwardly relative to said sleeve element from a point adjacent the fulcrum of said lever member to a point adjacent its said latching surface; and

(8) each of said latching elements extending radially inwardly from its supporting lever member a distance at least equal to 25% of the depth of the valley-defining portions of said pipe.

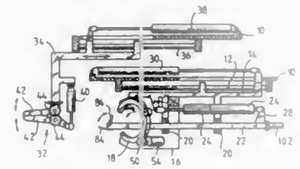
4,913,474

DEVICE FOR KNOTTING A FLEXIBLE TIE

Jean Boquet, Le Perray-en-Yvelines, and Georges Guennou, Elancourt, both of France, assignors to Sica Du Silo De La Rochelle-Pallice, La Rochelle Cedex, France

PCT No. PCT/FR88/00123, § 371 Date Oct. 25, 1988, § 102(e) Date Oct. 25, 1988, PCT Pub. No. WO88/06553, PCT Pub. Date Sep. 7, 1988
PCT Filed Mar. 3, 1988, Ser. No. 279,151
Claims priority, application France, Mar. 3, 1987, 8702863
Int. Cl.[4] D04G 5/00; B65B 13/26
U.S. Cl. 289—12 13 Claims

1. A device for knotting a flexible tie comprising tie support means, a tie displacement member mounted to rotate around the tie in a plane which is oblique relative thereof, said member comprising a C-shaped rotary support having a finger mounted thereon extending perpendicularly to said plane, drive means for rotating said member through about one turn in order to form a turn in the tie, and tie drawing means for drawing the tie through said turn, said tie drawing means comprising a tie engaging device mounted at an end of a rod, said rod having an axis and being movable therealong in a direction oriented perpendicularly to the tie.

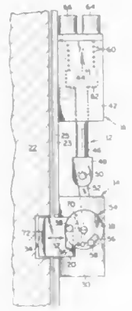


4,913,475

SECURITY LOCK MECHANISM

Raymond B. Bushnell, Lodi, and Larry W. Green, San Francisco, both of Calif., assignors to Phelps-Tointon, Inc., San Antonio, Tex.

Filed Apr. 18, 1988, Ser. No. 182,963
Int. Cl.[4] E05B 47/00
U.S. Cl. 292—144 41 Claims



1. A security lock mechanism comprising

a housing,

a locking bolt slidably mounted in the housing for sliding movement to an extended position from a retracted position;

a rotatable cam means operatively coupled with the locking bolt and having first and second relatively rotated positions to permit said bolt to slidingly move to an extended position for deadbolt and slam-lock operation;

a pneumatically powered means, and

a lost motion coupling between the pneumatically powered means and the rotatable cam means for facilitating slam-lock and deadlocked operation of the security lock mechanism.

4,913,476

DOOR LATCH AND RELEASE APPARATUS

Nathan M. Cook, Rochester, Minn., assignor to Creulo, Inc., Rochester, Minn.

Filed Aug. 4, 1988, Ser. No. 228,066
Int. Cl.[4] E05C 3/08
U.S. Cl. 292—196 4 Claims

1. A door latch apparatus for use in positively moving a door out of and into a finally closed condition with respect to a door frame wherein the initial and final movement of the door out of and into its closed condition with respect to the door frame must overcome substantial forces tending to retain the door in its closed condition and to resist movement of the door out of its closed condition, the door having a front outside surface and a back inside surface, a first hinged edge hinged to a first hinged edge of the door frame and a second latch edge opposite the first door hinged edge, the door latch edge being positioned to mate with a second latch edge of the door frame when the door is in closed condition, the door latch apparatus including:

(a) at least one latch plate fixedly mounted with respect to the latch edge of the door frame and extending outwardly therefrom in direction toward the door in position to be in adjacent relation to a latch edge portion of the door as the door is being closed, said latch plate being provided with a finger in spaced relation to the door frame latch edge, the finger providing an inwardly facing working surface extending in parallel relation to the latch edge;

(b) an elongate slide bar slidably mounted with respect to a latch edge portion of the door for longitudinal movement in direction parallel to the door latch edge, said slide bar having at least one transversely extending rocker arm actuating slot provided therein;

(c) a door latch handle accessible from the outside surface of the door and manually movable between a closed and an open position;

(d) means linking the door latch handle and the slide bar, said linking means being operable to move the slide bar between a first closed and a second open position upon movement of the handle between closed and open positions;

(e) at least one rocker arm assembly including:

(1) a rocker arm pivotally mounted with respect to the latch edge portion of the door and effectively pivoting in a plane parallel to the plane of the working surface of the latch plate finger,

(2) a rocker arm roller rotatably mounted to a first end portion of the rocker arm in position to lie in the plane of the latch plate finger, and

(3) a rocker arm actuating pin fixedly mounted to a second end portion of the rocker arm, extending transversely of the plane of movement of the rocker arm and situated within a transversely extending rocker arm actuating slot of the slide bar;

(f) wherein the parts are configured and positioned so that with the handle and slide bar in open position as the door is swung toward its closed condition, the rocker arm roller will initially contact the latch edge portion of the door frame, and with this roller in contact with the door frame, the door handle can be manually moved from open toward closed position, causing the roller to contact the working surface of the latch plate finger, further movement of the door handle

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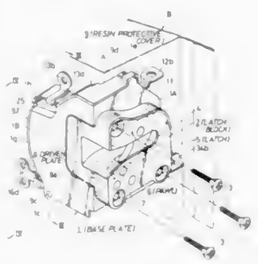
towards closed position causing the rocker arm assembly to force the roller against the working surface of the latch plate finger drawing the door positively to its finally closed condition against any substantial forces tending to resist movement of the door to its finally closed condition.

4,913,477

WATERPROOF DOOR LOCK FOR AUTOMOTIVE VEHICLE

Yoshio Watanuki, Ebina, and Haruo Mochida, Kanagawa, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 15, 1988, Ser. No. 219,506
Claims priority, application Japan, Jul. 17, 1987, 62-178699; Jul. 17, 1987, 62-109595
Int. Cl.[4] E05C *3/26*
U.S. Cl. 292—216 1 Claim



1. A waterproof door lock attached to a door to control a door latch locking/unlocking pawl for an automotive vehicle, comprising:
(a) a base plate member fixed to inside the door;
(b) a protective cover, attached to said base plate member, having at least one peripheral wall extending from a wall of said protective cover 9 to cover at least one upper end portion of said base plate member; and
(c) a door lock mechanism, arranged between said base plate member and said protective cover, for selectively actuating the door latch locking/unlocking pawl, said door lock mechanism comprising a plurality of control levers, each led outside through a lead-out opening formed horizontally outward between an end side surface of said base plate member and a lower surface of the peripheral wall of said protective cover, at least one of said control levers being formed with a U-shaped bent portion led out through the lead-out opening by taking a long way around the end side surface of the peripheral wall of said protective cover.

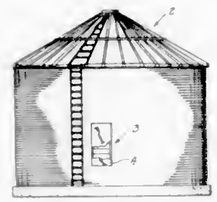
4,913,478

GRAIN BIN DOOR BOARD LATCH

Rodney B. Grossman, Goshen, Ind., assignor to CTB, Inc., Milford, Ind.

Filed Dec. 12, 1988, Ser. No. 283,379
Int. Cl.[4] E05C *3/04*
U.S. Cl. 292—259 R 14 Claims

1. A latch apparatus for releasably securing a cover member over an access opening in a bulk storage structure which structurally integrates the cover member into the storage structure for improving the structural integrity of the storage structure, said latching apparatus comprising: cover protuberant means projecting from a surface of said bulk storage structure for releasably retainably engaging corresponding cover protuberant means engaging bores formed in an overlying surface of said cover member, said cover member extending between at least two opposed edges of said access opening, said cover protuberant means being releasably retainably engagable with said bores for transferring forces on said access opening through said cover member; pivot receptacle means attached to said cover member; latch bar means operationally connected to said pivot receptacle means for movement between



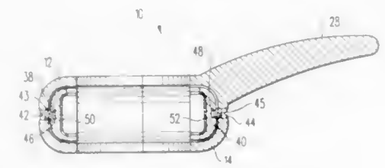
latching and releasing positions; and latch protuberant means mounted to an edge of said access opening for engaging said latch bar means in said latching position to hold said cover member in position.

4,913,479

DOOR KNOB HANDLE ATTACHMENT

Lawrence P. M. A. Allison, 1437 Peach Dr., Dublin, Ga. 31021

Filed Jan. 31, 1989, Ser. No. 304,238
Int. Cl.[4] F05B *1/00, 3/00*
U.S. Cl. 292—347 5 Claims



1. A door knob handle attachment, comprising:
a pair of mating semi-circular shell members;
means pivotally connecting said shell members at first aligned ends thereof;
means for selectively securing opposite ends of each of said shell members together to form a circular collar;
an elongated lever secured to one of said shell members;
each of said shell members having an interior undercut recess dimensioned for engagement with a door knob;
a radially movable clamp member disposed in the undercut recess of each of said shell members;
a set screw extending through each of said shell members and connected to one of said clamp members for radially moving said clamp members; and
each of said set screws having a head portion mounted for free rotation with respect to one of said clamp members and fixed for radial movement therewith.

4,913,480

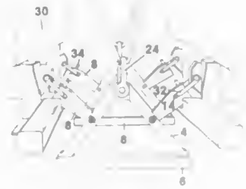
CARGO CARRIERS FOR HELICOPTERS

Philip K. Yohe, Clarksville, Tenn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 19, 1988, Ser. No. 260,208
Int. Cl.[4] B66C *13/04;* B64D *7/00*
U.S. Cl. 294—81.1 6 Claims

1. A coupling unit for linking two motorized vehicles rear-bumper-to-rear-bumper so that the two motorized vehicles can be carried by a helicpopter's external cargo carrier as a single,

stable, load, comprising truss members each having inclined truss member side posts, a shorter strut secured to the truss member sides to form a top end and a longer strut secured to the truss member sides to form a base end, with the truss member sides being inclined outwardly toward the base of each truss member, a beam, means connecting each end of the beam to the top end of each truss member so that the truss members are secured to the ends of the beam to form the coupling unit, arm members hinged at one end to each inclined truss member



side, means connecting the other end of each arm member to a motorized vehicle bumper lift provision, or sling point, the hinge permitting this connection to be readily accomplished, the length of the arm member and the size of the truss members being such that when the load is lifted the rear end of each motorized vehicle rests on inclined truss member sides so that a force on either vehicle causes the other vehicle to move in synchronization therewith, stabilizing the load, and means on said coupling unit for attaching helicopter cargo lines to the coupling unit.

4,913,481

CLEAN ROOM GRIPPER

Laurence D. Chin, West Newton, and Christopher J. Hiscock, Georgetown, both of Mass., assignors to Applied Power Inc., Milwaukee, Wis.

Filed Sep. 13, 1988, Ser. No. 243,872
Int. Cl.[4] B25J *15/08*
U.S. Cl. 294—88 10 Claims

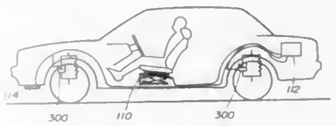
1. A sliding jaw gripper including:
a housing;
gripper elements formed as inner and outer finger blocks which are joined together;
said inner finger blocks being mounted upon guide rails within the housing to ensure uniform tracking of the finger blocks;
means for actuating the gripper elements towards and away from one another
means for adjusting the guide rails inwardly of the housing so as to enable optimum tracking of the finger blocks; and
sliding seal means located between the housing and the gripper elements to permit movement of the gripper elements with minimum friction while preventing the escape of any contaminating material from within the housing to the environment.

4,913,482

SEAT SUSPENSION SYSTEM FOR AUTOMOTIVE VEHICLE OR THE LIKE

Toshimichi Hanai, Yokosuka, and Ken Kamijo, Zushi, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 29, 1986, Ser. No. 912,801
Claims priority, application Japan, Sep. 30, 1985, 60-215127; Sep. 30, 1985, 60-215128; Sep. 30, 1985, 60-148031[U]
Int. Cl.[4] B60N *1/02*
U.S. Cl. 296—65.1 14 Claims



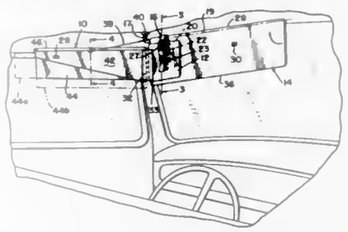
1. In a road vehicle
a chassis;
a seat; and
a seat control system comprising:
a first sensor for sensing the condition of the road on which the vehicle is running and for issuing a signal indicative of whether the surface of a road is smooth or rough, said sensor being mounted on said chassis and discrete from said seat;
a suspension operatively interconnecting said seat and said chassis, said suspension including:
structural members;
means for varying the resiliency of the suspension in respopnse to the signal issued by said first sensor; and
means for varying a bias applied to said structural members in response to a manually generated signal to vary the height of said seat above said chassis.

4,913,483

AUXILIARY SUN VISOR FOR AUTOMOTIVE VEHICLES

Daniel J. Jasso, 29493 Clearview La., Highland, Calif. 92346

Filed Aug. 25, 1988, Ser. No. 236,908
Int. Cl.[4] B60J *3/02*
U.S. Cl. 296—97.6 26 Claims



1. In a vehicle having a sun visor suspended from a bracket structure affixed to the vehicle, the improvement comprising:
a support panel to be removably attached flatwise to an outward end edge portion of the permanent visor, the support panel having an outer free edge,
an auxiliary visor,
flexible hinge strip means swingably connecting the auxiliary visor to the support panel such that the auxiliary visor has two degrees of motion, said hinge strip means extend-

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ing a substantial portion of the length of said outer free edge of the support panel, and

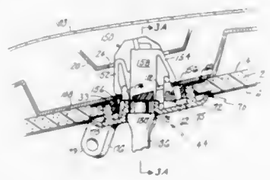
stabilizer means extending between the auxiliary visor and bracket structure to maintain the auxiliary visor in a stable position in spite of minor adjustments in the position of the permanent visor.

4,913,484

HEADLINER AND SUNSHADE FASTENER

James D. Dowd, Farmington Hills; David M. Hilborn, Sterling Heights; Roy Weilant, Clarkston, and Abdolhossein R. Lawassani, Pontiac, all of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Jun. 10, 1988, Ser. No. 204,804
Int. Cl.[4] B60J *3/02*
U.S. Cl. 296—97.12 22 Claims



1. A headliner and sunshade fastener for securing the substrate of a headliner defining a substrate opening and for securing a pivot rod extending from a sunshade, to body support members of a motor vehicle, wherein a body support member defines a first opening, which comprises:

a base defining a rod opening of a first diameter, and a generally planar bezel portion;

said rod extending through the rod opening of the base and wherein a sunshade may be mounted to the rod on one side of the base and a torque fitting mounted to the rod on the other side of said base, said torque fitting in the assembled position having a configuration which will not pass through the rod opening whereby the base supports the rod at the torque fitting;

a cover sized to receive the torque fitting fastened to the rod and including flexible extending flanges which may be compressed to allow the cover and flanges to fit through the first opening and, when released, said flanges spring outwardly to engage the body support member adjacent the first opening; and

means for securing the cover to the base with the cover extending through the substrate opening and the bezel engaging the substrate whereby the substrate and the pivot rod are secured to the vehicle body support members.

4,913,485

TRUCK SLEEPER CAB

Eugene V. Moffatt, 831 Douglas Dr.; Raymond H. Moffatt, 3448 Ellwood Rd., both of New Castle, Pa. 16101; Vivian S. Jones, R.D. #2 Frampton Rd., West Middlesex, Pa. 16159, and David A. Jones, 2060 Clayfurnace Rd., Sharpsville, Pa. 16150

Filed Jul. 6, 1987, Ser. No. 69,837
Int. Cl.[4] B60P *3/32*
U.S. Cl. 296—190 28 Claims

1. A sleeper cab unit for mounting on a tractor-truck having a tractor-truck operating cab and a rear-mounted hitch for hauling a trailer and the sleeper cab unit being located adjacent and behind a tractor-truck operating cab by attachment to the tractor-truck frame and comprising:

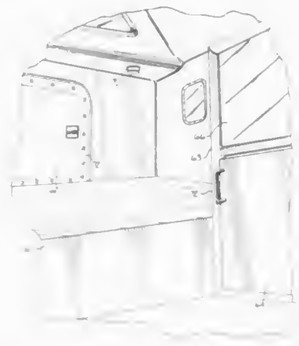
an outer shell made of one piece of continuously integrally connected molded fiberglass reinforced plastic material having vertical side wall portions, an upper roof portion and a lower floor portion providing a continuous wall and defining a box-like structure having interior side surfaces and exterior side surfaces;

a plurality of laterally spaced separate reinforcement strip members integrally bonded to the interior surfaces of said vertical side wall portions;

a separate flat rigid board-like reinforcement sheet member integrally bonded to the interior surface of said floor portion;

a separate flat rigid board-like reinforcement sheet member integrally bonded to the interior surface of said roof portion;

cut-out window opening means cut through said continuous wall in at least one of said side wall portions for enabling installation of a window unit;



a window unit mounted in each of said cut-out window opening means in sealed supporting relationship with said continuous wall;

cut-out door opening means cut through said continuous wall in at least one of said side wall portions for enabling installation of a door unit;

a door unit mounted in each of said cut-out door opening means in sealed supporting relationship with said continuous wall;

mounting means associated with said floor portion for fixedly mounting the sleeper cab unit on the truck frame behind and adjacent the truck cab;

said reinforcement strip members are made of fiberglass material; and

each reinforcement sheet member being made of one piece of wood material.

4,913,486

SUNROOF AND LATCHING ASSEMBLY THEREFOR

Dennis W. Staley, Birmingham, and Antony W. Chamings, Warren, both of Mich., assignors to ASC Incorporated, Southgate, Mich.

Filed Jan. 27, 1989, Ser. No. 302,375
Int. Cl.[4] B60J *7/057, 7/19*
U.S. Cl. 296—223 5 Claims

1. A latching assembly for use with a sliding closure, comprising:

(a) a first set of opposed tracks, the tracks being substantially parallel, at least one of the tracks having serrations associated therewith to engage the teeth of a gear;

(b) a gear shaft disposed between the tracks;

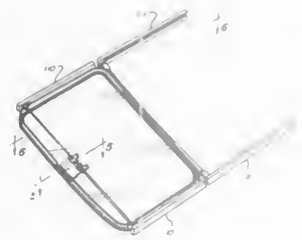
(c) at least one drive gear attached to the gear shaft proximate an end thereof for rotation therewith, the drive gear being substantially cylindrical and having teeth formed therearound which engage the serrations:

(d) a lock gear attached to the gear shaft for rotation therewith;

(e) a handle assembly comprising:

(1) a manually movable handle;

(2) an engaging member, the engaging member being disposed proximate the lock gear and being engagable therewith,



(3) means for biasing the engaging member against the lock gear; and

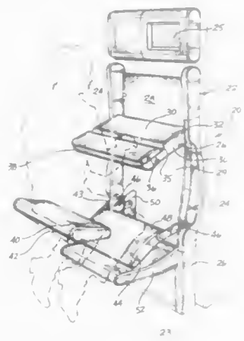
(4) means for disengaging the engaging member from the lock gear in response to movement of the handle.

4,913,487

AIRCRAFT WORKSTATION WHICH IS CONVERTIBLE BETWEEN A FLIGHT ATTENDANT'S SEAT AND A COMPUTER TERMINAL

David A. Breckel, Bellevue, and Michael A. Ritts, Issaquah, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 3, 1989, Ser. No. 332,134
Int. Cl.[4] A47C *9/06*; B60N *1/10*
U.S. Cl. 297—14 6 Claims



1. A multi-function workstation for an aircraft cabin, the workstation comprising:

a. a frame which forms an enclosure;

b. a first panel which is attached to a lower part of the frame for movement between a generally vertical stowed position inside the frame enclosure, and a generally horizontal position for use as a seat in a first functional mode;

c. a second panel which is attached to the frame above the first panel for movement between a generally vertical stowed position inside the frame enclosure, and a generally horizontal position, the second panel including (i) a cushion on a first side to act as a headrest when the second panel is in the generally vertical stowed position during the first functional mode, and (ii) a receptacle for supporting a computer keyboard on a second side of the second panel so that the keyboard is supported in a generally horizontal manner when the second panel is in the generally horizontal position for use of the keyboard by a computer operator in a second functional mode;

d. a third panel for accomodating the computer operator at the keyboard receptacle in a seated position; and

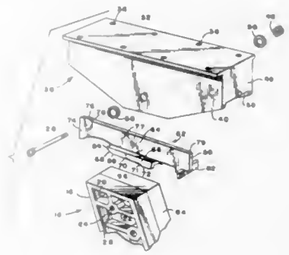
e. means for connecting the third panel to the frame below the second panel in a manner that the third panel is movable between a generally vertical stowed position inside the frame enclosure, and a generally horizontal position in which the third panel is spaced further away from the frame than the second panel in order to seat the operator on the third panel when accessing the keyboard receptacle in the second functional mode.

4,913,488

CONVERTIBLE BENCH AND TABLE TOP ASSEMBLY

Emerson B. Donnell, Jr., Neshanic, N.J., assignor to Nelson A. Taylor Co., Inc., Gloversville, N.Y.

Filed Jan. 18, 1989, Ser. No. 298,425
Int. Cl.[4] A47B *85/04*
U.S. Cl. 297—124 15 Claims



1. A locking member for use on a article of furniture, said article of furniture having frame means carrying a fixed seat section and a movable common section, said common section rotatably movable on said frame from a first non-locked seat back position to a second locked table top position, said common section maintained in its first non-locked seat back position by gravity, said common section maintained in its second locked table top position by said locking member, said locking member being associated at least one support member attached to said common section, said support member comprising a box-shaped housing member rotatably carried on said frame means, said locking member loosely contained between said frame member and said housing member for rotational movement with said housing member, said locking member longitudinally movable from a first non-wedging position to a second wedging position to lock by wedging action said common section in its second position, said wedging action resulting from said locking member being slidably moved longitudinally within said housing member to a position where it is wedged between said housing member and a planar portion of said frame member when said support member is in its second position, and wherein said locking member is provided at a forward end thereof with retention means cooperable with surface means on said housing member to retain said locking member in said second position.

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4,913,489

DEVICE FOR VARYING THE DISTANCE BETWEEN THE SEATS IN COMMERCIAL AIRCRAFT

Gerard Martin, Longpont-sur-Orge, France, assignor to Tissmetal Lionel-Dupont, Eyons, France

Continuation-in-part of Ser. No. 156,327, Jun. 4, 1980, abandoned. This application Mar. 21, 1983, Ser. No. 477,245

Int. Cl.[4] A47C *15/00*

U.S. Cl. 297—232 13 Claims

1. A device for varying the distance or pitch between seats of commercial aircraft, comprising:

longitudinal rails having upper horizontal flanges;

said rails having dovetail shaped grooves defined by two inner lips of the rails, and holes in said lips, the distance between two adjacent holes being equal to that of an elementary pitch of displacement of the seat;

each seat having a front foot and a rear foot, each provided with hooks, and on each foot of a seat, a device for securing said seat to said rail in the desired position;

one of said feet comprising a vertically mobile bolt engaging in a hole in said rail and the hook on said rear foot;

said seats including a fixed driving seat having a drive mechanism and mobile seats, at least one of said mobile seats being disposed in front of, and another of said mobile seats being disposed behind said driving seat;

driving racks coupled to said drive mechanism, located one on each rail and able to be displaced forwards or backwards by a predetermined distance depending on the desired change in pitch;

a transmission mechanism between said driving and said mobile seats comprising a set of slats and slidable on said rails, connecting, at rail level, the feet of said mobile seats together, said slats of the mobile seats nearest said driving seat being coupled to said connection racks, and said racks actuating said slats;

at least one of said mobile seats being located in front of the driving seat and placed on said two slats for establishing a connection of variable length between the foot of said at least one mobile seat and the rear foot of the preceding seat and the rear foot of said at least one mobile seat and the front foot of the following seat;

each of said slats having at the front thereof slots of constant dimensions for all the slats, enveloping the bolt and the hook of a rear foot;

at the rear of said slats, another longitudinal slot enveloping said hooks of the front foot and of a length equal to $A+(\Delta P-2)$, A being the length of said hooks and ΔP being the difference between the largest pitch of the seat and the smallest pitch in front of the seat in question; and

control and securing means associated with the feet of each mobile seat for automatically controlling the unlocking of the seat as soon as said slats are displaced;

each slat having a cross section in the form of an inverted U and being slidably mounted on said flange of a said rail;

each slat bearing on its upper surface two parallel and opposite cams, and a vertically movable bolt between said cams;

each slat having lateral catches and being pierced, in its median part, with a longitudinal slot allowing said slat a forward or backward movement equal to two elementary pitches by enabling said slat to slide between said rail and said control means, whatever the vertical position of said bolt;

said forward movement being determined by the abutting of the rear end of the slot against said securing means, said rearward movement being determined by said catches on said slat and abutting against said securing means.

4,913,490

AUXILIARY CHAIR MOUNTED IN VEHICLE

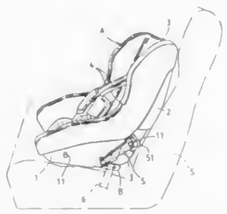
Takehiko Takahashi; Hideo Saito; Takashi Watanabe, and Tomihiro Kaneko, all of Tokyo, Japan, assignors to Combi Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1988, Ser. No. 262,907

Claims priority, application Japan, Oct. 26, 1987, 65-162554[U]; Nov. 2, 1987, 65-166858[U]

Int. Cl.[4] A47C *1/08*

U.S. Cl. 297—250 7 Claims



1. An auxiliary chair adapted to be removably mounted on an automotive seat and retained on said automotive seat by a seat belt associated with said automotive seat, comprising:

a seat portion having a front edge, and a rear edge;

a backrest extending from said rear edge of said seat portion;

means for adjusting a slant angle of said seat portion, said adjusting means including a pair of adjusting bars each of which is pivotally attached at its proximal end to a lower portion of said seat portion, so that said adjusting bars may take a forward position and a rearward position; and

means for fixing said auxiliary chair to said automotive seat, said fixing means including a pair of seat belt engaging levers for retaining said auxiliary chair to said automotive seat by engaging said seat belt, each of said engaging levers being pivotally attached at its proximal end portion to a respective side surface of said seat portion so that its distal end portion may freely be angularly moved, said fixing means further including associated engagement mechanisms each of which is provided at the side of said seat portion and is engageable with said distal end portion of a respective engaging lever to maintain engagement of said engaging levers with said seat belt.

4,913,491

AUTOMOTIVE SEAT WITH SIDE SUPPORTS-MOUNTED SEATBACK

Shyozi Mizuno, and Toru Kondo, both of Kanagawa, Japan, assignors to Ikeda Bussan Co., Ltd., Ayase and Nissan Shatai Company, Limited, Hiratsuka, both of, Japan

Filed Mar. 10, 1989, Ser. No. 321,400

Claims priority, application Japan, Mar. 31, 1988, 63-43901[U]

Int. Cl.[4] A47C *3/00*

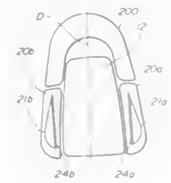
U.S. Cl. 297—284 9 Claims

1. An automotive seat comprising:

a seatback proper; and

a pair of side supports which are pivotally connected through respective pivot shafts to both sides of said setback proper, each side support including an elongate front surface whose longitudinal axis extends in a given direction, said side supports being arranged in such a manner that the distance therebetween gradually decreases with increase of heights of the side supports,

wherein the thickness of each side support gradually decreases with increase of height of the same, each pivot



shaft extends in a direction substantially in parallel with said given direction, and said pivot shafts extend in parallel with each other.

4,913,492

RECLINER FOR VEHICLE SEAT

J. Scott Shovar, Davenport, Iowa, assignor to Sears Manufacturing Company, Davenport, Iowa

Filed Apr. 3, 1989, Ser. No. 333,387

Int. Cl.[4] B60N *1/02*; A47C *3/00*

U.S. Cl. 297—300 2 Claims

1. A vehicle seat comprising:

a unitary seat pan, having formed therein adjacent the front end thereof a depending seat pan part which substantially transversely spans said seat pan and which defines an upwardly opening channel, and having a seat pan rear end part which substantially spans said seat pan and extends generally upwardly, transversely spaced pivot attachment points being formed into said seat pan rear end part adjacent the terminal free end thereof;

a unitary backrest pan, having upper and lower ends, pivotally attached intermediate said ends to said pivot attachment points, and having formed at said lower end a flange which substantially transversely spans said backrest pan; and

recliner means including a front pivot mount fixed to said depending seat pan part, a rear pivot mount fixed to said backrest pan flange, and a recliner mechanism extending between said front and rear pivot mounts generally immediately below, and intermediate the sides of, said unitary seat pan.

4,913,493

FLEXIBLE STRUCTURE

Charles Heidmann, Strasbourg, France, assignor to Strafor S.A., Strasbourg, France

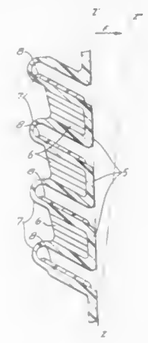
Filed Sep. 13, 1988, Ser. No. 243,903

Claims priority, application France, Sep. 22, 1987, 87 13247

Int. Cl.[4] A47C *7/44*

U.S. Cl. 297—306 2 Claims

1. Structure having a predetermined flexible ability in a single direction, said structure comprising a solid plate of semi-rigid plastic material in one face of which is provided a series of substantially parallel slits in a direction oblique to the other face of said plate, said slits defining in said plate a corresponding number of substantially parallel longitudinal blocks separated by a plurality of reinforcing ribs, said blocks being joined by webs of flexible material defining the bottom of said slits, said slits further comprising at least one rib formed on one



wall of at least one of said slits, said rib being parallel to said wall of said slit such that a distorting force exerted on the uncut face of said plate causes a flexural effect upon the entire plate limited by the abutment of one side wall of said slit with said rib formed in the other side wall.

4,913,494

SEAT APPARATUS HAVING A RECLINING APPARATUS

Isao Ikegaya, Kosai, Japan, assignor to Fujikiko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1988, Ser. No. 224,652

Claims priority, application Japan, Jul. 31, 1987, 62-116828[U]; Sep. 24, 1987, 62-145869[U]; Jan. 28, 1988, 63-9588[U]

Int. Cl.[4] B60N *1/02*

U.S. Cl. 297—367 17 Claims

1 A reclining apparatus comprising:

arm means for fixing a seat back thereto pivotally mounted to a holder plate means and having a latch gear portion;

lower teeth means pivotally mounted to the holder plate means and engaged with and disengaged from the latch gear portion to lock and unlock the arm means;

cam means pivotally mounted to the holder plate means and contacting the lower teeth means;

a joining portion joined to the cam means and an operating lever means; and

means for moving the joining portion to locate the joining portion invisibly behind the rear side of the holder plate means when the lower teeth means is completely locked with the latch gear portion, and to locate at least a portion

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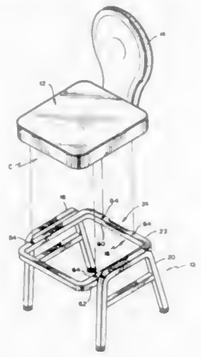
of the joining portion visibly from the outside of the holder plate means when the lower teeth means is incompletely locked with the latch gear portion.

4,913,495
SEAT
Youetsu Nagasaka, and Akihiko Yatsushiro, both of Fujisawa, Japan, assignors to Shiroki Corporation, Fujisawa, Japan
Filed Jai. 25, 1989, Ser. No. 384,539
Claims priority, application Japan, Feb. 23, 1989, 64-21015[U]
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—284 7 Claims

1. A seat comprising:
a seat cushion;
a seat back connected to said seat cushion, wherein a space is formed within a lower portion of said seat back;
a rod rotatably interposed between opposed side frames of said seat back and to one end of which a link plate is secured;
a hip support secured upon an intermediate portion of said rod and disposed within said space provided within said seat back;
an operation handle provided upon one of said side frames;
a pinion to which rotation of said operation handle is transmitted by means of a brake mechanism; and
a driven gear rotatably disposed upon the same axis as that of said rod upon said one side frame side for meshing engagement with said pinion, a rotating end portion of said driven gear being connected to a rotating end portion of said link plate.

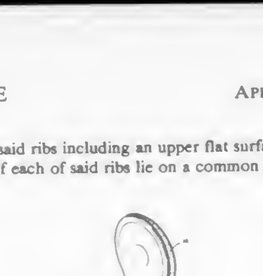
4,913,496
STACKABLE CHAIR AND METHOD OF MANUFACTURE
George V. Oke, 6718 Kerns Rd., Falls Church, Va. 22042
Filed Mar. 22, 1989, Ser. No. 327,028
Int. Cl.[4] A47C *1/12*
U.S. Cl. 297—443 15 Claims

1. A seating structure, comprising:
(a) a ground supported frame having an upper planar surface;
(b) a recessed portion in said frame interrupting said upper surface;
(c) an L-shaped bracket means has a first portion extending parallel to said surface and positioned within said recessed portion and a second portion extending upwardly therefrom generally perpendicular thereto;
(d) means for securing said first portion in said recessed portion;
(e) said recessed portion including two spaced parallel ribs extending parallel to said upper surface;
(f) each of said ribs including an upper flat surface, said flat surface of each of said ribs lie on a common plane;



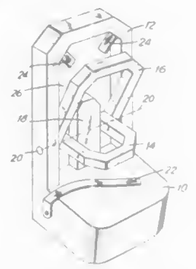
(g) said frame including a portion having a longitudinal axis; and
(h) said ribs extending parallel to said longitudinal axis.

4,913,497
BELT TIGHTENER FOR SEAT BELTS IN VEHICLES
Walter Knabel, Murnau/Staffelsee; Josef Mayer, Weichs, and Stephan Wentker, Dachau, all of Fed. Rep. of Germany, assignors to Britax-Kolb GmbH & Co., Dachau, Fed. Rep. of Germany
Filed Jul. 19, 1988, Ser. No. 221,332
Int. Cl.[4] B60R *21/00*; A47C *31/00*
U.S. Cl. 297—480 26 Claims



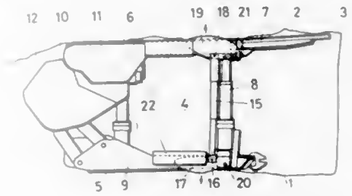
1. A belt tightener for seat belts in vehicles, said belt tightener including a device for moving the belt buckle in a belt-tightening sense and for locking the belt buckle at the end of the tightening movement, said device activated by a vehicle-senstive system which activates said belt tightener in response to an acceleration or deceleration in excess of predetermined critical values, characterized in that
the belt buckle is carried by a bracket which is guided for a longitudinal displacement in a housing, said housing being connected to the frame of the seat part of the vehicle and being provded with means which permit a pull-in movement of the bracket and block its movement in the opposite direction,
the belt buckle being operatively coupled to one end of a tensile element, which at its other end is connected to an energy storage device, said energy storage device including a prestressed spring and and being adapted in case of relaxation to impart a pull-in movement via the tensile element to the belt buckle, and
a locking device for retaining said spring in its prestressed position, said locking device being controlled by the vehicle-sensitive system in such a manner that said locking device will be disengaged in response to accelerations in excess of a predetermined value to cause tightening of the seat belt buckle.

4,913,498
CHILD RESTRAINT SEAT
Joseph Forlivio, 65 Bennett Ave., Yonkers, N.Y. 10701
Filed Aug. 28, 1989, Ser. No. 399,623
Int. Cl.[4] B60N *1/12*
U.S. Cl. 297—488 2 Claims



1. A child restraint that is storable in a seat back, and which is hingeable downwardly to an extended position to provide a child restraint, comprising:
a first U-shaped child restraint member pivotally mounted in said seat back for movement between a retracted position in which said first child restraint provides a continuation of the external surface of said seat back, and an extended position for use as a child restraint;
a second U-shaped child restraint member pivotally mounted in said seat back and moveable from a retracted position in which said second child restraint provides a continuation of the surface of said seat back, and an extended position for use as a child restraint;
said first and second child restraint members being moveable independently of each other between said retracted and extended positions; and,
a fixed portion of said seat back providing a continuation of the surface of said seat back, and which is surrounded by said first and second restraint members when in a retracted position;
whereby, with each said child restraint positioned in a retracted position a continuation of the surface of said seat back is provided providing back support for an adult;
when said first child restraint is extended, said fixed seat back portion provides a back support for an infant or small child;
when said first child restraint is retracted and said second child restraint is extended, said first child restraint provides a continuation of the surface of said fixed seat back portion to provide a back support for a larger child; and,
when both of said first and second child restraints are extended, an upper surface of said extended child restraints provides a play area for an infant or child.

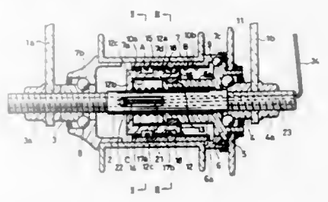
4,913,499
EQUIPMENT AND METHOD FOR MEASURING CONVERGENCE
Brian G. D. Smart, Stirlingshire, Scotland, assignor to Coal Industry (Patents) Limited, London, England
Filed Nov. 16, 1988, Ser. No. 271,642
Claims priority, application United Kingdom, Dec. 17, 1987, 8729482
Int. Cl.[4] E21D *15/40*; G08B *21/00*
U.S. Cl. 299—12 18 Claims



1. Equipment for measuring the convergence and distance between floor and roof of an excavated area including transducer means positioned between the floor and roof, cam means positioned at least at one end of the transducer means and adapted to engage the floor or roof and to maintain contact therewith and spring means arranged to exert a constant load on the cam means.

18. A method of measuring convergence in a mined area comprising placing a transducer in a telescopic element on a pivoted cam between the roof and the floor of the area, loading the transducer with a constant pressure between the roof and the floor, monitoring the output of the transducer as convergence occurs and deriving an electrical signal proportional to the convergence.

4,913,500
BICYCLE HUB
Tsukasa Waake, Matsubara, and Hiroyuki Noami, Wakayama, both of Japan, assignors to Maeda Industries, Ltd., Osaka, Japan
Filed Nov. 15, 1988, Ser. No. 272,107
Claims priority, application Japan, Nov. 17, 1987, 62-291579
Int. Cl.[4] B60B *27/02*; F16H *27/02*
U.S. Cl. 301—105 B 10 Claims



1. A bicycle hub comprising:
a hollow hub body rotatably supported on a hub shaft and having a substantially cylindrical inner surface, said inner surface being formed with at least one annular sliding portion;
a drive member rotatably supported on said hub shaft at one end of said hub body to receive a driving force;
a slider disposed within said hub body for co-rotation with said drive member on said hub shaft, said slider being slidable axially of said hub shaft;
a first ratchet mechanism including a first circumferential series of ratchet teeth formed on said inner surface of said hub body at one side of said sliding portion, said first

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ratchet mechanism further including at least one first ratchet pawl pivotally carried on said slider for movement therewith axially of said hub shaft, said first ratchet pawl coming into driving engagement with said first series of ratchet teeth to cause said slider to rotate with said hub body in one rotational direction while allowing said slider body to rotate idly relative to said hub body in the opposite rotational direction;

a second ratchet mechanism including a second circumferential series of ratchet teeth formed on said inner surface of said hub body at the other side of said sliding portion, said second ratchet mechanism further including at least one second ratchet pawl pivotally carried on said slider for movement therewith axially of said hub shaft, said second ratchet pawl coming into driving engagement with said second series of ratchet teeth to cause said slider to rotate with said hub body in said opposite rotational direction while allowing said slider to rotate idly relative to said hub body in said one rotational direction; and

change-over means for axially moving said slider to bring a selected one of said first and second ratchet pawls into sliding contact with said sliding portion.--

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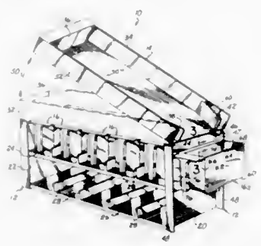
4,913,501

COMBINATION MULTIPLE-COMPARTMENT STORAGE BIN AND SORTING TRAY

Robert P. Swank, Bellville, Ohio, assignor to Leiter Industries, Inc., Lexington, Ohio

Filed Mar. 31, 1989, Ser. No. 332,501
Int. Cl.[4] A47B *29/14*
U.S. Cl. 312—211 10 Claims



1. In combination, a storage apparatus and sorting tray comprising

a frame having first and second end walls, said walls having inside surfaces and outside surfaces, a storage bin located between said inside surfaces of said end walls for storing containers within said frame,

a plurality of containers stored within said storage bin,

mounting means on said external surface of said one end wall for mounting a container removed from said storage bin on said outside surface of said one end wall of said frame externally of said storage bin,

a tray having first and second ends, said first end being pivotally mounted to said first end wall of said frame, said tray being adapted to receive articles for sorting, and

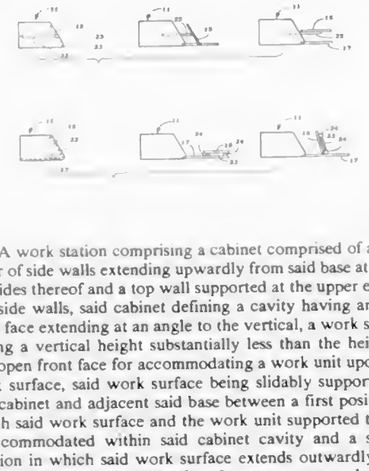
said tray being movable with respect to said frame between a generally horizontal sorting position and an angled discharge position, said second end of said tray being disposed vertically above said first end of said tray in said angled discharge position of said tray such that articles within said tray are discharged into a selected container mounted to said external surface of said one end wall of said frame by said mounting means upon pivoting of said tray to said angled position, and said selected container having articles from said tray contained therein being thereafter returnable to said storage bin.

4,913,502

WORK STATION

Edwin R. Russell, Cottesloe, Australia, assignor to Ergonomic Designs Ltd., Cottesloe, Australia

Continuation of Ser. No. 852,963, May 19, 1986, abandoned.
This application Jun. 29, 1988, Ser. No. 213,519
Claims priority, application Australia, Aug. 3, 1984, PG6419
Int. Cl.[4] A47B *41/06*
U.S. Cl. 312—233 16 Claims



1. A work station comprising a cabinet comprised of a base, a pair of side walls extending upwardly from said base at opposite sides thereof and a top wall supported at the upper ends of said side walls, said cabinet defining a cavity having an open front face extending at an angle to the vertical, a work surface having a vertical height substantially less than the height of said open front face for accommodating a work unit upon said work surface, said work surface being slidably supported by said cabinet and adjacent said base between a first position in which said work surface and the work unit supported therein is accommodated within said cabinet cavity and a second position in which said work surface extends outwardly from said cavity beyond said open face for user access to the work unit, a flap having opposing side faces pivotally supported by said cabinet for pivotal movement relative to said cabinet between a first stored position wherein one of said side faces extends at an angle to the vertical and upwardly and rearwardly from the front edge of said work surface when said work surface is in its first position and overlying and forming a closure for said open face and a second position in which at least one side face of said closure flap extends in an upright manner to provide a copy support surface from a position substantially rearwardly of the front edge of said work surface and adjacent said open face when said work surface is in its second position.

4,913,503

MOLDED CASE CIRCUIT BREAKER ACTUATOR-ACCESSOKY UNIT RESET MECHANISM

Roger N. Castonguay, Terryville; Joseph G. Nagy, Plainville; Richard E. Bernier, Southington; Ronald D. Ciarcia, Bristol, and Keith W. Klein, Simsbury, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Oct. 7, 1988, Ser. No. 254,754
Int. Cl.[4] H01H *9/00*
U.S. Cl. 335—172 10 Claims

1. A molded case circuit breaker having a combined trip actuator and accessory unit comprising:

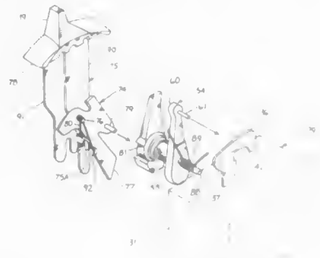
a molded case circuit breaker case and cover;

a circuit breaker operating mechanism within said case arranged for separating a pair of contacts to interrupt circuit current through said contacts;

a crossbar assembly connected with said operating mechanism, and one of said contacts, said crossbar assembly interfacing with an operating handle yoke for manual opening and closing of said contacts;

a trip actuator-accessory unit within a recess in said circuit breaker cover proximate said operating mechanism and including a trip actuator latch pivotally attached to a support housing for articulating said operating mechanism to separate said contacts automatically upon overcurrent conditions through said contacts;

an operating lever in said case proximate said operating mechanism and interfacing with said actuator-accessory unit through a latch support arm, said latch support arm including a latch pin being retained by said trip actuator latch in the absence of said overcurrent conditions through said contacts, said latch pin being released by said



trip actuator latch upon occurrence of said overcurrent conditions;

an electromagnetic coil and a spring-biased plunger within said actuator-accessory unit, said plunger being restrained from moving said trip actuator latch away from said latch pin; and

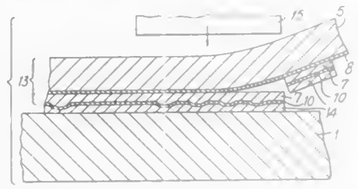
a drive lever attached to said operating handle yoke by means of a pivot pin and interacting with said operating lever to rotate said operating lever and said latch support arm to engage said latch pin with said trip actuator latch.

4,913,504

DOCUMENTS OR LIKE ARTICLES BEARING HOLOGRAMS

Terence J. Gallagher, Brookfield, Conn., assignor to American Bank Note Holographics, Inc., Elmsford, N.Y.

Division of Ser. No. 827,656, Feb. 7, 1986, Pat. No. 4,728,377, which is a division of Ser. No. 439,935, Nov. 8, 1982, abandoned.
This application Dec. 24, 1987, Ser. No. 137,747
Int. Cl.[4] G03H *1/00*
U.S. Cl. 350—3.6 10 Claims



1. An article comprising a document or like supportive substrate having a surface bearing a hologram, produced by the successive steps of

(a) establishing a laminate comprising a thin layer of transparent material capable of receiving a three-dimensional light-diffracting pattern, a support layer, and a heat-sensitive release layer bonding the transparent material layer to the support layer, such that a surface of the transparent material layer is exposed;

(b) forming, on said exposed surface, a three-dimensional light-diffracting pattern comprising a hologram while maintaining the transparent material layer bonded to the support layer by the release layer, said exposed surface being vacuum-deposited with a reflective coating of metal and said pattern being formed in said metal as well as in said exposed surface;

(c) applying, to said exposed surface, a layer of a heat-sensitive adhesive capable of providing a bond between the transparent material layer and the substrate, said transparent material layer having a shear strength less than that of said bond;

(d) juxtaposing the laminate and the supportive substrate such that the adhesive layer is in contact with the substrate surface and the support layer is exposed;

(e) applying heat and pressure to at least a region of the juxtaposed laminate and substrate in register with said pattern for simultaneously activating the adhesive layer and the release layer in said region to adhere the transparent material layer to the substrate surface in said region while releasing the transparent material layer from the support layer in said region; and

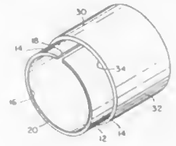
(f) removing the support layer, together with any nonadhered portion of the transparent material layer, from the adhered transparent material layer in said region, leaving the adhered transparent material layer bearing said pattern bonded to said substrate.

4,913,505

HOLLOW LIGHTPIPE AND METHOD FOR ITS MANUFACTURE

Michael B. Levy, 15018 NE. 177th Dr., Woodinville, Wash. 98072

Filed Nov. 29, 1988, Ser. No. 277,892
Int. Cl.[4] B29D *11/00*; G02B *6/20*
U.S. Cl. 350—96.10 35 Claims



1. A waveguide for high efficiency transmission of laser light made by the process of forming an elongated ribbon of a substrate material, said ribbon- having first and second opposite longitudinal edges and first and second sides therebetween, forming a reflective coating on said first side, and then bending said ribbon to position said first and second edges together to form a hollow tube with said first side forming an inner surface inside said tube.

4,913,506

OPTICAL MODULATION DEVICE

Masatoshi Suzuki; Shigeyuki Akiba; Hideaki Tanaka, all of Tokyo, and Katsuyuki Utaka, Musashino, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1989, Ser. No. 311,218
Claims priority, application Japan, Feb. 26, 1988, 63-42198; Feb. 26, 1988, 63-42199; Feb. 26, 1988, 63-42200
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.14 14 Claims

2. An optical modulation device which has, on a substrate, an optical waveguide layer, p- and n-type clad layers smaller in refractive index than that of the optical waveguide layer, and electrodes, and in which fixed-intensity light incident to a light receiving end face of the optical waveguide layer is modulated by changing its absorption coefficient for the incident light by an electric field which is applied to the optical waveguide layer

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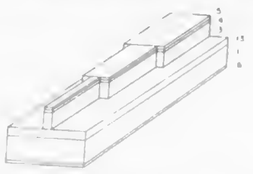
across the electrodes and the modulated light is emitted from an emitting end face of the optical waveguide layer, characterized in:

that when the intensity of the light incident to the optical waveguide layer is above 0.1 mW, the band-gap energy of the optical waveguide layer is 50 meV or more greater than the photon energy of the incident light, that a ratio of the energy difference between the band-gap energy and the photon energy to the length of the optical modulation



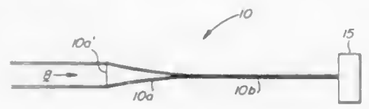
device, which is determined by the length from the light receiving end face to the emitting end face of the optical waveguide layer, is larger than 10 meV/mm but smaller than 250 meV/mm, and that a semiconductor layer of the same conductivity type as the optical waveguide layer is sandwiched between it and the p-type clad layer, the semiconductor layer having a band-gap energy larger than the band-gap energy of the optical waveguide layer but smaller or equal to the band-gap energy of each of the clad layers.

4,913,507

MODE FIELD CONDITIONER

Timothy C. Stamnitz, Encinitas, and Stephen D. Russell, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 8, 1988, Ser. No. 242,466
Int. Cl.[4] G02B *6/26*
U.S. Cl. 350—96.15 12 Claims



1. A method of conditioning optical signal energy for stimulating and enhancing nonlinear effects in dielectric waveguides for transmission comprising:

transmitting optical signal energy through a single-mode dielectric waveguide;

reducing the diameter of the single mode dielectric waveguide in a tapered section so as to retain single-mode transmission from a larger diametered end receiving the optical signal energy to a smaller diametered end; and

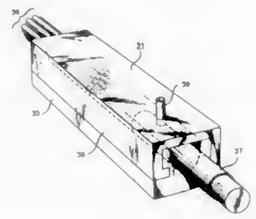
concentrating the intensity of the coupled optical signal energy at the smaller diametered end of the single mode dielectric waveguide as it transits the length of the tapered single-mode dielectric waveguide section from the larger diametered end to the smaller diametered end to provide a sufficient intensity level that induces an appropriate nonlinear effect.

4,913,508

PASSIVE OPTICAL DEVICE

Lee L. Blyler, Jr., Basking Ridge, N.J., and Gary J. Grimes, Thornton, Colo., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 30, 1988, Ser. No. 252,091
Int. Cl.[4] G02B *6/28*
U.S. Cl. 350—96.16 8 Claims



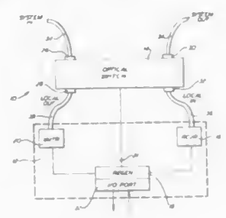
1. An optical waveguide device suitable for transmitting electromagnetic radiation comprising at least one optical fiber collection transmitting said electromagnetic radiation and at least one otpical fiber collection receiving said electromagnetic radiation, said collections comprising at least one fiber and said optical fiber collections optically connected by a waveguiding mixing region, said mixing region comprising a core and a cladding characterized in that the numerical aperture of each of said fibers transmitting said radiation into said mixing region is less than 20% larger than (A) the numerical aperture of all other fibers to which said fibers transmit and (B) the numerical aperture of said mixing region; the numerical aperture of said mixing region is less than 20% larger than the numerical aperture of all fibers to which said mixing region transmits, and the total core cross-sectional area of said receiving collections, the total core area of said transmitting collections, and the minimum core cross-sectional area of said mixing region are substantially matched.

4,913,509

FAIL-SAFE PORT FOR USE WITH AN OPTICAL FIBER

Anthony P. Baker, New York, N.Y., assignor to ITT Corporation, New York, N.Y.

Filed Nov. 5, 1985, Ser. No. 795,296
Int. Cl.[4] G02B *6/28*
U.S. Cl. 350—96.16 5 Claims



1. A fail-safe port apparatus comprises:

a subscriber port interface comprising a signal regeneration means;

a liquid crystal optical switching device, wherein said liquid crystal optical switching device includes:

a first input port, said first input port communicating with an optical transmission medium;

a first output port, said first output port communicating with said optical transmission medium;

a second output port, said second output port communicating with said subscriber port interface; and

a second input port, said second input port communicating with said subscriber port interface;

said liquid crystal optical switching device being adapted to selectively switch light signals received from said optical transmission medium at said first input port to said signal regeneration means of said subscriber port interface via said second outut port when said switch is in a power on condition, and wherein a light signal provided by said signal regeneration means to said second input port is directed to said optical transmission medium via said first output port when said switch is in a power on condition, and

wherein said light signals received at said first input port pass through said switch and exit via said first output port when said switch is in a power off condition, and means for sustaining an electromagnetic field when said switch is in a power on condition in a liquid crystal material, said electromagnetic field sustaining means including first and second spaced apart electrodes.

4,913,510

EXPANDED BEAM FIBER OPTIC LENS

Thomas M. Lynch, Williamsport, and Rudolph A. Montgelas, Lock Haven, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 6, 1989, Ser. No. 319,389
Int. Cl.[4] G02B *6/32*
U.S. Cl. 350—96.18 5 Claims

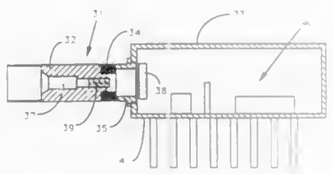
1. An expanded beam lens for an optical fiber comprising: an elongated, capillary glass tube having a longitudinally located, fiber receiving bore terminating in an integral, bulbous portion; the end of said tube opposite said bulbous portion being formed as a fiber receiving funnel; said bore being cylindrical for a major part of its length; said bore terminating in a substantially flat wall extending normal to said bore and adjacent said bulbous portion.

4,913,511

TRANSIENT VOLTAGE SUPPRESSION FOR ELECTRO-OPTIC MODULES

Camilo M. Tabalba, Kanata; Paul J. Koens, Ashton, and Joseph J. Lommen, Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Mar. 30, 1989, Ser. No. 330,743
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 11 Claims



1. An electro-optic module for connecting to an optical fiber, comprising:

an optical connector having a first portion used as a connecting end for receiving and securing said optical fiber;

a circuit board attached to said optical connector at a second portion thereof; and

isolating means at said optical connector, adapted to electrically isolate said connecting end of said first portion from said second portion, such that high voltage transients are directed away from said circuit board.

4,913,512

FIBER OPTIC IN-LINE SPLICE CASE ASSEMBLY

John J. Anderton, Oil City, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 562,926, Dec. 19, 1983, Pat. No. 4,836,640. This application Dec. 27, 1988, Ser. No. 290,715
Int. Cl.[4] G02B *7/26*
U.S. Cl. 350—96.20 5 Claims

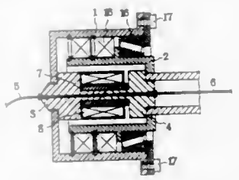
1. A fiber optic in-line splice case assembly comprising: a pair of end plugs each having a first axial aperture for receiving an optic fiber and a second axial aperture for receiving an associated fiber wand, said apertures being radially separated from one another, torque bars rigidly joining said end plugs, at least one resilient clip rotatably attached to one of the torque bars at a point intermediate the end plugs, said clip for securing a fiber optic splice, a substantially cylindrical housing for surrounding the end plugs, the torque bars and the clip; said housing including threaded portions at opposite ends of interior surfaces, and a pair of end caps, each exhibiting a threaded portion whereby the end caps are to be threaded into the opposite ends of the housing.

4,913,513

MONOCABLE BIDIRECTIONAL OPTICAL FIBER CONNECTOR ASSEMBLY

Noriteru Kuromatsu, and Koichiro Kuromatsu, both of Himeji, Japan, assignors to Shinko Sangyo Satsubi Yugen Kaisha, Hyogo, Japan

Filed Dec. 19, 1988, Ser. No. 286,007
Int. Cl.[4] G02B *6/38*
U.S. Cl. 350—96.21 9 Claims



1. A mono-axis bidirectional optical fiber connector assembly comprising:

a stationary housing,

a rotatable housing inserted into said stationary housing, a

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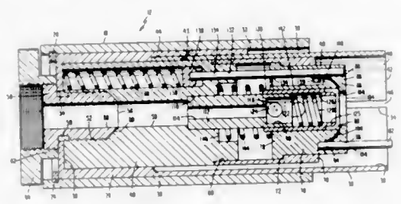
stationary ferrule mounted centrally of said stationary housing,
a rotatable ferrule mounted centrally of said rotatable housing,
said stationary ferrule and said rotatable ferrule being in abutment with each other at a rotational center of said rotatable housing, one of the ferrules including an abutment face defining a tapered recess, and the other ferrule including an abutment face defining a tapered projection,
each said stationary ferrule and said rotatable ferrule carrying an optical fiber cable centrally thereof, respectively,
each said optical fiber cable being opposed to each other with a spacing therebetween at an end-to-end abutment position of said ferrules,
an irregular reflection preventive tube mounted peripherally of said ferrules,
a magnet mounted peripherally of said irregular reflective preventive tube, and
a ferrite tube mounted between said irregular reflection preventive tube and said magnet.

4,913,514
FIBER OPTIC CONNECTOR

Joseph L. Then, Rockville, Md., assignor to Advanced Optical Systems, Rockville, Md.

Filed Nov. 22, 1988, Ser. No. 274,440
Int. Cl.[4] G02B *6/38*
U.S. Cl. 350—96.21 **22 Claims**



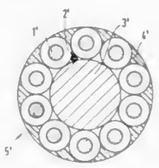
1. A connector for an optical fiber wherein said connector includes first ferrule means fitted on said optical fiber, said ferrul means and said optical fiber having coplanar end faces disposed at an acute angle to the axis of said optical fiber at its end, and second ferrule means having first and second opposed ends, said first ferrule means being mounted within said second ferrule means and disposed at a position wherein said coplanar end faces are between said opposed ends of said second ferrule means, said optical fiber extending from said first end of said second ferrule means, said second end of said second ferrule means having protruding portions separated by spaces between said protruding portions to form a hermaphroditic termination capable of mating with itself, said coplanar end faces being disposed within said second ferrule means in predetermined relationship to said hermaphroditic termination.

4,913,515
OPTICAL CABLE ELEMENT, MULTIPLE-FIBER TUBE UNIT, AND OPTICAL CABLE

Michael Braunmiller, Stuttgart; Ferdinand Grögl, Beilstein, and Thomas A. Klett, Murr, all of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Dec. 21, 1988, Ser. No. 288,413
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743802
Int. Cl.[4] G02B *6/44*; H01B *7/00*
U.S. Cl. 350—96.23 **10 Claims**

1. A round optical cable element having a longitudinal axis and comprising
a central filament,
two or more optical fibers arranged concentrically around the central filament, the fibers and the central filament being oriented in the direction of the longitudinal axis,
means for ripping open the envelope in the longitudinal direction of the cable at a predetermined position about the circumference between a predetermined adjacent pair of said optical fibers, and

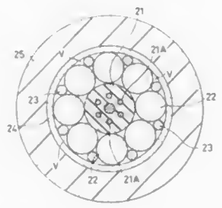


an envelope of plastic applied over and adhering to the optical fibers,
whereby a portion of the cable element may be ripped open along its longitudinal axis and the round cable element may be transformed into a ribbon cable element in the vicinity of the thus ripped open portion.

4,913,516
SUBMARINE OPTICAL FIBER CABLE

Jiro Ikeda, Yokohama, Japan, assignor to Ocean Cable Co., Ltd., Japan

Filed Oct. 3, 1988, Ser. No. 251,843
Claims priority, application Japan, Jun. 24, 1988, 63-82886[U]
Int. Cl.[4] G02B *5/14*
U.S. Cl. 350—96.23 **2 Claims**

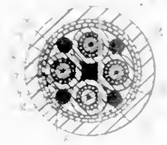


1. A submarine optical fiber cable comprising:
an optical fiber unit;
a plurality of large uniform diameter first tension wires wound around said optical fiber unit in a close fitting manner so as to form a single layer having a thickness substantially equal to the diameter of said first tension wires and to serve as a tension body; and
a plurality of small uniform diameter second tension wires wound around said single layer such that each of said second tension wires contacts adjacent first tension wires of said single layer.

4,913,517
COMMUNICATION CABLE HAVING WATER BLOCKING STRENGTH MEMBERS

Candido J. Arroyo, Lithonia; Jill B. Fluevog, Norcross; Krishnaswamy Kathiresan, Marietta, and Parbhubhai D. Patel, Dunwoody, all of Ga., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 11, 1988, Ser. No. 217,486
Int. Cl.[4] G02B *6/44*; H02G *15/20*
U.S. Cl. 350—96.23 **24 Claims**



1. A communications cable, comprising:
a core having a longitudinal axis and comprising at least one communications medium;
a jacket which comprises a plastic material and which encloses said core; and
a longitudinally extending, relatively supple strength member system for the cable which is disposed between said core and said jacket, said strength member system having a relatively high modulus to provide suitable strength characteristics for said cable and including means for blocking water flow within said cable.

4,913,518
FLUOROBOROSILICATE GLASS CLAD ARTICLE AND NIGHT VISION DEVICE

Gerald J. Fine, Corning, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Division of Ser. No. 278,853, Dec. 2, 1988, Pat. No. 4,868,141, which is a continuation-in-part of Ser. No. 111,217, Oct. 22, 1987, abandoned. This application Jun. 5, 1989, Ser. No. 361,447
Int. Cl.[4] G02B *6/18*
U.S. Cl. 350—96.29 **11 Claims**

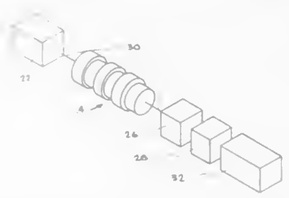
8. A night vision device embodying a plurality of clad glass fibers bonded together in a bundle, each clad glass fiber being composed of a core glass and a cladding glass, the numerical aperture of the clad fiber approximating one, and the cladding glass having a composition, in percent by weight, consisting essentially of 35–52% SiO_2, 8–23% Al_2O_3, the $SiO_2+Al_2O_3$ being at least 53%, 10–23% B_2O_3, 15–19% K_2O, the $B_2O_3+Al_2O_3$ being not over 36%, and 0–8% Na_2O, 0–5% alkaline earth metal oxides (RO), and containing by analysis 6–12% F.

4,913,519
OPTICAL SENSOR FOR THE DETECTION OF ICE FORMATION AND OTHER CHEMICAL SPECIES

Stanley M. Klainer, San Ramon, and Fred P. Milanovich, Lafayette, both of Calif., assignors to FiberChem Inc., Las Vegas, Nev.

Filed Mar. 4, 1988, Ser. No. 164,172
Int. Cl.[4] G02B *6/02*
U.S. Cl. 350—96.29 **19 Claims**

1. An optical sensor for detecting ice formation, comprising:
a light guiding means having a refractive index N_1 greater than the refractive index of ice at 0° C. and less than the refractive index of water at 0° C.;
stripes of a clad material having a refractive index N_2 substantially equal to the refractive index of ice at 0° C. and formed in a spaced parallel relationship on the light guiding means at a spacing between stripes that is effective to hold water in place when water contacts the sensor.



4,913,520
OPTICAL FIBER FOR PULSE COMPRESSION

James D. Kafka, Mountain View, Calif., assignor to Spectra Physics, San Jose, Calif.

Filed Oct. 25, 1988, Ser. No. 262,440
Int. Cl.[4] G02B *27/44*
U.S. Cl. 350—96.30 **4 Claims**

1. An optical fiber for pulse compression said optical fiber having a core portion and a cladding portion such that the optical fiber has a Δ of less than 0.3%.

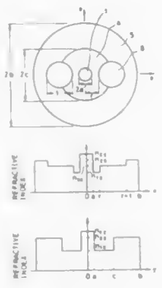
4,913,521
SINGLE-POLARIZATION OPTICAL FIBER

Katsusuke Tajima, Katsuta; Yutaka Sasaki; Masaharu Ohashi; Makoto Tsubokawa, and Nobuo Kuwaki, all of Mito, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Dec. 2, 1988, Ser. No. 279,022
Claims priority, application Japan, Dec. 4, 1987, 62-305751; Nov. 16, 1988, 63-287568
Int. Cl.[4] G02B *6/22*
U.S. Cl. 350—96.33 **13 Claims**

1. A single-polarization optical fiber comprising:
a core;
an inner cladding surrounding said core;
an outer cladding surrounding said inner cladding; and
at least one pair of stress-applying portions each of which are extended into both said inner and outer claddings so as to induce a geometrical birefringence due to an anisotropy of a refractive index profile as well as a stress-induced birefringence due to an anisotropy of an induced stress and which are symmetrical about said core, the thermal expansion coefficient of said stress-applying portions being higher than those of said inner and outer claddings;
wherein when the direction in which said stress-applying portions impact stresses is designated by the x-direction and the direction perpendicular to said x-direction is designated by the y-direction, the following conditions are satisfied:
$n_{1x}<n_{3x}<n_{cx}$,
$n_{3x}\leqq n_{2x}$,

$n_{1y} < n_{3y}$ and
$n_{3y} \leqq n_{2y}$
where n_{cx}, n_{1x}, n_{2x} and n_{3x} are refractive indices for



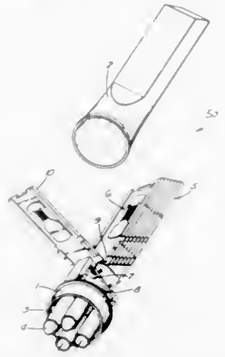
x-polarization of said core, said inner claddings, said outer cladding and said stress-applying portions, respectively, and n_{cy}, n_{1y}, n_{2y} and n_{3y} are refractive indices for y-polarization of said core, said inner cladding, said outer cladding and said stress-applying portions, respectively.

4,913,522

ELECTROFIT FIBRE OPTICS BUTT SPLICE

Jean-Marie E. Nolf, Korbeck-L.; Joris R. I. Franckx, Bonheiden, and Jos Doucet, Kessel-lo, all of Belgium, assignors to NV Raychem SA, Kessel-lo, Belgium

Continuation of Ser. No. 110,051, Oct. 13, 1987, abandoned, which is a continuation of Ser. No. 721,527, Apr. 9, 1985, abandoned. This application Oct. 24, 1988, Ser. No. 262,067
Claims priority, application United Kingdom, Apr. 11, 1984, 8409368
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **21 Claims**



1. An assembly for providing an environment seal for an optical fiber cable, which comprises:
- a hollow article comprising a base plate and a hollow cover disengageable from the base plate, the base plate having at least two mutually adjacent outlets capable of receiving respective optical fibre cables;
- at least one optical fibre organizer housed within the article for storing a plurality of optical fibres in a path from one of the outlets to another of the outlets, said path having a minimum radius of curvature no smaller than a minimum bend radius of said optical fibres; and
- first means for connecting the base plate to the hollow cover and second means for connecting the at least one optical fibre organizer to the base plate such that when the first and second means are so connected the optical fibres are stored in at least one storage plane and when the first means is disconnected the hollow cover is removable from the base plate by being moved along a direction substantially parallel to the storage plane, the storage plane being substantially parallel to a longitudinal axis of the base plate outlets.

4,913,523

OPTICAL FIBER CONNECTOR

Noriyuki Yoshida, and Kenichi Takahashi, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 856,985, Apr. 29, 1986, abandoned. This application Jun. 28, 1988, Ser. No. 212,531
Claims priority, application Japan, May 9, 1985, 60-98600
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **2 Claims**

1. A connector for optical fibers which transmit intense infrared light comprising:
- a sleeve having an optical fiber hole perforated along a center line in an axial direction, a front cylindrical surface and a rear conical surface formed in coaxial relation with the front cylindrical surface; and
- a receptacle having an inner cylindrical surface to be fitted with the front cylindrical surface of the sleeve and an inner conical surface formed in coaxial relation with the inner cylindrical surface to be fitted with the rear conical surface of the sleeve;
- wherein, when antiparallel forces are applied to the sleeve and the receptacle in the axial direction, the inner conical surface of the receptacle and the inner conical surface of the sleeve press each other with strong forces so that radial displacement of an optical fiber disposed within said optical fiber hole is suppressed; and
- wherein the rear conical surface of the sleeve has an inclination rate in a range from 1/80 to 1/8 and the inner conical surface of the receptacle also has an inclination rate in the range.

4,913,524

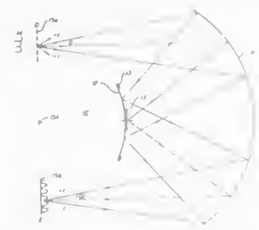
SYNTHETIC IMAGING TECHNIQUE

Justin L. Kreuzer, Trumbull, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 12, 1988, Ser. No. 193,015
Int. Cl.[4] G02B *27/46*
U.S. Cl. 350—162.12 **9 Claims**

1. In an ofocal optical system for projecting a well corrected ring field, off-axis image of an object;
- at least one concave and convex mirror having their centers of curvature nearly coincident on a common optical axis;
- a mask having a pattern formed therein disposed at a first conjugate point of the system;
- an illumination source disposed relative to said mask and mirrors for imaging said pattern at a second conjugate point of the system;

means disposed at said convex mirror for blocking zero order light and the second and above orders of light



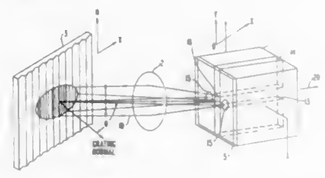
caused by diffraction of light by said mask pattern from said illumination source.

4,913,525

FREQUENCY STABILIZED LIGHT SOURCE

Hiroshi Asakura, Osaka; Kiyokazu Hagiwara, Hirakata, and Minoru Nishioka, Kobe, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 30,428, Mar. 26, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 334,793
Claims priority, application Japan, Mar. 31, 1986, 61-73503; Oct. 29, 1986, 61-257233
Int. Cl.[4] G02B *27/42. 5/18;* **H01S** *3/08, 3/10*
U.S. Cl. 350—162.12 **6 Claims**



1. A frequency stabilized light source comprising:
- a semiconductor laser element having an active layer for emitting a light from one facet of said active layer;
- a lens for collimating said light emitted from said one facet of said active layer of said semiconductor layer element;
- a Fourier diffraction grating having a corrugated profile and continuous first order differential coefficients for diffracting the light collimated from said lens so that a desired diffracted light from said grating is fed back through said lens to said active layer of said semiconductor laser element so as to cause said semiconductor laser element to emit an output light from another facet of said active layer,
- wherein said grating is disposed such that its dispersing direction is tilted relative to said active layer of said semiconductor laser element by an angle ϕ to thereby prevent a spurious diffracted light from said grating adjacent to said desired diffracted light from being fed back to said active layer of said semiconductor laser element, said angle ϕ satisfying substantially the following condition:

$$\cos \phi \cong d \cdot \cos \Theta \cdot \lambda / (f \cdot \delta\lambda \cdot NA\max)$$

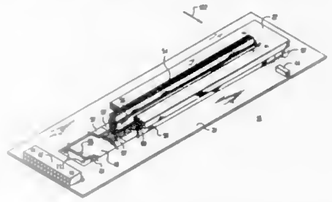
where d is a pitch of said corrugated profile of said grating, Θ is an angle between a normal of said grating and an optical axis of said lens, λ is a wavelength of said desired diffracted light, f is a focal length of said lens, $\delta\lambda$ is a difference between said wavelength of said desired diffracted light and a wavelength of said spurious diffracted light, and NAmax is a numerical aperture of said lens.

4,913,526

OPTICAL LED PRINTHEAD WITH LENS LOCATOR BAR

Edwin A. Hediger, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 1, 1988, Ser. No. 239,252
Int. Cl.[4] G02B *7/02, 6/04;* **G03B** *27/00*
U.S. Cl. 350—252 **14 Claims**



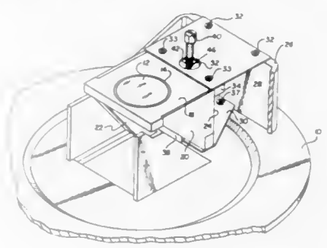
1. A printhead assembly for selectively exposing a moving photoconductive surface to provide a latent image, said printhead comprising:
- a linear array of light emitting diodes (LED's);
- a linear fiber optic lens assembly positioned to focus light from the LED's onto the photoconductive surface, said lens assembly having a first tolerance for the dimension which is parallel to the axis of the fibers in the lens assembly;
- means for mounting the lens assembly a predetermined distance from the LED's; and
- a stiffening, straightening, and locating bar, said bar being bonded to one side of the lens assembly, with a centerline of the bar positioned coincident with a centerline of the lens assembly, and with the tolerance for the dimension of the bar which is parallel to the axis of the fibers being substantially smaller than said first tolerance, thereby permitting convenient lens centerline location during alignment by locating the centerline of the dimensionally accurate bar rather than directly locating the centerline of the dimensionally inaccurate lens assembly.

4,913,527

LENS FOCUS ADJUSTMENT MEANS

Thomas C. Jessop, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 19, 1988, Ser. No. 246,575
Int. Cl.[4] G02B *7/02*
U.S. Cl. 350—255 **7 Claims**



3. A lens focus adjustment means comprising:
supporting means;
a lens mount;
a pair of parallel flexures supporting said lens mount for movment along a predetermined axis; and

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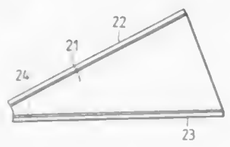
a compound screw having a section of one pitch threaded in said lens mount and a section of a second pitch threaded in said supporting means, said screw being rotatable to displace said lens mount on said flexures a distance related to the difference in pitch of said threaded portions.

4,913,528

OPTICAL PRISM, AND PROJECTION TELEVISION SET USING SAME

Shinichi Hasegawa, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 31, 1988, Ser. No. 200,271
Claims priority, application Japan, May 30, 1987, 62-135414
Int. Cl.[4] G02B *5/04, 5/06;* H04N *9/31*
U.S. Cl. 350—286 **17 Claims**



1. An optical prism comprising:
a base member (21) in the form of a prism having a total reflection surface (22) formed at a first surface thereof;
a plate-shaped member (23) having a dichroic film formed on a surface thereof which is optically coupled to said base member; and
means for fixing said plateshaped member to said prism at a position proximate to said base member with said dichroic film confronting a second surface of said base member and wherein said prism forming said base member includes another plate-shaped member (22) at said second surface to form said total reflection surface.

4,913,529

ILLUMINATION SYSTEM FOR AN LCD DISPLAY SYSTEM

Jill F. Goldenberg, Pelham Manor, and Joshua D. Eskin, Mt. Kisco, both of N.Y., assignors to North American Philips Corp., New York, N.Y.

Filed Dec. 27, 1988, Ser. No. 290,471
Int. Cl.[4] G02F *1/133;* G02B *5/30;* G03B *21/28;* H04N *9/31*
U.S. Cl. 350—337 **14 Claims**

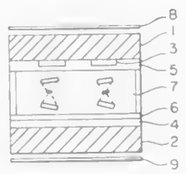
11. An illumination system for an LCD projection display system comprising:
(a) a light source;
(b) means for collecting the light of said light source into a beam;
(c) means for obtaining from said beam of light first and second beams of light, each of said first and second beams of light being linearly polarized, the direction of polarization of each of said first and second beams of light being orthogonal to one another;
(d) prism means, said prism means including at least, first, second and third faces;
(e) means for rotating the direction of polarization of a polarized beam of light 90°;
(f) first and second means for directing said first and second polarized beams of light towards said prism means, said first means directing said first beam of light through said first face of said prism means towards said second face of said prism means such that said first beam undergoes total internal reflection from said face and is directed towards said third face of said prism means where it exits said prism means, said second means directing said second beam through said polarization rotating means towards said second face of said prism means such that said second beam is refracted into said prism and is directed toward said third face where it exits said prism means; and
(g) LCD light modulating means for modulating said beams of light after exiting said prism means.

4,913,530

LIQUID CRYSTAL DISPLAY

Yukiko Ichimura, Yamatokooriyama; Shuichi Kozaki, Nara; Fumiaki Funada, Yamatokooriyama; Hideo Saito, Ichihara, and Kenji Furukawa, Yokosuka, all of Japan, assignors to Sharp Kabushiki Kaisha and Chisso Corporation, both of Osaka, Japan

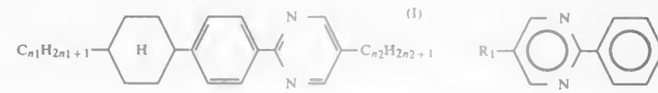
Filed Nov. 10, 1988, Ser. No. 269,316
Claims priority, application Japan, Nov. 10, 1987, 62-285016
Int. Cl.[4] G02F *1/13;* C09K *19/34*
U.S. Cl. 350—341 **16 Claims**



1. A liquid crystal display comprising two substrates and a positive dielectric anisotropy nematic liquid crystal present between said two substrates, wherein each of said substrates comprises a glass plate, an electrode thereon and an aligning layer subjected to a molecular aligning treatment for a pretilt angle of 1° to 30° on the electrode, wherin an optically active material is added to said nematic crystal, and wherein the average alignment direction in the longer direction of said liquid crystal molecule is twisted at an angle ϕ of 210° to 300° to impart a spiral structure to said liquid crystal and a ratio d/p of the spiral pitch p of said liquid crystal molecule and the liquid crystal thickness d are

$$(\phi/360-\tfrac{1}{4})<d/p<\phi/360;$$

wherein said nematic liquid crystal further contains one or more compounds represented by the following formula (I) in a total amount of not less than 10% by weight based on the total amount of the nematic liquid crystal:



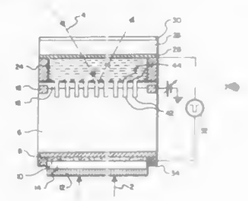
wherein n_1 and n_2 are each respectively a natural number of not more than 10.

4,913,531

LIQUID CRYSTAL LIGHT VALVE WITH GROOVED MICROGRID AND METHOD OF FORMING THE SAME

Uzi Efron, Los Angeles; Murray S. Welkowsky, Chatsworth, and Norman W. Goodwin, Encino, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 7, 1988, Ser. No. 241,680
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—342 **24 Claims**



1. A liquid crystal light valve (LCLV) having an input side and a readout side, comprising:
a layer of photoconductor material,
an electrode on the input side of the photoconductor material,
a grid of grooves extending into the readout side of the photoconductor material and dividing said material into a matrix of pixels,
a liquid crystal (LC) layer on the readout side of said photoconductor material and extending into said grooves, and
a transparent counter electrode on the readout side of said LC layer,
means for applying an electrical potential across said electrode and counterelectrode to establish an electrical potential across said LC layer, said photoconductor responding to an input light beam to spatially modulate the potential across said LC layer in accordance with the spatial characteristics of said input beam, said grooves establishing potential barriers to the migration of charge between said pixels.

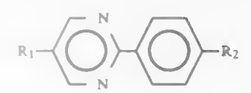
4,913,532

LIQUID CRYSTAL COMPOSITION AND LIQUID CRYSTAL DISPLAY DEVICE USING THE SAME

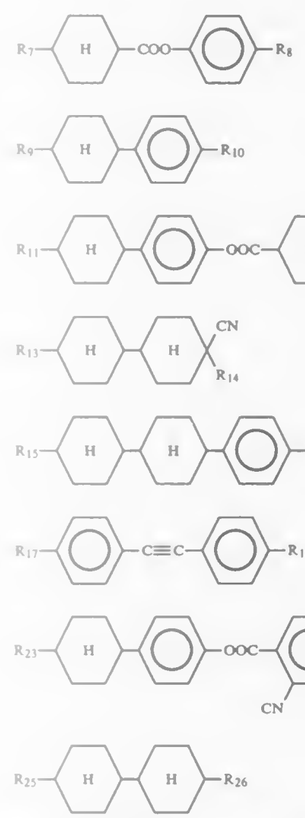
Tetsushi Yoshida, and Ken Kozima, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1988, Ser. No. 259,045
Claims priority, application Japan, Oct. 19, 1987, 62-263147
Int. Cl.[4] C09K *19/34;* G02F *1/13*
U.S. Cl. 350—350 R **25 Claims**

1. A nematic liquid crystal composition having a positive dielectric anisotropy, comprising:
20 wt % to 70 wt % of a first liquid crystal material consisting of at least one liquid crystal compound represented by a formula



wherein R_1 represents a linear alkyl group having 2 to 9 carbon atoms and R_2 represents a linear alkyl group or alkoxy group having 2 to 9 carbon atoms;
30 wt % to 80 wt % of a third liquid crystal material consisting of at least one liquid crystal compound represented by formulas

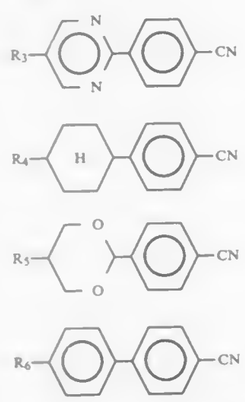


wherein R_7 represents a linear alkyl group having 3 to 5 carbon atoms and R_8 represents a linear alkyl group or alkoxy group having 1 to 5 carbon atoms, R_9 represents a linear alkyl group having 3 to 5 carbon atoms, R_{10} represents a linear alkyl group or alkoxy group having 1 to 4 carbon atoms, R_{11} represents a propyl group, each of R_{12} and R_{13} independently represents a linear alkyl group having 4 or 5 carbon atoms, R_{14} represents a linear alkyl group having 5 to 7 carbon atoms, R_{15} represents a propyl group, R_{16} represents a linear alkyl group having 1 to 3 carbon atoms, R_{17} represents a linear alkyl group having 3 to 5 carbon atoms, R_{18} represents an alkoxy group having 1 or 2 carbon atoms, R_{23} represents a linear alkyl group having 3 or 4 carbon atoms, R_{24} represents a linear alkyl

group having 2 to 4 carbon atoms, R_{25} represents a propyl group, and R_{26} represents an ethoxy group

in which the value of the dielectric anisotropy $\Delta\epsilon$ is negative or substantially "0"; and

optionally, not more than 10 wt % of a second liquid crystal material consisting of at least one liquid crystal compound having a positive dielectric anisotropy $\Delta\epsilon$ and represented by formulas:



wherein R_3 represents a linear alkyl group having 4 to 7 carbon atoms, R_4 represents a propyl group, R_5 represents a linear alkyl group having 3 to 5 carbon atoms, and R_6 represents an ethyl group;

wherein said nematic liquid crystal composition contains at least one kind of liquid crystal compound selected from the compounds of formulas (VIII), (IX), (X), (XI) and (XIV), the compounds of formulas (IX) and (XIV) being mixed at a mixing ratio of 3 wt % to 22 wt % and 5 wt % to 12 wt %, respectively, and the entire liquid crystal composition has a dielectric ratio $\Delta\epsilon/\epsilon\perp$ smaller than 0.5 and an elastic constant ratio K_{33}/K_{11} smaller than 0.8.

4,913,533

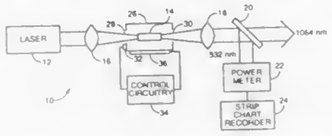
KTP CRYSTAL NONLINEAR OPTICAL DEVICE WITH REDUCED DRIFT AND DAMAGE

James D. Kafka; Thomas M. Baer, both of Mountain View, and Richard L. Herbst, Palo Alto, all of Calif., assignors to Spectra-Physics, Inc., Calif.

Filed Dec. 22, 1987, Ser. No. 136,896

Int. Cl.[4] G02F *1/01*; H01S *3/10*

U.S. Cl. 350—354 **18 Claims**



1. In a nonlinear optical device comprising means to direct at least one incident beam of electromagnetic radiation into a crystal having nonlinear optical properties whereby electromagnetic radiation emerging from said crystal contains at least one frequency different from the frequency of any incident beam of radiation, wherein the improvement comprises a KTP crystal heated to a drift reducing operating temperature at which a reduction of a falloff of output power as a function of time from said KTP crystal is achieved.

4,913,534

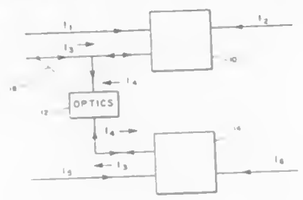
REAL-TIME DYNAMIC HOLOGRAPHIC IMAGE STORAGE DEVICE

Sharon S. Lafleur, and Raymond C. Montgomery, both of Hampton, Va., assignors to Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 2, 1989, Ser. No. 318,217

Int. Cl.[4] G03H *1/02*

U.S. Cl. 350—3.64 **23 Claims**



12. An apparatus for storing a holographic image, comprising:

supply means for supplying an object beam and first and second sets of counter-propagating, co-linear reference beams, each of said sets of counter-propagating, co-linear reference beams comprising a write beam and a read beam, said object beam and said write beams in said respective sets of reference beams being coherent;

first pattern means for creating a first dynamic interference pattern between the object beam and the first set of counter-propagating, co-linear reference beams to produce a phase-conjugate object beam;

second pattern means for creating a second dynamic interference pattern between the phase-conjugate object beam and the second set of counter-propagating, co-linear reference beams to produce a reconstructed object beam; and

directing means for directing the reconstructed object beam into the first dynamic interference pattern to enable continuance of the first and second dynamic interference patterns after said supply means discontinues supplying the object beam and continues supplying the first and second sets of counter-propagating, co-linear reference beams.

4,913,535

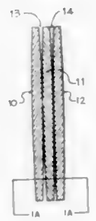
APOCHROMATIC LENS SYSTEMS

Paul N. Robb, Sunnyvale, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed May 1, 1989, Ser. No. 345,793

Int. Cl.[4] G02B *3/12*

U.S. Cl. 350—418 **6 Claims**



1. An apochromatic lens system comprising three glass lens elements and a liquid lens element disposed coaxially along an optic axis, said liquid lens element being contained between two of said glass lens elements, said three glass lens elements being made of substantially the same kind of optical glass and being of substantially the same geometrical configuration, said three glass lens elements and said liquid lens element coacting with each other to focus optical radiation passing through said lens system onto a focal surface with a change in focus of less than one-quarter wavelength within a wavelength range from 0.48 micron to 0.72 micron.

4,913,536

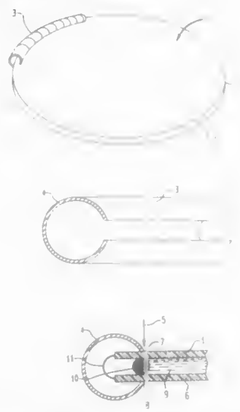
VARIABLE POWER LENS AND METHOD

Daniel Barnea, 1 Ugarit Street, Tel-Aviv, Israel (69016)

Filed Jun. 20, 1988, Ser. No. 208,660

Int. Cl.[4] G02B *3/14*; G02C *7/02*

U.S. Cl. 350—419 **25 Claims**



1. A variable power lens comprising:

(a) a pair of optical membranes at least one of which is flexible;

(b) a frame for clamping the periphery of one membrane to the periphery of the other so that an enclosed volume is created between the surfaces of the membranes;

(c) a refractive fluid filling said volume;

(d) means associated with said frame for applying forces and/or torques to the periphery of the membranes at selected locations therealong such that the pressure of the fluid in said enclosed volume is responsive to such forces and/or torques for displacing the surface of the flexible membrane in a substantially spherical manner.

4,913,537

VARI-FOCAL LENS SYSTEM WITH SWITCHABLE AUXILIARY LENS UNITS

Hiroshi Takase, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

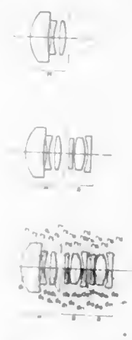
Filed Nov. 7, 1988, Ser. No. 267,845

Claims priority, application Japan, Nov. 10, 1987, 62-282154

Int. Cl.[4] G02B *15/02*

U.S. Cl. 350—422 **3 Claims**

1. A vari-focal lens system with switchable auxiliary lens units comprising a master lens system, a first auxiliary lens unit insertably and removably arranged after said master lens system and a second auxiliary lens unit insertably and removably arranged after said first auxiliary lens unit, said vari-focal lens system being so adapted as to permit photographing at different focal lengths with the master lens system alone, with the master lens system plus the first auxiliary lens unit, and with



the master lens system plus the first auxiliary lens unit plus the second auxiliary lens unit.

4,913,538

FOLDING BINOCULARS

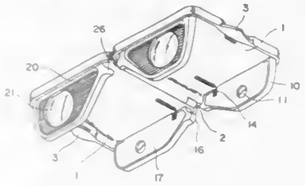
Shouji Wakayama, and Akio Akiyama, both c/o Young Optical Co., Ltd. No. 2-16-12, Tateishi, Katsushika-ku, Tokyo, Japan

Filed Sep. 15, 1988, Ser. No. 244,476

Claims priority, application Japan, Nov. 17, 1987, 62-175166[U]

Int. Cl.[4] G02B *23/18*

U.S. Cl. 350—546 **6 Claims**



1. Folding binoculars, comprising:

a pair consisting of left and right cover frames which are swingably supported by a support in such a manner as to be able to open and close with respect to each other, each of said cover frames having a respective rear edge and a respective front edge;

a pair consisting of left and right eyepiece frames which are each provided with an eyepiece, each of said eyepiece frames having a respective inner edge;

a pair consisting of left and right objective frames which are each provided with an objective, each of said objective frames having a respective inner edge;

each eyepiece frame and each objective frame being swingably supported by the rear edge and the front edge of a respective of one of said cover frames;

folding guide portions comprising first folding guide portions which are each formed on the inner edge of each of said eyepiece frames, and second folding guide portions which are each formed on the inner edge of each of said objective frames; and

set-up springs having resilience and urging respective eyepiece frames and respective objectives frames such that said respective eyepiece frames and said respective objective frames are raised in a first direction relative to said cover frames, and wherein, when said cover frames are swung toward each other to close and, accordingly, when said left and right eyepiece frames are moved toward each

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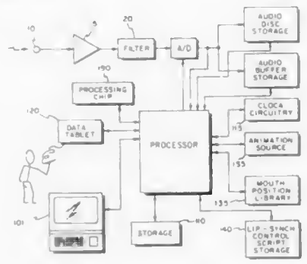
other to contact each other while said left and right objective frames are moved toward each other to contact each other, said folding guide portions which are formed on respective inner edges of said eyepiece frames and said objective frames guide said eyepiece frames and said objective frames in such a manner that said eyepiece frames and said objective frames are swung and are thus folded in an opposite second direction relative to said cover frames against the resilience of said set-up springs.

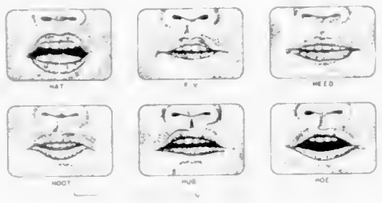
4,913,539

APPARATUS AND METHOD FOR LIP-SYNCHING ANIMATION

John P. Lewis, Port Washington, N.Y., assignor to New York Institute of Technology, Old Westbury, N.Y.

Filed Apr. 4, 1988, Ser. No. 176,843
Int. Cl.[4] G03B *21/32*
U.S. Cl. 352—87 19 Claims





1. Apparatus for producing lip-synching for a spoken sound track, comprising:

means for storing, for each of a number of mouth positions, an unvoiced phonetic information representation associated with a mouth position;

means responsive to samples of sound from the sound track for generating unvoiced phonetic information signals for the samples;

means for comparing said unvoiced phonetic information signals with the stored unvoiced phonetic information representations to determine which of the stored representations most closely matches the unvoiced phonetic information signals; and

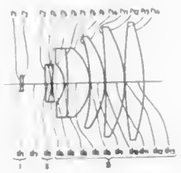
means for storing the determined representations in time correspondence with the sound track.

4,913,540

TELECENTRIC PROJECTION LENS SYSTEM

Nobutaka Minefuji, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 24, 1989, Ser. No. 383,689
Claims priority, application Japan, Jul. 30, 1988, 63-191160
Int. Cl.[4] G02B *9/60, 9/62*
U.S. Cl. 350—415 7 Claims



1. A telecentric projection system comprising, in order from a screen side to a chart side thereof, a first lens group consisting of a single positive lens element, a second lens group consisting of one of a single negative lens element and a positive lens cemented to a negative lens, and a third lens group comprising a negative lens cemented to a positive lens and a plurality of positive lens elements, which lens system satisfies the following conditions (1) and (2):

(1) $-2.5<f_I/f_{II}<-0.5$

(2) $0.6<f_{III}/f<0.95$

where

f: the focal length of the overall lens system

f_I: the focal length of the first lens group

f_{II}: the focal length of the second lens group

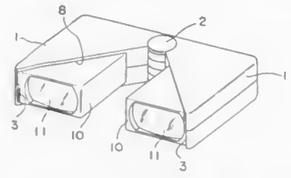
f_{III}: the focal length of the third lens group.

4,913,541

FOLDING BINOCULARS

Shouji Wakayama, and Akio Akiyama, both of c/o Youngs Optical Co., Ltd., No. 2-16-12, Tateishi, Katsushika-ku, Tokyo, Japan

Filed Sep. 15, 1988, Ser. No. 244,475
Int. Cl.[4] G02B *23/18*
U.S. Cl. 350—546 6 Claims



5. Folding binoculars comprising: a pair consisting of left and right eyepiece frames which are each provided with an eyepiece having an optical axis and which are swingably supported by a support and coupled to each other via said support in such a manner as to be able to be open and close with respect

to each other, each of said eyepiece frames having a substantially right-triangular planar configuration whereby said eyepiece frames have a substantially rectangular planar configuration when said eyepiece frames have been swung toward each other and are closed, and a pair of objective frames which are each provided with an objective having an optical axis and are each mounted on each of said eyepiece frames in such a manner as to be able to project from and retract into the eyepiece frame, wherein said objective frames are projected to and fixed at respective front portions of said eyepiece frames when said eyepiece frames are swung open, the optical axes of said objectives and the optical axes of said eyepieces being aligned with a state in which said eyepiece frames are open.

4,913,542

REAR VIEW MIRROR WITH TWO PARALLEL DISPLACED MIRROR PARTS

Rune Adolfsson, BorÅs, Sweden, assignor to SKF Nova AB, Gothenburg, Sweden

Filed Jan. 26, 1988, Ser. No. 148,558
Claims priority, application Sweden, Jan. 27, 1987, 8700303
Int. Cl.[4] G02B *5/09; B60R 1/08*
U.S. Cl. 350—612 2 Claims

1. In combination with a vehicle, a mirror system comprising a first mirror part (4) having a first reflecting surface mounted on the exterior of the vehicle located at a predetermined distance from a viewer within the vehicle, a second mirror part (5) mounted exteriorly on the vehicle closer to the viewer than said first mirror part (4) and having a second reflecting surface parallel to said first reflecting surface, the outer side edge of the first mirror part (4) being generally parallel to and vertically disposed with the inner side edge of the second mirror part (5), said vertically disposed edges lying along a visual line (6) originating from a viewer within the vehicle, and said mirror parts (4, 5) located on opposite sides of a line (9) tangent to the exterior side of the vehicle

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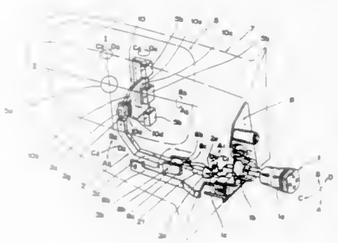
4,913,543

MIRROR ANGLE ADJUSTING DEVICE FOR DOOR MIRROR ASSEMBLY

Shinji Haba, and Hitoshi Kanazawa, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Nov. 3, 1988, Ser. No. 266,571
Claims priority, application Japan, Nov. 9, 1987, 62-170917[U]; Apr. 13, 1988, 63-50196[U]
Int. Cl.[4] G02B *7/18; B60R 1/06; A47G 1/24*
U.S. Cl. 350—635 2 Claims



1. A mirror angle adjusting device for a door mirror assembly comprising:

a door mirror case;

a mirror holder supporting a mirror and rotatably supported by said door mirror case;

a lever including an intermediate pivot fulcrum portion pivotally supported in said door mirror case, one end portion formed as an operating portion which is manually pivotable in both vertical and horizontal directions thereof so as to rotate said mirror holder around an axis thereof, and an opposite end portion located in said door mirror case and formed as a connecting portion;

a first connecting member including an intermediate pivot fulcrum portion pivotally supported by a support axis in said door mirror case so as to rotate in both vertical and horizontal directions thereof, one end portion formed as a first connecting portion, and an opposite end portion formed as a second connecting portion, the support axis of the fulcrum portion being supported by said door mirror case to move in a direction perpendicularly intersecting an axial direction thereof; and

a second connecting member including an axial portion arranged at a back surface of said mirror holder along a vertical axis of said mirror holder rotatably supported around an axis thereof, a protruding portion projecting from the axial portion in a backward direction of said mirror holder, and a first connecting portion formed at a specified portion of the protruding portion of said second connecting member along a horizontal axis of said mirror holder,

either one of the connecting portion of said lever and the first connecting portion of said first connecting member having a spherical portion, and the other of the connecting portion of said lever and the first connecting portion of said first connecting member having a clasping portion rotatably holding the spherical portion therein, so that said lever is connected with said first connecting member by both the connecting portions to relatively bend in both vertical and horizontal directions thereof, preventing movement in an axial direction of one of said lever and said first connecting member, and preventing removal thereof,

either one of the second connecting portion of said first connecting member and the first connecting portion of said second connecting member having a spherical portion, and the other of the second connecting portion of said first connecting member and the first connecting portion of said second connecting member having a clasping portion rotatably holding the spherical portion therein to rotate in both the vertical and horizontal directions with respect to said mirror holder,

said lever being connected to said mirror holder through said first connecting member and said second connecting member, and said mirror holder being rotatable around both the vertical and horizontal axes thereof by operation of said lever so as to adjust the rotating angle of the mirror.

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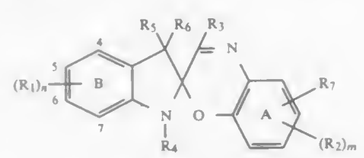
4,913,544
PHOTOCHROMIC ARTICLES
Martin Rickwood, Southport, and John D. Hepworth, Preston, both of England, assignors to Pilkington plc, St. Helens, England
Filed May 1, 1987, Ser. No. 44,715
Claims priority, application United Kingdom, May 1, 1986, 8610709
Int. Cl.⁴ G02B *27/00, 5/23*
U.S. Cl. 351—163 **63 Claims**

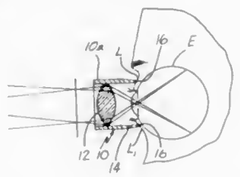
1. A plastic organic photochromic article comprising a plastics host material having a photochromic compound incorporated therein or applied thereto, the article exhibiting the following properties, measured at Air Mass 2 at 25° C.:
(a) an integrated visible transmission in the faded state (B.IVT) ranging from 90 to 25%,
(b) an integrated visible transmission in the darkened state (D.IVT) ranging from 1 to 50%,
(c) the rate of darkening of the article when it is exposed to actinic radiation is such that 88% of the darkening range is achieved in 30 seconds or less, i.e., $T_{88} \leqq 30$ secs,
(d) the rate of fading of the article from its fully darkened condition is such that more than 60% of the optical density range is recovered in 60 seconds, i.e., % ODG-1 $\geqq$ 60%, and
(e) the induced optical density of the article, i.e., the change in the optical density of the article, in moving from the faded state (B.IVT) to the darkened state (D.IVT), is greater than 0.45,
wherein the photochromic compound incorporated in or applied to the plastics host material is a photochromic compound of the general formula (I):



(I)

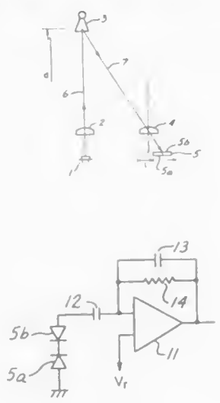
wherein n is an integer of 1 to 4, and m is 1, 2 or 3, each of R_1 and R_2 independently represents (i) a hydrogen atom or an amine functionality of general formula —NR'R", wherein each of R' and R" independently represents a hydrogen atom or an alkyl, cycloalkyl or phenyl group or a substituted derivative thereof, or an amine functionality which is a cycloheteroalkyl ring or a substituted cycloheteroalkyl ring which ring includes one or more heteroatoms, (ii) a group of formula —R, —OR, —SR, —COR, or —COOR wherein R represents H, alkyl, aryl or heteroaryl, (iii) —Z, $-CH_2Z$, $-CHZ_2$, $-CZ_3$ wherein Z represents a halogen, or (iv) $-NO_2$, —CN, —SCN, with the proviso that ring A is always substituted at the 6' position by a group R_2 which is an amine-functionality as defined above;
R_4 represents —H, alkyl, alkenyl, phenyl, phenylalkyl, mono-, di- or tri-substituted phenyl or alkoxy,
each of R_5 and R_6 independently represents —H, alkyl, alkenyl, phenyl, phenylalkyl such as benzyl, mono-, di- or tri-substituted phenyl, or R_5 and R_6 together represent an alicyclic ring including spiro carbons, norbornane, and adamantane,
R_3 represents a hydrogen atom, or an alkyl, aryl or heteroaryl group,
R_7 is as defined for R_1 and R_2 above, or is a ring system fused to ring A, which ring system may incorporate aromatic and/or alicyclic rings, the said ring system optionally carrying one or more substituents R_8, the substituent R_8 being as defined above for R_1 and R_2, and
Ring B may optionally contain one or more ring nitrogen atoms.

4,913,545
ADAPTER FOR LENS RETAINING RING FOR USE IN CONNECTION WITH EYE EXAMINATION
Donald A. Volk, 6805 Mayfield Rd., Apt. 1019, Mayfield Heights, Ohio 44124
Filed Oct. 6, 1988, Ser. No. 254,286
Int. Cl.⁴ A61B *3/10*
U.S. Cl. 351—205 **14 Claims**



1. An adapter for a lens retaining ring comprising means for coaction with the lens retaining ring, providing positioning of the lens retaining ring and associated lens a predetermined distance from an eye of a patient under examination, and a means on said adapter for aiding in maintaining the eyelids of the patient's eye open by engaging the external eyelids of the eye under examination.

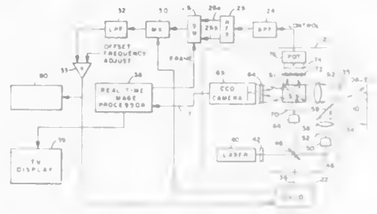
4,913,546
RANGE FINDER
Shinji Nagaoka; Koji Sato, and Yuji Nakajima, all of Yotsukaido, Japan, assignors to Seikosha Co., Ltd., Japan
Filed Jan. 29, 1985, Ser. No. 696,047
Claims priority, application Japan, Jan. 30, 1984, 59-14824
Int. Cl.⁴ G03B *3/00;* **G01C** *3/00*
U.S. Cl. 356—1 **11 Claims**



(a)

1. A range finder for measuring the distance of an object according to a position at which a reflected radiation beam is received, the range finder comprising: projection means for projecting a radiation beam towards an object whose distance is to be measured; receiving means movable along a line extending transversely of the axis of the projected radiation beam for receiving the radiation beam reflected by the object, the receiving means including a pair of photosensitive elements disposed adjacent to each other along the aforesaid line and each being operative to produce an electric signal proportional to the amount of radiation received thereby, and means electrically connecting the pair of photosensitive elements so that the electric signals produced thereby tend to cancel each other to thereby produce a differential output signal representative of the difference between the amounts of radiations received by the pair of photosensitive elements; and detection means for detecting when the differential output signal becomes zero during the movement of the receiving means to thereby determine the position at which the reflected radiation beam is received by the receiving means.

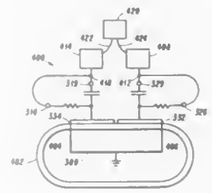
4,913,547
OPTICALLY PHASED-LOCKED SPECKLE PATTERN INTERFEROMETER
Steven E. Moran, 5386 Montego Pl., San Diego, Calif. 92124
Filed Jan. 29, 1988, Ser. No. 150,380
Int. Cl.⁴ G01B *9/02*
U.S. Cl. 356—349 **27 Claims**



1. A method for phase-locked optical interferometric inspection of a surface, comprising the steps of:
producing a first beam of energy by reflection from a target surface;
producing a second beam of energy having signal characteristics, said signal characteristics including frequency and phase;
mixing said first and second beams to produce a first interference pattern at a first image plane and a second interference pattern at a second image plane;
from a portion of said second interference pattern, deriving a control signal with frequency and phase characteristics representing a modulation of said first beam;
in response to said control signal, changing a signal characteristic of said second beam in synchronism with said modulation; and
generating successive images from said first interference pattern and combining said successive images to produce a contoured target surface image.

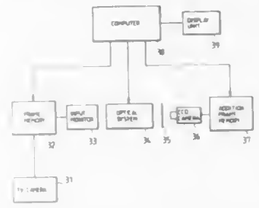
4,913,548
SOLID STATE FIBER OPTIC SEMICONDUCTOR RING LASER GYRO APPARATUS WITH NON-OPTICAL READOUT
Gerald L. Vick, Mt. Vernon, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Sep. 21, 1988, Ser. No. 247,986
Int. Cl.⁴ G01C *19/64*
U.S. Cl. 356—350 **4 Claims**

1. A ring laser gyro comprising;
a. an optical fiber , having a first fiber end and a second fiber end;
b. an optical amplifier diode having a ground electrode and a plurality of nonground electrodes and further having a first optical terminal and a second optical terminal;
c. said optical fiber being optically coupled at its first fiber end and its second fiber end to the first optical terminal and the second optical terminal, respectively, of said optical amplifier;
d. means for controlling and monitoring the voltage upon said plurality of nonground electrodes; and
e. means for comparing the voltages upon said plurality of nonground electrodes;
whereby, the direction and magnitude of rotation of the optical fiber can be determined by comparing the voltage output of



the nonground electrodes, these voltages output will correspond to the beat frequency between the two counterpropagating beams within the optical fiber, and with a comparison of the phase differences in the outputs and the known dimension of separation between the nonground electrodes, the direction of rotation can also be determined.

4,913,549
METHOD AND APPARATUS FOR REALTIME-MONITORING ASTRONOMICAL OBJECT WITH SPECKLE INTERFEROMETRY
Katsuyoshi Fujita, and Tamiki Takemori, both of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan
Filed Oct. 14, 1988, Ser. No. 257,674
Claims priority, application Japan, Dec. 22, 1987, 62-325983
Int. Cl.⁴ G01B *9/02*
U.S. Cl. 356—354 **7 Claims**



1. An apparatus for realtime-monitoring an astronomical object with speckle interferometry, comprising:
camera means whose light-receiving surface is disposed on an image plane of a telescope, for picking up an image of a star;
first means for producing an incoherent still picture of said image of said star on the basis of an output from said camera means;
second means for producing a power spectrum of said star by converting said incoherent still picture into a coherent image and optically Fourier-transforming said coherent image into said power spectrum;
third means for picking up power spectra consecutively produced by said second means, and adding said power spectra to obtain an average power spectrum, and
fourth means for controlling said first, second and third means and calculating a normalized average power spectrum of an object star through dividing said average power spectrum of said object star by said average power

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spectrum of a reference star which has been preliminarily obtained.

4,913,550

INTERFEROMETRIC MEASUREMENT METHOD AND APPARATUS

Paul C. Montgomery, Huddersfield, and John R. Tyrer, Ratcliffe on the Wreake, both of England, assignors to National Research Development Corp., United Kingdom

Continuation of Ser. No. 168,558, Mar. 4, 1988, abandoned, which is a continuation of Ser. No. 907,825, Sep. 16, 1986, abandoned. This application Dec. 19, 1988, Ser. No. 287,544

Claims priority, application United Kingdom, Sep. 16, 1985, 8522820

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—354 7 Claims

1. Apparatus for interferometric measurement of movement of a vibrating object, using a radiation sensor, comprising:

a source of coherent radiation arranged to illuminate the object,

means for focussing radiation scattered from a surface of the object on to the radiation sensor to produce an electrical signal dependent on an instantaneous amplitude of received scattered radiation,

means for varying a direction of illumination of said object by radiation from said source,

further means for focussing radiation from a reference beam on to the radiation sensor to generate a speckle pattern characteristic of the object at a given position, and

comparator means for comparing speckle patterns respectively characteristic of the object at a first and a second position.

4,913,551

LOG MEASURING METHOD AND APPARATUS

Richard B. Davis, 711 "H" St., Crescent City, Calif. 95531

Filed Jul. 28, 1987, Ser. No. 78,856

Int. Cl.[4] G01B *11/02*

U.S. Cl. 356—383 15 Claims

8. Apparatus for measuring the length and volume of an elongated object in a group of elongated objects, so arranged together in bundles, that access to or vision of said objects is limited to the viewing of their ends comprising:

(A) first stereocamera sensing means for determining the three-dimensional spacial coordinates of one end of said object with respect to said first sensing means;

(B) second stereocamera sensing means for determining the three-dimensional spacial coordinates of the other end of said object with respect to said second sensing means, wherein the spacial position of said first and second sensing means with respect to one another is accurately known in advance;

(C) analysing means for converting said sensed spacial coordinates into data representing cross-sectional area and length for computing said volume.

4,913,552

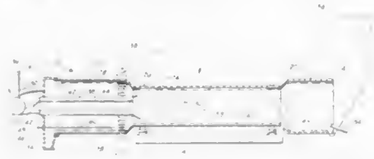
COUNTERCURRENT DRUM MIXER

Paul E. Bracegirdle, 559 Fairman La., Langhorne, Pa. 19047

Filed Sep. 1, 1989, Ser. No. 401,995

Int. Cl.[4] B28C *5/46, 1/22*

U.S. Cl. 366—4 32 Claims



1. In a method for continuously producing an asphaltic composition comprising the steps of:

introducing a first volume of material into an inclined, rotating drum at a first end to flow generally from the first end to a second end of the drum:

creating a flame at an intermediate location in the drum and directing a first stream of hot gases produced thereby to flow towards the first end of the drum in countercurrent relation to the flow of the first volume of material for heating the first volume of material;

introducing a second volume of material into the drum between the flame and the second end of the drum to flow generally towards the second end of the drum;

mixing the heated first volume of material with the second volume of material between the flame and the second end of the drum;

directing a second stream of hot gases produced by the flame to flow towards the second end of the drum in parallel relation to the flow of the mixing materials for heating the mixing materials; and

discharging the asphaltic composition from the second end of the drum.

4,913,553

METHOD AND APPARATUS FOR DELIVERING MULTI-COMPONENT ADHESIVE SYSTEMS

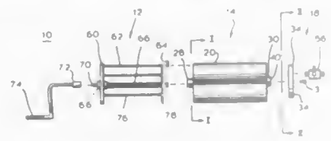
Gene A. Falco, 88 Toledo St., Farmingdale, N.Y. 11735

Continuation of Ser. No. 129,583, Dec. 7, 1989, abandoned. This application Sep. 9, 1988, Ser. No. 242,952

Int. Cl.[4] B01F *15/02*

U.S. Cl. 366—129 17 Claims

1. A method for delivering a multicomponent adhesive system to a work site, comprising the steps of providing each component of said adhesive system in a separate cartridge having an orifice at one end and a slideable plunger at the other, arranging the respective component cartridges of said adhesive system in an array parallel to and centric about a common axis, symmetrically to each other, applying a simultaneously uniform force against each of the slideable plungers to push the components from each said cartridge through its respective orifice, in intimate engagement with each other to



mix said components uniformly directly as they are pushed from said cartridges, and thereafter extruding said mixed components directly to said work site.

4,913,554

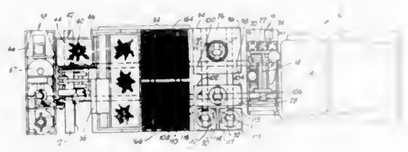
LIFTING APPARATUS

Dale E. Bragg, and Calvin L. Stegemoeller, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed May 27, 1988, Ser. No. 199,730

Int. Cl.[4] B01F *15/02*

U.S. Cl. 366—132 8 Claims



1. A transportable self-leveling mixer apparatus comprising.

a vehicle having a vehicle frame;

a self-leveling mixer assembly, including:

a mixer assembly base;

a mixing tub supported from said base; and

automatic level control means, operably associated with said mixing tub, for controlling a fluid level in said mixing tub;

a lifting linkage means, connected between said mixer assembly and said vehicle, for moving said mixer assembly between a lowered ground level position and a raised position located above said vehicle frame;

power drive means, mounted on said vehicle and operably connected to said lifting linkage means, for moving said lifting linkage means between first and second positions corresponding to said lowered and raised positions of said mixer assembly;

wherein said mixer assembly further includes a pump supported from said base and having a suction inlet connected to a fluid outlet of said tub and to a fluid supply line; and

wherein said lifting linkage means is further characterized as a means for lowering said mixer assembly to ground level prior to operation of said mixer assembly to thereby provide a maximum suction head to said pump inlet, and for subsequently raising said mixer assembly to said raised position for transport thereof by said vehicle.

4,913,555

WHIPPING MACHINE

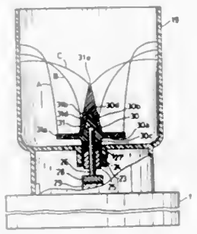
Yoshinari Maeda, and Tokio Akai, both of Kasai, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jan. 11, 1988, Ser. No. 142,680

Claims priority, application Japan, Jan. 14, 1987, 62-6557; Sep. 1, 1987, 62-218594

Int. Cl.[4] B01F *7/26*

U.S. Cl. 366—205 16 Claims



2. An apparatus for whipping a product, comprising:

a container for holding the product therein;

means for agitating and whipping the product in said container to a predetermined degree of whipping at which the volume of the product has increased due to the whipping by at least 60 percent, said agitating and whipping means including a rotatable member having a center of rotation; and

means for indicating when the product has been whipped to said predetermined degree of whipping by said rotatable member, said indicating means including an upper end of an indicator rod, said indicator rod extending from said rotatable member to a height at said upper end that is above an upper surface of a central portion of the product while the product is being whipped by said rotatable member for as long as the product has not achieved said predetermined degree of whipping and that is thereafter below the upper surface of the central portion of the product after the product has been whipped to said predetermined degree of whipping by said rotatable member, said central portion of the product rising along said indicator rod during the whipping;

an auxiliary indicator element which is removably fitted over said indicator rod so as to have a height at which the upper surface of the central portion of the product reaches when an amount of the product in the container is more than a corresponding amount of the product required to reach said beight of said indicator rod for achieving said predetermined degree of whipping.

4,913,556

MIXING APPARATUS FOR THERMOPLASTIC SYNTHETIC RESIN

Bernd Schröter, Troisdorf-Sieglar; Wilfried Schwarz, Königswinter; Richard Fellmann, Lohmar-Krahwinkel, and Hans-Joachim Bartels, Troisdorf-Spich, all of Fed. Rep. of Germany, assignors to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 159,096, Feb. 23, 1988, abandoned. This application Aug. 21, 1989, Ser. No. 396,806

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1987, 3706413

Int. Cl.[4] B01F *7/12, 7/08;* **B29B** *7/42*

U.S. Cl. 366—305 3 Claims

1. A device for mixing thermoplastic synthetic resin, comprising:

a stator extending along an axis, and a rotor extending along said axis and rotatable about said axis relative to said stator, said stator having an inner surface closely juxta-

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posed with an outer surface formed on said rotor, said rotor and said stator each being formed with respective arrays of circumferentially spaced mixing-chamber recesses lying in respective circumferential rows in said outer surface and said inner surface, respectively, with the mixing-chamber recesses in each surface lying in axially spaced relationship in respective axially extending rows,

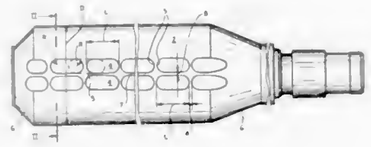
recesses of each axially extending row of the rotor inwardly of ends of the respective axially extending row being identical in geometrical shape to corresponding recesses of the stator,

each of said recesses at least inwardly of ends of the corresponding axially extending rows being formed with generally semicircular ends of a guide radius (R) and being elongated in axial direction with a length (L),

the numbers of mixing-chamber recesses around the peripheries of said rotor and stator being the same in the respective circumferential rows,

the mixing-chamber recesses of said rotor opening toward the mixing-chamber recesses of said stator,

the circumferential rows of the rotor and stator being axially



offset from one another by about one-half the length (L) of said mixing-chamber recesses, and wherein:

each mixing-chamber recess has a trough-shape with the cross section of a circular segment with a radius of curvature equal to the guide radius (R) and a trough depth (T) smaller than the guide radius (R),

the length (L) of said mixing-chamber recesses is three to four times the guide radius (R),

the mixing-chamber recesses of each circumferential row are separated by webs of a web width (B) which is less than half the guide radius (R),

the shear gap between said surfaces of the rotor and stator is selected to have a shear-gap width (W) dimensioned to generate a high shear velocity promoting mixing of the thermoplastic synthetic resin, and

the mixing chambers of the axially extending rows are axially spaced by a distance (A) which is about one third of the guide radius (R), said rotor having a diameter of about 100 mm, said guide radius being about 15 mm; and

means for heating the stator to a predetermined mixing temperature controllable for the thermoplastic synthetic resin to be mixed.

4,913,557

INTERGRATED LOGIC CIRCUIT HAVING TESTING FUNCTION CIRCUIT FORMED INTEGRALLY THEREWITH

Hiroshi Segawa, and Hideyuki Terane, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

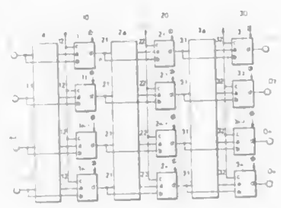
Filed Nov. 15, 1988, Ser. No. 271,488
Claims priority, application Japan, Nov. 17, 1987, 62-291344
Int. Cl.[4] G01K *31/28*
U.S. Cl. 371—22.3 9 Claims

1. A circuit having a testing function, comprising:

a plurality of circuit portions constituting a data processing circuit having an operation mode and a test mode, each having different number of bits to be processed therein:

a plurality of testing circuits, each having an independent input, provided corresponding to said plurality of circuit portions,

each of said plurality of testing circuits being interposed between an output of one of said circuit portions corresponding to said testing circuit and an input of another of said circuit portions each of said plurality of testing circuits having an additional input connected to a respective input of said circuit portion corresponding to said testing circuit,



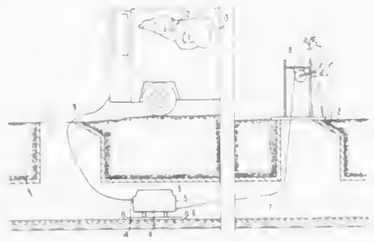
whereby, responsive to signals on said independent inputs of said testing circuits, said plurality of circuit portions are made to function as said data processing circuit in said operation mode, and are selectively isolated or bypassed for testing the corresponding circuit portion to output test data obtained from each processed bit in synchronization in said test mode.

4,913,558

METHOD AND APPARATUS FOR DETECTING LEAKS AND OTHER DEFECTS ON SEWERS AND THE LIKE CHANNELS

Lennart Wettervik, S-755 90, Uppsala, and Bo Ericsson, Östra Ågatan, both of Sweden, assignors to Lennart Wettervik, Uppsala, Sweden

Continuation of Ser. No. 893,304, Jul. 22, 1986, abandoned. This application Oct. 18, 1988, Ser. No. 259,405
Claims priority, application Sweden, Nov. 30, 1984, 8406065
Int. Cl.[4] G01N *25/72*; H04N *7/18*
U.S. Cl. 374—4 15 Claims



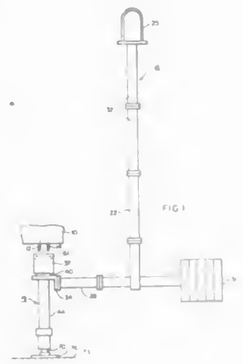
1. A method of inspecting underground sewers for defects, comprising placing an infrared scanning device in an underground sewer, moving the scanning device internally along the sewer to locate defects at which extraneous water is leaking into the sewer from the surrounding ground by sensing with the scanning device temperature deviations caused by the extraneous water leaking into the sewer at the defects, and processing output signals from the scanning device for at least one of displaying and recording thermal representations of the defective areas.

4,913,559

FUEL ASSEMBLY ALIGNMENT PIN STRAIGHTENING METHOD

Robert E. Meuschke, Penn Hills, and Edward P. Shields, N. Huntingdon, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 140,175, Dec. 31, 1987, Pat. No. 4,824,632. This application Mar. 8, 1989, Ser. No. 320,345
Int. Cl.[4] G21C *19/00, 19/26*
U.S. Cl. 376—260 13 Claims



9. A method of straightening bent fuel assembly alignment pins of a nuclear reactor internals structure by a pin straightening device which includes a housing having two generally parallel holes disposed therein, a first hole adapted to receive a bent fuel assembly alignment pin, and a second hole generally parallel to the first hole, a wedge-shaped shim adapted to be received on a surface of the housing, said shim also having two holes therethrough such that said two holes are concentric with said two parallel holes of the housing, means for moving the shim on the surface of the housing into full planar contact with a surface of the internal structure whereby the bent pin is received in the first hole and straightened, and a generally straight pin is received within the second hole, said method comprising the steps of:

(a) making a mold of the bent pin to determine the angle and direction at which the bent pin is oriented with respect to the core plate;

(b) selecting a corresponding wedge-shaped shim having an included angle of about 20% greater than and opposite to the angle which the alignment pin is oriented;

(c) placing the housing of the pin straightening device in such a position whereby a bent pin can be received within the first hole, and the generally straight pin is readily received within the second hole of the housing;

(d) moving the housing so as to cause the bent pin to be received within the first hole and the straight pin to be received in the second hole;

(e) continually moving the housing over said pins, such that the surface of the wedge shaped shim is brought into full planar contact with the reactor internals structure;

(f) bending the pin past its original centerline; and

(g) removing the housing out of engagement with the reactor internals structure.

4,913,560

STRETCHY STICKY TAPE BAG TIE CLOSURE

Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 8, 1989, Ser. No. 320,448
Int. Cl.[4] B65D *33/28*
U.S. Cl. 383—71 7 Claims

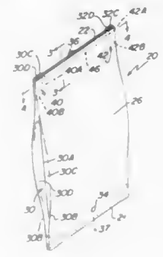
4. A thermoplastic bag having a stretchy sticky tape bag tie closure comprising a thermoplastic bag having two panels forming an open top, closed bottom bag, said panels being joined along the sides of said bag, and a stretchy sticky tape bag tie closure secured at one end to one of the sides of said bag adjacent the open top thereof said stretchy sticky tape bag tie closure comprising a tape of plastic material having high elongation in the lengthwise direction, the tape being coated on both sides with pressure sensitive adhesive and the adhesive being coated with a brittle coating material so that when the tape is manually stretched, causing the brittle coating to crack and separate, exposing the adhesive, the tape can be wrapped around the neck of the bag to effect a closure.

4,913,561

GUSSETTED FLEXIBLE PACKAGE WITH PRESEALED PORTIONS AND METHOD OF MAKING THE SAME

Jeffrey S. Beer, Perkiomenville, Pa., assignor to Fres-co System USA, Inc., Telford, Pa.

Filed Nov. 15, 1988, Ser. No. 271,973
Int. Cl.[4] B65D *33/00*
U.S. Cl. 383—94 20 Claims



1. A flexible tubular package having a longitudinal axis and formed from flexible sheet material, said package comprising first and second panels disposed opposite each other and connected by respective gusset folds on laterally opposite sides thereof, each of said gusset folds comprising a central fold edge interposed between a pair of outer fold edges and defining therebetween respective gusset sections which are subadjacent said respective panels, said package having an upper end portion comprising an open mouth and a lower end portion which is sealed, said mouth being defined by upper end portions of said panels which are located between first and second side seal means, each of said side seal means comprising a medially located longitudinally extending seal and an angularly diverg-

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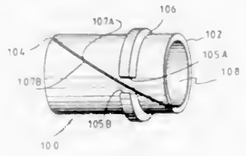
ing seal, one of said medially located seals sealing the panels together at opposed portions thereof which are contiguous with and include the central fold edge on one side of one of said central fold edges while also sealing the panels to their respective subadjacent gusset sections on the opposite side of said one central fold edge and contiguous therewith, the other of said medially located seals sealing the panels together at opposed portions thereof which are contiguous with and include the other of said central fold edges on one side of said other central fold edge while also sealing the two outer panels to their respective subadjacent gusset sections on the opposite side of said other central fold edge and contiguous therewith, the diverging seal of said first side seal means sealing the panels to their respective subadjacent gusset sections at portions thereof which are located between the outer fold edges and the medially located seal of the first seal means, the diverging seal of said second side seal means sealing the panels of their respective subadjacent gusset sections at portions thereof which are located between the outer fold edges and the medially located seal of said second seal means, the mouth of said package being readily sealable by bringing the upper end portions of the panels into contact with each other between said first and second fold seals.

4,913,562

THERMOPLASTIC BEARING LINER

Robert Rosen, Port Washington, N.Y., assignor to Thomson Industries, Inc., Port Washington, N.Y.

Filed Jan. 6, 1989, Ser. No. 294,208
Int. Cl.[4] F16C *17/00*
U.S. Cl. 384—276 8 Claims



1. A cylindrical bearing liner to be fitted within a supporting housing, said support housing having an interior hollow cylindrical bore, said cylindrical bore having a circumferential groove in spaced apart relation to the ends of said bore, said cylindrical bearing liner comprising:

a hollow, substantially cylindrical shaped member having two ends, and a gap extending from one to the other of said two ends,

said cylindrically shaped member further having support means located in spaced apart relation to said two ends of the cylindrically shaped member said support means comprising at least one external rib extending circumferentially about said cylindrically shaped member and projecting radially therefrom, said rib having two opposingly situated ends, each end being in proximity to one each of the two edges defining said gap in the cylindrically shaped member.

4,913,563

HYDRODYNAMIC PIVOTED PAD BEARING ASSEMBLY FOR A REACTOR COOLANT PUMP

Luciano Veronesi, O'Hara Township, Allegheny County, and Leonard S. Jenkins, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 7, 1988, Ser. No. 268,141
Int. Cl.[4] F16C *17/03*
U.S. Cl. 384—312 22 Claims

1. A pivoted pad bearing assembly for rotatably supporting a shaft extending through a housing, said bearing assembly comprising:

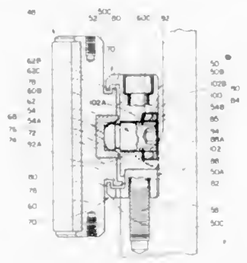
(a) an annular member attachable to the housing;

(b) a plurality of arcuate bearing segments disposable end-to-end in circumferentially spaced relation for encompassing the shaft and providing bearing contact therewith;

(c) a plurality of pivot pins each extending radially between said annular member and one of said bearing segments;

(d) means for universally pivotally mounting each of said pivot pins at an inner end thereof to one of said bearing segments; and

(e) means for mounting each of said pivot pins at an outer end thereof to said annular member and being adjustable for changing the radial position of said pivot pin relative



to said annular member and thereby of said bearing segment relative to the shaft, said pivot pin outer end mounting means including

(i) means defining a plurality of circumferentially spaced and radially extending openings through said annular member for receiving said respective pivot pins,

(ii) a set of external threads formed on said outer end of each of said pivot pins, and

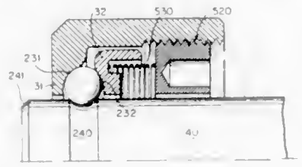
(iii) a plurality of adjustment elements each having a set of internal threads formed thereon for threadably mating with said set of external threads on one of said pivot pin outer ends such that relative rotation between each pivot pin and its respective adjustment element causes a change of the radial position of said pivot pin relative to said annular member.

4,913,564

ADJUSTABLY PRESTRESSED ROLLING BEARING

Gerard Stephan, Croissy-sur-Seine, and Jean-Denis Labedan, Bourges, both of France, assignors to Nadella, Vierzon, France

Filed Mar. 1, 1989, Ser. No. 317,428
Claims priority, application France, Mar. 4, 1988, 88 02776
Int. Cl.[4] F16C *33/66, 43/06*
U.S. Cl. 384—518 18 Claims



1. A prestressed rolling bearing comprising a housing, at least one first ring constituted by two ring parts, each ring part defining a circular raceway, rolling elements circulating along the two circular raceways, and said ring parts being freely

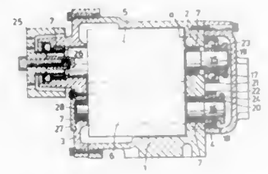
movably mounted one inside the other so as to be axially slidable, and an elastically yieldable device cooperative with said housing and at least one of said ring parts so as to axially bias said circular raceways toward each other and exert a prestress, a second ring defining a third circular raceway, said rolling elements being adapted to bear against said third raceway, said elastically yieldable prestressing device being adjustable between a first state in which the stress is substantially inactive to permit placing the rolling elements in contact with said third raceway of said second ring, and a second state in which said ring parts of said first ring are freely movable axially relative to one another and are biased axially toward one another by said elastically yieldable device to permit the rolling elements which are in contact with said three raceways at least to circulate with the required prestress for normal operation of the bearing.

4,913,565

AXIAL BEARING DEVICE

Arnold Englund, SpÅnga, Sweden, assignor to Svenska Rotor Maskiner AB, Stockholm, Sweden

Filed Jan. 23, 1989, Ser. No. 303,664
Claims priority, application Sweden, Aug. 20, 1986, 8603527-6
Int. Cl.[4] F16C *19/10*
U.S. Cl. 384—617 3 Claims



1. A screw rotor compressor in which a specific clearance can be set between an end wall of a rotor and an inner surface of a high pressure end wall of the screw rotor compressor, comprising:

a bearing seating in said high pressure end wall for receiving a thrust bearing;

said rotor of said compressor having an axle portion which extends externally beyond an outer surface of said high pressure end wall;

a thrust bearing mounted on said externally extending axle and received in said bearing seating;

means at said high pressure end wall of said screw rotor compressor for defining an access space to provide radial access to said bearing and bearing seating;

a feeler gauge transversely insertable in said radial access space at one or another end surface of said thrust bearing;

wherein said rotor is displaced into abutment with said inner surface of said high pressure end wall;

a separate heated shrink ring which is mounted over said axle of said rotor with said thrust bearing interposed between said heated shrink ring and said high pressure end wall, said heated shrink ring being pressed against said thrust bearing with said feeler gauge still in position in said radial access space at said one or said another end surface of said thrust bearing; and

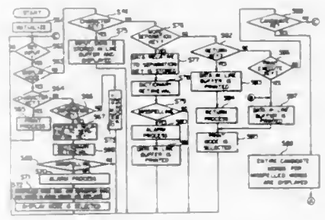
wherein said feeler gauge is removed after said shrink ring has cooled down, said shrink ring shrinking and being thereby fixed to said rotor axle when cooled down.

4,913,566

SPELL CHECK DEVICE WITH DISPLAY

Toshiyuki Sakai, Nagoya; Yoshio Sugiura, Nishikamo, and Satoshi Furukawa, Suzaka, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jan. 6, 1988, Ser. No. 142,190
Claims priority, application Japan, Jan. 7, 1987, 62-2077; Mar. 23, 1987, 62-69717
Int. Cl.[4] B41J *5/30*
U.S. Cl. 400—63 5 Claims



1. A typing device comprises:

input means for inputting data of characters and/or symbols;

display means for visually representing the input data;

print means for printing the input data on a print medium;

control means for controlling said display means and print means with selection of either a print mode for enabling said print means to print the input data or a display mode for enabling said display means to visually represent the input data, while disabling said print means the data input through said input means being successively printed on said print medium under said print mode while the data being successively represented on said display means under said display mode;

dictionary memory means for storing spelling information of a multiplicity of words;

spelling check means for checking the spelling of each input word by retrieving the relational word data in said dictionary memory means; and

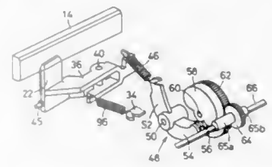
mode changeover means for switching said control means to a display mode in response to detection of any misspelled word by said spelling check means during the operation in print mode.

4,913,567

HEAD-PRESSURE MECHANISM IN THERMAL PRINTER

Teruo Imanaki; Yoshiaki Yuki, both of Nagoya; Michio Ueda, Gamagori, and Shigenori Hattori, Aichi, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Dec. 30, 1987, Ser. No. 139,835
Claims priority, application Japan, Jan. 7, 1987, 62-1169; Jan. 7, 1987, 62-1170; May 20, 1987, 62-75557[U]
Int. Cl.[4] B41J *3/20*
U.S. Cl. 400—120 22 Claims



1 A printing apparatus wherein a printing operation is ef-

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fected by a print head which is movable relative to a recording medium while the print head and the medium are held in pressed contact with each other, said printing apparatus comprising:

a print-head support member for supporting said print head movably to a printing position in which the print head is in pressed contact with said medium, and to a release position in which the print head is spaced away from the medium;

drive means for moving said support member;

a converting mechanism including a rotatable member which is rotated by said drive means, and a displaceable member which is displaced as said rotatable member is rotated, whereby a rotating movement of said rotatable member is converted into a displacement of said displaceable member; and

an elastic member connecting said support member and said displaceable member, to thereby move said print head from said release position to said printing position, and press said print head in said printing position against said medium with a predetermined force,

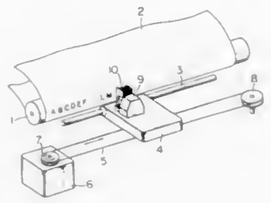
said displacement of said displaceable member comprising a first movement for moving, via said elastic member, said print head from said release position to said printing position, and a second movement for enabling said elastic member to elastically deform and produce a biasing force for pressing said print head in said print position against said medium with said predetermined force, an amount of displacement of said displaceable member per unit angle of rotation of said rotatable member being greater in said first movement than in said second movement.

4,913,568

DOT PRINTER

Yoshihiro Torisawa, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 580,808, Feb. 16, 1984, abandoned.
This application Sep. 16, 1988, Ser. No. 245,324
Claims priority, application Japan, Feb. 24, 1983, 58-29681; Feb. 24, 1983, 58-29863
Int. Cl.[4] B41J 3/10
U.S. Cl. 400—124 5 Claims



1. A dot printer comprising:

(a) a source of magnetic ink;

(b) a pair of magnetic pole plates forming a slit therebetween which, during use of the dot printer, is located adjacent to a recording medium, each one of said pair of magnetic pole plates being triangular in cross-section and having:

(i) a first flat surface which, during use of the dot printer, is adjacent to the recording medium, faces the recording medium, and is at least approximately parallel to the recording medium and

(ii) a second flat surface which, during use of the dot printer, faces away from the recording medium and slopes so that each one of said pair of magnetic pole plates has an essentially linear edge adjacent said slit and a maximum thickness at a point remote from said slit;

(c) first means for generating a magnetic flux between said pair of magnetic pole plates so as to feed magnetic ink from said source of magnetic ink into said slit in a film which, during use of the dot printer, is located adjacent to the recording medium and has two spaced surfaces, a first one of said two spaced surfaces of the film of magnetic ink being adjacent to the surface of the recording medium to be printed and a second one of said two spaced surfaces of the film of magnetic ink being farther away from the surface of the recording medium to be printed than the first one of said two spaced surfaces;

(d) a plurality of printing needles each one of which has a distal end and a proximal end, each one of said plurality of printing needles being disposed so as to be at least approximately perpendicular to said two spaced surfaces of the film of magnetic ink; and

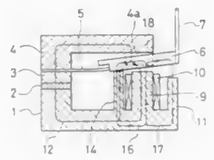
(e) second means for selectively moving each one of said plurality of printing needles back and forth between an inoperative position in which the distal end of the needle is located proximate to the first one of said two spaced surfaces of the film of magnetic ink and an operative position in which the distal end of the needle effects printing.

4,913,569

WIRE-TYPE PRINTING HEAD

Tatsuya Koyama; Tetsuhiro Yamada; Hirokazu Ando, and Katsuya Kamimura, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 122,240, Nov. 17, 1987, Pat. No. 4,820,065. This application Apr. 10, 1989, Ser. No. 335,813
Claims priority, application Japan, Nov. 25, 1986, 61-179816
The portion of the term of this patent subsequent to Apr. 12, 2006, has been disclaimed.
Int. Cl.[4] B41J 3/10
U.S. Cl. 400—124 12 Claims



7. A wire-type print head comprising:

printing wires extending forward substantially parallel with each other,

armatures in association with the respective print wires, a rear end of each print wire being fixed to a respective one of the associated armatures,

main cores in association with the respective armatures, each main core having a forward end adjacent to a rear surface of a respective one of the armatures,

coils in association with the respective main cores, each of the coils being wound on a respective one of the main cores,

a permanent magnet,

leaf springs in association with the respective armatures, each leaf spring having a first end fixed near the permanent magnet and a second end fixed to a respective one of the armatures,

auxiliary cores in association with the respective main cores, each auxiliary core being positioned between the permanent magnet and a respective one of the main cores, and having a forward end adjacent to a rear surface of a respective one of the armatures,

said permanent magnet being in the form of ring surrounding said armatures, said main cores, said leaf spring and said auxiliary cores,

first magnetic path means for completing a closed magnetic path for the magnetic flux from the permanent magnet, through the main cores and the armatures,

second magnetic path means for completing a closed magnetic path for the magnetic flux from the main cores through the armatures and the auxiliary cores,

means for causing an electric current to flow through the coils for generating a magnetic flux through the main cores in a direction to cancel the magnetic flux through the main cores from the permanent magnet,

wherein when each of the coils is not energized the associated armature is attracted toward the associated main core to resiliently deform the associated left spring, and

when each of the coils is energized the associated armature is released and moved forward to the action of the associated leaf spring, and

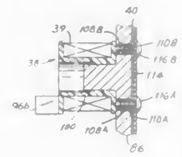
the rear surface of each of the armatures is kept in contact with the front end of the associated auxiliary core so that the front end of the associated auxiliary core so that the front end of the associated auxiliary core forms a fulcrum point for swinging of the associated armature.

4,913,570

PRINT WIRE DRIVING DEVICE FOR WIRE TYPE DOT PRINTER

Akio Mitsnishi; Yasuhiko Nekazawa, and Takumi Sato, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Division of Ser. No. 823,167, Jan. 27, 1986, Pat. No. 4,767,227.
This application Aug. 24, 1988, Ser. No. 235,865
Claims priority, application Japan, Jan. 25, 1985, 60-11854; Jan. 25, 1985, 60-11855; Jan. 25, 1985, 60-11856; Jan. 25, 1985, 60-8971; Jan. 25, 1985, 60-11858; Jan. 25, 1985, 60-8970; Feb. 20, 1985, 60-23357; Feb. 20, 1985, 60-31928; Feb. 20, 1985, 60-23356; Jan. 25, 1988, 60-11857
Int. Cl.[4] B41J 3/12
U.S. Cl. 400—124 10 Claims



1. A coil bobbin for driving a wire in a wire type dot printer having a mounting member with openings, comprising a spool portion molded from a thermoplastic material having a first flange, a coil having two ends, a region on said spool portion for winding said coil about said spool portion, and at least two pins extending from said first flange, said pins being integrally formed with said first flange by said thermoplastic material, said pins being inserted in said openings in said mounting member and extending therebeyond, said pins being held to said mounting member by deforming said pins through the melting of said thermoplastic material forming said pins, each of the ends of said coil being wound respectively around one of said two pins, said mounting member having conductor means, the ends of said coil being electrically coupled to said conductor means.

5. A flexible printed wiring cable connector for providing electrical connection to a printer having electrical connection pins extending therefrom to drive printing units in sequence in said printer, said connector comprising:

a substrate defining a plurality of branches, said substrate being configured so that portions of said branches may be stacked one upon the other to define stackable portions, said stackable portions being positioned one atop the other, said stackable portions having opposed front and rear sides, the back side of a stackable portion facing and being adjacent and contacting the front side of the stackable portion behind it;

said stackable portions having pin insertion through-holes at positions corresponding to said pins, said pin insertion through-holes being in registration on said stackable portions for receiving pins from said printer; and

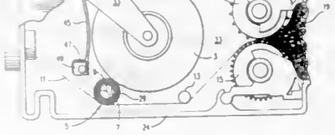
conductors on said substrate for selectively electrically coupling said stackable portions to said printer, said conductors extending to selected ones of said pin insertion through-holes on each stackable portion of said substrate.

4,913,571

RE-INKING ROLLER AND TRANSFER ROLLER ASSEMBLY

Kevin F. Bulson, Charlotte, N.C.; Charles L. Decoste, Jr., Lexington, and Jack W. Morris, Nicholasville, both of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 3, 1988, Ser. No. 266,748
Int. Cl.[4] B41J 32/00
U.S. Cl. 400—196.1 19 Claims



8. A cartridge containing a continuous printer ribbon which exits said cartridge for printing and then is returned to said cartridge comprising means to feed said ribbon for printing, a porous re-inking roller mounted for rotation, a transfer roller mounted for rotation by a central wall defining a smooth, non-wearing hole in said transfer roller central to said transfer roller and a shaft, said shaft being fixed in position relative to the position of said central hole, said transfer roller receiving said fixed shaft in said central hole and being limited in movement radial to said shaft by contact between said central hole and said shaft, said central hole being larger than said shaft and said shaft and said central hole being in locations which position said transfer roller in firm contact with said re-inking roller when said central hole contacts said shaft on the side of said shaft away from said re-inking roller and which permit movement of said transfer roller away from a firm contact with said re-inking roller, said ribbon being mounted in contact with the side of said transfer roller away from said re-inking roller so that feeding of said ribbon for printing will rotate said transfer roller and move said transfer roller into contact with said re-inking roller to rotate said re-inking roller while releasing ink from said re-inking roller to re-ink said ribbon, and a chamber into which said ribbon is stuffed after contact with said transfer roller and before exit of said ribbon from said chamber for printing.

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4,913,572

RELOADABLE RIBBON CASSETTE FOR TYPEWRITERS OR OFFICE MACHINES OF SIMILAR CONSTRUCTION

Rolf Behrens, Oldenburg; Hermann Jendricke, Varel; Manfred Sauer, Wilhelmshaven; Klaus D. Frerichs, Schortens; Alfred Keiter, Wilhelmshaven; Andreas Wesselhöft, Gifhorn; Hans P. Heins, and Heinz Lange, both of Wilhelmshaven, all of Fed. Rep. of Germany, assignors to AEG Olympia Office GmbH, Wilhelmshaven, Fed. Rep. of Germany

Filed Nov. 18, 1987, Ser. No. 122,164
Int. Cl.[4] B41J *35/28, 32/00*
U.S. Cl. 400—207 12 Claims

1. In a ribbon cassette for typewriters or office machines of a similar construction including an opening closable by a cover in the top of a cassette housing for the exchange of a supply spool for unwinding and a take-up spool for winding up a ribbon, a plurality of movable drive parts for controlling the supply and take-up spools, said drive parts being arranged in an operative configuration for guiding and transporting said ribbon and including a braking device for blocking and releasing said supply spool, a feed roller equipped with a sprocket wheel for driving the take-up spool and spring means for selectively moving said sprocket wheel into engagement with said ribbon, the improvement wherein said cassette further includes:

bearing pins secured only to a bottom member of said housing, said take-up spool and said supply spool being freely placeable on said bearing pins, and

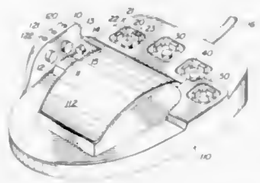
mounting means for mounting the movable drive parts to said bottom member only of the cassette housing, said mounting means including retaining means for securing said drive parts in said operative configuration to prevent said parts from falling out of the cassette housing when the cover is opened.

4,913,573

ALPHA-NUMERIC KEYBOARD

Dale J. Retter, 7350 Via Paseo Del Sur, E#206, Scottsdale, Ariz. 85258

Continuation-in-part of Ser. No. 015,886, Feb. 18, 1987. This application Aug. 18, 1988, Ser. No. 233,451
Int. Cl.[4] B41J *5/10*
U.S. Cl. 400—489 22 Claims



1. A keyboard for controlling data input characters of a full set of desired including in combination:

a keyboard housing having a raised central portion devoid of keys and adapted to generally underlie and fit against the palm of a hand thereon for supporting the hand through the palm thereof resting on said raised central portion and having thumb and finger positions adjacent the raised central portion arranged in a pattern generally corresponding to the relaxed position of a hand with the fingers extending downwardly from a generally horizontal plane when the palm of the hand is placed on said raised central portion with the palm of the hand remaining in one basic position resting on said raised portion throughout operation of said keyboard;

a plurality of key switch means arranged in an overall pattern corresponding substantially to a non-chording QWERTY style key arrangement wherein each data input character is produced by actuation of a single discrete key switch means, and also arranged in additional predetermined patterns at each of said thumb and finger positions for separate actuation by the thumb and finger at each such position, with the palm of the hand remaining on said raised central portion, the key switch means at said finger positions being arranged in a first predetermined pattern at each finger position and the key switch means at said thumb position being arranged in a second predetermined pattern at such thumb position, at least each of said finger positions comprising individual, substantially vertical open-top fingertip wells in said housing for freely receiving the fingertips of an operator, each of said wells having substantially vertical walls and a bottom, with first key switch means located in the bottom of each of said wells, and at least one other key switch means located on a vertical wall of each of said wells, such that each key switch means in each well is actuated by movement of the fingertips alone without requiring movement of the hand relative to said raised central portion, each key switch means being actuated by a distinct and different portion of the fingertip in each such well to provide a different tactile feedback to the operator for each different key switch means contacted by the fingertips in each well, sufficient key switch means being provided in said wells so that the full set of desired characters and functions are accessible without requiring movement of the hand from said one basic position;

the thumb position comprising a thumb cavity having bottom and upright sides located, respectively, adjacent the end and sides of a thumb placed in said thumb cavity, with the key switch means at said thumb position comprising keys arranged in the bottom and on the upright sides of the thumb cavity in said second predetermined pattern, such that upon actuation, each such key switch touches a distinct and different portion of the thumb to provide a different tactile feedback to the operator for each different key switch contacted by the thumb; and

means for coupling each of said key switch means with a processing device.

4,913,574

SHEET FEEDING APPARATUS IN A PRINTER

Takeshi Yokoi, Kagamigahara, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Sep. 22, 1988, Ser. No. 247,670
Claims priority, application Japan, Sep. 30, 1987, 62-247485; Nov. 13, 1987, 62-288084
Int. Cl.[4] B41J *11/50*
U.S. Cl. 400—605 4 Claims

1. A sheet feeding apparatus in a printer comprising:

a first paper feeding means and a second paper feeding means located at a first position before a printing position and at a second position after the printing position, respectively, for holding and feeding a sheet of paper toward said printing position, said first paper feeding means comprising a first roller and an opposite second roller and said second paper feeding means comprising a third roller and an opposite fourth roller;

a first paper path including pin tractors for feeding a first type of sheet, which is provided with pin feed holes on both side edges thereof, into said first paper feeding means by means of said pin tractors whose pins fit in the pin feed holes on said first type of sheet;

a second paper path for guiding a second type of sheet toward said first paper feeding means;

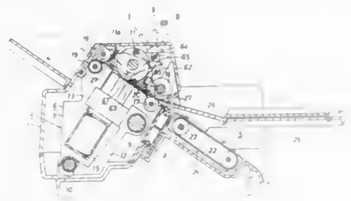
a driving source of said first and second paper feeding means;

a clutch means;

a torque transmission means for connecting said pin tractors with said driving source of said first and second paper feeding means by way of said clutch means that can be selectively connected and disconnected;

an operation means for shifting at least said first roller so as to selectively attach and detach said first roller to and from said second roller; and

an interlocking means for connecting said clutch means when said operation means detaches said first roller from said second roller, and for disconnecting said clutch means when said operation means attaches said first roller to said second roller.

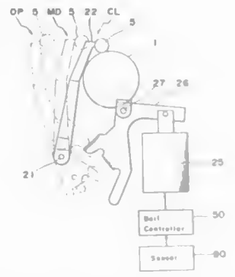


4,913,575

PRINTING MACHINE

Kenichi Wada, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 24, 1989, Ser. No. 300,901
Claims priority, application Japan, Mar. 10, 1986, 61-53412
Int. Cl.[4] B41J *13/00*
U.S. Cl. 400—638 3 Claims



1. A printer with a printing paper feeding apparatus comprising:

a platen roller rotatable in a normal direction and in a reverse direction;

sheet feeding means for feeding a sheet along a surface of said platen roller in a forward direction and in a backward direction accompanied by the rotation thereof;

printing means for printing images on a printing sheet fed by said sheet feeding means, said printing means being arranged near the platen roller;

pressing means for pressing the sheet on said platen roller and arranged at the leading side with respect to said printing means as viewed in a normal rotational direction of said platen roller, said pressing means being displaceable between a first position at which a portion of the printing sheet is pressed onto said platen roller by said pressing means and a second position at which said pressing means is located apart from said platen roller to permit said sheet to freely pass between said platen roller and said pressing means;

detection means for detecting a position of the sheet being fed along said platen roller by said sheet feeding means; and

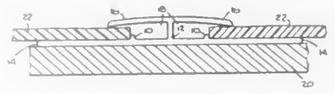
operation means for moving said pressing means from said first position to said second position or vice versa according to the position of the sheet detected by said detection means, said detection means comprising first detection means for detecting a printing sheet being fed by said sheet feeding means which is arranged at a trailing side of said pressing means with respect to a normal rotational direction of said platen roller and second detection means for detecting a printing sheet being fed by said sheet feeding means which is arranged at a leading side of said pressing means with respect to said normal rotational direction and said operation means moves said pressing means to said second position when said first detection means detects a printing sheet and locates said pressing means at said first position when said second detection means detects a printing sheet and when any printing sheet is not detected by said second detection means.

4,913,576

MOLDING BRACKET FOR COVERING THE END OF A PANEL SUBJECT TO THERMAL EXPANSION

Bowie L. Grant, Jr., Naperville, Ill., assignor to Dyrotech Industries, Inc., Joliet, Ill.

Filed Jun. 16, 1989, Ser. No. 367,328
Int. Cl.[4] A47G *27/04;* E04G *19/02*
U.S. Cl. 403—13 15 Claims



11. A molding bracket for covering a seam formed by two end-to-end panels subject to thermal expansion and contraction, the bracket comprising:

a division bar;

two pairs of flanges, each extending in opposite directions from said division bar to define opposed channels having openings for receiving the ends of the respective panels; and

stop bead means disposed on the inside of at least one of said flanges of each said respective pair at a location spaced from said division bar and extending transversely of said respective channel for at least a portion of the width thereof for engaging the ends of the panels inserted into said channels to position the ends of the panels a predetermined distance from said division bar, and with the height of said stop bead means being proportioned relative to the height of its respective channel such that said stop bead means allows the panels to be inserted far enough into said channels to cover the ends of the panels and allows the panels to move past the stop bead means and deeper into said channels upon thermal expansion of the panels to prevent buckling thereof.

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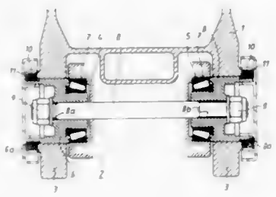
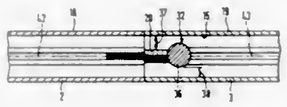
4,913,577
ELBOW JOINT OF AN INDUSTRIAL ROBOT
Karl-Erik Forslund, and Klas Klangeby, both of Västerås, Sweden, assignors to Asea Brown Boveri AB, Sweden
Filed May 18, 1988, Ser. No. 195,150
Claims priority, application Sweden, May 20, 1987, 8702082
Int. Cl.[4] F16C *11/06*
U.S. Cl. 403—158 2 Claims



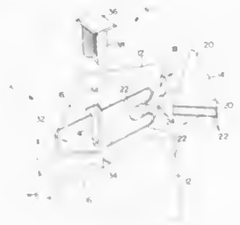
1. An industrial robot which comprises
a first arm part having spaced-apart first and second yoke means at an end thereof, said first and second yoke means having aligned through-holes therein,
a second arm part which has an end that is positioned between said first and second yoke means of said first arm part, said end of said second arm part having first and second sides which respectively face said first and second yoke means, said first and second sides forming respective bearing seats therein, and a bore which extends through said end of said second arm part from said first side to said second side thereof, and
elbow joint means connecting said end of said second arm part to said first and second yoke means of said first arm part, said elbow joint means comprising first and second shaft journals which respectively extend through said through-holes in said first and second yoke means and are rotatably journaled within the bearing seats within said first and second sides of said end of said second arm part, said first and second shaft journals having threaded portions which extend outwardly of the respective first and second yoke means through which they extend, a pull rod means which extends through said first and second shaft journals and said bore in said end of said second arm part, said pull rod means rotatably securing said first and second shaft journals in said bearing seats, and first and second nut means which are respectively connected to the threaded portions of said first and second shaft journals, said shaft journals and second arm part being laterally movable in relation to the first arm part in response to a loosening of one of said first and second nut means and a tightening of the other of said first and second nut means.

4,913,578
CONNECTION ARRANGEMENT
Heinz G. Baus, Hünibach-Thun, Switzerland, assignor to Altura Leiden Holding B.V., Maastricht, Netherlands
Filed Jan. 19, 1989, Ser. No. 298,698
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1988, 3801772
Int. Cl.[4] B25G *3/34*; F16B *11/00*
U.S. Cl. 403—270 19 Claims



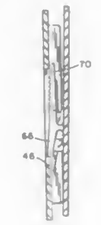
1. A connection arrangement for profiled parts, comprising:
at least one web arranged in a first hollow chamber in a first profiled part, and a connecting element connected, wherein:
said connecting element is connected to said web of said first profiled part and is at a distance from a front surface of said first profiled part,
a second hollow chamber in said second profiled part is provided with a further web, said connecting element being connected in said second hollow chamber by a weld-zone to said further web,
said second profile having a front surface adjacent said front surface of said first profile part,
said weld-zone is arranged in said second hollow chamber of said second profiled part at a predetermined: distance from said adjacent front surfaces of said first and second profiled parts,
said weld-zone is at a distance from an outer wall of said second profile part.

4,913,579
DECORATIVE PANEL
James W. Campana, Belle Vernon, Pa., assignor to Campana Technology, Inc., Belle Vernon, Pa.
Filed Oct. 11, 1988, Ser. No. 255,741
Int. Cl.[4] F16B *12/26*
U.S. Cl. 403—294 15 Claims



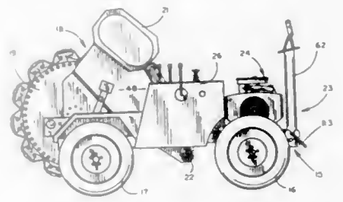
1. A decorative panel for a cabinet, cupboard or the like, said panel comprising:
a plurality of edge frames having mitered ends;
a center panel element having a plurality of edges;
each of said edge frames having an internal edge groove for respectively receiving one of said edges therein;
each of said edge frames having a laminated surface material secured to an outer surface thereof;
said laminated surface material on said each of said edge frames having a terminal portion which is located within said internal edge groove;
said center panel element being surrounded by said edge frames as said edges are respectively located within said internal edge grooves of said edge frames;
each of said edges securing said terminal portion of said laminated surface material within said internal edge groove;
said mitered ends of adjacent ones of said edge frames having aligned slot means in aligned areas of said outer surfaces including said laminated surface material to define material edges of said laminated surface material around said aligned slot means at said outer surfaces;
means for interlocking said mitered ends being disposed within said aligned slot means for joining said adjacent ones of said edge frames;
said means for interlocking said mitered ends including means for completely overlying said aligned slot means and said material edges of said laminated surface material therearound;
said means for completely overlying being substantially rectangular;
said means for completely overlying having at least two sides;
a remainder of said means for interlocking other than said means for completely overlying being centrally located at one side of said means for completely overlying;
said aligned slot means including a first width dimension at abutting edges of said mitered ends and at least a second width dimension remote from said edges of said mitered ends;
said second dimension being greater than said first dimension;
said remainder of said means for interlocking having a third width dimension located at edges of said mitered ends and a fourth dimension remote from said edges of said mitered ends;
said fourth width dimension being greater than said third dimension; and
said fourth dimension of said remainder of said means for interlocking being greater than said first dimension of said aligned slot means for said interlocking of said mitered ends for joining said edge frames.

4,913,580
RELEASABLE CONNECTOR ASSEMBLY
Stephen P. Whitehead, Elgin, Ill., assignor to Suncast Corporation, Batavia, Ill.
Filed Feb. 23, 1989, Ser. No. 314,387
Int. Cl.[4] F16B *21/00*; A44B *11/25*
U.S. Cl. 403—326 14 Claims



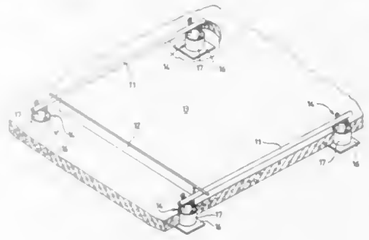
1. A connector assembly for releasably joining a first structural member and a second structural member, each said member having a wall and said connector holding said walls of said members in generally parallel overlapping relationship, said connector assembly comprising:
a female connector component carried by said first structural member and including a window having a first end and a second end, an outside surface and an inside surface, a cam wall disposed adjacent said first end and recessed with respect to said outside surface, and deflection means disposed adjacent said second end and said inside surface, said cam wall including a ramp surface converging with said outside surface away from said second end; and
a male connector component carried by said second structural member and including a male member for reception in said window and a stem joining said male member and said second structural member, said male member being resilient and having a head with an undersurface for riding on said ramp surface and a tail extending rearwardly of said head, insertion of said head into said window and movement of said head on said cam wall toward said window first end causing said male member to be directed into said window toward said female component outside surface and further causing said deflection means to deflect said tail until said tail moves into said window past said deflection means at which time said tail moves toward said outside surface of said female component to retain said male member in said window thereby joining said first and second structural members.

4,913,581
NARROW TRENCH TAMPER
Patrick J. Weller, Pella, Iowa, assignor to Vermeer Manufacturing Co., Pella, Iowa
Filed Jun. 26, 1989, Ser. No. 371,526
Int. Cl.[4] E01C *19/28*
U.S. Cl. 404—117 5 Claims



1. A narrow trench soil compactor comprising:
(a) a self-propelled mobile unit with a main frame having a pair of transversely opposite rear wheels and steerable front wheels and a wheel base of about six feet;
(b) a vibratory frame assembly, including a shaker unit and a rotatable soil compacting wheel;
(c) means pivotally connecting the vibratory frame assembly to the main frame for up and down vibratory movement of said soil compacting wheel between said rear wheels;
(d) primary power means on the main frame for driving said soil compacting wheel to propel said mobile unit;
(e) secondary power means on the vibratory frame assembly for driving said soil compacting wheel to propel said mobile unit; and
(f) means providing for a free floating pivotal movement of the vibratory frame assembly whereby the compaction wheel is permitted to follow the contour of the soil at the bottom of the trench.

4,913,582
ADJUSTABLE PIPE SCREED SUPPORT
Lamar Barrett, 108 Pine Cone Cir., Clanton, Ala. 35045
Filed Nov. 21, 1988, Ser. No. 273,899
Int. Cl.[4] E01C *19/22*
U.S. Cl. 404—119 6 Claims



1. A reusable screed chair for supporting a screen on a screed support comprising:
(a) a base tubular member having an open bottom;
(b) a pair of receptacles affixed to the inside of said base member with at least one of said receptacles being internally threaded;
(c) an upstanding vertical member threadedly engaged within one of said receptacles; and
(d) means connected to said vertical member for supporting a screed support at a predetermined position laterally of said vertical member such that threaded vertical member

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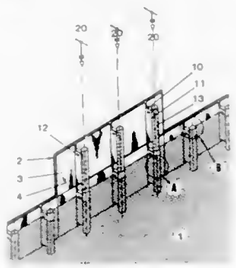
may be rotated in threaded engagement with said one of said receptacles to vary the height of said screed support without rotating said screed support.

4,913,583

METHOD FOR WATERPROOFING A ROLLER COMPACTED CONCRETE OF RUBBLE

Didier Ledeuil, 20, Le Clos de l'Alizé, avenue d'Haïfa, 13008 Marseille, France

Continuation of Ser. No. 54,686, May 27, 1987, abandoned. This application Jun. 23, 1989, Ser. No. 370,524
Claims priority, application France, Jun. 3, 1986, 86 08086
Int. Cl.[4] E02B *3/16, 7/00*
U.S. Cl. 405—107 26 Claims



1. Method of rendering waterproof a hydraulic structure comprising the steps of:

forming an impermeable membrane from a staggered series of worked and assembled thick plastics material with scales, by interlocking said staggered series with each other and welding together said staggered series in a continuous way;

attaching a material layer to one side of said membrane; and

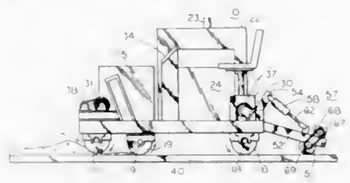
fixing vertical fixings to the one side of said membrane adapted to connect said membrane to said structure, wherein said membrane and said structure are separated from one another by said material layer enabling movement of said scales and initiating microfissures spread regularly through said structure.

4,913,584

CONCRETE SCREEDING MACHINE

James D. Garner, 2704 Boars Heads Rd., and John M. Hionant, 3973 Belair Rd., both of Augusta, Ga. 30907

Filed May 24, 1989, Ser. No. 356,260
Int. Cl.[4] E01C *19/29*
U.S. Cl. 404—123 10 Claims



7. For use with a concrete screeding machine having first and second drive rollers and a screed roller mounted on a forward portion of the machine, means for driving at least one of the drive rollers and means for driving the screed roller,

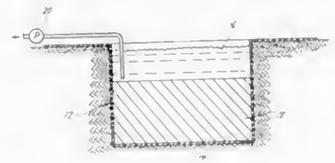
a finishing roller assembly comprising first and second spaced supports adapted to be pivotably mounted to the machine, a finishing roller extending between and rotatably supported by said support arms, and drive means mounted to one of said support arms and coupled to said finishing roller at one end thereof.

4,913,585

METHOD OF TREATING SOLIDS CONTAINING WASTE FLUID

Larry F. Thompson, and Wayne A. Moore, both of Gaylord, Mich., assignors to Tricor Envirobonds, Ltd., St. Louis, Mo.

Filed Dec. 21, 1988, Ser. No. 287,869
Int. Cl.[4] B09B *1/00;* **E21B** *21/06;* **B01D** *21/01*
U.S. Cl. 405—128 22 Claims



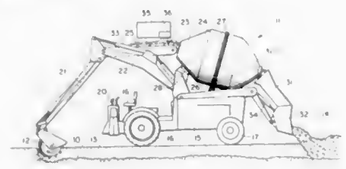
1. A method of treating a waste drilling mud residue having drilling mud solids suspended in an aqueous base comprising adding flocculating polymer to the waste drilling mud, the flocculating polymer consisting essentially of a mud solids flocculating polymer selected from the group consisting of acrylamide polyelectrolyes, quarternary amine polymers and mixtures thereof, the mud solids flocculating polymer being effective to agglomerate the drilling mud solids, flocculate the agglomerate drilling mud solids and separate free water from the flocculated drilling mud solids to produce a concentrated residue of wet drilling mud solids having a reduced volume and mass.

4,913,586

MIXTURE FOR DETOXIFICATION OF CONTAMINATED SOIL

Kasi V. Gabbita, Stanton, Calif., assignor to Analytical Liquid Waste Systems, Inc., Huntington Beach, Calif.

Filed Aug. 15, 1988, Ser. No. 231,948
Int. Cl.[4] C09L *17/00;* **E02D** *3/12*
U.S. Cl. 405—129 1 Claim



1. In the treatment of a quantity of petroleum hydrocarbon contaminated soil particles saturated with toxic components in surface exposure of said particles, the improvement which comprises the combination of:

a protective mixture chemically reactive with said hydrocarbon contaminated soil particles, consisting of humic acid and lime having a ratio of 9:1 (contaminated soil to said mixture);

said protective mixture surrounding each particle to encase said toxic components by covering the entire external surface of each particle in bonded chemical fixation relationship therewith so as to interfere with release of said toxic components from said particle;

said humic acid and lime mixture is dry and chemically

attaches to each particle external surface to provide an encapsulating coating;

said protective mixture includes a soil separate selected from;

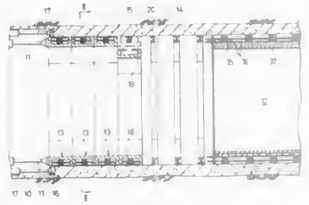
a. clay
b. glass
c. silt sand.

4,913,587

FORM ASSEMBLY FOR MAKING COVERING WALL OF TUNNEL MADE BY SHIELD TYPE EXCAVATOR

Fumitaka Kumai, Nishitama, and Yoshihiro Takano, Tokyo, both of Japan, assignors to Tekken Construction Co., Ltd., Japan

Division of Ser. No. 927,361, Nov. 6, 1986, Pat. No. 4,799,824. This application Jul. 29, 1988, Ser. No. 226,206
Claims priority, application Japan, Jul. 25, 1986, 61-176194
Int. Cl.[4] E21D *9/06, 11/10;* **E04B** *1/18*
U.S. Cl. 405—146 13 Claims



1. A covering-wall form structure for making a covering wall on a peripheral wall surface of a tunnel, said form structure comprising a plurality of arcuate form assemblies which can be connected to one another to form an annular shape, said form assemblies respectively including a form segment for use in casting concrete for forming said primary covering wall, said form segment having an outer arcuate wall portion which has an opening extending over the circumferential length of the outer wall portion, and a timbering member for reinforcing said primary covering wall of cast concrete, said timbering member being positioned in said opening and detachably coupled to said form segment.

4,913,588

METHOD AND MEANS FOR PROVIDING A THERMIC INSULATING EFFECT AROUND AN ARTICLE, SUCH AS A PIPELINE WHICH IS SUBMERGED IN WATER

Dag Vilnes, Kleivvein 16, N-3132 Husoysund, Norway

PCT No. PCT/NO88/00033, § 371 Date Dec. 29, 1989, § 102(e) Date Dec. 29, 1988, PCT Pub. No. WO88/08500, PCT Pub. Date Nov. 3, 1988
PCT Filed Apr. 28, 1988, Ser. No. 295,609
Claims priority, application Norway, Apr. 29, 1987, 871795
Int. Cl.[4] F16L *57/00, 59/14, 1/04*
U.S. Cl. 405—157 7 Claims

1. A method for providing thermal insulation for a submerged pipe disposed on the sea floor with a foam insulating material comprising the steps of:

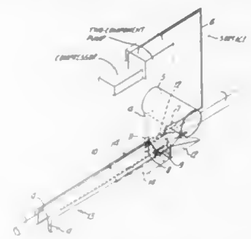
(a) drawing off from a supply sheet material having opposite side edges,

(b) shaping the sheet material about at least a portion of the pipe to provide a form including an area for receiving the foam insulating material,

(c) anchoring said side edges by applying weight thereto to substantially prevent movement of the sheet material relative to the pipe, and

(d) injecting the foam insulating material into said area between the pipe and the form as the pipe is covered by the sheet material.

6. An apparatus for providing thermal insulation for a submerged pipe disposed on the sea floor with a foam insulating material, the apparatus comprising means for supplying flexible sheet material for covering the pipe, forming means disposed to travel over the sheet material and the pipe, means for



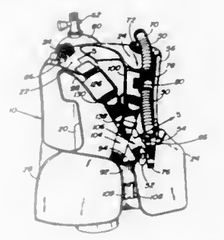
supplying foaming material to an area between the pipe and the sheet material while the sheet material is adjacent said forming means, plough means for providing troughs in the sear floor along and on bot sides of the pipe for receivign portions of the sheet material.

4,913,589

DIVER'S BUOYANCY COMPENSATOR AND BACKPACK WITH INDEPENDENT SUSPENSION

Mark Fanlconer, Costa Mesa, and Scott E. Greatrake, San Clemente, both of Calif., assignors to U.S. Divers Company, Inc., Santa Ana, Calif.

Filed Aug. 17, 1988, Ser. No. 233,153
Int. Cl.[4] B63C *9/16*
U.S. Cl. 405—186 22 Claims



1. A buoyancy compensation suspension system for suspending a buoyancy compensator having side portions, a back portion and shoulder portions wherein the improvement comprises:

a spider having waistband portions which extend at least partially around a user's waist, a back portion, and two shoulder portions which overlie a user's shoulders, and having means for securing the side portions of said buoyancy compensator to the waistband portions of the spider and means for securing the shoulder portions of the buoyancy compensator to the shoulder portions of the spider.

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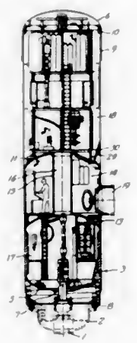
4,913,590

MONO-ATMOSPHERIC CHAMBER

Bjornar Svenning, Trondheim, and Per Brevig, Hommelvik, both of Norway, assignors to Den norske stats oljeselskap a.s, Norway

PCT No. PCT/NO87/00033, § 371 Date Jan. 5, 1988, § 102(e) Date Jan. 5, 1988, PCT Pub. No. WO87/06906, PCT Pub. Date Nov. 19, 1987
PCT Filed May 6, 1987, Ser. No. 143,139
Int. Cl.[4] B63C *11/40*
U.S. Cl. 405—188 7 Claims



1. A mono-atmospheric chamber module to be mounted on top of an underwater Christmas tree in a well-head, for keeping equipment and personnel at surface conditions during execution of operations, said chamber comprising:

(a) a mainly oblong cylindrical mantle having a lower and upper base-end, said lower base-end having a first opening therein for tight engagement with the top of said Christmas tree, said mainly oblong cylindrical mantle having a second opening therein for personnel;

(b) a pressure resistant personnel chamber positioned inside said mainly oblong cylindrical mantle and directly connected to said second opening;

(c) said upper base-end being detachable from said oblong cylindrical mantel and having a cylindrical wall extension which extends down the outside of said cylindrical mantle; and

(d) a sealing collar surrounding said first opening and attached to said lower base-end, said sealing collar for engagement with a cup shaped support member on top of said Christmas tree.

4,913,591

MOBILE MARINE PLATFORM AND METHOD OF INSTALLATION

James E. Steele, Beaumont, Tex., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Oct. 17, 1988, Ser. No. 258,466
Int. Cl.[4] B63B *35/44*; E02B *17/00*
U.S. Cl. 405—196 37 Claims

1. A mobile marine platform for operating at a deepwater site, comprising:

(a) horizontally disposed pontoon means for floating on or being submerged below the surface of a marine environment;

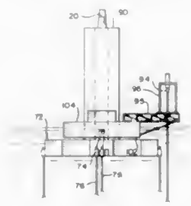
(b) at least a first vertically disposed column secured to said pontoon means and extending upwardly therefrom;

(c) a work platform having at least a first opening through which said column extends, said work platform overlying said pontoon means and vertically movable relative thereto along said column;

(d) jack means operably associated with said work platform and with said column for jacking said work platform relative to said column between a first position wherein said pontoon means and said work platform float on the marine environment while the platform is being moved to a site and a second position wherein said work platform is disposed above the surface of the marine environment and said pontoon means and a portion of said column are disposed below the surface of the marine environment;

(e) anchor means for being secured to the floor of the marine environment;

(f) a plurality of resilient tendons for extending between said pontoon means and said anchor means, said tendons for



being under tension when said pontoon means and said column portion are below the surface of the marine environment so that wave and current induced horizontal movement of said pontoon means and thereby of said column and work platform is permitted and upward and angular movement thereof is resisted; and

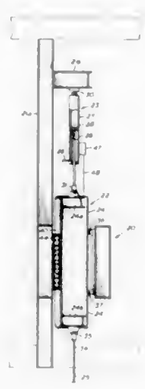
(g) said work platform being buoyant for providing with said pontoon means stability to the platform in the marine environment while the platform is being moved to the site, thereby permitting said column and said pontoon means to be sized so that stress on said tendons induced by wave action at the site is reduced.

4,913,592

FLOATING STRUCTURE USING MECHANICAL BRAKING

Terry D. Petty, Kenner, and William H. Rehmann, Jr., Slidell, both of La., assignors to Odeco, Inc., New Orleans, La.

Filed Feb. 24, 1989, Ser. No. 314,747
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—199 18 Claims



18. A structure for floating over a seabed and being subject to resonant oscillatory heave in response to wave action;

at least one long member having a bottom end anchored to said seabed and a top end suspended from said structure;

first means for applying a tension force to said long member;

second means for generating frictional coulomb damping forces when said floating structure heaves up, said frictional forces increasing said tension in said long member;

third means for deactivating said second means when said structure heaves down; and

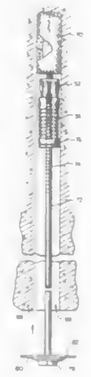
said third means including motion sensing means for activating said brakes when said floating structure heaves up.

4,913,593

MINE ROOF EXPANSION ANCHOR

Carl A. Clark, Liverpool, and Raymond L. Wright, Syracuse, both of N.Y., assignors to The Eastern Company, Naugatuck, Conn.

Filed Oct. 28, 1988, Ser. No. 264,050
Int. Cl.[4] E21D *21/00*
U.S. Cl. 405—261 18 Claims



9. A radially expansible support anchor assembly for anchoring a mine roof bolt having a nominal diameter of ¼" in a drill hole having a diameter of about 1", said assembly comprising:

(a) a one-piece expansion shell symmetrically formed about a central, longitudinal axis and having a continuous, ring-like base portion at its lower end, and four expansion leaf portions extending integrally from said base portions to terminal ends lying in a common plane perpendicular to said central axis and defining its upper end, said leaf portions being laterally separated by open slots extending axially from said base portion to said upper end of said shell, each of said leaf portions including:

(i) an outer surface formed in a succession of radially stepped serrations of substantially equal axial extent beginning at said base portion and extending for at least ½ of the distance to said terminal ends, the outermost extent of each of said serrations being substantially equally spaced from said central axis;

(ii) an inner surface having a first region extending downwardly from said terminal end and tapering inwardly toward said central axis at a first angle, a second region extending downwardly from said first region to an outwardly stepped shoulder and tapering inwardly toward said central axis at a second angle, less than said first angle, and a third region extending downwardly from said stepped shoulder and substantially parallel to said central axis to said base portion; and

(iii) two side surfaces joining said outer and inner surfaces, said side surfaces each joining said outer surface along outer lines extending downwardly from said terminal end substantially parallel to said central axis at least to a position adjacent said stepped shoulder, said side surfaces each joining said inner surface along inner lines extending downwardly from said terminal end converging inwardly toward one another at least to said stepped shoulder, whereby said inner surface is narrower at said stepped shoulder than at said terminal end and said leaf is thicker at said stepped shoulder than at any other axial position; and

(b) a one-piece camming plug having:

(i) a lower portion surrounded by said terminal ends of said leaf portions;

(ii) a through opening coaxial with and symmetrically arranged about said central axis;

(iii) internal threads within said opening for mating engagement with said roof bolt externally threaded end portion; and

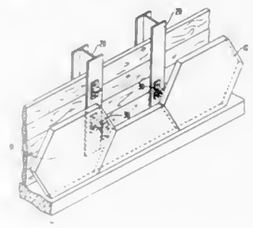
(iv) an outer surface tapering outwardly with respect to said central axis from said lower portion to an upper portion, whereby downward axial movement of said camming plug moves said leaf portions radially outwardly from said terminal ends with said leaf portions bending outwardly in the portions adjacent the juncture thereof with said base portion and lying between said first slot portions.

4,913,594

ADJUSTABLE CONNECTION SYSTEM FOR PRECAST FACING PANEL AND SOLDIER PILE

James W. Sigourney, Purcellville, Va., assignor to Schnabel Foundation Company, Bethesda, Md.

Continuation-in-part of Ser. No. 923,472, Oct. 27, 1986, abandoned. This application Feb. 22, 1988, Ser. No. 158,498
Int. Cl.[4] E02D *29/02*
U.S. Cl. 405—285 19 Claims



1. A rigid connection system for adjustably connecting facing panels to soldier piles so as to support the cut face of an excavation and to provide greater tolerance for misalignment of the soldier piles, said system comprising:

a first rigid bracket, said first bracket coupled to the rear face of said facing panel;

a second rigid bracket, said second bracket coupled to the front face of said soldier pile substantially opposite said first bracket;

at least one rigid connecting plate, said connecting plate being coupled between said first bracket and said second bracket, and

adjustment means provided by said first bracket, said second bracket and said rigid connecting plate for providing three degrees of adjustment between said soldier pile and said facing panel.

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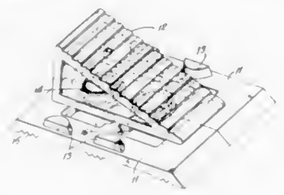
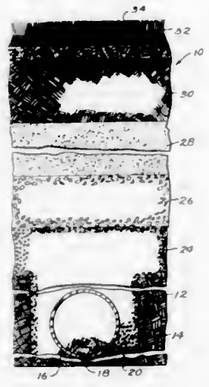
4,913,595
SHORELINE BREAKWATER
Frank E. Creter, Jr., Calverton, N.Y., and Richard E. Creter, Oldbridge Township, N.J., assignors to Creter Vault Corporation, Flemington, N.J.
Filed Nov. 13, 1987, Ser. No. 120,486
Int. Cl.[4] E02B *3/06*
U.S. Cl. 405—30 16 Claims



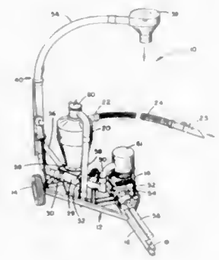
1. A shoreline breakwater comprising in combination
a plurality of substantially flat concrete base members, each including a front face, a rear face, parallel sides, an upper surface, and locking means on said upper surface, and
a plurality of concrete modular units having a substantially triangular shape when viewed in side elevation, each having parallel sides, a gently sloping seaward surface, a bottom surface, and locking means on said bottom surface,
wherein a modular unit is placed atop two adjacent base members and said locking means of said modular unit engages said locking means on each of the two adjacent base units on which it is placed to connect said adjacent base members.

4,913,596
ATHLETIC FIELD CONSTRUCTION
Louis N. Lambert, III, Northport, Ala., assignor to Erosion Control Systems, Inc., Tuscaloosa, Ala.
Filed May 4, 1989, Ser. No. 347,032
Int. Cl.[4] E02B *13/00*
U.S. Cl. 405—43 20 Claims



1. A prepared athletic field or the like comprising
a subgrade formed with a series of ditches having a series of drain tiles therein exteriorly covered with pea gravel,
a layer of pea gravel in direct contact with the subgrade including the ditches having drain tile covered with pea gravel,
a layer of crushed stone over the layer of pea gravel,
a layer of sand having an infiltration rate of at least 9" per hour over the layer of crushed stone,
a layer of soil mixture having an infiltration rate of between 5 to 9" per hour over the layer of sand,
said layer of soil mixture having a layer of soil reinforcement matting spaced from the upper surface thereof within a two-inch upper strata of said soil mixture layer, and
means on the upper surface of the layer of soil mixture for establishing a grass growth thereon,
said matting serving to prevent the grass from being disrupted by rough athletic use of the like.

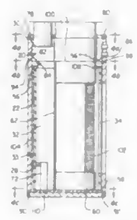
4,913,597
SILENCER FOR PNEUMATIC GRAIN CONVEYOR
Roy O. Christianson, and Frank W. Christianson, both of Blomkest, Minn., assignors to Christianson Systems, Inc., Blomkest, Minn.
Filed Aug. 12, 1987, Ser. No. 85,395
Int. Cl.[4] B65G *67/20*
U.S. Cl. 406—39 4 Claims



1. A pneumatic grain conveyor comprising:
a frame;
a cyclone separator mounted on said frame, said separator including a closed housing with a top end wall having an air outlet therein, a generally cylindrical upper side wall having a tangential material inlet therein, and a generally conical truncated lower side wall having a material outlet at the bottom end thereof;
a rotary valve including a material inlet connected to the material outlet of said cyclone separator, a material outlet, and an air inlet;
a blower including an air inlet connected to the air outlet of said cyclone separator, and an air outlet;
a silencer including an air inlet connected to the air outlet of said blower, and an air outlet connected to the air inlet of said rotary valve; and
means for driving said blower means.

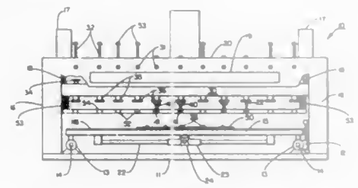
4,913,598
PNEUMATIC TRANSPORT SYSTEM TERMINAL
Charles W. Dozier, 10750 Forest La., Dallas, Tex. 75243
Filed Sep. 6, 1988, Ser. No. 240,194
Int. Cl.[4] B65G *51/32*
U.S. Cl. 406—112 20 Claims

1. Pneumatic transport system terminals for receiving and sending a carrier between a bank customer and a bank teller or the like, comprising:
a housing having a cavity, a side and an opening through the side,
an inner cylinder having a cavity, a top, a bottom, a side and an opening through the side,
two or more discs of resilient material acting as bearings, positioned with respect to the housing cavity forming an airtight seal above and below the housing opening, at least two of the bearings sealing against the top and bottom of the inner cylinder,
a carrier tube having an end and extending through the bearings located above the housing opening to the inner cylinder cavity,
a means for selectively providing a vacuum or pressure to the inner cylinder cavity, and



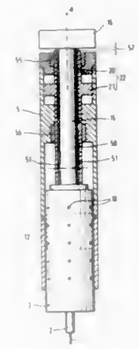
a carrier is placed in the inner cylinder cavity through the housing and inner cylinder openings sealing against the carrier tube end, the inner cylinder opening is closed, air is forced into the inner cylinder by the pressure means, thus increasing pressure in the inner cylinder cavity propelling the carrier through the carrier tube, alternatively, the pressure means is reversed creating a vacuum in the carrier tube whereby the direction the carrier is traveling may be reversed, thus retrieving the carrier by vacuum.

4,913,599
DRILL FOR FLEXOGRAPHIC PLATES AND NEGATIVES
Joseph A. Andolora, Caledonia, N.Y., assignor to Adflex Corporation, Rochester, N.Y.
Filed Apr. 8, 1988, Ser. No. 179,201
Int. Cl.[4] B23B *41/00*
U.S. Cl. 408—48 21 Claims



1. A drill for flexographic plates and negatives, said drill comprising:
a. a linear array of drill bits rotatably
b. a bearing system supporting said table for movement in a Y direction underneath said drill bar;
c. a clamp for clamping said table in a Y direction position,
d. a pin bar having upstanding pins fitting said plates and negatives, said pin bar being mounted in a recess in said table so that said plates and negatives rest on said table when mounted on said pins of said pin bar and said pin bar being movable along said recess relative to said table in an X direction;
e. a clamp for locking said pin bar to said table in an X direction position along said recess; and
f. a motor system for raising and lowering said drill bar and for rotating said drill bits for drilling a selected array of holes in said flexographic plates and negatives supported on said table.

4,913,600
DRILLING UNIT
Dieter Dierich, Holzgerlingen; Walter Rotter, Schoenaich, and Conrad Trollmann, Hildrizhausen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 25, 1988, Ser. No. 173,321
Claims priority, application European Pat. Off., Apr. 17, 1987, P 87105751.9
Int. Cl.[4] B23B *47/22*
U.S. Cl. 408—130 9 Claims



1. Drilling unit apparatus having a predetermined reference axis, said apparatus comprising:
a housing (5) affixed to a carrier member in concentric alignment with said predetermined axis;
drilling spindle housing means (3) axially moveable in a bidirectional manner along said predetermined axis within said housing (5);
a drilling spindle (2) rotatably received within said spindle housing means and driven by driving means (12);
plunger means having an elongated plunger with first and second ends, a flange at said first end, and a head member at said second end, said flange being affixed to said drilling spindle housing means (3), said plunger means being in concentric alignment with said predetermined axis, and said plunger means being axially moveable in a bidirectional manner along said axis and in unison with said drilling spindle housing means (3) within said housing (5);
piston means (22) slideably received within said housing (5) in concentric alignment with said predetermined axis, said piston means having an elongated sleeve-like member with an elongated bore in concentric aligned relationship with said predetermined axis, said plunger being disposed within said bore; means for operatively moving said piston means in a predetermined contacting relationship with said plunger means to move said plunger means and said spindle housing means in said unison therewith and along said axis in said bidirectional manner;
a first clearance (51) between said plunger and said bore, said first clearance being normal to said axis in an omnidirectional manner to allow a predetermined relative limited first movement between said plunger and said piston means within said first clearance; and
a second clearance between said piston means and a recess defined by the space between said flange and said head member, said second clearance being in the direction of said axis (A) to allow a predetermined relative limited second movement between said plunger and said piston means in said second clearance.

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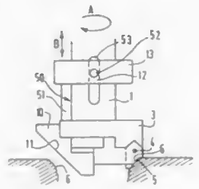
4,913,601

TOOL-HOLDER SPINDLE FOR A FINE-GRINDING MACHINE, IN PARTICULAR A MACHINE FOR GRINDING THE VALVE SEATS OF HEAT ENGINES

Fernand Tenand, Annecy, and Daniel Gerard, Annemasse, both of France, assignors to Societe D'Etude, de Realisation et de Diffusion Industrielles - Serdi, Annecy, France

Filed Nov. 17, 1988, Ser. No. 272,443
Claims priority, application France, Nov. 25, 1987, 87 16609
Int. Cl.[4] B23C 3/05
U.S. Cl. 408—143 5 Claims



1. A tool-holder spindle for a fine-grinding machine, in particular a machine for grinding the valve seats of heat engines, comprising:

an actual spindle having a free end,

a cutting tool fixed to the free end of said spindle, and having a cutting edge disposed to one side of said spindle,

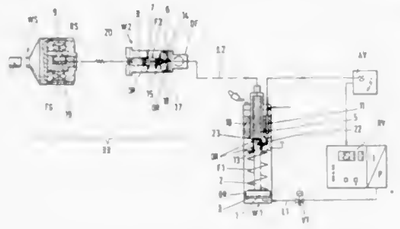
an antivibration device, separate from the cutting tool, removably mounted on said free end, comprising a sliding block arranged on an opposite side of the cutting tool relative to the axis of movement of the spindle, said sliding block having a front edge and a face for bearing against a surface to be machined, the sectional extension of said face defining a circle sector extending essentially angularly behind an axial plane passing through said cutting edge, in the direction of rotation of the spindle.

4,913,602

APPARATUS FOR THE FINE ADJUSTMENT OF A TOOL FOR A ROTATING RADIAL ADJUSTING HEAD

Hans-Jürgen Peter, Grossen-Linden, and Wilfried Gerk, Rödermark, both of Fed. Rep. of Germany, assignors to Samson AG, Frankfurt, Fed. Rep. of Germany

Filed Aug. 2, 1988, Ser. No. 227,510
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1987, 3726276
Int. Cl.[4] B23B 47/22, 29/034
U.S. Cl. 408—147 7 Claims



1. An apparatus for fine radial adjustment of a turning tool in a rotating head having a hydraulically operable adjusting member which acts on a stiff parallel spring joint carrying the turning tool, comprising:

first converter means for receiving low pneumatic control pressure and for discharging intermediate hydraulic pressure proportional to the low pneumatic control pressure, said first converter means carrying a hydraulic pressure medium reservoir and a pressure medium conduit communicating said pressure medium reservoir with said intermediate hydraulic pressure in at least one position of said first converter means, said first converter means being arranged so that the conversion from low pneumatic pressure to intermediate hydraulic pressure takes place externally of the rotating head; and

second converter means fluidically connected to said first converter means for receiving said intermediate hydraulic pressure, said second converter means being connected to the rotating head for rotation therewith and for supplying high adjusting pressure to the adjusting member, said converter means including a rotary transmission for providing the fluidic connection to the intermediate hydraulic pressure discharge from said first converter means.

4,913,603

SPIRAL DRILL

Paul Friedli, Rüttenen; Georges Petignat, Alle, and Jean-Marc Salomon, Porrentruy, all of Switzerland, assignors to Sphinzwerke Muller AG, Solothurn, Switzerland

PCT No. PCT/CH87/00155, § 371 Date Jul. 18, 1988, § 102(e) Date Jul. 18, 1988, PCT Pub. No. WO88/03849, PCT Pub. Date Jun. 2, 1988
PCT Filed Nov. 24, 1987, Ser. No. 236,228
Claims priority, application Switzerland, Nov. 25, 1986, 4703/86
Int. Cl.[4] B23B 51/02
U.S. Cl. 408—230 4 Claims

1. A two-flute drill, comprising a drill bit including two drill webs each having a cutting lip, said cutting lips of said webs being unequally angularly spaced from each other so that said cutting lips include with each other a first pitch angle (α) in one circumferential direction and a second pitch angle (β) in an opposite circumferential direction, said first pitch angle being smaller than said second pitch angle, said first pitch angle being in the range between 110° and 175°, each of said drill webs having a peripheral margin land, and one of said drill webs including an additional peripheral margin land in the region of said second pitch angle, said one of said drill webs being wider in a circumferential direction than another of said drill webs.

4,913,604

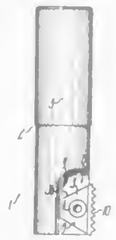
THREAD MILLING TOOL

Eduard Zaengerle, Ch-Baar-Zug, Switzerland, assignor to Vargus Ltd. Tool Manufacturing Co., Israel

Continuation of Ser. No. 100,017, Sep. 23, 1987, abandoned. This application Aug. 17, 1988, Ser. No. 233,201
Int. Cl.[4] B23C 3/32
U.S. Cl. 409—74 32 Claims

1. A thread milling tool for cutting a thread having a thread profile, said tool comprising:

a one-piece, multi-toothed thread milling plate constructed as a reversible plate, said milling plate having first and second plate sides on both sides of a plate plane, and further having edge faces, at least one plate edge and a plate thickness, said milling plate in accordance with the thread profile having a serration extending substantially over the entire plate thickness on at least one edge face, thereby forming on at least one plate edge of said at least one edge face a toothed thread milling edge located on at least one of said first and second plate sides, said milling edge being bounded by a rake surface formed by a chip surface, said milling edge providing top and bottom faces of said serration, and wherein said chip surface has a total width extending between said top faces and a chip surface boundary remote from said serration, said total width of the chip surface being substantially half as large as the plate thickness of the thread milling tool.

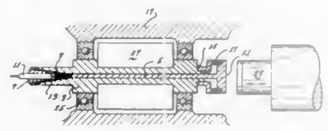


4,913,605

INTEGRAL SPRING FLEXURE FOR USE WITH HIGH SPEED ROTATING SHAFTS

Everett H. Schwartzman, 2751 Toledo St., Suite 309, Torrance, Calif. 90503

Division of Ser. No. 940,948, Dec. 12, 1986, Pat. No. 4,790,704, which is a continuation-in-part of Ser. No. 635,716, Jul. 30, 1984, Pat. No. 4,640,653. This application Aug. 22, 1988, Ser. No. 236,590
Int. Cl.[4] B23Q 3/12
U.S. Cl. 409—231 10 Claims



1. A high speed spindle assembly comprising.

a housing supporting a bearing assembly and including a rotatable collet mechanism mounted on a rotatable shaft assembly for rotation therewith,

said shaft assembly including means forming an aperture therein,

an axially moveable push rod means mounted concentrically within said means forming an aperture of said shaft assembly and cooperating with said collet mechanism and operative in one position to effect release of said collet mechanism,

integral spring means mounted concentrically with said shaft assembly for rotation therewith and with said collet mechanism and operative to bias said collet mechanism into a locking position,

said integral spring means including a cylindrical body member,

said cylindrical body member having spaced end faces and including wall means between said end faces,

said wall means including a plurality of tiered slots and lands and solid sections located between said slots,

said push rod being operative to bear against said integral spring to effect release of said collet mechanism, and

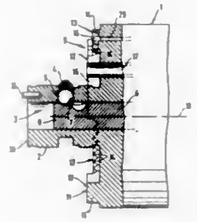
said integral spring being concentrically mounted with respect to said push rod, said collet mechanism and said shaft assembly such that the rotating parts, which include at least said shaft assembly and said collet mechanism, travel in a rotating such that the axis of the true mass thereof is coincident with the axis of rotation thereof.

4,913,606

TOOL-CHANGEOVER HOLDER

Franz Glaser, Nuremberg, Fed. Rep. of Germany, assignor to Hertel AG, Werkzeuge & Hartstoffe, Fed. Rep. of Germany

Filed Mar. 9, 1989, Ser. No. 321,180
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1988, 3807887
Int. Cl.[4] B23C 5/26; B23B 31/10
U.S. Cl. 409—232 16 Claims



1. A tool changeover holder for machine tools, comprising:

a rotationally driven spindle having a central spindle journal including a chucking device concentrically surrounded by an annular spindle face in a plan substantially perpendicular to the axis of said spindle, and

a replaceable tool head mountable on said spindle, said replaceable tool head having on a spindle side thereof:

a central bore for receiving said spindle journal and axially chucking said tool head by means of said chucking device, and

an annular matching surface that surrounds said central bore concentrically,

said spindle face and said matching surface having congruent centering and torque-transmission means that engage in each in a chucked position, said centering and torque-transmission means including Hirth serration elements disposed on said spindle face and arranged in a plurality of annular-sector shaped Hirth serration sections located on an annulus concentric with the axis of the spindle, said annular-sector shaped Hirth serration sections being separated from each other by flat contact surface sections.

4,913,607

TOOL COUPLING

Rainer von Haas, Geesthacht, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Jun. 15, 1988, Ser. No. 207,013
Claims priority, application European Pat. Off., Jun. 16, 1987, 87108662
Int. Cl.[4] B23B 29/26
U.S. Cl. 409—234 5 Claims

1. In a tool-and-tool holder assembly including

a tool having a tool shank; said tool shank having a longitudinal axis and a terminal stub;

a clamping member disposed in said terminal stub; said clamping member having a clamping member axis perpendicular to said longitudinal axis and said clamping member being movable along said clamping member axis;

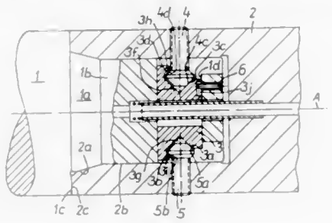
a tool holder including a tool holder body having a receiving bore for receiving said terminal stub and said clamping member; and

two clamping screws threadedly supported in said tool holder body for cooperating with said clamping member;

the improvement wherein

said clamping member is in a force-transmitting relationship with said terminal stub in either direction parallel to the longitudinal axis of said tool shank,

each said clamping screw has a first conical face and said clamping member has recesses each bounded by a first conical face; upon tightening at least one of said clamping screws, said first conical faces of the two screws are pressed against said first conical faces of respective said



recesses of said clamping member for generating a first axial force component urging said shank into said receiving bore, whereby said shank is axially tightened against said tool holder body;

at least one of said clamping screws has a second conical face adjacent said first conical face of said clamping screw;

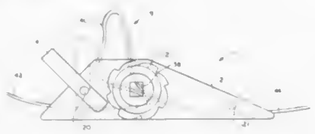
said clamping member has an overhanging portion projecting over at least one of said recesses and having a second conical face; upon unscrewing said clamping screw, said second conical face of said clamping screw and said second face of said clamping member are pressed to one another for generating a second axial force component urging said shank in a direction out of said receiving bore.

4,913,608

STRAP TIGHTENING DEVICE

Kenneth O. Royball, 1170 McKinley St., Redwood City, Calif. 94061

Filed Mar. 6, 1989, Ser. No. 320,211
Int. Cl.[4] A63B *61/04*
U.S. Cl. 410—103 12 Claims



9. A strap tightening device for tightening an elongated cargo strap that is secured on its opposite ends to hold cargo in place, the strap tightening device comprising:

a frame including a base and a pair of raised shoulders that extend outwardly from the base, each said shoulder having an interior surface and an exterior surface;

a drum rotatably mounted to the frame between said shoulders, the drum having a longitudinal axis of rotation and three longitudinally extending slots for receiving said strap, said slots being disposed between said shoulders and arranged to facilitate passing the strap into the drum through any first one of the slots and out of the drum through any second one of the slots; and

locking means for selectively preventing the drum from rotating in at least one direction, the locking means including a pawl and a pair of rachet wheels carried by opposite ends of the drum adjacent the exterior surfaces of the opposite shoulders, wherein said pawl takes the form of a U-shaped member having two leg members pivotally coupled to the frame, each said pawl leg member cooperating with one of said rachet wheels to selectively prevent the drum from rotating in one direction;

cranking means for rotating the drum about its longitudinal axis to wind the strap about the drum;

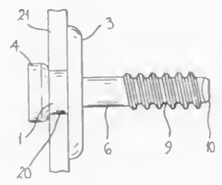
whereby to utilize the device for tightening straps, the elongated strap is threaded into the drum through a first one of the slots, out of the drum through a second one of the slots, back into the drum through a third one of the slots to form a loop between said second and third slots, and back out of the drum through the first slot.

4,913,609

PROFILED BOLT MOUNTING UNIT

Dieter Mauer, Lollar, Fed. Rep. of Germany, assignor to Emhart Industries, Inc., Farmington, Conn.

Continuation of Ser. No. 32,411, Mar. 30, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,146
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1986, 3610976
Int. Cl.[4] F16B *13/06*
U.S. Cl. 411—43 2 Claims



1. A profiled bolt mounting unit for mounting on a structural member which comprises:

a blind rivet body having a cylindrical sleeve and a flange for abutting against the structural member; and

a mandrel positioned within the rivet body, said mandrel having a setting head, a plurality of annular groove-like recesses, a profiled portion, breakneck and a pull stem, wherein said setting head has an oval cross-section and annular shoulder and is adapted to be held in place within the deformed rivet body sleeve after the setting operation so that said setting head cannot rotate in relation to said sleeve and so that axial forces in the direction of the structural member are absorbed by the profiled portion; wherein said annular groove-like recesses are positioned adjacent said setting head on that part of the mandrel located within said rivet sleeve and are adapted so that material from the sleeve flows into said recesses during the setting operation to provide an axial interlock between the mandrel and the sleeve; wherein said profiled portion is in the form of a helical thread having an outer diameter larger than the outer diameter of the non-profiled portion of said mandrel which extends outwardly away from said structural member and said flange and which does not contact said flange; wherein said breakneck separates said pull stem from said profiled portion; wherein said pull stem is adapted to be gripped by a setting tool and detached from the profiled portion of the mandrel at a predetermined breaking point after exceeding a certain pulling force during the setting operation; and wherein the mandrel remains inside the deformed rivet sleeve after the setting operation and projects said profiled portion away from said flange;

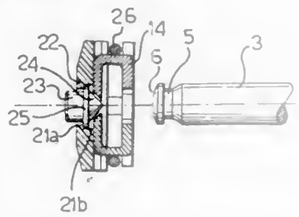
wherein said mounting unit is set by a setting tool gripping said pull stem and pulling said stem to deform said sleeve of said rivet body and wherein after setting a fixing element provided with a thread can be screwed onto the profiled portion.

4,913,610

DEVICE FOR PREVENTING A WHEEL FROM SLIPPING OFF A SPINDLE ON WHICH IT IS MOUNTED IN A FREELY ROTATABLE MANNER

Oliviero Olivieri, Montebelluna, Italy, assignor to Icaro Olivieri & C. S.p.A. Minuterie Metalliche, Treviso, Italy

Filed Jun. 9, 1989, Ser. No. 363,817
Claims priority, application Italy, Jun. 15, 1988, 20969 A/88
Int. Cl.[4] F16B *21/18;* B60B *27/02, 27/06*
U.S. Cl. 411—352 3 Claims



1. A device for preventing a wheel from slipping off a spindle on which it is mounted in a freely rotatable manner, said spindle having an end portion formed with an annular groove in the vicinity of the spindle free end, said device being particularly intended for use on roller skates, characterized in that it comprises:

a body wherein a cavity is defined for access from outside the body through a circular entrance to receive said spindle end portion thereinto:

at least two co-planar, juxtaposed retainer plates fitting for sliding movement in guides formed on said body and extending in a radial direction to said entrace, said plates being movable in said cavity from a working position where they lie close together to engage in said annular groove to a rest position where they are held apart to disengage from said groove; and

a spreader member operable substantially as a pushbutton, to drive, against the bias of a spring means, said retainer plates to the rest position, which spreader member is carried slidably in said body and movable in an axial direction relatively to the entrance of said cavity,

wherein said retainer plates are comprised of a leg of respective U-shaped members the other leg of said U-shaped members being fitted for sliding movement in respective guides formed in said body in parallelism with the slideway guides for said retainer plates, said spring means being arranged to act on said U-shaped members and hold them in said working position.

4,913,611

NAILING STRIP

Herbert E. Leistner, 167 Sweeney Drive, Toronto, Ontario, Canada (M4A 1V1)

Filed Dec. 23, 1988, Ser. No. 288,995
Int. Cl.[4] F16B *15/08;* B65D *85/24*
U.S. Cl. 411—442 6 Claims

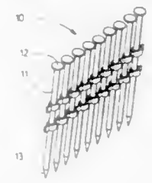
1. A nail strip for use in association with a power-operated nailing device and having a strip feed pawl means therein operable along a feed pawl axis, for advancing said nail strip through said device said strip defining a leading end and a trailing end portion and comprising:

a plurality of nails having heads, and points, and wherein said nails are arranged in parallel spaced-apart relation;

thermoplastic collar means molded around and encircling each said nail, intermediate said point and said head and defining a predetermined thickness;

web means molded integrally with and extending between adjacent said collar means and formed of a like thermoplastic material;

asymmetric shoulder means molded integrally with respective said collar means and extending outwardly from said



collar means and defining a thickness greater than said predetermined thickness of said collar means, said shoulder means defining engagement surfaces lying in planes generally normal to said feed pawl axis and facing away from said leading end of said strip for engagement by said pawl means, and,

said web means lying in a common plane spaced to one side of the plane containing said shoulder means whereby to leave said engagement surfaces free for unobstructed engagement by said feed pawl means.

4,913,612

APPARATUS FOR STORING AND FEEDING ELECTRONIC COMPONENTS HAVING IN-LINE LEADS INTO AN INSERTING MACHINE

Yoichi Asazuma, Fujisawa, and Shigeaki Mori, Tokyo, both of Japan, assignors to Toray Engineering Co., Ltd., Osaka, Japan

Filed Jul. 19, 1983, Ser. No. 515,146
Int. Cl.[4] B65G *59/06;* H05K *13/02*
U.S. Cl. 414—403 20 Claims

1 Apparatus for storing and feeding electronic components having in-line leads to a machine for sequentially inserting the components in a circuit board, which comprises:

a frame and

a series of component storing and feeding units mounted on said frame in a side-by-side relationship;

each of said component storing and feeding unit comprising;

(a) at least two stick-magazine holders for resiliently retaining by friction a stack of stick magazines, extending vertically and arranged one on the other, in such a manner as to prevent said stick magazines from sliding

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within said holders under the action of gravity but to permit said stick magazines to slide longitudinally within said holders when an additional force is applied at an end thereof, each of said stick magazines having open ends and adapted to receive a plurality of components to be inserted in the circuit board, said stick-magazine holders having a length less than that of said stick magazines so that a length of said stick magazines when retained in said holders; projects by a predetermined distance beyond said holders;

(b) a pair of parallel, opposite, upper and lower guiderails secured to said frame and spaced apart from each other along a vertical plane for movably supporting said stick-magazine holders therebetween and for guiding said holders along a predetermined path, said guiderails having an open frontal end and an open rear end to permit said holders to be loaded on and unloaded from said guiderails, said guiderails being slanted from said frontal end down toward said rear end to permit said holders to travel rearward and downward along said path under the action of gravity when said holders are loaded on said guiderails, said guiderails having a component storage and release section at the frontal part thereof for storing at least one stick-magazine holder carrying stick magazines charged with the components and for releasing the components therefrom and an empty holder storing section at the rear part thereof for storing at least one empty stick-magazine holder carrying depleted stick magazines deprived of the components, said upper and lower guiderails being spaced such that the outermost inner portions thereof are spaced apart from each other with a distance slightly greater than the length of said stick magazines so that a predetermined gap is left between said portions and the ends of said stick magazines at either ends of said stick magazines when said holders are loaded on said guiderails, the lower end of said stick magazines when said holders are loaded on said component storage and release section of the guiderails being disposed in the close vicinity or in a slight sliding contact with said outermost inner portion of said lower guiderail so that said gap is left between the upper end of said stick magazines and the outermost inner portion of said upper guiderail, said lower guiderail having a component discharge opening therethrough at the substantially rear end of said component storage and release section;

(c) carrier means mounted on said stick-magazine holders and engageable with said guiderails for movably carrying and guiding said holders to travel along said slanted guiderails under the action of gravity;

(d) an abutment arranged adjacent to said discharge opening and across the passageway in which the lower part of said stick magazines projecting downward beyond said holders is to travel, for abutting against said projecting lower part of any stick magazine in one holder to stop said holder with said any stick magazine aligned with said discharge opening;

(e) a raceway extending from said discharge opening down to said component inserting machine for delivering the components in said stick magazine aligned with said discharge opening toward said inserting machine;

(f) means for monitoring a condition in which all the components in said stick magazine at said discharge opening are released therefrom; and

(g) pusher means responsive to said monitoring means for pushing an empty stick magazine at said discharge opening to shift it upward out of engagement with said abutment to release said magazine holder to move by one step along said guiderails under the action of gravity until a subsequent stick magazine receiving the components is brought to abut said abutment and aligned with said discharge opening, said pusher means operating each time any one stick magazine brought at said discharge opening is depleted so that upon completion of release of the components from the last stick magazine in one magazine holder, said holder is disengaged from said abutment to travel away from said component storage and release section under the action of gravity into said empty holder storage section of the guiderails thereby permitting a subsequent stick-magazine holder carrying stick-magazines charged with the components to move into said component storage and release section to assure a continuous supply of the components to said inserting machine.

4,913,613

LINEAR UNIT FOR AN ASSEMBLY DEVICE IN HANDLING TECHNOLOGY

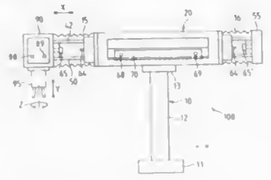
Gregory C. Hirschmann, Rautistrasse 12, Zurich, Switzerland

Filed Jul. 1, 1988, Ser. No. 214,330

Claims priority, application Switzerland, Jul. 10, 1987, 2639/87

Int. Cl.[4] B25J *11/00*

U.S. Cl. 414—751 10 Claims



1. Linear unit, particularly for an assembly device electrically/pneumatically or electrically/hydraulically operatively connected to an energy source and including a mounting element (**90**) with a handling gripper (**95**) thereon, the linear unit (**20**) comprising a casing (**25**), an actuator (**21**) positioned in the casing and including a cylinder tubular body (**40**), a piston (**41**) and a piston rod (**42**) mounted in said body, and guide means (**22**) including a guide tube (**50**) extending axially parallel to the piston rod (**42**) for cooperating with the mounting element (**90**) to be correspondingly controlled, whereby said gripper on said mounting element performs movement and/or handling sequences, wherein the linear unit (**20**) and the mounting element (**90**) are operatively connected with a control valve (**70**) mounted in the casing (**25**), and wherein:

(a) the actuator (**21**) is formed as a piston/cylinder unit and is supplied with pneumatic or hydraulic energy by means of a first duct system integrated in the casing (**25**);

(b) the mounting element (**90**) is supplied with pneumatic or hydraulic energy by means of a second duct system also integrated in the casing (**25**) and in the guide means (**22**);

(c) electric power can be supplied to the mounting element (**90**) by means of a cable (**61**) operatively connected thereto and integrated into a guide tube (**60**) of said actuator and therefore said mounting element is substantially linearly adjustable; and

(d) said second duct system for pneumatic or hydraulic energy supply of the mounting element (**90**) includes a tubular member (**45**) having a chamber (**45'**) operatively connected to said control valve via a distribution line (**4**) and control valve openings (**5, 5'**) provided in said casing (**25**) and in the tubular member (**45**), the guide tube (**50**) of said guide means axially penetrating the tubular member (**45**) and provided with an axially extended through-bore (**47**) which is connected by means of at least one radially directed bore through said guide tube of said guide means (**48**) to the chamber (**45'**) of said tubular member, said guide tube of said guide means being operatively connected to a third duct system (**91**) formed in a casing (**75**) of the mounting element (**90**).

4,913,614

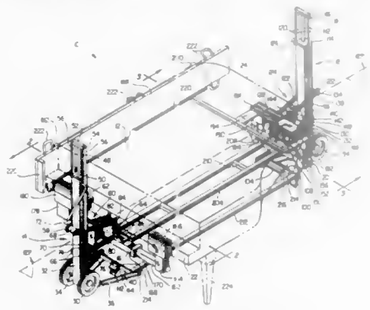
PIANO MOVING APPARATUS

Patrick L. O'Rarden, 1477 Rockshire, Plano, Tex. 75074

Continuation of Ser. No. 932,881, Nov. 20, 1986, abandoned. This application Mar. 9, 1989, Ser. No. 320,881

Int. Cl.[4] B60P *1/34*

U.S. Cl. 414—343 4 Claims



1. A piano moving apparatus comprising:

first and second jack means for moving a piano, each jack means including a jack having a housing, a jack lift mounted in the housing, a load support means connected to the jack lift for engaging one or more underside portions of a piano, and a wheeled support means connected to the jack means for movement thereof;

said load support means of each jack means including a plurality of interconnected piano supporting means for slidably supporting a piano, and a pivot means connected between the jack lift and interconnected piano supporting means for pivotally connecting the interconnected piano supporting means to the jack lift;

said wheel support means including first and second wheels attached to the housing normal to the longitudinal axis of the interconnected piano supporting members; and

a detachable piano board means for facilitating movement of a piano onto a transport means, the piano board means including a first retainer/support means extending upwardly of the load support means, a second retainer/support means normal to the first retainer means, and support arm means connected to the first retainer/support means for connection to the interconnected piano supporting means, whereby during piano pickup the first retainer/-support means acts to retain the piano against slippage, during tilting the first and second retainer/support means coact to retain the piano against slippage, and when the piano board means is moved together with the piano to the transport means with the support arm means disconnected from the interconnected piano supporting means of the first and second jack means, the first retainer/support means acts as a piano support and the second retainer/support means acts as a piano retainer during movement of the transport means.

4,913,615

HINGE AND RAMP ASSEMBLY

Harold Ward, 22905 Furton, St. Clair Shores, Mich. 48082

Filed Aug. 8, 1988, Ser. No. 229,250

Int. Cl.[4] B60P *1/00*

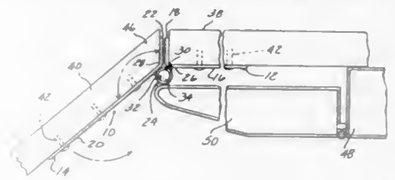
U.S. Cl. 414—537 5 Claims

1. A loading ramp apparatus removably usable with trucks having a tailgate and a bed, the loading ramp comprising:

first and second plate-like members each having first and second ends, a bottom portion and a flanged end portion extending upwardly from a first end of said plate-like members;

a first and second ramp member, each of predetermined length, each having first plate-engaging ends configured to matingly engage inner surfaces of said first and second plate-like members formed between said bottom portion and said flanged end portion;

pivot means, carried by said first and second plate-like members at the outer edges formed by the intersection of said bottom portions and said flanged end portions for pivotally connecting said plate-like members for pivotal movement from a first closed position in which said ramp members are in face-to-face engagement, to a second load-bearing position in which said flanged end portions of said first and second plate-like members are seated in face-to-face engagement and said bottom portions of said first and second plate-like members being disposed at an obtuse angle with respect to each other, thereby preventing further opening of said first and second ramp members about said hinge means and transmitting loading forces



placed on said ramp assembly from said second ramp member to said flanged end portions to prevent loading forces from being absorbed by said first plate-engaging ends of said ramp members;

said first ramp member having a second bed contacting end, said first ramp member adapted to be placed in removable overlying contact with the bed of the truck such that said second end extends into the bed interior, said first ramp member having sufficient length to span the tailgate when said pivot means is in the second laod-bearing position and said first ramp member is removably positioned in the bed;

said second ramp member having a second ground-contacting end, said second member having a length sufficient to span the distance between said pivot means and the ground when the apparatus is in said second load-bearing position and to define a space between the tailgate and the first ramp member when said first ramp member is in overlying removble contact with the bed of the truck.

4,913,616

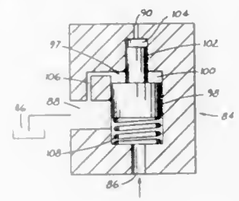
HYDRAULIC IMPLEMENT REGENERATION SYSTEM

Donnell L. Dunn, Wausau, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Feb. 23, 1989, Ser. No. 313,917

Int. Cl.[4] E02F *3/43*

U.S. Cl. 414—697 5 Claims



1. A hydraulic system for use in moving an implement, comprising:

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a hydraulic cylinder;
a piston mounted in said hydraulic cylinder;
an implement operably connected to said piston to be moved by said piston;
said cylinder and said piston defining a first power chamber on one side of said piston, a second power chamber on the opposite side of said piston and chamber lines leading to each of said power chambers;
a source of pressure hydraulic fluid;
a reservoir for returning hydraulic fluid and a reservoir line leading to said reservoir;
a change-over valve operably connected to said chamber lines, said pressure fluid source and said reservoir to selectively connect said pressure fluid source to one of said chamber lines and to connect said reservoir, through said reservoir line, to the other of said chamber lines, the connection of the pressure hydraulic fluid to a first of said power chambers moving the piston in a direction that will pivot the implement in a direction such that said implement's movement is assisted by gravity and the connection of said pressure fluid to the second of said power chambers causing the piston to move in a direction that pivots said implement in a direction such that said implement's movement is opposed by gravity; and
a regeneration valve being disposed in said reservoir line and being actuated when said change-over valve is in a position that causes said pressure hydraulic fluid to be sent to said first power chamber such that such regeneration valve causes a portion of the fluid returning to said reservoir from said second power chamber to be bypassed back into the chamber line leading to said first chamber to supplement the source of hydraulic fluid and compensate for the velocity said implement is moving at due to assistance of gravity;
said regeneration valve consists of a slide valve mounted within a valve cylinder;
a fluid line leading from said reservoir line entering said valve cylinder at one position and a second fluid line leading to said reservoir extending from said valve cylinder at a second position;
said slide valve being normally biased to a first position at which fluid can move from said reservoir line to said second fluid line leading to said reservoir and is unrestricted; and
a pressure tap leading from the one of said control pressure line that will contain the pressure control fluid when said change-over valve is being moved to its second position, said pressure tap applying the pressure control fluid against the bias on said slide valve so as to move said slide valve to a second position, the second position of said slide valve restricting the flow of said fluid from said reservoir line to said second fluid line leading to the reservoir.

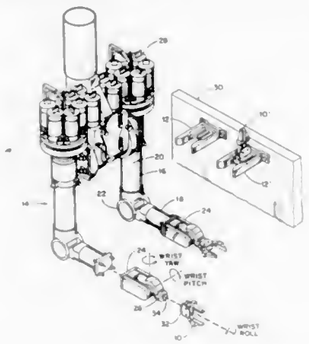
4,913,617

REMOTE TONG/TOOL LATCH AND STORAGE BRACKET FOR AN ADVANCED SERVO-MANIPULATOR

John R. Nicholson, Oak Ridge, Tenn., assignor to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Jul. 20, 1988, Ser. No. 221,689
Int. Cl.[4] B25J *15/04*
U.S. Cl. 414—729 **9 Claims**

8. A combination comprising:
a tong assembly comprising a tong housing, tong members supported from said housing and a tong actuator in said housing;
a wrist assembly of a servo-manipulator including first driven means for rotating said tong housing about an axis and second driven means for driving said tong actuator, said first driven means including a rotatable member, said tong housing being provided with latch means for releasably engaging said tong housing with said rotatable member, said tong housing being further provided with means for receiving said second driven means, said receiving means being operatively connected with said tong actuator; and a holder for storing said tong assembly and said latch means separate from said wrist assembly, said holder



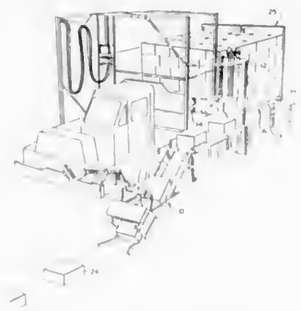
including means for operating said latch means when said wrist assembly moves said tong assembly into and out of said holder.

4,913,618

APPARATUS FOR LOADING AND PALLETIZING BOXES AND CARTONS, FROM AN AGRICULTURAL FIELD

Donald M. Grey, Selma, and Lee D. Butler, Kingsburg, both of Calif., assignors to Grey Technologies, Inc., Selma, Calif.

Division of Ser. No. 775,654, Sep. 12, 1985, Pat. No. 4,832,553.
This application Oct. 26, 1988, Ser. No. 262,785
Int. Cl.[4] B65G *57/24, 57/32*
U.S. Cl. 414—789.7 **46 Claims**



1. An apparatus for field loading and stacking a plurality of containers onto a transport vehicle, comprising:
(a) a platform, having first and second ends, disposed on a transport vehicle;
(b) a palletizer means operably associated with said platform for progressively stacking a plurality of containers into a preselected stacked configuration from said first end to said second end of said platform;
(c) conveyor means, having a pick up end and a discharge end, for transporting each of said containers from the field onto said palletizer means;
(d) said pick up end including a pick up means for engaging and lifting each of said containers from the field onto said conveyor means;
(e) said discharge end being associated with said palletizer means;

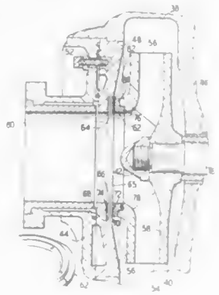
(f) said palletizer means including a false floor means for forming thereon at least one row of said containers;
(g) said palletizer means including an elevator means operably associated with said false floor means for vertically transporting to said false floor means each of said containers from said discharge end of said conveyor means;
(h) said palletizer means including means for transferring each of said containers from said elevator means to said false floor means for forming said at least one row of containers;
(i) said palletizer means including means for vertically and horizontally positioning said false floor means above at least one tier of previously stacked containers on said platform;
(j) said palletizer means including means for retracting said false floor means from underneath said at least one row of containers when said false floor means is positioned over said at least one tier of previously stacked containers, to thereby deposit said at least one row of containers over said at least one tier of previously stacked containers;
(k) said platform including at least first and second stacking areas; and
(l) means for moving said palletizer means from said first stacking area to said second stacking area after stacking a certain number of said containers in said first stacking area.

4,913,619

CENTRIFUGAL PUMP HAVING RESISTANT COMPONENTS

Walter D. Haentjens, and Thomas E. Stirling, both of Sugarloaf, Pa., assignors to Barrett Haentjens & Co., Hazleton, Pa.

Filed Aug. 8, 1988, Ser. No. 229,293
Int. Cl.[4] F04D *29/16*
U.S. Cl. 415—172.1 **4 Claims**



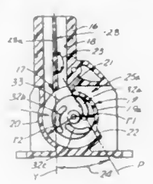
1. A centrifugal cantilevered pump having a centrally located inlet lying on an axis, comprising:
a pump housing defining an impeller chamber, said pump housing having a generally circular inlet opening forming said inlet, said pump housing having a housing wear face extending around said inlet opening and facing said impeller chamber, an annular channel formed in said pump housing in said housing wear face, said annular channel being coaxial with said axis and encircling said inlet opening;
a pump drive shaft extending into said impeller chamber from a side of said pump housing opposite said inlet opening and mounted for rotation in said pump housing about said axis;
an impeller mounted on said pump drive shaft and being rotatable within said impeller chamber, said impeller including a plurality of impeller blades connected by front and back shrouds, said front shroud having an impeller wear face facing said housing wear face, an annular channel formed in said impeller wear face which is smaller in diameter than said annular channel in said housing wear face;
a first replaceable annular seal member of wear resistant ceramic material mounted in said annular channel on said housing wear face within said pump housing and encircling said inlet opening, an outermost surface of said first annular seal member being flush with a surface of said pump housing, said first seal member being mounted in compression and having said outermost surface being a seal face substantially perpendicular to said axis to permit runout of said cantilevered impeller; and
a second replaceable annular seal member of wear resistant ceramic material mounted in said channel on said impeller wear face of said inlet front shroud of said impeller, portions of said second seal member extending radially beyond said channel in said impeller wear face and forming a seal face substantially perpendicular to said axis, said seal face of said second annular member being mounted opposite said seal face of said first annular seal member, said seal faces of said first and second seal members being closely adjacent one another to form a seal between said inlet of said of said pump and said impeller chamber to maintain a pressure differential across said seal during operation of said centrifugal pump; said first and second seal members being held in place in said housing and impeller channels solely by compression.

4,913,620

CENTRIFUGAL WATER PUMP

James L. Kusiak, Grand Rapids, and John E. Seevers, Ada, both of Mich., assignors to Attwood Corporation, Lowell, Mich.

Continuation-in-part of Ser. No. 28,870, Mar. 23, 1987, abandoned. This application Jun. 14, 1988, Ser. No. 206,530
Int. Cl.[4] F04D *7/00*
U.S. Cl. 415—211.1 **30 Claims**



1 A centrifugal water pump having a chamber;
an inlet means communicating with said chamber;
means for supporting said chamber and inlet means generally in a direction along a given plane;
an outlet means having an outlet port with a passageway means communicating with said chamber and extending generally perpendicular to said plane;
an impeller means having a plurality of blades positioned in said chamber and rotatably mounted in said chamber about an axis extending along the same general direction as said inlet and chamber;
means for rotating said impeller;
said chamber having a wall means surrounding said impeller means, a major wall portion of said wall means spaced from the outermost radial path of said impeller blades and a minor wall portion of said wall means being located immediately adjacent said path;
first and second spaced terminal walls formed at the terminal ends of said minor wall portion and extending between said major and minor wall portions and forming a barrier therebetween;
said first terminal wall being located adjacent said outlet port on the side thereof in the direction of rotation of said impeller blades and said second terminal wall being located at least ninety degrees (90°) from said first terminal wall in the direction of rotation of said propeller blades.

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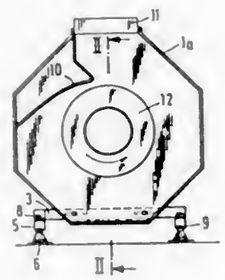
4,913,621

CENTRIFUGAL FAN

Karl Reither, Troisdorf-Spich, Fed. Rep. of Germany, assignor to Kt Kunststofftechnik GmbH, Troisdorf, Fed. Rep. of Germany

Filed May 29, 1985, Ser. No. 739,125
Claims priority, application Fed. Rep. of Germany, May 29, 1985, 8416413[U]
Int. Cl.[4] F04D *29/44*
U.S. Cl. 415—215.1 5 Claims



1. A centrifugal fan, comprising a housing having a generally flat front wall with an inlet opening at substantially the center thereof, a back wall spaced from said front wall and defining therebetween the interior of said housing, and a side wall having eight sections providing said housing with an octagonal outer and inner cross-section, said housing having an outlet opening arranged in one of the eight sections of said octagonal side wall;

impeller means for sucking air through the inlet opening and for centrifugally driving such air along the interior of said housing and through the outlet, said impeller means including a rotatable impeller shaft extending through the back wall of said housing and an impeller supported and driven by said shaft and located in said housing, said impeller having fan blades for imparting radial flow to the air within said impeller and housing in a first rotational direction as said impeller rotates, said fan blades being curved rearwardly relative to said first rotational direction;

said outlet opening having an upstream edge and a downstream edge relative to said first rotational direction of radial flow of air; said impeller having an outer diameter which is smaller than the diametral distance between two opposite sections of said octagon side wall of the housing; and

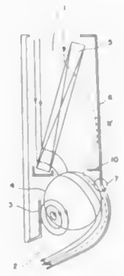
a deflector arranged within said housing downstream of said outlet opening between the interior of said housing and said impeller with a first wall extending generally radially inwards from said downstream edge of said outlet opening to the neighborhood of the circumference of said impeller and facing the air radially flowing in said first rotational direction, and a second wall extending from said first wall in said first rotational flow direction of the air to the inner side wall of said housing substantially in a spiral-like curve outwards to the housing side wall, said deflector extending from the front wall to the back wall.

4,913,622

CROSS FLOW FAN SYSTEM

Syozo Tanaka, Nara; Akira Yoshida, Kyoto; Yoshiharu Shinobu, Kashiharashi, and Akira Takushima, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 29, 1988, Ser. No. 150,390
Claims priority, application Japan, Jan. 30, 1987, 62-20890; Mar. 10, 1987, 62-55067; Mar. 10, 1987, 62-54693; Oct. 20, 1987, 62-160608[U]
Int. Cl.[4] F04D *5/00*
U.S. Cl. 415—53.3 8 Claims



1. A cross flow fan system having an inlet and an outlet comprising:

a rear guider defining a portion of the inlet and the outlet and having a rear side;

a cross flow fan being rotatable to drive air from the inlet to the outlet of said system, said air being driven through a side of the cross flow fan next to said rear side of said guider by rotation of said cross flow fan; and

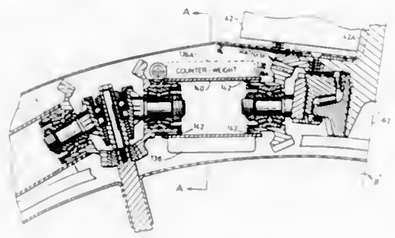
a flow changing board positioned between the inlet of the system and said cross flow fan and extending from the rear side of said guider, said flow changing board forcing air passing next to said rear side of said guider to be directed through said cross flow fan whereby substantially all air passing through said system is driven through said cross flow fan.

4,913,623

PROPELLER/FAN-PITCH FEATHERING APPARATUS

Jan C. Schilling, Middletown; Arthur P. Adamson, Cincinnati; Julius Bathori, Cincinnati, and Neil Walker, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 797,346, Nov. 12, 1985. This application May 20, 1988, Ser. No. 196,888
Int. Cl.[4] B64C *11/34*
U.S. Cl. 416—51 11 Claims



1. An aircraft propulsor system comprising:

a gas turbine engine for generating a high energy gas stream;

a propulsor stage coupled to said engine, said propulsor stage including first and second intermeshed counterrotating turbine blade sets driven by said gas stream and fore and aft multi-bladed propellers extending radially outward of said propulsor stage, each of said blade sets being operatively connected to corresponding ones of said fore and aft multi-blade propellers, one of said blade sets having radially inwardly extending blades and a radially outer blade support ring, the other of said blade sets having radially outwardly extending blades and a radially inner blade support ring and each of said propellers including a plurality of propeller blades;

controlling means coupled to said propeller blades of said fore and aft propellers for controlling the pitch thereof;

propeller blade pitch feathering means for automatically rotating said propeller blades to a predetermined pitch angle upon failure of said controlling means, said feathering means comprising:

a unison ring interconnecting said blades of a corresponding one of said propellers for effecting conjoint pitch change of each of the blades;

a plurality of counter-weights rotatably attached to said unison ring for rotation therewith about a rotational axis of said one of said propellers, each of said counter-weights being rotatable about an axis of rotation rotatable about said propeller rotational axis, and said counter-weights being rotatable only in a direction which effects radial displacement of said counter-weights with respect to said propeller axis; and

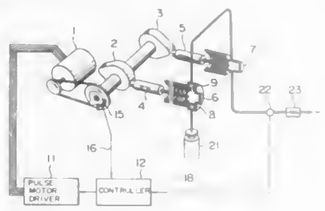
means coupled to said counter-weights for driving said propeller blades to said predetermined pitch when said counter-weights rotate radially outward from said propeller axis.

4,913,624

LOW PULSATION DISPLACEMENT PUMP

Kiwao Seki, and Tsuyoshi Nishitarumizu, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 5, 1988, Ser. No. 228,749
Claims priority, application Japan, Aug. 11, 1987, 62-200488
Int. Cl.[4] F04B *11/00*
U.S. Cl. 417—2 11 Claims



1. A method of operating a pump of the type that includes at least one plunger and driving means for reciprocating said plunger so that a liquid is sucked and discharged by the reciprocating movements of said plunger,

said method comprising:

measuring errors in the amount of driving movement per unit of time of said driving means at each of a plurality of predetermined operative positions of said plunger;

calculating a speed correction factor of said driving means for each of said plurality of predetermined operative positions in accordance with the thus measured errors, and then storing results of the calculation in a memory; and

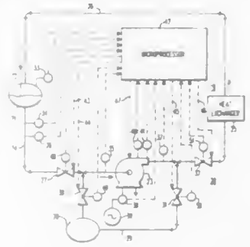
operating said driving means while the speed of said driving means is adjusted at each of said plurality of predetermined positions of said plunger in accordance with said stored speed correction factor so that said speed of said plunger is compensated substantially to meet a designed value for thereby making the rate of discharge substantially constant.

4,913,625

AUTOMATIC PUMP PROTECTION SYSTEM

Thomas J. Gerlowski, Crafton Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 18, 1987, Ser. No. 134,720
Int. Cl.[4] F04B *49/00*
U.S. Cl. 417—18 16 Claims



1 A system for automatically protecting a pump, comprising:

means for measuring process parameters indicative of a loss of pump suction;

first means responsive to said means for measuring for determining whether conditions leading to vortex formation are present;

second means responsive to said first means for determining and said means for measuring for determining whether conditions leading to air entrainment are present; and

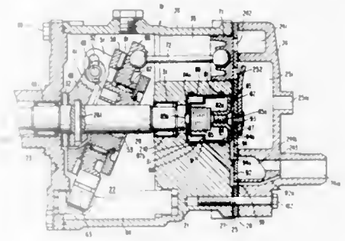
means for automatically initiating pump protective action in response to said second determination.

4,913,626

WOBBLE PLATE TYPE COMPRESSOR WITH VARIABLE DISPLACEMENT MECHANISM

Kiyoshi Terauchi, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Jul. 21, 1988, Ser. No. 222,418
Claims priority, application Japan, Jul. 24, 1987, 62-183598
Int. Cl.[4] F04B *1/26*
U.S. Cl. 417—222 16 Claims



1. In a refrigerant compressor including a compressor housing having a cylinder block provided with a plurality of cylinders, a front end plate disposed on one end of said cylinder block and enclosing a crank chamber within said cylinder block, a piston slidably fitted within each of said cylinders and reciprocated by a drive mechanism including a drive shaft, a

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rotor connected to said drive shaft, an adjustable slant plate having an inclined surface adjustably connected to said rotor and having an adjustable slant angle with respect to the longitudinal axis of said drive shaft, said slant angle changing in response to a change in pressure in said crank chamber to change the capacity of said compressor, and linking means operationally linking said drive mechanism to said pistons such that rotational motion of said drive shaft, said rotor and said slant plate reciprocates said pistons in said cylinders, a rear end plate disposed on the opposite end of said cylinder block from said front end plate and defining a suction chamber and a discharge chamber therein, said suction and discharge chambers having inlet and outlet portions respectively linked to an external fluid circuit, a communication path linking said crank chamber with said suction chamber, and a communication control means for controlling the link of said crank chamber with said suction chamber through said communication path, the improvement comprising;

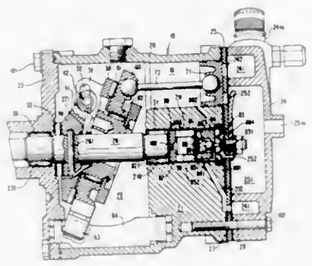
said communication control means including a valve control means responsive to the pressure of said suction chamber for controlling the opening and closing of said communication path, a valve control point shifting means for shifting the suction chamber pressure control point at which said valve control means responds, said valve control point shifting means acting in response to a pressure difference between a first pressure on one side thereof and a second pressure on a second side thereof, and a pressure difference producing means for producing said pressure difference in dependence upon the suction flow rate of refrigerant fluid into said compressor.

4,913,627

WOBBLE PLATE TYPE COMPRESSOR WITH VARIABLE DISPLACEMENT MECHANISM

Kiyoshi Terauchi, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Jul. 25, 1988, Ser. No. 223,338
Claims priority, application Japan, Jul. 23, 1987, 62-182293
Int. Cl.⁴ F04B *1/26*
U.S. Cl. 417—222 **10 Claims**



1. In a refrigerant compressor including a compressor housing having a cylinder block provided with a plurality of cylinders, a front end plate disposed on one end of said cylinder block an enclosing a crank chamber within said cylinder block, a piston slidably fitted within each of said cylinders and reciprocated by a drive mechanism including a rotor connected to a drive shaft, an adjustable slant plate having an inclined surface adjustably connected to said rotor and having an adjustable slant angle, and linking means for operationally linking said slant plate to said pistons such that rotation of said drive shaft, rotor and slant plate reciprocates said pistons said cylinders, said slant angle changing in response to a change in pressure in said crank chamber to change the capacity of said compressor, said front end plate rotatably supporting said drive shaft in a hole therethrough, a rear end plate disposed on the opposite end of said cylinder block from said front end plate and defining a suction chamber and a discharge chamber therein, a passageway linking said suction chamber with said crank chamber and a control mechanism controlling the opening and closing of said passageway, the improvement comprising:

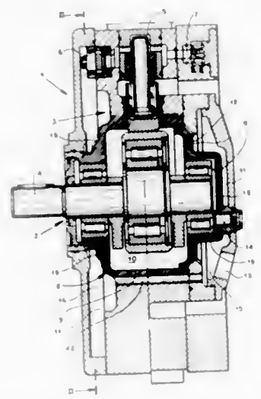
said control mechanism including a first valve control means disposed in said passageway near one end for controlling the link of said passageway to said crank chamber in response to the pressure in said passageway, and a second valve control means disposed near an opposite end of said passageway for controlling the link of said passageway to said suction chamber in response to a pressure difference between said discharge chamber and said suction chamber, said second valve control means linking said passageway with said suction chamber when said pressure difference exceeds a predetermined value to allow said first valve control means to act in response to said suction pressure.

4,913,628

RADIAL PISTON PUMP FOR PUMPING WATER

Ulrich Samland, Hattingen, and Wolfram Wittkop, Sprockhövel, both of Fed. Rep. of Germany, assignors to Hauhinco Maschinenfabrik G. Hausherr, Jochums GmbH & Co. KG, Essen, Fed. Rep. of Germany

Filed Jun. 30, 1988, Ser. No. 213,637
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1987, 3721698
Int. Cl.⁴ F04B *1/04*
U.S. Cl. 417—273 **3 Claims**



1. A radial piston pump for pumping water, comprising:

means forming a closed chamber having a single fitting enabling the introduction of a lubricant into and draining of the lubricant from said chamber, said chamber having a pair of axially spaced end walls;

a pump body peripherally surrounding said chamber and formed with at least one radially oriented piston-and-cylinder pumping unit having an intake valve at one axial side of said body and an outlet valve at an opposite axial side of said body;

a pump housing having axially spaced end walls juxtaposed with said end walls of said chamber and said sides of said body, said end walls of said housing defining with said end walls of said chamber a pair of axially spaced gaps with one of said gaps communicating with said intake valve, said body being formed with a plurality of passages parallel to an axis of said chamber, communicating between said gaps and arrayed around said chamber, said housing being formed with a suction intake fitting communicating with said gaps and said passages for delivering water to said intake valve, whereby said water passes in heat exchanging relationship with said lubricant through said end walls and said periphery of said chamber; and

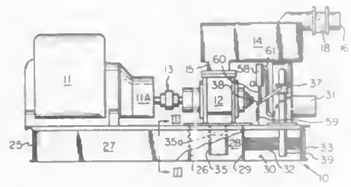
a drive mechanism for said unit having a shaft extending axially into said chamber and provided within said chamber with means immersed in said lubricant for actuating said unit.

4,913,629

WELLPOINT PUMPING SYSTEM

William C. Gilfillan, 255 Lakeside Blvd., Hopatcong, N.J. 07843

Filed Aug. 26, 1988, Ser. No. 236,946
Int. Cl.⁴ F04B *49/00*
U.S. Cl. 417—309 **10 Claims**



1. A wellpoint pumping system comprising

a frame,

a positive displacement rotary pump capable of pumping air, water or a mixture thereof mounted upon said frame, said pump having two rotors with intermeshing lobes mounted for counter rotation upon substantially horizontal and parallel shafts, said pump having an inlet port located blow said rotors opening downwardly and an outlet port located above said rotors opening upwardly,

a motor for driving said rotors mounted upon said frame.

means for coupling said motor to at least one of said rotor shafts to drive at least one of said rotor shafts,

means forming a closed air-tight inlet reservoir in said frame below said pump,

an outlet reservoir mounted on said frame at a level above said inlet reservoir,

an exhaust conduit for said outlet reservoir,

conduit means pendent from said pump inlet port extending into said inlet reservoir and terminating close to the bottom of said inlet reservoir,

conduit means for placing said outlet port of said pump in communication with said outlet reservoir,

water recirculation means for placing the lowermost portion of said outlet reservoir in communication with said air-tight inlet reservoir, and

an adjustable recirculation control valve for controlling the rate of flow from the lowermost portion of said outlet reservoir to said inlet reservoir.

4,913,630

METHOD AND APPARATUS FOR HIGH-EFFICIENCY GAS SEPARATION UPSTREAM OF A SUBMERSIBLE PUMP

Robert D. Cotherman, Houston, Tex., and Keith F. Way, Traverse City, Mich., assignors to Shell Western E&P Inc., Houston, Tex.

Filed Nov. 22, 1988, Ser. No. 275,244
Int. Cl.⁴ F04B *19/00*
U.S. Cl. 417—313 **4 Claims**

1. A submersible pump system for producing hydrocarbons from a gassy well in which liquid components of a production fluid are produced through a production tubing and gaseous components of the production fluid are produced through an annulus formed in a wellbore between a casing and the production tubing, said submersible pump system comprising:

(A) a motor;

(B) a power supply connected to the motor;

(C) A first-stage gas separator comprising;

(1) a first-stage housing supporting the motor;

(2) a first-stage inlet through the housing in communication with the production fluid within the wellbore;

(3) a primary means for separating gas from the production fluid within the first-stage housing and in communication with production fluid entering the first-stage inlet;

(4) a first-stage gas outlet through the first-stage housing positioned to receive the gaseous components separated in the primary means for separating gas and discharging the separated gaseous components to the annulus; and

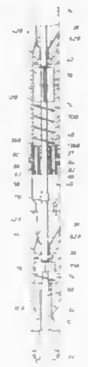
(5) a first-stage liquid outlet through the first-stage housing which receives the liquid components forwarded from the primary means for separating gas from the production fluid;

(D) a second-stage separator;

(1) a second-stage housing supporting the first-stage housing from its lower end;

(2) a second-stage inlet through the lower end of the second-stage housing in communication with the first-stage liquid outlet;

(3) A secondary means for separating the gas from the production fluid within the second-stage housing and in communication with the second-stage inlet;



(4) a second-stage gas outlet through the second-stage housing positioned to receive gaseous components separated by the secondary means for separating gas and discharging the separated gaseous components to the annulus; and

(5) a second-stage liquid outlet;

(E) a coupling connecting the first- and second-stage gas separators establishing a conduit receiving separated liquid components discharged through the axial first-stage liquid outlet of the first-stage gas separator;

(F) an adaptor connected to the coupling and to the second-stage gas separator having a bushing which rotatably receives the shaft and providing a plurality of axial flow passages establishing communication between the coupling and the second-stage gas separator;

(G) a pump connected to the production tubing on one end and supporting the second-stage housing on its other end, said pump comprising:

(1) a pump housing;

(2) a pump inlet positioned to receive the separated liquid components of the production fluid which passes through the second-stage liquid outlet;

(3) means for pumping the separated liquid component of the production fluid in communication with the pump inlet; and

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(4) a pump outlet in communication with the production tubing in position to receive the liquid component discharged from the means for pumping; and

(H) a shaft engaged to be driven by the motor and extending through the first-stage gas separator and the second-stage gas separator to drive the pump.

4,913,631

TURBINE-DRIVEN ROTARY PUMP

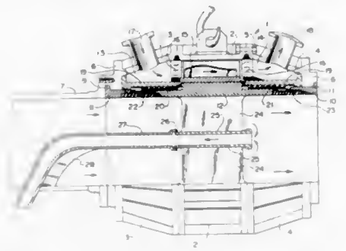
Guido Vandendorpe, Brussels, Belgium, assignor to S. A. Dragages Decloedt and Fils, Brussels, Belgium

Filed Jan. 12, 1989, Ser. No. 296,227

Claims priority, application Belgium, Jan. 18, 1988, 8800060

Int. Cl.⁴ F04B *35/00*

U.S. Cl. 417—355 20 Claims



1. Turbine-driven rotary pump driven by a pressurized fluid intended for the pumping of liquids and of liquids laden with solid particles, which comprises:

a stationary pump body possessing a connection forming a cylindrical suction port and a connection forming a cylindrical delivery port, these two connections of the same inside diameter being arranged in line with one another,

a cylindrical sleeve of inside diameter substantially equal to that of these two connections and mounted in line between these connections, with a small clearance relative to these, this sleeve being capable of rotating about its axis, and rotary pumping members being mounted inside this sleeve and being fixed to the latter,

a drive turbine actuated by pressurized fluid and mounted in a ring round the sleeve, a rotor supporting the blades of the turbine being mounted outside the sleeve and being fixed to the latter,

inlet means making it possible to inject a fluid into the turbine, and outlet means making it possible to discharge this fluid from the turbine,

a casing which fixes the stationary body of the turbine to the stationary pump body and which forms an annular space round the assembly consisting of the sleeve and of the two connections,

wherein the said annular space comprises two annular end zones each arranged respectively on the same side as one or other of the two ports of the pump and, between these two annular end zones, a central annular zone in which the rotor of the turbine is located, the said annular end zones forming respectively an inlet chamber and an outlet chamber of the turbine, ports made in the said casing making it possible to inject pressurized fluid into the inlet chamber and discharge this fluid out of the outlet chamber,

the sleeve being guided in rotation by means of bearings fixed to the casing and supporting it on its periphery,

the pressurized fluid drive means making it possible to inject a fluid into the inlet chamber of the turbine being capable of maintaining, in the central annular zone, a pressure higher than the pressure prevailing in the interior of the sleeve, the pressure difference between this central annular zone and the interior of the sleeve being such that, during the functioning of the motor-driven pump, a fluid film passes between bearings fixed to the casing and the sleeve, thus ensuring lubrication between these members and the lifting of the sleeve and preventing pumped liquid and particles from passing from the interior of the sleeve towards the annular zone.

4,913,632

FUEL INJECTION PUMP

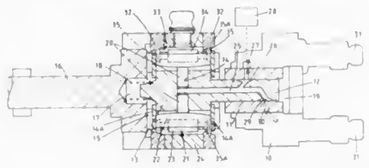
Ian R. Thornthwalte, Gillingham, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Oct. 19, 1988, Ser. No. 259,853

Claims priority, application United Kingdom, Oct. 22, 1987, 8724795

Int. Cl.⁴ F04B *39/00;* **F02M** *41/14*

U.S. Cl. 417—462 8 Claims



1. A rotary distributor fuel injection pump comprising a rotary distributor member supported for rotation and axial movement within a body part, a drive shaft mounted in the body part and in use driven in timed relationship with the associated engine, means coupling the distributor member to the drive shaft, a transverse bore in the distributor member and a pumping plunger in the bore, a cam follower positioned at the outer end of the plunger, the cam follower including a roller, a cam ring surrounding the distributor member, the cam ring having inwardly extending cam lobes which engage with the roller to impart inward movement to the plunger, means for admitting fuel to the bore, a delivery passage in the distributor member the delivery passage communicating with the bore and opening onto the periphery of the distributor member, a plurality of outlets with which the delivery passage can communicate in turn during successive inward movements of the plunger and further means for limiting the extent of outward movement of the plunger said further means being arranged so that axial movement of the distributor member will effect variation in the allowed outward movement of the plunger to vary the amount of fuel delivered through the outlets, said further means comprising a pair of stop rings mounted adjacent opposite sides of the cam ring respectively, the internal surfaces of said stop rings defining stop surfaces which are inclined relative to the axis of rotation of the distributor member, means locating said roller against axial movement relative to the distributor member and the end portions of said roller being shaped for co-operation with said stop surfaces respectively.

4,913,633

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Manfred Kraemer, Schwieberdingen; Thomas Kulder, Kornwestheim, and Johann Warga, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 237,196

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1987, 3736091

Int. Cl.⁴ F02M *59/24, 59/44*

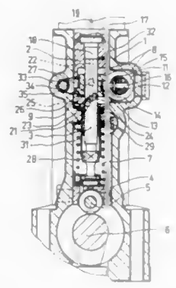
U.S. Cl. 417—499 14 Claims

1. A fuel injection pump for internal combustion engines, having a plurality of pump elements disposed in line in a

pump housing and driven by a common camshaft, each having one pump piston and one pump cylinder and defining a pump work chamber,

a control slide axially displaceable on each pump piston and controlling at least one control opening that discharges into the jacket face of the pump piston and communicates with a central blind bore of the pump piston that is open toward the pump work chamber,

a suction chamber that surrounds the individual control slides and is defined by the pump housing and has an inlet side and outlet side through which fuel flows at low pressure,



a driver arm, which is secured by a fastening element to a rotary shaft (12, 212) and which shaft via a driver means is adapted to engage an element on a device disposed on the control slide to thereby convert the rotational motion of the rotary shaft into an axial motion of the control slide, and

means for variably adjusting the axial position of the control slides relative to one another by changing the position of the driver arm relative to the position of the rotary shaft by means of a permanent deformation of the material.

4,913,634

SCREW COMPRESSOR WITH SLIDE VALVE MOVEMENT PREVENTING STRUCTURE

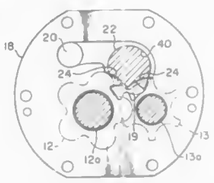
Kimio Nagata; Shigekazu Nozawa, and Minetoshi Izushi, all of Shimizu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 68,409, Jul. 1, 1987, abandoned. This application Jul. 25, 1988, Ser. No. 224,236

Claims priority, application Japan, Jul. 1, 1986, 61-152657

Int. Cl.⁴ F04C *18/16, 29/08*

U.S. Cl. 418—47 8 Claims



1. A screw compressor comprising, a pair of screw rotors supported by bearings and accommodated in a casing to compress a gas, a slide valve disposed between an inner wall of said casing and above said pair of screw rotors so as to move axially while maintaining a small gap between concave surfaces thereof and the outer peripheries of said screw rotors, the rate of gas flow bypassed to an inlet port during compression being regulated by axially moving said slide valve, a side cover in which bearings for supporting said pair of screw rotors on the discharge side and a slide-valve-driving hydraulic means are incorporated and which is disposed on the discharge side of said screw rotors; a discharge axial port formed in said side cover; and projection means continuous with an opening edge of said discharge axial port and in substantial contact over a major portion of the concave surfaces of said slide valve facing in the radial direction thereof for limiting the radial movement of said slide valve while said slide valve is moving in contact with the top of said projection means.

4,913,635

SCROLL TYPE COMPRESSOR WITH SEALING STRUCTURE FOR FIXED SCROLL END PLATE

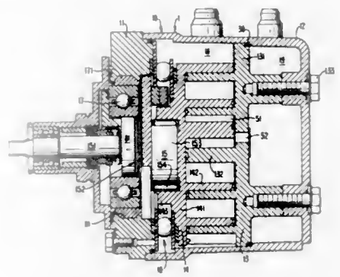
Yoshihiro Ochiai, Isesaki; Masashi Yaguchi, Takasaki, and Yoshio Kimura, Maebashi, all of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Apr. 4, 1988, Ser. No. 177,117

Claims priority, application Japan, Apr. 4, 1987, 62-50617[U]

Int. Cl.⁴ F04C *18/04, 27/00;* **F16J** *15/02*

U.S. Cl. 418—55 4 Claims



1. In a scroll type fluid compressor including a housing having a fluid input port and a fluid outlet port, a fixed scroll fixedly disposed within said housing and having an end plate from which a first spiral element extends, an orbiting scroll having an end plate from which a second spiral element extends, an inner chamber of said housing being partitioned into a front chamber disposed on the forward side of said end plate of said fixed scroll and a rear chamber disposed on the rearwardly facing side of said end plate of said fixed scroll, a sealing structure for insulating said front and rear chambers formed between the outer peripheral surface of said end plate of said fixed scroll and the inner peripheral wall of said housing, said scrolls being maintained angularly and radially offset from each other so that said first and second spiral elements interfit to form a plurality of line contacts between their spiral surfaces to thereby seal off and define at least one pair of fluid pockets, a driving mechanism operatively connected to said orbiting scroll to effect orbital motion of said orbiting scroll, and rotation preventing means for preventing rotation of said orbiting scroll so that the motion of said orbiting scroll relative to the fixed scroll shifts the line contacts along the spiral surfaces of said spiral elements to thereby change the volume of the fluid pockets, one of said chambers being associated with said fluid outlet port to receive compressed fluid from a centrally located fluid pocket formed by said scrolls during orbital motion, the improvement comprising:

said sealing structure including an annular cut-out portion, having an L-shaped sectional side view, formed in the outer peripheral surface of said end plate of said fixed scroll, an annular ridge formed in the inner peripheral wall of said housing and an O-ring seal element disposed between said annular cut-out portion and said annular ridge, said fixed scroll being mounted within said housing so that a radial gap is formed between the outer peripheral surface of the circular end plate and the inner peripheral wall

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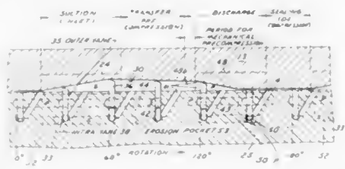
of said housing, and said annular ridge being located in the inner wall of said housing at a distance from the circular end plate of said fixed scroll to create a gap between the surface of said end plate and the surface of said annular ridge when said fixed scroll is fixedly disposed in said housing.

4,913,636

ROTARY VANE DEVICE WITH FLUID PRESSURE BIASED VANES

Albin J. Niemiec, Sterling Heights, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Filed Oct. 5, 1988, Ser. No. 253,781
Int. Cl.[4] F03C *2/22*, F04C *2/344*
U.S. Cl. 418—82 **12 Claims**



1. A fluid pressure energy translating device of the sliding vane type comprising:

a cam ring including an internal contour,

a rotor having a plurality of vanes rotatable therewith and slidable relative thereto in slots in the rotor with one end of each vane engaging the internal contour,

said rotor and cam having an internal contour configured to define one or more pumping chambers between the periphery of the rotor and the cam contour through which the vanes pass carrying fluid from an inlet port to an outlet port,

each said pumping chamber having a fluid inlet zone, a fluid precompression zone, a fluid discharge zone, and a fluid decompression zone,

means defining at least two pressure chambers for each vane,

each vane having at least two surfaces, one in each chamber, both being effective under pressure in the respective chambers to urge the vanes into engagement with the cam,

one of said pressure chambers comprising an undervane chamber adjacent the inner end of each vane and the other of said pressure chambers comprising an intra-vane chamber intermediate the ends of each vane,

pressure sensing passages extend from the periphery of the rotor to one of the chambers to provide pressure to the chamber,

the end to each vane being tapered with the radially outermost portion of the end extending in a trailing manner and each pressure sensing passage leading the respective vanes with respect to the direction of rotation thereby sensing pressure ahead of each respective vane as the vane moves successively through the fluid inlet zone, the fluid precompression zone, the fluid discharge zone, and the fluid decompression zone,

means for supplying fluid to the inlet zone of the cycle,

means for delivering fluid from the discharge zone of the cycle,

first means associated with the intra-vane chambers for providing communication between adjacent intra-vane chambers as the vanes move through a portion of the decompression zone, the inlet zone and a portion of the precompression zone,

second means associated with the intra-vane chambers for providing communication between adjacent intra-vane chambers as the vanes thereafter move through a portion of the precompression zone and the discharge zone,

third means associated with said undervane chambers for providing communication between adjacent undervane chambers as the vanes move through the inlet zone, and

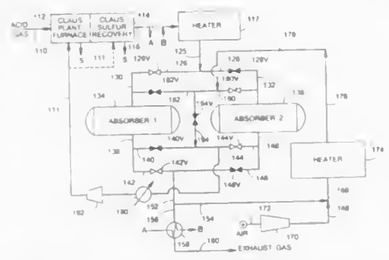
fourth means for providing communication between the undervane chambers as the vanes move through the discharge zone.

4,913,637

SULFUR RECOVERY SYSTEM

Min-Hsiun Lee, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 98,776, Sep. 18, 1987, Pat. No. 4,793,976, which is a continuation of Ser. No. 944,706, Dec. 19, 1986, abandoned, which is a continuation of Ser. No. 727,493, Apr. 26, 1985, abandoned, which is a continuation of Ser. No. 544,335, Oct. 21, 1983, Pat. No. 4,533,529. This application Aug. 24, 1988, Ser. No. 236,412
The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.
Int. Cl.[4] C01B *17/04*; B01J *8/04*
U.S. Cl. 422—190 **19 Claims**



1. In an apparatus for the recovery of sulfur comprising gas phase Claus conversion means for converting hydrogen sulfide to sulfur and for producing an effluent stream comprising hydrogen sulfide and sulfur dioxide, and means for providing in the effluent stream reducing species in at least the stoichiometric amount required for converting all sulfur species in the effluent stream to hydrogen sulfide, apparatus for treating the effluent stream comprising:

first heating means in flow communication with the Claus conversion means for receiving the effluent stream to a temperature greater than that of the effluent stream and effective for removal of at least hydrogen sulfide and sulfur dioxide in the presence of a zinc oxide sorbent effector for such removal thus producing a heated effluent stream;

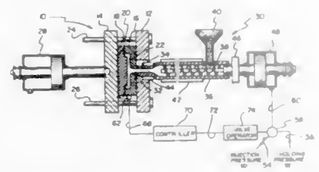
absorber means in flow communication with the first heating means and containing the zinc oxide sorbent for receiving the thus heated effluent stream directly therefrom and for removing both hydrogen sulfide and sulfur dioxide therefrom in the presence of the sorbent and in the presence of the reducing species and for producing an absorber effluent stream reduced in the content of hydrogen sulfide and sulfur dioxide.

4,913,638

APPARATUS FOR OPERATING AN INJECTION MOLDING PROCESS UTILIZING AN ACCEPTABLE PART AND PROCESS WINDOW

Frederick J. Buja, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 20, 1988, Ser. No. 208,927
The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.
Int. Cl.[4] B29C *45/77*, *45/80*
U.S. Cl. 425—140 **17 Claims**



1. In an injection molding apparatus utilizing a machine, said machine having a pair of separable mold elements forming a mold cavity with a part-line therebetween, said machine comprising means for opening and closing said mold elements, and means for introducing a moldable material into said mold cavity at a first pressure and for exerting a second pressure on said moldable material as said moldable material cures in said cavity, said apparatus including a device for operating said machine utilizing an acceptable part and process window for said machine, said device comprising means for operating the machine by closing said mold elements, means for introducing a moldable material into said mold cavity, means for measuring separation of the mold elements resulting from introduction of the moldable material into the mold cavity, means for incrementally changing a first operating parameter over a first plurality of molding cycles until unacceptable parts are produced to generate minimum part-line and time values and for incrementally changing said first or another operating parameter over a second plurality of molding cycles until unacceptable parts are produced to generate maximum part-line and time values, means for generating an acceptable part and process window utilizing said minimum and maximum part-line and time values, said measuring means arranged to measure the separation of the mold elements resulting from the introduction of the moldable material into the mold cavity, means for detecting a predetermined separation of said mold elements, means for changing the pressure from said first pressure to said second pressure upon said detection, said measuring means arranged to measure the separation of the mold elements following changing the pressure, means for sensing when the separation of the mold elements stops increasing, means for determining whether the cessation of mold element separation increase occurs within said acceptable part and process window, means for continuing the cycle and maintaining said second pressure until the moldable material has cured if said cessation occurs within said window, and means for generating a signal to indicate that the cycle has exceeded said part and process window if said cessation does not occur within said window.

4,913,639

COMPOSITE CAUL PLATE

Robert G. Wheeler, 3927 Clarence Cir., Corvallis, Oreg. 97330

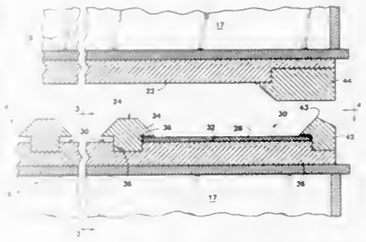
Filed Sep. 13, 1988, Ser. No. 243,890
Int. Cl.[4] B29C *43/04*, *43/36*
U.S. Cl. 425—193 **21 Claims**

1. A caul plate for impressing a wood product, said caul plate comprising:

a base plate;

an insert plate, the insert plate being thin with respect to the base plate; and

means for retention of said insert plate in face-to-face abutment with said base plate, said retention means including slot formations, said retention means including generally parallel rib members disposed in slot formations defined in the base plate and overlapping edges of the insert plate.

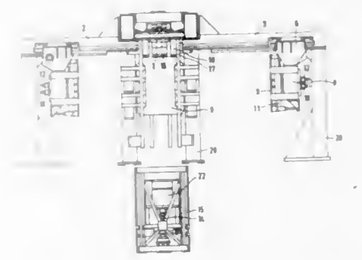


4,913,640

PRESS FOR MAKING SANITARY ARTICLES, IN PARTICULAR TOILET BOWLS, BY PRESSURE CASTING

Gerold Spieler, Laufen, Switzerland, and Walter Schlagenhaft, Penzberg, Fed. Rep. of Germany, assignors to Dorst Maschinen- und Anlagenbau, Otto Dorst und Dipl.-Ing. Walter Schlegel GmbH & Co., Fed. Rep. of Germany

Filed Nov. 23, 1988, Ser. No. 276,373
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1987, 3740163
Int. Cl.[4] B29C *43/36*
U.S. Cl. 425—195 **22 Claims**



1. A press for making sanitary articles, in particular toilet bowls, by pressure slip casting into a mold having a plurality of mold parts, the press comprising:

a press superstructure having a central press structure;

a plurality of guide portals extending radially from said central press structure and having an axis along its lateral dimension;

at least two slides rollingly engagable with said guide portals such that each said slide is free to move laterally along the length of each said guide portal;

a suspension frame suspended from each said slide;

mounting plates affixed to each said suspension frame;

each said mounting plate being configured so as to accept one of the mold parts;

first drive means in operative communication with said suspension frames such that each said suspensionn frame is caused to move in a direction toward or away from an-

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other said suspension frame, the movement of each said suspension frame being effected via said lateral rolling movement between said slides and said guide portals;

said lateral rolling movement causing the mold parts affixed to said mounting plates to move between an open and closed position;

second drive means in operative communication with at least one of said mounting plates, such that movement of said mounting plate may be effected independently of said movement of said suspension frames;

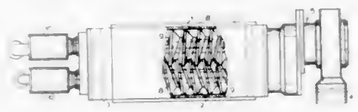
locking means in operative engagement with said suspension frames and locking said suspension frames together when the mold parts are in the closed position.

4,913,641

PREHEATING AND FEEDING APPARATUS FOR AN EXTRUDER

Rudolf Zahradnik, Vienna, Austria, assignor to TET Holding Ges.m.b.H, A-Korneuburg, Austria

Filed Oct. 12, 1988, Ser. No. 256,913
Claims priority, application Austria, Oct. 12, 1987, 2681/87
Int. Cl.[4] B29C *47/40*
U.S. Cl. 425—204 3 Claims



1. An apparatus for extrusion, comprising:

an extruder operating with a thermoplastifiable synthetic resin; and

a preheater and feeder having an inlet receiving said synthetic resin and an outlet communicating in said extruder for feeding preheated synthetic resin in said extruder, said preheater and feeder comprising:

an elongated housing formed with said inlet at one end of said housing and with said outlet at an opposite end thereof,

a pair of interfitting counterrotating hollow worms journaled at opposite ends in said housing for advancing said thermoplastifiable synthetic resin along said housing while heating same,

means for passing a heating fluid through each of said hollow worms,

said means for passing a heating fluid through each of said hollow worms including a respective pipe extending into each worm from one end thereof and terminating short of an opposite end of the respective worm, each of said worms having a hollow interior thereof receiving the respective pipe with all-around clearance and being closed at the respective said opposite end, each of said pipes having a diameter less than a diameter of the respective hollow interior and communicating with said hollow interior so that said heating fluid traverses each pipe and the respective hollow interior;

respective bearings at each of the ends of said worms respectively, journaling said worms in said housing at the respective ends, and

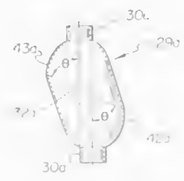
means for heating said housing for at least in part heating said thermoplastifiable synthetic resin as it is advanced from said inlet means to said outlet means.

4,913,642

MOLD FOR FORMING ASYMMETRIC BALLOON

Roland E. Weber, Minnetonka, Minn., assignor to Applied Biometrics, Inc., Minnetonka, Minn.

Division of Ser. No. 210,718, Jun. 23, 1988. This application Mar. 15, 1989, Ser. No. 324,241
Int. Cl.[4] B28B *21/46*; B29C *49/30*
U.S. Cl. 425—275 4 Claims



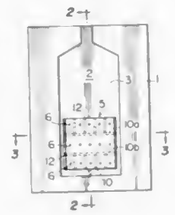
1. A mold form for a balloon cuff, said form comprising a pair of mated angularily sectioned cones, each of the two cones being sectioned at an equal acute angle relative to the central axis thereof, the cones being mated along the section lines thereof with one cone rotated 180° about its axis relative to the other.

4,913,643

PLASTIC MOLDING MOLD FOR INMOLD LABELLING

Kiyotaka Shinozawa, Saitama, and Tadashi Yamamoto, Tokyo, both of Japan, assignors to Pentel Kabushiki Kaisha, Japan

Filed Sep. 29, 1988, Ser. No. 251,509
Claims priority, application Japan, Sep. 29, 1987, 62-242833
Int. Cl.[4] B29C *49/24*
U.S. Cl. 425—503 12 Claims



1. A mold for labelling a plastic hollow body produced by blow molding, said mold comprising:

an inner surface having a curved portion and defining a cavity having a radial direction in which a parison of a thermoplastic material is inflated to form a plastic hollow body;

a label support portion protruding from the inner surface into the cavity and having an arcuate face for supporting a label thereon, the arcuate face having a curvature substantially corresponding to the curvature of the inner surface and having a surface dimension not less than that of the label;

a plurality of suction ports formed in the label support portion, the suction ports opening at a side edge of the label support portion in a direction substantially perpendicular to the radial direction of the cavity;

a plurality of intake ports formed in the arcuate face of the label support portion and opening in the radial direction of the cavity; and

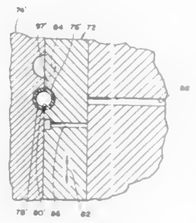
communicating means for communicating the plurality of suction ports with air exhaust means located outside the mold to thereby exhaust air existing between the parison and the label and inner surface to the exterior of the mold and for communicating the plurality of intake ports with air exhaust means located outside the mold to thereby attract and closely hold the label on the arcuate face of the label support portion.

4,913,644

SYSTEM FOR MAKING A HOLLOW-SHAPED BODY FROM MOLTEN RESIN BY INJECTION MOLDING

Hubert Kauer, Warren, Mich., assignor to Michael Ladney, Sterling Heights, Mich.

Division of Ser. No. 182,144, Apr. 15, 1988, Pat. No. 4,830,812.
This application May 12, 1989, Ser. No. 351,017
Int. Cl.[4] B29C *45/34, 49/62*
U.S. Cl. 425—522 11 Claims



1. In an injection molding system for making a hollow-shaped body from molten resin, the system including a mold having an injection aperture, an injection molding machine having a nozzle for injecting an amount of molten resin sufficient for the preparation of the hollow-shaped body from the injection nozzle through the injection aperture and along a resin flow path, and fluid injection means for injecting a fluid under pressure through a fluid aperture to distribute the molten resin over the interior surfaces of the mold wherein the hollow-shaped body is formed withia the mold and a fluid channel in communication with the interior of the hollow-shaped body is formed, wherein the improvement comprises:

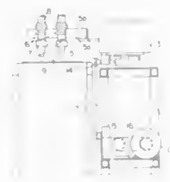
a movable cutting means at least partially defining said resin flow path and at least partially defining a fluid pressure relieving conduit for cutting a hole through the resin and aligning said conduit with said hole such that said hole communicates with the fluid aperture to relieve the pressure within the hollow-shaped body.

4,913,645

EXTRUSION APPARATUS

Alain Daouse, Noailles, and Alain Gueroult, Goincourt, both of France, assignors to Nestec S.A., Vevey, Switzerland

Filed Feb. 10, 1987, Ser. No. 12,867
Claims priority, application European Pat. Off., Feb. 27, 1986, 86102567.4
Int. Cl.[4] A21C *11/16*
U.S. Cl. 425—150 12 Claims



1. An apparatus for preparing decorative pastry products comprising:

a conveyor belt for providing a surface to be advanced and to accept deposit of extruded pastry material;

a mobile support disposed above the surface of the conveyor belt to be advanced extending transversely with respect to a direction of movement in which the surface of the conveyor belt is to be advanced;

at least one extrusion nozzle and means associated with each extrusion nozzle for securing each extrusion nozzle to the mobile support, each extrusion nozzle terminating in an extrusion nozzle outlet orifice positioned above the surface of the conveyor belt to be advanced and each securing means providing for inclining and adjusting the inclination of each extrusion nozzle, in operation, from being parallel with to being inclined at an angle of up to 60 ° towards and in the direction in which the surface of the conveyor belt is to be advanced;

at least one source for providing a supply of pastry product to each extrusion nozzle for extrusion from each extrusion nozzle outlet orifice onto the surface of the conveyor belt to be advanced; and

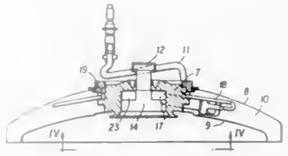
means adjacent an edge of the conveyor belt for transmitting movement to the mobile support for revolving the mobile support in one plane while keeping the mobile support in the same orientation in space for providing each extrusion nozzle outlet orifice with a repetitive curved trajectory for, in cooperation with advancing movement of the surface of the conveyor belt to be advanced, forming a continuous wound strand of pastry material.

4,913,646

COMBUSTION DEVICE

Tommy Backheim, Oxie, Sweden, assignor to Kockums Marine AB, Malmo, Sweden

Filed Apr. 24, 1989, Ser. No. 341,966
Claims priority, application Sweden, May 18, 1988, 8801860
Int. Cl.[4] F23L *5/10, 5/20*
U.S. Cl. 431—116 5 Claims



1. A combustion device in which an atomized liquid fuel is burned with an oxygen containing gas said device comprising ejector means mounted around a centrally disposed fuel nozzle, said ejector means being located in a duct extending from an exhaust space surrounding a combustion chamber located below the fuel supply nozzle and towards a generally cylindrical space located below and adjacent to the said nozzle and above the combustion chamber, said cylindrical space being limited by walls of a hub carrying a plurality of ejectors for supplying oxygen as driving gas for moving part of the combustion gases into the combustion chamber via said space below the fuel supply nozzle characterized in that said ejectors are coupled to said cylindrical space by means of delivery openings circumferentially arranged about the cylindrical space, and a plurality of guide vanes are arranged in the cylindrical space between the said duct and the said nozzle to direct the flow of driving gas from said ejectors, said guide vanes extending downwardly and having spiral shape in a plane perpendicular to the axis of said space to extend away from the delivery openings.

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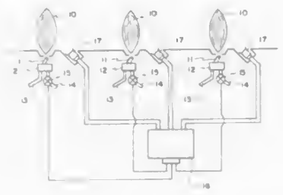
4,913,647

AIR FUEL RATIO CONTROL

Ulrich Bonne, Hopkins, and Brian C. Krafthefer, Minneapolis, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 19, 1986, Ser. No. 841,488
Int. Cl.[4] F23N *5/00*
U.S. Cl. 431—12 19 Claims



1. A method for regulating and maintaining
a predetermined desired fuel-air mixture for a fuel of interest over a substantially full combustion range as represented by a desired fuel number comprising the steps of:
a. sensing the presence of at least two chemical species of interest in the products of combustion of said fuel at least one of which contains oxygen;
b. generating input signals related to the concentration of each of said chemical species of interest;
c. deriving a sensed ratio signal by obtaining the ratio of a selected two of said input signals wherein at least one of said selected two input signals is based on an oxygen-containing species of interest, said ratio having a known relationship to the existing fuel number of the fuel of interest;
d. providing a control signal based on a known relationship between the desired fuel number and the particular ratio of the selected two chemical species of said input signals;
e. comparing the sensed present ratio signal with the control signal;
f. adjusting the proportion of fuel and air in said mixture based on the comparison of said sensed present ratio signal and said control signal until said sensed present ratio signal substantially equals said control signal.

4,913,648

QUARTZ BURNER:FOR USE IN AN ATOMIC ABSORPTION SPECTROMETER FOR THE ANALYSIS OF ORGANOMETAL COMPOUNDS VIA HYDRIDE DERIVATIZATION

Cesar Clavell, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 27, 1988, Ser. No. 290,738
Int. Cl.[4] F23D *5/12*
U.S. Cl. 431—13 4 Claims

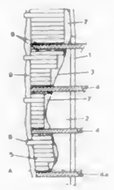
1. An improved burner for an atomic absorption spectrophotometer comprising:
a sample feeder tubelet sized to receive a sample to be analyzed;
a hydrogen feeder tubelet sized to receive hydrogen; an air feeder tubelet sized to receive air and being coupled to the sample feeder tubelet at an acute angle;
a burning chamber interposed between the sample feeder tubelet and the hydrogen feeder tubelet; and
an optical window disposed at one end of the burning chamber for permitting monitoring burning in the chamber.

4,913,649

REPAIR OF THE REFRACTORY LINING OF THE WALL OF A SHAFT FURNACE AND A REPAIRED SHAFT FURNACE

Joseph A. M. van der Hoeff, Limmen, Netherlands, assignor to Hoogovens Groep B.V., Ijmuiden, Netherlands

Filed Nov. 23, 1988, Ser. No. 275,507
Claims priority, application Netherlands, Dec. 2, 1987, 8702891
Int. Cl.[4] F27D *1/14*
U.S. Cl. 432—3 13 Claims



1. Method for the repair of a refractory lining of a wall of a shaft furnace, the wall having a steel shell, a worn residual refractory lining inside the shell and cooling plates which in use have coolant flowing through them and which extend through the shell into the refractory lining in a pattern of horizontal rings of regular pitch vertically and circumferentially, the method being characterized by the following steps:
(a) forming a refractory concrete layer at a first said ring (4*a*) of said cooling plates upwardly from which the repair is to be carried out and forming a flat upper surface of said concrete layer,
(b) building up on said flat upper surface a refractory brickwork which is self-supporting and which has recesses in which said cooling plates in rings above said first ring are located with clearance, said brickwork being made of refractory blocks whose dimensions in the direction transverse to the shell are selected in dependence on the amount of wear locally of the residual lining,
(c) filling space between said brickwork and said residual lining with concrete,
(d) after step (c), filling the clearance space between the brickwork and the cooling plates in said recesses with a thermally conductive rammed mass.

4,913,650

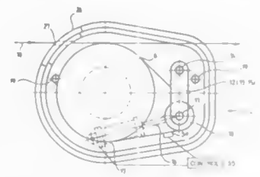
APPARATUS FOR THE HEAT TREATMENT OF A CONTINUOUSLY ADVANCED METAL WIRE

Gerhard Ritter, and Klaus Ritter, both of Graz, Austria, assignors to EVG Entwicklungs- u

Filed Sep. 21, 1987, Ser. No. 99,066
Claims priority, application Austria, Sep. 26, 1986, 2578/86
Int. Cl.[4] F27B *9/28*
U.S. Cl. 432—59 15 Claims

1. Apparatus for the heat treatment of a continuously advanced metal wire, comprising:
a housing,

a driven drum, around which a plurality of turns of said wire are looped, said drum having an axle;
at least one tension roller around which a plurality of turns of said wire are looped in series with said turns about said drum, said at least one roller having an axle;
said drum and said tension roller being disposed within said housing,



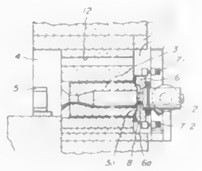
means responsive to the temperature in said housing, for changing the position of said axle of said tension roller relative to said axle of said drum from a predetermined position of rest when the temperature in said apparatus changes, and for applying tension to the turns of the wire which loop in series around said drum and said tension roller with a limited tension force.

4,913,651

BURNER UNIT FOR FIRING FURNACE

Toyoshiro Miyajima, Tajimi, and Kazuhiro Miyahara, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Mar. 31, 1989, Ser. No. 330,901
Claims priority, application Japan, Mar. 31, 1988, 63-42127[U]
Int. Cl.[4] F27B *5/14*
U.S. Cl. 432—209 3 Claims



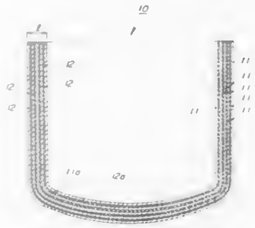
1. A burner unit for a firing furnace including a burner tile assembly provided in a furnace wall and a burner connected to the burner tile assembly and provided out of the firing furnace, wherein said burner unit is integrally provided with a connecting burner tile assembly having a tapered step, and said burner tile assembly is also provided with a tapered step, and said tapered steps of the connecting burner tile assembly and said burner tile assembly are connected through a sealing material to connect the burner to the burner tile assembly.

4,913,652

PYROLYTIC BORON NITRIDE CRUCIBLE AND METHOD FOR PRODUCING THE SAME

Hiroaki Tanji, Tokyo, and Masaharu Suzaki, Machida, both of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 216,589, Jul. 7, 1988, abandoned, which is a continuation of Ser. No. 866,823, May 22, 1986, Pat. No. 4,773,852. This application Mar. 3, 1989, Ser. No. 319,902
Claims priority, application Japan, Jun. 11, 1985, 63-125230; Jun. 11, 1986, 63-125231
The portion of the term of this patent subsequent to Sep. 27, 2005, has been disclaimed.
Int. Cl.[4] F27B *14/00*
U.S. Cl. 432—156 2 Claims



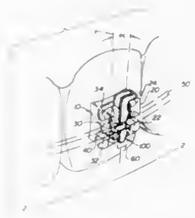
1 A pyrolytic boron nitride crucible having a multi-walled structure comprising at least five pyrolytic boron nitride wall layers, the thickness of each of first pyrolytic boron nitride wall layers being 5 to 100 microns, the thickness of each second pyrolytic boron nitride wall layers being 1/1 of that of the first wall layer, the total thickness of the entire wall layers being 0.5 to 3 mm, and said first wall layer being bonded to and laminated alternately with said second wall layer, whereby the peeling of one wall layer is prevented from affecting the other wall layers so that the peeling of one wall layer is not propagated into the adjacent layer.

4,913,653

AXIS INDICATOR FOR ORTHODOTIC BRACKET

Diane K. Bolliger, San Diego, and Howard Graham, La Mesa, both of Calif., assignors to Johnson & Johnson Consumer Products, Inc., New Brunswick, N.J.

Filed Mar. 20, 1989, Ser. No. 325,744
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—3 10 Claims



1. An improved axis indicator for use with a dental bracket having a pair of tie wings separated by a ridge and an archwire slot comprising:
a insert adapted to fit between the tie wings of said bracket in said bracket ridge, said insert containing a projection extending along one outer edge of said bracket and parallel to said archwire slot, said projection used to orient said bracket parallel to the occlusal plane of the mouth insur-

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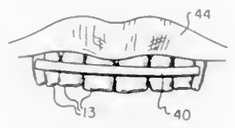
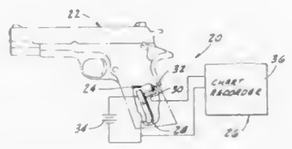
ing that said tie wings are oriented along the crown long axis of the tooth.

4,913,654
SHIELD FOR ORTHODONTIC APPLIANCE
Timothy J. Morgan, 1611 Kent Ave., and Patrick E. O'Neal, 1124 Klondike Rd., both of Quincy, Ill. 62301
Filed Jul. 5, 1988, Ser. No. 215,287
Int. Cl.[4] A61C 3/00
U.S. Cl. 433—8 12 Claims



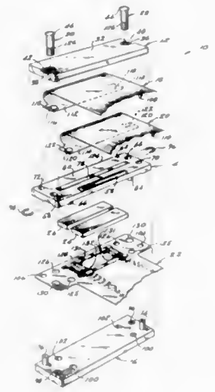
1. A protective shield for covering orthodontic appliance elements including brackets, an arch wire and elastomeric ligature rings, wherein said shield comprehends:
a flexible strip having an upstanding wall and projecting legs defining a C-shaped channel;
said wall having a smooth outer surface facing labially;
said legs projecting lingually and defining an opening extending longitudinally therebetween;
said wall having a medial longitudinal flexural hinge whereby said legs are elastically spreadable for receiving said elements in said opening interiorly of said channel; said legs having means for detenting engagement with said ligature rings; and
said legs are thereafter elastically biased together for detenting engagement with said rings.

4,913,655
TRIGGER PULL MEASURING DEVICE FOR AND METHOD OF IMPROVING TRIGGER PULL TECHNIQUE
David H. Pinkley, 1209 Sidney, and George H. Falterman, 609 W. Park, both of Malden, Mo. 63863
Filed Oct. 6, 1988, Ser. No. 254,215
Int. Cl.[4] F41F 27/00
U.S. Cl. 434—16 26 Claims



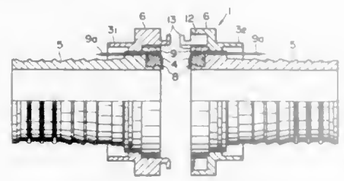
1. A trigger pull measuring device adapted for connection to the trigger mechanism of a weapon for measuring the trigger pull of the weapon in order to improve trigger pull technique, the device comprising:
means connected to the trigger mechanism for measuring the instantaneous position of the trigger;
and means for displaying the position of the trigger as a function of time.

4,913,656
ELECTRICAL CONNECTOR
Herman B. Gordon, Phoenix, Ariz.; Mark J. Owens, Vernon, and Scott Simpson, Woodstock, both of Conn., assignors to Rogers Corporation, Rogers, Conn.
Filed Apr. 7, 1989, Ser. No. 334,939
Int. Cl.[4] H01R 9/09
U.S. Cl. 439—67 21 Claims



1. An electrical connector for connecting at least two flexible circuits to another circuit device, comprising:
clamp plate means having a pair of opposed first openings, said clamp plate means having a top and bottom surface;
circuit block means having a pair of opposed second openings, said circuit block means also having at least one longitudinal slot therethrough, said slot being dimensioned to receive a flexible circuit therethrough, said circuit block means having an upper and lower surface, said lower surface including first retaining means for receiving a first resilient pressure pad and second retaining means for receiving a second resilient pressure pad;
a first resilient pressure pad in said first retaining means;
a second resilient pressure pad in said second retaining means;
fastening means for releasably retaining said bottom surface of said clamp plate means to said top surface of said circuit block means and defining a connector sub-assembly wherein said first openings are aligned with said second openings and said fastening means pass through said aligned first and second openings;
first flexible circuit means sandwiched between said clamp plate means and said circuit block means, said first flexible circuit means extending through said longitudinal slot and being folded along said first resilient pressure pad;
second flexible circuit means sandwiched between said clamp plate means and said circuit block means, said second flexible circuit means being wrapped about a longitudinal edge of said circuit block means and being folded along said second resilient pressure pad; and
backer plate means for supporting a third circuit device, said backer plate means including a pair of opposed third openings in alignment with said aligned pairs of first and second openings in said connector sub-assembly, said fastening means extending through said aligned first, second and third openings and fastening said connector sub-assembly to said backer plate means to effect electrical connection between said first and second circuit means and a third circuit device.

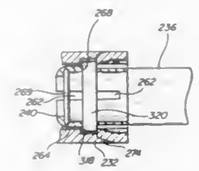
4,913,657
COUPLING FOR FIRE HOSE WITH BUILT-IN COMMUNICATION CABLE
Osamu Naito, Tokyo; Seiji Ozuki, Chiba; Hiromi Mizuguchi, Saitama; Shigesaku Shinozaki, Tochigi, and Tohei Kanda, Kanagawa, all of Japan, assignors to Tefkoku Sen-I Co., Ltd., Tokyo, Japan
Filed Jan. 4, 1989, Ser. No. 293,295
Claims priority, application Japan, Apr. 15, 1988, 63-93992; Apr. 15, 1988, 63-51035[U]
Int. Cl.[4] H01R 4/60
U.S. Cl. 439—192 1 Claim



1. A coupling for a fire hose with built-in communication cable, comprising:
an inner cylinder, substantially identical in shape for male and female units, having a base end part fitted with a fire hose with built-in communication cable, annular sealing material for insulating and water-proofing an opening end face tip of said inner cylinder, and provided with an annular conductor connected to the communication cable;
an outer cylinder idly engaged with an outer peripheral surface of the inner cylinder, said outer cylinder having an outer cylinder opening end surface corresponding to the opening end of the inner cylinder, along its circumferential direction, at least a pair of engaging projections being provided on said outer cylinder opening end as a male unit and opening windows as a female unit;
the end face of said annular sealing material being formed as an inclined surface that protrudes out of the inner cylinder end face in the direction from an outer side of the inner cylinder toward an inner side of the inner cylinder, and a groove part provided on an inner peripheral surface of said outer cylinder extending to a corresponding one of said opening windows such that when two outer cylinders are turned with respect to each other by being assembled so as to cause the groove part of one outer cylinder to be engaged with the engaging projections of the other outer cylinder, the outer cylinders can be brought into contact or separated from one another, thereby making it possible to bring the annular sealing materials on the respective inner cylinders into pressurized contact.

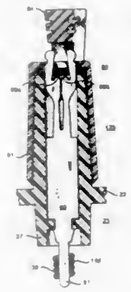
4,913,658
LOADBREAK PISTON STOP AND LOCKOUT
Borgstrom Alan D., Hackettstown, N.J., and George R. Hydock, Mount Bethel, Pa., assignors to Amerace Corporation, Parsippany, N.J.
Filed Aug. 1, 1989, Ser. No. 387,778
Int. Cl.[4] H01R 13/53
U.S. Cl. 439—185 9 Claims

1. In a high-voltage loadbreak bushing insert of the type having an elongate, insulative body member with a central bore extending from a first end to a second end: a static metallic contact means within said body member, said contact means having a first portion arranged to be coupled to the conductive stud of a high-voltage bushing well; and a second portion remote from said first portion of said contact means having a plurality of contact members; a movable female contact assembly positioned within said central bore of said body member for movement therein from a first position adjacent said first end of said body member to a second position closer to said second end of said body member; said movable female contact assembly comprising a female contact and a hollow tubular metallic sleeve portion having a first end coupled to said female contact and a second free end remote from said female contact, the interior surface of said metallic sleeve portion



engaging said contact members of said contact means as said female contact assembly moves from said first position to said second position; the improvement comprising stop means to prevent the movement of said female contact assembly to said first position once said female contact assembly has moved from said first position to said second position.

4,913,659
PUSH CAP TERMINALS AND TERMINAL BOARDS WITH SAME
Clarence E. Doyle, Chester, N.J., assignor to American Telephone and Telegraph Company, AT & T Bell Laboratories, Murray Hill, N.J.
Filed Jun. 29, 1989, Ser. No. 373,834
Int. Cl.[4] H01R 4/24
U.S. Cl. 439—395 20 Claims



1. A push cap terminal for a lead with a metallic core and insulation comprising: a post having a vertical axis, a base region and a channel therein extending in said post from said base region to a forward opening in said post; a metallic terminal strip received in said channel and having a lower portion connectable to a wire and an upper portion exposed above said opening and comprising a pair of tangs with cutting edges thereon and a vertical contact gap between such tangs; and a cap with a hollow therein and fittable in an up position on said post to cover said tangs and gap, said cap being perforated by an entrance hole having a centerline extending diagonally downward into said hollow to pass between said tangs above said gap when said cap is up, said hole being adapted to have said lead inserted therein to also pass between said tangs above said gap when said cap is up, and said cap being adapted to be then pushed down on said post to drive said lead downward between said tangs so as to produce a cutting of its insulation by said edges and a subsequent positioning of its core in said

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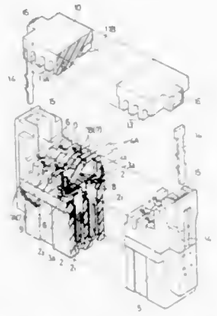
gap to thereby make electromechanical contact between said core and tangs.

4,913,660

PRESSURE-CONTACT TYPE CONNECTOR FOR FLAT CABLE

Yuji Hirai, Yokohama, Japan, assignor to Honda Tsushin Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1988, Ser. No. 251,812
Claims priority, application Japan, Oct. 1, 1987, 62-149273
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—396 5 Claims



1. A pressure contact type connector for a flat cable wherein each conductor wire of a flat cable is pressed into a U-shaped terminal member having plate-form contacts housed in a contact housing comprising:

a plurality of U-shaped terminal members arranged in a first row and a second row, said terminal members in each of first and second rows being disposed to form a zigzag arrangement having a pitch twice as large as the pitch of the conductor wires of the cable;

said cable being arranged in a direction perpendicular to the direction in which the terminal members are arranged;

each one of the terminal members in a first row being disposed to be shifted by one conductor wire arrangement pitch with respect to the corresponding one in the second row;

a first cable housing having a height at least equal to the length of a portion of the terminal member projecting out of an end surface of the contact housing and including insertion through holes for the terminal members and a plurality of grooves disposed to cross the insertion through holes for receiving the terminal members and the conductor wire connecting portions for pressing into the terminal members;

both side edges of each strip-like top side surface between two adjoining side edges of said grooves being formed to make a cutting edge;

a second cable housing including a plurality of projections for mating with said plurality of grooves of the first cable housing, said projections being provided with insertion grooves for receiving the terminal members inserted thereinto; and

both side edges of each of said projections of said second cable housing forming a cutting edge;

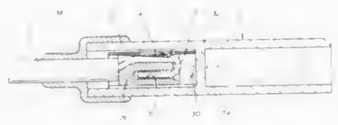
wherein the first cable housing is connected to the terminal members by inserting the terminal members through the insertion through holes, and the second cable housing is placed on the first cable housing via a flat cable and thereafter depressed to cause the plurality of projections thereof to be inserted into the plurality of grooves of the first cable housing, a plurality of conductor wires of the flat cable being separated from one another by the cutting edge of the first cable housing and the cutting edge of the second cable housing and brought into pressure contact with the terminal members for suitably bending and connecting the conductor wires.

4,913,661

NEON ELECTRODE WITH PLUG-IN CONNECTOR

Carl O. Gellenthin, Jr., and Jere D. Whorton, both of Houston, Tex., assignors to Signeon Corporation, Houston, Tex.

Filed May 24, 1989, Ser. No. 356,129
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—438 5 Claims



1. A high voltage electrical connector for connecting an electrical conductor to a neon electrode comprising,

a tubular glass insulator for providing high voltage protection,

a tubular electrically conductive metal liner positioned in the glass insulator, said liner including an inwardly biased electrical contact,

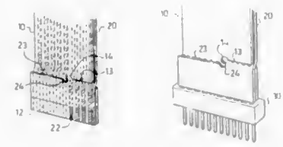
a metal connector positioned inside of the metal liner, said connector including an opening in its interior and a longitudinal channel on its exterior, the opening and channel adapted to receive the bare end of an electrical conductor, and the channel coacting with the biased electrical contact for providing an electrical connection between the conductor and the metal liner which is an electrical extension of the neon electrode.

4,913,662

FLAT, FLEXIBLE, CABLE CONSTRUCTION AND CONNECTOR ATTACHED THERETO

Nadin Noy, 29 Tchernihovski Street, Tel Aviv, Israel

Filed Mar. 6, 1989, Ser. No. 319,191
Int. Cl.[4] H05K *1/14;* H01B *7/08*
U.S. Cl. 439—498 19 Claims



1. A flat, flexible, cable construction, comprising:

a first flat, flexible, insulating strip including at least one electrical conductor extending longitudinally along one side thereof;

a second flat, flexible, insulating strip in overlying contact with said first insulating strip and including at least one electrical conductor extending longitudinally along the opposite side thereof;

each of said electrical conductors having exposed ends facing the inner contacting faces of the two insulating strips;

each of said insulating strips being formed with a transversely-extending slit spaced inwardly from the exposed end of its respective electrical conductor, starting from the edge of the side not including its respective electrical conductor and terminating short of the side including its respective electrical conductor;

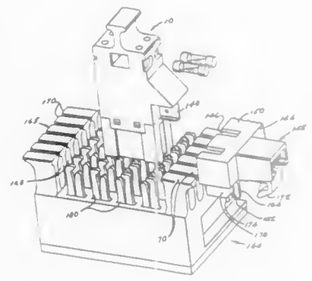
whereby the respective ends of the two insulating strips may be transposed with respect to each other by inserting the slitted side of one insulating strip into the slitted side of the other insulating strip so that the exposed ends of the electrical conductors facing each other on the inner contacting faces of the two strips are transposed from the inner faces to the outer faces of the two strips for connection to an electrical connector.

4,913,663

COMBINED TRANSIENT VOLTAGE AND SNEAK CURRENT PROTECTOR

John A. Slemon, Watertown, and Howard Reynolds, Waterbury, both of Conn., assignors to The Slemon Company, Watertown, Conn.

Division of Ser. No. 190,180, May 4, 1988. This application Mar. 6, 1989, Ser. No. 319,489
Int. Cl.[4] H01R *31/08*
U.S. Cl. 439—509 5 Claims



1. A bus connector for mounting on a fanning strip of a terminal block, the fanning strip comprising a plurality of spaced resilient I-shaped members comprising:

an elongated insulative housing having opposed first and second side surfaces and opposed upper and lower surfaces;

a plurality of spaced apertures in said insulative housing, each of said apertures extending through at least a portion of said first side surface and said upper surface;

a plurality of discrete connector clips in said housing, one connector clip being respectively aligned with one of said spaced apertures;

connecting rod means in said housing, said connecting rod means electrically Connecting each of said discrete connector clips;

at least one receptacle means extending from said housing, said receptacle means being electrically connected to said rod means to provide access to said rod means; and

mounting means for mounting said housing to the resilient I-shaped members of the fanning strip of a terminal block.

4,913,664

MINIATURE CIRCULAR DIN CONNECTOR

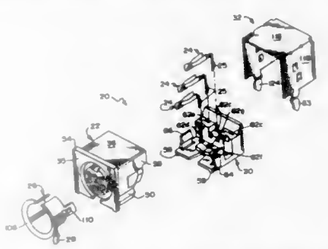
Daniel A. Dixon; Hsin Lee, both of Naperville; Eugene J. Mysiak, Cicero, and Henry Zielke, Hoffman Estates, all of Ill., assignors to Molex Incorporated

Filed Nov. 25, 1988, Ser. No. 275,818
Int. Cl.[4] H01R *13/648*
U.S. Cl. 439—607 15 Claims

1. A miniature DIN connector comprising:

a nonconductive housing having opposed front and rear ends, a top and a bottom, a plurality of terminal-receiving apertures extending between the front and rear ends of said housing, said housing comprising channels generally adjacent the rear thereof and extending from each of said terminal-receiving apertures to the bottom of said housing for positively positioning and retaining portions of terminals extending from the apertures in the housing to a circuit board, said housing further comprising an aperture extending into the front end thereof and generally around said terminal-receiving apertures;

a plurality of electrically conductive terminals having pin-receiving contact portions engaged in the terminal-receiving apertures of said housing and board contact portions positively retained in the channels of said housing and extending beyond the bottom of said housing;



an internal shield mounted in the aperture extending into the front end of said housing, said internal shield comprising contact means extending therefrom for electrical connection to a ground;

a base having an array of apertures extending therethrough for receiving the board contact portions of said terminals, said base being mountable to the circuit board and comprising means for lockingly engaging the housing to the base; and

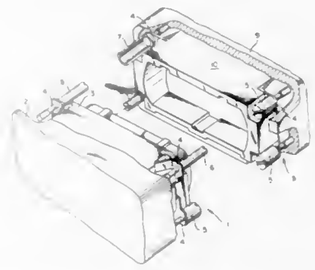
an external shield substantially defining at least three external sides of said miniature DIN connector and comprising contact means for grounding said external shield wherein said external shield and said internal shield are electrically and mechanically separate from one another.

4,913,665

MULTI-POLE PLUG CONNECTOR WITH CODING ELEMENTS

Claudia Sackses, Wiesbaden, Fed. Rep. of Germany, assignor to C. A. Weidmüller GmbH & Co., Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 270,513
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1987, 3738900
Int. Cl.[4] H01R *13/64*
U.S. Cl. 439—677 1 Claim



1. A multi-pole plug connector assembly, comprising

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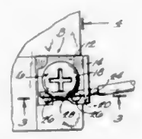
(a) separate pin and socket housings adapted to be plugged together;
(b) pin and socket insert members connected within said pin and socket housings, respectively, said insert members each containing a plurality of electrical contacts which are interconnected when said pin and socket housings are plugged together; and
(c) a plurality of fastening screws for connecting said insert members with said housings, respectively, said fastening screws including head portions which comprise coding elements for preventing improper plugging connections between said pin and socket housings, said fastening screw head portions comprising three separate configurations, including
(1) a first screw head configuration comprising a cylindrical head having a shorter length and a larger diameter than the remaining screw head configurations;
(2) a second screw head configuration comprising a cylindrical head having a longer length and smaller diameter than said first configuration; and
(3) a third screw head configuration comprising a cylindrical head having a length corresponding with the length of said second head, an outer diameter corresponding with that of said first head, and an inner diameter slightly greater than the diameter of said second head, whereby when said fastening screws are used to connect said inserts with said pin and socket housings, respectively, said third head is adapted to receive only said second head and the orientation of said different screws will determine the correct plugging of said pin and socket housings to interconnect the sockets thereof.

4,913,666

WIRING TERMINAL CONSTRUCTION

Mark A. Murphy, Franklin, Tenn., assignor to Apcom, Inc., Franklin, Tenn.

Continuation of Ser. No. 183,479, Apr. 15, 1988, abandoned, which is a continuation of Ser. No. 900,674, Aug. 27, 1986, abandoned. This application Mar. 6, 1989, Ser. No. 320,861
Int. Cl.[4] H01R *4/34*
U.S. Cl. 439—709 5 Claims



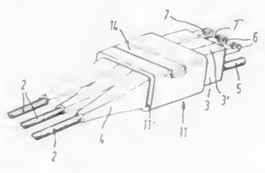
1. A wiring terminal assembly comprising:
a solid wire adapted for connection to the wiring terminal assembly;
a mounting member of plastic material;
a wiring terminal member of metal material mounted on said mounting member and having a base portion and an upturned tab portion, said tab and base portions being integral and rigid with respect to each other, said base portion having a screw opening therein, and said tab portion having a wire restraining opening means therein, the end of said solid wire being inserted through said wire restraining opening;
a screw member having a threaded body portion and a screw head, said screw body portion threaded into said screw opening in said base portion of said wiring terminal member, said solid wire positioned adjacent said screw body portion and underneath said screw head;
said mounting member further characterized as having a cavity wall portion thereon located close enough to said screw head to prevent passage of said solid wire along said screw body and past said screw head;
said screw head on said screw acting to contact said solid wire and clamp said solid wire against said base portion of said wiring terminal member when said screw member is tightened into said screw opening in said base portion of said wiring terminal member; and
said wire restraining opening means in said tab portion acting to prevent transfer of external movement of said solid wire from outside of said wire restraining opening to the portion of the wire that is clamped under the screw head of said screw member to thus prevent any tendency of the wire to loosen up from the screw due to external movement of said wire outside of said wire restraining opening.

4,913,667

CONNECTOR SYSTEM WITH REPLACEABLE PLUGS

Edwin Muz, Reutlingen, Fed. Rep. of Germany, assignor to NICOLAY GmbH, Fed. Rep. of Germany

Filed Mar. 8, 1989, Ser. No. 322,837
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1988, 3607645
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—733 9 Claims



1. A connector system, comprising:
a socket member having first connectors arranged in a row equally spaced from each other;
a unitary, rectangular plug housing open at first and second longitudinal ends thereof, said plug housing having a slot in one side extending transversely of a longitudinal axis of said plug housing and having an inside chamber;
individual plugs coupled to said first connectors and mounted in said plug housing in a row adjacent one another through one of said ends of said plug housing, said plugs projecting from said first end of said housing to permit introduction into said socket member, each of said plugs having an external locking recess;
a locking strip coupled to said plug housing and movable between locking and unlocking positions, in said locking position said strip being in said slot, projecting into said inside chamber and engaging said locking recesses of said plugs to secure said plugs against thrusts in longitudinal directions thereof;
a blade stop spring, included as part of said socket member, having a free end segment extending over said first connectors and into an insertion path of said plugs; and
lock-in recesses on said plugs engaging said stop spring.

4,913,668

BATTERY CLAMP

Lisa D. Chamberlain, 3157 Portis, St. Louis, Mo. 63116

Filed Apr. 11, 1989, Ser. No. 336,111
Int. Cl.[4] H01R *11/26*
U.S. Cl. 439—755 1 Claim

1. A battery terminal clamp comprising a pair of handles hingedly connect to provide jaws at one end wherein the improvement comprises:
spring means at the hinge point tending to close the jaws together;

the jaws having sequential first and second sets of matching teeth;
the first set of teeth at the tip of the handles having a concave configuration sized for grasping the compression bolt of a standard battery terminal connector;
the second set of teeth inwardly adjacent to the first set of teeth having a concave configuration sized to grasp the battery terminal;

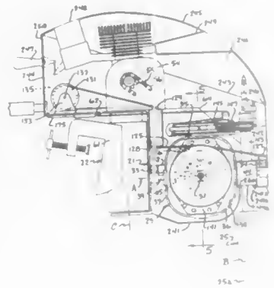
a first handle of the battery clamp extending back of the hinge point terminating in an adjustable end wrench;
a second handle extending back of the hinge point terminating in an electrical cable fastening means; and,
a cylindrical clamp head with serrated internal radius to frictionally grasp the battery terminal is fastened to the outside surface of one of the handles opposite the second set of jaw teeth.

4,913,669

BOAT PROPULSION APPARATUS

Ronald G. Young, 2698 Camcrest Drive, Nanaimo, B.C., Canada V9T 4W4

Filed Sep. 6, 1988, Ser. No. 240,524
Int. Cl.[4] B63H *1/36*
U.S. Cl. 440—14 22 Claims



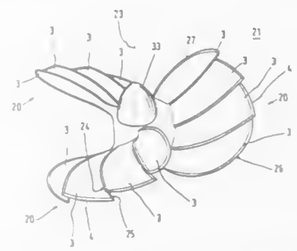
1. In a boat propulsion apparatus including a support structure adapted for mounting on a boat, at least one swing frame mounted on the support structure for swinging movement relative thereto about a swing axis adapted to extend generally lengthwise of the boat, at least one thrust blade and means mounting the thrust blade on the swing frame for swinging movement therewith about said swing axis and for turning movement relative to the swing frame about a generally upright blade axis, drive means for angularly oscillating said swing frame about said swing axis to swing the thrust blade in a direction crosswise of the boat, said drive means including means for angularly oscillating said thrust blade about the blade axis in timed relation with the angular oscillation of the swing frame, said drive means including a drive shaft mounted on the support structure for rotation about a generally horizontal axis crosswise of the swing axis, a drive head non-rotatably secured to the drive shaft for rotation therewith, a swash plate, means mounting the swash plate for rotation with the drive shaft and for pivotal movement relative thereto about an axis radially of the drive shaft, adjustable means interconnecting said drive head and said swash plate and including a rotary adjusting member mounted on the drive head at a location outwardly of the drive shaft to adjust the angle of the swash plate in response to rotation of said rotary adjusting member, and control means selectively operable to cause rotation of said rotary adjusting member in a first direction to increase the angle of the swash plate or in a second direction to decrease the angle of the swash plate, the improvement wherein said control means comprises:
(a) a first planetary gear set including a first sun gear coaxial with the drive shaft and a first ring gear coaxial with the first sun gear and a first planet gear means in meshing engagement with the first sun gear and the first ring gear, means operatively connecting the first ring gear to the rotary adjusting member for rotating the same in response to angular movement of the first ring gear relative to the drive head,
(b) a second planetary gear set including a second sun gear coaxial with the drive shaft and a second ring gear and second planet gear means in meshing engagement with the second sun gear and second ring gear,
(c) planet carrier means rotatably supporting the first and second planet gear means,
(d) means for rotating the second ring gear with said drive shaft,
(e) means for fixing the first sun gear against rotation; and
(f) selectively operable means for turning the second sun gear angularly relative to the first sun gear to effect angular movement of the first ring gear relative to the drive head.

4,913,670

BLADE-LIKE PROFILED DEVICE FOR ACTING ON A GASEOUS OR LIQUID FLUID FLOW

Guenter Spranger, Wagnerstrasse 2, DE-2000 Hamburg 76, Fed. Rep. of Germany

Filed Mar. 14, 1988, Ser. No. 168,044
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1987, 3708159; Dec. 31, 1987, 3744582
Int. Cl.[4] B63H *1/14*
U.S. Cl. 440—49 36 Claims



1. Blade-like profiled device for acting on a gaseous or liquid fluid flowing around it and having, as a means for improving efficiency, a slotted blade head having lamellar profiled blade elements between adjacent elements of which, to shift the flow separation zone, a slot is placed, said slot widening to a maximum width at an edge of the lamellar profiled blade elements, wherein each slot begins at a distance from a root of the blade-like device and runs radially outwardly; wherein said blade elements are placed relative to each other so that consecutive end edges thereof, in an initial flow direction, are offset relative to each other in a direction of a pressure zone side of the device; wherein at least a first of the blade elements in the initial flow direction protrudes in the plane of longitudinal axis

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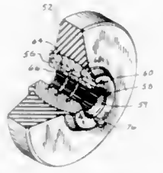
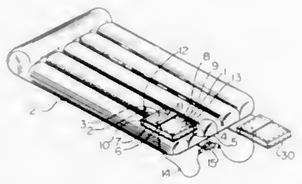
of the blade in the initial flow direction; and wherein at least a middle blade element is oriented generally coaxially to the longitudinal axis of the blade and subsequent blade elements protrude in the direction of the pressure zone side.

4,913,671
MARINE DRIVE WITH LUBRICATED OUTPUT COUPLER
James N. Gavriles, Oshkosh, and Ronald E. Lowe, Fond du Lac, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.
Filed Apr. 7, 1988, Ser. No. 178,456
Int. Cl.[4] B63H *23/00*
U.S. Cl. 440—83 6 Claims



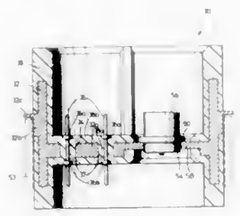
1. A marine drive having an engine output coupler driven to rotate about an axis and having a splined axial opening therein, an output drive shaft operatively coupled to a propeller for driving same and having a splined end received in said splined axial opening of said coupler, said coupler having a grease fitting for introducing grease therein and grease passages extending from said grease fitting and communicating with said splines to lubricate the latter, wherein said grease passages have a first portion extending axially in said coupler and spaced radially outwardly from said splines, and a second portion extending from said first portion radially inwardly to said splines.

4,913,672
ANCHOR FOR BEACH AIR MATTRESSES OR RAFTS
Stephen A. Martin, 11500 Summit West Blvd., Apt. 30-C, Tampa, Fla. 33617
Filed Jun. 16, 1988, Ser. No. 211,877
Int. Cl.[4] B63B *21/00*
U.S. Cl. 441—40 6 Claims



1. An achoring apparatus for attachment to a flotation device used on lakes or ocean waters comprising:
storage pocket means constructed integrally with the flotation device for storage of a flexible anchor bag;
said flexible anchor bag constructed of a flexible material to be filled with a substance heavier than water;
connecting means to the floatation device consisting of brass eyelets mounted to an outside perimeter flap of the flotation device allowing the tying of such storage pocket to the flotation device by means of small lengths of rope;
draw string at the top of the anchor bag which said draw string is sewn into a folded over portion at the top of said anchor bag with brass eyelets installed so as to allow the threading of said anchor draw string through the brass eyelets allowing one end to be knotted to prevent slippage of said draw string;
a tether connected to said anchor bag which is tied to such floatation device by means of brass eyelet mounted to the outside perimeter flap whereby the anchor bag tether can be coupled to the flotation device.

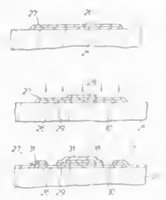
4,913,673
HERMETICALLY SEALED CONNECTOR
Robert J. Kohler, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Continuation of Ser. No. 226,333, Jul. 29, 1988, abandoned. This application May 16, 1989, Ser. No. 355,132
Int. Cl.[4] H01R *13/405*
U.S. Cl. 439—736 12 Claims



1. A hermetically sealed electrical connector of the type adapted to be mounted in an opening of a surrounding conductive member and suitable for high voltage applications at elevated in-service temperatures, comprising:
a support member comprised of metal having a known coefficient of thermal expansion, said support member having a transverse flat plate portion having at least one aperture extending therethrough, an annular metal rim portion surrounding said plate portion, and an annular metal flange portion extending outwardly from said rim portion at a location axially spaced from said transverse flat plate portion, said transverse flat plate portion being free of outwardly extending flanges peripherally about said at least one aperture;
an electrical contact extending through each said at least one aperture and having contact sections exposed on both sides of said transverse flat plate portion for electrical connection;
contact-retention means of plastic material selected to have a coefficient of thermal expansion similar to that of said metal of said support member, said contact-retention means being molded and adhered to a respective said contact simultaneously molded and adhered within each said at least one aperture for retaining each said contact within a respective said at least one aperture and for providing a hermetic seal between each said contact and said support member; and
each said electrical contact including at least one flange portion for increasing the bonding surface area at the interfaces between each said contact and said respective contact-retention means.

4,913,674
LIQUID CRYSTAL DISPLAY DEVICES AND THEIR METHOD OF MANUFACTURE
Keith H. Nicholas, Reigate, England, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 28, 1988, Ser. No. 276,729
Claims priority, application United Kingdom, Dec. 16, 1987, 8729309
Int. Cl.[4] G02F *1/03*
U.S. Cl. 445—24 6 Claims
1. A method of manufacturing a liquid crystal display device

of the kind having a matrix of individually operable liquid crystal picture elements, comprising the steps of:
(1) forming on a transparent substrate two sets of opaque substantially parallel address conductors with the one set extending substantially at right angles to the other set to provide row and column conductors;
(2) forming a matrix array of individual picture element electrodes;
(3) forming switching elements adjacent a respective picture element location; and

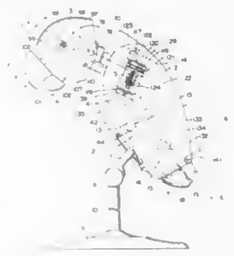


(4) providing interconnections electrically connecting the picture element electrodes to the switching elements, via which the picture element electrodes are connected to the address conductors,
characterized in that the picture element electrodes are formed after the address conductors by a self-alignment process using the facing edges of adjacent address conductors to define the edges of the picture element electrodes, by a photolithographic process.

4,913,675
MISSILE HELICOPTER DEVICE
Thomas R. Wilcox, 109 Wellington Ave., Short Hills, N.J. 07078
Filed Apr. 4, 1988, Ser. No. 176,950
Int. Cl.[4] A63H *27/12*
U.S. Cl. 446—36 10 Claims

1. A missle helicopter device capable of a projected, nose up ascent and a helicopter nose up descent, which comprises:
an elongated missle body having a tapered nose at its top end, and having a base at its bottom end and having a generally upper half and lower half;
a plurality of fins having a longer length than width, said fins being hingedly connected to the upper half of said missle body, said fins having a first position which is a substantially vertical position parallel to said elongated missle body such that said fins protrude along their widths radially outward from said missle body so as to function as flight stabilizing fins during ascent, and said plurality of fins having a second position which is at approximately right angles to said missle body such that said fins protrude radially outward along their lengths away from the upper half of said missle body so as to create a nose up helicopter type rotation during descent;
latch release means located on said missle body which includes a releasable hold mechanism on said plurality of fins to hold said fins in a first position during ascent and to release said fins into said second position during descent, and a drag actuated lever pivotally attached to said body for actuating said latch release means;
bias means located on said missle body and connected to each of said fins so as to bias said fins into said second position upon release by said latch release means from said first position; and,
propulsion means to propel said device into ascent.

4,913,676
MOVING ANIMAL TOY
Noriyuki Koguchi, Saitama, and Takashi Furuya, Tokyo, both of Japan, assignors to Iwaya Corporation, Tokyo, Japan
Filed Mar. 23, 1988, Ser. No. 172,251
Claims priority, application Japan, Oct. 20, 1987, 62-265060
Int. Cl.[4] A63H *13/00*
U.S. Cl. 446—300 6 Claims



1. A moving animal toy comprising:
a body frame having a rod;
a head frame including a head support shaft, said head frame mounted on said rod to permit said head frame to pivot up and down about said head support shaft and rotate clockwise and counterclockwise relative to said body frame about said rod, said head frame also having a beak opening, beak support shafts and upper and lower beaks mounted in said beak opening on said beak support shafts for vertical movement in open and closing directions toward and away from each other;
a beak actuating mechanism mounted in said head frame for moving said upper and lower beaks in said open and closing directions;
a head turning mechanism including a motor installed in said body frame and connected to said head frame to rotate said head frame clockwise and counterclockwise about said rod; and
a vertical head actuating mechanism mounted on said body frame to connect said head frame with said motor, which when actuated will pivot said head frame up and down about said head frame support shaft.

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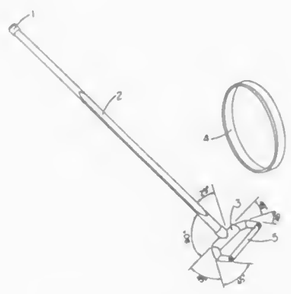
4,913,677

GUIDE STICK AND HOOP TOY

Donald W. Brasier, 2517 W. Brady, Tulsa, Okla. 74127, and Larry Schwegman, 4806 S. Sheridan Rd., Tulsa, Okla. 74145

Filed Feb. 21, 1989, Ser. No. 312,758
Int. Cl.[4] A63H *33/02*
U.S. Cl. 446—453 2 Claims



1. A toy, comprising in combination, a hoop and a guide stick for rotating and guiding said hoop in any path desired, the hoop being circular in shape and of solid plastic construction, said guide stick comprising a handle and a generally U-shaped yoke, an upper portion of said handle being formed of tubular plastic material with an end cap covering the upper end, an intermediate portion of said handle forming a flat depression on an upper surface thereof for starting the rotating motion of said hoop, the lower portion of said handle being formed of tubular plastic material and the lower end thereof adapted for being connected to said yoke, said yoke comprising a T-shaped tubular section connected to said lower end of said handle and having two opposite ends extending at right angles to said handle, said yoke further comprising a first pair of 45 degree tubular extension sections attached one at each opposite end of the T-shaped section and forming an obtuse angle therewith, said yoke further comprising a second pair of 45 degree tubular extension sections attached to the free end of each of the first extension sections and extending forwardly at an obtuse angle therefrom, said opposite ends of said T-shaped section and said first and second extension sections lying in substantially the same plane and forming a U-shape for engaging the hoop during operation of the toy, said handle extending at approximately a 29 degree angle rearwardly from a line drawn normal to said plane.

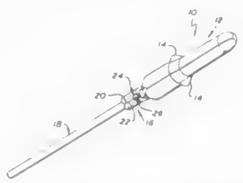
4,913,678

ELECTRICAL CONTACT

Frank J. Avellino, Russell, and Glenn A. Culbertson, Warren, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 2, 1989, Ser. No. 305,142
Int. Cl.[4] H01R *4/02, 4/18*
U.S. Cl. 439—879 2 Claims

1. An electrical contact comprising: a first hollow, bullet shaped end formed by rolling sheet material; a second, solid, wire-like end affixed to said first end at a crimp joint, said crimp joint being formed from a tail of said first end and being rolled about said second end to form a gas tight seal, the mating peripheral petal edges of said crimp seal contacting each other and said second end to form a trough; and a laser weld located on said crimp petals, said weld joining said petals and penetrating said wire-like second end to effectively prevent said second end from being axially removed.

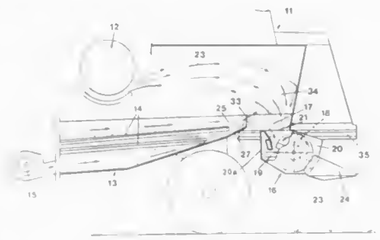


4,913,679

DEVICE FOR COMBINE HARVESTERS EQUIPPED WITH A ROTARY STRAW CHOPPER

Arne Bender, Larv, S-535 00 Kvänum, Sweden.

PCT No. PCT/SE87/00332, § 371 Date Jan. 31, 1989, § 102(e) Date Jan. 31, 1989, PCT Pub. No. WO88/00432, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 10, 1987, Ser. No. 298,882
Claims priority, application Sweden, Jul. 11, 1986, 8603089
Int. Cl.[4] A01D *41/12*; A01F *12/40*
U.S. Cl. 460—112 9 Claims



1. A device for a combine harvester, for mixing straw and chaff and for spreading the same behind the combine harvester, the device comprising:

a cleaning device for separating chaff from grain and a chaff discharging means associated with said cleaning device for discharging chaff;

a rotary straw chopper having an axis of rotation which extends transversely to a longitudinal dimension associated with said combine harvester;

a housing extending about said rotary straw chopper, said housing defining an inlet into said rotary straw chopper and an outlet from said rotary straw chopper, said outlet being circumferentially spaced from said inlet, said housing including a wall portion facing said chaff discharging means and extending from said inlet to said outlet, said wall portion extending upwards and reaching vertically above a radius of action of said rotary straw chopper, whereby said inlet into said chopper is defined above said rotary straw chopper; and

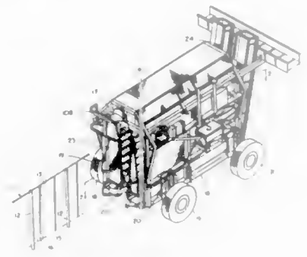
means for directing a flow of straw toward a fall-out region defined above said inlet and wherein said chaff discharging means includes means to cause the chaff to be discharged into said fall-out region to be mixed with the straw prior to reaching said inlet of said rotary straw chopper, said chaff discharging means being effective for creating a flow of air for transporting the chaff to the fall-out region at a pressure that slightly exceeds atmospheric pressure.

4,913,680

LOW-TRELLIS MOBILE HOP PICKER

Donald A. Desmarais, P.O. Box 125, Mabton, Wash. 98935

Filed Jul. 30, 1987, Ser. No. 79,588
Int. Cl.[4] A01D *46/02*
U.S. Cl. 460—129 16 Claims



1. A machine for picking hops from vines growing in a row on a relatively short trellis, said trellis rows including vertical posts and joining horizontal wires for supporting the hop vines growing upwardly on both sides of said trellis, said hop picker machine, comprising:

a wheel-mounted frame that straddles a portion of a hop vine trellis row;

an engine mounted upon said frame for propelling said picker along said trellis row and operating said hop picker;

a hop picking bank mounted upon said frame, said picking bank comprising a pair of substantial vertically oriented conveyors adjustably spaced from one another to accommodate said trellis and contact hop vines straddled by said frame, each picking bank conveyor including upwardly moving surfaces upon which are fixed a plurality of hop picking hooks that pull hops from the vines and a plurality of tines projecting from said surfaces to rake and separate the vines to prevent matting of the vines during picking;

a pair of hop collecting conveyors mounted upon said frame, each below and in alignment with a picking conveyor, said collecting conveyors collecting hops as they fall downwardly after being picked,said conveyors transporting the collected hops rearwardly with respect to said hop picker; and

a pair of elevating conveyors that receive the hops from the collecting conveyors and elevate them substantially vertically for transfer from said hop picker.

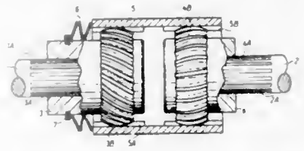
4,913,681

SHOCK ABSORBING ROTARY GEAR COUPLING

Paul C. Green, "Blackthorns", 35 Blackwood Rd., River Farm, Dosthill, Tamworth, Staffordshire, Great Britain

Filed May 17, 1988, Ser. No. 194,745
Claims priority, application United Kingdom, May 18, 1987, 8711700
Int. Cl.[4] F16D *3/18*
U.S. Cl. 464—154 6 Claims

1. A gear coupling adapted to absorb torsional shock loads and axial misalignment between two rotary members, the coupling comprising a first rotary member, a second rotary member disposed substantially coaxially with the first member, an intermediate member inbetween the first and second members, resilient means extending between the first member and the intermediate member for providing bias therebetween, external helical gear teeth being present about the first member, external helical teeth being present about the second member, internal gear teeth being present at each end of the intermediate member, the external gear teeth of the first member and the second member being in engagement with the internal gear teeth at the respective end of the intermediate member, the interengaged gear teeth on at least one of the first members, the second member and the intermediate member being crowned and barrelled so as to accommodate axial misalignment between the first and second members, the hand of the helical gear teeth on the second member opposing the hand of the teeth on the first member and the angle of the helical gear teeth of the second member being different from that of the helical gear teeth of the first member, whereby when torque is



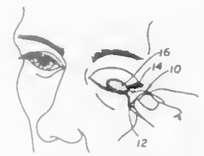
transmitted through the coupling, there is a resultant force axially separating the members so that the intermediate member is caused to move against the bias of the resilient means and so that if an increased or shock load is applied, the intermediate member is urged further against the bias of the resilient means thereby to absorb the shock load, the hand and angle of the gear teeth of the second member being selected so that the axial force tending to separate the gear teeth oppose and is substantially equal to the average sliding friction force generated between the helical gear teeth contact faces caused by the axial travel of the intermediate member.

4,913,682

APPLICATOR AND PACKAGE THEREFOR

Alan Shabo, 10921 Wilshire Blvd.; Suite 1205, Los Angeles, Calif. 90024

Division of Ser. No. 183,502, Apr. 14, 1988, Pat. No. 4,838,851.
This application Apr. 4, 1989, Ser. No. 334,064
The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.
Int. Cl.[4] A61M *35/00*
U.S. Cl. 604—1 6 Claims



1. An applicator for scrubbing, and for applying a liquid to an eyelid, comprising:

a thin, one-piece handle formed to be grasped between the thumb and forefinger of a user and having front and rear major surfaces joined by a minor, edge surface;

a peg extending outwardly entirely perpendicularly from a first edge of said handle horizontally axially thereof; and

a swab on said peg adjacent said handle edge, formed of liquid absorbent material;

said swab, said handle and said peg each having a length dimension defining the horizontal axis of the applicator, a width dimension in a first plane and a thickness dimension transverse of said first plane, the length and width of the handle being each substantially greater than its thickness, the length of the handle being substantially greater than its width but less than twice its width whereby to permit a

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user to freely grasp the handle between the user's thumb and forefinger adjacent said first handle edge, the distance between said swab and said handle edge being substantially less than either the width or length of said handle, and the width of said handle being greater than the width of said swab, said swab having greater length and width than thickness and greater length than width.

4,913,683

INFUSION STENT SYSTEM

Franklin P. Gregory, Racine, Wis., assignor to Medical Engineering Corporation, Racine, Wis.

Filed Jul. 5, 1988, Ser. No. 215,077
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—8 **24 Claims**

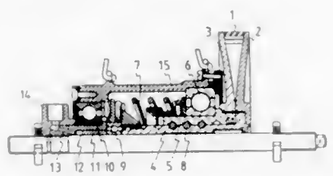
1. An infusion stent system comprising
a. a flexible stent member of a first predetermined length, said stent member having a main body portion with a proximal end portion and a distal end portion,
b. a hollow flexible guide tube member of a second predetermined length greater than said first predetermined length, said guide tube member being infusible with fluid and receivable in said stent member such that said stent member and said guide tube member are relatively slidable with respect to each other, said guide tube member having a proximal end that is positionable in said stent member at any selected location within said stent member, such that when the proximal end of said guide tube member is at any said selected location in said stent member infusion of fluid through said guide tube member is directed outwardly of said guide tube member at any said selected location in said stent member, said guide tube member being removable from said stent member.

4,913,684

AUTOMATIC VARIABLE TRANSMISSION FOR VEHICLES

Urpo Mantovaara, Tampere, and Jouko Niemi, Helsinki, both of Finland, assignors to Variped Oy, Helsinki, Finland

PCT No. PCT/FI87/00082, § 371 Date Feb. 2, 1989, § 102(e) Date Feb. 2, 1989, PCT Pub. No. WO87/07932, PCT Pub. Date Dec. 30, 1987
PCT Filed Jun. 17, 1987, Ser. No. 288,258
Claims priority, application Finland, Jun. 17, 1986, 862578
Int. Cl.[4] F16H *11/02*
U.S. Cl. 474—12 **9 Claims**



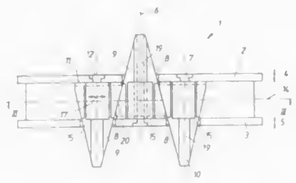
1. Variable transmission for automatically changing a transmission ratio thereof in accordance with a resistance to propagation of a vehicle, in which a force-transmitting link is a V-belt and in which at least a secondary pulley consists of cup disks being urged towards each other and interconnected with a multiple-end screw and a compression spring, wherein the screw is a ball screw having at least three ends for connecting the cup disks of the secondary V-belt pulley.

4,913,685

WHEEL WITH VARIABLE DIAMETER

Johann Lukatsch, Schnepfenweg 1, A-9065 Ebental (Karnten), Austria

Filed Mar. 13, 1989, Ser. No. 322,556
Claims priority, application Austria, Mar. 14, 1988, 689/88
Int. Cl.[4] F16H *55/52*
U.S. Cl. 474—49 **15 Claims**



1. A wheel of variable diameter, comprising a pair of disks and means interconnecting the pair of disks for axial movement relative to one another; a plurality of opposed cooperating plates disposed peripherally about the pair of disks, said plates having cooperating tapered edges; and means mounting said plurality of plates on said pair of disks for axial and radial movement relative to said pair of disks; whereby axial movement of one of said pair of disks towards the other of said pair of disks causes cooperation of said cooperating tapered edges of said plurality of plates to increase the diameter of said wheel, and axial movement of one of said pair of disks away from the other of said pair of disks causes cooperation of said cooperating tapered edges of said plurality of plates to coact to decrease the diameter of said wheel; wherein said cooperating tapered edges of said plurality of plates are connected to one another in a manner permitting said axial and radial movement relative to said pair of disks.

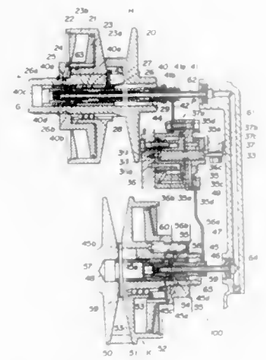
4,913,686

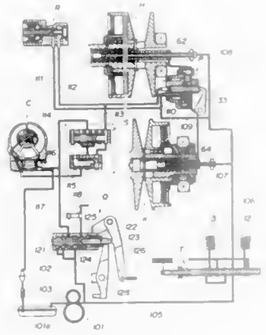
METHOD AND APPARATUS FOR CONTROLLING THE TRANSMISSION RATIO OF CONTINUOUSLY VARIABLE TRANSMISSION

Torao Hattori, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1988, Ser. No. 193,385
Claims priority, application Japan, May 12, 1987, 62-116221
Int. Cl.[4] F16H *11/02*
U.S. Cl. 474—69 **7 Claims**

1. A continuously variable transmission comprising:
an input shaft;
a drive pulley mounted on said input shaft and comprising a stationary conical member and a movable conical member;
an output shaft;
a driven pulley mounted on said output shaft and comprising a stationary conical member and a movable conical member;
a V-belt trained around said drive and driven pulleys;
an oil pressure source and an oil reservoir;
a first hydraulic servomechanism comprising an output member operatively coupled to at least said movable conical member of the drive pulley, a first hydraulic pressure chamber for moving said output member, and a pilot valve movable in a first direction and a second direction which is operatively opposite to said first direction for selectively communicating said first hydraulic pressure chamber with said oil pressure source and said oil reservoir, said output member being movable in unison with said pilot valve for controlling axial movement of said movable conical members to vary effective diameters of said drive and driven pulleys for controlling a speed ratio;
a first urging mechanism for applying a biasing force proportional to a vehicle speed to one end of said pilot valve to bias said pilot valve in said first direction; and





a second urging mechanism for applying a biasing force proportional to a throttle valve opening degree through a spring to the other end of said pilot valve to bias said pilot valve in said second direction.

4,913,687

POWER-TRANSMISSION SHEAVE HAVING ENHANCED BELT ENGAGEMENT CAPABILITY

Claude A. Soots, Gage County Industrial Park, Beatrice, Nebr. 68310

Filed Jan. 11, 1989, Ser. No. 295,589
Int. Cl.[4] F16H *55/36*
U.S. Cl. 474—167 **11 Claims**

1. In a power-transmission sheave conventionally comprising a centrally-open and shaft-engageable hub portion generally concentrically surrounding a directionally transversely extending hub-axis and further comprising at least one grooved belt-training portion that is surroundably connected with said hub portion and provides a grooved outward periphery for said sheave, said at least one belt-training portion including transversely separated flanged sides for the belt-training groove, the improvement of means for enhancing the sheave's engagement with a power-transmission belt guidably locatable within said plural flanges belt-training portion and said enhancement means comprising: providing at least one of said

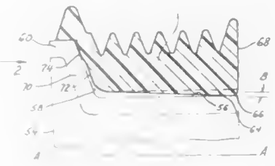
flanged sides with a plurality of directionally transversely extending openings therethrough.

4,913,688

PULLEY ASSEMBLY FOR ACCESSORY CLUTCH HAVING NONMETALLIC SHEAVE

Zaki C. Bekheet, Canton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 12, 1989, Ser. No. 364,386
Int. Cl.[4] F16H *55/36*
U.S. Cl. 474—170 **6 Claims**



1. A belt-driven Pulley assembly for an clutch comprising:
a pulley having a central axis, a mounting surface coaxial with the central axis , a surface adjacent the mounting surface, inclined with respect to the mounting surface extending radially therefrom; and
a sheave coaxial with the pulley surrounding the mounting surface, including
an external surface suited for driveable engagement by a drive belt,
a first surface facing and adjacent the mounting surface,
a second surface facing and adjacent the inclined surface of the pulley,
first means for establishing a radial spacing between the first surface and the mounting surface,
stop means for establishing a spacing between the second surface and the inclined surface of the pulley,
vent means for allowing air to pass the stop means; and
means located between the mounting surface and the first surface for bonding the pulley and the sheave forming a connection therebetween.

4,913,689

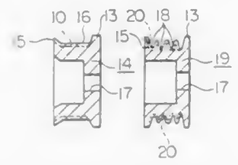
PULLEY WITH A HIGH-FRICTION GROOVE SURFACE AND MANUFACTURING METHOD THEREFOR

Akira Morishita, and Toshinori Tanaka, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1988, Ser. No. 271,969
Claims priority, application Japan, Dec. 4, 1987, 62-308198
Int. Cl.[4] F16H *55/49*
U.S. Cl. 474—170 **2 Claims**

1. A pulley (19), comprising:
(a) a central, generally cylindrical body portion,

(b) first (13) and second (15) flanges respectively defined at opposite ends of the body portion and integral therewith,
(c) a plurality of closely adjacent, circumferential, V-shaped grooves (18) defined in an outer surface of the body portion and adapted to matingly accommodate a belt having an inner surface defining a like plurality of longitudinally extending, similarly configured V-shaped grooves, and



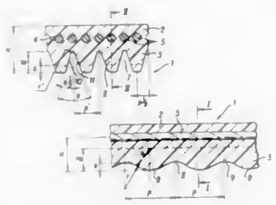
(d) a plurality of equally spaced axial grooves (20) defined in the body portion and extending over the entire axial length thereof, including sloping side walls, crowns, and bases of the V-shaped grooves, to increase the coefficient of sliding friction between the pulley and the belt.

4,913,690

DRIVING BELT

Tommaso Di Giacomo, Chieti, and Domenico Arces, Bari, both of Italy, assignors to Pirelli Trasmissioni Industriali S.p.A., Italy

Filed Jun. 16, 1989, Ser. No. 367,138
Claims priority, application Italy, Jun. 16, 1988, 20987 A/88
Int. Cl.[4] F16G *1/08*
U.S. Cl. 474—250 14 Claims



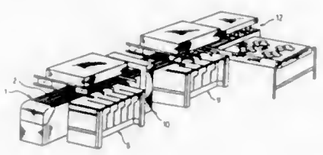
1. A belt formed of elastomeric material suitable for transmitting forces in cooperation with at least two pulleys, said belt comprising:
an outer part under traction;
an inner part under compression;
an intermediate part interposed between said outer part and said inner part and adapted to transport a load;
said inner part comprising in a longitudinal direction at least two lateral, opposite and convergent surfaces for transmitting frictional forces in cooperation with corresponding surfaces of a pulley and a plurality of alternating cavities and protuberances directed transversely relative to said lateral surfaces;
said protuberances and said cavities defining an undulated profile formed by curvilinear sections, each protuberance having a curvilinear section with a curvature opposite to the curvilinear section of its adjacent cavities; and
a ratio between a pitch and a maximum depth of the transversal cavities being between 8 and 20, a ratio between the radius of curvature of the cavities and the maximum depth of the cavities being between 3 and 6.

4,913,691

DEVICE FOR ASSEMBLING CUTTINGS MORE PARTICULARLY FOR THE PRODUCITON OF PACKING BOXES

Francois Chaygneaud-Dupuy, Dignac, France, assignor to Dupuy Engineering S.A., D'Espagnac, France

Filed Feb. 23, 1988, Ser. No. 159,149
Claims priority, application France, Feb. 24, 1987, 87 02381
Int. Cl.[4] B31B *1/12, 1/62*
U.S. Cl. 493—2 17 Claims



1. A device for assembling cuttings, more specially for the production of packing boxes, of the type including a plurality of work places arranged along a vacuum main conveyor, said work places including: a first work place comprising a first margin stop system (8) with at least one stack loader (66) and a conveyor (9) for positioning a first cutting on said main conveyor, a second work place comprising at least one glueing machine (10) for applying a film of glue on at least a portion of the first cutting and a third work place comprising at least one second margin stop system (11) including a stack loader and a conveyor for placing a second cutting on the first cutting, characterized by the fact that said main conveyor is a linear and horizontal conveyor and includes a plurality of notched belts (2), guided respectively in upwardly open grooved vertical rails (3), each of said rails being imperforate and having parallel vertical edges (4,5), whose groove depth is slightly less than the thickness of a corresponding notched belt (2) placed therein, said notched belt (2) being drum driven to a position above at least one fixed longitudinal and linear vacuum chamber with an opening at the top thereof and extending below said belts and said rails to apply vacuum between said rails against said cuttings on said belt but not against said belts within said imperforate rails.

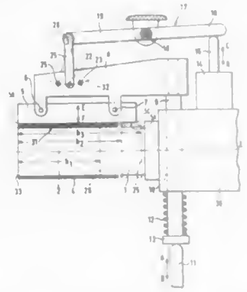
4,913,692

APPARATUS FOR PRESSING THE OVERLAPPED AREA OF A BLANK BEING FORMED INTO A JACKET

Berthold Müller, Süssen, Fed. Rep. of Germany, assignor to Michael Hörauf Maschinenfabrik GmbH & Co. KG, Donzdorf, Fed. Rep. of Germany

Filed Jan. 4, 1989, Ser. No. 293,425
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1988, 3809489
Int. Cl.[4] B31B *1/64*
U.S. Cl. 493—133 11 Claims

1. Apparatus for producing container jackets from blanks, comprising:
a winding core around which a blank is wound to form a blank overlapped area which is to be bonded,
pressing means including a pressing surface arranged to engage and press said overlapped area along a length of such area disposed parallel to a longitudinal axis of said jacket, said pressing surface including longitudinally spaced ends, and
actuating means for applying a force to said pressing means at a force transmitting zone thereof for urging said pressing surface against said overlapped area in a radial direction with reference to said axis to apply a pattern of radial pressing forces along the length of said overlapped area, said actuating means including shifting means for longitudinally shifting the location of said force transmitting zone relative to said longitudinally spaced ends of said pressing surface and thereby longitudinally shift the pressing force pattern along said overlapped area to



adapt said apparatus to the pressing of different types of jackets.

4,913,693

METHOD OF MANUFACTURING A TOP GUSSET BAG WITH INTEGRAL HANDLE

James R. Ball, Kent, and Delbert J. Barnard, Federal Way, both of Wash., assignors to Cello Bag Co., Tukwila, Wash.

Division of Ser. No. 278,785, Dec. 2, 1988, Pat. No. 4,874,255.
This application Jun. 29, 1989, Ser. No. 374,239
Int. Cl.[4] B31B *19/86*
U.S. Cl. 493—194 5 Claims

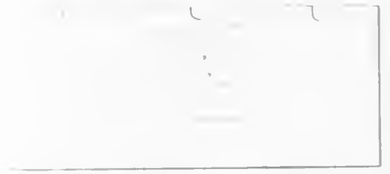
1. A method of manufacturing a plastic bag of a type having a handle located above a closed top, comprising:
providing a pair of substantially identical, generally rectangular, first and second panels of flexible thermoplastic material overlying one another and together presenting an upper boundary and a lower boundary;
providing a web of thermoplastic material which has parallel opposite edges;
folding the web of thermoplastic material on itself, to form two web sections joined by a bight, and to position the two edges near each other;
positioning the folded web between the two rectangular panels, with the bight of the folded web directed towards the lower boundary of the panels, and with the edges of the folded web spaced from the upper boundary of the panels a distance at least as large as the folded width of the web;
heat sealing an edge portion of each web section to an adjoining portion of the adjacent panel, to connect the web edge portions to the panels along web seal lines which extend parallel to the bight and edges of the web and also parallel to the upper and lower boundaries of the panels;
heat sealing the panels and folded web together along spaced apart side seal lines, extending parallel to each other and perpendicular to the bight and edges of the folded web and the upper and lower boundaries of the panels, to form bag side seals which connect together the two sections of the folded web and the adjoining portions of the two panels, in the region where the folded web is between the two panels, and which also connect the two panels together in the regions of the panels which extend between the bight of the folded web and the upper boundary of the panels; and
making the portion of the two panels that is located between the upper boundary of the panels and the web into a carrying handle.

4,913,694

METHOD FOR MANUFACTURING A PICTURE AND/OR TEXT CHANGING SLIDE

Gerrit Alphenaar, and Reindert Aafjes, both of Industrieweg 13, Wormerveer, Netherlands

Filed Jan. 11, 1989, Ser. No. 295,676
Claims priority, application Netherlands, Jan. 11, 1988, 8800051
Int. Cl.[4] G09F *7/10;* B65H *37/00*
U.S. Cl. 493—356 3 Claims



1. The method of manufacturing a picture and text changing slide comprising the steps of subdividing an elongated piece of rectangular planar material into three sections, said rectangular material having two side edges that are parallel to one another and also having upper and lower edges that are parallel to one another, a first one of said sections being defined between a first one of said side edges and a first fold line that extends between said upper and lower edges in parallel relation to said first side edge, a second one of said sections having substantially the same area as said first section and being defined between said first fold line and a second fold line that extends between said upper and lower edges parallel to and spaced from said first fold line, and a third one of said sections being defined between said second fold line and the second one of said side edges, forming a third fold line in said third section adjacent and parallel to said second fold line between said second fold line and said second side edge, forming a cut line in said third section adjacent and parallel to said third fold line between said third fold line and said second side edge, the opposing ends of said cut line being spaced from said upper and lower edges respectively, forming a group of spaced substantially parallel first incisions in said second section, each of said first incisions extending in a direction transverse to said side edges, severing said second section along a parting line passing through the ends of said first incisions closest to said second fold line whereby said parting line and said first incisions define a group of first elongated strips that are integral with said second section at the end of each strip closest to said first fold line and have free ends at the end of each strip closest to said second fold line, forming another group of spaced substantially parallel second incisions in said third section, each of said second incisions extending in a direction transverse to said side edges and being angularly inclined relative to the directions of extension of said first incisions, the portions of said third section between said second incisions defining a group of second elongated strips each of which has opposing ends integral with said third section, lifting the free ends of said first strips away from the plane of said second section and folding said third section onto said second section about said third fold line to insert said third section beneath said lifted first strips thereby to

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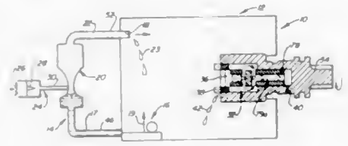
superpose said third section on said second section with the free end of each of said first strips being positioned adjacent to an edge of one of said second strips, refolding said third section relative to said second section about said second fold line to shift the position of said third section toward said first fold line thereby to push the free end of each of said first strips under one of said second strips, folding said first section about said first fold line onto the superposed second and third sections, attaching said first and second sections to one another adjacent said second fold line and outward of said cut line in said third section, and thereafter cutting away portions of said superposed first, second and third sections along lines that are generally parallel to said upper and lower edges and that intersect said cut line adjacent the opposing ends of said cut line to free said third section for movement between said first and second sections in a direction transverse to said upper and lower edges.

4,913,695

LIQUID VAPOR PURGING SYSTEM

Charles J. Gantzer, South Beloit, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 30, 1987, Ser. No. 139,613
Int. Cl.[4] B04B *1/16, 11/04, 7/04*
U.S. Cl. 494—2 14 Claims



1. A self-contained liquid vapor purging system for use in such electromotive means as integrated drive generators, or the like, which include casing means and rotatable shaft means extending into the casing means, comprising:

charge pump circuit means communicating with said casing means and including pump means for circulating liquid from the casing means and charging liquid back to the casing means;

aspirator means in the charge pump circuit means for mixing fresh air with the liquid for delivering an air-liquid mixture to the casing means; and

separator means on said rotatable shaft means for separating liquid and vapor, including vapor-liquid inlet means from the casing means to the separator means, liquid outlet means from the separator means to the casing means and vapor outlet means outside the casing means.

4,913,696

SUPPORT ARRANGEMENT FOR A TEMPERATURE SENSOR

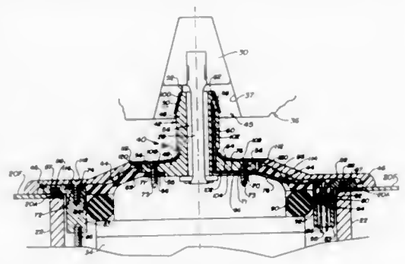
William A. Romanauskas, Southbury, and John F. Williams, New Canaan, both of Conn., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 135,449, Dec. 21, 1987. This application Aug. 4, 1988, Ser. No. 228,041
Int. Cl.[4] B04B *15/02*
U.S. Cl. 494—10 19 Claims

1. The centrifuge instrument having a chamber, a drive shaft projecting into the chamber, the drive shaft having an upper end having a predetermined configuration, the shaft being able to receive a rotor member in a mounted relationship thereon, the rotor member having a surface thereon and having a drive recess configured compatibly to the configuration of the upper end of the shaft, the improvement comprising:

a support member extending upwardly in the chamber the support member being generally tubular and being disposed in a coaxial surrounding relationship with the shaft, the support member having an upper end thereon that lies below the upper end of the shaft; and

a temperature sensor positioned at a predetermined location



along the support member such that, when a rotor is received on the shaft, the sensor is disposed proximally to the drive recess in a temperature sensing relationship with the surface of the rotor defining the drive recess.

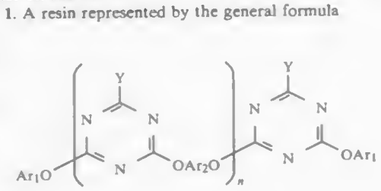
4,913,697

THERMOSETTING RESIN COMPOSITION FROM ALKENYLARYLOXY TRIAZINE

Yasuhisa Saito, Higashiosaka; Kunimasa Kamio, Suita; Shoichi Kanagawa, Niihama, and Yutaka Shiomi, Hirakata, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 45,431, May 4, 1987, Pat. No. 4,808,717. This application Dec. 8, 1988, Ser. No. 281,458
Claims priority, application Japan, Sep. 17, 1986, 61-218757; Sep. 19, 1986, 61-223455
Int. Cl.[4] C08G *63/38*
U.S. Cl. 528—205 2 Claims

1. A resin represented by the general formula



(1)

wherein, n denotes numbers of 0 to 15, Ar_1 denotes a monovalent alkenylphenol residue, Ar_2 denotes a divalent phenol residue, and Y denotes $—OAr_1$ or another substituent, at least 20% of said resin consisting of components having n values of at least 1.

4,913,698

AQUA-STREAM AND ASPIRATOR FOR BRAIN SURGERY

Haruhide Ito, Kanazawa, and Akihiro Kitamura, Ishikawa, both of Japan, assignors to Marui Ika Company, Limited, Tokyo, Japan

Filed Sep. 7, 1988, Ser. No. 241,423
Claims priority, application Japan, Oct. 26, 1987, 62-163367[U]; Mar. 2, 1988, 63-49220
Int. Cl.[4] A61B *17/20*
U.S. Cl. 604—22 6 Claims

1. An aqua-stream and aspirator for crushing and removing brain tumors in cerebral surgery, comprising:

(a) a pressure chamber;

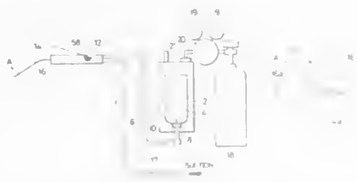
(b) a soft bottle filled with a sterilized saline solution and mounted within the pressure chamber;

(c) an irrigation tube connected at one end to an outlet of the soft bottle;

(d) an ejection needle removably connected to the other end of the irrigation tube via a switch for controlling passage of the solution through the irrigation tube; and

(e) a suction tube connected to the ejection needle and extending parallel to the ejection needle;

(f) the pressure chamber being pressurized with a harmless gas so as to compress the soft bottle to eject the solution in the soft bottle from the ejection needle;



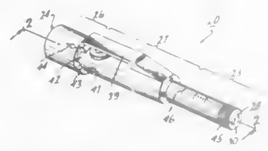
(g) the ejection needle having a bent nozzle means for outwardly directing the solution ejected from the nozzle means toward a confronting inside wall of a tip of the suction tube and for directing the ejected solution to intersect the longitudinal axis of the suction tube to thereby suck and crush brain tumor within the suction tube and to thereby permit the making of a small incision line in the brain tumor.

4,913,699

DISPOSABLE NEEDLELESS INJECTION SYSTEM

James S. Parsons, 23875 Longspur Ct., Laguna Niguel, Calif. 92677

Filed Mar. 14, 1988, Ser. No. 167,337
Int. Cl.[4] A61M *5/30*
U.S. Cl. 604—68 44 Claims



1. A method of administering a medication, comprising:

providing at least one needleless injector device having a barrel portion, a gas storage portion, and an intermediate portion extending between the barrel portion and the gas storage portion;

providing dose dispenser means for needleless loading of the injector device with medication withdrawn from a vial having a self-sealing lid;

attaching the dose dispenser means to the vial;

withdrawing a quantity of medication from the vial into the dose dispenser means;

coupling the dose dispenser means to the injector device;

loading a selected dosage from the dose dispenser means into the barrel portion of the injector device through an aperture in the barrel portion;

detaching the dose dispenser means from the injector device; and

operating the loaded injector device to eject the selected dosage from the injector device and thereby pass the selected dosage through the skin

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4,913,700

CULTURE AND TRANSPORT ASSEMBLY FOR PERCUTANEOUS ACCESS DEVICE

Adrian Kantrowitz, Pontiac, and Paul S. Freed, Bloomfield Hills, both of Mich., assignors to L. Vad Technology, Inc., Pontiac, Mich.

Continuation-in-part of Ser. No. 116,311, Apr. 11, 1987, Pat. No. 4,810,246. This application Oct. 21, 1988, Ser. No. 259,991
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—93 6 Claims

1. A culture and transport assembly for a PAD having a disk-like, horizontal base flange and a projection projecting vertically upwardly from the central portion of said base flange, said projection having an exterior surface adapted to have a coating of dermal cells cultured thereon and bonded to said surface,

said culture and transport assembly comprising a horizontal platform adapted to support said base flange of said PAD thereon, a culture well body having a bore extending upwardly into said body from the lower end of said body, said bore having a depth and diameter respectively greater than the height of said projection above said base flange and the maximum horizontal dimension of said projection, sealing means on the lower end of said body sealingly engageable with said base flange to seal the lower end of said bore to the upper surface of said base flange in peripherally spaced relationship to said projection to constitute said bore as a culture well enclosing said projection, retention means for detachably clamping said base flange between said sealing means and said platform, and passage means in said body for conducting fluid between said well and the exterior of said body while said sealing means is sealingly engaged with said base flange.

4,913,701

BALLOON CATHETER AND METHOD OF MANUFACTURING THE SAME

Allen J. Tower, N. Lawrence, N.Y., assignor to NuMed, Inc., Hopkinton, N.Y.

Filed Oct. 6, 1988, Ser. No. 254,198
Int. Cl.[4] A61M *29/02*
U.S. Cl. 604—103 7 Claims

1. A balloon catheter that includes an elongated cylindrical catheter body formed of polyethylene and having a distal end and a proximal end, said body further including a first reduced section having a smaller diameter than said body and a second further reduced section positioned adjacent to the first reduced section toward the distal end of said body, said second reduced section having a smaller diameter than the first reduced section, a thin walled balloon formed of thermosetting polyurethane having a central inflatable bag and two opposing end cuffs, one of said end cuffs being mounted over the second

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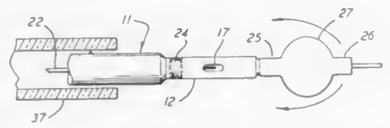
reduced section with the outer end face of said one end cuff facing a shoulder separating the first and second reduced sections, said other end cuff being mounted over the first reduced section with the outer end face of said other end cuff facing a second shoulder separating the first reduced section and said body so that the inflatable bag is everted over the said one end cuff to enclose the first reduced section, a first adhesive bond-



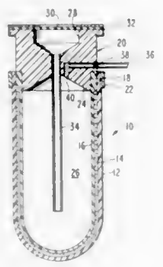
ing means for joining the end cuffs to the reduced sections and a second thermal bonding means formed by shrinkage of said cuffs and expansion of said catheter body section whereby the cuffs are double bonded to the catheter body; an inflation port formed in the wall of said first reduced section, and an air lumen mounted inside said body that is connected to the inflation port whereby the inflatable bag can be inflated and deflated.

4,913,702

FLUID IMBIBING PUMP WITH CATHETER

Su I. Yum, Los Altos, and Hans H. Balkie, Mountain View, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Aug. 15, 1988, Ser. No. 232,045
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—131 **9 Claims**



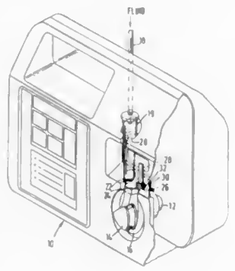
1. An agent dispenser comprising, in combination:
an outer, generally rigid casing at least a portion of which is a semipermeable membrane;
agent receiving means within said casing for receiving the agent to be dispensed;
a fluid imbibing means for forcing said agent from said agent receiving means;
a catheter; and
means for coupling the catheter to the agent receiving means with the catheter being in agent communication with the agent receiving portion of said agent receiving means, said coupling means including a resilient plug having an inner surface and provided with a recess extending into the plug from said surface thereof, said catheter extending through the plug and having an open end in agent communication with the recess, whereby the catheter can be filled as the agent receiving means is filled.

4,913,703

SAFETY INTERLOCK SYSTEM FOR MEDICAL FLUID PUMPS

Joseph Pasqualucci, and Frederick F. Schweitzer, both of Watertown, N.Y., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Sep. 30, 1987, Ser. No. 103,432
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—153 **9 Claims**



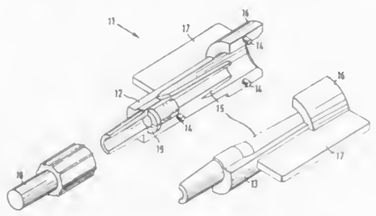
1. A medical fluid delivery system comprising;
a peristaltic pump and a corresponding fluid delivery set operatively mountable on said peristaltic pump,
a control means on said peristaltic pump for enabling operation of said peristaltic pump,
said control means including a means for detecting a predetermined alignment of at least a portion of said fluid delivery set on said peristaltic pump,
said control means enabling the operation of said peristaltic pump in response to the detection of said at least a portion of said fluid delivery set in the predetermined alignment on said peristaltic pump by said means for detecting,
said fluid delivery set including a magnetic field source mounted in a predetermined position on said fluid delivery set, and said
control means further including a magnetic field sensitive sensor located on said peristaltic pump for detecting said magnetic field source on said fluid delivery set.

4,913,704

DISPOSABLE INDWELLING CATHETER PLACEMENT UNIT INTO THE BLOOD VESSEL

Manehito Kurimoto, Iwata, Japan, assignor to Sherwood Medical Company, St. Louis, Mo.

Continuation of Ser. No. 937,161, Dec. 2, 1986, abandoned. This application Oct. 26, 1988, Ser. No. 263,979
Claims priority, application Japan, Dec. 6, 1985, 60-274573
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—171 **13 Claims**



5. A medical device, comprising:
a catheter having graduations spaced thereon from a distal end thereof, each of said graduations including an indica-

tion means thereon to indicate the distance from a graduation to said catheter distal end,
a tubular sheath telescoped over said catheter,
an insertion means slidably telescoped on said catheter for separating the sheath from said catheter responsive to movement of the catheter through said insertion means and for inserting said catheter to a selected depth from within said sheath into a blood vessel while maintaining sterility of said catheter until said catheter enters the blood vessel, and
a cannula having distal and proximal ends wherein said insertion means attaches to the proximal end thereof and the distal end of said cannula is inserted into a blood vessel to allow the catheter to pass from said insertion means into the blood vessel.

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4,913,705

DYEING A MIXED FIBRE FABRIC OF CELLULOSE/POLYACRYLONITRILE OF CELLULOSE/ACID-MODIFIED POLYESTER WITH A REACTIVE DYE AND A BASIC DYE

Bernhard Schlick, Basel, Switzerland, and Claudio Artico, Udine, Italy, assignors to Sandoz Ltd., Basel, Switzerland

Filed Sep. 2, 1988, Ser. No. 240,035
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, 3729769
Int. Cl.[4] D06P *3/82;* C09B *67/00*
U.S. Cl. 8—532 20 Claims

1. A process for dyeing a mixed fibre fabric of hydroxy-group-containing and cyano- and/or carboxy-group-containing fibres characterised by

(a) aftertreating the hydroxy-group-containing fibres of the fabric, which fibres have been dyed with a reactive dye, with a polymeric Product A which is the product of reacting a mono- or poly-functional amine having one or more primary and/or secondary and/or tertiary amino groups with cyanamide, dicyandiamide, guanidine or bisguanidine (in which up to 50 mole percent of the cyanamide, di-cyandiamide, guanidine or bisguanidine may be replaced by a dicarboxylic acid or mono- or di-ester thereof) whereby ammonia splits off, said Product A containing at least one free hydrogen atom linked to a nitrogen atom; and

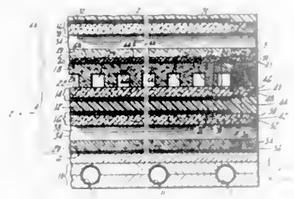
(b) dyeing the fabric, following aftertreatment with Product A, with a basic dyestuff.

4,913,706

METHOD FOR MAKING A SEAL STRUCTURE FOR AN ELECTROCHEMICAL CELL ASSEMBLY

Warren L. Luoma, Manchester, Conn.; Ronald G. Martin, Monson, Mass., and Richard D. Breault, Coventry, Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Filed Sep. 19, 1988, Ser. No. 246,246
Int. Cl.[4] H01M *8/00*
U.S. Cl. 29—623.5 11 Claims



1. A method for making an electrochemical cell assembly which includes a pair of adjacent gas porous plates having electrically and thermally conductive particles joined together leaving a void structure therebetween, the plates being joined together to form an integral structure that is electrically and thermally conductive and which includes a region that blocks the flow of reactant gas and electrolyte, which includes the steps of:

forming a first porous plate having electrically and thermally conductive particles which are joined together leaving a void structure therebetween, the first plate having a first surface which has a boundary defined by the particles;

forming a second porous plate having electrically and thermally conductive particles which are joined together leaving a void structure therebetween, the second plate having a second surface which has a boundary defined by the particles, the second surface being spaced from the first surface leaving a region therebetween;

disposing an intermediate layer between the plates such that the layer contacts the first surface of each plate, the intermediate layer consisting essentially of a binder and electrically and thermally conductive particles distributed throughout the binder, the intermediate layer having an initial concentration of particles in binder;

integrally joining the intermediate layer and the porous plates at a temperature and a pressure which forces the binder through the boundaries of the adjacent plates into the void structure and around particles in the adjacent plates to form a first layer of particles in binder in the first plate, to form a second layer of particles in binder in the second plate, and to form from the particles disposed in the intermediate binder layer a third layer of particles in binder disposed between the plates, the third layer having a first surface adjacent to the first surface of the first porous plate and a second surface adjacent to the second surface of the second porous plate;

cooling the plates and the third layer to a temperature which prevents separation of the porous plates and the intermediate layer while applying pressure to the assembly;

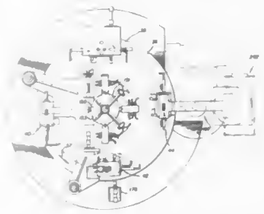
wherein the concentration of particles in binder in the third layer after cooling is at least twice the initial concentration of particles in binder in the intermediate layer which exists prior to the step of integrally joining the intermediate layer and the porous plates.

4,913,707

AUTOMATED ASSEMBLY APPARATUS

Pat F. Moreno, Roswell, Ga.; Robert H. Lewis, Cary, N.C.; Robert G. MacIvergan, Wilmington, N.C., and Harold B. King, Jr., Wrightsville Beach, N.C., assignors to General Electric Company, San Jose, Calif.

Filed Dec. 2, 1988, Ser. No. 270,006
Int. Cl.[4] G21C *21/00;* B23P *19/00*
U.S. Cl. 29—792 19 Claims



1. Automated apparatus for assembling nuclear fuel bundle spacers, said apparatus comprising, in combination:

A. an indexing table;

B. a plurality of identical ferrule fixtures affixed to said table in angularly spaced relation, each said ferrule fixture equipped to accept a pair of ferrules;

C. a ferrule loading station to which said ferrule fixtures are successively indexed by said table, said loading station operating to load a pair of ferrules onto the one of said ferrule fixtures thereat in a predetermined oriented relation;

D. a spring loading station to which said ferrule fixtures are successively indexed from said ferrule loading station by said table, said spring loading station operating to load a spring onto the one of said ferrule fixtures thereat in pre-assembled relation with the fixture mounted pair of ferrules;

E. a spring capturing station to which said ferrule fixtures are successively indexed from said spring loading station by said table, said spring capturing station operating to manipulate the ferrule pair and spring such as to produce a subassembly consisting of a pair of ferrules and a spring interlocked therewith in captive relation; and

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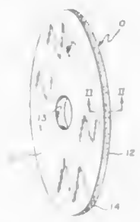
F. a spacer loading station to which said ferrule fixtures are successively indexed from said spring capturing station by said table, said spacer loading station operating to transfer said subassembly from the one of said ferrule fixtures thereat to a predetermined position in a spacer assembly fixture, said ferrule fixtures being successively indexed from said spacer loading station arount to said ferrule loading station by said table, the operations of said stations being performed substantially concurrently with regard to the one of said ferrule fixtures thereat.

4,913,708

GRINDING WHEEL

Paul W. Kalinowski, Boylston, Mass., assignor to Norton Company, Worcester, Mass.

Filed Nov. 18, 1988, Ser. No. 272,976
Int. Cl.[4] B24D *11/00*
U.S. Cl. 51—295 **15 Claims**



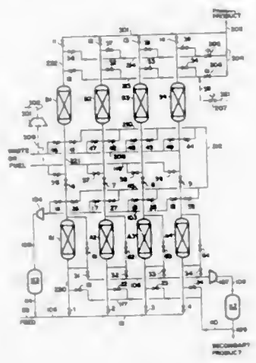
1. An abrasive product comprised of abrasive grains selected from the group consisting of aluminous and silicon carbide which are at least partially coated with a substance selected from the group consisting of magnesium oxide and manganese oxide, and an organic synthetic resin binder for said abrasive grains.

4,913,709

ADSORPTION PROCESS FOR RECOVERING TWO HIGH PURITY GAS PRODUCTS FROM MULTICOMPONENT GAS MIXTURES

Ravi Kumar, 991 N. Treeline Dr., Allentown, Pa. 18103

Filed Feb. 17, 1989, Ser. No. 312,146
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—26 **27 Claims**



1. In the separation of a multicomponent gas mixture by pressure swing adsorption to recover as individual products a primary key component and a secondary key component, wherein the secondary key component is more strongly adsorbed than the primary key component and there is present in the multicomponent gas mixture one or more minor tertiary components at low concentrations which are less strongly adsorbed than the secondary key component, by passing the multicomponent gas mixture in an adsorption step through a first bed of adsorbent selective for retention of the secondary key component, passing the effluent from said first bed through a second bed of adsorbent selective for the retention of the secondary key component and of the one or more minor tertiary components, withdrawing from said second bed a high purity product stream of the primary key component, and continuing said passing of the multicomponent gas mixture through the first and second beds for a predetermined time period or until the concentration of the secondary key component in the effluent from the first bed or the concentration of at least one of the tertiary components in said high-purity stream of said primary key component from the second bed reaches a predetermined level; the improvement comprising discontinuation of flow of the multicomponent gas mixture through said first and second beds at the end of said adsorption step and thereafter during a mutually extending time period:

(1) immediately following said discontinuation of flow through said first and second beds, depressurizing said first bed by withdrawing therefrom a gas stream comprising desorbed and void space gas;

(2) purging said first bed by passing therethrough a stream of the secondary key component whereby substantially all remaining primary key component and substantially all remaining tertiary components are displaced from said first bed and are withdrawn in a first purge effluent stream;

(3) evacuating said first bed by withdrawing therefrom a product stream comprising the secondary key component;

(4) depressurizing said second bed by withdrawing therefrom a gas stream comprising desorbed and void space gas; and

(5) purging said second bed by passing therethrough a stream of the primary key component whereby additional adsorbed components are desorbed and are withdrawn along with remaining void space gas in a second purge effluent stream; and thereafter following said mutually extending time period:

(6) pressurizing said first and second beds to a pressure up to the pressure of the adsorption step by passing a portion of said high purity product stream of primary key component into and through said second bed and passing pressurization effluent from said second bed into said first bed, whereby both beds are prepared for another cycle beginning with said adsorption step.

4,913,710

MODULAR COOLING TOWER

Francois R. Reverdy, Reisterstown, Md., assignor to Baltimore Aircoil Company, Inc., Jessup, Md.

Filed May 11, 1989, Ser. No. 350,257
Int. Cl.[4] B01D *47/06;* **B01F** *3/04*
U.S. Cl. 55—257.1 **22 Claims**

1. A modular cooling tower assembly comprising at least one cooling tower module, said cooling tower module comprising a frame in the form of a three-dimensional chamber having upper and lower horizontal members and vertical corner post members, drift eliminator means affixed within said frame at a level spaced below said upper horizontal member of said frame so as to provide an empty zone above said drift eliminator means, spray means affixed within said frame below said drift eliminator means, and fill means affixed within said frame below said spray means

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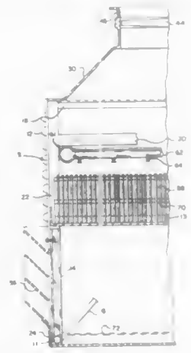
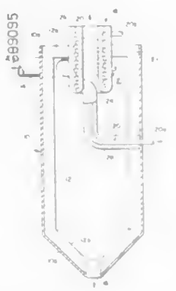


4,913,711

SPIRAL COIL COOL WALL CONSTRUCTION FOR HIGH TEMPERATURE CYLINDRICAL FURNACES, VESSELS, CYCLONES, ETC.

Robert D. Stewart, Verona, N.J., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.

Continuation of Ser. No. 399,095, Jul. 16, 1982, abandoned. This application May 25, 1984, Ser. No. 614,393
Int. Cl.[4] B01D *45/12*
U.S. Cl. 55—269 **5 Claims**



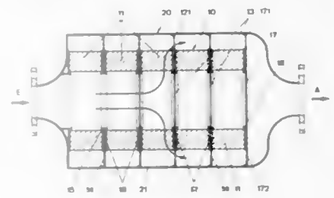
1. A vessel for separating entrained particles from a gas, comprising a metallic shell having a vertically extending axis, a circular cross section, and first and second openings in its upper end and its lower end, respectively; a refractory lining extending around said shell; a first tube formed into a first spiral coil extending between said shell and said lining; means for introducing a cooling fluid into said first tube; an inlet in communication with the interior of said shell and disposed in tangential relation to said shell so that said gas and entrained particles are discharged tangentially into the interior of said shell for separating said gases from said entrained particles by centrifugal forces said inlet being located in the upper portion of said shell so that the separated particles fall by gravity into the lower portion of said shell and discharge through said second opening; a second tube formed into a second spiral coil extending through said first opening for providing an outlet for the separated gas which rises into said upper portion by convection; a layer of insulation material surrounding said second spiral coil; means for introducing cooling fluid into said second spiral coil; and a first and second continuous fin extending from said first and second tubes, respectively, for the lengths of said tubes and welded to adjacent sections of said tubes to render said first and second spiral coils airtight.

4,913,712

FILTER FOR CLEANING EXHAUST GASES OF DIESEL ENGINES

Jean-Pierre Gabathuler, Schleitheim; Tiberiu Mizrah, Schaffhausen, both of Switzerland; Manfred Doll, Neustadt, and Harald Bressler, Westheim, both of Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Nov. 14, 1988, Ser. No. 271,060
Claims priority, application Switzerland, Nov. 18, 1987, 4505/87; Dec. 23, 1987, 5050/87
Int. Cl.[4] F01N *3/02*
U.S. Cl. 55—482 **14 Claims**



1 Filter for cleaning exhaust gases which comprises: a filter cup having an active filter section; an end plate made of gas-impermeable material as an insert in said filter cup; hollow cylindrical open-pore ceramic foam elements in said active filter section having a cylinder axis, wherein the exhaust gases flow through the active filter section essentially perpendicularly to the cylinder axis; said filter including at least two axially arranged ceramic foam cylinder elements; and a lamella between ceramic foam cylinder elements made of gas-impermeable material having at least approximately the same diameter as the ceramic foam cylinder elements and with at least one opening in the lamella spaced from the ceramic foam cylinder; a heat resisting packing flanking the lamella in the region of the ceramic foam cylinder elements to produce compressive force on said ceramic foam cylinder elements.

4,913,713

VERSATILE COUNTERTOP COOLER

Richard S. Bender, Canoga Park, and Lawrence Pleet, Bell Canyon, both of Calif., assignors to Riclar International, Encino, Calif.

Continuation-in-part of Ser. No. 333,090, Apr. 4, 1989, Pat. No. 4,866,945, which is a continuation of Ser. No. 238,827, Aug. 31, 1988, abandoned. This application Jun. 16, 1989, Ser. No. 367,467
Int. Cl.[4] F25B *21/02*
U.S. Cl. 62—3.61 **20 Claims**

1. A liquid chiller or countertop cooler for standard size water bottles or the like comprising:

an enclosed refrigeration case for removably receiving and closely enclosing a plastic water bottle approximately 6 inches wide, 12 inches deep, and 10 inches in height, said bottle having a dispensing spigot mounted at the lower front end thereof;

said case including a base, said enclosed case having a lower section fixed to said base and a fully removable top section including a portion covering more than one-half of the top of said bottle, and most of the front thereof, to permit placement of said bottle in said enclosed refrigeration case and to allow for the removal of said bottle therefrom;

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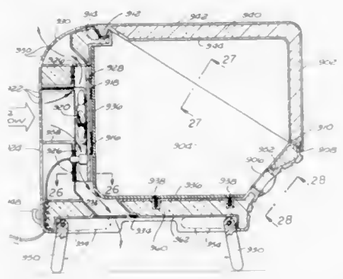
means for mounting said removable section in place to enclose said refrigeration case;

a thermally conductive metal member covering the inner rear of said case, and extending along at least a substantial portion of the inner rear of said case, and at least one adjacent inner wall of said refrigeration case, to cool said bottle by conduction;

thermoelectric cooling means mounted at the rear of said refrigeration case and in intimate thermal conductive relationship with said conductive metal member for cooling the water in said bottle;



said refrigeration case including a spigot receiving opening extending through the front wall of the lower fixed section thereof, whereby the bottle must be placed into said countertop cooler with the spigot being initially engaged through said opening before the remainder of the bottle can be placed into said cooler; and

means including downwardly extendable or foldable legs mounted under said base for varying the height of said countertop cooler from a relatively low height which will easily fit under kitchen cabinets to a higher elevation for greater convenience in filling tall receptacles.

4,913,714

AUTOMOTIVE AIR CONDITIONER

Kenji Ogura, Kariya; Takehito Mizutani, Oobu; Kiyoharu Kutsuna, Anjo, and Toshio Hirata, Ichinomiya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 2, 1988, Ser. No. 227,331

Claims priority, application Japan, Aug. 3, 1987, 62-193911; Sep. 1, 1987, 62-218547

Int. Cl.[4] F25B *1/00*

U.S. Cl. 62—149 7 Claims

1. An automotive air conditioner comprising:

a compressor for compressing a coolant containing a plurality of groups of coolant having different boiling points,

a condenser for condensing the coolant discharged from said compressor,

an expansion means for expanding the coolant condensed in said condenser,

an evaporator for evaporating the coolant from said expansion means, and

a rectifying circuit in which a first end thereof is connected to a portion between said condenser and said expansion means and a second end thereof is connected to a portion between said evaporator and said compressor,

wherein said rectifying circuit comprises:

a controlling valve for controlling whether the coolant flows through said rectifying circuit ,

a first pressure reducing means for reducing a pressure of the coolant introduced into said rectifying circuit,

a rectifying means for rectifying the coolant introduced from said first pressure reducing means,

a second pressure reducing means for reducing a pressure of a liquid phased coolant rectified by said rectifying means,

a heat exchanger for exchanging heat between the coolant introduced from said second pressure reducing means and a gas phased coolant rectified by said rectifying means, and

an opening area of at least one of said first pressure reducing means and said second pressure reducing means is varied in accordance with a condition of coolant downstream of said heat exchanger for controlling an amount of the cooling passing through said rectifying means.

4,913,715

METHOD OF MANUFACTURING AN OPTICAL FIBER HAVING A PROTECTIVE COATING

Cornelis M. G. Jochem, and Jacobus W. C. Van Der Ligt, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 948,469, Dec. 29, 1986, abandoned, which is a continuation of Ser. No. 679,329, Dec. 7, 1984, abandoned. This application Dec. 8, 1988, Ser. No. 283,003

Claims priority, application Netherlands, Sep. 13, 1984, 8402799

Int. Cl.[4] C03B *37/023*

U.S. Cl. 65—3.11 17 Claims

1. A method of manufacturing an optical fiber with a protective coating, said method comprising the steps of:

providing a hot preform;

drawing a hot optical fiber from the end of said hot preform;

passing the hot fiber through the space enclosed by a hollow cooling tube comprising means for providing an atmosphere of a heat-conductive gas in the space enclosed by the hollow tube and a second tube surrounding the inner tube having means for cooling the inner tube with a coolant, said tube having ends containing apertures and being heat-conductive;

cooling the tube using a non-cryogenic coolant;

flowing a heat-conductive gas through the space enclosed by the cooling tube so as to cool and conduct heat from the fiber sufficient to permit coating of the cooled fiber with a coating material, a substantial amount of the heat being removed by conducting heat from the fiber to the tube by the heat-conductive gas; the gas flow being at least that flow that is sufficient to prevent the penetration of the surrounding atmosphere through the apertures of the ends of said cooling tube and to compensate for loss of gas through said end apertures by less than the flow that prevents the heat-conductive gas from conducting heat to the wall of the tube; and

coating the cooled fiber with a protective coating.

4. The combination of a molten glass press of the type in which a series of molds are moved into and out of a pressing station where a pressing plunger is vertically reciprocated on a vertical axis of the press toward and away from the mold at the station, and apparatus for changing the plunger on said press, comprising a dual plunger handler, carriage means for supporting the handler for borizontal movement into and out of position adjacent the pressing station on said press, plunger supporting means on said handler for supporting a pair of plungers on opposite sides of a vertical axis, means on said carriage for raising and lowering said handler, horizontal guide means for supporting said carriage, said guide means extending from adjacent the vertical axis of the press to a remote position, means connected to said carriage for reciprocating the carriage on the guide means to move the handler and plunger supporting means in one direction into position to receive the plunger and in the opposite direction for carrying the plunger away from the press to the remote position.

4,913,716

PLUNGER CHANGE APPARATUS AND METHOD

Scott E. Raether, Dublin, Ohio, assignor to Ol-Neg TV Products, Inc., Toledo, Ohio

Filed Apr. 28, 1989, Ser. No. 344,795

Int. Cl.[4] C03B *11/02, 11/06*

U.S. Cl. 65—27 11 Claims

1. The method of changing an old plunger for a new plunger on a molten glass forming press of the type where a pressing plunger is moved downward into a mold containing molten glass which is positioned in vertical alignment with the pressing plunger of the press, comprising the steps of positioning a two-plunger supporting means adjacent the press at one side thereof, placing a new plunger on one half of the plunger supporting means, moving the plunger supporting means into position where the other half of the plunger supporting means is in vertical alignment with the old plunger on the press, releasing the old plunger from the press onto the plunger supporting means, moving the plunger supporting means away from the press with both the old and new plunger supported thereby, rotating the plunger supporting means about a vertical axis to exchange the positions of the old and new plungers, moving the plunger supporting means back into alignment with the press where the new plunger is in alignment with the press, attaching the new plunger to the press, moving the plunger supporting means away from the press until the supporting means is clear of the press, and then removing the old plunger from the plunger supporting means.

4,913,717

METHOD FOR FABRICATING BURIED WAVEGUIDES

Alfred R. Cooper, Cleveland, Ohio, assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 23, 1989, Ser. No. 300,571

Int. Cl.[4] C03C *21/00*

U.S. Cl. 65—30.13 4 Claims

1. A method for fabricating buried waveguides in a multicomponent glass containing sodium ions, said method comprising the steps of:

masking the surface of the substrate over the widthwise boundaries of the waveguide;

placing the surface of the masked substrate in contact with a molten salt containing silver ions while maintaining the temperature of the substrate and salt below 250° C.;

applying an electric field across the substrate at a voltage within the range from 50 to a few hundred volts/mm to exchange silver ions in the molten salt for sodium ions in the glass substrate to raise the index or refraction of the unmasked region of the substrate depthwise to form the waveguide while minimizing the reduction of silver so that the absorption of the waveguide is lower than it would otherwise be if the temperature were above 250° C.;

immersing the masked substrate in a second molten salt containing a low index ion whose mobility is lower than that of the silver ion in the substrate glass while maintaining the substrate and second molten salt below a temperature of 250° C.; and

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applying an electric field across the substrate to drive the silver ions further into the substrate while exchanging the low index ion for sodium to thereby bury the waveguide in the substrate to minimize scattering losses.

4,913,718

MOLDING METHOD FOR OPTICAL ELEMENT AND APPARATUS THEREFOR

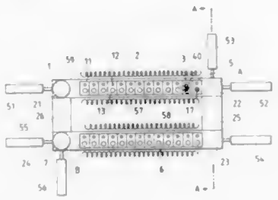
Fumitaka Yoshimura; Tomomasa Nakano, both of Yokohama, and Isamu Shigyo, Chiba, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1988, Ser. No. 272,321

Claims priority, application Japan, Nov. 20, 1987, 62-292156; Dec. 26, 1987, 62-330471; Dec. 26, 1987, 62-330472; Jan. 18, 1988, 63-006922; Jan. 18, 1988, 63-006923; Jan. 18, 1988, 63-006924; Jan. 18, 1988, 63-003816[U]; Feb. 4, 1988, 63-022876; Feb. 4, 1988, 63-022877

Int. Cl.[4] C03B *23/00*

U.S. Cl. 65—104 18 Claims



1. A glass press molding system, comprising:
a molding die for molding glass material, said die having an upper mold die and a lower mold die;
heating means for heating the glass material and the molding die;
pressurizing means for pressurizing the glass material in said mold;
a plurality of pallets for supporting the glass material and said mold die, said glass material and mold die being separately located on the pallet;
transporting means for successively transporting said pallets each supporting said glass material and said mold die; and
transferring means located between said heating means and said pressurizing means for transferring said glass material into said molding die prior to a pressing operation by said pressurizing means, wherein said glass material heated to a predetermined temperature by said heating means is transferred between said upper and lower mold dies and each pallet with the glass material inserted in the mold die is supplied to said pressurizing means.

11. Method for measuring a temperature of a glass press molding process comprising:
placing a glass material and a molding die onto a pallet;
transferring said pallet into a heating process;
heating said pallet to a predetermined temperature;
measuring the temperature of said molding die and said glass material, said temperature of said molding die and said glass material being respectively transmitted to thermal detection terminals provided on said pallet through a thermal transmitting path;
terminating said heating step when said detected temperature reaches the predetermined temperature;
transferring said glass material and said molding die to a pressurizing portion for molding said glass material into a molded article.

4,913,719

METHOD AND APPARATUS FOR FORMING MICROPIPETTE OF CONTROLLED CONFIGURATION BY SELECTING THE PATTERN OF HEAT APPLICATION

Dale G. Flaming, 2165-G Francisco Blvd., San Rafael, Calif. 94901

Continuation-in-part of Ser. No. 342,177, Apr. 24, 1989, Pat. No. 4,869,745. This application Jul. 10, 1989, Ser. No. 377,045

Int. Cl.[4] C03B *23/11*

U.S. Cl. 65—105 4 Claims

1. A micropipette puller comprising:
a pair of gripping members for gripping a length of glass tubing at spaced points along the length thereof;
means for applying pulling forces to separate said gripping means;
a laser device for directing a laser beam; and
a lens system capable of transmitting therefrom a beam of selected size and configuration, said lens being disposed to refract said laser beam against a predetermined length of said tubing between said spaced points.

3. The method of pulling micropipettes comprising the steps of:
providing means for gripping a length of glass tubing at spaced points along the length thereof and applying forces to pull said gripping means apart;
providing a laser device for directing a laser beam;
providing an assembly of a plurality of lenses, each capable of refracting a laser beam therefrom of a selected length; and
positioning said assembly so that a selected one of said lenses receives a laser beam from said laser device and refracts it against a predetermined length of said tubing.

4,913,720

GLASS SHEET MODULATED QUENCHING

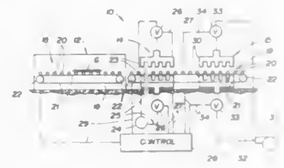
Robert Gardon, Farmington Hills, Mich.; Alejandro G. Bueno, Whitehouse, and Donivan M. Shetterly, Toledo, both of Ohio, assignors to Glasstech, Inc., Perrysburg, Ohio

Filed Sep. 29, 1988, Ser. No. 251,194

Int. Cl.[4] C03B *27/04*

U.S. Cl. 65—114 4 Claims

1. A method for tempering a glass sheet heated to tempering temperature, the method comprising:
initially conveying the heated glass sheet through a first cooling station that cools the oppositely facing surfaces of the glass sheet with a first rate of heat transfer for a finite time to cool the surfaces below the strain point without cooling the center of the glass sheet below the strain point; and
thereafter conveying the glass sheet through a second cooling station that cools the oppositely facing surfaces of the glass sheet at a second rate of heat transfer less than the first rate to cool the center of the glass sheet below the strain point and further cool the surfaces, the second rate of heat transfer at the second station being of a magnitude such that the surface temperature initially increases without going substantially above the strain point prior to



subsequently cooling, whereby the glass sheet upon ultimate cooling to ambient temperature has surface compression and center tension that cannot be achieved with conventional tempering at a uniform rate of cooling.

4,913,721

FUNGICIDES

John M. Clough, Marlow, and Christopher R. A. Godfrey, Bracknell, both of England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 893,272, Aug. 5, 1986, Pat. No. 4,802,913. This application Oct. 31, 1988, Ser. No. 264,874

Claims priority, application United Kingdom, Aug. 22, 1985, 8521082

Int. Cl.[4] A01N *37/10*; C07C *69/618*

U.S. Cl. 71—76 7 Claims

1. A compound having the formula (I):

and steroisomers thereof, wherein V and Z are independently oxygen or sulphur; X is hydrogen, C_{1-4} alkyl, C_{3-4} alkenyl, halogen, phenyl, naphthyl, pyridyl, pyrimidinyl, benzyl, phenoxy, benzyloxy, pyridyloxy, furyl, thienyl, benzothienyl or pyrrolyl, each aryl or heteroaryl moiety being optionally substituted with one or more of halogen, C_{1-4} alkyl, C_{1-4} alkoxy or halo(C_{1-4})alkyl; and Y is hydrogen or halogen, or X and Y together, when they are in adjacent positions on the phenyl ring, form a fused benzene ring.

7. A method of regulating plant growth which comprises applying to a plant, to a seed of a plant, or to the locus of the plant or seed, an effective amount of a compound as claimed in claim 1.

4,913,722

IMINOPHENYLTHIAZOLIDINES, PROCESS OF PREPARATION AND METHOD OF USE

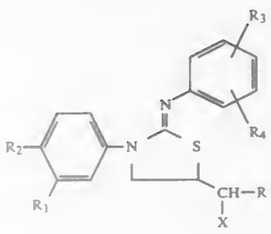
Raymond A. Felix, Richmond; Jeffery T. Springer, LaHonda; Eugene G. Teach, El Cerrito, and Frank X. Woolard, Berkeley, all of Calif., assignors to ICI Americas Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 126,133, Nov. 17, 1987, abandoned, which is a continuation-in-part of Ser. No. 941,404, Dec. 15, 1986, abandoned. This application Nov. 15, 1988, Ser. No. 269,819

Int. Cl.[4] C07D *277/18*; A01N *43/78*

U.S. Cl. 71—90 21 Claims

1. A compound having the formula



wherein
R is hydrogen or methyl;
R_1 is halo, nitro, cyano, C_1–C_4alkyl, C_1–C_4 alkoxy, perhalomethyl, difluoromethyl, pentafluoroethyl, trifluoromethylthio, difluoromethoxy, trifluoromethoxy, tetrafluoroethoxy, methylsulfonyl, C_1–C_4 alkyloxyiminomethyl, benzyloxyiminomethyl, 1-(C_1–C_4 alkyl)oxyiminoethyl or 1-benzyloxyiminoethyl;
R_2 is hydrogen or halo;
R_3 and R_4 are independently hydrogen, halo, nitro, cyano, C_1–C_4 haloalkyl, C_1–C_4 alkyl, C_1–C_4 fluoroalkoxy, C_1–C_4 alkoxy or C_1–C_4 alkylthio; and
X is hydrogen or halogen.

4,913,723

9-ARYLIMINO-8 THIA-1,6-DUZAFUCYCLO[4.3.0] NOMANE-7-ONE (AND THIONE) HERBICIDES

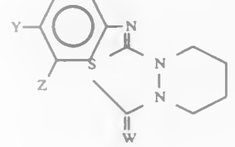
Jun H. Chang, Princeton Junction, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Aug. 8, 1988, Ser. No. 229,585

Int. Cl.[4] C07O *513/04*; A01N *43/82*

U.S. Cl. 71—90 10 Claims

1. A herbicidal compound of the formula



in which
W is S or O;
X is hydrogen, halogen, lower alkyl, halo lower alkyl, lower alkoxy, or nitro;
Y is hydrogen, halogen, lower alkyl, lower alkoxy, halo lower alkyl, halo lower alkylsulfinyl, or halo lower alkoxy;
Z is a substituent of the formula —C(R)═Q in which
R is hydrogen, lower alkyl, or unsubstituted or substituted phenyl;
Q is NR′ or oxygen, with the proviso that when R is unsubstituted or substituted phenyl Q is not oxygen;
R′ is lower alkoxy, hydroxy, lower alkenyloxy, lower alkynyloxy, lower alkylcarbonyloxy, unsubstituted or substituted phenyl carbonyloxy, lower trialkylsilyloxy, phenyl lower alkoxy in which the phenyl is unsubstituted or substituted, unsubstituted or substituted phenyl, lower alkyl, cycloalkyl of 3 to 7 carbon atoms, or a group of the formula —SO_2R″, —OCO_2R″, —OC(O)NHR″, or —CH_2CO_2R″;
R″ is lower alkyl, or unsubstituted or substituted phenyl; and
the substituents on the phenyl rings are independently se-

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lected from halogen, lower alkyl, halo lower alkyl, lower alkoxy, halo lower alkoxy, nitro, and cyano.

4,913,724

HERBICIDAL TETRAZOLINONES

Kathleen M. Poss, Lawrenceville, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Apr. 14, 1989, Ser. No. 338,029

Int. Cl.[4] C07D *257/04*; A01N *43/64*

U.S. Cl. 71—92 **36 Claims**

1. A herbicidal compound which is a Q-substituted 1-phenyl-4-substituted-1,4-dihydro-5H-tetrazol-5-one in which the Q-substituent is bonded to the ring-carbon atom at the 5-position of the phenyl group and in which:

Q is $-CH(R^2)C(R^3)(R^4)Q'$ or $-C(R^2)=C(R^4)Q'$;

R^2 and R^3 are each, independently, hydrogen, alkyl, or halogen; and

R^4 is hydrogen or lower alky!;

said compound being: (a) a carboxylic acid in which Q' is COOH or (b) a salt, ester, amide, or nitrile of said carboxylic acid, said compound being one whose 5-methoxy analog and 5-propargyloxy analog are herbicides.

13. A herbicidal composition comprising a herbicidally effective amount of the compound of claim 1 in admixture with a suitable carrier.

14. A method for controlling undesired plant growth which comprises applying to the locus where control is desired a herbicidally effective amount of the composition of claim 13.

4,913,725

GRANULAR FERTILIZER COMPOSITIONS

Akira Nishikawa, and Hironichi Oshio, both of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 18, 1987, Ser. No. 50,453

Claims priority, application Japan, May 16, 1986, 61-113402; Jun. 11, 1986, 61-135591

Int. Cl.[4] A01N *43/653*

U.S. Cl. 71—92 **5 Claims**

1. A granular fertilizer composition which comprises a granular fertilizer coated with a mixture of triethylene glycol and a plant growth regulator selected from the group consisting of (E)-1-(4-chlorophenyl)-4,4-dimethyl-2-(1,2,4-triazol-1-yl)-1-penten-3-ol or a salt thereof, (E)-1-cyclohexyl-4,4-dimethyl-2-(1,2,4-triazol-1-yl)-1-penten-3-ol or a salt thereof or 1-(4-chlorophenyl)-4,4-dimethyl-2-(1,2,4-triazol-1-yl)-penten-3-ol or a salt thereof, wherein the amount of plant growth regulator is 0.001% by weight of the fertilizer and that of triethylene glycol is 0.1–5% by weight of the fertilizer.

4,913,726

HERBICIDAL SULFONAMIDES

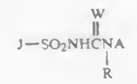
George Levitt, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 114,584, Oct. 30, 1987, Pat. No. 4,786,311, which is a continuation-in-part of Ser. No. 934,118, Nov. 24, 1986, Pat. No. 4,746,353, which is a continuation-in-part of Ser. No. 849,618, Apr. 11, 1986, abandoned, which is a continuation-in-part of Ser. No. 739,214, May 30, 1985, abandoned. This application Aug. 31, 1988, Ser. No. 238,781

Int. Cl.[4] C07D *401/12, 401/06, 401/14*; A01N *43/40*

U.S. Cl. 71—92 **57 Claims**

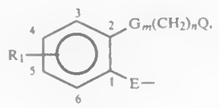
1. A compound of the formula:



1

wherein

J is



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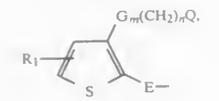

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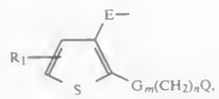

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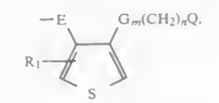

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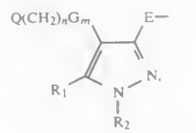

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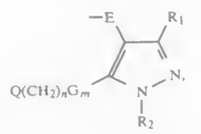

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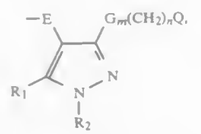
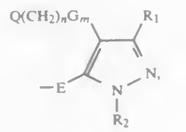


J-7



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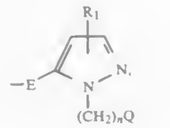

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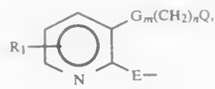
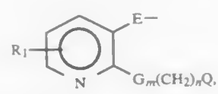


J-10



J-11

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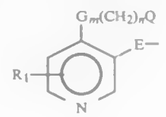
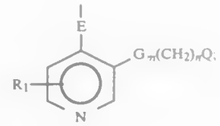


J-12

or



J-13

W is O or NH_X;

R_X is H, OH, C_1–C_3 alkyl, C_1–C_3 alkoxy, allyloxy, propargyloxy, C_1–C_3 haloalkyl, C_1–C_3 haloalkoxy or NR_YR_Z;

R_Y is H or C_1–C_3 alkyl;

R_Z is C_1–C_3 alkyl;

G is O, S, SO or SO_2;

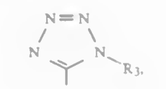
m is 0 or 1;

n is 0, 1 or 2;

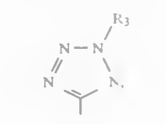
R is H or CH_3;

E is a single bond, CH_2 or O.

Q is



Q-1



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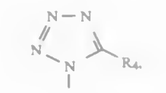

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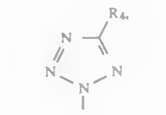

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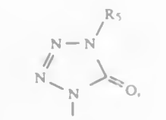

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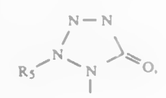

Q-6

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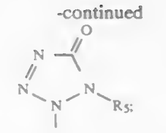


Q-7

R_1 is H, C_1–C_3 alkyl, C_1–C_3 haloalkyl, halogen, nitro, C_1–C_3 alkoxy, $SO_2NR_aR_b$, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, CN, SCN, CO_2R_c, C_1–C_3 haloalkoxy, C_1–C_3 haloalkylthio, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino or C_1–C_2 alkyl substituted with C_1–C_2 alkoxy, C_1–C_2 haloalkoxy, C_1–C_2 alkylthio, C_1–C_2 haloalkylthio or CN;

R_2 is H, C_1–C_3 alkyl, allyl or phenyl;

R_3 is H, C_1–C_6 alkyl, C_3–C_6 cycloalkyl, C_1–C_6 haloalkyl, CH_2—(C_2–C_5 alkenyl), CH_2(C_2–C_5 haloalkenyl), CH_2(C_2–C_5 alkynyl), CH_2(C_2–C_5 haloalkynyl), C_6H_5 or C_1–C_4 alkyl substituted with C_1–C_2 alkoxy, C_1–C_2 alkylthio, C_1–C_2 alkylsulfinyl or C_1–C_2 alkylsulfonyl;

R_4 is H, halogen, C_1–C_6 alkyl, C_3–C_6 cycloalkyl, C_1–C_6 haloalkyl, C_2–C_6 alkenyl, C_2–C_6 haloalkenyl, C_2–C_6 alkynyl, C_3–C_6 haloalkynyl, C_6H_5, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfinyl, C_1–C_4 alkylsulfonyl, OCH_2CH_2O—(C_1–C_2 alkyl) or di(C_1–C_3 alkyl)amino;

R_5 is H, C_1–C_3 alkyl, C_1–C_3 haloalkyl, allyl or propargyl;

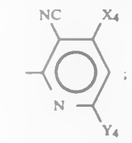
R_a is H, C_1–C_4 alkyl, C_2–C_3 cyanoalkyl, methoxy or ethoxy;

R_b is H, C_1–C_4 alkyl or C_3–C_4 alkenyl; or

R_a and R_b may be taken together as —$(CH_2)_3$—, —$(CH_2)_4$—, —$(CH_2)_5$— or —$CH_2CH_2OCH_2CH_2$—;

R_c is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_2–C_4 haloalkyl, C_1–C_2 cyanoalkyl, C_5–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl or C_2–C_4 alkoxyalkyl;

A is



A-7

X_4 is CH_3, OCH_3, OC_2H_5, CH_2OCH_3 or OCl; and

Y_4 is CH_3, OCH_3; OC_2H_5 or Cl.

and their agriculturally suitable salts; provided that

(a) when J is J-9 and n is 0, then Q is Q-1 or Q-2;

(b) when E is 0, then J is J-1;

(c) X_4 and Y_4 cannot simultaneously be Cl;

(d) when J is J-1 and m is 0, then n is 0; and

(e) when n is 0 and m is 1, then Q is Q-1 or Q2.

48. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

4,913,727

FUNGICIDAL AND PLANT GROWTH-REGULATING AZOLYLMETHYL-CYCLOPROPYL DERIVATIVES

Klaus Stroech, Solingen; Wilhelm Brandes, Leichlingen, and Stefan Dutzmann, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 14, 1988, Ser. No. 206,403

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1987, 3720755; Apr. 19, 1988, 3812967

Int. Cl.[4] A01N *43/653*; C07D *249/08*

U.S. Cl. 71—92 **10 Claims**

1. An azolymethyl-cyclopropyl derivative of the formula

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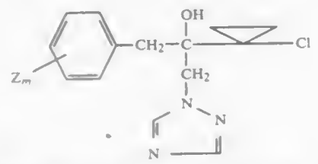


in which
Z represents fluorine, chlorine, bromine, methyl, ethyl, isopropyl, tert.-butyl, methoxy, methylthio, trifluoromethyl, trifluoromethoxy, trifluoromethylthio or phenyl which is optionally substituted by fluorine, chlorine and/or methyl, or represents phenoxy which is optionally substituted by fluorine, chlorine and/or methyl and
m represents the number 0, 1, 2 or 3,
or an additional product thereof with an acid or metal salt.

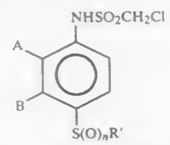
4,913,728

SUBSTITUTED-4-ALKYLTHIOALKANE-SULFONANILIDES AND OPERATIVES

Sharon L. Ruffing, Oakdale, and James R. Throckmorton, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 223,112, Jan. 7, 1981, abandoned, which is a continuation-in-part of Ser. No. 7,036, Jan. 29, 1979, abandoned. This application Nov. 21, 1983, Ser. No. 553,874
Int. Cl.[4] A01N *41/06*
U.S. Cl. 71—103 4 Claims

1. A compound of the formula



wherein R' is an alkyl group containing from 1 to 2 carbon atoms, A is chlorine or bromine, B is hydrogen or chlorine or an n is 0–2 and agriculturally acceptable salts thereof.

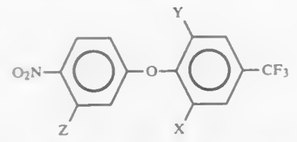
4,913,729

HERBICIDAL 4-TRIFLUOROMETHYL-3'-SUBSTITUTED AMINE-4'-NITRO DIPHENYL ETHERS

Colin Swithenbank, Perkasie, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 544,050, Oct. 24, 1983, which is a continuation-in-part of Ser. No. 312,453, Oct. 19, 1981, Pat. No. 4,419,124. This application Jun. 3, 1987, Ser. No. 57,674
Int. Cl.[4] A01N *37/34*
U.S. Cl. 71—105 16 Claims

1. A compound of the formula



wherein X is a hydrogen, fluoro, chloro, bromo, trifluoromethyl or cyano group; Y is a hydrogen, fluoro, chloro or bromo atom; and Z is NH—R_1–R_2 wherein R^1 is a (C_2–C_5-)alkylene, which may be optionally substituted with methyl groups, and R^2 is a carb-(C_1–C_4)alkoxy, a carboxy or an agronomically acceptable salt thereof or a cyano group.

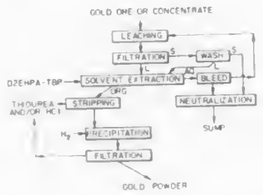
13. A herbicidal composition comprising a herbicidally effective amount of the compound of claim 1 and an agronomically acceptable carrier.

4,913,730

RECOVERY OF GOLD FROM AQUEOUS SOLUTIONS

Guy Deschenes, Hull, and Gordon M. Ritcey, Nepean, both of Canada, assignors to Canadian Patents and Development Ltd., Ottawa, Canada

Filed May 4, 1988, Ser. No. 190,244
Claims priority, application Canada, May 15, 1987, 537316
Int. Cl.[4] C22B *11/08*
U.S. Cl. 75—370 17 Claims



1. A process for recovering gold from aqueous solutions containing gold and a thiourea or a thiosulfate solubilizing reagent, optionally with HCL; comprising:
(a) contacting the aqueous gold solution with hydrogen by sparging or under pressures, with conditions selected so that the gold precipitates, and
(b) recovering the gold precipitate.

4,913,731

PROCESS OF MAKING PREALLOYED TUNGSTEN ALLOY POWDERS

Nelson E. Kopatz, Sayre, Pa.; Walter A. Johnson, Houghton, Mich., and Joseph E. Ritsko, Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Oct. 3, 1988, Ser. No. 252,411
Int. Cl.[4] B22F *9/24*
U.S. Cl. 75—346 19 Claims

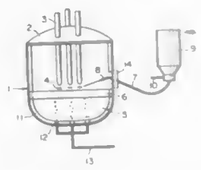
1. A process comprising:
(a) forming an aqueous solution of ammonium metatungstate wherein the tungsten content constitutes from about 70% to about 98% by weight of the total metal content in the solution and the balance is a second metal component wherein the second metal is selected from the group consisting of water soluble salts, nickel, iron, copper and mixtures thereof,
(b) forming a reducible solid material from said aqueous solution,
(c) reducing said solid material to form metallic powder particles,
(d) entraining at least a portion of said powder particles in a carrier gas to form a mixture,
(e) feeding the resulting entrained particles and gas mixture into a high temperature zone and retaining the particles in the zone for a sufficient time to achieve a temperature in the particles of between the melting point of the second metal component and the boiling point of the lowest boiling metal in the second metal component to form partially molten droplets and
(f) cooling such droplets to form a powdered tungsten heavy alloy having a continuous phase of an alloy of tungsten and the second metal component and a discontinuous tungsten phase containing individual tungsten grains and wherein in the alloy, tungsten constitutes from about 70% to about 98% by weight of the alloy and the balance is the second metal component.

4,913,732

METHOD FOR SMELTING REDUCTION IN ELECTRIC FURNACE

Haruo Miyano; Atsushi Watanabe, and Yukio Hongo, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Mar. 28, 1989, Ser. No. 329,675
Claims priority, application Japan, May 19, 1988, 63-123241; Sep. 30, 1988, 63-246479
Int. Cl.[4] C22B *4/00*
U.S. Cl. 75—10.46 10 Claims



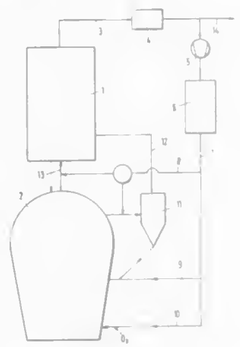
1. A method for smelting reduction of a solid-state material in an electric furnace having electrodes therein, comprising the steps of:
forming an arc between each electrode of the electric furnace and molten metal in the electric furnace;
charging a reducing agent into the electric furnace in which the arc is formed;
blowing inert gas into the molten metal in the electric furnace through gas blowing nozzles arranged in the hearth of the electric furnace, said blown-in inert gas stirring the molten metal in the furnace; and
feeding a solid-state powdery material ore, as a starting material, to an area in the furnace in which the arc is formed.

4,913,733

PROCESS FOR PRODUCING PIG IRON

Rolf Hauk, Düsseldorf, Fed. Rep. of Germany, assignor to Korf Engineering GmbH (now Deutsche Voest-Alpine Industrieanlagenbau GmbH), Duesseldorf, Fed. Rep. of Germany and Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Oct. 17, 1989, Ser. No. 788,621
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1984, 3438487
Int. Cl.[4] C21B *11/00*
U.S. Cl. 75—491 6 Claims



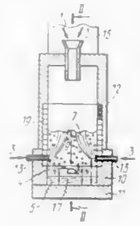
1. In a process for producing pig iron in which iron ore is reduced in a reduction shaft furnace issuing a top gas containing CO_2 and a sponge iron obtained as a result thereof is subsequently passed through a fluidized bed formed within a melt-down gasifier above an O_2 tuyere, a gas and a carbon carrier being introduced into said melt-down gasifier, and a reducing gas produced in said melt-down gasifier being introduced as the reducing gas into said reduction shaft furnace; the improvement comprising the steps of compressing and at least partially scrubbing the CO_2 from the top gas issuing from said reduction shaft furnace, and then introducing at least a portion of this scrubbed and compressed top gas into the melt-down gasifier at about half the height of said fluidized bed.

4,913,734

METHOD FOR PREPARING FERROCARBON INTERMEDIATE PRODUCT FOR USE IN STEEL MANUFACTURE AND FURNACE FOR REALIZATION THEREOF

Vladimir A. Romenets; Alexandr B. Usachev, both of Moscow; Alexei A. Ugarov, Belgorodskaya; Valentin P. Bystrov, Moscow; Valery S. Valavin, Moscow; Vasily R. Grebennikov, Moscow; Anatoly B. Glovataky, Moscow; Gennady L. Guraky, Moscow; Dmitry I. Ryzhonkov, Moscow; Alexandr D. Vaskevich, Moscow; Valentina M. Chizhikova, Moscow; Alexandr D. Yatsenko-Zhuk, Moscow; Vladimir G. Guglya, Moscow; Alexandr M. Pozhivanov, Lipetsk; Evgeny F. Vegman, Moscow; Nikolai A. Tulin, Moscow; Stanislav V. Kremenevsky, Moscow, all of U.S.S.R., and Andrei V. Vanjukov, deceased, late of Moscow, U.S.S.R. (by Ruf A. Berkman, Anna A. Pedos, Natalya A. Vanjukova, Administrators), assignors to Moskovsky Institut Stali I splavov, Moscow, U.S.S.R.

PCT No. PCT/SU87/00023, § 371 Date Oct. 5, 1988, § 102(e) Date Oct. 5, 1988, PCT Pub. No. WO88/06190, PCT Pub. Date Aug. 25, 1988
PCT Filed Feb. 16, 1987, Ser. No. 279,670
Int. Cl.[4] C21B *11/08*; F27B *3/02*
U.S. Cl. 75—501 21 Claims



1. A method for preparng a ferrocarbon intermediate product which comprises:
(a) forming a slag melt in a slag melt zone
(b) introducing an oxygen containing gas below the surface of the slag melt at a level to form an upper bubbling slag melt zone and a lower quiescent slag melt zone;
(c) introducing a solid, carbon containing fuel and an iron containing material into the slag melt in an amount sufficient to maintain a volumetric concentration of solid carbon containing fuel in the bubbling slag melt zone of from 0.5 to 50%, whereby additional slag and a liquid ferrocarbon intermediate product are formed, the liquid ferrocarbon intermediate product passing through the quiescent slag melt zone to form a layer in a ferrocarbon intermediate product zone; and
(d) recovering separately the slag melt from the quiescent slag melt zone and the ferrocarbons intermediate product from the ferrocarbon intermediate product zone.

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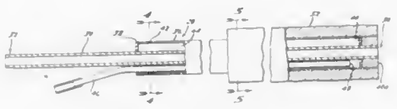
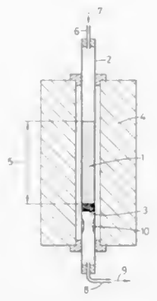
4,913,735
FLUX INJECTOR LANCE FOR USE IN PROCESSING ALUMINUM AND METHOD
John S. Palmer, Springfield, Ohio, assignor to Palmer Manufacturing & Supply, Inc., Springfield, Ohio
Filed Feb. 9, 1989, Ser. No. 308,828
Int. Cl.[4] C22B *21/00*
U.S. Cl. 75—683 19 Claims



1. A lance for introducing particulate matter into a molten metal, comprising:
(a) an injector conduit having a longitudinal axis, a first end for coupling to a source of particulate matter, and a second end with an opening therein for introducing said particulate matter into a molten metal;
(b) means surrounding at least a portion of said conduit for circulating a gaseous coolant about said injector conduit to thereby define a heat removal site about said injector conduit, said circulating means including a coolant feed tube having a longitudinal axis that is offset from said longitudinal axis of said injector conduit, for introducing said gaseous coolant into said heat removal site in a region near said second end of said injector conduit at a flow rate sufficient to promote cooling in said region; and
(c) means for insulating said heat removal site from heat transferred from said moiten metal.

4,913,736
PROCESS FOR RECOVERING PLATINUM GROUP METALS
Edmund Gimzeski, London, England, assignor to The British Petroleum Company p.l.c., London, England
PCT No. PCT/GB88/00086, § 371 Date Oct. 11, 1988, § 102(e) Date Oct. 11, 1988, PCT Pub. No. WO88/06192, PCT Pub. Date Aug. 25, 1988
PCT Filed Feb. 11, 1988, Ser. No. 259,567
Claims priority, application United Kingdom, Feb. 13, 1987, 8703323
Int. Cl.[4] C22B *11/02*
U.S. Cl. 75—631 7 Claims



1. A process for recovering Platinum Group metals from carbon supported catalyst material comprising one or more Platinum Group metals and one or more Group IA metals supported on carbon, the process comprising the steps (a) heating the material in a stream of an inert gas or in a vacuum at a temperature between 700° C. and 1150° C. to remove a major portion of the Group IA metals, and (b) heating the resultant residue from step (a) in a stream of carbon dioxide at a temperature between 700° C. and 1150° C. to remove the carbon and further Group IA metals.

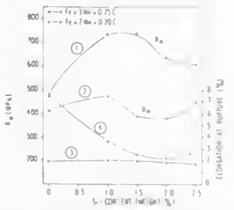
4,913,737
SINTERED METALLIC PARTS USING EXTRUSION PROCESS
Hideki Nakamura, Yonago, and Takayuki Fukaya, Yasugi, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan
Division of Ser. No. 57,636, Jun. 4, 1987, Pat. No. 4,769,212, which is a continuation of Ser. No. 844,567, Mar. 27, 1986, abandoned. This application Jun. 3, 1988, Ser. No. 211,269
Claims priority, application Japan, Mar. 29, 1985, 60-65540; Jul. 30, 1985, 60-168160; Jul. 30, 1985, 60-168161
Int. Cl.[4] C22C *39/02*
U.S. Cl. 75—228 18 Claims

1. An elongated, twisted, highly densified metallic sintered part having at least one continuous hole penetrating within the part in the direction of elongation, the part produced by the process of:
selecting, mixing and kneading a raw metallic powder having a particle size of 50 μm or less with a water-based binder composition selected to give an extrudable plastic mixture,
extruding the plastic mixture to give an extruded product including the step of forming said at least one hole penetrating along the direction of said part,
removing the binder composition from the extruded product with heating in vacuum or in a non-oxidizing atmosphere, and
sintering the resulting product for consolidation, wherein the binder composition comprises 1.0 to 15.0% by weight of at least one water-soluble organic binder selected from the group consisting of methylcellulose, polyvinyl alcohol, hydroxypropyl methylcellulose, hydroxymethylcellulose, and polyethylene glycol; 7% by weight or less of at least one moulding auxiliary agent selected from the group consisting of hydric alcohols, ethers and esters of hydric alcohols, propylene glycol, polyethylene oxide, water-soluble acryllic resins, wax emulsions, crystalline celluloses, stearic acid emulsion microcrystalline wax, the total weight of the organic binder and the molding auxiliary agent being 1.0 to 15.0% by weight; and 4.0 to 15.0% by weight of water, all the weight percents being based on the weight of the raw metallic powder, and
twisting the sintered product about the extrusion direction to a predetermined lead angle.

4,913,738
HEAT-RESISTANT COMPOSITE BODY
Kiyotaka Tsukada, Ogaki, Japan, assignor to Ibiden Co., Ltd., Ogaki, Japan
Division of Ser. No. 223,274, Jul. 22, 1988, Pat. No. 4,846,673. This application Apr. 13, 1989, Ser. No. 337,365
Claims priority, application Japan, Dec. 25, 1987, 326698
Int. Cl.[4] C22C *29/02*
U.S. Cl. 75—236 6 Claims

1. An improved heat-resistant composite body comprising a composite body of silicon carbide with metallic silicon, said metallic silicon filling interconnected pores in a porous silicon carbide sintered body formed from sintered crystalline silicon carbide particles, the improved comprising:
the silicon carbide particles constituting said porous silicon carbide sintered body have an average particle diameter of 5 μm or less, and at least a part of said silicon carbide particles being present in said sintered body in the form of porous secondary particles which are bonded together, said interconnected pores comprising (i) a group of fine pores having a pore diameter of 3 μm or less constituted of fine crystalline silicon carbide particles having an average particle diameter of 5 μm or less and (ii) a group of relatively coarse pores having a pore diameter of from 15 to 40 μm constituted of porous secondary particles which are bonded to have an average particle diameter of from 40 μm to 150 μm and have a particle size distribution such that 60% by weight or more of particles are included in ±20% of the average particle diameter; and
said metallic silicon which fills the pores is in an amount of from 45 to 140 parts by weight based on 100 parts by weight of said silicon carbide.

4,913,739
METHOD FOR POWDER METALLURGICAL PRODUCTION OF STRUCTURAL PARTS OF GREAT STRENGTH AND HARDNESS FROM SI-MN OR SI-MN-C ALLOYED STEELS
Fritz Thümmler, Karlsruhe; Aloisio N. Klein, Leopoldshafen, and Rainer Oberacker, Liedolsheim, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Fed. Rep. of Germany
Continuation of Ser. No. 498,002, May 23, 1983, abandoned. This application Mar. 8, 1985, Ser. No. 292,442
Claims priority, application European Pat. Off., Nov. 18, 1982, 82/110622.6; Fed. Rep. of Germany, Nov. 18, 1982, 3219324
Int. Cl.[4] C22C *29/00*
U.S. Cl. 75—243 7 Claims



1. Process for the powder metallurgical production of structural parts of the high strength and hardness of silicon-manganese or silicon-manganese-carbon alloyed steels, comprising: mixing, in powdered form the alloying elements silicon and manganese or silicon, manganese and carbon by way of a silicon-manganese-iron master alloy having silicon and manganese contents in the ranges from 10 to 30 weight percent Si, 20 to 70 weight percent Mn, remainder Fe, with an iron powder, and when carbon is present in the steel with graphite, to form a powder mixture consisting essentially of iron powder with the Fe content in the powder mixture being present in an amount of at least 92.5 weight percent, compressing the powder mixture and sintering the resulting compact in a protective gas atmosphere at a temperature in a range of 1150° or 1250° C. to form a liquid phase, and then cooling.

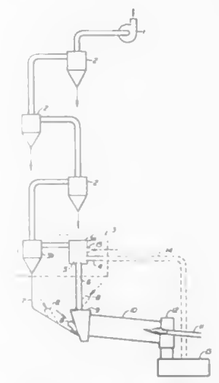
4,913,740
SOLUTION FOR USE IN THE PREVENTION OF SMEAR IN THE MANUFACTURE OF PRINTED CIRCUIT BOARDS
Jeffrey W. Frederickson, 2107 SW. Edgewood Rd., Portland, Oreg. 97201
Continuation-in-part of Ser. No. 87,000, Aug. 18, 1987. This application Oct. 24, 1988, Ser. No. 261,263
Int. Cl.[4] C04B *9/02*; B22F *7/00*
U.S. Cl. 106—1.11 4 Claims

1. A composition for preventing smear in the drilling a printed circuit board having a fiberglass/epoxy substrate, said composition consisting essentially of the following components in the following amounts
(a) 4–20 vol% fatty acids;
(b) 4–20 vol% of an amine selected from monoethanolamine, diethylamine, and mixtures thereof;
(c) 1–7 vol% of a surfactant;
(d) 0.1–0.2 vol% n-amyl alcohol; and
(e) balance water.

4,913,741
CHEMICAL ADDITIVE FOR HYDRAULIC CEMENT MIXES
Donald R. Lane, Richfield, and Jose A. Melendez, Bedford, both of Ohio, assignors to Solvay Construction Materials, Inc., Walton Hills, Ohio
Filed Jun. 29, 1989, Ser. No. 372,919
Int. Cl.[4] C04B *24/08*
U.S. Cl. 106—88 18 Claims

1. A hydraulic cement mix comprising a hydraulic cement, aggregate, sufficient water to effect hydraulic setting of the cement, and an air-entraining additive consisting essentially of a coconut acid diethanolamide produced by reacting alkyl ester of coconut acid with diethanolamine, said additive being in an effective amount of between 0.0013% and 0.004%, a capramide diethanolamine in an effective amount of between 0.008% and 0.0024%, and ricinoleic acid in an effective amount of between 0.0003% and 0.001% by weight based upon the weight of the cement, whereby air will be entrained in said mix in an amount of 3% to 9% by volume of said mix.

4,913,742
PROCESS OF MAKING CEMENT CLINKER AND APPARATUS FOR PERFORMING SAID PROCESS
Ludwig Kweck, Kaltenleutgeben, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria
PCT No. PCT/AU83/00010, § 371 Date Dec. 5, 1983, § 102(e) Date Dec. 5, 1983, PCT Pub. No. WO83/03601, PCT Pub. Date Oct. 27, 1983
PCT Filed Apr. 15, 1983, Ser. No. 556,673
Int. Cl.[4] C04B *7/02, 7/36*
U.S. Cl. 106—100 7 Claims



1. A process for producing cement clinker in which the raw material is heated in a preheating zone, is then at least partially deacidified in a calcination zone with secondary firing and then subjected to a burning process, whereupon the burned clinker is cooled in a cooling zone, comprising:
adding a first secondary fuel in the form of waste materials including combustible components in the introduction zone of the preheated raw material into the burning process;
adding to said introduction zone the exhaust gas formed

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upon the combustion of the primary fuel in the burning process;

subjecting the secondary fuel to incomplete pyrolysis;

feeding the gases thus formed upon such pyrolysis to the calcination zone as secondary combustion gas together with the exhaust gas from the burning process;

adjusting the CO-content of said secondary combustion gas to more than 3 percent by volume; and

burning said secondary combustion gas and exhaust gas in said calcination zone.

4,913,743

PROCESSES FOR MANAGING KERATINOUS MATERIAL USING GLYCOSAMINOGLYCAN AND CATIONIC POLYMER COMBINATIONS

George L. Brode, Bridgewater, N.J.; Philip A. Band, Brooklyn, N.Y.; Errol D. Goddard, Somerville, N.J.; Arminda G. Barbone, Union, N.J.; Adolf Leshchiner, Fairview, N.J.; Joseph P. Pavlichko, Helmetta, N.J.; Emmett Partain, III, Bound-Brook, N.J., and Pak S. Leung, Highland Mills, N.Y., assignors to Biomatrix, Inc., Ridgefield, N.J. and Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Division of Ser. No. 38,836, Apr. 15, 1987, Pat. No. 4,767,463.
This application May 25, 1988, Ser. No. 198,312
Int. Cl.[4] C08L *1/00*; A61K *7/09*; B32B *9/02*
U.S. Cl. 106—162 13 Claims

1. A process for managing keratinous material comprising applying an effective managing amount of a combination of glycosaminoglycan and cationic polymer to keratinous substrate wherein the combination of glycosaminoglycan and cationic polymer provides modification in the glycosaminoglycan properties due to the presence of the cationic polymer.

4,913,744

SOLAR CELL ARRANGEMENT

Helmut Hoegl, Seitnerstrasse 28, D-8023 München-Pullach, and Ralf M. Kern, Assenbucherstrasse 67, D-8137 Berg, both of Fed. Rep. of Germany

Filed Jan. 12, 1988, Ser. No. 142,964
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1987, 3700792
Int. Cl.[4] H01L *31/06, 25/02*
U.S. Cl. 136—244 23 Claims

1. A solar cell arrangement including a plurality of solar cell elements, wherein each solar cell element comprises:

an elongate base electrode; and

a photovoltaic layer of n-type or p-type disposed about said elongate electrode,

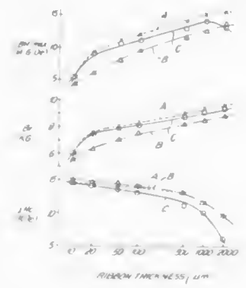
said elements being arranged within said solar cell arrangement such that elements having a p-type photovoltaic layer are so positioned with respect to elements having an n-type photovoltaic layer that the base electrode of each element functions as the counterelectrode of the adjacent elements.

4,913,745

METHOD FOR PRODUCING A RARE EARTH METAL-IRON-BORON ANISOTROPIC BONDED MAGNET FROM RAPIDLY-QUENCHED RARE EARTH METAL-IRON-BORON ALLOY RIBBON-LIKE FLAKES

Tadakuni Sato, Miyagi, Japan, assignor to Tokin Corporation, Miyagi, Japan

Filed Mar. 27, 1988, Ser. No. 171,694
Claims priority, application Japan, Mar. 23, 1987, 62-68705; Apr. 15, 1987, 62-92492; Sep. 5, 1987, 62-221219; Sep. 7, 1987, 62-222109; Oct. 15, 1987, 62-258190; Oct. 15, 1987, 62-258191; Oct. 16, 1987, 62-259791
Int. Cl.[4] H01F *1/02*
U.S. Cl. 148—103 23 Claims



1. A method for producing a rare earth metal-transition metal-boron (R-T-B) anisotropic bonded magnet wherein a magnetic powder of R-T-B alloy substantially consisting of $R_2T_{14}B$ is dispersed in and bonded by binder agent, the method comprising steps of:

preparing said R-T-B alloy in a molten state;

rapidly quenching said molten alloy to form an R-T-B alloy ribbon and/or ribbonlike flakes, each having a thickness of 20–1,000 μm and having $R_2T_{14}B$ crystal grains; the crystal grains having an average particle size less than the thickness of said ribbon and/or flakes and varying in orientation in the direction of said thickness;

crushing and grinding said ribbon and/or flakes into a magnetic powder having an average particle size which is less than the thickness of said ribbon and/or flakes before grinding;

mixing said magnetic powder with a binder agent to form a mixture;

and then forming said mixture into a desired bulk-shape body while disposed within an aligning magnetic flux to produce a bonded magnet characterized by magnetic anisotropy.

4,913,746

METHOD OF PRODUCING A ZN-FE GALVANNEAL ON A STEEL SUBSTRATE

Arnold R. Marder, and Mingyuan Gu, both of Bethlehem, Pa., assignors to Lehigh University, Bethlehem, Pa.

Filed Aug. 29, 1988, Ser. No. 237,424
Int. Cl.[4] C22F *1/16*
U.S. Cl. 148—127 14 Claims

1. A method for producing a galvanneal layer on a steel substrate, comprising:

forming a Zn-Fe alloy coating having a uniform distribution of Zn and Fe and an Fe content F (wt.%) on said steel substrate; and

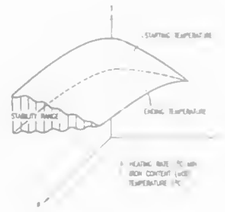
heat treating said Zn-Fe coating on said substrate at a heating rate R (°C./min) so that said coating attains a peak temperature between a first temperature T_1 and a second temperature T_2 which are respectively lower and upper

limits of an empirically determined stability range for producing substantially 100% δ_1 phase Zn-Fe, wherein F and R are selected so that the following conditions are met,

$1° C./min \leqq R \leqq 1000° C./min$,

$5 wt.\% Fe \leqq F \leqq 21 wt.\% Fe$,

and



said upper and lower limits T_1 and T_2 of said stability range at selected values of R and F are defined by:

$$a_1 \cdot R^2 + b_1 \cdot T_1^2 + c_1 \cdot R \cdot F + d_1 \cdot R R \cdot T_1 + e_1 \cdot R + f_1 \cdot f_1 \cdot T_1 = g_1,$$

$$a_2 \cdot R^2 + b_2 \cdot T_2^2 + c_2 \cdot R \cdot F + d_2 \cdot R \cdot T_2 + e_2 \cdot R + f_2 \cdot T_2 = g_2,$$

where:

$a_1 = -0.1696 \times 10^8$,	$a_2 = -31.027 \times 10^8$,
$b_1 = -0.4120 \times 10^9$,	$b_2 = 11.937 \times 10^9$,
$c_1 = -0.1387 \times 10^6$,	$c_2 = 11.113 \times 10^6$,
$d_1 = 0.2148 \times 10^7$,	$d_2 = 10.091 \times 10^7$,
$e_1 = -0.3774 \times 10^5$,	$e_2 = -52.242 \times 10^5$,
$f_1 = 0.3187 \times 10^6$	$f_2 = -9.5511 \times 10^6$,
$g_1 = 0.4429 \times 10^4$,	$g_2 = -19.057 \times 10^4$

4,913,747

METHOD OF AND APPARATUS FOR HEAT-TREATING RAILS

Keiji Fukuda; Takefumi Suzuki; Hideaki Kageyama; Yoshiaki Makino; Masanori Hisatsune; Eigo Matsubara; Mitiaki Ishii; Manabu Sato, and Haruo Koyama, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 73,333, Jul. 13, 1987, abandoned, which is a continuation of Ser. No. 806,996, Dec. 9, 1985, abandoned.
This application Feb. 9, 1989, Ser. No. 308,216
Claims priority, application Japan, Dec. 24, 1984, 59-272389; Jun. 5, 1985, 60-120576; Jul. 11, 1985, 60-151305
Int. Cl.[4] C21D *9/04*
U.S. Cl. 148—128 4 Claims

1. A method of heat-treating a rail for producing rails of a variety of strength levels from medium value to high value, said method comprising the steps of:

preparing a steel rail maintained at a high temperature region not lower than the austenite field, and disposing first nozzle means around the head of said rail and second nozzle means around the bottom said rail so that said first and second nozzle means direct air towards said head and bottom of said rail, respectively;

determining the distance H between said first nozzle means and said head of said rail in accordance with the harness level to be attained in said head of said rail and the carbon equivalent of the steel constituting said rail; moving said first nozzle means so that said distance is attained between said first nozzle means and said head of said rail, and directing said air towards said head at a constant flow rate and for a period of time so as to forcedly cool said head of the rail so that the desired strength level in said head of the rail is attained wherein said distance H between said first nozzle means and said head of said rail is determined in accordance with the following formula, from carbon equivalent Ceq of said steel, the hardness Hv to be obtained, flow rate of air Q to be used in the cooling and the pressure P in an upper header constituting said nozzle means;

$Hv = 10^n + (200\ ceq - 190)$

$n = 2.4993 + 0.039887 \log F - 0.0051918 \log F^2$ where,

Hv: Hardness (Vickers hardness at 10 Kg) to be attained in said head of said rail regarding the depth down to 10 mm from the rail head surface, indicative of the strength of said rail

Ceq: Carbon equivalent of the steel given by:

$Ceq = C + Mn/6 + Si/24 + Ni/40 + Cr/5 + Mo/4 + V/14$

F: cooling degree given by $F = O/\sqrt{P/H}$

Q: flow rate (m^2/m.min) of the gaseous cooling medium applied to unite length of rail

P: pressure in nozzle header (mmAq, nozzle resistance coefficient f=0.85)

H: distance between nozzle header and the said top surface of said head of said rail (mm)

n: a coefficient determined by the type of nozzle;

measuring an amount of a rail bend occurring along the rail during the cooling of the rail head; and

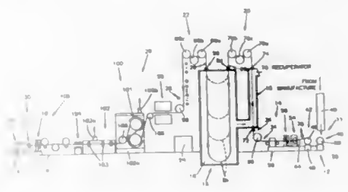
controlling a flow rate of air directed from the second nozzle means toward the bottom of the rail in accordance with the measured amount of the rail bend so that the rail bend in minimized.

4,913,748

METHOD AND APPARATUS FOR CONTINUOUS ANNEALING

Thomas A. Sellitto, 12800 Auburn Rd., Chardon, Ohio 44024, and Willis E. Perry, 10545 Ridgewater Dr., Painesville, Ohio 44077

Continuation of Ser. No. 214,960, Jul. 5, 1988, abandoned. This application Jul. 17, 1989, Ser. No. 382,010
Int. Cl.[4] C21D *9/56*
U.S. Cl. 148—128 16 Claims



1. A method for continuous annealing in a vertical annealing furnace comprising:

(a) regulating movement and condition of a lead metal strip through said furnace using a controller;

(b) receiving a successive metal strip to be annealed at an entry station;

(c) connecting a trailing end of said lead strip with a leaf end

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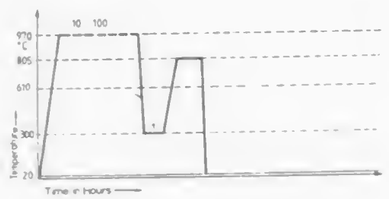
of a successive metal strip to form a continuous metal strip to be annealed;
(d) sensing strip conditions at said entry station using sensors and communicating said sensed strip conditions to the controller;
(e) supplying strip to the annealing furnace by an input feed mechanism operating at a rate established by said controller, said furnace receiving said strip and having heat elements activated and controlled by said controller to achieve a desired condition for annealing,
(f) sensing strip conditions in said furnace including strip temperature by using sensors and communicating said sensed strip conditions to the controller;
(g) accumulating said strip within said furnace in the form of a variable catenary loop;
(h) depleting said catenary loop while continuing to remove strip from said furnace by an output feed mechanism operating at a rate established by the controller according to said condition sensed in the furnace while concurrently operating said joiner forming said continuous metal strip; and
(i) periodically severing an annealed strip sections from said continuous metal strip an exit station.

4,913,749

PROCESS FOR CASE-HARDENING ROLLING BEARING ELEMENTS OF LOW-ALLOY NICKELIFEROUS STEEL

Frank Hengerer, Schwebheim; Gerhard Mend, Schweinfurt, both of Fed. Rep. of Germany; Ulf Sjöblom, Göteborg, and Roger Björn, Ångered, both of Sweden, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jan. 13, 1989, Ser. No. 297,292
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1988, 3800838
Int. Cl.[4] C21D *1/74*
U.S. Cl. 148—16 S 11 Claims



1. In a process for case-hardening rolling bearing elements of low-alloy nickeliferous steel, comprising the steps of producing a carburized layer by holding said rolling bearing elements in a carburizing furnace at a carburizing temperature of about 970° C. in the presence of a carburizing gas which dissociates into carbon and hydrogen; cooling said rolling bearing elements; heating said cooled rolling bearing elements to hardening temperature; austenitizing said rolling bearing elements in the carburization layer; and quenching said austenitized rolling bearing elements to obtain a surface hardness of 60 to 64 RHC, the improvement wherein the step of cooling comprises

cooling said rolling bearing elements from the carburizing temperature down to a temperature of about 300° C. in the presence of an agitated inert gas at a cooling rate which prevents precipitation of intercrystalline carbides in the steel structure and holding said rolling bearing elements at said temperature of about 300° C. in the presence of said inert gas so as to diffuse additional hydrogen out of said carburization layer,

whereby said cooling rate allows a substantial amount of the dissociated hydrogen of the carburizing gas to diffuse out of said carburized layer.

4,913,750

AMORPHOUS MAGNETIC WIRE

Keiichi Kakuno, Yokohama; Tutomu Yamada, Machida, and Sumio Masuda, Tokyo, all of Japan, assignors to Jeco Company Limited, Gyoda, Japan

Filed Mar. 3, 1988, Ser. No. 163,432
Claims priority, application Japan, Mar. 6, 1987, 62-52735; Oct. 9, 1987, 62-253515
Int. Cl.[4] H01F *1/00*
U.S. Cl. 148—304 6 Claims

1. An amorphous elongated magnetic wire comprising: first and second parts which occupy exclusively distinct sections of a length of said amorphous magnetic wire,

said first part entirely comprised of a magnetically hard wire portion for propagating a magnetoelastic wave,

said second part entirely comprised of a magnetically soft wire portion for generating or detecting the magnetoelastic wave.

4,913,751

HIGHER STRENGTH STEEL, ESPECIALLY REINFORCING STEEL OR DRAWING SHOP FEED STOCK WITH IMPROVED MATERIAL PROPERTIES AND IMPROVED PROCESSABILITY

Wolfgang Schmitt; Franz Tamm, both of Hennigsdorf, and Gunter Lankau, Falkensee, all of German Democratic Rep., assignors to VEB Stahl- und Walzwerk "Wilhelm Florin", Hennigsdorf, German Democratic Rep.

Filed Aug. 8, 1988, Ser. No. 229,596
Int. Cl.[4] C22C *33/00*
U.S. Cl. 148—320 7 Claims

1. An elongated steel element of enhanced strength suitable for use as reinforcement for concrete or drawing feed stock, the steel having a cross section which is heterogeneous in structure and strength, the cross section comprising a core, a peripheral layer and a transition region between the core and the peripheral layer, the transition region consisting essentially of higher strength, harder martensite, the peripheral layer being of lower strength than the transition region and the core being of lower strength than the peripheral layer.

4,913,752

NICKEL-BASED SOLDER FOR HIGH-TEMPERATURE SOLDERED JOINTS

Joachim Falk, Bruchkoebel, Fed. Rep. of Germany, assignor to Vacuumschmelze GmbH, Fed. Rep. of Germany

Filed Sep. 22, 1988, Ser. No. 247,661
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1987, 3732749; Sep. 30, 1987, 3732998
Int. Cl.[4] C22C *38/08*
U.S. Cl. 148—336 16 Claims

11. A rapidly quenched ductile crystalline solder ribbon for high-temperature soldering of steels and nickel-based alloys, said solder ribbon consisting essentially of 5 through 60 percent by weight iron and the remainder nickel.

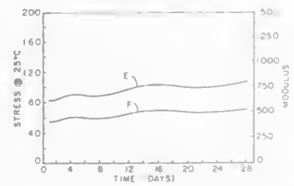
4,913,753

TMXDI, CURING AGENT FOR HYDROXY TERMINATED PROPELLANT BINDERS

Marjorie E. Ducote, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 25, 1989, Ser. No. 411,768
Int. Cl.[4] C06F *95/10*
U.S. Cl. 149—19.9 4 Claims

1. A composite rocket propellant composition comprising a hydroxy-terminated polymer binder in an amount from about 7 to about 15 weight percent with an antioxidant in an amount from about 0.15 to about 1.0% weigh percent of polymer; ammonium perchlorate oxidizer in an amount from about 65 to about 88 weight percent; optional plasticizer from about 0 to about 4 weight percent; burn rate catalyst from abut 0.05 to about 6.0 weight percent; optional aluminum metal fuel from about 0 to about 20 weight percent; a quick cure catalyst system of about 0.02 weight percent maleic acid or maleic anhydride of about 0.02 weight percent and triphenyl bismuthine in an amount from about 0.015 weight percent to about 0.025 weight percent; and a curing agent and crosslinking agent of meta-tetramethylxylene diisocyanate (m-TMXDI) in an amount from about 0.5% to about 2.0% weight percent, said weight percent of m-TMXDI effective in extending pot life of said composite rocket propellant composition and achieving said pot life that is less sensitive to temperature change as compared with an isophorone diisocyanate (IPDI) cured composition rocket propellant composition.

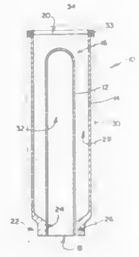


4,913,754

MANUFACTURE OF BETA-ALUMINA ARTIFACTS

James H. Duncan, Stafford, England, and Rodney J. Stead, Duffield, Great Britain, assignors to Lilliwyte Societe Anonyme, Luxembourg

Filed Sep. 30, 1988, Ser. No. 252,500
Claims priority, application United Kingdom, Oct. 6, 1987, 8723408
Int. Cl.[4] B32B *18/00, 31/26*
U.S. Cl. 156—85 6 Claims



1. A method of making a beta-alumina solid electrolyte separator tube for a high temperature rechargeable electrochemical cell, which tube comprises an inner tube portion located within and extending along a major proportion of the length of the interior of an outer tube portion, the full length of the inner tube portion being located within the outer tube portion so that it is enclosed thereby, the tube portions being hermetically sealed together at one end of the separator tube and defining an electrode compartment of annular cross-section therebetween, which annular electrode compartment extends along the full length of the inner tube portion and along a major proportion of the length of the outer tube portion, the method comprising

pressing an inner tube portion which is open at one end thereof and closed at the other, from a powder which, when sintered, shrinks and forms an integral beta-alumina artifact;

pressing an outer tube portion which is open at both ends thereof, from a powder which also, when sintered, shrinks and forms an integral beta-alumina artifact, the outer tube portion being pressed of a length and inner diameter respectively greater than the length and outer diameter of the inner tube portion and so that the inner portion can extend along a major proportion of the length of the interior of the outer portion;

arranging the tube portions so that the inner tube portion is located along its full length within the outer portion and extends lengthwise along the interior of the outer portion so that it is radially spaced from the outer tube portion; and

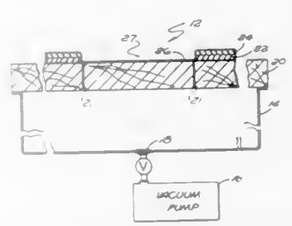
sintering the tube portions by heating them to a maximum temperature of 1500°–1650° C. to cause them to seal together hermetically at said one end of the separator tube while converting each of the tube portions into an integral beta-alumina artifact, the tube portions being made such that the outer tube portion undergoes a greater degree of shrinkage in radius during sintering than the inner tube portion, and at least one of the tube portions being pressed to have a shaped zone at said one end of the separator tube, so that there is a radial spacing between the tube portions at said one end of the separator tube which is less than the radial spacing elsewhere between the tube portions and which, before firing, is less than the difference between the decrease in inner radius of the outer portion upon sintering and the decrease in the outer radius of the inner portion upon sintering, and so that, during and after the hermetic sealing together of the tube portions at said shaped zone, said radial spacing elsewhere between the tube portions remains.

4,913,755

METHOD OF FORMING ORTHOPAEDIC GEL PADS

Tracy E. Grim, Broken Arrow, Okla., assignor to Royce Medical Company, Westlake Village, Calif.

Filed Mar. 16, 1988, Ser. No. 168,681
Int. Cl.[4] B32B *31/16, 31/18*
U.S. Cl. 156—145 17 Claims



12. A general purpose method for forming substantially flat orthopaedic gel pad assemblies, of any desired peripheral configuration and thickness, using a flat perforated base plate with a vacuum chamber, comprising the steps of:

placing a spacer pad over the base plate, with a plurality of patterned openings through the spacer pad having the desired peripheral configuration of the gel pads, and with a plurality of drilled holes in the base plate communicating between said patterned openings and the vacuum chamber;

placing a thin flexible plastic film or sheet over and extending down into the openings in the spacer pad;

drawing air through holes in the base plate for exerting force

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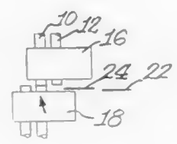
on the plastic film and pulling the film down into the openings and in engagement with said plate;
pouring a measured quantity of liquid gel into said patterned openings;
letting the gel harden to a semi-solid state;
placing a backing layer on top of the plastic sheet;
securing the backing layer to said plastic sheet to confine the gel into the resultant pockets and to seal the gel against contamination;
removing the thin film, the gel and the backing layer from the spacer pad; and
cutting the layers around the confined gel to form a plurality of orthopaedic gel pad assemblies;
whereby any desired gel pad peripheral configuration and thickness may be formed using the same substantially perforated base plate and vacuum chamber, using spacer pads having shaped openings of the desired configuration, and spacer pads of the desired thickness.

4,913,756

TECHNIQUES FOR WELDING THERMOPLASTIC TUBES

John B. Shaposka, and Dudley Spencer, both of Wilmington, Del., assignors to Denco, Inc., Wilmington, Del.

Division of Ser. No. 195,772, May 19, 1988, Pat. No. 4,832,773, which is a division of Ser. No. 99,714, Sep. 22, 1987, Pat. No. 4,770,735. This application Feb. 17, 1989, Ser. No. 312,027
Int. Cl.[4] B29C *65/18, 65/74*
U.S. Cl. 156—158 **1 Claim**



1. In a method of welding two thermoplastic tubes which are mounted in a holding device in parallel relation, the tubes are then severed to create four cut ends, the tubes are then shifted to align a cut end of one tube with a cut end of the other tube, the aligned cut ends are pressed into contact with each other while in a heated state to become welded together, the improvement being in that the tubes are generally of round cross section in a dry condition without fluid in the tubes, during the severing step and welding step the cut ends are not flattened so that the cut ends remain in an open condition, the aligned cut ends are heated by a hot wafer prior to the welding step, the tubes are severed by a severing wafer of lower temperature than the hot wafer, the hot wafer is at a temperature in the range of 500–1200° F. for melting and sterilizing the aligned cut ends, and the severing wafer is a warm wafer at about 350° F.

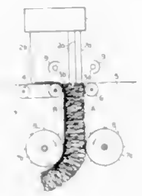
4,913,757

METHOD OF PRODUCING A MAT CONSISTING OF FILAMENT LOOP AGGREGATIONS

Minoru Yamanaka, Tokyo, and Tesuo Amawa, Kasukabe, both of Japan, assignors to Kabushiki-Kaisha Risuron, Tokyo, Japan

Filed Apr. 12, 1988, Ser. No. 180,536
Claims priority, application Japan, Feb. 16, 1988, 63-33534
Int. Cl.[4] D01D *5/22, 7/00*
U.S. Cl. 156—167 **12 Claims**

12. A method of producing a resilient mat having a plurality of bonded filament loops, said method comprising the steps of:
extruding a plurality of resin filaments such that they fall toward a cooling liquid;
heating said filaments as they fall toward said cooling liquid to keep said filaments at least close to their extrusion temperature;
maintaining the surface of said cooling liquid in a boiling state such that upon contact of said filaments within and



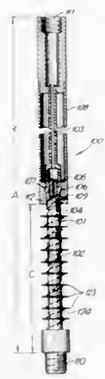
on said cooling liquid, said filaments are caused to wave and bond more than would occur absent said boiling surface;
facilitating the sinking of said filaments below said boiling surface.

4,913,758

METHOD AND APPARATUS FOR REPAIRING CASINGS AND THE LIKE

Charles H. Koster, Alvin, Tex., assignor to Nu-Bore Systems, Alvin, Tex.

Filed Jan. 10, 1989, Ser. No. 295,290
The portion of the term of this patent subsequent to Sep. 12, 2005, has been disclaimed.
Int. Cl.[4] E21B *33/127, 29/10*
U.S. Cl. 156—191 **15 Claims**



1. A mandrel assembly for inserting a spirally-wrapped strip material liner into a bore to be repaired; comprising telescoping means contained within said mandrel assembly for shortening the length of said mandrel assembly and for unwrapping strip material liner from said mandrel assembly by rotational movement coordinated to said shortening, lockable means located within said mandrel assembly which, when locked, prevent said shortening and capable, when unlocked, of permitting controlled telescoping and rotational movement, of said mandrel assembly such that said spirally-wrapped strip material when unwrapped against said bore will possess substantially the same edge-to-edge spacing as it possesses when wrapped on said mandrel, packer means at the upper and lower ends of said mandrel assembly defining the length of said assembly to be wrapped with said strip material liner, and supplemental packer means located below said defined length adapted to engage the bore to be lined when said supplemental packer means is inflated.

4,913,759

POLYIMIDE PRECURSOR AND PSEUDO HOT-MELT PREPREGGING PROCESS EMPLOYING SAME

William E. Wright, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 37,537, Apr. 13, 1987, abandoned. This application May 23, 1988, Ser. No. 197,642
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—238 **21 Claims**

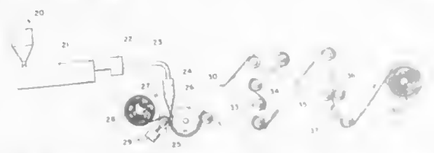
1. A high solids polyimide precursor solution consisting essentially of a resinous mixture of:
(a) about (i) 25–50 weight percent of 2,2-bis[4-(4-aminophenoxy)phenyl]hexafluoropropane or 2,2-bis[4-(3-aminophenoxy)phenyl]hexafluoropropane, or both, and (ii) 25–40 weight percent of a lower alkyl diester of at least one aromatic tetracarboxylic acid;
(b) about 2 to about 20 percent by weight of polyamide having a weight average molecular weight of about 1500 to 5000 produced by reaction between (i) 2,2-bis[4-(3-aminophenoxy)phenyl]hexafluoropropane or 2,2-bis[4-(3-aminophenoxy)phenyl]hexafluoropropane, or both, and (ii) a diester of a dianhydride of an aromatic tetracarboxylic acid; and
(c) about 15 to about 25 percent by weight of solvent from 10 to 100 percent by weight of which is one or more dipolar aprotic solvent;
said solution being a clear resinous solid at 25° C., that is a viscous tacky, varnish-like liquid at a temperature in the range of 40° to 100° C. suitable for use in a pseudo hot-melt prepregging process.

4,913,760

METHOD OF MANUFACTURING A DRIED, THERMOFORMABLE, PAINT-COATED SHEET MATERIAL HAVING GLOSS AND SMOOTHNESS

John E. Benson; Larry K. Maier, and Gerald G. Reafler, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 29, 1988, Ser. No. 237,128
Int. Cl.[4] B29C *47/04;* **B32B** *31/26*
U.S. Cl. 156—244.11 **12 Claims**



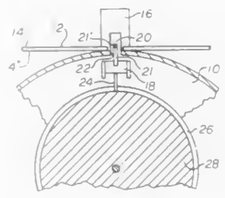
1. A method of manufacturing a dried, thermoformable, paint-coated sheet material having gloss and smoothness comprising a dried layer of an aqueous paint on a web of a stretchable, permanent carrier film of thermoplastic polymer composition (a), which comprises
continuously extruding a molten layer of said thermoplastic polymer composition (a) onto a continuously moving web of a temporary carrier film of composition (b), which has a heat deformation temperature higher than the Tg of composition (a)
pressing the extruded molten polymer composition (a) into bonding contact with the moving web and cooling the extruded layer to form a solid laminate of releasably bonded films of compositions (a) and (b),
continuously drawing the resulting laminate through a coating zone in contact with a laminar flow of said aqueous paint to coat a uniform liquid layer of paint on the film of polymer composition (a), said paint containing a polyurethane resin, an organic solvent and water
continuously drawing the paint-coated laminate through a series of drying stages of successively higher temperatures, including initial drying stages and a final drying stage,
introducing a flow of air to each stage to cause evaporation of water and organic solvent from the paint layer,
in the final drying stage providing air at a temperature above the Tg of polymer composition (a) but below the heat deformation temperature of composition (b),
cooling the laminate to a temperature below the Tg of polymer composition (a), and thereafter peeling the temporary carrier film away from the paint-coated permanent carrier film.

4,913,761

METHOD FOR SEVERING AND SEALING THERMOPLASTIC MATERIALS

Patrick M. Russell, Freeland; Roger K. Pihlaja, Sanford, and Timothy R. Woods, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 119,867, Nov. 13, 1987, abandoned. This application Nov. 23, 1988, Ser. No. 275,459
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—251 **10 Claims**



1 A process for severing a plurality of plies of a thermoplastic material and simultaneously sealing the severed margins thereof comprising the steps of:
(a) selecting a cutting and sealing element having a length at least as long as the section of thermoplastic material to be severed and sealed,
(b) heating said element to a temperature above about 1300 degrees F., the element having at about 1500 degrees F. a creep of less than about 2×10^{-5} hr^{-1} at about 4.5 ksi, an oxidation resistance in air of less than about 10 grams/cm^2 per 300 hours exposure, a fatigue resistance of about 10^7 cycles at about 10 ksi, and a tensile yield strength of greater than about 50 ksi, and
(c) bringing said element into proximity with said thermoplastic material to sever said plies and form a sealed edge.

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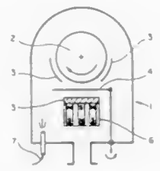
4,913,762

SURFACE TREATMENT OF POLYMERS FOR BONDING BY APPLYING A CARBON LAYER WITH SPUTTERING

Wilfred C. Kittler, Thousand Oaks, Calif., assignor to Andus Corporation, Canoga Park, Calif.

Division of Ser. No. 35,846, Apr. 8, 1987, Pat. No. 4,802,967.
This application Oct. 12, 1988, Ser. No. 256,871
Int. Cl.[4] C23C *14/34, 14/06*
U.S. Cl. 156—272.6 6 Claims



1. A method of bonding together a first and a second material, the first material comprising a polymeric material, which comprises:

(1) sputtering onto a surface of said first material a layer consisting essentially of carbon; and

(2) applying said second material to said layer consisting essentially of carbon.

4,913,763

DIE BONDING APPARATUS

Nobuto Yamazaki, Tachikawa, and Minoru Kawagishi, Kokubunji, both of Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 289,233
Claims priority, application Japan, Dec. 23, 1987, 62-325728
Int. Cl.[4] B03B *15/20, 15/22*
U.S. Cl. 156—358 1 Claim

1. A die bonding apparatus for bonding a die to a substrate characterized in that said apparatus comprises:

a vertically moving block which is driven upward and downward;

a collet holder provided on said vertically moving block such that said collet holder is free to move upward and downward relative to said vertically moving block;

a collet which is installed in said collet holder;

a vacuum suction means provided on said collet for holding said die on said collet;

a first contact provided on said vertically moving block;

a second contact provided on said collet holder so that said second contact is contactable with an upper surface of said first contact provided on said vertically moving block; and

a means for pressing said two contacts against each other when said die is not in contact with said substrate;

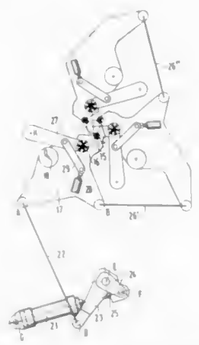
whereby when said die contacts said substrate, said first and second contacts separate from each other and a rate of downward movement of said collet is switched from a rapid rate to a slow rate in response to said separation.

4,913,764

DEVICE FOR MANUFACTURING SHELLS OF MINERAL FIBERS

Bernard Bichot, Clermont, and Bernard Louis, Liancourt, both of France, assignors to Isover Saint-Gobain c/o Saint-Gobain Recherche, Courbevoie, France

Division of Ser. No. 800,038, Nov. 20, 1985, Pat. No. 4,830,808.
This application Dec. 27, 1988, Ser. No. 290,265
Claims priority, application France, Jun. 14, 1985, 85 09059
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—446 5 Claims



1. An apparatus for manufacturing insulating shells made of mineral fibers, comprising:

a frame;

a mandrel rotatable about a first axis fixed to said frame;

means for heating said mandrel;

a plurality of main driven counterrollers rotatable about second axes parallel to said first axis;

means for moving said second axes toward and away from said first axis, whereby said main counterrollers may press a shell wound on said mandrel;

a plurality of auxiliary driven counterrollers rotatable about third axes parallel to said first axis, said second and third axes alternating with one another about the periphery of said mandrel,

first means for moving said third axes toward and away from said first axis simultaneously with said movement of said second axes; and

second means for moving said third axes toward and away from said first axis independent of said movement of said second axes, whereby said auxiliary counterrollers may press a shell wound on said mandrel independent of pressing by said main counterrollers.

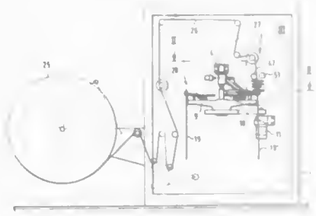
4,913,765

APPARATUS FOR MAKING BAGS OR SACKS FROM A PREFERABLY GUSSETED CONTINUOUS TUBULAR FILM OF THERMOPLASTIC PLASTIC

Konrad Tetenborg, and Helmut Hüwelmann, both of Lengerich i.W., Fed. Rep. of Germany, assignors to Windmöller & Höscher, Lengerich, Fed. Rep. of Germany

Filed May 5, 1988, Ser. No. 190,442
Claims priority, application Fed. Rep. of Germany, May 11, 1987, 371568503
Int. Cl.[4] B65B *43/30*
U.S. Cl. 156—498 12 Claims

1. Apparatus for making bags from a continuous tubular plastic film comprising conveying means for feeding the film intermittently in steps corresponding in length to a required bag length and in a downward direction, a gripping conveyor for receiving successive bag lengths from the conveying means at a receiving station, and delivering bags to a transfer station, a welding means above the gripping conveyor for forming transverse sealing webs at the bottom of each succeeding bag length, and a transverse cutter positioned between the welding means and the gripping conveyor for separating successive bag lengths from the tubular film when the respective bag lengths have been received in the gripping conveyor, wherein the gripping conveyor comprises a hub-like carrier mounted for rotational movement about a vertical axis, the carrier having radially extending arms with outer ends and grippers for the bag lengths on said outer ends for receiving the bag lengths in



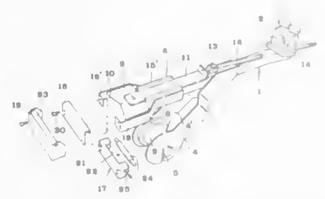
positions substantially tangentially disposed with respect to the carrier, drive means for rotatably moving the carrier in increments about said axis for moving the bag lengths in sequence from the receiving station through at least one cooling station to the transfer station, the apparatus further including gripper operating means for opening and closing the grippers at the receiving and transfer stations, wherein each of said arms is provided with two grippers and the bag lengths are adapted to be received between a pair of grippers which are on adjacent arms respectively.

4,913,766

STRIP APPLICATOR

Börje Löjdström, P.O. Box 1651 Vij, S-827 00 Ljusdal, Sweden

Filed Jan. 23, 1989, Ser. No. 299,929
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—523 11 Claims



1. A strip applicator for dispensing and applying a strip from a roll thereof comprising

(a) a main frame (1)

(b) a spaced-apart upper handle member (3) and

(c) a spaced-apart lower roll mounting member (4, 4'),

said frame (1) having first means (2) for mounting said handle member (3) in a first plane displaced from said frame member (1),

said frame (1) further including second means for mounting said roll mounting member in a plane displaced from and opposite to the plane of said handle member,

said handle member (3) including an applicator roller (28) disposed in operative relationship at one end of said handle member (3), to said roll monting member (4, 4'),

strip guiding means (18, 19) mounted by said frame (1) in operative relationship to said second mounting means, said strip guiding means (18, 19) being adapted to receive a strip (7) from a roll thereof mounted on said lower roll mounting member (4, 4') and to guide said strip (7) from said lower roll mounting member (4, 4') to and past said frame member (1) whereafter said strip (7) is adapted to be placed into juxtaposition with a joint between adjacent boards by said applicator roller (28), and

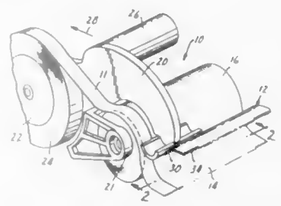
severing means (8) mounted by said frame member (1) adapted to sever said strip (7) between said frame member (1) and said lower roll mounting member (4, 4'), said severing means (8) including cutting means (9) mounted for reciprocal movement relative to said frame (1) along a path substantially parallel to said frame (1).

4,913,767

CUT OFF BLADE FOR SEVERING MULTIPLE LAYERS OF THIN POLYMERIC SHEET MATERIAL

Frederic A. Longworth, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 12, 1988, Ser. No. 283,237
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—527 4 Claims



1. A device from which lengths of sheet masking material having lengths of pressure sensitive adhesive tape applied along and projecting beyond one edge portion thereof may be dispensed, said device including a frame a first holder rotatably mounted on said frame and adapted to support a roll of sheet masking material, a second holder rotatably mounting on the frame and adapted for supporting a roll of masking tape with the tape having an end portion extending onto an edge portion of the outermost wrap of the masking material, means for guiding the tape into engagement with the edge portion of the masking material as the masking material and tape are withdrawn from the device, and a cut off blade mounted on the frame adapted to engaged the tape and masking material to sever a withdrawn portion thereof from the tape and masking material on the device, wherein said cut off blade is particularly adapted for severing thin polymeric sheet masking material that has been longitudinally folded and rolled into a said roll so that several layers of the masking material must be severed by the cut off blade after a predetermined taped length of the masking material has been withdrawn, said cut off blade comprising a thin metal sheet having opposite first and second major surfaces and edge surfaces between said first and second major surfaces, said metal sheet including an attachment portion mounted on said frame and a plurality of similarly shaped teeth defining a cutting edge portion of said cut off blade, each of which teeth defines parts of said first and second major surfaces in the shapes of isosceles triangles with two equal length sides terminating in points and having bases adjacent said attachment portion and aligned in a first direction along said blade so that said points project at right angles to said first direction, the sides of adjacent parts intersecting at the bases of the adjacent parts to define a generally V shaped opening between said adjacent parts, the angle between any portion of said edge surface along said cutting edge portion and said second major surface when measured in a plane normal to said first direction being the same acute angle in the range of 15 to 45 degrees, the metal of said sheet at said edge surface along

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said cutting edge portion having cold flowed toward the intersection thereof with said second major surface to define a sharp edge at said intersection, the distance between said points on adjacent ones of said teeth being in the range of 0.1 to 0.32 centimeter (0.04 to 0.125 inch); the dimension between said point and said base on each of said teeth being in the range of 0.25 to 0.5 centimeter (0.1 to 0.2 inch); and the included angle at said points between said equal length sides being in the range of 30 to 45 degrees so that with a moderate amount of force applied between the teeth and the several layers of masking material the teeth can pierce the several layers of masking material to hold them in place and subsequently sever the layers.

4,913,768

PROCESS FOR PRODUCING ELECTRICAL CONDUCTOR BOARDS

Gerhard D. Wolf, Dormagen; Kirkor Sirinyan, Bergisch-Gladbach; Ulrich von Gizycki; Rudolf Merten, both of Leverkusen, and Friedrich Langer, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 4, 1989, Ser. No. 293,261

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1988, 3800682

Int. Cl.[4] C23F *1/00;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—645 **9 Claims**

1. A process for producing two-layer electrical conductor boards with plated-through holes from substrates, which are clad on both sides with copper foils, comprising

(a) removing the copper cladding from said substrates chemically or mechanically after cutting to size and drilling,

(b) activating the surfaces of said substrates and the drilled hole walls by immersion in an activator bath,

(c) providing the substrate from (b) with 0.05–2.0 μm thick layer of nickel, cobalt, manganese, a nickel/iron or nickel/cobalt mixture,

(d) providing the substrate from (c) with a 0.5–5.0 μm thick copper layer in a subsequent copper bath, and

(e) building up the conductor pattern thereon by semiadditive methods.

4,913,769

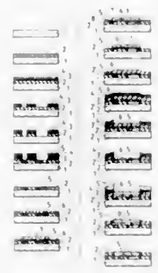
PROCESS FOR PREPARING SUPERCONDUCTIVE WIRING BOARD

Naoya Kanda, Yokohama; Takayoshi Sowa, Fujisawa; Tetsuya Yamazaki, and Hiroaki Okudaira, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 4, 1988, Ser. No. 228,297

Claims priority, application Japan, Aug. 24, 1987, 62-208107; Sep. 18, 1987, 62-232117; Oct. 30, 1987, 62-272950

Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06;* **C23F** *1/00*

U.S. Cl. 156—652 **8 Claims**

1. A process for preparing a superconductive wiring board comprising insulation layers and wiring layers composed of a superconductive material containing Cu, comprising steps of:

forming a first layer containing a first insulation layer and a first superconductive wiring layer;

forming on said first layer an over-etching preventing layer made of a thin metallic film composed of a group Ib element at portions corresponding to predetermined etching portions of a second insulation layer;

forming said second insulation layer; and

etching the predetermined portions of said second insulation layer so that the etching in the direction of depth reaches said thin metallic film and stops thereat to thereby increase the deterioration in characteristics of said superconductive wiring layer from touching an etching solution.

4,913,770

TIRE BEAD BREAKER

Douglas A. Sims, Attadale, Australia, assignor to Freezone Pty Ltd, Western Australia, Australia

Filed Dec. 2, 1988, Ser. No. 278,824

Claims priority, application Australia, Apr. 15, 1987, PI1460; Sep. 10, 1987, PI4270

Int. Cl.[4] B60C *25/07*

U.S. Cl. 157—1.17 **11 Claims**

1. A tire bead breaker for use in removing a tire bead from engagement with a rim of a wheel, the tire bead breaker comprising:

(a) a sleeve having a tine depending therefrom, the tine tapering in a direction away from the sleeve, the tine being dimensioned to be forceable between a wall of the tire adjacent the tire and the rim of the wheel, the tine being disposed substantially orthogonal to an axis of the sleeve;

(b) a post dimensioned to fit in the sleeve and capable of longitudinal movement therein;

(c) two or more tongues depending from the post in spaced apart manner, the tongues being disposed substantially orthogonal to an axis of the post, the tongues defining a recess into which the tine is capable of fitting, the tongues being disposed between the wall of the tire adjacent the tire bead and the rim of the wheel;

(d) a clamp means attached to the sleeve, the clamp means having an over-centre locking lever to releaseably lock the tine onto the rim of the wheel;

(e) a drive means disposed between the sleeve and the post to urge the two tongues away from the tine so as to force the tire bead off the rim;

(f) the sleeve comprises a knob extending therefrom adjacent the tine, and the clamp means comprises one or more plates fitted to the knob and capable of movement with respect thereto, the or each plate having a first end disposed adjacent the tine, and said plate being connected to and moveable with the over-centre locking lever such that the over-centre locking lever may urge the first end toward the tine to lock the clamp means to the rim.

4,913,771

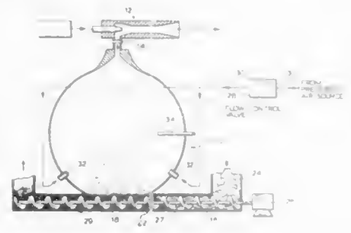
METHOD FOR DEWATERING SLUDGE OR SLURRY

Glover C. McIntyre, 743 Aspen Road, Pickering, Ontario, Canada (L1V 3P4)

Filed Nov. 25, 1988, Ser. No. 276,343

Int. Cl.[4] B01D *3/10*

U.S. Cl. 159—47.1 **8 Claims**



1. Method of removing moisture from sludge or slurry comprising:

transporting said sludge or slurry through the lower portion of a sealed vessel on a screw conveyor,

passing said sludge or slurry into and out of said vessel through respective inlet and outlet port extents

exposing said sludge or slurry on said conveyor to the environment in said sealed vessel

during said exposure creating a vacuum more negative than −10" Hg. in said environment,

removing from said environment water vapor resulting from said moisture from said sludge or slurry

transporting said sludge or slurry on said conveyor so as to effect substantial air sealing at said inlet and outlet port extents,

wherein the sludge or slurry entering and leaving the inlet and outlet port extents, respectively, has a sufficiently solid constituency to effect such substantial air sealing.

4,913,772

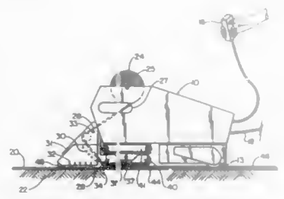
PORTABLE THERMOPLASTIC WELDING MACHINE

Philip A. Taylor, Columbus, and A. Neil Johnson, Gahanna, both of Ohio, assignors to G.R. Systems, Inc., Columbus, Ohio

Filed Apr. 1, 1988, Ser. No. 176,666

Int. Cl.[4] B32B *31/20, 31/26, 31/28*

U.S. Cl. 156—499 **4 Claims**



1. In an improved portable thermoplastic sheet welding machine in which opposing thermoplastic sheets, an upper strip and lower sheets, are welding together to make a unitary membrane, the machine having heat source means to heat the opposing thermoplastic sheets and compression means to compress the heated portions into a weld, an improved heat source means wherein the improvement comprises:

(a) a first, radiant, electric heat source directed at the thermoplastic surface of an upper strip of thermoplastic sheet and substantially dedicated to that material;

(b) a second, radiant, electric heat source directed at the opposing sheets and substantially dedicated to that material; and

(c) electric control means for independently controlling the temperatures of the first and second radiant heat sources to permit them to operate at different temperatures.

4,913,773

METHOD OF MANUFACTURE OF PAPERBOARD

Keith W. Knudsen; Thomas J. Ziolkowski, both of Neenah, and William C. Bean, Larsen, all of Wis., assignors to James River-Norwalk, Inc., S. Norwalk, Conn.

Continuation of Ser. No. 3,200, Jan. 14, 1987, abandoned, which is a continuation of Ser. No. 727,353, Apr. 25, 1985, abandoned. This application Feb. 17, 1989, Ser. No. 313,322

Int. Cl.[4] D21H *1/02*

U.S. Cl. 162—129 **10 Claims**

1. A method of making a stiff three-ply paperboard which is substantially stiffer than three-ply paperboard of the same basis weight in which the middle ply has the same degree of fiber convolution as the outer ply, comprising the steps of:

(a) preparing a conventional cellulosic papermaking fiber furnish in an aqueous carrier fluid in which the fibers are not highly convoluted;

(b) preparing a treated papermaking fiber furnish in an aqueous carrier fluid in which the fibers differ from those in said conventional cellulosic papermaking fiber furnish by being characterized by twists, kinks and curls without substantial fibrillation or breakage of the fibers;

(c) dispensing conventional fiber furnish onto a web-forming foraminous support where aqueous carrier fluid is drained from the dispensed conventional fiber furnish forming therefrom a first outer ply in which the fibers are not highly convoluted;

(d) dispensing treated fiber furnish onto said first outer ply on said forming support forming therefrom a middle ply in which the fibers are highly convoluted and which is intimately bonded to said first outer ply to resist delamination therefrom;

(e) dispensing conventional fiber furnish onto said middle ply on said forming support forming a second outer ply in which the fibers are not highly convoluted and which is intimately bonded to said middle ply to resist delamination thereof; and

(f) dewatering the resulting three-ply paperboard said paperboard to thereby provide a stiff three-ply paperboard which is substantially stiffer than three-ply paperboard of the same basis weight in which the middle ply has the same degree of fiber convolution as the outer ply.

4,913,774

REINFORCED THERMOPLASTIC MATERIAL AND PROCESS OF PREPARATION

Michel Goguelin, Charavines, France, assignor to Arjomari-Prioux S.A., Paris, France

Continuation of Ser. No. 161,975, Feb. 29, 1988, abandoned. This application Jan. 12, 1989, Ser. No. 296,879

Claims priority, application France, Mar. 5, 1987, 87 02987

Int. Cl.[4] D21H *3/00*

U.S. Cl. 162—158 **8 Claims**

1. A wet process for making a thermoplastic composition which can be transformed by molding, molding-stamping or thermomolding into a final product, which comprises forming an aqueous suspension containing reinforcing fibers, at least one thermoplastic resin and at least one adjuvant, dewatering and drying the suspension on a screen, wherein the thermoplastic resin and the adjuvant are intimately mixed in each grain of a powder having a granulometry larger than the mesh of the screen on which the composition is dewatered and which powder is added to the suspension prior to dewatering on the screen to produce a thermoplastic composition for thermoprocessing which contains substantially all of the adjuvants; said powder having been formed by grinding granules formed

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by extrusion of an intimate mixture of the thermoplastic resin and the adjuvant.

4,913,775

PRODUCTION OF PAPER AND PAPER BOARD

John Langley, and David Holroyd, both of West Yorkshire, England, assignors to Allied Colloids Ltd., Great Britain

Continuation-in-part of Ser. No. 6,953, Jan. 27, 1987, Pat. No. 4,753,710. This application Jun. 27, 1988, Ser. No. 211,780
Claims priority, application United Kingdom, Jun. 29, 1986, 8602121; Mar. 28, 1988, 8807444
The portion of the term of this patent subsequent to Jun. 28, 2005, has been disclaimed.
Int. Cl.[4] D21H *3/36*
U.S. Cl. 162—164.3 16 Claims

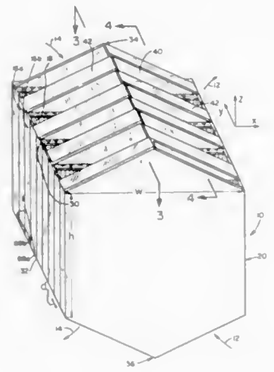
1. A process in which paper or paper board is made by forming an aqueous cellulosic suspension, passing the suspension through one or more shear stages, said shear stages being selected from cleaning, mixing and pumping stages, draining the suspension to form a sheet and drying the sheet and in which the suspension that is drained includes organic polymeric material that is flocculant or retention aid and inorganic material, and in which the inorganic material comprises bentonite which is added in an amount of at least 0.03% to the suspension after one of the said shear stages, and the organic polymeric retention aid or flocculant comprises a substantially linear synthetic cationic polymer having molecular weight above 500,000 and having a charge density of at least about 0.2 equivalents of nitrogen per kg polymer which is added to the suspension before that shearstage in an amount that is effective to give improved retention upon the addition of bentonite.

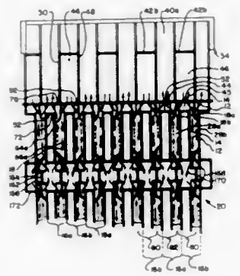
4,913,776

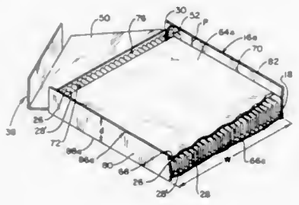
HIGH EFFICIENCY FOLDED PLATE HEAT EXCHANGER

Harlen E. Finemore, Pocatelleo, Id., and Arthur A. Oare, Wellsville, N.Y., assignors to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Aug. 15, 1988, Ser. No. 231,902
Int. Cl.[4] F28F *3/08*
U.S. Cl. 165—166 19 Claims







1. A folded plate heat exchanger module comprising:

a folded sheet of heat conductive material having opposed longitudinal edges and opposed side edges, the folds defining on the front and back of the sheet a plurality of parallel longitudinal ridges and parallel longitudinal channels between the ridges;

a pair of flat, substantially rectangular flow plates located on the front and back ridges, respectively, and having opposed side edges spanning the side edges of the folded sheet and having opposed longitudinal edges that are closer together than the longitudinal edges of the sheet, thereby exposing longitudinally upper and lower portions of the sheet;

a pair of opposed side plates sealingly attached at right angles to the side edges of the flow plates and longitudinally spanning the side edges of the sheet, the side plates having a depth in the front to back direction of the sheet which exceeds the distance between the flow plates so that each side plate projects a predetermined distance from at least one flow plate;

each flow plate being sealingly attached at its side edges to a respective side plate and each folded sheet being sealingly attached along its side edges to at least one of a respective side plate and a respective flow plate; and

means sealingly engaging one of the flow plates and the portions of the side plates projecting from the flow plates, for blanking off said upper and lower exposed portions of the sheet from each other except for flow through said channels.

4,913,777

SOLVENT EVAPORATOR

Martin Parkinson, 6 N. Delaware Dr., Nyack, N.Y. 10960

Continuation-in-part of Ser. No. 131,649, Dec. 11, 1987, Pat. No. 4,790,911, which is a continuation-in-part of Ser. No. 24,350, Mar. 10, 1987, abandoned. This application Dec. 2, 1988, Ser. No. 278,790
The portion of the term of this patent subsequent to Dec. 13, 2005, has been disclaimed.
Int. Cl.[4] B01D *1/22, 3/08*
U.S. Cl. 202—205 16 Claims

1. An apparatus for evaporating a solvent, which comprises:

(A) A motor with an attached magnet;

(B) A hot plate means;

(C) A container for said solvent;

(D) Said container having an opening for the placement of a rotor within said container;

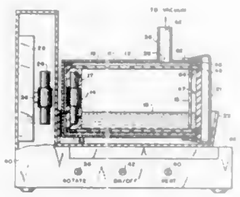
(E) A closure for said opening in said container;

(F) Means for connecting said container to a source of vacuum;

(G) Said rotor being cylindrical in shape, having a base and a closed top, said base in said rotor having an opening, said rotor being removably placed within said container;

(H) Means for magnetically attracting said base of said rotor to said magnet, and being affixed to said base of said rotor, and

(I) Said container and said rotor being positioned in a substantially horizontal position on the top surface of said hot plate means with the base of said rotor being immediately adjacent said magnet, such that the magnetic field of said magnet securely engages the means for magnetically attracting said base of said rotor to said magnet so that when said motor is energized said magnet is caused to rotate which simultaneously causes said rotor to rotate in synchrony with said magnet, and a thin film of solvent is caused to be deposited on to the inner and outer surfaces of said rotor.

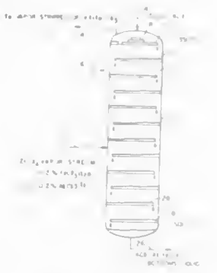


4,913,778

MOLTEN SALT SCRUBBING OF ZIRCONIUM OR HAFNIUM TETRACHLORIDE

Ernest D. Lee, Ogden, Utah, and David F. McLaughlin, Oakmont, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 2, 1969, Ser. No. 305,125
Int. Cl.[4] C01G *25/04, 27/04*
U.S. Cl. 203—29 7 Claims



1. A continuous process for removing impurities of iron or aluminum chloride or both from vaporous zirconium or hafnium chloride or both; said process comprising:

a. introducing impure zirconium or hafnium chloride vapor or both into a middle portion of an absorbing column containing a molten salt phase, said molten salt phase principally comprising; sodium or potassium chloride or both, zirconium or hafnium chloride or both, and iron or aluminum chloride or both, said molten salt phase absorbing said impurities of iron or aluminum chloride or both to produce chloride vapor stripped of zirconium or hafnium chloride;

b. introducing sodium or potassium chloride or both into a top portion of said column;

c. controlling the top portion of said column to between 300–375° C.;

d. heating a bottom portion of said column to 450–550° C. to vaporize zirconium chloride or hafnium chloride or hafnium and zirconium chloride from said molten salt;

e. withdrawing molten salt substantially free of zirconium and hafnium chloride from the bottom portion of said column; and

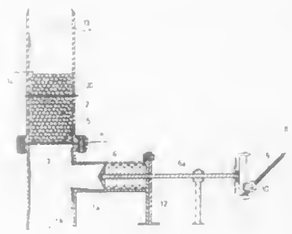
f. withdrawing zirconium chloride or hafnium chloride or hafnium and zirconium chloride vapor substantially free of impurities of iron and aluminum chloride from the top of said column.

4,913,779

PROCESS AND INSTALLATION FOR ELECTROLYSIS BY PERCOLATION ACROSS ONE OR SEVERAL POROUS VOLUMIC ELECTRODES

Germain Laceste, Tournefeuille, France, assignor to Institut National Polytechnique de Toulouse, Toulouse, France

PCT No. PCT/FR87/00192, § 371 Date Dec. 2, 1988, § 102(e) Date Dec. 2, 1988, PCT Pub. No. WO87/07653, PCT Pub. Date Dec. 17, 1987
PCT Filed Jun. 2, 1987, Ser. No. 297,858
Claims priority, application France, Jun. 6, 1986, 86 08331
Int. Cl.[4] B01D *59/40; C25C 1/00, 7/00*
U.S. Cl. 204—1.11 11 Claims



1 A process for electrolysis by percolation through at least one porous volumic electrode for bringing about an electrochemical reaction, comprising electrically polarizing each volumic electrode formed of a conductive bed of solid particles (2), causing upwardly directed circulation through said volumic electrode of a liquid electrolyte with an average flow velocity Vo, and causing a pulsation of the electrolyte circulating through the volumic electrode, said process being characterized in superimposing a periodic pulsation on the circulation of the electrolyte, the pulsation having an amplitude -a- and a frequency -f- such that:

$$a \cdot f > \frac{|Vmf - Vo|}{2\pi} \text{ and } a \cdot f > 4\,\frac{Vo}{2\pi}$$

where Vo, a and f are the arithmetic values respectively of the flow velocity, the amplitude and the frequency, and Vmf is the arithmetic value of the minimum fluidization velocity of the bed of particles, such that:

during one fraction of the cycle, the particles of the bed forming he volumic electrode are in a lower position in a fixed bed with an instantaneous velocity resulting from the electrolyte changing direction at the center of this fraction of the cycle for giving rise to an outflow in a turbulent agitated state, and

during the other fraction of the cycle termed the instant of fluidization, the particles are placed in a fluidized state.

2 A process for electrolysis as in claim 1, and wherein the

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velocity Vmf is great with respect to the velocity Vo, characterized in causing the pulsation in such a manner that:

$$a \cdot f \leq \frac{1.2\ Vmf - Vo}{2\pi}$$

so that, in each cycle, the duration of the instant of fluidization is much less than the duration of the other fraction of the cycle.

8. An electrolysis apparatus comprising a reactor (1) having an inlet (1*b*) and an outlet (1*c*) for an electrolyte, at least one porous volumic electrode (2) formed by a conductive bed of solid particles arranged in the reactor, at least one conductive counterelectrode (13) arranged in said reactor, electric means connected to each counterelectrode and to each volumic electrode for polarizing the latter, means (16) for circulating an electrolyte in the reactor and means (6–10) for causing a pulsation of the electrolyte in the bed(s) of particles forming the volumic electrode(s), characterized in that the means for causing the pulsation comprises an extension mounted on the reactor and provided with a periodic displacement member (6) actuated by drive means (8).

4,913,780

REDOX ELECTRODE FOR DETERMINING NITROUS ACID AND NITROSYL COMPOUNDS

Wolfgang Habermann, Mainz; Peter Hammes, Ruppertsberg; Reinhard Messlinger, Ludwigshafen-Ruchheim; Manered Munzinger, Dirmstein, and Helmut Froehlich, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 12, 1988, Ser. No. 231,383

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1987, 3727384

Int. Cl.[4] B01D *59/40;* **C25B** *11/04*

U.S. Cl. 204—153.14 **20 Claims**

8. A method for determining nitrous acid and nitrosyl concentrations in aqueous acidic solutions, the method comprising:

measuring the potential of a redox electrode against a reference electrode, wherein the redox electrode is cathodically polarized against an auxiliary electrode and the redox electrode has a metallic core and an n-conducting metal oxide surface that has a conductivity of from 10^{-7} to $1 \times 10^{2}\ \Omega^{-1}\ cm^{-1}$.

4,913,781

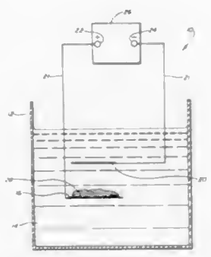
MICROPOROUS ELEMENTAL SILVER AND METHOD

Harvey N. Seiger, Mayfield Heights, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 18, 1987, Ser. No. 98,382

Int. Cl.[4] H01M *4/26, 4/34*

U.S. Cl. 204—21 **17 Claims**



1. A method of preparing microporous elemental silver, said method comprising the steps of

(a) oxidizing elemental silver powder particles to at least the monovalent state;

(b) electrochemically reducing oxidized silver powder particles from step (a) to form microporous particles of elemental silver wherein said steps (a) and (b) are carried out in a system which comprises a pair of spaced conductive metallic sheets of non-porous metallic elemental silver foil disposed in an aqueous electrolyte, at least one of said sheets supporting supply of elemental silver powder particles to be oxidized or reduced, said sheets being in electrical contact with a power supply to effect ionic current flow in said electrolyte between said sheets.

4,913,782

MICROPOROUS ELEMENTAL SILVER ARTICLE AND METHOD

Harvey N. Seiger, Mayfield Heights, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 18, 1987, Ser. No. 98,380

Int. Cl.[4] H01M *4/04, 4/54*

U.S. Cl. 204—2.1 **14 Claims**

1. A method of forming an article comprising microporous elemental silver, said method comprising the step of:

filling a porous conductive substrate with a mixture of Ag_2O and microporous elemental silver, said mixture being produced by electrochemical reduction of Ag_2O within the pores of said substrate, the degree of said filling being sufficient to reinforce said substrate, said filling step being carried out by the method comprising the steps of:

(a) impregnating said porous conductive substrate with an acidified solution of silver nitrate;

(b) electrochemically reducing said silver nitrate within the pores of said impregnated substrate to a degree sufficient to result in hydroxide ion formation whereby said silver nitrate solution is rendered sufficiently alkaline that Ag_2O is formed in said pores; and

(c) electrochemically reducing said Ag_2O to form microporous elemental silver in said pores.

4,913,783

PROCESS FOR THE MANUFACTURE OF A PERFORATED NICKEL FRAME BY ELECTROFORMING

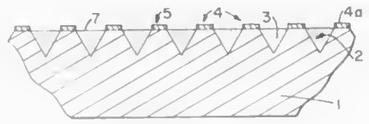
Armand Piolat, Saint Georges d'Esperanche, France, assignor to Piolat Industrie, St. Georges d'Esperanche, France

Filed May 1, 1989, Ser. No. 347,144

Claims priority, application France, May 2, 1988, 88 06428

Int. Cl.[4] C25D *1/08*

U.S. Cl. 204—11 **9 Claims**

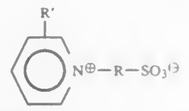


1. A process for the manufacture by electroforming of a perforated nickel frame, according to which the operation is carried out in at least two stages:

(a) according to a first stage, and in a first electrolytic bath, a first deposit of nickel is produced on an engraved support mandrel comprising alveoli whose opening is closed by a nonconductive substance, and whose edge or ridge is

conductive, and a nickel skeleton is separated from the mandrel, its perforations corresponding substantially to the alveoli of the said mandrel,

(b) according to a second stage, and in a second electrolytic bath, a second deposit of nickel is produced on the skeleton, characterized in that at least the second bath has added to it a pyridinium compound of formula:



in which:

R is a saturated alkyl chain containing at least one carbon atom and optionally substituted,

R' is a hydrogen atom or a substituent group in any position relative to the nitrogen atom of the pyridinium nucleus.

4,913,784

PROCESS FOR METALLIZING A CERAMIC SUBSTRATE

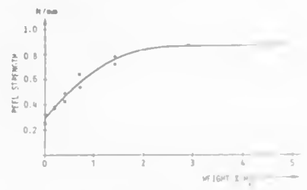
August F. Bogenschütz, Oberdischingen; Josef L. Jostan, and Robert Ostwald, both of Ulm, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs GmbH, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 885,252, Jul. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 881,100, Jul. 2, 1986, Pat. No. 4,721,549. This application Jan. 12, 1989, Ser. No. 298,245

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1985, 3523958

Int. Cl.[4] C25D *5/54;* **C23C** *18/18*

U.S. Cl. 204—29 **12 Claims**



11. In a chemical process for metallizing a ceramic substrate including the steps of providing a catalytic germination layer on the ceramic substrate, which layer is capable of catalyzing electroless precipitation of metals thereon; precipitating a first electrically conductive metal layer onto the catalytic germination layer by electroless precipitation from a chemical bath; and electrolytically precipitating a second electrically conductive metal layer onto the first layer from an electrolytic bath, the improvement comprising a pretreatment, prior to the step of providing the catalytic germination layer, including:

a. providing a melt bath consisting essentially of molten sodium hydroxide and from 1 to 5 percent by weight water;

b. preheating a ceramic substrate to be metallized to a temperature effective to at least mitigate thermal shock thereto when subsequently contacted by the melt bath, the ceramic substrate having a firing skin;

c. chemically etching the preheated ceramic substrate by contacting same with the melt bath for from 1 second to 10 hours under a protective gas atmosphere comprised of an inert gas and water vapor to maintain a water vapor partial pressure ranging from 0.234 atm up to saturation level, to remove the firing skin and surface-roughen the substrate to provide an etched ceramic substrate;

d. chemically treating the etched ceramic substrate with a solution having a pH ranging from 8 to 11 to provide an etched and treated ceramic substrate; and

rinsing the etched and treated ceramic substrate with a solvent and drying to remove the solvent.

4,913,785

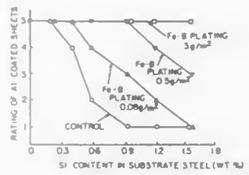
PROCESS FOR HOT-DIP METAL-COATING POORLY WETTABLE STEEL SHEETS

Yukio Uchida, Amagasaki; Yasunori Hattori, Izumisano; Yusuke Hirose, Osaka-Sayama; Nobuo Hatanaka, and Nobuhiko Sakai, both of Amagasaki, all of Japan, assignors to Nisshin Steel Company, Ltd., Tokyo, Japan

Filed Jan. 17, 1989, Ser. No. 297,961

Int. Cl.[4] C25O *5/00*

U.S. Cl. 204—38.5 **7 Claims**



1. A process for preparing hot-dip-metal-coated steel sheets having excellent corrosion resistance comprising electrolytically plating steel sheets containing Si and/or Cr with an Fe-B alloy containing 0.001 ~ 0.3% by weight of B to a thickness of of 0.05 ~ 5 g/m^2 and thereafter hot-dip-coating the thus pre-plated substrate sheets with a molten bath of Zn, Al or Zn-Al alloy

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4,913,786

METHOD OF CORROSION, SOUND, AND VIBRATION PROOFING OF A METAL STRUCTURE

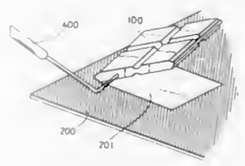
Seinosuke Horiki; Reiji Makino, both of Tokai, and Hisami Iwata, Toyota, all of Japan, assignors to Nagoya Oilchemical Co., Ltd. and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Continuation-in-part of Ser. No. 58,530, Jun. 5, 1987, abandoned. This application Nov. 23, 1988, Ser. No. 276,407

Claims priority, application Japan, Jun. 9, 1986, 61-132959

Int. Cl.[4] C25D *5/48;* **B05D** *1/32, 5/00*

U.S. Cl. 204—38.7 **4 Claims**



1. A method of corrosion, sound and vibration-proofing of a metal structure which comprises masking a selected surface of said metal structure by adhesively applying thereto a polystyrene foam, adhesive coated panel masking member wherein the polystyrene foam has a closed cell structure and a density in the range from about 12.5 to about 50 g/l, coating the surface of said metal structure including said masking member with plasticized polyvinyl chloride by spray coating and removing said masking member from the resulting polyvinyl chloride-coated metal structure by striking said spray coated masking member with a hook for penetrating and for removing said polyvinyl chloride-coated masking member from said metal structure.

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4,913,787
GOLD PLATING BATH AND METHOD
Masayuki Kiso, Tokyo, Japan, assignor to C. Uyemura & Co., Ltd., Osaka, Japan
Filed Sep. 6, 1989, Ser. No. 408,905
Claims priority, application Japan, Sep. 6, 1988, 63-222962
Int. Cl.[4] C25D *3/48, 3/62;* C23C *18/44*
U.S. Cl. 204—44.3 9 Claims

1. A gold electroplating bath comprising potassium aurous cyanide and thiourea complexing agent and having a pH of up to 3.

6. A gold electroless plating bath comprising potassium aurous cyanide, thiourea complexing agent, and a reducing agent and having a pH of up to 3.

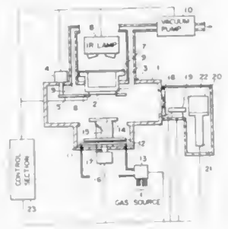
4,913,788
PROCESS AND APPARATUS FOR THE ELECTROCHEMICAL SEPARATION OF METAL MIXTURES AND METAL ALLOYS
Jozef Hanulik, Zurich, Switzerland, assignor to Recytec S.A., Neuchatel, Switzerland
Filed Sep. 26, 1988, Ser. No. 249,411
Claims priority, application Switzerland, Sep. 28, 1987, 3748/87
Int. Cl.[4] C25C *1/00, 7/00;* C22B *3/00*
U.S. Cl. 204—105 R 17 Claims

1. A process for the electrochemical separation of metal mixtures and metal alloys, which comprises dissolving the starting material in an electrolyte and substituting the metals dissolved in the electrolytic solution in succession in accordance with their electrochemical potential with electrochemically less noble metals in each case and depositing them.

4,913,789
SPUTTER ETCHING AND COATING PROCESS
David K. Aung, 7 Kimbercroft Court, Scarborough, Ontario, Canada M1S 4K7
Filed Apr. 18, 1988, Ser. No. 182,719
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—192.3 6 Claims

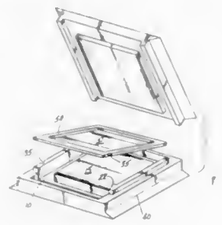
1. A process for sputter coating a diagram onto a substrate, comprising the steps of:
applying a high sputtering yield copper or stainless steel mask to a suitably prepared substrate, the mask having voids defining a diagram;
vacuum sputter etching the masked substrate;
vacuum sputter coating the etched masked substrate under high vacuum to apply a layer of an electrically conductive metal on the substrate, the layer having a thickness of at

4,913,790
TREATING METHOD
Tomonori Narita, Tokyo, and Kimihiro Matsuse, Yokohama, both of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan
Filed Mar. 21, 1989, Ser. No. 326,689
Claims priority, application Japan, Mar. 25, 1988, 63-72995
Int. Cl.[4] C23C *14/34, 16/00;* C03C *15/00*
U.S. Cl. 204—192.13 7 Claims



1. A workpiece treating method comprising a temperature rise step in which first temperature control is performed and a treatment step in which second temperature control is performed and adapted to treat a workpiece whose emissivity of infrared rays in the temperature rise step is different from that in the treatment step, wherein a temperature of the workpiece is detected by non-contact type temperature detecting means in the temperature rise step so as to perform the first temperature control, and the temperature of the workpiece is detected by contact type temperature detecting means in the treatment step so as to perform the second temperature control.

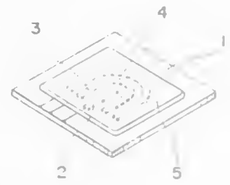
4,913,791
BLOT FRAME AND METHOD OF HANDLING
Stanley M. Hurd, Hamden, and Richard E. Kouri, New Haven, both of Conn., assignors to Bios Corporation, New Haven, Conn.
Division of Ser. No. 90,739, Aug. 28, 1987, Pat. No. 4,812,216.
This application Mar. 1, 1989, Ser. No. 317,423
The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.
Int. Cl.[4] G01N *27/28*
U.S. Cl. 204—299 R 10 Claims



1. In combination, a transfer membrane, a transfer membrane support means whereby said transfer membrane is handled and a receptacle for receiving the support means for orienting the

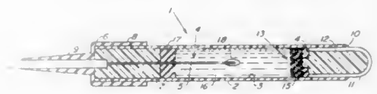
support means and the transfer membrane relative to the receptacle comprising:
a protuberance located on one of the support means and the receptacle and a mating indentation located on the other of said support means and said receptacle to insure proper orientation of said transfer membrane.

4,913,792
FLAMMABLE-GAS SENSOR
Yasuhiro Nagata, Kusatsu; Satoru Sato, Osaka, and Kiyoshi Furuya, Kasatsu, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan
PCT No. PCT/JP87/00551, § 371 Date Jan. 5, 1989, § 102(e) Date Jan. 5, 1989, PCT Pub. No. WO89/01148, PCT Pub. Date Feb. 9, 1989
PCT Filed Jul. 28, 1987, Ser. No. 295,599
Int. Cl.[4] G01N *27/56*
U.S. Cl. 204—412 3 Claims



1. A flammable-gas sensor comprising
an insulating substrate,
a working electrode provided at the surface of said insulating substrate,
a counter electrode provided at a surface of said insulating substrate and positioned with a set gap from said working electrode, and
a gas permeable, proton-conductive film which covers said working electrode and counter electrode and forms an integrated whole with said working electrode and counter electrode,
wherein said counter electrode is larger in area than said working electrode by a factor of 10 or more
2. A flammable-gas sensor comprising:
an insulating substrate,
a working electrode provided at a surface of said insulating substrate,
a counter electrode provided at the surface of said insulating substrate and positioned with a set gap from said working electrode,
a reference electrode provided at the surface of said insulating substrate and positioned with set gaps from said working electrode and counter electrode, and
a gas permeable, proton-conductive film which covers said working electrode, counter electrode and reference electrode and forms an integrated whole with said working electrode, counter electrode and reference electrode,
wherein said reference electrode and counter electrode form coaxial circles with said working electrode at the center
3. A flammable-gas sensor comprising:
an insulating substrate,
a working electrode provided at a surface of said insulating substrate,
a counter electrode provided at the surface of said insulating substrate and positioned with a set gap from said working electrode,
a reference electrode provided at the surface of said insulating substrate and positioned with set gaps from said working electrode and counter electrode, and
a gas permeable, proton-conductive film which covers said working electrode, counter electrode and reference electrode and forms an integrated whole with said working electrode, counter electrode and reference electrode,
wherein said reference electrode is positioned between said working electrode and counter electrode

4,913,793
REFERENCE ELECTRODE AND METHOD OF MAKING SAME
John E. Leonard, Irvine, Calif., assignor to Broadley-James Corporation, Santa Ana, Calif.
Continuation-in-part of Ser. No. 774,546, Sep. 10, 1985. This application Jan. 6, 1986, Ser. No. 816,378
Int. Cl.[4] G01N *27/30, 27/46*
U.S. Cl. 204—433 35 Claims



1. A reference electrode comprising:
a half cell;
means for making electrical connection to said half cell; and
means for making electrochemical connection between said half cell and a test material when said electrode is immersed in said material, said means for making electrochemical connection being substantially ion-impermeable and comprising a mixture of anionic ion exchange polymer and cationic ion exchange polymer.

4,913,794
PROCESS CONFIGURATION FOR PRODUCING HIGH VISCOSITY LUBRICATING OILS
Quang N. Le, Cherry Hill, N.J.; Robert A. Ware, Wyndmoor, Pa., and Stephen S. Wong, Medford, N.J., assignors to Mobil Oil Corp., New York, N.Y.
Continuation-in-part of Ser. No. 179,795, Apr. 11, 1988, abandoned. This application Jul. 13, 1989, Ser. No. 379,511
Int. Cl.[4] C10G *71/00*
U.S. Cl. 208—18 16 Claims

1. A process for improving the Viscosity Index of a hydrocarbon lubricating oil comprising the steps of:
(a) providing a flow reactor having separate first and second inlet ports for the separate co-injection of lubricating oil and an organic peroxide;
(b) charging said lubricating oil and said organic peroxide to said flow reactor through said first and second inlet ports respectively;
(c) controlling the relative flowrates of said lubricating oil and organic peroxide reactants together with the total volumetric flowrate through said flow reactor to maintain a flow regime which favors diffusional mixing between said organic peroxide and said lubricating oil; and
(d) maintaining said organic peroxide and said lubricating oil under conversion conditions including temperatures of between about 50° and 300° C. and pressure sufficient to maintain said lubricating oil and said organic peroxide substantially in the liquid phase.

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4,913,795
NOVEL CRYSTALLINE METALLOALUMINOPHOSPHATE
Ernest W. Valyocsik, Yardley, Pa., assignor to Mobil Oil Corp., New York, N.Y.
Filed Mar. 10, 1988, Ser. No. 166,585
The portion of the term of this patent subsequent to Apr. 3, 2007, has been disclaimed.
Int. Cl.[4] C01G *1/00*; B01J *29/04*; C01B *25/36*
U.S. Cl. 208—46 15 Claims

1. A crystalline metalloaluminophosphate composition comprising crystals which, as synthesized, exhibit a characteristic X-ray diffraction pattern with interplanar d-spacings at 14.980±0.1, 12.230±0.1, 7.493±0.1, 5.930±0.1 and 4.605±0.05 Angstroms and have a composition in terms of mole ratios, as follows:

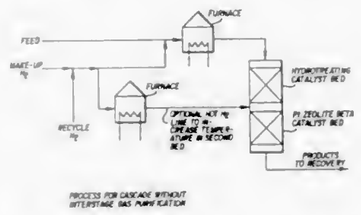
$$A_vQ^{q+}{}_{|v/q|}:(AlO_2^-)_{1-x}:(PO_2^+)_{1-y}:(MO_2^{m-4})_x.$$
$$+_yT^{t-}{}_{|y/t|}$$

wherein A represents occluded organic material, v is the number of moles of A, Q represents cations of valence o, T represents anions of valence t, M is one or more elements of valence m, other than aluminum or phosphorus, and combinations thereof with Si^{+4} wherein less than about 50% of M is Si^{+4}, and x,y,i and j are numbers which satisfy the relationship $i-j=y-x+(4+m)-(x+y)$ and wherein m is from +2 to +6 with M having a Radius Ratio of from 0.15 to 0.73, said Radius Ratio being from 0.52 to 0.62 when m is +2.

4,913,796
NOVEL CRYSTALLINE SILICOALUMINOPHOSPHATE
Ernest W. Valyocsik, Yardley, Pa., assignor to Mobil Oil Corp., New York, N.Y.
Filed Mar. 10, 1988, Ser. No. 166,571
The portion of the term of this patent subsequent to Apr. 3, 2007, has been disclaimed.
Int. Cl.[4] C10G *1/00*; B01J *29/04*; C01B *25/36*
U.S. Cl. 208—46 18 Claims

1. A crystalline silicoaluminophosphate composition comprising crystals exhibiting a characteristic X-ray diffraction pattern with interplanar d-spacings at 14.980±0.1, 12.230±0.1, 7.493±0.1, 5.930±0.1 and 4.605±0.05 Angstroms.

4,913,797
CATALYST HYDROTREATING AND DEWAXING PROCESS
Kenneth R. Albinson, Audubon; Sadi Mizrahi, and Daniel J. Neuman, both of Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.
Continuation of Ser. No. 800,088, Nov. 21, 1985, abandoned, which is a continuation of Ser. No. 668,773, Nov. 6, 1984, abandoned. This application Jan. 12, 1989, Ser. No. 296,929
Int. Cl.[4] C10G *65/04*, *65/12*
U.S. Cl. 208—89 19 Claims



1. In a process for dewaxing a waxy hydrocarbon feedstock containing waxy paraffins, normal paraffins, slightly branched paraffins, sulfur and nitrogen compounds over a dewaxing catalyst containing Zeolite Beta alone in a reactor of specified volume, the improvement comprising:
(a) substituting a portion of the said dewaxing catalyst in said reactor volume with a hydrotreating catalyst to form a distinct hydrotreating zone and a dewaxing zone, the ratio of the catalyst in the hydrotreating zone to the catalyst in the dewaxing zone being at least 1:2, but less than 2:1 to maintain a specified reactor volume;
(b) subjecting said feedstock to hydrotreating by contacting said feedstock with the hydrotreating catalyst in said hydrotreating zone operated at hydrotreating conditions sufficient to remove at least a portion of said sulfur and nitrogen compounds from the feedstock;
(c) subjecting said hydrotreated feedstock to catalytic dewaxing without changing the hydrogen partial pressure by contacting said feedstock with the dewaxing catalyst in the dewaxing zone containing Zeolite Beta and a hydrogenation/dehydrogenation component; and
(d) recovering a distillate having a reduced pour point compared to said feedstock at higher yield and with reduced hydrogen consumption than a process using the said dewaxing catalyst alone.

4,913,798
HYDROCRACKING CATALYTS AND PROCESSES EMPLOYING SILICOALUMINOPHOSPHATE MOLECULAR SIEVES
Frank P. Gortsema, Pleasantville; Regis Pellet, Croton-on-Hudson; Albert R. Springer, Yonkers; Jule A. Rabo, Armonk, and Gary N. Long, Putnam Valley, all of N.Y., assignors to UOP, Des Plaines, Ill.
Division of Ser. No. 682,946, Dec. 18, 1984, abandoned. This application Sep. 4, 1985, Ser. No. 772,618
Int. Cl.[4] C10G *47/04*, *47/20*
U.S. Cl. 208—111 13 Claims

1. A hydrocracking process for processing a hydrocarbon feedstock in the presence of hydrogen comprising contacting at hydrocracking process conditions a hydrocarbon feedstock boiling between about 400° F. and about 1200° F. and hydrogen with a hydrocracking conversion catalyst comprising a traditional hydrocracking catalyst component comprising a large pore zeolite and an amount of at least one hydrogenation component selected from the group consisting of cobalt, nickel, molybdenum, tungsten, platinum, palladium, chromium, rhodium, ruthenium and iridium effective to provide the hydrogenation function of the hydrocracking catalyst and further comprising an effective amount of at least one silicoaluminophosphate (SAPO) characterized in its calcined form by an adsorption of isobutane of at least 2 percent by weight at a partial pressure of 500 torr and a temperature of 20° C.

4,913,799
HYDROCRACKING CATALYSTS AND PROCESSES EMPLOYING NON-ZEOLITIC MOLECULAR SIEVES
Frank P. Gortsema, Pleasantville; Regis J. Pellet, Croton-On-Hudson; Albert R. Springer, Mt. Vernon; Jule A. Rabo, Armonk, and Gary N. Long, Putnam Valley, all of N.Y., assignors to UOP, Des Plaines, Ill.
Continuation-in-part of Ser. No. 772,924, Sep. 5, 1985, abandoned, which is a division of Ser. No. 683,241, Dec. 18, 1984, Pat. No. 4,818,739. This application Sep. 4, 1987, Ser. No. 93,477
Int. Cl.[4] C10G *47/12*, *47/20*, *69/10*
U.S. Cl. 208—89 51 Claims

1. A hydrocracking process for processing crude oil feedstock in the presence of hydrogen comprising contacting in the presence of hydrogen at conditions effective to hydrocrack a crude oil feedstock with a hydrocracking catalyst comprising an amount of at least one metal hydrogenation catalyst effective to provide a hydrogenation function and an amount of at least one non-zeolitic molecular sieve characterized in its calcined form by an adsorption of isobutane of at least 2 percent by weight at a partial pressure of 500 torr and a temperature of 20° wherein a hydrocracked product is formed.

4,913,800
TEMPERATURE CONTROL IN AN EBULLATED BED REACTOR
Scott M. Sayles; William B. Livingston, and Michael P. Bellinger, all of Baton Rouge, La., assignors to Texaco Inc., White Plains, N.Y.
Filed Nov. 25, 1988, Ser. No. 275,886
Int. Cl.[4] C10G *47/30*
U.S. Cl. 208—108 7 Claims

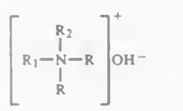
1. In a continuous process for treating a residual hydrocarbon oil with a hydrogen-containing gas at elevated catalytic reaction temperature and pressure in the presence of a bed of particulate solid catalyst, said process comprising introducing the hydrogen-containing gas and residual hydrocarbon oil into the lower end of a generally vertical catalyst containing reaction vessel wherein the catalyst is placed in random motion within the fluid hydrocarbon whereby the catalyst bed is expanded to a volume greater than its static volume, wherein the improvement comprises:
adding an aromatic feedstock into the lower end of the reaction vessel at a rate whereby said temperature is controlled in the range of 650° F. to 950° F. in the absence of heating said hydrogen-containing gas, said residual hydrocarbon oil and said aromatic feedstock by indirect heat exchange.

4,913,801
PASSIVATION OF FCC CATALYSTS
David R. Forester, Spring, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.
Filed Jan. 17, 1988, Ser. No. 208,202
Int. Cl.[4] C10G *11/04*
U.S. Cl. 208—121 8 Claims

1. In a method for cracking a hydrocarbon which comprises:
a. contacting a hydrocarbon feedstock with a fluidized zeolite-containing cracking catalyst in a cracking zone under cracking conditions;
b. recovering the cracked products;
c. passing the cracking catalyst from the cracking zone to a regeneration zone;
d. regenerating the cracking catalyst in the regeneration zone by contact with oxygen-containing gas under regeneration conditions to produce a regenerated catalyst; and
e. introducing the regenerated catalyst to the cracking zone for contact with the hydrocarbon feedstock;
wherein the catalyst during the cracking process is contaminated with from about 100 to 5000 parts nickel per million parts of catalyst, with nickel contained in a feedstock at concentrations of up to about 100 ppm, wherein nickel increases hydrogen and coke yields at the cracking temperatures and conditions in the cracking zone, and wherein the catalyst contains less than about 3000 ppm of vanadium;
the improvement comprising treating the feedstock containing the nickel contamination with cerium, with the amount of cerium utilized being from 0.005 to 240 ppm based on the concentration of the nickel in the feedstock and at atomic ratios with nickel of from 1:1 to 0.05:1 Ce/Ni.

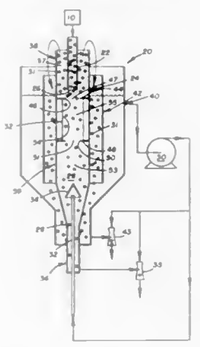
4,913,802
PROCESS FOR SWEETENING A SOUR HYDROCARBON FRACTION
Jeffery C. Bricker, Buffalo Grove; Laurence O. Stine, Western Springs, and Thomas A. Verachtert, Wheeling, all of Ill., assignors to UOP, Des Plaines, Ill.
Filed May 8, 1989, Ser. No. 348,620
Int. Cl.[4] C10G *27/10*, *29/00*
U.S. Cl. 208—207 7 Claims

1. A process for sweetening a sour hydrocarbon fraction containing mercaptans comprising contacting the hydrocarbon fraction in the presence of an oxidizing agent with a catalytic composite effective in oxidizing said mercaptans to disulfides, ammonium hydroxide and a quaternary ammonium hydroxide having the structural formula



where R is a hydrocarbon group containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl, and aralkyl; R_1 is a straight chain alkyl group containing from about 5 to about 20 carbon atoms; and R_2 is a hydrocarbon group selected from the group consisting of aryl, alkaryl and/or alkyl and said catalytic composite comprising a metal chelate dispersed on an adsorbent support.

4,913,803
PARTICLE SEPARATION SYSTEM
Jerome E. Earls, Aptos, and Dane T. Snyder, San Jose, both of Calif., assignors to Radiological & Chemical Technology, Inc., San Jose, Calif.
Filed Apr. 7, 1988, Ser. No. 178,529
Int. Cl.[4] B03B *7/00*
U.S. Cl. 209—17 23 Claims



1. A method for separating a mixture of a first and a second set of particles, each set having a particle size distribution generally centered about an average particle size section and having generally decreasing amounts of smaller and larger particles to define respective first and second particle size distributions each having a smaller particle size section, said average particle size section and a larger particle size section with the particle sizes of the smaller particle size sections overlapping one another and with the particle sizes of the larger particle size sections overlapping one another, the first set of particles having a higher average terminal velocity when placed in a separation liquid than the does the second set, comprising:

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separating from said mixture either at least a smaller particle size portion and any finer extraneous particles of said first set or at least a larger particle size portion and any larger extraneous particles of said second set in such a manner as to form a resulting mixture with either said first set substantially free of at least said smaller size particle portion thereof and of finer extraneous material or said second set substantially free of at least said larger size particle portion thereof and of larger extraneous material, said separating being such that the first and second sets of the resulting mixture are composed of particles having substantially completely non-overlapping terminal velocities in said separation liquid;

introducing said resulting mixture at an entry height into a generally vertically extending tube having said separation liquid flowing upwardly therethrough at a velocity less than the terminal velocities of the particles of said first set and greater than the terminal velocities of the particles of said second set whereby said first set falls downwardly in said tube to a lower region substantially free of particles of said second set and said second set is carried upwardly in said tube to an upper region substantially free of particles of said first set, said upper region being above said entry height;

removing the particles of said first set from said lower region; and

removing the particles of said second set from said upper region.

4,913,804

DEVICE AND PROCESS FOR SEPARATING GRANULAR MATERIAL

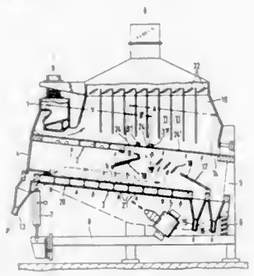
Roman Muller, Buelhofstrasse 22, CH-9244 Niederuzwil, Switzerland

Continuation of Ser. No. 834,326, Mar. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 817,730, Dec. 23, 1985, Pat. No. 4,652,362. This application Jan. 25, 1989, Ser. No. 303,025

Claims priority, application Switzerland, May 8, 1984, 2240784-8

Int. Cl.[4] B03B *4/00*; B07B *9/02*

U.S. Cl. 209—44.2 **20 Claims**



1. In a device for separating granular product into several fractions, with upper and lower fluidized bed tables journaled in vibratory fashion and adjustable in their inclination and capable of being permeated by a common stream of air, there being disposed above a higher end of the upper fluidized bed table an inlet for the granular product, opposite to which at a lower end is an outlet for the lightest grain fraction, and there further being present at a higher end of the lower fluidized bed table a stone outlet and, at a lower end, an outlet for the heavy granular fraction, and with an intermediate floor of lesser length disposed between the fluidized bed tables for leading off a mixed fraction, which extends from the lower ends of the fluidized bed tables in the direction toward the higher ends, the improvement comprising:

the fluidized bed tables being disposed in a stiff frame and journaled in vibratory fashion, to which is associated a common vibratory drive whose casting, vibratory movement is directed toward the stone outlet, with said intermediate floor being inclined toward said lower end of said lower fluidized table, with said upper fluidized table having a smooth but finely perforated surface, and with said lower fluidized table having a coarse surface.

4,913,805

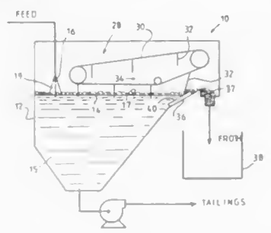
APPARATUS AND METHOD FOR FROTH FLOTATION

Ti-Hua Chin, Voorhees, N.J., assignor to BP America Inc., Cleveland, Ohio

Filed Feb. 23, 1989, Ser. No. 314,442

Int. Cl.[4] B03D *1/14*

U.S. Cl. 209—164 **12 Claims**



9. A method for the froth flotation separation of the components of a slurry having particulate matter therein which is to be separated and collected, said method comprising the steps of:

(i) spraying an input slurry of particulate matter into a liquid contained in a flotation tank to create a froth on the liquid surface;

(ii) removing the froth from said liquid surface by skimming means, said skimming means passing said froth over a discharge surface, said discharge surface having at least one raised ridge means disposed thereon for preventing the skimming means from contacting the portion of the discharge surface upon which said at least one raised ridge means is disposed and cooperating with said skimming means and discharge surface to separate excess liquid from the froth prior to the collection of the froth.

4,913,806

APPARATUS FOR SCREENING A SUSPENSION OF FIBROUS CELLULOSE PULP

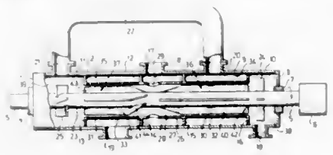
Rune Hillström, and Rolf Ekholm, both of Karlstad, Sweden, assignors to Kamyr AB, Karlstad, Sweden

Filed Jun. 5, 1989, Ser. No. 361,308

Claims priority, application Sweden, Jul. 4, 1988, 8802493

Int. Cl.[4] B07B *1/04*

U.S. Cl. 209—273 **8 Claims**



1. An apparatus for screening a suspension of fibrous cellulose pulp, said apparatus comprising an elongate housing and a rotor shaft extending therethrough, said housing having an inject section, at least first and second screening sections, each of which comprising rotor members mounted on the rotor shaft and a cylindrical screening means cooperating therewith and defining an outer accept chamber and an inner screening chamber, and a reject section for the removal from the apparatus of fiber suspension remaining at screening, said inject section communicating with the screening chamber of the first screening section, said inject section being disposed between the first screening section and the second screening section, whereby the screening sections being disposed at a corresponding axial distance from each other, said screening chamber of the first screening section communicating with the adjacent reject section, said housing further including an inlet section disposed at the end of the second screening section facing away from the inject section, so that an internal space of the inlet section communicates with the screening chamber of the second screening section, said accept chamber of the first screening section communicating with the internal space of the inlet section via at least one communication extending outside the housing for transferring the fiber suspension screened off in the first screening section to the second screening section, and said screening chamber of the second screening section communicating with the adjacent inject section for circulation of the remaining fiber suspension passing axially through the screening chamber, the accept chamber of the second screening section having at least one outlet for discharging fiber suspension which has been screened off.

4,913,807

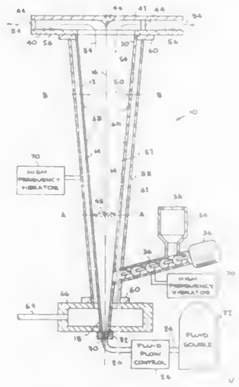
PARTICLE SEPARATOR

Charles D. Hendricks, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 26, 1988, Ser. No. 262,632

Int. Cl.[4] B03B *4/00*; B07B *4/00*

U.S. Cl. 209—461 **3 Claims**



1. An apparatus for separating and classifying an ensemble of particles of diverse size and shape into a multiplicity of portions of particles of similar size and shape, the apparatus comprising:

a cone-shaped hollow pipe symmetric about an axis thereof, having a smooth internal wall that is perforated throughout with holes that are approximately 1 to 50 microns in diameter and spaced apart from one another by a distance of approximately 5 to 200 microns, said pipe having an end of small diameter and an end of large diameter;

means, adapted to function at a variable rate of volumetric flow, for introducing a steady laminar flow of a first quantity of a fluid into the small diameter end of the pipe;

means for inserting the ensemble of particles into the pipe so that the ensemble is dispersed within the fluid;

an axially-symmetric shelf-like flange attached to the large diameter end of the pipe and extending perpendicularly outward from the axis of the pipe;

an axially-symmetric deflection plate oriented perpendicularly to and across the axis of the pipe, and mounted in a spaced apart relationship to the large diameter end of the pipe;

an outer housing that is attached to the cone-shaped pipe but spaced apart from an external wall of the pipe, to provide an enclosed space between the outer housing and the external wall of the pipe; and

means for intromitting a second quantity of the fluid into the enclosed space at a pressure that causes the fluid to flow inwardly through the holes in the pipe, and thereby prevent particles from sticking on the smooth internal wall of the cone-shaped pipe;

whereby, when the apparatus is in use the large diameter end of the pipe is upward and the axis of the pipe is oriented vertically, the fluid undergoes an upward steady laminar flow, within the pipe, that has an approximately common upward velocity at location shaving an approximately common vertical height; the upward velocity of the fluid monotonically decreases in magnitude at increasingly higher locations within the pipe; each portion of particles of similar size and shape migrates to an individual region within the fluid of approximately common vertical height whereat the terminal velocity of the particles of that portion, with respect to the fluid, is approximately equal to the upward velocity of the fluid; and, the fluid, as it passes through the large diameter end of the pipe, is deflected horizontally by the deflection plate, so that all the particles within the deflected fluid begin to undergo a vertical descent and are collected upon the shelf-like flange.

4,913,808

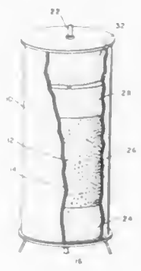
SUBCOMPACT INTERCHANGEABLE CARTRIDGE DRINKING WATER PURIFICATION SYSTEM

Maqsood Haque, 19400 Sorenson Ave. #220, Cupertino, Calif. 95014

Filed Oct. 3, 1988, Ser. No. 252,065

Int. Cl.[4] B01D *27/02*

U.S. Cl. 210—93 **5 Claims**



1 A water purifying device comprising:

a container having a water inlet and a water outlet, said container being formed for replaceably holding a water filtration cartridge threin;

said water filtration cartridge including four layers of water filtration material disposed within said container such that water from said inlet will pass through each said layer of filtration materials to said outlet;

said layers of filtration materials including, in sequence, a

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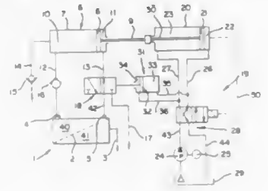
first layer of activated carbon, a second layer of ion exchange resins, a third layer of activated carbon, and a fourth layer of sub-micron filtration material.

4,913,809

CONCENTRATING APPARATUS WITH REVERSE OSMOSIS MEMBRANE

Iwao Sawada; Masaaki Imai, both of Nishinomiya, and Hayato Fujii, Osaka, all of Japan, assignors to Sasakura Engineering Co., Ltd. and Taiyo, Ltd., Osaka, both of, Japan

Filed Jun. 15, 1989, Ser. No. 366,640
Claims priority, application Japan, Jun. 29, 1988, 63-162004
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—98 6 Claims



1. Reverse osmosis apparatus comprising:

a reciprocating pump including a piston which defines on its opposite sides a first cylinder chamber and a second cylinder chamber, said first chamber having a larger maximum volume than said second chamber,

means connected with said first chamber for feeding fluid thereto through first one-way flow means for fluid flow to said first chamber,

a reverse osmosis membrane module including an inlet and an outlet,

second one-way flow means connecting said first chamber with said inlet for fluid flow to said inlet,

a selector valve connecting said second chamber with said outlet,

a concentrated fluid drain conduit means connecting with said selector,

said selector valve having a first position where said second chamber and said outlet are in communication and said drain conduit means is isolated from said second chamber and said outlet,

and a second position where said second chamber and said drain conduit means are in communication and said outlet is isolated from said second chamber and said drain conduit means,

means for providing accurate shifting of a directional control valve at the end of each stroke of a pump piston including

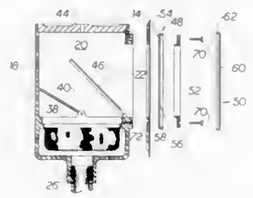
double-acting hydraulic cylinder including a piston which is coupled to said pump piston and defines two chambers on its opposite sides, said two chambers being adapted to be supplied alternately with hydraulic pressure to reciprocate said pistons, and an actuator responsive to the hydraulic pressure alternately supplied to said hydraulic cylinder chambers so as to shift said selector valve selectively to said first position immediately before said first chamber starts to contract, or to said second position immediately before said first chamber starts to expand.

4,913,810

SKIMMER APPARATUS SEALING AND CLOSURE ASSEMBLY

Jerry Hodak, 100 Hazel St., Zelienople, Pa. 16063

Filed Feb. 17, 1989, Ser. No. 311,814
Int. Cl.[4] E04H *3/20*
U.S. Cl. 210—169 7 Claims



1. Skimmer apparatus for a recreational pool comprising: a skimmer chamber having a substantially large port opening mountable outside the pool in sealed registration with a sidewall opening in the pool, whereby surface water from the pool flows through the port opening and into the chamber, and means for draining the water from the chamber;

a sealing and closure assembly for sealably securing the port opening in its registration with the sidewall opening, including a gasket frame, a face plate, and a cover panel;

the gasket frame having a planar central body portion with first and second oppositely-disposed flat surfaces and a central opening closely similar in size and shape to the port opening, the first flat surface bearing compressively against the inside surface wall of the pool, and an integral edge flange projecting peripherally from the body portion in a direction away from the chamber and substantially normal to the second flat surface of the body portion;

the cover panel having a major substantially thin-walled body portion and an integral peripheral projecting edge flange adapted to be slidably and sealably engaged in removable overlapping relation with the gasket frame flange and thereby form a pocket area for containing the face plate between the second surface of the gasket frame and the major body portion of the cover panel; and

the face plate having a planar body with a central opening similar in shape but slightly smaller than the port opening, and the central opening in the face plate being further defined by flange means integral to the face plate and projecting at least partially into the central opening in the gasket frame.

4,913,811

CLEANER FOR AQUARIUM

Liang-Chen Huang, and Po-Sheng Hoang, both of No. 63, Ta Hsin St., Tainan City, Taiwan

Filed Mar. 13, 1989, Ser. No. 322,513
Int. Cl.[4] A01K *63/04*
U.S. Cl. 210—169 8 Claims

1. A cleaner for cleaning solid impurities in an aquarium comprising:

a filter;

a water pump connecting to a first end of a waste-pipe;

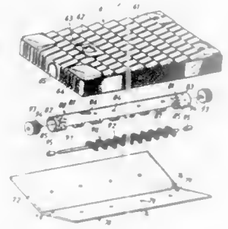
an air compressor having a hose connected to a first end of a hose; and

a base assembly comprising:

a substantially rectangular box having a top sieving plate with a plurality of sieving slits;

a gatherer disposed in said box for collecting the impurities coming from the sieving slits;

a cylinder having a first hole for receiving a second end of said waste-pipe, a second hole on a lower surface proximate to one end of said cylinder for receiving a second end of said hose, and a plurality of notches formed on the lower surface for passing the depositing impurities, said cylinder being clamped in said box between the sieving plate and the gatherer for confining a movement of the impurities collected therein;



a rotatable cleaning means rotatably disposed in the cylinder for urging the impurities to one end of the cylinder closed to the compartment under the first hole of the cylinder; and

an actuating means fixed to one end of the cleaning means for driving said cleaning means, said actuating means being driven by air provided from the hose

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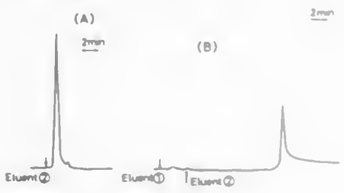
4,913,812

ACTIVE SUPPORT SUBSTANCE AND ADSORBENT FOR CHROMATOGRAPHY

Soyao Moriguchi; Yoshito Nakayama; Hiroshi Suzuki; Tae Ishii; Seiji Shioda, and Isao Kaibo, all of Tokyo, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 946,302, Dec. 24, 1986, abandoned.
This application Dec. 29, 1988, Ser. No. 290,861
Claims priority, application Japan, Dec. 26, 1985, 60-292300; Dec. 26, 1985, 60-292301; Dec. 27, 1985, 60-292551; Dec. 27, 1985, 60-292552; Dec. 27, 1985, 60-292553; Dec. 27, 1985, 60-292554; Dec. 27, 1985, 60-292555; Dec. 27, 1985, 60-292556; Jan. 9, 1986, 61-1243; Jan. 9, 1986, 61-1244
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—198.2 12 Claims



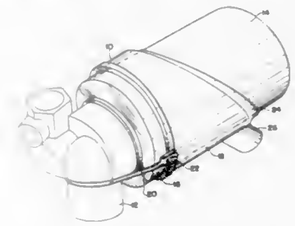
1. An adsorbent for chromatography which is a porous copolymer comprising a gel copolymer having particles sized and dimensioned to effect chromatographic separation which is principally composed of (A) a glycidyl monovinylester or glycidyl monovinylether and (B) alkyleneglycol divinylester, a combination group bound to the epoxy group of the (A) component and a ligand bound through a covalent bond to the combination group, the combination group being formed by binding an aminocarboxylic acid having a hydroxyl group to the epoxy group of said gel copolymer or the glycidyl group of a modified gel copolymer obtained by binding a glycidyl group-containing compound to the hydroxyl group formed by ring-opening with water of the epoxy group of said gel copolymer.

4,913,813

FILTER SPILL PREVENTION COVER

George A. Covarrubias, and G. Frank Dye, both of Greensboro, N.C., assignors to Gilbarco Inc., Greensboro, N.C.

Filed Dec. 8, 1988, Ser. No. 281,844
Int. Cl.[4] B01D *35/00*
U.S. Cl. 210—232 22 Claims



18. A cover for a filter cartridge installed on a filter adapter in a liquid filter assembly, for catching liquid spray and spillage during removal of the filter cartridge, said cover comprising:

an annular collar formed from a narrow cylinder completely open at an outer end, and partially closed at an opposite inner end to form a hole slightly less in diameter than the outside diameter of a filter mounting end of said filter adapter, the circumference of the hole being formed into a band-like portion, for permitting said collar to be slidably mounted on said filter adapter with a friction fit for substantially avoiding leakage of liquid therebetween, the outside circumference of the outer end being formed into a narrow raised rim;

a cylindrically-shaped housing for said filter cartridge having an inner end slightly greater in inside diameter than the outside diameter of said outer end of said collar for mounting thereover, with a circular groove being formed proximate and about the inside surface of the inner end for snap-fitting over said narrow raised rim at the outer end of said collar, said housing also having an inclined outer open end of reduced diameter relative to the body of said housing, truncated at an angle relative to the longitudinal axis thereof with its maximum length being defined as that of a bottom portion, the opening of the inclined outer end being slightly greater in diameter than said filter cartridge, and terminated to form a narrow band-like surface about the circumference;

a downwardly projecting drain spout located along the bottom portion of said filter housing proximate the outer end thereof;

a pair of outwardly projecting lugs located on opposite outer sides of said filter housing proximate said inner end thereof; and

a strap having eyelet-like ends for mounting over said pair of projecting lugs, respectively, for removably securing the mated assembly of said collar and filter housing to said filter adapter.

4,913,814

JET PUMP SYSTEM FOR FLUIDIC CONTACTOR CASCADE

Jaswant Singh, Forton, and John W. Stairmand, Blackpool, both of United Kingdom, assignors to Secretary of State for United Kingdom Atomic Energy Authority, London, England

Filed Feb. 10, 1989, Ser. No. 310,051
Claims priority, application United Kingdom, Feb. 11, 1988, 8803138
Int. Cl.[4] C02F *9/00*
U.S. Cl. 210—255 4 Claims

1. Apparatus for mixing and then separating two flow streams comprising a cascade of contactors and jet pumps arranged in counter-current flow mode in which a first flow

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stream is applied to a drive port of each jet pump and a second flow stream is applied to a suction port of each jet pump in the

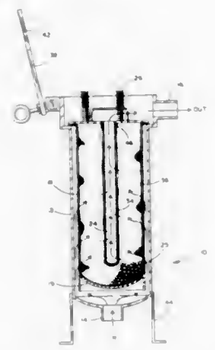
cascade; said jet pumps in the cascade increasing in size from a high pressure to a low pressure end of said cascade so that the suction pressure required at successive jet pumps is reduced.

4,913,815

CONCENTRIC DUAL BAG FILTER APPARATUS WITH CONTAINED MEDIA

David A. Sbulds, Costa Mesa, Calif., assignor to David A. Sbulda Enterprises, Inc., Fountain Valley, Calif.

Filed Feb. 24, 1987, Ser. No. 17,963
Int. Cl.[4] B01D *29/26*
U.S. Cl. 210—287 8 Claims



1. In a fluid filtering apparatus of the type having an inlet for unfiltered fluid, an outlet for filtered fluid and a filtering medium between the inlet and the outlet, the filtering medium being contained within a sealed housing; the improvement comprising:

an outer bag within said housing;

an inner bag generally concentric to and suspended within said outer bag, said filtering medium being retained between said outer and inner bags;

first means providing a fluid path between said housing and said outer bag and in fluid communication with said inlet; and

second means providing a fluid path within said inner bag and in fluid communication with said outlet;

whereby fluid from said inlet passes radially into said outer bag, through said filtering medium, into said inner bag and exits at said outlet.

4,913,816

CHLORINE TOLERANT COMPOSITE SEMIPERMEABLE MEMBRANE

Warren A. Waite, Burlington, Mass., assignor to Ionics Incorporated, Watertown, Mass.

Continuation-in-part of Ser. No. 190,204, May 4, 1988, Pat. No. 4,802,984. This application Dec. 1, 1988, Ser. No. 278,524
The portion of the term of this patent subsequent to Feb. 7, 2006, has been disclaimed.
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—490 9 Claims

1. A thin film composite semipermeable membrane comprising a porous substrate having a chlorine or other oxidant tolerant surface layer of an ultrathin film formed by the polymerization of an aqueous mixture of a water emulsion containing a carbon-carbon double bond reducing polymer or other organic reducing polymers containing a phenolic or resorcinol group and an amino compound having at least two primary or secondary amino groups using a polyfunctional crosslinking agent capable of reacting with said primary or secondary amino groups.

4,913,817

REINFORCED ION EXCHANGE MEMBRANE AND A PROCESS FOR PRODUCING THE SAME

Sakae Tsushima, Yokohama, and Tadashi Inoue, Fujisawa, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 17, 1988, Ser. No. 207,965
Claims priority, application Japan, Jun. 19, 1987, 62-151236
Int. Cl.[4] B01D *13/00, 13/04*
U.S. Cl. 210—500.27 12 Claims

1. A reinforced ion exchange membrane comprising at least two layers of a fluorinated polymer having pendant sulfonate groups, carboxylate groups or a mixture thereof and a woven reinforcing fabric comprising warp and weft strands, said warp and weft strands crossing each other to form crossover points and form window portions defined by the crossed warp and weft strands, said fabric being encapsulated in at least one of said layers,

wherein the difference between the thickness of the membrane at said crossover points and that at said window portions is sufficiently small to preclude bubble entrapment when in operation within an electrolytic cell.

8. A process for producing a reinforced ion exchange membrane comprising the steps of:

(1) providing a first and a second sheet material,

said first sheet material comprising a support sheet and, laminated thereto, at least one film layer of a melt-fabricable fluorinated polymer having pendant sulfonyl and/or carboxyl groups in a melt-fabricable form,

said second sheet material comprising a film of a melt-fabricable fluorinated polymer having pendant sulfonyl and/or carboxyl groups in a melt-fabricable form;

(2) sandwiching a woven reinforcing fabric comprising warp and weft strands between said first sheet material and said second sheet material in a manner such that the fabric contacts the polymer film layer of the first sheet material and contacts the polymer film of the second sheet material,

said warp and weft strands crossing each other to form crossover points and from window portions defined by the crossed warp and weft strands;

(3) heating the resultant assembly of the first sheet material, the fabric and the second sheet material while applying a negative pressure to one side of the second sheet material that is remote from the support sheet, thereby performing encapsulation of the fabric into the polymer film layer of said first sheet material, the polymer film of said second sheet material or the film of each of said first sheet material and said second sheet material;

(4) removing said support sheet from the assembly, thereby obtained a precursor membrane comprising the polymer film layer derived from said first sheet material, said second sheet material laminated to said polymer film layer and said reinforcing fabric encapsulated into said polymer film layer of said first sheet material, the polymer film of said second sheet material or the film of each of said first sheet material and said second sheet material, wherein the difference between the thickness of the membrane at the crossover points and that at the window portions is sufficiently small to preclude bubble entrapment when in operation within an electrolytic cell; and

(5) converting the sulfonyl groups, carboxyl groups or a mixture thereof of the precursor membrane to sulfonate groups, carboxylate groups or a mixture thereof.

4,913,818

METHOD AND MEMBRANE FOR THE REMOVAL OF WATER VAPOR FROM A GAS/VAPOR MIXTURE BY MEANS OF VAPOR PERMEATION

Hendrik F. Van Wijk, Zeist, and Albert E. Jansen, Nieuwegein, both of Netherlands, assignors to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek TNO, The Hague, Netherlands

Filed Sep. 9, 1988, Ser. No. 242,711
Claims priority, application Netherlands, Sep. 9, 1987, 8702150
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—500.27 3 Claims

1. Membrane for removing water vapour from a gas/ vapour mixture by means of vapour permeation, comprising: a hygroscopic electrolyte of a dryness sufficient to increase the flux of said membrane by a factor of up to about 5.

4,913,819

LIQUID JET SOLIDS REMOVAL SYSTEM FOR PROCESS VESSELS

John C. Patterson, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 28, 1987, Ser. No. 90,814
Int. Cl.[4] B01D *12/00*
U.S. Cl. 210—523 8 Claims

1. In a process separator vessel wherein accumulations of relatively fine solids occur along a bottom wall surface of said vessel, and said vessel includes at least one outlet opening for discharging a fluidized mixture of said solids with a solids evacuation liquid, a system for removing said accumulated solids for discharge through said outlet opening comprising:

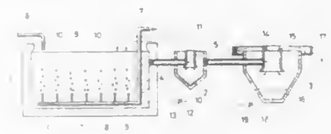
at least one elongated jet manifold extending along said vessel and standing off from said wall surface in the vicinity of accumulated solids, said jet manifold including an array of jet nozzles spaced apart along said manifold including a plurality of jet nozzles opening from a bottom side of said manifold and adjacent to said wall surface and a plurality of jet nozzles opening from a top side of said manifold, the angular orientation of said nozzles with respect to said manifold being such as to create a substantially vortical flow of liquid around said manifold and in the vicinity of said wall surface, and at least a majority of said nozzles being oriented to emit liquid jets in a direction which includes a directional component extending toward said outlet opening for fluidizing and entraining accumulated solids in said vessel in said vortical flow of liquid and to move toward said outlet opening to prevent substantial accumulations of said solids along said wall surface.

4,913,820

ORGANIC SEWAGE TREATMENT PROCESS

Nariyoshi Kawabata, Osaka, and Kiyoshi Kuriyama, Kyoto, both of Japan, assignors to Kyoto Suiken Co., Ltd., Kyoto, Japan

Filed Jul. 18, 1989, Ser. No. 381,291
Claims priority, application Japan, Jul. 22, 1988, 63-184243
Int. Cl.[4] C02F *1/56*
U.S. Cl. 210—616 7 Claims



1. A process for treating organic sewage comprising the steps of:

mixing sewage containing organic pollutants with activated sludge under aerobic conditions;

bringing the mixture of said sewage and activated sludge into contact with polyvinyl pyridine, thereby producing floc; and

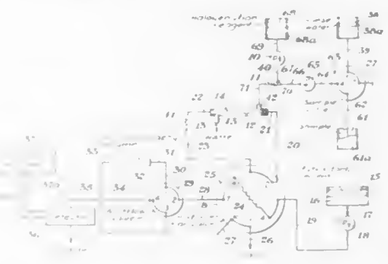
separating said floc from liquid based on the difference in specific gravity.

4,913,821

METHOD FOR THE DETERMINATION OF PHENOLS IN WATER

Richard G. Meicher, Midland, Mich., and Earl E. Burt, III, Cincinnati, Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 27, 1989, Ser. No. 343,967
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—635 16 Claims



13. A chemical analysis liquid chromatography method for the determination of total phenols in a water, comprising the steps of:

(a) introducing a halogenating agent into the water;

(b) reacting the halogenating agent with the phenols to form halo-derivatives of the phenols;

(c) permeating the halo-derivatives of the phenols across a membrane into a liquid extractant; and

(d) determining the halo-derivatives of the phenols in the liquid extractant by backflow liquid chromatography.

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4,913,822

METHOD FOR CONTROL OF SCALE AND INHIBITION OF CORROSION IN COOLING WATER SYSTEMS

Fu Chen, Newtown, Pa., and J. Michael Brown, The Woodlands, Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 201,645, Jun. 1, 1988, abandoned, which is a continuation of Ser. No. 944,160, Dec. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 37,484, Apr. 13, 1987, Pat. No. 4,759,851, which is a continuation of Ser. No. 864,049, May 16, 1986, Pat. No. 4,659,481, which is a continuation of Ser. No. 545,563, Oct. 26, 1983, abandoned. This application Jan. 12, 1989, Ser. No. 296,253

Int. Cl.[4] C02F 5/14

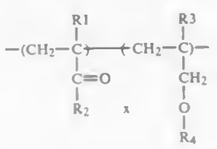
U.S. Cl. 210—699 7 Claims

1. A method for inhibiting corrosion and mineral deposition including calcium carbonate in a cooling water system comprising

(a) maintaining the pH of said cooling water system at a minimum of 8;

(b) maintaining said cooling water system in a state of super saturation with respect to calcium carbonate and operating said cooling water system at a Langelier Saturation Index maintained at a minimum level of 0.8;

(c) adding to said cooling water system, about 0.1–500 ppm of a water soluble polymeric corrosion inhibitor and deposition control agent, having repeat units x and y comprising the structure:



wherein

R1 and R3 are independently hydrogen or lower alkyl group (C1–C3);

R2 is OH or OM;

M is a water soluble cation;

R4 is 2 hydroxypropyl the molar ratio of said repeat units x:y is from about 8:1 to about 1:5;

(d) adding to said cooling water system a water soluble zinc salt at a concentration of from about 0.1–15 ppm;

(e) adding to said cooling water system a water soluble phosphonate compound at a concentration of about 6 ppm.

4,913,823

PROCESS FOR DISSOLVING AND REMOVING SCALE FROM AQUEOUS SYSTEMS

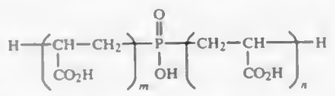
Richard J. Lipinski, Aurora, and Kelvin Y. Chang, Solon, both of Ohio, assignors to The Mogul Corporation, Chagrin Falls, Ohio

Filed Oct. 14, 1988, Ser. No. 258,034

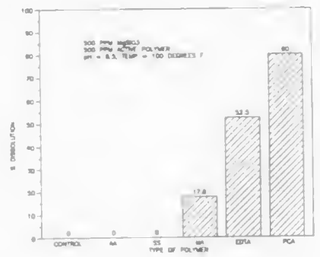
Int. Cl.[4] C02F 5/14

U.S. Cl. 210—699 10 Claims

1. A process for dissolving and removing silicate scale comprising magnesium silicate from aqueous systems which comprises adding to the water in said systems from about 500 to 2000 parts by weight per million parts by weight of water of a water-soluble phosphinocarboxylic acid having the formula



wherein the sum of m plus n is an integer having a value ranging from about 3 to 100, wherein the phosphinocarboxylic acid has an average molecular weight ranging from about 300 to 12,000.



4,913,824

ANIONIC POLYMERS CONTAINING N-VINYL-PYRROLIDONE OR OTHER VINYL AMIDES AS SCALE INHIBITORS FOR PREVENTING OR REDUCING CALCIUM PHOSPHATE AND OTHER SCALES

James F. Kneller, La Grange Park, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Continuation of Ser. No. 101,628, Sep. 28, 1987, abandoned, which is a continuation-in-part of Ser. No. 730,609, May 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 789,535, Oct. 21, 1985, abandoned. This application Sep. 29, 1988, Ser. No. 253,355

Int. Cl.[4] C02F 5/12

U.S. Cl. 210—701 7 Claims

1. A method of inhibiting calcium phosphate scale or calcium carbonate scale which is formed on metal surfaces in contact with industrial cooling waters, which comprises treating the water with a formulation having a pH of 11–13 containing tolyltriazole, and from ½ to 100 ppm of water-soluble anionic co- or terpolymer which contains about 10–20 mole percent of a vinyl amide mer unit and said co- or terpolymer is selected from the group consisting of a copolymer containing only acrylic acid and N-vinyl pyrrolidone, a copolymer containing only acrylic acid and N-vinyl-N-methyl acetamide; a copolymer containing only acrylic acid and N-vinyl succinimide; a terpolymer containing only acrylic acid, N-vinyl pyrrolidone and methacrylic acid; a terpolymer containing only acrylic acid and N-vinyl pyrrolidone and methacrylamide; and a terpolymer containing only acrylic acid, N-vinyl pyrrolidone and a (meth)acrylate ester where said co- or terpolymer has a molecular weight range between about 5000–40,000.

4,913,825

METHOD FOR CONTROLLING OVERSPRAY IN PAINT SPRAY BOOTHS

David B. Mitchell, Palatine, Ill., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed May 27, 1988, Ser. No. 199,508

Int. Cl.[4] C02F 1/56

U.S. Cl. 210—705 25 Claims

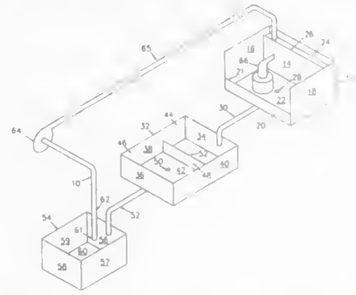
1. A method of detackifying spray booth water containing particles from paint spray comprising the steps of:

(a) adding to the spray booth water at least about 100 ppm of polymers selected from the group consisting of those derived by reacting dimethylamine, diethylamine, or methylethylamine with an epihalohydrin;

(b) adding to the spray booth water at least about 500 ppm of compounds selected from the group consisting of modified tannin compounds formed by reacting a condensed tannin with both an amino compound and an aldehyde;

(c) providing a pH above about 6.5 in the spray booth water such that the modified tannin added in step (b) forms a floc which is dispersed in the spray booth water for detackification, with the polymer added in step (a) stabilizing said floc and improving detackification;

(d) separating the floc and paint particles from said spray booth water.



4,913,826

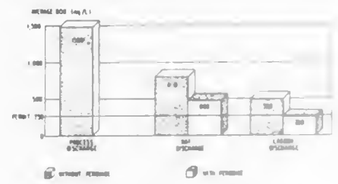
FAT, OIL AND GREASE FLOTATION TREATMENT OF POULTRY AND FOOD INDUSTRY WASTE WATER UTILIZING HYDROGEN PEROXIDE

Det Mannig, Allendale, and Gerd Scherer, Montvale, both of N.J., assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 141,816, Jan. 11, 1988, abandoned. This application Jan. 2, 1989, Ser. No. 363,363

Int. Cl.[4] C02F 1/24

U.S. Cl. 210—707 4 Claims



1. A process for treating waste water from a food processing plant consisting essentially of introducing an effective amount up to 150 ppm of a source of hydrogen peroxide into the waste water discharge from a food processing plant which contains fat, oil or grease, or mixtures thereof, contacting said waste water with said hydrogen peroxide to create a flotation effect through hydrogen peroxide decomposition to fine oxygen bubbles and water and removing said fat, oil or grease or mixtures thereof by flotation means.

4,913,827

PROCESS FOR PURIFYING AND DE-PYROGENATING WATER

Carl Nebel, Millington, N.J., assignor to PCI Inc., West Caldwell, N.J.

Continuation of Ser. No. 82,831, Aug. 6, 1987, abandoned. This application Jun. 27, 1988, Ser. No. 213,500

Int. Cl.[4] C02F 1/32

U.S. Cl. 210—748 7 Claims

1. A method for producing pyrogen-free water which comprises mixing gaseous ozone with water to achieve a concentration of dissolved ozone in the water of from about 1 ppm to about 8 ppm, separating the gas and liquid phases, and exposing the ozone-containing water to ultraviolet radiation having a wavelength of from about 250 to 260 nanometers at an intensity sufficient to destroy pyrogens present in the water.

4,913,828

CONDITIONING AGENTS AND COMPOSITIONS CONTAINING SAME

Debra S. Caswell, and Mark H. Mao, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 10, 1987, Ser. No. 61,063

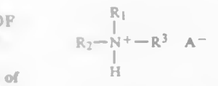
Int. Cl.[4] C11D 9/30, 9/48

U.S. Cl. 252—88 40 Claims

1. A detergency composition comprising:

A. from about 1% to about 98% of a water-soluble detergent surfactant selected from the group consisting of cationic surfactants, nonionic surfactants, zwitterionic surfactants, amphoteric surfactants and anionic surfactants and mixtures thereof;

B. from about 0.1% to about 20% of a water-insoluble composite having an average diameter of from about 10 to about 300 microns, comprising (i) from about 1 to about 99% of an alkyl amine-anionic surfactant ion-pair complex having the formula:



wherein each R_1 and R_2 independently is C_{16} to C_{20} alkyl or alkenyl, R_3 is H or CH_3, and A is an anionic surfactant selected from the group consisting of alkyl sulfonates, aryl sulfonates, alkylaryl sulfonates, alkyl sulfates, dialkyl sulfosuccinates, alkyl oxybenzene sulfonates, acyl isethionates, acylalkyl taurates, olefin sulfonates, alkyl ethoxylated sulfates and paraffin sulfonates, and mixtures of such ion-pair complexes; and (ii) from about 99% to about 1% of a nonsilicone wax; and

C. from about 5% to about 50% of a detergency builder other than C_{10}–C_{18} alkyl monocarboxylic acids or salts thereof.

4,913,829

AQUEOUS FABRIC SOFTENER COMPOSITION: OPTIONALLY QUATERNIZED ALIPHATIC AMINE AND SULFONIC OR PHOSPHONIC ACID COMPOUND

Horst Rutzen, Langenfeld, and Eric Sung, Monheim, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 16, 1988, Ser. No. 272,171

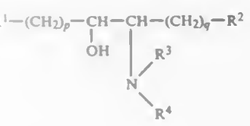
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1987, 3739143.7

Int. Cl.[4] C11D 1/62, 3/20; D06M 13/36

U.S. Cl. 252—8.75 21 Claims

1. An aqueous fabric softener composition based on a combination of acids and amines or quaternary ammonium compounds thereof bearing a long-chain alkyl or alkenyl radical, comprising

(a) one or more amines corresponding to formula (I) or (II)



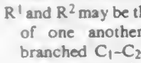
(I)

-continued

(II)

wherein in formula (I)

R^1 and R^2 may be the same or different and, independently of one another, represent hydrogen, a linear or branched C_1–C_{20} alkyl radical, and wherein the alkyl radical may be interrupted by ether groups, and R^2 may also be a hydroxy group or a group corresponding to formula (III)



(III)

in which

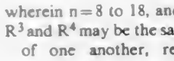
R^5 is hydrogen, or a linear or branched C_1–C_6 alkyl radical; in formula (II), R^1 may represent hydrogen, a linear or branched C_1–C_{20} alkyl radical wherein the alkyl radical may be interrupted by ether groups, or a group corresponding to the following formula

wherein n = 8 to 18, and

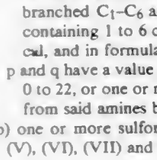
R^3 and R^4 may be the same or different and, independently of one another, represent hydrogen, a linear or branched C_1–C_6 alkyl radical or hydroxyalkyl radical containing 1 to 6 carbon atoms in the linear alkyl radical, and in formula (I)

p and q have a value of 0 to 22, the sum (p + q) being from 0 to 22, or one or more ammonium compounds derived from said amines by quaternization,

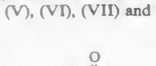
(b) one or more sulfonic acids corresponding to formulae (V), (VI), (VII) and (VIII)



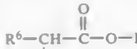
(V)



(VI)

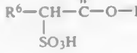


(VII)



(VIII)

or one or more phosphonic acids corresponding to formulae (IX), (X), (XI) and (XII)



(IX)

(X)

(XI)

(XII)

in which

R^6 represents a linear or branched alkyl or alkenyl radical containing 1 to 18 carbon atoms and

R^7 represents a linear or branched C_1–C_6 alkyl radical, and

(c) other constitutents typically present in a fabric softener composition selected from perfumes, colorants, solvents, preservatives and viscosity regulators.

4,913,830

LACTONE-MODIFIED, MANNICH BASE DISPERSANT ADDITIVES USEFUL IN OLEAGINOUS COMPOSITIONS

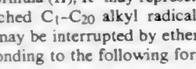
Robert D. Lundberg, Bridgewater, and Antonio Gutierrez, Mercerville, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 77,716, Jul. 24, 1987, Pat. No. 4,828,742. This application Jan. 9, 1989, Ser. No. 294,459

Int. Cl.[4] C10M *149/16, 159/16*

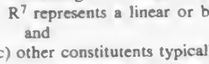
U.S. Cl. 252—49.6 **119 Claims**

1. A post-treated poly(C_5–C_9 lactone) modified Mannich base useful as an oil additive and formed by reacting a C_5–C_9 lactone, an amine, an aldehyde, and a hydrocarbyl hydroxy aromatic compound, said hydrocarbyl substituted hydroxy aromatic compound being formed by reacting an olefin polymer of a C_2–C_{10} monoolefin having a number average molecular weight of about 700 to about 10,000 and a hydroxy aromatic material, and said poly (C_5–C_9 lactone) modified Mannich base adduct containing the unit



wherein m has an average value of from 0.2 to about 100, and z is 4 to 8, and post-treating said adduct with a boron compound.

52. An oleaginous composition comprising a fuel lubricating, and a poly (C_5–C_9 lactone) modified Mannich base adduct material prepared by reacting an amine, a hydrocarbyl substituted hydroxy aromatic compound, an aldehyde, and a C_5–C_9 lactone, wherein said hydrocarbyl substituted hydroxy aromatic compound has been formed by reacting an olefin polymer of a C_2–C_{10} monoolefin of 700 to about 10,000 $\overline{M}_n$ with a hydroxy aromatic compound, and wherein said poly (C_5–C_9 lactone) modified Mannich base adduct material contains the unit



where m is a number having an average value of from 0.2 to about 100, and z is 4 to 8.

4,913,831

DEICING COMPOSITIONS COMPRISING CALCIUM MAGNESIUM ACETATE DOUBLE SALT AND PROCESSES FOR THEIR PRODUCTION

Harold E. Todd, Jr., Pinole, and Daniel L. Walters, San Francisco, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 77,148, Jul. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 3,097, Jan. 14, 1987, abandoned. This application Jan. 14, 1988, Ser. No. 144,848

The portion of the term of this patent subsequent to Aug. 8, 2005, has been disclaimed.

Int. Cl.[4] C09K *3/18;* **C07B** *51/42*

U.S. Cl. 252—70 **39 Claims**

1. A composition comprising less than about 8% by weight crystalline calcium acetate, less than about 8% by weight magnesium acetate, about 1% to about 3% by weight unreacted base, less than about 5% by weight water and the remainder being calcium magnesium acetate double salt.

19. A process for preparing a calcium magnesium acetate double salt which is substantially free from crystalline calcium acetate, magnesium acetate and unreacted magnesium base which comprises:

(a) preparing an aqueous mixture of CM base having a calcium:magnesium ratio of from about 4:6 to about 3:7 which contains at least about 40 percent by weight water;

(b) admixing the mixture of step (a) with from about 70 percent to about 110 percent of the stoichiometric amount of acetic acid necessary to convert said CM base to said double salt, the resulting mixture containing at least about 50 percent by weight water to give a CMA slurry;

(c) if required, adding sufficient additional acetic acid to said slurry so that the total amount of acetic acid is approximately the stoichiometric amount of acetic acid necessary to convert said CM base to said double salt; and

(d) aging the CMA slurry to allow substantially complete reaction of the CM base with acetic acid.

4,913,832

DETERGENT COMPACTS

Hans Kruse, Korschenbroich; Jochen Jacobs, Wuppertal; Theodor Altenschoepfer, Duesseldorf, and Peter Jeschke, Neuss, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Continuation of Ser. No. 144,784, Jan. 20, 1988, abandoned, which is a continuation of Ser. No. 931,764, Nov. 17, 1986, abandoned. This application Jan. 24, 1989, Ser. No. 302,067

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1985, 3541147

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.[4] C11D *3/395*

U.S. Cl. 252—99 **18 Claims**

1. A detergent composition in the form of a compact for a dishwashing machine having a pre-rinse cycle and a main wash cycle comprising a combined cold water-soluble tablet portion and a warm water-soluble solidified melt portion in block form, said tablet portion having a dissolving rate in flowing water at about 15° C. of from about 25 to about 40 grams per hour and being soluble in the pre-rinse cycle of said dishwashing machine, said tablet comprising sodium metasilicate nonahydrate and sodium tripolyphosphate containing from about 7 to about 22.4% by weight water of crystallization in a weight ratio of from about 0:1 to 1:0, based on anhydrous substances, said solidified melt portion having a dissolving rate in flowing water at about 15° C. of below about 25 grams per hour and being soluble in the main wash cycle of said dishwashing machine and substantially insoluble in said pre-rinse cycle, said solidified melt comprising from about 5% to about 50% by weight of sodium tripolyphosphate and from about 5% to about 60% by weight of sodium metasilicate, based on the weight of anhydrous compounds, said dissolving rate being measured on a compact having a weight of about 15 grams with a diameter-to-weight ratio of from about 0.6 to about 1.5:1.

4,913,833

STERICALLY HINDERED POLYETHER POLYOLS AS CHLORINE BLEACH STABLE SURFACTANTS

Jay G. Otten, Flat Rock; Michael G. Kinnaird, Dearborn; Ronald E. Greenough, Lincoln Park, and Edward J. Parker, Riverview, all of Mich., assignors to BASF Corporation, Parsippany, N.J.

Filed Jun. 9, 1988, Ser. No. 204,634

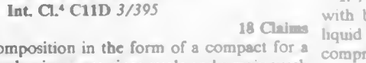
Int. Cl.[4] C11D *7/54*

U.S. Cl. 252—99 **16 Claims**

1. An automatic dishwashing detergent composition having improved chlorine bleach stability comprising:

(a) an active chlorine containing compound selected from the group consisting of chlorinated trisodium phosphate, chlorinated cyanuric acid and alkali metal salts thereof, 2,3-dichloro-5,5-dimethylhydantoin, hypochlorite bleach and mixtures thereof to yield available chlorine in an amount of from about 0.1 percent to 5 percent;

(b) about 0.1 percent to 5 percent of a chlorine bleach stable nonionic surfactant having the general formula:



wherein A_1 and A_2 are C_2–C_4 alkylene groups, tetramethylene and mixtures thereof, A_3 is a sterically hindered C_4–C_{30} alkylene group, C_4–C_{30} arylalkylene group, and mixtures thereof, n + n' = a value such that the total molecular weight of the molecule prior to capping is about 500 to 25,000, n'' is a number from 1 to 8, m is a number from 1 to 8, and Y is the residue of an organic compound having from about 1 to 30 carbon atoms and at least one reactive hydrogen atom, said surfactant having a hydrophilic content of from about 5 to 40 weight percent; and

(c) the balance water.

4,913,834

STORAGE STABLE FLUID DETERGENT FORMULATIONS WITH BLEACHING ACTION

Bernard Dubreux, Francheville Le Bas, and Jean-Pierre Schirmann, Oullins, both of France, assignors to Atochem, Paris, France

Filed Sep. 18, 1984, Ser. No. 652,291

Claims priority, application France, Sep. 20, 1983, 8314913

Int. Cl.[4] C11D *7/54;* **D06L** *3/02*

U.S. Cl. 252—104 **4 Claims**

1. A storage stable anhydrous fluid detergent formulation with bleaching action for textiles comprising an anhydrous liquid phase and an anhydrous solid phase; the liquid phase comprising anhydrous hydrogen peroxide and said solid phase suspended in said liquid phase.

4,913,835

NOVEL COMPOSITIONS AND METHOD FOR NEUTRALIZATION AND SOLIDIFICATION OF HAZARDOUS ALKALI SPILLS

Frederick S. Mandel; James A. Eagman, both of Marinette; Wayne R. Whiting, Oconto, all of Wis., and James Nicol, Plano, Tex., assignors to Wormald U.S. Inc., Marinette, Wis.

Continuation-in-part of Ser. No. 29,845, Mar. 31, 1987, abandoned, which is a continuation-in-part of Ser. No. 859,122, May 2, 1986, abandoned. This application Apr. 25, 1988, Ser. No. 185,797

Int. Cl.[4] C09K *3/00;* **A62C** *1/00, 35/00;* **C02F** *1/42*

U.S. Cl. 252—190 **15 Claims**

1. A device for the treatment of hazardous alkali spills having a means for dispensing under pressure in a collimated, directable stream, a dry fluidized particulate composition comprising, based on the total weight of the composition:

A. about 45% to 80% by weight of an organic neutralizing acid selected from the group, consisting of citric acid, fumaric acid, tartaric acid, benzoic acid or mixtures thereof;

B. about 5% to 45% by weight of a first absorptive clay having an absorbant capacity of about 60% to 90% by weight of water selected from the group consisting of attapulgite, perlite and fullers earth;

C. about 0.5% to 10% by weight of a water soluble weak acid salt, the reaction product of a base and a weak acid; and

D. the composite having a particle size in the range of −40 to +200 Tyler screen mesh size.

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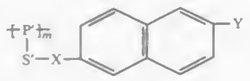
4,913,836

SIDE CHAIN LIQUID CRYSTALLINE POLYMERS EXHIBITING NONLINEAR OPTICAL RESPONSE

Anthony J. East, Madison, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Filed Dec. 5, 1988, Ser. No. 280,096
Int. Cl.[4] C09K *19/52, 19/32*
U.S. Cl. 252—299.01 11 Claims

1. A thermotropic liquid crystalline polymer which is characterized by a recurring monomeric unit corresponding to the formula:



where
P' is a polymer main chain unit selected from the group consisting of polyvinyl, polysiloxane, and polyoxyalkylene structures,
m is an integer with a value of at least 5,
S' is a flexible spacer group having a linear chain length of between about 2–20 atoms,
X is an electron-donating substituent, and
Y is an electron-withdrawing substituent; and where
the recurring monomeric unit comprises at least about 50 weight percent of the polymer, and the polymer has a glass transition temperature between about 0°–120° C.

4,913,837

HETEROCYCLIC COMPOUNDS

George W. Gray, Cottingham; Kenneth J. Toyne; David Lacey, both of Hull; Michael P. Burrow, Bristol, all of Great Britain; Rudolf Eidenschink, Mühltal, Fed. Rep. of Germany; Andreas Wächtler, Griesheim, Fed. Rep. of Germany, and Georg Weber, Erzhausen, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP86/00760, § 371 Date Sep. 1, 1987, § 102(e) Date Sep. 1, 1987, PCT Pub. No. WO87/04158, PCT Pub. Date Jul. 16, 1987
PCT Filed Dec. 18, 1986, Ser. No. 116,079
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1986, 3600052
Int. Cl.[4] G02F *1/13;* C09K *19/34;* C07D *409/00, 241/18*
U.S. Cl. 252—299.61 10 Claims

1. In a liquid crystalline phase comprising at least two liquid crystal components, the improvement wherein at least one liquid crystal component is a pyridine compound of formula Ien

$$R^1\text{-Py-Phe-}Z^2\text{-Cy-}R^2 \qquad \text{Ien}$$

wherein
R^1 and R^2 are each independently of each other alkyl of 1–15 C atoms, wherein one or two non-adjacent CH_2 groups can also be replaced by O atoms and/or —CO— groups and/or —O—CO— groups and/or —CO—O— groups and/or —CHCN— and/or —CH—halogen groups, and one of the radicals R^1 and R^2 can also be F, Cl, Br, or CN;
is pyridine-2,5-diyl;
Phe is a 1,4-phenylene group which is unsubstituted or monosubstituted by F;
Z^2 is —CO—O— or —O—CO—; and
Cy is a 1,4-cyclohexylene group.

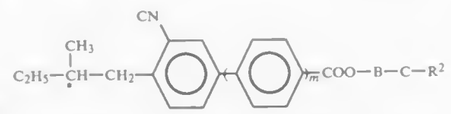
4,913,838

LIQUID CRYSTAL COMPOUND WITH A 4-(OPTICALLY ACTIVE ALKYL)-3-CYANOPHENYL GROUP

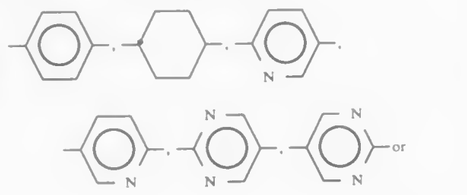
Kazutoshi Miyazawa; Takashi Inukai; Hiromichi Inoue; Shinichi Saito, and Kouji Ohno, all of Kanagawa, Japan, assignors to Chisso Corporation, Ohsaka, Japan

Filed Mar. 18, 1988, Ser. No. 168,319
Claims priority, application Japan, Mar. 20, 1987, 62-67097
Int. Cl.[4] C09K *14/12, 14/20, 19/30, 19/24;* C07C *121/75;* C07D *239/36, 239/38, 239/30*
U.S. Cl. 252—299.61 13 Claims

1. An optically active liquid crystal compound expressed by the formula



wherein R^2 represents an alkyl group or alkoxy group each of 1 to 20 carbon atoms, B represents



C represents B or a single bond, and m represents 0 or 1.

4,913,839

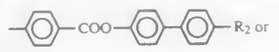
FERROELECTRIC LIQUID CRYSTAL POLYMER

Sbunji Uchida; Kazuharu Morita, both of Sodegaura, and Kenji Hashimoto, Ichibara, all of Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Division of Ser. No. 383, Dec. 22, 1986, Pat. No. 4,844,835. This application Apr. 18, 1989, Ser. No. 340,033
Claims priority, application Japan, Dec. 26, 1985, 60-292274; May 27. 1986, 61-120313; May 29, 1986, 61-122155; Sep. 17, 1986, 61-217235
Int. Cl.[4] C09K *19/52;* C08F *122/14*
U.S. Cl. 252—299.01 17 Claims

1. A ferroelectric liquid crystal polymer consisting essentially of the recurring units represented by the following general formula:

in which
k is an integer of from 1 to 30,
R_1 is



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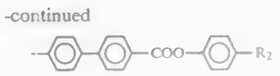
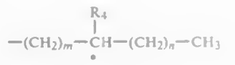


R_2 is —$COOR_3$, —$OCOR_3$, —OR_3, or —R_3,
in which
R_3 is



R_4 is —CH_3 or Cl,
m is 0 or an integer of from 1 to 10, and
n is 0 or an integer of from 1 to 10, providing that n is not 0 when R_4 is —CH_3 and having a number average molecular weight of from 3,000 to 400,00.

4,913,840

PRODUCTION OF STABLE ANIONIC SOLS CONTAINING COLLOIDAL ALUMINA HYDRATE

Kenneth A. Evans; Richard J. G. Hedley; Christopher F. Pygall, all of Bucks, England; Adrian K. A. Smith, Fife, Scotland, and Kevin J. Wills, Slough Berkshire, England, assignors to Alcan International Limited, Quebec, Canada

Continuation-in-part of Ser. No. 768,249, Aug. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 576,575, Feb. 3, 1984, abandoned. This application Nov. 19, 1987, Ser. No. 131,773
Claims priority, application United Kingdom, Feb. 3, 1983, 8302952
Int. Cl.[4] B01J *13/00;* C01B *33/141*
U.S. Cl. 252—313.2 14 Claims

1. A method of making a stable anionic sol containing anionic colloidal alumina hydrate which consists essentially of the steps of:
(a) calcining alumina hydrate to form coarse particles of crystalline alumina monohydrate, and
(b) reducing the average diameter of the coarse particles so formed to less than 1 micron in all dimensions by an operation consisting essentially of attrition milling said coarse particles with a dispersion liquid to produce a colloidal dispersion of the particles in the liquid.

11. A method of making a mixed anionic sol containing anionic colloidal alumina hydrate and anionic colloidal silica in the dispersed state, which comprises mixing a stable anionic sol containing anionic colloidal alumina hydrate made by a method according to claim 1 with an anionic colloidal silica dispersion.

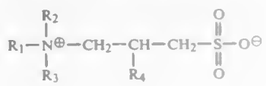
4,913,841

ALKALINE TOLERANT SULFOBETAINE AMPHOTERIC SURFACTANTS

William J. Zeman, Janesville, Wis., assignor to Sherex Chemical Company, Inc., Dublin, Ohio

Continuation of Ser. No. 877,019, Jun. 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 732,509, May 9, 1985, abandoned. This application Jan. 5, 1988, Ser. No. 140,972
Int. Cl.[4] C11D *1/755*
U.S. Cl. 252—352 5 Claims

1. An aqueous basic solution comprising:
(a) a betaine having the following general structure:



where
R_1 is a C_6–C_8 alkyl group;
R_2 and R_3 are a methyl group, a 2-hydroxy ethyl group, or a 2-hydroxy propyl group; and
R_4 is H or OH;
(b) at least about 50% by weight sodium hydroxide; and
(c) water.

4,913,842

STEAM REFORMING OF METHANOL

Mikio Yoneoka; Tomiyoshi Furuta; Yasuo Yamamoto; Sadao Nozaki; Kazuo Takada; Kumiko Watabe, and Takeo Ikarashi, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Feb. 14, 1984, Ser. No. 579,952
Claims priority, application Japan, Feb. 14, 1983, 58-22493
Int. Cl.[4] C01B *3/38*
U.S. Cl. 252—373 15 Claims

1. A method for steam reforming methanol wherein the gas produced by the steam reforming reaction of methanol with water or by the steam reforming reaction of a mixture of methanol and a condensed liquid with water by gaseous phase reaction in the presence of catalysts is separated by cooling to form a reformed gas containing hydrogen and carbon dioxide and a condensed liquid containing water, methanol, ethanol and high boiling point organic components, characterized in that the condensed liquid is brought into contact with a catalyst containing (A) copper oxide, (B) an oxide of at least one type of metal selected from the group consisting of zinc, aluminum and chromium and (C) an oxide of a group VIII metal of the periodic table, whereby the methanol, ethanol and high boiling point organic components in the condensed liquid are decomposed to gaseous components, resulting in substantially pure water.

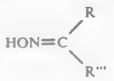
4,913,843

PREDICTING THERMOPARTICULATION

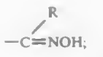
D. Colin Phillips, Monroeville, and James D. B. Smith, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 260,863, May 6, 1981, abandoned, which is a division of Ser. No. 85,446, Oct. 16, 1979, abandoned. This application Dec. 8, 1983, Ser. No. 559,019
Int. Cl.[4] G01N *31/00*
U.S. Cl. 252—408.1 14 Claims

1. A room temperature, air dryable coating composition comprising about 20 to about 250 phr of at least one thermoparticulating compound and a solution in an organic solvent of a resinous carrier air-dryable at room temperature which is substantially unreactive with said thermoparticulating compound and which is stable when cured, said thermoparticulating compound being selected from the group consisting of:
oximes having the general formula



where R''' is R or



each R is independently selected from the group consisting of hydrogen, alkyl to C_{20}, aryl, alkaryl to C_{20}, aralkyl to C_{20}, heterocyclic including ring nitrogen, oxygen or sulfur, and aryl with nitro or halide substituents.

14. A room temperature, air dryable coating composition comprising about 20 to about 250 phr of at least one thermoparticulating compound and a solution in an organic solvent of a resinous carrier air-dryable at room temperature which is

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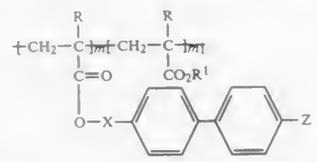
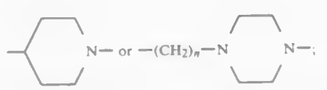
substantially unreactive with said thermoparticulating compound and which is stable when cured, said thermoparticulating compound being selected from the group consisting of:
triphenyltin chloride-benzyldimethylamine,
triphenyltin chloride-morpholine,
triphenyltin chloride-n-propylamine,
diphenyltin dichloride-morpholine,
diphenyltin dichloride-benzyldimethylamine,
tris (ethylenediamine)-chromium (III) chloride,
pyridine-chromium (III) oxide,
boron trifluoride-monoethylamine,
antimony pentafluoride-triethylamine,
antimony pentachloride-pyridine,
titanium tetrachloride-morpholine,
tetrabutyl phosphonium acetate,
tetrabutyl phosphonium chloride,
triphenylmethyl phosphonium iodide,
methyltrioctyl phosphonium dimethyl phosphate,
tetrabutylarsonium chloride,
tetraphenylarsonium iodide,
catechol-antimony pentachloride,
catechol-antimony pentafluoride,
tetrabutyl stibonium chloride,
tetraphenyl stibonium iodide,
triphenyl methyl stibonium bromide,
n-butylamine picrate,
triethylamine picrate,
m-phenylene diamine picrate,
1-methylimidazole picrate,
triethylmethyl ammonium chloride,
trimethylethyl ammonium iodide,
benzyl dimethyl ammonium bis (o-phenylene dioxy) phenyl siliconate,
triethylammonium bis (o-phenylene dioxy) phenyl siliconate,
triethanolamine bis (o-phenylene dioxy) phenyl siliconate,
benzyl sulfamic acid,
napthyl sulfamic acid,
benzal doxime, and
benzophenone oxime.

4,913,844
ACRYLIC POLYMERS AND COPOLYMERS EXHIBITING NONLINEAR OPTICAL RESPONSE
Ronald N. DeMartino, Wayne, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.
Filed Jan. 25, 1988, Ser. No. 148,262
Int. Cl.[4] F21V *9/00*; G02B *5/02*
U.S. Cl. 252—582 **18 Claims**

1. An isotropic acrylic polymer which is characterized by recurring monomeric units corresponding to the formula:



where m and m^1 are integers which total at least 10, and the m monomer comprises between about 10–100 mole percent of the total $m+m^1$ monomer units; R is hydrogen or a C_1–C_4 alkyl, phenyl, chloro or trifluoromethyl substituent; R^1 is a C_1–C_6 alkyl substituent; X is a divalent cycloaliphatic radical having the structure:

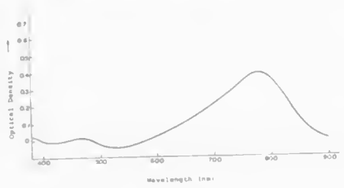


n is an integer between 1–12; and Z is a nitro or cyano subsitutent.

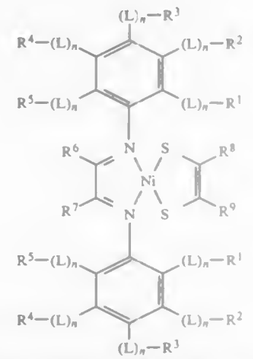
4,913,845
ORGANIC-INORGANIC COMPOSITES WITH ENHANCED NONLINEAR OPTICAL RESPONSE
Guanilla E. Gillberg-LaForce, Summit, and Garo Khanarian, Berkeley Heights, both of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.
Division of Ser. No. 171,088, Mar. 21, 1988, Pat. No. 4,828,758.
This application Jan. 10, 1989, Ser. No. 295,267
Int. Cl.[4] F21V *9/00*
U.S. Cl. 252—582 **8 Claims**

1. A nonlinear optical medium which is a composite comprising (1) a polymer matrix of a side chain polymer which exhibits nonlinear optical response; (2) about 5–30 weight percent, based on the composite weight, of an organic compound which exhibits nonlinear optical response; and (3) about 0.001–5 weight percent, based on the composite weight, of a metal colloid which is uniformly dispersed in the polymer matrix, wherein the metal colloid has an average particle diameter in the range between about 10–1000 angstroms and has a particle surface plasmon frequency in the range between about 300–800 nm.

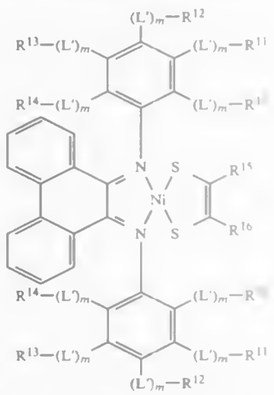
4,913,846
INFRARED ABSORBING COMPOSITION
Yoshiaki Suzuki, and Goulchi Hayashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Aug. 5, 1987, Ser. No. 82,004
Claims priority, application Japan, Aug. 5, 1986, 61-183947
Int. Cl.[4] C07D *333/00*; F21V *9/04*
U.S. Cl. 252—587 **13 Claims**



1. An infrared absorbing composition containing a binder and at least one compound selected from compounds represented by formula (I)

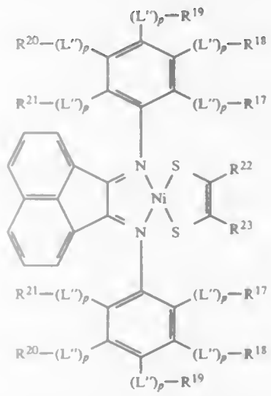


wherein R^1, R^2, R^3, R^4 and R^5, which may be the same or different, each represents a halogen atom, a hydrogen atom, or a substituted or unsubstituted alkyl, aryl, cycloalkyl or heterocyclic group, L is a divalent linking group and n is 0 or 1, or any pair of R^1, R^2, R^3, R^4 and R^5 adjacent to one another on the same ring combine to form a ring; R^6 and R^7, which may be the same or different, each represents an alkyl group or a substituted or unsubstituted aryl group; and R^8 and R^9, which may be the same or different, each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group; or R^8 and R^9 combine for form a substituted or unsubstituted ring, which may be condensed with one or more additional rings or ring systems which may be substituted with substituents;
compounds represented by the formula (II)



(II)

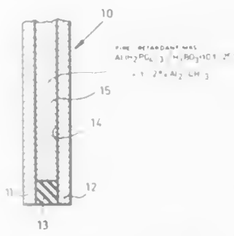
wherein R^{10}, R^{11}, R^{12}, R^{13} and R^{14}, which may be the same or different, each represents a halogen atom, a hydrogen atom, or a substituted or unsubstituted alkyl, aryl, cycloalkyl or heterocyclic group, L' is a divalent linking group and m is 0 or 1, or any pair of R^{10}, R^{11}, R^{12} and R^{14} having adjacent positions on the same ring combine to form a ring; and R^{15} and R^{16}, which may be the same or different, each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group or a cyano group; or R^{15} and R^{16} combine for form a substituted or unsubstituted ring, which may be condensed with one or more additional rings or ring systems which may be substituted with substituents:
and compounds represented by the formula (III)



(III)

wherein R^{17}, R^{18}, R^{19}, R^{20} and R^{21}, which may be the same or different, each represents a halogen atom, a hydrogen atom, or a substituted or unsubstituted alkyl, aryl, cycloalkyl or heterocyclic group, L'' is a divalent linking group and p is 0 or 1, or any pair of R^{17}, R^{18}, R^{19}, R^{20}, and R^{21} having adjacent positions on the same ring combine to form a ring; and R^{22} and R^{23}, which may be the same or different, each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group or a cyano group; or R^{22} and R^{23} combine to form a substituted or unsubstituted ring, which may be condensed with one or more additional rings or ring systems which may be substituted with substituents.

4,913,847
FIRE-RETARDANT MASS AND METHOD OF MAKING SAME
Gerhard Tünker, Duisburg-Rheinhausen, Fed. Rep. of Germany, assignor to Flachglas Aktiengesellschaft, Furth, Fed. Rep. of Germany
Filed Aug. 31, 1988, Ser. No. 239,214
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, 3729867
Int. Cl.[4] C09K *21/00*; B32B *17/00, 9/00, 17/06*
U.S. Cl. 252—606 **10 Claims**



1. A method of making a fire-retardant mass adapted to be received between glass panes, comprising the steps of:
(a) reacting in the presence of water an amount from 90 to 95% by weight of monoaluminumhydrophosphate, from 4 to 8% by weight of boric acid, and from 1 to 2% by weight of aluminum hydroxide gel to produce a reaction product; and
(b) adjusting the water content of said reaction product to

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yield a fire-retardant mass having a viscosity within a range from flowable liquid through viscous to extrudable.

4,913,848

PROCESS FOR PRODUCING A HIGH PURITY DIBROMONEOPENTYL GLYCOL PRODUCT

John Y. Lee, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Calif.

Filed Oct. 12, 1988, Ser. No. 256,593
Int. Cl.[4] C09K *21/00*; C07C *31/34, 69/34, 69/52*
U.S. Cl. 252—609 9 Claims

1. A process for treating a first product which contains monobromopentaerythritol, dibromoneopentyl glycol and tribromoneopentyl alcohol to yield a second product having a dibromoneopentyl glycol content, on a weight percent basis, greater than that of said first product, said process comprising:

a. forming a stirrable mass from at least (i) said first product and (ii) a solvent system in which, at a temperature within the range of from about 0° C. to about 40° C., said monobromopentaerythritol and said tribromoneopentyl alcohol are more soluble than said dibromoneopentyl glycol and in which at least 85% of said dibromoneopentyl glycol in said mass is insoluble;

b. maintaining said mass at said temperature whereby said mass comprises (i) an insoluble portion and (ii) a solvent and solute portion; and

c. separating said insoluble portion and said solvent and solute portion without the substantial precipitation of the solute from said solvent and solute portion, said separated insoluble portion being said second product.

4,913,849

PROCESS FOR PRETREATMENT OF CHROMIUM-RICH OXIDE SURFACES PRIOR TO DECONTAMINATION

Aamir Husain, 3301 Hargrove Road, Mississauga, Ontario, Canada L5L 4E9

Filed Jul. 7, 1988, Ser. No. 216,218
Int. Cl.[4] G12F *9/00*; C02F *5/08*; C23G *1/02*; B08B *7/04*
U.S. Cl. 252—626 7 Claims

4. A method of decontaminating stainless steel components of the cooling system of a nuclear reactor, comprising the steps of contacting the components successively with:

(a) a reducing agent in acidic aqueous solution;

(b) an aqueous acidic oxidizing solution consisting essentially of potassium permanganate and chromic acid as chromium (VI) oxide, at a temperature of about 50° C. or greater; and

(c) a reducing agent in acidic aqueous solution.

4,913,850

PROCESS FOR THE REMOVAL OF IODINE AND ORGANIC IODINE COMPOUNDS FROM GASES AND VAPORS USING SILVER-CONTAINING ZEOLITE OF THE FAUJASITE TYPE

Lothar Puppe, Burscheid, and Jürgen Wilbelm, Gondelsheim/-Baden, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 6, 1989, Ser. No. 318,841
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1988, 3808742
Int. Cl.[4] G21F *9/02*; G21C *19/42*; B01J *29/08*; C01B *7/00*
U.S. Cl. 252—630 8 Claims

1. A process for the rapid and substantially complete removal of iodine and organic iodine compounds from gases or vapors, which comprises passing gases or vapors containing iodine, organic iodine compounds or both through binder-free silver-exchanged molecular sieve granulates of the faujasite type.

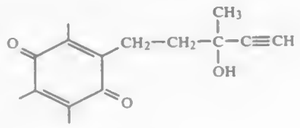
4,913,851

ASYMMETRIC SYNTHESIS OF NATURAL VITAMIN E.

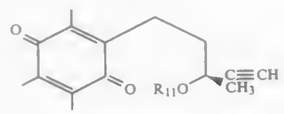
Ka-kong Chan, Hopatcong, N.J., and Gabriel G. Saucy, Vero Beach, Fla., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 303,502, Jan. 30, 1989, Pat. No. 4,855,085, which is a division of Ser. No. 135,128, Dec. 18, 1987, Pat. No. 4,831,185. This application May 15, 1989, Ser. No. 352,229
Int. Cl.[4] C07C *50/06*
U.S. Cl. 552—309 1 Claim

1. A process for producing a racemate of the formula:



from a quinone of the formula:



wherein R_{11} is mesyl or tosyl comprising hydrolyzing said quinone in an aqueous medium in the presence of a metal catalyst to form said racemate.

4,913,852

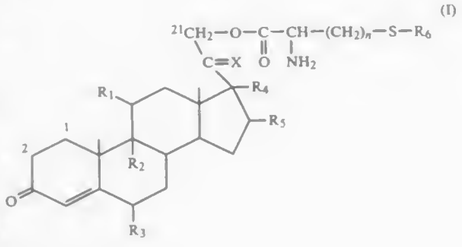
COMPOUNDS OBTAINED FROM THE ASSOCIATIVE SYNTHESIS OF SULFUR-CONTAINING OR SULFUR-FREE AMINO ACIDS WITH PREGNANE DERIVATIVES

Catherine Milioni, 84, Rue 17 Noemvriou; Constantin Efthyimiopoulos, 74, rue 17 Noemvriou, both of 16341 Ilioupoli, Greece; Bernard Koch, 24a, rue de Lièpvre, 67100 Strasbourg, France; Lonis Jung, and Jean Jung, both of 205, route d'Oberhausbergen, 67200 Strasbourg, France

PCT No. PCT/FR87/00244, § 371 Date Feb. 24, 1988, § 102(e) Date Feb. 24, 1988, PCT Pub. No. WO88/00202, PCT Pub. Date Jan. 14, 1988
PCT Filed Jun. 24, 1987, Ser. No. 166,122
Claims priority, application France, Jun. 24, 1986, 86 09246
Int. Cl.[4] C07S *9/00*; A61K *31/56*
U.S. Cl. 514—179 20 Claims

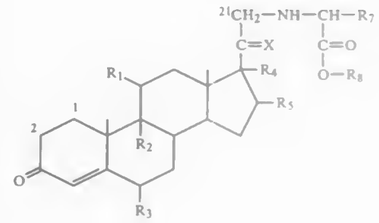
1. A compound represented by one of the following formulae:

(I)

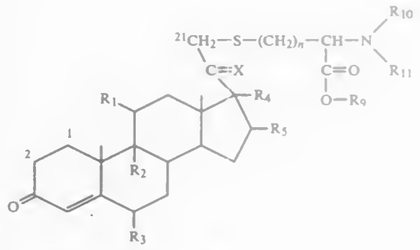


wherein n is 1 or 2;

(II)



(III)



wherein n is from 1 to 6; and

wherein the C_1–C_2 bond may be a saturated or ethylenic bond;

R_1 is oxygen, sulfur, chlorine or hydroxy;

R_2 is hydrogen, fluorine, chlorine or methyl;

R_3 is hydrogen, fluorine, chlorine or methyl;

R_4 is hydrogen, bydroxy, methyl, or ethyl;

R_5 is hydrogen, hydroxy, methyl, ethyl or methylene;

R_4 and R_5 may form a heterocycle of the type —O—CH-(Y)—O— or —O—C(Y)$_2$—O, wherein Y is hydrogen or a straight or branched chain alkyl group;

X is oxygen or sulfur;

R_6 is methyl, arylalkyl, or any other group which protects the thiol function; R_6 may correspond to formula (I) in its entirety with the formation of a disulfur bridge;

R_7 is hydrogen, a linear alkyl group, a branched chain alkyl group, a linear hydroxy alkyl group, a thioalkyl group, an arylalkyl group, a hydroxybenzyl group, indolyalkyl, imidazolyalkyl, amidoalkyl, glutamine, a carboxylic alkyl group is free form or salified by sodium, an alkyl amino group, a guanidinoalkyl group, a dithiodimethyl group;

the NH group in formula (II) may form with R_7 a nitrogen-containing heterocycle of the pyrrolidine type;

R_8 is hydrogen, a sodium salt, a potassium salt or calcium salt, a straight or branched chain alkyl group, a heterocyclic group, or an arylalkyl group;

R_9 is a straight or branched chain alkyl group, a heterocyclic group, or an arylalkyl group;

R_{10} is hydrogen, a straight or branched chain alkyl group containing amino or ammonium;

R_{11} is hydrogen, a straight or branched chain alkyl group containing amino or ammonium; and

R_{10} and R_{11} may have the structure —CO—Z— wherein Z is a straight or branched chain alkyl group or an arylalkyl; and

pharmaceutically acceptable salts thereof.

4,913,853

COMPOSITIONS USEFUL FOR FLUORINE MAGNETIC RESONANCE IMAGING

George B. Hoey, St. Louis, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Division of Ser. No. 671,456, Nov. 14, 1984, Pat. No. 4,639,634. This application Dec. 10, 1986, Ser. No. 940,012
Int. Cl.[4] C07C *83/00, 91/00, 93/00, 143/74*
U.S. Cl. 562—113 2 Claims

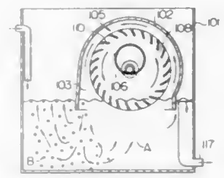
1. N-Methylglucaminium trifluoromethanesulfonate.

4,913,854

WATER WARMING METHOD AND APPARATUS THEREFOR

Kingo Miyahara, Tokyo, Japan, assignor to Dowa Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1988, Ser. No. 289,280
Claims priority, application Japan, Dec. 25, 1987, 62-329306
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—92 15 Claims



1. A water warming method comprising the steps of:

drawing and discharging the water in a water tank into a hot air chamber which is positioned in said water tank and has a lower end disposed substantially on the water contained in said water tank by a rotary body accommodated in said hot air chamber;

introducing heated air into said hot air chamber; and

continuously plunging said drawn water mixed with said heated air back into the water contained in said water tank, such as to generate hot air bubbles in the water causing direct heat exchange between the water and said hot air bubbles to quickly warm said water in said water tank.

4,913,855

CARBURETOR USABLE WITH MOTORCYCLE ENGINE

Ignatius J. Panzica, Morgan Hill, Calif., assignor to Custom Chrome, Inc., Morgan Hill, Calif.

Filed Feb. 29, 1988, Ser. No. 161,751
Int. Cl.[4] F02M *19/06*
U.S. Cl. 261—50.1 16 Claims

1. In a carburetor as for a motorcycle engine, the combination with said engine comprising:

(a) a body forming an axial through passage for intake air, and a butterfly valve in said passage,

(b) a venturi tube removably fitting axially endwise in said passage, the tube having an inner wall defining a venturi for passing the air, the tube having a side port,

(c) a fuel jet tube carried by the body and projecting laterally through said side port into the venturi for jetting fuel into air passing through the venturi,

(d) and an orifice plug removably carried by the body at one end of said tube, and removable to provide access to the fuel jet tube to enable lateral withdrawal of the fuel jet tube from the venturi tube and said port therein,

(e) a starting carburetor mounted on the body and having a flow control member, and a handle for moving the start-

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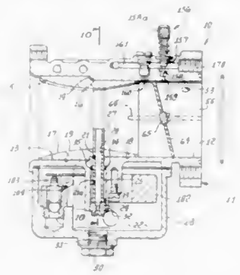
ing carburetor flow control member between closed and open positions,



(f) said handle presented upwardly for direct grasping by the hand of the motorcyclist, the body being attached to motorcycle engine structure.

4,913,856

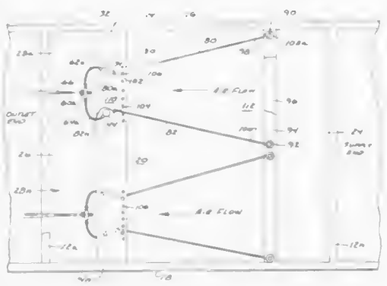
HUMIDIFIER SYSTEM

Bernard W. Morton, Minnetonka, Minn., assignor to Dri-Steem Humidifier Company, Hopkins, Minn.

Continuation of Ser. No. 152,321, Feb. 4, 1988, abandoned. This application Jul. 14, 1989, Ser. No. 380,672

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—116 5 Claims



3. A humidifier system including wall means forming a duct that is of a first predetermined size, and having an air inlet and an air outlet at opposite ends thereof comprising:

at least one pair of deflector vanes in said duct, said vanes extending across said duct and forming an air channel that converges in a downstream direction, said vanes having downstream ends defining an outlet opening, and terminating along a plane so that the air path for air through said duct means expands abruptly at the outlet ends of said vanes, the space between the vanes being unobstructed; and

a humidification assembly having an output for adding humidity to the air in the duct, said humidification assembly being spaced downstream from the downstream end of said vanes, in a region where the air passing through the outlet formed by said vanes becomes turbulent caused only by expansion of air as air exits from the downstream ends of the vanes, whereby the assembly for adding humidity to the air is mounted in a region of turbulent air for enhancing intermixing of the air flowing through said duct with the output from the humidification assembly.

4,913,857

METHOD FOR MOLDING A TRANSPARENT CAPSULE

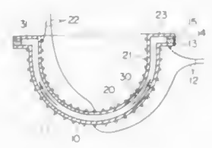
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Mar. 4, 1988, Ser. No. 164,035

Claims priority, application Japan, Apr. 3, 1987, 62-82520; Apr. 20, 1987, 62-98446

Int. Cl.[4] B29D *11/00*

U.S. Cl. 264—1.1 3 Claims



1. A method for manufacturing a portion of a transparent capsule utilizing a lower die cast having a substantially semi-spherical inner surface having an outer flange and an upper die cast having a substantially semi-spherical outer surface having an outer flange in which the radius of said upper die cast is smaller than that of said lower die cast, the method comprising the steps of:

disposing the outer surface of said upper die cast and the inner surface of said lower die cast coaxially with said inner surface being spaced from said outer surface and with said outer flange of said lower die cast being spaced from said outer flange of said upper die cast;

disposing a spacer having a uniform thickness over its entire circumference and a large number of radial grooves on an upper surface thereof between said outer flange of said lower die cast and said outer flange of said upper die cast and utilizing said spacer to determine a molding space between said inner and outer surfaces, said grooves providing communication to said molding space;

introducing fused transparent resin into said molding space between said inner and outer surfaces by pouring said resin through said radial grooves in said spacer;

causing said resin to overflow from said molding space through said radial grooves and thereby venting said molding space and precluding pressurization of said molding resin in said space;

uniformly and gradually cooling said lower die cast along with said upper die cast and said transparent resin to effect hardening of said resin in said molding space; and

separating said upper die cast from said lower die cast and removing from said upper die cast and said lower die cast a molded body made of said transparent resin which together with another like molded body forms a spherical transparent capsule.

4,913,858

METHOD OF EMBOSSING A COATED SHEET WITH A DIFFRACTION OR HOLOGRAPHIC PATTERN

Richard G. Miekka, Sudbury; Thomas D. Bushman, Dover; Arthur W. Taylor, Uxbridge; Tim Parker, Shrewsbury, all of Mass., and Dennis R. Benoit, Woonsocket, R.I., assignors to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 113,689, Oct. 26, 1987, abandoned, and a continuation-in-part of Ser. No. 234,448, Aug. 19, 1988, abandoned, and a continuation-in-part of Ser. No. 64,039, Jun. 19, 1987, abandoned. This application Oct. 3, 1988, Ser. No. 253,163

Int. Cl.[4] B29D *11/00*

U.S. Cl. 264—1.3 24 Claims

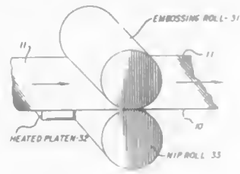
1. The method of decorating sheeting which comprises the steps of:

A. providing a substrate comprising paper;

B. providing a coating of thermoplastic material comprising styrene butadiene on a surface of said substrate forming a multilayer sheeting, said thermoplastic material containing a hydroxylated polysiloxane release agent;

C. heating the coating before embossing to a temperature above its softening temperature;

D. embossing said sheeting by embossing the thermoplastic coating on said substrate with a diffraction or holographic



pattern, said embossing achieved with an embossing roller which comes into pressure contact with said coating; said embossing roller being at a temperature below the softening temperature of the thermoplastic coating during embossing said embossing being carried out at speeds of between about 100 to 800 ft/min of said sheeting, and wherein, the depth of surface roughness of said substrate before embossing exceeds the depth of the embossment.

4,913,859

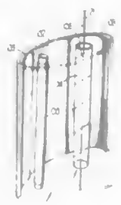
METHODS OF CURING OPTICAL FIBER COATINGS

Bob J. Overton, and Carl R. Taylor, both of Lawrenceville, Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 115,233, Oct. 30, 1987, abandoned. This application Apr. 21, 1989, Ser. No. 342,600

Int. Cl.[4] B29C *47/02*; G02B *6/02*

U.S. Cl. 264—1.4 11 Claims



1. A method of making an optical fiber having a layer of coating material thereon, said method including the steps of

drawing an optical fiber from a preform;

applying a curable coating material to the drawn optical fiber;

exposing the curable coating material to radiant energy to cure the coating material, the radiant energy ranging from infrared through ultraviolet frequencies with a portion thereof being effective to cure the coating material and with portions thereof having frequencies outside the range of frequencies which are used to cure the coating material and which are absorbed by said coating material thereby causing heating of the coating material;

controlling said step of exposing the curable coating material to the radiant energy to modulate those portions of the radiant energy which are outside the useful curing range and which cause heating of the curable coating material and thereby to control the energy influx into and the heating profile of the coating material during its cure and thereby cause the modulus of cured material to be a desired value; and

taking up the drawn, coated optical fiber.

4,913,860

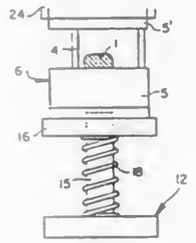
METHOD OF USING PORCELAIN BLOCK IN PORCELAIN PRESS TECHNIQUE FOR DENTAL USE

Naotaka Nakaji, and Kisao Nakaji, both of Hayashi-Bldg. # 201, 7-8, Nishikigaoka, Kumamoto-shi, Japan

Continuation of Ser. No. 5,273, Jan. 20, 1987, abandoned. This application Jul. 22, 1988, Ser. No. 224,226

Int. Cl.[4] A61C *13/00, 13/20*; B28B *1/00*

U.S. Cl. 264—16 6 Claims



1. A process for manufacturing dental prosthesis:

providing a mold assembly including upper and lower flasks having a selectively configured mold cavity defined in investment material therein;

preparing a homogeneous block of porcelain material in advance by baking porcelain powder to fuse together particles of said porcelain powder;

cutting and placing said preformed homogeneous block of porcelain material onto said lower flask such that said cutting of said porcelain block facilitates stable placement of said block onto said lower flask;

heating said mold assembly having said porcelain block on said lower flask until said porcelain block is heated to approximately 100° C. above the firing temperature of said porcelain material thereby softening said porcelain block; and

pressing said softened porcelain block into said mold cavity to form said dental prosthesis.

4,913,861

PROCESS FOR PREPARING CARBON FIBER-REINFORCED COMPOSITE MATERIALS

Tadao Mishima; Atsuo Mitani, both of Kanazawa, and Takashi Yamamoto, Komatsu, all of Japan, assignors to Ishikawa Prefecture, Ishikawa and Nippon Oil Co. Limited, Tokyo, both of, Japan

Continuation of Ser. No. 33,336, Mar. 31, 1987, abandoned. This application Dec. 28, 1988, Ser. No. 292,656

Claims priority, application Japan, Mar. 31, 1986, 61-75108

Int. Cl.[4] D06H *7/00*; B26F *3/00*

U.S. Cl. 264—23 2 Claims

1. In a process for preparing a carbon fiber-reinforced composite material comprising molding a textile weave-reinforced composite material using a plain textile weave obtained by weaving multifilament yarns comprising a plurality of substantially non-twisted carbon fiber filaments which have been bonded to each other with a sizing agent, the improvement

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wherein preceding the molding of the textile weave, the process includes a yarn disintegrating step of applying ultrasonic waves to said textile-weaves in water, thereby breaking the bonds between the filaments of yarns constituting said textile weaveto thereby produce the composite material with improved strength.

4,913,862

METHODS FOR APPLYING NO MIX PLASTIC COMPOUNDS

H. Nash Babcock, Old Greenwich, and Edward P. Holub, Bethel, both of Conn., assignors to Nomix Corporation, Fairfield, Conn.

Continuation-in-part of Ser. No. 53,561, May 21, 1987, Pat. No. 4,732,782, which is a continuation-in-part of Ser. No. 843,316, Mar. 24, 1986, abandoned. This application Aug. 6, 1987, Ser. No. 82,180

Int. Cl.[4] B28B *1/14*; B29C *39/02, 41/02, 41/42*

U.S. Cl. 264—36 21 Claims

1. A method for preparing a cured, filled, two component organic thermosetting composition which comprises:

placing resin and hardener components of an organic thermosetting composition upon a substrate without physical pre-mixing thereof; and

adding to said components a filler material in the form of particles, wherein a major proportion of said particles have substantially the same drop rate through said resin and hardener components, without any physical mixing other than the mixing of said components by the falling of said filler material through said resin and hardener components to allow said components to react and cure thus forming a cured organic thermosetting composition having particles of said filler material dispersed therein.

4,913,863

SPLIT EXTRUSION DIE ASSEMBLY FOR THERMOPLASTIC MATERIALS AND METHODS OF USING THE SAME

John F. Burrafato, Wayne, and Robert E. Hooper, Long Valley, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jan. 30, 1989, Ser. No. 303,215

Int. Cl.[4] B29C *47/88, 47/92*

U.S. Cl. 264—40.6 51 Claims

1. A die spool for extrusion of thermoplastic materials comprising:

an axially elongate spool body including means which allow separation of said spool body into first and second spool segments mateable with one another along a longitudinal plane;

said first and second spool segments including means for collectively defining an extrusion cavity extending axially between opposing ends of said spool body;

said spool body including boss means at one of said ends, and means defining a recess at the other of said ends, said boss means and said recess defining means for respectively mateably engaging boss means and recess defining means of other die spools so as to form a die spool assembly comprised of a number of individual die spools; and

alignment means associated with said die spool for ensuring that said defined extrusion cavity is exactly aligned with respective extrusion cavities of said other die spools when said first mentioned die spool is mateably engaged therewith to form said die spool assembly.

34. A method of forming extruded thermoplastic products comprising the steps of:

(a) extruding a molten thermoplastic material through an extrusion die so as to form a product preform having a preselected cross-sectional geometry;

(b) supporting a length of said product preform on a portion of an extrusion cavity defined by a lower segment of a die spool by coupling said lower die spool segment to said extrusion die;

(c) positioning a remaining portion of said extrusion cavity defined by an upper segment of said die spool in mated relationship with said first mentioned portion of said lower die spool segment, by bringing said upper and lower die spool segments into mated relationship with one another while said product preform length is being supported by said lower spool segment; and then

(d) effecting temperature control of said product preform within said extrusion cavity collectively established by said mated upper and lower die spool segments by controlling temperature within said extrusion cavity through which said product preform is conveyed, wherein

step (a) is practiced continually so as to allow said length of product preform to increase by being conveyed beyond a downstream end of said die spool, and wherein the method further comprises the steps of;

(e) supporting said increased length of said product preform on a portion of an extrusion cavity defined by a lower segment of a second die spool by coupling said second lower die spool segment to said first mentioned lower die spool segment; and then

(f) positioning a remaining portion of said extrusion cavity defined by an upper segment of said second die spool in mated relationship with said extrusion cavity portion of said second lower die spool segment, by bringing said second upper and lower die spool segments into mated relationship with one another.

4,913,864

PROCESS FOR PREPARATION OF POROUS HOLLOW FILAMENT

Kouzi Soga, and Nobuo Taneda, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Sep. 28, 1988, Ser. No. 250,420

Claims priority, application Japan, Nov. 19, 1987, 62-290533; Feb. 10, 1988, 63-27632

Int. Cl.[4] D01D *5/247*; D01F *2/24*

U.S. Cl. 264—41 7 Claims

1. A process for the preparation of a porous hollow filament composed mainly of cellulose acetate, which comprises separately feeding a cellulose acetate powder and a liquid additive to a feed zone of a twin-screw extruder means, kneading and heating the cellulose acetate with the additive in a kneading and heating zone of the extruder means to form a plasticized melt, further kneading and compressing the plasticized melt in a kneading and compressing zone of the extruder means, feeding the plasticized melt to an extruding zone of the extruder means, and extruding the plasticized melt from the extruding zone in the form of a hollow filament and with removal of said liquid additive to thereby obtain said porous hollow filament.

4,913,865

PROCESS FOR PREPARING ULTRAFINE PARTICLES OF ORGANIC COMPOUNDS

Hideki Toyotama, Saitama, Japan, assignor to Research Development Corp of Japan and Stanley Electric Co. Ltd., both of Tokyo, Japan

Filed May 22, 1986, Ser. No. 865,801

Claims priority, application Japan, Jul. 15, 1985, 60-155375

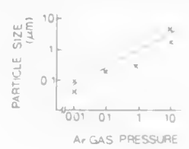
Int. Cl.[4] B29B *9/00*

U.S. Cl. 264—81 5 Claims

1. A method for preparing ultrafine particles of an organic

compound having a good affinity to a dispersion medium comprising the steps of:

a. heating and evaporating the organic compound in a vacuum vessel while controlling the inert gas pressure in the vessel;



b. condensing the resulting vapour and depositing on a recovering plate in the vessel; and

wherein the inert gas is argon or nitrogen and the pressure thereof is controlled to be at highest 10 Torr.

4,913,866

PROCESS FOR REDUCING FOGGING DUE TO PLASTICIZERS IN PLASTICS

Jürgen Heuser, Krefeld; Lothar Meier, Sprockhoevel; Karola Brudermanns, Leverkusen; Otto Billinger, Linz, and Rolf Kubens, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 27, 1989, Ser. No. 328,618

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1988, 3811449

Int. Cl.[4] B29C *41/18, 43/24, 47/00*; C08J *3/00*

U.S. Cl. 264—83 9 Claims

1. A process for reducing fogging when using polymer plasticizers in plastics which comprises treating a melt of a polymer plasticizer with water vapor.

4,913,867

THERMAL PROCESS FOR STRETCH-ORIENTATION OF POLYANILINE FILMS AND FIBERS

Arthur J. Epstein, Bexley; Keith Cromack, Columbus; Mikolaj Jozefowicz, Columbus, and John M. Ginder, Columbus, all of Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio

Filed Feb. 2, 1989, Ser. No. 305,891

Int. Cl.[4] B29C *55/04*

U.S. Cl. 264—104 31 Claims

1. A process for producing an oriented polyaniline film comprising the steps of applying a stress to the film of an order of at least 1×10^7 N/m^2 and simultaneously heating the film rapidly to an elevated temperature of between 110° C. and 250° C.

4,913,868

METHOD FOR MAKING POROUS MOLD FOR PRESSURE SLIP CASTING

Haruyuki Ito, and Akio Matsumoto, both of Kitakyushu, Japan, assignors to Toto Ltd., Kitakyushu, Japan

Filed Jul. 24, 1987, Ser. No. 77,657

Claims priority, application Japan, Jul. 26, 1986, 61-176370

Int. Cl.[4] B29C *39/12, 39/26, 41/22, 41/38*

U.S. Cl. 264—135 6 Claims

1. A method of making a porous mold for pressure slip casting large size ceramic articles, comprising the steps of:

casting a fine porous mold layer having an average pore diameter of at most 20 microns and a thickness of 5 to 40 mm;

applying an adhesive in a pattern to a rear surface of said fine porous mold layer to leave an unapplied portion on said rear surface;

mixing a liquid resin and a filler of a particle size of 0.1 to 5.0 mm at a volume ratio of 15 to 50:100;

forming a coarse porous mold layer directly on the adhesive applied and unapplied portions of said rear surface of said fine porous mold layer, and said coarse porous mold layer having a thickness of 5 to 30 mm and made of the mixture of the liquid resin and the filler;

curing the first adhesive and said coarse porous mold layer;

substantially sealing an outer surface of said coarse porous mold layer with a sealing adhesive resin after the first adhesive and said coarse porous mold layer have cured; and

connecting at least one pipe to said coarse porous mold layer for passage of water from and air into said coarse porous mold layer.

4,913,869

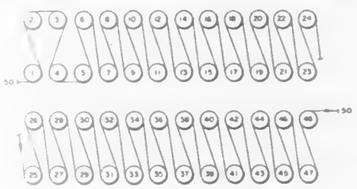
WET-SPINNING PROCESSES FOR PRODUCING ACRYLIC FILAMENTS

Paul M. Funk, Decatur, Ala., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 23, 1988, Ser. No. 289,142

Int. Cl.[4] D01F *6/38*

U.S. Cl. 264—182 10 Claims



1. In a process for producing acrylic filaments wherein a solution of acrylic polymer is a suitable solvent therefor is extruded through one or more spinnerets immersed in a coagulation bath comprising water and solvent for said polymer to form filaments that are withdrawn from said bath, washed with water to remove solvent therefrom, wet-stretched in a hot water bath to impart molecular orientation thereto and then dried and collapsed on a drying roll train comprising at least 20 heated rotating rolls arranged serpentinely in series, said filaments being passed from roll to roll and over each roll with a partial wrap and under sufficient tension to prevent significant slippage of said filaments on said rolls, wherein said process imparts a total stretch and a denier to said filaments, the improvement for reducing filament breaks and wraps or increasing productivity or both comprising the steps of (a) operating at least two pair of said rolls, each pair consisting of successive heated rolls, at peripheral speeds such that a drying roll stretch is imparted to said filaments between each said pair of said rolls and (b) reducing said wet-stretch to keep said total stretch and denier the same.

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4,913,870

PROCESS FOR PREPARING POLYACRYLONITRILE FILAMENTS HAVING HIGH TENSILE STRENGTH AND MODULUS

Ronald M. A. M. Schellekens, Smeermaas/Lanaken, Belgium, and Pieter J. Lemstra, Brunssum, Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Continuation of Ser. No. 887,616, Jul. 21, 1986, abandoned, which is a continuation of Ser. No. 679,407, Dec. 7, 1984, abandoned. This application Jul. 8, 1987, Ser. No. 71,213
Claims priority, application Netherlands, Dec. 10, 1983, 8304263
Int. Cl.[4] D01F *6/18*
U.S. Cl. 264—182 17 Claims

1. A process for the preparation of polyacrylonitrile articles having the combined properties of high tensile strength and high modulus which consists essentially in the combination of steps of:

(a) preparing a solution of 0.5–15 wt. % of polyacrylonitrile or copolyacrylonitrile in a solvent for polyacrylonitrile having at most 15 wt. % of comonomer therein and of a weight-average molecular weight of from 0.3×10^6 to 10×10^6, said solution also containing a bivalent metal compound present in an amount of from 0.01 to 0.2 moles per mole of acrylonitrile units;

(b) forming, at an increased temperature, a solvent-containing article from said solution;

(c) cooling said article to a temperature below the gelation temperature to form a gel article;

(d) substantially removing from said gel article the solvent and metal compound contents thereof; and

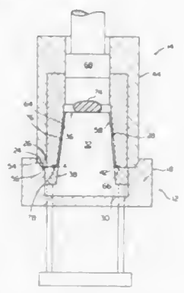
(e) stretching the article thus obtained at a temperature between 140° C. and 180° C., and at a stretch ratio of at least 10.

4,913,871

METHOD OF COMPRESSION MOLDING SYNTHETIC RESIN

Kiyoshi Kawaguchi, and Hideki Yagishi, both of Yokohama, Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 874,948, Jun. 16, 1986, abandoned.
This application Oct. 31, 1988, Ser. No. 266,230
Claims priority, application Japan, Jun. 21, 1985, 60-133952; Aug. 30, 1985, 60-189362
Int. Cl.[4] B29C *43/04, 43/14*
U.S. Cl. 264—294 5 Claims



1. A method of producing a compression-molded article having a predetermined capacity which method comprises compression-molding an amount of synthetic resin material provided to a cooperative male mold means and a female mold means in which are movable toward and away from each other; wherein

said male mold means h as a front end surface which defines an inner surface of a bottom wall of the article and an outside surface which defines an inner surface of a cylindrical side wall that extends upwardly from the peripheral edge of the bottom wall,

said female mold means comprises an outside member having a central opening and an inside surface that defines the outer surface of the cylindrical side wall and an outer surface of a cylindrical leg that extends downwardly from the peripheral edge of the bottom wall, and a plunger movable relative to the outside member through the central opening, said plunger defining the central portion of the molded article in cooperation with said male mold means, said plunger having a front surface that defines substantially all of the outer surface of the bottom wall and an outside surface which defines the inner surface of the cylindrical leg, and

said method comprises the steps of,

(A) performing a pre-mold closing step of moving said outside member into a predetermined closed position with said male mold means without substantially compressing the synthetic resin material,

(B) maintaining said outside member and said male mold means together under a predetermined closing pressure when said outside member and said male mold means are in said closed position, and thereafter,

(C) moving said plunger toward said front end surface of said male mold means to compress the resin material between said front end surface of said male mold means and said front surface of said plunger to substantially fill a first mold space between said surfaces for forming said bottom wall; and

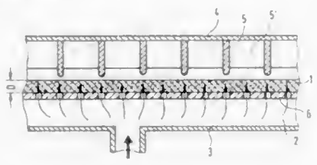
(D) further moving said plunger toward said front end surface of said male mold means until a portion of the resin material flows from the first mold space to fill a second mold space between said outside surface of said male mold means and said inside surface of said outside member of said female mold means to form the sidewall independently of the provided amount of resin material, and until another portion of the resin material flows from the first mold space to fill a third mold space between said inside surface of said outside member of said female mold means and said outside surface of said plunger to form the leg independently of the amount of provided resin material, whereby the thickness of the bottom wall is dependent upon the amount of resin material provided and the height of the sidewall, the height of the leg and the capacity of the article are independent of such amount.

4,913,872

GRID STEAM TREATMENT

Günter H. Kiss, Sontra, Fed. Rep. of Germany, assignor to Societe Generale, Paris, France

Filed Feb. 1, 1989, Ser. No. 305,462
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1988, 3804416
Int. Cl.[4] B29C *59/00*
U.S. Cl. 264—320 7 Claims



1. A process for shaping a resin-impregnated fibrous mat, containing cellulose or lignocellulose fibers or a mixture thereof, comprising the steps of:

(A) providing a resin-impregnated fibrous mat;

(B) providing a lattice-like grid in superposition to at least a portion of a surface of the fibrous mat; and

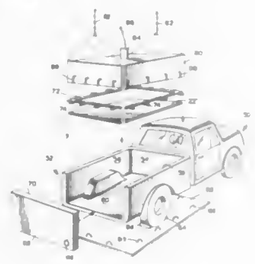
(C) contacting the fibrous mat with steam, at a temperature and for a time sufficient to cause the fibrous mat to expand in such a manner so as to urge the portion of the surface of the fibrous mat into engagement with the grid, thereby preventing further expansion of the fibrous mat at locations in contact with the grid while allowing further expansion of the mat at locations not in contact with the grid.

4,913,873

METHOD OF FORMING A TRUCK BED LINER

Edward S. Robbins, III, 459 North Ct., Florence, Ala. 26360

Continuation of Ser. No. 78,676, Jul. 28, 1987, abandoned. This application Dec. 30, 1988, Ser. No. 291,367
Int. Cl.[4] B29C *45/14*
U.S. Cl. 264—516 8 Claims



1. A method of providing a plastic liner to the bed of a truck without male or female molds, said truck bed defined by a front wall, a pair of side walls, a tailgate and a bed surface, the method comprising the steps of:

(a) removing the tailgate from the truck;

(b) installing a dummy tailgate on the truck, said dummy tailgate provided with coupling means for operative attachment to a vacuum source;

(c) locating a sheet of plastic material on upper surfaces of said front wall, said pair of side walls and said dummy tailgate in substantial alignment with said bed surface;

(d) clamping said sheet to said truck bed;

(e) heating said sheet to a pliable state;

(f) applying a vacuum through said coupling beneath said sheet to draw said pliable sheet into conformance with said bed.

4,913,874

PROCESS OF PROVIDING TUBULAR POLYMERIC ANTICORROSION FILM

Leonid S. Pinchuk, ulitsa Petchenko, 14, kv. 17; Elena N. Aleshkevich, ulitsa Jubileinaya, 4, kv. 99; Viktor A. Goldade, ulitsa Kozhara, 5, kv. 30; Semen Y. Liberman, ulitsa B.Khmelnitskogo, 108, kv. 27; Grigory V. Rechits, ulitsa Fedjuninskogo, 6, kv. 88, and Ekaterina I. Parkalova, ulitsa Fedjuninskogo, 6, kv. 82, all of Gomel, U.S.S.R.

Filed Feb. 21, 1989, Ser. No. 313,595
Int. Cl.[4] B05D *7/26;* B29C *55/28*
U.S. Cl. 264—564 5 Claims

1. A process of producing a tubular polymeric anticorrosion film comprising the steps of:

extruding a melt of a mixture of a thermoplastic polymer with one of a corrosion inhibitor in a liquor phase and a corrosion inhibitor in liquid phase with a solution thereof in a plastifying agent employed in amounts exceeding a limit of compatibility with said polymer;

blowing said melt into a tubular film upon cooling; and

applying, onto an external surface of the formed tubular film before a line of crystallization, of a layer of one of an enamel and a varnish incompatable with said thermoplastic polymer having a difference of solubility parameters in respect of said one of a corrosion inhibitor in a liquid phase and a corrosion inhibitor liquid phase with a solution thereof in a plastifying agent of less than 8.

4,913,875

SWIRL VANES INTEGRAL WITH SPACER GRID

Eric B. Johansson, and Louis C. Bulger, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Continuation of Ser. No. 100,678, Sep. 24, 1987, abandoned. This application Mar. 14, 1989, Ser. No. 323,075
Int. Cl.[4] G21C *3/34*
U.S. Cl. 376—439 7 Claims

1. A spacer assembly for use in a nuclear boiling water reactor for imparting a swirl to a passing steam water mixture within an elongate polygon section elongate fuel channel having elongate longitudinally extending fuel rods comprising in combination:

a matrix of helically twisted sheet metal spacing elements, each helically twisted sheet metal element forming a continuous helix and having a small fraction of the total length of said elongate fuel channel, said helically twisted sheet metal elements arrived so that each said fuel rod has a plurality of said helically twisted sheet metal spacing elements surrounding a small fraction of the total length of said rod in substantially the same horizontal plane of said rod,

each helically twisted sheet metal element intermediate an upper helically twisted end and a lower helically twisted end defining protruding lattice connectors spanning between adjacent said helical elements to form points of connection between adjacent said discrete helically twisted sheet metal elements to enable each said helically twisted sheet metal element to be joined into a matrix of said helical elements about each said fuel rod;

means connecting said defined protruding lattice connectors together whereby said helical elements space said fuel rods one from another, space said fuel rods from said fuel channel and impart a helical flow and turbulence to a passing fluid stream.

4,913,876

NUCLEAR REACTOR FUEL ASSEMBLY

Haas Lettau, Effeltrich; Gerhard Preusche, and Guenther Lill, both of Herzogenaurach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 6, 1988, Ser. No. 178,130
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1987, 371153617
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—444 8 Claims

1. Nuclear reactor fuel assembly, comprising an elongated fuel assembly box, fuel rods containing nuclear fuel being mutually spaced apart in said fuel assembly box and parallel to the longitudinal direction of said fuel assembly box, a water

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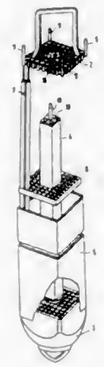
tube inside said fuel assembly box parallel to said fuel rods, said water tube having a lower end with an inlet opening and an upper end with an outlet opening for liquid water, a first shield fastened inside said water tube and spaced apart from both of



said ends of said water tube, said first shield having a flow-through opening formed therein for the liquid water, and a second shield fastened inside said water tube and spaced apart from said first shield, said second shield having another flow-through opening formed therein for the liquid water.

4,913,877

SURFACE MODIFIED CEMENTED CARBIDES

Warren C. Yohe, Troy, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Continuation of Ser. No. 129,565, Dec. 7, 1987, Pat. No. 4,828,612. This application Jan. 3, 1989, Ser. No. 293,044

Int. Cl.[4] G22F *1/00*

U.S. Cl. 419—13 1 Claim

1. A process for forming a binder enriched layer near a peripheral surface of a cemented carbide body having a peripheral surface formed by sintering a blended powder mixture.

said process comprising forming a homogeneous mixture of powders comprising at least 70 weight percent tungsten carbide in hexagonal form and a sufficient amount of additional carbides for improving crater resistance, said additional carbides having a B-1 structure and selected from the group consisting of the carbides of titanium, tantalum, columbium, molybenum, vanadium, chromium, zirconium and hafnium and being less than 15 percent by weight additional carbides, a cobalt metal binder material, and an effective amount of aluminum nitride in an amount sufficient for enhancing the surface toughness of the cemented carbide body by promoting binder enrichment and depletion of aluminum nitride and said additional carbides near a peripheral surface,

sintering said powder mixture under conditions resulting in the decomposition of at least a portion of said aluminum nitride near said peripheral surface of said body during formation thereof whereby binder enrichment and depletion of aluminum nitride results,

said binder enrichment comprising an increased cobalt metallic binder content near said peripheral surface of at least 1.2 times the average concentration of cobalt metallic binder in said substrate,

said depletion of aluminum nitride and said additional carbides near a peripheral surface comprising substantially entirely depleting said aluminum nitride and said additional carbides near said peripheral surface while said average concentration of aluminum nitride and said additional carbides is retained in a remaining portion of said substrate.

4,913,878

METHOD OF TESTING THE MAGNESIUM CONTENT OF MAGNESIUM-TREATED CAST IRON

John V. Dawson, Wilmcote Nr. Stratford-Upon-Avon, and Peter White, Redditch, both of England, assignors to General Signal Corporation, Stamford, Conn.

Filed Jan. 24, 1989, Ser. No. 301,569

Claims priority, application United Kingdom, Feb. 5, 1988, 8802619

Int. Cl.[4] C22C *33/00*

U.S. Cl. 420—18 9 Claims

1. A method of testing the actual magnesium content of magnesium-treated iron wherein a molten sample of the magnesium-treated iron is introduced into a receptacle containing additives of tellurium and either sulphur or selenium and is allowed to cool and solidify, the amounts of tellurium and of said sulphur or selenium being controlled measured quantities, the quantity in the case of tellurium being sufficient to allow carbidic eutectic solidification of non-magnesium-containing iron, the quantity, in the case of the sulphur or selenium, being such that the addition is just sufficient to neutralize a desired content of magnesium in the iron, and then observing whether the cooling behavior results in (1) carbidic eutectic solidification, signifying neutralization of all magnesium in the iron sample such that actual magnesium content is less than the desired magnesium content or (2) graphitic eutectic solidification signifying neutralization of less than all the actual magnesium in the iron sample such that the actual magnesium content is greater than the desired content.

4,913,879

HYDROGEN ABSORBING MODIFIED $ZRMN_2$ -TYPE ALLOYS

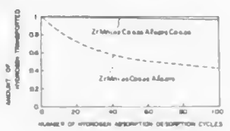
Naojiro Honda; Nobuhiro Furukawa; Shin Fujitani, and Ikuo Yonezu, all of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

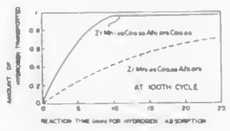
Filed Oct. 7, 1988, Ser. No. 255,063

Claims priority, application Japan, Oct. 8, 1987, 62-252351; Oct. 20, 1987, 62-262670; Nov. 20, 1987, 62-291795

Int. Cl.[4] C01B *6/02*

U.S. Cl. 420—434 8 Claims





1. Hydrogen absorbing $ZrMn_2$ alloys having $MgZn_2$-type Laves phase structure with its Mn partially substituted by Co and containing Al as an additive and having the composition $Zr(Mn_{1-x}Co_x)_yAl_z$, where y is from about 1.7 to 2.3, x is from 0 to about 0.5, and z is from 0 to about 0.15.

4,913,880

NOVEL AMINE-CONTAINING COPOLYMERS AND THEIR USE

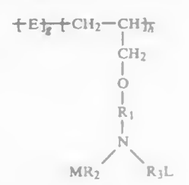
Fu Chen, Newtown, and William S. Carey, Ridley Park, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Division of Ser. No. 215,100, Jul. 5, 1988, which is a continuation-in-part of Ser. No. 37,484, Apr. 13, 1987, Pat. No. 4,759,851, which is a continuation of Ser. No. 864,049, May 16, 1986, Pat. No. 4,659,481, which is a continuation of Ser. No. 545,563, Oct. 26, 1983, abandoned. This application Mar. 9, 1989, Ser. No. 321,236

Int. Cl.[4] C23F *11/173*

U.S. Cl. 422—15 27 Claims

1. Method of inhibiting corrosion of metallic parts in contact with an aqueous system, said method comprising adding to said system between 0.5 and about 100 parts per million on our actives basis of a water soluble polymer comprising repeat unit moieties (g) and (h) comprising the structure:



wherein E in the above formula is acrylic acid, methacrylic acid, or polymerized mixtures or water soluble salts thereof, wherein R1 in the above formula comprises a C1–C6 linear or branched alkylene or hydroxyl substituted alkylene, R_2 and R_3 independently represent hydrogen, C1–C5 lower alkylene or substituted lower alkylene, and M and L independently represent hydrogen or a water-soluble cation and wherein the mole ratio of repeat units g:h is about 4:1 to about 6:1.

4,913,881

DOSIMETER

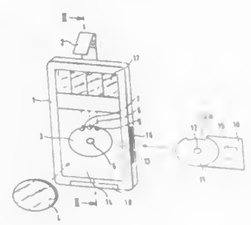
Wolfgang Evers, Lübeck, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Oct. 13, 1988, Ser. No. 257,088

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1987, 3735176

Int. Cl.[4] G01N *21/27, 31/22*

U.S. Cl. 422—56 10 Claims



1. A dosimeter for detecting the presence of a substance in the form of a gas or a vapor, the dosimeter comprising:

a housing having a forward wall and a flat measuring chamber formed in said housing so as to have a rearward wall facing said forward wall;

said forward wall having a wall portion for closing said chamber to the ambient;

said wall portion being non-transparent to light and yet being permeable to said substance;

an exchangeable diffusion member adapted to be removably insertable into said measuring chamber so as to be disposed rearwardly of said wall portion and including a chemically reacting sensor layer which changes color in the presence of said substance;

said diffusion member being disposed in said chamber on said rearward wall so as to cause said sensor layer to face toward said wall portion;

said diffusion member having first and second cutouts; and,

a photometric diffusion-reflectance measuring device for measuring the degree of coloration in said sensing layer, the measuring device including: light source means disposed on said rearward wall of said measuring chamber and arranged in the region of said first cutout for irradiating light onto said sensor layer; and, a photosensor also disposed in said measuring chamber on said rearward wall and mounted in the region of said second cutout for receiving the light reflected from said sensor layer.

4,913,882

DIFFUSION SAMPLER HAVING A CONVERSION ZONE

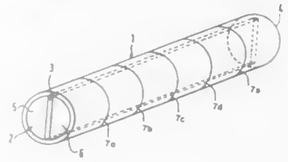
Wolfgang May, Reinfeld; Edgar Eickeler, and Wolfgang Evers, both of Lübeck, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Sep. 1, 1988, Ser. No. 239,469

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1987, 3729080

Int. Cl.[4] G01N *31/22, 21/75*

U.S. Cl. 422—58 12 Claims



1. A diffusion sampler for detecting a gas, the diffusion sampler comprising:

a vessel defining a longitudinal axis and an interior space and having at least one inlet opening exposed to the gas to be detected;

permeable barrier means disposed in said inlet opening for defining a moderating zone through said gas passes into said interior space;

first elongated carrier means extending along said axis and through said interior space starting from said barrier means;

second elongated carrier means extending along and parallel to said axis and likewise extending through said interior space starting from said barrier means;

said first and second carrier means conjointly defining a narrow gap transverse to said axis to provide a diffusion path therebetween which is arranged along the length of said vessel;

conversion means disposed on first carrier means for converting said gas into predetermined substances which migrate across said gap; and,

collection means for taking up said predetermined substances and being formed on said second carrier means to react with said predetermined substances to form a coloration indicaiton of the dosage of said gas.

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4,913,883
PARTICLE AGGLUTINATION IMMUNOASSAY APPARATUS
Kazumichi Imai, Kodaira; Daizo Tokunaga, Hachioji, and Koichi Yokosawa, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 20, 1988, Ser. No. 221,971
Claims priority, application Japan, Jul. 20, 1987, 62-178895
Int. Cl.[4] G01N 30/96, 33/553
U.S. Cl. 422—82.01 11 Claims

1. A particle agglutination immunoassay apparatus that measures the concentration of antigen in a specimen by measuring the agglutination of microparticles formed by the reaction of said antigen with antibody coupled to the surfaces of microparticles, the improvement comprising:

means which disperses agglutinated masses of microparticles formed by the reaction and moves the agglutinated masses together with the flow of liquid; and

detect means which magnetically measures the sizes of agglutinated masses in the flow of liquid.

4,913,884
URANIUM-PREEXTRACTION IN ZIRCONIUM/HAFNIUM SEPARATIONS PROCESS
Robert J. Feuling, Sandy, Utah, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Nov. 9, 1988, Ser. No. 268,101
Int. Cl.[4] C01G 43/00
U.S. Cl. 423—9 7 Claims

7. In a process for recovering zirconium values from uranium containing zircon ore, said process comprising a fluidized bed carbochlorination of the zircon ore at 800°–1250° C., producing a relatively impure, hafnium-containing zirconium tetrachloride stream and by-product silicon tetrachloride, which silicon tetrachloride by-product is separated by differential condensation, and wherein uranium chloride is volatilized at the ore chlorinator temperature and follows as an impurity in the zirconium-hafnium tetrachloride stream, mixing the zirconium-hafnium tetrachloride with water to produce a zirconium-hafnium oxychloride solution, and removing iron impurities by liquid-liquid iron extraction with a methyl isobutyl ketone extractant; the improvement comprising:

adding 1–9 weight percent quaternary ammonium halide to the methyl isobutyl ketone extractant in said liquid-liquid iron extraction; whereby the methyl isobutyl ketone extractant strips uranium and iron from the zirconium-hafnium oxychloride solution.

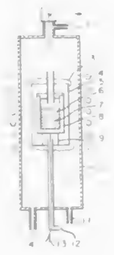
4,913,885
RECOVERY OF VANADIUM VALUES
Francoise Seon, Montreuil, and Michel Ries, Vitry/sur/Seine, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France
Filed Apr. 27, 1988, Ser. No. 186,947
Claims priority, application France, Apr. 29, 1987, 87 06089
Int. Cl.[4] C01G 31/00
U.S. Cl. 423—67 14 Claims

1. A process for the recovery of vanadium values from a material comprised thereof, comprising intimately contacting an aqueous suspension of such material with a gaseous admixture of sulfur dioxide and oxygen, whereby a phase separation thus results, and recovering an aqueous phase which comprises a solution of vanadium values said gaseous admixture comprising a stoichiometric vanadium reducing amount of SO_2.

4,913,886
PRODUCTION OF IMPROVED COPPER ALUMINUM BORATE
Larry C. Satek, Wheaton, Ill., assignor to Amoco Corporation, Chicago, Ill.
Filed Jun. 5, 1989, Ser. No. 361,278
Int. Cl.[4] C01B 35/00, 35/10, 15/12, 35/12
U.S. Cl. 423—277 31 Claims

1. The process of producing copper aluminum borate which comprises forming an aqueous composition comprising a volatile organic liquid having at least partial miscibility with water, a source of copper(II) ions, a source of alumina, and a source of boria at a pH in a range from about 4 to about 10, drying the composition to form a superficially dry solid, and calcining the dry solid at a sufficiently high temperature to form crystalline copper aluminum borate.

4,913,887
PRODUCTION OF BORON NITRIDE
Tadao Sato, and Toshihiko Ishii, both of Ibaraki, Japan, assignors to National Institute for Researches in Inorganic Materials, Ibaraki, Japan
Continuation of Ser. No. 440,998, Nov. 12, 1982, abandoned. This application Aug. 22, 1984, Ser. No. 642,717
Claims priority, application Japan, Apr. 15, 1982, 57-63067
Int. Cl.[4] C01B 21/06
U.S. Cl. 423—290 4 Claims



1. A process for producing amorphous boron nitride, substantially free from hexagonal system boron nitride and oxygen, which comprises heating a mixture consisting of a borohydride of an alkali metal and ammonium chloride at a temperature within a range of from 800° to 1100° C. in a non-oxidizing atmosphere.

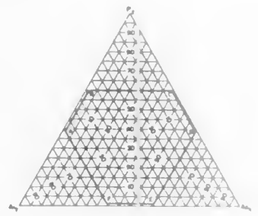
4,913,888
ARSENIC-ALUMINUM-PHOSPHORUS-OXIDE MOLECULAR SIEVE COMPOSITIONS
Edith M. Flanigen, White Plains; Brent M. T. Lok, New City; Robert L. Patton, Katonah, and Stephen T. Wilson, Shrub Oak, all of N.Y., assignors to UOP, Des Plaines, Ill.
Continuation-in-part of Ser. No. 600,166, Apr. 13, 1984, abandoned. This application Feb. 19, 1986, Ser. No. 830,889
The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.
Int. Cl.[4] C01B 25/36
U.S. Cl. 423—306 13 Claims

1. Crystalline molecular sieves having three-dimensional microporous framework structures of AsO_2, AlO_2 and PO_2 tetrahedral units having an empirical chemical composition on an anhydrous basis expressed by the formula:

$$mR : (As_xAl_yP_z)O_2$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "m" represents the molar amount of "R" present per mole of $(As_xAl_yP_z)O_2$ and

has a value of from zero to about 0.3; and "x", "y" and "z" represent the mole fractions of arsenic, aluminum and phosphorus, respectively, present as tetrahedral oxides, said mole fractions being such that they are within the hexagonal compo-



sitional area defined by points A, B, C, D, E and F of FIG. 1, said crystalline molecular sieves having a characteristic X-ray powder diffraction pattern which contains at least the d-spacings set forth in one of the following Tables J, K, O, Q, R, S. and V:

TABLE J*

	(AsAPO-33)	
2θ	d(Å)	Relative Intensity
9.25–9.55	9.56–9.26	w–m
12.5–12.9	7.08–6.86	vs
16.9–17.3	5.25–5.13	w–m
20.45–20.9	4.34–4.25	w–m
23.85–24.25	3.73–3.67	w–m
26.05–26.35	3.42–3.38	w–m
27.3–27.6	3.27–3.23	vs

*as-synthesized form

TABLE K*

	(AsAPO-33)	
2θ	d(Å)	Relative Intensity
13.15–13.4	6.73–6.61	vs
18.05–18.35	4.91–4.83	m
18.4–18.6	4.82–4.77	m
26.55–26.7	3.36–3.34	m
32.0–32.1	2.80–2.79	m

*calcined form

TABLE O

	(AsAPO-37)	
2θ	d(Å)	Relative Intensity
6.1–6.3	14.49–14.03	vs
15.5–15.7	5.72–5.64	w–m
18.5–18.8	4.80–4.72	w–m
23.5–23.7	3.79–3.75	w–m
26.9–27.1	3.31–3.29	w–m

TABLE Q

	(AsAPO-40)	
2θ	d(Å)	Relative Intensity
7.6–7.7	11.79–11.48	vw–m
8.0–8.1	11.05–10.94	s–vs
12.4–12.5	7.14–7.08	w–vs
13.6–13.8	6.51–6.42	m–s
14.0–14.1	6.33–6.28	w–m
27.8–28.0	3.209–3.187	w–m

TABLE R

	(AsAPO-41)	
2θ	d(Å)	Relative Intensity
13.6–13.8	6.51–6.42	w–m
20.5–20.6	4.33–4.31	w–m
21.1–21.3	4.21–4.17	vs
22.1–22.3	4.02–3.99	m–s
22.8–23.0	3.90–3.86	m
23.1–23.4	3.82–3.80	w–m
25.5–25.9	3.493–3.440	w–m

TABLE S

	(AsAPO-42)	
2θ	d(Å)	Relative Intensity
7.15–7.4	12.36–11.95	m–vs
12.5–12.7	7.08–6.97	m–s
21.75–21.9	4.09–4.06	m–s
24.1–24.25	3.69–3.67	vs
27.25–27.4	3.273–3.255	s
30.05–30.25	2.974–2.955	m–s

TABLE U

	(AsAPO-46)	
2θ	d(Å)	Relative Intensity
7.2–8.1	12.3–10.9	vs
21.2–21.8	4.19–4.08	w–m
22.5–23.0	3.95–3.87	vw–m
26.6–27.2	3.351–3.278	vw–w
28.5–29.0	3.132–3.079	vw–w

4,913,889
HIGH STRENGTH HIGH MODULUS CARBON FIBERS
Yasuyuki Takai; Minoru Takabatake; Hideyuki Nakajima; Katsumi Takano, all of Hasaki, and Masami Watanabe, Sagisawa, all of Japan, assignors to Kashima Oil Company, Tokyo, Japan
Continuation-in-part of Ser. No. 774,790, Sep. 11, 1985, abandoned, which is a continuation-in-part of Ser. No. 562,132, Dec. 16, 1983, and Ser. No. 738,315, May 28, 1985, abandoned, which is a continuation-in-part of Ser. No. 681,334, Dec. 13, 1984, abandoned, which is a continuation-in-part of Ser. No. 638,085, Aug. 6, 1984, abandoned. This application Nov. 12, 1987, Ser. No. 119,602
Claims priority, application Japan, Mar. 9, 1983, 58-37310; Nov. 10, 1983, 58-209856; Sep. 5, 1984, 59-184491
Int. Cl.[4] D01F 9/12
U.S. Cl. 423—447.1 7 Claims

1 High strength, high modulus carbon fibers derived from mesophase pitch consisting essentially of a plurality of sheets consisting essentially of long arrangements of planes of hexagonal carbon networks, said sheets being highly oriented in the direction of the fiber axis, and having, in cross-sections, a wrinkled layer structure with a radius of curvature in the range of 15–200 Å, said sheets being characterized in that the (10) band is present in the electron ray and x-ray diffraction patterns, but is not resolved into separate (100) and (101) lines

even after being heated and carbonized at a temperature up to 3000° C., having an inter-layer spacing d_{002} greater than 3.38 Å, and electric resistance greater than 250×10^{-6} ohm-cm at room temperature, and a magnetic resistivity which is always negative when measured between 4.2° K. and 300° K. in a magnetic field between 0 KG and 8 KG.

4,913,890

PREPARATION OF ACICULAR α-FE_2O_3

Volker Arndt, Bobenheim-Roxheim; Helmut Aaweter, Limburgerhof; Rainer Feser, Gruenstadt, and Ekkehard Schwab, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 24, 1989, Ser. No. 315,849

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1988, 3807042

Int. Cl.[4] C01G *49/06*

U.S. Cl. 423—633 4 Claims

1. In an improved process for the preparation of finely divided, dendrite-free and pore-free tin-containing α-Fe_2O_3 by precipitating iron(III) hydroxide from an aqueous solution of iron(III) salt in the presence of tin ions at a pH of from 6.0 to 8.0 by adding an alkali metal hydroxide to an aqueous iron(III) salt solution containing from 10^{-3} to 4×10^{-2} mole of tin salt per mole of iron(III) salt at a temperature of from 30° to 70° C. and heating the aqueous suspension of iron(III) hydroxide at a temperature of from 80° to 250° C. at a pH of from 8.5 to 12.0 after the addition of at least one compound capable of forming complexes with iron(III) ions, the improvement which comprises: heating the precipitated iron(III) hydroxide in the form of the resulting unfiltered aqueous suspension containing less than 0.6 mole of iron(III) hydroxide per liter.

4,913,891

POSITRON EMITTER LABELED ENZYME INHIBITORS

Joanna S. Fowler, Bellport; Robert R. MacGregor, Sag Harbor; Alfred P. Wolf, Setauket, all of N.Y., and Bengt Langstrom, Upsala, Sweden, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 853,119, Apr. 17, 1986, abandoned. This application May 22, 1987, Ser. No. 52,921

Int. Cl.[4] A61K *49/02, 31/135;* **C07C** *93/06, 87/28*

U.S. Cl. 424—11 8 Claims

1. A method of selective irreversible binding and mapping of functional monoamine oxidase activity in vivo in different body tissues and organs using positron emission tomography which comprises administering an effective amount of the radiotracers [^{11}C]clorgyline of the formula N-[3-(2,4-dichlorophenoxyl)propyl]-N—$^{11}CH_3$-2-propynylamine which binds irreversibly to monoamine oxidase-A, and [^{11}C]-L-deprenyl of the formula N,α-CH_3—N- CH_3—N-2-propynylphenethylamine, which binds irreversibly to monoamine oxidase-B, prior to performing the positron emission tomography.

4,913,892

PREPARATION AND USE OF NEW SOLVATES OF BECLOMETHASONE 17,21-DIPROPIONATE

Philip R. Page, Parede, and William Heggie, Barreiro, both of Portugal, assignors to Hoviione Inter Ltd., Switzerland

Filed Jul. 24, 1985, Ser. No. 758,287

Claims priority, application Portugal, Jul. 25, 1984, 78972; Jul. 11, 1985, 80796

Int. Cl.[4] A61K *31/56;* **C07J** *1/00;* **A61L** *9/04*

U.S. Cl. 424—45 11 Claims

1. Process for the preparation of di-isopropyl ether solvates of beclomethasone 17,21-dipropionate, characterised by the act that beclomethasone 17,21-dipropionate is dissolved in an organic solvent and is precipitated by addition of di-isopropyl ether.

4,913,893

AEROSOL HAIR SETTING COMPOSITION CONTAINING AN ALGINATE

Joseph J. Varco, Fairfield; Gabriela M. Wis-Surel, Milford, and Janusz Jachowicz, Bethel, all of Conn., assignors to Clairol Incorporated, Stamford, Conn.

Filed Aug. 28, 1987, Ser. No. 90,642

Int. Cl.[4] A61K *7/11*

U.S. Cl. 424—47 9 Claims

1. An aerosol composition contained in an aerosol can and useful for conditioning and/or setting hair comprising by weight of the aerosol composition:

(a) from about 0.1% to about 9% of an alginate selected from the group consisting of ammonium alginate, ethylene glycol alginate and propyleneglycol alginate,

(b) from about 64.2% to about 96.8% of an aqueous carrier,

(c) from about 0.1% to about 1.8% of a foaming aid component, and

(d) from about 3% to about 25% of a propellent system,

said composition producing a mousse when dispensed from the aerosol can.

4,913,894

APPETITE SUPPRESSANT DENTIFRICE

John P. Curtis, Piscataway; Susan E. Wieckowski, Iselin, and Karen J. De Pierro, Piscataway, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 96,184, Sep. 11, 1987, abandoned. This application May 1, 1989, Ser. No. 346,423

Int. Cl.[4] A61K *7/16, 7/26*

U.S. Cl. 424—49 4 Claims

1. In the art of providing temporary topical anesthetic action on nerve endings in the oral mucosa and tongue to decrease one's ability to detect degrees of sweetness and reduce the craving for food and beverages with effective appetite suppressant amounts of benzocaine, the improvement which consists essentially of brushing the teeth before meals, on a regular basis, with an appetite suppressant toothpaste or dental cream essentially containing (A) 0.075–1.5% by weight benzocaine, and (B) about 0.5–1.5% by weight of an intense high impact synthetic or artificial chocolate chip mint or chocolate, artificial cherry, artificial cheesecake and artificial devils food cake flavor, each having an intense immediate initial impact and at least about a 45 to 60 seconds lasting pleasant after-taste effective to satisfy the cravings for sweets without adding weight, and (C) about 0.2 to 0.6% by weight of a sweetening agent effective to coact with said flavoring agent to produce a sweet intense pleasant taste.

4,913,895

ORAL COMPOSITION

Mikio Miyake, and Akinori Takahashi, both of Kanagawa, Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jul. 22, 1987, Ser. No. 76,211

Claims priority, application Japan, Jul. 24, 1986, 61-174026

Int. Cl.[4] A61K *7/16, 7/26*

U.S. Cl. 424—57 19 Claims

1. In the art of inhibiting *Actinomyces viscosus* and the formation of hard deposits of calculus on the surfaces of teeth, and to thereby prevent the development of gingivitis and periodontal disease, by contacting the teeth and *Actinomyces viscosus* with oral hygiene toothpaste or mouthwash compositions formulated to contain 0.1 to 10% by weight, based on the total amount of the oral hygiene composition, of component (i) which is a polyphosphate selected from the group consisting of sodium pyrophosphate, potassium pyrophosphate, sodium tripolyphosphate, potassium tripolyphosphate, sodium tetrapolyphosphate, potassium tetrapolyphosphate, sodium metaphosphate, potassium metaphosphate, sodium trimetaphosphate, potassium trimetaphosphate, sodium tetrametaphosphate, potassium tetrametaphosphate, sodium hexametaphosphate, and mixtures potassium hexametaphosphate, the synergistically effective improvement consisting of the step of including with said anti-calculus polyphosphate 0.01% to 2% by weight, based on the total amount of the oral hygiene composition, of component (ii) which is a member selected from the group consisting of (a) l-menthol, (b) anethol and (c) mixtures of (a) and (b), in order to exert a synergistic antibacterial effect against *Actinomyces viscosus*, a plaque-forming bacteria causing the formation of calculus and periodental disease.

4,913,896

MULTI-PURPOSE BODY POWDER COMPOSITION

Norman A. Harvey, 19 Broad Acres Rd., Glens Falls, N.Y. 12801

Continuation-in-part of Ser. No. 837,650, Mar. 5, 1986, abandoned, which is a continuation of Ser. No. 696,260, Jan. 30, 1985, abandoned. This application Feb. 22, 1988, Ser. No. 158,917

Int. Cl.[4] A61K *7/035*

U.S. Cl. 424—69 5 Claims

1. A multi-purpose body powder composition having moisture absorbency at least 20 times greater than that of talc consisting essentially of about 65% to 80% of the total composition of talc, about 15% to 30% of the total composition of starch, about 2% to 10% of the total composition of calcium undecylenate, about 0.25% to 2% of the total composition of citric acid or ascorbic acid, and optionally, about 0.20% to 0.25% fragrance, said starch being of pure cosmetic grade unmodified granular starch selected from the group consisting of cornstarch of average particle size about 15 microns and rice starch of average particle size of 3 to 8 microns, and said powder composition having pH of 4.5 to 5.5.

4,913,897

USE OF HYDROGEL SOLUTIONS TO FORM A HYDROPHILIC PROTECTIVE FILM ON THE SKIN AGAINST TOXIC SUBSTANCES, POLLUTANTS, INFECTIONS AND SKIN SECRETIONS

Milos Chvapil, and Stuart A. Hoenig, both of Tucson, Ariz., assignors to Bio-Products, Inc., Tucson, Ariz.

Filed Dec. 28, 1987, Ser. No. 139,300

Int. Cl.[4] A61K *7/42*

U.S. Cl. 424—59 10 Claims

1. A method of forming a protecting film on a person's skin, the method comprising the steps of:

(a) dissolving a hydrophilic hydrogel polymer from the group consisting of hydrophilic polyurethane, polymers and copolymers of acrylonitrile, and polyvinyl acetate with a solvent from the group consisting of ethanol/water, ethyl alcohol, isopropyl alcohol, dimethylsulfoxide, and glycerol to form a polymeric solution;

(b) uniformly spreading a thin layer of the polymeric solution onto substantially all of a portion of the person's skin;

(c) drying the layer to form a pliable, tough, hydrogel film which is adhesive to the person's skin;

(d) absorbing water from perspiration by the person's skin under the layer through an inner surface of the film into the film while blocking passage of greasy seabum from the person's skin;

(e) passing the absorbed water through the film from the inner surface of the film to an outer surface of the film; and

(f) evaporating the water from the outer surface of the film.

4,913,898

HAIR TREATMENT COMPOSITION AND METHOD

Rocco F. Altobelli, Eagan; Wallace R. Hlavac, and Richard J. Hudavout, both of Minneapolis, all of Minn., assignors to Altobella Hair Products Inc., St. Paul and Tiro Industries, Inc., Minneapolis, both of, Minn.

Filed Apr. 6, 1988, Ser. No. 178,320

Int. Cl.[4] A61K *7/075*

U.S. Cl. 424—70 16 Claims

1. A hair treatment composition comprising:

water;

an amount of clay sufficient to produce a paste;

an amount of a moisturizer component effective to provide body without adding a weighty oil coat;

an amount of a reconstruction component effective to return elasticity to the hair; and

an effective amount of an oil phase, said oil phase serving as a lubricating vehicle to enhance application of said composition.

4,913,899

APPARATUS FOR COOLING STRANDS OF SYNTHETIC MATERIAL

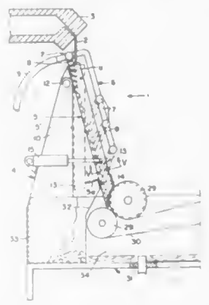
Günter Hartig, Lerchenweg 1, 6458 Bodenbach 2, Fed. Rep. of Germany

Filed Aug. 9, 1988, Ser. No. 230,619

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1987, 3726606

Int. Cl.[4] B29C *47/88*

U.S. Cl. 425—71 5 Claims



1. An apparatus for cooling strands of synthetic material exiting from an extruder nozzle, especially for the production of synthetic material granules, comprising a lower strand guide and upper strand guide chute (5) having an upper guide inlet end near said extruder nozzle and an outlet end leading into said lower strand guide for normally guiding said synthetic material strands from said extruder nozzle into said lower strand guide, cooling means (7, 8) arranged for cooling strands travelling on said upper strand guide chute (5) so that usable and unusable strand material is cooled, strand cutting means (19, 19'; 21, 21') arranged directly downstream of said cooling means directly between said outlet end of said upper strand guide chute (5) and an inlet of said lower strand guide for cutting cooled strands, said upper strand guide chute (5) having a sufficient longitudinal extent such that said strands are sufficiently cooled while on said upper strand guide chute (5) so as to prevent clumping or sticking of the material at said strand cutting means, container means for receiving cooled cut

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scrap material arranged near said outlet end of said upper strand guide chute (5), said lower strand guide being arranged for normally receiving cooled strands from said outlet end, and horizontal axis means arranged at said upper inlet end near said extruder nozzle for journalling said upper strand guide chute (5) at said upper guide inlet end, whereby said upper guide inlet end of said upper strand guide chute is so positioned that it always receives said strands of synthetic material exiting from said extruder nozzle, said upper strand guide chute (5) being tiltable about said axis means into a first position in which said outlet end guides cooled waste strands into said container means, said upper strand guide chute (5) being also tiltable into a second position in which said outlet end guides cooled strands onto said lower strand guide.

4,913,900

CONDITIONING PERMANENT WAVE COMPOSITION AND METHOD

Stanley J. Kolc, Chicago, and Gerald P. Newell, Hanover Park, both of Ill., assignors to Helene Curtis, Inc., Chicago, Ill.

Filed May 31, 1988, Ser. No. 200,614
Int. Cl.[4] A61K *7/09*; A45D *7/04*
U.S. Cl. 424—72 22 Claims

1. A composition capable of breaking sulfur to sulfur bonds in human hair for permanently waving both damaged and undamaged hair in a single formulation and in a single processing time when in contact with said human air so that said hair can be reconfigured in a predetermined configuration, comprising an aqueous solution of an alkaline salt of thioglycolic acid in an amount of about 2% to about 22% by weight; an alkaline dithiodiglycolate in an amount of about 0.1% to about 18% by weight; a polyhydric moisturizing compound in an amount of about 0.1% to about 20% by weight, and sufficient alkali such that the composition has a pH of about 7.5 to 8.7.

4,913,901

PHARMACEUTICAL COMPOSITION FOR ORAL ADMINISTRATION AND PROCESS FOR THE USE THEREOF

Ludwig H. Schlager, Nottebohmstrasse 12, 1190 Vienna, Austria

Continuation of Ser. No. 162,997, Jun. 25, 1980, abandoned. This application Mar. 28, 1984, Ser. No. 594,060
Claims priority, application Austria, Jun. 25, 1979, 4459/79; Apr. 24, 1980, 2210/80
Int. Cl.[4] A61K *31/35, 31/74*
U.S. Cl. 424—78 25 Claims

1. An orally administrable pharmaceutical preparation for treatment of psoriasis comprising a stable solution of (a) at least 1.0% by weight of 8-methoxy-furo [3',2':6,7]-coumarin as an active ingredient; (b) a polyethylene glycol or an ether or ester thereof; and optionally (c) a solvent selected from the group consisting of (1) a derivative of 1,3-dioxolane; (2) an alkylene glycol; (3) a pharmaceutically acceptable ethereal oil; (4) an ester or partial ester of a C_2 to C_{30}-fatty acid with a 2- to 8-valent alcohol or with a polyglycerol; (5) a dialkylamide having 3 to 6 carbon atoms; (6) dimethyl sulfoxide and (7) a mixture thereof.

4,913,902

PURIFICATION BY AFFINITY BINDING TO LIPOSOMES

Peter K. Kilpatrick; Ruben G. Carbonell, and Johnny D. Powers, all of Raleigh, N.C., assignors to North Carolina State University, Raleigh, N.C.

Filed Nov. 10, 1987, Ser. No. 119,351
Int. Cl.[4] A61K *39/00*
U.S. Cl. 424—85.8 20 Claims

1. A method of purifying a compound specifically bound by a ligand from a crude solution containing that compound and other compounds, the method comprising:

(a) providing a multiplicity of liposomes, the liposomes having said ligand bound to the surface thereof;

(b) mixing the liposomes having said ligand bound to the surface thereof with the crude solution so that the ligand binds to the compound to be extracted;

(c) separating the liposomes from the crude solution by passing the crude solution including said other compounds through a filter, said filter having pores smaller in size than the diameter of said liposomes to restrain said liposomes from passing therethrough; and

(d) separating and recovering the compound to be extracted from the liposomes which have been restrained from passing through the filter.

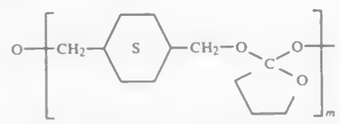
4,913,903

POST-SURGICAL APPLICATIONS FOR BIOERODIBLE POLYMERS

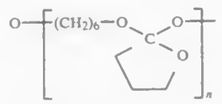
Einar Sudmann, Os, Norway; Pieter Bonsen, Los Altos, and Eun S. Lee, Redwood City, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 10,881, Feb. 4, 1987, abandoned. This application Apr. 10, 1989, Ser. No. 336,555
Int. Cl.[4] A61M *7/00*
U.S. Cl. 424—426 9 Claims

1. A method of providing hemostasis at the site of a surgical procedure comprising placing a bioerodible material in hemostatic relationship to a bleeding body substrate, maintaining said hemostatic relationship up to and after the completion of said surgical procedure, said bioerodible material being free of any chemotherapeutic agent and being selected from the group consisting of polymer (A), polymer (B), physical mixtures of polymers (A) and (B), block copolymers of (A) and (B) and random copolymers of (A) and (B), wherein said polymer (A) has the following structure:



where m equals a number such that the molecular weight of polymer (A) is within the range of 10,000 to 60,000; and wherein said polymer (B) has the following structure:



where n equals a number such that the molecular weight of polymer (B) is within the range of 10,000 to 60,000.

4,913,904

OPHTHALMOLOGICAL COLLAGEN COVERINGS

Svyatoslav N. Fyodorov; Sergey N. Bagrov; Tatyana S. Amstislavskaya; Irina A. Maklakova, and Sergey V. Maslenkov, all of 59 A Beskudnikovsky Boulevard, Moscow 127486, U.S.S.R.

Continuation-in-part of Ser. No. 908,349, Sep. 17, 1986, abandoned. This application Dec. 11, 1987, Ser. No. 131,958
Int. Cl.[4] B32B *5/26*; A61L *15/04*; C08L *89/06*
U.S. Cl. 424—427 9 Claims

1. In the method of treatment of all kinds of ophthalmological conditions with a collagen substance, the improvement comprising using a collagen preparation isolated from animal eyes.

4,913,905

TRANSDERMAL THERAPEUTIC SYSTEMS FOR ACTIVE INGREDIENT COMBINATIONS

Peter Fankhauser, Ettingen, and Lotte Schenkel, Basle, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 25, 1988, Ser. No. 172,883
Claims priority, application Switzerland, Apr. 2, 1987, 1259/87
Int. Cl.[4] A61L *15/03*
U.S. Cl. 424—449 3 Claims

1. A therapeutic system for the transdermal combined administration of oestrogens and gestagens, consisting of:

(1) a closed outer layer which is impermeable to the constituents of the active ingredient formulation,

(2) a reservoir containing essential constituents of the active ingredient formulation and a control membrane,

(3) an adhesive layer and

(4) a peel-off protective layer on the adhesive layer, characterised in that the therapeutic system contains oestrogen derivative in combination with a synthetic gestagen derivative, and a C_2–C_4 alkanol as the agent that enhances percutaneous absorption.

4,913,906

NOVEL CONTROLLED RELEASE DOSAGE FORM OF VALPROIC ACID

Michael Friedman, 11 Ejn Gedi Street; Meir Bialer, 36 Hachalutz Street; Avraham Rubinstein, 24 Nahage Hapredot St., all of Jerusalem, and Upd Dufrovsky, 24 Yehuda Hanassi Street, Tel-Aviv, all of Israel

Filed Feb. 24, 1986, Ser. No. 832,244
Claims priority, application Israel, Feb. 28, 1985, 74468
Int. Cl.[4] A61K *9/50*
U.S. Cl. 424—499 12 Claims

1. A controlled release oral dosage form comprising an essentially homogenous admixture of an active ingredient selected from the group consisting of, pharmaceutically acceptable salts and esters of valproic acid, valpromide (VPD), and other VPA derivatives which biotransform to provide VPA in human serum, and a physiologically acceptable polymer said active ingredient comprising from about 10 to about 80 weight percent of said dosage form in an amount effective to provide a prolonged serum level of VPA.

4,913,907

PORPHYCENE ANTI-CANCER AGENTS AND TREATMENT METHODS

Giulio Jori, Padova, Italy; Matthias Köcher, Overath; Emanuel Vogel, Cologne, both of Fed. Rep. of Germany, and Alexander D. Cross, Atherton, Calif., assignors to Cytopharm, Inc., Menlo Park, Calif.

Filed Aug. 15, 1988, Ser. No. 232,411
Int. Cl.[4] A61K *37/22*
U.S. Cl. 424—450 8 Claims

1. A liposome including at least one porphycene of Formula I or Formula II:

(I)

wherein R_1, R_2, R_3, and R_4 are hydrogen or a lower alkyl having from 1 to 6 carbons;

(II)

wherein R_5, R_6, R_7, and R_8 are hydrogen or a lower alkyl having from 1 to 6 carbons.

4,913,908

PREPARATION OF SUBMICROSCOPIC PARTICLES, PARTICLES THUS OBTAINED AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Patrick Couvreur, Wavre; Michel Roland, Brussels, both of Belgium, and Peter Speiser, Forch, Switzerland, assignors to N. V. Sopar S.A., Sart-Dames-Avelines, Belgium

Continuation of Ser. No. 370,892, Apr. 22, 1982, abandoned. This application May 6, 1988, Ser. No. 193,139
Claims priority, application France, Apr. 24, 1981, 81 08172
Int. Cl.[4] A61K *9/50, 9/18, 9/52*
U.S. Cl. 424—501 29 Claims

1. A process for the preparation of an aqueous suspension of submicroscopic particles having a diameter of less than 600 nanometers, formed of a biodegradable synthetic polymer and containing at least one biologically active substance adsorbed into and/or attached to the polymer carrier particles, which comprises:

preparing an aqueous solution or aqueous colloidal solution of at least one biologically active substance, this aqueous solution or aqueous colloidal solution being free of surface-active agent,

adding a polymer forming composition consisting of at least one alkyl cyanoacrylate, in which the term "alkyl" denotes a linear or branched alkyl radical having 1 12 carbon atoms, to this aqueous solution or aqueous colloidal solution, with stirring, and

continuing the stirring until substantially all the alkyl cyanoacrylate introduced into the aqueous reaction medium has been converted to submicroscopic particles formed of polyalkyl cyanoacrylate, the entire process being carried out without a surfactant.

26. Submicroscopic particles having a diameter of less than 400 nanometers, formed by the polymerization of an alkyl cyanoacrylate in aqueous medium in the absence of surface-active agent, in which the term "alkyl" denotes a linear or branched radical having 6 to 12 carbon atoms, the polymer formed being biodegradable and containing at least one biologically active substance adsorbed into and/or attached to the polymer carrier particles in the aqueous medium, the entire process being carried out without a surfactant.

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4,913,909

COMPLEX OF TEA-LEAF EXTRACT AND ACTIVE ALUMINUM HYDROXIDE

Yukihiko Hara, Shizuoka; Hajime Asai, Nagoya; Tadashi Kitamikado, Inuyama; Hajime Yamamoto, Nagoya; Kazuo Okushio, Shizuoka, and Kozo Nakamura, Tokyo, all of Japan, assignors to Mitsui Norin Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1986, Ser. No. 914,716
Int. Cl.[4] A61K *31/35, 33/08*
U.S. Cl. 424—688 3 Claims

1. A complex of a tea-leaf extract containing (−)-epigallcatechin gallate as the principal ingredient and active aluminum hydroxide.

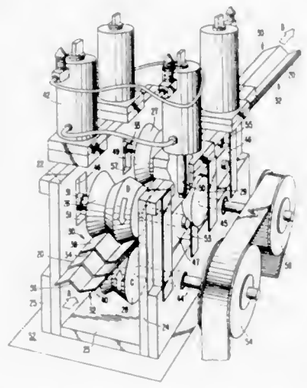
3. A method for suppressing gastic ulcers in mammals comprising orally administering to the mammal in need of such treatment an effective amount of the complex of claim 1.

4,913,910

APPARATUS FOR FORMING LAMINATE INTO A PREDETERMINED CONFIGURATION

Douglas A. McCarville, Wichita, Kans., and Dennis C. Rocheleau, Euless, Tex., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 22, 1988, Ser. No. 209,986
Int. Cl.[4] B29C *53/28*
U.S. Cl. 425—336 23 Claims



1. A device for forming elongate laminate into a predetermined configuration having a substantially uniform cross-sectional shape in the axial direction, comprising:

first and second roller means rotatably mounted in peripheral tangential relation for defining a forming path therebetween, each said roller means having a transverse peripheral profile corresponding to the predetermined configuration of the formed laminate and being complementary to the other said roller means;

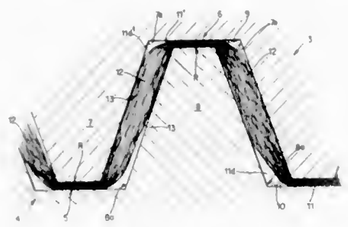
a pair of elongated plate means adapted to be positioned between the laminate and said first and second roller means for maintaining a predetermined pressure on the laminate along the forming path, each said plate means having a side for engaging the laminate and a side for engaging the periphery of a corresponding one of said first and second roller means and each having a transverse configuration corresponding to the transverse peripheral profile of the corresponding one of the first and second roller means.

4,913,911

EMBOSSING MACHINE FOR TEXTILE MATERIALS

Eberhard Wildt, Grenzach-Wyhlen, Fed. Rep. of Germany, assignor to Robert Casaretto Walzengravieranstalt und Walzenfabrik GmbH & Co. KG, Grenzach-Wyhlen, Fed. Rep. of Germany

Filed Feb. 10, 1989, Ser. No. 309,381
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1988, 3804611
Int. Cl.[4] B29C *53/26*
U.S. Cl. 425—385 20 Claims



1. A machine for embossing a fleece of fibrous material, comprising first and second rotary embossing rolls defining a nip for the fibrous material and having peripheral surfaces provided with spaced apart knobs forming depressions, the knobs of said first roll extending with clearance into the depressions of said second roll and the knobs of said second roll extending with clearance into the depressions of said first roll during travel of said knobs and said depressions through the nip, said knobs having top lands and flanks and said rolls having internal surfaces bounding said depressions, clearances between respective flanks of the knobs of said first and second rolls being greater than clearances between said top lands and the internal surfaces bounding the respective depressions during travel of said knobs and said depressions through said nip; and means for rotating said rolls so that the rolls rotate in opposite directions said rotating means including means for positively driving at least one of said rolls.

4,913,912

PLASTIC INJECTION MOLD APPARATUS WITH MULTIPLE TIP TORPEDO HEATER

David Leverenz, Elk Grove Village, Ill., assignor to Fast Heat Element Manufacturing Co., Inc., Elmhurst, Ill.

Continuation-in-part of Ser. No. 913,020, Sep. 29, 1986, Pat. No. 4,755,126, which is a continuation-in-part of Ser. No. 817,008, Jan. 8, 1986, abandoned. This application Apr. 8, 1988, Ser. No. 179,531
The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.
Int. Cl.[4] B29C *45/22*
U.S. Cl. 425—549 34 Claims

1. A plastic injection molding system comprising

means defining a generally cylindrical bore with tapered opposite ends communicating with respective small diameter gates through which fluid plastic material is directed,

means defining a mold cavity in communication with at least one of said gates,

a composite torpedo heater comprising a pair of tip members and a mounting collar interposed between said tip members, said tip members each having a tapered, pointed tip at one end thereof, said tip members and mounting collar exposed outer cylindrical surface with said tips at opposite ends thereof,

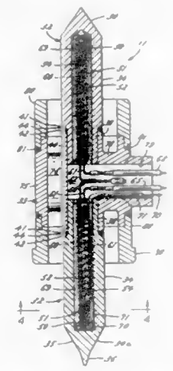
means supporting said torpedo heater concentrically in said bore with said tips each in closely adjacent relation to one of said gates and with said exposed outer surface and said bore defining an unobstructed annular fluid plastic flow passageway about each said tip and a portion of said outer cylindrical surface adjacent said tip and substantially along the entire length of said outer cylindrical surface through which fluid plastic material is directed at an elevated temperature, said annular flow passageway having a radial width defined by the distance between said outer cylindrical surface and the inner perimeter of said cylindrical bore that is less than the diameter of said outer cylindrical surface,

said tip members being formed with an internal bore at the location of each said tip, said outer cylindrical surface defined by said tip members and collar having a diameter of about twice the diameter of said tip member bores so as to define a thick wall about the respective tip member bore,

electrical heating means disposed in the bore of each tip, said electrical heating means comprising a core with a resistance wire disposed thereon and heat transmitting material surroundin, the resistance wire and core, said heat transmitting material being compacted about the resistance wire and core for filling all air voids therebetween and effecting efficient heat transfer;

means exiting said outer cylindrical surface intermediate the ends thereof for electrically coupling said heating means to a power source for enabling heating of said heating means and heat conduction outwardly through said tip member walls for heating fluid plastic material directed through said flow passageway and over said tips to a desired temperature independent of temperature conditions external to said torpedo heater, and

means for controlling the temperature of said heating means and thus the temperature of said tips and fluid plastic material directed through said passageway and over said tips.



4,913,913

METHOD OF PREPARATION OF BIFIDOBACTERIA-CONTAINING FERMENTED MILK

Toshiaki Takano, Kanagawa; Yoshio Saito, Tokyo, and Akira Futami, Kanagawa, all of Japan, assignors to The Calpis Food Industry Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1988, Ser. No. 163,478
Claims priority, application Japan, Feb. 25, 1987, 62-040098
Int. Cl.[4] A23C *9/127*
U.S. Cl. 126—43 12 Claims

1. A method of preparation of a bifidobacteria-containing fermented milk, which consists essentially of

inoculating into a milk medium

Lactobacillus casei C-2254 (FERM P-9109: BP-1723), and *Bifidobacterium longum*, and cultivating these bacteria under temperature and time conditions sufficient to bring about the resulting fermented milk having 5.2×10^8-1.2×10^9 cells/ml of the *L. casei* and 10^8-2.6×10^9 cells/ml of the *B. longum*.

4,913,914

METHOD OF CONTROLLING THE FERMENTATION OF MOROMI MASH

Hikotaka Hashimoto, and Kunio Kobayashi, both of Chiba, Japan, assignors to Kikkoman Corporation, Japan

Filed Mar. 25, 1988, Ser. No. 173,124
Claims priority, application Japan, Mar. 25, 1987, 62-68943
Int. Cl.[4] A23L *1/20, 1/00*; A01K *43/00*; G01N *33/02*
U.S. Cl. 426—46 5 Claims

1. A method of controlling the fermentation of moromi mash, comprising the steps of:

automatically sampling a portion of a prescribed amount of moromi mash;

automatically and simultaneously analyzing the concentrations of at least two ingredients of the sampled portion of the moromi mash with a near infrared automatic multiple analyzer;

calculating an amount to be added of at least one controlling element in order to adjust the concentrations of said at least two ingredients to target values according to analytic results;

adding the calculated amount of said at least one controlling element to said prescribed amount of moromi mash; and

periodically repeating said sampling, analyzing, calculating, and adding steps throughout a fermentation period of the moromi mash.

4,913,915

SOLID FOOD STUFF COMPOSITION CONTAINING DUNALIELLA ALGAE AND PROCESS FOR THE PRODUCTION THEREOF

Yoshio Tanaka, 22 Banchi, Yamaguchi-cho, Gifu-shi, Gifu-ken, Japan

Filed Jul. 28, 1988, Ser. No. 225,420
Claims priority, application Japan, Feb. 25, 1988, 63-40756
Int. Cl.[4] A23L *1/42*
U.S. Cl. 426—72 4 Claims

1. A solid food sugar-coated tablet comprising a composition of dried powder of Dunaliella algae, cyclodextrin, an antioxidant, a lubricant, a binder, said composition having a coating thereon, said coating comprising sugar and a coloring agent;

said lubricant and said binder being blended at a ratio of 0.10 to 0.25 parts by weight of antioxidant, 3.50 to 4.50 parts by weight of said lubricant, and 35.50 to 40.60 parts by weight of said binder per 100 parts by weight of a mixture of said dried powder and said cyclodextrin; the weight ratio of said dried powder to said composition being from 10 to 240:300.

4,913,916

BEVERAGE INFUSION DEVICE

Joseph Tanner, 117 Schenck Ave., Great Neck, N.Y. 11021

Division of Ser. No. 245,917, Sep. 16, 1988, Pat. No. 4,826,695, which is a continuation of Ser. No. 844,313, Mar. 26, 1986, abandoned. This application Feb. 10, 1989, Ser. No. 309,077
Int. Cl.[4] A23F *5/24*; B65B *29/02*
U.S. Cl. 426—80 4 Claims

1. A non-electric disposable beverage infusion device for brewing a hot beverage in a hot liquid contained in a receptacle, comprising a gas-liquid chamber comprising side walls, a top and a bottom and made of a flexible inert material having at least the bottom of said chamber permeable to air and water, an infusible, insoluble dry beverage substance containing soluble edible food solids contained in and partially filling said chamber, handle means to dunk said chamber in and out of said hot liquid, said substance resting on at least the bottom of said chamber, and means for introducing said hot liquid into the gas-liquid chamber at a point above said dry beverage sub-

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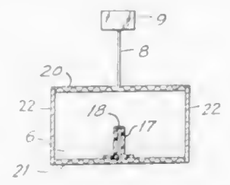
stance, said means comprising a hollow conduit contained within said chamber and having one end attached to the bottom of said gas-liquid chamber beneath the dry beverage substance, said one end communicating with the outside of the chamber, and said hollow conduit having a second end terminating inside the chamber at a point above the dry beverage substance, the water permeable portions of said chamber and said conduit being selected and arranged such that said hot liquid enters said chamber by passing through said first and



then said second end of said means for introducing said hot liquid and drains through the infusible, insoluble dry beverage substance and out of the gas-liquid chamber through said permeable portions when the beverage infusion device is repeatedly immersed in and removed from the hot liquid, and such that the hot liquid agitates the infusible, insoluble dry beverage substance and extracts the edible food solids from the dry beverage substance, thereby allowing the edible food solids to dissolve in the hot liquid to form a liquid beverage.

4,913,917
FORMED MEAT PRODUCT AND PROCESS OF PREPARING

James Polancic, 728 W. Lafayette St., Ottawa, Ill. 61350

Continuation-in-part of Ser. No. 271,631, Nov. 16, 1988, abandoned. This application Sep. 25, 1989, Ser. No. 411,680
Int. Cl.[4] A23L *1/314*; A23P *1/08*
U.S. Cl. 426—92 20 Claims

12. A process of manufacturing a meat product from a slice of meat comprising the steps of:

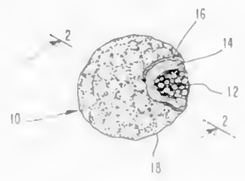
applying a first coating to said slice of meat, said coating comprising a wash including egg and milk protein and said coating further comprising a covering including wheat gluten; and

forming said product by overlapping selected edges of the coated slice of meat and pressing said edges with pressure sufficient to deform said meat, said pressure causing adhesion of said edges by action of the adhesion properties of said coating in response to said deforming pressure to produce a product of flattened shape and of substantially uniform thickness which presents the appearance of a single coated slice of meat wherein the transition between joined edges becomes substantially un-noticeable.

4,913,918
OIL-IMPREGNATED AND WATER-RETAINING COATED FOOD ARTICLES

Richard J. Stypula, Colts Neck, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Continuation of Ser. No. 93,352, Sep. 3, 1987, abandoned. This application Jan. 27, 1989, Ser. No. 302,273
Int. Cl.[4] A23L *1/317*
U.S. Cl. 426—92 8 Claims



1. A food article of manufacture having:

(1) a porous inner food structure comprising water and macerated beef or macerated chicken meat;

(2) a first outer surface contiguous with an integral part of said porous inner food structure; and

(3) fixedly coated on the entirety of said first outer surface a composition of matter consisting of:

(i) macerated beef or macerated chicken meat;

(ii) a fat and/or a polyolpolyester; and

(iii) a barrier composition consisting of, in intimate admixture, a starch, methyl cellulose and xanthan gum.

4,913,919
COATING COMPOSITION FOR COMESTIBLE PRODUCTS

Chris J. Cornwell, Coppell, Tex.; Amy L. Joseph, New Fairfield, Conn., and Stephen L. Rice, Lewisville, Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

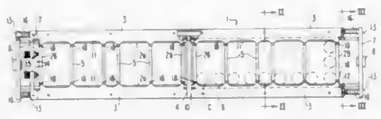
Continuation of Ser. No. 931,861, Nov. 18, 1986. This application Dec. 5, 1988, Ser. No. 279,724
Int. Cl.[4] H23P *1/08*
U.S. Cl. 426—94 30 Claims

1. A coating composition for modifying the texture of a comestible product comprising an aqueous suspension having a solids content of at least 40%, said suspension comprising from 10% to 40% by weight maltodextrin and from 10% to 40% by weight starch granules.

4,913,920
METHOD FOR THE MANUFACTURE OF CONFECTIONERY WAFER PRODUCTS

Pietro Ferrero, Bruxelles, Belgium, assignor to Ferrero S.p.A., Alba, Italy

Division of Ser. No. 109,151, Oct. 16, 1987, Pat. No. 4,854,228. This application Mar. 31, 1989, Ser. No. 331,186
Claims priority, application Italy, Oct. 29, 1986, 67814 A/86
Int. Cl.[4] A23G *3/20*
U.S. Cl. 426—283 8 Claims



1. A method for the manufacture of food products, comprising:

inserting a first wafer into a frame means for receiving and holding wafers, the first wafer comprising a perimeter portion bordering a core portion containing cells opening onto one face of the wafer and generally closed on another face of the wafer, and the frame means comprising frame members extending only along the perimeter of the wafer;

inserting a second wafer into the frame means in a mating position with respect to the first wafer; and

bonding together the first and second wafers to provide a unitary product.

4,913,921
FOOD PRODUCTS CONTAINING FISH OILS STABILIZED WITH FRUCTOSE

Lisa R. Schroeder, Brooklyn Park, and Dorothy J. Muffett, Bloomington, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Sep. 11, 1987, Ser. No. 95,181
Int. Cl.[4] A23D *5/00*
U.S. Cl. 426—321 31 Claims

30. A food product containing fish oil exhibiting enhanced stability and extended shelf life against fish oil flavor degradation without heat treatment consisting essentially of:

A. about 0.1% to 80% by weight of the food product comprising an oil component, of which all or a portion is a deodorized, nonhydrogenated fish oil containing:

(1) about 150 to 200 ppm of a fish oil stabilizing antioxidant and

(2) about 1500–2000 ppm tocopherol;

B. a sugar component, of which all or a portion is fructose such that about 0.5% to 30% by weight of such food product is fructose;

C. water;

D. a protein component; and

E. an emulsifier to maintain the food product in an emulsion.

4,913,922
METHOD FOR TREATMENT OF COOKING OIL

Ralph O. Hawkes, and Charles E. Silverblatt, both of Salt Lake City, Utah, assignors to Peregrine International Associates, Inc., Salt Lake City, Utah

Filed Sep. 1, 1988, Ser. No. 239,438
Int. Cl.[4] C11B *3/00*
U.S. Cl. 426—417 4 Claims

1. The continuous method for deep-oil cooking of food comprising the steps of establishing and maintaining a bath of cooking oil at a temperature in the range from 350° F. to 380° F., continuously submerging food in said bath for cooking while removing a quantity of cooked food therefrom, continuously removing from said bath a mixture of oil and particulates said particulates being derived from food materials and including particles larger than about 170 microns in diameter, subjecting said particulates to comminution to effect size reduction thereof to a degree whereat substantially all of said particulates are less than about 170 microns in diameter, separating said particulates from said mixture by filtration on a pressure differential precoat filter of the type employing as a filter media a bed of finely divided material to yield a cake of particulates and a filtrate of particulates-free oil, and maintaining said oil bath as a substantially constant volume but everchanging bath by establishing a predetermined volume for said bath then continuously supplying particulates-free oil thereto at a rate to maintain said predetermined volume at least some of said particulates-free oil supplied to said bath being filtrate derived from filtration of said mixture of oil and particulates.

4,913,923
PROCESS FOR IMPROVING OR MODIFYING THE TASTE AND AROMA OF CITRUS FRUIT COMPOSITIONS

Godefridus A. M. Van Den Ouweland, Plan-Les-Ouates, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Continuation of Ser. No. 649,572, Sep. 12, 1984, abandoned. This application Apr. 7, 1989, Ser. No. 336,634
Int. Cl.[4] A23L *1/235*
U.S. Cl. 426—533 8 Claims

1. A process to improve or modify the taste and aroma of citrus fruit flavor compositions of both natural and synthetic origin by conferring thereto a cooked gustative, fleshy, juicy and peely character, which process comprises adding to said flavor compositions the product obtained by reacting at a temperature of between about 50° and 120° C., at least one L-diastereomeric form amino acid selected from glycine, α-alanine, valine, serine, threonine, histidine, arginine, cysteine, methionine, proline and citrulline, with a mixture consisting of:

a. a carbohydrate selected from a pentose and a hexose,

b. ascorbic acid,

c. thiamine hydrochloride,

d. a concentrated citrus fruit juice, a citrus fruit oil, or a mixture of aldehydes derived from citrus fruits, and, optionally,

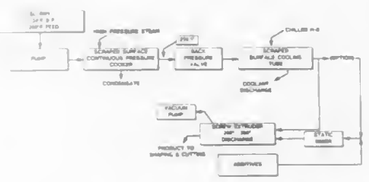
e. water;

during a time sufficient to develop a composition which, upon dilution in water, possesses the desired flavor note.

4,913,924
PROCESS FOR MANUFACTURING GEL PIECES

Carl O. Moore, Rochester, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Feb. 9, 1988, Ser. No. 154,155
Int. Cl.[4] A23G *3/00*
U.S. Cl. 426—578 8 Claims



1. A continuous process for producing a starch-based, formed gel composition comprising:

(a) first, preparing a flowable mixture comprised of a starch and water;

(b) deaerating said flowable mixture;

(c) hydrating substantially all of the starch of said flowable mixture;

(d) introducing said flowable mixture into a non-aerating extruder;

(e) cooling said flowable mixture to a formable viscosity in said extruder, and

(f) lastly, forming said mixture at a formable viscosity upon exit from said extruder.

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4,913,925

FOODSTUFF CONTAINING A HYPERGLYCEMIA CONTROLLING AGENT

Yasutake Hiji, c/o Tottori University School of Medicine, 86, Nishi-machi, Yonago-shi, Tottori-ken, Japan

Continuation of Ser. No. 860,395, May 7, 1986, abandoned, which is a division of Ser. No. 712,507, Mar. 22, 1985, Pat. No. 4,629,725, which is a continuation-in-part of Ser. No. 545,335, Oct. 25, 1985, abandoned. This application Jan. 19, 1988, Ser. No. 147,559

Claims priority, application Japan, Oct. 25, 1982, 57-187037

Int. Cl.[4] A23L *2/02*

U.S. Cl. 426—599 2 Claims

1. A foodstuff product consisting essentially of:

A. A member selected from the group consisting of sucrose, starch and mixtures thereof, and

B. pullulan as a hyperglycemia controlling agent for inhibiting the increase in blood sugar content which usually arises from the intake of component A,

wherein the weight ratio of component B to component A is from 1:400 to 1:20, and said foodstuff product is for oral ingestion.

4,913,926

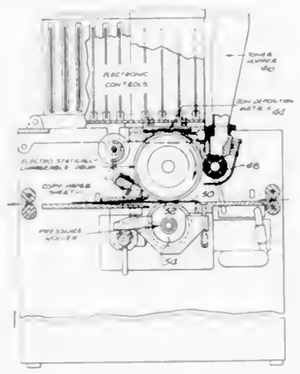
CURL FREE ION DEPOSITION LABEL PRINTING

Wayne L. Rutkawski, South Wales, N.Y., assignor to Avery International Corporation, Pasadena, Calif.

Filed Mar. 28, 1989, Ser. No. 329,803

Int. Cl.[4] B05D *5/10*

U.S. Cl. 427—14.1 14 Claims



1. A method for preparing curl-free printed sheets of labels adhered with pressure sensitive adhesive to backing sheets, comprising the steps of:

preparing a composite sheet including a backing sheet, and a sheet of labels having a discontinuous patterned layer of adhesive on the labels releasably adhering said label sheet to said backing sheet, with the patterned layer of adhesive being in the form of closely spaced geometric figures with a narrow adhesive-free band between the geometric figures of adhesive;

printing onto said composite sheets in an ion deposition type electrostatic printer; and

applying substantial pressure to said sheets in the course of said printing operation between an output pressure roller and an electrostatically chargeable drum employed in applying toner to said sheets.

4,913,927

LUBRICATED ALUMINUM WELD WIRE AND PROCESS FOR SPOOLING IT

Bruce E. Anderson, Traverse City, Mich., assignor to Alcotec Wire Co., Traverse City, Mich.

Continuation-in-part of Ser. No. 826,759, Feb. 6, 1986, abandoned. This application Jul. 20, 1988, Ser. No. 221,892

Int. Cl.[4] C05B *11/16;* B65B *33/00;* B23K *9/28, 35/34*

U.S. Cl. 427—37 28 Claims

1. An arbitrary length of predominantly aluminum lubricated weld wire useful for welding and metallizing, and having a nascent aluminum surface lubricated with a dual coating consisting of an essentially anhydrous lower alkanol and a solid lubricant, each concurrently present as first and second thin layers, respectively, the first layer consisting of a substantially monoparticulate layer of essentially oil-free colloidal graphite particles, optionally in combination with a minor amount by weight of a colloidal sulfide of molybdenum, the second thin layer consisting of an essentially anhydrous lower alkanol having from 2 to 4 carbon atoms present in an amount in the range from about 100 ppm to about 0.1% by weight of said lubricated weld wire, the solid lubricant being present on the nascent aluminum surface as randomly distributed particles forming a non-uniform monoparticulate layer wherein the particles are in spaced-apart relation.

26. A process for metallizing with a lubricated predominantly aluminum metallizing wire through a feed tube for said wire, through which tube said wire is urged without significant binding therewithin, said process comprising,

(a) feeding said wire which is selected from the group consisting of a wrought alloy of the 1000, 2000, 4000 and 5000 series, and a cast alloy of the 100, 200 and 300 series, having a nascent aluminum outer surface coated with a randomly spaced-apart particles forming a non-uniform monoparticulate layer of solid lubricant wetted with from about 100 ppm to about 0.1% by weight of an essentially anhydrous lower alkanol having a boiling point below 100° C. and a viscosity lower than about 5 cp at 15° C., said layer derived from a dispersion of a colloidal solid lubricant in the alkanol in which the solid lubricant is present in an amount in the range from about 1% to about 15% by weight, based on the weight of the dispersion,

(b) vaporizing said lubricated wire in vapor-depositing proximity with a deposit-receptive surface, and,

(c) depositing aluminum vapor essentially free of pores without occluding hydrogen.

4,913,928

MICROWAVE PLASMA CHEMICAL VAPOR DEPOSITION APPARATUS WITH MAGNET ON WAVEGUIDE

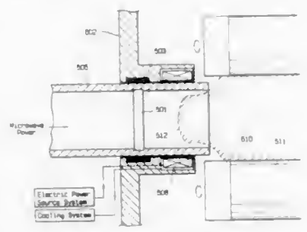
Satoshi Sugita, Yokohama, and Shotaro Okabe, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1988, Ser. No. 208,214

Claims priority, application Japan, Jun. 22, 1987, 62-153504

Int. Cl.[4] C23C *16/50*

U.S. Cl. 427—39 3 Claims



3. A process for forming a silicon and hydrogen-containing deposited amorphous film on a substrate in a vacuum chamber using a microwave plasma chemical vapor deposition comprising supplying a film-forming raw material gas including a silicon and hydrogen-containing raw material gas into said vacuum chamber at a desired flow rate, maintaining the inner pressure of said vacuum chamber at a value of from 8×10^{-4} to 1×10^{-3} Torr, maintaining said substrate at a temperature of from 50° to 350° C., and applying a microwave energy through a microwave introducing window into said vacuum chamber to effect formation of said film while actuating magnets positioned adjacent said microwave introducing window so as to form a magnetic field in the same direction as that of said microwave energy near the microwave introducing window, whereby said microwave energy is sufficiently stabilized to prevent a film from being deposited on said microwave introducing window.

4,913,929

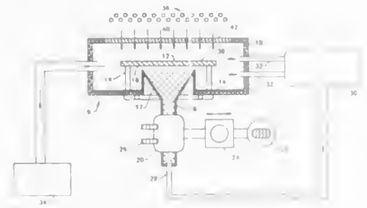
THERMAL/MICROWAVE REMOTE PLASMA MULTIPROCESSING REACTOR AND METHOD OF USE

Mehrdad M. Moslehi, Palo Alto, and Krishna C. Saraswat, Santa Clara County, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Apr. 21, 1987, Ser. No. 40,909

Int. Cl.[4] C23C *16/00*

U.S. Cl. 427—39 14 Claims



1. A rapid thermal plasma multiprocessing reactor for in-situ growth and deposition of layers on a wafer comprising

a vacuum chamber including top, bottom and side walls,

means for supporting said wafer with a top surface of said wafer to be processed facing the bottom of said chamber,

at least one quartz discharge tube mounted in said bottom of said reactor facing said wafer top surface for conveying plasma gas from a remote plasma generating chamber located outside of said vacuum chamber to said vacuum chamber,

heating means mounted facing said wafer mount for heating said back side of said wafer, and

at least one non-plasma injector port connected through a non-plasma manifold to a plurality of gas sources for selectively conveying gas to said chamber whereby a plurality of processes affecting said wafer may be carried out without removing said wafer from said chamber.

10. In a rapid thermal plasma multiprocessing reactor for in situ growth and deposition of layers on a wafer comprising a vacuum chamber including top, bottom and side walls, means for supporting said wafer with a top surface of said wafer to be processed facing the bottom of said chamber, at least one quartz discharge tube mounted in said bottom of said reactor facing said wafer top surface for conveying plasma gas from a remote plasma generating chamber located outside of said vacuum chamber to said vacuum chamber, means mounted adjacent to the top surface of said chamber facing said wafer mount for heating said back side of said wafer, and at least one non-plasma injector port connected through a non-plasma manifold to a plurality of gas sources for selectively conveying gas to said chamber whereby a plurality of processes affecting said wafer may be carried out without removing said wafer from said chamber, a method of fabricating tungsten-gate MOS devices comprising the steps of in situ growth of a gate dielectric by rapid thermal oxidation and rapid thermal nitridation cycles followed by a non-selective tungsten deposition process to form the gate electrode.

4,913,930

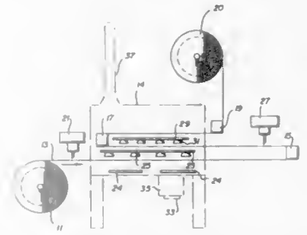
METHOD FOR COATING SEMICONDUCTOR COMPONENTS ON A DIELECTRIC FILM

John C. Getson, Adrian, Mich., assignor to Wacker Silicones Corporation, Adrian, Mich.

Division of Ser. No. 212,645, Jun. 28, 1988, Pat. No. 4,862,827. This application Mar. 31, 1989, Ser. No. 331,132

Int. Cl.[4] H01L *21/56, 21/96, 21/98, 23/30*

U.S. Cl. 427—58 3 Claims



1. A method for coating semiconductor components comprising

providing a film having a plurality of apertures along its length;

mounting semiconductor components within said apertures;

moving said film along a predetermined path in a first direction;

coating one side of said components with a curable composition;

passing said film through a chamber for curing said composition;

reversing the direction of said film by bending said film between said semiconductor components;

coating the other side of said components with a curable composition;

passing said film through said chamber for curing said second applied composition; and

storing said film with said coated components.

4,913,931

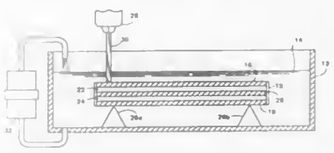
METHOD AND SOLUTION FOR THE PREVENTION OF SMEAR IN THE MANUFACTURE OF PRINTED CIRCUIT BOARDS

Jeffrey W. Frederickson, 2126 NE. 21st, Portland, Oreg. 97212

Filed Aug. 18, 1987, Ser. No. 87,000

Int. Cl.[4] B05D *5/12*

U.S. Cl. 427—97 13 Claims



1. A method of drilling holes in a printed circuit board which prevents the formation of smear comprising the steps of mounting the printed circuit board in a drilling jig and drilling

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the printed circuit board in the presence of an aqueous smear preventing solution containing an active amine which wets the interior walls of the holes in the printed circuit board as they are being drilled.

4,913,932

METHOD FOR THE PRODUCTION OF A COMPONENT WITH A FILLED LAYER

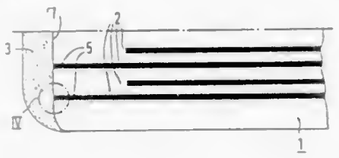
Thomas Moser, Schnaittach; Klaus Otto, Nuremberg; Horst Kippenberg, Herzogenaurach, and Ralf-Dieter Krause, Nuremberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 18, 1987, Ser. No. 86,520

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1986, 3627936

Int. Cl.[4] B05D 5/12

U.S. Cl. 427—123 11 Claims



1. A method for the production of a component with filled layers consisting of:

impregnating channels inside of a sinter-ceramic body of dense and porous layers with a liquid metallic impregnating material which in a liquid state is capable of wetting the sinter-ceramic body, applying electrical contacts onto the outside of the sinter-ceramic body after impregnation of the inside channels by the metallic material, and effecting electrical bonding of the contacts to the metallic impregnating material, wherein the impregnating material is a lead-indium alloy having an indium content which is between about 2.5% to about 20% by weight and wherein the impregnating material is prevented from running out of the inside channels of the sinter-ceramic body after impregnation without applying a pre-coating on the outer surface of the sinter-ceramic body prior to impregnation.

4,913,933

METHOD FOR PREPARING MAGNETIC RECORDING MEDIUM

Yuji Kasanuki, Yokohama; Takayuki Yagi, Tokyo; Kenji Suzuki, and Hiroshi Takagi, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1988, Ser. No. 283,904

Claims priority, application Japan, Dec. 21, 1987, 62-321574

Int. Cl.[4] B05D 5/12

U.S. Cl. 427—129 5 Claims

1. A method for preparing a magnetic recording medium comprising delivering a substrate from a delivery roller, passing the substrate through one or a plurality of conveying rollers and forming a magnetic recording layer on said substrate by the physical vapor deposition method in the course of running along the circumferential surface of a rotatory drum, characterized in that said substrate is heated between the delivery roller and the conveying roller or between a conveying roller and another conveying roller, and the conveying roller through which said substrate passes after heating is made an expander roller.

4,913,934

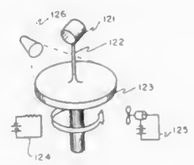
PROCESS FOR MAKING LASER Q-SWITCH

Edward J. Sharp, Stafford; Richard R. Shurtz, II, Fairfax; Wolfgang Elser, Alexandria, and Gary L. Wood, Fairfax, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 46,329, May 6, 1987, Pat. No. 4,819,239. This application Jun. 30, 1988, Ser. No. 213,819

Int. Cl.[4] B05P 5/06

U.S. Cl. 427—163 9 Claims



1. The process of forming a narrow band light radiatio filter form from organic monomers with a first center frequency which can be detuned to a second center frequency by a strong electric field with an intensity level such as that found in an intense laser beam, comprising the steps of:

A. forming dielectric materials suitable for the deposition of a structure of superposed thin dielectric layers with various preselected dielectric constants and transparent to said above radiation, wherein the required successive differences in the dielectric constants of adjacent ones of said layers define a preselected sequence to provide a rugate interference form of said filter;

B. successively molecularly orienting and depositing said layers on a substrate transparent to said radiation with adjacent layers in contact while varying the material formulation between layer depositions such that said layers have first order susceptibilities to electric polarization of sufficient magnitude to provide said preselected dielectric constants but also have higher order susceptibilities of sufficient magnitude and polarity to provide said layers with slightly altered dielectric constants in the presence of said strong electric field, all of which alter said preselected sequence in a manner that shifts said first center frequency to a second center frequency; and

C. treating the resultant structure to improve the bonding between said layers and said substrate while retaining their transparency.

4,913,935

POLYMER COATED ALUMINA

GwoChung Lin, McCandless Township, Allegheny County, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 28, 1988, Ser. No. 294,342

Int. Cl.[4] B05D 7/00

U.S. Cl. 427—221 20 Claims

1. A process for producing polybutadiene coated alumina particles wherein the alumina contains an alumina having a habit or form of crystals formed during a precipitation of aluminum hydroxide from an alkali metal aluminate by preselecting and controlling the pH of the alkali metal aluminate and the addition of certain monohydric and polyhydric alcohols to the alkali metal aluminate solution comprising:

(a) coating an alumina having a habit or form of crystals formed during a precipitation of aluminum hydroxide from an alkali metal aluminate by preselecting and controlling the pH of the alkali metal aluminate and the addition of certain monohydric and polyhydric alcohols to the

alkali metal aluminate solution with a solution of polybutadiene, radical generator, and solvent to form a polymer film layer on an acicular or lamellar alumina-based support, and

(b) crosslinking said film layer to form a stable polybutadiene coating on said alumina-based support.

4,913,936

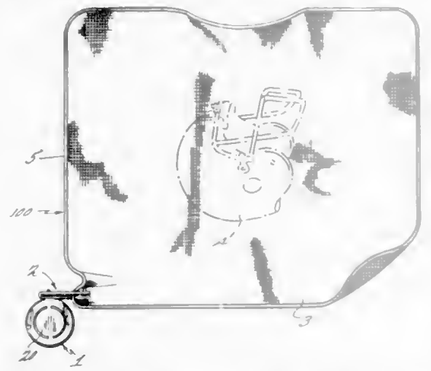
METHOD OF SURFACE ALLOYING SIALON ARTICLES

Pankaj K. Mehrotra, Greensburg, and Joyce L. Swiokla, Ligonier, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Division of Ser. No. 51,964, May 19, 1987, abandoned. This application Mar. 30, 1989, Ser. No. 331,474

Int. Cl.[4] C23C 16/32, 16/40

U.S. Cl. 427—249 24 Claims



1. A method of alloying the surface of a sialon article consisting essentially of beta-prime-sialon phase to increase the Z value of the beta-prime-sialon phase near the surface, said method comprising the steps of:

(a) preparing a sialon article,

(b) applying an approximately 1 to 10 micron thick coating of alumina to the surface of the sialon article by chemical vapor deposition, and

(c) heat treating the coated sialon article at a temperature between about 1300 to 1800 degrees Centigrade to diffuse oxygen and aluminum of the alumina coating into the surface of the sialon article to produce a diffusion zone containing beta-prime-sialon with an increased Z value compared to beta-prime-sialon phase in the remainder of the sialon article.

4,913,937

COMPOSITE ARTICLES USING MELTABLE RESIN HOLDING THREADS

Roger A. Englahl, St. Paul, and Todd Drummond, Maple Grove, both of Minn., assignors to Xerkon Inc., Minneapolis, Minn.

Filed Feb. 17, 1988, Ser. No. 156,937

Int. Cl.[4] B05D 3/02

U.S. Cl. 427—314 1 Claim

1. A process for preparing a non-porous oriented fiber reinforced hardened composite material, comprising the steps of:

preparing a fabric comprised of at least one ply of commonly oriented fibers;

stabilizing a plurality of said fabrics adjacent each other by knitting or stitching said fabrics together, with at least one course of resin holding thread, to form a stabilized fiber form having a distorted fiber orientation due to the stitching operation;

substantially surrounding said fibers and said thread of said stabilized fiber form, with a curable resin to form a non-porous fiber reinforced composite material, and

heating said composite material to melt a portion of said resin holding thread to relax the distorted fiber orientation and cure said resin to produce said hardened composite.

4,913,938

METHOD FOR PRODUCING COPPER FILM-FORMED ARTICLES

Takamasa Kawakami; Kazuhiro Ando, and Ryuji Fujira, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Dec. 23, 1988, Ser. No. 288,928

Int. Cl.[4] B05D 3/02

U.S. Cl. 427—383.1 3 Claims

1. A method for producing a copper film-formed molding which comprises coating a mixed solution consisting essentially of a copper compound selected from the group consisting of copper hydroxide and organic acid copper salts and a polyhydric alcohol on the desired area of an article having a heat deflection temperature of at least 165° C., and then heating and maintaining the article at a temperature of from 165° C. to the heat deflection temperature of the article in a nonoxidizing atmosphere, wherein the mixed solution consists essentially of 10 to 70% by weight of the copper compound and 90 to 30% by weight of the polyhydric alcohol.

4,913,939

METHOD OF MAKING AND USING SURFACE PRIMING COMPOSITION FOR PROTEINACEOUS SUBSTRATES

Robert E. Montgomery, Los Angeles, Calif., assignor to Rem Systems, Inc., Los Angeles, Calif.

Division of Ser. No. 130,603, Dec. 9, 1987, Pat. No. 4,863,993. This application Aug. 2, 1989, Ser. No. 388,663

Int. Cl.[4] B05D 3/02

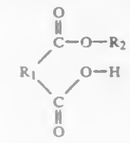
U.S. Cl. 427—389 23 Claims

1. A method of making a composition for promoting the adhesion of adhesives, coatings and/or composites to proteinaceous substrates comprising the steps of:

(a) providing a cyclic anhydride;

(b) providing a hydroxyl-containing, terminally unsaturated reactant;

(c) reacting said cyclic anhydride with said hydroxyl containing terminally unsaturated reactant to form an unsaturated carboxylic acid of the general formula:



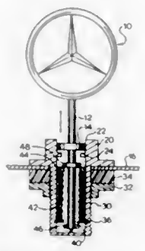
VOL 1113 ISS 1 AP 3 1990 UMI

where
R_1 is selected from CH=CH, $C(CH_3)$=$C(CH_3)$, $C(CH_3)$=CH, CH_2CH_2, or $CH_2CH_2CH_2$; and
R_2 is selected from a terminally mono-, di-, tri-, or multi-unsaturated group;
(d) dissolving said adduct of step c in a water-miscible solvent.

4,913,940
WHIRLING BANNER OR KERCHIEF
Richard J. Pratt, 1390 Carol La., Deerfield, Ill. 60015
Filed Feb. 9, 1988, Ser. No. 153,729
Int. Cl.[4] G09F *17/00, 21/02*
U.S. Cl. 428—7 9 Claims

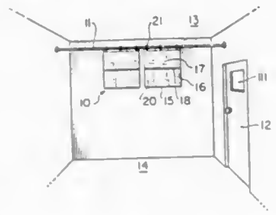
1. A whirling banner, comprising:
a. a banner member having an edge;
b. a handle member having an axle portion; and
c. a radial arm member having first and second ends, having a lower half and an upper half bent over the lower half, thereby defining a fold at one of the first and second ends, and having means for attaching said banner at the first end and means for rotatingly supporting said axle portion at the second end, said means for rotatingly supporting the axle portion comprising a hole passing through each of the upper and lower halves, for rotatingly supporting the axle portion, wherein the axle portion further comprises hub means for rotatingly engaging the means for supporting, said banner being whirlable around said axle when said handle member is held and moved back and forth.

4,913,941
REMOVABLE CAR HOOD ORNAMENT APPARATUS
Russell Tedrahn, 1915 N. Cherry, Wheaton, Ill. 60187
Filed Jul. 10, 1989, Ser. No. 377,893
Int. Cl.[4] B60R *13/04*
U.S. Cl. 428—31 7 Claims



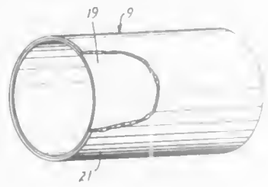
1. A detachable ornament apparatus for an automobile hood having a small opening arranged therein for receipt of a portion of said ornament apparatus comprising:
a shaft member;
an ornament mounted to the upper portion of said shaft;
transversely protruding key member prongs affixed to the lower portion of said shaft;
a bracket member affixed to the automobile under the hood;
a lower plate member positioned by said bracket member underneath the hood and having an opening therein in alignment with said hood opening, wherein said lower plate member opening exhibits a transverse elongated slot for receipt of said shaft member and said protruding key member prongs, when aligned therewith; and
means mounted within said bracket member for urging said shaft member upwardly such that said prongs are locked against said lower plate member when said key member is inserted through said lower plate opening and rotated to un-align said prongs and said slot.

4,913,942
REGENERATIVE DESICCANT BUNDLE
John J. Jick, P.O. Box 3716, Beverly Hills, Calif. 90212
Filed Dec. 20, 1988, Ser. No. 286,939
Int. Cl.[4] B01D *53/14*
U.S. Cl. 428—35.2 1 Claim



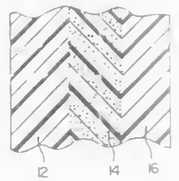
1. In combination with a walk-in refrigerator having a heavily laden moisture environment, the improvement comprising:
a plurality of overhead supporting structure arranged in parallel spaced-apart relationship across the top of said refrigerator.
a plurality of moisture absorbing pouches carried on said overhead support structure so as to downwardly depend therefrom;
each of said pouches composed of a porous fabric having an internal enclosed compartment;
a quantity of desiccant particles disposed in said pouch compartment substantially occupying the entire volume thereof;
said desiccant particles being of a multiple exposed surface exterior of a diameter larger than 1/32 of an inch;
attachment means releasably connected to each of said pouches for suspending said pouch from said supporting structure in said moisture environment;
said attachment means includes a plurality of spaced-apart hangers detachably secured along the edge marginal region of said pouch;
said pouch includes reinforcement means integrally carried about the edge marginal regions thereof;
said pouch includes a plurality of compartments arranged side-by-side in rows and columns having each of said compartments defined by linear stitching integrally joining a pair of porous fabric sheets together so that opposing surfaces of said sheets enclose said quantity of desiccant particles;
said fabric sheets are pervious to moisture so as to absorb and retain moisture; and
said fabric sheets and said particles are regenerated and adapted to be ambient heat dried for reuse.

4,913,943
DAMPENER ROLL COVER AND METHODS OF PREPARATION AND USE THEREOF
Charles G. Goossen, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 796,953, Nov. 12, 1985, abandoned.
This application Sep. 27, 1988, Ser. No. 252,012
Int. Cl.[4] B21B *31/08;* B60B *7/02*
U.S. Cl. 428—36.1 7 Claims



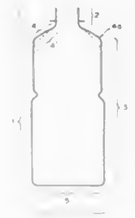
1. A cylindrical sleeve of non-woven web material comprising hydrophilic cellulosic fibers, polyvinyl alcohol binder fibers, and from about 10 to about 50 percent by weight of partially hydrolyzed acrylic fibers.

4,913,944
BOAT HULL
Llewellyn A. Gilman Jr., Hampden, Me., assignor to Old Town Canoe Company, Old Town, Me.
Division of Ser. No. 53,542, May 26, 1987, Pat. No. 4,836,963, which is a continuation of Ser. No. 606,067, May 1, 1984, abandoned. This application Jan. 17, 1988, Ser. No. 209,103
Int. Cl.[4] B32B *3/26*
U.S. Cl. 428—36.5 20 Claims



1. A boat hull comprised of three integral layers of polyethylene, said integral layers comprising:
an outer layer made from a polyethylene having a density after cross-linking in the range of 0.930–0.933 gm/cc;
a middle layer made from a polyethylene having a noncross-linked density of 0.955 gm/cc, said middle layer polyethylene having been blended with a blowing agent such that said middle layer is a foam; and
an inner layer made from a polyethylene having a density after cross-linking of about 0.937 gm/cc.

4,913,945
PROCESS FOR BLOW-MOLDING AND HEAT SETTING OF POLYESTER HOLLOW FORMED BODY
Yoshitsugu Maruhashi; Setsuko Iida; Takashi Sugisaki, all of Yokohama; Yohji Mizutani, and Nobuhiro Kishida, both of Tokyo, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan
Division of Ser. No. 91,137, Aug. 31, 1988, Pat. No. 4,803,036.
This application Oct. 13, 1988, Ser. No. 256,951
Claims priority, application Japan, Aug. 30, 1986, 61-202640
Int. Cl.[4] B65D *1/02;* B29C *49/08*
U.S. Cl. 428—36.92 5 Claims



1 A heat-resistant polyester hollow formed body comprising a neck, a shoulder, a barrel and a closed bottom, wherein the center of the shoulder of the vessel is transparent and has a crystallization degree of at least 30% as measured by a density method using an n-heptane/tetrachlorocarbon density gradient tube, the refractive index (nxo) in the thickness direction of the outer face side of the center of the shoulder, measured by using NaD rays, is larger than the refractive index (nxi) in the thickness direction of the inner face side of the center of the shoulder, measured by using NaD rays, and there is formed such a molecular orientation distribution that the orientation degree ratio (Ro) defined by the following formula is less than 0.95:

$$Ro=(na-nxo)/(na-nxi)$$

wherein na is a refractive index of the unoriented polyester, which is equal to 1.5760.

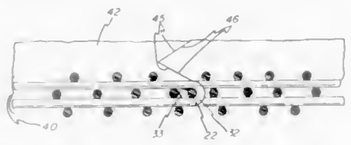
4,913,946
FLUORESCENT ADHESIVE TAPE FOR USE AS A HIGHLIGHTER
Guido Sala, Milan, and Ivano Zacchiatti, Arese, both of Italy, assignors to Lucas International Carbon Solvent, Passirana di Rho and SICAD Spa, Uboldo, both of, Italy
Filed Feb. 13, 1987, Ser. No. 14,810
Claims priority, application Italy, Jan. 8, 1987, 20433/87[U]
Int. Cl.[4] B32B *7/12;* C09J *7/02*
U.S. Cl. 428—38 10 Claims

1 A fluorescent tape for use as a highlighter to apply to a support with writing, comprising a transparent or semi-transparent film having a layer of fluorescent colored ink and a layer of adhesive of low adhesive power which allows removal from said support without altering the support itself or the writing.

4,913,947
SEAM FOR PAPERMAKER'S FELT
Dimitri P. Nicholas, Savannah, Ga., and Pieter S. Diehl, Pleasant Hill, Ohio, assignors to The Orr Felt Company, Piqua, Ohio
Filed Feb. 1, 1989, Ser. No. 305,269
Int. Cl.[4] B32B *3/00*
U.S. Cl. 428—60 3 Claims

1. In a papermaker's felt having a base fabric with first and second opposed ends joined by a pin seam, and in which a

relatively heavy batting is applied to one surface of said base fabric and extends to each of said base fabric ends forming batting free ends substantially coterminous with said base fabric ends, the improvement in said felt in which one free end of the batting is joined to the opposed free end thereof at the pin seam comprising:



means exclusively in one of said batting free ends forming a transverse Vee groove, and

means exclusively in the opposed batting free end forming a transverse Vee proportioned to be received and interlocked in said groove when said base fabric ends are joined at said pin seam.

4,913,948

OPTICAL RECORDING MEDIUM

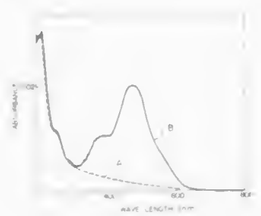
Eiji Ando, Katano, and Junichi Hibino, Hirakata, both of Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Sep. 26, 1988, Ser. No. 249,177

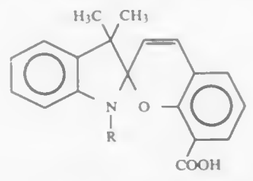
Claims priority, application Japan, Apr. 11, 1988, 63-87263

Int. Cl.[4] B32B *3/02*

U.S. Cl. 428—64 5 Claims



1. An optical recording medium comprising a mixture of a photochromic compound represented by the following general formula in which a carboxyl group and an alkyl group have been introduced to the 8-position and the 1'-position, respectively, at the same time, and a long-chain carboxylic acid:



wherein R is a hydrocarbon chain having 5 to 31 carbon atoms.

4,913,949

PLANAR, MULTILAYERED, LASER-OPTICAL RECORDING MATERIAL

Helmut Steininger, Worms, and Horst Binder, Lampertheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 8, 1988, Ser. No. 216,616

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1987, 3725134

Int. Cl.[4] B32B *3/02*

U.S. Cl. 428—64 7 Claims

1. A planar, multilayered, laser-optical recording material, comprising

(a) a dimensionally stable, optically clear base material composed of a plastics substance and having a structured surface,

(b) a superposed intermediate layer which is insoluble in organic solvents and which acts as a diffusion barrier thereagainst, and superposed thereon

(c) an amorphous, thermally alterable, dye-containing recording layer producible by application from a solution and drying,

wherein said intermediate layer (b)

(b_1) is from 5 to 95 nm thick and, based on (b), consists of

(b_2) from 88 to 99.5% by weight of an oxide and/or hydrated oxide of one or more of the elements of the group consisting of titanium, zirconium, hafnium, thorium, vanadium, niobium, tantalum, tungsten, aluminum, gallium, indium, silicon, germanium and tin and of

(b_3) from 0.5 to 12% by weight of a hydrocarbyl and

(b_4) is producible by dissolving one or more alkoxides of one or more of the abovementioned elements in a polar liquid medium essentially comprising a C_1–C_6-alkanol, applying this solution to the surface of base material (a) and heat-treating the moist layer obtainable in this way in the presence of water at from 50 to 120° C. for from 5 minutes to 2 hours.

4,913,950

REPAIR PATCH FOR RUBBER AND PLASTIC ARTICLES

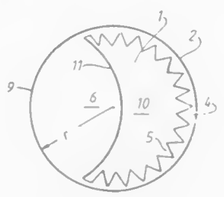
Adolf Riesinger, Poinger Strasse, Fed. Rep. of Germany, assignor to Stahlgruber Otto Gruber GmbH & Co., Fed. Rep. of Germany

Filed Aug. 10, 1988, Ser. No. 230,583

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1987, 3726991

Int. Cl.[4] B32B *3/02*

U.S. Cl. 428—64 9 Claims



1. A repair patch for rubber and plastic articles comprising a main element of vulcanized rubber for spanning a damage site in the article and a connecting layer of unvulcanized rubber extending along the underside of the main element and forming a projecting edge outwardly extending beyond the main element, the connecting layer also partially covering the top area of the main element whereby the underside of a patch of similar configuration may be secured to the partial connecting layer area on the top of the patch to repair elongate damage sites in the article.

4,913,951

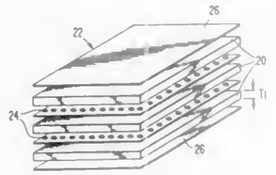
FABRICATION OF REINFORCED PTFE GASKETING MATERIAL

Stefan Pitolaj, Palmyra, N.Y., assignor to Garlock Inc., Palmyra, N.Y.

Filed Jul. 26, 1988, Ser. No. 224,393

Int. Cl.[4] B32B *1/04*; C09J *5/00*

U.S. Cl. 428—76 20 Claims



1. A process for producing a high strength, dimensionally stable gasketing material including the steps of:

a. forming a first sheet from a blend of polytetrafluoroethylene and at least one filler;

b. providing a second sheet of perforated metal;

c. providing a third sheet of aluminum foil;

d. forming a composite wherein said second metal sheet is layered alternately with said first polytetrafluoroethylene/filler sheets so that the outermost layers are said first polytetrafluoroethylene/filler sheets;

e. applying a layer of said third foil sheet to cover each outermost layer of said first sheet of said composite;

f. subjecting the composite formed in step e to pressure sintering at a temperature above the gel point of said polytetrafluoroethylene material; and

g. subjecting the pressure sintered composite formed in step f to rapid cooling under pressure.

4,913,953

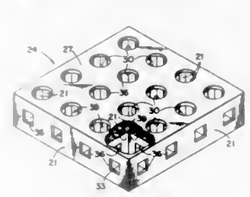
INTEGRAL CHOPPED FIBER REINFORCED GLASS OR GLASS-CERAMIC STRUCTURES

Karl M. Prewo, Vernon, and Eric Minford, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 124,324, Nov. 23, 1987, Pat. No. 4,857,093. This application Dec. 23, 1988, Ser. No. 289,110

Int. Cl.[4] B32B *3/10, 5/02*

U.S. Cl. 428—131 1 Claim



1. A lightweight integral chopped fiber reinforced glass or glass-ceramic matrix structure comprising:

(a) a face plate;

(b) a back plate;

(c) a grid array of chamber walls;

(d) said face plate connected to said back plate through said chamber walls forming a grid array of chambers;

(e) said back plate having an array of apertures therein said apertures leading to said chambers;

(f) said chamber walls having apertures therein;

(g) said fibers being carbon or ceramic; and

(h) a fiber volume of about 15% to about 50% based on total volume; wherein the chopped fiber reinforced structure is an integral structure having no bond lines.

4,913,952

CARPET COMPOSITES, HAVING IMPROVED STATIC ELECTRICITY CHARACTERISTICS

James E. Fowler, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Nov. 14, 1988, Ser. No. 270,875

Int. Cl.[4] B32B *3/02*

U.S. Cl. 428—87 2 Claims

1. A carpet composite having improved static electricity characteristics which comprises a surface layer comprised of face yarn, said face yarn having been embedded into a backing layer of thermoplastic resin material into which has been uniformly incorporated throughout the entire cross sectional dimension of said backing layer a mixture of from about 0.2 to about 0.4 percent by weight based upon the total weight of the thermoplastic resin backing layer of carbon black particles having an average particle size of from about 15 to about 30 nanometers, and from about 0.4 to about 2 percent by weight based upon the weight of the thermoplastic resin backing layer of carbon fibers having an average length of from about 0.1 to about 0.2 inch.

4,913,954

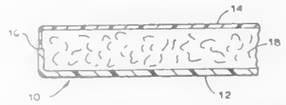
DISPOSABLE PAD FOR ODOR PREVENTION IN CAT LITTER BOXES

Robert J. Mack, Aberdeen, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 26, 1987, Ser. No. 113,092

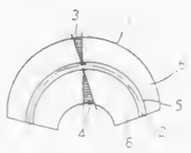
Int. Cl.[4] B32B *7/02*

U.S. Cl. 428—213 3 Claims



1. A pad for cat litter boxes for facilitating evaporation of liquid waste comprising a fluid impervious backing sheet of material selected from the group consisting of polyethylene and polypropylene film, a top sheet of non-woven hydrophobic fibers selected from the group consisting of polyethylene, polypropylene and polyester, securd to said backing sheet, and a layer of hydrophobic fibers disposed between said top sheet and said backing sheet, the fibers of said layer being selected from the group consisting of polyethylene, polypropylene and polyester.

4,913,955
EPOXY RESIN LAMINATE
Masayuki Naoki; Kenichi Hasegawa; Tsuneharu Yamaguchi, and Kazuaki Takahashi, all of Ohtawara, Japan, assignors to Shin-Kobe Electric Machinery Co., Ltd., Tokyo, Japan
Filed Jan. 3, 1989, Ser. No. 293,484
Claims priority, application Japan, Jan. 5, 1987, 62-141196; Jan. 5, 1987, 62-141197; Jan. 5, 1987, 62-141198; Sep. 28, 1987, 62-240778; Mar. 9, 1988, 63-53560
Int. Cl.[4] B32B 15/08, 15/14, 17/10, 17/12; H05K 1/03
U.S. Cl. 428—236 14 Claims



1. An epoxy resin laminate comprising a center base layer of glass fiber woven cloth and outer base layers of sheet-like material more expansible and compressible than said glass fiber woven cloth provided on both faces of said center base layer and integrally impregnated with a composition produced by reacting 5 to 60 weight parts of polybutadiene-acrylonitrile copolymer having carboxyl groups at its terminal with 95 to 40 weight parts of epoxy resin having more than two functional groups.

4,913,956
MOLDABLE FIBER GLASS MATERIAL
Ralph M. Fay, Lakewood, and Philip F. Miele, Highlands Ranch, both of Colo., assignors to Manville Corporation, Denver, Colo.
Continuation-in-part of Ser. No. 123,824, Nov. 23, 1987, abandoned. This application May 9, 1989, Ser. No. 349,298
Int. Cl.[4] B32B 15/00
U.S. Cl. 428—285 6 Claims

1. An uncured, readily moldable blanket comprising:
non-woven glass fibers and a binder component;
said binder component comprising a liquid binder material having a tacky characterisitic and a powdered binder material; and wherein,
said liquid binder material forms a first coating about the surface of said fibers;
said powdered binder material forms a second coating over said liquid binder material to effectively eliminate surface tackiness of said liquid binder material; and,
said fibers and binder component are present in said blanket in the dry weight percentage range of between 45 to 90% of glass fibers and 10–55% of binder.

4,913,957
THERMAL RETAINING FABRIC LAMINATE
David C. Strack, Canton, and La-Donna M. Brown, Dunwoody, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed May 23, 1988, Ser. No. 197,377
Int. Cl.[4] B32B 27/00
U.S. Cl. 428—286 9 Claims

1. A thermal retaining fabric laminate comprising in sequence:
a. a skin contact layer impregnated with a treatment liquid, the skin contact layer comprising an absorbent for retaining the treatment liquid;
b. a first barrier layer adhered to the skin contact layer;
c. a reservoir layer adhered to the first barrier layer impregnated with a heat retention liquid, the reservoir layer

comprising an absorbent for retaining the heat retention liquid; and
d. a second barrier layer adhered to the reservoir layer.

4,913,958
PROCESS FOR PREPARING POLYURETHANE-BACKED SUBSTRATE
Kenneth W. Skaggs; Robert B. Turner, both of Lake Jackson, Tex., and Terry L. Lamb, Ringgold, Ga., assignors to The Dow Chemical Company, Midland, Mich.
Filed Jan. 29, 1989, Ser. No. 373,856
Int. Cl.[4] B32B 3/26; B05D 5/00
U.S. Cl. 428—316.6 12 Claims

11. A substrate having attached thereto successive polyurethane layers, wherein one of such layers is a cellular polyurethane which is attached directly to a non-cellular polyurethane layer containing about 0.03 to about 2.0 weight percent of a polysiloxane-polyether block copolymer, said block copolymer containing about 10 to about 30 weight percent dialkylsiloxane units, about 30 to about 70 weight percent oxyethylene units and about 0 to about 55 weight percent other oxyalkylene units.

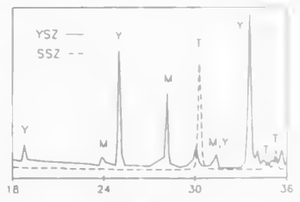
4,913,959
MAGNETIC RECORDING MEDIUM
Akira Miyake, Kyoto, and Mikio Kishimoto, Osaka, both of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan
Filed May 8, 1987, Ser. No. 47,147
Claims priority, application Japan, May 9, 1986, 61-106371
Int. Cl.[4] G11B 5/70
U.S. Cl. 428—329 4 Claims

1. A magnetic recording medium of improved durability which comprises a non-magnetic substrate and a magnetic layer formed thereon containing magnetic powder consisting of platelet hexagonal ferrite particles, non-magnetic granular powder particles having a Vickers hardness greater than that of said platelet hexagonal magnetic ferrite particles, a lubricant present in an amount of from 2–25 parts by weight per 100 parts of said magnetic ferrite particles and a binder, said non-magnetic granular powder particles being present in an amount of from 0.1 to 30 parts by weight per 100 parts by weight of said platelet hexagonal ferrite particles, said magnetic layer having a void volume created by the presence of said non-magnetic granular powder particles of not less than 20% by volume, with said lubricant being contained in said voids.

4,913,960
PRESSURE SENSITIVE ADHESIVE AND A PRESSURE SENSITIVE ADHESIVE FILM HAVING THEREON A LAYER OF THE SAME
Hideo Kuroda, Hanasancho, and Masao Taniguchi, Sennan, both of Japan, assignors to Bando Chemical Industries, Ltd., Hyogo, Japan
Division of Ser. No. 829,818, Feb. 14, 1986, Pat. No. 4,818,621.
This application Dec. 21, 1988, Ser. No. 287,009
Claims priority, application Japan, Feb. 14, 1985, 60-28030; Feb. 14, 1985, 60-28031; Sep. 4, 1985, 60-196540; Sep. 4, 1985, 60-196541; Sep. 4, 1985, 60-196542; Sep. 4, 1985, 60-196543; Sep. 4, 1985, 60-196544; Sep. 4, 1985, 60-196545
Int. Cl.[4] B32B 27/08, 27/16, 27/20, 27/30
U.S. Cl. 428—345 4 Claims

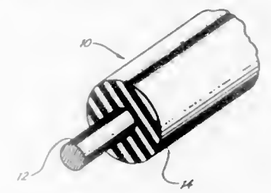
1. A pressure sensitive adhesive film reducible in adhesive force by the application thereto of ultraviolet light which comprises:
(a) a base film permeable to the ultraviolet light; and
(b) a layer of a pressure sensitive adhesive formed on one side of the base film, the adhesive comprising:
(i) at least one elastic polymer selected from the group consisting of a polymer comprising an acrylic acid ester copolymer, and a saturated copolyester comprising a dibasic carboxylic acid and a dihydroxy alcohol;
(ii) an ultraviolet light polymerizable acrylic acid ester having not less than two acryloyl or methacryloyl groups in the molecule and having a molecular weight of not more than about 1000, in amounts of about 15–200 parts by weight in relation to 100 parts by weight of the elastic polymer;
(iii) a tackifier in amounts of about 10–200 parts by weight in relation to 100 parts by weight of the elastic polymer;
(iv) anhydrous silica powder in amounts of about 1–30 parts by weight in relation to 100 parts by weight of the elastic polymer;
(v) a polyisocyanate in amounts of about 1–100 parts by weight in relation to 100 parts by weight of the elastic polymer; and
(vi) a photopolymerization initiator in a sufficient amount to induce the photopolymerization of the ultraviolet light polymerizable acrylic acid ester, and
wherein the base film contains a plasticizer therein and a barrier layer composed of a resin permeable to the ultraviolet light but impermeable both to the ultraviolet light polymerizable acrylic acid ester and the plasticizer between the base film and the layer of the adhesive

4,913,961
SCANDIA-STABILIZED ZIRCONIA COATING FOR COMPOSITES
Robert L. Jones, Fairfax, and Robert P. Ingel, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed May 27, 1988, Ser. No. 199,815
Int. Cl.[4] B32B 9/04
U.S. Cl. 428—332 17 Claims



1. A composite structure comprising a substrate and a protective coating of scandia stabilized zirconia on said substrate, said coating of scandia stabilized zirconia having an outer surface which is exposed to, and resistant to corrosion by, sodium vanadates and sodium sulfates under combustion conditions.

4,913,962
CABLES FORMED WITH INTERDISPERSED POLYMER INSULATION COMPOSITIONS AND METHOD OF MAKING
Edward V. Wilkus, and Alexander F. Wu, both of Trumbull, Conn., assignors to Valkor Incorporated, Lowell, Mass.
Division of Ser. No. 427,386, Sep. 29, 1982, abandoned. This application Feb. 13, 1984, Ser. No. 579,828
Int. Cl.[4] B32B 15/00; H01B 7/00
U.S. Cl. 428—372 5 Claims



1. A cable article comprising a conductor,
said conductor being at least partially insulated by a flexible composition comprising low density polyethylene and polyvinyl chloride polymer ingredients and at least an amount of an interdispersing agent selected from the group consisting of fibrous polytetrafluoroethylene and ultra high molecular weight polyethylene effective to at least partially interdisperse the ingredients.

4,913,963
MAGNET WIRE WITH EQUILIBRATING POLYAMIDE INSULATION
Francois A. Lavallee, Fort Wayne, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.
Division of Ser. No. 106,695, Oct. 8, 1987, Pat. No. 4,775,726, which is a division of Ser. No. 945,159, Dec. 22, 1986, Pat. No. 4,716,190. This application May 31, 1988, Ser. No. 200,488
Int. Cl.[4] B32B 15/00, 27/00; H01B 7/00
U.S. Cl. 428—379 2 Claims

1. A magnet wire having at least one insulating layer comprising the reaction product of a polyamide resin, about 0.5 to about 5 percent by weight of said resin of an organic titanium catalyst selected from the group consisting of (RO^4) T, dimers, trimers and mixtures thereof where R is an alkyl group or an aromatic group, and a solvolytic agent comprising an active hydrogen containing compound capable of cleaning the larger molecules of said polyamide resin.

4,913,964
COVERING MATERIAL FOR ELECTRIC TRANSMISSION LINES, AND ELECTRIC TRANSMISSION LINE
Fusayoshi Fujii, Machida; Kenji Hijikata, Mishima; Makoto Ilyama; Toshio Nakane, both of Fuji, and Yukihiko Kageyama, Fujinomiya, all of Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan
Filed Feb. 23, 1988, Ser. No. 159,121
Claims priority, application Japan, Feb. 23, 1987, 62-39613
Int. Cl.[4] B32B 15/00; H01B 7/00
U.S. Cl. 428—379 14 Claims

1. An electric transmission line, which comprises:
(i) an electrically conductive line, and
(ii) a melt-extruded covering layer on the line consisting essentially of a halogen-containing, flame-retarding, aro-

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matic copolyester obtained by the condensation polymerization of constituent (A) comprising an aromatic dicarboxylic acid or an ester-forming derivative thereof, constituent (B) comprising an aliphatic glycol or an ester-forming derivative thereof, and constituent (C) comprising an ester-forming compound containing a halogen atom, wherein when the ester-forming functional group of the halogen compound of constituent (C) is alcoholic, the proportion of constituents (B) and (C) is 90–200 mol, relative to 100 mol of constituent (A); and when the ester-forming functional group of the halogen compound of constituent (C) is of a carboxylic acid system, the proportion of constituent (B) is 90–200 mol, relative to 100 mol of constituents (A) and (C).

4,913,965

FLAME RETARDANT COMPOSITIONS

Michael J. Keogh, Bridgewater, N.J., assignor to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Nov. 18, 1988, Ser. No. 273,047
Int. Cl.[4] C08L 33/06; C08K 9/04, 5/09, 3/22
U.S. Cl. 428—379 9 Claims

1. A composition useful in the manufacture of plenum cable comprising:

(i) a copolymer comprised of ethylene and vinyl acetate wherein the portion of the copolymer attributed to the vinyl acetate is in the range of about 25 to about 60 parts by weight based on 100 parts by weight of the copolymer; and

(ii) magnesium hydroxide having (a) a strain in the <101> direction of not more than 3.0×10^{-3}; (b) a crystallite size in the <101> direction of more than 800 angstroms; and (c) a surface area, determined by the BET method, of less than 20 square meters per gram, the amount of magnesium hydroxide being in the range of about 180 to about 350 parts by weight based on 100 parts by weight of the copolymer, said magnesium hydroxide having been surface treated with one or more carboxylic acids having about 8 to about 24 carbon atoms or one or more metal salts thereof.

5. A plenum cable comprising a metal core conductor and at least one layer surrounding the core comprising the composition defined in claim 1.

4,913,966

POROUS STRUCTURES

Michael J. Garvey, and Ian C. Griffiths, both of Merseyside, United Kingdom, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Filed Apr. 22, 1987, Ser. No. 41,329
Claims priority, application United Kingdom, Apr. 24, 1986, 8610024
Int. Cl.[4] B29C 67/00; C01B 33/12
U.S. Cl. 428—402 11 Claims

1. Spheroidal porous silica structures having both macro- and mesopores and comprising a cluster of silica platelets, said platelets generating the macropores in the spaces between them and the mesopores being generated by the spaces between the silica particles forming the platelets, said mesopores interlink the macropores.

4,913,967

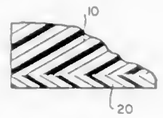
ANTI-FOGGING STRUCTURAL SHEET

J. David Bilhorn, 652 Hwy. 73, Edgerton, Wis. 53534

Filed Jan. 2, 1987, Ser. No. 142
Int. Cl.[4] B32B 9/04
U.S. Cl. 428—411.1 20 Claims

15. A plastic structural sheet with a long lasting surfactant to increase the longevity of the anti-fogging and moisture dispersion characteristics the surfactant generates on the sheet, prepared by a process comprising the steps of:

exposing the surface of the sheet to a saturated solution of long lasting surfactant while the surface of the sheet is still tacky, and



providing pressure means to the surface of the sheet to force the surfactant into the surface of the sheet.

4,913,968

WATER-COMPATIBLE COATING RESIN

Alphonsus V. Poclus, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 906,830, Sep. 12, 1986, Pat. No. 4,822,464.
This application Jan. 17, 1989, Ser. No. 296,950
Int. Cl.[4] B32B 15/08, 27/38; C25D 13/06; C08L 63/00
U.S. Cl. 428—418 18 Claims

1. A water-compatible resin having a substantially linear structure and water-solubilizing groups, the resin having a backbone derived from reaction between a polyepoxide and an aryl or cycloalkyl linking compound having a plurality of epoxide-reactive groups, said linking compound having a sufficiently bulky structure that is sufficiently Tg enhancing to raise by more than 20° C. the Tg of a first cured epoxy resin that has been (a) made from the reaction product obtained by combining DGEBA and said linking compound at a 1.05:1 ratio of moles of said DGEBA to moles of said epoxide-reactive groups in said linking compound, (b) cured using piperidine at a 9.08:1 ratio of moles of epoxy groups in said reaction product to moles of said piperidine, and (c) analyzed using dynamic mechanical analysis, when compared to the Tg of a second cured epoxy resin made and cured similarly but using bisphenol A in place of said linking compound.

4,913,969

PROCESS FOR BONDING SUBSTRATES IMPERMEABLE TO WATER VAPOR

Heinz-Guenther Schulte, Muelheim; Guenter Tauber, Duesseldorf, and Wolfgang Pille-Wolf, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 20, 1988, Ser. No. 221,964
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1987, 3723923
Int. Cl.[4] B32B 7/04; C09J 5/04
U.S. Cl. 428—420 52 Claims

1. A process for bonding a substrate, impermeable to water vapor, with a hotmelt material which post-crosslinks on contact with moisture which comprises:

(1) applying a suspension or solution of an activator material in a liquid to at least one substrate surface to be bonded, the activator material being a substance which releases chemically or adsorptively bound water at the temperature of application of the hotmelt material;

(2) removing the liquid; and

(3) applying the hotmelt material at its application temperature to the at least one substrate surface.

4,913,970

ADHESION PROMOTING COMPOSITION AND COATED FILM

Jack Hayward, Hilton; Michael W. Orem, and Gerald G. Reafler, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 116,426, Nov. 3, 1987. This application Aug. 29, 1988, Ser. No. 237,129
Int. Cl.[4] B32B 27/18; B29C 55/00; C08G 18/06
U.S. Cl. 428—423.7 14 Claims

7. A coated film comprising a stretchable carrier film formed of an immiscible blend of a polyester with another polymer having on its surface a thin, dried tie coat layer comprising a urethane resin and a non-ionic fluorinated surfactant of the formula:

$$CF_3-(CF_2)_n-SO_2-N(-(CH_2CH_2O)_pR)-(CH_2)_mCH_3$$

wherein R = H or lower alkyl,
m = 1–4,
n = 5–9,
p = 2–30,

and a polyurethane paint layer, whereby said tie layer improves the adhesion of the paint layer to the carrier film.

4,913,971

ADHESIVE MIXTURE

Manfred Beck, Wipperfuerth; Horst Müller-Albrecht, Cologne, and Heinrich Königshofen, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 139,733, Dec. 28, 1987, abandoned.
This application Apr. 27, 1989, Ser. No. 346,385
Claims priority, application Fed. Rep. of Germany, Jan. 6, 1987, 3700194; Jan. 28, 1987, 3702594
Int. Cl.[4] C08L 75/04; B32B 27/40
U.S. Cl. 428—424.8 6 Claims

1. Mixtures of

(A) from 20 to 99 parts by weight of a polyurethane,

(B) from 0.5 to 50 parts by weight of an non-halo-genated aromatic vinyl compound/diene block polymer,

(C) from 0.5 to 50 parts by weight of a halogen modified aromatic vinyl compound/diene polymer and

(D) from 0 to 10 parts by weight of a polyisocyanate optionally dissolved in an organic solvent.

4,913,972

TRANSPARENT COATING SYSTEM FOR PROVIDING LONG TERM EXTERIOR DURABILITY TO WOOD

John F. Grunewalder, Glenshaw; Mark A. Hurley, Oakmont; Alan J. Kaylo, and Paul J. Fracnal, both of Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 11,958, Feb. 6, 1987, abandoned. This application Feb. 23, 1989, Ser. No. 315,816
Int. Cl.[4] B05D 3/10; B32B 27/40
U.S. Cl. 428—425.5 16 Claims

1. A method of providing a wood substrate with durability against weathering comprising:

(A) applying to said wood substrate a transparent treatment comprising an organosilicon-containing compound having at least one hydrolyzable silyl group in a carrier for said compound; and thereafter

(B) coating said wood substrate with a transparent, film-forming, coating composition containing components comprising an aliphatic polyisocyanate and an organic polyol whereby said components of said coating composition react to form a polyurethane film, characterized in that a transparent free film from said coating composition retains an elongation of at least 20 percent and a tensile strength of at least 2,000 pounds per square inch after at least 1,000 hours exposure in a Xenon Weatherometer.

9. A wood substrate having firmly adhered thereto a material comprising:

(A) a dry layer of a transparent treatment comprising an organosilicon-containing compound having at least one hydrolyzable silyl group; and immediately above and firmly adhered to said dry layer

(B) a transparent film from a film-forming, coating composition containing components comprising an aliphatic polyisocyanate and an organic polyol whereby said components of said coating composition react to form a polyurethane film, characterized in that a transparent free film from said coating composition retains an elongation of at least 20 percent and a tensile strength of at least 2,000 pounds per square inch after at least 1,000 hours exposure in a Xenon Weatherometer.

4,913,973

PLATINUM-CONTAINING MULTILAYER ANODE COATING FOR LOW PH, HIGH CURRENT DENSITY ELECTROCHEMICAL PROCESS ANODES

Mark J. Gestic, Berkley Heights, N.J., assignor to Engelhard Corporation, Edison, N.J.

Continuation of Ser. No. 97,379, Sep. 16, 1987, abandoned, which is a continuation of Ser. No. 946,877, Dec. 15, 1986, abandoned, which is a continuation of Ser. No. 775,921, Sep. 13, 1985, abandoned. This application Sep. 8, 1988, Ser. No. 243,182
Int. Cl.[4] B32B 3/02
U.S. Cl. 428—469 8 Claims

1. An anode for oxygen evolution consisting essentially of a substrate of a film forming metal having thereon a multilayer coating comprising:

an interior layer consisting essentially of substantially pore free platinum applied electrolytically to a thickness of at least about 150 microinches, then densified by heat treating in an oxygen containing atmosphere at from 600° to 775° C. so as to close the pores in the platinum layer; and

an exterior layer consisting essentially of at least about 97% iridium oxide and up to about 3% rhodium oxide, said exterior layer having been applied by thermal decomposition of one or more thermally decomposable iridium and, optionally, rhodium compounds in an oxygen containing atmosphere at a temperature of not more than about 600° C.

4,913,974

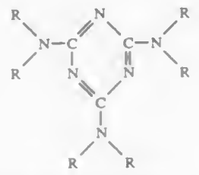
UV-STABILIZED MELAMINE-POLYOL COATED THERMOPLASTIC SUBSTRATE

James E. Moore, Mt. Vernon, Ind.; Arnold Factor, and Peter M. Miranda, both of Scotia, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 31, 1987, Ser. No. 140,109
Int. Cl.[4] B32B 27/36; C08G 12/32
U.S. Cl. 428—480 8 Claims

1. A coated article comprising a thermoplastic substrate and a surface coating of a transparent ultraviolet light-resistant polymer comprising the reaction product of a mixture of a melamine compound, a polyol and a UV absorber,

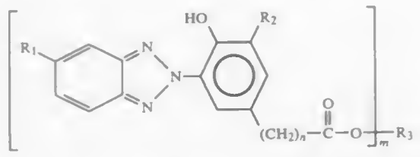
(A) said melamine compound being present at a level of from about 20% to 80% by weight based on the total weight of the mixture exclusive of the UV absorber, said melamine compound having the formula,



wherein the R groups are independently selected from H, $—CH_2OH$, $—CH_2O(CH_2)_xH$, wherein x is an integer from 1 to 4;

(B) said polyol being present at a level of from 80% to 20% by weight based on the total weight of the mixture exclusive of the UV absorber, and

(C) said UV absorber being present in a stabilizing amount, said UV absorber having the formula



wherein R_1 is hydrogen, a halogen, a lower alkyl of from 1 to about 6 carbon atoms or a lower alkoxy of from 1 to about 6 carbon atoms; R_2 is hydrogen, halogen, lower alkyl of from 1 to about 6 carbon atoms, or an arylsulfonyl, wherein the aryl group contains from 6 to about 10 carbon atoms; n is an integer from 1 to about 4, m is 3 and R_3 is a trivalent hydrocarbon radical or lower alkyl ether radical of from 2 to about 22 carbon atoms.

4,913,975

FLAME-RETARDANT ELECTROTHERMAL TRANSFER RECORDING MEDIUM

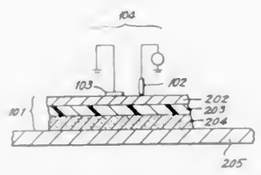
Makoto Taniguchi, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Jan. 28, 1988, Ser. No. 149,324

Claims priority, application Japan, Jan. 29, 1987, 62-19147

Int. Cl.[4] B41M *5/26*

U.S. Cl. 428—480 **13 Claims**



1. An electrothermal transfer recording sheet, comprising:

a support layer;

a current-passing resistance layer integrally bound to the support layer on one surface thereof, said resistance layer including carbon black dispersed evenly therein, and a brominated aromatic compound having at least two aromatic rings; and

an ink layer integrally bound to the opposed surface of the support layer.

4,913,976

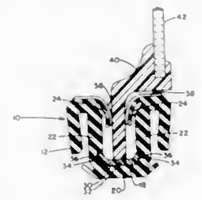
COHESIVE BONDING PROCESS FOR FORMING A LAMINATE OF A WEAR RESISTANT THERMOPLASTIC AND A WEATHER RESISTANT RUBBER

Mark L. Brooks, and Keith E. Wilson, both of Wabash, Ind., assignors to GenCorp Inc., Fairlawn, Ohio

Filed Jan. 25, 1988, Ser. No. 148,247

Int. Cl.[4] B32B *25/08*

U.S. Cl. 428—494 **11 Claims**



1. A wear resistant polymer laminate, comprising: a thermoplastic wear resistant layer having a melting point of less than 350° F. mechanically melt bonded to a cured weather resistant rubber layer along a mutual interior interface, each of said layers being free of adhesive on the surfaces bonded.

4,913,977

LOW TEMPERATURE HEAT SHRINKABLE FILM

Toshio Taka, Fujisawa; Kihachi Shishido, and Takuo Ohkubo, both of Yokohama, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 897,691, Aug. 11, 1986, abandoned. This application Feb. 3, 1989, Ser. No. 306,228

Int. Cl.[4] B32B *27/08*

U.S. Cl. 428—516 **4 Claims**

1. A low temperature heat shrinkable film comprising a plurality of laminated films composed of a linear low density ethylene-C_3–C_{12}-α-olefin copolymer resin having a short branched chain and a density of 0.935 g/cm^3 or less, and whose film properties are such that the haze value is 2.9% or less, the heat shrinkage at 90° C. in the M direction is 30% or more, the heat shrinkage at 90° C. in the T direction is 5% or less, and the shrinkage stress at 90° C. in the M direction is 300 g/mm^2 or more.

4,913,978

METALLIZED TEXTILE WEB AND METHOD OF PRODUCING THE SAME

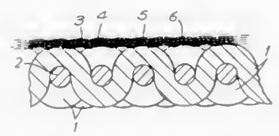
Dietmar Klotz, Biebricher Allee 31, 6200 Wiesbaden, and Alban Puetz, Heligasse 10, 5456 Rheinbrohl, both of Fed. Rep. of Germany

Filed Apr. 8, 1988, Ser. No. 179,383

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1987, 3712192

Int. Cl.[4] B22F *3/00*

U.S. Cl. 428—551 **15 Claims**



1. A metallized textile web comprising a textile web having a web surface; a first polymer adhesive agent layer applied on said web surface of said textile web and composed of a dried latex enriched with powdered quartz, acrylic acid and alkyd resin; a second adhesive agent layer applied on said first adhesive agent layer and composed of a dried water dispersion of powdered quartz and sugar; a first metal layer applied on said second adhesive agent layer and composed of a metal in form of spider-shaped microscopical individual particles; and a second metal layer applied on said first metal layer and composed of the same metal in form of ball-shaped or droplet-shaped microscopic particles.

4,913,979

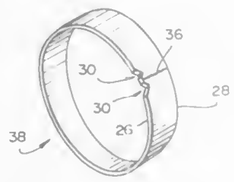
WHEEL TRIM RING

Michael H. Buerger, Hendersonville, Tenn., assignor to Del-Met Corporation, Walton, N.Y.

Division of Ser. No. 152,403, Feb. 4, 1988, Pat. No. 4,825,524. This application Apr. 3, 1989, Ser. No. 332,711

Int. Cl.[4] B60B *7/00*

U.S. Cl. 428—577 **12 Claims**



1. A blank suitable for fabrication into a composite metal wheel trim ring, the blank comprising a substantially rectangular strip of sheet metal, the strip having a pair of parallel opposite ends adapted for mating registration, the blank being adapted for integral welding along a weld seem registered with at least one of the ends, strain relief means for permitting cold forming expansion of the blank without fracture or tear at or adjacent the weld seam, the strain relief means comprising a pair of symmetrically disposed wedge shaped notches cut in at least one longitudinal edge of the blank adjacent each end, the one longitudinal edge being subject to cold forming expansion, each notch extending from the longitudinal edge to a maximum depth adjacent the end and tapering from the maximum depth toward the longitudinal edge.

4,913,980

CORROSION RESISTANT COATINGS

David J. Rowcliffe, Stockholm, Sweden; Ibrahim M. Allam, Dhahran, Saudi Arabia, and Paul J. Jorgensen, Cupertino, Calif., assignors to S R I International, Menlo Park, Calif.

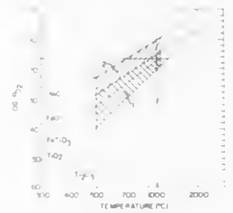
Continuation-in-part of Ser. No. 325,504, Nov. 27, 1981, Pat. No. 4,483,720, and a continuation-in-part of Ser. No. 662,253, Oct. 17, 1984, abandoned, and a continuation-in-part of Ser. No. 662,252, Oct. 17, 1984, abandoned, and a continuation-in-part of Ser. No. 111,210, Oct. 21, 1987. This application Apr. 22, 1988, Ser. No. 185,087

Int. Cl.[4] B32B *15/00*

U.S. Cl. 428—632 **12 Claims**

7. A metal structure which is exposed during use to a corrosive aqueous liquid, such structure comprising a substrate metal forming a major part of the structure and which in use is exposed to and in the absence of a protective coating would be corroded by such liquid, such substrate metal being coated in the area so exposed by a dense, uniform, adherent, non-porous coating, such coating being an oxidized alloy of (1) a metal M_1 which is at least one of the metals titanium, zirconium, tantalum and niobium and (2) a metal M_2 which is more noble than M_1, M_1 and M_2 being selected such that when the coating of alloy is exposed to a high temperature and an atmosphere having a low partial pressure of oxygen it forms a dense, uniform adherent, non-porous coating in which the M_1 metal forms a stable oxide and the M_2 metal does not form a stable oxide, the M_2 metal serving to bond the alloy and its oxidation product to the substrate metal,

said alloy being applied by dipping the substrate metal in the molten alloy or by applying a slurry of particles of the alloy in a volatile liquid and evaporating the liquid and then fusing the particles of alloy,



said coating having been exposed to a high temperature and an atmosphere having a low partial pressure of oxygen whereby the M_1 metal is oxidized and the M_2 metal is unoxidized and serves to bond the coating to the substrate metal.

4,913,981

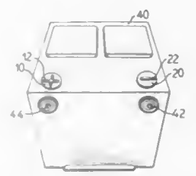
BATTERY MARKERS

David M. Hynes, 1120 West Pratt, No. Chicago, Ill. 60626, and Kenneth P. Mahoney, 1377 Borden Dr., Elgin, Ill. 60120

Filed Jan. 23, 1989, Ser. No. 299,627

Int. Cl.[4] H01M *2/00, 4/36*

U.S. Cl. 429—1 **10 Claims**



1. A device for indicating the polarity of a battery terminal, comprising:

a durable hard plastic disc having an indicating side and an adhering side;

a heat resistant adhesive layer on the adhering side of the disc adapted to affix the marker to the surface of a battery; and

a raised portion on said indicating side of said wafer including a raised indicium of one of a plus sign or a minus sign.

4,913,982

FABRICATION OF A MONOLITHIC SOLID OXIDE FUEL CELL

David M. Kotchick, San Pedro, and Nguyen Q. Minh, Fountain Valley, both of Calif., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 941,492, Dec. 15, 1986, Pat. No. 4,816,036. This application Oct. 19, 1988, Ser. No. 259,672

Int. Cl.[4] H01M *8/12, 8/24*

U.S. Cl. 429—12 **24 Claims**

22. A monolithic green state ceramic assembly comprising:

a core having a plurality of multilayer cells each cell having a cathode layer, an electrolyte layer, an anode layer and an interconnect layer, said plurality of multilayer cells

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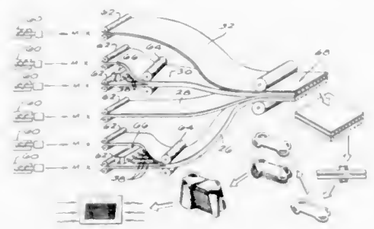
stacked together to form a stacked array, said stacked array being substantially free of voids and open spaces;
a first pair of manifolds located at opposite ends of said core;
a second pair of manifolds located at opposite ends of said core;



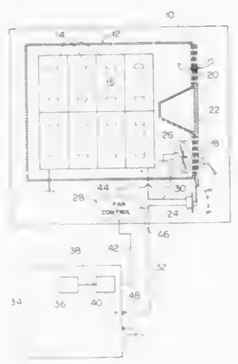
a first plurality of oriented organic fibers disposed within said anode layers or said cells, said first fibers extending from one of said pair of first manifolds through said core to the other of said first manifolds.

4,913,983

METAL-AIR BATTERY POWER SUPPLY

Michael C. Cheiky, Santa Barbara, Calif., assignor to Dreisbach Electromotive, Inc., Santa Barbara, Calif.

Filed Sep. 13, 1988, Ser. No. 243,912
Int. Cl.[4] H01M *8/04*
U.S. Cl. 429—13 **15 Claims**



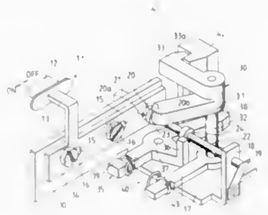
1. A metal-air battery power supply for powering a device, comprising:
an enclosed power supply container, including:
an air inlet for allowing air to flow into the power supply container;
an air outlet for allowing air to flow out of the power supply container;
baffle means for alternately opening and closing the air inlet and the air outlet;
at least one metal-air battery cell located inside the power supply container for generating electrical power, said battery having a low level of residual power when said outlet is closed and the container is depleted of oxygen;
a switch means for controlling the operation of the baffle means;
a fan located near the air inlet that causes air to flow into the power supply container when the air inlet is open and the fan is running said fan being capable of start-up at the low, residual power level of said cell;
fan starting means, in circuit connection with the fan and the switch means, for starting the operation of the fan solely by means of the low residual power in said cell in response to said switch means; and
a first output means, in circuit connection with said battery cell, for outputting electrical power generated by the battery cell.

4,913,984

OPENING/CLOSING DEVICE FOR BATTERY COVER

Hitoshi Shimizu, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1989, Ser. No. 386,478
Claims priority, application Japan, Aug. 23, 1988, 63-208850
Int. Cl.[4] H01M *2/02*
U.S. Cl. 429—97 **3 Claims**



1. A device for opening and closing a cover for a battery, comprising:
a cover opening member for opening said cover;
a power switch manipulator for turning on and off a power switch for the electric power of said battery; and
a safety mechanism for enabling the opening operation of said member only when said manipulator is in the position of turning off said switch, and for preventing movement of said manipulator to a position for turning on said power switch when said cover is open, said safety mechanism being disposed between said member and said manipulator.

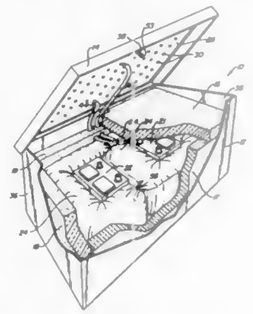
4,913,985

BATTERY TEMPERATURE REGULATION SYSTEM

Stephen C. Baer, Albuquerque, N. Mex., assignor to Zomeworks Corporation, Albuquerque, N. Mex.

Filed Feb. 21, 1989, Ser. No. 313,684
Int. Cl.[4] H01M *10/50*
U.S. Cl. 429—50 **27 Claims**

1. An enclosure for a controlling the ambient temperature of a battery utilizing a quantity of water for thermal transfer and thermal mass, said enclosure comprising:
a housing having a thermally insulated interior defining an internal cavity adapted to contain a battery;
a water container within the cavity in thermal contact with the battery;
a flat radiator with a hollow interior having a nearly horizontal orientation located proximate the housing above the level of the water container; and
warm supply and cold return conduits extending from the hollow interior of the radiator to the interior of the water container, the cold return conduit extending to a position within the water container relatively below the position to which the warm supply conduit extends so that water occupying the water container, the conduits and the hollow interior of the radiator circulates upwardly through the warm supply conduit, through the radiator and downwardly through the cold return conduit when the temperature of the water is above about 45 degrees Fahrenheit and the temperature of the radiator is less than the temperature of the water in the water container, and circulation of the water ceases below a water temperature of about 45 degrees Fahrenheit and when the temperature of the radiator is greater than the temperature of the water in the water container.

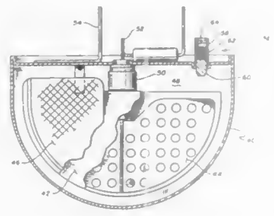


4,913,986

BATTERY FILL-POST SEAL ARRANGEMENT FOR HERMETICITY LEAKAGE TESTING

William G. Howard, St. Paul, and David R. Berberick, Maple Grove, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 537,256, Sep. 28, 1983, abandoned. This application May 5, 1986, Ser. No. 859,925
Int. Cl.[4] H01M *10/48*
U.S. Cl. 429—90 **3 Claims**



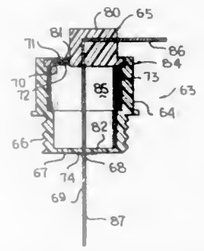
1. An inner and outer seal arrangement for facilitating the leak testing of hermetically sealed fill openings in battery containers, comprising:
a fill opening in the battery container through which battery contents may be inserted and for receiving the seal arrangement which comprises;
upstanding housing means forming a chamber about the opening, the housing having an open top;
inner seal means closing the battery interior and its contents off from the container opening and the housing chamber, the seal means consisting of a plastic plug press-fit into the container opening;
outer hermetic seal means spaced from the inner seal means and hermetically closing the open top of the housing and consisting of a metal cap welded to the housing, and
test gas holding means comprising graphite in the housing chamber between the inner and outer seals.

4,913,987

UNIVERSAL ELECTROLYTE LEVEL INDICATOR FOR WET CELL BATTERIES

Donald P. Dattilo, 2302 Taylorsville Rd., Louisville, Ky. 40205

Filed Sep. 20, 1988, Ser. No. 246,786
Int. Cl.[4] H01M *10/48*
U.S. Cl. 429—92 **12 Claims**



1. An indicator, for use with a battery sensor, that provides an indication when a parameter monitored by said battery sensor has achieved at least a threshold state, said indicator comprising:
(a) input means for detecting the presence or absence of a signal from said battery sensor, wherein said input means provides an appropriate trigger signal when said parameter monitored by said battery sensor achieves at least said threshold state;
(b) first oscillator means responsive to said trigger signal for providing an output from said oscillator having a first frequency;
(c) second oscillator means responsive to said first oscillator output signal for providing a second oscillator output signal having a second frequency with said second frequency being different from said first frequency; and
(d) output means responsive to said second oscillator output signal for providing an indication of when said parameter has achieved at least said threshold state.

4,913,988

Li_2CO_3-$CA(OH)_2$ ADDITIVE FOR CATHODES IN NONAQUEOUS CELLS

Richard A. Langan, Parma, Ohio, assignor to Eveready Battery Company, Inc., St. Louis, Mo.

Filed Jun. 11, 1987, Ser. No. 61,185
Int. Cl.[4] H01M *6/14*
U.S. Cl. 429—194 **11 Claims**

1. A nonaqueous cell comprising an active metal anode, a nonaqueous electrolyte solution comprising a solute dissolved in at least one organic solvent, and a solid cathode comprising an active cathode material, wherein the improvement comprises:
said cathode containing a minor amount of both lithium carbonate and calcium hydroxide.

4,913,989

POSITIVE COLLECTOR ELECTRODE FOR BATTERIES WITH ALKALINE ELECTROLYTES

Oskar Glemser; Dieter H. Buss, both of Gottingen; Jürgen Baner, Hildesheim, and Helga Low, Vorstetten, all of Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Fed. Rep. of Germany

Filed Apr. 7, 1989, Ser. No. 334,916
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1988, 3811717
Int. Cl.[4] H01M *4/48*
U.S. Cl. 429—218 **9 Claims**

1. A positive collector electrode for batteries with alkaline

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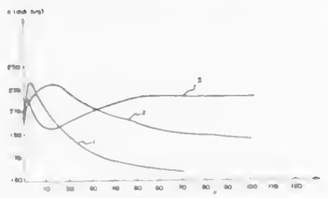
electrolytes which provides for better current efficiency and capacity utilization by being immune to the harmful effects of iron contamination, which comprises an active paste which in the uncharged state is a double hydroxide of the general formula



$$M^{2+}{}_{(1-x)}Fe^{3+}{}_{(x)}(OH)_2]^{x+}[(x/n)X^{n-}, yH_2O]^{x-}$$

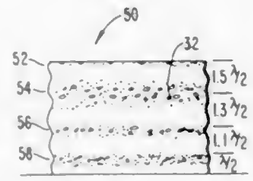
in which the transient parameter x can assume values between 0.05 and 0.4, M^{2+} is an oxidizable and reducible cation, and X^{n-} is an anion formed at least partly by PO_4^{3-} or HPO_4^{2-}.

4,913,990

METHOD OF TUNING A VOLUME PHASE RECORDING

Richard D. Rallison, Box 142, 8901 S. 400 West, Paradise, Utah 84328

Filed Oct. 20, 1987, Ser. No. 110,459
Int. Cl.[4] G03C 5/39
U.S. Cl. 430—30 7 Claims



1. A method of processing a recording medium having a porous structure, comprising the steps of:
(a) applying a solvent and resin mixture solution to the recording medium;
(b) allowing the mixture solution to migrate into the recording medium without filling the structure; and
(c) setting the resin after a desired change in the recording medium is detected and removing the solvent.

4,913,991

ELECTROPHOTOGRAPHIC PROCESS USING FLUORINE RESIN COATED HEAT APPLICATION ROLLER

Shunichi Chiba, Numazu; Satoru Inoue, Mishima; Akio Matsui, Numazu, and Yoshihiro Okamoto, Fuji, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 15, 1988, Ser. No. 181,978
Claims priority, application Japan, Apr. 17, 1987, 62-093139; May 28, 1987, 62-129825
Int. Cl.[4] G03G 13/01, 13/20
U.S. Cl. 430—45 3 Claims

1. An electrophotographic process for producing color copies comprising the steps of: forming latent electrostatic images on a photoconductive material, developing said latent electrostatic images with a toner to toner images, transferring said toner images to a recording sheet, fixing said toner images to said recording sheet by causing said toner image bearing recording sheet to pass between a heat application roller coated with a fluorine-containing resin and a pressure application roller for applying pressure to said toner images for fixing said toner images to said recording sheet, in which the rheological characteristics of said toner are such that the loss tangent (tan δ), which is a ratio of a loss modulus (G'') to a storage modulus (G') of said toner, is in the range of 1.70 to 3.00 when the storage modulus (G') is 10^5 dynes/cm^2, namely

$$1.70 \leqq \tan\delta \leqq 3.00$$

where

$$\tan\delta = \frac{\text{Loss Modulus } (G'')}{\text{Storage Modulus } (G')}$$

4,913,992

METHOD OF IMPROVING A MULTI-COLOR ELECTROPHOTOGRAPHIC IMAGE BY BUFFING AN IMAGE TONED WITH AN IMPROVED TONER

Lawrence C. Stoda, Webster; Kenneth E. Rook, Rochester; Domenic Santilli, Webster, and Dennis R. Kamp, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 26, 1989, Ser. No. 358,101
Int. Cl.[4] G03G 13/10
U.S. Cl. 430—45 4 Claims

1. In a method for producing a multi-stage electrophotographic image comprising the steps of providing and electrophotographic medium on a carrier therefor, translating the carrier and medium together over a predetermined path, charging the medium, exposing the medium to a first light-borne image, developing the image bearing charged region of the medium to produce a first visible image, and returning the carrier to the first position to repeat the foregoing steps of charging said medium, exposing it to a second light-borne image and developing said second image with a second toning element to produce a second visible image wherein at least one of said images is a cyan image, the improvement comprising the steps of:
developing said cyan image with a self-fixing, liquid electrographic developer comprising a volatile, electrically insulating liquid carrier and, dispersed in said carrier,
(i) toner particles comprising a polymeric binder, cyan pigment and a dispersing agent and
(ii) wax particles, and
buffing the surface of said cyan image with a relatively coarse, stiff, and rough fibrous brush member to prevent unwanted small toner particles from adhering to said cyan image.

4,913,993

PHOTOSENSITIVE MEMBER COMPOSED OF CHARGE TRANSPORTING LAYER AND CHARGE GENERATING LAYER

Izumi Osawa, Ikeda; Shuji Iino, Hirakata; Hideo Hotomi, Suita, and Mitsutoshi Nakamura, Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 27,892, Mar. 19, 1987, abandoned. This application Feb. 13, 1989, Ser. No. 309,934
Claims priority, application Japan, Mar. 20, 1986, 61-63742
Int. Cl.[4] G03G 5/14
U.S. Cl. 430—58 7 Claims

1. A photosensitive member comprising:
an electrically conductive substrate;
a charge generating layer; and
a charge transporting layer for retaining and transporting charges, said charge transporting layer having a thickness of from about 5 to about 50 microns and comprising a plasma-polymerized layer of amorphous material comprising hydrogen and carbon atoms, said carbon atoms consti-

tuting methyl groups in a ratio of from about 20 to about 60% based on the amount of all carbon atoms.

4,913,994

PHOTOSENSITIVE MEMBER COMPOSED OF CHARGE TRANSPORTING LAYER AND CHARGE GENERATING LAYER

Izumi Osawa, Ikeda; Shuji Iino, Hirakata; Hideo Hotomi, Suita, and Mitsutoshi Nakamura, Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 27,867, Mar. 19, 1987, abandoned. This application Feb. 13, 1989, Ser. No. 309,989
Claims priority, application Japan, Mar. 20, 1986, 61-63745
Int. Cl.[4] G03G 5/14
U.S. Cl. 430—58 8 Claims

1. A photosensitive member comprising:
an electrically conductive substrate;
a charge generating layer; and
a charge transporting layer for retaining and transporting charges, said charge transporting layer having a thickness of from about 5 to about 50 microns and comprising a plasma-polymerized layer of an amorphous material comprising hydrogen and carbon atoms, said carbon atoms constituting methyl group and methylene group in a ratio of the former to the latter being 0.5:1 to 3:1.

4,913,995

AMORPHOUS SILICON ELECTROPHOTOGRAPHIC PHOTORECEPTOR WITH AN INTERMEDIATE GRADIENT LAYER AND ITS METHOD OF PREPARATION

Dong-zhi Chi, and Ru-guang Cheng, both of Shanghai, China, assignors to Guo Jing Kun, Shanghai Institute of Ceramics, Shanghai, China

Filed Dec. 13, 1988, Ser. No. 283,922
Claims priority, application China, Dec. 14, 1987, 87101140.9
Int. Cl.[4] G03G 5/14
U.S. Cl. 430—58 15 Claims

1. A function separation type photoreceptor comprising
(1) metal substrate (105),
(2) a thin transport layer (104) deposited on the surface of said metal substrate (105), having large optical gap Eopt≧2.1 ev and conductivity activation energy Ea≧0.85 ev,
(3) a thin intermediate gradient layer (103) deposited on the surface of said transport layer (104), wherein the ratio of N/Si or C/Si varying from that of transport layer (104) to zero, and
(4) a thin photosensitive layer of a—Si:H (102) slightly doped with boron, having an optical gap Eopt = 1.6–1.8 ev and conductivity activation energy Ea≧0.75 ev, deposited on the surface of said intermediate gradient layer (103).

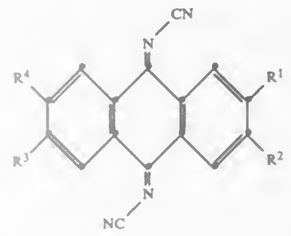
4,913,996

ELECTROPHOTOGRAPHIC ELEMENTS CONTAINING CERTAIN ANTHRAQUINONE DERIVATIVES AS ELECTRON-TRANSPORT AGENTS

Teh-Ming Kung, Rochester; William B. Vreeland, Webster, and Ralph H. Young, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 21, 1988, Ser. No. 287,949
Int. Cl.[4] G03G 5/10
U.S. Cl. 430—59 3 Claims

1. In an electrophotographic element containing an electron-transport agent, the improvement wherein the electron-transport agent comprises a chemical compound having the structure



wherein:
one of R^1, R^2, R^3, and R^4 is acyclic alkyl having 2 to 10 carbon atoms or —$COOR^5$;
another one of R^1, R^2, R^3, and R^4 is H, acyclic alkyl having 1 to 10 carbon atoms, or —$COOR^5$;
the remaining two of R^1, R^2, R^3, and R^4 are each H; and
R^5 is alkyl having 1 to 10 carbon atoms.

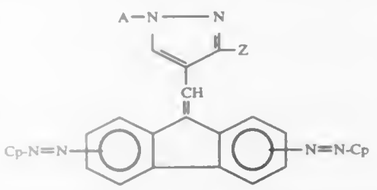
4,913,997

DISAZO ELECTROPHOTOGRAPHIC PHOTORECEPTOR

Kazuhiro Emoto, and Koze Haino, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Jan. 12, 1989, Ser. No. 296,129
Claims priority, application Japan, Dec. 2, 1988, 63-306634
Int. Cl.[4] G03G 5/06
U.S. Cl. 430—76 3 Claims

1. An electrophotographic photoreceptor which comprises an electroconductive support and, provided thereon, a photosensitive layer containing an azo pigment represented by the formula [I]:



[I]

wherein A represents an aryl group, a heterocyclic group or an alkyl group, Z represents a hydrogen atom, —B or —CH=CH—B wherein B represents an aryl group, a heterocyclic group or an alkyl group and Cp represents a coupler residue.

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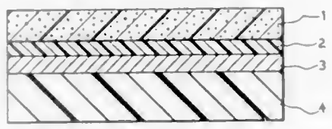
SILVER-BASED ELECTROSTATIC PRINTING MASTER

Allan Cairncross, Hockessin, and Catherine T. Chang, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 196,803, May 16, 1988, Pat. No. 4,868,081, which is a continuation-in-part of Ser. No. 859,114, May 2, 1986, abandoned. This application Dec. 30, 1988, Ser. No. 267,407

Int. Cl.[4] G03G *5/026*; G03C *1/30, 1/94*

U.S. Cl. 430—96 39 Claims



1. A photosensitive element suited for aqueous processing consisting essentially of a silver halide photographic salt dispersed in a synthetic insulating polymeric binder that is swellable in aqueous solutions having a pH higher than approximately 8½, said binder being prepared by crosslinking:

(a) a copolymer of an aromatic monomer and an unsaturated carboxylic acid, said copolymer having ionizing carboxylic acid groups, with.

(b) approximately 1 to 30% by weight, based on said copolymer weight, of a polyfunctional epoxide or aziridine crosslinking agent,

said element having an insulation value such that it will support an apparent macroscopic electric field of at least approximately five (5) volts/micron as measured 2 seconds following full charging of its surface that has been allowed to equilibrate at 50% relative humidity at 20° C. for 1 hour.

4,913,999

LIGHT-SENSITIVE MATERIAL COMPRISING LIGHT-SENSITIVE LAYER PROVIDED ON SUPPORT WHERE LAYER HAS SPECIFIED PH

Shigehisa Tamagawa, Shizuoka, and Masayuki Kuroishi, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 29, 1988, Ser. No. 150,279

Claims priority, application Japan, Jan. 29, 1987, 62-19460

The portion of the term of this patent subsequent to Aug. 10, 2006, has been disclaimed.

Int. Cl.[4] G03C *1/06, 1/76*

U.S. Cl. 430—138 10 Claims

1. A light-sensitive material comprising a light-sensitive layer containing silver halide, a reducing agent and an ethylenically unsaturated polymerizable compound provided on a paper support, wherein said silver halide and polymerizable compound are contained in microcapsules which are dispersed in the light-sensitive layer, the light-sensitive layer has a pH value of not higher than 7, and the paper support comprises a coating layer containing a hdyrophobic polymer and a pigment provided on a base paper sheet, said coating layer having a pH value in the range of 4 to 9.

4,914,000

THREE DIMENSIONAL REPRODUCTION MATERIAL DIAZONIUM CONDENSATES AND USE IN LIGHT SENSITIVE

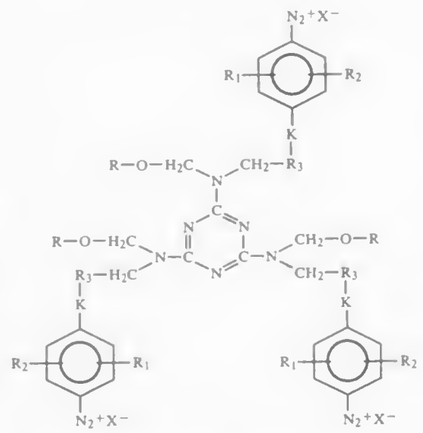
Major S. Dhillon, Belle Mead, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Feb. 3, 1988, Ser. No. 151,813

Int. Cl.[4] G03C *1/54*; C07C *113/04*

U.S. Cl. 430—157 21 Claims

1. A light-sensitive compound having the formula: wherein



R_3 is selected from the group consisting of phenyl and C_1 to C_4 alkyl substituted phenyl.

—K—is selected from the group consisting of —S—, —O—, and —CH_2—, or is absent;

R_1 and R_2 are independently selected from the group consisting of C_1 to C_4 alkyl, methoxy, ethoxy, butoxy, and H;

X—is an anion; and

R denotes a C_1 to C_4 alkoxy group.

9. A photographic element which comprises a substrate, and a light-sensitive composition disposed on said substrate, said light-sensitive composition comprising a compound having the formula: wherein

R_3 is selected from the group consisting of phenyl and C_1 to C_4 alkyl substituted phenyl.

—K—is selected from the group consisting of —S—, —o—, and —CH_2—, or is absent;

R_1 and R_2 are independently selected from the group consisting of C_1 to C_4 alkyl, methoxy, ethoxy, butoxy, and H;

X—is an anion; and

R denotes a C_1 to C_4 alkyl group.

4,914,001

OPTICAL INFORMATION RECORDING MEDIUM

Yoshio Inagaki; Masayoshi Tsuboi, and Yoshiaki Suzuki, all of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 19, 1987, Ser. No. 109,394

Claims priority, application Japan, Oct. 20, 1986, 61-248978; Nov. 12, 1986, 61-268821

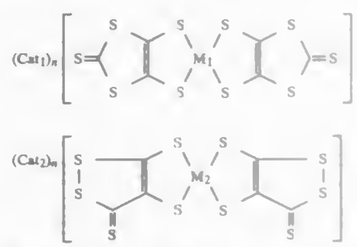
The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.

Int. Cl.[4] G11B *7/24*; G03C *5/16*; G01D *9/00*; B41M *5/26*

U.S. Cl. 430—270 18 Claims

1. An optical recording medium capable of being written upon by a laser which causes changes in the absorption of a recording layer, or which is capable of being read by a laser, comprising a support having thereon said recording layer

comprising a dye and at least one quencher compound represented by formula (I) or (II)



(I)

(II)

wherein (Cat_1) and (Cat_2) respectively represent a cation necessary for making the compound neutral, M_1 and M_2 respectively represent nickel, copper, cobalt, palladium or platinum, and n represents 1 or 2.

4,914,002

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Nobuaki Inone; Hiroshi Okada; Shigeo Hirano; Kunitaka Kameoka; Tetsuo Yoshida, and Mario Yagihara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 4, 1988, Ser. No. 267,469

Claims priority, application Japan, Nov. 4, 1987, 62-278692; Dec. 4, 1987, 62-307134

Int. Cl.[4] G03C *1/06*

U.S. Cl. 430—264 20 Claims

1. A silver halide negative photographic material comprising a support having thereon at least one silver halide emulsion layer, at least one hydrophilic colloidal layer thereof comprising:

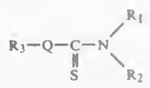
(1) a hydrazine derivative;

(2) a compound having no substantial absorption maximum in the visible light region represented by formula (I):

(I)

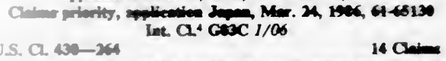
wherein Z^{11} and Z^{12}, which may be the same or different, each represents a non-metallic atomic group necessary for forming a substituted or unsubstituted heterocyclic ring selected from benzoxazole, benzothiazole, benzoselenazole, naphthoxazole, naphthothiazole, naphthoselenazole, thiazole, thiazoline, oxazole, selenazole, selenazoline, pyridine, benzimidazole and quinoline; R^{11} and R^{12}, which may be the same or different, each represents a substituted or unsubstituted alkyl group or a substituted or unsubstituted aralkyl group, provided that at least one of R^{11} and R^{12} is substituted with an acid group; X represents a counter ion necessary for charge balance; and a is 0 or 1; and

(3) at least one compound represented by formula (II) or (III):



(II)

wherein R_1 and R_2, which may be the same or different, each represents hydrogen, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted heterocyclic group or an amino group; R_3 represents hydrogen, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group or a substituted or unsubstituted heterocyclic group; and Q represents a single bond or a divalent group selected from sulfur, selenium, oxygen, a disulfide group,



wherein R_4 has the same definition as R_3; provided that R_1 and R_2, R_1 and R_3, or R_3 and R_4 may be linked to form a substituted or unsubstituted 5-membered or 6-membered heterocyclic ring; further provided at least one of R_2 and R_4 represents a group other than hydrogen when R_1 and R_3 are linked to form a heterocyclic ring, and said heterocyclic ring formed by R_1 and R_3 is a ring other than a rhodanine ring; and

(III)

wherein R_{21}, R_{22}, R_{23}, and R_{24}, which may be the same or different, each represents hydrogen, a hydroxyl group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, a halogen atom, a primary amino group, a secondary amino group, a tertiary amino group, a carbonamido group, a sulfonamido group, an alkyl group, an aryl group, a 5-membered or 6-membered heterocyclic group containing at least one hetero atom selected from nitrogen, oxygen and sulfur, a formyl group, a keto group, a sulfo group, a carboxyl group, an alkylsulfonyl group or an arylsulfonyl group; provided that at least one of R_{21}, R_{22}, R_{23}, and R_{24} represents a group other than hydrogen when the compound represented by formula (III) is 1,4-dihydroxybenzene, said at least one compound of the formula (II) and the formula (III) being incorporated in said layer containing said hydrazine compound.

4,914,003

SILVER HALIDE PHOTOGRAPHIC MATERIAL AND PROCESS FOR THE FORMATION OF IMAGE USING SAME

Mario Yagihara, and Nobuaki Inone, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 29,510, Mar. 24, 1987, abandoned. This application Dec. 27, 1988, Ser. No. 291,391

Claims priority, application Japan, Mar. 24, 1986, 61-65130

Int. Cl.[4] G03C *1/06*

U.S. Cl. 430—264 14 Claims

1. A silver halide photographic material comprising at least one light-sensitive silver halide emulsion layer provided on a support and containing at least one hydrazine compound and at least one amine compound of the general formula (I) in said emulsion layer or at least one of other constituting layers, wherein said hydrazine compound and said amine compound can be present in the same or different layers:

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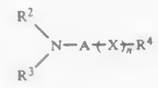


(I)

wherein R^2 and R^3, which can be the same or different, each represents a substituted or unsubstituted alkyl group or R^2 and R^3 may be linked to each other to form a ring; R^4 represents a substituted or unsubstituted alkyl, aryl or heterocyclic group; A represents a divalent linkage group; X represents —$CONR^5$—, —$OCONR^5$—, —NR^5CONR^5—, —NR^5COO—, —COO—, —OCO—, —CO—, —NR^5CO—, —SO_2NR^5—, —NR^5SO_2—, —SO_2—, —S— or —O— group, in which R^5 represents a hydrogen atom or a lower alkyl group having 1 to 5 carbon atoms; and n represents an integer of 0 or 1, with the proviso that the total number of carbon atoms contained in R^2, R^3, R^4 and A is 20 or more.

4,914,004

TWO-LAYER SYSTEM

Manfred Köhler, Darmstadt; Elke Poetsch, Mühltal; Jörg Ohngemach, Reinheim; Dieter Dorsch, Darmstadt; Rudolf Eidenschink, Mühltal, all of Fed. Rep. of Germany, and Gerhard Greber, Bad Vöslau, Austria, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Aug. 28, 1987, Ser. No. 90,283

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1986, 3629543; Jan. 31, 1987, 3702897

Int. Cl.[4] G03C *1/76, 1/68*

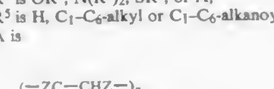
U.S. Cl. 430—272 **5 Claims**

1. In a radiation-curable two-layer system comprising a layer containing polymerization photoinitiator and applied to a substrate, and a second layer containing photopolymerizable compounds superposed on said first layer, the improvement wherein said photoinitiator is immobilized on a macrostructure and attached to a polymer matrix by a covalent bond and wherein said photoinitiator is of the formula

Ar—CO—R

wherein
Ar is

R is Ar or $CR^2R^3R^4$,
R^1 is H, halogen, C_1–C_{12}-alkyl, C_1–C_{12}-alkoxy, C_1–C_{12}-alkylthio or A,
R^2 and R^3 independently of one another are each H, C_1–C_6-alkyl or phenyl, or one of R^2 and R^3 is C_1–C_6-alkylene-O-A, or R^2 and R^3 together are C_2–C_6-alkylene or C_1–C_6-oxaalkylene,
R^4 is OR^5, $N(R^5)_2$, SR^5, or A,
R^5 is H, C_1–C_6-alkyl or C_1–C_6-alkanoyl,
A is



X is O, NH OR (C_1–C_6-alkyl)—N,
Y is O, N or S,
Z is in each case independently of one another H or CH_3,
m is 0 to 4 and
n is 2 to 10^6,
subject to the proviso that said initiator contains at least one radical of the formula A.

4. A radiation-curable two-layer system according to claim 1, wherein said substrate is metal or glass.

4,914,005

PHOTOGRAPHIC ELEMENT CONTAINING A CYAN DYE FORMING COUPLER

Philip T. S. Lau; Ping W. Tang, and Stanley W. Cowan, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 56,194, Jun. 1, 1987. This application Aug. 11, 1989, Ser. No. 392,756

Int. Cl.[4] G03C *7/34, 5/44*

U.S. Cl. 430—377 **8 Claims**

1. A photographic element comprising a radiation sensitive silver halide emulsion, a cyan dye forming coupler, and a latex polymer which is free of repeating units containing coupler moieties, the polymer comprising recurring units derived from a monomer represented by formula (I), below and up to 20% by weight of an ionomer represented by formula (II), below:

(I)

wherein
m=1 to 4, and
n=1 to 10;

(II)

wherein
m=1 to 4,
n'=0 to 10,
X, when n'=0, represents —OH, and
X, when n'=1 to 10, represents —CO_2H, —SO_3H, —O—$PO(OH)_2$ or a metal salt of —CO_2H, —SO_3H, —O—$PO(OH)_2$.

6. In a process of bleaching silver from a photographic element having associated therewith image dye derived from a cyan dye forming coupler, the improvement comprising bleaching in the presence of a latex polymer which is free of repeating units containing coupler moieties, the polymer comprising recurring units derived from a monomer represented by formula (I), and up to 20% by weight of an ionomer represented by formula (II), below:

(I)

wherein
m=1 to 4, and
n=1 to 10;

(II)

wherein
m=1 to 4,
n'=0 to 10,
X, when n'=0, represents —OH, and
X, when n'=1 to 10, represents —CO_2H, —SO_3H, —O—$PO(OH)_2$ or a metal salt of —CO_2H, —SO_3H, —O—$PO(OH)_2$.

4,914,006

POSITIVE RESIST QUATERNARY AMMONIUM HYDROXIDE CONTAINING DEVELOPER WITH CATIONIC AND NONIONIC SURFACTANT

Tiharu Kato, Yokohama; Saito Kazuyuki, Kawasaki; Norio Ishikawa, Souka, and Kiyoto Mori, Kasukabe, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Kanto Chemical Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 813,238, Dec. 24, 1985, abandoned. This application Apr. 4, 1988, Ser. No. 178,848

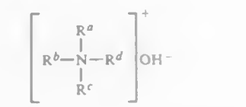
Claims priority, application Japan, Dec. 25, 1984, 59-278443

Int. Cl.[4] G03C *5/24, 5/34*

U.S. Cl. 430—331 **2 Claims**

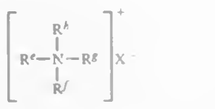
1. A positive resist developer comprising an aqueous solution containing:

a quaternary ammonium hydroxide acting as an active developing agent in an amount sufficient to develop a positive resist, wherein said quarternary ammonium hydroxide is represented by the general formula:

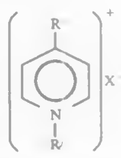


wherein R^a and R^c are respectively alkyl groups each having 1 to 4 carbon atoms, and R^d is an alkyl group having 1 to 4 carbon atoms or a hydroxyalkyl group having 1 to 3 carbon atoms;

a cationic surfactant in an amount sufficient to suppress dissolution of a non-exposed portion of the positive resist, wherein said cationic surfactant is represented by the following general formula:



wherein R^e is an alkyl group having 8 to 18 carbon atoms, R^f and R^h are respectively alkyl groups each having 1 to 4 carbon atoms, R^g is an alkyl group having 1 to 4 carbon atoms or a hydroxyalkyl group having 1 to 4 carbon atoms, and X is a halogen atom, or by the general formula:

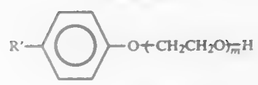


wherein R^i is an alkyl group having 12 to 16 carbon atoms, R^j is a hydrogen atom or methyl group, and X is halogen atom; and

a water-soluble nonionic surfactant in an amount sufficient to prevent trailing of the positive resist and roughening of a resulting resist pattern during development thereof, wherein said nonionic surfactant is selected from the group consisting of polyoxyethylene ethers and esters of fatty acids of polyhydric alcohols of the following general formulas:

$RO\text{-}(CH_2CH_2O)_m\text{-}H$

-continued



$R''\text{—}COO\text{-}(CH_2CH_2O)_n\text{-}H$

wherein R and R'' are respectively alkyl groups each having 12 to 18 carbon atoms, R' is an alkyl group having 8 or 9 carbon atoms, and m and n are the numbers of the respective repeating units.

4,914,007

IMAGE FORMING PROCESS COMPRISING CONTROLLING THE SWELLING DEGREE OF THE PHOTOGRAPHIC MATERIAL

Yoshihiro Fujita, and Takatoshi Ishikawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 927,490, Nov. 6, 1986, abandoned. This application Nov. 7, 1988, Ser. No. 268,610

Claims priority, application Japan, Nov. 6, 1985, 60-247223; Apr. 18, 1986, 61-89512; Jul. 31, 1986, 61-178886

Int. Cl.[4] G03C *1/30, 1/76, 7/32*

U.S. Cl. 430—372 **13 Claims**

1. An image forming process which comprises, in the photographic processing of a silver halide color photographic material containing cyan, magenta and yellow dye forming couplers, processing the color photographic material in a continuous manner with a color developer containing a p-phenylenediamine-based color developing agent for a color developer processing time of 30 seconds to 2 minutes, said color photographic material having a swelling degree of the photographic layer(s) of from 2.0 to 3.5 in the water washing step for a total water washing processing time of from 30 to 90 seconds.

4,914,008

PROCESSING METHOD OF LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Masayuki Kurematsu, and Shigeharu Koboshi, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 173,030, Mar. 22, 1988, abandoned, which is a continuation of Ser. No. 854,187, Apr. 21, 1986, abandoned. This application Dec. 8, 1988, Ser. No. 283,006

Claims priority, application Japan, Apr. 25, 1985, 60-89997; May 16, 1985, 60-105217

Int. Cl.[4] G03C *7/40, 7/34, 5/39*

U.S. Cl. 430—372 **14 Claims**

1. A processing method of a light-sensitive silver halide color photographic material which comprises, in a method of processing a light-sensitive silver halide color photographic material with a bleach-fixing solution after color developing, and thereafter treating said photographic material with a stabilizing solution substituted for water washing, said bleach-fixing solution containing as main components an organic acid ferric complex salt of which the molecular weight of a free acid being not more than 280, a thiosulfate and a sulfite, and a processing time with said stabilizing solution substituted for water washing of 2 minutes or shorter, the added amount of stabilizing solution added to the stabilizing bath being in the range of 1 to 50 fold based on the amount brought from a prebath per unit area of the light sensitive material to be processed.

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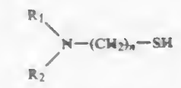
4,914,009

PROCESS FOR FORMING DIRECT POSITIVE COLOR IMAGE COMPRISING THE USE OF BLEACH ACCELERATORS

Shinji Ueda; Tetsuo Hoki, and Noriyuki Inoue, all of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

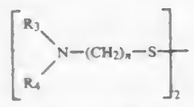
Filed Jan. 26, 1987, Ser. No. 66,615
Claims priority, application Japan, Jan. 30, 1986, 61-153902
Int. Cl.[4] G03C *7/02, 7/42*
U.S. Cl. 430—378 **6 Claims**

1. A process for forming a direct positive color image comprising (i) exposing a photosensitive material comprising, on a support, at least one photographic emulsion layer containing previously unfogged internal latent image-type silver halide grains and a color image-forming coupler, (ii) color-developing the material with a color developer having a pH of 11.5 or lower in the presence of a nucleating agent, and then (iii) processing the material with a processing solution having a bleaching effect, wherein said process a bleaching accelerator is incorporated into a bath containing the processing solution having the bleaching effect, or into a pre-processing bath, or said bleaching accelerator is incorporated into the photosensitive material, and wherein the bleaching accelerator is a compound selected from those represented by the following general formulae:



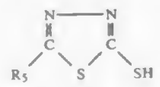
(I)

wherein R_1 and R_2 may be the same or different and each represents a hydrogen atom or a substituted or unsubstituted lower alkyl group or acyl group and n represents an integer of 1 to 3 and R_1 and R_2 may be combined to form a ring,

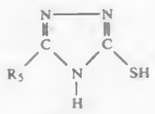


(II)

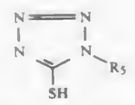
wherein R_3 and R_4 have the same meanings as those of R_1 and R_2 in general formula (I), n represents an integer of 1 to 3, and R_3 and R_4 may be combined to form a ring,



(III)

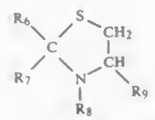


(IV)



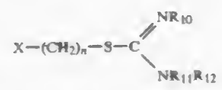
(V)

wherein R_5 represents a hydrogen atom, halogen atom, amino group, substituted or unsubstituted alkyl group, or amino group having an alkyl group,



(VI)

wherein R_6 and R_7 may be the same or different and each represents a hydrogen atom, substituted or unsubstituted alkyl group, substituted or unsubstituted phenyl group, or substituted or unsubstituted heterocyclic group, R_8 represents a hydrogen atom or a substituted or unsubstituted lower alkyl group, and R_9 represents a hydrogen atom or carboxyl group, and



(VII)

wherein R_{10}, R_{11} and R_{12} may be the same or different and each represents a hydrogen atom or lower alkyl group, R_{10} and R_{11} or R_{12} may be combined to form a ring, and X represents a substituted or unsubstituted amino group, sulfonic acid group or carboxyl group.

4,914,010

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Yasuhito Mamoki, Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 279,224, Nov. 28, 1988, abandoned, which is a continuation of Ser. No. 892,964, Aug. 4, 1986, abandoned. This application Jul. 31, 1989, Ser. No. 396,775
Claims priority, application Japan, Aug. 5, 1985, 60-172018
Int. Cl.[4] G03C *5/30, 1/02*
U.S. Cl. 430—399 **8 Claims**

1. A process for forming a color image which comprises developing at a temperature of 30° C. or more,

an image-wise exposed silver halide color photographic material comprising a support having thereon at least one silver halide photographic emulsion, wherein said silver halide photographic emulsion comprises silver halide grains in which tubular grains are present so as to account for at least 50% of the total projected area of all grains present, said tubular grains having an average aspect ratio of not less than 5, and the halide composition of the silver halide being from 96 to 98 mole % bromide, no iodide and the remainder chloride,

with a color developing solution, wherein the content of KBr in the initial developing solution is adjusted to 1.0 g/l or more, and the amount of replenisher added to the developing solution is reduced to 50 to 60 vol % of the replenishing amount in standard processing, and then bleaching and fixing, or bleach-fixing.

4,914,011

PROCESS FOR FORMING ANTI-HALATION LAYERS OF POLYESTER PHOTOGRAPHIC FILM SUPPORTS

William R. Gross, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 21, 1988, Ser. No. 274,157
Int. Cl.[4] G03C *5/24*
U.S. Cl. 430—422 **10 Claims**

1. A process for forming an anti-halation layer on the surface of a polyester photographic film support, said process comprising the steps of:

(1) subjecting said surface to an activation treatment;

(2) coating said activated surface with a composition comprising an anti-halation agent and an alkali-soluble polymeric binder dispersed in a liquid organic medium; and

(3) drying said coating to thereby form an anti-halation layer which is strongly adherent to said polyester film support yet is readily removable by an alkaline photographic processing solution.

4,914,012

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Masayoshi Kawai, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 28, 1988, Ser. No. 291,023
Claims priority, application Japan, Dec. 28, 1987, 62-335570
Int. Cl.[4] G03C *1/76*
U.S. Cl. 430—536 **8 Claims**

1. A silver halide photographic light-sensitive material comprising a support having thereon at least two hydrophilic colloid layers, wherein at least one of said layers is a photosensitive silver halide emulsion layer, and at least one of said layers contains a composite polymer latex comprising polymeric acrylic acid ester and/or polymeric methacrylic acid ester and colloidal silica.

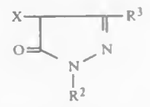
4,914,013

SILVER HALIDE LIGHT-SENSITIVE COLOR PHOTOGRAPHIC MATERIAL

Satoru Ikesu, and Noboru Mizukura, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

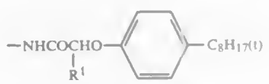
Filed Mar. 2, 1989, Ser. No. 317,935
Claims priority, application Japan, Mar. 25, 1988, 63-71264
Int. Cl.[4] G03C *7/38*
U.S. Cl. 430—555 **8 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer containing a magenta coupler represented by the following Formula M-1;



Formula M-1

wherein R^2 and R^3 are each a substituent, provided that at least one of which has a group represented by the following Formula I; and X is a hydrogen atom or a group capable of being split off upon reaction with the oxidation product of a color developing agent,



Formula I

wherein R^1 is a hydrogen atom or a normal or branched alkyl group having 1 to 20 carbon atoms.

4,914,014

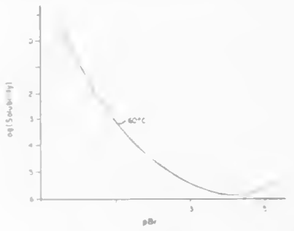
NUCLEATION OF TABULAR GRAIN EMULSIONS AT HIGH PBR

Richard L. Daubendiek; Timothy R. Gersey, and Gary S. Proehl, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 30, 1988, Ser. No. 214,267
Int. Cl.[4] G03C *1/02*
U.S. Cl. 430—569 **23 Claims**

1. A process for the preparation within a reaction vessel of a thin tabular grain silver bromide or bromoiodide emulsion wherein tabular grains having a thickness of less than 0.2 μm exhibit an average aspect ratio of greater than 5:1 and account for at least 50 percent of total grain projected area of said emulsion, said process comprising

introducing into said reaction vessel an aqueous dispersing medium and silver, bromide, and, optionally, iodide ions, and



maintaining pBr values within said reaction vessel during grain nucleation and growth that favors the formation and growth of tabular grains,

characterized in that

at the time said tabular grains are being formed, (a) pH in said reaction vessel is maintained at a value

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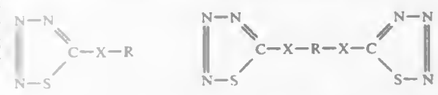
4,914,015

RED AND INFRARED FILMS CONTAINING 5-SUBSTITUTED-THIO-1,2,3,4-THIATRIAZOLES AND 5-SUBSTITUTED-OXY-1,2,3,4-THIATRIAZOLES

James B. Phillip, Jr., Mahtomedi; Craig A. Perman, Woodbury, and Peter D. Sills, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 17, 1988, Ser. No. 258,497
Int. Cl.[4] G03C *1/28*
U.S. Cl. 430—572 **28 Claims**

1 A silver halide photographic emulsion in a hydrophilic colloidal binder, said emulsion being spectrally sensitized to the red or infrared portion of the electromagnetic spectrum and having a supersensitizing amount of a 5-substituted-thio- or oxy-1,2,3,4-thiatriazole wherein said 5-substituted-1,2,3,4-thiatriazole is represented by the general formula



wherein R is selected from the group consisting of alkyl groups, aryl groups, allyl, and 5- or 6-membered heterocyclic groups having only C, N, S or O ring atoms, and X is oxygen or sulfur.

4,914,016

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL AND PROCESSING METHOD THEREFOR

Masanobu Miyoshi; Makoto Kajiwara, both of Odawara; Shigeo Tanaka, Tachikawa, and Mitsuhiro Okumura, Sagamihara, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,803
Claims priority, application Japan, May 31, 1987, 62-135878; May 31, 1987, 62-135879; Jun. 10, 1987, 62-144792; Jun. 13, 1987, 62-147711; Jun. 16, 1987, 62-149400; Jun. 18, 1987, 62-150216; Jul. 25, 1987, 62-186355
Int. Cl.[4] G03C *1/06*
U.S. Cl. 430—603 **66 Claims**

1. A silver halide photographic light-sensitive material comprising:

(a) a support; and

(b) one or more photographic component layers on the

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support, the photographic component layers including at least one silver halide emulsion layer chemically sensitized with a gold compound and containing a nitrogen-containing heterocyclic compound having a solubility with silver ion of not more than 1×10^{-10};

wherein at least one of said photographic component layers contains elementary sulfur.

4,914,017

GOLD SENSITIZED SILVER HALIDE EMULSION AND PHOTOGRAPHIC SILVER HALIDE LIGHT-SENSITIVE MATERIAL USING SAME

Hiroyuki Mifune, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 16, 1987, Ser. No. 62,642

The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.

Int. Cl.[4] G03C *1/06*

U.S. Cl. 430—604 15 Claims

1. A gold-sensitized silver halide emulsion substantially of surface latent image type comprising silver halide grains, a gold sensitizer, and a binder, at least 80% by weight of the gold sensitizer being present in the silver halide grain phase.

4,914,018

ANTISTATIC PHOTOGRAPHIC BASE AND LIGHT-SENSITIVE ELEMENT

Mauro Besio, Vado Ligure Savona, and Alberto Valsecchi, Ferrania Savona, both of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 1, 1988, Ser. No. 278,358

Claims priority, application Italy, Dec. 16, 1987, 23024 A/87

Int. Cl.[4] G03C *1/82*

U.S. Cl. 430—528 11 Claims

1. A base for use in a photographic element comprising a polymeric support film having coated thereon in sequence a first antistatic layer comprising a quaternary polyelectrolyte compound and a polymeric hydrophobic binder and a second protective layer comprising a polymeric hydrophobic binder, characterized in that said quaternary polyelectrolyte compound is a homopolymer or a copolymer of a diallyldialkylammonium salt compound.

4,914,019

MULTI-PURPOSE LEARNING DEVICE

Tung Y. Chu, 11303 1st Pl., W., Everett, Wash. 98204

Filed Feb. 6, 1989, Ser. No. 307,266

Int. Cl.[4] G09B *1/36*; A63H *33/08*

U.S. Cl. 434—171 4 Claims

1. A block structure comprising,

(a) a plurality of openings, capable of receiving one interlock per said opening, each of said openings being located near the side of said block structure and each of said openings being recessed from the face of said block structure,

(b) a pair of parallel support members, each of said support members forming the side of said block structure,

(c) an arm mounted to one side of said block member and made to insert into an opening of another block member,

(d) and a recessed area on the face of said block structure for removably holding an indicium block.

4,914,020

MULTI-LAYER ANALYTICAL ELEMENT WITH PRESERVED ENZYME CONTAINING SPREADING LAYER

Kazumi Arai, Hachioji; Mikio Koyama, Tokorosawa; Morio Kobayashi, Sagamihara; Kenichiro Okaniwa, Tokyo; Takasi Momose, Hino; Kunihiro Furukawa, Urawa, and Souichi Zanma, Kawaguchi, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd. and Chugai Seiyaku Kabushiki Kaisha, both of Tokyo, Japan

Filed Jan. 31, 1986, Ser. No. 824,450

Claims priority, application Japan, Feb. 5, 1985, 60-19324

Int. Cl.[4] C12Q *1/00*

U.S. Cl. 435—4 23 Claims

1. An analytical element for the analysis of a specific component in a fluid, said element comprising:

(a) a support,

(b) a layer containing a reagent provided on said support,

(c) a spreading layer provided on said reagent-containing layer, said spreading layer having a porous structure, and

(d) a dispersion mixture contained in the porous structure of said spreading layer and including a mixture of an enzyme and a protein and/or polypeptide, formed by freeze-drying a mixture of said enzyme and said protein and/or said polypeptide from an aqueous solution thereof, said enzyme being of a type supporting a reaction with said specific component to produce a product capable of being detected with said reagent, and said protein and/or polypeptide being substantially free from a substance disturbing said reaction or analysis whereby the protein and/or polypeptide prevent rapid deterioration of the enzyme.

4,914,021

CARCINOMA OROSOMUCOID-RELATED ANTIGEN, A MONOCLONAL ANTIBODY THERETO, AND THEIR USES

Carol A. Toth, Westwood, and Peter Thomas, Pembroke, both of Mass., assignors to New England Deaconess Hospital Corporation, Boston, Mass.

Filed Mar. 4, 1988, Ser. No. 164,071

Int. Cl.[4] G01N *33/53*, *33/577*; A61K *39/00*; C07K *15/14*

U.S. Cl. 435—7 15 Claims

1. A monoclonal antibody specific to carcinoma orosumucoid-related antigen (CORA) glycoprotein,

said CORA glycoprotein having a binding affinity for the tumor marker carcinoembryonic antigen (CEA), having a molecular weight of about 46,000–50,000 daltons, an isoelectric point in the range of about 3.0–3.5, a carbohydrate content of about 30% by weight, of which approximately 10.3% is N-acetyl glycosamine and approximately 0.2% is fucose, and having substantially no cross-reactivity with antisera to nonspecific cross-reacting antigen (NCA) or to CEA.

4,914,022

METHOD FOR PREPARING MULTIPLE TISSUE SAMPLES FOR MICROSCOPIC INVESTIGATION AND TESTING

Philip Furmanski, Littleton; Michael B. Fortuna, Denver, and Wen-Hui Wan, Lakewood, all of Colo., assignors to AMC Cancer Research Center, Denver, Colo.

Filed Oct. 21, 1987, Ser. No. 110,818

Int. Cl.[4] G01N *33/543*, *33/552*, *33/577*

U.S. Cl. 435—7 8 Claims

5. A method for testing immunohistochemical reactivity of a monoclonal antibody against multiple tissue samples simultaneously, comprising:

providing a plurality of tissue specimens,

boring at least one core from each of said specimens,

assembling and arranging said cores to obtain a plurality of cores of tissue specimens, arranged in concentric circles in a tubular holder, whereby said cores retain the same spatial relationship through out the length of the holder

fixing said plurality of embled cores in position in said holder casing with a hot softened synthetic or natural binder matrix to encompass said holder and said cores with said matrix,

cooling and removing said matrix from around said holder after solidification of said matrix,

A

removing said holder casing from said cores,

cutting at least one section from said cores in the matrix to obtain a thin section suitable for microscopic inspection of said tissue specimens,

placing at least one of said sections on a surface for inspection,

depositing an antibody preparation on said surface, and examining any sections so treated.

4,914,023

METHOD OF EXTENDING THE LINEAR RANGE OF AN ENZYME IMMUNOASSAY BY MEASURING OFF-PEAK ABSORBANCE

Roger Philo, Guilford, England, assignor to Serono Diagnostics Partners, Boston, Mass.

Filed Jan. 5, 1987, Ser. No. 58,483

Claims priority, application United Kingdom, Jan. 10, 1986, 8614084

Int. Cl.[4] G01N *33/53*, *33/543*, *33/536*

U.S. Cl. 435—7 8 Claims

1. In an enzyme immunoassay which quantifies a substance under assay by measuring absorbance of a colored product formed by substrate convertion of an enzyme label-substrate pair, the improvement comprising extending the linear range of said immunoassay without reducing its sensitivity by measuring absorbance at or near the peak wavelength for absorbance measurements for that enzyme label-substrate pair and measuring absorbance at an off-peak wavelength, at which absorbance is significantly lower than at the peak wavelength, when said absorbance measurement at the peak wavelength exceeds the linear range of the measuring technique employed, then determining the quantities of said substance under assay by comparing said measurements to a standard composite curve which plots absorbance at both peak and off-peak wavelengths versus known quantities of said substance.

4,914,024

MICROBIAL SOLUBILIZATION OF COAL

Gerald W. Strandberg, Farragut, and Susan N. Lewis, Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 21, 1988, Ser. No. 146,622

Int. Cl.[4] C12P *1/00*

U.S. Cl. 435—41 12 Claims

1. A process for the microbial solubilization of coal into solubilized coal products which comprises:

introducing coal to a medium containing a bacterial culture which comprises a species selected from the group consisting of *Streptomyces setonii* 75 Vi2 and *Streptomyces*

viridosporus T7A so as to cause microbial solubilization of said coal to produce solubilized coal products.

10. An extracellular coal solubilizing component produced by *Streptomyces setonii* 75 Vi2 wherein said component has a molecular weight of less than 10,000 daltons.

4,914,025

EXPORT OF INTRA-CELLULAR SUBSTANCES

Colin Manoil, 389 Heath St., Chestnut Hill, Mass. 02167; Jonathan Beckwith, 84 Appleton Rd., Cambridge, Mass. 02138; Michael Symmes, 31 Winthrop Rd., Brookline, Mass. 02146; Ralph R. Isberg, 1080 Nad Dr. #6, Menlo Park, Calif. 94025; Charles S. Hoffman, 58 Arbor St., Wenham, Mass. 01984, and Andrew Wright, 16 Regent St., West Newton, Mass. 02165

Filed Dec. 5, 1985, Ser. No. 805,406

Int. Cl.[4] C12P *21/00*, *21/02*; C12N *12/00*

U.S. Cl. 435—69.8 15 Claims

1. A method for identifying a transformed bacterial cell comprising an export DNA sequence, said method comprising:

providing a vector comprising a transposon, said transposon comprising a pair of repeated insertional sequences that are inverted with respect to one another, said vector further comprising a structural gene whose N-terminal-encoding end is adjacent the end of one of said insertional sequences, said structural gene encoding alkaline phosphatase, said transposon lacking DNA encoding an export peptide positioned to export alkaline phosphatase produced by expression of said gene, said cell lacking the ability to secrete alkaline phosphatase prior to said transposition;

transforming said cell with said vector and growing transformants to allow transposition to occur;

screening for transformants able to secrete alkaline phosphatase in which an export DNA sequence of said bacterial cell has been positioned adjacent the N-terminal encoding end of said gene encoding alkaline phosphatase.

4,914,026

ALPHA FACTOR LEADER SEQUENCE DIRECTED SECRETION OF INSULIN

Anthony J. Brake, Berkeley; Lawrence S. Cousens, San Francisco; Mickey S. Urdea, San Francisco, and Pablo D. T. Valenzuela, San Francisco, all of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Continuation of Ser. No. 463,823, Apr. 7, 1983, abandoned. This application Oct. 23, 1986, Ser. No. 922,298

Int. Cl.[4] C12P *21/00*, *21/02*; C12N *15/00*, *5/00*

U.S. Cl. 435—69.4 15 Claims

1. An improved method for expressing "pre"-proinsulin in yeast resulting in processing and secretion of said "pre"-proinsulin, wherein said "pre" means the presence of yeast secretion signals, said method comprising:

(a) providing a "pre"-proinsulin gene comprising a first DNA sequence encoding proinsulin and a second DNA sequence encoding a yeast alpha-factor leader sequence that provides for secretion from a Saccharomyces host, wherein the coding sequences of said first and second DNA sequences are in the same reading frame;

(b) introducing said "pre"-proinsulin gene into an expression vector for a Saccharomyces host;

(c) transforming a Saccharomyces host with said expression vector comprising said "pre"-proinsulin gene; and

(d) growing said transformed Saccharomyces host in a nutrient medium under conditions whereby proinsulin is expressed and secreted.

4,914,027
PROCESS FOR THE MICROBIOLOGICAL PREPARATION OF HUMAN SERUM ALBUMIN

Michael Knapp; Georges Bréfort; Martine Latta, all of Paris; Jean-Francois Mayaux, Fontenay-aux-Roses, and Paolo Sarmientos, Paris, all of France, assignors to Genetica, Joinville Le Post, France

Filed Mar. 25, 1986, Ser. No. 843,725
Claims priority, application France, Mar. 25, 1985, 85 04385
Int. Cl.[4] C12N *1/00, 15/00;* C12P *21/00, 21/02*
U.S. Cl. 435—69.6 4 Claims

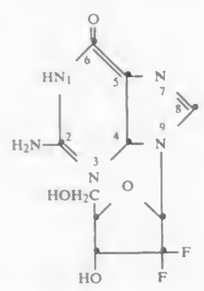
1. Process for the microbiological preparation of human serum albumin which comprises culturing an *E. coli* transformed with, and capable of maintaining a plasmid containing a DNA sequence encoding the signal peptide of *E. coli* penicillin amidase linked to the structural gene for human serum albumin, and having, operably linked to the penicillin amidase signal sequence human serum albumin gene and situated upstream thereof, the penicillin amidase promoter in tandem down stream of, with an inducible promoter, and isolating human serum albumin.

4,914,028
METHOD OF PREPARING BETA-2',2'-DIFLUORONUCLEOSIDES

Larry W. Hertel; Cora Sue Grossman, and Julian S. Kroin, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

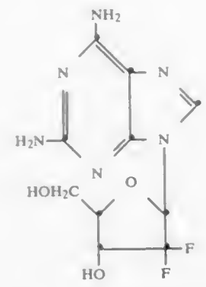
Filed Feb. 10, 1988, Ser. No. 159,792
Int. Cl.[4] C12P *19/40;* C12N *9/06;* C07H *19/36*
U.S. Cl. 435—88 2 Claims

1. A process for isolating the β-diastereomer of a compound of the formula



I

comprising treating a racemic mixture of a compound of the formula



II

with adenosine deaminase, and recovering the β-diastereomer as a solid from the reaction mixture.

4,914,029
PROCESS FOR STEEPING CEREALS WITH A NEW ENZYME PREPARATION

Abraham Caransa, Utrecht, Netherlands; Timo Vaara; Martti Vaara, both of Helsinki, Finland; Maarit Simell, Vantaa, Finland, and Antti Lehmussaari, Rajamaki, Finland, assignors to Dorr-Oliver Incorporated, Milford, Conn.

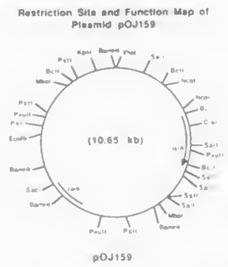
Filed Sep. 12, 1988, Ser. No. 242,243
Claims priority, application Netherlands, Nov. 17, 1987, 8702735
Int. Cl.[4] C12P *19/04, 19/14*
U.S. Cl. 435—101 26 Claims

1. A steeping process for corn or sorghum kernels capable of yielding an essentially phytin-free steep liquor wherein said kernels are steeped in warm water or process water containing sulfur dioxide in the presence of an enzyme preparation comprising at least one phytin-degrading enzyme in an amount capable of degrading the phytin in said kernels.

4,914,030
CARBOMYCIN RESISTANCE-CONFERRING GENE, DESIGNATED CARB, FOR USE IN STREPTOMYCES AND OTHER ORGANISMS

Brigitte E. Schoner, Zionsville, and Janet K. Epp, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 28, 1986, Ser. No. 901,334
Int. Cl.[4] C12N *15/00, 1/20, 1/00;* C12P *21/00, 21/02, 19/62, 19/34;* C12R *1/465;* C07K *13/00;* C07H *15/12*
U.S. Cl. 435—172.3 25 Claims



1. A method for selecting a recombinant DNA-containing host cell that comprises transforming a carbomycin-sensitive actinanyceles host cell with a recombinant DNA vector that codes for the carB gene product and culturing the transformed cell under conditions suitable for selection of carbomycin-resistant transformants.

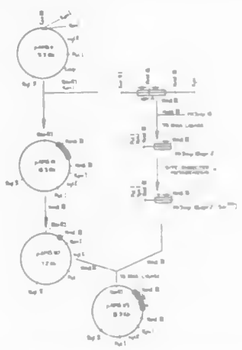
4,914,031
SUBTILISIN ANALOGS

Mark M. Zukowski, Thousand Oaks, Calif.; Yitzhak Stabinsky, Boulder, Colo., and Michael Levitt, London, England, assignors to Amgen, Inc., Thousand Oaks, Calif.

Filed Apr. 10, 1987, Ser. No. 36,872
Int. Cl.[4] C12N *9/56, 9/54, 15/00*
U.S. Cl. 435—222 22 Claims

1. A subtilisin analog having an amino acid sequence of a naturally occurring Bacillus subtilisin that has been modified by having:

(1) one or more of the amino acids present in the calcium binding site of the naturally occurring Bacillus subtilisin represented by Asp[41], Leu[75], Asn[76], Asn[77], Ser[78], Ile[79], Gly[80], Val[81], Thr[208], and Tyr[214] replaced by a negatively charged amino acid; and



(2) one or more of the amino acids comprising any Asn-Gly sequence of the naturally occurring Bacillus subtilisin deleted or replaced by a different amino acid.

4,914,032
PROCESS FOR THE LONG-TERM SURVIVING CULTURE OF HEPATOCYTES

Walid Kuri-Harcuch, and Tomas Mendoza-Figueroa, both of México, Mexico, assignors to Centro de Investigation Y Estudios Avanzados Del Instituto Politecnico Nacional, Mexico, Mexico

Filed Jun. 6, 1985, Ser. No. 741,850
Int. Cl.[4] C12N *5/00, 5/02*
U.S. Cl. 435—240.2 30 Claims

1. A process for the long-term surviving culture of hepatocytes, comprising: culturing said hepatocytes at a density of from about 180 to about 65,000 cells/cm^2 in a culture medium containing from about 1 to about 100 ug/ml of hydrocortisone, in the presence of either fibroblast cells treated to prevent their multiplication and to maintain normal morphology and expression of hepatocyte function for long-term periods, or fibroblast cells products on a modified substrate, at controlled densities of from about 30,000 to about 65,000 cells/cm^2.

4,914,033
STRUCTURE AND PROPERTIES OF MODIFIED INTERFERONS

Leslie D. Bell, Thame; Paul G. Boseley, and Alan G. Porter, both of High Wycombe, all of England, assignors to G. D. Searle & Co., Chicago, Ill.

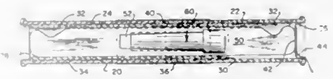
Division of Ser. No. 730,017, May 3, 1985, Pat. No. 4,769,233.
This application May 18, 1988, Ser. No. 195,232
Claims priority, application United Kingdom, May 17, 1984, 8412564
Int. Cl.[4] C12N *1/20, 15/00;* C07H *21/04*
U.S. Cl. 435—252.3 12 Claims

1. A gene comprising a recombinant DNA molecule encoding a polypeptide comprising a modified beta interferon comprising a beta interferon wherein amino acids 36 to 48 of said beta interferon are replaced by amino acids 34 to 46 of alpha 1 interferon and the cysteine at position 17 of said beta interferon is replaced by serine.

4,914,034
DISPOSABLE BIOLOGICAL INDICATOR TEST PACK FOR MONITORING STEAM AND ETHYLENE OXIDE STERILIZATION CYCLES

Jon D. Welsh, Fairview, and Denis G. Dyke, Edinboro, both of Pa., assignors to American Sterilizer Company, Erie, Pa.

Continuation-in-part of Ser. No. 50,585, May 15, 1987, Pat. No. 4,839,291. This application Dec. 22, 1988, Ser. No. 288,362
Int. Cl.[4] C12Q *1/22;* C12M *1/16*
U.S. Cl. 435—296 18 Claims



1. A device for monitoring the efficacy of sterilization cycles wherein steam is the sterilant comprising:

a housing having an interior, at least a portion of said interior being made of a material having heat sink, insulating and moisture absorbent properties, said housing being configured to define at least one tortuous path for entry of sterilant into said housing, said tortuous path having a moisture absorbent surface and being dimensioned to promote intimate contact between said sterilant and said surface as said sterilant moves along said tortuous path; and

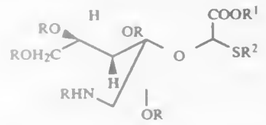
a biological indicator within said housing which includes a calibration of microbes which are resistant to sterilization by steam.

4,914,035
PROCESS FOR PRODUCING SIALIC ACID DERIVATIVES

Akira Hasegawa, and Makoto Kiso, both of Gifu, Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed May 16, 1989, Ser. No. 352,594
Claims priority, application Japan, Aug. 12, 1988, 63-201107
Int. Cl.[4] C07G *3/00, 37/00;* C07H *23/00, 1/00*
U.S. Cl. 536—18.6 12 Claims

1. A process for producing a 2-α-O-glycoside compound of sialic acid which comprises reacting an alkylthiosialic acid derivative represented by the formula [I]:



[I]

wherein R represents an acyl group and R^1 and R^2 each represents a lower alkyl group, with a compound having alcobolic hydroxyl group at a low temperature in a polar solvent having no hydroxyl group in the presence of a thiophilic promoter.

4,914,036
METHOD AND APPARATUS FOR SIMULTANEOUSLY ANALYZING VANILLYLMANDELIC ACID, HOMOVANILLIC ACID AND CREATININE

Seiji Kawaguchi, Yokohama; Hiroaki Takahashi, Sagamihara, and Yuji Saito, Yokohama, all of Japan, assignors to Tosoh Corporation, Shin-nanyo, Japan

Filed Mar. 2, 1988, Ser. No. 163,318
Claims priority, application Japan, Mar. 2, 1987, 62-45297
Int. Cl.[4] G01N *33/00*
U.S. Cl. 436—98 2 Claims

1. A method for analyzing a test solution comprising vanillylmandelic acid, homovanillic acid and creatinine by fast liquid chromatography, which comprises:

a step of introducing a first inlet stream comprising a test

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solution containing vanillylmandelic acid, homovanillic acid and creatinine and a second inlet stream comprising a first eluent to a cation exchange resin column, separating creatinine from vanillylmandelic acid and homovanillic acid using said first eluent, and removing from said cation exchange resin column a first outlet stream comprising vanillylmandelic acid and homovanillic acid and a second outlet stream comprising creatinine, wherein at least one of said first and second outlet streams further comprises said first eluent;

a step of introducing said first outlet stream from said cation exchange resin column and a second eluent stream into a separation column, separating vanillylmandelic acid and homovanillic acid using said second eluent, and removing from said separation column a third outlet stream comprising vanillylmandelic acid and a fourth outlet stream comprising homovanillic acid, wherein at least one of said third and fourth outlet streams further comprises said second eluent; and

a step of detecting each component in said second, third and fourth outlet streams.

4,914,037

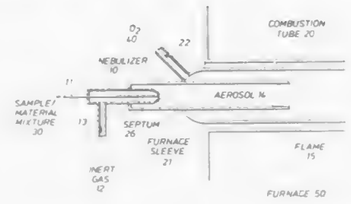
METHOD AND APPARATUS FOR ANALYSIS OF A SAMPLE FOR NITROGEN

Alan R. Forster, and Gregory J. Kamla, both of Houston, Tex., assignors to Sheli Oil Company, Houston, Tex.

Continuation of Ser. No. 20,296, Feb. 27, 1987, abandoned. This application Sep. 22, 1988, Ser. No. 249,256

Int. Cl.[4] G01N *31/12*

U.S. Cl. 436—106 4 Claims



1. A method for analyzing a sample for nitrogen, comprising:

injecting a portion of said sample at a preselected rate into a nebulizing zone located in a cool zone,

injecting an inert gas into said nebulizing zone at a preselected rate to form an aerosol with said injected sample,

transporting said nebulized sample to a decomposition zone positioned in a furnace,

decomposing said sample in an oxygen-rich atmosphere of oxygen and an inert gas at a temperature sufficient to ensure complete combustion of said sample,

transporting said decomposed sample to a detection zone,

analyzing said decomposed sample for nitrogen.

4,914,038

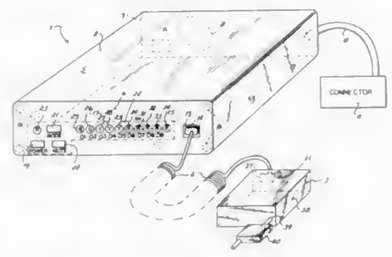
APPARATUS AND METHOD FOR AVOIDING CIRCUMVENTION OF AN IDENTITY CONFIRMING BREATH TESTER

Jeffrey C. Jewitt, Etobicoke, Canada, assignor to Guardian Technologies, Inc., Cincinnati, Ohio

Continuation of Ser. No. 209,091, Jun. 17, 1988. This applicatioo Aug. 12, 1988, Ser. No. 231,887

Int. Cl.[4] G01N *33/00*

U.S. Cl. 436—132 17 Claims



1. A sobriety breath test apparatus, comprising:

(a) sampling means for receiving exhaled breath from a test subject, said sampling means including an alcohol sensor for generating an electrical signal related to the level of alcohol in the breath;

(b) identity confirming means connected to said sampling means for confirming the identity of the test subject in accordance with the ability of the test subject to perform an identity-confirming act, said act requiring the delivery of breath into said sampling means;

(c) means for reading said electrical signal to produce a first reading related the level of alcohol in a breath sample received by said sampling means and a second reading reflecting the response of said sensor to breath delivered to said sampling means during an attempt to perform said identity-confirming act, and

(d) means for comparing said first and second readings and generating a test fail signal in the event said second reading differs from said first reading by more than a predetermined amount.

10. A method of avoiding circumvention of a breath sobriety tester of the type having an alcohol sensor operable to generate an electrical signal related to the amount of alcohol present in breath to which the sensor is exposed, said method comprising the steps of:

(a) delivering a first sample of exhaled breath to the alcohol sensor;

(b) taking a first reading of the electrical signal generated by the alcohol sensor in response to said breath sample;

(c) monitoring an attempt to perform an identity-confirming act in order to confirm the identity of a test subject in accordance with the ability of the test subject to perform said act, said act requiring delivery of a second breath sample to the sensor;

(d) taking a second reading of the electrical signal generated by the alcohol sensor in response to said second breath sample, and

(e) generating a test fail signal in the event said second reading differs from said first reading by more than a predetermined amount.

4,914,039

WATER DEVELOPABLE, NEGATIVE WORKING OVERLAY OR TRANSFER TYPE DIAZO COLOR PROOFING SYSTEM

Stanley F. Wanat, Scotch Plains, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Apr. 20, 1988, Ser. No. 183,841

Int. Cl.[4] G03C *7/00, 5/34;* **G03F** *3/00, 7/08*

U.S. Cl. 430—143 17 Claims

1. A method for forming a colored image which comprises:

(A) providing a negative working, photosensitive transfer color proofing film which comprises, in order:

(i) a substrate having a release surface; and

(ii) a single, colored photosensitive layer on said release surface, which photosensitive layer consists essentially of a light sensitive, negative working, polymeric diazonium compound which is the polycondensation product of 3-methoxy-4-diazodiphenylamine sulfate and 4,4'-bismethoxymethyl diphenyl ether precipitated as the chloride salt, which diazonium compound is present in sufficient amount to photosensitize said layer; and a water insoluble, water swellable binder resin in sufficient amount to bind the layer components in a uniform film; and at least one colorant in sufficient amount to uniformly color said layer; and

(iii) an adhesive layer on said photosensitive layer, which adhesive layer comprises a major amount of a polymeric material and which adhesive layer has a softening point in the range of from about 60° C. to about 180° C., and thereafter

(B) either

(i) laminating said element with heat and pressure via said adhesive layer to a developer resistant receiver sheet; and removing said substrate by the application of peeling forces; and imagewise exposing said photosensitive layer to actinic radiation; or

(ii) imagewise exposing said photosensitive layer to actinic radiation; and laminating said element with heat and pressure via said adhesive layer to a developer resistant receiver sheet; and removing said substrate by the application of peeling forces; or

(iii) laminating said element with heat and pressure via said adhesive layer to a developer resistant receiver sheet; and imagewise exposing said photosensitive layer to actinic radiation; and removing said substrate by the application of peeling forces; and

(C) removing the non-exposed areas of said photosensitive layer with water alone, which removing is conducted at a temperature at which said adhesive layer is substantially non-tacky.

4,914,040

REAGENT AND METHOD FOR DETERMINATION OF A POLYVALENT SUBSTANCE USING AN IMMUNOAGGREGATE

Helmut Lenz; Ellen Mössner, both of Tutzing; Werner Stock, Gräfelfing; Albert Röder, Seeshaupt; Harald Haug, Peissenberg, all of Fed. Rep. of Germany, and Robert C. McCarthy, Carmel, Ind., assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Mar. 3, 1988, Ser. No. 164,054

Int. Cl.[4] C01N *1/00, 33/503, 33/53*

U.S. Cl. 436—175 41 Claims

1. Method for determining a compound of a sample of a biological fluid obtained from a first animal species, which biological fluid contains an interferent, comprising contacting said sample with at least two immunoreactants obtained from an animal species different from said first animal species, wherein said immunoreactants specifically bind with said component to be determined and further contacting said sample with a soluble substance which prevents said interferent from interfering with binding between said component to be determined and said at least two immunoreactants, said substance characterized as a cross-linked immunoaggregate containing an immunocomponent obtained from an animal species different from said first animal species, at a concentration from about 0.1 to about 50 ug/ml, wherein said substance does not bind with said component to be determined, said contacting taking place under conditions favoring formation of an identifiable complex between said component to be determined and said immunoreactants, and determining said complex or non-complexed immunoreactant as a measure of said component to be determined.

4,914,041

REAGENT AND METHOD FOR DETECTING RHEUMATOID FACTOR

Caron C. Thrasher, Diamond Bar, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 12, 1988, Ser. No. 155,661

Int. Cl.[4] G01N *33/564*

U.S. Cl. 436—509 20 Claims

1. A reagent for use in an immunoassay for rheumatoid factor comprising a plurality of IgG antibodies with Fc portions thereof exposed, a buffer and an amount of heparin effective to inhibit any interference of Clq during use in the immunoassay.

4,914,042

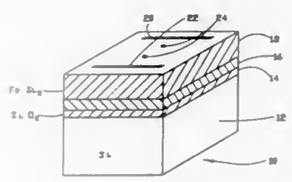
FORMING A TRANSITION METAL SILICIDE RADIATION DETECTOR AND SOURCE

John E. Mahan, Fort Collins, Colo., assignor to Colorado State University Research Foundation, Fort Collins, Colo.

Division of Ser. No. 913,354, Sep. 30, 1986, Pat. No. 4,782,377. This application Apr. 5, 1988, Ser. No. 177,772

Int. Cl.[4] H01L *29/48*

U.S. Cl. 437—2 4 Claims



1. A method of manufacturing a radiation detector comprising the steps of:

depositing a first thin film of semiconductive metal silicide on a substrate of opposite doping type of said first thin film;

depositing a second thin film of semiconductive metal silicide, doped with a type of dopant the same as said substrate, on said first thin film;

forming a pattern of electrical conductors on said first and said second thin films.

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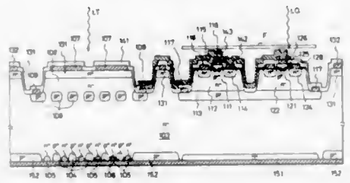
4,914,043

METHOD OF MAKING AN INTEGRATED LIGHT-TRIGGERED AND LIGHT-QUENCHED STATIC INDUCTION THYRISTOR

Jun-ichi Nishizawa; Takashige Tamamushi, and Ken-ichi Nonaka, all of Sendai, Japan, assignors to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Division of Ser. No. 108,368, Sep. 23, 1987, Pat. No. 4,866,500. This application Apr. 14, 1989, Ser. No. 338,271
Claims priority, application Japan, Sep. 26, 1986, 61-229251
Int. Cl.[4] H01L *21/92*
U.S. Cl. 437—2 1 Claim



1. The fabrication process of an integrated light-triggered and light-quenched static induction thyristor comprising the steps of:

forming anode regions, buried-gate regions and a drain region of the static induction phototransistor by diffusing an impurity of a first conductivity type into a semiconductor substrate containing an impurity of a second conductivity type at a low density;

forming an epitaxial layer of the second conductivity type and a high-resistivity epitaxial layer of the second conductivity type;

simultaneously forming cathode regions and emitter regions of said light-triggered static induction thyristor as well as gate regions and isolation regions of said static induction phototransistor by diffusing an impurity of the first conductivity type;

forming diffusion windows for forming the source regions of said static induction phototransistor by depositing a polycrystalline silicon layer having low impurity density;

forming said source regions by diffusing an impurity of the first conductivity type through said polycrystalline silicon layer and etching said polycrystalline silicon for forming polycrystalline silicon electrodes;

applying a masking material to said semiconductor substrate, to isolate the high-resistivity epitaxial layer between said buried-gate regions and said cathode regions of said light-triggered static induction thyristor from the first and second high-resistivity channel regions of said static induction phototransistor and said isolation diffusion regions, and to etch said epitaxial layer and said high-resistivity epitaxial layer for partially exposing said buried-gate regions of said light-triggered static induction thyristor and said drain regions;

performing ion implantation and annealing of the impurity of the first conductivity type into the portions exposed on the surfaces of the buried-gate regions of said light-triggered static induction thyristor and the drain region of said static induction phototransistor;

forming cathode electrodes, gate electrodes and anode electrodes of said light-triggered static induction thyristor, and first and second source electrodes, first and second gate electrodes and the drain electrodes of said static induction phototransistor; and

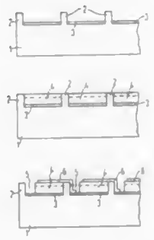
forming a contact hole after forming an intermediate insulating film on the surface of said semiconductor substrate, and forming a first electrode wiring for connecting the gate electrodes of said light-triggered static induction phototransistor to the first source electrodes of said static induction phototransistor and a second electrode wiring for connecting the first gate electrodes of said static induction phototransistor to the second source electrodes of said static induction phototransistor.

4,914,044

METHOD OF MAKING TANDEM SOLAR CELL MODULE

Josef Grabmaier, Berg; Wolfgang Krumbler, Unterhaching, and Arthur Endroes, Krumbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 19, 1988, Ser. No. 221,406
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1987, 3727823
Int. Cl.[4] H01L *31/18*
U.S. Cl. 437—4 5 Claims



1. A method for manufacturing a tandem solar cell module comprising the steps of:

(a) applying an electrically conductive layer on a substrate of electrically insulating material that has bars proceeding parallel to one another at defined spacings from one another, said layer being applied between said bars;

(b) inserting between the bars strips of p-doped, polycrystalline silicon fitting over the conductive layer, and the strips being connected to the conductive layer in an electrically conductive fashion thereby defining a plurality of strip-shaped individual solar cells;

(c) forming a pn-junction in each of the silicon strips;

(d) providing holes that extend to the surface of the conductive layer in the silicon strips, the holes being provided at the end of said strips;

(e) applying a strip pattern forming front-side contacts to the strip-shaped, individual solar cells with a silk screening process, said strip pattern being composed of an electrically conductive paste;

(f) providing an electrically conductive connection between the front-side contact and the conductive layer of a neighboring individual cell, the conductive layer forming a back-side contact of individual solar cells and being exposed in the holes;

(g) providing the strip-shaped solar cells, series-connected to form a first sub-module, with an anti-reflection layer;

(h) joining via an optical coupler the first sub-module to a second previously manufactured sub-module of amorphous, hydrogenated silicon solar cells that is of the same size, so that a substrate of the second sub-module forms a covering for the tandem solar cell; and

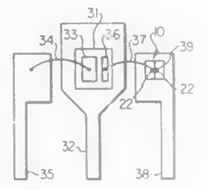
(i) integrating the overall module into a frame, whereby independently provided photocurrent generated by the individual sub-modules is provided via a total of at least four electrical contacts.

4,914,045

METHOD OF FABRICATING PACKAGED TRIAC AND TRIGGER SWITCH

Monty F. Webb, Richardson; Vinh Q. Le, Arlington, and Elmer L. Turner, Jr., Cedar Hill, all of Tex., assignors to Teccor Electronics, Inc., Irving, Tex.

Continuation of Ser. No. 811,161, Dec. 19, 1985, abandoned. This application May 9, 1988, Ser. No. 193,193
Int. Cl.[4] H01L *21/31*
U.S. Cl. 437—6 1 Claim



1. A method for fabricating a TRIAC and a low voltage silicon trigger switch as a single semiconductor packaged device having three terminals, comprising the step of:

mounting a first main terminal of a TRIAC integrated circuit chip directly to a first metallic terminal of the semiconductor device so that electrical signals can be coupled between said first metallic terminal and said TRIAC chip;

connecting a second main terminal of said TRIAC chip to a second metallic terminal of the semiconductor device;

forming an isolation groove in a silicon trigger switch integrated circuit chip in opposing conductive sides thereof to isolate a first PNPN structure from an adjacent inverse PNPN structure, filling said grooves with an isolation material, and forming a pair of metallization layers on each side of the chip isolated by a respective said isolation groove;

mounting one said conductive side of the silicon trigger switch integrated circuit chip directly to a metallic gate terminal of the semiconductor device so that both pairs of metallization layers of said mounted side are short circuited and one PNPN structure is shorted to the inverse PNPN structure;

short circuiting the pair of metallization layers of the other conductive side of said trigger switch chip with a conductive bridge; and

connecting a gate of the TRIAC chip to the conductive bridge of said silicon trigger switch chip, whereby a packaged device having three package terminals corresponding to the three terminals of the TRIAC provide a TRIAC triggered by low voltage silicon trigger switch.

4,914,046

POLYCRYSTALLINE SILICON DEVICE ELECTRODE AND METHOD

Philip J. Tobin; Bich Y. Nguyen, and Fabio Pintchovski, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 3, 1989, Ser. No. 305,590
Int. Cl.[4] H01L *21/265, 21/283*
U.S. Cl. 437—24 7 Claims

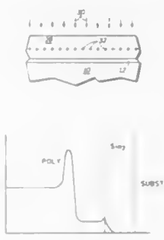
1. A method for fabricating an insulated gate field effect transistor comprising the steps of:

providing a semiconductor substrate; forming a gate insulator overlying said substrate;

depositing a first layer of polycrystalline silicon overlying said gate insulator, said first layer being undoped or relatively lightly doped with conductivity determining dopant impurities;

implanting ions selected from the group consisting of oxygen, nitrogen, and carbon into the surface of said first layer; and

depositing a second layer of impurity doped polycrystalline silicon overlying said first layer, said second layer being



relatively heavily doped with conductivity determining dopant impurities.

4,914,047

METHOD OF PRODUCING INSULATED GATE MOSFET EMPLOYING POLYSILICON MASK

Yasukazu Seki, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Feb. 27, 1989, Ser. No. 316,474
Claims priority, application Japan, Mar. 3, 1987, 63-50513
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—29 8 Claims

1 A method for forming an electrical device comprising the steps of:

(a) sequentially forming a semiconductor layer of a first conductivity type, a semiconductor well region of a second conductivity type, different from said first conductivity type embedded within and forming a part of a first surface of said semiconductor layer, a gate oxide layer disposed on said first surface, and a polycrystalline semiconductor layer;

(b) selectively etching said polycrystalline semiconductor layer so as to leave a central part and peripheral portions thereof intact and to form a window region between said central part and said peripheral portions, said window extending over portions of the semiconductor layer of the first conductivity type and the semiconductor well region;

(c) introducing impurities through the window region and treating at high temperature to diffuse the impurities such that the base region of the second conductivity type is formed within the portions of the semiconductor layer of the first conductivity type and the semiconductor well region which are aligned with the window;

(d) introducing further impurities through the window region suitable for forming a region of the first conductivity type;

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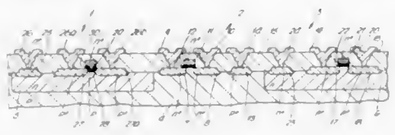
(e) forming a resist mask over the peripheral portions of the polycrystalline semiconductor layer which extend to cover a portion of the window, such that a second smaller window is formed between the control part of the polycrystalline semiconductor layer and the resist mask;
(f) introducing impurities through the second smaller window suitable for a high impurity density region of the second conductivity type;
(g) removing the resist mask, the central part of the polysilicon layer and a central portion of the gate oxide layer; and
(h) thermally diffusing the impurities introduced in steps (d) and (f) to form a source region and a high impurity density region.

4,914,048

METHOD OF MAKING BICMOS DEVICES

Peter D. Scovell, Chelmsford; Peter F. Blomley, Bishops Stortford, and Roger L. Baker, Chelmsford, all of Great Britain, assignors to STC plc, London, England

Continuation of Ser. No. 836,685, Mar. 6, 1986, abandoned. This application Dec. 16, 1987, Ser. No. 133,269
Claims priority, application United Kingdom, Mar. 23, 1985, 8507624
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—33 6 Claims



1. A method of manufacturing an integrated circuit including a bipolar transistor having a polycrystalline silicon emitter and CMOS transistors consisting of at least one p channel MOS transistor and at least one n channel MOS transistor, each MOS transistor having a respective gate, the method including the use of only two extra masks in addition to the number of masks employed to form the DMOS transistors in order also to form said bipolar transistor, one said extra mask defining a window for the implantation of a base region of the bipolar transistor and the other said extra mask defining a window in an oxide layer covering the base region whereby the polycrystalline silicon emitter contacts the base region, and including the step of forming the gates of the CMOS transistors and the emitter of the bipolar transistor from polycrystalline silicon by a process including depositing a layer of polycrystalline silicon, etching the said gates and the emitter simultaneously from the layer of polycrystalline silicon, and doping the polycrystalline silicon, and performing further processing to complete the manufacture of the integrated circuit such that the polycrystalline silicon gates and the emitter in the completely manufactured integrated circuit have the same doping levels and the same doping type.

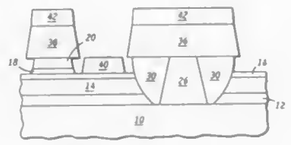
4,914,049

METHOD OF FABRICATING A HETEROJUNCTION BIPOLAR TRANSISTOR

Jenn-Hwa Huang, Gilbert, and Luke Mang, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 16, 1989, Ser. No. 421,918
Int. Cl.[4] H01L *21/283*
U.S. Cl. 437—31 14 Claims

8. A method of fabricating a heterojunction bipolar transistor comprising the steps of:
providing a semi-insulating gallium arsenide substrate;
forming a gallium arsenide sub-collector layer on said substrate;
forming a gallium arsenide collector layer on said sub-collector layer;
forming a gallium arsenide base layer on said collector layer;
forming an aluminum gallium arsenide emitter layer on said base layer;
forming a gallium arsenide emitter cap layer on said first emitter layer;
forming a first photoresist mask on said second emitter layer;
forming an opening using said first photoresist mask, said opening extending to said sub-collector layer;
forming a first collector metal in said opening so that said first collector metal is not in contact with the sidewalls of said opening;
removing said first photoresist mask;
forming a dielectric layer on the structure including in said



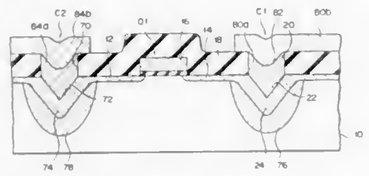
opening between said sidewalls of said opening and said first collector metal;
forming a photoresist layer on said dielectric layer and etching through said photoresist layer and said dielectric layer to said emitter cap layer so that the structure is substantially planar;
forming a second photoresist mask and using said second mask to form emitter metal on said second emitter layer and second collector metal on said first collector metal;
removing said second photoresist mask;
removing said emitter layer and said emitter cap layer excepting the portions disposed beneath said emitter metal to expose said base layer; and
forming base metal on said base layer between said emitter metal and said second collector metal so that said base metal formation is self-aligned.

4,914,050

SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREOF

Tadashi Shibata, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 293,570, Jan. 3, 1989, Pat. No. 4,860,084, which is a continuation of Ser. No. 770,246, Aug. 28, 1985, abandoned. This application Jun. 7, 1989, Ser. No. 362,653
Claims priority, application Japan, Sep. 3, 1984, 59-182810
Int. Cl.[4] H01L *21/22, 21/467*
U.S. Cl. 437—38 8 Claims



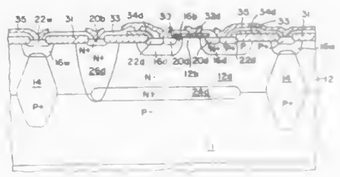
1. A method for manufacturing a semiconductor device having a field effect transistor which is formed on a semiconductive substrate of a first conductivity type and which has an electrode layer insulatively disposed above said substrate, said method comprising the steps of:
(a) forming an insulative layer on said substrate having a surface in which first and second semiconductive regions of a second conductivity type are formed;
(b) forming first and second openings in said insulative layer so as to define first and second contact holes for said first and second regions;
(c) subjecting said substrate to an etching treatment to form first and second concave portions under said first and second openings;
(d) doping impurities into said substrate to form third and fourth semiconductive regions of the second conductivity type, said third and fourth regions being deeper than said first and second regions;
(e) doping impurities into said substrate so as to form fifth and sixth semiconductive regions which surround said third and fourth regions respectively; and
(f) forming first and second conductive layers for said first and second contact holes.

4,914,051

METHOD FOR MAKING A VERTICAL POWER DMOS TRANSISTOR WITH SMALL SIGNAL BIPOLAR TRANSISTORS

Wing K. Hwie, North Wales, Pa.; Alexander H. Owens, Pennington, N.J.; David S. Pan, Doylestown, Pa., and Michael J. Zuzino, Spencer, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Dec. 9, 1988, Ser. No. 281,998
Int. Cl.[4] H01L *21/20, 21/302*
U.S. Cl. 437—59 8 Claims



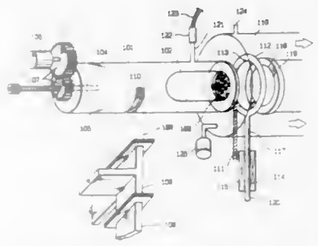
1. The method for making an integrated circuit combining in a silicon die a high current carrying vertical DMOS transistor in a first epitaxial pocket and a small signal vertical NPN transistor in a second epitaxial pocket, including forming isolation walls to define said pockets; simultaneously forming a plurality of spaced apart free-standing D-well regions in said first pocket and a base region in said second pocket; forming simultaneously an elemental source region in each of said D-well regions and an emitter in said base region; simultaneously forming two heavily doped buried layers of the same polarity-type as that of said emitter and source regions in said first pocket and second pocket, respectively; forming simultaneously two plug regions extending through said pockets, respectively, from said buried layers to an outer epitaxial surface of said die;
forming a glass layer over said surface, said glass layer having one hole positioned over a portion of each of said elemental DMOS source regions and a hole over said isolation wall and extending over an adjacent portion of the corresponding D-well region;
forming a metal conductor over said glass layer and through said one holes and through said isolation-wall hole to make shorting ohmic contacts between said each elemental source and corresponding D-well region and to electrically connect said source regions to each other and to said isolation wall, said metal conductor serving as the single source contact of said DMOS transistor;
forming another hole in said glass layer over said DMOS plug region in said first pocket and forming another conductor over said glass layer that is spaced away from said metal conductor and that makes ohmic contact with said DMOS plug region to serve as the drain contact of said DMOS transistor.

4,914,052

PROCESS FOR THE FORMATION OF A FUNCTIONAL DEPOSITED FILM CONTAINING GROUPS III AND V ATOMS BY MICROWAVE PLASMA CHEMICAL VAPOR DEPOSITION PROCESS

Masahiro Kanai, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1989, Ser. No. 302,260
Claims priority, application Japan, Feb. 1, 1988, 63-21601
Int. Cl.[4] H01L *21/20*
U.S. Cl. 437—81 10 Claims



1. A process for the formation of a functional deposited film containing atoms belonging to the group III and V of the periodical table as the main constituent atoms by introducing, into a film forming space for forming a deposited film on a substrate disposed therein, a compound (1) and a compound (2) represented respectively by the following general formulae (I) and (II) as the film-forming raw material and, if required, a compound (3) containing an element capable of controlling valence electrons for the deposited film as the constituent element each in a gaseous state, or in a state where at least one of such compounds is previously activated in a activation space disposed separately from said film forming pace, while forming hydrogen atoms in excited state which cause chemical reaction with at least one of said compounds (1), (2) and (3) in the gaseous state or in the activated state in an activation space different from said film forming space and introducing them into the film-forming space, thereby forming the functional deposited film on said substrate, wherein said hydrogen atoms in excited state are formed from a hydrogen gas or a gas mixture composed of a hydrogen gas and a rare gas by means of a microwave plasma generated in a plasma generation chamber disposed in a cavity resonator integrated with two impedance matching circuits in a microwave circuit and the excited state of the hydrogen atoms is controlled:

$$R_aM_m \quad \text{(I)}$$

$$A_aB_b \quad \text{(II)}$$

where m represents a positive integer equal to or multiple integer of the valence number for R, n represents a positive integer equal to or multiple integer of the valence number for M, M represents an element belonging to the group III of the periodical table, R represents a member selected from hydrogen (H), halogen (X) and hydrocarbon group, a represents a positive integer equal to or multiple integer of the valence number for B, b represents a positive integer equal to or multiple integer of the valence number for A and A represents an element belonging to the group V of the periodical table, B represents a member selected from hydrogen (H), halogen (X) and hydrocarbon group.

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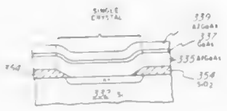
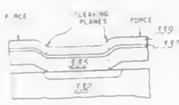
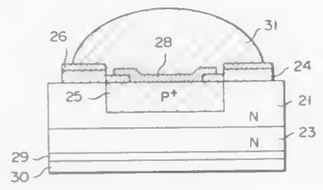
4,914,053
HETEROEPITAXIAL SELECTIVE-AREA GROWTH THROUGH INSULATOR WINDOWS
Richard J. Matyi, Richardson, and Hiroshi Shichijo, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Sep. 8, 1987, Ser. No. 94,231
Int. Cl.[4] H01L *21/20*
U.S. Cl. 437—90 **8 Claims**





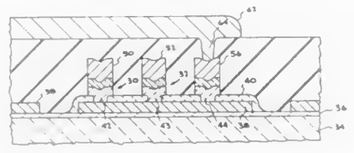
1. A method of heteroepitaxy, comprising the steps of:
(a) providing a substrate with a surface layer of a first semiconductor material;
(b) providing an insulating mask on said surface layer;
(c) growing a second layer of a second semiconductor material on said mask and unmasked portions of said surface layer, said growth characterized by single crystal regions on unmasked portions and polycrystalline or amorphous regions on said mask;
(d) annealing, said anneal characterized by said single crystal regions extending laterally over said mask.

4,914,054
METHOD OF PRODUCING A SEMICONDUCTOR DEVICE PROVIDED WITH FRONT AND BACK SURFACE ELECTRODES
Shigeru Moriyama, Himeji; Kinzo Tao, Hyogo, and Yoshio Yamamoto, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Division of Ser. No. 610,703, May 16, 1984, abandoned. This application Oct. 29, 1986, Ser. No. 925,490
Claims priority, application Japan, May 18, 1983, 58-87033
Int. Cl.[4] H01L *21/285, 21/304*
U.S. Cl. 437—183 **2 Claims**



1. A method of producing a semiconductor device, comprising the steps of:
forming a front surface electrode connected to a prescribed semiconductor region of a semiconductor substrate, provided with a plurality of semiconductor regions, via an opening made in an insulation film formed on the substrate surface;
polishing the back side of the substrate after said front surface electrode has been formed; and then
forming a back surface electrode by forming a gold alloy layer on the polished back surface of the substrate and forming a silver layer on the gold alloy layer, said back surface electrode being formed without a heat treatment step, wherein the gold alloy layer is formed by vapor deposition of an alloy consisting essentially of Au-Ge alloy.

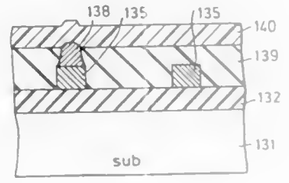
4,914,055
SEMICONDUCTOR ANTIFUSE STRUCTURE AND METHOD
Kathryn E. Gordon, Palo Alto, and Ching S. Jenq, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Filed Aug. 24, 1989, Ser. No. 398,141
Int. Cl.[4] H01L *21/283*
U.S. Cl. 437—192 **7 Claims**

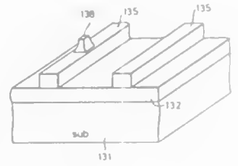


1. A method of forming an array of antifuse structures on a semiconductor substrate having circuit elements formed thereon, comprising the steps of:
providing a semiconductor substrate which has been processed with CMOS process steps up to but not including first metallization;
depositing a first layer of TiW over said substrate, including over said circuit elements;
masking and etching said first layer of TiW to provide TiW bottom conductors for said array of antifuses and to leave a protective layer of TiW over said circuit elements;
forming a first dielectric layer over said first layer of TiW;
masking and etching away portions of said first dielectric layer to define an array of fuse vias in said first dielectric layer and to define connection vias for connection of said first layer of TiW to subsequently deposited second metal conductors by exposing portions of said first layer of TiW;
removing the first dielectric layer over the protective layer of TiW over said circuit elements;
depositing a layer of antifuse silicon over said first dielectric layer and over said exposed portions of said first layer of TiW;
depositing a second layer of TiW over said layer of antifuse silicon;
masking and etching away portions of said second TiW layer and said layer of antifuse silicon to define an array of fuses;
forming a protective photoresist layer over said array of fuses and removing said protective TiW layer over said circuit elements;
depositing a first-metal conductor over said second layer of TiW, said circuit elements, and said connection vias;
forming an intermetal dielectric layer over said first metal conductor;
forming vias in said intermetal dielectric layer to said first metal conductor;
forming second-metal conductors over said intermetal dielectric layer to provide a plurality of connections between said second metal conductors and said first layer of TiW to reduce connection resistance to said antifuse structures; and

forming a passivation layer over the surface of the semiconductor substrate.

4,914,056
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING TAPERED PILLARS
Katsuya Okumura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 154,532, Feb. 5, 1988, abandoned, which is a continuation of Ser. No. 856,973, Apr. 29, 1986, abandoned. This application Dec. 5, 1988, Ser. No. 281,924
Claims priority, application Japan, May 13, 1985, 60-100916
Int. Cl.[4] H01L *21/283*
U.S. Cl. 437—192 **8 Claims**

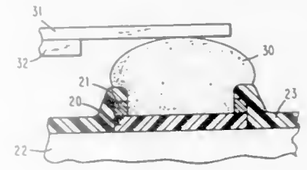




1. Method of manufacturing a semiconductor device comprising the steps of:
forming on a semiconductor substrate multi-layer structured layer consisting of a first Al or Al alloy layer and a second refractory metal or refractory metal silicide layer formed on said first layer;
selectively forming a resist layer on said layers;
isotropically etching said second layer to form a pattern having a tapered portion from said second layer using said resist layer as a mask;
anisotropically etching said first layer to form from said first layer a first interconnection layer using said resist layer as a mask;
selectively etching said pattern to remove a portion of said pattern from said first interconnection layer and leave a portion of said pattern on said first interconnection layer to form pillars thereon;
forming an insulating layer including SiO_2 on said substrate;
exposing top and edge surfaces of said pillars from said insulating layer; and
forming a second interconnection layer connected with said top and edge surfaces of said pillars.

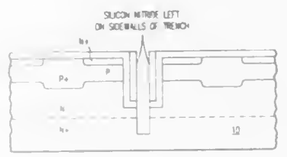
4,914,057
CONTACTING METHOD AND STRUCTURE FOR INTEGRATED CIRCUIT PADS
Jean-Pierre Gloton, Aix En Provence, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France
Filed Jul. 15, 1988, Ser. No. 323,604
Claims priority, application France, Jul. 16, 1987, 87 10413
Int. Cl.[4] H01L *21/44*
U.S. Cl. 437—193 **2 Claims**

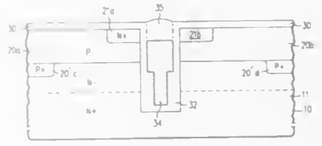
1. A method for contacting an integrated circuit aluminum pad, comprising the following steps: providing beneath the aluminum a conductive underlayer constituted of a material ensuring a good electrical contact with aluminum; locally



removing the aluminum layer for uncovering a portion of the underlayer surface; and establishing a connection with the underlayer by means of a drop of conductive adhesive.

4,914,058
GROOVED DMOS PROCESS WITH VARYING GATE DIELECTRIC THICKNESS
Richard A. Blanchard, Los Altos, Calif., assignor to Siliconix Incorporated, Santa Clara, Calif.
Filed Dec. 29, 1987, Ser. No. 138,999
Int. Cl.[4] H01L *21/283, 21/22*
U.S. Cl. 437—203 **9 Claims**





1. A method of making a semiconductor device comprising the steps of:
providing a first region of semiconductor material having a first conductivity type;
forming a second region of semiconductor material having a second conductivity type, overlying said first region;
forming a first groove, said first groove extending through said second and third regions and into said first region so that a first portion of said third region and a first portion of said second region lie on at least one side of said first groove;
lining said first groove with a dielectric material thereby forming a second, inner groove, having a first portion of said dielectric material of a predetermined thickness on a sidewall of said first groove thicker than a second portion thereof of a predetermined thickness on said sidewall of said first groove, with the first portion thereof closer to the depth of the first groove than the second portion thereof;
filling the depth of said second, inner groove with a conductive material; and

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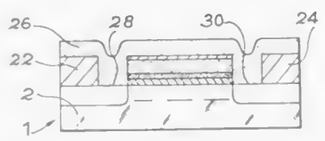
forming an insulating layer over the device resulting from the preceding steps.

4,914,059

PROCESS FOR THE HEAT FLASH VAPOUR PHASE DEPOSITION OF AN INSULATING LAYER ON A III-V MATERIAL SUBSTRATE AND ITS APPLICATION TO THE PRODUCTION OF A MIS STRUCTURE

Yves Nissim, 57 Quai de Dion Bouton, 92800 Puteaux, and Marcel Bensoussan, 881 Cours Aquitaine, 92100 Boulogne, both of France

Continuation of Ser. No. 113,557, Oct. 27, 1987, abandoned. This application Aug. 19, 1988, Ser. No. 236,325
Claims priority, application France, Oct. 27, 1986, 86 14896
Int. Cl.[4] H01L *21/316, 21/318, 29/78*
U.S. Cl. 437—235 **14 Claims**



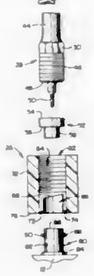
1. Process for depositing an electrically insulating layer (12) on a III-V material substrate (6), comprising at least one first stage (A) of preparing the surface of the substrate (6) performed under a heat flash and a second stage (B) of chemical vapour phase deposition of said insulating layer (12) at a temperature exceeding the non-congruent decomposition temperature of the substrate surface, said second stage (B) being performed by exposing the substrate (6) to a heat flash.

4,914,060

CONNECTOR FOR ANTENNAS AND COAXIAL CABLE

James A. Seas, 3629 Whetstone River Rd. South, Marion, Ohio 43302

Filed Mar. 17, 1989, Ser. No. 325,451
Int. Cl.[4] H01R *13/54*
U.S. Cl. 439—318 **11 Claims**



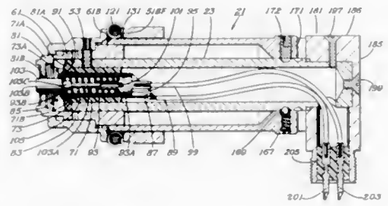
1. A connector for mounting an electrical transmission component to a bayonet-type fixed connector having a cylindrical support shell, an end surface, oppositely disposed bayonet pins and surrounding a centrally disposed conductive receiver, comprising:
a support clamp having a rearwardly disposed support portion for supporting said electrical transmission component, a coupling portion adjacent thereto, a compression shoulder and conductive leads means electrically communicating with said transmission component for removable connection with said conductive receiver;
a spacer having a compression surface configured for receiving said compression shoulder in force transmitting communication, and an oppositely disposed contact shoulder;
a connector sleeve having a cylindrical passageway extending therethrough, said connector sleeve being configured having an engaging region for receiving and engaging said support clamp coupling portion in compression deriving connection upon relative movement therebetween, said passageway including intrenally disposed ramp means having oppositely disposed ramp contact surfaces for engagement with said bayonet pins, channel means for accessing said bayonet pins with said ramp contact surfaces upon positioning of said passageway over said fixed connector cylindrical support, said channel means extending to an end surface;
whereby, said connector sleeve, upon rotation, is drawn toward said bayonet-type fixed connector by said connector sleeve ramp contact surfaces engagement with said bayonet pins to effect connection of said fixed connector conductive receiver and said conductive lead, and upon relative movement of said support clamp and said connector sleeve, said ramp contact surfaces and said bayonet pins are urged into enhanced compressive engagement.

4,914,061

TEST PROBE APPARATUS

Robert A. Williams, 55 Bounty Rd. East, Fort Worth, Tex. 76132

Continuation-in-part of Ser. No. 104,813, Oct. 1, 1987, Pat. No. 4,850,893, which is a continuation-in-part of Ser. No. 50,091, May 14, 1987, abandoned. This application May 8, 1989, Ser. No. 348,720
Int. Cl.[4] H01R *13/639*
U.S. Cl. 439—349 **15 Claims**



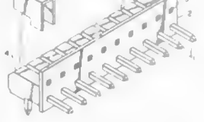
1. A test probe apparatus, comprising:
tubular body means having a front end and a rear end,
structure including electrical contact means supported at said front end of said tubular body means,
electrical leads connected to said electrical contact means and extending through said tubular body means towards said rear end,
structure coupled to the front portion of said tubular body means forming an outer annular slot,
said annular slot being defined by forward and rearward facing wall means and inner wall means facing outward,
said forward and rearward facing wall means and said inner wall means being secured in place relative to said tubular body member,
said structure comprising means spaced from and surrounding said tubular body means defining opening means leading to said annular slot,
a first ring shaped member located in said annular slot adjacent to said inner wall means, said first ring shaped member being of the type that can be expanded outwardly from its center and when released it will retract inwardly towards its center,
a second ring shaped member located in said annular slot outwardly of said first ring shaped member such that said first ring shaped member is between said inner wall means and said second ring shaped member, said second ring shaped member being of the type that can be expanded outwardly from its center and when released it will retract inwardly towards its center, said second ring shaped member having an outer surface that is adapted to coactingly engage an interior surface of an opening of a device which is to be tested,
said second ring shaped member being expandable in response to the expansion of said first ring shaped member and retractable in response to the retraction of said first ring shaped member,
an axially movable sleeve means located around said tubular body means,
said sleeve means being adapted to be moved between rearward and forward positions relative to said tubular body means,
said sleeve means having front means adapted to be received by said opening means so as to be located inwardly of said first ring shaped member, said front means being movable in said opening means such that when said sleeve means is moved toward said forward position said front means moves at least portions of said first ring shaped member and said second ring shaped member outwardly, said outward portions of said second ring shaped member comprising said outer surface and being for latching said test probe apparatus to the interior surface of the device to be tested, and when said sleeve means is moved to said rearward position said front means of said sleeve means allows said first and second ring shaped members to retract inwardly into said annular slot wherein said second ring shaped member is in an unlatched position.

4,914,062

SHIELDED RIGHT ANGLED HEADER

John Voltz, Newark, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Feb. 15, 1989, Ser. No. 311,664
Int. Cl.[4] H01R *13/648*
U.S. Cl. 439—608 **4 Claims**



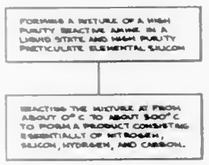
1. A right-angled header for connecting a coaxial electrical cable to a printed circuit board comprising:
(a) a molded thermoplastic encapsulating insulative body surrounding and holding in evenly ordered arrangement;
(b) one or more right-angled conductive metal electrical signal contact pins;
(c) each of which pins is surrounded by said insulative body and a separate conductive metal shell;
(d) associated with each signal contact pin a right-angled metal ground contact pin which is affixed to each conductive metal shell; and
(e) a molded thermoplastic shroud surrounding all faces of said header which do not have contact pins extending from their surface and bonding said header into an unitary whole.

4,914,063

PROCESS FOR PRODUCING ORGANIC PRODUCTS CONTAINING SILICON, HYDROGEN, NITROGEN, AND CARBON BY THE DIRECT REACTION BETWEEN ELEMENTAL SILICON AND ORGANIC AMINES

Eloise A. Pugar, Isla Vista, and Peter E. D. Morgan, Thousand Oaks, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 4, 1988, Ser. No. 177,270
Int. Cl.[4] C04B *35/56;* **C08G** *77/04*
U.S. Cl. 501—92 **30 Claims**



29. A process for continuously producing, from particulate metallic silicon and a reactive amine liquid, an intermediate product consisting essentially of silicon, hydrogen, nitrogen, and carbon which is capable, upon subsequent heating to a temperature of at least 800° C., of being converted into a high purity silicon carbide/silicon nitride ceramic which process comprises:
(a) continuously reacting elemental silicon particles having a purity of at least 99.5 wt.%, at a temperature, equivalent at atmospheric pressure of from about 0° C. up to about 300° C. with a reactive amine selected from the class consisting of:
(1) amines having the formula $R^1R^2R^3(N)$ wherein R^1 is a 1–18 carbon alkyl group, an aryl group, an aralkyl group, or an alkaryl group; R^2 is hydrogen, a 1–18 carbon alkyl group, an aryl group, an aralkyl group, or an alkaryl group; and R^3 is hydrogen, a 1–18 carbon alkyl group, an aryl group, an aralkyl group, or an alkaryl group;
(2) a diamine, triamine, or tetramine; and
(3) organic nitrogen compounds having a direct N—N bond, including cyclic organic nitrogen compounds; and
(b) continuously removing from said reaction vessel an intermediate product consisting essentially of silicon, hydrogen, nitrogen, and carbon.

4,914,064

HIGHLY AROMATIC POLYUREA/URETHANE MEMBRANES AND THEIR USE FOR THE SEPARATION OF AROMATICS FROM NON-AROMATICS

Robert C. Schucker, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 14, 1987, Ser. No. 108,822
Int. Cl.[4] B01J *20/28*
U.S. Cl. 502—4 **9 Claims**

1. A dense non-porous polyurea/urethane membrane characterized by possessing a urea index of at least about 20% but less than 100%, an aromatic carbon content of at least about 15 mole percent, a functional group density of at least about 10 per 1000 grams of polymer and a C=O/NH ratio of less than about 8.

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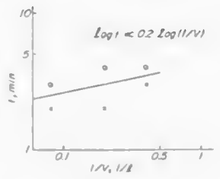
4,914,065

PROCESS FOR REGNERATING CERAMIC HONEYCOMB FILTERS BY COMBUSTION

Toshihiko Hijikata, and Toshiaki Higuchi, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Oct. 20, 1988, Ser. No. 260,025
Claims priority, application Japan, Nov. 12, 1987, 62-284106
Int. Cl.[4] B01J *38/14, 38/12;* B01D *53/36;* F23N *3/00*
U.S. Cl. 502—52 3 Claims



1. A process for regenerating ceramic honeycomb filters by removing soot deposited thereon through combustion, which comprises the step of controlling the combustion of the soot such that a time t (minutes), required for raising a temperature of an exhaust gas from a Tig, soot-ignition temperature, to a Tig+200° C., satisfies the following equation:

$$t \geq \frac{S \cdot Tig}{Q \cdot V^{0.2}} \times 7 \times 10^{-4}$$

wherein
Q is the total flow rate of the waste gas per unit volume of said filters in the initial stage of soot ignition ($Nm^3/min/l$);
V is the volume of said filters (l); and
S is the heaped soot per unit volume of said filters (g/l).

4,914,066

PELLETS OF CLAY AND SUPERABSORBENT POLYMER

Guy T. Woodrum, Chesapeake, Va., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Feb. 24, 1989, Ser. No. 315,434
Int. Cl.[4] B01J *20/12*
U.S. Cl. 502—62 16 Claims

1. A moisture absorbing composition comprising a blend of (a) about 0.5 to about 15 weight percent of a solid water-swellable organic polymeric hydrocolloid insoluble in water but capable of absorbing water and (b) about 85 to about 99.5 weight percent bentonite clay, said weight percents being based on the total weight of (a) and (b), wherein (a) and (b) are compressed into pellets.

4,914,067

CATALYTIC CRACKING CATALYSTS AND CRACKING PROCESS USING MIXED CATALYST SYSTEM

Regis J. Pellet, Croton; Peter K. Coughlin, Yorktown Heights; Mark T. Staniulis, Peekskill; Gary N. Long, Putnam Valley, and Jule A. Rabo, Armonk, all of N.Y., assignors to UOP, Des Plaines, Ill.

Continuation of Ser. No. 675,283, Nov. 27, 1984, abandoned, which is a continuation-in-part of Ser. No. 490,952, May 2, 1983, Pat. No. 4,512,875. This application Nov. 28, 1986, Ser. No. 935,599
The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.
Int. Cl.[4] B01J *29/08, 27/182*
U.S. Cl. 502—63 20 Claims

4. A cracking catalyst comprising at least one zeolitic aluminosilicate having cracking activity at conditions effective for cracking crude oil feedstocks and at least one silicoaluminophosphate molecular sieve, characterized in its calcined form by an adsorption of isobutane of at least 2 percent by weight at a pressure of 500 torr and a temperature of 20° C., wherein the weight ratio of said zeolitic aluminosilicate to said silicoaluminophosphate is between about 1:10 and about 500:1 and wherein at least one of said zeolitic aluminosilicate and said silicoaluminophosphate contains an effective amount of at least one cation selected from the group consisting of ammonium, Groups IIA, IIIA, IIIB, IVB, VB, VIB, VIIB, rare earth cations and mixtures thereof.

4,914,068

PROCESS FOR THE DISPERSION OF GROUP VIII METALS IN LARGE PORE ZEOLITE CATALYSTS

Virginia R. Cross; Jar L. Kao, both of Houston; Thomas H. Vanderspurt, Atascocita; Murray Nadler, Houston, all of Tex., and Theodorus M. Wortel, Rotterdam, Netherlands, assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Mar. 21, 1988, Ser. No. 170,503
Int. Cl.[4] B01J *29/06, 37/22, 23/90*
U.S. Cl. 502—74 37 Claims

1. A method for dispersing at least one Group-VIII metal in a catalyst containing a large pore zeolite and at least one Group-VIII metal comprising the steps of:
(a) dispersing the at least one Group-VIII metal on the zeolite by exposing the catalyst to a gaseous stream containing at least one halogen source elected from a halogen, a halogen and oxygen, a hydrogen halide and oxygen, oxygen and an organic compound containing halogen, and mixture of these at a temperature sufficient to form oxyhalides or halides of said metal;
(b) cooling the catalyst to a temperature less than the dispersing temperature of step (a) and then
(c) reducing said Group-VIII metal by contacting the catalyst with a reducing as at least initially within the temperature range of step (b).

30. The method of reducing a catalyst comprising a large-pore zeolite and at least one Group-VIII metal, the catalyst initially containing one or more halogens, the method comprising the steps of reducing the catalyst by contacting it with a hydrogen-containing reducing gas at a reducing temperature sufficient to cause reduction of said metal by the hydrogen in said gas, whereby hydrogen halides are formed in said reducing gas, and limiting the concentration of hydrogen in said reducing gas so as to limit the concentration of hydrogen halides in said reducing gas to less than about 1200 vppm.

4,914,069

PREPARATION OF OLEFIN POLYMERIZATION CATALYST COMPONENT

Robert C. Job, Houston, and Steven M. Nestlerode, Katy, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 46,203, May 4, 1987, abandoned. This application Aug. 8, 1988, Ser. No. 229,406
Int. Cl.[4] B01J *4/64*
U.S. Cl. 502—107 11 Claims

1. The process for preparing a solid catalyst component for use in the polymerization of olefins, which catalyst component contains magnesium, titanium and halogen and is prepared by the steps of:
(a) halogenating a magnesium compound of formula Mg R'R", wherein R' is an alkoxy, alkyl carbonate or aryloxy group and R" is halogen or an alkyl, aryl, alkoxy, alkyl carbonate or aryloxy group with a first halide of tetravalent titanium and a first electron donor;
(b_1) contacting the resulting halogenated product with a second halide of tetravalent titanium; and
(c) washing a resulting treated halogenated product with an inert hydrocarbon liquid, characterized in that a second electron donor is used in step (a) or step (b_1) and in that the product of step (b_1) is contacted in a step (b_2) with a third halide of tetravlent titanium at a temperature of 40° to 140° C. and thereafter the treated product is washed in step (c).

4,914,070

PROCESS FOR THE PRODUCTION OF SILICON CARBIDE WITH A LARGE SPECIFIC SURFACE AREA AND USE FOR HIGH-TEMPERATURE CATALYTIC REACTIONS

Marc J. Ledoux; Jean-Louis Guille; Sylvain Hantzer, all of Strasbourg, and Dominique Dubots, Le Fayet, all of France, assignors to Pechiney Electrometallurgie, Courbevoie, France

Filed Oct. 6, 1988, Ser. No. 254,149
Claims priority, application France, Oct. 19, 1987, 87 14742; Jan. 29, 1988, 88 01399; Mar. 30, 1988, 88 04727
Int. Cl.[4] B01J *21/18, 27/22*
U.S. Cl. 502—178 10 Claims

1. A process for the production of fine grains of silicon carbide which are formed by an agglomerate of submicronic grains having a specific surface area that is at least 100 $m^2 \cdot g^{-1}$, which are intended in particular to serve as a carrier for catalysts for petrochemistry, and for catalytic reactions at elevated temperature which can attain 1000° C., the process comprising reacting vapours of silicon monoxide SiO on carbon by the steps of:
(a) generating vapours of SiO in a first reaction zone by heating a mixture of SiO_2 + Si at a temperature of between 1100° and 1400° C., under a pressure of between 0.1 and 1.5 hPa; and
(b) contacting in a second reaction zone at a temperature of between 1100° and 1400° C , the SiO vapours generated in said first reaction zone with finely divided reactive carbon with a specific surface area that is equal to or greater than 200 $m^2 \cdot g^{-1}$.

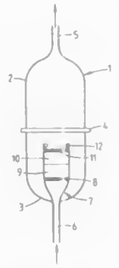
10. Silicon carbide catalyst carrier produced by the process of claim 1.

4,914,071

METHOD FOR PREPARING A CATALYST

Ann Collins, Feltham; Jonathon C. Frost, Chobham, and Peter J. Price, Kingston-on-Thames, all of England, assignors to The British Petroleum Company p.l.c., London, England

Continuation-in-part of Ser. No. 217,993, Jul. 12, 1988, abandoned. This application Sep. 11, 1989, Ser. No. 410,780
Claims priority, application United Kingdom, Jul. 14, 1987, 8716565
Int. Cl.[4] B01J *21/18, 23/62;* A62D *9/00;* B01D *53/36*
U.S. Cl. 502—185 12 Claims



1. A method for preparing a catalyst suitable for oxidation of carbon monoxide comprising the steps of (a) treating a high surface area carbon support with an aqueous solution comprising a soluble stannic salt and a promoter, said promoter being one or more salts of the platinum group of metals (b) drying the material from step (a), (c) immersing the material from step (b) in a hydrocarbon and reacting it with hydrazine hydrate with vigorous agitation to convert the stannic salt to stannic oxide, (d) washing the material from step (c), and (e) drying the material from step (d) so as to form a catalyst comprising 0.5 to 10% by weight of each platinum group metal and 10 to 30% by weight of stannic oxide.

4,914,072

PHOSPHORUS/TITANIA/ZIRCONIA CATALYST FOR PREPARATION OF LINEAR POLYETHYLENEPOLYAMINES

Neal J. Grice; John F. Kaifton, both of Austin, Tex., and Chau-Hwa Yang, Hopewell Junction, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 2, 1988, Ser. No. 163,355
Int. Cl.[4] B01J *21/06, 27/18*
U.S. Cl. 502—208 25 Claims

1. A method for preparing a catalytically active composition consisting essentially of a pelleted heterogeneous coprecipitate of titania and zirconia having about 0.5 to about 6 wt. % of phosphorus thermally chemically bonded thereto in the form of hydroxy-containing phosphate groups, said method comprising the steps of:
preparing a polar organic solvent solution of a tetravalent aliphatic organic compound of titanium and a tetravalent aliphatic organic compound of zirconium, said polar organic solvent solution containing from about 0.1 to about 10 wt. % of said tetravalent compounds of titanium and zirconium, the weight of the tetravalent titanium compound comprising about 40 to about 60 wt. % of the combined weight of both the tetravalent titanium compound and the tetravalent zirconium compound and, correspondingly, the weight of the tetravalent zirconium compound comprising about 60 to about 40 wt. % of the said combined weight,
adding an amount of a hydrolysing agent to said solution sufficient to hydrolyse said titanium compound and said zirconium compound to titania and zirconia, respectively, and to coprecipitate a heterogeneous mixture of titania and zirconia,
recovering and washing said coprecipitated mixture of titania and zirconia,
impregnating said coprecipitate with a solution of a phosphorus compound containing phosphorus-oxygen bonds at a temperature of about 20° to about 150° C., draining and drying said impregnated coprecipitate and then stabilizing said coprecipitate by calcination at a temperature within the range of about 200° to about 800° C. sufficient to thermally chemically bond about 0.5 to 6 wt. % of phosphorus to said pellets in the form of hydroxy-containing phosphate groups.

4,914,073

PROCESS FOR THE MANUFACTURE OF CATALYTIC ELEMENTS AND CATALYTIC ELEMENTS SO PRODUCED

Daniel Grimm, Bad Schwalbach; Hartmut Kainer, Wiesbaden; Albert Kleinevoss, Höhr-Grenzhausen; Karl-Heinrich Lase, Hattingen; Claus Flockenhaus, and Klaus Merkel, both of Essen, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden and Didier Engineering GmbH, Essen, both of, Fed. Rep. of Germany

Filed Aug. 12, 1988, Ser. No. 231,702
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1987, 3727118
The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.
Int. Cl.[4] B01J *27/053, 27/185, 27/188, 27/198*
U.S. Cl. 502—209 21 Claims

1. A process for the manufacture of catalytic elements, said process comprising the steps of:
(a) providing a solid primary material, said solid primary material being a member selected from the group consisting essentially of iron oxide, a mixture of iron oxide and chromium oxide, a mixture of iron oxide and manganese

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oxide, a mixture of iron oxide, chromium oxide and manganese oxide and combinations of members of the group;

(b) treating said solid primary material according to at least one of subprocess I and subprocess II; wherein said subprocess I comprises the steps of:

(1) acid treating said solid primary material with a member selected from the group consisting essentially of:

(a) sulfuric acid;

(b) a mixture of sulfuric acid and phosphoric acid;

(c) a mixture of sulphuric acid and an additional component; and

(d) a mixture of sulphuric acid and phosphoric acid containing an additional component;

said additional component being a member selected from the group consisting essentially of a sulfate of a constituent, a hydrogen sulfate of said constituent, a phosphate of said constituent and a hydrogen phosphate of said constituent;

said constituent being a member selected from the group consisting essentially of ammonium, aluminum, iron, vanadium, manganese, molybdenum, chromium, copper, and cobalt, and

(2) producing a catalytic element from said acid treated solid primary material resulting from said step (1) above and wherein said subprocess II comprises the steps of:

(1) producing catalytic elements from said solid primary materials; and

(2) acid treating said catalytic elements with a member selected from the group consisting essentially of sulfuric acid, sulfuric acid containing a sulphate of a constituent and sulfuric acid containing a hydrogen sulfate of said constituent;

said constituent being selected from the group consisting essentially of ammonium, aluminum, iron, vanadium, manganese, molybdenum, chromium, copper, and cobalt;

(c) drying said catalytic elements at a temperature in the range of from about 110° C. to about 250° C.; and

(d) tempering said catalytic elements at a temperature in a range from about 250° C. to about 600° C.

4,914,074

CATALYST COMPOSITION

Timothy K. McNiff, Weybridge, Surrey, England, assignor to The British Petroleum Company p.l.c., London, England

Filed Nov. 3, 1988, Ser. No. 267,206

Claims priority, application United Kingdom, Nov. 18, 1987, 8726974

Int. Cl.[4] B01J *21/04, 23/58, 23/62, 23/64*

U.S. Cl. 502—226 **8 Claims**

1. A catalyst composition which comprises alumina and platinum; characterized in that the alumina carried internally and/or on its surface, gallium and a Group II A metal.

4,914,075

DEHYDROGENATION CATALYST COMPOSITION

Jeffery C. Bricker, Buffalo Grove; Deng-Yang Jan, Mount Prospect, and John M. Foreman, Westmont, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed Dec. 5, 1988, Ser. No. 279,609

Int. Cl.[4] B01J *21/04, 23/58, 23/62*

U.S. Cl. 502—330 **8 Claims**

1. A catalytic composite comprising a first component selected from Group VIII noble metal components or mixtures thereof, a second component selected from the group consisting of alkali or alkaline earth metal components or mixtures thereof, and a third component selected from the group consisting of tin, germanium, lead, indium, gallium, thallium, or mixtures thereof, all on an alumina support comprising essentially theta-alumina and having a surface area of from about 50 to 120 m^2/g and an Apparent Bulk Density of 0.5 g/cm^3 or more.

4,914,076

METHOD OF PRODUCING AN ADSORBENT FOR SEPARATION AND RECOVERY OF CO

Toshiaki Tsuji; Akira Shiraki, and Hiroaki Shimono, all of Amagasaki, Japan, assignors to Kansai Netsukagaku Kabushiki Kaisha, Amagasaki, Japan

Filed Dec. 1, 1988, Ser. No. 278,509

Claims priority, application Japan, Dec. 12, 1987, 62-315054

Int. Cl.[4] B01J *20/08, 20/10*

U.S. Cl. 502—407 **4 Claims**

1. A method of producing an adsorbent for separation and recovery of CO which comprises contacting an alumina or silica-alumina carrier with a mixed solution or dispersion of a cupric salt and a reducing agent in a solvent and, then, removing the solvent, wherein said reducing agent is a salt of a metal in a low valence state or an organic compound which is in a degree of low oxidation.

2. The method of claim 1 wherein the amount of said cupric salt relative to said carrier is 0.5 to 10 mmols/g and the amount of said reducing agent supported on the carrier is sufficient to reduce the cupric ion supported on the carrier to cuprous ion.

4,914,077

ALKYL- OR ARYL-AMINO-PYRIDINYL- OR PYRIMIDINYL-AZO YELLOW DYE-DONOR ELEMENT FOR THERMAL DYE TRANSFER

Leslie Shuttleworth, and Helmut Weber, both of Webster, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 190,810, May 6, 1988, abandoned. This application Mar. 16, 1989, Ser. No. 324,476

Int. Cl.[4] B41M *5/035, 5/26*

U.S. Cl. 503—227 **20 Claims**

10. In a process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a plastic film support having thereon a dye layer comprising a yellow dye dispersed in a polymeric binder and transferring a dye image to a dye-receiving element to form said dye transfer image, the improvement wherein said dye comprises a 3-arylazo-2,6-di-alkyl- or aryl-amino-pyridine or 5-arylazo-2,6-di-alkyl- or aryl-amino-pyrimidine yellow dye, said dye not having any reactive pendant moiety capable of undergoing Michael-type addition.

4,914,078

THERMAL TRANSFER RECEIVER

Richard A. Hann, Frodsham, and Nicholas C. Beck, Runcorn, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Apr. 25, 1988, Ser. No. 185,875

Claims priority, application United Kingdom, Apr. 24, 1987, 8709800

Int. Cl.[4] B41M *5/035, 5/26*

U.S. Cl. 503—227 **8 Claims**

1. A receiver sheet for dye-diffusion thermal transfer printing, comprising a substrate which supports a receiver coat, the receiver coat comprising a dye-receptive material and a dye-permeable release agent, characterised in that the release agent is a thermoset amino-modified-silicone organic-oligoepoxide resin.

4,914,079

THERMAL TRANSFER INK MEDIUM AND METHOD OF PRINTING

Katsumori Takei; Hitoshi Fukushima; Kohei Iwamoto, and Hiroto Nakamura, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Oct. 5, 1987, Ser. No. 104,139

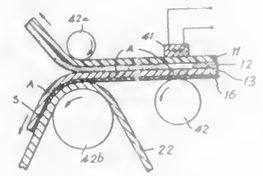
Claims priority, application Japan, Oct. 6, 1986, 61-237482; Oct. 6, 1986, 61-237483; Oct. 6, 1986, 61-237484

Int. Cl.[4] B41M *5/035, 5/26*

U.S. Cl. 503—227 **35 Claims**

6. A method of printing an image on a transfer medium using a thermal transfer ink medium having at least a heat-resistant support layer, a thermoplastic ink layer provided on the support layer, a release layer disposed on the ink layer and an ink transfer layer that includes one of a film forming thermoplastic and cross-linking organic material provided on the release layer, comprising:

placing the ink transfer layer in contact with the transfer medium;



selectively applying thermal energy to the support layer in accordance with the image signals in an amount sufficient to cause the ink in the portions corresponding to the image to be printed to form a latent image on the ink transfer layer;

adhering the ink transfer layer as a continuous film supporting the selected portions of ink corresponding to the latent image to the transfer medium; and

removing the support layer and the non-selected portion of the ink layer from the ink transfer layer.

4,914,080

METHOD FOR FABRICATING SUPERCONDUCTIVE FILM

Kohta Yoshikawa, Yokohama; Naoki Awaji; Kyung-ho Park, both of Kawasaki; Nagisa Ohsako, and Seigen Ri, both of Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 24, 1989, Ser. No. 300,889

Claims priority, application Japan, Jan. 27, 1988, 63-014387; Jun. 8, 1988, 63-140701

Int. Cl.[4] B05D *5/12;* **C23C** *14/08*

U.S. Cl. 505—1 **10 Claims**

1. A method of producing a superconductive film which comprises:

mixing powders comprising compounds of rare earth metal, barium and copper in elemental atomic ratios of 1:2:3 for rare earth metal, barium and copper, respectively;

pressing said first mixed powders into a first predetermined shape;

sintering said first shaped article in an atmosphere containing oxygen under conditions necessary to produce a first sintered shaped article having a rhombic perovskite crystal structure which exhibits superconductivity at liquid nitrogen temperatures;

comminuting said sintered shaped article;

mixing the comminuted particles with additional powder comprising at least one rare earth metal oxide and copper;

pressing said second mixed powders into a second shaped article;

sintering said second shaped article under an atmosphere containing oxygen;

subjecting said second sintered article to electron beam evaporation under an atmosphere containing oxygen to deposit a film thereof on a substrate and annealing said film under an atmosphere containing oxygen wherein the amount and composition of said additional powder is selected such that when said film is laid down it has a rhombic perovskite crystal structure and exhibits superconductivity at liquid nitrogen temperatures.

4,914,081

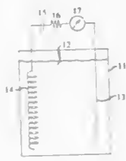
PROCESS FOR MAKING METALLIZED STRUCTURE AND ARTICLE COMPRISING STRUCTURE

Barry Miller, New Providence, and Joseph M. Rosamilia, Berkeley Heights, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 15, 1988, Ser. No. 144,832

Int. Cl.[4] C25D *7/00*

U.S. Cl. 505—1 **39 Claims**



1. A process for making an article comprising a metal-material interface comprising the step of electroplating said metal onto the material from an electroplating bath with conductivity greater than $10^{-3}1$ mho-cm, said electroplating bath comprising nonaqueous solvent and source of metal to be electroplated, said metal capable of electrodeposition from a nonaqueous electroplating bath characterized in that the material is a superconducting oxide with superconducting transition temperature greater than 77 degrees Kelvin.

22. An article comprising metal-material interface characterized in that the material is a superconducting oxide with superconducting transition temperature greater than 77 degrees Kelvin and the metal-material interface is made by electroplating metal onto the material from an electroplating bath comprising nonaqueous solvent and source of metal.

4,914,082

S(4-HYDROXY-1-ISOPROPYL-4-METHYLHEXYL) THIOACETATE, ORGANOLEPTIC USES THEREOF AND PROCESS FOR PREPARING SAME

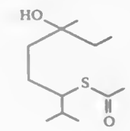
Richard M. Boden, Ocean, and Joseph A. McGhie, South Orange, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 273,017, Nov. 18, 1988. This application Sep. 14, 1989, Ser. No. 407,062

Int. Cl.[4] A61K *7/46*

U.S. Cl. 512—7 **9 Claims**

1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of intimately admixing with said consumable material, an aroma augmenting or enhancing quantity of s(4-hydroxy-1-isopropyl-4-methylhexyl) thioacetate having the structure:



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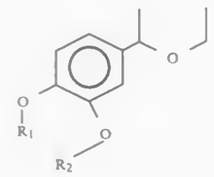
4,914,083

OXY-SUBSTITUTED-2-PHENYL PYRAN DERIVATIVES AND PROCESS FOR PREPARING SAME AND PERFUMERY USES THEREOF

Wilhelmus J. Wiegers, Red Bank, and Anton Van Ouwerkerk, Livingston, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jul. 14, 1989, Ser. No. 380,081
Int. Cl.[4] A61K *7/46*
U.S. Cl. 512—12 15 Claims

1. An oxy-substituted-2-phenyl pyran derivative defined according to the structure:



wherein:

(i) the dashed lines each represent carbon-carbon single bonds; or one of the dashed lines is a carbon-carbon double bond and the other of the dashed lines is a carbon-carbon single bond;

(ii) wherein R_1 is hydrogen and R_2 is lower alkyl; or

(iii) R_1 and R_2 taken together as represented by the moiety:

represent methylene.

6. The process for augmenting or enhancing the aroma of a perfume composition, cologne or perfumed article comprising the step of intimately admixing with a perfume base, cologne base or a perfumed article base, an aroma augmenting or enhancing quantity of at least one oxy-substituted-2-phenyl pyran derivative defined according to claim 1.

4,914,084

COMPOSITION AND METHOD FOR INTRODUCING HEME, HEMOPROTEINS, AND/OR HEME-HEMOPROTEIN COMPLEXES INTO THE BODY

Bernard Ecanow, Wilmette, Ill., assignor to Synthetic Blood Corporation, Deerfield, Ill.

Continuation-in-part of Ser. No. 1,814, Jan. 8, 1987, Pat. No. 4,794,000, which is a continuation-in-part of Ser. No. 896,844, Aug. 14, 1986, which is a continuation-in-part of Ser. No. 710,648, Mar. 11, 1986, abandoned, Ser. No. 711,066, Mar. 12, 1986, abandoned, and Ser. No. 608,483, May 9, 1984, abandoned.
This application Mar. 26, 1987, Ser. No. 31,237
Int. Cl.[4] A61K *37/14, 9/48*
U.S. Cl. 514—6 6 Claims

1. A method of stabilizing a solution of an iron-containing molecule capable of carrying and releasing oxygen comprising intimately contact the solution with a chemical agent capable of forming a complex with iron prior to coacervation to complex substantially all of the iron-containing molecules with said chemical agent, in solution, with said chemical agent; thereafter, intimately contacting the solution with an interactant capable of interacting with said chemical agent, as complexed with the iron-containing molecules in solution, to release said chemical agent from solution; and including the iron-containing molecule within a coacervate phase of a two-phase coacervate composition.

4,914,085

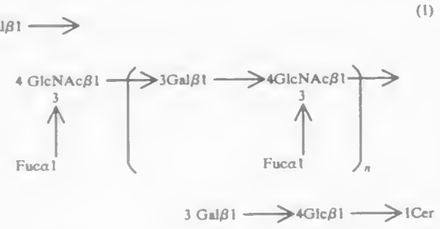
ANTIRHEUMATIC AGENT

Takahiro Ochi, Kawanishi, Japan, assignor to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

Filed May 20, 1987, Ser. No. 51,598
Claims priority, application Japan, May 21, 1986, 61-116703
Int. Cl.[4] A61K *31/70, 31/715, 37/20*
U.S. Cl. 514—25 3 Claims

1. A method for treating rheumatoid arthritis characterized by administering a glycolipid represented by the general formula (1),

(1)



(wherein n is 1 or 2).

4,914,086

METHOD FOR TREATING AFRICAN HUMAN AND VETERINARY TRYPANOSOMIASES

Cyrus J. Bacchi, East Northport, N.Y.; Randolph L. Berens, Littleton; J. Joseph Marr, Englewood, both of Colo., and Henry C. Nathan, Riverdale, N.Y., assignors to University Patents, Inc. and Pace University

Filed Dec. 18, 1987, Ser. No. 134,931
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—45 4 Claims

1. A method for treating African human and veterinary trypanosomiases, which comprises administering a non-toxic effective amount of 9-deazainosine or its pharmaceutically acceptable acid addition salt thereof, to a human being or an animal in need of such treatment.

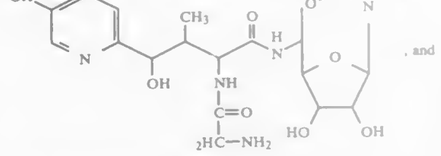
4,914,087

NIKKOMYCIN DERIVATIVES, ANTIMYCOTIC COMPOSITIONS OF NIKKOMYCIN DERIVATIVES AND AZOLE ANTIMYCOTICS

Richard F. Hector, Dublin, Calif.; Klaus Schaller, Wuppertal, Fed. Rep. of Germany; Heinrich F. Moeschler, Leverkusen, Fed. Rep. of Germany, and Manfred Plempel, Haan, Fed. Rep. of Germany, assignors to Bayer AG, Leverkusen, Fed. Rep. of Germany

Filed Feb. 29, 1988, Ser. No. 161,645
Int. Cl.[4] A61K *31/41, 31/70*
U.S. Cl. 514—50 4 Claims

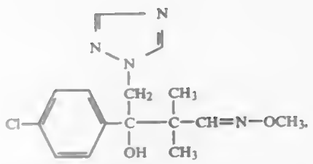
1. A method of treating an animal infected with fungi, the method comprising administering to the animal synergistically effective amounts of nikkomycin derivative selected from the group consisting of compounds having the following structures



, and

, and

and an azole antimycotic having the following structure



the amounts of the nikkomycin derivative and the azole antimycotic being in a ratio of 1:1 to 30:1.

4,914,088

DRY EYE TREATMENT SOLUTION AND METHOD

Thomas Glonek, 803 Highland Ave., Oak Park, Ill. 60304; Jack V. Greiner, 208 Stearns Hill Rd., Waltham, Mass. 02154, and Donald R. Korb, 10 Brimmer St., Boston, Mass. 02108

Continuation-in-part of Ser. No. 33,185, Apr. 2, 1987, abandoned. This application Oct. 23, 1987, Ser. No. 111,874
Int. Cl.[4] A61K *31/66*
U.S. Cl. 514—76 27 Claims

1. An artificial tear film over the surface of an eye comprising a first layer in direct contact with the ocular surface, an aqueous layer over the first layer, and a layer of a complex phospholipid having a net positive or negative charge over the aqueous layer.

4,914,089

PHARMACEUTICAL DOSAGE UNIT

Lambert J. W. M. Tax, Macharen, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Jul. 6, 1988, Ser. No. 215,838
Claims priority, application Netherlands, Jul. 6, 1987, 87.01586
Int. Cl.[4] A61K *31/56*
U.S. Cl. 514—170 11 Claims

1. Pharmaceutical composition for oral administration for treating or preventing climacteric complaints, comprising 17β-oestradiol and desogestrel in the weight ratio, respectively, of from 25:1 to 25:15.

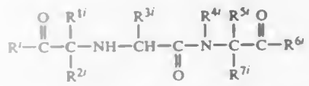
4,914,090

OPHTHALMIC COMPOSITIONS

Robert W. Watkins, Great Meadows, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Filed Nov. 1, 1985, Ser. No. 793,929
Int. Cl.[4] A61K *31/56*
U.S. Cl. 514—171 5 Claims

1. A method for reducing and controlling the elevated intraocular pressure associated with the use of hydrocortisone which comprises administering the combination of an anti-inflammatory-effective amount of hydrocortisone in a pharmaceutically acceptable carrier and an intraocular pressure-lowering effective amount of an angiotensin converting enzyme inhibitor of the formula



or a pharmaceutically acceptable salt thereof, where R^{1} and R^{6} are the same or different and are hydroxy, lower alkoxy, lower alkenyloxy, dilower alkylamino lower alkoxy, acylamino lower alkoxy, acyloxy lower alkoxy, aryloxy, aryllower alkoxy, amino, lower alkylamino, dilower alkylamino, hydroxyamino, arylower alkylamino, or substituted aryloxy or substituted aryllower alkoxy wherein the substitutent is methyl, halo

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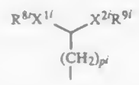
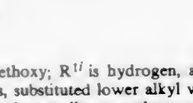
or methoxy; R^{1j} is hydrogen, alkyl of from 1 to 10 carbon atoms, substituted lower alkyl wherein the substitutent is hydroxy, lower alkoxy, aryloxy, substituted aryloxy, heteroaryloxy, substituted heteroaryloxy, amino, lower alkylamino, diloweralkylamino, acylamino, arylamino, substituted arylamino, guanidino, imidazolyl, indolyl, lower alkylthio, arylthio, substituted arylthio, carboxy, carbamoyl, lower alkoxy carbonyl, aryl, substituted aryl, aralkyloxy, substituted aralkyloxy, aralkylthio or substituted aralkylthio, wherein the aryl or heteroaryl portion of said substituted arylkoxy, heteroaryloxy, arylamino, arylthio, aryl, aralkyloxy, aralkylthio group is substituted with a group selected from halo, lower alkyl, hydroxy, lower alkoxy, amino, aminomethyl; carboxyl, cyano, or sulfamoyl; R^{2j} and R^{7j} are the same or different and are hydrogen or lower alkyl; R^{3j} is hydrogen, lower alkyl, phenyl lower alkyl, aminomethylphenyl lower alkyl, hydroxyphenyl lower alkyl, hydroxy lower alkyl, acylamino lower alkyl, amino lower alkyl, dimethylamino lower alkyl, guanidino lower alkyl, imidazolyl lower alkyl, indolyl lower alkyl, or lower alkyl thio lower alkyl; R^{4j} and R^{5j} are the same or different and are hydrogen, lower alkyl or Z^j, or R^{4j} taken together form a group represented by Q^j, U^j, V^j, Y^j, D^j or E^j, wherein;



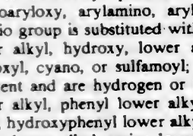
wherein X^{1j} and X^{2j} independent of each other are O, S or CH_2, R^{8j} and R^{9j} independent of each other are lower alkyl, lower alkenyl, lower alkynyl, cycloalkyl having 3 to 8 carbon atoms, hydroxy lower alkyl, or $-(CH_2)_{n^j}Ar^j$, wherein n^j is 0, 1, 2 or 3 and Ar^j is unsubstituted or substituted phenyl, furyl, thienyl or pyridyl, wherein said substituted phenyl furyl, thienyl or pyridyl groups are substituted with at least one group that is independently selected from C_1 to C_4 alkyl, lower alkoxy, lower alkylthio, halo, CF_3 and hydroxy, or R^{8j} and R^{9j} taken together form a bridge W^j, wherein W^j is a single bond or a methylene bridge or a substituted methylene bridge when at least one of X^{1j} and X^{2j} is methylene, or W^j is an alkylene or substituted alkylene bridge having 2 or 3 carbon atoms, said substituted methylene bridge or said substituted alkylene bridge having one or two substituents selected from lower alkyl, aryl and aryl lower alkyl groups, and p^j is 0, 1 or 2; with the proviso that at least one of R^4 and R^5 is Z^j, with the proviso that if R^4 is Z^j and p^j is 0 then X^{1j} and X^{2j} must both be methylene, and with the proviso that if X^{1j} and X^{2j} are both methylene then R^{8j} and R^{9j} must form an alkylene bridge W^j;

Q^j is



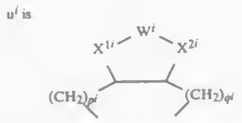
wherein R^{8j}, R^{9j}, X^{1j} and X^{2j} are as defined above, p^j is 0, 1 or 2, q^j is 0, 1 or 2, with the proviso that the sum of p^j and q^j must be 1, 2 or 3, with the proviso that if p^j is 0 then X^{1j} and X^{2j} must be methylene, and with the proviso that if X^1 and X^{2j} are methylene then R^{8j} and R^{9j} taken together form a bridge W^j, wherein W^j is as defined above;

V^j is



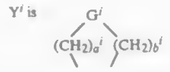
wherein R^{8j}, R^{9j}, X^{1j} and X^{2j} are as defined above, p^j is 0, 1 or 2 and q^j is 0, 1 or 2, with the proviso that the sum of p^j and q^j is 1, 2 or 3, with the proviso that if X^{1j} and X^{2j} are CH_2 then R^{8j} and R^{9j} taken together form a bridge W^j, wherein W^j is as defined above;

u^j is



wherein W^j is as defined above (except that W^j may also be a methylene bridge when X^{1j} and X^{2j} are oxygen or sulfur), X^{1j} and X^{2j} are as defined above, p^j is 0, 1 or 2, q^j is 0, 1 or 2, with the proviso that the sum of p^j and q^j is 1 or 2, and with the proviso that if p^j is 0, X^{1j} must be CH_2;

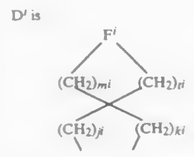
Y^j is



wherein G^j is oxygen, sulfur or CH_2, a^j is 2, 3 or 4 and b^j is 1, 2, 3, 4 or 5, with the proviso that the sum of a^j and b^j is 5, 6 or 7 or

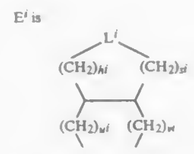
G^j CH_2, a^j is 0, 1, 2 or 3, b^j is 0, 1, 2 or 3 with the proviso that the sum of a^j and b^j is 1, 2 or 3, with the proviso that the sum of a^j and b^j may be 1, 2 or 3 only if R^{1j} is lower alkyl substituted with aralkylthio or aralkyloxy;

D^j is



wherein F^j is O or S, j^j is 0, 1 or 2 and k^j is 0, 1 or 2, with the proviso that the sum of j^j and k^j must be 1, 2 or 3, and m^j is 1, 2 or 3 and t^j is 1, 2 or 3, with the proviso that the sum of m^j and t^j must be 2, 3 or 4;

E^j is



wherein L^j is O or S, u^j is 0, 1 or 2 and v^j is 0, 1 or 2, with the proviso that the sum of u^j and v^j must be 1 or 2, and h^j is 1 or 2 and s^j is 1 or 2, with the proviso that the sum of h^j and s^j must be 2 or 3 in a topical ophthamological pharmaceutically acceptable carrier to a human in need of such treatment.

4,914,091

ESTERS OF CEPHALOSPORIN DERIVITIVES

William V. Curran, Pearl River, and Adma S. Ross, Suffern, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 2, 1984, Ser. No. 595,844
Int. Cl.[4] A61K *31/545*; C07D *501/20*
U.S. Cl. 514—206 3 Claims

1. The compound adamantane-1-carbonyloxymethyl 7β-[2-(2-aminothiazol-4-yl)-(Z)-2-methoximinoacetamido]-3-[(1,2,3-thiadiazol-5-yl)-thiomethyl]ceph-3-em-4-carboxylate.

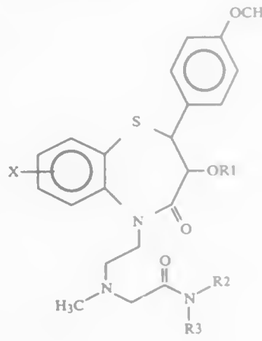
4,914,092

BENZOTHIAZEPIN-4-ONE DERIVATIVES, THEIR PREPARATION AND THEIR APPLICATION IN THERAPY

Alistair Lochead, Paris; Jean C. Muller, Morsang Sur Orge; Colombe Denys, Bourg La Reine, and André Dumas, Palaiseau, all of France, assignors to Synthelabo, Paris, France

Filed Apr. 18, 1989, Ser. No. 339,978
Claims priority, application France, Apr. 19, 1988, 88 05131
Int. Cl.[4] A61K *31/55*; C07D *281/10*
U.S. Cl. 514—211 12 Claims

1. A compound, in the form of a pure diastereoisomer or mixture thereof, which is a benzothiazepin-4-one derivative of formula (I):



(I)

in which:

R1 is hydrogen or a C_2–C_4 alkanoyl group;

R2 and R3 independently each is hydrogen, a linear or branched C_1–C_4 alkyl group, a C_3–C_5 cycloalkyl group, a phenyl group, a benzyl group or a phenethyl group, or R2 and R3 together form, with the nitrogen atom to which they are attached, a pyrrolidinyl, 2,2-dimethylpyrrolidinyl, piperidyl, 4-phenylpiperidyl, 4-(3-methoxyphenyl)-piperidyl, 4-(4-fluorobenzoyl)piperidyl, 1,2,3,6-tetrahydropyridyl, perhydroazepinyl, perhydroazocinyl, 1,3-thiazolidinyl, thiomorpholinyl, morpholinyl, 2,3-dihydroindolyl, 1,2,3,4-tetrahydroisoquinolyl, 6-methoxy-1,2,3,4-tetrahydroisoquinolyl, 6,7-dimethoxy-1,2,3,4-tetrahydroisoquinolyl or 2,3,4,5-tetrahydro-1H-benz[b]azepinyl group; and

X is hydrogen or chlorine; or a pharmacologically acceptable acid addition salt thereof.

12. A method of treatment of a condition requiring a modulator of the transmembranous and intracellular movement of calcium or of a condition requiring an antiatherogenic, platelet aggregation-inhibitory, cardiac anti-ischaemic, cerebral anti-ischaemic, antimigraine, antiepileptic, antiasthmatic or anti-ulcer agent, which comprises adminstering to a subject in need of said treatment a compound as defined in claim 1.

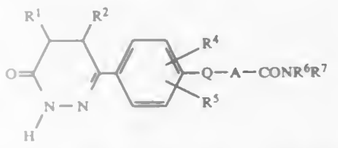
4,914,093

PYRIDAZINONE DERIVATIVES, THEIR PREPARATION AND USE

Yasuhiro Morisawa; Mitsuru Katsoka; Seiji Kumakura; Hiroyuki Koike, and Shinsaku Kobayashi, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Continuation of Ser. No. 102,756, Sep. 24, 1987, abandoned, which is a continuation of Ser. No. 785,452, Oct. 8, 1985, abandoned. This application Mar. 16, 1989, Ser. No. 325,112
Claims priority, application Japan, Oct. 12, 1984, 59-213968
Int. Cl.[4] C07D *237/04, 237/14, 403/12*; A61K *31/50*
U.S. Cl. 514—211 31 Claims

1. A compound of formula (I):



(I)

R^1 and R^2 are independently selected from the group consisting of hydrogen atoms and methyl groups;

Q represents an oxygen atom;

A represents a C_1–C_4 alkylene group;

R^6 and R^7 are independently selected from the group consisting of hydrogen atoms; C_1–C_6 alkyl groups; C_5 and C_6 cycloalkyl groups; 2,5-dimethylpyrrolyl groups; C_3 and C_4 alkenyl groups; heterocyclic groups selected from the group consisting of:

tetrahydrofuryl, tetrahydropyranyl, tetrahydrothiofuryl, tetrahydrothiopyranyl, pyrrolidinyl, piperidyl, imidazolidinyl, oxazolidinyl, thiazolidinyl, morpholinyl, thiomorpholinyl and piperazinyl groups;

said heterocyclic groups having at least one substituent selected from the group consisting of:

methyl, ethyl, phenyl, methoxycarbonyl, ethoxycarbonyl, benzyl, oxygen, hydroxyethyl, chlorophenyl, methoxyphenyl, trifluoromethylphenyl, pyridyl, benzhydryl, chlorobenzhydryl, difluorobenzhydryl, formyl, acetyl, valeryl, 3-butenoyl, chlorobutyryl, ethoxyacetyl, benzyloxycarbonyl, methanesulfonyl, toluenesulfonyl, benzoyl, chlorobenzoyl, methoxybenzoyl, nicotinoyl, isonicotinoyl, thenoyl, furoyl, methylcarbamoyl, p-chloro-m-sulfamoylbenzoyl, propionyl, isobutyryl, octanoyl, phenylpropionyl, cyclohexylpropionyl, heptanoyl and dimethoxybenzoyl groups;

and substituted C_1–C_4 alkyl groups having at least one substituent selected from the group consisting of:

C_1–C_4 alkoxy groups, C_2 and C_3 alkoxycarbonyl groups, morpholino groups, thiomorpholino groups, piperazinyl groups, homopiperazinyl groups, phenyl groups, phenyl groups having at least one substituent selected from the group consisting of halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy and trifluoromethyl substituents, pyridyl groups and 1-piperazinyl groups having at the 4-position at least one substituent selected from the group consisting of methyl, ethyl, phenyl, methoxycarbonyl, ethoxycarbonyl, benzyl, oxygen, hydroxyethyl, chlorophenyl, methoxyphenyl, trifluoromethylphenyl, pyridyl, benzhydryl, chlorobenzhydryl, difluorobenzhydryl, formyl, acetyl, valeryl, 3-butenoyl, chlorobutyryl, ethoxyacetyl, benzyloxycarbonyl, methanesulfonyl, toluenesulfonyl, benzoyl, chlorobenzoyl, methoxybenzoyl, nicotinoyl, isonicotinoyl, thenoyl, furoyl, methylcarbamoyl, p-chloro-m-sulfamoylbenzoyl, propionyl, isobutyryl, octanoyl, phenylpropionyl, cyclohexylpropionyl, heptanoyl and dimethoxybenzoyl groups;

R^4 represents a hydrogen atom; and

R^5 represents a hydrogen atom, halogen atom, nitro group or methyl group at the 3-position;

the dotted line indicates a single or double carbon-carbon

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bond between the carbon atoms at the 4- and 5-positions of the pyridazinone system;

and pharmaceutically acceptable acid addition salts thereof.

3. A method of treating cardiac disorders in a mammal comprising administering to said mammal an effective amount of a compound which potentiates myocardial contractivity, and wherein said compound is the compound of claim 1.

4,914,094

METHOD FOR TREATING HYPOXIA

Yasuo Oshiro; Masaaki Osaki, and Tetsuro Kikuchi, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Japan

Continuation of Ser. No. 938,068, Dec. 4, 1986, abandoned. This application Mar. 21, 1989, Ser. No. 326,845

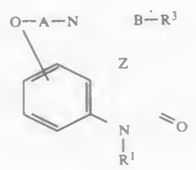
Claims priority, application Japan, Dec. 9, 1985, 60-277632; Dec. 9, 1985, 60-277633; Dec. 9, 1985, 60-277634

Int. Cl.[4] A61K *31/55, 31/54, 31/535, 31/50*

U.S. Cl. 514—213 15 Claims

1. A method for treating hypoxia comprising, administering to a host in need of said treatment a compound or salt thereof represented by formula (1),

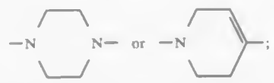
(1)



wherein R^1 is a hydrogen atom, a lower alkyl group, a lower alkenyl group, a lower alkynyl group or a phenyl-lower alkyl group; Z is a group of the formula

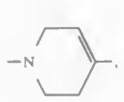
in which R^2 is a hydrogen atom or a lower alkyl group; and the bond indicated as is a single or double bond, a group of the formula $-(CH_2)_3-$, a group of the formula $-O-CH_2-$ or a group of the formula $-S-CH_2-$; R^3 is a pyridyl group, or a phenyl group which may have 1 to 3 substituents selected from the group consisting of a halogen atom, a lower alkyl group, a lower alkoxy group and a hydroxy group; and a group of the formula

is a group of the formula



and A is a lower alkylene group; provided that when a group of the formula

is a group of the formula



then Z is a group of the formula

and at the same time R^3 should be neither a pyridyl group nor a phenyl group having at least one hydroxy group as the substituent; or when R^3 is a pyridyl group, then Z is a group of the formula

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4,914,095

USE OF IMIDAZOBENZODIAZEPINES FOR PSYCHOTIC DISORDERS

Walter Merz, Basel, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

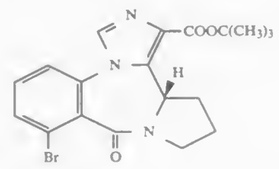
Filed Jan. 13, 1989, Ser. No. 297,228

Claims priority, application Switzerland, Jan. 15, 1988, 143/88

Int. Cl.[4] A61K *31/54*

U.S. Cl. 514—219 5 Claims

1. A method of treating or preventing psychotic disorders comprising administering to a host having such a disorder an antipsychotic amount of a compound of the formula



4,914,096

6-ARYL-SUBSTITUTED-4H-THIENO(2,3-E)(1,2,4)TRIAZOLO(3,4-C)(1,4)DIAZEPINES

William J. Houlihan, Mountain Lakes, and Seung H. Cheon, Glen Ridge, both of N.J., assignors to Sandoz Pharmaceuticals Corp., East Hanover, N.J.

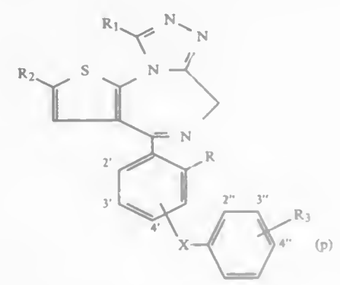
Continuation-in-part of Ser. No. 285,579, Dec. 16, 1988, abandoned, which is a continuation of Ser. No. 184,537, Apr. 21, 1988, abandoned. This application Mar. 31, 1989, Ser. No. 331,937

Int. Cl.[4] C07D *513/14;* A61K *31/55*

U.S. Cl. 514—220 23 Claims

1. A compound of formula I:

I

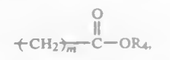


where

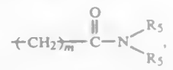
R is hydrogen or chloro;

R_1 is hydrogen; methyl or cyclopropyl;

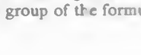
R_2 is hydrogen; methyl; ethyl; a group of the formula



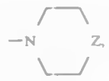
where m is 1 to 4 and R_4 is methyl, ethyl or an alkali metal cation; a group of the formula



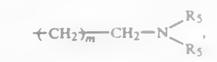
where m is as defined above and each R_5, independently, is straight or branched chain C_{1-3}alkyl, or the two R_5's together with the nitrogen atom to which they are attached form a group of the formula



where n is 4 or 5, or a group of the formula



where Z is —O—, —S— or —NCH_3—; or a group of the formula

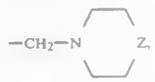


where m and the R_5's are as defined above;

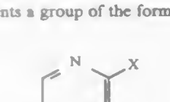
X is CH_{2m} where m is as defined above; —OCH_2— or —CH_2OCH_2—;

P is 0 or an integer 1 to 3; and

R_3 is chloro; fluoro; methyl; t-butyl; OR_6, where R_6 is methyl or ethyl; or a group



where Z is as defined above; with the provisos that: (1) when R is hydrogen, X is only in the 3' or 4'-positions, and when R is chloro, X is only in the 4'-position; (2) when R_3 is chloro, fluoro or methyl, the maximum number of said substituents is two; (3) when R_3 is t-butyl or a group



then p is 1; and (4) when p is 2, the R_3's cannot be in the 2"- and 6"-positions, simultaneously;

or a pharmaceutically acceptable acid addition salt thereof.

11. A method of inhibiting PAF-induced blood platelet aggregation comprising administering to a subject afflicted therewith a therapeutically effective amount of a compound according to claim 1, or a pharmaceutically acceptable acid addition salt thereof.

4,914,097

N-INDANYL CARBOXAMIDE DERIVATIVE AND AGRICULTURAL/HORTICULTURAL FUNGICIDE CONTAINING THE DERIVATIVE AS ACTIVE INGREDIENT

Masatsugu Oda; Toshiro Sakaki, both of Yokohama; Naoko Sasaki, Machida; Hirofumi Tomita, Machida, and Nobuyuki Nonaka, Yokohama, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Feb. 23, 1988, Ser. No. 159,277

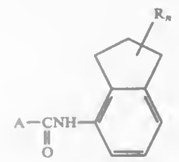
Claims priority, application Japan, Feb. 25, 1987, 62-42136; Apr. 16, 1987, 62-93799; Oct. 16, 1987, 62-261131; Oct. 16, 1987, 62-261132

Int. Cl.[4] A61K *31/495;* C07D *241/14*

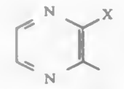
U.S. Cl. 514—255 2 Claims

1. An N-indanyl carboxamide compound having the formula (I):

(I)



wherein A represents a group of the formula:



wherein X represents halogen, methyl or trifluoromethyl; Y represents hydrogen, halogen, lower alkyl, amino, mercapto or lower alkylthio; R^1 represents methyl or trifluoromethyl; and R^2 and R^3 independently represents hydrogen or methyl; R represents lower alkyl and n represents an integer of 1 to 6.

VOL 1113 ISS 1 AP 3 1990 UMI

4,914,098

SUBSTITUTED THIOUREAS, ISOTHIOUREAS AND CARBODIIMIDES AND THEIR USE AS PESTICIDES

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany; Jozef Drabek, Oberwill, Switzerland; Josef Ehrenfreund, Allschwil, Switzerland, and Odd Kristiansen, Möhlin, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

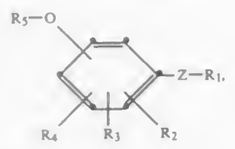
Filed Aug. 12, 1987, Ser. No. 84,652

Claims priority, application Switzerland, Aug. 15, 1986, 3295/86

Int. Cl.[4] **A61K** *31/50, 31/505, 31/495;* **C07D** *237/00, 239/02, 241/02*

U.S. Cl. 514—274 **14 Claims**

1. A compound of formula I



(I)

wherein

R_1 is C_1–C_{12}alkyl, C_3–C_8cycloalkyl, polycyclic alkyl containing a total of 7 to 10 carbon atoms, C_1–C_{12}alkyl which is substituted by 1 to 12 halogen atoms, C_1–C_4alkyl which is substituted by one or two C_3–C_6cycloalkyl radicals, alkoxyalkyl containing a total of 3 to 10 carbon atoms, C_1–C_5alkyl which is substituted by a phenyl radical, C_1–C_5alkyl which is substituted by a phenyl radical which is in turn substituted by one or two members selected from the group consisting of halogen, methyl, methoxy and ethoxy; or is C_3–C_{10}-alkenyl or C_3–C_{10}alkynyl,

R_2 is hydrogen or C_1–C_4alkyl,

R_3 is C_1–C_4alkyl

R_4 is hydrogen or C_1–C_4alkyl, and

R_5 is a radical selected from

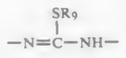
R_6 is halogen, C_1–C_4alkyl, C_1–C_3alkyl which is substituted by 1 to 7 halogen atoms, C_1–C_4alkoxy, C_1–C_3alkoxy which is substituted by 1 to 7 halogen atoms; or is phenyl,

R_8 is C_1–C_4alkyl,

R_9 is C_1–C_4alkyl or C_3–C_4alkenyl,

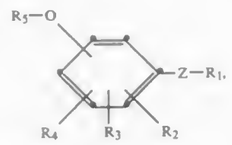
n is an integer from 0 to 3, and

Z is a group selected from



and —N=C=N— or a salt thereof.

12. A method of controlling pests selected from insects and representatives of the order Acarina, which comprises treating or contacting said pests, their various development stages or the locus thereof, with a pesticidally effective amount of a compound of formula I



(I)

wherein

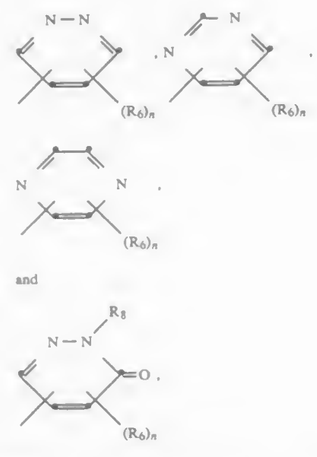
R_1 is C_1–C_{12}alkyl, C_3–C_8cycloalkyl, polycyclic alkyl containing a total of 7 to 10 carbon atoms, C_1–C_{12}alkyl which is substituted by 1 to 12 halogen atoms, C_1–C_4alkyl which is substituted by one or two C_3–C_6cycloalkyl radicals, alkoxyalkyl containing a total of 3 to 10 carbon atoms, C_1–C_5alkyl which is substituted by a phenyl radical, C_1–C_5alkyl which is substituted by a phenyl radical which is in turn substituted by one or two members selected from the group consisting of halogen, methyl, methoxy and ethoxy; or is C_3–C_{10}-alkenyl or C_3–C_{10}alkynyl,

R_2 is hydrogen or C_1–C_4alkyl,

R_3 is C_1–C_4alkyl

R_4 is hydrogen or C_1–C_4alkyl, and

R_5 is a radical selected from



and

wherein

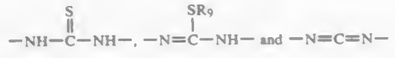
R_6 is halogen, C_1–C_4alkyl, C_1–C_3alkyl, C_1–C_3alkyl which is substituted by 1 to 7 halogen atoms, C_1–C_4alkoxy, C_1–C_3alkoxy which is substituted by 1 to 7 halogen atoms; or is phenyl,

R_8 is C_1–C_4alkyl,

R_9 is C_1–C_4alkyl or C_3–C_4alkenyl,

n is an integer from 0 to 3, and

Z is a group selected from



or a salt thereof.

4,914,099

HYDANTOIN DERIVATIVES AS ALDOSE REDUCTASE INHIBITORS

Ei Mochida, Tokyo; Kazuo Kato, Mishima; Katsuaki Kato, Gotenba; Ichitomo Miwa, and Jun Okuda, both of Nagoya, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

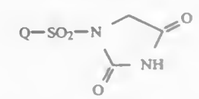
Filed Aug. 24, 1988, Ser. No. 235,557

Claims priority, application Japan, Aug. 28, 1987, 62-214549

Int. Cl.[4] **A61K** *31/415;* **C07D** *233/80*

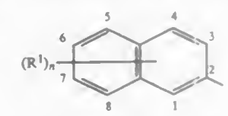
U.S. Cl. 514—390 **8 Claims**

5. A pharmaceutical composition for preventing or relieving diabetic complications, which comprises a pharmaceutically acceptable carrier and an effective amount of at least one hydantoin derivative represented by formula (I):

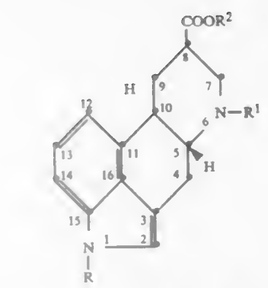


(I)

or a non-toxic salt, or a solvate, or a solvate of a non-toxic salt thereof; wherein Q represents an alkyl group having 1 or from 3 to 8 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms, a biphenylyl group, or a group:



wherein R^1 represents an amino group which may be substituted with lower alkyl and/or lower alkanoyl, a halogen atom other than bromo at a position other than position 5, a lower alkyl group, an alkoxy group, a nitro group or a cyano group, or a combination of any of these groups when n represents an integer of 2 or more, and n represents an integer of 1, 2, 3 or 4.



wherein R is primary or secondary C_{1-8} alkyl, CH_2–C_{2-4} alkenyl, C_{3-8} cycloalkyl or C_{3-6} cycloalkyl-substituted C_{1-5} primary or secondary alkyl, the total number of carbon atoms in R not to exceed 8; R^1 is C_{1-4} straight chain alkyl, and R^2 is C_{1-3} alkyloxy-C_{5-7} cycloalkyl, and pharmaceutically-acceptable salts thereof.

4,914,100

ALKOXY CYCLOALKANOL ESTERS OF DIHYDROLYSERGIC ACID

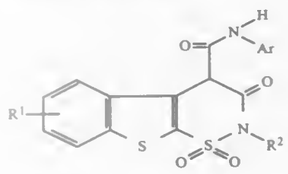
William L. Garbrecht; Gifford P. Marzoni, both of Indianapolis, and Kathleen R. Whitten, Zionsville, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 251,412, Sep. 29, 1988, Pat. No. 4,847,261, which is a continuation of Ser. No. 94,999, Sep. 10, 1987, abandoned, which is a division of Ser. No. 782,340, Oct. 1, 1985, Pat. No. 4,714,704. This application Apr. 24, 1989, Ser. No. 342,280

Int. Cl.[4] **A61K** *31/48;* **C07D** *457/04*

U.S. Cl. 514—288 **1 Claim**

1. A method of treating thrombosis which comprises administering to a mammal subject to thromobotic episodes, a thromobosis alleviating dose of a compound of the formula:



I

or a pharmaceutically acceptable salt thereof

wherein

R^1 is hydrogen, halogen or C_1 to C_4 alkyl;

r^2 is hydrogen or C_1 to C_4 alkyl; and

Ar is phenyl or phenyl substituted with one or more substituents selected from C_1 to C_4 alkyl, halo, trifluoromethyl, nitro, hydroxyl, halophenyl, or C_1 to C_4 alkoxy.

4,914,101

3,4-DIHYDRO-2-ALKYL-3-OXO-N-ARYL-2H-(1)BENZOTHIENO(3,2-E)-1,2-THIAZINE-4-CARBOXAMIDE-1,1-DIOXIDES

Anthony Marfat, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

PCT No. PCT/US87/01357, § 371 Date Feb. 6, 1989, § 102(e) Date Feb. 6, 1989, PCT Pub. No. WO88/09793, PCT Pub. Date Dec. 15, 1988

PCT Filed Jun. 10, 1987, Ser. No. 382,161

Int. Cl.[4] **C07D** *513/04, 495/04;* **A61K** *31/54*

U.S. Cl. 514—229.8 **14 Claims**

1. A compound of the formula

I

or a pharmaceutically acceptable salt thereof

wherein

R^1 is hydrogen, halogen or C_1 to C_4 alkyl;

r^2 is hydrogen or C_1 to C_4 alkyl; and

Ar is phenyl or phenyl substituted with one or more substituents selected from C_1 to C_4 alkyl, halo, trifluoromethyl, nitro, hydroxyl, halophenyl, or C_1 to C_4 alkoxy.

4,914,102

N-AMINOCARBAMATES RELATED TO PHYSOSTIGMINE, PHARMACENTICAL COMPOSITIONS AND USE

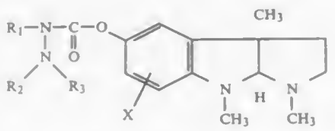
Edward J. Glamkowski, Warren, N.J., assignor to Hoechst Roussel Pharmaceuticals, Inc., Somerville, N.J.

Filed Sep. 28, 1989, Ser. No. 413,901

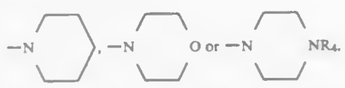
Int. Cl.[4] **A61K** *31/40, 31/535;* **C07D** *487/04*

U.S. Cl. 514—232.8 **23 Claims**

1. A compound of the formula



where X is hydrogen, halogen or loweralkyl; and R_1, R_2 and R_3 are each independently hydrogen, loweralkyl, cycloalkyl, arylloweralkyl or aryl, or alternatively the group—NR_2R_3 taken as a whole constitutes



R_4 being hydrogen or loweralkyl; or a pharmaceutically acceptable acid addition salt thereof.

22. A pharmaceutial composition comprising a compound as defined in claim 1 in an amount effective for alleviating a memory dysfunction characterized by a cholinergic deficit and a suitable carrier therefor.

4,914,103

PYRIDO(3,4-F)PYRROLO(1,2-B)(1,2,5)TRIAZEPINES

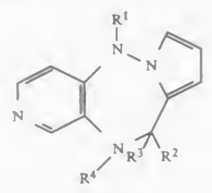
Richard C. Effland, Bridgewater; Larry Davis, Sergentsville; Kevin J. Kapples, Little York, and Gordon E. Olsen, Somerset, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 223,847, Jul. 25, 1988, Pat. No. 4,879,382. This application Aug. 24, 1989, Ser. No. 397,922

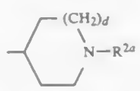
Int. Cl.[4] A61K *31/50, 31/495*

U.S. Cl. 514—250 4 Claims

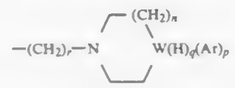
1. A pharmaceutical composition comprising an effective amount of a compound of the formula:



wherein R^1 is loweralkyl; R^2 is hydrogen, loweralkyl, arylloweralkyl, aminoloweralkyl, aryl or a group of the formula



wherein d is an integer having a value of zero or 1 and R^{2a} is hydrogen, lowrealkyl, arylloweralkyl or aminoloweralkyl; R^3 is hydrogen; and R^4 is hydrogen, loweralkyl, arylloweralkyl, aminoloweralkyl, formyl, loweralkylcarbonyl, aminocarbonyl, arylaminocarbonyl, or a group of the formula



wherein W is carbon or nitrogen, Ar is aryl, q is an integer having a value from zero to 2, inclusive, p is an integer having a value of zero or 1, with the proviso that the sum of p and q is 1 when W is nitrogen and 2 when W is carbon, n is an integer having a value of zero or 1, and r is an integer having a value from 2 to 4, inclusive; and a suitable carrier therefor.

4,914,104

IMIDAZO [1,5-A]PYRIMIDINE DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Tsutomu Irikura, Tokyo; Seigo Suzue, Kuki; Satoshi Murayama, Tochigi; Susumu Kinoshita, Oksya; Hiroaki Uchida, Tokyo, and Hirotaka Shinoda, Kawaguchi, all of Japan, assignors to Kyorin Pharmaceutical Co., Ltd., Tokyo, Japan

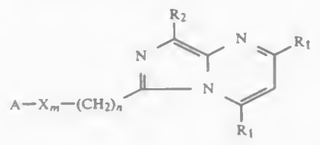
Continuation of Ser. No. 918,648, Oct. 14, 1986, abandoned, which is a continuation of Ser. No. 758,445, Jul. 24, 1985, abandoned. This application Jan. 4, 1989, Ser. No. 294,905

Claims priority, application Japan, Aug. 7, 1984, 59-165468

Int. Cl.[4] A61K *31/505;* **C07D** *487/04*

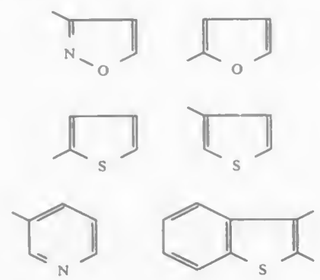
U.S. Cl. 514—258 2 Claims

1. A compound selected from the group consisting of a free base and its acid addition salts, said free base having the formula (I),



(I)

wherein R_1 is a halogen atom, R_2 is a hydrogen atom or a halogen atom, X is a sulfur atom, a sufinyl group, a sulfonyl group or an oxygen atom, m and n are each independently 0 or 1, A is a phenyl group which may be substituted by 1 or 2 substituents selected from the group consisting of methyl, bromine, and chlorine, a C_{3-6} cycloalkyl group or an aromatic heterocyclic group selected from the group consisting of



which may be substituted by 1 phenyl, bromine, chlorine, or methyl; with the proviso that when m is 0 and A is a phenyl group which may be substituted or a cycloalkyl group, R_2 is not a hydrogen atom.

4,914,105

ANTI-CANCER COMPOSITIONS FOR DELIVERING 5-FLUOROURACIL

Setsuro Fujii, 4/27 - 131, 1-chome, Nishimidorigaoka, Toyonaka-shi, Osaka-fu; Norio Uenmi, 34-14, Aza-Onishi, Tainohama, Kitajima-cho, Itano-gun, Tokushima-ken, and Setsuo Takeda, 6, 6-chome, Suiketohon-cho, Tokushima-shi, Tokushima-ken, all of Japan

Division of Ser. No. 552,263, Nov. 16, 1983, Pat. No. 4,650,801, which is a continuation of Ser. No. 214,021, Dec. 8, 1980, abandoned, which is a continuation-in-part of Ser. No. 21,317, Mar. 16, 1979, abandoned. This application Nov. 20, 1986, Ser. No. 932,516

Claims priority, application Japan, Mar. 27, 1978, 53-35834; Jul. 28, 1978, 53-92813; Nov. 7, 1978, 53-137686

Int. Cl.[4] A61K *31/505, 31/70*

U.S. Cl. 514—274 8 Claims

6. A method of delivering a 5-fluorouracil to a cancer sensitive to a 5-fluorouracil in a warm-blooded animal, the method comprising administering to the animal an effective amount to deliver (a) at least one 5-fluorouracil selected from the group consisting 1-(2-tetrahydrofuryl)-5-fluorouracil, 3-(2-tetrahydrofuryl-5-fluorouracil and 1,3-bis(2-tetrahydrofuryl)-5-fluorouracil and (b) 3-benzoyluracil, wherein about 0.5 to about 20 moles of 3-benzoyluracil is used per mole of the 5-fluorouracil.

4,914,106

COMPOSITIONS AND METHODS EMPLOYING 2-OXA- OR -AZA-PREGNAN COMPOUNDS FOR INHIBITING ANDROGEN OR SUPPLYING PROGESTIN IN MAMMALS

Kenyu Shibata, Inagi; Nobuaki Yamakoshi, Kawasaki; Naoyuki Koizumi, Kawasaki; Shigehiro Takegawa, Kawasaki; Eiichiro Shimazawa, Sagamihara, and Mamoru Mieda, Ebina, all of Japan, assignors to Teikoku Hormone Mfg. Co., Ltd., Tokyo, Japan

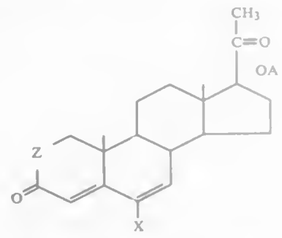
Division of Ser. No. 833,715, Feb. 27, 1986, Pat. No. 4,785,103. This application Aug. 4, 1988, Ser. No. 228,316

Claims priority, application Japan, Mar. 7, 1985, 60-43731; Mar. 7, 1985, 60-43732

Int. Cl.[4] A61K *31/585, 31/57*

U.S. Cl. 514—284 8 Claims

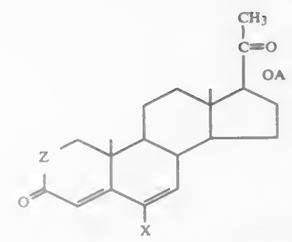
1. A method for inhibiting androgen in mammals in need of such inhibition which comprises administering to the mammals an effective amount of the compound of the formula



wherein A is a hydrogen atom or a lower alkanoyl group of 2 to 6 carbon atoms, Z is an oxygen atom or the group

in which R is a hydrogen atom or an alkyl group of up to 6-carbon atoms, and X is a halogen atom.

2. A method for supplying progestin in mammals in need of such supplying which comprises administering to the mammals an effective amount of the compound of the formula



wherein A is a hydrogen atom or a lower alkanoyl group of 2to 6 carbon atoms, Z is an oxygen atom or the group

in which R is a hydrogen atom or an alkyl group of up to 6-carbon atoms, and X is a halogen atom.

4,914,107

METHOD FOR SELECTIVELY BLOCKING 5-HT$_2$ RECEPTORS

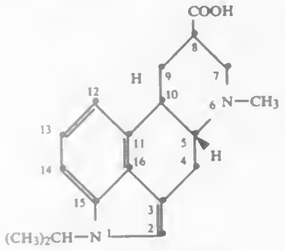
Marlene L. Cohen; Mark J. Goldberg, and Louis Lemberger, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 17, 1989, Ser. No. 297,208

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—288 4 Claims

1. A method of blocking 5HT$_2$ receptors which comprises administering to a mammal having an excess of serotonin, whether centrally or peripherally, a 5HT$_2$ blocking dose of a compound of the formula



or a pharmaceutically acceptable salt thereof.

4,914,108

5-SUBSTITUTED(4,5-C)IMIDAZOPYRIDINE COMPOUNDS WHICH HAVE USEFUL PLATELET ACTIVATING FACTOR ANTAGONISTIC ACTIVITY

Ish K. Khanna, Skokie; Roger Nosal, Buffalo Grove, and Richard M. Weier, Lake Bluff, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

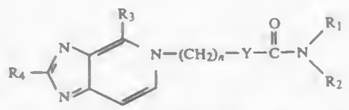
Filed Mar. 14, 1988, Ser. No. 167,671

Int. Cl.[4] A61K *31/435;* **C07D** *471/04*

U.S. Cl. 514—303 53 Claims

1. A compound of the formula

VOL 1113 ISS 1 AP 3 1990 UMI



(I)

or a pharmaceutically acceptable acid addition salt thereof: wherein

R_1 and R_2 are each independently selected from hydrogen; straight or branched chain alkyl of 1 to 15 carbon atoms; cycloalkyl having 3 to 8 carbon atoms; substituted cycloalkyl wherein the substituent is alkyl of 1 to 6 carbon atoms; bicycloalkyl having 3 to 8 carbon atoms in each ring; phenyl; substituted phenyl wherein the substituent is alkyl of 1 to 6 carbon atoms or halogen; straight or branched alkenyl having 3 to 15 carbon atoms with the proviso that the double bond of the alkenyl group cannot be adjacent to the nitrogen; R_1 and R_2 cannot both be hydrogen,

Y is phenyl or phenyl substituted once or more than by substituents selected from the group consisting of halogen wherein the halogen is selected from the group consisting of bromo, fluoro or chloro; alkyl of 1 to 6 carbon atoms; alkoxy wherein the alkyl is 1 to 6 carbon atoms; thioalkyl wherein the alkyl is 1 to 6 carbon atoms; alkoxyalkyl wherein the alkyl groups are each 1 to 6 carbon atoms; hydroxyalkyl wherein the alkyl is 1 to 6 carbon atoms; alkylthioalkyl wherein the alkyl group are each 1 to 6 carbon atoms; cyano; mercaptoalkyl wherein the alkyl is 1 to 6 carbon atoms; hydroxy, substituents on the phenyl ring can be ortho, para, or meta to the connecting chain, depending on the position of the carboxamide,

n is an integer of 1 to 5,

R_3 is hydrogen or alkyl of 1 to 6 carbon atoms,

R_4 is hydrogen or alkyl of 1 to 6 carbon atoms.

51. A method for treating diseases or disorder mediated by platelet-activating factor comprising administering a therapeutically effective dose of at least one compound of claim 1 to a mammal in need of such treatment.

4,914,109

METHOD OF TREATING ANIMALS USING FUSED IMIDAZOHETEROCYCLIC COMPOUNDS

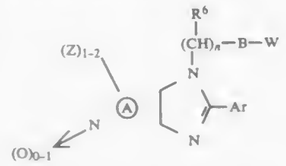
Bruce E. Tomczuk, and Deborah S. Sutherland, both of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 215,170, Jul. 5, 1988, which is a division of Ser. No. 871,772, Jun. 9, 1986, Pat. No. 4,772,600. This application Jul. 25, 1989, Ser. No. 384,618

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—303 1 Claim

1. A method for the treatment of a living animal body for muscle tension and spasticity and/or anxiety and/or convulsions which comprises administering a compound selected from the group having the formula:



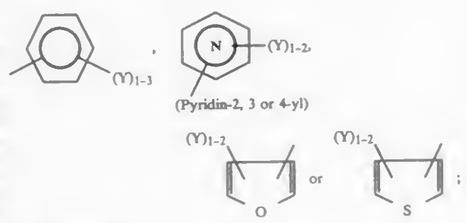
wherein

A represents a heterocyclic ring having two of its carbon atoms held mutually with the imidazo moiety selected from the group consisting of pyridine in any of its four positions wherein nitrogen is unshared by the imidazo moiety and substituted by one or two Z radicals on a carbon not shared by the imidazo moiety selected from the group consisting of hydrogen, halogen, loweralkyl, hydroxy, loweralkoxy, diloweralkylamino or nitro;

n is 1 to 3;

R^6 is hydrogen or loweralkyl;

Ar is selected from:



(Pyridin-2, 3 or 4-yl)

B is carbonyl;

W is selected from:

hydrogen,

loweralkyl

$(Y)_{1-3}$-phenyl,

$(Y)_{1-3}$-phenyl-loweralkyl,

$—OR^1$, —OM, $—O(CH_2)_p—OH$,

$—NR^2(CH_2)_pCOOR^1$,

$—NR^2(CH_2)_pCOOM$ or

$—NR^2[(CH_2)_pNHC(O)R^1]$,

wherein R^1 and R^2 are selected from hydrogen, loweralkyl, $(Y)_{1-3}$-phenyl, or $(Y)_{1-3}$-phenyl-loweralkyl;

p is 0–3;

wherein all of the above Y is hydrogen, halo, loweralkoxy, loweralkyl, trifluoromethyl, cyano, nitro or diloweralkylamino;

M is a pharmaceutically acceptable metal, forming an acid salt;

the optical isomers, the oxides represented by O and the pharmaceutically acceptable acid addition salts thereof.

4,914,110

QUINOLINE DERIVATIVES, THEIR PREPARATION AND THERAPEUTIC COMPOSITIONS CONTAINING THE SAME

André Esanu, Paris, France, assignor to Societe de Conseils de Recherches et d'Applications Scientifiques, France

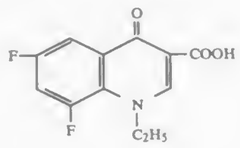
Continuation of Ser. No. 22,620, Mar. 4, 1987, Pat. No. 4,782,068, which is a continuation of Ser. No. 730,788, May 3, 1985, abandoned. This application Jul. 8, 1988, Ser. No. 217,211

The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.

Int. Cl.[4] C07D *215/16;* **A61K** *31/47*

U.S. Cl. 514—312 2 Claims

1. A quinoline compound of the formula:



4,914,111

4-BENZYLTHIOPHENE (OR FURAN)-2-SULFONAMIDES AS ANTIGLAUCOMA AGENTS

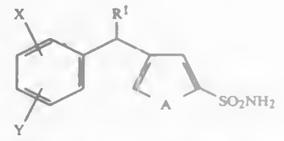
George D. Hartman, Lansdale, and Wasyl Halczenko, Hatfield, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 23, 1987, Ser. No. 28,825

Int. Cl.[4] A61K *31/38, 31/34;* **C07D** *333/32, 307/02*

U.S. Cl. 514—326 6 Claims

1. A compound of structural formula:



or an ophthalmologically acceptable salt thereof wherein:

A is —S— or —O—;

R^1 is hydrogen or $—NHR^2$ wherein R^2 is hydrogen or C_{1-6} alkyl, either straight or branched chain, and either unsubstituted or substituted with one or more of phenyl or C_{3-6} cycloalkyl; and

X and Y are independently:

a) hydrogen,

b) C_{1-6} alkyl,

c) C_{1-6} alkoxy,

d) hydroxy,

e) halo, or

f) $—(CH_2)_nNR^2R^3$, wherein n is O, 3; R^2 is as previously defined and R^3 is hydrogen or C_{1-3} alkyl; and if both R^2 and R^3 are lower alkyl, they can be joined together to form, with the nitrogen to which they are attached, a 5-, or 6-membered heterocycle.

4,914,112

AMINOAZOLE DERIVATIVES AND THEIR PRODUCTION AND USE

Yukinori Ozato, Takarazuka; Nobuhiko Tamura, Toyonaka; Hiroaki Masumori, Ibaraki; Michihiro Yamamoto, Nishinomiya; Atsuyuki Kojima, Takarazuka; Fumio Nishikawa, Itami, and Yoshihiko Kimura, Osaka, all of Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan

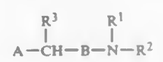
Filed May 28, 1987, Ser. No. 55,079

Claims priority, application Japan, Jun. 3, 1986, 61-128910; Jul. 11, 1986, 61-164508

Int. Cl.[4] C07D *277/42, 277/46;* **A61K** *31/425*

U.S. Cl. 514—326 7 Claims

1. A compound of the formula:

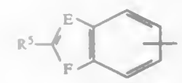


wherein A is the group of the formula:

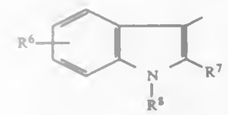
$Ar^1—D—Ar^2—$

wherein Ar^1 is phenyl or thienyl which may be optionally substituted with at least one of the same or different halogen; Ar^2 is phenylene or thienylene which may be optionally substituted with at least one of the same or different halogen; D is a divalent radical selected from the group consisting of $>C=N—OR^4$, where R^4 is hydrogen or lower alkyl, >C=O,

>CHOH, >NH and a single bond; or A is the group of the formula:



wherein R^5 is lower alkoxy or phenyl which may optionally substituted with at least one of the same or different halogen; E is methine or nitrogen; F is vinylene or oxygen; or A is the group of the formula:



wherein R^6 is lower alkoxy; R^7 is lower alkyl; R^8 is benzoyl which may be optionally substituted with at least one of the same or different halogen; B is thiazoiediyl; R^1 is hydrogen or lower alkyl; R^2 is hydrogen, lower alkyl, phenyl-lower alkyl, or the group of the formula:

$R^9—G—$

wherein R^9 is hydrogen, lower alkyl, halo-lower alkyl, amino-lower alkyl, phenyl or phenyl-lower alkyl or the group of the formula:

wherein R^{10} is hydrogen or lower alkyl; R^{11} is hydrogen, lower alkyl, lower alkenyl, lower cycloalkyl, phenyl-lower alkyl, phenyl or aroyl, or the group of the formula: $—NR^{10}R^{11}$ which is pyrrolidinyl, piperidinyl or hexahydroazepinyl, or the group of the formula:

$R^{12}—O—$

wherein R^{12} is lower alkyl or polyhalo-lower alkyl; G is a divalent group selected from the group consisting of >C=O, >C=S, $(>C=O)_2$ and $>SO_2$ radical; or the group of the formula: $—NR^1R^2$ which is pyrrolidinyl, piperidinyl or hexahydroazepinyl; R^3 is hydrogen or lower alkyl, or its acid addition salts.

4,914,113

INSECTICIDAL IMIDAZOLINES

Kozo Shiokawa, Kanagawa; Shinichi Tsuboi, Tokyo; Shoko Sasaki, Tokyo; Koichi Moriya, Tokyo; Yumi Hattori, Tokyo, and Katsuhiko Shibuya, Tokyo, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

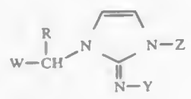
Filed Nov. 1, 1988, Ser. No. 265,642

Claims priority, application Japan, Nov. 6, 1987, 62-279042

Int. Cl.[4] A01N *43/50;* **C07D** *401/14, 401/06*

U.S. Cl. 514—333 8 Claims

1. A compound of the formula



in which
R is hydrogen or methyl,
Y is nitro or cyano,
W is an aromatic 5- or 6-membered heterocyclic group having one nitrogen hetero-atom and optionally a second hetero atom selected from the group consisting of nitrogen, oxygen and sulfur, the heterocyclic group radical optionally being substituted by at least one substituent selected from the group consisting of halogen, alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, haloalkyl with 1 to 4 carbon atoms, haloalkoxy with 1 to 4 carbon atoms, alkenyl with 2 to 4 carbon atoms, alkylthio with 1 to 4 carbon atoms, alkylsulfinyl with 1 to 4 carbon atoms, alkylsulfonyl with 1 to 4 carbon atoms, and alkynyl with 3 to 4 carbon atoms, and
Z is alkyl with 1 to 4 carbon atoms, alkenyl with 3 carbon atoms, alkynyl with 3 carbon atoms, alkoxyalkyl with 2 to 4 carbon atoms in total, alkylthioalkyl with 2 to 4 carbon atoms in total, cyano-substituted alkyl with 1 to 2 carbon atoms, chloroalkenyl with 3 carbon atoms, benzyl (which may optionally be substituted with chlorine or cyano), acetyl (which may optionally be substituted by chlorine), benzoyl or $-CH_2-W$.

7. A method of combating insects which comprises applying to such insects or to an insect habitat an insecticidally effective amount of a compound according to claim 1.

4,914,114

3-[4-(4-PHENYL-1,2,3,6-TETRAHYDRO-1-PYRIDYL)-BUTYL]-5-HYDROXY-INDOLE METHANESULFONATE HAVING SEDATING AND ANTI-PARKINSONISM PROPERTIES

Hans-Heinrich Hausberg, Ober-Ramstadt; Henning Böttcher, Darmstadt; Christoph Seyfried, Seeheim-Jugenheim, and Rolf Bergmann, Reichelsheim, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Breschrankter Haftung, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP87/00518, § 371 Date May 16, 1988, § 102(e) Date May 16, 1988, PCT Pub. No. WO88/01998, PCT Pub. Date Mar. 24, 1988
Division of Ser. No. 907,909, Sep. 16, 1986, Pat. No. 4,711,983, which is a continuation-in-part of Ser. No. 738,329, May 28, 1985, abandoned. This PCT application Sep. 12, 1987, Ser. No. 213,571
Int. Cl.[4] C07D *401/06;* A61K *31/435*
U.S. Cl. 514—339 5 Claims

1. 3-[4-(4-Phenyl-1,2,3,6-tetrahydro-1-pyridyl)-butyl]-5-hydroxy-indole methanesulfonate (I).

4. A method of achieving a sedating effect comprising administering the compound of claim 1.

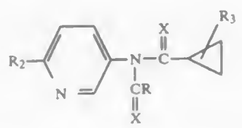
4,914,115

FUNGICIDAL PYRIDYL CYCLOPROPANE CARBOXIMIDES

Don R. Baker; Charles Kezerian, both of Orinda, and Keith H. Brownell, San Jose, all of Calif., assignors to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 36,545, Apr. 15, 1987, Pat. No. 4,767,772, which is a continuation-in-part of Ser. No. 29,103, Mar. 23, 1987, abandoned, which is a continuation of Ser. No. 859,169, May 2, 1986, abandoned. This application May 13, 1988, Ser. No. 193,620
Int. Cl.[4] C07D *213/75, 213/76;* A01N *43/40*
U.S. Cl. 514—346 9 Claims

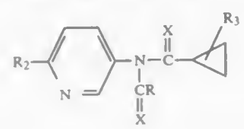
1. A compound having the structural formula



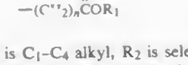
wherein R is selected from the group consisting of oxalyl, OR_1, SR_1 and

wherein n is 0–2, R_1 is C_1–C_4 alkyl, R_2 is selected from the group consisting of halogen, C_1–C_3 alkoxy and C_1–C_3 haloalkoxy, R_3 is selected from the group consisting of hydrogen and methyl, X is —O or —S and Y is —O or —S; or a fungicidally acceptable organic or inorganic salt thereof.

6. The method of controlling fungi comprising applying to the area where control is desired, a fungicidally effective amount of a compound having the formula



wherein R is selected from the group consisting of oxalyl, OR_1, SR_1 and



wherein n is 0–2, R_1 is C_1–C_4 alkyl, R_2 is selected from the group consisting of halogen, C_1–C_3 alkoxy and C_1–C_3 haloalkoxy, R_3 is selected from the group consisting of hydrogen and methyl, X is —O or —S and Y is —O or —S; or a fungicidally acceptable organic or inorganic salt thereof.

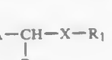
4,914,116

NITROGEN-CONTAINING HETEROCYCLIC COMPOUNDS, AND THEIR USE AS INSECTICIDES

Hirosi Kisida, Tokyo; Sumio Nishida, Takarazuka, both of Japan, and Makoto Hatakoshi, Seattle, Wash., assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

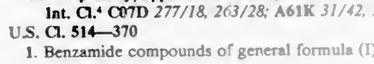
Division of Ser. No. 100,308, Sep. 23, 1987, Pat. No. 4,847,259, which is a division of Ser. No. 868,716, May 30, 1986, Pat. No. 4,714,706. This application Apr. 10, 1989, Ser. No. 335,274
Claims priority, application Japan, May 20, 1985, 60-117189
Int. Cl.[4] A61K *31/38, 31/435, 31/505;* C07D *277/34*
U.S. Cl. 514—369 16 Claims

1. A nitrogen-containing heterocyclic compound of the formula:



wherein R_1 is a group of the formula:

wherein
R_4 is a hydrogen atom, a halogen atom or a methyl group and l is an integer of 1 or 2;
R_2 is a hydrogen atom or a methyl group;
R_3 is an alkyl group, an alkoxy group, an alkenyl group or an alkenyloxy group, all of which may be optionally substituted with one or more substituents selected from the group consisting of lower alkoxy, halo(lower)alkoxy, halogen, nitro and amino;
A is one of the following groups:



wherein R_5, R_6, R_7, R_8 and R_9 are the same or different and are each a hydrogen atom or a methyl group, R_{10} is a hydrogen atom, a halogen atom or a lower alkyl group and m is an integer of 1 to 4; and X is an oxygen atom or a sulfur atom.

13. A composition for preventing or exterminating insects which comprises as an active ingredient an insecticidally effective amount of the compound according to claim 1, and an inert carrier or diluent.

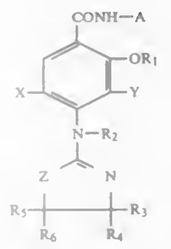
4,914,117

NOVEL BENZAMIDES, INTERMEDIATES AND PROCESS FOR THE PREPARATION AND THERAPEUTIC USE THEREOF

Jacques Acher, Itteville; Jean-Claude Monier, Lardy; Jean-Paul Schmitt, Arpajon; Gardaix-Lathereau Renee, Cachan, all of France; Brenda Costall, and Robert Naylor, both of Addingham, United Kingdom, assignors to Societe d'Etudes Scientifiques et Industrielle de l'Ile-d-France, Paris, France

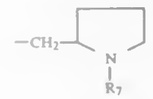
Division of Ser. No. 943,708, Dec. 19, 1986, Pat. No. 4,835,172. This application Mar. 13, 1989, Ser. No. 322,122
Claims priority, application France, Dec. 19, 1985, 85 18829
Int. Cl.[4] C07D *277/18, 263/28;* A61K *31/42, 31/425*
U.S. Cl. 514—370 7 Claims

1. Benzamide compounds of general formula (I)



(I)

their optical isomers and their pharmacologically acceptable acid addition salts, wherein:
A is C_1–C_6 alkyl, C_2–C_6 alkenyl, diethylaminoethyl or a group of the formula:



R_7 is hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, phenyl-substituted C_1–C_6 alkyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkyl substituted C_1–C_6 alkyl, C_4–C_6 cycloalkenyl, or C_4–C_6 cycloalkenyl substituted C_1–C_6 alkyl,
R_1 and R_2 are each hydrogen, C_1–C_6 alkyl or C_2–C_6 alkenyl
R_3, R_4, R_5 and R_6 are each hydrogen or a C_1–C_6 alkyl
X is halogen
Y is hydrogen or halogen
Z is oxygen or sulfur.

4,914,118

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF 2-(DECYLTHIO)ETHANAMINE HYDROCHLORIDE AND A MIXTURE OF 5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE AND 2-METHYL-4-ISOTHIAZOLIN-3-ONE

Deborah K. Donofrio, The Woodlands, and Wilson K. Whitekettle, Conroe, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed May 25, 1989, Ser. No. 357,144
Int. Cl.[4] A01N *33/08, 43/80*
U.S. Cl. 514—372 7 Claims

1. A bacterial inhibiting composition comprising a synergistic mixture of (a) 2-(decylthio)ethanamine hydrochloride ("DTEA") and (b) a mixture of 5-chloro-2-methyl-4-isothiazolin-3-one and 2-methyl-4-isothiazolin-3-one ("Kathon 886F") wherein the weight ratio of said DTEA to said "Kathon 886F" is from about 7:1 to 1:18.3.

VOL 1113 ISS 1 AP 3 1990 UMI

4,914,119

FUNGICIDAL AGENTS

Wilhelm Brandes, Leichlingen; Helmut Kaspers, Leverkusen; Paul Reinecke, Leverkusen; Hans Scheinpflug, Leverkusen, and Wolfgang Krämer, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 55,585, May 29, 1987, abandoned, which is a continuation of Ser. No. 526,934, Aug. 26, 1983, abandoned. This application Aug. 23, 1988, Ser. No. 235,777

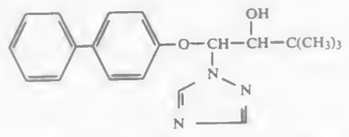
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1982, 3234625

Int. Cl.[4] A01N *43/64*

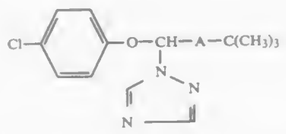
U.S. Cl. 514—383 9 Claims

1. A fungicidal composition comprising a fungicidally effective amount of:

(a) 1-(4-phenyl-phenoxy)-1-(1,2,4-triazol-1-yl)-3,3-dimethyl-butan-2-ol of the formula (I)



(b) plus another fungicidally active derivative of 1,2,4-triazole of the formula (II)



A is the keto group or the CH(OH) group and wherein the weight ratio of the compound of formula (I) to the compound of formula (II) is from 1:01 to 1:10.

4,914,120

FUNGICIDAL IMADAZOLE KETONE DERIVATIVES

John R. H. Wilson, Kent, England, assignor to Shell Internationale Research Maatschappij, B.V., The Hague, Netherlands

Filed Nov. 4, 1988, Ser. No. 267,165

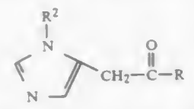
Claims priority, application United Kingdom, Nov. 6, 1987, 8726110

Int. Cl.[4] A01N *43/50*; C07D *233/64*

U.S. Cl. 514—400 12 Claims

9. A method of combating fungus at a locus, which method comprises treating the locus with a fungicidally-effective amount of a compound of the formula:

(I)



or an acid-addition salt or metal salt complex thereof, in which R represents a phenyl group substituted by one or more halogen atoms and R^2 represents an optionally substituted alkyl group.

4,914,121

3-PHENYL-1-PHENYLPYRAZOLE-4 ACETIC ACID COMPOUNDS WHICH ARE USEFUL IN TREATING IMMUNE DISEASES

Kiichi Sawai; Masayasu Kurono; Takahiko Mitani; Kazumi Niu, and Kyoichi Asano, all of Aichi, Japan, assignors to Sanwa Kagaku Kenkyusho Co., Ltd., Nagoya, Japan

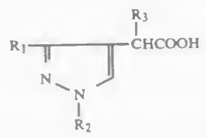
Division of Ser. No. 137,217, Dec. 22, 1987, abandoned. This application Oct. 26, 1988, Ser. No. 266,280

Claims priority, application Japan, Dec. 26, 1986, 61-308588; Mar. 5, 1987, 62-51030

Int. Cl.[4] A61K *31/45*; C07D *231/12*

U.S. Cl. 514—406 6 Claims

4. A method for treating an immunity disease in an animal requiring such treatment which comprises administering to the animal an immune response-controlling amount of a compound of the formula



wherein each of R_1 and R_2 is phenyl or p-halogenophenyl, and R_3 is hydrogen or methyl, or a pharmaceutically acceptable salt thereof.

4,914,122

1-AMINOMETHYL-3-ARYL-4-CYANO-PYRROLES, USEFUL AS FUNGICIDES

Detlef Wollweber, Wuppertal; Wolfgang Krämer, Burscheid; Wilhelm Brandes, Leichlingen; Stefan Dutzmann, Duesseldorf, and Gerd Hänssler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

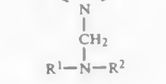
Filed Jan. 25, 1988, Ser. No. 147,466

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1987, 3702852

Int. Cl.[4] A61K *31/40, 31/395, 31/435, 31/50*; C07D *403/00, 405/00, 409/00, 413, 00*

U.S. Cl. 514—422 16 Claims

1. A 1-aminomethyl-3-aryl-4-cyano-pyrrole of the formula



in which

Ar represents phenyl which is optionally substituted by halogen, or by alkyl, alkoxy, alkylthio, halogenoalkyl, halogenoalkoxy or halogenoalkylthio in each case having 1 to 4 carbon atoms and, if appropriate, 1 to 9 identical or different halogen atoms,

R^1 represents alkyl having 1 to 6 carbon atoms and optionally substituted by cyano, cycloalkyl having 3 to 7 carbon atoms, alkoxy, alkylcarbonyl, alkoxycarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, alkylsulphinyl, alkylsulphonyl or dialkylamino in each case having 1 to 6 carbon atoms in the individual alkyl parts; in addition represents alkenyl or alkynyl in each case having 3 to 6 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, or phenyl or benzyl which is in each case optionally substituted in the phenyl part by halogen, cyano, alkyl, alkoxy, halogenoalkyl, halogenoalkoxy, alkylcarbonyl or alkoxycarbonyl in each case having 1 to 6 carbon atoms in the individual alkyl parts and, in the case of the halogenoalkyl or halogenoalkoxy radical, in each case having 1 to 9 identical or different halogen atoms, and

R^2 represents heterocyclylalkyl having 1 to 6 carbon atoms in the alkyl part, heterocyclylalkenyl having 3 to 6 carbon atoms in the alkenyl part, heterocyclylalkynyl having 3 to 6 carbon atoms in the alkynyl part or heterocyclyl, where heterocyclyl in each case represents a heterocyclic radical selected from the group consisting of furyl, thienyl and pyranyl, which is optionally substituted by halogen, cyano, alkyl, alkoxy, halogenoalkyl, halogenoalkoxy, alkylcarbonyl or alkoxycarbonyl in each case having 1 to 6 carbon atoms in the individual alkyl parts and, in the case of the halogenoalkyl or halogenoalkoxy radical, in each case having 1 to 9 identical or different halogen atoms; in addition represents dialkylaminoalkyl in each case having 1 to 6 carbon atoms in the individual alkyl parts, furthermore cycloalkylalkyl, having 1 to 6 carbon atoms in the alkyl part and 3 to 7 carbon atoms in the cycloalkyl part, which is optionally substituted in the cycloalkyl part by halogen and straight-chain or branched alkyl having 1 to 4 carbon atoms, or phenylethyl which is optionally substituted in the phenyl part by cyano, halogen, or alkyl or alkoxy in each case having 1 to 4 carbon atoms.

14. A fungicidal composition comprising a fungicidally effective amount of a 1-aminomethyl-3-aryl-4-cyano-pyrrole according to claim 1 and a diluent.

4,914,123

ACYLOXYTHIOPHENE DERIVATIVES

Werner Daum, Krefeld; Erich Klauke, Odenthal; Engelbert Kühle, Bergisch-Gladbach; Wilhelm Brandes, Leichlingen, and Paul Reinecke, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

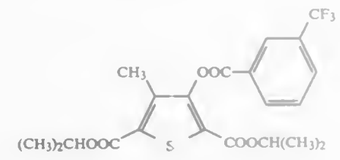
Filed Jan. 11, 1985, Ser. No. 690,930

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1984, 3402625

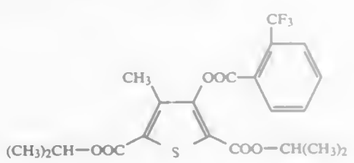
Int. Cl.[4] A01N *43/02*; C07D *333/32*

U.S. Cl. 514—445 2 Claims

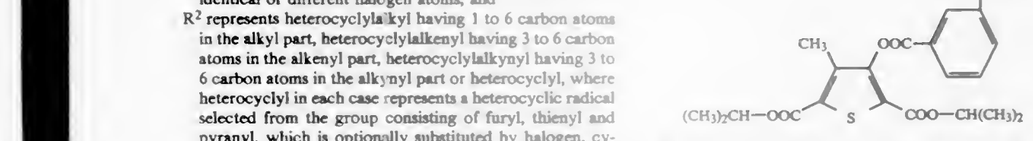
1. An acyloxythiophene wherein such compound is selected from the group consisting of 2,5-bis-(isopropoxycarbonyl)-3-(3-trifluoromethylbenzoyloxy)-4-methyl-thiophene of the formula



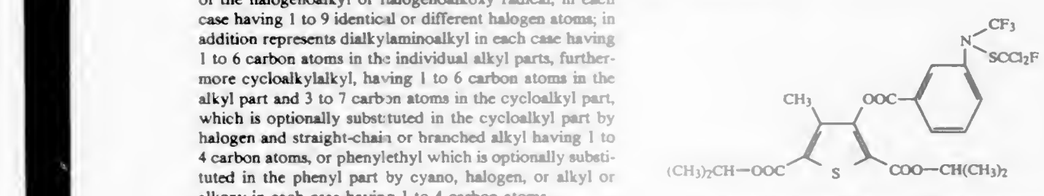
2,5-bis-(isopropoxycarbonyl)-3-(2-trifluoromethylbenzoyloxy)-4-methyl-thiophene of the formula



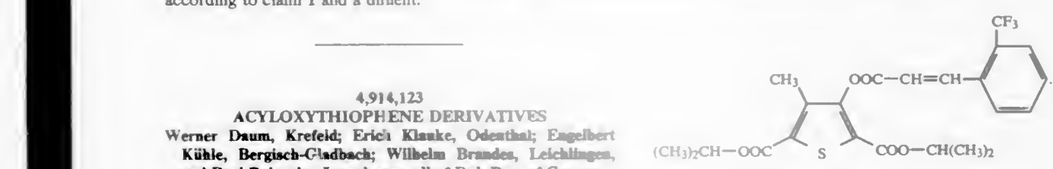
2,5-bis-(isopropoxycarbonyl)-3-(3-trifluoromethoxybenzoyloxy)-4-methyl-thiophene of the formula



2,5-bis-(isopropoxycarbonyl)-3-(3-N-trifluoromethyl-N-dichlorofluoromethylthio-aminobenzoyloxy)-4-methyl-thiophene of the formula



and 2,5-bis-(isopropoxycarbonyl)-3-(2-trifluoromethyl-cinnamoyloxy)-4-methyl-thiophene of the formula



4,914,124

N-ORGANOOXYCARBAMIC ACID ESTERS FOR COMBATING ENDOPARASITES

Nikolaus Müller, Monheim, and Peter Andrews, Wuppertal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 25, 1988, Ser. No. 147,469

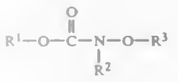
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1987, 3703106; May 19, 1987, 3716685; Sep. 16, 1987, 3731052

Int. Cl.[4] A01N *47/24*

U.S. Cl. 514—478 8 Claims

1. A method of combating endoparasites which comprises applying thereto or to an endoparasite habitat an endoparasiticidally effective amount of an N-organooxycarbamic acid ester of the formula

I



in which

R^1 represents C_{1-20}-alkyl, C_{2-20}-alkenyl, C_{3-20}-cycloalkyl, C_{2-20}-alkinyl, phenyl or naphthyl, optionally substituted by alkyl with 1 to 4 carbon atoms; alkoxy with 1 to 4 carbon atoms; alkylthio with 1 to 4 carbon atoms; halogeno- alkyl with 1 to 4 carbon atoms and 1 to 5 halogen atoms; halogenoalkoxy with 1 to 4 carbon atoms and 1 to 5 halogen atoms; halogenoalkylthio with 1 to 4 carbon atoms and 1 to 5 halogen atoms; in the case of phenyl, for alkylenedioxy with 1 or 2 carbon atoms and for halogen-substituted alkylenedioxy with 1 or 2 carbon atoms and 1 to 4 halogen atoms; halogen; cyano; nitro; dialkylamino with 1 to 4 carbon atoms per alkyl group; alkylcarbonyl

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with 2–4 carbon atoms; carbalkoxy with 2 to 4 carbon atoms; alkylsulphonyl with 1 to 4 carbon atoms; arylsulphonyl with 6 or 10 aryl carbon atoms; phenyl, naphthyl, phenoxy, naphthoxy, phenylthio and naphthylthio,

R^2 represents C_{1-6}-alkyl, C_{2-6}-alkenyl or C_{2-6}-alkinyl, which can optionally be substituted by halogen, and

R^3 represents C_{1-6}-alkyl, C_{2-6}-alkenyl or C_{2-6}-alkinyl, which can optionally be substituted by halogen,

at least one of R^2 and R^3 being alkinyl.

4,914,125

(S)-EMOPAMIL FOR THE TREATMENT OF MIGRAINE

Verena Baldinger, Heidelberg; Liliane Unger, Ludwigshafen, and Laszlo Szabo, Heidelberg, all of Fed. Rep. of Germany, assignors to Knoll AG, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 6, 1989, Ser. No. 375,996

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1988, 3823378

Int. Cl.[4] A61K *31/275*

U.S. Cl. 514—520 **1 Claim**

1. A method of treating migraine in patients suffering therefrom, which comprises administering to said patients an effective amount of (S)-emopamil or a physiologically acceptable salt thereof.

4,914,126

AROMATIC AMINES

John Dixon, Great Dalby Nr. Melton Nowbray, and Francis Ince, Loughborough, both of England, assignors to Fisons plc, Leicestershire, United Kingdom

Continuation of Ser. No. 653,239, Sep. 10, 1984, abandoned. This application Sep. 23, 1987, Ser. No. 102,781

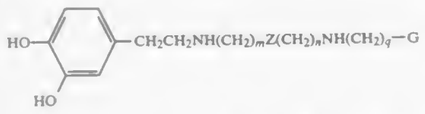
Claims priority, application United Kingdom, Jan. 21, 1983, 8301749; Jan. 21, 1983, 8301751

Int. Cl.[4] A61K *31/38, 31/135, 31/40*

U.S. Cl. 514—438 **7 Claims**

1. A method of treatment of congestive heart failure, which comprises administration to a patient suffering from such a condition of an effective amount of a compound of formula I,

I



in which Z represents O, S, SO_2, CO, NR or a single bond, G represents a one or two ring, saturated or unsaturated carbocyclic or heterocyclic group, G being optionally substituted by phenyl, trihalomethyl or at least two groups selected from alkoxy C_1 to C_6 or halogen, provided that when Z represents a single bond, G does not represent phenyl,

R represents hydrogen or alkyl C_1 to C_6,

m and n each independently represent 2, 3 or 4, and q represents an integer from 1 to 3 inclusive,

or a pharmaceutically acceptable derivative thereof.

4,914,127

3-DEMETHYLMEVALONIC ACID DERIVATIVES, A PROCESS FOR THEIR PREPARATION PHARMACEUTICAL PRODUCTS BASED ON THESE COMPOUNDS, THEIR USE AND INTERMEDIATES

Gerhard Beck; Bela Kerekjarto, both of Frankfurt am Main; Hans-Hermann Lau, Bad Soden am Taunus, and Günther Wess, Erlensee, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 900,887, Aug. 27, 1986, abandoned. This application Mar. 8, 1989, Ser. No. 320,924

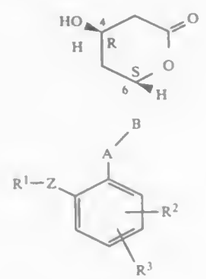
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1985, 3530797; May 7, 1986, 3615446

Int. Cl.[4] A61K *31/365;* **C07D** *309/30*

U.S. Cl. 514—460 **5 Claims**

1. A 3-demethylmevalonic acid derivative of the formula I (δ-lactone)

I



in which

A-B is a —CH=CH— group,

Z is a $—CH_2—$ or $—CH_2—CH_2—$ group,

R^1 is a cycloaliphatic hydrocarbon group which has 3 to 7 carbon atoms or a cycloaliphatic hydrocarbon having 3 to 7 carbon atoms which is substituted with 1 or 2 methyl groups,

R^2 and R^3 are halogen or alkyl having 1–4 carbon atoms.

4,914,128

ACRYLATES AND FUNGICIDES WHICH CONTAIN THESE COMPOUNDS

Ulrich Schirmer, Heidelberg; Stefan Karbach, Ludwigshafen; Ernst-Heinrich Pommer, Limburgerhof; Eberhard Ammermann, Ludwigshafen; Wolfgang Steglich, Bonn-Roettgen; Barbara A. M. Schwalge, Lohmar, and Timm Anke, Kaiserslautern, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

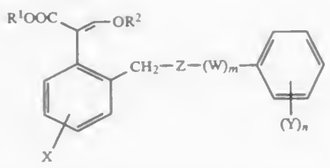
Continuation of Ser. No. 939,109, Dec. 8, 1986, abandoned. This application Oct. 11, 1988, Ser. No. 257,129

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1985, 3545319

Int. Cl.[4] A01N *37/12;* **C07C** *69/618*

U.S. Cl. 514—532 **5 Claims**

1. An acrylate of the formula

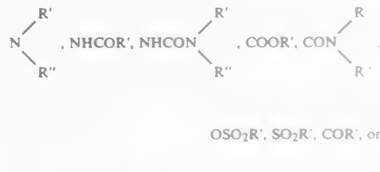


wherein R^1 and R^2 independently of one another are each C_1–C_8-alkyl,

X is hydrogen, halogen, C_1–C_4-alkoxy, trifluoromethyl, cyano or nitro,

W is unsubstituted or alkyl-substituted, saturated or unsaturated alkylene of up to 10 carbon atoms,

Y is hydrogen, alkyl, trifluoromethyl, alkoxyalkyl, cycloalkyl, benzyl, phenyl, phenoxy, halogen, an unsubstituted C_4H_4 chain which is fused to the benzene radical to form a naphthyl ring, alkoxy, 1,1,2,2-tetrafluoroethoxy, thiocyanato, cyano, NO_2,



where R' and R" independently of one another are each hydrogen, alkyl, or cycloalkyl, or are phenyl which is unsubstituted or substituted by alkyl, halogen or alkoxy, m is 0 or 1, n is from 1 to 3 and Z is oxygen, sulfur, SO or SO_2.

4,914,129

ANTIHYPERTENSIVE 5-AMINO-4-HYDROXYVALERYL DERIVATIVES SUBSTITUTED BY SULPHUR-CONTAINING GROUPS

Peter Bühlmayer, Arlesheim, Switzerland; James L. Stanton, Lebanon, N.J.; Walter Fuhrer, Lupsingen, Switzerland; Richard Göschke, Bottmingen, Switzerland; Vittorio Rasetti, Basel, Switzerland, and Heinrich Rüeger, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

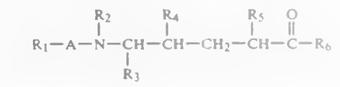
Division of Ser. No. 341,239, Apr. 19, 1989, which is a continuation of Ser. No. 187,608, Apr. 28, 1988, abandoned, which is a division of Ser. No. 11,183. Feb. 5, 1987, Pat. No. 4,758,584. This application Sep. 8, 1989, Ser. No. 405,372

Claims priority, application Switzerland, Feb. 7, 1986, 486/86; Aug. 20, 1986, 3347/86

Int. Cl.[4] A61K *31/165;* **C07C** *147/05*

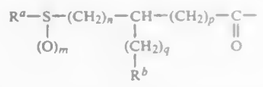
U.S. Cl. 514—616 **10 Claims**

1. A compound of the formula



(I)

wherein A is alanyl or seryl; R_6 is of the formula



(Ia)

in which R_a is lower alkyl which is unsubstituted or substituted by hydroxy, lower alkoxy, lower alkanoyloxy, halogen, amino, lower alkylamino, dilower alkylamino, or by lower alkoxycarbonylamino; m is 0, 1 or 2; n is 0 or 1; p is 0; q is 1 or 2; and R^b is phenyl which is unsubsituted or substituted by at last one substituent selected from lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy amino, lower alkylamino, dilower alkylamino, t-butoxycarbonylamino, and halogen; R_2 is hydrogen or lower alkyl; R_3 is cyclo lower alkyl-lower alkyl; R_4 is (a) hydroxy, (b) hydrxy etherified by an organic radical that can be removed under physiological conditions and the cleavage products of which are physiologically tolerable in the resulting concentration, or (c) hydroxy etherified by lower alkanoyl, cyclo lower alkylcarbonyl, or benzoyl; R_5 is lower alkyl; and R_6 is alkylamino having 1–10 carbon atoms or dilower alkylamino; or a pharmaceutically acceptable salt thereof.

10. A method of treating a warm-blooded animal suffering from renin-associated hyperaldosteronism, hypertension or cardiac insufficiency by administering to said animal a therapeutically effective amount of a compound or a pharmaceutically acceptable salt thereof according to claim 1.

4,914,130

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF 2-(DECYLTHIO)ETHANAMINE HYDROCHLORIDE AND DODECYLGUANIDINE

Deborah K. Donofrio, The Woodlands, and Wilson K. Whitekettle, Conroe, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed May 25, 1989, Ser. No. 357,150

Int. Cl.[4] A01N *33/08, 37/52*

U.S. Cl. 514—634 **7 Claims**

1. A bacterial inhibiting composition comprising a synergistic mixture of (a) 2-(decylthio) ethanamine hydrochloride ("DTEA"), and (b) n-dodecylquanidine or water soluble salt thereof ("DGH") wherein the weight ratio of said DTEA to said DGH is from about 42.4:1 to 1:12.

4,914,131

ANTIVIRAL PHARMACEUTICAL PREPARATIONS AND METHODS FOR THEIR USE

Harold G. Haines, and Caroline B. Dickens, both of Miami, Fla., assignors to Dana P. Brigham, Miami Lakes, Fla.

Continuation of Ser. No. 67,230, Jun. 29, 1987, abandoned, which is a division of Ser. No. 939,513, Oct. 22, 1986, Pat. No. 4,757,088, which is a division of Ser. No. 587,398, Mar. 8, 1984, Pat. No. 4,628,063. This application Apr. 14, 1989, Ser. No. 338,448

Int. Cl.[4] A61K *31/16*

U.S. Cl. 514—626 **5 Claims**

1. Method of inhibiting replication of herpes simplex virus in a mammal infected with herpes simplex virus, which consists essentially of administration to said mammal of an effective replication inhibiting amount of lidocaine or a pharmaceutically acceptable salt thereof.

4,914,132

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXUTE OF 2-(DECYLTHIO)ETHANAMINE HYDROCHLORIDE AND N-ALKYL DIMETHYL BENZYL AMMONIUM CHLORIDE

Deborah K. Donofrio, The Woodlands, and Wilson K. Whitekettle, Conroe, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed May 25, 1989, Ser. No. 357,372

Int. Cl.[4] A01N *33/08, 33/12*

U.S. Cl. 514—643 **7 Claims**

1. A bacterial inhibiting composition comprising a synergistic mixture of (a) 2-(decylthio)ethanamine hydrochloride ("DTEA") and (b) n-alkyl dimethyl benzyl ammonium chloride ("Quat") wherein said Quat comprises an alkyl distribution of about 40% C_{12}, 50% C_{14}, and 10% C_{16}, wherein the weight ratio of said DTEA to said Quat is from about 70:1 to 1:7.3.

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4,914,133

AMINO COMPOUNDS AND FUNGICIDES CONTAINING THEM

Walter Himmele, Walldorf; Hubert Sauter, Mannheim; Hardo Siegel, Speyer; Eberhard Ammermann, Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

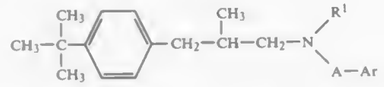
Filed Apr. 14, 1988, Ser. No. 181,503

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1987, 3713934

Int. Cl.[4] A01N *33/02*

U.S. Cl. 514—654 5 Claims

1. Amino compounds of the formula



where R^1 is alkyl of up to 3 carbon atoms, A is alkylene of up to 4 carbon atoms or alkenylene of up to 3 carbon atoms, and Ar is phenyl or indan-1-yl, or substituted phenyl or indan-1-yl, and acid addition salts thereof.

4,914,134

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF 2-(DECYLTHIO)ETHANAMINE HYDROCHLORIDE AND 2-BROMO-2-NITRO PROPANE-1,3-DIOL

Deborah K. Donofrio, The Woodlands, and Wilson K. Whiteketie, Conroe, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed May 25, 1989, Ser. No. 357,391

Int. Cl.[4] A01N *33/08, 33/18*

U.S. Cl. 514—665 7 Claims

1. A bacterial inhibiting composition comprising a synergistic mixture of (a) 2-(decylthio)ethanamine hydrochloride ("DTEA") and (b) 2-bromo-2-nitropropane-1,3-diol ("BNPD"), wherein the weight ratio of said DTEA to said BNPD is from about 11.2:1 to 1:91.

4,914,135

USE OF METHYLSULFONYLMETHANE TO TREAT PARASITIC INFECTIONS

Robert J. Herschler, 3080 N.W. 8th Ave., Camas, Wash. 98607

Division of Ser. No. 878,948, Jun. 26, 1987, Pat. No. 4,863,748, which is a continuation-in-part of Ser. No. 727,989, Apr. 29, 1985, Pat. No. 4,616,039, Ser. No. 601,771, Apr. 17, 1984, Pat. No. 4,559,329, Ser. No. 589,354, Feb. 18, 1984, Pat. No. 4,568,547, and Ser. No. 418,110, Sep. 14, 1982, Pat. No. 4,514,921, which is a continuation-in-part of Ser. No. 277,592, Jun. 26, 1981, Pat. No. 4,477,469, which is a division of Ser. No. 71,068, Aug. 6, 1979, Pat. No. 4,296,130. This application Jul. 26, 1989, Ser. No. 385,116

Int. Cl.[4] A61K *31/10*

U.S. Cl. 514—711 9 Claims

1. A method of treating a patient systemically infected with a parasite against which methylsulfonylmethane exhibits in vitro toxicity, which comprises administering systemically to the patient an amount of methylsulfonylmethane effective to inhibit the growth of the parasite in the patient.

4,914,136

PROCESS FOR THE PRODUCTION OF METHANOL AND CATALYST COMPOSITION FOR SAID PROCESS

Elt Drent; Willem W. Jager, and Swan T. Sie, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 30, 1988, Ser. No. 213,818

Claims priority, application United Kingdom, Nov. 19, 1987, 8727058

Int. Cl.[4] C07C *27/08, 29/136*

U.S. Cl. 518—700 12 Claims

1. A process for the production of methanol comprising contacting in at least two reaction zones a gaseous mixture of carbon monoxide and hydrogen at a temperature in the range from 30° C. to 100° C. and a pressure in the range from about 5 to 100 bar with a catalytic system in the liquid phase obtainable by combination of:

component (a): a substantially dry nickel formate,

component (b): water in a molar ratio of water to nickel formate in the range of from 1.0 to 3.5, and

component (c): an alcoholate derived from an alkali metal or from an alkaline earth metal wherein said gaseous mixture has a H_2/CO ratio less than the stoichiometric consumption ratio in the first zone and a H_2/CO ratio greater than the stoichiometric consumption ratio in the second zone

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4,914,137

METHOD FOR STABILIZING POLYURETHANE FOAM USING AN ADDITIVE COMBINATION OF A PHENOTHIAZINE AND AT LEAST ONE CO-STABILIZER

Bernard C. Smith, Naugatuck, Conn.; Frank Powell, Rome, Italy, and John F. Sierakowski, Middlebury, Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Continuation of Ser. No. 112,180, Oct. 21, 1987, abandoned, which is a continuation of Ser. No. 895,566, Aug. 11, 1986, abandoned, which is a continuation of Ser. No. 715,135, Mar. 22, 1985, abandoned. This application Aug. 11, 1988, Ser. No. 231,573

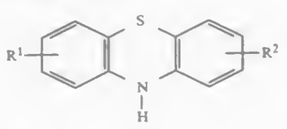
Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—107 15 Claims

1. A stabilized polyurethane foam composition comprising a polyurethane foam containing an effective amount of a stabilizing mixture comprising:

a phenothiazine of formula (I)

I



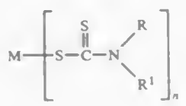
wherein

R^1 and R^2 are the same or different and are hydrogen or C_1–C_{12} alkyl; and

a co-stabilizer selected from the group consisting of:

(A) a dithiocarbamate having the formula II:

II



wherein

M is a metal;

n is 1 to 4; and

R and R^1 are the same or different and are C_1–C_{18} alkyl, C_5–C_6 cycloalkyl, benzyl, phenyl or tolyl, or

R and R^1 together form a C_4–C_5 alkylene, C_4–C_6 oxydialkylene or C_4–C_6 thiodialkylene;

(B) mercaptobenzothiazole; and

(C) mixtures thereof.

4,914,138

BLENDS OF HIGH NITRILE POLYMERS AND POLYOLEFINS AND METHOD FOR THE PREPARATION THEREON

Elena S. Percec, Pepper Pike; Lacy Melamud, Beachwood, and Gerald P. Coffey, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Aug. 22, 1988, Ser. No. 234,912

Int. Cl.[4] C08L *51/06, 33/20, 51/04*

U.S. Cl. 525—71 33 Claims

1. A polymer blend comprising:

from about 1 to 99 parts by weight of a high nitrile polymer containing more than about 50 percent by weight nitrile polymer and produced by polymerizing a major proportion of a monounsaturated nitrile, a minor proportion of another monovinyl monomer copolymerizable therewith optionally in the presence of a diene rubber; and

from about 99 to 1 parts by weight of a polyolefin, prepared from a monoolefin having from 2 to about 6 carbor atoms and functionalized with an unsaturated compound selected from the group consisting of unsaturated carboxylic acids, esters, anhydrides and imides.

4,914,139

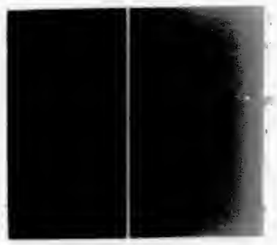
MODIFIED ALKYD CATIONIC ELECTRODEPOSITION COMPOSITIONS FOR PRODUCING CHIP-RESISTANT FILMS

Philip J. Ruhoff, Minneapolis; Rodney W. Stockstad, Plymouth; James A. Prevost, Bloomington; Larry B. Brandenburger, Lino Lakes, all of Minn., and Robert B. Edenborg, Beaver Dam, Wis., assignors to The Valspar Corporation, Minneapolis, Minn.

Filed Aug. 19, 1988, Ser. No. 234,471

Int. Cl.[4] C08L *67/08*

U.S. Cl. 523—500 14 Claims



1. A cationic electrodeposition coating composition comprising, in aqueous dispersion, an alkyd derived from the reaction of a polyol with at least one unsaturated fatty acid and reacted with addition-polymerizable ethylenically unsaturated monomers including an amine functional unsaturated monomer in a quantity sufficient to render the coating composition water dispersible and cationically electrodepositable; the resulting modified alkyd having chemically incorporated in it one or more chemical agents in sufficient quantity to significantly increase the resistance to chipping of coatings made therefrom, said agents being selected from the group consisting of:

(a) a pre-formed elastomer having one or more functional groups reacted with carboxyl or hydroxyl groups of the respective acid and polyol precursors of the alkyd resin, and

(b) an addition polymerizable monomer having primary and secondary ethylenic unsaturation.

4,914,140

ACRYLIC COPOLYMER AND SKIN PROTECTIVE

Izumi Saitoh, Hyogo; Shigeru Kido, Osaka; Yoshio Sasaki, and Syuichiro Shinohara, both of Fukui, all of Japan, assignors to Shinonogi and Co., Ltd., Osaka and Nisshin Chemical Co., Ltd., Fukui, both of, Japan

Division of Ser. No. 109,619, Oct. 19, 1987, Pat. No. 4,874,890. This application May 18, 1989, Ser. No. 353,818

Claims priority, application Japan, Oct. 23, 1986, 61-253071; Oct. 23, 1986, 61-253072

The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.

Int. Cl.[4] C08L *15/00*

U.S. Cl. 523—111 17 Claims

1. A skin-protective composition consisting essentially of an effective skin-protective amount of an acrylic copolymer of ethyl acrylate and methacrylate acid in which the ratio of ethyl acrylate to methacrylic acid is within a range of 75:25 and 95:5 and which contains residual monomers of 50 ppm or less, but substantially no surfactants and an alcoholic solvent.

4,914,141

ANTIFOULING PAINT CONTAINING POLYMER OF ETHYLENICALLY UNSATURATED ORGANOTIN MONOMER

Toshiaki Matsuo, Kyoto, and Hiroshi Doi, Hyogo, both of Japan, assignors to Nippon Oil and Fats, Co., Ltd., Tokye, Japan

Continuation of Ser. No. 687,338, Dec. 28, 1984, abandoned. This application Nov. 19, 1987, Ser. No. 125,802

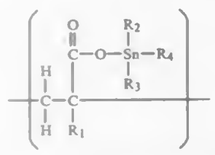
Claims priority, application Japan, Dec. 30, 1983, 58-250726

Int. Cl.[4] C08J *3/00*

U.S. Cl. 523—122 10 Claims

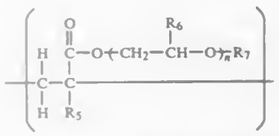
1. An antifouling paint containing as a vehicle a copolymer comprising units (a) and (b)

(a)



wherein R_1 represents a hydrogen atom or a methyl group, and R_2, R_3, R_4 each represents an alkyl group having from 1 to 8 carbon atoms or a phenyl group,

(b)



wherein R_5 and R_6 each represents hydrogen atom or a methyl group, R_7 represents an alkyl group having from 1 to 4 carbon atoms or an acyl group, and n is a positive number from 1 to 30, wherein the average total weight of unit (b) per molecule is at least 5 wt. %, said copolymer containing from 1 wt % to 50 wt % unit (a), and said paint further containing from 0 to 80 wt % of a non-polymeric antifouling agent.

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4,914,142

METHOD OF PRODUCING EMULSION POLYMER

Kunihide Takarabe, and Shinichi Kuwamura, all of Izumi-ohtsu, Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed May 19, 1988, Ser. No. 195,864
Claims priority, application Japan, May 19, 1987, 62-120229
Int. Cl.[4] C08F 2/22, 291/00, 251/00; C08K 5/04
U.S. Cl. 523—511 17 Claims

1. A method of producing an emulsion polymer which comprises adding a polymerizable unsaturated monomer to an emulsion polymer comprising a high-molecular-weight compound not containing a polyfunctional cross-linkable monomer or a chain transfer agent and having a weight average molecular weight of 20,000 to 2,000,000 as a seed polymer, the amount of the unsaturated monomer being 1.5 to 0.5 times the total volume of the solids in the emulsion polymer, and thereafter, polymerizing the monomer in the presence of a film-forming aid which is at least one compound selected from the group consisting of ethylene glycol, ether, ester or etherester derivatives of ethylene glycol, glycols having 3 to 8 carbon atoms, alkyl-substituted C_3–C_8 glycols, ether, ester or etherester derivatives of said glycols, diethylene glycol, ether, ester or etherester derivatives of diethylene glycol, glycerol, glycerol derivatives, aromatic alcohols, substituted aromatic alcohols, aromatic polycarboxylic acid esters, and alkyl-substituted aromatic polycarboxylic acid esters.

4,914,143

FLEXIBLE SILICONE COATINGS FOR PLASTIC SUBSTRATES AND METHODS FOR MAKING THERMOFORMABLE, ABRASION-RESISTANT THERMOPLASTIC ARTICLES

Gautam A. Patel, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 25, 1988, Ser. No. 185,594
Int. Cl.[4] C08F 2/46
U.S. Cl. 522—148 12 Claims

1. A silica-containing curable coating composition having an alkaline pH and comprising:

(A) about 80% to 95% by weight of a mixture of a diorganodiorganooxysilane and an organotriorganooxysilane in a weight ratio within the range of about 1:99 to 15:85, wherein the diorganodiorganooxysilane has the formula $R'_2Si(OR)_2$ and the organotriorganooxysilane has the formula $R'Si(OR)_3$, each R being independently selected from the group consisting of alkyl groups containing about 1–8 carbon atoms and aromatic groups containing about 6–20 carbon atoms, each R' being independently selected from the group consisting of alkyl groups containing about 1–3 carbon atoms and aromatic groups containing about 6–13 carbon atoms;

(B) about 5% to 20% by weight solids of colloidal silica in a water/organic solvent dispersion of ammonium-stablized colloidal silica having an average particle diameter no greater than about 5 to about 10 millimicrons;

(C) an effective amount of a hydrolysis catalyst; and any reaction products of components (A), (B), and (C).

4,914,144

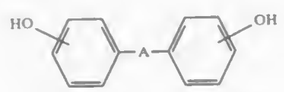
HALOGEN-FREE FLAMEPROOF MOLDING MATERIALS

Klaus Muehlbach, Heppenheim; Graham E. McKee, Weinheim; Hermann Brandi, Schiffestadt, and Dieter W. Blum, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 16, 1988, Ser. No. 285,662
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1987, 3742768
Int. Cl.[4] C08K 5/53
U.S. Cl. 524—139 7 Claims

1. A flameproof, thermoplastic molding material consisting, based on the sum of A, B, C, D and E, essentially of

(A) 40 to 95% by weight of a thermoplastic halogen-free aromatic polycarbonate based on a diphenol of the formula (I)



(I)

where A is a single bond, C_1–C_3-alkylene, C_2–C_3-alkylidene, C_3–C_6-cycloalkylidene, —S— or —SO_2—,

(B) from 5 to 30% by weight of one or more halogen-free graft polymers obtained from, based on (B),

(b_1) an elastomer (rubber), which accounts for from 40 to 80% by weight, and

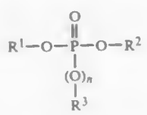
(b_2) a graft shell on this elastomer which accounts for from 20 to 60% by weight and is obtained from, based on (b_2),

(b_2a_1) from 50 to 95% by weight of styrene, α-methylstyrene, styrene which is substituted in the nucleus, methyl methacrylate or a mixture of these, and

(b_2a_2) from 50 to 5% by weight of (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleimide or a mixture of these,

(C) from 5 to 50% by weight of one or more halogen-free thermoplastic copolymers consisting of, based on C, from 50 to 95% by weight of styrene, α-methylstyrene, styrene which is substituted in the nucleus, methyl methacrylate or a mixture of these, and from 50 to 5% by weight of (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleimide or a mixture of these,

(D) 1 to 25% by weight of one or more halogen-free phosphorus compounds of the formula



(I)

where R^1, R^2 and R^3 independently of one another are each halogen-free C_1–C_8-alkyl or halogen-free C_6–C_{20}-aryl and n is 0 or 1, and

(E) from 0.05 to 5% by weight of a tetrafluoroethylene polymer, wherein the elastomer (b_1) is prepared by polymerizing a monomer mixture of

(b_1a_1) from 70 to 99.9% by weight, based on b_1), of one or more alkyl acrylates where alkyl is of 1 to 8 carbon atoms,

(b_1a_2) from 0 to 30% by weight, based on (b_1), of one or more further copolymerizable monoethylenically unsaturated monomers

and (b_1a_3) from 0.1 to 5% by weight, based on (b_1), of a copolymerizable polyfunctional, crosslinking monomer.

4,914,145

POLYESTER COMPOSITION

Akira Tohdoh, Iwakuni; Takashi Nagai, Ootake; Takayuki Nakano, Saeki, and Takashi Ueda, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 751,852, Jul. 5, 1985, abandoned. This application Jun. 16, 1987, Ser. No. 62,415
Claims priority, application Japan, Jul. 9, 1984, 59-140475; Aug. 10, 1984, 59-166327; Aug. 31, 1984, 59-180367
Int. Cl.[4] C08L 67/02
U.S. Cl. 524—285 9 Claims

1. A polyester composition comprising:

(A) 100 parts by weight of a substantially linear polyester comprising, as the main constituent unit, ethylene terephthalate;

(B) 0.05 to 15 parts by weight of a crystallization promotor; and

(C) 0.1 to 15 parts by weight of at least one plasticizer selected from an ester compound derived from an organic acid and a compound selected from the group consisting of a compound of the formula (I)

$$(HQ-R)_2S \quad (I)$$

wherein two R groups which may be the same or different, represent a hydrocarbon group selected from the group consisting of aliphatic, alicyclic, and aromatic hydrocarbon groups and any combination thereof, and two Q groups, which may be the same or different, which represent oxygen or sulfur and a condensation product thereof with an organic compound containing two alcoholic or phenolic hydroxyl groups.

4,914,146

POLYTETRAFLUOROETHYLENE CONTAINING COATING COMPOSITION

Norimasa Honda; Mutsusuke Namba, and Yoshiaki Kataoka, all of Osaka, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 76,020, Jul. 21, 1987, abandoned. This application Jul. 3, 1989, Ser. No. 376,230
Claims priority, application Japan, Jul. 21, 1986, 61-172350; Jan. 5, 1987, 62-642
Int. Cl.[4] C08K 3/34; C08F 116/24, 112/20; C08L 27/12
U.S. Cl. 524—449 12 Claims

1. A tetrafluoroethylene base polymer-containing coating composition consisting essentially of a dispersion of a tetrafluoroethylene base polymer having a primary particle size of 0.1 to 0.5 μm and having a molecular weight of at least 5,000,000 in a liquid medium containing a surfactant.

4,914,147

PNEUMATIC TIRES

Hiroshi Mouri, and Hiromi Maeda, both of Kodaira, Japan, assignors to Bridgestone Corporation and Japan Synthetic Rubber Co., Ltd., both of Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,257
Claims priority, application Japan, Sep. 11, 1987, 62-228017
Int. Cl.[4] C08K 3/04; C08L 7/00, 9/00, 9/06
U.S. Cl. 524—495 5 Claims

1. A pneumatic tire, characterized in that at least a tread portion of said tire is comprised of a rubber composition comprising 20–100 parts by weight of a modified styrene-butadiene copolymer and 80–0 parts by weight of another diene series rubber as a rubber component, and containing 40–80 parts by weight of carbon black having a specific surface area of nitrogen adsorption of 110–160 m^2/g and a DBP oil absorption of 100–150 ml/100 g based on 100 parts by weight of said rubber component; wherein said modified styrene-butadiene copolymer is obtained by copolymerizing 15–50 parts by weight of stryrene and 85–50 parts by weight of 1,3-butadiene in a hydrocarbon solvent in the presence of an organolithium polymerization initiator and then modifying an active end of the resulting polymer with a terminal modifying agent; said copolymerization being carried out by using (a) 0.01–0.5 mol of at least one anionic surfacant having a —SO_2M or —OSO_3M group (wherein M is an element selected form the group consisting of Na, K, Rb and Cs), per 1 gram-atom of lithium in said organolithium polymerization initiator and (b) 0.1–5 mol of at least one member selected form the group consisting of alcohols, thioalcohols, organic carboxylic acids, organic sulfonic acids, organic phosphites, primary amines and secondary amines, based on 1 mol of said surfacant, wherein said hydrocarbon solvent is used in an amount of 0.5–20 parts by weight per 1 part by weight of monomer, wherein said organolithium polymerization initiator is used in an amount of 0.02–5 milligram-atom as a lithium atom per 100 g of monomer, and wherein said terminal modifying agent is selected from the group consisting of alkenyl aromatic vinyl compounds, halogenated tim compounds, halogenated silicon compounds, isocyanate compounds, dialkylamino-substituted aromatic vinyl compounds, nitrogen-containing aromatic heterocompounds and cyclic urea compounds.

4,914,148

WATER-DILUTABLE COATING AGENT FOR PREPARING THE BASE LAYER OF A MULTILAYER COATING

Hans-Dieter Hille, Bergisch Gladbach; Franz Ebner, Kist, and Hermann-Josef Drexler, Greven, all of Fed. Rep. of Germany, assignors to BASF Lacke & Farben AG, Munster, Fed. Rep. of Germany

PCT No. PCT/EP86/00736, § 371 Date Aug. 22, 1988, § 102(e) Date Aug. 22, 1988, PCT Pub. No. WO87/03829, PCT Pub. Date Jul. 2, 1987
PCT Filed Dec. 11, 1986, Ser. No. 276,455
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1985, 3545618
Int. Cl.[4] C08L 75/04
U.S. Cl. 524—507 23 Claims

1. A basecoating composition for preparing a multi-layered, protective or decorative coating, comprising an aqueous dispersion which contains:

(a) as a film-forming material a polyurethane resin having an acid number of from 5 to 70, which has been prepared from

(A) linear polyetherdiol or polyesterdiol having a molecular weight of from 400 to 3,000,

(B) diisocyanate and

(C) a compound which contains two groups which are reactive toward isocyanate groups,

component C having one or more groups capable of anion formation which have preferably been neutralized before the reaction with a tertiary amine, and components (A), (B) and (C) forming an intermediate which has terminal isocyanate groups and whose free isocyanate groups have subsequently been reacted with

(D) further compounds which contain groups reactive toward isocyanate groups, and

(b) pigments,

wherein the aqueous polyurethane dispersion has been prepared by (1) reacting the intermediate obtained from (A), (B) and (C) with a polyol which contains three or more hydroxyl groups and (2) transferring the reaction product thus obtained into an aqueous phase.

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4,914,149

FLEXIBLE, CORROSION RESISTANT, THERMOSETTING METAL COATING COMPOSITIONS

Keaneth E. Fleming, Edinboro, and Douglas H. Mowrey, Erie, both of Pa., assignors to Lord Corporation, Erie, Pa.

Continuation-in-part of Ser. No. 920,558, Oct. 20, 1986, Pat. No. 4,769,413. This application Aug. 15, 1988, Ser. No. 232,208
The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.
Int. Cl.[4] C08L 75/00
U.S. Cl. 524—507 15 Claims

1. A coating composition comprising

A. about 5 to 30% by weight of blocked isocyanate-functional urethane prepolymer;

B. about 2 to 25% by weight of at least one organic solvent-soluble phenolic resin;

C. about 0.5 to 18% by weight of a halogenated resin selected from the group consisting of halogenated rubber, halogenated polyolefins and halogenated vinyl halide polymers; and

D. inert solvent in an amount sufficient to provide an adhesive primer having a solids content in the range of about 10 to 70%;

said weight percent of components A, B and C being based on the combined weights of components A, B, C and D.

4,914,150

PROCESS FOR PREPARING ANTI-STATIC POLYISOCYANATE-BASED POLYMERS VIA INCORPORATING A POLYALKYLENE CARBONATE-SALT MIXTURE

Donald G. Prier, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 2, 1988, Ser. No. 279,468
Int. Cl.[4] C08G 18/44
U.S. Cl. 524—701 17 Claims

1. A process for preparing a polyisocyanate-based polymer by the reaction of a polyisocyanate with an active hydrogen-containing composition characterized in that the said composition comprises a polyalkylene carbonate polyol having dispersed therein a non-volatile ionizable salt, and said reaction being conducted in the substantial absence of a carboxylic acid ester of C_{6-30} carbon atoms, a fatty acid salt and a phosphate ester compound.

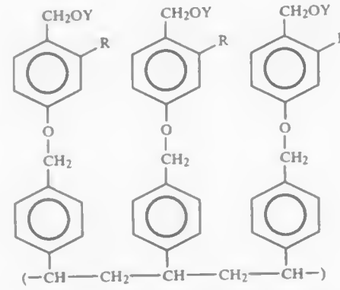
4,914,151

RESIN-LINKER COMBINATION FOR THE SOLID-PHASE SYNTHESIS OF PEPTIDES AND INTERMEDIATES

Monika Mergler, Liestal; Jacques Gosteli, Basel, and Peter Grogg, Bubendorf, all of Switzerland, assignors to Bachem Feinchemikalein A.G., Switzerland

Division of Ser. No. 189,294, May 2, 1988, Pat. No. 4,831,084.
This application Mar. 29, 1989, Ser. No. 329,985
Claims priority, application Switzerland, May 18, 1987, 872/87
Int. Cl.[4] C08L 89/00; C08F 283/00; C08K 283/00
U.S. Cl. 525—54.1 10 Claims

1. Peptidylresin fragments consisting of a polymer having the formula IV:



cross-linked with 0.5–2.0% of divinylbenzene optionally substituted by halogen or lower alkyl, in which R represents a lower alkoxy, lower alkylthio or a

group, in which R_1 and R_2 stand for lower alkyl, and Y represents the residue of an amino acid or peptide of which the carboxyl group is condensed in ester manner and in which the functional groups may optionally be protected.

4,914,152

POLYESTER RESIN COMPOSITION

Shunitsu Miyashita, Kobe, and Kenji Mogami, Settsu, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki, Osaka, Japan

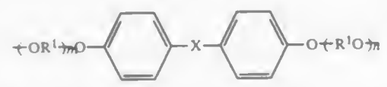
Filed Nov. 19, 1987, Ser. No. 122,738
Claims priority, application Japan, Nov. 20, 1986, 61-276927; May 30, 1987, 62-135805
Int. Cl.[4] C08L 67/02
U.S. Cl. 525—68 11 Claims

1. A polyester resin composition comprising:

(a) a thermoplastic polyester,

(b) 1 to 100 parts by weight of a polymer containing a least one epoxy group per molecule and having a modulus of elasticity in bending of at most 10^4 kg/cm^2 as determined by the procedure of ASTM D790 at room temperature, and

(c) 0.5 to 100 parts by weight of a copolymer of an α-olefin and an α,β-unsaturated carboxylic acid wherein at least 5% by mole of the carboxyl groups are neutralized with an alkali metal, said parts being parts by weight per 100 parts by weight of the component (a), said thermoplastic polyester (a) being a block copolymer of polyethylene terephthalate and a polyether compound of the formula (2):



(2)

wherein

R^1 is a bivalnet hydrocarbon group having 2 to 4 carbon atoms,

X is a single bond or a bivalent group selected from $-C(CH_3)_2-$, $-CH_2-$, $-S-$, $-SO_2-$ and $-CO-$,

m and n are independently an integer of 5 to 20, and

the R^1 groups in respective recurring units may be different from each other, and the derivatives of the polyether compound (2) having an ester-forming ability.

4,914,153

SOLVENT-RESISTANT POLYPHENYLENE ETHER RESIN COMPOSITION

Shizuo Togo, Ichikawa; Akikuza Amagai, Tokyo; Yoshinori Kondo, Tokyo, and Toshiaki Yamada, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Nov. 17, 1987, Ser. No. 122,235
Claims priority, application Japan, Nov. 19, 1986, 61-273958
Int. Cl.[4] C08L 51/06, 71/04
U.S. Cl. 525—68 4 Claims

1. A solvent-resistant polyphenylene ether resin composition comprising

(A) a modified polyphenylene ether obtained by modifying a polyphenylene ether with a modifier selected from the group consisting of maleic anhydride, glycidyl methacrylate and glycidyl acrylate in the absence of a radical initiator,

(B) a modified polyolefin obtained by modifying a polyolefin with styrene and a modifier selected from the group consisting of maleic anhydride, glycidyl mathacrylate and glyoidyl acrylate in the presence of a radical initiator, and

(C) a binder selected from the group consisting of phenylenediamine, aminobenzoic acid, bisphenol A, terephthalic acid and diepoxy compounds.

4,914,154

NOVEL MATTING AGENT AND ITS USE

Ingo Haller; Ernst Spindler; Manfred Heisler, and Willi Kleine, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Fed. Rep. of Germany

Filed Aug. 15, 1983, Ser. No. 766,044
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1984, 3431201; Jul. 3, 1985, 3523788
Int. Cl.[4] C08L 51/00, 27/06; C08F 14/06
U.S. Cl. 525—80 13 Claims

1. A matting agent for plastic compositions which is a high molecular weight, gel-containing vinyl chloride polymer with a gel content of 10 to 99% by weight, a maximum mercury porosity of 0.2 cm^3/g, a maximum plasticizer absorption of 15%, a particle size parameter d' of 10 to 80 μm and a coefficient of uniformity n greater than 3.

4,914,155

THERMOPLASTIC RESIN COMPOSITION

Yozo Shimomura; Kinya Mori, and Osamu Kojima, all of Chiba, Japan, assignors to Chisso Corporation, Japan

Filed Apr. 12, 1988, Ser. No. 180,843
Claims priority, application Japan, Apr. 15, 1987, 62-92750
Int. Cl.[4] C08L 53/00, 25/06
U.S. Cl. 525—89 4 Claims

1. A thermoplastic resin composition comprising:

(A) 20 to 60% by weight of a propylene-ethylene block copolymer obtained by block copolymerizing 70 to 95% by weight, based on the total weight of the block copolymers, of propylene homopolymers obtained by polymerizing propylene at first stage, having a relationship represented by the formula:

$$1.00 \geqq P \geqq 0.015 \log MFR + 0.955$$

wherein P is an isotactic pentad ratio of a propylene homopolymer and MFR is a melt flow rate thereof, and 30 to 5% by weight, based on the total weight of the block copolymer, of ethylene or ethylene and propylene at one or more stages, the ethylene content being 3 to 12% by weight based on the total weight of the block copolymers;

(B) 60 to 20% by weight of a styrene homopolymer; and

(C) 5 to 30% by weight of a styrene-ethylene-butylene-styrene block copolymer or a styrene-ethylene-propylene block copolymer,

the total of (A), (B) and (C) being 100% by weight.

4,914,156

BLOW MOLDING POLYESTER COMPOSITIONS

King L. Howe, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 14, 1987, Ser. No. 132,487
Int. Cl.[4] C08L 67/02
U.S. Cl. 525—166 4 Claims

1. A melt-blend of a mixture consisting essentially of:

(a) 85–95 parts by weight of a semicrystalline polyester;

(b) 5–15 parts be weight of an epoxide-group containing copolymer containing recurring units of monomer of the formula (1) $CH_2{=}C(R)COOCH_2CHCH_2O$ wherein R=H or lower alkyl of 1–6 carbon atoms and recurring units of one or more monomers selected from the group consisting of (2) $CH_2{=}CHR$ where R=H, lower alkyl, or phenyl, (3) $CH_2{=}C(R_1)COOR_2$ where R^1=H or lower alkyl and R_2=alkyl of 1–8 carbon atoms, (4) $RCOOCH{=}CH_2$ where R=lower alkyl, and (5) CO;

(c) 0.01 to 3.0 parts by weight of a source of catalytic cations selected from the group consisting of metal salts of hydrocarbon mono-, di, or poly-carboxylic acids and metal salts of organic polymers containing carboxyl groups, said cations being selected from the group consisting of Al^{+++}, Cd^{++}, Co^{++}, Cu^{++}, Fe^{++}, In^{+++}, Mn^{++}, Nd^{+++}, Sb^{+++}, Sn^{++}, and Zn^{++} and provided that the source of catalytic cation imparts into the melt blend 0.05 to 0.5 miliimoles of catalytic cation per 100 grams of components (a) and (b) combined; and

(d) 0.1–3.0 parts by weight of a fibrillatable polytetrafluoroethylene resin.

4,914,157

ENHANCING CURE RATES OF RUBBER

Lawson G. Wideman, Tallmadge; Thomas J. Botzman, Stow, and George Jalics, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 26, 1988, Ser. No. 249,489
Int. Cl.[4] C08L 23/26, 9/00, 15/00, 7/00
U.S. Cl. 525—192 18 Claims

1. A, method for enhancing the rate of cure of a sulfur vulcanizable rubber comprising adding to the sulfur vulcanizable rubber an amount of hydroformylated rubber effective to enhance the rate of cure of said sulfur vulcanizable rubber, said hydroformylated rubber being prepared from a rubber containing olefinic unsaturation.

4,914,158

GRANULAR POWDER OF MELT PROCESSABLE FLUORINE-CONTAINING RESIN AND PREPARATION OF THE SAME

Tatsuhiro Yoshimura, Takatsuki; Takeshi Suzuki, Nagaokakyo; Shuhei Shimasaki, Yono, and Masashi Watada, Settsu, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 35,804, Apr. 8, 1987, abandoned. This application May 27, 1988, Ser. No. 201,295
Claims priority, application Japan, Apr. 11, 1986, 61-84722
Int. Cl.[4] C08L 27/12
U.S. Cl. 525—199 2 Claims

1. A granular powder of a melt processable fluorine-containing resin which is at least one member selected from the group consisting of a tetrafluoroethylene copolymer containing tetrafluoroethylene in an amount of not more than 97% by weight, a chlorotrifluoroethylene polymer and a vinylidene fluoride polymer, and is an agglomerate, comprising particles of the melt processable fluorine-containing resin having an average particle size of not more than 200 μm and a tetrafluoroethylene polymer as a binder, said agglomerate has an average particle

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size of not more than 1000 μm and a bulk density of not less than 0.3 g/cm^3, and said tetrafluoroethylene polymer as a binder is at least one member selected from the group consisting of a tetrafluoroethylene homopolymer and a tetrafluoroethylene polymer modified by copolymerizing a tetrafluoroethylene with at least one monomer, in an amount of 0.001 to 2% by mole, selected from the group consisting of perfluoro alkyl vinyl ether, hexafluoropropylene, chlorotrifluoroethylene and vinylidene fluoride, and a weight ratio of the melt processable fluorine-containing resin to the tetrafluoroethylene polymer as a binder is 99.5/0.5 to 90.9/9.1.

4,914,159

OPTICALLY ACTIVE (METH)ACRYLAMIDES, A PROCESS FOR THEIR PREPARATION, AND THEIR USE FOR RACEMATE RESOLUTION

Bruno Bömer, Bergisch Gladbach; Rolf Grosser; Ulrich Schwartz, both of Leverkusen; Dieter Arlt, and Karl-Erwin Piejko, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 1, 1988, Ser. No. 162,529

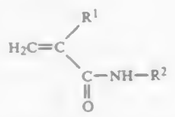
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1987, 3706890

Int. Cl.^{4} C07B *57/00;* G01N *30/48*

U.S. Cl. 525—328.2 **8 Claims**

1. A silica gel-immobilized, optically active (co)polymer made from

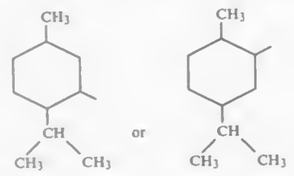
(a) 10–100% by weight of an optically active monomer unit of the formula



in which

R^1 is hydrogen or methyl, and

R^2 is one of the stereoisomers of the eight possible stereoisomeric forms of each of the optically active radicals of the formulae



and

(B) 90–0% by weight of a monomer unit of the group comprising C_1–C_8-alkyl (meth)acrylates, styrene, acrylonitrile, (meth)acrylamide and nitrogen-substituted (meth)acrylamides.

4,914,160

DEUTERATION OF UNSATURATED POLYMERS AND COPOLYMERS

Hormoz Azizian, No. 1210, 3620 Kaneff Crescent, Mississauga Ontario, Canada (L5A 3X1)

Filed Jun. 23, 1988, Ser. No. 210,408

Int. Cl.^{4} C08F *8/04*

U.S. Cl. 525—329.3 **10 Claims**

1. An elastomeric addition copolymer of vinyl monomer 1,3-conjugated diene, said copolymer being deuterated to saturate between about 50 percent and about 100 percent of the polymer backbone and side-chain ethylenic double bonds from the diene units incorporated in the copolymer and wherein essentially only the ethylenic double bonds are deuterated.

4,914,161

IONICALLY CONDUCTIVE MACROMOLECULAR MATERIAL

Daniel Muller; Jean-Michel Chabagno; Hervé Cheradame, all of Pau; Jean-Francois Le Pert, Grenoble, and Michel Leveque, Le Fayet, all of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France and Hydro-Quebec, Montreal, Canada

Filed Jul. 11, 1986, Ser. No. 884,604

Claims priority, application France, Jul. 12, 1985, 85 10737; Dec. 11, 1985, 85 18352

Int. Cl.^{4} C08G *65/32;* C08F *283/00*

U.S. Cl. 525—403 **10 Claims**

1. Ionically conductive macromolecular material consisting essentially of at least one salt in solution in or grafted onto a macromolecular material, said macromolecular material being mainly constituted by an amorphous polyether structure, wherein said salt is represented by the formula (I):

R—F—M (I)

wherein:

M is an alkali metal;

R is a polyether structure consisting essentially of ethylene oxide or propylene oxide units, or mixtures thereof;

F represents a function selected from the group consisting of alcoholates, sulfonates, sulfates, phosphates, phosphonates, amides, carboxylates, borates, thiophosphates and perhalogenosulphonates and mixtures thereof.

4,914,162

ADHESIVE COMPOSITION COMPRISING THERMOPLASTIC POLYAMIDE FROM DIMER ACID AND N-SUBSTITUTED ALIPHATIC DIAMINE

Roberto Leoni, Milan, Italy; Werner Gruber, Korschenbroich, and Juergen Wichelhaus, Wuppertal, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Division of Ser. No. 33,429, Apr. 1, 1987, Pat. No. 4,810,772, which is a continuation-in-part of Ser. No. 905,728, Sep. 8, 1986, abandoned. This application Oct. 31, 1988, Ser. No. 265,172

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1985, 3535732

Int. Cl.^{4} C08L *77/08*

U.S. Cl. 525—420.5 **16 Claims**

1. A hot-melt adhesive composition comprising

(A) from about 10 to about 90% by weight of at least one thermoplastic polyamide which consists essentially of the polymeric reaction product of:

(a) from about 10 to about 50 mole percent of at least one dimer fatty acid containing from about 10 to about 20 mole percent dimer fatty acid;

(b) from about 25 to about 45 mole percent of at least one diamine selected from the group consisting of aliphatic, aromatic and cyclic diamines having a carbon chain length of from 2 to about 40 carbon atoms and which is a diprimary diamine, a diamine containing one or two secondary amino groups having a C_1–C_8 alkyl group on the N-atom, or a heterocyclic diamine capable of diamide formation;

(c) from about 5 to about 25 mole percent of at least one aliphatic diamine containing from 2 to about 10 carbon atoms, which is capable of diamide formation, and which has substituted on one or both N-atoms a straight or branched chain alkyl group having from about 10 to about 25 carbon atoms; and

(d) from 0 to about 40 mole percent of at least one aliphatic dicarboxylic acid having from about 6 to about 22 carbon atoms;

(B) from about 10 to about 90% by weight of at least one polyamide which consists essentially of the polymeric reaction product of

(a) from about 20 to about 55 mole percent of at least one dimer fatty acid,

(b) from 0 to about 25 mole percent of an aliphatic C_6–C_{22} dicarboxylic acid,

(c) from 0 to about 30 mole percent of an aminocarboxylic acid, its lactam, or a mixture thereof, containing from 8 to 22 carbon atoms,

(d) from about 20 to about 55 mole percent of at least one diamine selected from the group consisting of aliphatic, and cyclic C_2–C_{40} diamine, and

(e) from 0 to 30 mole percent of a polyether diamine;

(C) from 0 to about 20% by weight of polyethylene having a number average molecular weight in the range of from about 250 to about 8000; and

(D) from 0 to about 20% by weight of standard hot-melt auxiliary materials.

4,914,163

PROCESS FOR PREPARING HETEROCYCLIC COPOLYMERS

Kazuyuki Sakota; Wataru Minoshima; Takayuki Masuda, all of Saitama; Chihiro Imai, Kanagawa; Tetsuro Nakahama, Hiroshima; Toshimitsu Sugawara, Hiroshima, and Yoshio Nakagawa, Hiroshima, all of Japan, assignors to Tosoh Sekiyu Kagaku Kabushiki Kaisha and Nitto Chemical Industry Co., Ltd., both of Tokyo, Japan

Filed Dec. 27, 1988, Ser. No. 290,188

Claims priority, application Japan, Dec. 28, 1987, 62-333889; Dec. 5, 1988, 63-307138

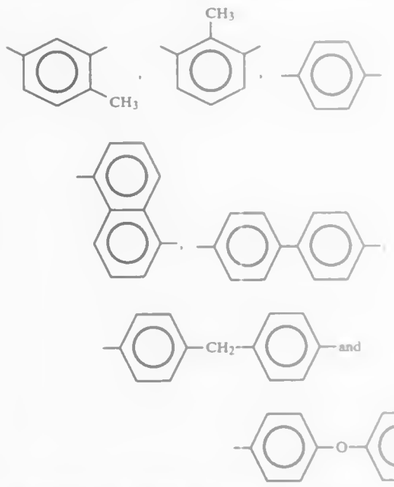
Int. Cl.^{4} C08G *18/82*

U.S. Cl. 525—452 **16 Claims**

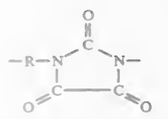
1. A process for perparing a heterocyclic copolymer having recurring units represented by the following formulas [A] and [B], which process comprises hydrolyzing a reaction product of a diisocyanate compound represented by the formula [A]

OCN—R—NCO [a]

(wherein R represents a divalent aromatic group selected from the class consisting of

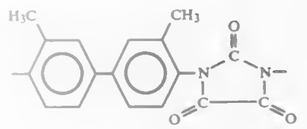


with tolidine diisocyanate and hydrogen cyanide;



[A]

wherein R is as defined above.



[B]

4,914,164

METHOD OF COATING WITH POLYGLYCIDYL ETHER OF SORBITOL AND POLYAMIDOAMINE

John A. Gannon, Danbury, Conn.; Vincent Brytus, Mahopac, and Joseph S. Puglisi, Crompond, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 47,525, May 4, 1987, abandoned, which is a continuation of Ser. No. 847,338, Apr. 2, 1986, abandoned. This application Jan. 14, 1988, Ser. No. 145,675

Int. Cl.^{4} C08L *63/00*

U.S. Cl. 525—523 **2 Claims**

1. A method of through-curing a coating which comprises curing at a temperature of 5°–80° C. for a period of 2 to 24 hours a polyfunctional glycidyl ether of sorbitol having at least 2 oxirane groups per molecule with an effective curing amount of a polyamidoamine hardener.

4,914,165

RADIATION CROSSLINKABLE COMPOSITIONS

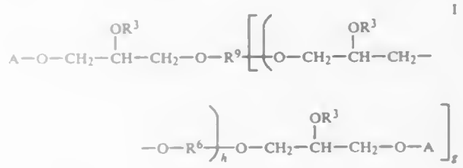
Thomas P. Klun; Aida F. Robbins, and M. Zaki Ali, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St Paul, Minn.

Filed Feb. 3, 1988, Ser. No. 151,879

Int. Cl.^{4} C08F *283/00;* C08G *59/14;* C08L *75/06*

U.S. Cl. 525—528 **15 Claims**

1 A compound having a formula selected from the group consisting of Formulae I, III, IV, and V, wherein Formula I is:



wherein

in which

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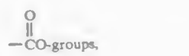
in which R is hydrogen, halogen, or methyl, and a is an integer of 1 to 6;

R^1 is a polyvalent aliphatic group having 1 to 15 carbon atoms and a valence of c+1, and optionally containing one or two catenary oxygen or



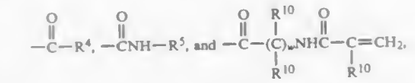
b is zero or an integer of 1 to 6,

c is an integer of 2 to 5,

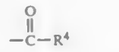
d is an zero or an integer of 1 to 6; and

R^2 is a divalent linear or branched saturated or unsaturated aliphatic group having 2 to 10 carbon atoms or a divalent arylene group having 6 to 10 carbon atoms;

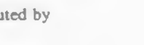
R^3 is selected from the group consisting of hydrogen,



in which each R^{10} is hydrogen or lower alkyl of 1 to 4 carbon atoms, and each R^4 and R^5 is independently an organic group selected from alkyl groups having 1 to 10 carbon atoms, ethylenically unsaturated groups having 2 to 10 carbon atoms, cycloalkyl groups having 5 to 7 ring carbon atoms and a total of 5 to 10 carbon atoms, and aryl groups having 6 to 10 carbon atoms, with the provision that 5 to 100 mole percent of all R^3 groups are



in which R^4 is substituted by



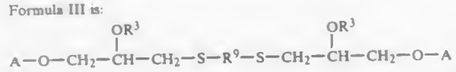
and w is 1 or 2;

R^6 is a divalent organic group;

R^9 is R^6 or a polyvalent organic group having a valence of g+1, in which g is an integer having a value of 1 to 10, that is aliphatic, cycloaliphatic, or aromatic and having a weight average molecular weight of in the range of 28 to 1000, and

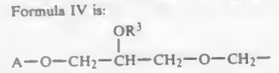
h is zero or a number having an average value of up to 20, with the proviso that when R^9 is not R^6, then h is zero;

Formula III is:



wherein A, R^3, and R^9 are as previously defined;

Formula IV is:



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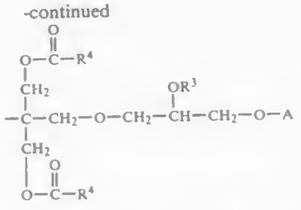
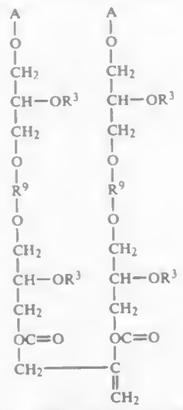


wherein A, R^3, and R^4 are as previously defined; and

Formula V is:

V



wherein A, R^3, and R^9 are as previously defined.

4,914,166

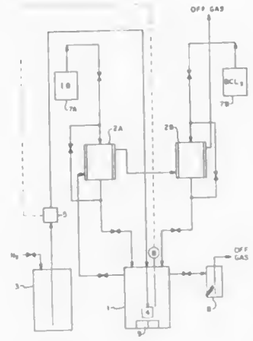
NON-FOULING LIQUID NITROGEN COOLED POLYMERIZATION PROCESS

Joseph P. Kennedy, Akron, Ohio, and Miklos Zsuga, Debrecen, Hungary, assignors to The University of Akron, Akron, Ohio

Filed Jan. 20, 1988, Ser. No. 145,962

Int. Cl.[4] C08F *2/02, 2/06*

U.S. Cl. 526—61 **24 Claims**



1. A method of polymerizing under cryogenic conditions a monomer or monomers with a carbocationic catalyst comprising charging a charge of said monomer or monomers with or without solvent to a reactor, chilling said charge to cryogenic polymerization temperature by the evaporation of a controlled feed of liquid nitrogen, contacting said charge with a carbocationic catalyst to effect said polymerization to thereby generate heat, removing the said heat by the evaporation of said controlled feed of liquid nitrogen to maintain the cryogenic polymerization temperature, said liquid nitrogen feed and removal of said heat by the evaporation of said controlled feed of liquid nitrogen being controlled by magnetic on and off valves which open and close in response to temperature variations in the reactor measured electrically and the evaporation of said feed of liquid nitrogen being able to maintain an inert nitrogen atmosphere in said reactor at or above atmospheric pressure.

4,914,167

POLYMERIC ORGANIC ACIDS, THEIR PREPARATION AND THEIR USE IN DETERGENTS AND CLEANSERS

Juergen Hambrecht, Heidelberg; Heinrich Hartmann, Limburgerhof; Walter Denzinger, Speyer; Albert Hettche, Heusheim; Wolfgang Trieselt, Ludwigshafen, and Rolf Schneider, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 425,699, Sep. 28, 1982, abandoned. This application Jul. 8, 1985, Ser. No. 752,013

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1981, 3140383

Int. Cl.[4] C08F *6/02, 2/02*

U.S. Cl. 526—65 **10 Claims**

1. A continuous process for the preparation of a water-soluble organic acid copolymer, having a K value between 18–33, which exhibits scale inhibiting properties when used in low phosphate detergents and calcium-binding capability and detergent action when used as a builder comprising the following steps:

A. copolymerizing in two polymerization zones arranged in series a comonomeric mixture consisting essentially of:

(1) 60–85% by weight of acrylic acid, methacrylic acid or combinations thereof,

(2) 1–5% by weight of at least one monomer devoid of acid groups being copolymerizable with monomer (1) selected from the group consisting of vinyl acetate, n-butyl acrylate, 2-ethylhexyl acrylate, hydroxypropyl acrylate, styrene, N-vinylpyrrolidone, vinylisobutyl ether and mixtures thereof, and

(3) 10–40% by weight of maleic anhydride, the total of components (1), (2) and (3) being 100%,

under continuous mass polymerization conditions with thorough mixing of the components in the absence of a solvent in the presence of from 0.1–5% by weight, based on the total amount of monomer components, of a free radical initiator at a temperature of from 200°–400° C. for 5 to 30 minutes and at a superatmospheric pressure ranging from 1 to 200 bar, thereby producing the molten copolymer;

B. discharging said molten copolymer from the reactor, while simultaneously introducing into the reactor said comonomeric mixture, wherein the amount of said molten copolymer discharged from said reactor at any time is equal to the amount of said comonomeric mixture simultaneously introduced into the polymerization medium in said polymerization zones;

C. at least partially neutralizing said discharged copolymer; and

D. recovering said at least partially neutralized, water-soluble organic acid polymer having a K value between 18–33.

4,914,168

CATALYST SYSTEM FOR (CO) POLYMERIZATION OF ETHYLENE IN SOLUTION

Luc M. C. Coosemans, Houthalen, Belgium, and Frans J. P. G. Van Den Bosch, Schinnen, Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Division of Ser. No. 154,370, Feb. 10, 1988, Pat. No. 4,826,794. This application Aug. 1, 1988, Ser. No. 226,863

Claims priority, application Netherlands, Feb. 11, 1987, 8700322

Int. Cl.[4] C08F *4/64*

U.S. Cl. 526—127 **2 Claims**

1. Process for the (co)polymerization of ethylene and optionally minor amounts of 1-alkenes and/or dienes, comprising the following steps:

polymerizing ethylene and optionally minor amounts of 1-alkenes and/or dienes at a temperature above 110° C. employing a catalyst, said catalyst prepared by combining at least two components A and B said components including,

A. One or more magnesium compounds, one or more aluminum compounds, one or more transition metal compounds and optionally one or more halogen compounds, in such amounts that the atomic ratio of halogen to magnesium is at least 2, the atomic ratio of aluminum to transition metal is at least 3, the atomic ratio of aluminum to magnesium is at least 1, and the atomic ratio of magnesium to transition metal is at least 0.5, wherein the transition metal compound(s) is/are one or more titanium compound(s) of the general formula $Ti(OR^6)_{4-p}X^2_p$ and/or $Ti(OR^7)_{3-q}X^3_q$, where the symbols R^1 and R^2 are equal or different and represent hydrocarbon radicals with 1–20 carbon atoms, X^2 and X^3 halogen atoms, $0 \leqq p \leqq 4$ and $0 \leqq q \leqq 3$, the magnesium compound(s) belong(s) to the compounds of the general formula $R^8_rMgX^4_{2-r}$, where R^8 represents a hydrocarbon radical with 1–20 carbon atoms and X^4 a halogen atom or an alkoxy group, and $0 \leqq r \leqq 2$, the aluminum compound(s) belong(s) to the compounds of the general formula $R^9_sAlX^5_{3-s}$, where the symbols R^9 are equal or different and represent a hydrocarbon radical with 1–20 carbon atoms, X^5 represents a halogen atom and $0 \leqq s \leqq 3$, and the optional halogen compound(s) belong(s) to the group of chlorides, of alkyl, acyl, aryl, and/or chlorides of elements from groups 3a and 4a of the Periodic System,

B. one or more organoaluminum compounds of the general formula $R_m{}^1AlX^1_{3-m}$, where the symbols R^1 are equal or different and represent a hydrocarbon radical with 1–20 carbon atoms and the symbols X^1 are equal or different and represent a hydrogen atom, a group of the general formula $—NR^2_2$ (where R^2 is a hydrocarbon radical with 1–10 carbon atoms), a group of the general formula $—OR^3$ (where R^3 is a hydrocarbon radical with 1–20 carbon atoms or a group of the general formula $—Si(R^4)_3$, where the symbols R^4 are equal or different and represent a hydrogen and/or a hydrocarbon radical with 1–20 carbon atoms), and 021 $m<3$, or a group of the general formula $—(OAlR^5))_n—OAlR_2^5$, where the symbols R^5 are equal or different and represent a hydrocarbon radical with 1–10 carbon atoms, and $\geqq 0$,

which two components are, separately or in combination, supplied direct to the polymerization vessel in such amounts that the atomic ratio of the aluminum from component B to the aluminum from component A is at least 0.1.

4,914,169

METHOD OF POLYMERIZING VINYL CHLORIDE

Shuji Suyama, and Tomoyuki Nakamura, both of Aichi, Japan, assignors to Nippon Oil and Fats Company, Limited, Japan

Filed May 13, 1988, Ser. No. 193,577
Claims priority, application Japan, May 21, 1987, 62-122543
Int. Cl.[4] C08F 4/38
U.S. Cl. 526—228 7 Claims

1. A method of polymerizing vinyl chloride series monomer in the co-existence of a fast polymerization initiator and a retarded polymerization initiator, wherein

(A) from 0.001 to 0.5 parts by weight of pinane peroxy neodecanoate is used as the fast polymerization initiator per 100 parts by weight vinyl chloride, and

(B) at least one of peroxy ester, diacyl peroxide and peroxy dicarbonate of which a half life temperature at 10 hours becomes within a range of 40°–65° C. is used as the retarded polymerization initiator.

4,914,170

SUPERABSORBENT POLYMERIC COMPOSITIONS AND PROCESS FOR PRODUCING THE SAME

Ching-Jen Chang, Chalfont, and Walter DeWitt, Southampton, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 17, 1987, Ser. No. 121,567
Int. Cl.[4] C08F 30/04, 20/04, 18/00
U.S. Cl. 526—240 13 Claims

1. A process for the preparation of a superabsorbent polymeric composition for absorbing and retaining aqueous fluids, the process comprising:

(a) preparing a monomer mixture including at least one first hydrophilic monomer selected from the group consisting of acrylic acid and the water soluble salts of acrylic acid, and an effective amount of at least one second hydrophilic monomer to at least reduce the extent of the phase separation of said mixture which would occur shortly after polymerization began in the absence of said second hydrophilic monomer;

(b) adjusting the pH of said mixture prior to polymerization to substantially completely exclude the free acid forms of said first hydrophilic monomer and said second hydrophilic monomer: and

(c) polymerizing said monomer mixture: wherein said second hydrophilic monomer is selected from beta-acryloxypropionic acid, the water-soluble salts of beta-acryloxypropionic acid, 2-hydroxyethyl methacrylate, the (C_1–C_4) alkoxy (C_1–C_4) alkyl (meth) acrylates, the (C_1–C_4) alkoxy (C_1–C_4) alkoxy (C_1–C_4)alkyl (meth) acrylates, the mono (meth) acrylate esters of $HO(CH_2CH_2O)_nH$ where n is a positive integer from 2 to about 10, and the (meth) acrylate esters of $CH_3O(CH_2CH_2O)_xH$ where x is a positive integer from 2 to about 10.

4,914,171

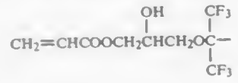
FLUORINATED DIACRYLATES

Andrew M. Zweig, Schaumburg, Ill., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Oct. 26, 1988, Ser. No. 263,152
Int. Cl.[4] C08F 18/20
U.S. Cl. 526—246 7 Claims

1. A miscible mixture which is curable to form a polymer coating comprising:

(a) a fluorinated diacrylate monomer having the formula:



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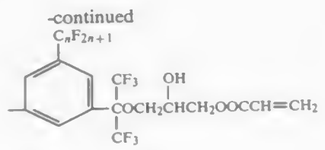


where n is an integer from 1 to 30;

(b) a fluorinated monoacrylate; and

(c) a triacrylate.

4,914,172

WATER-SOLUBLE COPOLYMERS AND THEIR PREPARATION

Hans-Peter Seelmann-Eggebert, Schriesheim; Dieter Boeckh; Heinrich Hartmann, both of Limburgerhof, and Wolfgang Trieselt, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 8, 1988, Ser. No. 179,477
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 3712317; Mar. 4, 1988, 3807086
The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.
Int. Cl.[4] C08F 210/02, 30/04
U.S. Cl. 526—318.3 5 Claims

1. A water-soluble copolymer based on monoethylenically unsaturated carboxylic acids of 3 to 6 carbon atoms, wherein the copolymer has a K value of from 8 to 100 (determined on the Na salt according to H. Fikentscher in aqueous solution at 25° C., a pH of 7 and polymer concentration of the Na salt of 1% by weight) and contains, as copolymerized units,

(a) from 99 to 15 mol % of one or more monoethylenically unsaturated C_3–C_6-monocarboxylic acids,

(b) from 0.5 to 84.5 mol % of one or more monoethylenically unsaturated C_4–C_6-dicarboxylic acids,

(c) from 0 to 20 mol % of one or more hydroxyalkyl esters, where hydroxyalkyl is of 2 to 6 carbon atoms, of monoethylenically unsaturated C_3–C_6-carboxylic acids,

(d) from 0 to 30 mol % of other water-soluble, monoethylenically unsaturated monomers copolymerizable with (a), (b) and (c) and

(e) from 0.5 to 15 mol % of one or more comonomers which possess two or more ethylenically unsaturated, nonconjugated double bonds and one or more —CO—OX groups in which X is hydrogen, one equivalent of an alkali metal or alkaline earth metal or an ammonium group, with the proviso that the sum of the mol % (a) to (e) is always 100.

4,914,173

ADHESIVES, THEIR PREPARATION AND USE

Christopher W. G. Ansell, Sawston, United Kingdom, assignor to Smith and Nephew Associate Companies plc, United Kingdom

Continuation of Ser. No. 129,526, Dec. 7, 1987, abandoned. This application Nov. 14, 1988, Ser. No. 271,096
Claims priority, application United Kingdom, Dec. 6, 1986, 8629231
Int. Cl.[4] C08G 18/04
U.S. Cl. 528—49 15 Claims

1. A skin friendly pressure sensitive adhesive suitable for use on skin which comprises an inherently tacky polyurethane gel which adhesive contains both polyurethane and acrylate residues and which is not self-adherent, and which contains up to 95% by weight of water when hydrated.

4,914,174

LIQUID ISOCYANATE PREPOLYMERS

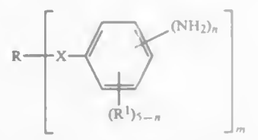
William E. Slack, Moundsville, W. Va., assignor to Mobay Corporation, Pittsburgh, Pa.

Filed Jan. 23, 1989, Ser. No. 300,870
Int. Cl.[4] C08G 18/32
U.S. Cl. 528—68 3 Claims

1. A liquid, storage-stable isocyanate prepolymer having an isocyanate group content of from 3 to 45% by weight, prepared by reacting

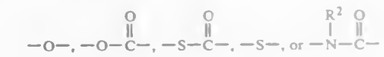
(i) toluene diisocyanate and

(ii) a polyamine of the structure



where R represents an m-valent residue obtained by the removal of m functional groups from a compound having m functional groups and having a molecular weight of from 76 to about 10,000,

X represents



R^1 represents hydrogen or an inert substituent,

R^2 represents hydrogen, a C_1 to C_5 alkyl group or a phenyl group,

n is 1 or 2, and

m is an integer of from 2 to 8

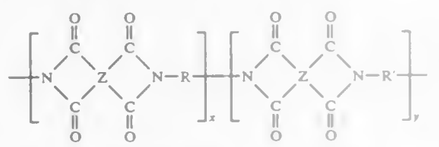
4,914,175

INJECTION MOLDABLE POLYIMIDES

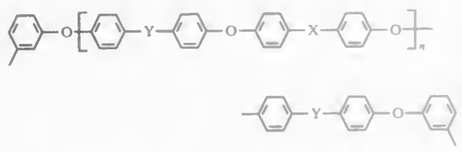
Eui W. Choe, Randolph, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Filed May 10, 1988, Ser. No. 192,460
Int. Cl.[4] C08G 69/26, 8/02, 14/00
U.S. Cl. 528—173 37 Claims

1. A polyimide which has a glass transition temperature between about 150°–250° C., a melt index between about 5–150 at 350° C., and which corresponds to the formula:



where z is a tetravalent aromatic radical containing between about 6–20 carbon atoms, R is a radical corresponding to the formula:



where X is a single bond, or an oxy, thio, carbonyl, sulfonyl radical, or a alkylene, haloalkylene or aralkylene radical containing between about 1–18 carbon atoms; Y is a C_1–C_6 alkylene, carbonyl or sulfonyl radical; and n is a number having an average value between about 1–5; R' is a aromatic radical containing between about 6–30 carbon atoms; and x is 1 and y is 0.1–0.6 x.

4,914,176

POLY(HETEROCYCLIC) POLYMERS

Pen C. Wang, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 17, 1989, Ser. No. 324,867
Int. Cl.[4] C08G 8/02
U.S. Cl. 528—220 36 Claims

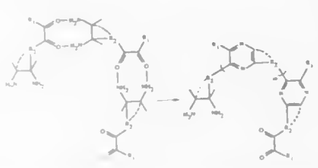
1. A thermoplastic benzoheterocyclic polymer wherein a five-carbon moiety containing a keto group in the 3-position alternates with a bis(benzoheterocyclic) moiety.

4,914,177

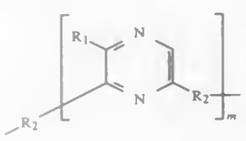
POLYQUINOXALINE POLYMERS, AND ARTICLES COMPRISING SAME

Trelliant Fang, Lawrenceville, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y.

Filed Jul. 13, 1987, Ser. No. 72,326
Int. Cl.[4] C08G 12/00
U.S. Cl. 528—229 13 Claims



1 An article of manufacture comprising a polyquinoxaline polymer, said polymer having repetitive units being represented by the formula



wherein

R_1 is selected from the group consisting of a cyclic and an aromatic moiety, and R_2 is part of a moiety selected from the group consisting of an aliphatic, a cyclic and an aromatic moiety,

and wherein said formula can be represented by a repetitive unit containing only one quinoxaline moiety.

4,914,178

THERMOPLASTIC POLYETHERESTER BLOCK COPOLYMERS

Kyung M. Kim, and Sang J. Lee, both of Kumi, Rep. of Korea, assignors to Kolon Industries, Inc., Seoul, Rep. of Korea

Filed Dec. 30, 1988, Ser. No. 292,161
Claims priority, application Rep. of Korea, Dec. 31, 1987, 87-15680
Int. Cl.[4] C08G 63/02
U.S. Cl. 528—272 5 Claims

1. A branched polyetherester block copolymer comprising hard and soft segments wherein the hard segments comprise a multiplicity of recurring structures of formula 1 and the soft

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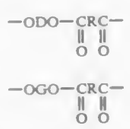
segments comprise a multiplicity of recurring structures of formula II;



(I)

(II)

wherein D is the non-hydroxylic residue of a saturated aliphatic or cyclic diol having 2 to 8 carbon atoms, R is the non-carboxylic residue of an aromatic, aliphatic or cyclic dicarboxylic acid wherein the residue has a molecular weight less than about 500, and G is a polyether having recurring oxyalkylene units and a molecular weight between about 300 and 4,000, said polyetherester block copolymer being branched as a result of the presence of a branching agent during preparation of said copolymer, said branching agent having three or more functional groups wherein at least one of said functional groups is a primary or secondary amine group and the remainder are selected from the group consisting of hydroxyl or carboxyl groups.

4,914,179

COPOLYESTERS FROM 4,4'-BIPHENYLDICARBOXYLIC ACID, 1,4-CYCLOHEXANEDIMETHANOL AND ETHYLENE GLYCOL

John C. Morris, and Winston J. Jackson, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 23, 1988, Ser. No. 288,901
Int. Cl.[4] C08G *63/02*
U.S. Cl. 528—272 17 Claims

1. A copolyester comprising

(A) an acid component comprising repeating units of at least 80 mol % 4,4'-biphenyldicarboxylic acid, and

(B) a glycol component comprising repeating units of from about 90–20 mol % 1,4-cyclohexanedimethanol, and about 10–80 mol % ethylene glycol,

wherein the total mol % of acid component and glycol component are each 100 mol %, and wherein said copolyester has an inherent viscosity of at least about 0.6 determined at 25° C. in 25/35/40 (wt./wt./wt.) phenol/tetrachloroethane/p-chlorophenol at a concentration of 0.1 g./100 ml.

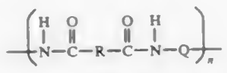
4,914,180

POLYAMIDES PREPARED FROM 2-(3-AMINOPHENYL)-2-(4-AMINOPHENYL) HEXAFLUORO PROPANE

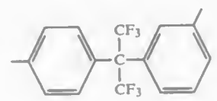
Rohitkumar H. Vora, West Warwick, R.I., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Sep. 30, 1988, Ser. No. 252,724
Int. Cl.[4] C08G *69/26, 69/32*
U.S. Cl. 528—348 11 Claims

1. A polyamide polymer comprising recurring groups having the structure:



wherein n is the number of repeating groups, R is a divalent alphatic, aromatic or alicyclic organic radical, and Q is the amidized residuum of 2-(3-aminophenyl)-2-(4-aminophenyl) hexafluoropropane having the formula:



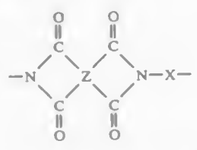
4,914,181

POLYIMIDES, A PROCESS FOR THEIR PREPARATION AND THEIR USE, AND TETRACARBOXYLIC ACIDS AND TETRACARBOXYLIC ACID DERIVATIVES

Josef Pfeifer, Therwil, and Rudolf Duthaler, Zürich, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

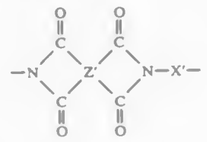
Division of Ser. No. 796,380, Nov. 8, 1985, Pat. No. 4,698,295.
This application Jul. 6, 1987, Ser. No. 70,750
Int. Cl.[4] C08G *69/26, 8/02*
U.S. Cl. 528—353 21 Claims

1. A soluble photocrosslinkable homo- or in a suitable organic solvent or copolyimide of at least one aromatic tetracarboxylic acid and at least one diamine, which essentially contains 0.1 to 100 mol % of at least one structural element of the formula I

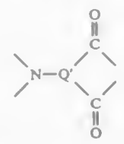


(I)

and 99.9 to 0 mol % of at least one structural element of the formulae II and/or III

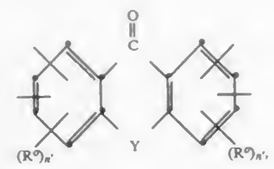


(II)



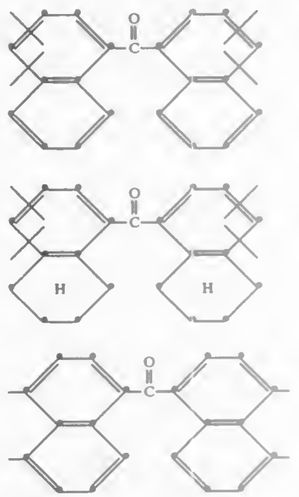
(III)

in which Z is at least one tetravalent radical of the formula IV, V, VI or VII

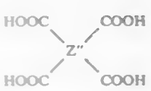


(IV)

-continued



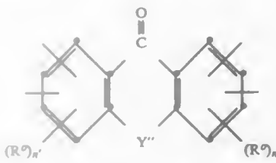
(V)



XII

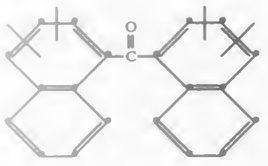
in which Z" is a radical of the formulae XIIIa to XIIIc

(VI)

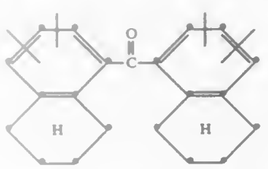


(XIIIa)

(VII)



(XIIIb)



(XIIIc)

in which the free bonds are in the ortho-position relative to one another and Y is a direct bond, $—CH_2—$, $—(CH_2)_2—$, —O—, —S—, —SO—, $—SO_2—$, —CO—, —NR— or $—CRR^1—$, in which R is a hydrogen atom, C_1–C_{10}-alkyl, phenyl, naphthyl or phenyl-(C_oH_{2a})—, where a is 1–4, and R^1 is R, with the exception of a hydrogen atom. R^0 is C_1–C_{10}-alkyl, halogen, —CN, $—NO_2$, C_1–C_{12}-alkoxy, phenoxy, naphthoxy or phenyl-(C_oH_{2a})—, where a is 1–4, n' is 0, 1 or 2, X is an unsubstituted or substituted divalent aliphatic radical, which can be interrupted by heteroatoms or aromatic, heterocyclic or cycloaliphatic groups, a substituted or unsubstituted heterocyclic, cycloaliphatic or araliphatic radical, an aromatic radical, in which two aryl nuclei are linked via an aliphatic group, or an aromatic radical which is substituted by at least one alkyl group, cycloalkyl group, alkoxy group, alkoxyalkyl group, alkylthio group, alkyl-thioalkyl group, hydroxyalkyl group, hydroxyalkoxy group, hydroxyalkylthio group, aralkyl group or, in the case of two adjacent C atoms of the aromatic radical, by an alkylene group, Q' is a trivalent aromatic radical, Z' has the same meaning as Z or is a tetravalent organic radical other than Z and X' is the divalent radical, other than X, of an organic diamine, and in which Z in formula I can also be a tetravalent benzophenone radical if structural elements of the formula III are present.

in which the free bonds are in the ortho-position relative to one another and Y" is a direct bond, $—CH_2—$, $—CH_2—CH_2—$, —O—, —S—, —SO—, $—SO_2—$, —NR— or $—CRR^1—$, in which R is a hydrogen atom, C_1–C_{10}-alkyl, phenyl, naphthyl or phenyl-(C_oH_{2a})—, where a is 1–4, and R^1 has the meaning of R, with the exception of a hydrogen atom, and R^o is C_1–C_{10}-alkyl, halogen, —CN, $—NO_2$, C_1–C_{12}-alkoxy, phenoxy, naphthoxy or phenyl-(C_oH_{2a})—, where a is 1–4, and n' is 0, 1 or 2, or an acid derivative thereof selected from the group consisting of the anhydride, the esters, the amides and the acid halides.

4,914,182

POLYIMIDES, A PROCESS FOR THEIR PREPARATION AND THEIR USE, AND TETRACARBOXYLIC ACIDS AND TETRACARBOXYLIC ACID DERIVATIVES

Josef Pfeifer, Therwil, and Rudolf Duthaler, Zurich, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 796,380, Nov. 8, 1985, Pat. No. 4,698,295.
This application Jul. 6, 1987, Ser. No. 70,749
Claims priority, application Switzerland, Nov. 15, 1984, 5486/84
Int. Cl.[4] C08G *69/26, 8/02*
U.S. Cl. 528—353 2 Claims

1. A tetracarboxylic acid of the formula XII

4,914,183

STEADY STATE PREPARATION OF HIGH BULK DENSITY POLYMER OF CARBON MONOXIDE AND OLEFINS

Maarten M. Geuze, Houston, Tex.; Gerrit G. Rosenbrand, and James A. Salter, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 23, 1988, Ser. No. 235,265
Claims priority, application Netherlands, Aug. 28, 1987, 8702031
Int. Cl.[4] C08G *67/02*
U.S. Cl. 528—392 12 Claims

1. A process for preparing high bulk density polymers from carbon monoxide and at least one olefinically unsaturated compound, comprising the steps of:

polymerizing carbon monoxide and one or more olefinically unsaturated compounds in a continuous flow reactor in the presence of a palladium catalyst composition, the polymerization occuring in a liquid diluent in which the polymer product is almost or entirely insoluble; and

maintaining the polymerization at a steady state wherein the ratio of the quantity of the polymer product formed per hour to the quantity of the polymer product in the reactor is less than 0.2.

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4,914,184

POLYMERIZATION OF CO/OLEFIN WITH HALO MONOCARBOXYLIC ACID AND NON HYDROGEN HALIDE ACID

Gerrit G. Rosenbrand, and James A. Salter, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 27, 1989, Ser. No. 343,771

Claims priority, application Netherlands, Apr. 29, 1988, 8801123

Int. Cl.[4] C08G *67/02*

U.S. Cl. 528—392 7 Claims

1. In the process of producing linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon by contacting the carbon monoxide and hydrocarbon under polymerization conditions in the presence of a catalyst composition formed from a mixture of a palladium salt, a non-hydrohalogenic acid having a pKa less than 2 and a bidentate ligand of phosphorus, the improvement wherein the acid provided to the initial catalyst composition mixture is a halogen-containing monocarboxylic acid provided in a quantity less than 6 equivalents of acid per mol of palladium and, when the concentration of the polymer thereby produced has reached at least 0.2 g of polymer per 100 g of polymer-containing suspension, an amount of non-hydrohalogemic acid, having a pKa less than 2, from about 1 equivalent to about 25 equivalents per mol of palladium is added.

4,914,185

ADDUCTS OF METABROMINATED PHENOLS AND POLYFUNCTIONAL EPOXIDES

Chun S. Wang, Lake Jackson, Tex., and Abei Mendoza, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 14, 1986, Ser. No. 851,996

Int. Cl.[4] C07D *265/38*

U.S. Cl. 528—102 5 Claims

1. An electrical component encapsulated with a cured composition which comprises

(I) an epoxy-containing composition selected from

(A) a composition which comprises an adduct prepared by reacting

(1) a metabromiated monophenol and

(2) a multifunctional polyepoxide having an average of more than two vicinal epoxide groups per molecule; wherein components (1) and (2) are employed in quantities which provide a ratio of phenolic hydroxyl groups to epoxide groups of from about 0.05:1 to about 0.05:1; and

(B) a mixture comprising

(1) a glycidyl ether of a metabrominated monophenol and

(2) a polyepoxide having an average of more than one vicinal epoxide group per molecule; wherein components (1) and (2) are employed in quantities which provide the resultant mixture with a bromine content of from about 2 to about 20 percent by weight; and

(II) a curing amount of a curing agent for component (I).

4,914,186

METHOD FOR THE CONTINUOUS RECOVERY OF ORGANIC POLYMERS FROM SOLUTIONS OR EMULSIONS THEREOF

Helmut Miss, Hilden; Dieter Oppelt, Burscheid; Diez Heine, Leverkusen, and Reinhard Sipos, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

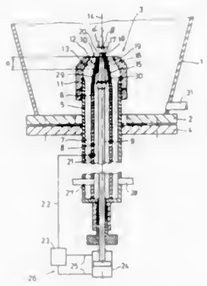
Filed Apr. 12, 1988, Ser. No. 180,411

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1987, 3712798

Int. Cl.[4] C08F *6/12, 6/20*

U.S. Cl. 528—500 3 Claims

1. A method for the continuous recovery of organic polymers from solutions or emulsions thereof, comprising injecting such a solution or emulsion in a jet with a nozzle having an axis and into a liquid in a vessel which is immiscible with the solution or emulsion, heating the solution or emulsion above the boiling point of the respective azeotrope and supplying vapour jet concentrically to the jet of solution or emulsion, the improvement wherein the solution or emulsion is injected in the form of a hollow jet at an angle β enclosed between the jet of solution or emulsion and the nozzle axis and the vapour jet is injected at an angle α which is between 1° and 90° greater than the angle β enclosed between the jet of solution or emulsion and the nozzle axis.



4,914,187

ESTER DERIVATIVES OF ANTIBIOTIC L 17046

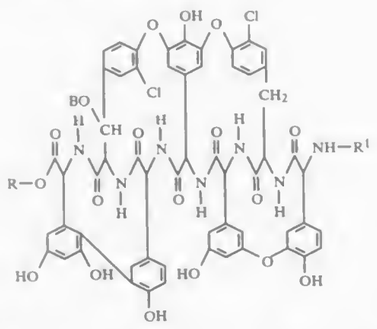
Adriano Malabarba, Milan; Paolo Strazzolini, Fiume Veneto; Ambrogio Magni, Osnago; Bruno Cavalieri, and Aldo Trani, both of Milan, all of Italy, assignors to Gruppo Lepetit S.p.A, Gerenzano, Italy

Continuation of Ser. No. 248,316, Sep. 19, 1988, abandoned, which is a continuation of Ser. No. 11,645, Feb. 4, 1987, abandoned, which is a division of Ser. No. 797,295, Nov. 12, 1985, Pat. No. 4,661,470. This application Jun. 23, 1989, Ser. No. 373,680

Int. Cl.[4] C07K *5/12*

U.S. Cl. 530—317 5 Claims

1. A process for preparing an antibiotic 1 17046 ester derivative of the following formula I



wherein R represents hydroxy (C_1–C_{12})alkyl, (C_1–C_3)alkoxy(C_1–C_{12})alkyl, a group of formula

$$H-[O(CH_2)_m]-_n$$

$$(C_1-C_3)alkyl[O(CH_2)_m]-_n$$

wherein m represents the integer 2 or 3, n is an integer from 1 to 10, and one of the hydrogen atoms of the —(CH_2)— group may be substituted by a methyl group; (C_2–C_{10})alkanoyloxymethyl, phenyl, substituted phenyl, phenyl (C_1–C_6)alkyl, substituted phenyl (C_1–C_6)alkyl, R^1 represents hydrogen or an amino-projecting group, B is a N-acetyl-β-glucosaminyl group; and, the pharmaceutically-acceptable acid addition salts thereof, which comprises reacting a N-projected antibiotic L 17046 derivative with a compound of formula RX wherein R is as above and X represents a chlorine, bromine or iodine atom, in an inert organic polar parotic solvent, preferably in the presence of a hydrogen halide acceptor and at a temperature from about —5° C. and 50° C.

4,914,188

NOVEL 6-POSITION CYCLOSPORIN ANALOGS AS NON-IMMUNOSUPPRESSIVE ANTAGONISTS OF CYCLOSPORIN BINDING TO CYCLOPHILIN

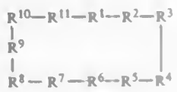
Francis J. Dumont, Rahway; Philippe L. Durette, New Providence; Arsenio A. Pessolano, Colonia; Joshua S. Boger, and Nolan H. Sigal, both of Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 16, 1987, Ser. No. 121,827

Int. Cl.[4] C07K *7/64*

U.S. Cl. 530—317 3 Claims

1. A compound of formula

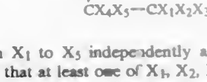


I

wherein:

R^1 is MeBMT or dihydro MeBMT;

R^2 is Abu or a fluorinated derivative or formula II:



II

wherein X_1 to X_5 independently are H or F with the proviso that at least one of X_1, X_2, X_3, X_4 and X_5 is F;

R^3 is Sar, D-MeAla or a fluorinated analog thereof;

R^4, R^9 and R^{10} independently are MeLeu or a fluorinated analog thereof;

R^5 is Val or a fluorinated analog thereof;

R^6 is MeAla, MeAbu, or a fluorinated analog thereof;

R^7 is Ala or a fluorinated derivative thereof;

R^8 is

(a) D-Ala or a fluorinated derivative thereof; or

(b) O-acyl-D-Ser or O-acyl-D-Thr wherein the acyl group is defined as R^{12}—CO— where R^{12} represents hydrogen, C_{1-6}alkyl, phenyl or substituted phenyl of the formula;

wherein X^1 and X^2 independently are

(a) C_{1-6}alkyl;

(b) C_{1-6}alkanoyl;

(c) CH_2OH;

(d) halo;

(e) C_{1-6}alkoxy;

(f) $—NH_2$;

(g) $—NO_2$;

(h) —COOH;

(i) $—COOC_{1-6}$alkyl; or

(j) —H; and

R^{11} is L-MeVal or a fluorinated derivative thereof.

4,914,189

SYNTHETIC GHRH ANALOGS

Andrew V. Schally, Metairie, La.; Jozsef Gulyas, Budapest, Hungary, and Sandor Bajusz, New Orleans, La., assignors to The Administrators of the Tulane Educational Fund, Orleans, La.

Filed Feb. 5, 1987, Ser. No. 11,152

Int. Cl.[4] C07K *7/10*

U.S. Cl. 530—324 8 Claims

1. A polypeptide of the structure

Q^1-CO-R_2-Asp_3-Ala_4-Ile_5-Phe_6-Thr_7-Asn_8-Ser_9-Tyr_{10}-Arg_{11}-Lys_{12}-Val_{13}-Leu_{14}-Gly_{15}-Gln_{16}-Leu_{17}-Ser_{18}-Ala_{19}-Arg_{20}-Lys_{21}-Leu_{22}-Leu_{23}-Gln_{24}-Asp_{25}-Ile_{26}-Nle_{27}-Ser_{28}-Agm_{29}.

wherein

Q^1 is 1-amino-2-(4-hydroxyphenyl)-1-ethyl, 1-amino-2-(imidazol-4-yl)-1-ethyl or 2-(4-hydroxphenyl)-1-ethyl, D-1-amino-2-(4-hydroxyphenyl)-1-ethyl,

R_2 is D-N-Me-Ala or D-Ala,

and the pharmaceutically acceptable addition salts thereof with pharmaceutically acceptable organic or inorganic bases and organic or inorganic acids.

4,914,190

TRICYANOVINYL-N,N-DISUBSTITUTED ANILINES AS DISPERSE DYES

Peter Liechti, Arlesdorf, and Angelo Della Casa, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

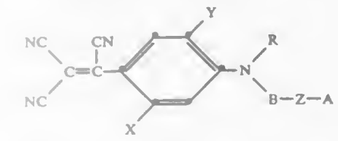
Filed Mar. 11, 1988, Ser. No. 166,944

Claims priority, application Switzerland, Mar. 19, 1987, 1050/87; Dec. 29, 1987, 5091/87

Int. Cl.[4] C09B *23/14, 43/00*; D06P *1/16, 3/00*

U.S. Cl. 534—859 13 Claims

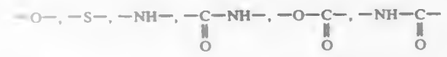
1. A disperese dye of the formula



(1)

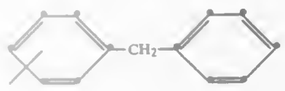
in which

X is hydrogen, C_1–C_4alkyl, C_1 –C_4alkoxy or halogen, Y is hydrogen, halogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4alkoxy-C_1–C_4alkyl or C_1–C_4-alkoxy –C_1–C_4alkoxy, R is hydrogen, C_1–C_{12}alkyl, C_2–C_{12}alkenyl or phenyl, or Y and R, together with the nitrogen atom and the two C atoms linking them, form a 5- or 6-ring, B is a straight-chain or branced C_2–C_6alkylene radical, Z is a bridge member of the formula



—O—, —S—, —NH—, —C(=O)—NH—, —O—C(=O)—, —NH—C(=O)—

or a direct bond and A is a radical of the formula



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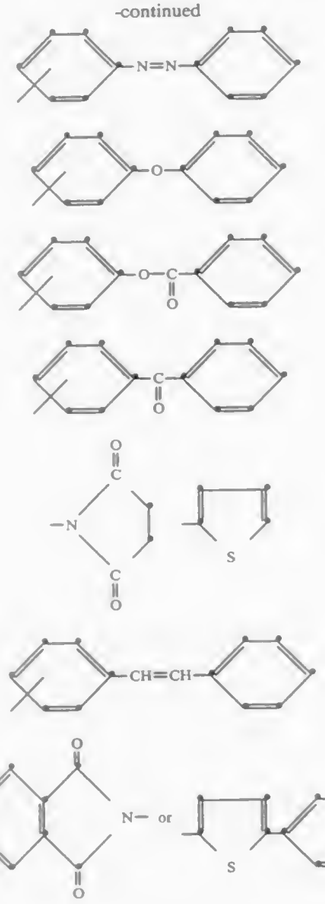


which radicals are unsubtituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen or nitro.

4,914,191

ANTHRACYCLINE DERIVATIVES HAVING CYTOSTATIC ACTIVITY

Peter Hermentin, Marburg; Michael Paal, Hamburg; Cenek Kolar; Hans P. Kraemer, both of Marburg; Dieter Hoffmann, Lahntal; Hans G. Berscheid, Schwalbach, and Dirk Böttger, Liederbach, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

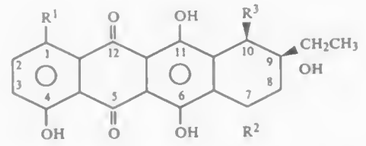
Filed Jul. 7, 1988, Ser. No. 216,199

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1987, 3722698

Int. Cl.[4] C07H *15/24*; C07G *37/00*

U.S. Cl. 536—6.4 **13 Claims**

1. An anthracycline derivative having the formula I or physiologically acceptable inorganic or organic acid salt thereof



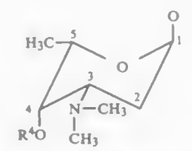
I

in which the radicals have the following meaning:

R^1 is hydrogen or a hydroxyl group,

R^2 is hydrogen or a hydroxyl group or a structure of the formula II below,

R^3 is hydroxyl group or a structure of the formula II below



II

in which R^4 is a benzoyl, substituted benzoyl, or an aliphatic acyl radical having 1–7 carbon atoms, with the proviso that at least one of the radicals R^2 and R^3 represent a structure of the formula II, and when radicals R^2 and R^3 both represent a structure of the formula II, R^4 in one of these radicals is hydrogen.

4,914,192

MYCAMINOSYL TYLONOLIDE DERIVATIVES

Hamao Umezawa, Tokyo; Sumio Umezawa, Tokyo; Tsutomu Tsuchiya, Kanagawa; Tomio Takeuchi, Tokyo; Akihiro Tanaka, Tokyo, and Shuichi Sakamoto, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Division of Ser. No. 861,537, May 9, 1986, Pat. No. 4,794,173.

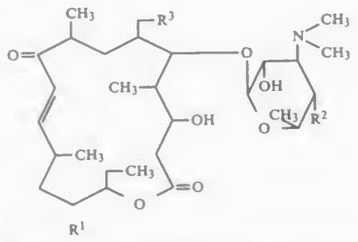
This application Sep. 14, 1988, Ser. No. 244,500

Claims priority, application Japan, May 13, 1985, 60-102402

Int. Cl.[4] C07H *17/08*

U.S. Cl. 536—7.1 **5 Claims**

1. Mycaminosyl tylonolide derivatives represented by the formula:



wherein R^1 represents a hydroxyl group; R^2 represents hydrogen or a hydroxyl group; R^3 represents hydrogen or a formyl group; and represents

and salts thereof.

4,914,193

5'-O-TRIORGANOSTANNYL DERIVATIVES OF DEOXYNUCLEOSIDES OR DEOXYNUCLEOTIDES AND THEIR USES

Tadao Yoshida, Aichi, and Iwao Ohmori, Ichinomiya, both of Japan, assignors to Tosgosei Chemical Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 727,270, Apr. 25, 1985, abandoned.

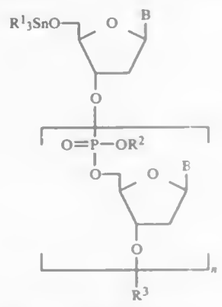
This application Nov. 22, 1988, Ser. No. 274,619

Claims priority, application Japan, Jan. 8, 1984, 59-116538; Aug. 27, 1984, 59-176863

Int. Cl.[4] C07H *19/073, 19/173*

U.S. Cl. 536—23 **3 Claims**

1. A triorganostannyl derivative of a deoxynucleoside or deoxynucleotide of the formula (I):



(I)

wherein R^1 is a lower alkyl or phenyl, R^2 is o-chlorophenyl or p-chlorophenyl, R^3 is acetyl, benzoyl or t-butyldimethylsilyl, B is a thymine, N^2-isobutyrylguanine, N^4-benzoylcytosine or N^6-benzoyladenine moiety, and n is zero or a positive integer, or a lower alkylamine salt thereof.

4,914,195

PROCESS FOR PREPARING N-ACETYLNEURAMINIC ACID DERIVATIVES

Haruo Ogura, Matsudo; Kimio Furuhata, Tokyo; Yoshiyasu Shitori, Musashino, and Masayoshi Ito, Kunitachi, all of Japan, assignors to MECT Corporation, Japan

Continuation of Ser. No. 387,528, Jun. 11, 1982, abandoned.

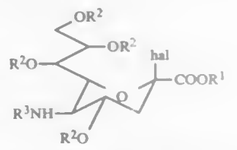
This application Nov. 26, 1984, Ser. No. 664,686

Claims priority, application Japan, Jun. 26, 1981, 56-99364

Int. Cl.[4] C08B *37/00*

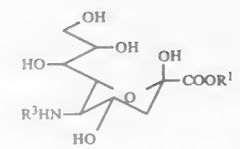
U.S. Cl. 536—53 **6 Claims**

1. A process for preparing acid derivatives represented by the following general formula (I):



[I]

wherein R^1 is methyl R^2 and R^3 represent acetyl group and hal represents a halogen atom, characterized by simultaneously acetylating and halogenating an acid of the formula:



[I']

wherein R^1 and R^3 represent the same meaning as defined above,

at a temperature of from about 20° to 25° C. in the presence of acetylchloride.

4,914,196

COMPLEXES CONTAINING OPTICALLY ACTIVE SUGAR LIGANDS, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Martin Riediker, Rieben; Robert W. Lang, Pratteln; Rudolf Duthaler, Bettingen; Peter Herold, Basel; Konrad Oertle, Therwil, and Guido Bold, Frick, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 76,250, Jul. 21, 1987, Pat. No. 4,826,965.

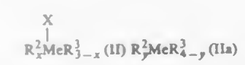
This application Feb. 27, 1989, Ser. No. 316,127

Claims priority, application Switzerland, Jul. 23, 1986, 2941/86

Int. Cl.[4] C07F *7/28*; C07H *23/00, 15/04*

U.S. Cl. 536—18.1 **3 Claims**

1. A compound of the formula II or IIa



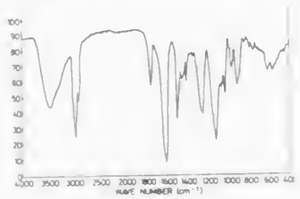
in which Me is tetravalent titanium, zirconium or hafnium, R^1 is linear or branched alkyl, alkenyl, alkynyl, cycloalkyl or cycloalkenyl which is unsubstituted or substituted by C_1–C_4-alkyl, or is aryl, alkaryl, aralkyl, alkaralkyl, aralkenyl, alkaralkenyl, aralkynyl or alkaralkynyl which is unsubstituted or monosubstituted or polysubstituted by $(C_6H_5)P$—, $(R^5O)_2P(O)$—, $R^5{}_3Si$—, $R^5{}_3SiO$—, R^5SO_2—, —S—C_2–C_4-alkylene—S—, —O—C_2–C_4-alkylene—O—, R^5 being phenyl, benzyl or C_1–C_8-alkyl, or is cyano, F, nitro C_1–C_{12}-alkylthio, C_1–C_{12}-alkoxy, secondary amino or —COR^4 in which R^4 is the radical of a monohydric alcohol; or R^1 is a radical of an enol, enamine or enehydrazine; R^2 is cyclopentadienyl, alkoxy, cycloalkoxy, cycloalkylalkoxy, aryloxy, aralkyloxy, alkylthio, arylthio, or aralkylthio which is unsubstituted or substituted by alkyl, alkenyl, alkoxy, cycloalkyl, aryl aralkyl, trialkoxysilyl, trialkylsilyl or halogen; or R^2 is halogen, pseudohalogen, acyloxy, acylamino or trialkylsilyloxy, R^3 is the radical, diminished by a hydroxyl or thiol group or an amine hydrogen atom, of a protected, monohydroxyfunctional, monothiolfunctional or monoaminefunctional optically active sugar, thio-sugar or amino-sugar or derivatives thereof belonging to the group of sugar alcohols; esters of a sugar acid, aldo-sugar acid or keto-sugar acid; amino sugars, sugar mercaptals or deoxy-sugars; x is 0, 1 or 2; y is 0, 1, 2 or 3; and X is an anion.

VOL 1113 ISS 1 AP 3 1990 UMI

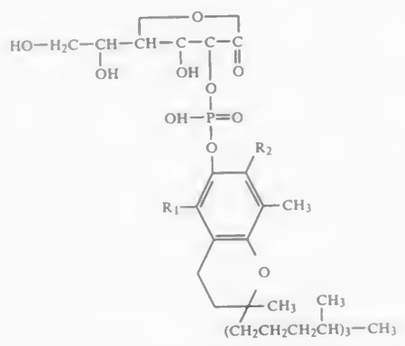
4,914,197
NOVEL PHOSPHORIC DIESTERS

Itaru Yamamoto, Okayama, and Kazumi Ogata, Toyonaka, both of Japan, assignors to Senju Pharmaceutical Co., Ltd., Osaka, Japan

Filed Mar. 4, 1987, Ser. No. 21,655
Claims priority, application Japan, Mar. 4, 1986, 61-46878
Int. Cl.[4] A61K *31/355*; C07F *9/06, 9/28*
U.S. Cl. 536—117 12 Claims



1. A phosphoric diester of general formula:



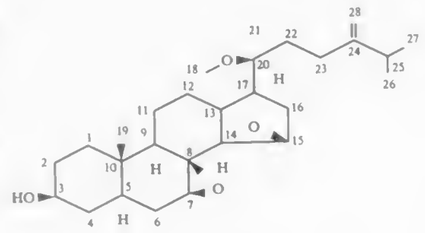
wherein R_1 and R_2 are the same or different and each represents a methyl group or a hydrogen atom, provided that at least one of R_1 and R_2 is a hydrogen atom, or a salt thereof.

4,914,198
NOVEL SUBSTANCE UCY1003 AND PROCESS FOR PREPARING THE SAME

Hirofumi Nakano; Mitsunobu Hara; Yoshinori Yamashita, all of Machida; Isao Kawamoto, Hiratsuka; Katsuhiko Ando, Machida; Hiroshi Sano, Machida; Toru Yasuzawa, Machida, and Katsuichi Sbuto, Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1986, Ser. No. 946,842
Claims priority, application Japan, Dec. 26, 1985, 60-294884
Int. Cl.[4] C07J *71/00*; C12N *1/14*
U.S. Cl. 540—62 2 Claims

1. A substance UCY1003 having the following chemical structure:

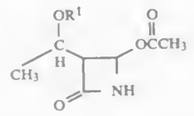


4,914,199
PROCESS FOR PREPARING 4-ACETOXY-3-HYDROXYETHYLAZETIDIN-2-ONE DERIVATIVES

Isao Sada, Akashi; Kazunori Kan, Kobe; Noboru Ueyama, Kakogawa; Shingo Matsumoto, Takasago; Takehisa Ohashi, Kobe, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

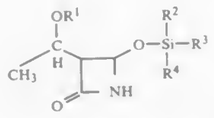
Filed Feb. 18, 1988, Ser. No. 156,873
Claims priority, application Japan, Feb. 20, 1987, 62-38855; Feb. 25, 1987, 62-42205; May 26, 1987, 62-128630
The portion of the term of this patent subsequent to Apr. 3, 2007, has been disclaimed.
Int. Cl.[4] C07D *205/08*; C07F *7/18*; C07B *41/12*
U.S. Cl. 540—357 20 Claims

1. A process for preparing a 4-acetoxy-3-hydroxyethylazetidin-2-one derivative having the formula (II):



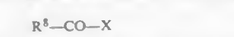
(II)

wherein R^1 is a protective group for the hydroxyl group, which comprises reacting a β-lactam compound having the formula (I):



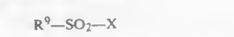
(I)

wherein R^1 is as defined above and R^2, R^3 and R^4 are the same or different and each is a lower alkyl group having 1 to 4 carbon atoms or an aralkyl group, with acetic anhydride in the presence of a base and a catalyst selected from the group consisting of an organic strong acid, a mineral acid, a Lewis acid, a halogenated acyl compound having the formula (IV):



(IV)

wherein R^8 is an alkyl group, an aralkyl group or phenyl group and X is a halogen atom, a halogenated sulfonyl compound having the formula (V):



(V)

wherein R^9 is an alkyl group, an aralkyl group or phenyl group and X is a halogen atom, and a compound having the formula (VI):

(VI)

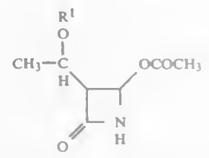
wherein R^{10} is a lower alkyl group having 1 to 6 carbon atoms or phenyl group, X' is a halogen atom or CF_3SO_2O group and n is an integer of 1 to 4.

4,914,200
PROCESS FOR PREPARING 4-ACETOXY-3-HYDROXYETHYLAZETIDIN-2-ONE DERIVATIVES

Kazunori Kan, Kobe; Noboru Ueyama, Kakogawa; Isao Sada, Akashi; Takehisa Ohashi, Kobe, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

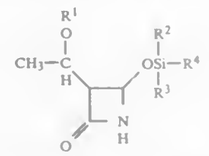
Continuation of Ser. No. 43,387, Apr. 28, 1987, abandoned. This application Feb. 14, 1989, Ser. No. 309,935
Claims priority, application Japan, Apr. 30, 1986, 61-101856; Nov. 13, 1986, 61-270622; Feb. 9, 1987, 62-28942
Int. Cl.[4] C07D *205/08*; C07B *41/12*
U.S. Cl. 540—357 10 Claims

I. A process for preparing a 4-acetoxy-3-hydroxyethylazetidin-2-one derivative having the formula (II):



(II)

wherein R^1 is a protective group for the hydroxyl group, which comprises reacting a β-lactam compound having the formula (I):



(I)

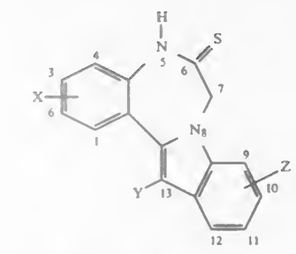
wherein R^1 is as defined above, and each of R^2, R^3 and R^4 is independently a lower alkyl group having 1 to 6 carbon atoms, phenyl group or an aralkyl group, with acetic anhydride in an organic solvent containing water in an amount of from 0.1% to 1.0% by volume or containing acetic acid in an amount of from 0.6% to 5.0% by volume in the presence of a dialkylaminopyridine, 4-pyrrolidinopyridine or 4-piperidinopyridine at a temperature ranging from 0° C. to −70° C., the concentration of said acetic anhydride being from 10% to 50% by weight and the concentration of said dialkylaminopyridine, 4-pyrrolidinopyridine or 4-piperidinopyridine being from 0.2% to 3% by weight in the reaction system.

4,914,201
INDOLO[1,2-D][1,4]BENZODIAZEPIN-6(7H)-THIONES

John J. Tegeler, Bridgewater; Eileen M. Gardenhire, Califon, and Grover C. Helsley, Pluckemin, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 375,444, Jul. 3, 1989. This application Oct. 30, 1989, Ser. No. 428,566
Int. Cl.[4] C07D *487/04*
U.S. Cl. 540—494 4 Claims

1. A compound of the formula,



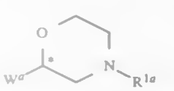
where X is H, halogen, —OH, $—OCH_3$, $—NO_2$ or $—CF_3$; Y is H, Cl or Br; and Z is H, halogen, —OH or $—OCH_3$.

4,914,202
MORPHOLINE COMPOUNDS

Jonathan R. S. Arch, Epsom, and Norman H. Rogers, Tadworth, both of England, assignors to Beecham Group p.l.c., Middlesex, England

Filed Mar. 10, 1988, Ser. No. 166,328
Claims priority, application United Kingdom, Mar. 10, 1987, 8705587; Feb. 12, 1988, 8803261
Int. Cl.[4] C07D *265/30*
U.S. Cl. 544—163 2 Claims

1. A compound of formula (IA), or a veterinarily or pharmaceutically acceptable acid addition salt thereof:



(IA)

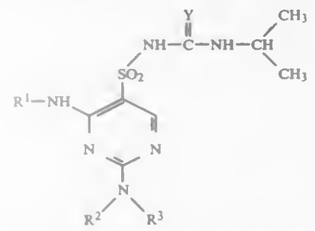
wherein R^{1a} is secondary or tertiary C_{3-6} alkyl, and W^a is phenyl substituted with amino and at least one other substituent selected from halogen, hydroxy, amino, cyano and trifluoromethyl.

4,914,203
5 STEP PROCESS FOR PREPARING CERTAIN 2,4-DIAMINO-5-PYRIMIDINE-SULFONYL UREAS

Terence M. Dolak, Canadaigua, N.Y.; Sung J. Lee, Clarks Summit, Pa., and James L. Bullington, Hamilton Square, N.J., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 186,499, Apr. 26, 1988, Pat. No. 4,853,387. This application Apr. 5, 1989, Ser. No. 333,476
Claims priority, application Canada, Jul. 24, 1987, 542916
Int. Cl.[4] C07D *239/46, 239/48*
U.S. Cl. 544—298 1 Claim

1. The process for producing compounds of formula (I)



(I)

wherein R^1 is lower alkyl or lower alkylene containing 3 to 6 straight chain or branched carbon atoms; cycloalkyl, bicy-

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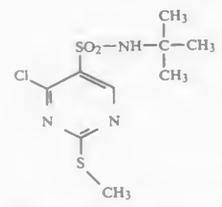
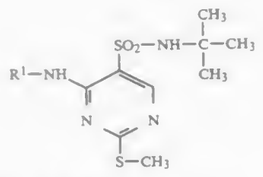
cloalkyl, tricycloalkyl, or alicycloalkyl containing 4 to 10 carbon atoms; phenyl or phenyl substituted with lower alkyl, lower alkoxy, or halogen; R^2 and R^3 are each independently hydrogen or methyl; Y is oxygen which comprises the steps

(a) reacting the compound of formula (XVIII)



(XVIII)

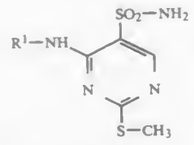
with $R^1—NH_2$ wherein R^1 is as defined above to produce the compound of formula (XIX)



(XIX)

wherein R^1 is as defined above

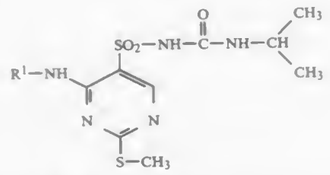
(b) removing the protective group of said compound of formula (XIX) to produce the compound of formula (XX)



(XX)

wherein R^1 is as defined above

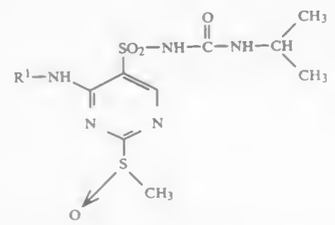
(c) reacting said compound of formula (XX) with isopropylisocyanate in the presence of a strong base to produce the compound of formula (XXI)



(XXI)

wherein R^1 is as defined above

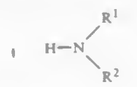
(d) oxidizing said compound of formula (XXI) to produce the compound of formula (XXII)



(XXII)

wherein R^1 is as defined above, and

(e) reacting said compound of formula (XXII) with



wherein R^1 and R^2 are as defined above to produce the compound of formula (I).

4,914,204

4-PENTAFLUOROPHENOXYPIPERIDINES

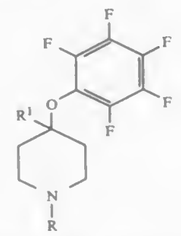
Grover C. Helsley, Pluckemin; Larry Davis, Sergeantsville, and Gordon E. Olsen, Somerset, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.

Filed Mar. 14, 1988, Ser. No. 167,941

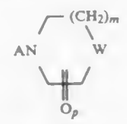
Int. Cl.[4] C07D *401/06, 413/06;* A61K *31/495, 31/445*

U.S. Cl. 544—360 **11 Claims**

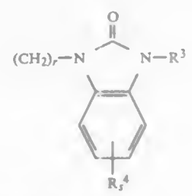
1. A compound of the formula



wherein R_1 is hydrogen or aryl; and R is a monovalent radical selected from a group of the formula



where A is loweralkylene, loweralkenylene or loweralkynylene, m is an integer having a value of 0 or 1, W is CH_2 or NR^{1a} where R^{1a} is hydrogen, loweralkyl or aryl, and p is an integer having a value of 0 or 1; and a group of the formula



wherein r is an integer having a value of 2 or 3; s is an integer having a value of zero or 1; R_3 is hydrogen or loweralkyl and R^4 is halogen or loweralkyl; the term aryl in each occurrence signifying a phenyl group optionally substituted by one or more substituents selected from the group consisting of halogen, loweralkyl, loweralkoxy, and trifluoromethyl.

4,914,205

CAMPTOTHECIN DERIVATIVES

Seigo Sawada; Kenichiro Nokata; Satoru Okajima; Hisako Nagai; Takashi Yaegashi; Kenichi Tezuka, all of Tokyo, and Tadashi Miyasaka, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan

Filed Jun. 24, 1988, Ser. No. 210,918

Claims priority, application Japan, Jun. 25, 1987, 62-156495

Int. Cl.[4] C07D *487/12*

U.S. Cl. 546—70 **1 Claim**

1. Camptothecin derivatives of the formula:

(I)

wherein

X is a lower alkyl group, and R is a hydrogen atom or the grouping -COY where Y is a linear or branched unsubstituted C_1–C_{18} alkyl group; a lower alkyl group substituted by a halogen atom or a lower alkylthio, amino, acylamino, hydroxyl, lower alkoxy, aryloxy or lower alkoxycarbonyl group; a C_3–C_{19} alkenyl, C_3–C_{19} alkynyl or C_3–C_8 cycloalkyl group; a C_3–C_8 cycloalkyl group substituted by an acylamino-lower alkyl group; an N-acylpyrrolidyl group, a phenyl group; a phenyl group substituted by a halogen atom or a trifluoromethyl, nitro, amino, lower alkoxycarbonyl, lower alkyl, phenyl or lower alkoxy; a cinnamyl group; a benzyl group; a naphthyl group; a pyridyl group; a furyl group; or a thienyl group,

and their physiologically acceptable acid addition salts formed at the amino group and quaternary ammonium salts.

4,914,206

LANKACIDIN DERIVATIVES AND PRODUCTION THEREOF

Isao Minamida, Kawabegun, and Naoto Hashimoto, Suita, both of Japan, assignors to Takeda Chemical Industries, LTD., Osaka, Japan

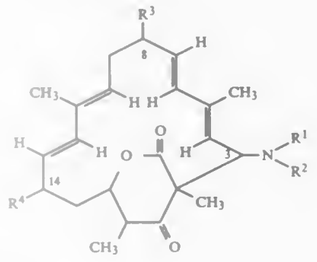
Continuation of Ser. No. 937,625, Dec. 1, 1986, abandoned. This application Dec. 15, 1988, Ser. No. 285,302

Claims priority, application Japan, Oct. 6, 1985, 61-238788; Dec. 5, 1985, 60-274256

Int. Cl.[4] C07D *405/04*

U.S. Cl. 544—376 **21 Claims**

1. A compound of the formula



wherein

(1) one of R^1 and R^2 is hydrogen and the other is a group of the formula

wherein Z is oxygen or sulfur, and R^5 is

(a) hydrogen

(b) a group of the formula

$$—C(=O)R^{5A}$$

wherein R^{5A} is C_{1-3} alkyl

(c) a group of the formula

$$—CH_2—R^{5B}$$

wherein R^{5B} is C_{1-8} alkyl which is unsubstituted or is substituted by (1) C_{1-5} alkyl, (2) halogen substituted C_{1-5} alkyl, (3) halogen, (4) phenyl or (5) a member of the group consisting of triazolylthio, tetrazolylthio, pyridylthio and thiazolylthio which groups are unsubstituted or are substituted by dimethylaminoethyl, methyl or amino,

(d) a group of the formula

$$—CH(Y^A)R^{5C}$$

wherein Y^A is (1) hydroxy, (2) C_{2-8} alkyanoyloxy, (3) C_{1-3} alkoxycarbonyl, (4) halogen substituted C_{1-3} alkoxycarbonyl, (5) halogen, (6) amino which is unsubstituted or is substituted with C_{1-3} alkoxycarbonyl, C_{2-5} alkanoyl or phenylsulfonyl, (7) hydroxycarbonyl, (8) alkylsulfonyloxy, (9) phenylsulfonyloxy, (10) tri-C_{1-3} *alkylsilaxy*, (11) phenylthio, (12) C_{1-3} alkylthio, (13) alkylsulfonyl, (14) azido or (15) benzothiazol-2-ylthio, and R^{5C} is C_{1-3} alkyl,

(e) $—R^{5D}$

wherein R^{5D} is phenyl, C_{5-7} cycloalkyl or 2-aminothiazol-4-yl,

(f) a group of the formula

$$—C(=NOR^{5E})R^{5F}$$

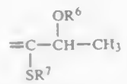
wherein R^{5E} is hydroxy or C_{1-3} alkoxy, and R^{5F} is pyridin-2-ylthio or C_{1-3} alkyl which is unsubstituted or is substituted by halogen, or

(g) a group of the formula

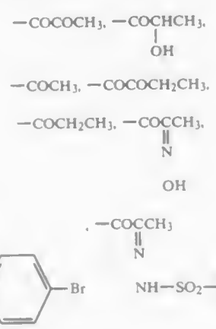
$$-CY^B=CH_2$$

wherein Y^B is hydrogen, C_{2-5} alkanoyloxy, C_{1-5} alkoxycarbonyloxy or tri-C_{1-3} alkylsilyl, or

(ii) R^1 and R^2, taken together, represent a group of the formula



wherein R^6 is C_{1-8} alkylcarbonyl, sulfonyl or C_{1-3} alkoxycarbonyl, and R^7 is C_{1-4} alkyl, one of R^3 and R^4 is hydroxyl or $-OCOR^{14}$ wherein R^{14} is hydrogen or C_{1-3} alkyl and the other is a member selected from the group consisting of $-OCONR^{15}R^{16}$ and $-OCSNR^{17}R^{18}$, wherein R^{15} together with R^{16} and R^{17} together with R^{18} with the nitrogen atom to which they are attached form piperazino, provided that, when R^1 is a hydrogen atom and R^2 represents



or a group of the formula;

wherein R^8 is a straight-chain alkyl having 1–13 carbon atoms, R^3 is other than hydroxyl or a group of the formula $-OCOR^{14}$ wherein R^{14} is C_{1-3} alkyl and R^4 is other than hydroxyl or a group of the formula $-OCOR^{14}$ wherein R^{14} is as defined above, or both R^3 and R^4 represent groups other than formyloxy, or a salt thereof.

4,914,207

ARYLTHIAZOLYLIMIDAZOLES

Arthur A. Nagel; James P. Rizzi, and Terry J. Rosen, all of Groton, Conn., assignors to Pfizer Inc., New York, N.Y.

Filed May 9, 1989, Ser. No. 349,278

Int. Cl.[4] C07D *417/04, 417/14*

U.S. Cl. 546—167 **11 Claims**

1. A compound of the formula

$$Ar—HET—CH_2—X$$

and a pharmaceutically acceptable acid addition salt thereof wherein Ar is pyridyl, 3-indolyl, 8-quinolyl, phenyl or mono- or disubstituted phenyl wherein said substituent is each methyl, methoxy, fluoro, chloro or bromo; HET is thiazolyl; and X is imidazole or mono- or dimethylimidazole.

4,914,208

OPTICALLY ACTIVE SALTS OF A SUBSTITUTED THIAZOLIDINE-4-CARBOXYLATE AND 3-CHLORO-2-HYDROXYPROPYLTRIMETHYL AMMONIUM, THEIR PREPARATION AND USE

Harald Jakob, Hasselroth; Klaus Huthmacher, Gelnhausen; Herbert Klenk, Hanau; Axel Kleemann, Muehlheim, and Gunes Giray, Kleinostheim, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

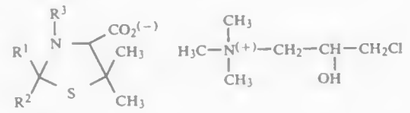
Filed Oct. 17, 1988, Ser. No. 262,722

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1987, 3735757

Int. Cl.[4] C07D *277/06*

U.S. Cl. 548—201 **3 Claims**

1. Optically active salt of the general formula



(1)

wherein

R^1 and R^2 each are independently hydrogen, alkyl containing carbon atoms 1 to 8 carbon atoms, or cycloalkyl of 4 to 11 carbon atoms with the proviso that only one of R^1 or R^2 maybe cycloalkyl,

R^3 is an acyl group selected from benzoyl, tosyl, nitrophenyl sulfenyl, acetyl or formyl.

2. An optically active salt of the formula D-(+)-3-formyl-2,2,5,5-tetramethylthiazolidine-4-carboxylate and L-(−)-3-chloro-2-hydroxypropyltrimethyl ammonium.

3. An optically active salt of the formula L-(−)-3-formyl-2,2,5,5-tetramethylthiazolidine-4-carboxylate and D-(+)-3-chloro-2-hydroxypropyltrimethyl ammonium.

4,914,209

PYRAZOLOTRIAZOLES AND PROCESSES FOR THEIR FORMATION

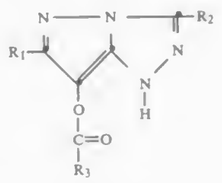
Robert W. Arnold, and Cataldo A. Maggiulli, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 22, 1989, Ser. No. 313,561

Int. Cl.[4] C07D *249/00*

U.S. Cl. 548—262.4 **12 Claims**

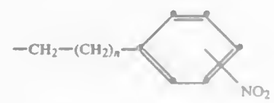
1. Process for the preparation of a pyrazolotriazole having the formula:



wherein

R_1 is hydrogen or a hydrocarbyl group having up to about 20 carbon atoms,

R_2 is a group having the formula:

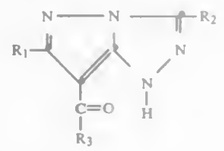


wherein

n is a small whole number having a value of 0 to 6, and

R_3 is an alkyl or aryl group having up to about 20 carbon atoms;

said process comprising reacting a compound having the formula:



wherein

R_1, R_2, and R_3 have the same significance as above, with an oxidant selected from the class consisting of peroxymonosulfuric acid, the sodium or potassium salt thereof, the oxidant mixture $K_2S_2O_8$, H_2SO_4 and K_2SO_4, and the oxidant mixture $2KHSO_5 \cdot KHSO_4 \cdot K_2SO_4$.

4,914,210

OLIGONUCLEOTIDE FUNCTIONALIZING REAGENTS

Corey Levenson, Oakland; Chu-An Chang, El Cerrito, both of Calif., and Fred T. Oakes, Rochester, N.Y., assignors to Cetus Corporation, Emeryville, Calif.

Filed Oct. 2, 1987, Ser. No. 104,200

Int. Cl.[4] C07F *9/24, 9/65*

U.S. Cl. 548—413 **7 Claims**

1. An oligonucleotide functionalizing reagent having the structure:

wherein

R is a protected amino, sulfhydryl, or hydroxyl moiety;

R^1 is a protected hydroxymethyl or hydrogen;

R^2 is methyl or β-cyanoethyl,

R^3 is lower alkyl; and

N is an integer in the range of 2 through 20 inclusive.

4,914,211

PIGMENT COMPOSITIONS

Max Jost, Oberwil; Abul Iqbal, Ettingen, and Alain C. Rochat, Fribourg, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 932,258, Nov. 19, 1986, Pat. No. 4,791,204. This application Aug. 12, 1988, Ser. No. 231,324

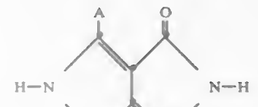
Claims priority, application Switzerland, Nov. 26, 1985, 5054/85

Int. Cl.[4] C07D *498/04, 401/14, 403/14*

U.S. Cl. 548—453 **5 Claims**

1. A composition which is a mixture of pyrrolopyrrole pigments which comprises

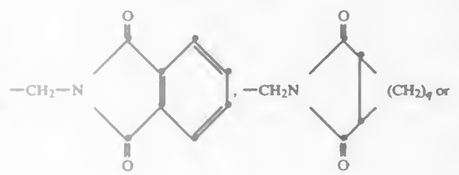
(a) 99.9 to 75% by weight of a pyrrolopyrrole pigment of formula I'

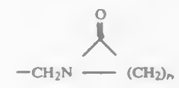


(I')

wherein A and B are identical or different phenyl groups or phenyl radicals which are substituted by water-insolubilizing substituents selected from the group consisting of halogen, C_1–C_6-alkyl, C_1–C_4-alkoxy, C_1–C_6-alkyl-mercapto, trifluoromethyl, cyano, dimethylamino, diethylamino, C_2–C_6-alkoxycarbonyl, acetylamino, carbamoyl or sulfamoyl, or A and B are 4-biphenylyl, naphthyl or pyridyl, and

(b) 0.1 to 25% by weight of a modified pyrrolopyrrole pigment of formula I' which modified pigment additionally contains at least one group of formula $—SO_3L$, $—CO_2L$, $—PO_3(L)_2$, $—N(R_4)(R_5)$,





wherein L is —H, a group of formula

$$\frac{M^{+n}}{n}$$

or $N^+H(R_3)(R_4)(R_5)$, M is a monovalent, divalent or trivalent metal cation, n is 1, 2 or 3, R_3, R_4 and R_5 are each independently —H or alkyl, benzyl, C_5–C_6cycloalkyl or phenyl radicals, or R_4 and R_5, together with the nitrogen atom to which they are attached, form a morpholine or piperidine radical, q is an integer from 0 to 4, and r is an integer from 3 to 5.

4,914,212

PROCESS FOR PREPARING FLAME RETARDANT BISIMIDE PRODUCT

Mo A. Khaddas, and David R. Brackenridge, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jun. 23, 1988, Ser. No. 210,328

Int. Cl.[4] C07D *209/48*

U.S. Cl. 548—461 **14 Claims**

1. A process for preparing a flame retardant product which principally contains a bisimide of the formula, T,0230

wherein R is an alkylene radical containing 1 to 6 carbon atoms and b is 1 or 0, said process comprising:

(a) providing, in a reaction vessel, an essentially water-free solution containing tetrabromophthalic anhydride and a solvent which contains at least about 15 wt % of a mono-, di- or tri- carboxylic acid having a dissociation constant not higher than 8.5×10^{-5} at 25° C., said tetrabromophthalic anhydride being provided to said solution via a tetraphthalic anhydride product which contains a principal amount of tetrabromophthalic anhydride and a minor

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amount of, as impurities, Br_2, H_2SO_4, tetrabromophthalic acid or mixtures thereof;

(b) forming, at a temperature of at least about 125° C., a reaction mass by adding to said solution, a diamine of the formula,

$$H_2N—(R)_b—NH_2$$

or a diamine salt formed by the partial or total diamine, that is $H_2N—(R)_bNH_2$, neutralization of a mono-, di- or tri- carboxylic acid having a dissociation constant not higher than 8.5×10^{-5} at 25° C.;

(c) removing water from the reaction mass substantially as the water is formed therein;

(d) terminating said addition of said diamine or diamine salt when the molar ratio of said tetrabromophthalic anhydride initially present in said solution to said diamine or diamine salt added is within the range of from about 2.03:1 to

(e) maintaining the reaction mass at a temperature of at least 125° C. for at least 0.5 hr after said addition of the diamine or diamine salt; and

(f) recovering from the reaction mass said flame retardant product.

4,914,213

INDOLE DERIVATIVES AND PROCESS FOR PRODUCING THE SAME

Masato Satomura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 687,328, Dec. 28, 1984, Pat. No. 4,707,553. This application Feb. 4, 1987, Ser. No. 10,605

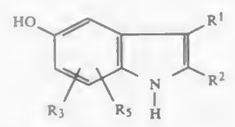
Claims priority, application Japan, Dec. 28, 1983, 58-248910

The portion of the term of this patent subsequent to Nov. 17, 2004, has been disclaimed.

Int. Cl.[4] C07D *209/08, 401/12*

U.S. Cl. 548—469 **3 Claims**

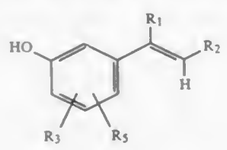
1. A process for producing a compound of the formula (IV)



(IV)

wherein R_1 and R_2 are each selected from the group consisting of a hydrogen atom, an alkyl group, an aralkyl group, an aryl group, and an alkoxy group, and R_3 and R_5 are each selected from the group consisting of a hydrogen atom, an alkyl group, a halogen atom, an alkenyl group, an acyl group having 2 to 4 carbon atoms, an aryl group, an aralkyl group and an alkoxy group, comprising:

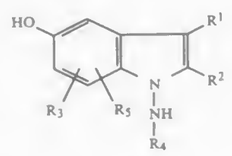
(1) reacting a phenol derivative having the formula (II) with a diazonium salt having the formula (III):



(II)

$$-X^+N_2R_4 \quad \text{(III)}$$

wherein R_1, R_2, R_3 and R_5 have the same meaning as defined for the formula (IV), R_4 represents a diazonium salt residue which is a substituted or unsubstituted aromatic amine selected from the group consisting of aniline, anisidine, chloroanisidine, chloroaniline, phenetidine, dichloroaniline, toluidine, chlorotoluidine, nitroaniline, aminobenzoic acid, aminobenzenesulfonic acid, aminonaphtholsulfonic acid, aminonaphtholdisulfonic acid, α-aminonaphthalene, diaminobenzene, aminobenzothiazole, aminocoumarin, aminocarbazole, amino-methyl-naphthylidin-2-ol, N-4-amino-2-methylphenyl-4-chlorophthalimide, N-(p-methoxyphenyl)-p-phenylenediamine (Variamine Blue B), amino-methoxybenzothiazole, aminomethoxypyridine, aminomethyl-benzothiazole, and aminosalycilic acid, and ^-X is an anion, to produce a 5-hydroxy-N-substituted indole of formula (I)



(I)

wherein R_1, R_2, R_3, R_4 and R_5 are as defined for the formulae (II) and (III), and

(2) reducing the 5-hydroxy-N-substituted indole of formula (I).

4,914,214

PROCESS FOR THE INDUSTRIAL SYNTHESIS OF PERINDOPRIL

Michel Vincent, Bagneux; Jean Baliarda, Anthony; Bernard Marchand, Checy, and Georges Remond, Versailles, all of France, assignors to Adir Et Cie, Neuilly-sur-Seine, France

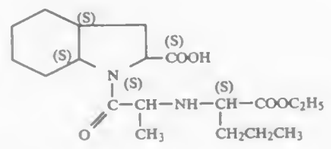
Filed Sep. 16, 1988, Ser. No. 245,446

Claims priority, application France, Sep. 17, 1987, 87 12896

Int. Cl.[4] C07D *209/18*

U.S. Cl. 548—492 **5 Claims**

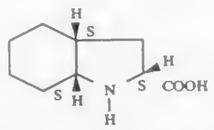
1. Process for the synthesis of the tert-butylamine salt of (2S,3aS,7aS)-1-{2-[1-(ethoxycarbonyl)-(S)-butylamino]-(S)-propionyl}octahydroindole-2-carboxylic acid of formula (I):



(I)

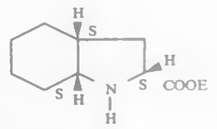
wherein

(2S,3aS,7aS)-2-carboxyperhydroindole of formula (IIaS)



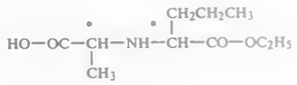
(IIaS)

is protected by esterification with an alcohol EOH, where E denotes a linear or branched lower alkyl group or the benzyl group, in the presence of an acidic esterification catalyst to give an ester of (2S,3aS,7aS)-2-carboxyperhydroindole of formula (IX):



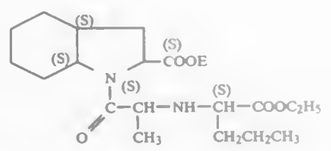
(IX)

is condensed with to the (S,S) diastereoisomer of N-[(S)-1-carbethoxybutyl]-(S)-alanine of formula (VI):



(VI)

in an alkaline medium in the presence of a catalyst for peptide synthesis such as dicyclohexylcarbodiimide in the presence of 1-hydroxybenzotriazole to lead to the compound of formula (X):



(X)

in which E has the same meaning as in formula (IX), which is subjected to deprotection of the carboxylic group of the heterocyclic ring, to lead to the compound of formula (I) in the form of a base,

which is dissolved in a solvent chosen from lower aliphatic alcohol, acetonitrile, ethyl acetate, dioxane by itself or mixed with each other, before the addition of tert-butylamine,

the salt thus obtained being crystallized by heating the reaction mixture, filtering hot, cooling and finally filtering off.

4,914,215

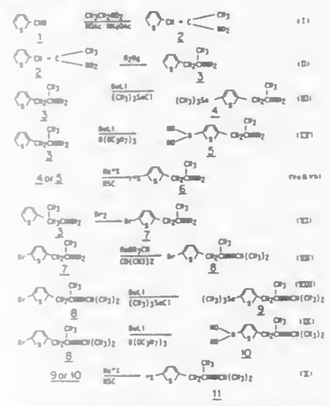
AMINOPROPYL THIOPHENE COMPOUNDS

Mark M. Goodman, Knoxville, and Furn F. Knapp, Jr., Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 288,349, Dec. 22, 1988. This application Aug. 25, 1989, Ser. No. 398,574

Int. Cl.[4] C07D *327/00, 333/04*

U.S. Cl. 549—3 **2 Claims**



1. A compound for producing a radiopharmaceutical comprising 2-(2-aminopropyl)-5-trimethylstannylthiophene.

4,914,216

AMYCIN AND ITS DERIVATIVES, A PROCESS FOR THEIR PREPARATION, AND THEIR USE

Peter Hammann, Kelkheim; Susanne Grabley, Königstein/-Taunus; Hartmut Voelskow, Hattersheim am Main; Burkhard Sachse, Kelkheim; Wolfgang Raether, Dreieich; Carlo Giani, Frankfurt am Main, and Gerhard Seibert, Darmstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

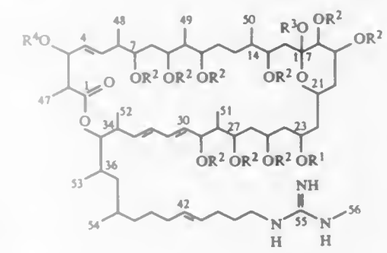
Filed Dec. 22, 1987, Ser. No. 136,393

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644374; Jan. 8, 1987, 3700325

Int. Cl.[4] C07D *321/00, 323/00*

U.S. Cl. 549—267 **3 Claims**

1. A compound selected from the group consisting of the formula Ia



Ia

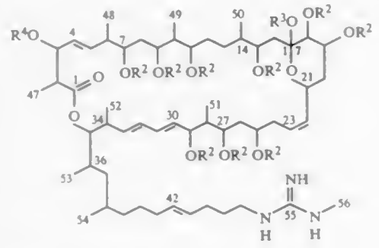
wherein

(a) R^1 and one R^2 are malonyl, while the remaining R^2 groups are hydrogen, R^3 is hydrogen and R^4 is hydrogen or C_1 to C_6 alkyl or allyl;

(b) R^1, R^2, R^3 are hydrogen and R^4 is hydrogen or C_1 to C_6 alkyl or allyl;

(c) R^1 and one R^2 are malonyl, R^3 is C_1 to C_6 alkyl, and R^4 is C_1 to C_6 alkyl or allyl; and
(d) R^1 is malonyl, R^2 is hydrogen and R^3 and R^4 are C_1 to C_6 alkyl

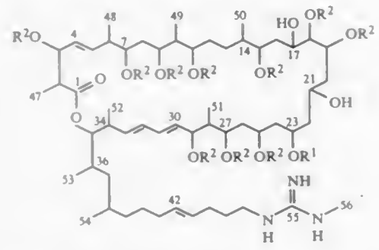
and the compound of the formula IIa which is unsaturated in the 22/23 position



IIa

wherein
(e) R^2, R^3 and R^4 are defined as under (a)
(f) R^2, R^3 and R^4 are defined as under (b)
(g) R^2, R^3 and R^4 are defined as under (c) and
(h) R^2, R^3 and R^4 are defined as under (d)

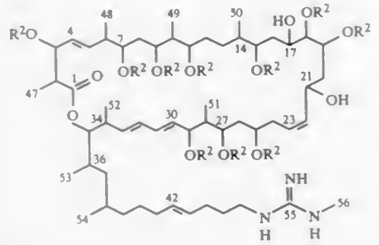
and the compound of the formula Ib



Ib

wherein
(i) R^1 and one R^2 are malonyl, while the remaining R^2 groups are hydrogen;
(j) R^1 is hydrogen and one R^2 is malonyl, while the remaining R^2 groups are hydrogen; and
(k) R^1 is malonyl and R^2 is hydrogen

and the compound of formula IIb



IIb

wherein
(l) one R^2 is malonyl, while the remaining R^2 groups are hydrogen and
(m) R^2 is hydrogen, and

wherein the numbers 47 to 54 and 56 in each of formulas Ia, Ib, IIa and IIb represent a methyl group.

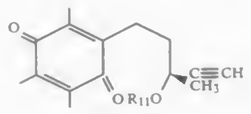
4,914,217

ASYMMETRIC SYNTHESIS OF NATURAL VITAMIN E

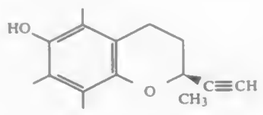
Ka-kong Chan, Hopatcong, N.J., and Gabriel G. Saucy, Vero Beach, Fla., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 303,502, Jan. 30, 1989, Pat. No. 4,855,085, which is a division of Ser. No. 135,128, Dec. 18, 1987, Pat. No. 4,831,185. This application May 15, 1989, Ser. No. 352,587
Int. Cl.[4] C07D *311/04, 311/20*
U.S. Cl. 549—398 **2 Claims**

1. A process for converting a quinone of the formula:



wherein R_{11} is tosyl or mesyl, lower alkanoyl into a compound of the formula:



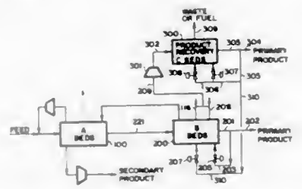
comprising reducing said quinone with an alkali metal hydride reducing agent, or zinc dust.

4,914,218

ADSORPTIVE PROCESS FOR SEPARATING MULTICOMPONENT GAS MIXTURES

Ravi Kumar, 991 N. Treeline Dr., Allentown, Pa. 18103; Wilbur C. Kratz, 7057 Heather Rd., Macungie, Pa. 18062; David L. Rarig, 830 Frank Dr., Emmaus, Pa. 18049; David E. Guro, 1141 Snyder Rd., Lansdale, Pa. 19446, and William P. Schmidt, Apartment - Linden 2C, Allentown, Pa. 18104

Filed Feb. 17, 1989, Ser. No. 313,580
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—26 **29 Claims**



1. In the separation of a multicomponent gas mixture by pressure swing adsorption to recover as individual products a primary key component and a secondary key component, wherein the secondary key component is more strongly adsorbed than the primary key component and there is present in the multicomponent gas mixture one or more minor tertiary components at low concentrations which are less strongly adsorbed than the secondary key component, by passing the multicomponent gas mixture in an adsorption step through a first bed of adsorbent selective for retention of the secondary key component, passing the effluent from said first bed through a second bed of adsorbent selective for the retention of the secondary key component and of the one or more minor tertiary components, withdrawing from said second bed a high purity product stream of the primary key component, and continuing said passing of the multicomponent gas mixture

through the first and second beds until the concentration of the secondary key component in the effluent from the first bed or the concentration of at least one of the tertiary components in said high-purity stream of primary key component from the second bed reach predetermined levels, or until a predetermined time period has elapsed; the improvement comprising discontinuing flow of the multicomponent gas mixture through said first and second beds at the end of said adsorption step and thereafter during a mutually extending time period:
(1) depressurizing said first bed immediately after the discontinuing of flow through said first and second beds by withdrawing from said first bed a first gas stream comprising desorbed and void space gas until the concentration of the secondary key component reaches a predetermined level in said gas stream or until a predetermined pressure is reached;
(2) evacuating said first bed by withdrawing therefrom a product stream of substantially pure secondary key component;
(3) depressurizing said second bed by withdrawing therefrom a gas stream comprising desorbed and void space gas; and
(4) purging said second bed by passing therethrough a stream of the primary key component whereby additional adsorbed components are desorbed and are withdrawn along with remaining void space gas in a purge effluent stream;

and thereafter following said mutually extending time period
(5) further pressurizing said first and second beds to a pressure up to the pressure of the adsorption step by passing a portion of said high-purity product stream of primary key component into and through said second bed and passing pressurization effluent from said second bed into said first bed, whereby both beds are prepared for another cycle beginning with said adsorption step.

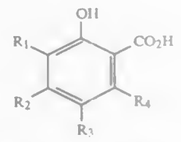
4,914,219

PROCESS FOR PREPARING ZINC SALT OF SALICYLIC ACID COMPOUND

Masato Satomura, and Ken Iwakura, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 13, 1988, Ser. No. 256,940
Claims priority, application Japan, Oct. 14, 1987, 62-259109
Int. Cl.[4] C07F *3/06*
U.S. Cl. 556—132 **11 Claims**

1. A process for preparing a water dispersion of a zinc salt of a salicylic acid compound comprising the steps of:
(1) reacting:
(A) at least one compound selected from the group consisting of a salicylic acid compound represented by formula (I), an alkali metal salt of a salicylic acid Compound represented by formula (I) and a mixture thereof



(I)

wherein R_1, R_2, R_3 and R_4, are the same or different consisting of a hydrogen atom, a substituted alkyl group, an unsubstituted alkyl group, a substituted alkoxy group, an unsubstituted alkoxy group, a substituted aryl group, an unsubstituted aryl group and a halogen atom; with
(B) a zinc compound selected from the group consisting of zinc oxide, zinc hydroxide, zinc carbonate, zinc sulfate and zinc chloride,
wherein the reaction is carried out in a mixture of water and an organic solvent, wherein said organic solvent has a water solubility of not more than 0 1 g/100 g of water at 25° C., and wherein the resulting zinc salt product has a solubility of not less than 10 g/100 g or organic solvent at 25° C.,
(2) removing a water layer from the resulting reaction mixture of step (1) so as to obtain an organic solvent layer containing the resulting zinc salt product;
(3) admixing water with the resulting organic solvent layer containing the resulting zinc salt product of step (2); and
(4) removing the organic solvent layer by distillation in the presence of said added water so as to obtain said water dispersion.

4,914,220

PROCESS FOR SYNTHESIS OF E-2-METHYL-α,β-UNSATURATED ALDEHYDES

Richard Desmond, Metuchen; Sander G. Mills, Woodbridge; Ralph P. Volante, East Windsor, and Ichiro Shinkai, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 197,549, May 23, 1988, abandoned. This application Feb. 27, 1989, Ser. No. 316,607
Int. Cl.[4] C07F *7/08, 7/18*
U.S. Cl. 556—436 **16 Claims**

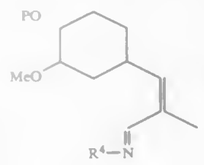
1. A process comprising the steps of:
(a) contacting the aldehyde I:

I

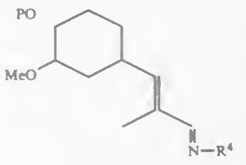
where P is a triorganosilyl protecting group, with the imine lithium salt IIa:

IIa

where R^1, R^2, R^3 are independently selected from C_1–C_4 linear or branched alkyl or phenyl, and R^4 is C_3–C_8 secondary or tertiary alkyl, phenyl or substituted phenyl; in an inert organic solvent at −80° C. to −20° C. for a sufficient time to form a mixture of imines III and IV;



III (Z)



IV (E)

(b) contacting the mixture of imines III and IV from step (a) with anhydrous trifluoroacetic acid at a temperature of −10° C. to +25° C. for a sufficient time to substantially convert imine III (Z) to imine IV (E); and
(c) contacting the resulting mixture from step (b) with water at a temperature of −0° C. to +25° C. to form

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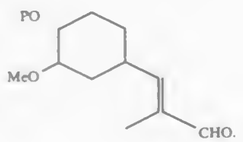


VI

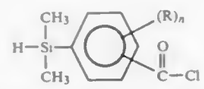
4,914,221

DIMETHYLSILYL-SUBSTITUTED BENZOYL CHLORIDES AND A PROCESS FOR PREPARING THE SAME

Peter-Paul Winkler, Munich, and Franz-Heinrich Kreuzer, Martinsried, both of Fed. Rep. of Germany, assignors to Consortium für Elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 8, 1988, Ser. No. 229,188
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1987, 3726999
Int. Cl.[4] C07F *7/08, 7/10*
U.S. Cl. 556—436 4 Claims

1. A dimethylsilyl-substituted benzoyl chloride of the formula



(I)

in which R is selected from the group consisting of alkyl radicals having from 1 to 8 carbon atoms, alkyl radicals substituted with a group selected from the group consisting of fluorine atoms alkoxy, alkenyloxy, aryloxy and dialkylamino groups, alkenyl radicals having from 2 to 8 carbon atoms, alkoxy, alkenyloxy or aryloxy radicals having up to 8 carbon atoms and dialkylamino groups having from 1 to 3 carbon atoms per alkyl radical, and n is 0 or 1, in which the COCl and R radicals are each arranged in the 2-, 3- or 4-position on the benzene ring to the silyl radical.

4,914,222

CRYSTALLINE SALTS OF L OR (S)-3-(3,4-DIHYDROXYPHENYL)-2-METHYLALANINE ESTERS AND PROCESS

John Budavari, Watchung; Robert F. Czaja, Scotch Plains; Edward J. J. Grabowski, Westfield; William F. Shukis, Edison, and Arthur J. Zambito, Clark, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 527,526, Aug. 29, 1983, abandoned. This application Sep. 30, 1986, Ser. No. 913,807
Int. Cl.[4] C07C *101/77*
U.S. Cl. 560—40 21 Claims

1. A process for preparing to be simultaneously present in the reaction mixture in their crystalline forms, a mixture of salts of (R) and (S) diasteromers of 1-pivaloyloxyethyl ester of (S)-3-(3,4-dihydroxyphenyl)-2-methylalanine which comprises

(a) forming a solution of (R,S)-1-pivaloyloxyethyl (S)-3-(3,4-dihydroxyphenyl)-2-methylalaninate in a non-polar substantially water-immiscible organic solvent,

(b) adding thereto a solvent forming hydroxylated solvent and a salt forming oxygenated acid, and

(c) intimately contacting the mixture for time sufficient to cause crystallization of the mixture of salts of the (R) and (S) isomers.

18. A crystalline product consisting essentially of solvate salts of (R,S)-1-pivaloyloxyethyl (S)-3-(3,4-dihydroxyphenyl)-2-methylalaninate with one or two oxygenated acids and a hydroxylated solvate.

4,914,223

ACRYLAMIDOACYLATED OLIGOMERS

Jerald K. Rasmussen; Steven M. Heilmann, and Frederick J. Palensky, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 316,234, Oct. 21, 1981, Pat. No. 4,777,276. This application Aug. 17, 1988, Ser. No. 233,218
Int. Cl.[4] C07C *121/413, 121/66*
U.S. Cl. 560—49 10 Claims

1. An acrylamido- or methacrylamido-acyl oligomer having the general formula

$$A_p(HX)_{n-p}R$$

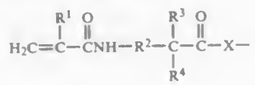
wherein

R is an organic group having a valence of n and is the residue of a nucleophilic group-substituted oligomer, $(HX)_nR$, said oligomer being a polyacrylic acid ester having one or more hydroxyl, amino, or thiol groups and having a molecular weight of 200 to 20,000;

n is a positive number of at least one and represents the valence of R;

p is a positive number in the range of 1 to n;

A is an acrylamido-acyl group or a methacrylamidoacyl group having the formula



wherein

R^1 is hydrogen, chlorine, or a methyl group;

R^2 is a single bond or a methylene or ethylene group that can be substituted by an alkyl group having 1 to 6 carbon atoms or phenyl;

R^3 and R^4 are independently hydrogen, an alkyl or cycloalkyl group having 1 to 12 carbon atoms, phenyl or alkyl-substituted phenyl having 6 to 12 carbon atoms, or R^3 and R^4 taken together with the carbon atom to which they are attached form a 5- to 12-membered carbocyclic ring; and

X is

—O—, or —S—, in which R^5 is (a) hydrogen, (b) a group selected from an alkyl or cycloalkyl group having 1 to 12 carbon atoms optionally substituted by a cyano, hydroxyl, or an alkoxy group having 1 to 4 carbon atoms, or A;

with the proviso that when R^5 is an alkyl or cycloalkyl group, then at least one of R^3 and R^4 is hydrogen.

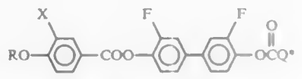
4,914,224

OPTICALLY ACTIVE CARBOXYLIC ACID DERIVATIVES AND LIQUID CRYSTALLINE COMPOSITIONS COMPRISING THEM

Tadao Shoji; Sadao Takehara, both of Sakura; Toru Fujisawa, Kawaguchi; Masashi Osawa, Sakura; Hiroshi Ogawa, Kawaguchi; Yoshi Arai, Hasuda, and Jitsuo Kurokawa, Ohmiya, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo and Kawamura Institute of Chemical Research, Saitama, both of, Japan

Filed Jan. 28, 1987, Ser. No. 7,612
Claims priority, application Japan, Jan. 31, 1986, 61-18014; Apr. 7, 1986, 61-78178; Jun. 17, 1986, 61-139249; Jun. 18, 1986, 61-140157
Int. Cl.[4] C09K *19/12, 19/20;* C07C *69/78, 69/92*
U.S. Cl. 560—65 3 Claims

1. An optically active carboxylic acid derivative represented by the general formula



(II)

wherein R represents a normal alkyl group having 5 to 20 carbon atoms, X represents a hydrogen or halogen atom, and Q* represents an optically active alkyl.

4,914,225

ACRYLAMIDE DERIVATIVES AND THEIR POLYMERS

Yuji Suzuki, Osaka; Satoshi Urano, Kyoto; Hirotoshi Umemoto, Kyoto; Ryuzo Mizuguchi, Kyoto; Kei Aoki, Nara, and Noriyuki Tsuboniwa, Osaka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Apr. 27, 1987, Ser. No. 42,893
Claims priority, application Japan, Apr. 25, 1986, 61-97760; Apr. 25, 1986, 61-97761
The portion of the term of this patent subsequent to Sep. 25, 2001, has been disclaimed.
Int. Cl.[4] C07C *103/92*
U.S. Cl. 560—145 8 Claims

1. An N-(substituted oxalyl)acrylamide of the formula: CH_2=CH—CO—NH—CO—CO—OR, wherein R has a molecular weight of not more than 500 and is selected from the group consisting of an alkenyl group, an alkynyl group, an aryl group, an aralkyl group and an alkyl group substituted with alkenyloxy.

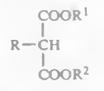
4,914,226

MALONIC ACID DERIVATIVES AND METHODS FOR THEIR SYNTHESIS

Romano Di Trapani, and Antonio S. Verdini, both of Monterotondo, Italy, assignors to Enitricerche S.p.A., Milano and Sclavo S.p.A., Siena, both of, Italy

Filed Jul. 16, 1987, Ser. No. 74,053
Claims priority, application Italy, Jul. 16, 1986, 21143 A/86
Int. Cl.[4] C07C *175/65*
U.S. Cl. 560—157 5 Claims

1. A compound of the formula:



wherein R^1 and R^2 each independently represent hydrogen atoms, or a straight or branched alkyl group having 2 to 6 carbon atoms or an aralkyl group, and R is selected from the group consisting of

$-(CH_2)_m-NHY$,

wherein, m is 3 or 4 and Y is a tert-butoxy-carbonyl.

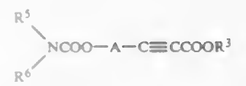
4,914,227

CERTAIN INTERMEDIATE 3-CARBAMOYLOXYALKYL PROPIOLIC ACID DERIVATIVES

Tetsuji Miyano; Kunio Suzuki, both of Nagoya; Ryosuke Ushijima, and Susumu Nakagawa, both of Okazaki, all of Japan, assignors to Banyu Pharmaceutical Company, Ltd., Tokyo, Japan

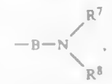
Division of Ser. No. 517,844, Jul. 27, 1983, abandoned. This application May 16, 1986, Ser. No. 863,984
Claims priority, application Japan, Aug. 6, 1982, 57-136343; Sep. 2, 1982, 57-151706; Oct. 12, 1982, 57-177647
Int. Cl.[4] C07C *125/06;* C07D *243/06, 413/12*
U.S. Cl. 560—157 7 Claims

1. A 3-carbamoyloxyalkylpropiolic acid derivative represented by the general formula:



(VI)

where R^3 is lower alkyl, mono-, di- or tri-halo-C_{1-4}-alkyl, lower alkenyl, lower alkynyl, C_{7-8}-aralkyl, C_{6-10}-aryl, mono- or di-hydroxy-C_{2-4}-alkyl, lower alkoxy-C_{2-4}-alkyl, lower alkenyloxy-C_{2-3}-alkyl, C_{7-8}-aralkyloxy-C_2-alkyl, C_6-aryloxy-C_{2-4}-alkyl, pyridyl, quinolyl, pyridyloxy-C_{2-6} alkyl or



where B is straight-chained or branched C_{2-4}-alkylene, and each of R^7 and R^8 is lower alkyl, C_7-aralkyl or C_{6-10}-aryl, or R^7 and R^8 form, together with the adjacent nitrogen atom, piperidino, 1-piperazinyl, 1-(4-methylpiperazinyl), 1-(4-ethylpiperazinyl), 1-(4-propylpiperazinyl), 1-(4-methylhomopiperazinyl), morpholino, homomorpholinyl, 1-pyrrolidinyl, 1-imidazolidinyl, 1-imidazolinyl, 1-pyrazolidinyl or 1-indolinyl group, A is C_{1-8}-alkylene or phenyl substituted C_{1-8} alkylene, and each of R^5 and R^6 is hydrogen, lower alkyl, mono-, di- or tri-halo-C_{1-4}-alkyl, hydroxy-C_{2-4}-alkyl, C_{3-7}-cycloalkyl, pyridyl, C_{7-8}-aralkyl, or C_{6-10}-aryl, or R^5 or R^6 form, together with the adjacent nitrogen atom, piperidino, 1-piperazinyl, 1-(4-methylpiperazinyl), 1-(4-ethylpiperazinyl), 1-(4-propylpiperazinyl), 1-(4-methylhomopiperazinyl), morpholino, homomorpholinyl, 1-pyrrolidinyl, 1-imidazolidinyl, 1-imidazolinyl, 1-pyrazolidinyl or 1-indolinyl group.

4,914,228

PREPARATION OF HALOGENATED QUINOLONECARBOXYLIC ACIDS

Klaus Grohe, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 29,939, Mar. 24, 1987, Pat. No. 4,782,156, which is a division of Ser. No. 754,563, Jul. 12, 1985, Pat. No. 4,680,401. This application Jan. 21, 1988, Ser. No. 209,751
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1984, 3426483
Int. Cl.[4] C07C *69/78*
U.S. Cl. 560—103 1 Claim

1. Ethyl 2,4-dichloro-5-fluorobenzoate.

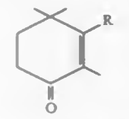
4,914,229

NOVEL PREPARATION OF COMPOUNDS OF THE 4-OXODAMASCONE SERIES, AND NOVEL SCENTS FROM THIS CLASS OF COMPOUNDS

Lothar Janitschke, Kleinniedesheim, and Werner Hoffmann, Neuhofen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 588,882, Mar. 12, 1984, Pat. No. 4,550,211. This application Sep. 9, 1985, Ser. No. 761,695
Int. Cl.[4] C07C *69/00, 49/603*
U.S. Cl. 560—259 6 Claims

1. A compound of the formula (A)



(A)

where R is one of the following radicals: —CH(OH)—CH-

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$_2$—CH=CH$_2$ (IIIb), —CH(OH)—CH$_3$ (IIIc), —CH(OH-)—CH=CH$_2$ (IIIe), —CH(OCOCH$_3$)—CH$_3$ (IIIf), and —CO—CH$_3$ (Ic).

4,914,230

CATALYST RECOVERY METHOD

Kenneth J. Abrams; Daniel W. Marsh, both of Naperville, Ill., and Bruce B. Doll, Decatur, Ala., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 890,129, Jul. 28, 1986, Pat. No. 4,769,489. This application Mar. 23, 1988, Ser. No. 172,205

The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.

Int. Cl.^{4} C07C *51/265*

U.S. Cl. 562—416 **3 Claims**

1. In a method for the continuous production of an aromatic carboxylic acid product by liquid phase, exothermic oxidation of an aromatic alkyl with an oxygen-containing gas in the presence of an oxidation catalyst comprising cobalt, manganese and bromine components and in a solvent medium comprising a monocarboxylic C_2 to C_6 aliphatic acid and water and present in an oxidation reactor, wherein heat generated in the oxidation reaction is dissipated at least in part by refluxing a portion of a reactor overhead vapor stream, with the remainder of the vapor stream being passed on to an absorber system for recovery of unreacted aromatic alkyl and solvent, and wherein product stream is withdrawn from the reactor and thereafter subjected to crystallization to produce a solid product stream and a mother liquid stream,

the improvement which comprises:

separating the mother liquor stream into a stream of monocarboxylic C_2 to C_6 aliphatic acid, a stream of water, and a solids-containing catalyst-rich stream;

recovering a catalyst-bearing stream that is substantially free from solids from said catalyst-rich stream;

contacting at least a portion of the recovered catalyst-bearing stream with vapor stream potion passing through the absorber system;

withdrawing from the absorber system a catalyst-rich bottomds stream; and

recycling at least a portion of the bottoms stream to the reactor.

4,914,231

METHOD FOR PURIFYING A CRUDE DIPHENYLSULFONE TETRACARBOXYLIC ACID

Hiroshi Manami, Jyoyo; Shigeo Miki, Hirakata, and Mikio Nakazawa, Uji, all of Japan, assignors to New Japan Chemical Co., Ltd., Kyoto, Japan

Filed Sep. 16, 1988, Ser. No. 245,425

Claims priority, application Japan, Sep. 19, 1987, 62-235749

Int. Cl.^{4} C07C *51/43*

U.S. Cl. 562—429 **9 Claims**

1. A method for purifying a diphenylsulfone tetracarboxylic acid produced by oxidizing the corresponding tetraalkyldiphenylsulfone in the presence of a cobalt-containing catalyst and containing cobalt ion as an impurity, which comprises dissolving the said diphenylsulfone tetracarboxylic acid in a solvent mixture of water and acetic acid, recrystallizing the diphenylsulfone tetracarboxylic acid from the solvent mixture and separating purified diphenylsulfone tetracarboxylic acid from the solvent mixture.

4,914,232

POLYSUBSTITUTED 2-MORPHOLONES, RELATED COMPOUNDS, PROCESSES FOR THEIR PREPARATION, AND U-V LIGHT STABILIZED COMPOSITIONS

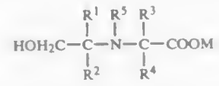
John Ta-Yuan Lai, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 750,438, Jul. 1, 1985, abandoned, which is a division of Ser. No. 367,631, Apr. 12, 1982, Pat. No. 4,528,370. This application Sep. 28, 1987, Ser. No. 101,523

Int. Cl.^{4} C07C *101/04*

U.S. Cl. 562—507 **3 Claims**

1. A polysubstituted alkali metal hydroxyethylaminoacetate having the structure:



wherein,

R^1, R^2, R^3 and R^4 are independently selected from the group consisting of aryl, alkyl each having from 1 to 24 carbon atoms, cycloalkyl having from 5 to 7 carbon atoms, aralkyl having from 7 to 20 carbon atoms, cyanoalkyl having from 2 to 12 carbon atoms, ether having from 4 to 18 carbon atoms, and hydroxyalkyl having from 1 to 18 carbon atoms, so that each C atom on either side of the N atom is disubstituted;

R^1 and R^2 together, or R^3 and R^4 together, may be cyclized forming a ring having from 5 to 8 carbon atoms;

except that not more than three of R^1, R^2, R^3 or R^4 may be cyclic;

R^5 is selected from hydrogen, oxygen, and alkyl having from 1 to 24 carbon atoms, and hydroxyl; and,

M represents an alkali metal.

4,914,233

SYNTHESIS OF BETA-THYMIDINE

John N. Freskos, and K. Pushpananda A. Senaratne, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Mar. 1, 1988, Ser. No. 162,508

Int. Cl.^{4} C07H *1/00*

U.S. Cl. 536—23 **20 Claims**

1. A process for producing beta-thymidine which comprises the steps of:

(a) converting a mixture of alpha- and beta-anomers of tetra-O-acylribofuranose to tri-O-acyl-β-ribothymidine by reacting said mixture with a protected thymine;

(b) hydrolyzing tri-O-acyl-β-ribothymidine to β-ribothymidine;

(c) converting β-ribothymidine to 2,2,-anhydro-β-thymidine by reacting said β-ribothymidine with dialkyl or diaryl carbonate;

(d) subjecting 2,2,-anhydro-β-thymidine to hydrohalogenation to produce 2,-halo-2'-deoxy-5-methyluridine; and

(e) hydrogenating 2'-halo-2,-deoxy-5-methyluridine to produce beta-thymidine.

4,914,234

10,10-DIHYDRO-10-((SUBSTITUTED-CARBONYL-)IMINO)-10-PHENYL-10H-PHENOXAPHOSPHINE, HYDROCHLORIDE

Andrew S. Tomcufcik, Bergen, N.J.; Joseph W. Marsico, Rockland, N.Y.; Nancy H. Eudy, Orange, N.Y., and Howard Newman, Rockland County, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 61,981, Jul. 27, 1987, Pat. No. 4,777,290, which is a division of Ser. No. 836,278, Mar. 5, 1986, Pat. No. 4,689,324. This application Aug. 4, 1988, Ser. No. 228,894

The portion of the term of this patent subsequent to Oct. 11, 2005, has been disclaimed.

Int. Cl.^{4} C07F *9/02*

U.S. Cl. 564—12 **1 Claim**

1. The compound 10,10-dihydro-10-imino-10-phenyl-10H-phenoxaphosphine, hydrochloride.

4,914,235

PROCESS FOR OBTAINING GUANIDINE HYDROHALIDES FROM BY-PRODUCT MIXTURES OBTAINED IN THE PRODUCTION OF MERCAPTOALKYLSILANES

Clemens Grambow, Seebruck, and Ferdinand Beck, Trostberg, both of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Mar. 7, 1989, Ser. No. 320,154

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1988, 3808766

Int. Cl.^{4} C07C *129/00*

U.S. Cl. 564—241 **8 Claims**

1. The method of recovering a guanidine hydrohalide from the by-product mixtures obtained in the production of mecaptoalkylsilanes, said by-product mixture consisting essentially of guanidine hydrohalide, ammonium chloride, thiourea and silane compounds, with and aliphatic ketone containing up to 7 carbon atoms, and separating the extract from the residue containing the guanidine hydrohalide.

4,914,236

PROCESS FOR THE PREPARATION OF MULTINUCLEAR AROMATIC POLYAMINES

Hartmut Knöfel, Odenthal; Michael Brockelt, Bergisch Gladbach; Marcel Petinaux, and Rudolf Uchdorf, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Apr. 25, 1988, Ser. No. 185,762

Claims priority, application Fed. Rep. of Germany, May 1, 1987, 3714606

Int. Cl.^{4} C07C *87/50;* **C09B** *11/02*

U.S. Cl. 564—334 **9 Claims**

1. A process for the preparation of multinuclear aromatic polyamines by the reaction of aniline with formaldehyde in the presence of water and acid catalysts in a single stage or two-stage reaction within the temperature range of from 0°–180° C., optionally preceded by an aminal preliminary stage in which the formation of N,N'-disubstituted aminal takes place in the absence of acid catalyst, which aminal is then converted into the desired end product in one or more stages in the presence of acid catalyst within the temperature range of from 0° to 180° C., working up of the resulting reaction mixture by extraction with an aniline-containing hydrophobic solvent, separation by distillation of the resulting organic phase into (i) a distillate consisting of aniline-containing solvent, which distillate is used again for extraction, optionally after the addition of fresh aniline, and (ii) a distillation residue consisting substantially of end product of the process and return of the aqueous phase obtained from the extraction process and containing acid catalyst, with reuse of the catalyst contained in the aqueous phase and removal of the water of condensation formed in the condensation reaction and of the water introduced into the system with the aqueous solution of formaldehyde in a water separator placed downstream of the aminal preliminary stage and upstream of the first reaction stage and/or in an evaporator placed downstream of the extraction stage and upstream of the first reaction stage, characterized in that

(a) the formaldehyde which is put into the process in the form of an aqueous solution is mixed with and thereby reacted with aniline-containing hydrophobic solvent in an aminal preliminary stage and/or with an aniline-containing hydrophobic solvent and recycled aqueous phase containing the catalyst in the form of amine salts in the first reaction stage

(b) after termination of the reaction, the diphasic reaction mixture obtained is separated into an aqueous phase and an organic phase in a phase separator arranged upstream of the extraction stage

(c) the organic phase obtained in the phase separator is separated by distillation, either separately or together with the organic phase leaving the extraction stage, into (i) a distillate consisting of aniline-containing solvent or two distillates consisting of aniline-containing solvent and (ii) one or two distillation residues consisting substantially of end product of the process, and

(d) two partial streams are produced from the distillate according to (c) or the distillates according to (c), which two partial streams may be identical with the two distillates according to (c), one of the partial streams is mixed with the aqueous formaldehyde in the aminal preliminary stage or, in the absence of an aminal preliminary stage, it is mixed in the first reaction stage with the aqueous formaldehyde and the aqueous phase containing the acid catalyst, and the other partial stream is used in the extraction stage for the extraction of the end product of the process from the aqueous phase of the reaction mixture.

4,914,237

ALKYLATION OF TOLUENEDIAMINE AND PARA-PHENYLENEDIAMINE WITH ISOBUTYLENE IN THE PRESENCE OF ACIDIC, CRYSTALLINE MOLECULAR SIEVES

Rakesh Agrawal, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 29, 1988, Ser. No. 277,096

Int. Cl.^{4} C07C *85/24, 87/58;* **B01J** *29/38*

U.S. Cl. 564—409 **9 Claims**

1. In a fixed bed process for producing ring alkylated toluenediamine and para-phenylenediamine amines by the reaction of toluenediamine or paraphenylenediamine with isobutylene in the presence of an acidic crystalline alumino-silicate catalyst, the improvement for effecting catalyst regeneration during the ring alkylation of said toluenediamine or paraphenylenediamine which comprises contacting the catalyst with water in an amount sufficient to saturate the catalyst but insufficient for substantially retarding the reaction and then reducing water addition.

4,914,238

PROCESS FOR THE PRODUCTION OF DIISOCYANATES, SELECTED DIISOCYANTES PRODUCED THEREBY AND THE PRODUCTION OF POLYURETHANE PLASTICS THEREFROM

Josef Sanders, Pittsburgh, Pa., assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 84,547, Aug. 12, 1987, Pat. No. 4,820,866. This application Mar. 8, 1989, Ser. No. 320,678

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1986, 3628316

The portion of the term of this patent subsequent to Feb. 7, 2006, has been disclaimed.

Int. Cl.^{4} C07C *85/11*

U.S. Cl. 564—420 **4 Claims**

1. A process for the production of diamines corresponding to the formula

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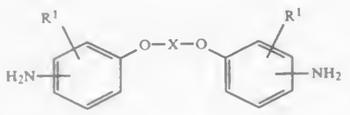


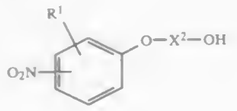
comprising

(a) reacting

(1) a monofunctional or difunctional alcohol corresponding to the following formula I or formula II

(I)

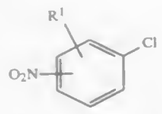
or



(II)

with

(2) a compound corresponding to the formula

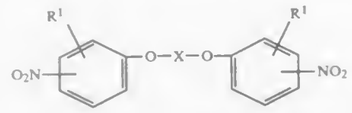


(III)

in the presence of

(3) powdered sodium hydroxide and/or potassium hydroxide in a quantity sufficient to neutralize eliminated hydrogen chloride and

(4) a strongly polar, aprotic solvent to form a dinitro compound corresponding to the formula



(IV)

with the radicals in each of formulae (I) through (IV) having the following meanings:

R^1 represents hydrogen or a methyl group

X^1 represents a difunctional aliphatic hydrocarbon radical containing from 2 to 31 carbon atoms

X^2 represents a difunctional aliphatic hydrocarbon radical containing from 2 to 9 carbon atoms which may be interrupted by ether bridges provided that at least two carbon atoms are present before such interruption and

X represents X^1 or X^2; and

(b) hydrogenating the dinitro compound to produce the corresponding diamine.

4,914,239

METHOD FOR PRODUCTION OF CYCLOHEXYLAMINES

Tatsuo Kiyuma, Uji, and Isao Naramoto, Tokushima, both of Japan, assignors to New Japan Chemical Co., Ltd., Kyoto, Japan

Filed Apr. 6, 1988, Ser. No. 178,722

Claims priority, application Japan, Jun. 24, 1987, 62-157256; Feb. 17, 1988, 63-34561

Int. Cl.⁴ C07C *87/36*

U.S. Cl. 564—450 **10 Claims**

1. A method for continuous production of a cyclohexylamine compound by liquid phase hydrogenation of an aniline compound selected from aniline, nuclearly lower alkyl-substituted aniline, N-(lower alkyl)aniline and N,N-di(lower alkyl-)aniline with hydrogen gas in the presence of a nickel catalyst, which comprises continuously feeding an aniline compound, continuously hydrogenating the aniline compound in the absence of a solvent and in the presence of an ammonia compound at a reaction pressure of about 2 to 10 kg/cm^2 and at about 210° to 240° C., continuously withdrawing a product gas containing product cyclohexylamine compound, unreacted aniline compound, byproducts, hydrogen and ammonia compound from the reaction system, separating the hydrogen and ammonia compound from the product gas, separating the unreacted aniline compound and byproducts from the cyclohexylamine compound and recycling the unreacted aniline compound and byproducts to the reaction system continuously together with starting material feed aniline compound, wherein the ammonia compound is ammonia when the aniline compound is aniline or nuclearly lower alkyl-substituted aniline; the ammonia compound is mono(lower alkyl)amine when the aniline compound is N-(lower alkyl)aniline; and the ammonia compound is fi(lower alkyl)amine when the aniline compound is N,N-di(lower alkyl)aniline and wherein the hydrogen and ammonia compound are fed in the form of a gas mixture such that the mol ratio of hydrogen to ammonia compound is 5:0.5-3.

4,914,240

GEM-DIHALO-1, 8-DIAMINO-4-AZA-OCTANES

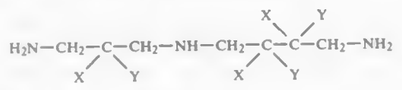
Fritz Gerhart, Kehl Leutesheim, Fed. Rep. of Germany, and Pierre Mamont, Strasbourg, France, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 62,302, Jun. 15, 1987, Pat. No. 4,851,448, which is a division of Ser. No. 767,928, Aug. 21, 1985, Pat. No. 4,695,654. This application Mar. 30, 1989, Ser. No. 330,663

Int. Cl.⁴ C07C *85/06*

U.S. Cl. 564—478 **3 Claims**

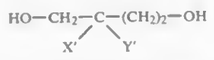
1. A process for the preparation of gem-dihalo-1,8-diamino-4-aza-octane derivatives having the formula:



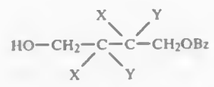
wherein X and Y represent hydrogen or halogen with the proviso that both halogens are substituted on one and only one carbon atom at any given time which comprises:

(1) in the case of the 6,6-dihalo or 7,7-dihalo derivatives

(a) reacting 2,2-dihalo-1,4-butanediol having the formula



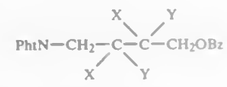
wherein X' and Y' are chlorine or fluorine, with benzyl bromide to form a mixture of the corresponding 1-benzyloxy-2,2-dihalo-4-hydroxybutane and 1-benzyloxy-3,3-dihalo-4-hydroxybutane as represented by the formula



wherein X and Y are as described above and Bz represents the benzyl group;

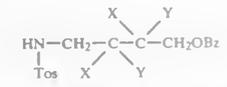
(b) separating said isomers, reacting the free hydroxyl group with methanesulfonyl chloride, and reacting the 1-benzyloxy-gem-dihalo-4-methanesulfonyloxybutane

so obtained with potassium phthalimide to obtain the corresponding N-(4-benzyloxy-gem-dihalobutyl)phthalimide derivative having the formula



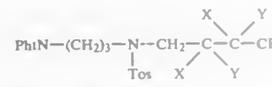
wherein Pht represents the phthaloyl group;

(c) reacting said phthalimide with hydrazine to form the corresponding 4-benzyloxy-gem-dihalobutylamine, protecting the free amine with p-toluenesulfonyl choride to form the corresponding N-(4-benzyloxy-gem-dihalobutyl)-p-toluenesulfonamide derivative having the formula

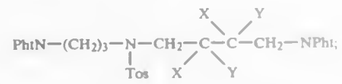


wherein Tos represents the p-toluenesulfonyl group;

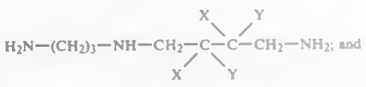
(d) alkylating said p-toluenesulfonamide derivative with 3-bromopropylphthalimide to form the corresponding 1-phthalimido-4-p-toluenesulfonyl-gem-dihalo-8-benzyloxy-4-aza-octane derivative having the formula



(e) cleaving said benzyloxy group to form the primary alcohol, reacting said primary alcohol with methanesulfonyl chloride and reacting the 1-phthalimido-4-p-toluenesulfonyl-gem-dihalo-8-methanesulfonyloxy-4-aza-octane so obtained with potassium phthalimide to obtain the corresponding 1,8-diphthalimido-4-p-toluenesulfonyl-gem-dihalo-4-aza-octane derivative having the formula

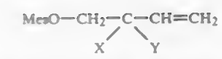


(f) heating said 1,8-diphthalimido-4-p-toluenesulfonyl-gem-dihalo-4-aza-octane with hydrazine in ethanol to remove the phthaloyl protecting groups, followed by heating with aqueous HBr to remove the tosyl protecting group to obtain the desired 6,6- or 7,7-dihalo-1,8-diamino-4-aza-octane derivatives having the formula



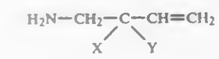
(2) in the case of the 2,2-dihalo derivatives:

(a) reacting said 2,2-dihalo-1,4-butanediol with two equivalents of methanesulfonyl chloride to form the corresponding 1,4-bis-methanesulfonyloxy-2,2-dihalobutyl, heating with diazabicycloundecen to prepare the corresponding 1-methanesulfonyloxy-2,2-dihalo-3-butene having the formula

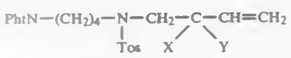


wherein Mes represents the methanesulfonyl group;

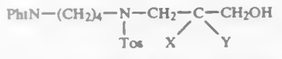
(b) reacting said 1-methanesulfonyloxy derivative with potassium phthalimide and cleaving the resulting phthaloyl moiety to yield the corresponding 2,2-dihalo-3-butenylamine having the formula



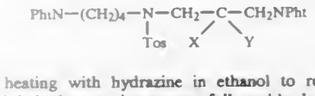
(c) protecting said amine with p-toluenesulfonyl chloride and alkylating said protected derivative with 4-bromobutylphthalimide to yield the corresponding N-(4-phthalimidobutyl)-N-(2,2-dihalo-3-butenyl)-p-toluenesulfonamide having the formula



(d) oxidizing the double bond of said N-(4-phthalimidobutyl) derivative, followed by reduction with boranemethylsulfide complex to form the corresponding 8-phthalimido-4-p-toluenesulfonyl-2,2-dihalo-4-aza-octanol having the formula



(e) reacting said 2,2-dihalo-4-aza-octanol derivative with methanesulfonyl chloride to form the corresponding 1-methanesulfonyloxy-8-phthalimido-4-p-toluenesulfonyl-4-aza-octane and reacting with potassium phthalimide to obtain the corresponding 2,2-dihalo-1,8-diphthalimido-4-p-toluenesulfonyl-4-aza-octane having the formula



(f) heating with hydrazine in ethanol to remove the pbthaloyl protecting groups, followed by heating with aqueous HBr to remove the tosyl protecting group to obtain the desired 2,2-dihalo-1,8-diamino-4-aza-octane derivatives having the formula

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4,914,241

PREPARATION OF DIAMINES

Michael Hesse, Ludwigshafen; Wolfgang Hoelderich, Frankenthal, and Matthias Schwarzmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 15, 1988, Ser. No. 206,755

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1987, 3720676

Int. Cl.⁴ C07C *85/18, 87/28, 87/32, 87/48*

U.S. Cl. 564—485 **12 Claims**

1. A process for the preparation of a diamine of the formula (I)

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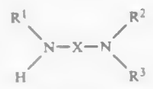
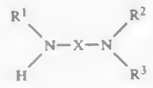


(I)

where R^1 and R^2 are each hydrogen, alkyl, aryl, aralkyl or cycloalkyl, R^3 is alkyl, aryl, aralkyl or cycloalkyl and X is a group of the formula (II)

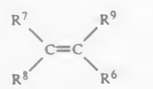
(II)

where R^4 and R^5 have the meanings given above for R^1 and m is from 1 to 12, which comprises; reacting a diamine, of the formula (III)



(III)

where R^1, R^2 and X are the groups described above for formula (I), with an olefin, of the formula (IV)



(IV)

where R^6 to R^9 are each hydrogen or alkyl which is straight-chain in the α-position, in the presence of a zeolite as a catalyst.

4,914,242

PROCESS FOR PREPARING 3-ETHYLBENZOPHENONE

Isoo Shimizu; Yasuo Matsumura, both of Yokohama, and Yutaka Arai, Tokyo, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

PCT No. PCT/JP88/00303, § 371 Date Nov. 23, 1988, § 102(e) Date Nov. 23, 1988, PCT Pub. No. WO88/07517, PCT Pub. Date Oct. 6, 1988

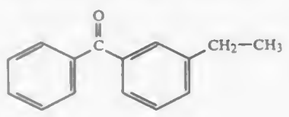
PCT Filed Mar. 24, 1988, Ser. No. 294,694

Claims priority, application Japan, Mar. 24, 1987, 62-69982

Int. Cl.⁴ C07C *45/28*

U.S. Cl. 568—321 **7 Claims**

1. A process for preparing highly pure 3-ethylbenzophenone, which comprises the steps of: obtaining an alkylation product mainly comprising unreacted benzene, ethylbenzene, polyethylbenzene and heavier components containing (3-ethylphenyl)phenylmethane by alkylating benzene with ethylene in the presence of ZSM-5 type synthetic zeolite catalyst, then recovering by distillation a fraction which contains (3-ethylphenyl)phenylmethane and which mainly comprises the components in the range of 288° to 295° C. in boiling point (atmospheric pressure basis) from said alkylation product, further oxidizing said fraction without splitting carbon-to-carbon bonds, and then recovering 3-ethylbenzophenone represented by the following formula (I) by distillation.



(I)

4,914,243

PRODUCTION OF 2-ALKOXY OR ARYL(LOWER)ALKOXY-6-METHOXY-1-NAPHTHALENECARBOXALDEHYDE

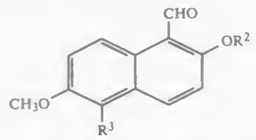
John G. Bauman, Windsor, N.J., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 137,390, Dec. 23, 1987, Pat. No. 4,866,197. This application Apr. 27, 1989, Ser. No. 344,187

Int. Cl.⁴ C07C *41/548*

U.S. Cl. 568—433 **2 Claims**

1. A process for producing compounds of formula (II)



(II)

wherein R^2 is lower alkyl containing 2 to 6 carbon atoms or aryl(lower)alkyl wherein lower alkyl contains 1 to 6 carbon atoms and R^3 is hydrogen which comprises reacting an aldehyde of formula (II) wherein R^2 is methyl and R^3 is hydrogen with a nucleophilic sulfide demethylating agent and reacting the resulting phenolate salt with an alkylating agent of formula R^2X wherein R^2 is the desired lower alkyl containing 2 to 6 carbon atoms or aryl(lower)alkyl wherein (lower)alkyl contains 1 to 6 carbon atoms and X is bromine, iodine, OSO_3R^2, or a sulfonate to produce the desired compound of formula (II).

4,914,244

PROCESS FOR PREPARING DIFLUOROCHLOROMETHOXYBENZENES

Albrecht Marhold, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

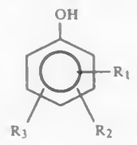
Filed Jan. 14, 1987, Ser. No. 3,096

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1986, 3602681

Int. Cl.⁴ C07C *43/225, 41/00*

U.S. Cl. 568—585 **11 Claims**

1. A process for preparing a difluorochloromethoxybenzene, from a phenol, comprising reacting a phenol of the formula



in which

R_1, R_2 and R_3 are identical or different and each stands for hydrogen, halogen, alkyl, aryl, O-aryl or S-aryl with trichloromethyl chloroformate in the presence of hydrogen fluoride, in the absence of a Friedel-Crafts catalyst, wherein the reaction is carried out at a temperature of −10° C. to +100° C., wherein the halogen is selected from the group consisting of fluorine, chlorine, bromine and iodine, wherein the aryl, O-aryl, or S-aryl is an aryl radical containing 6 to 8 C atoms which is unsubstituted or substituted by NO_2; CN; $COOC_1$-C_4-alkyl; C_1-C_4-alkyl; fluorine; chlorine; bromine; C_1-C_4-alkoxy; fluoro-C_1-C_4-alkyl; chloro-C_1-C_4-alkyl or bromo-C_1-C_4-alkyl.

4,914,245

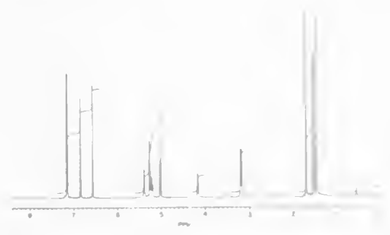
CULPIN

Gordon W. Robinson, Lawrenceville; Joseph O'Sullivan, Belle Mead; Edward Meyers, East Brunswick; Jerry S. Wells, Ringoes, and Janice H. Del Mar, Hopewell, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

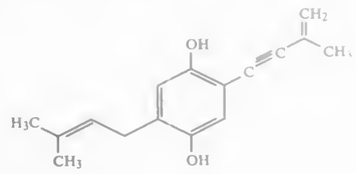
Filed Apr. 5, 1989, Ser. No. 333,496

Int. Cl.⁴ C07C *39/08*

U.S. Cl. 568—766 **3 Claims**



1. A compound having the formula



4,914,246

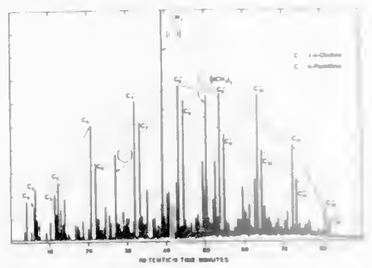
ALKYLPHENOLS AND DERIVATIVES THEREOF VIA PHENOL ALKYLATION BY CRACKED PETROLEUM DISTILLATES

Alexis A. Oswald, Annandale, N.J.; Ram N. Bhatia, Baton Rouge, La.; Edmund J. Mozeleski, Califon; Darrell W. Brownawell, Scotch Plains, both of N.J., and Thomas L. Ashcraft, Baytown, Tex., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 922,877, Oct. 24, 1986, abandoned. This application Oct. 26, 1987, Ser. No. 113,619

Int. Cl.⁴ C07C *37/14, 39/06*

U.S. Cl. 568—793 **20 Claims**



1. In the process of alkylating phenol with olefins in the presence of a strong acid catalyst whereby ortho and para monoalkylphenols are obtained, the improvement comprising reacting at least stoichiometric amount of phenol at temperatures of about 20° C. to 45° C. with an olefin containing feed having C_5 to C_{35} carbon ranges, said feed containing substantial amounts of linear aliphatic olefins whereby alkylphenols having on average less than 2 side chains in the alkyl group are obtained and wherein the ratio of ortho to para isomers of the monoalkylphenols are in the range of about 10 ortho to 90 para to about 40 ortho to 60 para isomers.

4,914,247

PROCESS FOR PREPARING PARA-SUBSTITUTED HALOGENOBENZENE DERIVATIVES

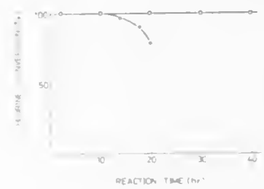
Kazuhiko Sekizawa, Shinnanyo; Toshio Hironaka, Tokuyama; Masao Nakano, Hikari, and Yukihiro Tsutsumi, Tokuyama, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Continuation of Ser. No. 9,346, Jan. 30, 1987, abandoned. This application Jun. 30, 1989, Ser. No. 374,578

Claims priority, application Japan, Jan. 31, 1986, 61-19693

Int. Cl.⁴ C07C *17/12*

U.S. Cl. 570—208 **12 Claims**



1. A process for preparing a parasubstituted halogenobenzene derivative selected from the group consisting of p-dichlorobenzene, p-dibromobenzene, p-diiodobenzene, p-chlorohalogenobenzene, p-bromohalogenobenzene, p-iodohalogenobenzene, p-chloroalkylbenzene, p-bromoalkylbenzene, and p-iodoalkylbenzene, wherein benzene, a monohalogenobenzene or a monoalkylbenzene is halogenated with a halogen selected from the group consisting of chlorine, bromine and iodine in the liquid phase in the presence of an L-type zeolite catalyst at a temperature of 0° C. to 200° C., said zeolite catalyst being a molded zeolite catalyst body which comprises, based on the weight of an L-type zeolite in the anhydrous state and 5 to 90% by weight of amorphous silica.

4,914,248

DIENE POLYMERS, PROCESS FOR PRODUCTION, THEREOF, AND RUBBER COMPOSITIONS CONTAINING SAME

Yuichi Kitagawa; Yasuo Hattori, both of Yokohama, and Akira Saito, Fujisawa, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP87/00159, § 371 Date Jun. 9, 1987, § 102(e) Date Jun. 9, 1987, PCT Pub. No. WO87/05610, PCT Pub. Date Sep. 24, 1987

PCT Filed Mar. 13, 1987, Ser. No. 71,343

Claims priority, application Japan, Mar. 13, 1986, 61-53786; Mar. 13, 1986, 61-53787

Int. Cl.⁴ C08F *8/32*; C08L *63/00, 53/02, 83/04*

U.S. Cl. 525—113 **8 Claims**

1. A diene polymer expressed by the following general formula and with a weight average molecular weight, determined by GPC, of 10,000 to 1,000,000:

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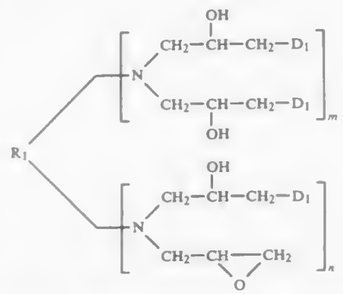


wherein D_1 is a diene polymer bonded via a carbon-carbon linkage, R_1 is an organic group of 1 to 20 carbon atoms free from active hydrogen or a silicon compound, m is 0 or an integer of from 1 to 6, and n is 0 or an integer of from 1 to 6; and when m is 1 or more n =0; and when n is 2 or more, m =0.

4,914,249

DEHYDROGENATION OF DEHYDROGENATABLE HYDROCARBONS

Bryan L. Benedict, Evanston, Ill., assignor to UOP, Des Plaines, Ill.

Filed Dec. 29, 1988, Ser. No. 290,478
Int. Cl.[4] C07C *5/32*

U.S. Cl. 585—443 **17 Claims**

1. In a process for the dehydrogenation of a dehydrogentable hydrocarbon with separate and intermediate selective oxidation of hydrogen which comprises the steps of:

(a) contacting said hydrocarbon with a dehydrogenation catalyst comprising an alkaline metal-promoted iron compound in a first reaction dehydrogenation zone in the presence of steam at dehydrogenation conditions to produce a first reaction dehydrogenation zone effluent stream comprising a mixture of dehydrogenated hydrocarbons, unconverted hydrocarbons, hydrogen and steam;

(b) removing said first reaction dehydrogenation zone effluent stream from said first dehydrogenation zone;

(c) passing said effluent stream of step (b) to a second reaction oxidation zone which is separate and discrete from said first reaction dehydrogenation zone;

(d) contacting said first dehydrogenation zone effluent stream in said second reaction oxidation zone with oxygen-containing gas in the presence of an oxidation catalyst consisting essentially of a Group VIII noble metal, a Group IVA metal, and lithium composited on a solid porous support at oxidation conditions to selectively oxidize said hydrogen within said first reaction zone effluent stream to the substantial exclusion of oxidation of said dehydrogenated and unconverted hydrocarbons, wherein said selective oxidation of said hydrogen is exothermic in nature to provide additional heat and thereby raise the temperature of said dehydrogenated and unconverted hydrocarbons;

(e) withdrawing a dehydrogenated and unconverted hydrocarbon effluent stream from said second reaction oxidation zone having an increased temperature with respect to the temperature of said first reaction dehydrogenation zone effluent stream;

(f) passing said second reaction oxidation zone product effluent stream of step (e) at dehydrogenation conditions to a third reaction dehydrogenation zone containing a dehydrogenation catalyst comprising an alkaline metal-promoted iron compound to produce dehydrogenated hydrocarbons; and

(g) withdrawing and recovering said dehydrogenated hydrocarbons, the improvement which comprises utilizing as said selective oxidation catalyst a composite which has been prepared by the steps of impregnating a solid porous support which a compound containing a Group VIII noble metal and a compound containing a Group IVA metal, calcining said impregnated support and sequentially impregnating said calcined impregnated support with a compound containing lithium.

4,914,250

COUPLING PROCESS

R. Scott Smith, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 207,959, Jun. 17, 1988, abandoned. This application May 24, 1989, Ser. No. 356,185
Int. Cl.[4] C07C *2/64*

U.S. Cl. 585—452 **16 Claims**

1. In a process for coupling an alkene selected from ethene, propene, and mixtures thereof with an aromatic hydrocarbon having an active hydrogen on a saturated alpha-carbon in the presence of a supported potassium or potassium alloy as a catalyst, the improvement which comprises conducting the reaction in the presence of sodium hydroxide, potassium hydroxide, or a mixture thereof as a co-catalyst, the catalyst composition containing about 200–1500 weight % of support and about 4–40 mol % of co-catalyst, based on the amount of alkali metal catalyst.

4,914,251

CATALYST SYSTEM FOR ALKYLATING ALKYL AROMATICS WITH OLEFINS, PROCEDURE FOR PREPARING THE CATALYST, AND PROCEDURE FOR CARRYING OUT THE ALKYLATING

Pekka Knuuttila, Porvoo, and Alla Ali-Hokka, Kulloo, both of Finland, assignors to Neste OY, Finland

Filed Feb. 10, 1989, Ser. No. 309,680
Int. Cl.[4] C07C *5/393, 2/64*

U.S. Cl. 585—453 **16 Claims**

1. Catalyst for alkylation of an alkyl aromatic, said catalyst comprising sodium oxide on a potassium carbonate carrier.

4,914,252

SELECTIVE OXIDATIVE COUPLING

Pochen Chu, West Deptford, and Michael E. Landis, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 128,124, Dec. 3, 1987, abandoned. This application Jan. 12, 1989, Ser. No. 298,240
Int. Cl.[4] C07C *2/00*

U.S. Cl. 585—500 **10 Claims**

1. A process for converting feedstock comprising methane into a product comprising C_2+ hydrocarbons including ethylene which comprises contacting said feedstock at conversion conditions including a temperature of from about 400° C. to about 800° C., a pressure of from about 1 kPa to about 1000 kPa and a gas hourly space velocity of from about 100 hr^{-1} to about 6000 hr^{-1} with a catalyst composition comprising layered titantate having adjacent layers separated by silica pillars, said catalyst composition further comprising an alkali metal.

3. A process for converting feedstock comprising methane into a product comprising C_2+ hydrocarbons including ethylene, said process comprising contacting said feedstock at conversion conditions including a temperature of from about 400° C. to about 800° C., a pressure of from about 1 kPa to about 1000 kPa and a gas hourly space velocity of from about 100 hr^{-1} to about 6000 hr^{-1} with a catalyst composition comprising (1) layered metal chalcogenide having adjacent layers separated by chalcogenide pillars, said catalyst composition further comprising (2) one or more alkali metals.

4,914,253

METHOD FOR PREPARING POLYETHYLENE WAX BY GAS PHASE POLYMERIZATION

Main Chang, Houston, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Nov. 4, 1988, Ser. No. 267,216
Int. Cl.[4] C07C *2/02*

U.S. Cl. 585—523 **12 Claims**

1. A process for preparing polyethylene wax having a narrow molecular weight distribution of 5 or less, which comprises polymerizing ethylene in a gas phase polymerization reactor in the presence of:

(a) a catalytically effective amount of a dried free-flowing powder comprising a Group IV B or V B transition metal metallocene-alumoxane catalyst complex adsorbed upon the surface of silica gel said complex having an aluminum to transition metal mole ratio of 1000:1 to 1:1; and

(b) from about 0.01 to about 20 mole percent of hydrogen based on the total weight percent of hydrogen and ethylene.

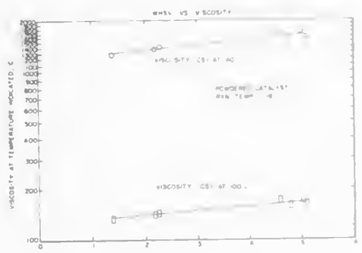
4,914,254

FIXED BED PROCESS FOR HIGH VISCOSITY INDEX LUBRICANT

Bruce P. Pelrine, Trenton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 12, 1988, Ser. No. 282,769
Int. Cl.[4] C07C *2/02*

U.S. Cl. 585—530 **11 Claims**



1. In a process for the preparation of liquid hydrocarbons suitable as lubricant basestocks from alpha-olefin feedstock containing 6 to 20 carbon atoms, or mixtures of such olefins, comprising contacting said olefins under oligomerization conditions, at reaction temperature between 90° to 250° C. to vary product viscosity, and with a chromium catalyst on a porous support, which catalyst has been treated by oxidation at a temperature of 200° C. to 900° C. in the presence of an oxidizing gas and then by treatment with a reducing agent at a temperature and for a time sufficient to reduce said catalyst to a lower valence state to obtain an oligomeric liquid lubricant composition comprising C_{30}–C_{1300} hydrocarbons, said composition having a branch ratio of less than 0.19, weight average molecular weight between 420 and 18,000, molecular weight distribution between 1 and 5 and pour point below −15° C., the improvement comprising; oligomerizing said olefins in a fixed bed reactor in contact with extruded reduced chromium oxide catalyst on a porous support at essentially constant oligomerization temperature and varying said olefin feedstock WHSV based on catalyst whereby said liquid lubricant hydrocarbon product viscosity can be selectively varied.

4,914,255

HEAT TRANSFER USING FLUIDIZED PARTICLES

Amos A. Avidan, Yardley, Pa., and Reuel Shinnar, Great Neck, N.Y., assignors to Mobil Oil Corp., New York, N.Y.

Filed Dec. 15, 1988, Ser. No. 284,627
Int. Cl.[4] C07C *5/333*

U.S. Cl. 585—661 **11 Claims**

1. A process for converting a hydrocarbon feedstream in a fluidized-bed reaction zone containing a finely divided catalyst comprising the steps of:

(a) fluidizing a Geldart Group A powder containing up to 50 weight percent fines in an inert gas stream to form a fluidized heat transfer mixture, wherein said fines have a cross-sectional dimension of less than about 40 microns;

(b) heating said fluidized heat transfer mixture;

(c) charging said hydrocarbon feedstream to said fluidized-bed reaction zone under conversion conditions at a rate sufficient to maintain said finely divided catalyst in a state of sub-transport fluidization, wherein a hydrocarbon converted product is formed; and

(d) indirectly transferring heat from said heat transfer mixture to said fluidized-bed reaction zone.

4,914,256

REACTIVATION OF PARTIALLY DEACTIVATED CATALYST EMPLOYING ULTRASONIC ENERGY

Paul G. Rodewald, Rocky Hill, N.J., assignor to Mobil Oil Corp., New York, N.Y.

Filed Jan. 30, 1988, Ser. No. 213,801
Int. Cl.[4] C07C *2/58*; B01J *37/34*; B08B *3/12*

U.S. Cl. 585—726 **2 Claims**

1. In a catalyzed alkylation process employing a solid boron-containing catalyst composition which undergoes a loss of activity due to accumulation of solid contaminant on the catalyst, the improvement which comprises subjecting the catalyst after it has undergone a partial but less than complete loss of activity due to solid contaminant accumulation with ultrasonic energy within a chemical conversion zone containing a liquid feedstock, the catalyst being present therein, the magnitude of such ultrasonic energy and its duration being sufficient to restore a substantial percentage of the lost activity of the catalyst, wherein said catalyst includes boron trifluoride.

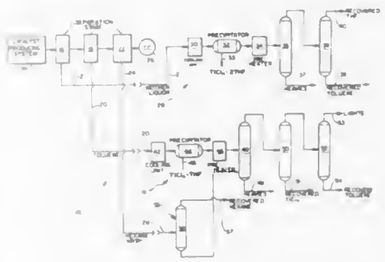
4,914,257

METHOD AND APPARATUS FOR RECOVERING HIGH PURITY TOLUENE, HEXANE, TITANIUM TETRACHLORIDE AND TETRAHYDROFURAN FROM MIXTURES

Steven A. Cohen, Naperville; James H. Lee, Aurora, both of Ill., and David B. Manley, Rolla, Mo., assignors to Amoco Corporation, Chicago, Ill.

Filed May 23, 1988, Ser. No. 197,217
Int. Cl.[4] C08F *4/64*

U.S. Cl. 585—814 **12 Claims**



1. A method for recovering toluene and at least one com-

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pound selected from the group consisting of tetrahydrofuran and titanium tetrachloride from a mixture derived from an olefin polymerization catalyst preparation process comprising the steps of:

(a) supplying a mother liquor having the capability of forming selected complexes of titanium tetrachloride and tetrahydrofuran;

(b) cooling the mother liquor to precipitate the selected complexes of titanium tetrachloride and tetrahydrofuran from the mother liquor;

(c) removing the precipitate of the selected complexes from the mother liquor; and

(d) distilling the remaining mother liquor at least once to recover the toluene and at least one compound selected from the group consisting of tetrahydrofuran and titanium tetrachloride.

4,914,258

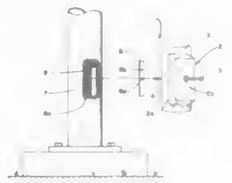
UTILITY POLE HAVING AN ACCESS OPENING COVER OVER A RAISED PERIMETER ACCESS OPENING

Burt B. Jackson, Rte. 5, Box 475, Denham Springs, La. 70726

Filed Nov. 14, 1988, Ser. No. 270,622

Int. Cl.[4] F21S *1/10;* **H02G** *7/20;* **B65D** *45/00*

U.S. Cl. 174—45 R **4 Claims**



1. In combination with a utility pole having an access opening with a raised perimeter, an access opening cover comprising:

(a) a shell overlying said raised perimeter of said access opening, said shell having a perimeter surrounding said raised perimeter of said access opening, said perimeter of said shell corresponding to an outer curvature of said utility pole, said shell having sufficient depth to contact said outer curvature of said utility pole when overlying said access opening;

(b) a bar positioned inside said utility pole across said access opening, the length of said bar being greater than a distance across said access opening; and

(c) means engaging said shell and said bar.

4,914,259

MOLDED CIRCUIT BOARD

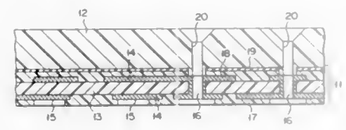
Kenzo Kobayashi, Ichihara, and Hirokazu Shiroishi, Hiratsuka, both of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1989, Ser. No. 311,838

Claims priority, application Japan, Sep. 8, 1987, 62-136269

Int. Cl.[4] H05K *1/00*

U.S. Cl. 174—255 **8 Claims**



1. A molded circuit board comprising:

a circuit film having an insulating film and a desired circuit pattern on said insulating film; and

a resin substrate integrally molded on one surface of said circuit film,

said circuit film having bonding pad regions, formed in a surface thereof opposite the surface in contact with resin substrate, for mounting surfacemounting type parts, and through-holes formed at locations thereof where insert-mounting parts are to be mounted,

said resin substrate having holes, formed at locations thereof corresponding to said through-holes, for receiving the leads of insert-mounting type parts,

4,914,260

CERAMIC MULTI-LAYER PRINTED CIRCUIT BOARDS

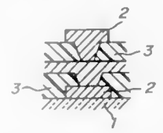
Go Suzuki, and Toshiki Goto, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Mar. 30, 1989, Ser. No. 330,761

Claims priority, application Japan, Mar. 30, 1988, 63-74713

Int. Cl.[4] H05K *1/00*

U.S. Cl. 174—255 **3 Claims**



1. A ceramic multi-layer printed circuit board characterized in that a wiring pattern layer is formed on a ceramic substrate by a copper plating and a ceramic insulating layer is formed thereon by a printing process with a ceramic paste and formations of such a wiring pattern layer and insulating layer are repeated plural times.

4,914,261

CABLE CONNECTING BOX

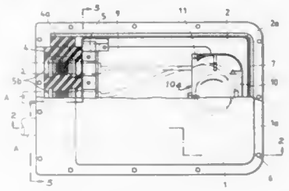
Yuzo Tokumaru, Kanagawa; Hideo Satou, and Kunio Kobayashi, both of Aichi, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka and Chubu Telecommunications Company Inc., Nagoya, both of, Japan

Filed Sep. 6, 1988, Ser. No. 240,204

Claims priority, application Japan, Sep. 3, 1987, 62-136097[U]

Int. Cl.[4] H02G *15/113;* **G02B** *6/24*

U.S. Cl. 174—92 **5 Claims**



5. A cable connecting box as recited in claim 3, wherein said fastening means comprises a hinged ring connected to said first case half; and

a turn lever attached to said second case half, said hinged ring rotatively attached to said turn lever.

4,914,262

QUICK DISCONNECT SWITCH

Arthur I. Appleton, 22 Indian Creek Island, Miami Beach, Fla. 33154

Filed May 27, 1988, Ser. No. 199,941

Int. Cl.[4] H01H *19/56, 21/76, 1/60*

U.S. Cl. 200—8 R **6 Claims**

1. A quick disconnect switch for an electrical circuit, comprising:

a rotating member pivotable between a first position and a second position;

means for supporting said rotating member;

at least one conductor element mounted in said rotating member such that it is free to rotate relative to said rotating member;

a pair of terminals associated with each of said at least one

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conductor element including a first terminal having a contact member associated therewith and a second terminal having a contact member associated therewith wherein said contact member contact said conductor element when said rotating member is in said first position to thereby make an electrical connection therebetween and said contact members are separated from said conductor element when said rotating member is in said second position to thereby break said electrical connection, said conductor element rotating incrementally independently of the pivoting of said rotating member upon movement of the rotating member between said first and second positions; and

means for supporting said terminals.

4,914,263

MAGNETICALLY-DAMPED, TESTABLE ACCELEROMETER

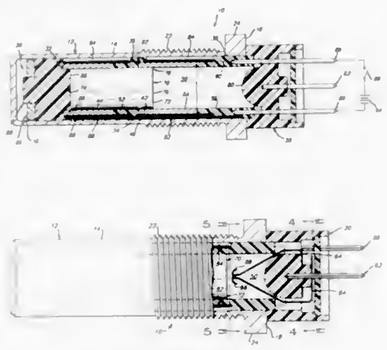
Leonard W. Behr, Pontiac, Mich., assignor to Automotive Systems Laboratory, Inc., Farmington Hills, Mich.

Continuation of Ser. No. 248,143, Sep. 23, 1988, Pat. No. 4,827,091. This application Mar. 1, 1989, Ser. No. 317,652

The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.

Int. Cl.[4] H01H *35/14*

U.S. Cl. 200—61.45 M 2 Claims



1. An accelerometer comprising

a housing having a passage formed therein;

a magnetically permeable element secured to said housing proximate with said passage;

a magnetic sensing mass within said passage, said sensing mass being magnetically biased towards said element so as to remain in an initial position within said passage proximate with said element until said magnetic bias is overcome by acceleration of said housing, whereupon said sensing mass is displaced in response to such acceleration towards a second position within said passage, said magnetic bias being sufficient to return said sensing mass to said initial position from any other position short of said second position;

switchable means for increasing the magnetic bias on said sensing mass; and

switch means on said housing operable by said sensing mass when said sensing mass is displaced to said second position within said passage.

4,914,264

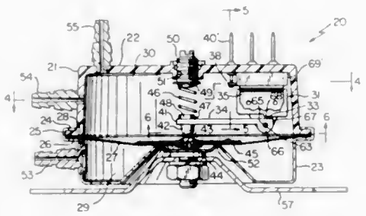
CONTROL DEVICE HAVING A SELF-SUPPORTING SWITCH UNIT THEREIN

Charles J. Everett, Killingworth, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jul. 11, 1988, Ser. No. 217,398

Int. Cl.[4] H01H *35/34*

U.S. Cl. 200—83 S 9 Claims



1. In a control device comprising a housing means divided into two chambers by a movable wall means that is responsive to a pressure differential created between said chambers, an electrical switch means carried by said housing means and having a movable actuator, and a lever pivotally carried by said housing means and having opposed ends one end of which is interconnected to said wall means so as to be pivoted by the movement thereof, said lever being operatively interconnected to said actuator to operate said switch means between the different conditions thereof in relation to the pivoted position of said lever, the improvement comprising a pair of mounting plate means respectively having holding means that holds said switch means between said plate means and respectively having pivot means that pivotally mount said lever between said plate means and between said opposed ends of said lever whereby said plate means, said switch means and said lever form a self-supporting unit that is carried by said housing means and has the other end of said lever acting on said actuator of said switch means, said switch means comprising a housing having opening means passing therethrough, said holding means of said plate means comprising post means extending therefrom and respectively being received in said opening means, said lever having opening means passing therethrough, said pivot means of said plate means comprising post means extending therefrom and respectively being received in said lever opening means.

4,914,265

EXTERIOR COVER FOR AN ELECTRICAL SOCKET OR SWITCH

Francois Mongeau, Ile Bizard, Canada, assignor to Nicolet Plastique LTEE, Nicolet, Canada

Filed Aug. 3, 1988, Ser. No. 227,270

Int. Cl.[4] H01R *13/44;* **H01H** *9/04, 3/20*

U.S. Cl. 200—330 11 Claims

1. An exterior cover assembly for an electrical box containing at least one electrical component having at least one screw hole, the assembly comprising:

a cover plate having one orifice for each electrical component in said electrical box and having a screw hole for each screw hole in said at least one electrical component;

a slider mounted over each orifice outwardly of said cover plate;

each said slider having an inner face and an outer face;

a first guide means on said cover plate;

a second guide means on said slider;

said second guide means is a pair of parallel tongues extending rearwardly from said inner face of said slider along at least a portion thereof, and said first guide means is a pair of parallel grooves bilaterally flanking said orifice in said cover plate, and wherein each individual tongue of said pair of parallel tongues fit in a respective individual groove of said one pair of parallel grooves to allow rectilinear sliding motion of said slider relative to said plate; and

a clip for retaining said first guide means in sliding relationship with said second guide means to allow guided, rectilinear displacement of said slider in a plane parallel to said cover plate.

4,914,266

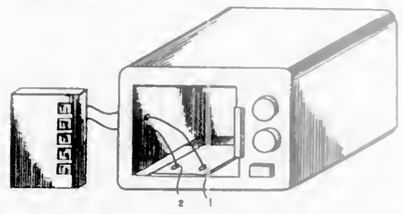
PRESS APPLIED SUSCEPTOR FOR CONTROLLED MICROWAVE HEATING

Christopher J. Parks, Ellicott City, Md., and Kenneth J. Wolfe, State College, Pa., assignors to Westvaco Corporation, New York, N.Y.

Filed Mar. 22, 1989, Ser. No. 327,514

Int. Cl.[4] H05B *6/64*

U.S. Cl. 219—10.55 E 14 Claims



10. A printed food container for use in a microwave oven prepared from susceptor packaging material comprising:

(a) a container body formed from a dielectric substrate having a solvent based susceptor-ink composition printed on the food contact surface thereof in a preselected pattern corresponding to the location of food placed in the container, said susceptor-ink composition containing conductive carbon particles suspended in a mixture of resins and solvents comprising polymeric cellulosic resins soluble in alcohol, to provide a surface resistivity within the preselected printed area in the range of from about 50–5000 ohms per square; and,

(b) a barrier coating applied over the printed susceptor-ink composition to provide a food contact surface for food packaged in the container.

4,914,267

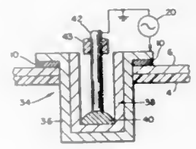
CONNECTOR CONTAINING FUSIBLE MATERIAL AND HAVING INTRINSIC TEMPERATURE CONTROL

Rodney L. Derbyshire, Menlo Park, Calif., assignor to Metcal, Inc., Menlo Park, Calif.

Continuation of Ser. No. 837,559, Mar. 3, 1986, abandoned, which is a continuation of Ser. No. 568,220, Nov. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 445,819, Dec. 1, 1982, abandoned. This application Mar. 11, 1988, Ser. No. 170,108

Int. Cl.[4] H05B *5/00*

U.S. Cl. 219—85.1 54 Claims



1. A coupling mechanism to be incorporated in an electric circuit and operating at a constant temperature to melt a fusible material to join at least two members,

a ferromagnetic member having a predetermined Curie temperature,

a first member to be connected electrically in series with another member in said electric circuit,

a fusible material positioned to contact at least two of the members when fused and joining the members when solidified,

said ferromagnetic member disposed in heat conducting relationship to at least one of said members and said fusible material,

said fusible material having a fusion temperature below the Curie temperature of said ferromagnetic member, and

means for connecting said ferromagnetic member to a source of a constant alternating electric current to heat said ferromagnetic member sufficiently to cause said ferromagnetic member to approach its Curie temperature when said another member is to be coupled to said first member,

said means including means for subjecting said ferromagnetic member to an alternating current wherein

$$\frac{\Delta I}{I} < -\frac{1}{2}\frac{\Delta R}{R},$$

where I is the current prior to approach of Curie temperature, ΔI is the change in current upon said ferromagnetic material being heated to a temperature approaching its Curie temperature, ΔR is the change in resistance of said mechanism as Curie temperature is approached and R is the resistance before said change.

4,914,268

BEAM WELDING PROCESS

Charles E. Hixon, Huffman, Tex., and Clinton J. Wohlmuth, Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jan. 1, 1989, Ser. No. 360,106

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—121.14 23 Claims

1. A beam welding process for joining two bulky, irregularly configured metal workpieces including the steps of:

(a) positioning the two workpieces to be joined adjacent to each other so that the surfaces of the workpieces to be joined contact each other to form a joint,

(b) applying a first high energy beam to the joint to fuse the two workpieces together and to produce at least one weld undercut;

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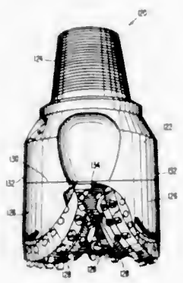
(c) applying substantially simultaneously, a second high energy beam to the joint to flatten the undercut produced by the first beam;
(d) applying, substantially simultaneously, a third high energy beam to the joint to heat treat the welded joint; and



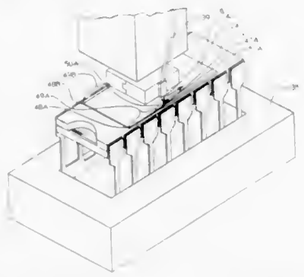
(e) repeating steps (b), (c) and (d) to completion and in sequence for the number of times required to form a reliable welded joint with acceptable mechanical properties between the workpieces.

4,914,269

METHOD OF SEALING A CERAMIC LID ON A CERAMIC SEMICONDUCTOR PACKAGE WITH A HIGH-POWER LASER

Larry D. Kinsman; Steven H. Laney, and Wade D. Jorgensen, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jul. 24, 1989, Ser. No. 384,029
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.64 **14 Claims**



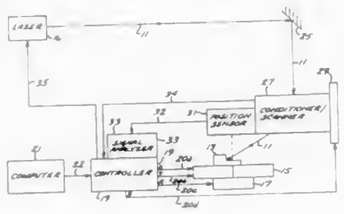
1. A method of sealing the die installation cavity of a ceramic semiconductor package body with a ceramic lid, comprising the following steps:
positioning the lid such that it completely covers the die installation cavity; and
simultaneously heating portions of the ceramic material around the perimeter of the lid and adjacent portions of the ceramic material of the package body with a beam of coherent light to a temperature sufficient to cause a fusing of the lid and body materials in the region so heated.

4,914,270

METHOD AND APPARATUS FOR SHAPING ARTICLES USING A LASER BEAM

Stephen M. Copley, Palos Verdes Estates, Calif.; Michael Bass, Winter Springs, Fla., and Ralph Hsu, Ottawa, Canada, assignors to University of Southern California, Los Angeles, Calif.

Filed Nov. 8, 1988, Ser. No. 268,770
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.68 **12 Claims**



1. Laser shaping apparatus for removing a succession of thin layers of material from a workpiece, the layers having accurately positioned and oriented side walls, to provide a stepwise approximation of a specified, contoured, three-dimensional shape, the apparatus comprising:
laser means for providing a laser beam having a wavelength that is absorbed by the workpiece;
beam conditioner means for conditioning the laser beam's state of polarization to an elliptically polarized state having a predetermined value for the ratio of the intensity of the beam's electric vector component perpendicular to a predetermined reference plane to the intensity of the beam's electric vector component parallel to the reference plane;
beam scanner means for focusing the beam relative to the workpiece and for scanning the focused beam repeatedly across the workpiece surface in a predetermined fashion; and translation and rotation means for moving the workpiece relative to the scanning beam so that the beam traces a predetermined scan pattern across a predetermined portion of the workpiece, to remove a thin layer of material from the workpiece surface and form an upright wall at an edge of the removed layer;
wherein the beam scanner means includes means for orienting the beam such that the beam makes a predetermined angle θ with an axis perpendicular to the layer plane, at its point of impingement on the workpiece surface adjacent to the wall, and such that the beam lies in a predetermined reference plane, normal to the layer plane, for at least part of each scan;
and wherein the angle θ and ratio r are selected such that a desired fraction of the beam's intensity is absorbed at all points along the wall, regardless of the wall's orientation relative to the reference plane.

4,914,271

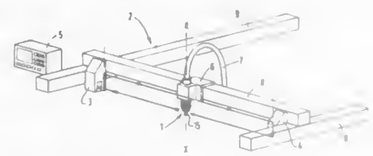
ARC WORKING TORCH AND MACHINE, AND CARTRIDGE FOR SAID TORCH

Michel Delzenne, Francoville, and Pierre Legrand, Pontoise, both of France, assignors to L'Air Liquide, Societe Anonyme pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France

Filed Jan. 10, 1989, Ser. No. 295,381
Claims priority, application France, Jan. 25, 1988, 88 00782
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121.48 **14 Claims**

12. Machine for working with an arc, comprising an arc torch and means for selectively positioning the torch, the torch comprising a torch body having an axis, an interchangeable

cartridge comprising an electrode and a nozzle, and connecting means between the body and the cartridge comprising means for axially inserting the cartridge in the body and means



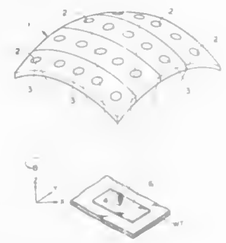
for locking the cartridge in position in the body; said machine further comprising a station for extracting used cartridges and a station for loading new cartridges.

4,914,272

LASER BEAM SOLDERING APPARATUS AND SOLDERING METHOD USING THE SAME

Yujiro Ito; Takashi Otobe, and Syunsuke Matsui, all of Kanagawa, Japan, assignors to Sony Coporation, Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,215
Claims priority, application Japan, Sep. 14, 1987, 62-140529[U]; Sep. 14, 1987, 62-230051
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.63 **13 Claims**



1. A soldering apparatus employing a laser beam comprising:
a plurality of laser beam irradiation units for irradiating a laser beam; and
means for providing a predetermined positional relationship among said laser units so as to focus a plurality of laser beams generated from said units onto a desired point, wherein said means defines a parabolic dish having a predetermined radius of curvature and includes a plurality of through openings for receiving said laser beam irradiation units, the axis of said openings intersecting said point.

4,914,273

HAIR PROCESSING APPARATUS UTILIZING A PLURALITY OF INFRARED UNITS POSITIONABLE ABOUT THE HEAD

Tadateru Matsui, Osaka, Japan, assignor to Takara Belmont Co., Ltd., Osaka, Japan

Continuation of Ser. No. 910,232, Sep. 19, 1986, abandoned, which is a continuation of Ser. No. 631,084, Jul. 16, 1984, abandoned. This application May 26, 1987, Ser. No. 56,262
Claims priority, application Japan, Dec. 16, 1983, 58-192857[U]
Int. Cl.[4] H05B *1/02, 1/00;* **A45D** *20/00;* **F26B** *3/30*
U.S. Cl. 219—222 **3 Claims**

1. Apparatus for processing hair on the head of a person, said apparatus including:
(a) a framework;
(b) mounting means for supporting said framework, said mounting means including adjustable means operable selectively positioning said framework vertically, and accurately relative to the person's head;
(c) first infrared radiating means adjustably carried by said framework for heating hair on one side of the person's head, said first infrared radiating means being independently positionable with respect to the one side of the person's head and said framework;
(d) second infrared radiating means carried by said framework for heating hair on the other side of the person's head, said second infrared radiating means being independently positionable with respect to the other side of the person's head and said framework;
(e) third infrared radiating means fixedly carried by said framework for heating hair on the back and top of the person's head, said third infrared radiating means being positionable with said framework;
(f) fourth infrared radiating means carried by said framework and above third infrared radiating means for heating hair on the top of the person's head, said fourth infrared radiating means being fixed with respect to said third infrared radiating means and positionable with said framework;
(g) control means carried by said framework for controlling said first, second, third and fourth infrared radiating means individually and collectively, said control means including a heat sensor carried by a support means extendable from said control means so as to be fixedly juxtapositioned in closely spaced proximity to the rear portion of the head of the person, said sensor when so supported serving as a reference point for adjusting the position of said first, second, third and fourth infrared radiating means relative to the person's head, and means responsive to said head sensor for turning off said first, second, third and fourth infrared radiating means collectively in response to said heat sensor sensing at least a predetermined temperature of the hair.

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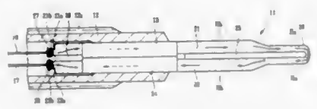
4,914,274
DIESEL ENGINE GLOW PLUG HAVING SIALON HEATER

Koji Hatanaka; Takashi Aota; Kenji Maruta; Hirohisa Suwabe, and Seiji Okazaki, all of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Shibuya and Hitachi Metals, Ltd., Chiyoda, both of, Japan

Continuation of Ser. No. 146,291, Jan. 20, 1988, abandoned. This application Jul. 19, 1989, Ser. No. 382,087
Claims priority, application Japan, Jan. 22, 1987, 62-11523; May 28, 1987, 62-81651[U]
Int. Cl.[4] F23Q *7/24*; F02P *19/02*; H05B *3/00*
U.S. Cl. 219—270 6 Claims

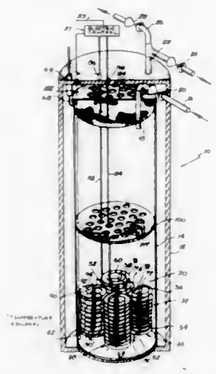


1. A glow plug for a diesel engine, comprising:
a hollow holder; and
a heater comprised of SiAlON extending through a distal end portion of said hollow holder and held thereby;
said heater being provided with an exposed U-shaped heating element and a pair of lead portions extending backward from both ends of said U-shaped heating element and parallel to each other, said heating element and said pair of lead portions being integrally made of a resistive ceramic material, one of said lead portions being coupled to one end of an electrically conducting flexible wire, a second end of said wire being coupled to an external connecting terminal extending into the other end of said holder, wherein a ratio (=SH/SL) of cross-sectional areas SH of the leg portions of the U-shaped heating element to cross-sectional areas SL of said lead portions falls with a range of $0.15 \leqq \epsilon \leqq 0.6$.

4,914,275
REGASIFIER

Robert A. Kramer, Crown Point, Ind., assignor to Northern Indiana Public Service Company, Hammond, Ind.

Filed Nov. 8, 1988, Ser. No. 268,800
Int. Cl.[4] F22B *1/28*
U.S. Cl. 219—275 16 Claims

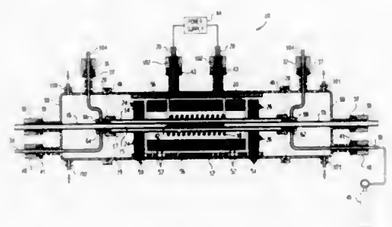


1. A regasifying apparatus comprising vessel means for receiving a quantity of liquified gas, and heating means within said vessel means for heating and gasifying the liquified gas, said heating means including heating members positioned within said vessel means for immersion in liquified gas said heating members comprising a first outer vertically and helically wound heating wire arranged in a generally upright coil and having a first predetermined diameter, and a second vertically and helically wound heating wire providing a coil within said first mentioned coil and having a diameter less than said first mentioned diameter, said first and second coils defining an annular flow passageway therebetween for heating and upwardly directing liquified gas to flow through said passageways at a sufficient velocity for sweeping gas bubbles from the surface of said coils and promoting liquid contact therewith thereby minimizing unstable boiling of the liquified gas.

4,914,276
EFFICIENT HIGH TEMPERATURE RADIANT FURNACE

David W. Blair, Princeton, N.J., assignor to Princeton Scientific Enterprises, Inc., Princeton, N.J.

Filed May 12, 1988, Ser. No. 193,725
Int. Cl.[4] H05B *3/64*
U.S. Cl. 219—390 17 Claims

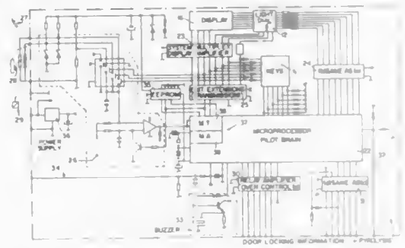


1. A radiant furnace apparatus comprising:
an inner tube which is substantially highly transmissive to radiant energy in the range from infrared to ultraviolet and which defines a working chamber for containing a workpiece;
an outer tube which is also substantially highly transmissive to radiant energy in the range from infrared to ultraviolet and which surrounds said inner tube and which forms an annulus therebetween for receiving a cooling fluid;
a source of said cooling fluid for supplying said annulus between said inner and outer tubes and for providing a flow of cooling fluid along the length of said inner and outer tubes;
an electrical resistance heating means connectable to a power supply and surrounding a spaced apart from said outer tube for providing radiant energy to said workpiece through said cooled inner and outer tubes;
radiation shielding means surrounding said heating means for reducing radiant loss and non-uniformity and for forming a uniform high temperature near blackbody radiant cavity about said heating means and said outer tube; and,
an outer shell surrounding said inner tube, said outer tube, said heating means and said shielding means for providing for maintenance of a controlled atmosphere about said heating means and said shielding means,
wherein the radiant energy produced by said electrical resistance heating means is transmitted to said workpiece through said substantially highly transmissive inner and outer tubes cooled by said cooling fluid so that the temperature of said workpiece approaches that of said electrical resistance heater means during operation.

4,914,277
ELECTRONIC CONTROL DEVICE FOR AUTOMATIC COOKING, INCLUDING LEARNING FOR HOME ELECTRIC OVEN

Jacky Guerin, Mertzwiller; Franck Darigny, Mittelhausbergen, and Paul Muller, Reichshoffen, all of France, assignors to De Dietrich et CIE, S.A., Niederbronn les Bains, France

Continuation-in-part of Ser. No. 923,342, Oct. 27, 1986, abandoned. This application Dec. 15, 1987, Ser. No. 132,587
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—506 13 Claims



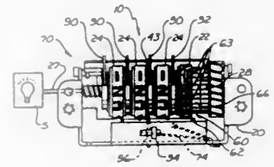
1. Electronic control for an electric home cooking oven comprising a cooking chamber with multiple cooking resistors, comprising base, chamber top, and turbine resistors, capable of being used in combination, characterized by the fact that it comprises:
power supply means for supplying electrical power to said resistors;
a microprocessor for managing the actions of the user on the keys and automatically controlling the application of voltage to the cooking resistors,
a control panel serving as keyboard for the microprocessor comprising keys and light dials of indicators of operation of each key, a display, a GO key and a STOP key, as well as an operation dial indicating the application of voltage to the cooking resistors, the control panel comprising a separate keyboard of memory keys,
a working memory being part of the microprocessor for storing the work parameters and using them as the cooking progresses,
a learning memory contained in the microprocessor for storing all the parameters of an experimental cooking as it is being executed,
a permanent EEPROM memory with several memory positions for selectively storing on command of the user or automatically during a stop in the course of cooking the parameters contained at a given moment in the learning memory.

4,914,278
INTERNALLY ILLUMINATED RESET COUNTER

Achim J. Rudolph, Glastonbury, and Arnold C. Johnson, West Hartford, both of Conn., assignors to Western Pacific Industries Inc., New York, N.Y.

Filed May 22, 1989, Ser. No. 355,986
Int. Cl.[4] G06C *5/02*
U.S. Cl. 235—10 19 Claims

1. An internally illuminatable reset counter comprising:
a plurality of counter wheels adapted to be rotatably driven, each of said counter wheels comprising a medial portion comprised of light transmissive material, an outer indicia rim and axially spaced portions of generally opaque material;
assembly means comprising an axially extending shaft for mounting said counter wheels to form a bank of co-axial rotatable counter wheels of increasing order, said shaft being formed of light transmissive material and comprising a series of axially spaced light distributing means for directing light generally radially from said shaft;
transfer means for rotatably advancing a higher order wheel in response to a pre-established angular rotation of a lower order wheel; and

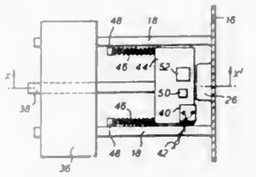


reset means for angularly rotatably resetting said counter wheels to a pre-established reference position,
so that a light source in optical communication with said shaft optically communicates axially along said shaft and generally radially through said indicia rim to highlight said indicia.

4,914,279
CARD READING APPARATUS HAVING A PASSIVE ELECTRICAL SPEED CONTROLLER

James C. R. Massey, Glasgow, Scotland, assignor to Unisys Corporation, Blue Bell, Pa.

Division of Ser. No. 868,755, May 30, 1986, abandoned. This application Jan. 19, 1989, Ser. No. 300,689
Claims priority, application United Kingdom, Dec. 5, 1985, 8530002
Int. Cl.[4] G06K *13/08*, *13/077*
U.S. Cl. 235—449 16 Claims



1. A card reading apparatus comprising:
guide means for guiding movement of a card along a path;
transducer means for detecting information recorded on said card as said card is moved along said path;
energy store means for elastically storing energy as said card is inserted into said guide means and moved along said path by an insertion force, said energy store means further for moving said card along said path towards expulsion from said guide means in response to removal of said insertion force; and
controller means for controlling the rate of movement of said card along said path;
said controller means comprising a D.C. electrical generator operative to produce across its output terminals and electromotive force proportional in sense and magnitude to the direction and velocity respectively of said card;
said generator having an electrical load including at least one unidirectional current conducting device connected across said output terminals, said unidirectional current conducting device being driven to a conducting state when the produced electromotive force reaches a predetermined magnitude.

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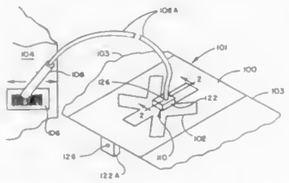
4,914,280
OPTICAL WAND INTERFACE TO FIXED SCANNER
Donald S. Peterson, Philomath, Oreg., assignor to Spectra-Physics, Inc., San Jose, Calif.
Filed Oct. 19, 1988, Ser. No. 259,890
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—472 8 Claims

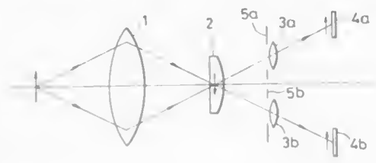


1. An electrically isolated interface for coupling electrical output signals representative of a bar code scanned by an optical wand to a fixed bar code scanner comprising:
- circuit means for amplifying said output signals received from said optical wand;
- light emitting means connected to said circuit means for generating light signals representative of said output signals; and
- support means for supporting said circuit means and said light emitting means such that said light signals are passed to an optical input of the fixed bar code scanner.

4,914,281
IDENTIFICATION APPARATUS FOR OPERATING SECURE EQUIPMENT
William M. Benton, Fort Lauderdale, and William Mee, Pompano Beach, both of Fla., assignors to Moneyfax, Inc., Ft. Lauderdale, Fla.
Filed Aug. 23, 1988, Ser. No. 236,612
Int. Cl.[4] G06K *19/06*
U.S. Cl. 235—492 10 Claims

1. Data processing apparatus for enabling/disabling secured equipment, comprising:
- a key adapted to interfit with a key receptacle provided at equipment to be secured;
- an integrated circuit including solid state memory means within said key for processing electrical signals;
- electrical contacts positioned on a periphery of said key to be in contact with corresponding electrical contacts in said receptacle;
- means for interconnecting said electrical contacts on said periphery with said integrated circuit; and
- an information bearing identification card coupled to the key, the card having stored thereon data corresponding to data stored in the integrated circuit.

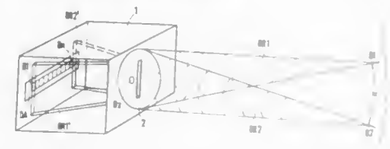
4,914,282
FOCUS DETECTION SYSTEM EMPLOYING MULTIPLE AREA LIGHT DISTRIBUTION SENSORS
Akira Akashi; Akira Ishizaki; Akira Hiramatsu; Yasuo Suda, all of Yokohama, and Keiji Obtaka, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 750,283, Jul. 1, 1985, abandoned. This application Jan. 9, 1989, Ser. No. 294,920
Claims priority, application Japan, Jul. 6, 1984, 59-140196; Jul. 11, 1984, 59-143722
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201.8 21 Claims



1. A focus detection system for detecting a focus state of an object lens, comprising:
- optical means for forming first and second light distributions respectively corresponding to first and second images having light reflective fluxes passing through the different parts of the object lens, whereby the positional relationship between said first and second light distributions varies in accordance with the focus state of the object lens;
- first and second sensing means for sensing said first and second light distributions, said first and second sensing means each having a plurality of sensor elements; and
- signal processing means for processing output signals from said first and second sensing means to detect the focus state of the object lens in accordance with the positional relationship between the two light distributions;
- said signal processing means processing the signals from said first and second sensing means in accordance with a predetermined formula to determine a degree of coincidence of the said light distributions, said signal processing means providing an output signal in accordance with the degree of similarity of said two light distributions, and said signal processing means detecting a focus state of the object lens by processing signals from two groups of sensor elements being provided in corresponding positions, and each having the same number of sensor elements, which number is smaller than the total number thereof.

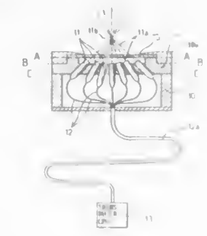
4,914,283
CIRCUIT ARRANGEMENT FOR EVALUATING THE OUTPUT OF A PHOTODIODE UNIT
Willi Brinckmann, Tamm, and Siegfried Nestel, Stuttgart, both of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands
Filed Jan. 26, 1989, Ser. No. 302,544
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1988, 3802450
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—206.01 4 Claims

1. A circuit arrangement for determining the angle of incidence of optical radiation, comprising
- a plurality of closely spaced photodiodes which each have a respective individual field of view corresponding to optical radiation having a different respective range of said angle of incidence,
- central photodiode means having a combined field of view which includes all said individual fields of view,
- a plurality of analog comparators, each having an input coupled to a respective one of the outputs from said plurality of photodiodes, a second input of each of the analog comparators being coupled to a common reference voltage,
- a first analog comparator having an input coupled to the central photodiode means and a second input also coupled to the common reference voltage,



reference control means responsive to the output from the central photodiode means, for varying said common reference voltage in accordance with the intensity of radiation detected by the central photodiode.

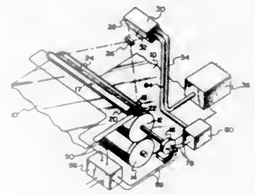
4,914,284
OPTICAL WIDE ANGLE SENSOR HEAD
Thorstein Halldorsson; Konrad Altmann, both of Munich, and Ernst-August Seiffarth, Taufkirchen, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany
Filed Oct. 25, 1988, Ser. No. 262,480
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1987, 3736616
Int. Cl.[4] G01J *1/20*; H01J *5/16*
U.S. Cl. 250—206.2 16 Claims



1. An optical wide angle sensor head for directionally sensing optical radiation, comprising housing means for mounting said sensor head, a plurality of individual optical elements (11) for said sensing, each optical element having its own light entrance and field of view and its individual optical axis, and means for mounting said individual optical elements in said housing means in such positions, that said individual optical axes converge in an intersection (11*b*) forming an origin of a three-dimensional coordinate system as a reference system of said wide angle sensor head, said intersection (11*b*) being located upstream of said light entrances as viewed in a direction of incident light entering said light entrances.

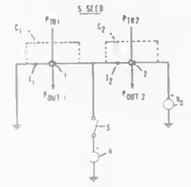
4,914,285
CONTROL MEANS FOR WEB SCANNING APPARATUS
Leon R. Zoeller, Hamlin, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 27, 1988, Ser. No. 289,873
Int. Cl.[4] G01J *1/32*
U.S. Cl. 250—205 4 Claims

1. In an apparatus for scanning a transverse region of a moving web, said apparatus comprising:
- (a) driving means for moving said web along a predetermined path;
- (b) scanning means for scanning successive transverse scanning regions of said web during respective successive scanning intervals as said web is moved past said scanning means by said drive means; and
- (c) illumination means for illuminating the illumination region of said web scanned by said scanning means, the improvement means comprising;



- (d) sensing means for sensing the speed at which said moving web moves past said scanning means; and
- (e) illumination intensity control means for adjusting the intensity of the illumination provided by said illumination means as a function of the web speed sensed by said sensing means so that each scanned web region receives the same amount of light from said illumination means during each scan interval regardless of web speed.

4,914,286
METHOD AND APPARATUS FOR INCREASING THE PROCESSING CAPACITY OF OPTICAL DIGITAL PROCESSING SYSTEMS HAVING OPTICALLY BISTABLE DEVICES
Leo M. F. Chirovsky, Bridgewater, N.J.; Anthony L. Lentine, St. Charles, Ill., and David A. B. Miller, Fair Haven, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Apr. 20, 1989, Ser. No. 340,975
Int. Cl.[4] H01J *31/50*
U.S. Cl. 250—213 A 23 Claims



1. A method for increasing the processing capacity of an optical digital processing system, the optical digital processing system having at least one optically bistable device responsive to an optical input signal and having a metastable state between two stable states, characterized by the steps of:
- applying a stimulus to force the optically bistable device into the metastable state;
- applying the optical input signal to the device; and,
- removing the stimulus.

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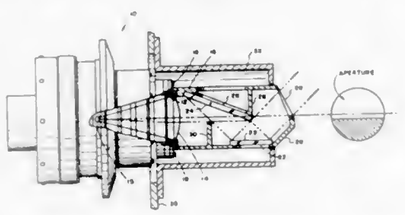
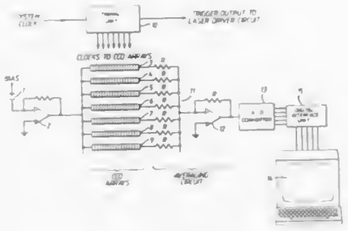
4,914,287
LASER RADIATION PROTECTED HORIZON SENSOR WITH SUCCESSIVE RESTSTRAHLEN
Robert C. Savoca, Ridgefield, Conn., assignor to Barnes Engineering Company, Shelton, Conn.
Filed Jul. 19, 1988, Ser. No. 221,101
Int. Cl.[4] H01J 3/14
U.S. Cl. 250—216 14 Claims



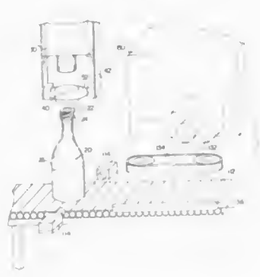
1. A laser radiation protected horizon sensor for scanning a distant line of discontinuity in optical radiation by a detector sensitive to such radiation and using the signals generated by the detector in crossing the line of discontinuity in optical radiation for attitude control of moving bodies comprising:
a detector sensitive to optical radiation,
a rotary scanning means having two successive Reststrahlen reflecting means in optical alignment with said detector for scanning and reflectively applying predetermined optical radiation from the field of view scanned by said two successive Reststrahlen reflecting means which includes said line of discontinuity,
said Reststrahlen reflecting means reflecting radiation from said line of discontinuity in optical radiation and attenuating other optical radiation by preventing significant amounts of laser radiation from reaching said detector.

4,914,288
OPTICAL SENSING SYSTEM WITH AVERAGING CIRCUIT
John P. Dakin, Hampshire, Great Britain, assignor to Plessy Overseas Limited, Ilford, Great Britain
PCT No. PCT/GB87/00898, § 371 Date Oct. 11, 1988, § 102(e) Date Oct. 11, 1988, PCT Pub. No. WO88/04407, PCT Pub. Date Jun. 16, 1988
PCT Filed Dec. 11, 1987, Ser. No. 229,890
Claims priority, application United Kingdom, Dec. 11, 1986, 8629635
Int. Cl.[4] G01N 21/00
U.S. Cl. 250—227.11 4 Claims



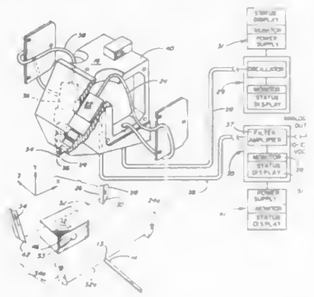
1. A multi-channel signal averaging circuit arrangement as for use with optical sensing systems utilizing back-scattered light return signals for establishing the scattering profile along a fibre sensor, in which the circuit arrangement comprises a plurality of charge-coupled-device arrays each consisting of a multiplicity of devices capable of storing all the successive elements of a signal waveform (e.g. corresponding to the return optical signal of back-scattered light in an optical sensing system), in which the charge-coupled-device arrays are arranged to be rendered operative sequentially for storing successive incoming signal waveforms under the control of timing means and in which, following the storage of a predetermined number of signal waveforms in the respective charge-coupled-device arrays, groups of signal waveform elements data stored in devices of the charge-coupled device arrays are fed sequentially under the control of clock pulses from said timing means into an averaging circuit arrangement prior to being fed into a processor for providing an indication of the averaged signal waveforms in respect of the successive incoming signal waveforms to the circuit arrangement.

4,914,289
ARTICLE INSPECTION SYSTEM FOR ANALYZING END AND ADJACENT SIDES
Cap V. Nguyen, Lantana; Tyce Fitzmorris, Lake Park; Eric Espenhahn, West Palm Beach; all of Fla.; Dale W. Kline, Hatfield, Pa., and Roger Chang, Fort Lauderdale, Fla., assignors to Inex-Vistech Technologies Incorporated, Riveria Beach, Fla.
Filed Oct. 26, 1988, Ser. No. 262,885
Int. Cl.[4] G01N 9/04
U.S. Cl. 250—223 B 24 Claims



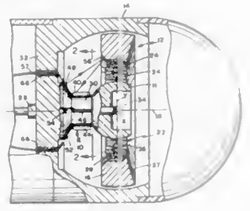
1. A method for inspecting successive articles, each having an end and sides adjacent the end, comprising the steps of:
placing the article at an inspection station having an optical system directed toward the end, the optical system producing a focused image wherein each point viewed on the article is focused to a corresponding point in the focused image, the optical system defining a line of view toward the end, and defining light rays directed obliquely toward the side, each focused to a point in said image;
collecting with the optical system a two dimensional image of the end of the end and the sides, said image being a focused but spatially distorted view of the end and the sides wherein the sides appear folded up adjacent the end; and,
discriminating among the articles by recognizing features appearing in the two dimensional image.

4,914,290
METHOD AND APPARATUS FOR MEASURING OF MICRODISTANCES
Michael J. Hilgart, Westmont, and John M. Mucci, Schaumburg, both of Ill., assignors to Dukane Corporation, St. Charles, Ill.
Filed Apr. 6, 1988, Ser. No. 178,123
Int. Cl.[4] G01B 11/14
U.S. Cl. 250—227.30 29 Claims



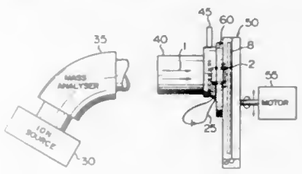
17. A sensor of the position of small objects, which comprises:
a light emitting source; a light sensing fiber positioned in spaced relation from said source to receive light therefrom; light detecting means optically connected to said light sensing fiber; and means for moving said sensor in steps of predetermined micromotion to a position where a small object blocks light from said source from reaching said light sensing fiber.

4,914,291
GIMBAL ANGLE DETECTOR
Philip T. Kan, and William R. Yueh, both of Fullerton, Calif., assignors to General Dynamics Corporation, Pomona Div., Pomona, Calif.
Filed Apr. 29, 1988, Ser. No. 188,580
Int. Cl.[4] G01D 5/34
U.S. Cl. 250—231.12 6 Claims



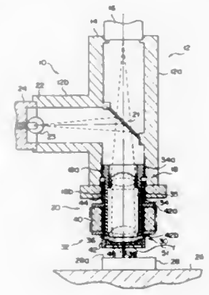
1. Apparatus for detecting deflection of the spin axis of a gimbal shaft supported spinning mass relative to the gimbal axis, comprising:
a gimbal shaft supported spinning mass;
a total of four equally spaced linear arrays of radiation receiving elements mounted on said gimbal shaft to extend parallel to the gimbal axis of said gimbal at 90 degree intervals, each array consisting of a single line of spaced elements;
a total of four radiation sources, each mounted in alignment with a respective one of said arrays; and
a reflective surface on said spinning mass for reflecting radiation from said sources onto respective aligned ones of said arrays according to the deflection of the spin axis of said spinning mass, whereby deflection of the spin axis from the gimbal axis will be registered by displacement of the detected radiation in at least one of said arrays.

4,914,292
ION IMPLANTING APPARATUS
Tadamoto Tamai, Tokyo, and Masatoru Sato, Saijo, both of Japan, assignors to Sumitomo Eaton Nova Corporation, Tokyo, Japan
Filed Jun. 13, 1988, Ser. No. 206,055
Claims priority, application Japan, Jul. 2, 1987, 62-163952
Int. Cl.[4] H05H 3/00
U.S. Cl. 250—251 8 Claims



1. An ion implanting apparatus for implanting ions into a workpiece, comprising:
(a) a vacuum chamber for forming an evacuated space;
(b) support means for supporting a workpiece in the vacuum chamber;
(c) means for generating and accelerating an ion beam, and ion introducing channel means for directing the ion beam onto the workpiece;
(d) an electrically conducting member having an open internal space and surrounding the ion beam in the vacuum chamber and having an open end extending to a position close to a surface of the workpiece; and
(e) an electron shower for supplying electrons to the space in said conducting member.

4,914,293
MICROSCOPE APPARATUS
Masakazu Hayashi, Yokohama; Fumihiko Ishida, Kawasaki, and Junzou Utida, Fuji, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 1, 1989, Ser. No. 317,465
Claims priority, application Japan, Mar. 4, 1988, 63-50891; Aug. 29, 1988, 63-214104
Int. Cl.[4] H01J 37/00
U.S. Cl. 250—306 39 Claims



1. A microscope apparatus for observing an observation surface of a sample by utilizing the tunnel effect, comprising:
a microscope body;

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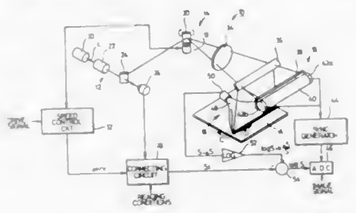
objective optical means attached to the body and including an objective lens facing the observation surface, for forming an optical image of the observation surface viewable through the body;
a fine conductive tunneling tip;
support means for supporting the tip substantially parallel to an optical axis of the objective lens, within a region between the objective lens and the observation surface;
shift means for shifting the tip and the sample relative to each other;
means for applying a voltage between the sample and the tip so that a fine tunnel current flows between the sample and the tip; and
means for measuring the fine tunnel current while the sample and the tip shift are shifted relative to each other.

4,914,294

METHOD OF AND APPARATUS FOR CORRECTING IMAGE SIGNAL

Nobotaka Fukai, and Akira Yamaguchi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 28, 1988, Ser. No. 250,189
Claims priority, application Japan, Sep. 28, 1987, 62-244832
Int. Cl.[4] G01N *23/04*
U.S. Cl. 250—327.2 9 Claims



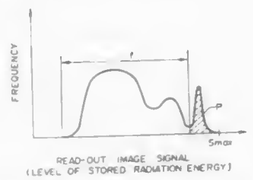
1. A method of correcting an image signal read by scanning a stimulable phosphor sheet on which radiation image information is recorded, with a stimulating light beam to cause the stimulable phosphor sheet to emit light representative of the recorded radiation image information, and photoelectrically detecting the emitted light, said method comprising the steps of:
determining a change in the scanning speed at which the stimulable phosphor sheet is scanned with the stimulating light beam;
receiving reading conditions used to read said recorded radiation image information, and producing a corrective coefficient with respect to said reading conditions, said reading conditions including at least one of the density of scanning lines produced on the stimulable phosphor sheet by the stimulating light beam, the time in which to apply the stimulating light beam to the stimulable phosphor sheet per unit area thereof, and the type of the stimulable phosphor sheet;
producing a corrective signal based on the change in the scanning speed and said corrective coefficient; and
correcting said image signal with said corrective signal.

4,914,295

RADIATION IMAGE READ-OUT AND IMAGE SIGNAL STORING APPARATUS

Kazuo Shimura, and Masamitsu Ishida, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 877,450, Jun. 23, 1986, abandoned.
This application Jan. 30, 1989, Ser. No. 302,992
Claims priority, application Japan, Jun. 25, 1985, 60-138793; Jun. 25, 1985, 60-138794
The portion of the term of this patent subsequent to Oct. 6, 2005, has been disclaimed.
Int. Cl.[4] G01T *1/105*
U.S. Cl. 250—327.2 5 Claims



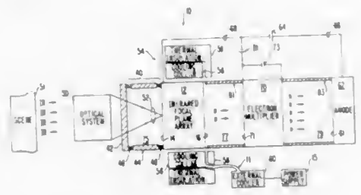
1. A radiation image read-out and image signal storing apparatus which includes:
(i) a stimulating ray emission means for emitting stimulating rays onto a stimulable phosphor sheet carrying a radiation image of an object stored thereon,
(ii) a light detection means for photoelectrically detecting light emitted by the stimulable phosphor sheet in proportion to the stored radiation energy when the stimulable phosphor sheet is exposed to the stimulating rays, and
(iii) a recording means for storing read-out image signals generated by the light detection means on an image file,
wherein the improvement comprises the provision of:
(iv) a histogram creation means for creating a histogram of said read-out image signals,
(v) a histogram analysis means for determining a range of said read-out image signals outside of a peak region arising in the vicinity of the maximum signal value and/or the minimum signal value in said histogram, and
(vi) an image signal selection means positioned between said light detection means and said recording means for receiving a signal representing said range of said read-out image signals generated by said histogram analysis means and selecting only the image signals within said range from said read-out image signals.

4,914,296

INFRARED CONVERTER

Ralph R. Reinhold, and Melvin G. Wode, both of Huntsville, Ala., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 21, 1988, Ser. No. 184,190
Int. Cl.[4] G01J *5/00*; H01J *31/50*
U.S. Cl. 250—330 14 Claims



1. An infrared converter for converting infrared radiation

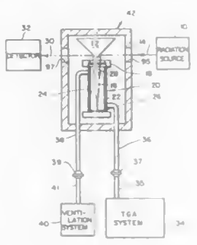
emanating from a scene being viewed into a beam of electrons, comprising:
(A) an infrared focal plane array having opposed first and second surfaces, the array including:
an infrared transparent window having opposed first and second surfaces, said first surface of said infrared transparent window being said first surface of said array, said infrared transparent window being substantially transparent to infrared radiation emanating from the scene being viewed;
an electrically conductive window disposed on the second surface of said infrared transparent window, said electrically conductive window being substantially opaque to infrared radiation and including one or more transmissive areas substantially transparent to infrared radiation;
a photoconductor layer disposed on said conductive window for changing resistivity in response to infrared photons incident thereon;
an interface layer disposed on said photoconductor layer; and
an emitter layer disposed on said interface layer for emitting electrons, said interface layer providing ohmic contact between said photoconductor layer and said emitter layer;
(B) an anode disposed in spaced relation to said electron emitter; and
(C) anode supply means for establishing an electric field between said anode and said electron emitter, said electric field attracting electrons emitted from said emitter to said anode.

4,914,297

INFRARED SPECTROMETER INTERFACE FOR THERMOGRAVIMETRIC ANALYSIS

Richard C. Wieboldt, Verona, and Gregory E. Adams, Madison, both of Wis., assignors to Nicolet Instrument Corporation, Madison, Wis.

Filed Dec. 23, 1987, Ser. No. 137,452
Int. Cl.[4] G01N *21/01*
U.S. Cl. 250—343 9 Claims



1. A flow-through gas cell unit for use in infrared spectrometry, comprising:
(a) an elongated tubular glass cell body having first and second ends and a wall defining an internal bore;
(b) glass inlet and outlet transfer lines integrally fused to the cell body to form a single unit, the inlet and outlet transfer lines having channels for flowing a gas therethrough which communicate with the internal base of the cell body;
(c) a window element for allowing passage of a radiation beam into and out of the cell body, the window element mounted at the first end of the cell body; and
(d) a mirror element for reflecting the radiation beam, the mirror element mounted at the second end of the cell body such that substantially all of the radiation beam passing into the window element of the cell body is reflected by the mirror element out of the window element for analysis, wherein the window element and mirror element are releasably secured to the ends of the cell body by support rods extending between the window element and mirror element.

4,914,298

INFRARED DETECTOR WITH DIRECTION IDENTIFICATION CAPABILITY

Reiner Quad, Tannenstein, and Karlheinz Storck, Lorch, both of Fed. Rep. of Germany, assignors to Heimann GmbH, Fed. Rep. of Germany

Filed Apr. 1, 1988, Ser. No. 176,454
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1987, 8705296
Int. Cl.[4] G01S *7/50*
U.S. Cl. 250—349 2 Claims

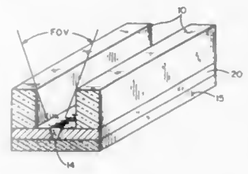
1. An infrared detector system comprising:
a plurality of infrared radiation-sensitive elements disposed at the corners of a square on which radiation from a moving radiation source is incident in a sequence, each infrared radiation-sensitive element generating an output signal corresponding to the radiation incident thereon;
means for detecting a maximum in the output signal for each infrared radiation-sensitive element and generating a normalized pulse upon the occurrence of said maximum;
means for generating a series of said normalized pulses for all of said infrared radiation-sensitive elements; and
means for generating a signal identifying the direction of movement of said radiation source based on the sequence and chronological spacing of said normalized pulses.

4,914,299

GLASS COLD SHIELD

David L. Jungkman, Hudson, N.H., and James W. Howard, Natick, Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 9, 1988, Ser. No. 269,121
Int. Cl.[4] G01J *5/02*; H01L *31/00*
U.S. Cl. 250—352 8 Claims



1. An electromagnetic radiation detection system comprising:
(a) optics for viewing a scene, the optics providing a field-of-view of the scene;
(b) a linear array of detectors mounted in the path of the field-of-view of the optics for producing electrical signals

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representative of electromagnetic radiation impinging on the detectors;

(c) a shield comprising a pair of glass rods mounted in a parallel relationship to each other and to the linear array of detector elements so as to shield the array from interfering electromagnetic radiation generated outside of the field-of-view of the detectors along the length of the array;

(d) cooling means for the array of detectors and the shield; and

(e) electro-optics coupled to the electrical output of the array for forming a display of the scene viewed by the optics.

4,914,300

SCINTILLATION SPECTROMETER

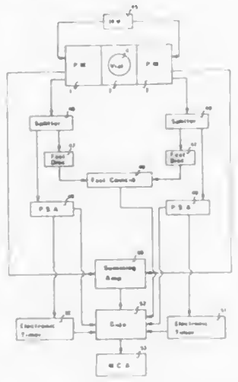
Yeboshua Kalish, 27 Ha'aztmaut St., Hod HaSharon, Israel

Filed Apr. 4, 1988, Ser. No. 177,111

Claims priority, application Israel, Sep. 9, 1987, 83847

Int. Cl.[4] G01T *1/20*

U.S. Cl. 250—369 7 Claims



1. An alpha-beta-gamma scintillation spectrometer comprising:

a scintillation crystal,

two photomultiplier tubes coupled to the scintillation crystal,

means for the detection of a slow pulse originating from said crystal,

a multichannel analyzer for registering and storing coincident pulses from both of said photomultiplier tubes, and

inhibition circuit means for inhibiting delayed light emission background pulses originating from the crystal from passing to said multi-channel analyzer of said spectrometer for a period of about 1 to about 20 msec following the detection of a slow pulse originating from said crystal.

4,914,301

X-RAY DETECTOR

Yoshimi Akai, Yaita, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 15, 1988, Ser. No. 182,233

Claims priority, application Japan, Apr. 21, 1987, 62-96184; Aug. 6, 1987, 62-198812

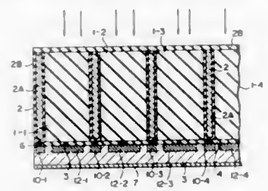
Int. Cl.[4] G01T *1/24*; H01L *27/14*

U.S. Cl. 250—370.01 24 Claims

1. An X-ray detecting device comprising:

a plurality of converting elements for converting incident X-rays into light rays, each of the converting elements having a first surface from which the light rays emerge, said converting elements being arranged in an array;

a semiconductor structure having a second surface, said semiconductor structure including a plurality of semiconductor light detecting regions formed in the second surface and spaced from one another to form a corresponding plurality of intermediate regions in the second surface between the respective detecting regions, each of the detecting regions being positioned substantially adjacent to a corresponding one of the converting elements to receive light rays emerging from the first surface of that converting element and convert the light rays into an



electrical signal, said semiconductor structure further including a plurality of trap regions formed in respective ones of the intermediate regions of the second surface for substantially confining the electrical signals to the respective detecting regions;

first electrode means, formed on said semiconductor structure and coupled to the detecting regions, for outputting the electrical signals from the respective detecting regions; and

second electrode means, formed on said semiconductor structure and coupled to the trap regions, for controlling the electrical potential of the trap regions.

4,914,302

RADIATION IMAGE DETECTING APPARATUS

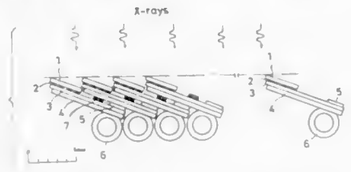
Motosada Kiri, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed May 16, 1988, Ser. No. 194,291

Claims priority, application Japan, May 15, 1987, 62-119766

Int. Cl.[4] G01T *1/22*; G01J *1/00*

U.S. Cl. 250—370.15 1 Claim



1. A radiation image detecting apparatus having its radiation image receiving portion composed of arrayed unit radiation sensors for the purpose of detecting a radiation image with the same divided into pixels, said radiation image detecting apparatus comprising:

a plurality of radiation detector units each of which consists of said unit radiation sensor and a semiconductor chip carrying thereon an integrated circuit for processing output signals from said unit radiation sensor, both said unit radiation sensor and said semiconductor chip assembled in one body by mounting said unit radiation sensor on one end of said semiconductor chip, said radiation detector units being arrayed two-dimensionally with their respective units radiation sensors exposed;

a plurality of first cooling pipes each of which prolonged along each row of said radiation detector units arrayed two-dimensionally and has thermal contact with the semiconductor chips of the radiation detector units belonging to the same row, said first cooling pipes allowing a liquid coolant to flow therethrough; and

a plurality of second cooling pipes, each of which is prolonged along each row of said radiation detector units arrayed two-dimensionally and being inserted in the clearances made between the upper and the lower surfaces of the radiation detector units belonging to two adjacent rows of said radiation detector units arrayed two-dimensionally, said second cooling pipes, which are to allow a gaseous coolant to flow therethrough, being made of a porous material for the purpose of letting said gaseous coolant leak in the form of turbulent gas streams while said gaseous coolant flows through said second cooling pipe.

4,914,303

X-RAY INTENSIFIER FOIL

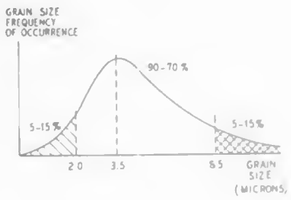
Wolfgang Knuepfer, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 22, 1987, Ser. No. 111,652

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1987, 3707863

Int. Cl.[4] G01T *1/00*

U.S. Cl. 250—483.1 13 Claims



1. An x-ray intensifier foil comprising:

a substrate;

a luminophore consisting of grains having the composition of grains having the composition $Gd_2O_2S:Tb$, the mean grain size of the luminophore is approximately 3.4 microns to about 3.6 microns with approximately 5% to about 15% of the luminophore grains having a size greater than 6.5 microns and approximately 85% to about 95% having a size greater than 2 microns and said luminophore otherwise having a scattered grain size distribution;

a bonding agent, the luminophore grains being embedded in the bonding agent and the bonding agent being applied to the substrate; and

a protective film for covering the luminophore and bonding agent.

4,914,304

CHARGED-BEAM EXPOSURE SYSTEM

Kiyomi Koyama, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 114,039, Oct. 29, 1987, abandoned. This application Aug. 14, 1989, Ser. No. 394,160

Claims priority, application Japan, Oct. 31, 1986, 61-259709

Int. Cl.[4] H01J *37/302*

U.S. Cl. 250—492.2 9 Claims

1. A charged-beam vector scanning exposure system for applying a charged beam onto a target, thereby to draw a pattern having identical segment patterns wherein each of said segment patterns are exposed at a predetermined location on said target, said system comprising:

beam-emitting means for emitting a charge beam;

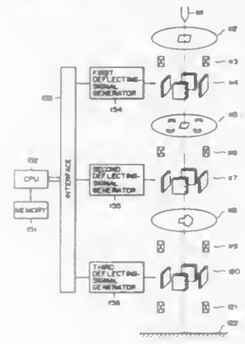
an electrooptical system for applying a charged beam onto a target, said electrooptical system having a beam path in which the charged beam passes, and including:

first deflection means arranged along said beam path, for deflecting the charged beam;

first mask means arranged in said beam path, for receiving the charged beam deflected by said first deflection means, and having a first aperture, and at least one auxiliary aperture located close to said first aperture, for shaping said charged beam;

second deflection means arranged along said beam path for deflecting the charged beam;

second mask means arranged in said beam path, for receiving the charged beam deflected by said second deflection means, and having a second aperture for shaping said charged beam wherein said second aperture is larger than any one of said at least one auxiliary aperture so that a



beam passing through any one of said at least one auxiliary aperture is not shaped by said second aperture; and

electron lens means for forming the images of the first, second and auxiliary apertures on the target; and

drive signal-generating means for generating first and second drive signals for driving said first and second deflection means, said first drive signal driving said first and second deflection means such that the charged beam passes through said first and second apertures, whereby the image of said first and second apertures are superposed to thereby form a prescribed pattern segment on the target, and said second drive signal driving said first and second deflection means such that charged beam passes through said auxilliary aperture and said second aperture, thereby to form the image of said auxiliary aperture on the target as one of said identical pattern segments.

4,914,305

UNIFORM CROSS SECTION ION BEAM SYSTEM

Victor M. Benveniste, Magnolia, and Raymond P. Boisseau, Waltham, both of Mass., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 4, 1989, Ser. No. 293,334

Int. Cl.[4] H01J *37/00*

U.S. Cl. 250—492.3 8 Claims

1. An ion implantation system having apparatus for defining an ion beam used in treating a wafer comprising:

(a) an ion source for providing a plurality of relatively small cross section ion beams which combine to form a larger beam having a cross section on the order of a wafer surface to be treated;

(b) an ion distribution control including a plurality of spaced beam electrodes that selectively deflect ions in the small cross section ion beams;

(c) a magnet for analyzing ions leaving the intensity control

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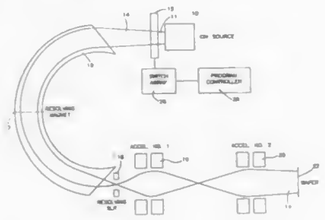
and for directing certain ions to follow a wafer treatment trajectory;

(d) a wafer treatment station for placing wafers in a position to intercept said certain ions after said ions exit the mass analyzer; and



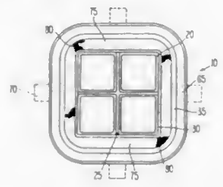
(e) switching means coupled to the ion distribution control for individually controlling biasing potentials of the beam electrodes to provide a controlled ion distribution of ions impacting a wafer surface at the wafer treatment station.

4,914,306

VERSATILE COMPOSITE RADIATION SHIELD

Kenneth H. Dufrane, 7 Holly La., Avon, Conn. 06001, and Kevin R. Kingsley, 45 King St., Danbury, Conn. 06811

Filed Aug. 11, 1988, Ser. No. 231,252
Int. Cl.[4] G21F *5/00*
U.S. Cl. 250—506.1 32 Claims



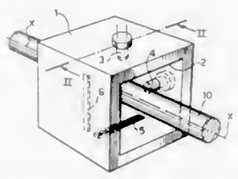
12. The container for containment of radioactive material defined in claim 11 wherein the second material is solid at normal operating temperatures.

4,914,307

OPTOELECTRONIC DEVICE FOR CONTACTLESS MEASUREMENT OF THE DIMENSIONS OF OBJECTS

Veselin Kmev, Turin, Italy, assignor to Artos Italia S.p.A., Turin, Italy

Filed May 18, 1988, Ser. No. 195,314
Claims priority, application Italy, May 18, 1987, 67430 A/87
Int. Cl.[4] G01N *21/86*
U.S. Cl. 250—560 5 Claims



1. A device according to the contactless measuring of the dimensions of an object comprising an opaque hollow body with an opening for the introduction of the object to be measured,

at least one radiation emitter diode and a linear photovoltaic cell for generating an electrical signal indicative of the quantity of radiation received; the emitter diode and the photovoltaic cell being arranged in the cavity of the body in a common plane perpendicular to the direction of introduction of the object to be measured so that, in use, an object introduced into the body in the predetermined direction of introduction can be interposed between the emitter diode and the photovoltaic cell so as to project on to the latter a shadow which is a function of its transverse dimensions.

4,914,308

WEB DEFECT SCANNING APPARATUS WITH INCANDESCENT ILLUMINATION MEANS

Neil A. Hochgraf, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 27, 1988, Ser. No. 289,872
Int. Cl.[4] G01N *21/88*
U.S. Cl. 250—572 4 Claims

1. In an apparatus for scanning a transverse region of a moving web, said apparatus comprising:

(a) driving means for moving said web along a predetermined path;

(b) scanning means for scanning said web within a predetermined scanning region transverse to said web and said path; and

(c) illumination means for illuminating said web within said scanning region; the improvement in said illumination means comprising:

(d) an elongate incandescent lamp located adjacent said scanning region, said lamp including an elongate light producing filament supported only at its ends and resiliently tensioned to maintain said filament in straight parallel condition in generally parallel relation to said scanning region; and

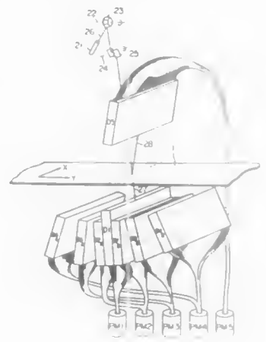
(e) optical means having a focal point axis coincident with said filament for directing light from said filament to said scanning region.

4,914,309

DISCRIMINATING TYPE FLAW DETECTOR FOR LIGHT-TRANSMITTING PLATE MATERIALS

Okafuji Masaharu; Takeoka Tatsuo; Ichinose Nagayoshi, all of Dosho; Abe Junichi, Ohaza-Kamifujisawa; Miyano Mitsuo, Ohaza-Kamifujisawa, and Tanaka Kenji, Ohaza-Kamifujisawa, all of Japan, assignors to Nippon Sheet Glass Co., Ltd. and Kabushikikaisha Yaskawa Denki Seisakusho, both of, Japan

PCT No. PCT/JP88/00502, § 371 Date Mar. 20, 1989, § 102(e) Date Mar. 20, 1989, PCT Pub. No. WO88/09497, PCT Pub. Date Dec. 1, 1988
PCT Filed May 25, 1988, Ser. No. 298,747
Claims priority, application Japan, May 27, 1987, 62-128089; May 27, 1987, 62-128090; May 28, 1987, 62-129639; May 28, 1987, 62-129641; May 28, 1987, 62-129644; May 28, 1987, 62-79978; May 29, 1987, 62-131524
Int. Cl.[4] G01N *21/47*
U.S. Cl. 250—572 9 Claims



1. A discriminating type flaw detector for light-transmitting plate materials comprising

light-spot scanning means for scanning a travelling light-transmitting plate material with a light spot;

light-receiving means having a plurality of light receptors each for receiving each of more than two types of light among transmitted light, transmitted and diffused light, reflected light and reflected and diffused light from said light-transmitting plate material scanned by said light spot;

photoelectric converting means having a plurality of photoelectric converters each connected to each of said light receptors for converting light received by said corresponding light receptor into an electrical signal;

flaw data generating means for processing said electrical signal from said photoelectric converting means to generate flaw data containing information on the types and sizes of flaws existing in said light-transmitting plate material;

flaw data acquisition means for collecting flaw data from said flaw data generating means, combining and processing said collected flaw data to form a flaw pattern indicating the types and sizes of flaws and a flaw location data; and

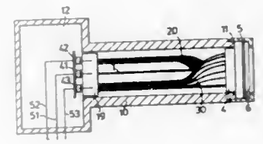
information processing means for comparing said flaw pattern with a flaw discriminating pattern table stored in advance to discriminate at least the types and sizes of flaws and discriminate flaw locations based on said flaw location data.

4,914,310

METHOD AND APPARATUS FOR MEASURING PARTICLE CONCENTRATION IN A SUSPENSION

Dieter Jarofski, Lithonia, Ga., assignor to Bonnier Technology Group, Inc., Decatur, Ga.

Filed Feb. 21, 1989, Ser. No. 313,394
Claims priority, application Sweden, Feb. 22, 1988, 8800599
Int. Cl.[4] G01N *15/06*
U.S. Cl. 250—574 15 Claims



1. A method of measuring concentration of particles suspended in a fluid, comprising directing radiation energy into to the fluid and measuring the intensity of the energy scattered by the particles, characterized by measuring the intensity at a first position located relatively near to an emission position where energy is directed into the fluid, and also at a second position located relatively far from said emission position, and calculating as a measure of the concentration,

$$\operatorname{arctanh}(E_f/E_n)$$

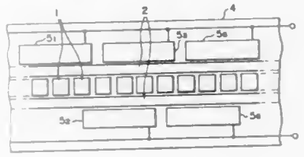
wherein E_n is the energy intensity at said first relatively near position and E_f is the energy intensity at said second relatively far position.

4,914,311

INTEGRATED SEMICONDUCTOR IMAGER CIRCUITS WITH UNIFORM TEMPERATURE DISTRIBUTION

Yukio Kinoshita; Tadakuni Narabu, and Masahide Hirama, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 25, 1988, Ser. No. 147,535
Claims priority, application Japan, Feb. 23, 1987, 62-039776
Int. Cl.[4] H01J *40/14*; H01L *29/78, 27/14, 31/00*
U.S. Cl. 250—578.1 7 Claims



1. A linear sensor formed on a semiconductor chip, comprising:

imager means for converting received light into signal charges;

charge transfer means disposed on two opposite sides of said imager means for transferring said signal charges; and

a plurality of calorific circuit elements composing a timing generator and plural drive circuits for said charge transfer means, said calorific circuit elements being divided into plural segments and arranged dispersedly around said imager means and said charge transfer means, in order to provide uniform temperature distribution of said imager means and said charge transfer means.

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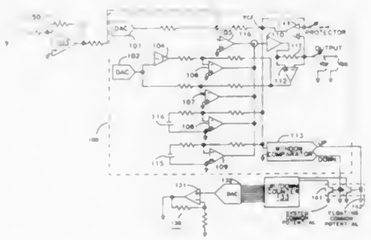
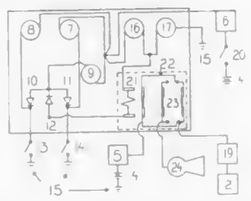
4,914,312
PULSED POWER SUPPLY FOR DETERMINING BREAKDOWN VOLTAGE
Hideo Akama, Hachiojishi; Norio Sone, Tachikawashi, and Masaharu Goto, Tachikawa, all of Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Feb. 10, 1989, Ser. No. 309,755
Claims priority, application Japan, Dec. 2, 1988, 63-30215
Int. Cl.[4] H02J *3/00*
U.S. Cl. 307—5 2 Claims



2. A voltage source comprising:
a slowly variable voltage supply for providing a voltage of a given magnitude,
a rapidly variable floating voltage supply coupled in series with said slowly variable supply,
means for controlling said rapidly variable voltage supply so that its voltage changes rapidly in a given direction through a range of voltage that is less than said magnitude,
means responsive to the voltage supplied by said rapidly variable supply reaching the end of said range for slowly changing its voltage in the opposite direction and the voltage provided by said slowly variable supply in said given direction, and
means responsive to a current drawn through said rapidly variable supply while its voltage is changing through said range for reducing the voltage it supplies.

4,914,313
POWER INTERRUPTION SYSTEM
Ricky A. Clingon, Rockford, Ill.; Doyle Clingon, 4612 Stenstrom Rd., Rockford, Ill. 61109, and Russell L. Fewkes, Rockford, Ill., assignors to Doyle Clingon, Rockford, Ill.
Filed Jul. 5, 1988, Ser. No. 215,231
Int. Cl.[4] H02J *1/00*
U.S. Cl. 307—10.1 19 Claims

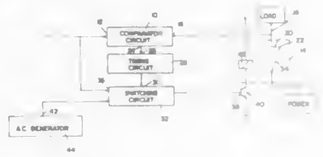


1. An analog power interruption system for automatically turning off power transmission, the power interruption system comprising:
a power generating device;
means for energizing the power interruption system;
an electrically activated energy transmission component for transmitting energy to the power generating device;
means for sensing a need to turn off the power generating device;
means for disconnecting electrical power from the energy transmission component, without grounding the energy transmission component, to inactivate the energy transmission component and turn off the power generating device in response to the means for sensing, wherein the energy transmission component is an induction coil or solenoid actuated fuel valve.

4,914,314
ANTI-THEFT DEVICE FOR MOTOR VEHICLES USING AN ELECTRONIC ENGINE CONTROL
Helmut Hirtz, Alemannenstrasse 7, D-100 Berlin 28, Fed. Rep. of Germany
Filed Dec. 15, 1988, Ser. No. 285,783
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1986, 3620297
Int. Cl.[4] B60R *25/04;* **H01R** *33/96*
U.S. Cl. 307—10.3 13 Claims

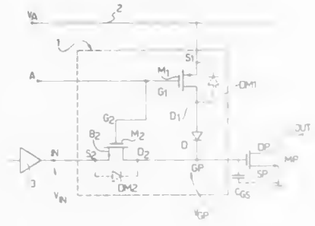
1. A vehicle anti-theft device, said anti-theft device comprising:
electronic control means for controlling at least one function of the vehicle;
said electronic control means comprising anti-theft circuitry; and
said electronic control means controlling said vehicle function through an electrical cable; and
plug in connection means for physically connecting and disconnecting said electrical cable to and from said electronic control means; said plug in connection means comprising:
at least a first electrical contact electrically connected to said electrical cable;
at least a second electrical contact which is electrically connected to said electronic control means when said plug in connection means is physically connected to said electronic control means;
at least one switching means having a first condition wherein said first and second electrical contacts are electrically connected and a second condition wherein said first and second electrical contacts are electrically nonconnected;
sensor means for sensing a physical disconnection of said plug in connection means from said electronic control means and for placing said at least one switching means in said second condition in response thereto; and
restricted access switch setting means for placing said at least one switching means in said first condition;
said restricted access switch setting means having means for using restricted access information for enabling said at least one switching means and for placing same in said first condition.

4,914,315
METHOD FOR LOOSENING THE CONTACTS OF A STICKING RELAY AS WELL AS CIRCUIT ARRANGEMENT FOR CARRYING OUT THE METHOD
Norbert Nickolai, Laufen, Fed. Rep. of Germany, assignor to Bayeriache Motoren Werke AG, Munich, Fed. Rep. of Germany
Filed Jun. 10, 1988, Ser. No. 204,852
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1987, 3719298
Int. Cl.[4] H01H *47/12*
U.S. Cl. 307—137 14 Claims



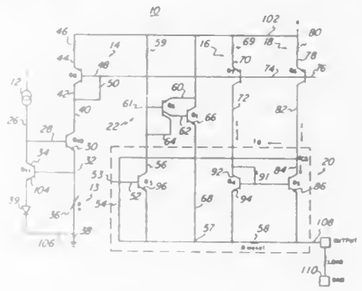
1. A method for releasing the contacts of a sticking relay, whose one contact is locally fixed and whose other contact is arranged at a ferromagnetic relay armature which is attracted with its contact toward the locally fixed contact by application of an electric voltage control signal to the winding of the relay coil and which in the de-energized condition of the relay coil, with an intact relay, again drops off whereby the two contacts are again separated from one another, comprising the steps of sensing if the one and other contacts stick together, and applying an AC or pulsating DC voltage to the winding of the relay coil when the one and other contacts stick together.

4,914,316
CIRCUIT FOR HOLDING A MOS TRANSISTOR IN A CONDUCTION STATE IN A VOLTAGE SUPPLY OUTAGE SITUATION
Domenico Rossi, Pavia; Giovanni Pietrobon, Treviso; Sandro Storti, and Carlo Cini, both of Milan, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Milan, Italy
Filed Dec. 12, 1988, Ser. No. 283,232
Claims priority, application Italy, Dec. 22, 1987, 23162 A/87
Int. Cl.[4] H03K *17/56, 3/01*
U.S. Cl. 307—246 2 Claims



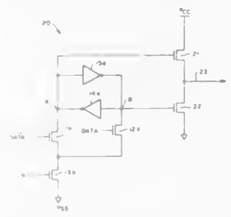
1. A circuit for holding a MOS power transistor in a conduction state on the occurrence of an outage in the voltage supply, comprising a first MOS transistor, a diode and a second MOS transistor, said first MOS transistor having its source coupled to a line of said voltage supply, said diode coupling a drain of said first transistor to a gate of said power transistor, said second transistor having its gate coupled to a gate of said first transistor and its drain coupled to said gate of said power transistor.

4,914,317
ADJUSTABLE CURRENT LIMITING SCHEME FOR DRIVER CIRCUITS
Dan Agiman, Lewisville, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 12, 1988, Ser. No. 283,104
Int. Cl.[4] H03K *3/01, 17/00*
U.S. Cl. 307—270 11 Claims



1. A circuit for driving an output load, comprising:
current source for providing input drive current for said circuit;
current adjusting circuit for adjusting said input drive current to establish and maintain a desired circuit drive current;
load drive current regulating circuit for sensing said circuit drive current and subsequently regulating said circuit drive current at a desired load driving value;
current coupling circuit for providing said input drive current as input to said load drive current regulating circuit; and
output driver circuit for providing said desired load drive current to said output load.

4,914,318
LATCH CIRCUIT FOR A PROGRAMMABLE LOGIC DEVICE USING DUAL N-TYPE TRANSISTORS
Michael J. Allen, Rescue, Calif., assignor to Intel Corporation, Santa Clara, Calif.
Filed Dec. 30, 1988, Ser. No. 292,305
Int. Cl.[4] H03K *3/356*
U.S. Cl. 307—272.2 7 Claims



1. In a complementary-metal-oxide-semiconductor (CMOS) integrated circuit, a latch circuit comprising:
a first CMOS driver coupled between a first input node and a second input node for driving said first input node;
a second CMOS driver coupled between said first input

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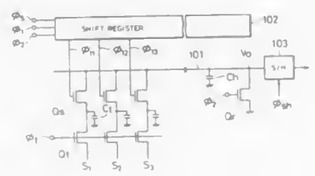
node and said second input node for driving said second input node;
a first n-type driver transistor coupled to have its gate driven by said second input node, its drain coupled to an output node and its source coupled to a supply return;
a second n-type driver transistor coupled to have its gate driven by said first input node, its source coupled to said output node and its drain coupled to a supply voltage, wherein having said two n-type driver transistors ensures that one is turned off prior to the other between turned on in order to provide a symmetrical output.

4,914,319

SIGNAL READING CIRCUIT

Seiji Hashimoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1988, Ser. No. 183,632
Claims priority, application Japan, Apr. 30, 1987, 62-104604
Int. Cl.[4] G11C *27/02;* **H03K** *17/16, 17/693*
U.S. Cl. 307—353 **11 Claims**



1. A signal reading apparatus comprising:
(a) a plurality of signal sources;
(b) a plurality of accumulating means each of which is provided for each of said signal sources for temporarily holding signals of said plurality of signal lines;
(c) a plurality of switch means each of which is provided for a corresponding one of said accumulating means for reading out the signals stored in the accumulating means, one end of each of said switch means being connected to a corresponding one of said accumulating means;
(d) a capacitive lead connected commonly to another end of each of said plurality of switch means;
(e) control means for selectively making said plurality of switch means operative, and thereby sequentially leading the signals stored in said accumulating means to said capacitive load;
(f) clearing means for clearing the signals led to said capacitive load; and
(g) reading means for reading out the signals held in the capacitive load for a period of time until the capacitive load is cleared by said clearing means after each of said switch means was made inoperative by said control means.

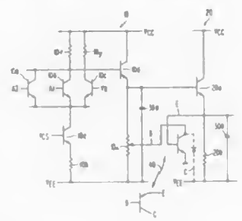
4,914,320

SPEED-UP CIRCUIT FOR NPN BIPOLAR TRANSISTORS

Xiaonan Zhang, San Diego, Calif., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Jul. 27, 1988, Ser. No. 224,733
Int. Cl.[4] H01L *27/02;* **H03K** *19/088*
U.S. Cl. 307—443 **11 Claims**

1. A speed-up circuit, in a semiconductor chip of the type that includes a P-type substrate with a plurality of components integrated into a surface thereof; said components including a first NPN transistor having a base which receives a control signal, a collector coupled to a voltage bus, and an emitter which drives a first resistor plus a base of a second NPN transistor plus a small capacitance; said second NPN transistor having a collector coupled to a voltage bus, and an emitter which drives a second resistor plus a large capacitance; wherein said speed-up circuit is comprised of:
a PNP transistor having an emitter coupled to said large capacitance, a base coupled to a tap on said first resistor, and a collector coupled to said substrate;



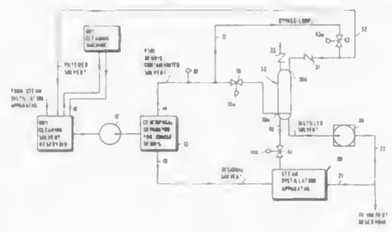
the emitter and base of said PNP transistor consisting of doped regions in said substrate which respectively extend to the same depth below said surface as the base and collector of each NPN transistor, and said collector of said PNP transistor being the entire substrate below said components in said surface.

4,914,321

BIMOS LEVEL CONVERTOR

Darrell E. Davis, Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 10, 1989, Ser. No. 335,341
Int. Cl.[4] H03K *19/08*
U.S. Cl. 307—446 **14 Claims**



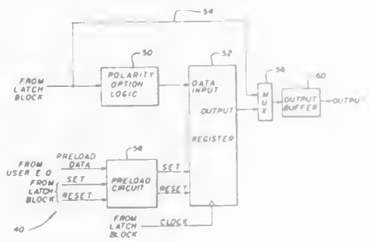
1. A BIMOS level converter, comprising:
bias means for defining a bias current;
a MOS transistor, disposed between said bias means and a first load coupled to a voltage source;
a bipolar transistor, having first, second, and third ports, arranged such that said first port is coupled to said first load, said second port is coupled to a second load connected to said voltage source, and said third port is coupled to a third load connected to said bias means;
whereby, said MOS transistor receives an input signal, and said second port of said bipolar transistor provides an output signal.

4,914,322

POLARITY OPTION CONTROL LOGIC FOR USE WITH A REGISTER OF A PROGRAMMABLE LOGIC ARRAY MACROCELL

Vincent K. Z. Win, Milpitas, and Andrew K. Chan, Palo Alto, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 16, 1988, Ser. No. 285,721
Int. Cl.[4] H03K *19/177*
U.S. Cl. 307—465 **4 Claims**



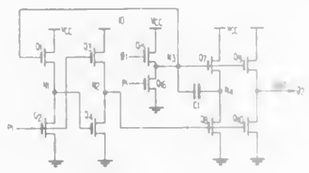
1. In a macrocell having a register with first and second input paths, said first input path including an inverter, and first and second switches in each path respectively, polarity option control logic comprising:
first logic means for receiving a clock input and a polarity input signal and controlling the activation of said first switch in response thereto and
second logic means for receiving said clock input and said polarity input signal inverted and controlling the activation of said second switch in response thereto;
whereby when said polarity input signal is in a first state, said first input path is enabled via said first switch in accordance with said clock signal and when said polarity input signal is in a second state, said second input path is enabled via said second switch in accordance with said clock signal.

4,914,323

BOOT-STRAP TYPE SIGNAL GENERATING CIRCUIT

Kazuo Shibata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 9, 1987, Ser. No. 36,399
Claims priority, application Japan, Apr. 9, 1986, 61-82716
Int. Cl.[4] H03K *19/01, 19/94*
U.S. Cl. 307—482 **5 Claims**



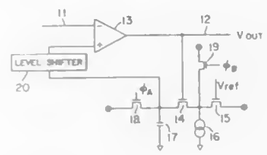
1. A boot-strap type signal generating circuit comprising means for receiving a first input signal, means for receiving a second input signal complementary to said first input signal, a first field effect transistor coupled between a power voltage terminal and a first node and having a gate supplied with said first input signal, a second field effect transistor coupled between said first node and a reference voltage terminal and having a gate supplied with said second input signal, a third field effect transistor coupled between said power voltage terminal and a second node and having a gate coupled to said first node, a fourth field effect transistor coupled between said second node and said reference voltage terminal and having a gate supplied with said second input signal, a fifth field effect transistor coupled between said power voltage terminal and a third node and having a gate supplied with said second input signal, a sixth field effect transistor coupled between said third node and said reference voltage terminal and having a gate coupled to said second node, a seventh field effect transistor coupled between said power voltage terminal and a fourth node and having a gate coupled to said first node, an eighth field effect transistor coupled between said fourth node and said reference voltage terminal and having a gate coupled to said third node, a capacitor coupled between said first node and said fourth node, a ninth field effect transistor coupled between said power voltage terminal and an output terminal and having a gate connected to said first node, and a tenth field effect transistor coupled between said output terminal and said reference voltage terminal and having a gate connected to said third node.

4,914,324

CLAMPING CIRCUIT

Hiroshige Goto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 225,816
Claims priority, application Japan, Jul. 31, 1987, 62-192070
Int. Cl.[4] H03K *5/08*
U.S. Cl. 307—546 **13 Claims**



1. A clamping circuit comprising:
a differential output circuit having first and second input terminals, an input signal being applied to said first input terminal;
two MOS type gate circuits connected in series, means for applying an output signal from said differential output circuit to be clamped and a reference voltage which is a clamping target value to respective gate electrodes of said MOS type gate circuits, respectively;
a holding capacitor connected to a drain side of one of said MOS type gate circuits;
reset means for resetting a potential of said holding capacitor at a time when a clamping operation is initiated;
a current source connected to a junction between said MOS type gate circuits;
charge current flow control means for controlling current flowing between said junction and said holding capacitor to selectively prevent current from said current source from affecting the potential on said capacitor; and
feedback means for feeding back a potential of said holding capacitor to said second input terminal of said differential output circuit.

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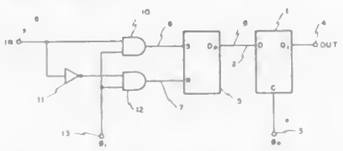
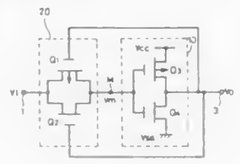
4,914,325
SYNCHRONIZING CIRCUIT
Kazuyoshi Yamada, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Oct. 7, 1988, Ser. No. 255,831
Claims priority, application Japan, Oct. 9, 1987, 62-255834
Int. Cl.[4] H03K *3/013, 3/027, 19/003, 5/05*
U.S. Cl. 307—592 9 Claims



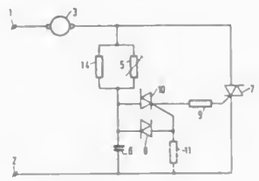
1. A synchronizing circuit comprising a data input terminal for receiving an input signal; an input gate circuit having an input end coupled to said data input terminal, having a control signal input end for receiving a control signal, and having first and second output ends; said input gate circuit outputting a first output data from said first output end in synchronism with said control signal when said input signal is applied to said data input terminal and when a second output data from said second output end is in synchronism with said control signal and when said input signal is not applied to said data input terminal; a clock terminal for receiving a lock signal; a delay circuit connected between said clock terminal and said control signal input end and delaying said clock signal to generate said control signal; an SR flip-flop having a set input end connected to said first output end, having a reset input end connected to said second output end, and having an output end; a D flip-flop having an input end connected to said output end of said SR flip-flop, having an output end, and having a clock end connected to said clock terminal; and an output terminal connected to said output end of said D flip-flop.

4,914,326
DELAY CIRCUIT
Shigeru Kikuda; Hiroshi Miyamoto, and Michibiro Yamada, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 12, 1988, Ser. No. 155,541
Claims priority, application Japan, Feb. 25, 1987, 62-41837
Int. Cl.[4] H03K *5/13, 17/284, 17/30*
U.S. Cl. 307—605 9 Claims



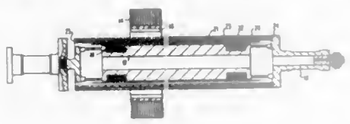
1. A delay circuit, comprising:
an input terminal for receiving an input signal;
an output for providing an output signal;
transmission gate means having first and second field effect devices of opposite conductivity types, respective sources of said first and second field effect device connected together to form one terminal of said transmission gate means, respective drains of said first and second field effect devices connected together to form another terminal of said transmission gate means, one of said terminals of said transmission gate means constituting said input terminal of said delay circuit, and the other of said terminals of said transmission gate means constituting an output terminal of said transmission gate means; and
inverter means including
(a) an input terminal,
(b) an output terminal,
(c) a series connection of third and fourth field effect devices of opposite conductivity types, said inverter means output terminal connected to a junction of said third and fourth field effect deivces forming said series connection, respective gates of said third and fourth field effect devices connected to said input terminal of said inverter means, said input terminal of said inverter means connected to said output of said transmission gate means and said output terminal of said inverter means constituting said delay circuit output, and
the gates of said first and second field effect devices of said transmission gate means connected to said delay circuit output,
wherein a delay characteristic between said input signal and said output signal is responsive to one of the threshold values of said first and second field effect devices.

4,914,327
CIRCUIT ARRANGEMENT FOR CONTROLLING THE ALTERNATING CURRENT THROUGH A LOAD
Jan H. Dekker, Hoogeveen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 1, 1988, Ser. No. 265,658
Claims priority, application Netherlands, Nov. 5, 1987, 8702645
Int. Cl.[4] H03K *17/72*
U.S. Cl. 307—632 6 Claims



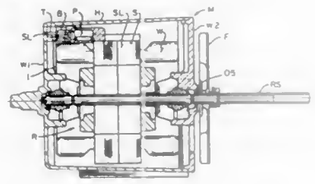
1. A circuit arrangement for controlling an alternating current through a load a terminal of which is connected to a first power supply terminal, said circuit arrangement being connected, during operation, between an other load terminal and a second power supply terminal, said circuit arrangement comprising, a series circuit including a resistor section and a capacitor section connected between the other load terminal and the second power supply terminal, a first controlled rectifier connected between the other load terminal and the second power supply terminal, a further controlled rectifier connected between a control terminal of the first controlled rectifier and a junction point between the resistor section and the capacitor section thereby to supply a control current to said control terminal of said first controlled rectifier from said junction point, and a diac connected between the junction point and a control terminal of the further controlled rectifier.

4,914,328
ELECTRICAL MACHINE WITH A SUPERCONDUCTING ROTOR HAVING AN IMPROVED WARM DAMPER SHIELD AND METHOD OF MAKING SAME
George D. Hooper, Murrysville, and True T. Shih, Monroeville, both of Pa., assignors to Electric Power Research Institute, Palo Alto, Calif.
Filed Jan. 11, 1984, Ser. No. 569,889
Int. Cl.[4] H02K *9/00*
U.S. Cl. 310—52 9 Claims



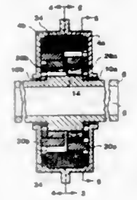
7. A dynamoelectric machine comprising:
a stator with a stator winding; a rotor on a shaft with a superconducting winding thereon located within said stator and with a warm or enter damper shielding said superconducting winding from external magnetic fields of said stator winding;
said damper comprising a metallurgically bonded cylindrical composite having ends fastened to said shaft; said cylindrical composite comprising a copper containing core cylinder, an end cylinder at each end of said core cylinder, an inner cylinder within said core cylinder and said end cylinders and an outer cylinder around said core cylinder and said end cylinders where said end cylinders and said inner and outer cylinders are all of metal of higher strength and lower electrical conductivity than said core cylinder; and,
said core cylinder and said end cylinders are fitted together with mating grooves.

4,914,329
VENTILATION AIR FLOW BLOCK IN AN ELECTRIC MOTOR
Thomas V. Ottersbach, Normandy, Mo., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Oct. 7, 1988, Ser. No. 255,707
Int. Cl.[4] H02K *11/00*; H02H *7/085*
U.S. Cl. 310—68 C 5 Claims



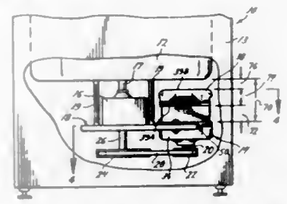
1. In a dynamoelectric machine comprising a stator assembly, a rotor assembly including a rotatable shaft and a rotor affixed to and rotatable with the shaft, a housing in which the stator assembly and rotor assembly are installed, means for providing cooling air to the stator assembly, and a motor protector including means responsive to the temperature of the stator exceeding a predetermined temperature to interrupt an electrical circuit to the machine, the improvement comprising means for blocking air flow through the machine from flowing over the protector and the portion of the stator adjacent the protector so that protector remains responsive to the second stator temperature to operate the protector's responsive means, the blocking means comprising a strip of blocking material configured to fit closely about the stator adjacent the protector, the strip being folded generally diagonally backwardly at a first point approximately one-quarter way along the length of the strip, and at a second point approximately three-quarters of the way along its length so to form a central section of the strip and two side sections.

4,914,330
LOW SPEED BRUSHLESS ELECTRIC MOTOR
Michel Pierrat, 2355 24th St., Boulder, Colo. 80302
Filed Mar. 9, 1989, Ser. No. 321,160
Int. Cl.[4] H02K *7/10*; F16H *1/28*
U.S. Cl. 310—82 14 Claims



7. An electric motor including
a housing,
an output shaft rotatably carried by said housing,
a rotor carried by said shaft and rotatable therewith,
and second stator-rings,
means supporting each of said first and second stator-rings for limited movement along two perpendicular axes thereby to permit orbital non-rotational movement of said first and second stator-rings,
first and second sets of magnetic poles positioned respectively around said first and second stator-rings,
magnetic drive means for electrically and sequentially energizing said first and second sets of magnetic poles to induce orbital motion of said stator-rings,
said second stator-ring being positioned circumferentially 180 degrees from the position of said first stator-ring, said magnetic means causing orbital movement of said second stator-ring 180 degrees out of phase from the orbital movement of said first stator-ring, and
trochoidal speed-reduction means coupling said first and second stator-rings to said rotor whereby said rotor is caused to rotate at a speed slower than the orbital speed of said stator-rings.

4,914,331
MINIMUM HEIGHT MOTOR ASSEMBLY USING ALUMINUM ENDSHIELDS
John G. Lewis, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Aug. 2, 1988, Ser. No. 227,164
Int. Cl.[4] H02K *5/00, 7/10*; D06F *35/00*
U.S. Cl. 310—90 15 Claims



1. An electric motor and mounting assembly for supplying power to a transmission for a washing machine agitator and tub said motor being mounted in operating relationship with said

transmission on a mounting plate attached to the washing machine structure, comprising:

a stator assembly having a lamination centrally disposed rotor bore, slots opening on said bore, and windings in said slots,

a rotor assembly disposed rotatably in said rotor bore and having a centrally located shaft extending therethrough, said shaft having bearings journaled on opposite ends of said rotor,

a rear endshield for said motor, said endshield having an internally disposed, centrally located, flush bearing housing for rotatable containment of the bearing at one end of said rotor shaft, said endshield being operatively attached to said stator assembly,

a front endshield for said motor, said endshield having a bearing housing with a centrally located circular opening, said housing projecting axially from the outside surface of said endshield for rotatable containment of the opposed bearing near the end of said rotor shaft extending through said opening external to said motor assembly, said endshield being operatively attached to said stator assembly, and means for mounting said motor attached to said front endshield for securing said motor, shaft extension downward, to said mounting plate; said transmission including a shaft mounted pulley, and a belt;

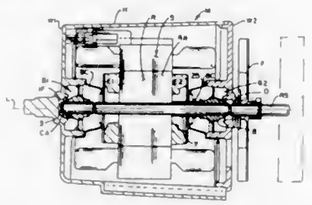
a pulley mounted to said rotor shaft and engaged with said belt to drive said transmission, said mounting means attaching said motor to said mounting plate, so that said motor pulley is maintained in fixed planar relationship with respect to said transmission pulley.

4,914,332

DYNAMOELECTRIC MACHINE SHAFT RESTRICTOR FOR CONTROLLING END PLAY

Gary W. Borcherding, Florissant, and John G. Lewis, St. Louis, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 7, 1988, Ser. No. 255,758
Int. Cl.[4] H02K *5/16*
U.S. Cl. 310—90 8 Claims



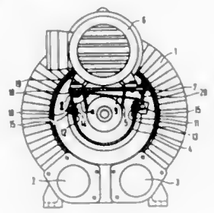
1. In dynamoelectric machine comprising a stator assembly, a rotor assembly including a rotor shaft and a rotor affixed to and rotatable with the shaft, a bearing assembly at each end of the shaft for journaling the shaft, and first and second endshields in which the bearing assemblies are housed, an improvement comprising means for restraining longitudinal movement of the rotor assembly during transport of the machine and during machine start-up and coast-down, the restraining means including means integrally formed with the first endshield to restrain axial movement in one direction and spacer means mounted on the shaft for restraining axial movement in the other direction, the first endshield having an interior wall surface adjacent one end of the shaft with a "bump" being formed in the wall, the bump forming a hemispherically shaped dome projecting axially inwardly toward the end of the shaft thereby restraining movement of the shaft in the direction of the wall.

4,914,333

ELECTROMOTOR BELT DRIVE ADJUSTMENT ASSEMBLY

Eberhard Breyer, Bad Neustadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 24, 1989, Ser. No. 315,719
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1988, 3806172
Int. Cl.[4] H02K *15/26*
U.S. Cl. 310—91 10 Claims



1. An Assembly, comprising:

an operating machine having a machine shaft;

a cantilever extending from the operating machine;

a one-piece intermediate part comprising first and second side pieces that join at an angle at a connecting site, and being made of a material having a known strength and yield point, the first side piece having a first free end connected to the cantilever, the second side piece having a second free end connected to the cantilever;

an electric motor having a motor shaft;

a base plate fastened to the first side piece in the region of the connecting site for supporting the base plate substantially perpendicular to a plane containing machine shaft and the motor shaft and allowing for the base plate to tilt and to change the distance between the motor shaft and machine shaft;

the electric motor being mounted on said base plate with its shaft parallel to the shaft of the operating machine;

a belt coupling the motor shaft to the machine shaft;

at least one adjusting bolt for adjusting the base plate to control the tension of the belt; and

the first side piece extending in the direction of the base plate, and having a length adapted to the length of the base plate and the longitudinal extension of the second side piece from the cantilever to the connecting side dimensioned such that the vertical swinging motion does not exceed the strength and yield point of the material.

4,914,334

PERMANENT MAGNET DC MACHINE

Hiroaki Aso, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

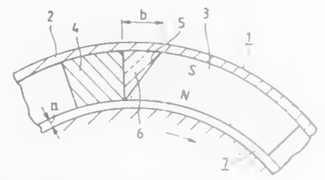
Filed Mar. 23, 1989, Ser. No. 327,673
Claims priority, application Japan, Mar. 30, 1988, 63-79133
Int. Cl.[4] H02K *23/04*
U.S. Cl. 310—154 8 Claims

1. A permanent magnet DC machine comprising:

a rotor;

a stator diametrically opposed to the rotor through a fine air gap therebetween, wherein said stator comprises a yoke, main magnetic poles provided on an inner circumferential surface of said yoke and auxiliary magnetic poles provided respectively adjacent to said main magnetic poles side by side, each of said main magnetic poles being made of an anisotropic permanent magnet, and each of said auxiliary magnetic poles being made of a material having higher reversible permeability than that of said permanent magnet of said main magnetic poles, and wherein each pair of

said main and auxiliary magnetic poles disposed adjacent to each other is arranged so that said each pair of main and auxiliary magnetic poles are in contact with each other at a radially inner portion of said magnetic poles and are separated from each other at a radially outer side of said magnetic poles to thereby form a magnetic leakage-path



breaking air gap portion therebetween, said magnetic leakage-path breaking air gap portion being provided so that a circumferential length thereof at said radially outer side is larger than a radial distance of said fine air gap; and

a nonmagnetic member provided in said magnetic leakage-path breaking air gap portion.

4,914,335

PHASE-DISPLACED MULTIPLE POLYPHASE DYNAMOELECTRIC MACHINE WITH WAVE WINDINGS

Malcolm D. Horton, Schenectady; Manoj R. Shah, Latham, and Charles J. Czech, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 23, 1988, Ser. No. 275,486
Int. Cl.[4] H02K *3/28*
U.S. Cl. 310—207 3 Claims

1. An armature for an AC generator comprising:

a first polyphase winding in said armature;

said first polyphase winding being wave wound;

at least a second polyphase winding in said armature;

said at least a second polyphase winding being wave wound;

said first and at least a second polyphase winding being phase displaced with respect to each other;

a first plurality of connector sectors supported in first parallel planes adjacent said armature;

at least a second plurality of connector sectors supports in second parallel planes adjacent said armature;

each of said first parallel planes being coplanar with one of said second parallel planes;

at least some phases of said first polyphase winding being connected to individual ones of said first plurality of connector sectors; and

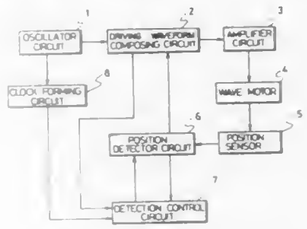
at least all remaining phases of said at least a second polyphase winding being connected to said second plurality of connector sectors.

4,914,336

WAVE MOTOR DRIVING CIRCUIT

Masaharu Yamasaki, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

Filed Jul. 13, 1988, Ser. No. 218,698
Int. Cl.[4] H01L *41/68*
U.S. Cl. 310—316 15 Claims



1. A wave motor driving circuit for driving a wave motor having a movable body frictionally rotationally driven by vibrations generated by applying electric signals to an electromechanical transducer affixed to an elastic body, the wave motor driving circuit comprising:

driving-wave forming means for forming driving signals to drive a wave motor;

a position sensor for detecting a rotational position of the movable body of the wave motor;

position detector means responsive to a request signal for outputting a first signal representing that the movable body has stopped at a certain position defined by a given number of driving signals; and

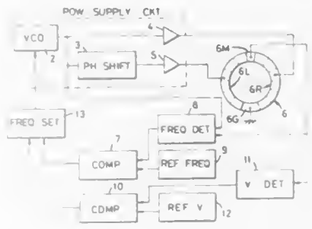
detection control means responsive to the first signals for generating intermittently the request signals, the detection control means having means for lengthening an interval between generation of the request signals in response to receipt of a predetermined number of the first signals.

4,914,337

POWER SUPPLY FREQUENCY REGULATING DEVICE FOR VIBRATION WAVE DRIVEN MOTOR

Tadao Takagi, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 152,644, Feb. 5, 1988, abandoned. This application May 30, 1989, Ser. No. 361,744
Claims priority, application Japan, Feb. 9, 1987, 62-27771
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—316 19 Claims



1 A vibration wave driven motor comprising:

a movable member;

stator means comprising a resilient member having a surface maintained in contact with said movable member, and electrostriction means adapted to be vibrated by an AC

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voltage to generate a vibration wave on the surface of said resilient member;
power supply means for supplying said electrostriction means with said AC voltage;
comparator means for comparing the frequency of said AC voltage with the resonance frequency of said stator means; and
means for controlling the frequency of said AC voltage to an optimum frequency not lower than said resonance frequency in response to the output of said comparator means, wherein said control means is adapted to bring the frequency of said AC voltage toward said optimum frequency after passing through a frequency range higher than said resonance frequency when the frequency of said AC voltage is identified lower than said resonance frequency by said comparator means.

4,914,338
VIBRATION WAVE MOTOR
Shuji Murakami, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 132,184, Dec. 14, 1987, abandoned. This application Aug. 17, 1989, Ser. No. 395,215
Claims priority, application Japan, Dec. 17, 1986, 61-300694
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—323 **6 Claims**

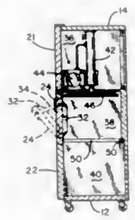
1. A vibration wave motor comprising:
a vibration member; and
a movable member contacting under pressure said vibration member by a vibration wave generated in said vibration member, wherein said movable member comprises a contact area adapted to contact said vibration member, wherein at least said contact area has a CO_2 laser irradiated alumite film thereon having a hardness in the range of approximately Hv 750–800,
wherein said vibration member comprises a contact area adapted to contact said contact area of said movable member and comprising a WC-Co 12% flame sprayed film.

4,914,339
MISTING SYSTEM
John J. Hayman, Jr., 3151 Holly Mill Run, and Itamar C. Kleinberger, 3263 Holly Mill Ct., both of Marietta, Ga. 30062
Filed Oct. 14, 1988, Ser. No. 257,731
Int. Cl.[4] F16B *12/00*
U.S. Cl. 312—115 **10 Claims**

1. In a misting system for a display counter for providing an intermittent spray of water, said system comprising a feed line, a water supply, electrically operated valve means connected between said water supply and said feed line, and a timer for controlling said electrically operated valve means to render the spray intermittent, and a plurality of nozzle assemblies spaced along said feed line for providing said spray of water, the improvement wherein said feed line has a rectangular cross-section, at least one hole is defined in a side of said rectangular feed line, said nozzle assemblies include a nipple for attachment to said feed line, said nipple being threadedly received by said hole defined in a side of said rectangular feed line said feed line being formed of two layers, said two layers comprising a first inner layer that is black to absorb ultra violet

light and a second outer layer that is colored to be aesthetically pleasing in conjunction with said display counter.

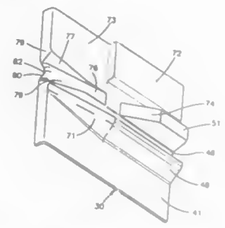
4,914,340
TRASH COMPACTOR LOADING DOOR CONSTRUCTION
Anthony Fox, Bloomington, Minn., assignor to TFC Corporation, Bloomington, Minn.
Filed Apr. 24, 1989, Ser. No. 342,074
Int. Cl.[4] B30B *15/06*
U.S. Cl. 312—211 **8 Claims**



1. In a trash compactor of the type including a frame supporting three mutually perpendicular stationary side walls, a top and a base forming a cabinet, said cabinet having an open front, a relatively large door hinged to said frame for opening and closing relative to said open front, said cabinet being functionally divided into three compartments including an upper machinery compartment, a middle trash loading compartment and a lower compaction compartment, said relative larger door including a generally rectangular opening therethrough for receiving trash in alignment with said trash receiving compartment, an improved trash loading door comprising:
(a) an outer generally rectangular decorative panel having first and second side edges each bent to form thin U-shaped channels extending along a major portion of said side edges, the top and bottom edges of said decorative panel being bent perpendicular to the plane of said panel providing top and bottom stiffeners therefor and a rectangular latch handle receiving opening formed through said panel next to said top edge and centered between said side edges;
(b) a box-shaped inner panel having a generally flat planar surface with its top, bottom and two side edges bent out of said flat plane at a 90° angle, said two side edges further having a major portion thereof bent to define laterally projecting flanges matching and slidably insertable into said thin U-shaped channels extending along said side edges of said outer decorative panel said top and bottom stiffeners of said decorative panel further cooperating with said bent top and bottom edges of said inner panel to complete a closed structure in a manner whereby said

outer decorative panel provides a slidably removable cover for a first side of said planer surface interior to the box-shaped structure;
(c) mean defining a chute with and secured to a second side of said planar surface of said inner panel; and
(d) a pair of hinge halves affixed to said two side edges of said inner panel at said bottom edge for mating with corresponding hinge halves secured to said relatively larger door at said rectangular opening therethrough to allow said trash loading door to pivot about a horizontal axis.

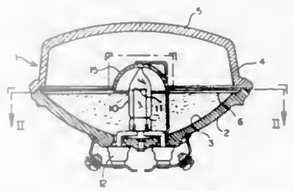
4,914,341
REFRIGERATOR CABINET CONSTRUCTION
Douglas E. Weaver, and Roger D. Chapin, both of Greenville, Mich., assignors to White Consolidated Industries, Inc., Cleveland, Ohio
Filed Mar. 23, 1989, Ser. No. 327,752
Int. Cl.[4] A47B *81/00*
U.S. Cl. 312—214 **10 Claims**



1. A refrigerator cabinet comprising a shell having side walls, a top wall, and a bottom wall, said walls defining an opening and having inturned edges defining a face, said edges forming a channel behind said face, a liner within said shell having walls defining a chamber and having an outwardly extending flange received within said channel, a horizontal partition within said liner intermediate said top and bottom, said liner walls having at least one integrally formed rib projecting into said chamber adjacent said partition, a mullion on the front face of said partition extending between the edges of said side walls in vertical alignment with said partition, said liner flange having an offset portion extending horizontally away from said shell face in a zone adjacent said rib, said offset portion curving smoothly and having a semicircular portion of maximum horizontal displacement from said shell face at a point adjacent said mullion, said offset portion and said rib providing vertical compliance of said liner during thermal expansion and contraction.

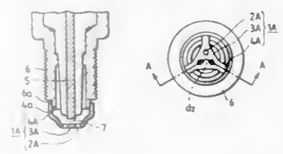
4,914,342
NARROW SPOT REFLECTOR LAMP WITH DIFFUSING REFLECTOR
Mohammad Mujahid; Harry H. Haft, both of Little Rock, Ark., and William Murray, Somerset, N.J., assignors to North American Philips Corp., New York, N.Y.
Filed Jun. 30, 1988, Ser. No. 213,962
Int. Cl.[4] H01K *1/28*
U.S. Cl. 313—113 **7 Claims**

1. In a narrow spot reflector lamp of the type comprising an outer envelope having a concave reflector surface terminating at an outer edge and a lens covering said reflector surface, wherein said lens has a protruding wall extending forward from the outer edge of said reflector surface and a stippled dome surface, a light source within said outer envelope on the lamp axis of symmetry, a light shield within said outer envelope between said light source and said lens dome and positioned and dimensioned to obstruct light from said light source and prevent direct transmission of light from said light source out of said lens dome, the improvement comprising,
the entire reflector surface having stippling effective for smoothing the spatial distribution of light reflected therefrom;
said light shield being effective to prevent any light from passing directly through said lens; and



all of the light from said lamp undergoing a first diffusion upon reflection and a second diffusion upon passing through said lens.

4,914,343
SPARK PLUG WITH COUNTERELECTRODE HAVING PLURAL APERTURES IN FLAT PORTION THEREOF
Junichi Kagawa; Wataru Matsutani, both of Aichi, Japan; Alfred Krappel, Ismaning, Fed. Rep. of Germany; Josef Holzmann, Munich, Fed. Rep. of Germany, and Johannes Guggenmos, Fürstenfeldbruck, Fed. Rep. of Germany, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan and Bayerische Motoren Werke A.G., Munich, Fed. Rep. of Germany
Filed Dec. 23, 1988, Ser. No. 288,920
Claims priority, application Japan, Dec. 25, 1987, 62-326891
Int. Cl.[4] H01T *13/32*
U.S. Cl. 313—139. **4 Claims**



1. In a spark plug comprising a cylindrical shell (6), an insulator, a center electrode (5) extending axially through the insulator with a tip thereof protruding therefrom, and a side electrode having a centered flat plate portion facing the tip of said center electrode to form a spark gap (7) between said tip and said flat plate portion, the periphery of said flat plate portion being joined to the shell via a plurality of legs, the improvement wherein a plurality of holes are made in said flat plate portion.

4,914,344
SPARK PLUG FOR INTERNAL COMBUSTION ENGINES
Kiyohiko Watanabe, Chiryu; Toshihiko Igashira, Toyokawa; Takeo Miyoshi, Toyota; Masahiro Yamashita, Toyota; Hiroshi Hosoi, Toyota, and Nobuo Takagi, Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan
Filed Aug. 3, 1988, Ser. No. 227,852
Claims priority, application Japan, Aug. 4, 1987, 62-195058
Int. Cl.[4] H01T *13/20, 13/46*
U.S. Cl. 313—141 **7 Claims**

1. A spark plug for internal combustion engines comprising:
a center electrode;
an insulator enclosing said center electrode;
a metal housing enclosing said insulator;
a ground electrode extending from a forward end of said

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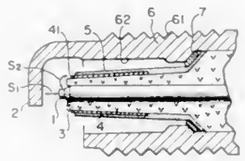
housing to a forward end of said center electrode to define a spark gap between said ground electrode and the forward end of said center electrode; and



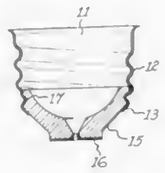
a third electrode arranged to define an auxiliary, creepage-surface gap between said third electrode and said center electrode and grounded through a capacitance component so as to generate a capacitive discharge between the center electrode and the third electrode.

4,914,345

CORROSION RESISTANT BASE FOR ELECTRIC LAMPS

Albert L. Suster, Chagrin Falls; Winston T. Bachmann, Lyndhurst; Edward M. Beesley, Bedford Heights; John Gritti, Macedonia; Clifford W. Paugh, Diamond; William H. Sullivan, Sagamore Hills, and Gene I. Thomasson, Chesterland, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 4, 1988, Ser. No. 164,145
Int. Cl.[4] H01J *5/52*
U.S. Cl. 313—318 **24 Claims**



1. A substantially metal base for an electric lamp wherein said base is fabricated from a bigh copper content copper alloy comprising copper in an amount of at least about 94 wt. % along with at least one other metal selected from the group consisting essentially of Cd, Zn, Fe, P, Zr, Sn, Co, Si, Al, Cr and mixture thereof.

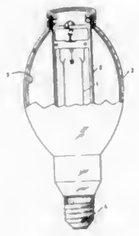
4,914,346

LAMP ENVELOPE HAVING A LUMINESCENT MATERIAL ON THE INTERIOR SURFACE THEREOF, METHOD OF APPLYING SAID MATERIAL, AND MATERIAL TO BE APPLIED

Robert C. Ingraham, Bedford, N.H., assignor to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 655,115, Sep. 27, 1984, abandoned, which is a division of Ser. No. 472,399, Mar. 4, 1983, abandoned. This application Dec. 11, 1987, Ser. No. 132,726
Int. Cl.[4] H01J *61/42, 61/46*
U.S. Cl. 313—485 **2 Claims**

1. An envelope for a high intensity discharge lamp, said envelope having a luminescent composition of matter securely secured to its inside surface by boron oxide formed on the envelope surface from boric acid admixed with the luminescent composition of matter, the luminescent composition of matter having a coating weight of 0.0087 to 0.010 g/cm^2.

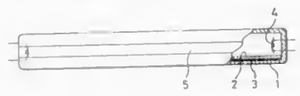


4,914,347

HOT-CATHODE DISCHARGE FLUORESCENT LAMP FILLED WITH LOW PRESSURE RARE GAS

Takashi Osawa; Katsuo Murakami; Yoshinori Anzai; Takeo Saikatsu; Seishiro Mitsuhashi; Kazutoshi Ishikawa; Yujiro Kamano, and Hiroshi Ito, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1988, Ser. No. 263,863
Claims priority, application Japan, Oct. 28, 1987, 62-272153
Int. Cl.[4] H01J *61/16*
U.S. Cl. 313—485 **2 Claims**



1. A hot-cathode discharge fluorescent lamp filled with low pressure rare gas comprising:
a tubular glass bulb made of thin glass having fluorescent material layer on an inside surface thereof, and an inner diameter of 16 mm or less; and
a pair of electrodes, one on each end of the tubular glass bulb, at least one of which operates as a hot-cathode at least in a stable discharge condition,
the tubular glass bulb containing a mixture of rare gases, the mixture containing Xe and at least one of He, Ne, Ar and Kr at predetermined pressure values,
the fluorescent material being illuminated with radiation from a discharge in the mixture of rare gases.

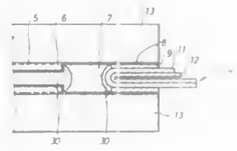
4,914,348

ELECTROLUMINESCENCE MULTI-COLOR DISPLAY DEVICE

Kenji Kameyama; Seiichi Oseto; Yoshiyuki Kageyama, and Hiroshi Deguchi, all of Yokohama, Japan, assignors to Ricob Company, Ltd., Tokyo, Japan

Filed Dec. 2, 1988, Ser. No. 279,054
Claims priority, application Japan, Dec. 3, 1987, 62-183777[U]; Dec. 14, 1987, 62-314164
Int. Cl.[4] H05B *33/04*
U.S. Cl. 313—509 **3 Claims**

1. An electroluminescence multi-color display device comprising:
two electroluminescence panels each having a glass substrate, a plurality of first strip-like electrode layers on signalling side each laminated on one face of said glass substrate and having a strip-like lead electrode connected thereto, a first insulation layer formed on said first strip-like electrode layers, a luminescence layer formed on said first insulation layer, a second insulation layer formed on said luminescence layer, and a plurality of second strip-like electrode layers on scanning side each laminated on said second insulation layer in a direction perpendicular to said first strip-like electrode layers, one panel and the other panel of said electro-luminescence panels being appended with each other such that the second strip-like electrode layers of said one panel oppose through a gap to the second strip-like electrode layers of said other panel; and



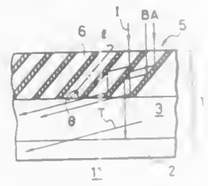
a plurality of double-folded film-like lead electrodes each interposed between an end portion of the second strip-like electrode layer of said one panel and an end portion of the second strip-like electrode of said other panel such that one picture element of said one panel defined by one display address of said one panel and the other picture element of said other panel defined by the same display address as said one display address are electrically connected to be simultaneously scanned.

4,914,349

PHOTO-ELECTRIC CONVERSION TUBE WITH OPTICAL FIBER PLATE

Toshikazu Matsui, and Takeo Sugawara, both of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Oct. 26, 1987, Ser. No. 112,490
Claims priority, application Japan, Oct. 27, 1986, 61-253712
Int. Cl.[4] H01J *1/78*
U.S. Cl. 313—524 **10 Claims**



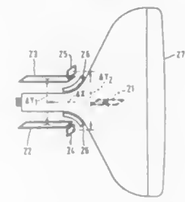
1. A photo-electric conversion tube comprising:
a tube container having an incident light window; and
a translucent photocathode surface provided inside said incident light window having an absorption coefficient;
said incident light window including an optical fiber plate composed of a plurality of optical fibers for increasing the absorption coefficient of said photocathode surface and said optical fibers being fixed together in a parallel relationship and being oriented at an angle to said photocathode surface wherein said angle is less than 90 degrees.

4,914,350

PICTURE DISPLAY DEVICE WITH INTERFERENCE SUPPRESSION MEANS

Gerrit Bosch; Tjebbe R. Pasma, and Albertus A. S. Sluyterman, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 145,651, Jan. 13, 1988, which is a continuation of Ser. No. 919,910, Oct. 16, 1986, abandoned. This application Feb. 14, 1989, Ser. No. 310,805
Claims priority, application Netherlands, Oct. 25, 1985, 8502918; Sep. 23, 1986, 8602397
Int. Cl.[4] H01J *29/06*
U.S. Cl. 315—8 **4 Claims**



1. A picture display device having a display tube with a rear part which accommodates a device for generating at least one electron beam and a front part which comprises a display phosphor screen, said display device also being provided with an electromagnetic deflection unit mounted around the display tube for deflecting electron beams across the display screen and including a line deflection coil and a field deflection coil which, when energized, generate magnetic interference fields having at least a dipole component and a quadrupole component, comprising an interference suppression coil system which is orientated, in such a manner, and in operation is energizable in such a manner, that, measured at a predetermined distance from the display device, both the strength of the dipole component and the strength of the quadrupole component are below a desired standard, wherein the interference suppression coil system comprises at least two interference suppression coils which are provided symmetrically relative to the plane of symmetry of the line deflection coil on the outer side of the deflection unit

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4,914,351

ELECTRON MULTIPLIER DEVICE HAVING ELECTRIC FIELD LOCALIZATION

Kei-Ichi Kuroda, Geneva, Switzerland, assignor to Agence Nationale de Valorisation de la Recherche Anvar , Paris, France

Filed May 8, 1985, Ser. No. 731,860
Claims priority, application France, May 9, 1984, 84 07142
Int. Cl.[4] H01J *29/41*
U.S. Cl. 315—12.1 **14 Claims**

1 An electron multiplier device comprising, in a vacuum tube, a succession of plane parallel electrodes defining a plurality of dynode stages capable of secondary electron emission, said dynode stages being disposed between an inlet window and an outlet anode, and the device further including means connected to said electrodes in order to establish an electron-accelerating electric field therebetween, with the general direction of said field being perpendicular to the electrodes, wherein each dynode stage is defined on two successive planes, each of which is constituted by interconnected parallel laminations, with the laminations in the two planes of a single dynode stage being offset relative to each other in such a manner that said two planes together constitute an obstacle or baffle for electron trajectories which are perpendicular thereto, and wherein each dynode stage is disposed in such a manner that the majority of secondary electrons effectively leaving a lamination of its first plane do not strike a lamination

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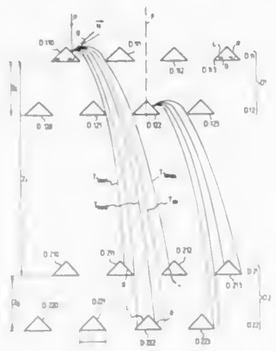
of its second plane, the distance Z_1 between two consecutive dynode stages being large relative to the distance Z_0 between the two planes of a single stage, and being chosen as a function



of the electric field in such a manner that the secondary electrons from an upstream stage strike a reduced number of laminations in the downstream stage in a concentrated distribution.

4,914,352

PLASMA PANEL WITH FOUR ELECTRODES PER PIXEL AND METHOD FOR THE CONTROL OF A PLASMA PANEL OF THIS TYPE

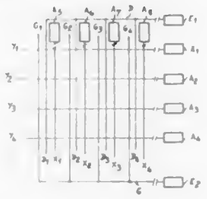
Michel Gay, Le Fontanil; Louis Delgrange, Saint Egreve, and Michel Specty, Grenoble, all of France, assignors to Thomson-CSF, Paris, France

Filed Feb. 17, 1988, Ser. No. 156,938

Claims priority, application France, Feb. 20, 1987, 87 02205

Int. Cl.[4] G09G *3/10, 3/20;* **H01J** *17/00, 61/00*

U.S. Cl. 315—169.4 7 Claims



1. An alternating type of plasma panel, comprising several pixels, each pixel being defined by electrodes perpendicular to one another, connected to circuits that give, during operation, addressing signals and refresh signals to each pixel, wherein each pixel is defined by three parallel and coplanar electrodes and by an electrode which is perpendicular to the three parallel and coplanar electrodes and is separated from the three parallel and coplanar electrodes by at least one dielectric layer, two of the three parallel electrodes being connected to circuits giving, during operation, the refresh signals to each pixel, while the electrode which is perpendicular to the three parallel and coplanar electrodes as well as that electrode, among the three parallel electrodes, which is not connected to a circuit giving refresh signals during operation, are connected to circuits giving the addressing signals to each pixel during operation.

4,914,353

THIN-FILM EL DISPLAY PANEL DRIVE CIRCUIT

Shigeyuki Harada; Toshihiro Obba; Yoshiharu Kanatani, all of Nara, and Hisashi Uede, Wakayama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 737,220, May 23, 1985, abandoned. This application Jul. 8, 1988, Ser. No. 217,076

Claims priority, application Japan, May 23, 1984, 59-105377

Int. Cl.[4] G09G *3/10*

U.S. Cl. 315—169.3 4 Claims

1. A thin-film electroluminescent display panel drive circuit having electroluminescent layers disposed between scan-side electrodes and data-side electrodes, said scan side and data-side electrodes being orthogonally aligned, said scan-side electrodes being alternatively divided into an odd group and an even group comprising:

a pull-up charge drive circuit;

a write drive circuit for supplying a write pulse;

a preliminary charge drive circuit;

a diode array, connected to said preliminary charge drive circuit;

a scan-side first type channel high-voltage resistant drive for each odd and even group of scan-side electrodes including a plurality of transistors having grounded source terminals and drain terminals connected to said scan-side electrodes;

a scan-side second type channel high-voltage resistant driver for each odd and even group of scan-side electrodes including a plurality of transistors having drain terminals connected to said drain terminals of said first type channel high voltage driver and having source terminals connected to said pull-up charge drive circuit and to said write drive circuit via a scan-side common bus line, said scan-side second type channel high voltage resistant driver providing a write pulse from said write drive circuit to selected pixels through said scanning electrodes of a first polarity in a first driving field and of a second polarity in a second driving field;

a data-side first type channel high-voltage resistant driver including a plurality of transistors having grounded source terminals and drain terminals connected to said data-side electrodes, and also having anode common terminals connected to the cathode terminals of the diode array which is connected to the preliminary charge drive circuit via a data-side common bus line;

means for activating repeatedly in said first driving field a selected transistor of said scan-side first type channel high voltage resistant driver and all the transistors of said scan-side second type channel high voltage resistant driver of the opposite group of said scan-side electrodes, and for activating repeatedly in said second driving field a selected transistor of the scan-side second type channel high voltage resistant driver of the same group as the selected scan-side electrode, several units of the same group as the selected scan side first type channel high-voltage resistant driver, and a selected MOS transistor of the data-side first drive channel high-voltage resistant driver so as to develop first and second write pulses to all said pixels in said first and second driving fields with a constant phase relationship therebetween to each said selected pixel.

4,914,354

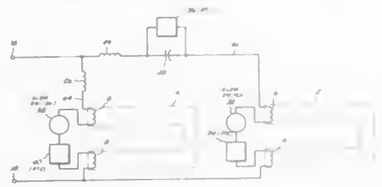
REACTOR-TYPE BALLAST CIRCUIT

Edward E. Hammer, Mayfield Village, and Eugene Lemmers, Cleveland Hts., both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 8, 1983, Ser. No. 241,991

Int. Cl.[4] H05B *41/16*

U.S. Cl. 315—247 8 Claims



1. An improved reactor type ballast circuit for a plurality of fluorescent lamps, each having a cathode disposed at each end thereof and shaped so that the ends are proximate to each other, said ballast circuit comprising:

a first input terminal and a second input terminal said second terminal serving for electrical connection with one cathode of each lamp;

a plurality of inductive ballasting coils, each having one end electrically connected to said first input terminal and another end for electrical connection respectively to the other cathodes of the lamps;

separate switch means for electrical connection between the lamp cathodes of each lamp, each said switch means operating to close when line voltage is applied across said first and second input terminals to conduct pre-heating current to said cathodes of each lamp before the lamps are started and to open after a time delay; whereby, said ballasting coils respectively induce a high voltage pulse across the cathodes of each lamp to start each lamp in response to said switch means openings;

means for effectively removing each said switch means from said ballast circuit in the event said switch means fails to open upon expiration of said time delay and

a power factor correction capacitor connected in series with one of said ballasting coils;

said series connection of said power factor correction capacitor with said one of ballasting coils forming a lead circuit whereas, said other ballasting coil being devoid of any connection to said power factor correction capacitor forming a lag circuit; said lead and lag circuit counteracting each other for more efficient consumption of power of said line voltage during the steady state operation of said plurality of fluorescent lamps.

4,914,355

D.C. VOLTAGE SUPPLY CIRCUIT FOR FLUORESCENT LAMPS

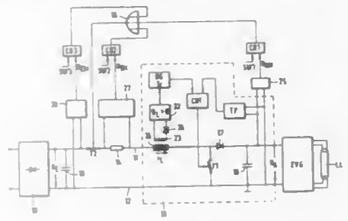
Ferdinand Mertens; Fred Haeemann, and Norbert Wittig, all of Arnsberg, Fed. Rep. of Germany, assignors to Trilux-Lenze GmbH & Co. KG, Arnsberg, Fed. Rep. of Germany

Filed Feb. 18, 1988, Ser. No. 158,284

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1986, 3639116; European Pat. Off., Sep. 25, 1987, 87114018

Int. Cl.[4] H05B *37/02*

U.S. Cl. 315—307 8 Claims



1. A voltage supply circuit for a fluorescent lamp, said voltage supply circuit comprising:

a flyback converter having an input and an output for converting a supply voltage to a d.c. voltage of constant amplitude, the flyback converter including an inductor connected to the supply voltage and charging means for enabling intermitent charging of the inductor,

switching means provided between the supply voltage and the input of the flyback converter, the switching means being alterable between a conductive state in which the supply voltage is connected to the input of the flyback converter and a nonconductive state in which the supply voltage is not connected to the input of the flyback converter,

output voltage sensor means for sensing an output voltage of the flyback converter in excess of a predetermined output voltage threshold value and for altering the switching means to the nonconductive state in response to sensing an output voltage of the flyback converter in excess of the predetermined output voltage threshold value,

whereby the supply voltage is not connected to the output of the flyback converter when the output voltage exceeds the predetermined output voltage threshold value.

4,914,356

CONTROLLER FOR GAS DISCHARGE LAMPS

David J. Cockram, Midrand, South Africa, assignor to Actronic Lighting CC, Transvaal, South Africa

Continuation of Ser. No. 35,606, Apr. 7, 1987, abandoned. This application Nov. 21, 1988, Ser. No. 274,382

Claims priority, application South Africa, Apr. 8, 1986, 86/2614

Int. Cl.[4] H05B *41/38*

U.S. Cl. 315—307 15 Claims

1. A method of operating a gas discharge lamp including the steps of:

obtaining a direct current power supply from an AC or DC main power supply;

pulse-width modulating direct current from the direct current power supply at a high frequency in accordance with at least one predetermined lamp operating parameter;

smoothing the pulse-width modulated direct current to obtain a constant direct current with generally constant voltage and current values during steady-state lamp operating conditions;

applying the smoothed pulse-width modulated constant direct current directly to the lamp; and

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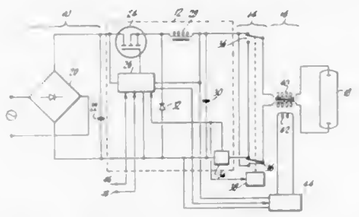
sensing at least one of the lamp operating current, the lamp operating voltage and the power dissipated by the lamp and deriving a feedback signal related thereto for main-



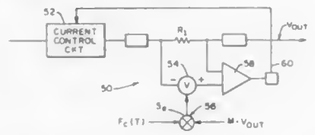
taining the predetermined parameter constant by varying the pulse width of the pulse-width modulated direct current, the lamp being ignited by the application of a high voltage ignition pulse.

4,914,357

TEMPERATURE COMPENSATED FOLDBACK CURRENT LIMITING

Richard L. Valley, Nashua, N.H., assignor to Unitrode Corporation, Lexington, Mass.

Filed Mar. 23, 1988, Ser. No. 172,009
Int. Cl.[4] H03K *5/08*
U.S. Cl. 315—309 **8 Claims**



1. Current limit apparatus, comprising:
a sensing resistor receiving a flow of current therethrough and having a resistance temperature coefficient;
means for providing a temperature responsive signal;
means for providing a variable reference voltage according to at least said temperature responsive signal; and
means for providing a current limit control signal corresponding to the difference of the voltage developed across said sensing resistor and said variable reference voltage, wherein
said temperature responsive signal provides a change in said variable reference voltage to compensate for temperature induced change in the voltage across said sensing resistance temperature coefficient.

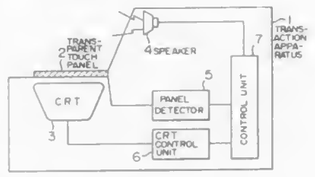
4,914,358

TOUCH PANEL INPUT CONTROL METHOD

Kenji Nakamura, Owariasahi, Japan, assignor to Hitachi, Ltd., Chiyoda, Japan

Filed May 17, 1988, Ser. No. 195,096
Claims priority, application Japan, May 21, 1987, 62-124416
Int. Cl.[4] H01J *29/70;* **G09G** *3/02*
U.S. Cl. 315—364 **2 Claims**

1. A method for controlling input to a touch panel of a touch panel input device that has a display for displaying key illustrations to request input operation on a screen, a transparent touch panel arranged substantially horizontally on said display for inputting the input operation as touch inputs into key-shaped illustration areas on the touch panel, and a control unit connected to said display and said touch panel for controlling said display and said touch panel, comprising the steps of:
(a) detecting if touch input to said touch panel including said key-shaped illustrating areas and other areas of the touch panel lasts for a first predetermined time longer than a normal key input operation time;
(b) when a touch input lasting for a period longer than said first predetermined time is detected on said other areas of said touch panel, preventing from responding to and requesting removal of an undesired material from said touch panel; and



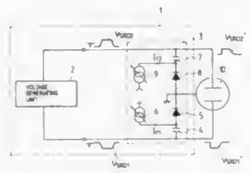
(c) detecting continuous presence of the undesired material on said touch panel for a second predetermined time after requesting removal of the undesired material, said second predetermined time being longer than said first predetermined time; and
(d) when said continuous presence of the undesired material is detected for a period longer than said second predetermined time, producing an output to call a service man for the touch panel input device.

4,914,359

DEFLECTING VOLTAGE GENERATING CIRCUIT

Akira Takahashi; Akira Takeshima, and Musubu Koishi, all of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Dec. 29, 1988, Ser. No. 291,821
Int. Cl.[4] H01J *29/74*
U.S. Cl. 315—410 **7 Claims**



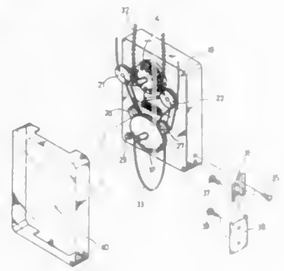
1. A deflecting voltage generating circuit for generating a deflecting voltage comprising:
voltage generating means for generating a deflecting voltage; and
voltage correcting means for correcting and shaping said deflecting voltage generated by said voltage generating means to have a greater slope and applying said deflecting voltage thus corrected to deflecting electrodes,
said voltage correcting means preventing application of said deflecting voltage to said deflecting electrodes for a predetermined period from the time instant when said deflecting voltage changes and applying said deflecting voltage to said deflecting electrodes immediately after the lapse of said predetermined period.

4,914,360

VENETIAN BLIND CONTROLLER

Chi-Sheng Hsieh, No. 1, Lane 64, Da Lien Rd., Ping Tung, and Ming Nien, Rm. C, 4th Fl., Wonderful Bldg., 101, Sec. 4, Jen Ai Rd., Taipei, both of Taiwan

Filed Mar. 10, 1989, Ser. No. 321,995
Int. Cl.[4] A47H *5/00*
U.S. Cl. 318—16 **6 Claims**



1. A venetian blind controller comprising:
two electromagnetic clutch fitted DC motors;
a casing and a cover, said casing having two holes for setting therein respectively said two DC motors, said cover encloses said casing;
a chain wheel fixedly mounted on an elongated shaft of one of said electromagnetic clutch fitted DC motors, and being positioned on the top of an electromagnetic coil, a circular groove for mounting thereon a chain rope, and a plurality of holes at both sides of said circular groove;
a pull rope wheel made of resilient rubber material, being fixedly mounted on an elongated shaft of the other electromagnetic clutch fitted DC motor, and being provided for mounting thereon on a pull rope of venetian blind;
two guide wheels pivotally mounted on said casing at both sides below said chain wheel;
two rectangular plates mounted on said casing and respectively connected with said two guide wheels at one end;
two pressure wheels mounted on said casing and respectively connected with the other end of said two rectangular plates;
a spring connecting said two rectangular plates at both ends to drive said two pressure wheels to press on said pull rope wheel;
a receiver circuit and a remote controller;
wherein said remote controller provides a signal to said receiver circuit to drive said electromagnetic clutch fitted DC motors, rotation of said motors drives said chain wheel or said pull rope wheel to move the chain rope or the pull rope of the venetian blind to control the closing and opening or the angular position of the blind blades.

4,914,361

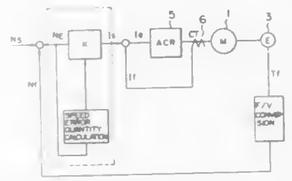
METHOD AND APPARATUS FOR CONTROLLING THE SPEED OF MOVING BODY

Fumio Tajima, Ibaraki; Hiroshi Katayama; Kunio Miyashita, both of Hitachi; Seiichi Narushima, Ibaraki, and Kouichi Saito, Kitaibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 6, 1989, Ser. No. 362,239
Claims priority, application Japan, Jun. 6, 1988, 63-137456; Dec. 10, 1988, 63-312457
Int. Cl.[4] 1102P *6/02*
U.S. Cl. 318—254 **46 Claims**

29. An apparatus for controlling the speed of a moving body, which comprises:
means for successively detecting the speed of said moving body so as to send out the detected value as a detection speed value;
means for successively calculating a difference between a command speed value and said detection speed value so as to send out the difference as a speed error;
means for calculating a speed error quantity on the basis of the speed errors obtained a predetermined number of times whenever the speed errors have been obtained said predtermined number of times;
means for comparing the presently obtained speed error quantity with the last obtained speed error quantity;
means for changing a control gain on the basis of the result of said speed error quantity comparison;
means for generating a command signal on the basis of both said speed error and said control gain; and
means for driving said moving body in accordance with said command signal.

35. An apparatus for controlling the speed of a moving body, which comprises:
means for successively detecting the speed of said moving body so as to send out the detected value as a detection speed value;



means for successively calculating a difference between an command speed value and said detection speed value so as to send out the difference as a speed error;
means for calculating a speed error quantity on the basis of speed errors obtained a predetermined number of times whenever the speed errors have been obtained said predetermined number of times;
means for comparing the presently obtained speed error quantity with the last obtained speed error quantity;
means for changing a control gain on the basis of the result of said speed error quantity comparison;
means for generating a command signal on the basis of both said speed error and said control gain;
means for driving said moving body in accordance with said command signal; and
said error quantity calculating means including means for removing DC components and predetermined frequency components from said speed errors, so that said speed error quantity is calculated from said speed errors from which said DC components and said predetermined frequency components are removed.

4,914,362

ELECTRIC CIRCUIT WITH LIMIT SWITCHES FOR LIMITING ROTATABLE RANGE OF ELECTRIC DRIVE UNIT

Masayoshi Onishi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1989, Ser. No. 372,743
Claims priority, application Japan, Jun. 28, 1988, 63-161851; Jun. 28, 1988, 63-161852
Int. Cl.[4] H02P *3/12;* **B60K** *31/00*
U.S. Cl. 318—266 **2 Claims**

2. An electric circuit with limit-switch for limiting rotatable range of an output shaft of an electric drive unit disposed between an electric motor and a control device for supplying a drive current thereto, comprising;
a first snap action limit switch disposed on a first input terminal of said motor, and a second snap action limit

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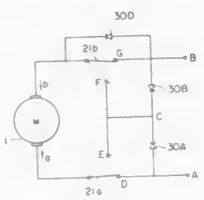
switch disposed on a second input terminal of said motor, said limit switches having pivot points of movable contacts on a motor side, their normally-closed contacts being connected to an output side of said control device and their normally-open contacts being connected to a common connecting point, and each of said normally-closed contacts is connected to said common connecting



point through a diode in the direction allowing an electric current to flow from each of said normally-closed contacts toward said common connecting point, and further comprising a diode for allowing an electric current to flow in parallel to said second limit switch, bypassing between said normally-closed contact and said movable contact and flowing toward said motor.

4,914,363

METHOD FOR CONTROLLING THE MOTION OF A MACHINE ELEMENT

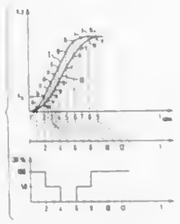
Joerg Stelzer, and Raimund Kram, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 28, 1989, Ser. No. 345,471

Claims priority, application Fed. Rep. of Germany, May 3, 1988, 3815030

Int. Cl.[4] G06F *15/46*

U.S. Cl. 318—568.1 **2 Claims**



1. A method for controlling a resultant motion of movements along a plurality of coordinate axes of a machine element between two points in space in accordance with selectively variable override values, each override value corresponding to a ratio, expressed as a percentage, of the desired velocity of movement of the machine element to a predetermined operating velocity, wherein the improvement comprises:

predetermining for each axis a distance-time curve at the normal operating velocity, corresponding to an override value of 100%, between the points in space, and

determining an instantaneous distance-time curve for moving the machine part so as to establish, in synchronism with a time sequence of selectively varied override values for each axis, a time expansion of the predetermined distance-time curve that is inversely proportional to the respective override value.

4,914,364

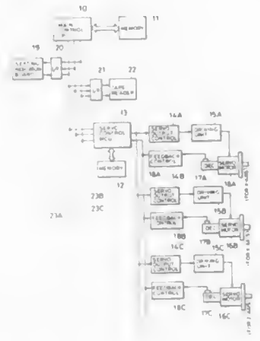
NUMERICAL CONTROL APPARATUS

Hayao Hirai, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 22, 1987, Ser. No. 111,322

Int. Cl.[4] G05B *11/18*

U.S. Cl. 318—590 **5 Claims**



1. A numerical control apparatus which controls servomotors for driving respective control spindle heads to thereby perform positioning control of a tool or the like relative to a work to be processed or the like, said apparatus comprising:

(a) means for determining whether an instruction in a machining program relates to a rapid-traverse circular-arcuate pass mode or not;

(b) a computation means for computing a distance by which each of said servomotors is caused to move per unit time in the rapid-traverse circular-arcuate pass mode, when said determining means proves that said instruction in said machining program relates to the rapid-reaverse circular-arcuate pass mode; and

(c) a servomotor control means for generating a signal for controlling each of said servomotors in accordance with the result of the computation by said computation means to cause said servomotors to perform the relative positioning in said rapid-traverse circular-arcuate pass mode.

4,914,365

CONTROL DEVICE FOR SERVO MOTOR

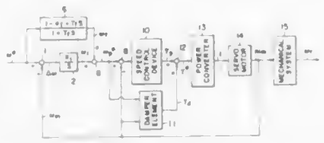
Shin Murakami, Hachioji, and Ryoichi Kurosawa, Kokubunji, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 5, 1988, Ser. No. 253,482

Claims priority, application Japan, Oct. 9, 1987, 62-255303

Int. Cl.[4] G05B *11/36*

U.S. Cl. 318—609 **7 Claims**



1. A control device for a servo motor comprising:

position control means for obtaining a reference speed necessary to control a rotational angle position of said servo motor to an objective rotational angle position, said position control means including an integrating component to obtain said reference speed on the basis of a speed deviation between an actual speed and an objective speed of said servo motor;

feedforward means for obtaining a correction amount necessary to compensate for the response delay of said position control means, said feedforward means functioning to obtain said correction amount on the basis of said objective speed and having a transfer function $G_f(S)$ represented by the following equation

$$G_f(S)=(1-K_f+T_fS)/(1+T_fS)$$

wherein S is a Laplace complex variable, K_f is a coefficient satisfying $0 \leqq K_f \leqq 1$ and T_f is a positive coefficient;

correction means for correcting said reference speed obtained by said position control means by said correction amount obtained by said feedforward means;

speed control means for obtaining a reference torque necessary to reduce to zero a deviation between said actual speed of said servo motor and said corrected reference speed obtained by said correction means; and

a power converter for controlling an armature current of said servo motor on the basis of said reference torque obtained by said speed control means.

4,914,366

POSITIONING CONTROL SYSTEM

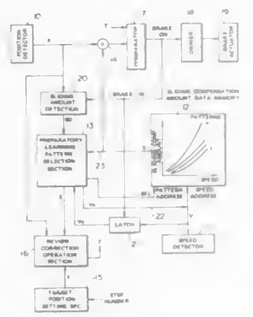
Yasuhiro Yuasa, and Akira Yamashita, both of Tokyo, Japan, assignors to Kabushiki Kaisha SG, Tokyo, Japan

Filed Sep. 13, 1988, Ser. No. 243,803

Claims priority, application Japan, Sep. 15, 1987, 62-230056; Mar. 24, 1988, 63-68283

Int. Cl.[4] G05B *5/01*

U.S. Cl. 318—612 **12 Claims**



1. A positioning control system comprising:

position detection means for detecting a position of an object by providing position data corresponding thereto;

speed detection means for detecting the speed of the object;

sliding compensation amount data generation means for selecting one speed-sliding function from plural speed-sliding functions, in response to input of a selection signal, and for generating sliding compensation amount data determined in correspondence to the speed detected by said speed detection means;

compensation means for correcting at least one of position data provided by said position detection means and target position data, with the sliding compensation amount data generated by said sliding compensation amount data generation means;

controol means for generating a brake signal on the basis of comparison of the position data and the target position data which have been subjected to correction by said compensation means and for controlling the stopping of the object by using this brake signal;

sliding amount detection means for detecting the amount of sliding of the object from generation of the brake signal till actual stopping of the object; and

function selection means for generating the selection signal in accordance with the sliding amount detected by said sliding amount detection means and the speed detected by said speed detection means during generation of the brake signal and for providing this selection signal to said compensation amount data

4,914,367

OPERATING DEVICE FOR THE COVER OF A SLIDING AND LIFTING SUNROOF

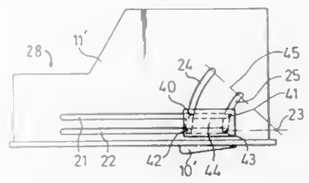
Klaus Niewiadomski, Lorsch, and Dimitrios Mecheridis, Eppelheim, both of Fed. Rep. of Germany, assignors to Gaus Mikrotechnik GmbH & Co., Heidelberg, Fed. Rep. of Germany

Filed Nov. 28, 1988, Ser. No. 276,524

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1987, 3741419

Int. Cl.[4] G05B *1/06*

U.S. Cl. 318—663 **17 Claims**



1. In an operating device for a displaceable cover of a sliding and lifting sunroof of a motor vehicle of the type having a desired value transmitter, an actual value transmitter, and an actuator forming part of a control circuit, by which a desired value signal supplied by the desired value transmitter and corresponding to a respective selected desired position of the cover is compared with an actual value signal supplied by the actual value transmitter corresponding to a respective actual position of the cover and the position of the cover adjusted until actual and desired positions coincide, the improvement wherein an operating element of the desired value transmitter is mounted so as to enable it to slide and swing in a manner corresponding to a cover sliding movement and a swinging out movement of the cover as a means for causing the desired value transmitter to issue a cover swinging movement controlling desired value signal which varies, upon swinging of the operating element, dependent on the respective angle of the operating element and upon sliding the operating element to issue a cover sliding movement controlling desired value signal which varies dependent on the respective sliding position of the operating element; and wherein desired value transmitter is a digital device.

4,914,368

RC SERVO

Kevin R. Orton, c/o Tekin Electronics, 1027 Trepadora, San Clemente, Calif. 92672

Filed Sep. 30, 1988, Ser. No. 251,569

Int. Cl.[4] G05B *5/01*

U.S. Cl. 318—663 **16 Claims**

1. A servo for driving a control linkage, comprising:

a motor;

a gear train coupled to the motor;

an output shaft coupled to the gear train to which to couple a control linkage;

position sensing means coupled to the output shaft for producing a signal indicative of output shaft position for feedback control purposes; and

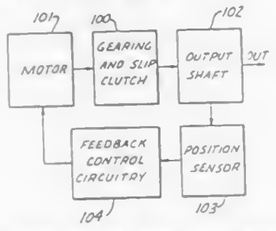
slip clutch means within the gear train, between the motor

and the output shaft, for at least partially inhibiting the transmission of a transient force through the gear train between the output shaft and the motor by enabling the output shaft to slip relative to the motor when the transient force reaches a predetermined level;

the slip clutch means including at least first and second hubs, each one of which first and second hubs is coupled to a respective one of the output shaft and the motor;

the first hub having a transverse surface generally perpendicular to an axis of rotation of the first hub;

the first hub defining a central opening that extends along the axis of rotation through the first hub;



the second hub including a radially extending portion that faces the transverse surface of the first hub;

the second hub extending along the axis of rotation through the central opening so that the second hub can rotate about the axis of rotation relative to the first hub and so that the second hub can be moved axially for purposes of forcing the radially extending portion against the transverse surface; and

the radially extending portion of the second hub having means for engaging the first hub when the radially extending portion is forced against the transverse surface of the first hub.

4,914,369

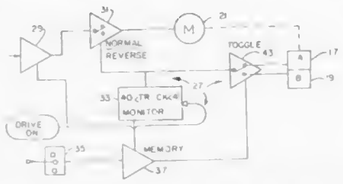
DISC DRIVE WITH IMPROVED STORAGE CAPACITY

Nisso Cordovi, 1720 Lochmoor Blvd., Jackson, Mich. 49201

Filed Nov. 4, 1988, Ser. No. 267,018

Int. Cl.[4] H02P *8/00*

U.S. Cl. 318—696 **7 Claims**



1. A drive system for a floppy disc having numbered data tracks on both sides thereof, said data tracks being ordered in a predetermined sequence, said drive system comprising:

a first head for transferring data between a personal computer or the like and one side of the floppy disc;

a second head for transferring data between the personal computer and the second side of the floppy disc;

a stepper motor responsive to stepper motor control signals for moving the first and second heads to predetermined tracks on the floppy disc, said stepper motor control signals determining the predetermined track to which the stepper motor moves the heads;

a control circuit for generating the stepper motor control signals, said control circuit receiving signals from the computer in a predetermined standard format defining the action desired by the computer;

the tracks on said floppy disc being disposed with the first "n" tracks on one side of the floppy disc and the "n+1"s track and remaining tracks on the other side of the floppy disc, said "n"th and "n+1"st tracks being disposed adjacent each other along a boundary of the disc but on opposite sides of the disc;

said control circuit including means for generating a first predetermined sequence of stepper motor control signals when the computer requests movement from any one track to a higher track and for generating a second predetermined sequence of stepper motor control signals when the computer requests movement from any one track to a lower track;

said control circuit further including transforming means responsive to a transition from the "n"th track to the "n+1"st track to accept the first predetermined sequence of stepper motor control signals and transform those signals into signals which cause movement of the stepper motor in the direction opposite that caused by the untransformed signals of the first predetermined sequence and to accept the second predetermined sequence of stepper motor control signals and transform those signals into signals which cause movement of the stepper motor in the direction opposite that caused by the untransformed signals of the second predetermined sequence.

4,914,370

SERVO-CONTROL CIRCUIT

Keiji Sakamoto, Tokyo, and Shunsuke Matsubara, Yamanashi, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

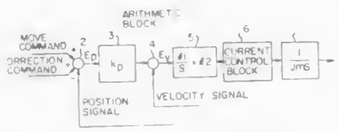
PCT No. PCT/JP88/00408, § 371 Date Nov. 9, 1988, § 102(e) Date Nov. 9, 1988, PCT Pub. No. WO88/08563, PCT Pub. Date Nov. 3, 1988

PCT Filed Apr. 26, 1988, Ser. No. 274,147

Claims priority, application Japan, Apr. 30, 1987, 62-107256

Int. Cl.[4] G11B *21/08*

U.S. Cl. 318—616 **3 Claims**



1. A servo-control circuit having a position feedback loop and a velocity feedback loop including an integration element with an incomplete integration gain for controlling a mechanical system based on a position feedback error and a velocity feedback error, comprising:

means for receiving a move command;

arithmetic means for computing an error between the position feedback error and the move command; and

control means for suppressing the incomplete integration gain when said error exceeds a set reference value.

4,914,371

APPARATUS FOR CONTROLLING AC SERVO MOTOR

Nobuho Shibata; Takashi Dohi, and Kenichi Ohara, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 9, 1986, Ser. No. 939,875

Int. Cl.[4] H02P *5/40*

U.S. Cl. 318—723 **5 Claims**

1. Apparatus for controlling the rotational speed of a synchronous motor comprising:

(a) an inverter having switches for selectively energizing windings of a stator of said synchronous motor, and diodes connected to said switches in inverse parallel, said inverter being responsive to a dc power source;

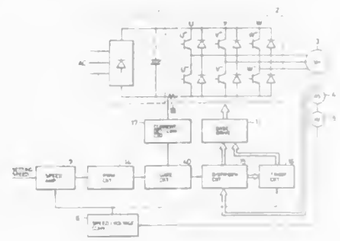
(b) a rotational speed sensing means for producing an output signal indicative of the rotational speed of said synchronous motor;

(c) speed setting means responsive to said output signal from said rotational speed sensing means and to a signal indicative of a setting speed for producing a difference signal;

(d) a pulse width modulation circuit responsive to said difference signal, said pulse width modulation circuit having a sawtooth wave generator and a comparator for outputting outputs through comparison of magnitude between the sawtooth wave from said sawtooth save generator and said difference signal;

(e) a rotor position sensor for producing an output signal indicative of the position of the rotor of said synchronous motor;

(f) a distribution circuit responsive to said output signal from said rotor position sensor and to an output signal from said



pulse width modulation circuit for determining current distribution to said windings of said synchronous motor;

(g) timer means responsive to an output signal from said distribution circuit for providing an output signal for a given period of time;

(h) a drive circuit responsive to output signals from said distribution circuit and to an output from said timer means for selectively controlling said switches included in said inverter so that said switches are kept in off state for said given period of time determined by said timer means;

(i) means responsive to said speed setting means for producing a plugging signal by detecting a sign of said difference signal; and

(j) switching means response to said means for supplying said drive circuit with an output signal of said timer means when said motor is in plugging state.

4,914,372

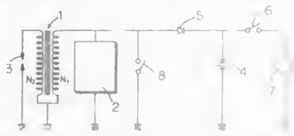
SMALL ENGINE FOR HAND-HELD WORK MACHINES

Shigetoshi Ishida, Chiba, Japan, assignor to Tanaka Kogyo Co., Ltd., Chiba, Japan

Filed Sep. 20, 1988, Ser. No. 247,043

Int. Cl.[4] F02P *1/00*; H02J *7/00*

U.S. Cl. 320—61 **4 Claims**



1. A small engine for hand-held work machines, comprising:

a magnetic which generates AC voltages by the rotation of the engine;

an ignition mechanism which causes spark discharge at an ignition plug for the engine with a first voltage of either positive or negative polarity of the magneto output;

a self-starting motor for starting the engine;

a secondary battery for driving the self-starting motor; and

a charging mechanism for charging said secondary battery with a second voltage of the other of said positive or negative polarity of said magneto during rotation of the engine;

said magneto comprising a rotor mounted so as to be driven by rotation of said engine and a starter which includes an ignition coil means opposed to said rotor;

said rotor including a first magnet fixed thereto for generating said AC voltage at said ignition coil means of said stator;

coil means including a primary coil in which said AC voltage is induced when said first magnet sweeps past said primary coil during the rotation of said rotor, and a secondary coil electromagnetically coupled to said primary coil and electrically connected to said ignition plug;

said ignition mechanism including a transistorized ignitor connector to said primary coil to control a short circuit of said primary coil for a period when said first AC voltage is induced in said primary coil; and

said charging mechanism including means for supplying said second AC voltage to said secondary battery.

4,914,373

GENERATOR SET FOR USE ON A BUILDING SITE

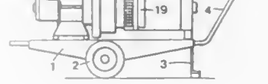
Jacques Rivkine, 33, chemin Moise Duboule, 1209 Geneve, Switzerland

PCT No. PCT/CH85/00166, § 371 Date Sep. 22, 1987, § 102(e) Date Sep. 22, 1987, PCT Pub. No. WO87/03430, PCT Pub. Date Jun. 4, 1987

PCT Filed Nov. 25, 1985, Ser. No. 87,722

Int. Cl.[4] H02K *5/00*; H02J *9/08*; H02P *9/42*

U.S. Cl. 322—1 **5 Claims**



1. A generator set for use on a building site comprising

(a) a frame;

(b) an internal combustion engine mounted on said frame;

(c) a generator mounted on said frame and driven by said engine to produce at an outlet at least one of a single-phase and three-phase alternating current at the voltage and frequency of a local mains supply;

(d) an electrical converter mounted on said frame and having an outlet;

(e) connection means including a switch for connecting said converter with the outlet of said generator, said converter producing a current at a higher frequency than the current of the mains supply; and

(f) at least two sockets, one of said sockets being connected with the outlet of said generator for supplying generator current and the other of said sockets being connected with the outlet of said converter for supplying converter current.

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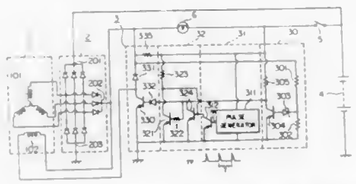
4,914,374

VOLTAGE REGULATOR FOR AC GENERATOR WITH CONSTANT INTERRUPTION FREQUENCY

Shiro Iwatani, and Hirofumi Watanabe, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1989, Ser. No. 306,421
Claims priority, application Japan, Feb. 24, 1988, 63-41075
Int. Cl.[4] H02J *7/16;* **H02P** *9/30*
U.S. Cl. 322—28 **4 Claims**



1. A voltage regulator for regulating an output voltage of a rectifier circuit coupled to output terminals of an AC generator including a field winding for generating a magnetic field for inducing AC voltages in an armature winding of the generator, said voltage regulator comprising:

a power transistor coupled in series with a field winding of an AC generator, said power transistor controlling a supply of excitation current to said field winding by being turned on and off into a conductive and a non-conductive state;

output voltage detector circuit means coupled across output terminals of a rectifier circuit for detecting an output voltage thereof and turning off said power transistor when said output voltage rises above a predetermined level;

holding circuit means for holding said power transistor in a non-conductive state after the output voltage of said rectifier circuit detected by said output voltage detector circuit means falls from above to below said predetermined level; and

releasing circuit means for releasing a holding action of said holding circuit means periodically at a predetermined interval, thereby turning on said power transistor which is held in a non-conductive state by said holding circuit means;

wherein said power transistor turned on by a releasing action of said releasing circuit means is turned off by said output voltage detector circuit means to lower the output voltage across said output terminals of said rectifier circuit below said predetermined level before a subsequent releasing action of said releasing circuit means occurs, so that a frequency of turning on and off of said power transistor is made equal to a frequency of releasing actions of said releasing circuit means occurring at said predetermined interval.

4,914,375

SATURABLE REACTOR APPARATUS FOR AUTOMATIC CONTROL OF POWER FACTOR OF INDUCTIVE LOAD

Takefumi Hatanaka, Tokyo, Japan, assignor to Arex Electronics Corporation, Tokyo, Japan

Filed Jun. 6, 1989, Ser. No. 362,196
Claims priority, application Japan, Jun. 8, 1988, 63-139537
Int. Cl.[4] G05F *1/70*
U.S. Cl. 323—206 **4 Claims**

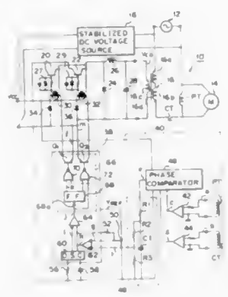
1. An automatic power factor control apparatus comprising:

a saturable reactor having an alternating winding for controlling a level of current which flows in an inductive load that is coupled to an AC power source, and having a control winding for controlling a value of impedance of said alternating winding

a stabilized DC voltage source for supplying a DC control voltage to said control winding;

semiconductor switching element means coupled between said stablized DC voltage source and said control winding, for controlling application of said DC control voltage to said control winding;

power factor detection circuit means for producing an output voltage signal which varies in proportion to a value of power factor of said inductive load; and



high frequency pulse width control circuit means for generating a high frequency drive signal comprising pulses having a width which varies in accordance with said output voltage signal;

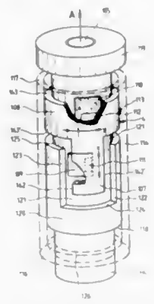
wherein said semiconductor switching element means execute adjustment of said DC control voltage by being alternately set in conducting and non-conducting states in accordance with the pulse width of said high frequency drive signal, for thereby controlling the impedance of said control winding in accordance with said power factor.

4,914,376

ACTUATION DEVICE FOR AN ELECTRICAL APPLIANCE

Werner Meyer, Schwalbach, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Mar. 30, 1988, Ser. No. 175,095
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1987, 3711484
Int. Cl.[4] G05B *24/02*
U.S. Cl. 323—352 **16 Claims**



1. An actuation device for an electrical appliance for the open- or closed-loop control of at least one operating quantity of the electrical appliance, including an appliance housing, a primary detector for the generation of controlled variables, said primary detector including a movable magnetic field

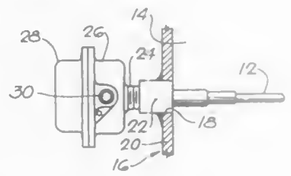
varying element which is arranged on the outside of said appliance housing and produces magnetic fields of varying field strengths in dependence on its position, and an element fixedly disposed on the electrical appliance and sensitive to magnetic fields, said field-sensitive element being disposed inside said housing including a magnetoresistive element and being adapted to produce an output quantity which is a measure of the field strength at the site of said field-sensitive element, a circuit arrangement inside said housing, and means for delivering said output quantity to said circuit arrangement, said circuit arrangement incorporating at least one control function responsive to said output quantity which in turn operates on the operating quantity of the electrical appliance.

4,914,377

RADIO FREQUENCY CAPACITANCE PROBE SYSTEM FOR MATERIAL DETECTION

Craig A. Russell, Elburn, Ill., assignor to Ludlow Industries, Inc., Elburn, Ill.

Filed Aug. 25, 1983, Ser. No. 236,639
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—690 **20 Claims**



1. A radio frequency capacitance probe system for material direction, comprising

a capacitance probe adapted to be located in a container where material is to be detected,

said probe having a minimum capacitance to the container when the material is absent and a substantially increased capacitance when the material is present around the probe,

a radio frequency (RF) source for producing a fixed RF voltage,

a first electronic translating circuit having an RF input connection to said source and an RF output connection to said probe,

said first electronic translating circuit having means including a first active electronic element affording a first DC signal path along which a DC signal current is increased while the DC resistance of said path is decreased in response to increasing capacitance of said probe and consequent increasing RF current into said probe,

a DC signal line to which said first DC signal path is connected for drawing current from said line,

a first signal level detector having an input connected to said signal line for triggering an output when the signal voltage on said line drops below a first reference level,

utilization means connected to said first signal level detector and operative to perform at least one control function in response to the output thereof,

a second electronic translating circuit having a second RF input connection to said RF source and a second RF output connection,

a variable balancing capacitance connected to said second RF output connection,

said second electronic translating circuit having means including a second active electronic element affording a second DC signal path connected to said DC signal line for supplying a variable DC balancing current to said line,

said second electronic translating circuit being operative to produce an increased balancing current and a decreased resistance along said second DC signal path in response to increasing the value of said variable capacitance and thereby increasing the RF current therein,

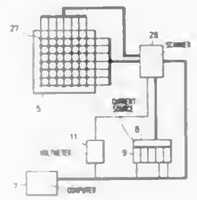
and calibration means for varying said variable capacitance to adjust and calibrate the initial voltage on said signal line and thereby to compensate for increases in the minimum capacitance of said probe due to adherent material after the material contacts the probe and then recedes therefrom.

4,914,378

METHOD AND APPARATUS FOR INSPECTING SURFACE DEFECTS

Makoto Hayashi; Masahiro Ootaka; Akisuke Naruse, and Kazuo Takaku, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

PCT No. PCT/JP87/00789, § 371 Date Jun. 20, 1988, § 102(e) Date Jun. 20, 1988, PCT Pub. No. WO88/02857, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 16, 1987, Ser. No. 235,683
Claims priority, application Japan, Nov. 21, 1986, 61-278163; Oct. 20, 1988, 61-247428
Int. Cl.[4] G01R *27/14, 27/26;* **G01N** *27/82*
U.S. Cl. 324—696 **9 Claims**



1. A method of detecting the shape of a crack on a surface of material on which cracks may appear comprising:

providing a plurality of electrodes arranged in the form of a matrix on said surface, said electrodes being connected to serve both as power supplying electrodes and potential difference measuring electrodes;

switching a first pair of electrodes in said matrix to serve as power supplying electrodes while other electrodes in said matrix are switched for measuring the potential difference distribution;

thereafter switching a second pair of electrodes in said matrix to serve as power supplying electrodes while said first pair of electrodes are switched for measuring part of said potential difference distribution to thereby measure potential difference distribution in various directions and precisely determine a surface crack shape.

4,914,379

SEMICONDUCTOR INTEGRATED CIRCUIT AND METHOD OF TESTING SAME

Hideshi Maeno, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1989, Ser. No. 341,561
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—22.3 **8 Claims**

1. A semiconductor integrated circuit, comprising:

clock input means for receiving externally applied clock signals;

a plurality of tested circuits subject to logic tests;

test data signal input means for receiving a externally applied test data signal for testing said plurality of tested circuits; and

a plurality of shift register means forming pairs, one of said shift register means in each pair being coupled to the input

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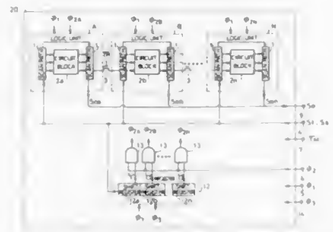
of the associated one of said plurality of tested circuits, with the other shift register means being coupled to the output of said associated one of said plurality of tested circuits, said plurality of shift register means performing shifting operation in response to clock signals applied thereto via said clock input means;

wherein:

each of said shift register means coupled to the inputs of said tested circuits is coupled to said test data signal input means and responsive to clock signals applied thereto via said clock input means by applying the test data signal to the tested circuit to which that shift register means is coupled, and each of said shift register means coupled to the outputs of said tested circuits is responsive to clock signals applied thereto via said clock input means by



providing a test result representative signal after the completion of testing the tested circuit to which that shift register is coupled; and

said semiconductor integrated circuit further comprises:

selection signal input means for receiving an externally applied selection signal for selecting that pair of shift register means to which clock signals applied via said clock input means are to be applied; and

clock signal selective application means coupled to said clock input means and to said selection signal input means and responsive to the selection signal provided via said selection signal input means for selectively applying clock signals applied at said clock input means to that pair of shift register means which is designated by said selection signal.

4,914,380

SIGNAL RECEIVING ARRANGEMENT

Alan F. Dadds, Hartfield, England, assignor to U.S. Philips Corp., New York, N.Y.

Filed Dec. 8, 1988, Ser. No. 281,575

Claims priority, application United Kingdom, Dec. 18, 1987, 8729515

Int. Cl.[4] G01R *23/14*

U.S. Cl. 324—79 R 17 Claims

1. A signal receiving arrangement comprising:

first and second groups of successively ordered frequency down-converting stages for producing frequency down-converted signals,

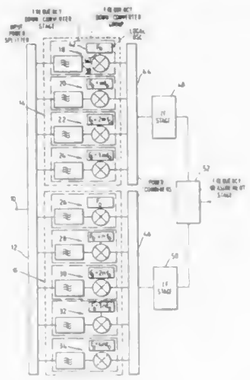
a signal input coupled to the stages of each group for applying an input signal to each of the stages,

each stage comprising a mixer and a local oscillator,

the local oscillators of the successive stages in each of the first and the second groups producing different frequencies such that the frequencies of the local oscillators of successive stages in the first and in the second groups form respective arithmetic progressions,

combining means for combining the frequency down-converted outputs of the respective stages of each group, and

means for determining the frequency of the input signal by measuring the frequency of the frequency down-converted signals produced at the output of each of the combining means and treating the measured frequency values as residues in order to determine the interval in the respective arithmetic progressions to which the measured frequency values correspond on the basis of the Chinese remainder theorem.



4,914,381

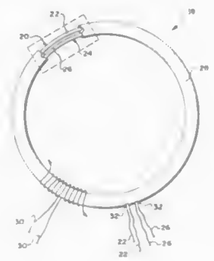
DIRECT-COUPLED FLUXGATE CURRENT SENSOR

Barry Narod, Vancouver, Canada, assignor to Barrigar & Oyen, Vancouver, Canada

Continuation-in-part of Ser. No. 55,434, May 28, 1987, abandoned. This application Aug. 19, 1988, Ser. No. 234,206

Int. Cl.[4] G01R *33/02;* F02P *1/00*

U.S. Cl. 324—117 R 19 Claims



1. A direct-coupled fluxgate current sensor which is driven by alternating electrical current to hard saturation to achieve a sudden change in magnetic properties of the sensor, comprising:

(a) a first closed loop core means comprising ferromagnetic material susceptible to hard saturation encased in a sleeve wound with a first toroidal drive winding, the winding for the first core means extending around the circumference of the first core means;

(b) a second closed loop core means comprising ferromagnetic material susceptible to hard saturation encased in a sleeve wound with a second toroidal drive winding independent of the first winding, the winding for the second core means extending around the circumference of the second core means; and,

(c) a closed loop core casing means which is adapted to cooperate with the first core means and the second core means, for holding them in parallel side-by-side relationship, the closed loop core casing means and the first and second core means being wound as a unit with toroidal sense winding independent of the first and second toroidal drive windings, the winding for the closed loop core casing means extending around the circumference of the closed loop core casing means.

4,914,382

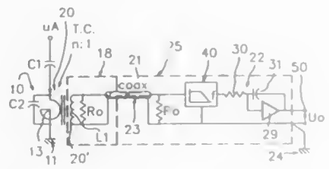
HIGH VOLTAGE MEASURING CIRCUIT COUPLED TO THE CAPACITIVE GROUNDING TAP BUSHING OF AN HV DEVICE

Jean Donville, Beloeil; Ryszard Malewski, St-Lambert, and Louis Lavallée, Beloeil, all of Canada, assignors to Hydro-Quebec, Montreal, Canada

Continuation-in-part of Ser. No. 108,000, Oct. 14, 1987, abandoned. This application Oct. 27, 1988, Ser. No. 263,079

Int. Cl.[4] G01R *1/20, 19/00*

U.S. Cl. 324—127 7 Claims



1. A high voltage measuring circuit for broadband measurement of transient signals occurring in high voltage apparatus, said measuring circuit being housed in a shielded housing, said measuring circuit having an input sensing circuit for connection to a capacitive grounded tap bushing of a high voltage apparatus, said sensing circuit having an electrical shielded connection connected to an output circuit, said measuring circuit having means to generate output signals which are replicas of the high voltage transient signals appearing on said tap bushing, said measuring circuit having a broadband which extends over a frequency band of from about 1 Hz to 1 MHz and has a signal level higher than background noise, said input sensing circuit having an input current transformer, said current transformer having a primary winding connected to the said capacitive grounded tap busing and to a bushing flange, said transformer having a sufficient number of turns in its secondary winding to maintain a constant transformation ratio up to about 3 MHz, said secondary winding of said current transformer having its output integrated by a passive integrator and an active integrator acting respectively in the low and high frequency spectrum of said frequency band and ensuring a constant ratio of the input and output signals of said frequency band of the said measuring circuit.

4,914,383

NON-CONTACT AMMETER

Alan W. Wilkerson, 410 Madero Dr., Thiensville, Wis. 53092

Continuation of Ser. No. 785,572, Oct. 10, 1985, abandoned. This application Jul. 26, 1989, Ser. No. 386,028

Int. Cl.[4] G01R *1/22, 33/00*

U.S. Cl. 324—127 20 Claims

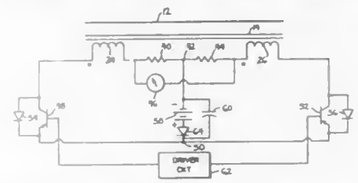
1. An ammeter for measuring the magnitude of direct current, alternating current, or a combination thereof in a conductor, said ammeter comprising:

a single core capable of carrying a changeable magnetic flux, said core being in operative association with the conductor so that the conductor may serve as a primary winding for said core;

second winding means operatively associated with said core for being inductively coupled to the conductor through the flux in the core so that the current in said second winding means may bear a relationship to the current in the conductor;

means for sensing the magnetic flux condition of the core;

voltage establishing means coupled to said second winding means for establishing the polarity of a voltage on said second winding means and the direction of flux change in said core, said voltage establishing means being responsive to said flux condition sensing means for periodically reversing the polarity of the voltage on said second winding means to reverse the direction of flux change in said core to maintain the inductive coupling between said second winding means and the conductor, said voltage establishing means including electrical power supply means coupled to said second winding means, said voltage establishing means providing a current flow path for the current in said second winding means in which said second winding means functions as an electrical source for said power supply means, as a load, and a given polarity of voltage is established in said second winding means and providing a current flow path for the current in said second winding means in which said second winding means functions as a load for the said power supply means, as an electrical source, and the polarity of the voltage on said second winding means is reversed; and



means coupled to said second winding means and responsive to the instantaneous current in said second winding means for indicating the magnitude of the current in the conductor.

4,914,384

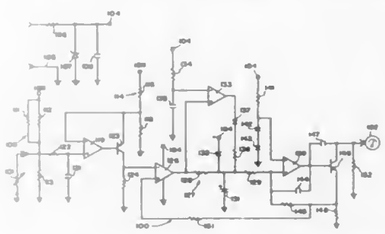
MAGNETIC GAGE DRIVER CIRCUIT

David W. Taylor; Phillip R. Peterson, both of Grand Blanc, and Arthur C. Kovacic, Flint, all of Mich., assignors to Lucas Girtek Corporation, Flint, Mich.

Filed Jun. 12, 1989, Ser. No. 364,096

Int. Cl.[4] G01F *23/36;* G08B *21/00*

U.S. Cl. 324—125 10 Claims



1. A gage driver circuit for use with a magnetic gage and a gage signal source for providing a source signal to be displayed by said magnetic gage, comprising:

(a) a resistor coupled to said magnetic gage;

(b) first simulation means coupled to said gage signal source for simulating said magnetic gage;

(c) second simulation means for simulating said magnetic gage coupled to said resistor; and

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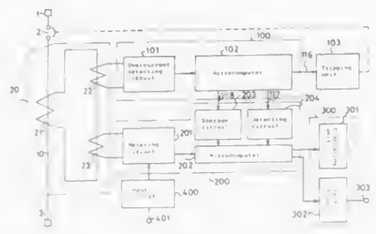
(d) signal processing means coupled to said first simulation means and to said second simulation means for providing a drive signal to said magnetic gage.

4,914,385

CURRENT DETECTOR

Ichirou Arinobu, Fukuyama, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1987, Ser. No. 77,934
Int. Cl.[4] G01R 19/145, 19/165
U.S. Cl. 324—127 13 Claims



10. A current detector comprising:

first current sensor means provided for respective phases of AC power liens, wherein said first current sensor means includes a closed loop electromagnetically coupled to said line and has a core made of at least two different materials of silicon steel sheets and permalloy sheets, respectively;

second current sensor means electromagnetically coupled to an output of said first sensor means and having a core formed of silicon steel sheets; and

third current sensor means in series with said second current sensor means electromagnetically coupled to said output of said first sensor means and having a core formed of permalloy sheets,

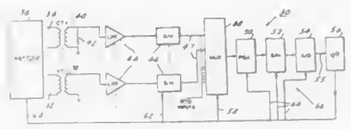
wherein said second current sensor means has a core formed of silicon steel exclusive of permalloy sheets and said third current sensor means has a core formed of permalloy sheets exclusive of silicon steel sheets.

4,914,386

METHOD AND APPARATUS FOR PROVIDING THERMAL PROTECTION FOR LARGE MOTORS BASED ON ACCURATE CALCULATIONS OF SLIP DEPENDENT ROTOR RESISTANCE

Stanley E. Zocholl, Holland, Pa., assignor to ABB Power Distribution Inc., Purchase, N.Y.

Filed Apr. 28, 1988, Ser. No. 187,317
Int. Cl.[4] G01R 27/00; H02P 5/40
U.S. Cl. 324—158 MG 17 Claims



1. A system for determining rotor resistance values of a an induction motor from an input voltage and an input current applied to said induction motor, said system comprising:

first means for repetitively sampling the input voltage and input current of said induction motor to obtain a plurality of voltage and current samples including at least one pair of voltage and current samples taken at start up of said induction motor;

second means, responsive to said first means, for calculating from said voltage and current samples instantaneous total apparent resistance values including an initial apparent total resistance value obtained at said start up;

third means, responsive to said second means, for deriving from said initial apparent total resistance value a calculated stator resistance;

fourth means, responsive to said first second and third means, for repetitively calculating instantaneous slip values from said instantaneous apparent total resistance values and from said calculated stator resistance;

fifth means, responsive to said second third and fourth means for calculating instantaneous rotor resistance values from said instantaneous slip values

sixth means for calculating, from said instantaneous rotor resistance values and said current input, the quantity of heat generated and the temperature prevailing in said rotor;

seventh means for tripping said motor when said temperature reaches a predetermined value, said seventh means including means for repetitively calculating an instantaneous temperature value;

a microprocessor and an associated control program, said microprocessor and control program comprising said second, third, fourth, fifth and sixth means; and

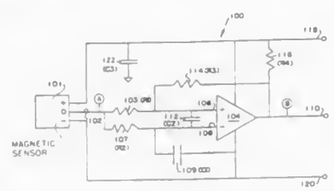
an interface circuit for interfacing said microprocessor to said motor.

4,914,387

MAGNETIC SPEED SENSOR WITH AN ADAPTIVE THRESHOLD CIRCUIT FOR USE WITH A BEARING ASSEMBLY

A. J. Santos, Canton Center, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Apr. 4, 1988, Ser. No. 177,290
Int. Cl.[4] G01P 3/487; H03K 19/18, 5/153; F16C 32/00
U.S. Cl. 324—166 11 Claims



1. A speed sensor assembly for use with a bearing assembly and a rotatable shaft, said sensor assembly comprising in combination:

means for providing a magnetic signal corresponding to the rotational speed of said rotatable shaft, said means connected to said shaft;

a solid-state magnetic sensor for detecting said magnetic signal, said sensor providing an analog output signal to a sensor output terminal, said output signal being proportionate to said magnetic signal and the speed of rotation of said shaft;

means for mounting said sensor on said bearing assembly; and

an adaptive threshold circuit connected to said sensor output terminal, and processing said sensor signal to provide a square-wave digital output signal, said adaptive threshold circuit consisting of:

a comparator having first and second analog input signal terminals and one digital output signal terminal;

a first analog comparator input signal terminal connected to said sensor output terminal and having a positive feedback signal from said comparator output terminal connected to said fist comparator input terminal to provide hysteresis; and

a second analog comparator input signal terminal connected to said sensor output terminal and a low-pass filter in series, said low-pass filter consisting of a resistor and a capacitor;

said comparator being responsive to the relative amplitudes of said fist and second input signals so as to provide a corresponding signal output signal to said comparator output terminal, and

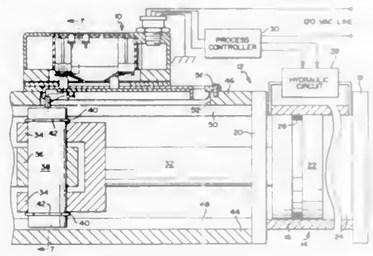
said adaptive threshold circuit being integrated entirely onto an integrated circuit chip, with the exception of said capacitor in said low-pass filter.

4,914,388

DUAL OUTPUT SENSOR FOR DETECTING THE PROXIMITY OF A RECIPROCATING MEMBER

Daniel J. Kalista, Milwaukee, and Earl T. Piber, Oconomowoc, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 30, 1988, Ser. No. 213,400
Int. Cl.[4] G01B 7/14; H01H 15/14, 35/38; G08C 19/06
U.S. Cl. 324—207.16 30 Claims



1. A proximity switch for use with a power actuated device including a member mounted for movement between first and second limits of travel, said switch comprising:

means operative to change conductive state in response to a control signal;

first and second inductive circuit elements;

means operative to electrically energize said inductive elements to establish substantially isolated flux fields thereabout, each said field disposed within the atmosphere surrounding its respective element and having a characteristic amplitude;

first target means displaceable between a position remote from said first inductive element and a sensed position adjacent said first element to effect a change in said first element characteristic amplitude;

second target means displaceable between a position remote from said second inductive element and a sensed position adjacent said second element to effect a change in said second element characteristic amplitude;

circuit means operative to generate said control signal as a function of said change in at least one of said characteristic amplitudes; and

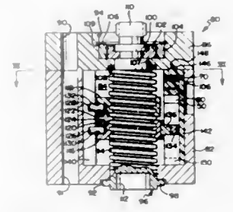
means operatively engaging said member and said first and second target means to effect simultaneous reciprocal displacement of said first and second target means between said respective remote and sensed positions when said member alternately substantially arrives at one of its end limits of travel.

4,914,389

MULTITURN SHAFT POSITION SENSOR WITH BACKLASH COMPENSATION

Mark A. Juds, New Berlin, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 24, 1988, Ser. No. 261,191
Int. Cl.[4] G01B 7/30, 7/14
U.S. Cl. 324—207.21 11 Claims



7. A multiturn shaft position sensor for detecting the position of a multiturn shaft comprising:

a magnet for generating magnetic flux;

a means connected to the multiturn shaft and said magnet for converting multiturn motion of the multiturn shaft into linear motion of said magnet along a predetermined movement path;

means continuously biasing said means connected to the multiturn shaft in one direction along the axis of said multiturn shaft;

at least one magneto resistive structure disposed for receiving said magnetic flux from said magnet which differs depending upon the location of said magnet along said movement path, said at least one magneto resistive structure having an electrical resistance dependent on the magnitude of received magnetic flux;

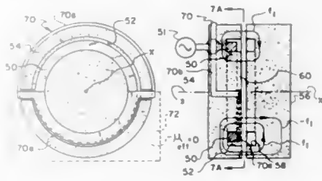
an electrical circuit connected to said at least one magneto resistive structure for measuring said electrical resistance of said at least one magneto resistive structure and generating a position signal indicative of the position of the multiturn shaft proportional to said electrical resistance of said at least one magneto resistive structure.

4,914,390

TRANSDUCER FOR DETERMINING THE INSTANTANEOUS RELATIVE ANGULAR POSITIONS BETWEEN TWO MEMBERS

David M. Orlicki, Rochester; Bruce E. Koppe, Caledonia, and Thomas W. Palone, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 11, 1988, Ser. No. 231,301
Int. Cl.[4] G01B 7/30
U.S. Cl. 324—207.17 6 Claims



1. A transducer for determining the instantaneous relative positions between a first member and a second member in response to relative movement between the members, the transducer comprising:

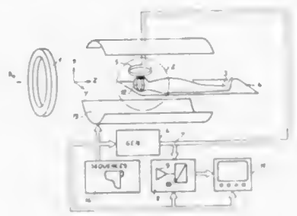
a sensor connectable to the first member, the sensor being made from a material having a high permeability,
a coil of an electrical conductor carried by the sensor and being energizable from a source of electrical energy to produce flux paths, the coil being located relative to the sensor so that flux paths produced by current flow in the coil are enhanced by the high permeability material of the sensor,
means carried by the sensor for effectively blocking flux paths from one portion of the coil without substantially affecting the flux paths from a second portion of the coil,
a target of a material having a high permeability, the target being connectable to the second member so it is movable with respect to the sensor, the target having a portion located adjacent the sensor, and
means carried by the target portion for effectively blocking at least part of the flux paths from the second portion of the coil during movement of the target with respect to the sensor.

4,914,391

METHOD FOR FAST IMAGING BY NUCLEAR MAGNETIC RESONANCE

Patrick Leroux, Gif sur Yvette, France, assignor to General Electric CGR S.A., Issy les Moulineaux, France

PCT No. PCT/FR88/00136, § 371 Date Nov. 21, 1988, § 102(e) Date Nov. 21, 1988, PCT Pub. No. WO88/07672, PCT Pub. Date Oct. 6, 1988
PCT Filed Mar. 15, 1988, Ser. No. 286,985
Claims priority, application France, Mar. 25, 1987, 87 04132
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **9 Claims**



1. A method of fast imaging by nuclear magnetic resonance of a body subjected to an intense magnetic orienting field, said method comprising a plurality of sequences said sequences including steps of:
orienting the magnetic moments of particles of said body in a direction imposed by said intense magnetic field wherein said magnetic moments of said particles of said body are excited by means of a radio-frequency electromagnetic excitation in order to tilt the orientation of said magnetic moments with respect to the direction said intense oriented magnetic field;
producing a de-excitation signal from said excitation of said magnetic moments;
coding said de-excitation signal by means of pulses of magnetic field gradients and outputting a resultant coded signal;
detecting said resultant coded signal and outputting a detected signal;
processing said detected signal by decoding said detected signal in order to extract an image of a part of said body wherein said electromagnetic excitation comprises excitation pulses for facilitating regrowth of components, aligned with said intense orienting magnetic field, of magnetic moments of said particles prior to a following sequence;
wherein said following sequence is characterized by said electromagnetic excitation comprising a pulse for tilting the magnetic moments through an angle which is substantially smaller than 90 degrees, followed by an even number of excitation pulses at 180 degrees wherein said even number of excitation pulses are spin echo pulses.

4,914,392

AMPLITUDE AND FREQUENCY/PHASE MODULATED PULSES TO ACHIEVE PLANE ROTATIONS OF NUCLEAR SPIN MAGNETIZATION VECTORS WITH INHOMOGENEOUS B_1 FIELDS

Kamil Ugurbil, Maple Plaine, and Michael Garwood, Minneapolis, both of Minn., assignors to Reagents of the University of Minnesota, Minneapolis, Minn.

Filed Mar. 27, 1987, Ser. No. 32,059
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **27 Claims**

1. A method for executing a plane rotation of magnetic spins in the matter under the influence of a spin aligning magnetic field B_0, said method comprising the steps of:
(a) providing a coil responsive to electrical energization to generate a B_1 field;
(b) orienting said coil so that the B_1 field generated by said coil has components transverse to said B_0 field; and
(c) energizing said coild to generate an RF adiabatic pulse providing said B_1 field, said pulse generated to include a substantially 180° phase shift in said B_1 field at a time when B_1 substantially equals the effective field B_1^e to cause a flip in the effective field B_1^e in said matter and to further include an additional discontinuous phase shift of a predetermined degree in said B_1 field to cause said magnetic spins to undergo a plane rotation of a certain degree corresponding to said predetermined degree whereby plane rotations of variable degree can be achieved.

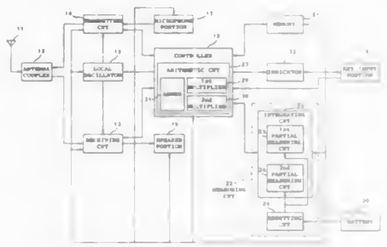
4,914,393

ACCURATELY INDICATING A STATUS OF CONSUMPTION OF A BATTERY BY WHICH AN ELECTRONIC CIRCUIT IS CONTROLLABLY PUT INTO OPERATION

Koichi Yoshido, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Aug. 26, 1988, Ser. No. 236,898
Claims priority, application Japan, Aug. 27, 1987, 62-213884
Int. Cl.[4] G01N *27/46*
U.S. Cl. 324—428 **9 Claims**

1. A battery-status-indicating arrangement for use in an electronic circuit that is controllably put into operation by a battery, said battery-status-indicating arrangement being for indicating a status of consumption of said battery, wherein the improvement comprises, in combination with the foregoing;
measuring means coupled to said electronic circuit for measuring a total time interval during which said electronic circuit is put into operation, said measuring means thereby producing a time-duration signal indicative of said total time interval;
memory means for preliminarily memorizing a current-rate signal representative of a current rate at which said electronic circuit is controllably put into operation;
arithmetic means coupled to said memory means and to said measuring means for multiplying said current-rate signal and said time-duration signal to produce a multiplied



signal representative of a product of said current rate and said total time interval as a status signal representative of a calculated status for said battery; and
indicating means responsive to said status signal for indicating said status of consumption based on said calculated status.

4,914,394

POCKET-SIZE TIME DOMAIN REFLECTOMETER

Jack R. Meyer, Fairfax, Va., assignor to Electromagnetic Technology, Inc., Fairfax, Va.

Continuation of Ser. No. 891,387, Jul. 31, 1986, abandoned. This application Dec. 1, 1988, Ser. No. 279,265
Int. Cl.[4] G01K *31/11*
U.S. Cl. 324—534 **15 Claims**

1. A pocket-sized time domain reflectometer for testing a cable to determine the impedance characteristics of the cable at any point along the length of the cable comprising:
first pulse generator means for producing a test pulse, said test pulse having a substantially sharp peak;
test connector means for connecting the reflectometer to the cable, said test connector means outputting said test pulse to the cable, said test connector means further receiving any reflections by the cable of said test pulse;
adjustable second pulse generator means for producing a delay pulse, said delay pulse being produced at a time t following the production of said test pulse where said time t can be adjusted along the entire length of the cable being tested in accordance with a specific point along its length that is being tested, said delay pulse having a substantially sharp peak;
reflection signal sensing means, connected to said first pulse generator means and said adjustable second pulse generator means and responsive to said test pulse and said delay pulse, for sensing reflection by the cable of said test pulse at said specific point and producing a reflection sensing output signal that is indicative of the presence and magnitude of a reflection signal from said cable at said specific point that has been received by said test connector; and
meter means, connected to said reflection signal sensing means, for producing a meter reading indicative of the impedance characteristics of the cable at said specific point in accordance with said reflection sensing output signal;
said reflection signal sensing means comprising a clamp circuit for continually sensing for said test pulse and including,
a charging capacitor, and
a diode,
said charging capacitor maintaining a first voltage level when no reflections are received by said test connector means,
said charging capacitor maintaining a second voltage level when a reflection indicative of a cable short circuit is received by said test connector means,
said charging capacitor maintaining a third voltage level when a reflection indicative of an open circuit cable is received by said test connector means.

4,914,395

METHOD AND APPARATUS FOR DETECTING PINHOLE

Yoshikazu Hamada, Tokyo, Japan, assignor to Nikka Densok Limited, Tokyo, Japan

Filed May 12, 1989, Ser. No. 351,362
Claims priority, application Japan, May 16, 1988, 63-118741
Int. Cl.[4] G01R *31/12*
U.S. Cl. 324—557 **10 Claims**

1. A method for detecting a pinhole, comprising steps of;
(a) applying a high voltage to an electrode which is close to or brought into contact with an insulation member to be detected;
(b) detecting a pinhole being in existence on the insulation member to be detected through detection of a discharge current which flows through the electrode; and
(c) cooling a portion of the insulation member to be detected which faces said electrode during at least a time when the high voltage is applied to the electrode.

4,914,396

PWM WAVEFORM GENERATOR

Ronald J. Berthiaume, Lafayette, Colo., assignor to Acme Electric Corporation, East Aurora, N.Y.

Filed Sep. 21, 1987, Ser. No. 98,972
Int. Cl.[4] H03B *19/00;* **H03L** *5/00;* **H03K** *5/153, 7/00*
U.S. Cl. 328—14 **15 Claims**

1. A pulse width modulated waveform frequency generator comprising in combination:
frequency controlling means including means to establish a series of pulses of substantially constant amplitude and of a width directly in accordance with data of the amplitude of steps of a desired output waveform at a selected frequency; and amplitude controlling means connected to modify the output of said frequency controlling means to proportionally control the width of said pulses with re-

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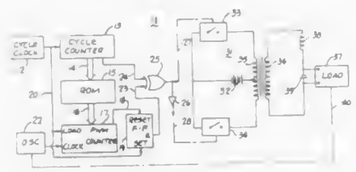
spect to said data controlled width so that a desired effective amplitude is directly proportional to said modified



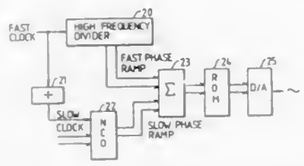
width, whereby a modified amplitude waveform frequency is generated.

4,914,397

DIGITAL FREQUENCY CONVERTER

Simon J. Gale, Bishop Stortford, and Stephen M. Moroz, Devon, both of Great Britain, assignors to STC PLC, London, United Kingdom

Filed Aug. 1, 1988, Ser. No. 227,017
Claims priority, application United Kingdom, Oct. 10, 1987, 8723856
Int. Cl.[4] H03B *19/00*
U.S. Cl. 328—15 3 Claims



1. A digital frequency up conversion arrangement comprising

a first source of fixed high speed clock pulses the frequency of which is near to the desired output frequency of the converter arrangement,

a high frequency divider to which the output of said first source is applied to produce a repetitive fixed first digital word, the sample rate of the digital word being equal to the high speed clock frequency,

a second source of slow clock pulses synchronised with the high speed clock pulses,

a slow frequency numerically controlled oscillator (NCO) to which the output of said second source is applied together with negative frequency input data to produce second digital words the sample rate of which is equal to the slow clock frequency,

summing means to which the digital word outputs of the high frequency divider and the slow frequency NCO are applied to produce resultant digital words which form a digital representation of a sine wave at the desired output frequency of the converter arrangement, and

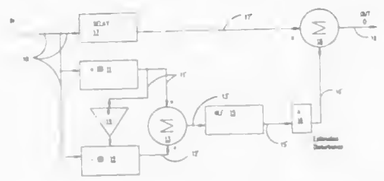
digital-to-analog conversion means to which the output of the summing means is applied to produce an analog sine wave at the desired output frequency.

4,914,398

METHOD AND CIRCUITRY TO SUPPRESS ADDITIVE DISTURBANCES IN DATA CHANNELS CONTAINING MR SENSORS

Stephen A. Jove, Watsonville; Klaas B. Klaassen, and Jacobus C. L. van Peppen, both of San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 1, 1988, Ser. No. 226,634
Int. Cl.[4] H03K *5/00*; H04B *1/10*
U.S. Cl. 328—167 11 Claims



1. Circuitry for suppressing additive transient disturbances in an input data signal, comprising

a positive envelope detector and a negative envelope detector, both having the data signal as their inputs, and both having outputs containing an envelope component and a residue component;

means interconnecting said detectors for insuring that both envelope detectors respond rapidly to the onset of an additive disturbance;

first means for summing the envelope components;

nonlinear signal-adaptive filter means connected to the summed envelope output for reducing the residue component; and

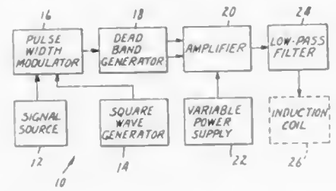
second means for summing or subtracting the output derived from said filter means with or from, respectively, the input data signal for producing an output signal free of the additive transient disturbance.

4,914,399

INDUCTION COIL DRIVER

Ziyad H. Doany, Austin, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 1, 1989, Ser. No. 317,820
Int. Cl.[4] H03F *3/38*
U.S. Cl. 330—10 18 Claims



1. An apparatus for amplifying an analog signal, comprising:

means for generating a pulse modulated signal having pulse widths which are a function of the analog signal;

means for creating first and second delay signals from said pulse modulated signal, each of said delay signals having pulses therein corresponding to pulses in said pulse modulated signal, the falling edge of each said pulse in said first delay signal being delayed, and the rising edge of each said pulse in said second delay signal being delayed, thereby creating a dead band between said first and second delay signals for each said pulse;

a first switch having an output responsive to said first delay signal;

a second switch having an output responsive to said second delay signal;

power supply means connected to said outputs of said first and second switches; and

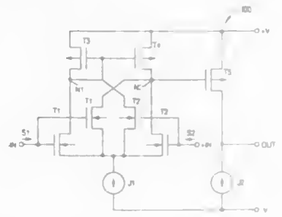
low-pass filter means connected to said outputs of said first and second switches.

4,914,400

DIFFERENTIAL AMPLIFIER CIRCUIT IMPROVED TO SHORTEN A CIRCUIT RECOVERY TIME THEREOF

Osamu Kobayashi, Yokohama, and Kunihiko Gotoh, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 77,299, Jul. 24, 1987, abandoned. This application Mar. 16, 1989, Ser. No. 325,032
Claims priority, application Japan, Jul. 24, 1986, 61-174657
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—252 11 Claims



10. A differential amplifier operatively connectable to receive first and second power supply voltages and to receive differential input signals, and for producing an output signal in response to receiving said differential input signals, said differential amplifier circuit comprising:

first input terminal means for receiving a first one of said differential input signals;

second input terminal means for receiving a second one of said differential input signals;

output terminal means for providing said output signal;

first transistor means of a first conductivity, having a first mutual conductance and having a control electrode operatively connected to said first input terminal means for controlling said first transistor means in accordance with receiving the first one of said differential input signals, said first transistor means having a first electrode operatively connected to receive said first power supply voltage, and having a second electrode;

second transistor means of the first conductivity, having a second mutual conductance and having a control electrode operatively connected to said second input terminal means for controlling said second transistor means in accordance with receiving the second one of said differential input signals, said second transistor means having a first electrode operatively connected to said output terminal means and having a second electrode operatively connected to the second electrode of said first transistor means;

a first load element operatively connectable to receive said first power supply voltage and operatively connected to the first electrode of said second transistor means;

third transistor means of the first conductivity, having a third mutual conductance less than said first mutual conductance, and having a control electrode operatively connected to the control electrode of said first transistor means for controlling said third transistor means in accordance with receiving the first one of said differential input signals, said third transistor means having a first electrode operatively connected to the first electrode of said second transistor means, and having a second electrode operatively connected to the second electrode of said first transistor means, said third transistor means continuously providing a current through said first load element;

fourth transistor means of a second conductivity opposite to the first conductivity of said first, second and third transistor means, having a control electrode connected to said output terminal means, for receiving, amplifying and providing a voltage of said output signal; and

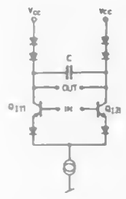
constant current source means, operatively connected to the second electrode of said first transistor means and operatively connectable to receive said second power supply voltage, for providing a constant current to said differential amplifier.

4,914,401

IMPLEMENTATION AND CONTROL OF FILTERS

Heinz B. Mäder, Brütten, Switzerland, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed May 17, 1988, Ser. No. 194,947
Claims priority, application Sweden, Jun. 18, 1987, 8702561
Int. Cl.[4] H03F *3/45*; H03B *5/24*
U.S. Cl. 330—261 15 Claims



1. An active filter comprising a first differential gain stage with a first differential input and a first differential output, said first differential gain stage including two amplification components, at least four diode components, a capacitive component connected in parallel with the differential output of said differential gain stage, and a current generator, said amplification components having substantially equal relationship between current and forward voltage drop, each amplification component having its control electrode connected in counterphase directly to the first differential input, so that the difference between the potentials on the control electrodes increases with increased voltage across the first differential input, said diode components each having substantially the same relationship between current and forward voltage drop as the amplification components, said diode components being series-connected in groups so that there are at least two series-connected diode components in each group, of which groups a first is connected to a first of the amplification components, while a second group is connected to a second of the amplification components, said second group including as many diode components as the first group, said first and second amplification components being coupled in counterphase directly to the first differential output, such that the magnitude of the voltage across the first differential output varies with the difference between the forward voltage drops across the first and the second amplification components, and wherein the first group and second group of diode components are connected in counterphase directly to the first differential output, said current generator being connected to one of the amplification components and the groups, such that for an unloaded first differential output the magnitude of the current through the first group substantially agrees with the magnitude of the current through the first amplification component, while the magnitude of the current through the second group substantially agrees with the magnitude of the current through the second amplification component.

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4,914,402

OPTO-ELECTRONIC TRANSIMPEDANCE AMPLIFIER

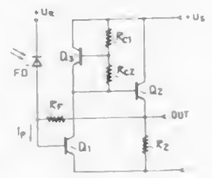
Stefanos Dermitzakis, Heilbronn-Neckargartach, and Jasbeer-Singh Suri, Heilbronn-Klingenberg, both of Fed. Rep. of Germany, assignors to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Feb. 6, 1989, Ser. No. 306,682

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1988, 3806283

Int. Cl.[4] H03F 3/08

U.S. Cl. 330—308 16 Claims



1. An opto-electronic transimpedance amplifier for the amplification of optical signals supplied by a photovoltaic cell, including: a transistor connected as an amplifier and having a load resistor and a signal input connected to a photovoltaic cell, with said load resistor of the amplifier transistor comprising a transistor and two series connected ohmic resistors whose series connection is connected in parallel with the emitter-to-collector path of the load resistor transistor and whose connection point is connected to the base of the load resistor transistor; and a third transistor provided as an output transistor of the transimpedance amplifier with said third transistor being controlled by the photovoltaic cell.

4,914,403

CESIUM OSCILLATOR

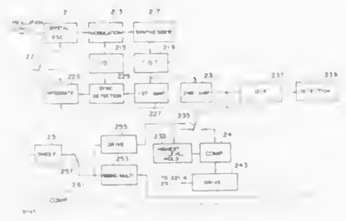
Yoshifumi Nakajima, Kawasaki; Kazuharu Chiba, Yokobama, and Hideo Sumiyoshi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 18, 1989, Ser. No. 381,457

Claims priority, application Japan, Jul. 19, 1988, 63-179614

Int. Cl.[4] H03L 7/26

U.S. Cl. 331—3 22 Claims



1. A cesium oscillator comprising:

a cesium beam tube;

oscillator means, coupled to said cesium beam tube, for generating an oscillation signal of a frequency, said cesium beam tube being supplied with said oscillation signal and thereby outputting a resonance signal;

sweep means, coupled to said oscillator means, for continuously varying the frequency of said oscillation signal, the frequency of said oscillation signal being continuously varied two times when the frequency of said oscillation signal is to be adjusted;

hold means, coupled to said cesium beam tube, for holding the highest signal level of said resonance signal supplied from said cesium beam tube when said sweep means continuously varies the frequency of said oscillation signal first; and

control means, coupled to said oscillator means, said sweep means and said hold means, for controlling said sweep means so as to stop continuously varying the frequency when the signal level of said resonance signal obtained by continuously varying the frequency of said oscillation signal by said sweep means for the second time, becomes equal to said highest signal level held by said hold means.

4,914,404

METHOD FOR SYNCHRONIZATION OF A SIGNAL FREQUENCY TO INTERFERENCE-PRONE REFERENCE SIGNAL FREQUENCIES

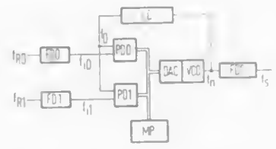
Wolfram Ernst, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 26, 1989, Ser. No. 358,978

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1988, 3826249

Int. Cl.[4] H03L 7/00

U.S. Cl. 331—11 5 Claims



1. A method for synchronizing a signal frequency generated by a signal frequency generator to an interference-prone reference signal frequency of one of several reference frequency signal generators that are available and are independent of each other and supply approximately the same frequency, using a digital phase control circuit which is controlled by a processing unit (MP) that supplies control values to the oscillator (VCO) of the phase control circuit, comprising the following steps:

(a) assigning each reference signal frequency (f_{R0}, f_{R1}) its own phase discriminator (PD0, PD1);

(b) determining for each phase discriminator the value of the phase relationship between the reference signal frequency and the signal frequency generated by the signal frequency generator and relaying it to the processing unit for storage;

(c) when there are sudden phase shifts exceeding a predetermined threshold value, the processing unit determines a control value which contains an offset value by means of which correction of these phase shifts is prevented; and

(d) when switching to a different reference signal frequency, the processing unit controls the setting at this reference signal frequency on the basis of the data supplied by the respective phase discriminator before switching, and this is done by means of appropriate correction of the control value in the sense that an accumulation of the phase deviation between the reference signal frequency and the signal frequency of the signal frequency generator is largely prevented.

4,914,405

FREQUENCY SYNTHESIZER

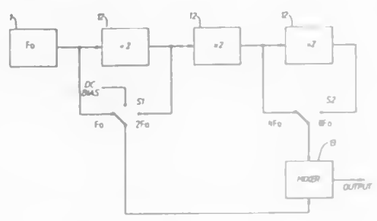
John N. Wells, St Albans, United Kingdom, assignor to Marconi Instruments Limited, St. Albans, United Kingdom

Filed Sep. 1, 1988, Ser. No. 239,567

Claims priority, application United Kingdom, Sep. 4, 1987, 8720794

Int. Cl.[4] H03L 7/00

U.S. Cl. 331—25 8 Claims



1. A frequency synthesizer comprising

an oscillator for generating a signal having a predetermined frequency;

means for multiplying said predetermined frequency by an integer value;

means for dividing said predetermined frequency by an integer value;

a phase locked loop for combining the outputs of said multiplying means and said dividing means, said phase-locked loop comprising a phase detector, a voltage controlled oscillator and a mixer, said voltage controlled oscillator being steered to a frequency substantially equal to the multiplied frequency ± the divided frequency, the output of said phase lock loop providing the output of said frequency synthesizer; and

phase detector switch means for selectively switching said phase detector into and out of said phase-locked loop.

4,914,406

VOLTAGE CONTROLLED OSCILLATOR FREE FROM FREE-RUN OSCILLATING FREQUENCY ADJUSTMENT

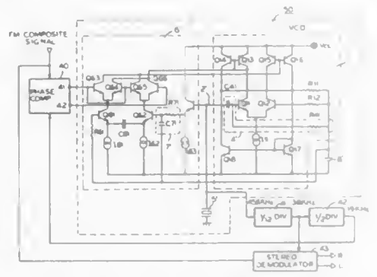
Fumikazu Ohkubo, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Apr. 19, 1989, Ser. No. 340,427

Claims priority, application Japan, Apr. 25, 1988, 63-103287

Int. Cl.[4] H03B 5/30

U.S. Cl. 331—116 R 6 Claims



1. A voltage controlled oscillator oscillating at a frequency which is variable by a control voltage, said oscillator comprising an amplifier having input and output terminals and a positive feedback circuit provided between the input and output terminals, a resonator coupled to the output terminal of said amplifier, circuit means supplied with said control voltage and having a controllable capacitance component which is controlled by said control voltage, a low-pass filter coupled to said circuit means in cascade to the output terminal of said amplifier.

4,914,407

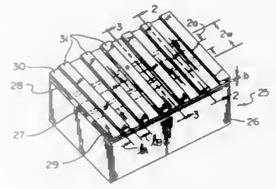
CROSSTIE OVERLAY SLOW-WAVE STRUCTURE AND COMPONENTS MADE THEREOF FOR MONOLITHIC INTEGRATED CIRCUITS AND OPTICAL MODULATORS

Tatsuo Itoh, Austin, Tex., assignor to Board of Regents, University of Texas System, Austin, Tex.

Filed Jun. 7, 1988, Ser. No. 203,330

Int. Cl.[4] H01P 1/18

U.S. Cl. 333—161 20 Claims



1. A periodic slow-wave transmission structure for miniature monolithic circuit elements operable at a microwave frequency, said transmission structure comprising, in combination, a substrate of semiconductor material having a planar upper surface, an elongated conductive metal strip deposited on the planar upper surface of said substrate, a layer of insulating material disposed over said strip and said substrate, and a plurality of spaced conductive strip portions disposed on said layer of insulating material and aligned over and transverse to said elongated conductive strip, adjacent ones of said conductive strip portions being offset by distances less than a free-space wavelength at said microwave frequency.

4,914,408

ASYMMETRIC POLYPHASE FILTER

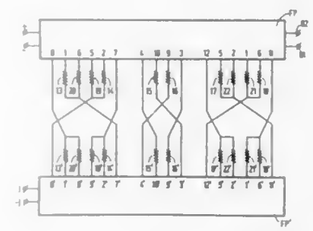
Johannes O. Voorman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 24, 1989, Ser. No. 342,417

Claims priority, application Netherlands, Jun. 2, 1988, 8801412

Int. Cl.[4] H03H 7/02, 11/04

U.S. Cl. 333—167 3 Claims



1. An asymmetric polyphase filter comprising first to fourth input terminals for applying thereto a 4-phase input signal comprising first to fourth signal vectors, respectively, which succeed one another in phase each time through 90°, first to fourth intercoupled identical filter sections, respectively, con-

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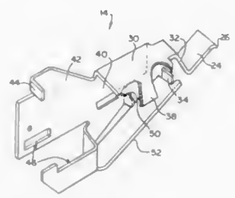
nected to said terminals, at least one of the odd and even filter sections being coupled to two output terminals, said filter sections having constant reactances, characterized in that the first and third filter sections and the second and fourth filter sections constitute a balanced in-phase and a balanced quadrature filter section circuit, respectively, in which the mutually corresponding reactances of the first and third filter sections and those of the second and fourth filter sections are constituted by active balanced integrators each having a balanced input terminal pair and output terminal pair with a balanced amplifier stage arranged therebetween, said output terminal pair being fed back to the input terminal pair via two mutually equal capacitances, couplings being provided between the output terminal pair of each of the integrators of the in-phase filter section circuit via two mutually equal resistors to the input terminal pair of the corresponding integrator of the quadrature filter section circuit, and conversely, which couplings are pairwise anti-reciprocal with respect to one another.

4,914,409

ELECTRIC CIRCUIT BREAKER

Vivian Cohen, Johannesburg, South Africa, assignor to Circuit Breaker Industries Limited, Elandsfontein

Filed Jul. 29, 1988, Ser. No. 226,475
Int. Cl.[4] H01H *75/10*
U.S. Cl. 335—41 13 Claims



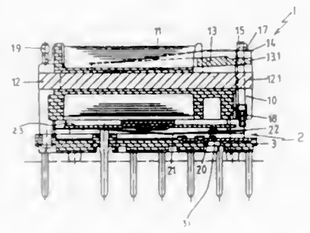
1. A mounting frame for components of a circuit breaker, formed from a single piece of an electrically conducting material and forming an elongate space in which a bi-metal element is receivable, said frame including:
- a supply connection region electrically connectable to supply cable;
- a bi-metal connecting region that is remote from the supply connection region for connection to said bi-metal element;
- a field generating portion that is electrically between the supply connection region and the bi-metal connecting region wherein said field generating portion extends substantially parallel to the space and the supply connection region is electrically connected to the field generating portion at an appropriate end thereof such that in use, current flows from the supply connection region, through the field generating portion, to the bi-metal connection region said current flow through the field generating portion and through the bi-metal element being in the same direction such that a magnetic field generated by current flow in the field generating portion enhances a magnetic field generated by current flow in the bimetal element.

4,914,410

RELAY FOR PRINTED CIRCUIT BOARD

Hans A. Diem, Richterswil, and Afro Cecchini, Au, both of Switzerland, assignors to Standard Telephon und Radio AG, Zurich, Switzerland

Filed Nov. 29, 1988, Ser. No. 277,200
Claims priority, application Switzerland, Nov. 30, 1987, 04650/87
Int. Cl.[4] H01H *51/22*
U.S. Cl. 335—80 5 Claims



1. A relay for printed circuit boards with dual-in-line terminal configuration comprising:
- a coil former,
- a magnet yoke having two parallel legs and attached to said coil former,
- two biased leaf spring attached to said coil former,
- a U-shaped armature having two parallel legs and movably mounted between said leaf springs and said yoke,
- a slider attached to said armature for transmitting armature motion to a plurality of contacts including four changeover contacts arranged side by side adjacent said coil former, wherein

the legs of the armature overlap the corresponding legs of the magnet yoke by at least half their length, a first end of each of said biased leaf springs is connected to a respective one of the two legs of the armature the other end of each of said leaf springs is connected to the coil former so that each of said leaf springs extends essentially parallel to said respective armature leg, and that the length of each leaf spring is at least equal to the length of the leg of the respective armature connected thereto.

4,914,411

ELECTRO-MAGNETIC RELAY

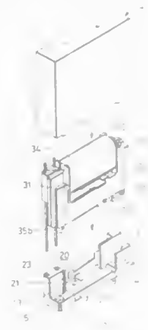
Hiroshi Hikita; Katsumi Shibata; Hideo Oishi, and Hiroshi Yoshikawa, all of Kanagawa, Japan, assignors to Fujl Electric Co., Ltd., Kanagawa, Japan

Filed Jan. 9, 1989, Ser. No. 295,704
Claims priority, application Japan, Jan. 26, 1988, 63-15144; Mar. 11, 1988, 63-57824
Int. Cl.[4] H01H *67/02*
U.S. Cl. 335—128 7 Claims

1. An electro-magnetic relay comprising:
- an insulating substrate being rectangularly shaped and having two end portions containing inserting holes;
- a gate-shaped iron core having first and second sides and formed of a flat plate shaped to include two leg portions and a middle portion positioned between said two leg portions, said two leg portions being received in said inserting holes of said insulating substrate;
- a winding bobbin having an exciting coil wound thereon, said winding bobbin including one end at which a coil terminal is located, said winding bobbin being relatively flat and substantially U-shaped and including a U-shaped groove said middle portion of said iron core being press-fitted into said U-shaped groove of said winding bobbin;
- a stationary leaf spring and a movable leaf spring fixedly secured to said insulating substrate and positioned at said

middle portion of said iron core and along one of said two sides of said iron core;

said stationary leaf spring including a confronting surface on which a stationary contact is located, said stationary contact being supported by a first contact stand, a first contact terminal extends perpendicular to said first contact stand, and said movable leaf spring including a confronting surface on which a movable contact is located and having a rear surface, said movable contact being supported by a second contact stand, a second contact terminal extends perpendicular to said second contact stand;



a flat plate-shaped armature arranged along said first side of said iron core located opposite said stationary leaf spring and said movable leaf spring so that said armature abuts said rear surface of said movable leaf spring through an insulating member and bridges said two leg portions of said iron core, said armature having a first end portion and a second end portion and a leg piece formed on said end portion for swingably supporting said armature, said leg piece of said armature being inserted into one of said inserting holes of said insulating substrate; and

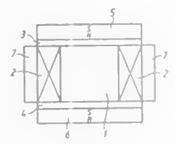
a casing fixedly engaged with said insulating substrate.

4,914,412

MAGNETIC CIRCUIT

Göran Engdahl, Täby, and Lars Kvarnsjö, Stockholm, both of Sweden, assignors to Asea Brown Boveri AB, Västerås, Sweden

Filed Apr. 24, 1989, Ser. No. 341,823
Claims priority, application Sweden, Jan. 16, 1989, 8900135
Int. Cl.[4] H01F *7/00*
U.S. Cl. 335—215 3 Claims



1. A magnetic circuit for magnetization of cylindrically shaped magnetic materials (1) in the axial direction, said magnetic circuit comprising a magnetizing coil (2), permanent magnets (5, 6) for magnetization of the magnetic material, and magnetic return conductors (3, 7) of a ferromagnetic material with low losses,

said magnetizing coil is arranged to surround the cylindrically shaped magnetic material and to have the same axial extension, at this,

a cylindrical circular ring (7) of a ferromagnetic material with low losses is arranged to surround the magnetizing coil and to have the same axial extension as the cylindrically shaped magnetic material and the coil,

against the two parallel and plane surfaces of the circle formed by the cylindrically shaped material and the end surfaces of the magnetizing coil, there are arranged circular discs of a ferromagnetic material with low losses and with the same diameter as the outer diameter of the magnetizing coil, and wherein

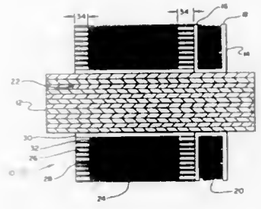
against each of said discs there are arranged permanent magnets shaped discs and having the same diameter as the outer diameter of the magnetizing coil.

4,914,413

TRANSFORMER WITH LAYER-WOUND AND RANDOM WOUND WINDINGS

Roger A. McGrath, Huntington, Ind., assignor to MagneTek, Inc., Los Angeles, Calif.

Filed Aug. 24, 1989, Ser. No. 398,232
Int. Cl.[4] H01F *15/14, 27/28*
U.S. Cl. 336—70 9 Claims



1. An unproved transformer for withstanding and decoupling high voltage input impulses comprising:
- (a) a laminated iron core;
- (b) a random-wound, secondary coil carried by a bobbin on said core;
- (c) a layer-wound primary coil mounted in spaced adjacent relationship to said secondary coil on said core; and
- (d) electrical insulation means interposed between successive layers of windings in said primary coil for reducing stresses imposed by high voltage impulses imposed on said primary coil

and wherein said impulses are decoupled from said secondary by said spaced adjacent relationship between said primary and secondary coils.

4,914,414

THERMALLY RESPONSIVE SWITCH

Susumu Ubukata, Kabushiki Kaisha Ubukata Seisakusho, 4-30, Hosei-cho, Minami-ku, Nagoya-shi, Aichi-ken, and Yasukazu Mizutani, Nagoya, both of Japan, assignors to Susumu Ubukata, Nagoya, Japan

Filed Aug. 3, 1989, Ser. No. 388,855
Int. Cl.[4] H01H *37/12, 61/08*
U.S. Cl. 337—368 4 Claims

1. A thermally responsive switch comprising:
- (a) first and second metallic members serving as two electrical terminals electrically insulated from each other;
- (b) a fixed contact secured to the first metallic member;
- (c) a support arm electrically conductively secured at one end thereof to the second metallic member;
- (d) a thermally responsive element mounted on the other end of the second metallic member in cantilever relation, the thermally responsive element having a free end on which a movable contact is carried and a dish-shaped portion

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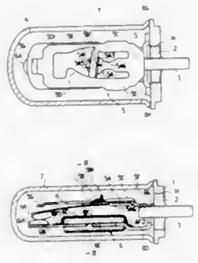
formed in a suitable portion thereof for a snap-acting reversing operation;

(e) first and second metallic beam members held on a suitable stationary member with the support arm interposed therebetween; and

(f) a calibration strip substantially integral with the first beam member to be extended therefrom and having a portion where the same is bendable, the calibration strip being interposed between the support arm and the second



beam member into a wedge structure so that the calibration strip is slidably adjacent to one side of the support arm and so that the free end thereof is slidably engaged with the second beam member, whereby the support arm undergoes the bending deformation, the amount of which deformation corresponds to that of the bending deformation of the calibration strip with slidable movement, such that the contact pressure between the movable and fixed contacts are set.

4,914,415

DRIVING ELEMENT WITH A THIN PART, DEFORMABLE IN THE DIRECTION OF ITS THICKNESS

Jean C. Cambien, 19, Rivoire de la Dame, F-38660 Sassenage, France

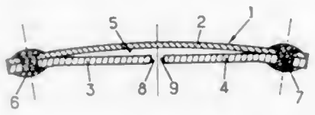
PCT No. PCT/FR88/00110, § 371 Date Oct. 26, 1988, § 102(e) Date Oct. 26, 1988, PCT Pub. No. WO88/06799, PCT Pub. Date Sep. 7, 1988

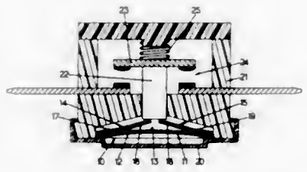
PCT Filed Feb. 26, 1988, Ser. No. 315,376

Claims priority, application France, Feb. 27, 1987, 87 02685

Int. Cl.[4] H01H *37/52, 35/40*

U.S. Cl. 337—379 12 Claims





1. Driving element comprising:

a thin part having an area deformable along an axis in the direction of its thickness between at least two positions in at least one of which said area is arcuate,

at least one tab extending along one surface of said deformable area towards a central part of said area and having an inner and outer end and

said thin part being a disk,

said tab extending radially to said disk and having its outer end part fixed on an outer part of one surface of said disk and its inner end free and spaced from said one surface of said central part of said area of said disk,

a peripheral edge of said disk and said free end of said tab bearing, respectively, against a support and a member to be actuated so as to act parallel to said axis of deformation of said disk

whereby, when said disk is deformed in the direction of its thickness, the resulting amplitude of movement of said support and said member from each other imparting by the free end of said tab, is greater than the amplitude of the movement of said central part if said area of said disk.

4,914,416

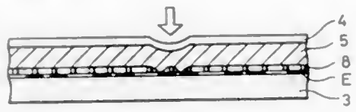
PRESSURE SENSING ELECTRIC CONDUCTOR AND ITS MANUFACTURING METHOD

Takahiro Kunikane, 2335 Komuro, Inamachi, Saitama-ken, Japan

Filed Aug. 10, 1988, Ser. No. 230,590

Int. Cl.[4] H01C *10/10*

U.S. Cl. 338—114 16 Claims



1. A pressure-sensing electrical conductor comprising:

an elastic electrically conductive layer, having

a flexible resin insulating layer, said layer having a form of a net with a plurality of holes,

said insulating layer being overlaid on said elastic conductive layer.

4,914,417

VARIABLE RESISTOR

Kenji Matsui; Fumitoshi Masuda, and Yukinori Ueda, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Dec. 9, 1988, Ser. No. 281,711

Claims priority, application Japan, Dec. 10, 1987, 62-313060

Int. Cl.[4] H01C *10/34*

U.S. Cl. 338—174 10 Claims

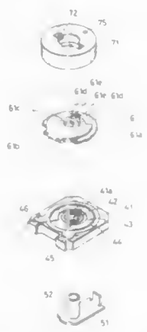
1. A variable resistor whose resistance is adjustable through a rotating operation, comprising;

an insulating substrate including an arcuate resistive element,

external electrodes formed on said insulating substrate, each connected to an end of said resistive element and each comprising a lower layer formed of a material appropriate to plate, an intermediate layer for plating the lower layer with another material which improves its abrasion-resistance against solder and an upper layer for plating the intermediate layer with still another material which has excellent solderability.

a rotor formed of an insulating material and rotatably mounted on said insulating substrate, wherein a bottom surface facing said insulating substrate has a sealing means for sealing a space accommodating said resistive element, and

a metallic slider integrated with said rotor by insert molding, wherein said slider has a base embedded in said rotor and arms extending from the base, wherein the base comprises at least two layers of metal plate, one of which closes an upper opening of said space accommodating said resistive element, wherein the arms are projected toward said



insulating substrate in said space, and wherein contacts at the tips of the arms are in contact with said resistive element.

4,914,418

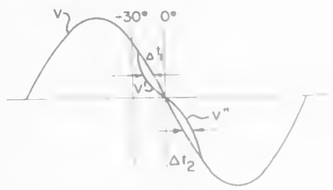
OUTBOUND DETECTOR SYSTEM AND METHOD

Sioe T. Mak, Chesterfield; David S. Takach, Brentwood, both of Mo., and Ray C. Hatton, Jr., Columbus, Ind., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 3, 1989, Ser. No. 293,181

Int. Cl.[4] H04M *11/04;* H04J *1/12*

U.S. Cl. 340—310 A 30 Claims



1. Apparatus for detecting outbound signals carried by cyclic waveforms over an electric power distribution network comprising:

means for rectifying cyclic waveforms transmitted from a central site over an electric power distribution network to create a rectified cyclic waveform of successive half cycles;

means for sampling the rectified waveform to obtain sample waveform values, said sampling occurring in three segments of each cycle of said waveform, a first segment being a region of the cycle in which valid signals are always absent, a second segment being a region of the cycle in which valid signals appear, and a third segment distinct from the second segment being a region in which valid signals appear; and

means for detecting the presence of outbound signal information as a function of the sample waveform values in the three segments.

4,914,419

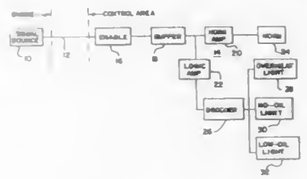
SINGLE-WIRE ENGINE INDICATOR DEVICE

Richard J. Bragenzer, Kenosha, Wis., and Donald H. Wood, Gurnee, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 1, 1988, Ser. No. 201,085

Int. Cl.[4] B60Q *1/00*

U.S. Cl. 340—459 21 Claims



1. Apparatus for use in alerting an operator of an internal combustion engine, such as a marine engine of a boat, of operating conditions of the engine, wherein the operator is normally positioned at a location remote from the engine, comprising:

means for sensing at least two operating conditions of the engine and for providing a unique output signal for each of said sensed operating conditions, each of the unique output signals for each operating condition having a predetermined duty cycle different from the others and therefore being capable of distinguishing each operating condition from the others;

means for identifying each of said unique output signals that are applied thereto;

a single electrically conducting wire interconnecting said sensing means and said identifying means;

means connected to said identifying means for producing an alerting indication in response to said identifying means, said alerting indication providing information that identifies the status of at least one of the operating conditions.

4,914,420

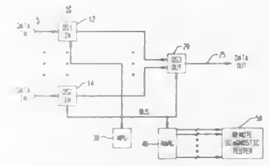
TELECOMMUNICATION SYSTEM INCLUDING A REMOTE ALARM REPORTING UNIT

Salim M. Khan, St. Joseph, Ill., assignor to Siemens Transmission Systems, Inc., Tempe, Ariz.

Filed Mar. 3, 1988, Ser. No. 163,907

Int. Cl.[4] G08B *29/00*

U.S. Cl. 340—516 14 Claims



1 A telecommunication system, comprising:

a plurality of functional units, each producing a status signal;

a maintenance processor, coupled to said functional units, for receiving said status signals and producing signals representative of said status signals wherein said processor transmits said status representative signals as successive signals over a bus; and

a remote alarm reporting unit, coupled to said processor, for generating optically isolated alarm signals corresponding to said status representative signals, comprising:

a bus interface circuit, coupled to said bus, for extracting said status representative signals;

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a plurality of optical couplers for producing said alarm signals; and

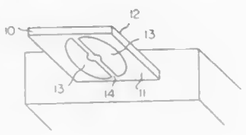
means, coupled between said bus interface circuit and said optical couplers, for controlling a selected one of said optical couplers in response to the value of a corresponding one of said successive status representative signals.

4,914,421

DETECTOR FOR DISC RECORDS

Stéphane M. A. d'Alayer de Cosmemore d'Arc, Genappe, and Christiaan G. M. H. G. Van Damme, Leuven, both of Belgium, assignors to Staar S.A., Belgium

Filed Feb. 10, 1989, Ser. No. 308,541
Int. Cl.[4] G08B *13/14*
U.S. Cl. 340—568 35 Claims



28. A detector for detecting the presence of a record having a metallic layer comprising:

a support for supporting a record having a metallic layer;

at least one metal plate disposed on said support forming part of a variable capacitance capacitor, the metallic layer of a record forming a another part of the capacitor when a record is present;

an oscillator that produces an electrical signal that varies with the capacitance of said capacitor; and

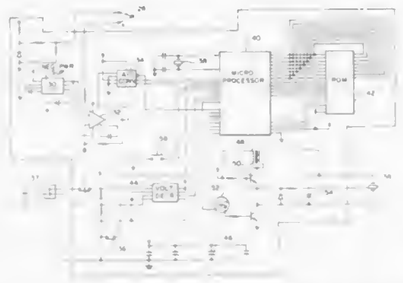
a circuit for detecting changes in said signal to indicate the presence of a record having a metallic layer proximate said support.

4,914,422

TEMPERATURE AND MOTION SENSOR

Daniel Rosenfield, 1646 Westwind Way, McLean, Va. 22102, and Michael Rosenfield, 9414 Menton Rd., Chardon, Ohio 44024

Filed Sep. 14, 1989, Ser. No. 407,095
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—573 9 Claims



1. A safety system in the form of a temperature and motion sensor comprising:

(a) a temperature resistant housing adapted for mounting on personal safety harness;

(b) an on/off switch rotatably affixed to an end of said housing; and

(c) an activating circuit supported within the housing, including;

(i) a positive power supply activated by said on/off switch and a negative power supply;

(ii) a thermocouple heat sensor extending from said circuit to the exterior of said housing;

(iii) an operational amplifier interposed between said thermocouple heat sensor and said negative power supply;

(iv) an analogue-to-digital convertor adjacent said operational amplifier within said circuit;

(v) a processor of digital information, including a time base operably connected to said convertor;

(vi) a read only memory operationally connected to said processor;

(d) a signalling circuit connected to said processor and including a switching transistor and signal horn to signal temperature changes; and

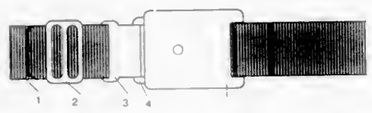
(e) a motion detector operationally connected to said processor so as to signal by activating said signal horn in the event of non-movement.

4,914,423

POSTURE IMPROVING DEVICE

Luis C. Fernandez, 131 Deerfield Dr., Tenafly, N.J. 07670

Filed Jan. 25, 1989, Ser. No. 301,246
Int. Cl.[4] G08B *23/00;* A61B *5/10*
U.S. Cl. 340—573 11 Claims



11. An alarm device to indicate expansion of the wearer's waist and used in conjunction with a belt, said alarm device comprising:

(a) a hollow housing;

(b) a member with at least four sides nestled in the said housing, said housing having one or more channels extending from within the housing into the outside of the housing to accommodate sliding of the said member;

(c) an alarm;

(d) a leaf spring with said housing for pulling said member into the said housing; and

(e) an electrical circuit means for coupling electrical power to said alarm when said member pulls said leaf spring outward to a predetermined position, said electrical circuit means comprising said leaf spring and two conductive wires held in place in the housing and spaced from and in registry with each other via the leaf spring such that when the leaf spring reaches the predetermined position it completes the circuit created by the two conductors.

4,914,424

OXYGEN CONCENTRATION MONITOR USING GALVANIC CELL TYPE OXYGEN SENSOR

Atsushi Hirao, and Yasufumi Fukao, both of Kyoto, Japan, assignors to Japan Storage Battery Company, Limited, Kyoto, Japan

Filed Mar. 2, 1988, Ser. No. 163,334
Claims priority, application Japan, Mar. 2, 1987, 62-48492; Mar. 2, 1987, 62-48493; Mar. 2, 1987, 62-48494; Mar. 2, 1987, 62-48495
Int. Cl.[4] G08B *17/10*
U.S. Cl. 340—632 6 Claims

1. An oxygen concentration monitor comprising:

a Galvanic cell type oxygen sensor;

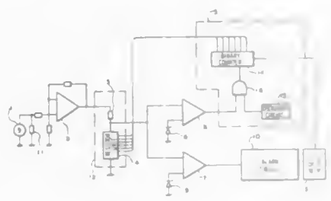
an operational amplifier for amplifying an output voltage of said Galvanic cell type oxygen sensor;

an attenuator comprising resistors and switches connected to each other for attenuating an output signal from said operational amplifier;

a switch control circuit for controlling the operation of said switches by outputting a binary code;

a first comparator for comparing an output signal from said attenuator with a first reference voltage and for determining whether or not said binary code from said switch control circuit is to be sequentially changed, said binary code being changed when said output signal from said attenuator is at a first value with respect to said first reference voltage; and,

a second comparator for comparing said output signal from said attenuator with a second reference voltage and for



activating an alarm when said output signal from said attenuator is at a second value with respect to said second reference voltage,

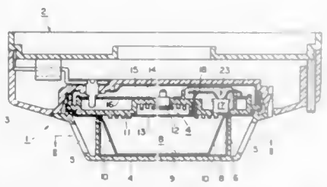
wherein the maximum output of said Galvanic cell type oxygen sensor is determined by said switch control circuit and said attenuator, and calibration is automatically conducted such that said maximum output of said Galvanic cell type oxygen sensor corresponds to an oxygen concentration of 21%, and when an oxygen concentration, corresponding to said output signal from said attenuator, becomes lower than a predetermined value, corresponding to said second reference voltage, said alarm is activated.

4,914,425

HIGHLY SENSITIVE SMOKE DETECTOR

Yoshinori Kaminaka, Sagamihara; Hiroshi Yashima, Shibata; Satoru Koizumi, Hachioji; Tetsuya Nagashima, Tokyo; Yoshihito Hirai, Odawara, and Tetsuji Sato, Sagamihara, all of Japan, assignors to Hochiki Corporation, Tokyo, Japan

Filed Dec. 16, 1988, Ser. No. 285,802
Claims priority, application Japan, Dec. 26, 1987, 62-198632
Int. Cl.[4] G08B *17/10*
U.S. Cl. 340—693 4 Claims



1. An ionization smoke detector comprising a detector body with an inner electrode mounted therein and an outer electrode, said outer electrode having a cup-like shape, a side wall of said outer electrode being provided with a plurality of smoke inlets surrounding said inner electrode, and an outer cover having a side wall with a plurality of smoke inlets surrounding said outer electrode, said smoke detector further comprising

a cylindrical partition wall having a plurality of smoke inlets provided between said outer cover and said outer electrode to form a triple wall structure,

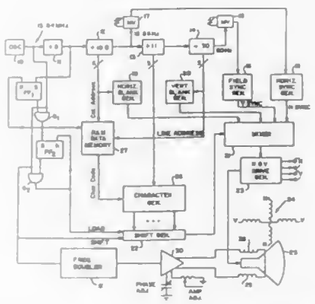
said smoke inlets of the outer cover, partition wall and outer electrode being staggered from each other.

4,914,426

SINUSOIDALLY MODULATED DOT-MATRIX DATA DISPLAY SYSTEM

Jonathan M. Schine, Los Angeles, Calif., assignor to High Resolution Sciences, Inc., Los Angeles, Calif.

Filed Aug. 4, 1987, Ser. No. 81,654
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—736 4 Claims



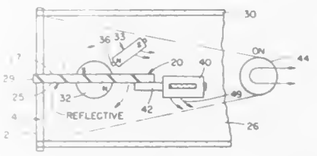
1. A method of enhancing the dot matrix display of data on a system using a cathode ray tube for display, wherein the data display is formed by dots in a dot matrix, comprising the steps of producing a train of binary digits defining the data to be displayed as a matrix of dots with a maximum of one dot display in each dot space of the matrix consisting or horizontal rows and vertical columns of dot space positions, and sinusoidally modulating the cathode ray tube beam in a vertical direction as it scans horizontally for display of rows of dots in a raster with a frequency of sinusoidal modulation that provides two cycles of sinusoidal modulation per dot space, wherein only one dot is to be displayed, thereby to more fully fill the dot space of each dot displayed in a vertical dimension relative to the center line of the raster scan without affecting the horizontal dimension of a dot displayed.

4,914,427

MATRIX DISPLAY SYSTEM AND METHOD

Edmund G. Trunk, East Meadow, N.Y., assignor to The Staver Company Inc., Bay Shore, N.Y.

Filed Nov. 3, 1988, Ser. No. 266,938
Int. Cl.[4] G09F *9/37, 13/34*
U.S. Cl. 340—764 8 Claims



1. A matrix display system for graphic characters comprising:

a vertical panel having a multiplicity of openings arranged in a closely spaced array to visibly display a graphic character at each of said openings;

a multiplicity of display disks each having a light reflective display side, and a non-reflective opposite side to provide a light blocking background for one of said characters;

pivot means rotatably mounting said disks at said openings respectively;

first electromagnetic means adjacent said openings and be-

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hind said panel, and arranged to turn all of said disks simultaneously to an upright non-reflective forward facing first position, and further arranged to turn selected ones of said disks through paths of approximately 180° to an upright reflective forward facing second postion for displaying said characters by reflected light;

second electromagnetic means adjacent each of said disks, each of said second electromagnetic means having a stop member extensible electromagnetically into said path of the respective disk to limit turning thereof to a midway 90° horizontal position, at midway points in said paths, where said openings are substantially cleared by said disks, said stop members being retractable from said paths; and

light sources disposed behind said panel, each of said light sources being aligned with one of said openings for transmitting light from said light sources through said cleared openings; whereby all of said cleared openings collectively define a graphic pattern rendered visible by said light transmitted from said light sources through said cleared openings when selected ones of said first electromagnetic means are energized to turn said selected ones of said disks in said paths to said midway positions, and whereby all others of said disks remain in said first upright position to provide a nonreflective and non-transmissive light blocking background for said visible pattern.

4,914,428

DIGITAL REMOTE CONTROL TRANSMISSION APPARATUS

Hiroshi Kobayashi; Shinji Suda; Hongo Katsunobu; Daisuke Shichinohe, and Masako Hiroma, all of Itami, Japan, assignors to Mitsubishi Denki Kaushiki, Tokyo, Japan

Filed May 28, 1987, Ser. No. 55,129

Claims priority, application Japan, May 30, 1986, 61-125997; Jul. 7, 1986, 61-159197; Jul. 15, 1986, 61-167687

Int. Cl.⁴ H04Q *9/00*

U.S. Cl. 340—825.620 2 Claims

1. A digital remote control apparatus for transmitting digital instruction signals to a controllable apparatus for controlling the operation thereof, comprising:

transmitting means for transmitting a coded digital instruction signal to said controllable apparatus, including,

means for developing a synchronizaton pulse train having a predetermined period, and

means for developing data pulses each inserted between successive synchronization pulses of said synchronization pulse train at predetermined positions dependent upon whether said data pulse represents a "0" bit or a "1" bit;

said coded digital instruction signal including a custom code for distinguishing a specific apparatus to be controlled and an instruction code for designating a specific operation to be performed, said custom code and instruction code being separated in said synchronization pulse train by a separation code, wherein said separation code comprises a period between successive synchronization pulses containing at least two data pulses.

4,914,429

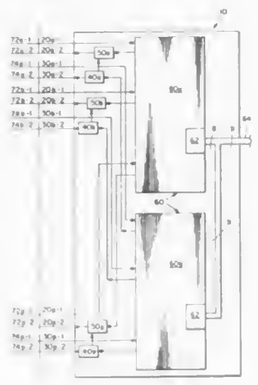
SWITCH COMPONENTS AND MULTIPLE DATA RATE NON-BLOCKING SWITCH NETWORK UTILIZING THE SAME

Daniel C. Upp, Southbury, Conn., assignor to Transwitch Corp., Shelton, Conn.

Filed Dec. 9, 1988, Ser. No. 283,173

Int. Cl.⁴ H04Q *3/42*

U.S. Cl. 340—825.800 19 Claims



1. A switching component comprising:

(a) a plurality of data ports, with a first plurality of said data ports designated data inlet ports and a second plurality of said data ports designated data outlet ports;

(b) a plurality of clock ports associated with the plurality of data ports, with a first plurality of said clock ports designated clock inlet ports and a second plurality of said clock ports designated clock outlet ports;

(c) connection means for coupling any of said inlet data ports to any of said outlet data ports and for associatingly coupling a clock inlet port to a respective clock outlet port;

(d) a plurality of clock regeneration means associated with said plurality of clock outlet ports, each clock regeneration means for obtaining a clock signal exiting said connection means and for regenerating said clock signal to provide a regenerated clock signal to an associated clock outlet port; and

(e) a plurality of timing means associated with said plurality of clock regeneration means, each timing means for causing data exiting said connection means to be clocked out of said switching component in conjunction with said regenerated clock signal according to said regenerated clock signal.

4,914,430

REARRANGEABLE MULTICONNECTION SWITCHING NETWORKS CONSTRUCTED USING COMBINATORIAL DESIGNS

Frank K. Hwang, Warren, N.J., and Gaylord W. Richards, Naperville, Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 946,431, Dec. 23, 1986, Pat. No. 4,887,079. This application Jul. 19, 1989, Ser. No. 382,508

Int. Cl.⁴ H04Q *1/00, 3/00*

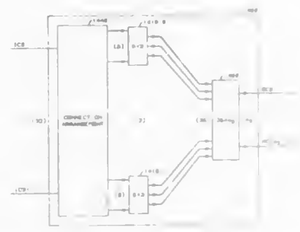
U.S. Cl. 340—825.79 14 Claims

1. A switching network for selectively connecting N_1 input channels to n_2 output channels such that none of said n_2 output channel is connected to more than one of said N_1 input channels at any time, N_1 and n_2 being positive integers each greater than one, n_2 being at most equal to N_1, said switching network comprising

v first stage switches each having at most r inlets and at least one outlet and each comprising means for selectively connecting any one of the inlets of said each first stage switch to the at least one outlet of said each first stage switch, v being a positive integer greater than one and at least equal to n_2, r being a positive integer greater than one,

a second stage switch having n_2 outlets each connected to a different one of said output channels and having a plurality of inlets each associated with a different one of said first stage switches and each being connected to the at least one outlet of the associated first stage switch, said second stage switch comprising means for selectively connecting said outlets of said second stage switch to said inlets of said second stage switch and

connection means for connecting each of said inlets of said



first stage switches to only an associated predetermined one of said input channels in accordance with a $M \times N^2$ connection matrix, where said first stage switches have unique switch designations $d_0, d_1, \ldots d_{v-1}$, where for integer $i, 0 \leqq i \leqq M-1$, the elements of row i of said matrix are obtained by adding iN to corresponding elements of an orthogonal array of order N and depth M, said array having symbols $0, 1, \ldots N-1$, where each column of said matrix is associated with at most w of said input channels, and having each element e of a given column of said matrix define that the input channels associated with said given column are connected to the one of said first stage switches having the switch designation d_e, where M, N and w are positive integers each greater than one, where wN^2 is at least equal to N_1, where MN is at least equal to v, and where wN is equal to r.

4,914,431

ELECTRONIC CONTROL SYSTEM FOR MODEL RAILROADS

Frederick E. Severson, 945 SW. Perfecta Ave., Beaverton, Oreg. 97005, and Patrick A. Quinn, 20195 SW. Imperial Dr., Aloha, Oreg. 97006

Continuation-in-part of Ser. No. 672,397, Nov. 16, 1984, abandoned. This application Apr. 13, 1987, Ser. No. 37,721

Int. Cl.⁴ H04Q *1/00*

U.S. Cl. 340—825.690 30 Claims

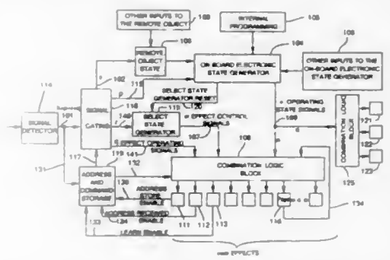
1. An electronic control system for selecting and controlling effects associated with a remote object on a model railroad layout comprising:

means for generating a plurality of predetermined state control signals;

a state generator in the remote object for generating a plurality, n, of operating state signals wherein one operating state signal at a time is generated in response to said state control signals to select one of a predetermined number of effects groups;

means in the remote object for generating a plurality, m, of effect control signals; and

means in the remote object responsive to predetermined combinations of said n operating state signals and said m effect control signals, where m and n are both greater than



one, for selecting and controlling effects among the selected effects group.

4,914,432

APPARATUS FOR LOCATING A MEMBER IN A BOREHOLE

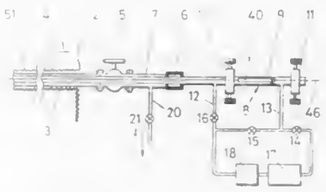
Alan Meadows, Stretton, England, assignor to Coal Industry (Patents) Limited, London, England

Division of Ser. No. 281,857, Dec. 9, 1988, Pat. No. 4,879,695. This application Jul. 7, 1989, Ser. No. 376,584

Claims priority, application United Kingdom, Jan. 28, 1988, 8801881

Int. Cl.⁴ G01V *1/00*

U.S. Cl. 340—853 29 Claims



18. Borehole apparatus comprising a tubular open ended casing arranged in use to extend partially into a borehole, a breech assembly adapted for connection to a part of the said casing extending from the borehole; rope means; anchor means connected to one end of said rope means; a member adapted for connection to the rope means upstream of the anchor means; signal cable means; the signal cable means being connected to conduct signals between the member and a location remote from the member, and valve means in the breech assembly arranged to control the passage of the anchor means and the member into the casing.

4,914,433

CONDUCTOR SYSTEM FOR WELL BORE DATA TRANSMISSION

Edward M. Galle, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Apr. 19, 1988, Ser. No. 183,572

The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.

Int. Cl.⁴ G01V *1/00*

U.S. Cl. 340—854 9 Claims

1. An improved electrical transmission system for use in a fluid filled well bore, comprising in combination:

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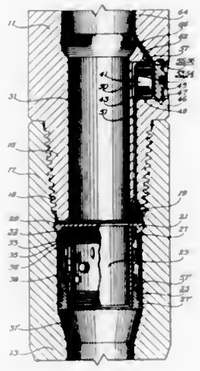
a tubular member with threaded ends for connection in a drill string in a wellbore, having a transmitting end adapted for transmitting data signals, and a receiving end adapted for receiving data signals;
a partition releasably carried by said transmitting end of said tubular member for mating with said tubular member;
a compartment bounded in part by said partition and in part by said tubular member;
a transmitter disposed in said compartment of said tubular member;
seal means for sealing said compartment where said partition



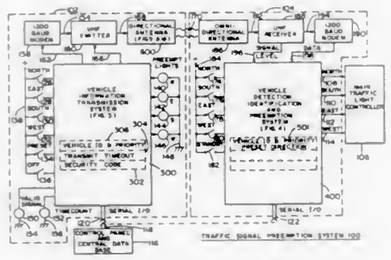
mates with said tubular member to protect said transmitter from said fluid in said well bore;
a flexible planar conductor having at least one substantially planar conductive band covered by electrically insulating material, said flexible planar conductor extending between said receiving end of said tubular member and said transmitting end of said tubular member, passing between said tubular member and said seal means into said compartment, and electrically coupling said receiving end of said tubular member with said transmitter, wherein said seal means is not disturbed and said transmitter is protected from said fluid in said well bore.

4,914,434

TRAFFIC SIGNAL PREEMPTION SYSTEM

Rodney K. Morgan, P.O. Box 94, Belle Rive, Jefferson County, Ill. 62810, and Bradley K. Cross, P.O. Box 152, McLeansboro, Hamilton County, Ill. 62859

Filed Jun. 13, 1988, Ser. No. 206,172
Int. Cl.[4] G08G *1/07*
U.S. Cl. 340—906 28 Claims



22. A traffic signal preemption system for enabling emergency vehicles to cause a traffic light controller at an intersection to preempt traffic signals at the intersection, said system comprising:
a vehicle information transmission system installed in said emergency vehicle and including directional transmission means actuatable by the vehicle's occupants for generating information identifying said emergency vehicle and for repeatedly transmitting said information as a vehicle identification signal in the direction of vehicular motion, said directional transmission means including a transmitting antenna mounted upon said vehicle and transmitting radio signals beamed sufficiently in the direction of travel of said vehicle to minimize the likelihood of causing a preemption of an intersection to the side or rear of the vehicle;
a vehicle detection, identification, and preemption system connecting to said traffic light controller, said detection, identification, and preemption system including
radio signal receiving means for receiving vehicle identification signals from one or more of said transmission systems and for extracting information identifying the emergency vehicle therefrom, said radio receiving means including gain control means for producing a signal level signal indicative of the strength of said vehicle identification signals, and
processing means for determining, based upon said received vehicle identification signals, said signal level signal, and preprogrammed preemption criteria including the identity of the vehicles, when and for how long to preempt an intersection.

4,914,435

PEDESTRIAN TRAFFIC SIGNAL

Samuel Gould, San Pedro, and James S. Gould, Los Alamitos, both of Calif., assignors to Indicator Controls Corporation, Gardena, Calif.

Continuation of Ser. No. 653,355, Sep. 24, 1984, abandoned. This application May 12, 1986, Ser. No. 861,828
Int. Cl.[4] G08G *1/095*
U.S. Cl. 340—144 5 Claims

1. A pedestrian traffic signal unit to be mounted in a rectangular case, which includes a rectangular housing adapted to be fitted into said case, said housing having an open front and having a partition therein separating the housing into first and second compartments, each of said first and second compartments having a reflective rear wall with a parabolic configuration in both horizontal and vertical planes; a first tubular lamp mounted on said housing and extending across said first compartment and configured to extend outwardly at the focal point of the reflective rear wall of said first compartment so that when energized all of its light is directed outwardly through the portion of the open front of the housing facing said first compartment, and when de-energized any light entering through said portion of the open front of the housing is reflected to the focal point; a second tubular lamp mounted on said housing and extending across said second compartment and configured to extend outwardly at the focal point of the

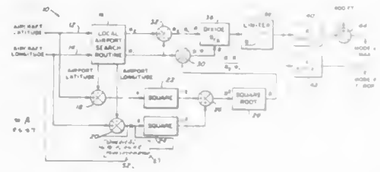
reflective rear wall of said second compartment so that when energized all of its light is directed outwardly through the portion of the open front of the housing facing said second compartment, and when de-energized any light entering through said last-mentioned portion of the open front is reflected to the last-named focal point; and a face plate covering the open front of the housing and bearing first indicia to be illuminated by the tubular lamp in the first compartment, and bearing second indicia to be illuminated by the tubular lamp in the second compartment.

4,914,436

GROUND PROXIMITY APPROACH WARNING SYSTEM WITHOUT LANDING FLAP INPUT

Charles D. Bateman, Bellevue, and Michael M. Grove, Snohomish, both of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Apr. 6, 1987, Ser. No. 35,112
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—970 5 Claims



1. A system for use in an aircraft for providing an enabling envelope for a ground proximity warning system for an aircraft comprising:
a first source of signals representative of the longitude and latitude of an airport;
a second source of signals representative of the current longitude and latitude of said aircraft;
means responsive to said first source of signals representative of the longitude and latitude of said airport and said second source of signals representative of the current longitude and latitude of said aircraft for computing the distance of said aircraft from said airport and providing an enabling envelope for enabling the warning system as a function of said distance of the aircraft with respect to said airport;
a source of signals representative of the relative angular position of a particular runway with respect to the heading of the aircraft; and
means responsive to said first and second sources of signals for providing a signal representative of the alignment of the aircraft with the runway by determining the angle between the runway and the heading of the aircraft.

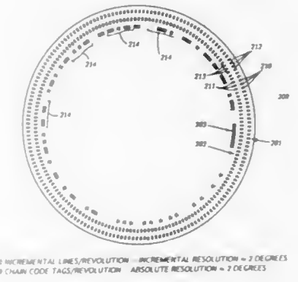
4,914,437

ENCODER FOR MEASURING BOTH INCREMENTAL AND ABSOLUTE POSITIONS OF MOVING ELEMENTS

Robert I. Kibrick, Santa Cruz, and Calvin R. Delaney, Aptos, both of Calif., assignors to Regents of the University of California, Alameda, Calif.

Continuation-in-part of Ser. No. 938,164, Dec. 4, 1986. This application Mar. 8, 1988, Ser. No. 165,714
The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.
Int. Cl.[4] H03M *1/22*
U.S. Cl. 341—3 100 Claims

1. An encoding system for determining the absolute and the incremental positions of a movable member relative to a stationary member, including in combination:
an encoding band supported by one said member and having a timing and incremental encoding track comprising at least one series of alternating activating stripes and non-activating stripes, and
a single data track comprising a series of absolute position tags disposed at regular intervals along said data track, each said tag being distinctly different from every other said tag and each comprising a serial bit stream for encoding the absolute position corresponding to the location of its tag along said data track,
reading means supported by the other said member and having three non-sweeping sensing means, two in quadrature with each other for said timing and incremental en-



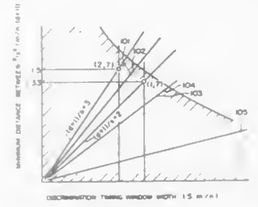
coding track, and one for said data track, each said sensing means having a single energy-source-energy-sensor pair including means for generating an analog signal voltage,
said movable members being capable of both discrete and continuous motion in both directions, and
decoding means actuated by said analog signal voltages for determining the incremental and absolute positions of said movable member relative to said stationary member,
whereby said absolute and incremental positions can be determined solely from said system without dependence on any additional information external to said system.

4,914,438

DIGITAL INFORMATION CODING SYSTEM

Tadahiko Kameyama, Odawara, Japan, assignor to Hitachi, Ltd., Chiyoda, Japan

Filed Jul. 29, 1988, Ser. No. 226,321
Claims priority, application Japan, Sep. 1, 1987, 62-216396; Sep. 12, 1987, 62-226477
Int. Cl.[4] H03M *7/00*
U.S. Cl. 341—59 12 Claims



1. A digital information coding method for transforming a binary code train of digital information without limitation of bit arrangement into another binary code train with limitation of bit arrangement, wherein said transformed binary code train is constructed of run length limited codes of the type that between a first binary digit and the next first binary digit, a second binary digit is inserted, and that the number (run length) of inserted consecutive digits takes a value between an

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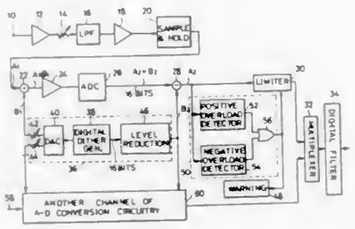
optional integer minimum value d and another integer maximum value k, said run length taking a value obtained by adding an integer multiple of a specific positive integer s to said minimum value d, within the range of said minimum value d and said maximum value k, and wherein said positive integer s is 2 or more and is an aliquant number relative to d+1, and said maximum value k is a value obtained by adding an integer multiple of said positive integer s to said minimum value d.

4,914,439

ANALOG TO DIGITAL CONVERSION SYSTEM UTILIZING DITHER

Teruyoshi Nakahashi, Iruma, and Tetsuji Ono, Musashino, both of Japan, assignors to Teac Corporation, Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,366
Claims priority, application Japan, Sep. 14, 1987, 62-230788
Int. Cl.[4] H03M *1/20*
U.S. Cl. 341—131 **8 Claims**



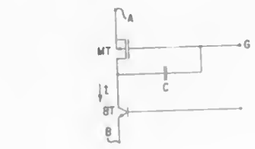
1. An analog to digital conversion system comprising:
(a) input means for inputting an analog information signal (A1) to be digitized;
(b) a digital dither generator for generating a first digital dither signal of m bits;
(c) a digital to analog converter connected to the digital dither generator for translating the first digital signal of m bits into a first analog dither signal of equivalent magnitude;
(d) analog level reduction means connected to the digital to analog converter for reducing the magnitude of the first analog dither signal and providing a second analog dither signal (B1) equivalent in magnitude to a digital dither signal of 1 bits, where 1 is less than m;
(e) an adder connected to both the input means and the analog level reduction means for adding the second analog dither signal (B1) to the analog information signal (A1) and providing an analog information/dither signal (A1+B1);
(f) an analog to digital converter connected to the adder for translating the analog information/dither signal (A1+B1) into a digital information/dither signal (A2+B2) of n bits, where n is equal, or not equal, to m and greater than 1;
(g) a digital level reduction circuit connected to the digital dither generator for translating the first digital dither signal of m bits into a second digital dither signal (B2) of substantially 1 bits, the 1 bits of the second digital dither signal being composed of the 1 consecutive bits, including the most significant bit, of the first digital dither signal; and
(h) a subtracter connected to both the analog to digital converter and the digital level reduction circuit for subtracting the second digital dither signal (B2) from the digital information/dither signal (A2+B2) and providing a digital information signal (A2).

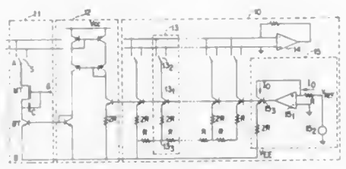
4,914,440

ADJUSTABLE CURRENT SOURCE AND DIGITAL/ANALOG CONVERTER WITH AUTOCALIBRATION USING SUCH A SOURCE

Serge Ramet, Grenoble, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Sep. 20, 1988, Ser. No. 246,853
Claims priority, application France, Sep. 21, 1987, 87 13332
Int. Cl.[4] H03M *1/66*
U.S. Cl. 341—140 **4 Claims**





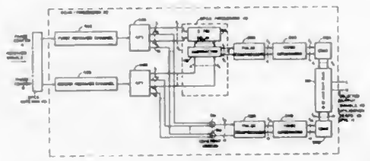
3. A digital/analog converter comprising stages each having a current source, said stages corresponding to lower rank bits and higher rank bits, wherein each of said stages corresponding to higher rank bits includes,
an adjustable current source comprising a bipolar transistor, the base of which receives a signal adapted to approximately set the current which flows therethrough, further comprising a MOS transistor, in series with said bipolar transistor, the gate of which receives an adjustment signal stored by a capacitor connected between its gate and its drain,
wherein said bipolar transistor is a NPN transistor and said MOS transistor is an enhanced P-channel transistor, the source of the MOS transistor being connected with a high voltage, its drain being connected with the collector of the bipolar transistor and the emitter of the bipolar transistor being connected with a low voltage source.

4,914,441

METHOD OF PROCESSING IN A PULSE DOPPLER RADAR

Eli Brookner, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Aug. 29, 1988, Ser. No. 237,351
Int. Cl.[4] G01S *13/52*
U.S. Cl. 342—161 **6 Claims**



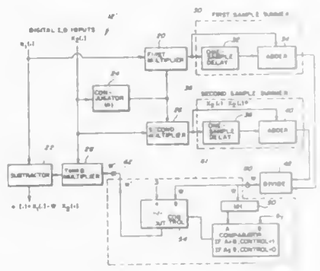
1. The method of operating a pulse Doppler radar in a satellite moving in orbit around the earth to increase the probability of detection of an airborne target moving relative to the earth so that the Doppler velocity of such target as observed by such radar falls within a predetermined range of velocities centered on zero, such radar also incorporating a Displaced Phase Center Antenna feeding at least a first and a second receiving channel to provide signals for cancelling clutter, such method comprising the steps of:
(a) transmitting a burst of interrogating pulses characterized by a first carrier frequency, a duty cycle less than about 10%, a pulse repetition frequency higher than the lowest pulse repetition frequency that results in a blind speed within the predetermined range of velocities and a duration preferably much greater than the round trip propagation time of pulses between the pulse Doppler radar and the airborne target;
(b) separately processing received signals in the first and the second receiving channel to derive a first and a second spectrum of the Doppler shift frequencies of such received signals, each such spectrum having lower bands of frequencies indicative of clutter and echo signals from any airborne target having a like lower Doppler shift frequency and higher bands of frequencies indicative of echo signals from any airborne target having a like higher Doppler shift frequency;
(c) delaying each signal in the lower band of frequencies out of the first receiving channel by a length of time equal to N times the interval between successive pulses in the burst of interrogating pulses, where N is an integer greater than or equal to 1;
(d) subtracting each delayed signal from the corresponding signal in the then extant lower band of frequencies out of the second receiving channel to cancel clutter, thereby forming a first resultant band wherein any signal is representative of an airborne target;
(e) coherently combining the higher bands of frequencies out of the first and the second receiving channel thereby forming a second resultant band wherein any signal is representative of an airborne target; and
(f) selecting from the first and the second resultant band, the signal of greater magnitude.

4,914,442

ADAPTIVE MTI TARGET PRESERVATION

Frank F. Kretschmer, Jr., Laurel, Md., and Bernard L. Lewis, Satellite Beach, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 30, 1989, Ser. No. 304,041
Int. Cl.[4] G01S *13/52*
U.S. Cl. 342—162 **6 Claims**



1. A method for preserving targets in the clear in an adaptive baseband MTI radar system with pulse compression, comprising the steps of:
receiving a target return signal;
generating a digitized and time sampled signal $x_1(i)$ having in-phase I and quadrature Q components of said target return signal, wherein $x_1(i)$ is the ith sampled complex signal for a range cell;
generating a second signal $x_2(i)$, wherein $x_2(i)$ is delayed by one pulse repetition interval from said signal $x_1(i)$;
generating a first complex weighting signal W(i) from said first and second signals $x_1(i)$ and $x_2(i)$;
determining an angle Θ of said weighting signal, wherein said angle Θ is represented in terms of the in-phase I and quadrature Q components of said weighting signal such that $\Theta=\tan^{-1}Q/I$;
comparing the absolute value of said angle Θ to a threshold angle Θ_T;
generating a modified complex weighting signal W' from said first complex weighting signal according to the following expression:

$$W'=W \text{ for } |\Theta| \leqq \Theta_T$$

$$W'=-W \text{ for } |\Theta|>\Theta_T;$$

combining signal pulses $x_1(i)$ and $x_2(i)$ spaced a period T apart with said modified complex weighting signal W' and producing a residual signal $e_o(i)$ according to the following expression:

$$e_o(i)=x_1(i)-W'(i)\cdot x_2(i); \text{ and}$$

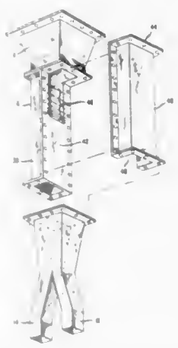
compressing said residual signal.

4,914,443

ANGLE DIVERSITY SIGNAL SEPARATOR USING MODE CONVERSION

Michael J. Gans, Moanmouth Beach, N.J.; Adolf J. Giger, Boxford, and Chung-Li Ren, Andover, both of Mass., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 26, 1988, Ser. No. 224,606
Int. Cl.[4] H01Q *21/06, 13/00;* H01P *1/16;* H04B *1/18*
U.S. Cl. 342—361 **13 Claims**



9. A diversity receiving system for providing receiving means with an improved signal version of a transmitted signal comprising
receiving antenna means for receiving said transmitted signal;
diversity signal separating means coupled to said antenna means for obtaining a primary signal version and a diversity signal version of said received signal;
combining means for combining said primary signal version and said diversity signal version to produce said improved version; and
means connecting said improved signal version to said receiving means characterized in that

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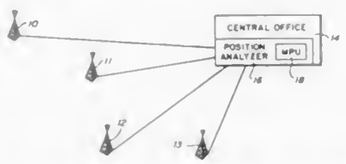
said diversity signal separating means comprises a multimode input section for supporting both fundamental modes and higher order modes of said received signal;
an output section bifurcated by a conductive septum to form two waveguides for producing said primary signal version and said diversity signal version; and
mode transducer means between said input and output sections for converting selective higher order modes into fundamental modes that will propagate in said bifurcated output section.

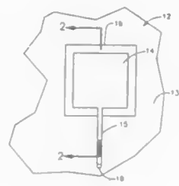
4,914,444
SYSTEM AND METHOD FOR SYNCHRONIZING LIGHTNING DETECTORS
Albert E. Pifer, and Dion W. Howard, both of Tucson, Ariz., assignors to Lightning Location and Protection, Inc., Tucson, Ariz.
Filed Aug. 11, 1987, Ser. No. 84,377
Int. Cl.[4] G01S *3/18*
U.S. Cl. 342—460 25 Claims



1. A system utilizing detected lightning as a reference for synchronizing two or more remote clocks comprising:
first lightning detecting means for detecting the occurrence of a plurality of lightning events, said detecting means identifying the time of occurrence of said lighting events according to a first clock;
second lightning detecting means for detecting the occurrence of said plurality of lightning events, said detecting means identifying the time of occurrence of said lightning event according to a second clock;
means responsive to the times of occurrences of said plurality of lightning events detected by the first detecting means and to the times of occurrence of said plurality of lightning events detected by the second detecting means for correlating lightning events detected by the first detecting means with lightning events detected by the second detecting means based on the time intervals between lightning events detected by the first detecting means and the time intervals between lightning events detected by the second detecting means; and
means responsive to said correlating means for calculating a correction factor used to synchronize said first and second clocks.

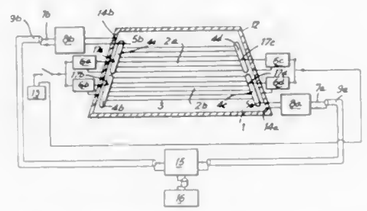
4,914,445
MICROSTRIP ANTENNAS AND MULTIPLE RADIATOR ARRAY ANTENNAS
Kevin O. Shoemaker, P.O. Box 322, Morrison, Colo. 80465
Filed Dec. 23, 1988, Ser. No. 289,248
Int. Cl.[4] H01Q *1/38*
U.S. Cl. 343—700 MS 23 Claims

1. A microstrip antenna comprising:
a ground reference,
a radiator in the form of a microstrip patch,
a microstrip feedline connected at one end to an edge of said radiator, said radiator and feedline being coplanar,
a first dielectric layer having a selected first dielectric constant disposed between said radiator and said ground reference,
a second dielectric layer having a selected second dielectric constant disposed between said feedline and said ground reference,
said first dielectric constant being different than said second dielectric constant,



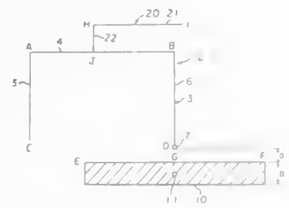
said first dielectric constant being selected to provide for a selected bandwidth, a selected beamwidth and a selected gain for said radiator,
said second dielectric constant being selected to provide for selected low conductive losses and selected low dielectric losses for said feedline.

4,914,446
DIVERSITY ANTENNA SYSTEM
Heinz Lindenmeier, Fuerstenriederstr. 7, 8033 Planegg; Gerhard Flachenecker, Bozenerstrasse 2, 8012 Ottobrunn; Jochen Hopf, Salmdorfstrasse 3a, 8013 Haar, and Leopold Reiter, Ludwig-Thomastrasse 9, 8031 Gilching, all of Fed. Rep. of Germany
PCT No. PCT/EP87/00297, § 371 Date Feb. 12, 1988, § 102(e) Date Feb. 12, 1988, PCT Pub. No. WO87/07770, PCT Pub. Date Dec. 17, 1987
PCT Filed Jun. 5, 1987, Ser. No. 162,402
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1986, 3618452
Int. Cl.[4] H01Q *1/02*
U.S. Cl. 343—704 31 Claims



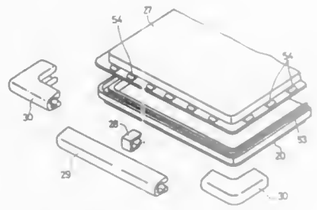
1. A diversity antenna configuration for a motor vehicle, comprising:
at least two diversity antennas operating with a same receiving frequency and switchable to operate alternatingly and each having a window-mounted heater structure (*2a*, *2b*) and a feeder network (*8a*, *8b*), said heater structure including bus bars (*4a*, *4d*; *4b*, *4c*) and conductive heater sections (*2a*, *2b*) extending between the bus bars;
at least a pair of terminals electrically connected to each of the feeder networks (*8a*, *8b*), the terminals including a conductive tap (*5a*, *5b*) on a respective one of the bus bars (*4a*, *4b*) and including a grounded connection (*14a*, *14b*), the taps being substantially isolated from each other with respect to radio frequencies;
DC power leads extending to the bus bars; and
RF taps (*6a*–*6d*) in the DC power leads.

4,914,447
ANTENNA FOR MOBILE TELEPHONE ON A GLASS PANEL OF AN AUTOMOBILE
Kenichi Ishii, and Kouji Tabata, both of Chita, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan
Continuation of Ser. No. 122,450, Nov. 19, 1987, abandoned. This application Feb. 16, 1989, Ser. No. 311,390
Claims priority, application Japan, Nov. 21, 1986, 61-179304
Int. Cl.[4] H01Q *1/32*
U.S. Cl. 343—713 5 Claims



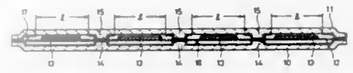
1. An antenna for the transmission/reception of radio waves for mobile telephone on a glass panel of an automobile comprising:
a main antenna part comprising a substantially horizontal antenna element, a pair of substantially vertical antenna elements respectively extending vertically from the both ends of said horizontal antenna elements, and a first feeding point connected to the free end of one of said vertical antenna elements,
an earth line part, provided apart from said main antenna part, which extends in substantially parallel to said horizontal antenna elements and which has a second feeding point at an intermediate portion of the earth line part and below said first feeding point, and
an auxiliary antenna part shaped as an inverted L which has an extension element extending in substantially parallel to said earth line part which is connected to said horizontal antenna element of the main antenna part.

4,914,448
MICROWAVE ANTENNA STRUCTURE
Takashi Otsuka, Kanagawa; Toshihiro Kikuchi, Tokyo; Katashiro Yamashita, Tokyo, and Tomohiko Haga, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Nov. 29, 1988, Ser. No. 277,186
Claims priority, application Japan, Nov. 30, 1987, 62-301918; Aug. 12, 1988, 63-201155
Int. Cl.[4] H01Q *1/42*
U.S. Cl. 343—872 7 Claims



1. A microwave planar antenna comprising:
an antenna body sandwiched between a radome and a rear cover, characterized by a plurality of U-shaped clips for securing the peripheral portions of said radome and said rear cover at a plurality of points, and protective trim means for enclosing said clips and said peripheral portions of said radome and said rear cover without using screws.

4,914,449
MICROWAVE ANTENNA STRUCTURE WITH INTERGRAL RADOME AND REAR COVER
Keiji Fukuzawa, Chiba; Takashi Otsuka, Kanagawa; Shinobu Tsurumaru, Kanagawa; Junichi Kajikuri, Kanagawa, and Fumihiro Ito, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Nov. 29, 1988, Ser. No. 277,313
Claims priority, application Japan, Nov. 30, 1987, 62-301916
Int. Cl.[4] H01Q *1/42, 1/38*
U.S. Cl. 343—872 10 Claims



1. A suspended line feed type planar antenna comprising:
a substrate sandwiched between top and bottom conductive surfaces;
a plurality of radiators provided on said substrate;
a radome positioned at the upper side of said top conductive surface; and
a rear cover positioned at the lower side of said bottom conductive surface, characterized in that at least one of said top and bottom conductive surfaces is formed on one of the inner surfaces of said radome and said rear cover.

4,914,450
HIGH FREQUENCY WHIP ANTENNA
Douglas M. Dilley, La Mesa, and Donald B. Forman, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jan. 31, 1985, Ser. No. 696,943
Int. Cl.[4] H01Q *1/22, 1/36*
U.S. Cl. 343—895 23 Claims

1. In an assembly for securing an HF whip antenna to a mounting surface that is held at ground potential, said assembly including an electrically conductive base spring for permitting said whip antenna to yield to shocks and for providing flexibility in the mounting of said whip antenna, said assembly further including an electrically conductive base support flange mechanically secured to said base spring and for attachment to said mounting surface, the improvement comprising:
said base spring being electrically connected to said base

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support flange such that the entirety of said base spring is held at ground potential and such that said base support flange is held at ground potential.

4,914,451

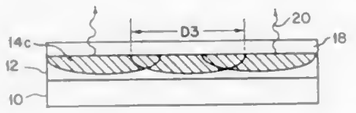
POST-PRINTING IMAGE DEVELOPMENT OF INK-JET GENERATED TRANSPARENCIES

Peter C. Morris, El Cajon, and Mark S. Hickman, Escondido, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 57,131, Jun. 1, 1987, abandoned. This application Mar. 23, 1988, Ser. No. 172,946

Int. Cl.[4] G01D *15/34;* **B41J** *3/04*

U.S. Cl. 346—1.1 **3 Claims**



1. A method of printing on a non-ink receptive substrate having an ink-receptive coating thereon to form an imaged medium, comprising:

(a) employing as said ink-receptive coating a material such that

(1) upon depositing ink drops on the surface thereof, adjacent drops of ink do not contact one another,

(2) said drops of ink are then absorbed into said ink-receptive coating to form dots of ink,

(3) radial diffusion of said dots then occurs within said ink-receptive layer until said dots achieve a dot size at least about $\sqrt{2}$/DPI, where DPI is the number of dots per inch, and

(4) radial diffusion of said dots is then terminated by solvent elimination from said ink-receptive layer such that said dot size is less than about 2/DPI;

(b) printing an ink on said ink-receptive coating by ink-jet techniques; and

(c) storing said imaged medium between removable protective sheets comprising a cellulose acetate having water absorption greater than 3% and water vapor transmission rate greater than 10 g water per 1 mil thickness per 100 square inches per 24 hours, such that the correct amount of lateral dot spread is promoted.

4,914,452

INK SHEET/RECORDING PAPER CASSETTE

Kazumi Fukawa, Asaka, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 6, 1988, Ser. No. 191,059

Claims priority, application Japan, May 8, 1987, 62-112134; May 8, 1987, 62-112135; May 8, 1987, 62-112136; Jul. 14, 1987, 62-108685[U]; Jul. 14, 1987, 62-108686[U]

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH **15 Claims**

14. A recording apparatus for use with an ink sheet cassette, wherein said ink sheet cassette comprising:

a case;

a first roll of an ink sheet contained in said case, said ink sheet having thereon a thermally transferrable ink layer;

a second roll of recording paper contained in said case; and

a take-up spool rotatably mounted in said case for taking up said ink sheet supplied from said first roll after having been used for recording information on said recording paper supplied from said second roll; and said recording apparatus comprising:

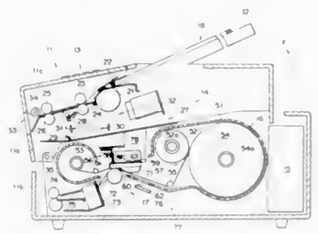
holding means for detachably holding said ink sheet cassette in position;

a thermal print head engageable with said ink sheet when said ink sheet cassette is set in position;

a platen roller pressed against said thermal print head with said ink sheet and said recording paper sandwiched therebetween;

driving means for driving to rotate said platen roller;

first power transmitting means for transmitting only a normal rotation of said platen roller to said take-up spool; and



second power transmitting means for transmitting only a reversed rotation of said platen roller to said take-up spool.

4,914,453

INK RESERVOIR OF INK JET PRINTER

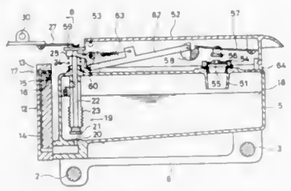
Yoshio Kanayama, Nabari, and Hirokazu Kohda, Gose, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 21, 1989, Ser. No. 341,490

Claims priority, application Japan, Apr. 25, 1988, 63-55516[U]

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **25 Claims**



1. An ink reservoir of an ink jet printer for supplying ink to a nozzle portion jetting the ink comprising:

an ink tank (**5**) having an ink outlet (**20**) storing ink feeding the stored ink to said nozzle and a vent hole (**34**) for circulating air between an external atmosphere and an internal space;

an outlet opening/closing means (**19**) movably provided for opening/closing said ink outlet (**20**);

vent hole opening/closing means (**56**) and (**57**) movably provided for opening/closing said vent hole (**34**); and

operation transferring means (**58**), (**60**) and (**62**) for mechanically transferring the movement of said outlet opening/closing means (**19**) to said vent hole opening/closing means (**56**) and (**57**) so as to interlock the opening/closing operation of said outlet opening/closing means (**19**) with the opening/closing operation of said vent hole opening/closing means (**56**) and (**57**).

4,914,454

IMAGE RECORDING SYSTEM CAPABLE OF FORMING IMAGE WITH DIFFERENT COLORS IN DIFFERENT AREAS

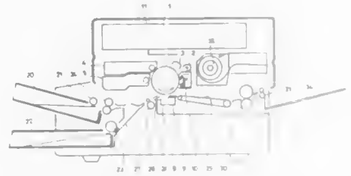
Yukio Tadauchi; Hiroshi Maekawa, and Kiyoshi Enori, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 12, 1989, Ser. No. 337,096

Claims priority, application Japan, Apr. 14, 1988, 63-93227; Apr. 14, 1988, 63-93228

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—150 **11 Claims**



1. An image recording system comprising a host control unit for generating image data and a printer apparatus for forming an image on a sheet of paper in accordance with the image data generated from said host control unit,

said printer apparatus having a function of dividing the image into at least two image areas with respect to a boundary extending in a direction orthogonal to the direction of transport of the paper and of forming each of the image areas with different colors,

said host control unit adapted to supply to said printer apparatus a boundary signal indicative of the boundary of said at least two image areas to be printed with different colors,

said printer apparatus comprising

selecting means for automatically selecting a first orientation in which the lengthwise direction of the sheet is the direction of transport when said boundary signal indicates a boundary extending in the widthwise direction of the sheet, and for automatically selecting a second orientation in which the widthwise direction of the sheet of paper, when said boundary signal indicates a boundary extending in the lengthwise direction of the sheet.

4,914,455

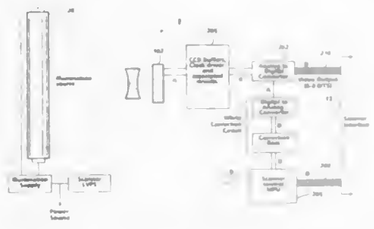
PROCESS CONTROL FOR ELECTROSTATOGRAPHIC PRINTERS

Thomas A. Hayes, Clifton Springs, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 31, 1989, Ser. No. 387,259

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—154 **9 Claims**



1. In an electrostatographic printing machine having a photoreceptor, means providing a uniform charge on said photoreceptor, a laser providing an imaging beam modulated in accordance with an image signal input to produce image spots on said photoreceptor forming latent electrostatic images representative of said image signal input, said image signal input including black, white, and at least one gray image; scanning means for scanning said imaging beam across said photoreceptor; developer means for developing said latent electrostatic images; biasing means providing a bias to said developer means having ac and dc bias components; and means to transfer said developed images to a print medium, comprising, in combination:

(a) means for repeatedly generating laser control signals for operating said laser;

(b) means for synchronizing said laser control signals with said image signal input whereby to provide one laser control signal for each image signal; and

(c) control means for adjusting the duration of said laser control signals when producing said gray images in response to the developing density of said developer means whereby to control the size of the image spots produced on said photoreceptor through exposure by said imaging beam in accordance with the developing density of the developer means.

4,914,456

ELECTROSTATOGRAPHIC APPARATUS

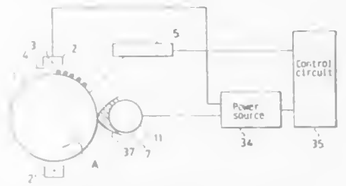
Yuzo Kawano, Oosojyou; Katsumi Ogawa, Fukuoka; Tatsuya Tokoshima, Mii, and Hiroshi Fujiwara, Fukuoka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 21, 1988, Ser. No. 260,999

Claims priority, application Japan, Oct. 23, 1987, 62-268567; Oct. 23, 1987, 62-268568

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—154 **3 Claims**



1. An electrostatographic apparatus comprising:

a photoconductor;

a charger disposed adjacent to a circumference of said photoconductor;

a laser unit for emitting laser beam to scan a surface of said photoconductor in response to recording signals and forming latent image on said surface which has been charged by said charger;

a developer for developing said latent image;

a power source for supplying power to said charger and said developer; and

control means for controlling said laser unit to scan said photoconductor during a predetermined time period with laser beam lit irrespective of said recording signals after stoppage of power supply from said power source to said charger and said developer.

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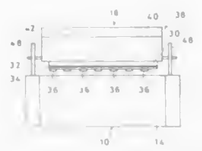
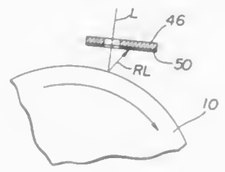
4,914,457
ELECTROSTATIC LATENT IMAGE FORMING APPARATUS
Takeo Fukatsu, Kyoto; Kazuyuki Gotoh, Osaka; Masaru Takeuchi, Osaka; Kenichiro Wakizaka, Osaka; Kazuhiko Honma, Osaka; Shoichi Nakano, Osaka, and Yukinori Kuwano, Osaka, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Mar. 15, 1988, Ser. No. 168,170
Claims priority, application Japan, Mar. 16, 1987, 62-60341
Int. Cl.[4] G01D 15/06
U.S. Cl. 346—153 50 Claims



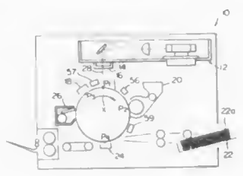
1. An electrostatic latent image forming apparatus comprising:
a dielectric film;
a recording head for partially and selectively applying electric charges onto said dielectric film in accordance with a light signal or for partially and selectively removing electric charges from said dielectric film in accordance with a light signal, said recording head including a transparent base plate, a transparent electrode on a surface of said transparent base plate facing said dielectric film, a photoconductive layer on said transparent electrode, and discharging electrodes;
an optical system for entering said light signal in accordance with an image signal to said photoconductive layer from a surface of said transparent base plate of said recording head opposing to said dielectric film;
bias means for applying a bias voltage having a predetermined polarity to said transparent electrode, said discharging electrodes being on said photoconductive layer so that an electrostatic capacitance forms between said discharging electrodes and said transparent electrode to thereby prevent an unevenness in density of the electric charges which are discharged between said discharging electrodes and said dielectric film from arising and to thereby concentrate an electric field.

4,914,458
IMAGE FORMING APPARATUS
Hiroshi Mori, and Yoichiro Sugino, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Sep. 21, 1988, Ser. No. 247,257
Claims priority, application Japan, Oct. 6, 1987, 62-252016
Int. Cl.[4] G01D 15/00
U.S. Cl. 346—160 12 Claims

2. An image forming apparatus as claimed in claim 1, in which said photosensitive body comprises a rotatable photosensitive drum, and said optical scanning means scans a surface of said photosensitive drum in a main scanning direction along a longitudinal direction of said photosensitive drum and in a sub scanning direction as said photosensitive drum rotates, said optical scanning means emitting the laser beam with a predetermined incident angle with respect to the surface of said photosensitive drum so that the laser beam reflected by the surface of said photosensitive drum travels in a direction different from that of the incident laser beam from said optical scanning means.



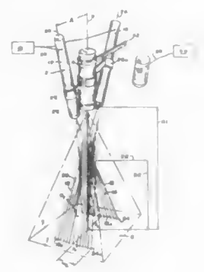
4,914,459
IMAGE FORMING APPARATUS
Takashi Mama, Yokohama; Kenichirou Asada, Tokyo; Takanobu Fujioka, Tokyo; Yoshio Kaneko, Tokyo, and Masaaki Kogure, Asaka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Apr. 14, 1989, Ser. No. 338,273
Claims priority, application Japan, Apr. 18, 1988, 63-93593; Apr. 28, 1988, 63-104230; May 11, 1988, 63-112620
Int. Cl.[4] G01D 15/00
U.S. Cl. 346—160 11 Claims



1. An apparatus for forming an electrostatic latent image representative of image information and a visible image of said latent image on an image carrier by illuminating said image carrier by a spot beam which is manipulated by an image forming signal associated with said image information, said apparatus comprising:
sensor means for sensing a condition of said image carrier and producing an output signal representative of the sensed condition; and
illumination time changing means for changing a duration of illumination of said image carrier by the spot beam in response to the output signal of said sensor means.

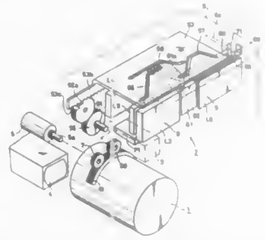
4,914,460
APPARATUS AND METHODS OF DETERMINING DISTANCE AND ORIENTATION
Frank M. Caimi, Vero Beach, and Robert F. Tusting, Ft. Pierce, both of Fla., assignors to Harbor Branch Oceanographic Institution Inc., Ft. Pierce, Fla.
Filed May 29, 1987, Ser. No. 55,338
Int. Cl.[4] G03B 17/08; H04N 7/18
U.S. Cl. 354—64 10 Claims

1. Apparatus for determination of the distance of a submarine object to a submarine surface and the orientation of the longitudinal axis of said object relative to said surface which comprises:
a first laser unit capable of emitting a plurality of first spot beams of light lying spaced apart in a first plane,
a second laser unit capable of emitting a plurality of second spot beams of light lying spaced apart in a second plane with the number of said second spot beams and their spacing being substantially equal to said first spot beams,
means to fix said first laser unit adjacent said object with its longitudinal axis at an acute angle A relative to said object longitudinal axis so that said first spot beams of light emitted thereby project forward of said object with said first plane crossing said object longitudinal axis at said acute angle A,
means to fix said second laser unit adjacent said object opposed to said first laser unit with its longitudinal axis at said acute angle A relative to said object longitudinal axis so that said second spot beams of light emitted thereby



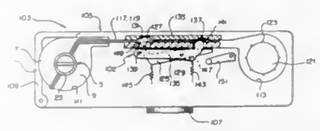
project forward of said object with said second plane crossing said object longitudinal axis at substantially the same position as said first plane and so the intersection of said second plane with said first plane at said same position defines a line that is perpendicular to said object longitudinal axis and is located between said object and said surface,
means to energize said first and second laser units to cause said first and second spot beams of light to project onto said surface and
means to compare said pattern of illuminations on said surface of said projected first and second spot beams with a predetermined illumination pattern.

4,914,461
CAMERA HAVING VARIABLE ILLUMINATION ANGLE STROBE DEVICE AND ZOOM LENS
Masakatsu Hori, Tokyo, Japan, assignor to Asahi Kogaku Kogyo K.K., Tokyo, Japan
Continuation of Ser. No. 244,009, Sep. 14, 1988, abandoned. This application Jun. 19, 1989, Ser. No. 367,735
Claims priority, application Japan, Sep. 14, 1987, 62-230749
Int. Cl.[4] G03B 15/03
U.S. Cl. 354—149.1 22 Claims



1. A camera comprising a zoom lens which has a group of variable power lenses for changing the focal length of said lens, a variable illumination angle strobe device which has an illumination angle varying mechanism having a condenser lens, a light emitting tube and a light reflecting shade, said condenser lens, said light emitting tube and said light reflecting shade being relatively movable in the optical axis direction to change the illumination angle of said strobe device, wherein said illumination angle varying mechanism comprises association means for controlling the illumination angle in association with the focal length of the zoom lens and an independently driven means for controlling the illumination angle independently of the association means.

4,914,462
METERING DEFEAT MECHANISM
Daniel M. Pagano, Henrietta, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed May 9, 1989, Ser. No. 349,474
Int. Cl.[4] G03B 1/00
U.S. Cl. 354—213 5 Claims



1. A metering defeat mechanism for a photographic camera to be used with a film cassette in which a filmstrip has a relatively short nonprotruding leader portion, including a row of take-up perforations adjacent a longitudinal film edge for enabling the leader portion to be engaged by a toothed take-up spool in the camera, and a relatively long imaging portion, including a row of metering perforations adjacent the same film edge for enabling the imaging portion to be engaged by a metering member in the camera preparatory to each exposure, and a film spool is rotatable to unwind the filmstrip off the spool to thrust the leader portion from the cassette to enable the leader portion to be moved in the camera along a film advance path to said take-up spool, characterized in that said metering defeat mechanism comprises:
actuation means for moving said metering member ino the film advance path to permit the metering member to engage the imaging portion at one of its metering perforations, and
film sensing means for normally maintaining said metering member removed from the film advance path to prevent the metering member from being moved into said advance path to erroneously engage the leader portion at one of is take-up perforations, but responsive to sensing the leader portion for allowing said metering member to be moved into the film advance path only after the take-up perforations are out of reach of said metering member.

4,914,463
DEVELOPMENT OF IMAGING SHEETS EMPLOYING PHOTOSENSITIVE MICROCAPSULES
Yasuji Yui, Saitama; Akio Hitachi, Tokyo; Tatsaru Sato, Chiba, and Akira Shirakura, Tokyo, all of Japan, assignors to Sony Corp., Tokyo, Japan
Filed Nov. 14, 1988, Ser. No. 271,156
Claims priority, application Japan, Nov. 14, 1987, 62-288178; Nov. 24, 1987, 62-295796; Nov. 26, 1987, 62-298605; Nov. 28, 1987, 62-301115; Dec. 10, 1987, 62-313080; Dec. 12, 1987, 62-314936; Dec. 16, 1987, 62-318199
Int. Cl.[4] G03D 5/02
U.S. Cl. 354—304 41 Claims

1. An apparatus for developing a picture on a sheet of developing paper from a sheet of photo-sensitive material of a type which develops said picture upon the pressing together of said

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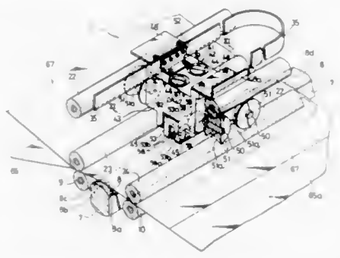
sheets of developing paper and photo-sensitive material, said apparatus comprising:

a back-up member having a back-up surface and standby surfaces extending from the opposite ends of said back-up surface and being raised relative to the latter for defining guide shoulders at said ends of the back-up surface;

means for intermittently transporting said sheets of developing paper and photo-sensitive material in contact with each other across said back-up surface between said guide shoulders in a predetermined direction of sheet travel at a substantial angle to a longitudinal median of said back-up surface;

at least one rotatable roller disposed in opposing relation to said back-up surface and having an axis of rotation substantially at right angles to said longitudinal median of said back-up surface;

means mounting said roller for bodily movements relative to said back-up member toward and away from said back-up



surface and parallel to the back-up surface in directions parallel to said longitudinal median thereof;

means for transporting said roller relative to said back-up member in said directions parallel to said longitudinal median from one to another of said standby surfaces while urging said roller toward said back-up surface with said sheets of developing paper and photo-sensitive material being in contact with each other between said roller and said back-up surface so as to be pressed together thereby; and

control means for causing coordinate operations of said means for intermittently transporting the sheets and said means for transporting said roller so that said sheets are transported a predetermined incremental distance in said direction of sheet travel while said roller is situated on one of said standby surfaces and said sheets are at rest while said roller is transported along said back-up surface from one to another of said standby surfaces.

4,914,464

FOCUSSING APPARATUS FOR CAMERA WITH ZOOM LENS

Miyazawa Azuma, and Hirotsugu Nakazawa, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Jan. 31, 1989, Ser. No. 304,801

Claims priority, application Japan, Feb. 8, 1988, 63-026934; Feb. 8, 1988, 63-026935

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—400 **30 Claims**

1. A focussing apparatus for a camera with zoom lens in which travel of a focussing lens from a reference position varies with a particular focal length being used when an object being photographed is located at a given distance from the camera; the apparatus comprising:

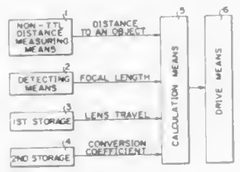
non-TTL distance measuring means for determining a distance to an object being photographed;

detecting means for detecting a particular focal length;

first storage means for storing a travel of a focussing lens at at least one reference focal length which corresponds to the distance to the object;

second storage means for storing conversion coefficients which are used to convert a lens travel for the reference focal length to a corresponding lens travel for a selected focal length;

calculation means responsive to a particular focal length



detected to derive a conversion coefficient from the second storage means and responsive to a distance to an object being photographed detected to derive a lens travel from the first storage means, the calculation means performing an arithmetic operation using the lens travel and the conversion coefficient;

and drive means responsive to a calculated output from the calculation means to drive the focussing lens.

4,914,465

SINGLE-REFLEX CAMERA DRIVEN BY MOTOR

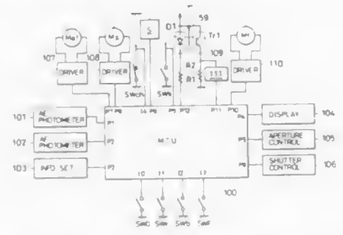
Takashi Saegusa, Kawasaki; Kimio Uematsu, Tokyo, and Yoshiyuki Daimon, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed May 24, 1989, Ser. No. 356,374

Claims priority, application Japan, May 27, 1988, 63-129576

Int. Cl.[4] G03B *7/08, 19/12*

U.S. Cl. 354—412 **5 Claims**



1. A single-reflex camera, comprising:

a movable mirror provided on a photographing optical path;

driving means for driving said movable mirror by means of an electrical motor, said driving means being arranged to cause said movable mirror to move out of said photographing optical path in a first cycle of driving prior to exposure and to cause said movable mirror to move onto said photographing optical path in a second cycle of driving following said first cycle of driving;

photometric means arranged to receive a portion of a light flux which passes through said photographing optical path and which is incident upon said movable mirror and then to generate information concerning the brightness of an object;

counting means for counting the time period required for said first cycle of driving of said driving means; and

determining means for determining, on the basis of said required time period counted by said counting means, the time interval between the starting of said first cycle of driving of said driving means and the starting of the operation of said photometric means.

4,914,466

BRACKETING EXPOSURE CONTROL DEVICE

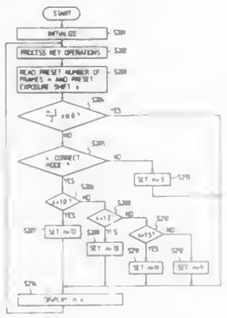
Tsutomu Wakabayashi, Tokyo, and Tetsuro Goto, Funabashi, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Apr. 10, 1989, Ser. No. 335,870

Claims priority, application Japan, Apr. 11, 1988, 63-87241; Sep. 5, 1988, 63-221939; Oct. 14, 1988, 63-257231

Int. Cl.[4] G03B *7/26*

U.S. Cl. 354—412 **8 Claims**



1. An exposure control device for a camera, comprising:

input means for entering a number of frames to be exposed and an amount of exposure shift per frame;

discrimination means for comparing a total shift range of the exposure value determined by the combination of the number of frames and the amount of exposure shift thus entered, with a predetermined shift range;

setting means for retaining the number of frames and the amount of exposure shift per frame entered by said input means in case said total shift range of the exposure value does not overflow said predetermined shift range, but, in case said total shift range of the exposure value overflows said predetermined shift range, modifying at least one of said number of frames and said amount of exposure shift per frame in such a manner that said total shift range of the exposure value does not overflow said predetermined shift range and retaining the number of frames and the amount of exposure shift per frame after said modification; and

means for executing exposure of plural frames with stepwise shifts of the exposure value, according to the number of frames and the amount of exposure shift per frame thus retained.

4,914,467

INTERCHANGEABLE CAMERA AND INTERCHANGEABLE FLASH DEVICE

Satoshi Takami; Teruhiko Narao, and Yutaka Ohsawa, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 130,585, Dec. 9, 1987, abandoned. This application Jul. 3, 1989, Ser. No. 376,197

Claims priority, application Japan, Dec. 9, 1986, 61-291521; Dec. 19, 1986, 61-301189; Dec. 19, 1986, 61-301190; Dec. 27, 1986, 61-309093; Jan. 9, 1987, 62-1678; Feb. 4, 1987, 62-14290[U]; Feb. 6, 1987, 62-24477; Feb. 6, 1987, 62-15517[U]

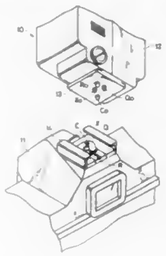
Int. Cl.[4] G03B *15/05*

U.S. Cl. 354—413 **14 Claims**

1. An interlocking system for an improved photographing camera and an improved flash device, said improved flash device having a first camera operation mode with said improved flash device and a second camera operation mode with an ordinary flash device, said improved flash device having a first flash operation mode for said improved photographing camera and a second flash operation mode for an ordinary photographing camera comprising:

a first control terminal provided on said improved flash device for connection to said improved photographing camera;

a second control terminal provided on said improved camera for connection to said improved flash device, said second control terminal being electrically connected to said first



control terminal when said improved flash is mounted to said improved photographing camera; and

a power supply means for causing variation in voltage to occur across said first and second control terminals when said first and second control terminals are coupled to each other,

said improved photographing camera and improved flash device being put automatically in said first camera operation mode and said first flash operation mode, respectively, upon detection of said variation in voltage across said first and second control terminals.

4,914,468

LIGHT MEASURING DEVICE

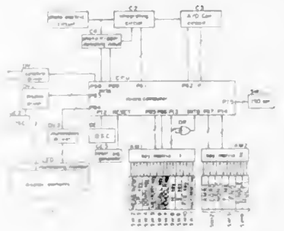
Kazuhiko Naruse, 137-banchi, 5-buncho, Suzurandai, Nabari-Shi, Mie-Ken, and Yoshio Yuasa, 4-18-3, Fuminosato, Abeno-Ku, Osaka-Shi, Osaka-Fu, both of Japan

Continuation of Ser. No. 893,596, Aug. 6, 1986, abandoned. This application Mar. 22, 1988, Ser. No. 171,641

Claims priority, application Japan, Aug. 7, 1985, 60-173819

Int. Cl.[4] G03B *15/02;* **G01J** *1/44*

U.S. Cl. 354—415 **9 Claims**



1. A light measuring device comprising:

means for measuring light incident on a light measurement device to produce a light measuring signal;

means for obtaining an ambient light intensity data in response to the light measuring signal without the influence of flash light;

first means for calculating the quantity of flash light based on the light measuring signal with the influence of the flash

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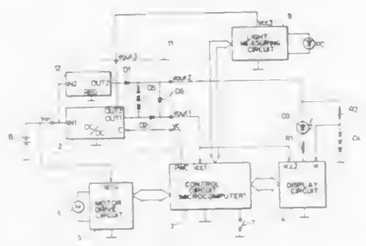
light and the ambient light intensity data to produce a flash light quantity data;
first means for setting a shutter speed;
second means for setting an apparatus value;
second means for calculating a deviation data corresponding to a deviation of an actual exposure amount from a necessary exposure amount in accordance with the ambient light intensity data, the set shutter speed and the set aperture value;
third means for calculating a calculated data corresponding to a ratio between the deviation data and the flash light quantity data; and
means for displaying a value corresponding to the calculated data.

4,914,469

POWER SUPPLY SYSTEM FOR A CAMERA

Toshihiko Ishimura; Reiji Seki; Hirokazu Kuroda; Shuji Izumi, and Akira Okuno, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 15, 1989, Ser. No. 352,290
Claims priority, application Japan, May 16, 1988, 63-118766
Int. Cl.[4] G03B 7/26
U.S. Cl. 354—484 **6 Claims**



1. An electrical power supply system in a camera having an electrical circuit, comprising:
(a) a power source;
(b) power supply means for supplying electrical power of said power source to said electrical circuit;
(c) switching means having a first state and a second state and arranged to be operable manually; and
(d) control means for controlling said power supply means to supply the electrical power continuously to said electrical circuit when said switching means is in the first state and to supply the electrical power intermittently when said switching means is in the second state.

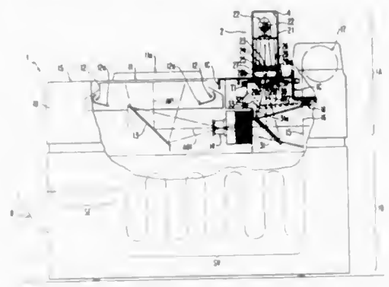
4,914,470

DEVICE TO BE PARTICULARLY FITTED ONTO COLOR PHOTOCOPYING MACHINES FOR OBTAINING REPRODUCTIONS ALSO FROM DIAPOSITIVES

Franci Giosue,acu/e/ , Pordenone, Italy, assignor to Gretag San Marco S.p.A., Pordenone, Italy

Filed Aug. 31, 1988, Ser. No. 238,814
Claims priority, application Italy, Sep. 1, 1987, 45742
Int. Cl.[4] G03B 27/32
U.S. Cl. 355—32 **16 Claims**

1. A color photocopying machine comprising:
an upper horizontally extending shooting surface for supporting medium having an image to be reproduced;
lamp means disposed below said shooting surface for illuminating media supported on said shooting surface;
mirror means disposed below said shooting surface and inclined thereto for reflecting images on media supported on said shooting surface along a projection axis in the machine;
photosensitive paper support means for supporting photosensitive paper as a planar screen in a projection position in the machine;
an optical control unit disposed in the path of the projection axis between said mirror means and the projection position at which said photosensitive paper support means supports photosensitive paper in the machine for focusing images reflected by said mirror means onto photosensitive paper supported by said photosensitive paper support means in the projection position;
developing means for developing photosensitive paper which has been exposed to images in the machine;
a stereopticon lantern removably mountable in the machine laterally of said shooting surface,
said stereopticon lantern including an enclosure, a lamp supported in said enclosure, reflector means disposed in said enclosure in association with said lamp for reflecting



light from the lamp in a diapositive illuminating direction, and diapositive support means disposed in said enclosure and adapted to support diapositives in the path of light reflected in the diapositive illuminating direction by said reflector means;
a movable mirror movable in the machine, with said stereopticon lantern mounted in the machine, between a first position at which said movable mirror reflects light from said lamp that has been reflected by said reflector means through diapositives supported by said diapositive support means onto photosensitive paper supported in said projection position by said photosensitive paper support means, and a second position which allows said optical control unit to focus images reflected by said mirror means onto photosensitive paper supported in said projection position by said photosensitive paper support means.

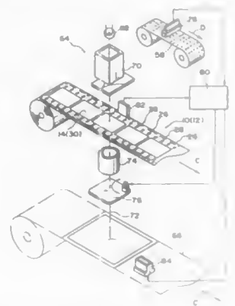
4,914,471

PHOTOGRAPHIC PRINTING METHOD, APPARATUS THEREFOR, AND A STRIP OF ORIGINAL FILM EMPLOYED IN THE METHOD AND APPARATUS

Yoshihiko Saeki; Kanji Tokuda; Kiichiro Sakamoto, all of Kanagawa, and Fumio Matsumoto, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 1, 1988, Ser. No. 200,830
Claims priority, application Japan, Jun. 5, 1987, 62-140899; Jun. 5, 1987, 62-140900
Int. Cl.[4] G03B 27/52
U.S. Cl. 355—40 **22 Claims**

1. A photographic printing apparatus for printing a plurality of images carried on an original film onto a sheet of printing paper, comprising:
(a) means for reading bar codes on said original film which is provided with main numbers, sub numbers and said bar codes representing said main numbers and said sub numbers, said main numbers and said sub numbers being alternately provided on said original film at intervals, each of which is equivalent to the length of a half-size frame image;
(b) a light source for printing said images;
(c) an optical means for forming said images onto said printing paper; and



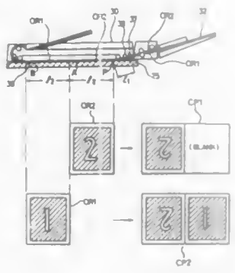
(d) means for providing said printing paper with main frame numbers or sub frame numbers which correspond to said bar codes read by said reading means,
whereby the images printed on said printing paper are made to correspond to said images on said original film using said frame numbers.

4,914,472

AUTOMATIC DOCUMENT FEEDER AND A COPYING APPARATUS EQUIPPED WITH SUCH AN AUTOMATIC DOCUMENT FEEDER

Wataru Hamakawa, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 184,662, Apr. 21, 1988, Pat. No. 4,831,413, which is a divisior of Ser. No. 95,954, Sep. 14, 1987. This application Mar. 23, 1989, Ser. No. 328,062
Claims priority, application Japan, Sep. 18, 1986, 61-217954
Int. Cl.[4] G03G 15/00
U.S. Cl. 355—55 **5 Claims**



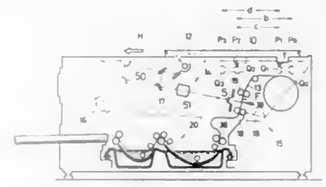
1. A copying apparatus having document feeding means for supporting a plurality of documents and feeding the documents successively to an exposure position and for discharging them from the exposure position after exposure, and image forming means for forming the image of one document on a single surface of copy paper in a first copy mode and forming the images of two successive documents on a single surface of copy paper in a second copy mode, the apparatus comprising:
a plurality of paper storage means for storing copy paper, each of said storage means storing a different size of paper;
paper feeding means for feeding copy paper from a selected one of said plurality of paper storage means;
magnification setting means for setting a selected magnification;
copy mode selecting means for selecting the first copy mode and the second copy mode; and
automatic selecting means for automatically selecting a prescribed copy magnification and one of said plurality of paper storage means storing a prescribed size of paper in response to the selection of the second mode.

4,914,473

MULTIPLE-EXPOSURE APPARATUS IN A GRAPHIC ARTS COPYING MACHINE OF A SLIT-EXPOSURE TYPE

Masaaki Matsukawa; Eiji Miyasaka; Yoshio Sugimoto; Masayuki Handa, and Morihiro Takeda, all of Hikone, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Jan. 24, 1989, Ser. No. 300,917
Claims priority, application Japan, Jan. 25, 1988, 63-15668
Int. Cl.[4] G03G 15/00
U.S. Cl. 355—50 **20 Claims**



1. A multiple exposure apparatus in a graphic arts copying machine, said apparatus comprising:
original holding means mounted for horizontal reciprocating motion;
an optical exposure system for exposing an optical image of a slitwise segment of said original onto a photosensitive material;
moving means for reciprocating said holding means and conveying said photosensitive material relative to said optical exposure system, said moving means being operative to advance said original holding means and to convey said photosensitive material in synchronism;
data setting means for setting predetermined data for a predetermined multiple-exposure layout mode of said original onto said photosensitive material;
means for controlling the operation of said optical system and said moving means in an associated relationship as a function of said predetermined data set by the data sensing means;
whereby multiple-exposures of said original are made on said photosensitive material in said predetermined multiple-exposure layout mode.

4,914,474

SPEED CONTROL FOR FILM AND DOCUMENT TRANSPORT DRIVES IN A MICROFILM CAMERA

Emley E. Townsend, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 10, 1988, Ser. No. 204,836
Int. Cl.[4] G03B 27/32, 27/52
U.S. Cl. 355—64 **10 Claims**

1. In an automatic microfilm camera including a document transport system for transporting individual documents of varying size the improvement comprising:
means for driving said transport system;
means for monitoring the speed of said document transport system and generating a first signal proportional thereto;
an intermittently operable film drive;

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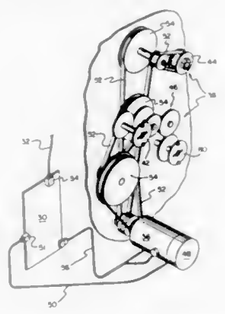
means for driving said film drive only when documents are present in said transport system;
means for generating a second signal in response to said first signal; and



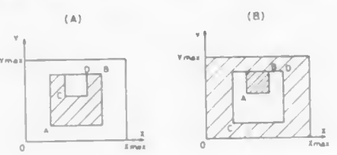
means for controlling the speed of said film drive in response to said second signal so as to electronically synchronize with respect to a predetermined ratio the speed of said film drive when driven to the speed of said document transport.

4,914,475

EDITING AREA SETTING METHOD AND EDITING AREA SETTING APPARATUS IN AN IMAGE FORMING APPARATUS

Yoshio Sugishima, Fukushima, and Masashi Matsumoto, Higashiosaka, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 30, 1987, Ser. No. 126,371
Claims priority, application Japan, Nov. 28, 1986, 61-285543
Int. Cl.[4] G03G *21/00*; G03B *27/62*
U.S. Cl. 355—202 **6 Claims**



1. An editing area setting method in an image forming apparatus, comprising:
sequentially inputting co-ordinates corresponding to diagonal points of different-sized rectangular areas with one of said rectangular areas being entirely included in another of said rectangular areas so as to set at least one all-inclusive, multiple-rectangle area, and
setting an area inside or outside of one of the all-inclusive, multiple-rectangle areas as an image forming area and another area as a non-image forming area.

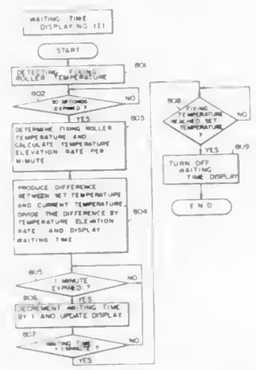
4,914,476

DEVICE FOR DISPLAYING WARM-UP WAITING TIME OF IMAGE FORMING APPARATUS

Hidefumi Nishitsuji, and Kunio Kudoh, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 19, 1988, Ser. No. 259,907
Claims priority, application Japan, Oct. 19, 1987, 62-158768[U]
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—208 **9 Claims**

1. In an image forming apparatus including a fixing unit, a device for determining and displaying a waiting time necessary for said fixing unit to reach an operable temperature, comprising:
fixing unit temperature sensing means for sensing a temperature of said fixing unit;
control means for calculating a temperature elevation rate per unit time from temperatures of said fixing unit which



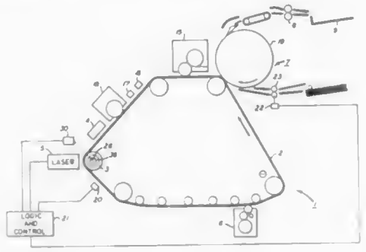
are sensed at a predetermined time interval, producing a difference between an actual temperature of said fixing unit and a reference fixing temperature set beforehand, and dividing the temperature difference by the temperature elevation rate to produce the waiting time; and
display means for displaying the waiting time produced.

4,914,477

REPRODUCTION APPARATUS HAVING AN IMAGE MEMBER WITH TIMING INDICIA

Timothy J. Young, Williamson; Fereidoon S. Jamzadeh, Fairport, and David J. Reed, Reed, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 14, 1988, Ser. No. 270,981
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—208 **11 Claims**



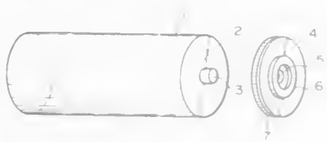
1. A reproduction apparatus comprising:
means for transporting an image member through a path, said member having at least one image frame and at least two spaced indicia for each frame,
means for sensing such indicia as said indicia passes a position in the path,
means for initiating formation of an image in timed relation to the sensing of a first of said indicia,
means for transferring the image so formed to a receiving surface in timed relation to the sensing of a second of said indicia,
logic and control means for controlling the timing of said apparatus, said logic and control means including means for receiving data from which the distance between the first and second indicia can be determined and for controlling the timing of said apparatus according to such data and the sensing of said indicia.

4,914,478

IMAGE HOLDING MEMBER

Yuichi Yashiki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 818,264, Jan. 13, 1986, abandoned. This application Jan. 23, 1989, Ser. No. 300,177
Claims priority, application Japan, Jan. 16, 1985, 60-3984
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—211 **9 Claims**



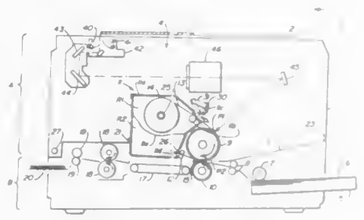
1. A storage stable image holding member, comprising a hollow cylindrical photosensitive member provided with a photosensitive layer containing an organic photoconductive material on the surface of a hollow cylinder and a bonding member to be bonded to said photosensitive member at an end portion thereof, said bonding member being adhered to said photosensitive member with a non-solvent type adhesive to be made into an integrated structure.

4,914,479

IMAGE FORMATION APPARATUS WITH CARTRIDGE FOR ROLL OF PHOTOSENSITIVE SHEET

Mitsuru Ogura, and Shougo Iwai, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 27, 1988, Ser. No. 228,580
Claims priority, application Japan, Aug. 11, 1987, 62-201503; Aug. 11, 1987, 62-201504; Aug. 11, 1987, 62-201505; Aug. 12, 1987, 62-202447; Aug. 12, 1987, 62-202448
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—213 **20 Claims**



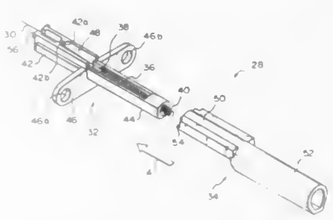
1. An image formation apparatus comprising
a cartridge having an outlet and containing a rolled photosensitive sheet, a roller disposed near said outlet for contacting said photosensitive sheet to thereby pull said photosensitive sheet out of said cartridge,
a sensor for outputting a detection signal when said cartridge is detected as being set in said image formation apparatus, and
driving means for driving said roller in response to said detection signal until a predefined condition comes to be satisfied.

4,914,480

CORONA DISCHARGING DEVICE FOR AN ELECTROPHOTOGRAPHIC APPARATUS

Hidenobu Endo, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 15, 1988, Ser. No. 244,671
Claims priority, application Japan, Sep. 16, 1987, 62-140027
Int. Cl.[4] G03G *15/02*
U.S. Cl. 355—221 **5 Claims**



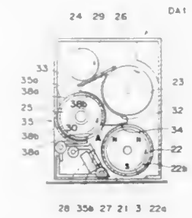
1. A corona discharging device comprising:
a shield case;
end blocks made of an insulating material and each being located at a respective one of opposite ends of said shield case while accommodating a conductive member;
a corona wire connected to a feed terminal by the conductive member which is accommodated in one of said end blocks and extending between said end blocks; and
a generally hollow cylindrical end block cover made of an insulating material and surrounding at least that part of any of said end blocks in which said conductive member is provided, said end block cover being slid on and along outer periphery of said end block in an axial direction of said end block cover into and out of engagement with said end block.

4,914,481

DEVELOPING APPARATUS

Tamio Yoshikai, Kyoto; Masato Asanuma, Nara; Masatoshi Kaneshige, Ikoma, and Hideaki Hagihara, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 7, 1988, Ser. No. 216,359
Claims priority, application Japan, Jul. 9, 1987, 62-173189; Aug. 25, 1987, 62-129475[U]; Sep. 25, 1987, 62-241643
Int. Cl.[4] G03G *15/06*
U.S. Cl. 355—245 **6 Claims**



1. A developing apparatus comprising:
a developing section disposed to confront a recording medium for effecting development;
means for supplying developing material to said developing section;
stirring means rotatably provided in a supply passage for

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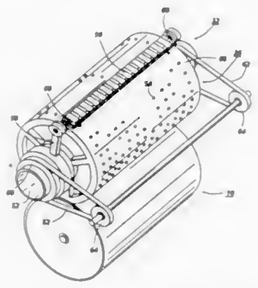
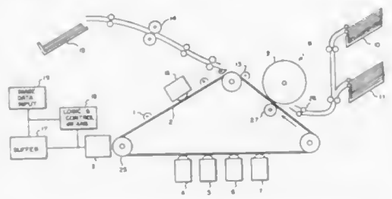
supplying the developing material to said developing section;
transport means for transporting the developing material from said developing section to said stirring means; and
shutter means provided on an outer periphery of said stirring means so as to be controlled during rotation of said stirring means, thereby selectively closing or opening said supply passage.

4,914,482
SHEET TRANSPORT SYSTEM
Herbert H. Ammenheuser, Henrietta, and Joseph Fantuzzo, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Feb. 6, 1989, Ser. No. 306,116
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—271 20 Claims



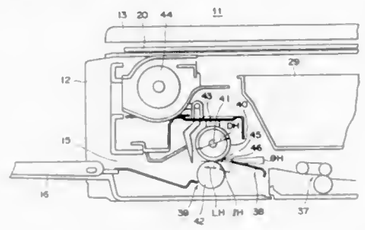
1. An apparatus for transporting a sheet through a transfer station to transfer an image from an image receiving member thereto, including:
a stationary transfer member having at least a portion thereof positioned closely adjacent the image receiving member to define a transfer zone therebetween;
means for vacuum tacking a substantial portion of the sheet to said transfer member; and
means for moving the sheet relative to said transfer member to advance the sheet through the transfer zone to transfer the image from the receiving member to the sheet.

4,914,483
ELECTROSTATOGRAPHIC TRANSFER WITH ARTIFACT SUPPRESSION
James F. Paxon, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 17, 1989, Ser. No. 338,812
Int. Cl.[4] G03G *21/00, 15/14*
U.S. Cl. 355—271 9 Claims



1. An electrostatographic reproduction apparatus comprising:
an image member for bearing toned electrostatic images;
transfer apparatus having a transfer member for transferring toned images from the image member to a receiver sheet with a given transfer efficiency, said transfer member including means for gripping a receiver sheet thereto such that the gripping means affects the transfer efficiency in the region of the toned images which align with said gripping means; and
means for adjusting the density of the toned image on the image member in said region such that the affect on the transfer efficiency by the gripping means is substantially offset by the adjustment to the density of the toned image.

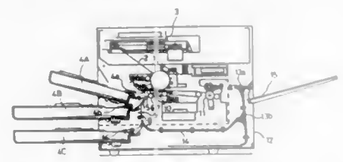
4,914,484
TONER IMAGE FIXING APPARATUS FOR AN IMAGE FORMING MACHINE
Hiroshi Kida, Nara, Japan; assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed May 25, 1989, Ser. No. 356,947
Claims priority, application Japan, May 31, 1988, 63-135051
Int. Cl.[4] G03G *5/20*
U.S. Cl. 355—290 4 Claims



4. A toner image fixing apparatus for an image forming machine comprising:
image formation means for forming an electrostatic latent image corresponding to an image of a document on an photoconductive body;
development means for developing the electrostatic latent image formed on said photoconductive body in a visible toner image with toner;
transfer means for transferring the visible toner image formed on said photoconductive body onto a paper running at a transfer speed of 60 mm/sec or less;
fixing means for heating the toner image transferred on the paper running at a predetermined fixing speed slightly lower than the transfer speed so as to fix it thereon, said fixing means having two cylindrical rollers for pressing the paper therebetween; and
guide means for guiding the paper on which the visible toner image is transferred by said transfer means to said fixing means;
said toner image fixing apparatus characterized in that the distance between said fixing means and the edge of said guide means positioned on the side of fixing means is set to be larger than or equal to 0.2 times the diameter of one of said rollers.

4,914,485
IMAGE FORMING APPARATUS
Kiyoshi Emori, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 236,934, Aug. 26, 1988, abandoned.
This application Jun. 26, 1989, Ser. No. 372,140
Claims priority, application Japan, Aug. 28, 1987, 62-216144; Aug. 28, 1987, 62-216115
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—313 9 Claims
1. An image forming apparatus which transfers images

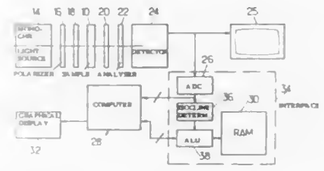
formed on a rotating photoconductive drum onto a moving sheet of paper at a transfer position, comprising:
a first paper feeding means for feeding a sheet of paper stored in a stack section to the transfer position;
a paper re-feeding means for re-feeding the sheet of paper transferred to the transfer position again so as to carry on repeated image formations;
a sheet guide for selectively guiding a sheet of paper transferred either to a discharge tray or to the re-feeding means depending on whether image formation is completed;
a second paper feeding means provided in front of the transfer position for adjusting a timing to transport a sheet of paper coming out of the first paper feeding means to the transfer position by stopping the sheet of paper for a predetermined time;
a detecting means for detecting correlative positional error between a sheet of paper and an image at a time of first image formation; and
a control means for setting an exposure timing corresponding to an error detected by the detecting means without stopping register rollers by the second paper feeding means when a sheet is fed to the transfer position on second image formation.



4,914,486
IMAGE FORMING APPARATUS HAVING SIMULTANEOUS MULTICOLOR COPYING MODE
Kimihiko Higashio, and Masazumi Ito, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Jan. 18, 1989, Ser. No. 298,113
Claims priority, application Japan, Jan. 19, 1988, 63-10192
Int. Cl.[4] G03G *15/01*
U.S. Cl. 355—326 4 Claims

1. An image forming apparatus comprising,
a movable electrostatic latent image carrier;
image processing means, while scanning a document with relative motion between said document and lighting means, for irradiating light to said document to form an electrostatic latent image on said electrostatic latent image carrier by exposing an image of said document;
image editing means for dividing said document into plural areas in the scanning direction of said image processing means to designate a developing color for each of said divided area;
a plurality of developing means disposed in the moving direction of said electrostatic latent image carrier and containing developers having respectively different colors;
simultaneous multicolor copy designating means for designating simultaneous multicolor copying;
control means, when the simultaneous multicolor copying designated by said simultaneous multicolor copy designating means, for operating and stopping respective developing means during one scanning operation of said image processing means to supply the developers having designated developing color respectively to the electrostatic latent image opposing to the area divided by said image editing means;
interrupt copy designating means for designating and releasing interrupt copying which performs, during copying of a document, copying of a document different therefrom;
interrupt copying control means, when interrupt copying is designated by said interrupt copy designating means, for storing the present copying mode so as to return to that mode when the interrupt copying is released; and
designation prohibiting means for prohibiting designation by said interrupt copy control means, when the simultaneous multicolor copying is designated by said simultaneous multicolor copy designating means.

4,914,487
PHOTOELASTICITY DETERMINATION OF A DEFORMATION OR STRESS FIELD
Pierre Croizer, Elancourt, and Philippe Demeudier, Palaiseau, both of France, assignors to Matra, Paris, France
Filed Feb. 19, 1988, Ser. No. 158,804
Claims priority, application France, Feb. 19, 1987, 87 02149
Int. Cl.[4] C01B *11/18*
U.S. Cl. 356—35 5 Claims



1. Method for photoelasticity determination of the distribution of principal stresses along a straight line segment across a loaded test-piece of a material exhibiting induced birefringence, comprising the steps of:
(a) directing polarized monochromatic light on the test-piece, forming a two-dimensional image of said test-piece as a two-dimensional array of pixels under conditions causing isochromatic fringes to appear while eliminating isoclinals and storing a brightness value for each of said pixels in digital form;
(b1) directing light having a first angular direction of linear polarization onto said test-piece, forming a two-dimensional image of said test-piece as a two-dimensional array of pixels under conditions which provide isoclinals and storing data including only those pixels which are located on said isoclinals with said first angular direction of polarization at least in a part of interest of said image including said straight line segment and two lateral straight line segments located on either side of the first-named straight line segment, at the same distance thereof and parallel thereto;
(b2) repeating step (b1) with a plurality N−1 of other and mutually different angular directions of linear polarization, N being an integer greater than 1, whereby a table is obtained storing a respective angular direction of polarization for each of said pixels in the part of interest;
(c) deriving the value of the difference between the respective principal stresses at each pixel along said straight line segment from said stored brightness values,
(d) computing a partial derivative of the variation of the

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stresses along a predetermined direction at each point of said first-named straight line segment from the stored values of the difference between the principal stresses at locations of the pixels of said lateral straight line segments, using finite difference approximations;

(e) computing the sum of the principal stresses at each pixel along said first-named straight line segment by integration of said derivative and using the stored values of the difference between the principal stresses along said first-named straight line segment;

(f) and computing the principal stresses from said sums and differences.

4,914,488

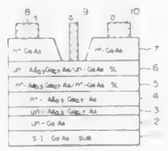
COMPOUND SEMICONDUCTOR STRUCTURE AND PROCESS FOR MAKING SAME

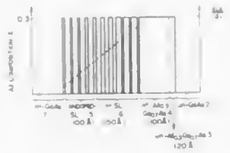
Masao Yamane, Kokubunji; Tomoyoshi Mishima, Shiki; Shigeo Goto, Kokubunji; Susumu Takahashi, and Makoto Morioka, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 60,606, Jun. 11, 1987. This application May 2, 1988, Ser. No. 189,179

Int. Cl.[4] **M01L** *27/12*

U.S. Cl. 357—4 19 Claims





1. A compound semiconductor structure comprising:

a first and a second uniform composition layer having a first and a second uniform composition, respectively;

a superlattice structure disposed between and first and second uniform composition layers, and comprising a plurality of alternating first layers containing an element as a constitutent and second layers not containing said element, adjacent first and second layers forming pairs with such thickness ratio that varies gradually and monotonically in the direction of film thickness throughout successive pairs, with one of the pair of first and second layers adjacent the first uniform composition layer being thicker than the other of the pair, and one of the pair of first and second layers adjacent the second uniform composition layer being thicker than the order of the pair; and

the first and second uniform composition layers having conduction bands substantially equal to those of the thicker one of the first and the second layers in the adjacent pair.

4,914,489

CONSTANT CURRENT SEMICONDUCTOR DEVICE

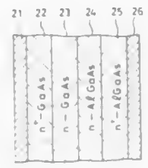
Yuji Awano, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 134,996, Dec. 18, 1987, abandoned. This application Aug. 24, 1989, Ser. No. 397,339

Claims priority, application Japan, Dec. 20, 1986, 61-302865

Int. Cl.[4] **H01L** *29/61, 29/205, 29/80*

U.S. Cl. 357—16 15 Claims



1. A constant current semiconductor device supplied with first and second potentials, comprising:

a first semiconductor active layer which serves as a cathode and which is supplied with the first potential; and

a second semiconductor active layer which serves as an anode, which is supplied with the second potential, and which is of a different material from said first semiconductor active layer, and forming a heterojunction together with said first semiconductor active layer, the first potential being a negative potential with respect to the second potential;

an intervalley energy difference ΔE_1 of said first semiconductor active layer which is a difference in energy between bottoms of L and Γ valleys of the conduction band of said first semiconductor active layer, being larger than an intervalley energy difference ΔE_2 of said second semiconductor active layer which is a difference in energy between bottoms of L and Γ valleys of the conduction band of said second semiconductor active layer, a current saturating voltage at which a current passing through said constant current semiconductor device is saturated, is set so as to be equal to or greater than $\Delta E_2/e$, where e is an absolute value of charge of an electron.

4,914,490

NON-SINGLE CRYSTAL ELECTROLUMINESCENT DEVICE

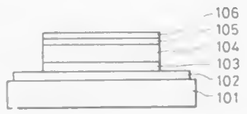
Katsuji Takasu; Masafumi Sano; Hisanori Tsuda, all of Atsugi, and Yutaka Hirai, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 900,745, Aug. 27, 1986, abandoned. This application Jan. 30, 1989, Ser. No. 303,032

Claims priority, application Japan, Aug. 28, 1985, 60-189274; Aug. 30, 1985, 60-191422; Sep. 3, 1985, 60-195083; Sep. 3, 1985, 60-195084; Sep. 5, 1985, 60-197449; Sep. 20, 1985, 60-209331; Sep. 21, 1985, 60-209338

Int. Cl.[4] **H01L** *33/00*

U.S. Cl. 357—17 23 Claims



1. A light emitting device comprising: (a) a luminescent layer having at least two layers laminated to each other, the thickness of each laminated layer being approximately the De Broglie wavelength of the carrier or about the mean free path of the carrier; (i) each layer comprising a non-single crystalline material containing silicon atoms, carbon atoms and hydrogen atoms and (ii) having a homo-junction at the interface of said layers, and (b) at least a pair of electrodes connected electrically to said luminescent layer, and each of said non-single crystalline silicon layers having an optical band gap of at least 2.0 eV and a localized level density at mid-gap of no more than 5×10^{16} cm^{-3}-eV^{-1}.

4,914,491

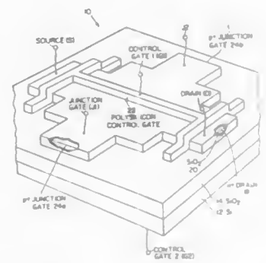
JUNCTION FIELD-EFFECT TRANSISTORS FORMED ON INSULATOR SUBSTRATES

Duy-Phach Vu, Taunton, Mass., assignor to Kopin Corporation, Taunton, Mass.

Continuation of Ser. No. 120,019, Nov. 13, 1987, abandoned. This application Jun. 29, 1989, Ser. No. 374,621

Int. Cl.[4] **H01L** *29/80, 29/78, 27/12*

U.S. Cl. 357—22 8 Claims



2. A JFET device formed on a semiconductor island over an insulator comprising:

a channel semiconductor region of a first type of conductivity in said island and having a cross-portion with end portions extending in a direction orthogonal to said cross-portion;

source and drain regions of the same type of conductivity as the channel located on opposite ends of the end portions of the channel region;

junction gate regions having the opposite conductivity as that of the channel and that extend laterally from the cross-portion of said channel region between said source and drain regions; and

a control gate extending over said channel region and co-extensive therewith and insulated therefrom.

4,914,492

INSULATED GATE FIELD EFFECT TRANSISTOR

Hiroshi Matsumoto, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 14, 1983, Ser. No. 257,851

Claims priority, application Japan, Oct. 16, 1987, 62-260836

Int. Cl.[4] **H01L** *29/78*

U.S. Cl. 357—23.3 3 Claims

1. An insulated gate field effect transistor comprising:

a semiconductor substrate of a first conductivity type having a major surface and an impurity concentration;

a first impurity region of said first conductivity type having a first net impurity concentration obtained, in every part, by compensating first impurity atoms of said first conductivity type involved in said first impurity region with second impurity atoms of a second conductivity type opposite to said first conductivity type, involved in said first impurity region, a maximum value of said first net impurity concentration being higher than said impurity concentration of said substrate, and said first impurity region defined by said first net impurity concentration having an upper surface coinciding with said major surface and a bottom positioned at a first depth from said major surface;

a second impurity region having a second net impurity concentration obtained, in every part, by compensating each other between first impurity atoms of said first conductivity type involved in said second impurity region and second impurity atoms of said second conductivity type involved in said second impurity region, a maximum value of said second net impurity concentration being lower than said maximum value of said first net impurity concentration of said first impurity region, said second impurity region defined by said second net impurity concentration being formed in an inner section of said substrate abutted against said bottom of said first impurity region at said first depth, and said second impurity region by said second net impurity concentration being said second conductivity type so that PN junctions are formed at said first depth by said first and second impurity regions and at a boundary of said second impurity region and said substrate, respectively;

a channel region positioned in said major surface and composed of a surface portion of said first impurity region;

a gate insulating film formed on said channel region;

a gate electrode formed on said gate insulating film; and

source and drain regions of said second conductivity type formed in said substrate and separated each other by

interposing said channel region therebetween, at least said drain region having a third net impurity concentration obtained, in every part, by compensating second impurity atoms of said second conductivity type involved in said drain region with first impurity atoms of said first conductivity type involved in said drain region, a maximum value of said third net impurity concentration of said drain region being higher than said maximum value of said first net impurity concentration of said first impurity region, and said drain region defined by said third net impurity concentration having an upper surface coinciding with said major surface, a bottom contacted to a first portion of said first impurity region at a second depth from said major surface shallower than said first depth and side facing to said source region, said side being extended from said major surface to an edge of said bottom and contacted in full depth to a second portion of said first impurity region including said surface portion thereof;

whereby said first portion of said first impurity region under said bottom of said drain region is sufficiently narrow between said first and second depths such that said first portion is completely filled with a depletion layer extending from a PN junction between said bottom of said drain region and said first portion contacted to said bottom when said transistor including said drain region is in a substantially zero bias state.

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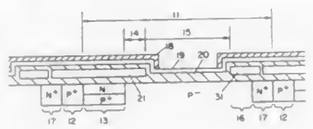
4,914,493

CCD (CHARGE COUPLED DEVICE) SOLID-STATE IMAGE PICKUP ELEMENT

Yasuyuki Shiromizu, Tokyo, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Jul. 13, 1987, Ser. No. 72,682
Claims priority, application Japan, Jul. 14, 1986, 61-163895; Nov. 28, 1986, 61-281648
Int. Cl.[4] H01L 29/78, 27/14, 31/00
U.S. Cl. 357—24 6 Claims



1. A solid state image pickup device for producing a picture signal, said device comprising:

a semiconductor substrate the bulk of which is formed of a semiconductor material of one conductivity type of relatively low doping over which extends a film of an oxide of said semiconductor material and within which are included a plurality of picture element regions spaced apart by channel stop regions, each picture element extending between first and second channel stop regions each of said one conductivity type and of relatively high doping and including in succession therebetween a region which includes a surface layer of conductivity type opposite said one conductivity type and of relatively low doping overlying a layer of said one conductivity type of relatively high doping providing an input to a vertical shift register, a readout gate region of said one conductivity type of relatively low doping, a photosensitive region of said one conductivity of relatively low doping for generating charge corresponding to the intensity of light incident thereon, an overflow control gate region of said one conductivity type of relatively low doping, and an overflow drain region of said opposite conductivity type and of relatively high doping, each said picture element region having associated therewith a first electrode overlying said oxide film and extending over and defining said first channel stop region, the region providing the input to the vertical shift register and the readout gate region, and a reset electrode overlying said oxide film and extending over and defining the overflow control gate region, said reset electrode being responsive to application thereto of a reset voltage pulse at a predetermined time prior to each time that an image-representing signal is read from said device for periodically discharging charge accumulated on said photosensitive region to said overflow drain region.

4,914,494

AVALANCHE PHOTODIODE WITH CENTRAL ZONE IN ACTIVE AND ABSORPTIVE LAYERS

Paul P. Webb, Beaconsfield, Canada, assignor to RCA Inc., Vaudreuil, Canada

Filed Jun. 9, 1988, Ser. No. 204,365
Claims priority, application Canada, Jul. 17, 1987, 542375
Int. Cl.[4] H01L 27/14
U.S. Cl. 357—30 10 Claims

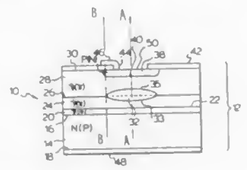
1. An avalanche photodetector comprising a semiconductor body, said body including:

a light absorptive region comprising a first light absorptive layer of a first conductivity type;

an active region of the first conductivity type overlying the light absorptive region and forming a heterojunction at an interface between the active region and the light absorptive region;

a cap region of a second conductivity type overlying the active region forming a PN junction at an interface between the cap region and the active region;

a central zone spaced below the cap region having a lateral ex tent less than that of the cap region, the central zone



extending from the active region through the heterojunction and into the light absorptive region, and the central zone having a greater concentration of modifiers of the first conductivity type than the active region; and,

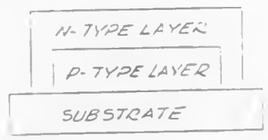
electrical contacts for the semiconductor body.

4,914,495

PHOTODETECTOR WITH PLAYER COVERED BY N LAYER

Paul R. Norton, Santa Barbara; Michael Moroz, and Carol S. Talley, both of Goleta, all of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Dec. 5, 1985, Ser. No. 804,711
Int. Cl.[4] H01L 27/14
U.S. Cl. 357—30 15 Claims



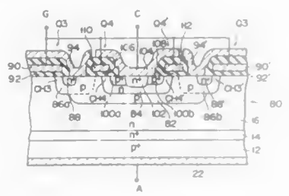
1. A photodetector having a detectivity of at least about $2\times10^{17}\lambda(\eta/Q_B)^{\frac{1}{2}}$cmHz$^{\frac{1}{2}}$/Watt, where λ is the wavelength of radiation incident on said photodetector, Q_B is the background photon flux, and η is the quantum efficiency, and where the radiation incident on said photodetector is in the range of about 1 to about 25 microns, and comprising an electrically insulating substrate attached to a body of semiconductor material comprising a region of first conductivity type and a region of second, opposite conductivity type, said region of first conductivity type substantially completely overlying the top and sides of said region of second conductivity type, said region of second conductivity type tending to trap, and to separate minority carriers from majority carriers in said region of first conductivity type.

4,914,496

GATE TURN-OFF THYRISTOR WITH INDEPENDENT TURN-ON/OFF CONTROLLING TRANSISTORS

Akio Nakagawa, Hiratsuka, and Takashi Shinohe, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 913,753, Sep. 30, 1986, Pat. No. 4,760,431.
This application Feb. 19, 1988, Ser. No. 157,584
Claims priority, application Japan, Sep. 30, 1985, 60-214578; Apr. 24, 1986, 61-95418
The portion of the term of this patent subsequent to Jul. 26, 2005, has been disclaimed.
Int. Cl.[4] H01C 29/74
U.S. Cl. 357—38 14 Claims



1. A gate turn-off thyristor comprising:

(a) a semiconductor substrate of a first conductivity type serving as a first base layer;

(b) a first emitter layer and a second base layer both of a second conductivity type, which are formed on opposing surfaces of said substrate;

(c) a second emitter layer of the first conductivity type formed in said second base layer, said second emitter layer at least partially having a substantially rectangular slender planar shape defined by long and short sides;

(d) a first metal oxide semiconductor field effect transistor of a certain channel conductivity type for performing a switching operation to turn on said thyristor, said first transistor having a channel region formed along the short side of said second emitter layer, said first transistor comprising,

a first semiconductor layer of the first conductivity type formed in said second base layer to serve as a source of said first transistor and to define a surface portion of said second base layer positioned between itself and said first base layer as a channel region of said first transistor, and

a first gate electrode layer insulatively provided above said first base layer to cover said channel region;

(e) a second field effect transistor for performing a switching operation to turn off said thyristor by short-circuiting said first base layer and said second emitter layer, said second transistor having a channel region which is formed along the long sides of said second emitter layer to have a channel width which is greater than that of said first transistor, said second transistor comprising,

a second semiconductor layer of the first conductivity type formed in said second base layer to serve as a drain of said second transistor, said second semiconductor layer defining a surface portion of said second base layer positioned between itself and said second emitter layer as a channel region of said second transistor, and

a second gate electrode layer insulatively provided above said channel region of said second transistor; and

(f) a source electrode layer formed on said second base layer, for causing said source and said drain to be electrically conductive together with said second base layer, whereby said source electrode layer serves as an amplifying gate electrode of said first transistor, sao that a source current of said first transistor acts as a base current of said thyristor to improve a gate sensitivity thereof.

4,914,497

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE PROVIDED WITH A CAPACITOR ELEMENT HAVING AN OXIDATION-RESIST FILM AS A DIELECTRIC AND PROCESS FOR MANUFACTURING THE SAME

Hideyuki Kondo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 630,114, Jul. 12, 1984, abandoned. This application Dec. 21, 1988, Ser. No. 287,653
Claims priority, application Japan, Jul. 12, 1983, 58-126714
Int. Cl.[4] H01L 27/02
U.S. Cl. 357—51 3 Claims

1. A semiconductor device comprising a semiconductor substrate, an oxide layer formed on said semiconductor substrate, said oxide layer including a first portion of a flat surface, a second portion continuous with said first portion to surround said first portion and having an increasing thickness and a third portion having a thickness larger than said first portion and being continuous with said secood portion and partially embedded in the surface of said semiconductor substrate, an oxidation-resist film formed on said oxide layer and having a central portion located on said first portion of said oxide layer and peripheral edge portions all located and terminated on said second portion of said oxide layer, a first conductive layer formed on said central portion of said oxidatioo-resist film, all peripheral edges of said first conductive layer being located and terminated on said central portion of said oxidation-resist film and separated from all the peripheral edge portions of said oxidation-resist film, an insulating layer formed on said second and third portions of said oxide layer and extended on said central portion of said oxidation-resist film to cover all the peripheral edge portions of said oxidation-resist film, said insulating layer being in contact with the peripheral edges of said first conductive layer and free of substantial contact with an upper surface of said first conductive layer to surround said first conductive layer and to expose a whole of the upper surface of said first conductive layer, and a second conductive layer formed on the upper surface of said first conductive layer and in contact with edges of the upper surface of said first conductive layer and elongated over said insulating layer, wherein said insulating layer intervenes between said second conductive layer and said peripheral edge portions of said oxidation-resist film and wherein said first conductive layer, said first portion of said oxide layer and said central portion of said oxidation-resist film, and said semiconductor substrate constitute a capacitor and operate as a first electrode, a dielectric film, and a second electrode of said capacitor, respectively.

4,914,498

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

Toru Imamura, Kumamoto, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 553,944, Nov. 21, 1983. This application Jan. 8, 1987, Ser. No. 1,484
Claims priority, application Japan, Nov. 19, 1982, 57-203400
Int. Cl.[4] H01L 27/02
U.S. Cl. 357—51 5 Claims

1. A semiconductor device comprising a semiconductor substrate of one conductivity type and including memory element portions including a capacitor, and a contact portion,

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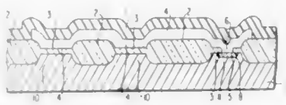
a thick field insulating layer on the surface of said semiconductor substrate except at said memory element portions and said contact portion, an impurity region of the opposite conductivity type formed in said contact portion of said semiconductor substrate outside said memory element portions, an insulating film formed on said impurity region of said contact portion, a contact hole having a predetermined area and formed in said



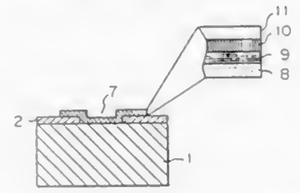
insulating film to expose a predetermined surface part of said impurity region, and a conductive layer formed on said memory element portions and serving as an upper electrode of said capacitor of said memory element portions, said conductive layer being continuously formed on said thick insulating layer and directly connected to a surface part of said impurity region through said contact hole.

4,914,499

SEMICONDUCTOR DEVICE HAVING AN OHMIC ELECTRODE ON A P-TYPE III-V COMPOUND SEMICONDUCTOR

Takeshi Himoto, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 000,079, Jan. 2, 1987, abandoned, which is a division of Ser. No. 708,052, Mar. 4, 1985, Pat. No. 4,673,593. This application Jan. 23, 1989, Ser. No. 300,235
Claims priority, application Japan, Mar. 7, 1984, 59-43634
Int. Cl.[4] H01L *23/54*
U.S. Cl. 357—67 **1 Claim**



1. A semiconductor device having an ohmic electrode which has formed on the surface of a p-type III-V compound semiconductor an assembly of a first Ti layer, a second Zn layer, a thick metal layer made of one element selected from the group consisting of Pt, Mo, W and Cr, and a fourth Au layer, wherein said first Ti layer has a thickness of approximately 50A which is such that Zn in the second layer penetrates the first Ti layer to reach the surface of the semiconductor during heat treatment, thereby forming a layer of an alloy of said semiconductor with Zn.

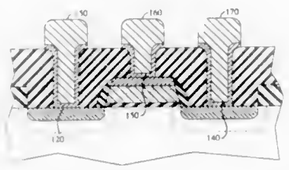
4,914,500

METHOD FOR FABRICATING SEMICONDUCTOR DEVICES WHICH INCLUDE SOURCES AND DRAINS HAVING METAL-CONTAINING MATERIAL REGIONS, AND THE RESULTING DEVICES

Ruichen Liu, Warren; William T. Lynch, Summit, and David S. Williams, Convent Station, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 4, 1987, Ser. No. 128,742
Int. Cl.[4] H01L *23/54, 21/441, 21/461*
U.S. Cl. 357—67 **5 Claims**

1. A device, comprising:
a substrate which includes a surface, semiconductor material, and a substrate region having a conductivity which is opposite to that of the surrounding semiconductor material, said substrate region extending from said surface into said substrate and having a lateral extent less than that of said surface; and
a material region, having a composition which includes cobalt and silicon, contacting said surface and overlying said substrate region, CHARACTERIZED IN THAT



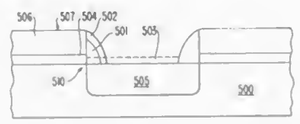
a depth of said substrate region, as measured from the top of said material region, is equal to or less than about 0.2 μm, and
a specific contact resistance of said material region to said substrate is equal to or less than about $10^{-6}\Omega\text{-cm}^2$.

4,914,501

VERTICAL CONTACT STRUCTURE

Anthony L. Rivoli, and William R. Young, both of Palm Bay, Fla., assignors to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 25,464, Mar. 13, 1987, abandoned. This application Apr. 6, 1989, Ser. No. 334,148
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—68 **15 Claims**



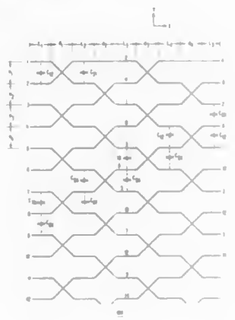
1. An improvement contact structure for providing an electrical connection between first and second regions vertically separated by a dielectric region comprising:
a first region comprising a metal conductor;
a dielectric region having a vertical dielectric edge portion, said vertical dielectric edge portion extending vertically above said first region;
a second region of a second conducting or semiconducting material, said second region being vertically separated from said first region by said dielectric region;
said second region having a first vertical edge portion and a top surface;
a vertical contact of a conducting or semiconducting material in physical contact with said first vertical edge portion, said vertical dielectric edge portion and said first region;
said vertical contact being physcially separated from said top surface of said second region; and
wherein said vertical contact does not extend vertically above said top surface of said second region; and
wherein said vertical contact has a width of less than 20,000 Angstroms.

4,914,502

LATERALLY MARCHING INTERCONNECTING LINES IN SEMICONDUCTOR INTERGRATED CIRCUITS

Joseph Lebowitz, Watchung, and William T. Lynch, Summit, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 899,982, Aug. 25, 1986, abandoned. This application Jan. 29, 1988, Ser. No. 147,038
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—68 **3 Claims**



1. A semiconductor integrated circuit including an interconnection array comprising a multiplicity of conductivity metallization lines located on a surface of a semiconductor body within a metallization area bounded by a pair of parallel edges,
all the lines being mutually essentially parallel everywhere except in a plurality of separate crossing regions each extending between the pair of essentially parallel edges and in each of which every line, or every line except for the lines located closest to the edges, crosses at least one other line, whereby each of the lines is divided into a plurality of mutually essentially parallel segments each of which runs between successive crossing regions,
such that the nearest neighboring segment with respect to each such line (e.g., **1**) on one side thereof located between first and second successive crossing regions (d_2, d_3) is a segment of another line (e.g., **6**) and
such that the nearest neighboring segment with respect to such line (e.g., **1**) on the one side thereof between the second and a third successive crossing region (e.g., d_3, d_4) is a segment of yet another line (e.g., **8**) different from such another line (e.g., **6**).

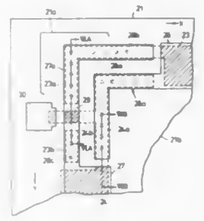
4,914,503

SEMICONDUCTOR DEVICE

Takehide Shirato, Hiratsuka, and Teruo Tazunoki, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 11, 1987, Ser. No. 84,056
Claims priority, application Japan, Aug. 12, 1986, 61-189095
Int. Cl.[4] H01L *23/52, 21/60*
U.S. Cl. 357—71 **11 Claims**

1. A semiconductor device comprising: a semiconductor chip having main power supply lines which are arranged in peripheral regions in the vicinity of edges of said semiconductor chip, said main power lines being formed with multi-level layers with a first insulating layer being interposed therebetween, said multi-level layers being formed on a second insulating layer provided on said semiconductor chip, each of said main power lines being formed with arrangements in that layers of the same potential face each other through said first insulating layer in chip corner regions adjacent to corners of said semiconductor chip; and



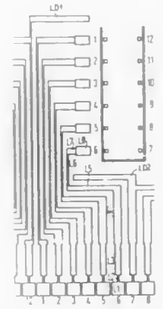
a package made of plastics for sealing said semiconductor chip.

4,914,504

OPTO-ELECTRONIC IMAGE SENSOR ARRANGEMENT

Karlheinz Rosan, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 6, 1988, Ser. No. 202,553
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1987, 3726569
Int. Cl.[4] H01L *21/90*
U.S. Cl. 357—30 H **8 Claims**



1 An opto-electronic image sensor arrangement, comprising:
thin-film photodiodes arranged in a row on a substrate and connected by interconnects to a read-out chip means arranged on said substrate, said read-out chip means reading out as electrical signals charge carriers generated in the photodiodes by light reflected from an image master and conducted by the interconnects to the read-out chip means; and
means for compensating interconnect coupling capacitances of neighboring interconnects differing in length, said means comprising the neighboring interconnects each being divided into sub-sections, and the sub-sections of the neighboring interconnects which are directly adjacent one another having a same width, the sub-sections of each interconnect having varying widths such that a sum of coupling capacitances of all sub-sections of the neighboring interconnects always has a same value independently of overall length of the interconnects.

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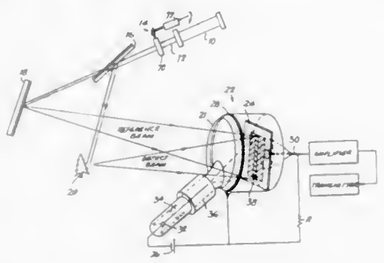
4,914,505
HIGH DEFINITION TELEVISION SYSTEM
Ernest Gladstone, 721 Ave. O, Brooklyn, N.Y. 11230
Filed May 22, 1989, Ser. No. 354,751
Int. Cl.[4] H04N *11/00*
U.S. Cl. 358—2 11 Claims



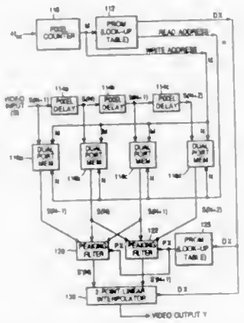
1. A high definition television system, comprising:
(a) means for generating a reference beam of coherent light from a coherent light source; and for reflecting from an object to be televised an object beam of coherent light from the source;
(b) an electronic analyzer having a signal plate;
(c) means for recording on the signal plate an interference pattern formed by impingement of the beams thereon, thereby producing a recorded hologram of the object;
(d) means for electronically scanning a scan line extending linearly across the recorded hologram, said scan line being comprised of a multitude of pixels, each pixel containing all the information about the object possessed by the entire recorded hologram, said scanning means being further operative for electronically generating a multitude of electrical picture signals, each corresponding to a respective pixel;
(e) transmitter means for successively transmitting said picture signals within a predetermined time period away from the signal plate;
(f) a display screen having a front viewing side and a back side;
(g) receiver means responsive to the transmitter means, and operative for successively receiving the transmitted picture signals within said predetermined time period, said receiver means including means for forming a multitude of screen lines in close adjacent relationship on the screen, each screen line corresponding to a respective transmitted picture signal, all of said screen lines together constituting a display hologram of the object; and
(h) means for back-lighting the display hologram at the back side of the display screen to enable a viewer at the front viewing side to see the display hologram of the object being televised.

4,914,506
COMPONENT COLOR BAR ALIGNMENT TEST SIGNAL
Warren G. Kafer, and Bruce J. Penney, both of Portland, Oreg., assignors to Tektronix, Inc., Beaverton, Ohio
Filed Apr. 24, 1989, Ser. No. 342,773
Int. Cl.[4] H04N *17/04*
U.S. Cl. 358—10 7 Claims

1. A test signal for calibrating a component picture monitor having as component inputs a luminance component and two orthogonal chrominance components comprising:
a main color bars portion that presents a first set of color bars for display; and
a chroma set color bars portion having a second set of color bars contiguous each to one of the first color bars, the chroma set color bars being matched to the first color bars such that a color that is sensitive to the adjustment of one of the chrominance components is contiguous to a color

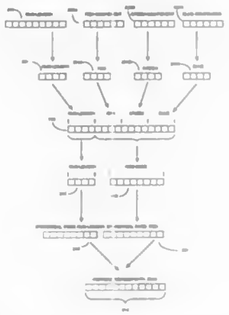
that is relatively insensitive to the adjustment of that chrominance component.

4,914,507
VIDEO SIGNAL TIME-EXPANSION/COMPRESSION APPARATUS USING PROGRAMMED OUTPUT VALUES
Terrence R. Smith, Westmont; Michael A. Isnardi, Plainsboro; Jack S. Fuhrer, Princeton, all of N.J., and Christopher H. Strolle, Glenside, Pa., assignors to General Electric Company, Princeton, N.J.
Division of Ser. No. 78,341, Jul. 27, 1987. This application Aug. 4, 1988, Ser. No. 228,193
Int. Cl.[4] H04N *5/262*
U.S. Cl. 358—11 24 Claims



1. In a system for processing a widescreen video signal containing a main panel component and a side panel component each having associated picture element image information, apparatus for providing video signal time expansion or time compression comprising:
pixel counter means responsive to a clock signal for providing an output pixel location signal representative of pixel locations along a video signal scanning direction of said main panel and side panel components;
a programmed memory device for receiving said pixel location signal, said programmed memory device being a single device programmed so as to provide at a first output one of a time expanded or time compressed version of said pixel location signal for one of said main panel and side panel components in accordance with programmed values; and
memory means having a first input for receiving said video signal, a second input for receiving said pixel location signal, a third input for receiving said signal from said first output of said programmed memory device, and a video signal output at which a time expanded or time compressed video signal is provided in accordance with said programmed values.

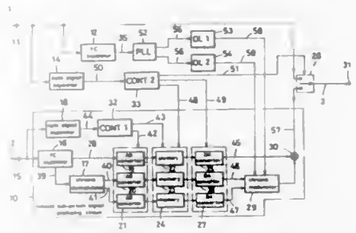
4,914,508
METHOD AND SYSTEM FOR COMPRESSING AND STATISTICALLY ENCODING COLOR VIDEO DATA
John Music, Irvine; Gordon H. Smith, Santa Ana, and James L. Thomas, Placentia, all of Calif., assignors to Universal Video Communications Corp., Irvine, Calif.
Filed Apr. 27, 1988, Ser. No. 186,637
Int. Cl.[4] H04N *11/04*
U.S. Cl. 358—13 18 Claims



1. A method of compressing digital color video data in a video communication system for transmitting a plurality of video picture frames, with each picture frame comprising a plurality of scan lines composed of a plurality of pixels, utilizing a digitized color video signal having three digital color components, said system including means for determining a luminance function for each pixel, means for determining which of said pixels on each scan line represent decision points based upon said luminance function, and means for encoding at least a portion of said plurality of pixels in each scan line as a plurality of combinations of run lengths and said three digital color components, said run length being of a first digital word size, and said three digital color components being of second, third and fourth digital word sizes, respectively, comprising the steps of:
(a) encoding all of said digital color components in said picture frame according to a look up table in a memory means of digitally compressed color codes of the most visually significant color combinations of a fifth digital word size smaller than the sum of said second, third and fourth digital word sizes; and
(b) encoding a plurality of run lengths and said digitally compressed color codes representing at least a portion of said picture frame in said memory means.

4,914,509
COLOR VIDEO SIGNAL SYNTHESIZER
Toshio Idei, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 3, 1988, Ser. No. 163,540
Claims priority, application Japan, Mar. 3, 1987, 62-49408; Mar. 3, 1987, 62-49409; Mar. 3, 1987, 62-49410; May 21, 1987, 62-126660
Int. Cl.[4] H04N *5/272*
U.S. Cl. 358—22 8 Claims

1. A video signal synthesizer for producing a synthetic composite video signal which reproduces a main picture on a screen of a display device and a reduced sub-picture within the framework of and in a superimposed relationship with the main picture on the same screen by synthesizing a first composite video signal reproducing the main picture, a second composite video signal reproducing the sub-picture and a third composite video signal obtained by reducing said second composite video signal, comprising:
phase-locked loop means for generating first and second carrier signals;
extracting means for extracting a color burst signal from the first composite video signal, wherein the color burst signal and the first composite video signal have a mutual phase difference of 90 degrees;
synchronizing means for synchronizing the color burst signal with the first and second carrier signals;
first and second delay means for delaying the first and second carrier signals by predetermined quantities respectively;
separating means for separating the second composite video signal into a luminance signal, a red color difference signal, and a blue color difference signal,
means for time-compressing the luminance signal, the red color difference signal, and the blue color difference signal;
reduced sub-picture signal producing means for producing the third composite signal from the time-compressed luminance signal, the red color difference signal, and the blue color difference signal, comprising;



chroma modulating means for chroma modulating the time-compressed red color difference signal and the time-compressed blue color difference signal by the delayed first and second carrier signals to obtain a color subcarrier signal, and
adding means for adding the time-compressed luminance signal to the color subcarrier signal to produce the third composite under signal, and
time-division multiplexing means for time-division multiplexing the first composite video signal and the third composite video signal to thereby deliver said synthetic composite video signal;
whereby the delay-time of the first and second delay means is set such that the color subcarrier signal of the first composite video signal and the color subcarrier signal of third composite video signal may be matched in phase in accordance with the set delay time of the first and second delay means.

4,914,510
METHOD FOR IMPROVING THE WHITE FIELD UNIFORMITY OF A PROJECTION COLOR TV USING CRTS HAVING INTERFERENCE FILTERS, PROJECTION COLOR TV AND CRTS RESULTING FROM THE METHOD
Matthew S. Breazesholtz, Waterloo, and Raymond G. Greene, Romulus, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.
Filed Dec. 23, 1988, Ser. No. 289,338
Int. Cl.[4] H04N *9/16, 9/31*
U.S. Cl. 358—60 28 Claims

1. A method for improving the white field uniformity of a projection color television display device incorporating red, blue and green monochrome cathode ray tubes, at least one

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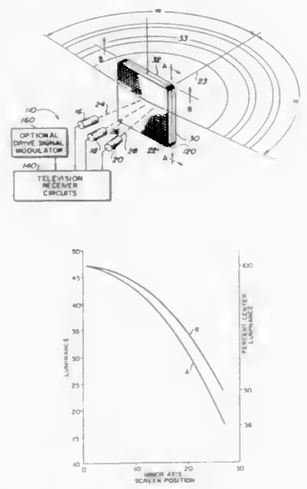
tube having an interference filter, the method comprising altering the center-to-edge luminance gradient of at least one



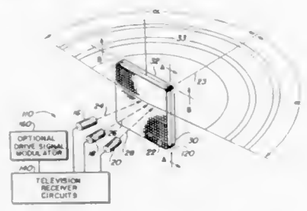
of the tubes to match the center-to-edge luminance gradient of the tube to that of at least one of the other tubes.

4,914,511

PROJECTION COLOR TV USING CRTS HAVING INTERFERENCE FILTERS WITH DIFFERENT NUMBER OF LAYERS

Matthew S. Brennesholtz, Waterloo, and Raymond G. Greene, Romulus, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Dec. 23, 1988, Ser. No. 288,833
Int. Cl.[4] H04N *9/16, 9/31*
U.S. Cl. 358—60 6 Claims



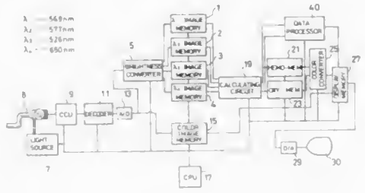
1. A three-tube color projection television display device having red, blue and green emitting monochrome cathode ray display tubes, the tubes each comprising in an evacuated envelope a display screen on the inside of a display window in the wall of the envelope, said display screen comprising a layer of a luminescent material, and a multi-layer interference filter between the luminescent material layer and the display window, means for altering the center-to-edge luminance gradient of at least one of the tubes in order to match the luminance gradient of the tube to that of one of the other tubes, characterized in that the interference filter of the red and/or blue filter has a smaller number of layers than the filter of the green tube.

4,914,512

ELECTRONIC ENDOSCOPE APPARATUS CAPABLE OF DISPLAYING HEMOGLOBIN CONCENTRATION ON COLOR IMAGE

Tadashi Sekiguchi, Saitama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 18, 1989, Ser. No. 298,624
Claims priority, application Japan, Jan. 19, 1988, 63-7515; Mar. 3, 1988, 63-48587
Int. Cl.[4] A61B *1/06;* H04N *7/18*
U.S. Cl. 358—98 24 Claims



1. An electronic endoscope apparatus comprising:
light source means for separately producing colored light having a predetermined light-wave band and monochromatic light having a plurality of different wavelengths;
scope means for producing an image single of a biological body under examination while the biological body is irradiated by one of said colored light and monochromatic light;
color signal processing means for processing said image signal derived from scope means so as to obtain a color television signal;
means for converting the brightness of the color television signal acquired while said biological body is irradiated by one of said monochromatic light wave lengths to obtain a brightness-converted image signal;
a plurality of memories, one associated with each wavelength of said monochromatic light and a color image memory for storing the calculated functional information; and,
calculating means for calculating a plurality of brightness-converted image signals to obtain a functional-information signal representative of functional information on said biological body.

4,914,513

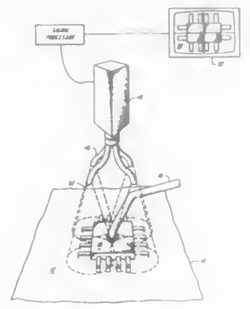
MULTI-VISION COMPONENT ALIGNMENT SYSTEM

Donald J. Spigarelli, Carlisle, and William F. Drislane, Townsend, both of Mass., assignors to Srtechnologies, Inc., Townsend, Mass.

Filed Aug. 2, 1988, Ser. No. 227,380
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—101 6 Claims

1. An electrical component alignment observation system for providing a segmented view of selected portions of an electronic printed circuit board work area to the system operator, comprising:
at least one image-receiving device adjustably positioned adjacent the work area;
a display screen, and
image signal processing means electrically connected to said at least one image-receiving device and said display screen

for converting light received by said at least one image-receiving device into a plurality of selectively dimen-



sioned image segments of the work area for display on said display screen.

4,914,514

METHOD AND APPARATUS FOR GAUGING WELL SCREENS

Jeffrey P. Smith, Conroe, and Michael T. Giroux, Huntsville, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Apr. 19, 1989, Ser. No. 340,252
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—107 9 Claims

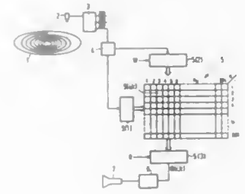
1. The method of gauging the separation of successive turns of a wire helically wound on a fluid pervious, generally cylindrical body to form a wire screen for use in subterranean wells, comprising the steps of:
rotating the cylindrical body about its longitudinal axis;
scanning a field of vision including at least two adjacent wire turns with a video camera having a magnifying lens;
projecting the resultant enlarged image of two adjacent wire turns on a video camera;
simultaneously projecting on the same video screen two pair of parallel visible lines alignable with the space between the two adjacent wire images on said screen; and
calibrating the spacing of said parallel lines to represent prescribed maximum and minimum tolerance dimension for the magnified video spacing of the wire turns.

4,914,515

METHOD OF TRANSMITTING UPDATE INFORMATION FOR A STATIONARY VIDEO PICTURE

Balthasar A. G. Van Luyt, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 38,807, Apr. 15, 1987, abandoned. This application Nov. 25, 1988, Ser. No. 275,709
Claims priority, application Netherlands, Apr. 18, 1986, 8600980
Int. Cl.[4] H04N *7/04*
U.S. Cl. 358—141 13 Claims



1. An apparatus for reproducing an updated image of a video picture represented by information stored on a record carrier, respective regions of such record carrier being adapted to store respective packets of digital information words, the information words in each packet respectively corresponding to respective picture elements of said video picture, the information word for a picture element signifying a replacing value of one or more video characteristic thereof in order to update it to correspond to said updated image of said picture; the information words in each packet being partitioned into one or more sub-blocks of information words, each such sub-block relating to contiguous picture elements forming one of different identifiable geometric patterns in said updated image, a majority of such picture elements being those which are to be updated by information words relating thereto in such sub-block; each sub-block being prefixed by an operational code including a first code identifying the geometric pattern formed by the picture elements to which such sub-block relates and a second code identifying the position of said pattern in said updated image; said apparatus comprising:
means for reading from said record carrier the information words stored thereon;
a memory having a plurality of addressable memory locations, each memory location corresponding to a respective one of said picture elements and being adapted to store the information word corresponding to such picture element;
means for separating said operation code from each of said sub-blocks of information words read from said record carrier;
addressing means responsive to the operational code of a sub-block for storing the information words in such sub-block respectively in the respective locations in said memory for the picture elements corresponding to such information words;
means for reading-out the information words stored in said memory locations;
a video display comprising picture elements therein corresponding to the picture elements in said video picture; and
means responsive to said read-out information words for updating the picture elements corresponding thereto in said video display in accordance with such information words.

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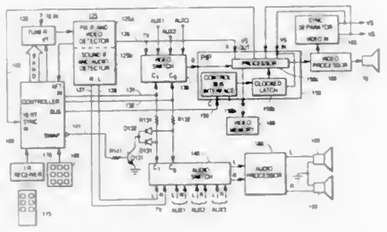
4,914,516

FAST RESPONSE PICTURE-IN-PICTURE CIRCUITRY

David J. Duffield, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Apr. 20, 1989, Ser. No. 340,948
Int. Cl.[4] H04N 5/272, 5/50, 5/44
U.S. Cl. 358—183 9 Claims



1. A picture-in-picture system for a television receiver, comprising:

data entry means for generating data signals in response to activation by a user;

tuner demodulator means having an input for receiving a plurality of radio frequency signals, and having a control input for receiving a first control signal, said tuner demodulator means tuning one of said radio frequency signals in response to said first control signal and producing a detected video signal therefrom at a first output, and having a second output for producing a first feedback signal indicative of the completion of the tuning of a television channel;

memory means having data representing a list of television channels stored therein;

picture-in-picture processing means coupled to said first output of said tuner demodulator means for receiving said detected video signal, for storing in response to a second control signal a predetermined amount of said video signal, and for producing a display signal which when displayed on a display screen produces a display comprising an image displayed in one of a plurality of image locations, said image being related to said stored video signal,

control means for controlling said tuner demodulator means and for controlling said picture-in-picture processing means, said control means having a first input coupled to said data entry means for receiving said data signals, having a second input coupled to said tuner-demodulator means for receiving said feedback signal, having a first output for developing said first control signal, and having a second output for developing said second control signal;

said control means in response to said data signals generates said first output signal causing said tune-demodulator means to tune a first television channel from said list of television channels, and in response to said first feedback signal generates said second control signal causing said picture-in-picture processing means to store said predetermined amount of signal.

4,914,517

TUNER CONTROL APPARATUS HAVING TUNE-BY-LABEL CAPABILITY AND USING ALPHABETICAL LABEL STORAGE

David J. Duffield, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Apr. 6, 1989, Ser. No. 334,067
Int. Cl.[4] H04N 5/50, 5/44, 9/74
U.S. Cl. 358—191.1 8 Claims

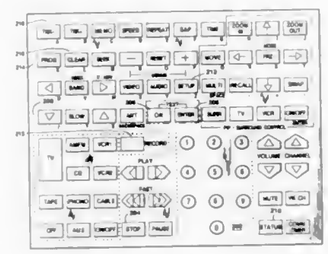
1. A tuning system comprising:

an input terminal for receiving a plurality of RF signals;

tuning means coupled to said input terminal for selecting a particular RF signal from said plurality of RF signals in response to a tuner control signal;

memory means for storing label data representative of labels comprising at least one alphabetical character and tuning data associated with respective channels for tuning said channels;

data entry means for generating said label data and said tuning data under user control;



control means coupled to said data entry means for evaluating said label data and for storing said label data in said memory means in alphabetical order and storing said tuning data in said memory means during a programming mode; and

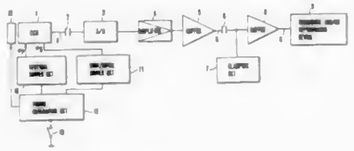
said control means retrieving said tuning data corresponding to a particular channel to be tuned from said memory means in response to label data corresponding to said particular channel.

4,914,518

ELECTRONIC STILL CAMERA WITH A SOLID STATE IMAGE PICKUP WHOSE OUTPUT PART IS KEPT FROM BEING DRIVEN DURING A MAJOR PART OF THE IMAGE PICKUP PERIOD

Akira Suga, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 144,242, Jan. 14, 1988, abandoned. This application Jun. 12, 1989, Ser. No. 366,258
Claims priority, application Japan, Jan. 19, 1987, 62-008073
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—213.15 28 Claims



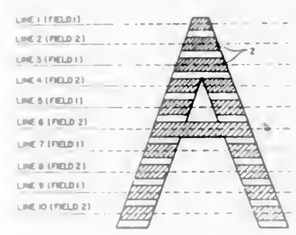
1. An image pickup apparatus comprising:

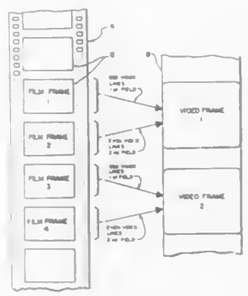
(a) image pickup means having a light receiving part for converting an optical image to an electrical signal and an output part for producing an output signal of the light receiving part;

(b) read means for reading the output signal of said image pickup means after a predetermined time period after clearing the electrical signal of said image pickup means, said read means being so arranged that it does not drive said output part in a major part of said predetermined period; and

removing means for removing a residual signal in said output part of said predetermined time period just before the reading by said read means.

storing said fields in a video storage medium as respective time-spaced video storage frames, with each pair of time-





spaced fields occupying and interleaved with respect to each other on a single respective storage frame.

4,914,519

APPARATUS FOR ELIMINATING NOISE IN A SOLID-STATE IMAGE PICKUP DEVICE

Seiji Hashimoto, Yokohama; Tsuneo Suzuki, Hiratsuka; Hayao Ohzu, Fuchu, and Tadanori Harada, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1987, Ser. No. 96,534
Claims priority, application Japan, Sep. 19, 1986, 61-219666; Sep. 20, 1986, 61-229625; Dec. 16, 1986, 61-300802; Dec. 16, 1986, 61-300803
Int. Cl.[4] H04N 5/232
U.S. Cl. 358—213.18 27 Claims

1. An image pickup apparatus including:

(a) a photoelectric transducer element for converting incident light into a photoelectrical signal.

(b) amplifying means for amplifying said photoelectric signal from said photoelectric transducer element; and

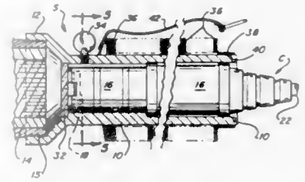
(c) operating means having a first mode for causing said amplifying means to amplify the photoelectrical signal from said phtoelectrical transducer element to form a first signal, and a second mode for causing said amplifying means to amplify a signal which is left in said photoelectric element after refreshing said photoelectrical transducer to form a second signal, and for processing said first and second signals to form a third signal in order to remove noise, said first and second signals being obtained from the same photoelectric transducer element.

4,914,521

STERILIZABLE VIDEO CAMERA COVER

Edwin L. Adair, 2800 S. University Blvd., Denver, Colo. 80210

Filed Feb. 3, 1959, Ser. No. 306,809
Int. Cl.[4] H04N 5/30
U.S. Cl. 358—229 9 Claims



1 An apparatus for enclosing a non-sterile video camera and its trailing cable in a sterile enclosure for use of the camera in the sterile environment of an operating room, said apparatus comprising:

a generally cylindrical housing having an outer surface and an inner surface with a diameter of a size to snugly receive a camera through a first open end;

a transparent window mounted at a second end of said housing which is contacted by the end of the camera;

means for aligning the camera within said housing in a fixed position;

a flared annular mounting attached to and extended from said second end of said housing;

means for attaching an optical transmitting means to said mounting to provide light images to the camera through said window; and

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4,914,520

VIDEO TRANSFER METHOD USING TIME-SPACED INTERLEAVED FIELDS

Terry D. Beard, 1407 N. View Dr., Westlake Village, Calif. 91362

Continuation-in-part of Ser. No. 150,073, Jan. 29, 1988, Pat. No. 4,814,885. This application Feb. 22, 1989, Ser. No. 314,633
Int. Cl.[4] H04N 3/36
U.S. Cl. 358—214 16 Claims

1. A method of forming a series of video frames representing a visual sequence on a video storage medium, comprising:

generating a series of line fields representing respective time-spaced increments in the visual sequence, said fields being organized into successive pairs with the two fields of each pair interleaved with respect to each other,

encoding said fields into a video format, and

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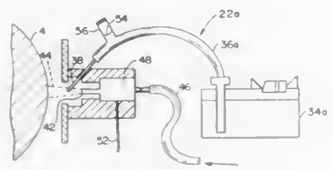
a sleeve attached to said outer surface of said housing extendable over the trailing cable of the camera for a substantial distance.

4,914,522

REPRODUCTION AND ENLARGING IMAGING SYSTEM AND METHOD USING A PULSE-WIDTH MODULATED AIR STREAM

Peter L. Duffield, Meredith, and Arthur L. Cleary, Derry, both of N.H., assignors to Vutek Inc., Meredith, N.H.

Filed Apr. 26, 1989, Ser. No. 343,917
Int. Cl.[4] H04N *1/23;* **G01D** *15/18*
U.S. Cl. 358—296 32 Claims



1. In a system for reproducing an image, the combination comprising

scanner means for scanning an image to be reproduced and generating control signals therefrom,

a medium on which the image is to be reproduced,

drive means for transporting said medium,

an ink spray head positioned adjacent said medium,

carriage means for moving said head laterally across the width of said medium, and

a source of air at substantially constant pressure,

said head including

an ink spray nozzle,

an ink supply reservoir,

conduit means connecting said reservoir to said nozzle to form a first meniscus of said ink on said nozzle,

means communicating with said conduit means for forming a second meniscus of said ink having an area at least as large as the area of said first meniscus,

means directing said air across said first meniscus to spray said ink on said medium, and

means for pulse-width modulating the flow of said air in accordance with said control signals.

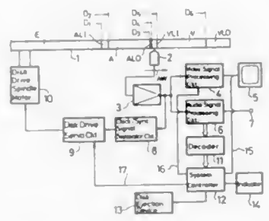
4,914,523

OPTICAL DISK APPARATUS COMPATIBLE WITH DIFFERENT TELEVISION SYSTEM STANDARDS

Keiji Maruta, Kanagawa, Japan, assignor to Sony Corp., Tokyo, Japan

Filed Jui. 19, 1988, Ser. No. 221,048
Claims priority, application Japan, Jul. 28, 1987, 188582
Int. Cl.[4] G11B *7/00*
U.S. Cl. 358—310 16 Claims

1. The combination of an optical disk having radially discrete main and lead-in track areas in which there are respectively recorded color video information according to one of a plurality of TV systems, and code data including data identifying said one of the TV systems; and an optical disk player including head means for initially scanning and picking up said code data recorded in said lead-in track area and then scanning and picking up said color video information recorded in said main track area, reproducing circuit means connected with an output of said head means and having at least one operating mode corresponding to a predetermined one of said TV systems for processing said color video information from said output of the head means when said one TV system used for recording is consistent with said predetermined one of the TV systems corresponding to said operating mode, decoding means for deriving said identifying data from said output of the head means when the latter scans said lead-in track area, and control means for controlling a function of said optical disk



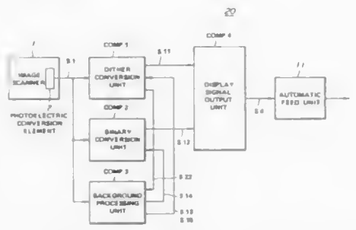
player in response to an inconsistency between said predetermined TV system corresponding to the operating mode and said one TV system used for recording as determined from the derived identifying data.

4,914,524

IMAGE READING APPARATUS AND METHOD

Ken Kimura, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 20, 1988, Ser. No. 221,665
Claims priority, application Japan, Jul. 27, 1987, 62-188227
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—462 28 Claims



1. An image reading apparatus for converting an image on a document having a white/black text area into a display signal, comprising:

an image reader for scanning pixels forming the image to produce a read signal having a level corresponding to the brightness density of each of the scanned pixels;

means for generating a dither matrix data signal;

means for comparing the read signal with the dither matrix data signal to produce a dither converted signal;

a binary converter for comparing the read signal with a threshold level to produce a binary signal having a first level representing a white pixel and a second level representing a black pixel;

a discrimination circuit responsive to the binary signal for producing a detection signal when the black/white text area is scanned; and

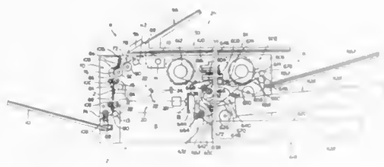
means responsive to the detection signal for mixing the dither converted signal and the binary signal to form the display signal.

4,914,525

IMAGE PROCESSING MACHINE

Yuji Abe, Osaka; Kenji Sakane, Gojo; Masahiro Hashizume, Yao; Taiichi Jinno; Kazuo Nakamura, both of Sakai, and Katsumi Nagata, Kyoto, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed May 11, 1988, Ser. No. 193,277
Claims priority, application Japan, May 13, 1987, 62-114754
Int. Cl.[4] H04N *1/04, 1/387*
U.S. Cl. 358—498 52 Claims



1. An image processing machine, comprising:

a housing having a substantially horizontally extending upper surface and side surfaces;

a document insertion opening on said upper surface of said housing;

a document discharge opening on a said side surface of said housing; and

means for scanning a document comprising a first scanning zone on the upper surface of said housing, a second scanning zone within said housing, an image receiving means, optical means for optically connecting said first scanning zone and said second scanning zone to said image receiving means, first document scan moving means for moving a document across said first scanning zone, and second document scan moving means for moving a document across said second scanning zone, wherein:

said first document scan moving means comprises a movable document placing stand mounted on said upper surface of said housing so as to be free to reciprocate substantially horizontally across said first scanning zone, said movable document placing stand having a transparent plate for receiving a document thereon, and means for reciprocating said movable document placing stand;

said second document scan moving means comprises a sheet-like document conveying passage extending within said housing from said document insertion opening to said document discharge opening across said second scanning zone and means for conveying a sheet-like document through said sheet-like document conveying passage;

said movable document placing stand comprises a document insertion guiding passage such that when said movable document placing stand is at a predetermined position, said document insertion guiding passage is aligned with said document insertion opening to enable a sheet-like document to be inserted into said document insertion opening through said document insertion guiding passage, a frame member having said transparent plate fixed thereto and said document insertion guiding passage connected thereto, and a document cover mounted on said frame member for free pivotal movement between closed and open positions; and

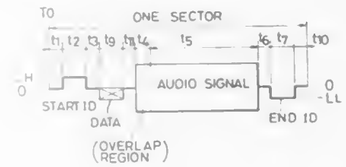
a sheet-like document supporting plate is mounted on said frame member of said movable document placing stand so as to be pivotable between an operative position whereat said supporting plate extends inclinedly upwardly from said document insertion guiding passage and an inoperative position whereat said plate covers said document insertion guiding passage.

4,914,526

INFORMATION RECORDING SYSTEM AND APPARATUS

Tsuguhide Sakata; Norio Kimura, both of Tokyo, and Masahiro Takei, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 864,149, May 16, 1986, abandoned. This application Dec. 22, 1988, Ser. No. 289,455
Claims priority, application Japan, May 22, 1985, 60-109640; May 24, 1985, 60-111467
Int. Cl.[4] G11B *5/02, 5/09*
U.S. Cl. 360—8 31 Claims



1. An information recording apparatus comprising:

(a) means for supplying a time base compressed information signal whose length is variable, a start signal indicative of the beginning of the time base compressed information signal, a control data signal which is used to control an expanding process of the time base compressed information signal, and an end signal indicative of the end of the time base compressed information signal; and

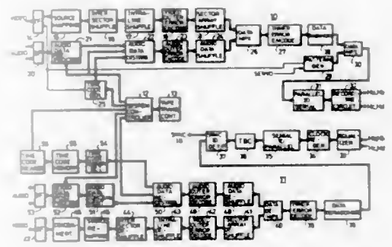
(b) means for writing into a medium said start signal, said control data signal, said time based compressed information signal and said end signal, supplied by said supplying means in this order.

4,914,527

RECORDING AND REPRODUCING DIGITAL VIDEO AND AUDIO SIGNALS TOGETHER WITH A TIME CODE SIGNAL WHICH IS WITHIN USER CONTROL WORDS OF THE AUDIO DATA

Toshiya Asai; Kaichi Tatsuzawa, and Hiroki Kotani, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 35,371, Apr. 7, 1987, abandoned. This application Mar. 24, 1989, Ser. No. 328,523
Claims priority, application Japan, Apr. 9, 1986, 61-081613; Mar. 31, 1988, 63-078635
Int. Cl.[4] H04N *5/783*
U.S. Cl. 360—10.3 26 Claims



1. A method for tape recording a time code signal together with digital video and audio signals comprising:

scanning successive slant tracks extending obliquely across a tape;

processing at least one channel of a digital audio signal into

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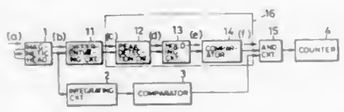
audio blocks each comprised of data words and user control words;
recording said audio blocks in intermediate sections of said slant tracks which are spaced from the opposite ends of the respective tracks;
recording a digital video signal in other sections of said slant tracks which are located before and after said intermediate sections considered in the direction of said scanning; and
recording a time code signal as said user control words in at least some of said audio blocks recorded in said intermediate sections of said slant tracks, with said time code signal in said audio blocks recorded in the intermediate sections of a successive plurality of said slant tracks representing the same time code.

4,914,528

DETECTION OF A SYNCHRONIZING SIGNAL IN A MAGNETIC RECORDING/REPRODUCING APPARATUS

Takayoshi Aoki; Masayuki Takeda, both of Kanagawa, and Yutaka Masumoto, Saitama, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 22, 1987, Ser. No. 52,818
Claims priority, application Japan, May 22, 1986, 61-118003
Int. Cl.[4] G11B *5/09*
U.S. Cl. 360—46 6 Claims



1. A magnetic recording/reproducing apparatus comprising:
a magnetic head for reproducing a signal recorded on a recording medium;
a differentiating circuit for differentiating an output signal of said magnetic head;
a discrimination circuit for discriminating a normal signal from an output signal of said differentiating circuit;
a reading circuit, responsive to an output of said discrimination circuit, for reading said output signal of said magnetic head; and
a control circuit for allowing said reading circuit to read said output signal of said magnetic head only when said discrimination circuit discriminates said normal signal, said control circuit including enabling means, responsive to said output signal of said magnetic head, for enabling said control circuit to pass an output of said discrimination circuit.

4,914,529

DATA DISK DEFECT HANDLING USING RELOCATION ID FIELDS

Carl Bonke, Rancho Santa Margarita, Calif., assignor to Western Digital Corp., Irvine, Calif.

Filed Jul. 18, 1988, Ser. No. 220,552
Int. Cl.[4] G11B *5/09*
U.S. Cl. 360—48 2 Claims

1. A method for data relocation due to disk media defects comprising providing:
an alternate storage sector having an identification field;
asserting a bad block bit and a mapped flag bit in the ID field of the defective sector;
storing an alternate ID field corresponding to the alternate sector in the data field of the defective sector only if the sector is defective;
reading the bad block bit during data transfer;
reading the alternate sector ID from the data field;
completing data transfer from the current track;

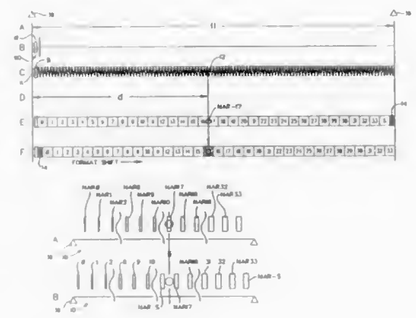
seeking to the alternate sector defined by the alternate ID present in the data field; and
reading the data stored in the alternate sector.

4,914,530

MEDIA DEFECT MANAGEMENT WITHIN DISK DRIVE SECTOR FORMAT

Randolph H. Graham, Fremont, and Dennis W. Hollenbeck, Santa Clara, both of Calif., assignors to Plus Development Corporation, Milpitas, Calif.

Filed Sep. 21, 1987, Ser. No. 98,913
Int. Cl.[4] G11B *5/09*
U.S. Cl. 360—48 16 Claims



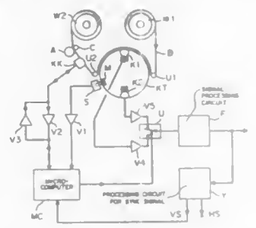
1. A method for managing media defects of a rotating data storage disk drive comprising the steps of:
providing a narrow gap within a data sector format for a concentric data track of the disk drive wherein the sector format comprises at least one sector having at least one address marker region, the narrow gap being sized in relation to the length of the address marker region;
detecting the presence of a media defect;
determining whether a detected defect is located within the address marker region of a sector of the track;
formatting the data track having no media defect therein lying in an address marker region and positioning said narrow gap at a first predetermined location within said format of the track; and, formatting the data track having a media defect therein otherwise lying within an address marker region and positioning the narrow gap at a second predetermined location which is different from said first predetermined location of the data track format, thereby shifting the position of said sector within said format by an amount equal to the narrow gap thereby to move the media defect out of the address marker region.

4,914,531

VIDEORECORDER WITH ROTATING HEAD DRUM AND VIDEO HEADS

Jürgen Kaaden, Villingen-Schwenningen, and Hermann Link, VS-Obereschach, both of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, VS-Villingen, Fed. Rep. of Germany

Continuation of Ser. No. 84,968, Aug. 12, 1987, abandoned. This application Jan. 30, 1989, Ser. No. 304,890
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629481
Int. Cl.[4] G11B *21/04*; H04N *5/782*
U.S. Cl. 360—64 7 Claims



1. A video recorder comprising: a rotating head drum with video heads for scanning a FBAS-signal, a horizontal-synchronization signal and a vertical-synchronization signal; a magnetic tape looped partly around said drum; pulse generator means mounted on said head drum; single sensor means generating a pick-up signal; a control head for scanning control signals on said tape for a control servoloop during playback; said sensor means being coupled with said pulse generator means; means for generating a processed vertical synchronization signal; means for measuring the time interval between said pick-up signal from said sensor means and the occurrence of said processed vertical synchronization signal and providing a measured output, said measuring means being connected to said sensor means and said means for generating said processed vertical synchronization signal, said measuring means receiving said pick-up signal from said sensor means; comparator means for comparing said measured output with a reference value and providing a comparison output; and means for generating a head-shift signal and controlling timing of said head-shift signal dependent on said comparison output; said means for generating said head-shift signal delaying said head-shift signal dependent on said comparison output, said head-shift signal switching from one video head to the other.

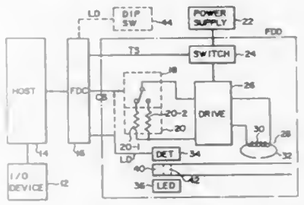
4,914,532

METHOD OF EFFICIENTLY ERASING DATA IN ACCORDANCE WITH TYPE OF MAGNETIC RECORDING MEDIUM AND APPARATUS FOR REALIZING THE SAME

Hiroshi Ohashi; Yoshiaki Uchida, and Masahiro Kusunoki, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 30, 1988, Ser. No. 213,808
Claims priority, application Japan, Jun. 30, 1987, 62-162886
Int. Cl.[4] G11B *5/024, 27/36*
U.S. Cl. 360—66 8 Claims

1. A magnetic recording apparatus for writing on a recording medium, said recording apparatus comprising:
instruction determining means for determining if an input instruction is a write instruction with or without a verify instruction;
erasing means, having an erase head, for erasing data recorded on a data area of said recording medium utilizing said erase head with a supplied erase current when it is determined by said instruction determining means that said instruction is said write instruction;
writing means for writing new data on said data area of said recording medium when it is determined by said instruction determining means that said instruction is said write instruction;
verifying means for reading said new data from said recording medium when it is determined by said instruction determining means that said write instruction is accompanied by said verify instruction, and determining if said new data is correctly written;



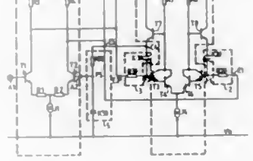
current supply means for supplying said erase current to said erasing means; and
control means for generating a change command when said verifying means determine that said new data is incorrectly written and changing a value of said erase current supplied by said current supply means to a new value in response to said change command.

4,914,533

DIFFERENTIAL AMPLIFIER WITH DIFFERENTIAL OUTPUTS

Meunier Thierry, Obereschach, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Jun. 17, 1988, Ser. No. 208,225
Claims priority, application France, Jun. 19, 1987, 87 08656
Int. Cl.[4] G11B *5/02*
U.S. Cl. 360—67 6 Claims



1 A differential amplifier comprising two differential inputs, one of which is a signal input having a nonfiltered signal applied directly thereto and the other one of which is a reference input, and two differential outputs, a first and a second low-pass filter, the first filter being connected with one differential output, the second filter being connected with the other differential output, a comparator having two inputs and one output respectively receiving on one input an output signal from one of the filters and on the other input an output signal from the other filter, the output of the comparator being connected with said reference input of the amplifier in order to form a regulation loop which compensates for the d.c. level variations of said signal applied directly to said signal input and which servo-controls the d.c. levels difference of the outputs to a level approaching zero.

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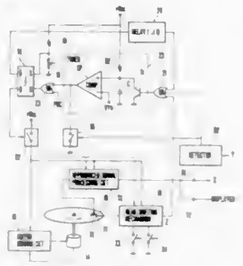
4,914,534

INFORMATION REPRODUCING APPARATUS HAVING A TIMER FOR RESTRICTING OPERATION THEREOF AND MEANS FOR OVERRIDING SAID TIMER WHEN THE INFORMATION REPRODUCING APPARATUS IS OPERATIVELY COUPLED TO A REPRODUCED INFORMATION HANDLING APPARATUS

Yasuo Chito, Saitama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 567,546, Jan. 3, 1984, abandoned. This application Dec. 23, 1987, Ser. No. 136,475
Claims priority, application Japan, Jan. 7, 1983, 58-974
Int. Cl.[4] G11B *5/09, 15/04, 15/02, 15/03*
U.S. Cl. 360—69 **10 Claims**



1. An information reproducing apparatus for reproducing information respectively recorded in a plurality of regions on a record bearing medium, comprising:
(a) a reproducing head for tracing one recording track out of a plurality of recording tracks formed on said record bearing medium, said recording head being able to reproduce the information recorded on said recording tracks;
(b) a reproducing head shifting mechanism for shifting said reproducing head relative to said plurality of recording tracks;
(c) time measuring means for measuring a time of continuation of a tracing operation after the tracing operation effected by said reproducing head with respect to one of a plurality of recording tracks formed on said bearing medium has started and for outputting an arrival signal when the measured time has arrived at a predetermined value;
(d) tracing operation control means for interrupting the tracing operation effected by said reproducing head in synchronism with the timing when said arrival signal is outputted from said measuring means; and
(e) measuring operation control means for resetting the measuring operation effected by said time measuring means in a case where said reproducing head is shifted to another recording track on said record bearing medium by said recording head shifting mechanism when a predetermined time has elasped after starting of the tracing operation effected by said reproducing head with respect to one of the plurality of recording tracks formed on said record bearing medium.

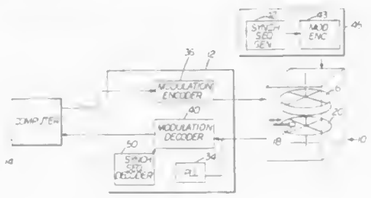
4,914,535

SYNCHRONIZATION FOR STORED DATA

Lih-Jyh Weng, Lexington, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 6, 1988, Ser. No. 141,204
Int. Cl.[4] G11B *5/09, 15/8*
U.S. Cl. 360—72.2 **29 Claims**

1. A method of identifying the location of a sequence of data bits stored on a storage medium, comprising
generating a predetermined synchronization sequence of symbols, each said symbol comprising a plurality of bits,
storing on said storage medium a bit sequence corresponding to said predetermined synchronization sequence to indicate said location of said data bit sequence,
deriving from said stored corresponding bit sequence on said storage medium a trial sequence of symbols, each said symbol comprising a plurality of bits, and
determining whether said trial sequence corresponds to said predetermined synchronization sequence by



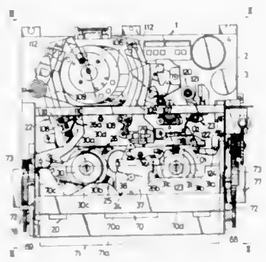
comparing said trial sequence with said predetermined synchronization sequence symbol by symbol and, based on said comparing,
determining the number of symbols in which said trial sequence differs from said predetermined synchronization sequence, whereby the effect of clustered bit errors is reduced.

4,914,536

BRAKE DEVICE FOR MAGNETIC RECORDING AND REPRODUCING DEVICE

Takashi Yamanaka, Tokyo, Japan, assignor to Tanashin Denki Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1987, Ser. No. 127,756
Claims priority, application Japan, May 30, 1987, 62-137538
Int. Cl.[4] G11B *15/48*
U.S. Cl. 360—96.3 **1 Claim**



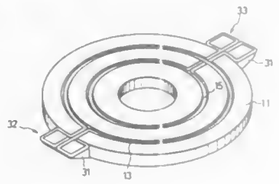
1. A brake device for a magnetic recording and reproducing device, comprising a cam motor which rotates forwardly in response to a reproduction mode setting instruction signal or a recording mode setting instruction signal and rotates reversely in response to a fast feeding mode setting instruction signal or a rewinding mode setting instruction signal until a position thereof corresponding to a mode indicated by such an instruction signal is reached, a first movable member mounted for reciprocal movement and normally biased by a spring, said first movable member putting a low speed side gear into a means for transmitting rotation from a capstan motor to reel bases when said first movable member is moved in one direction by the biasing force of said spring, said first movable member putting said low speed side gear out of said means for transmitting rotation when said first movable member is moved in the other direction, a second movable member mounted for reciprocal movement and normally biased by a spring, said second movable member putting a high speed side gear out of said means for transmitting rotation when said first movable member is moved in one direction by the biasing force of said spring, said second movable member putting said high speed side gear into said means for transmitting rotation when said second movable member is moved in the other direction, a connecting means for selectively connecting said first and second movable members to each other so that, when said first movable member is moved in said the other direction, said second movable member may be moved in the same direction, a take-up side brake member which applies a braking force to a take-up side one of said reel bases for a time after a mode in which said cam motor rotates reversely is completed until another mode in which said cam motor rotates forwardly is started and which is operated, when said second movable member is moved in said the other direction, by said second movable member to cancel the application of a braking force thereof to the take-up side reel base, a supply side brake member which applies a braking force to a supply side one of said reel bases for a time after a mode in which said cam motor rotates reversely is completed until another mode in which said cam motor rotates forwardly is started and which is operated, during setting of any mode and in response to operation of said take-up side brake member to cancel the application of a braking force thereof, to cancel the application of a braking force thereof to the supply side reel base, and a canceling means which is operated by the turning force of said cam motor upon forward rotation of said cam motor to cancel the connection between said first and second movable members by said connecting means.

4,914,537

MAGNETIC HEAD DEVICE HAVING A BRIDGE CORE

Hiroyuki Ota, Saitama, Japan, assignor to Pioneer Electric Corporation, Tokyo, Japan

Filed Apr. 25, 1988, Ser. No. 185,654
Claims priority, application Japan, Apr. 24, 1987, 62-102497; May 21, 1987, 61-125335; May 21, 1987, 62-125336; May 28, 1987, 62-132795
Int. Cl.[4] G11B *5/20*
U.S. Cl. 360—108 **2 Claims**



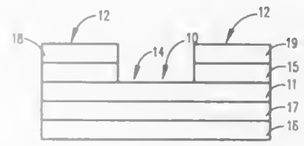
1. A magnetic head device comprising:
a head tip including a pair of cores which are confronted with each other in such a manner that a magnetic gap is formed at one end portion thereof, the remaining portion of said cores being sufficiently spaced from each other such that a magnetic flux flowing through said cores during playback does not flow directly between said pair of cores;
a bridge core bridging said pair of cores to allow said magnetic flux to flow out of one of said pair of cores and flow in the other core through said bridge core; and
at least one coil disposed on at least one of said pair of cores such that said magnetic flux passes through a center thereof so as to induce electromotive force therein.

4,914,538

MAGNETORESISTIVE READ TRANSDUCER

James K. Howard, Morgan Hill; Hung-Chang W. Huang, and Chernyye Hwang, both of San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 18, 1988, Ser. No. 234,250
Int. Cl.[4] G11B *5/127, 5/33*
U.S. Cl. 360—113 **6 Claims**



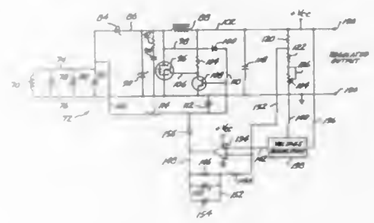
1. A magnetoresistive sensor comprising;
a thin film of magnetoresistive material;
a plurality of electrically conductive lead structures, each of said electrically conductive lead structures electrically contacting said thin film of magnetoresistive material at spaced positions, said electrically conductive lead structures comprising a thin film of tungsten in contact with said thin film of magnetoresistive material and a thin film overlayer formed of a material taken from the group consisting of titanium, chromium, tantalum, zirconium, hafnium and a titanium-tungsten alloy, said thin film of tungsten and said overlayer being coextensive in said lead structures, whereby, when a signal output means is connected between two of said electrically conductive lead structures, the resistance changes in said magnetoresistive material can be detected as a function of the fields which are intercepted by said thin film of magnetoresistive material.

4,914,539

REGULATOR FOR INDUCTIVELY COUPLED POWER DISTRIBUTION SYSTEM

James B. Turner, Mountlake Terrace, and Gary W. Roth, Lynnwood, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 15, 1989, Ser. No. 324,205
Int. Cl.[4] H02H *7/10*
U.S. Cl. 361—18 **18 Claims**



1. In a power supply system having a power source for producing an AC signal that is resonantly and inductively coupled to a pickup circuit, apparatus for regulating a DC voltage on an output of the pickup circuit to a predetermined level, comprising:
(a) means connected to the output of the pickup circuit, for producing a regulated reference voltage having a magnitude substantially less than the predetermined level;
(b) divider means, connected to the output of the pickup circuit, for providing a comparison voltage that varies as

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a function of the DC voltage output from the pickup circuit and has a magnitude less than said DC voltage;

(c) comparator means, for producing a signal that varies as a function of the difference between the regulated reference voltage and the comparison voltage; and

(d) shunt means, connected to receive the signal from the comparator means, for cyclically shunting a current flowing through the pickup circuit so that the current circulates within the pickup circuit and does not reach its output, for an interval of time that varies as a function of said signal and with a frequency no greater than that of the AC signal.

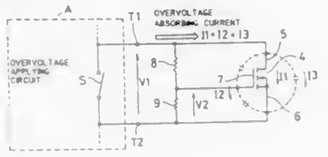
4,914,540

OVERVOLTAGE-PROTECTIVE DEVICE

Mitsuharu Tabata, and Gourab Majumdar, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1988, Ser. No. 148,717
Claims priority, application Japan, Feb. 12, 1987, 63-30028
Int. Cl.[4] H02H *3/20*

U.S. Cl. 361—91 3 Claims



3. An overvoltage-protective device for protecting a device to be protected, comprising:

two input terminals connected to terminals of said device to be protected;

an enhancement field effect transistor having three terminals, two of said three terminals being connected to said two input terminals;

two voltage dividing resistors, each having one terminal in common and one terminal connected to one of said input terminals;

said terminal in common being connected to the third terminal of said field effect transistor.

4,914,541

SOLID-STATE TRIP DEVICE COMPRISING AN INSTANTANEOUS TRIPPING CIRCUIT INDEPENDENT FROM THE SUPPLY VOLTAGE

Paul Tripodi, Eybens, and Luc Weynachter, Grenoble, both of France, assignors to Merlin Gerin, France

Filed Jan. 27, 1989, Ser. No. 302,610
Claims priority, application France, Jan. 28, 1988, 88 01152
Int. Cl.[4] H02H *3/093*

U.S. Cl. 361—94 8 Claims

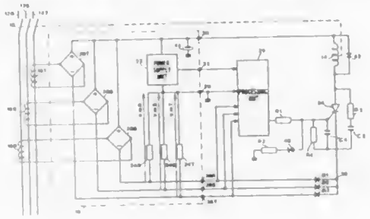
1. A solid-state trip device for a multipole electrical circuit breaker comprising:

a current detection circuit delivering analog signals proportional to the current flowing through conductors to be protected and comprising one current sensor per pole,

a rectifier, measurement and power supply circuit comprising a plurality of rectifier bridges respectively associated with said poles, the inputs of a rectifier bridge being connected to the outputs of the associated current sensor, a rectifier bridge associated with a pole being connected, in series with an independent associated measuring resistor, between terminals of a common power supply circuit, each resistor comprising first and second terminals, said first terminal, connected to the power supply circuit, being connected to ground, measurement voltages being generated across the measurement resistors,

an electronic processing unit receiving said measurement voltages and receiving a supply voltage from the common power supply circuit, said processing unit delivering on an output terminal, with or without a time delay, a circuit breaker tripping order in the event of preset pick-ups being exceeded by said measurement voltages,

a plurality of diodes respectively associated with said measuring resistors, the cathode of a diode being connected to the second terminal of the associated resistor and the anodes of the diodes being connected together,



a trip coil connected in series with a thyristor between a supply terminal of the power supply circuit and the anodes of the diodes, the output terminal of the electronic processing unit being connected to the thyristor gate in such a way that the trip coil causes the circuit breaker to open when a tripping order is delivered by the electronic processing unit,

a Zener diode having its anode connected to the thyristor gate and having its cathode connected to ground, for determining an instantaneous tripping pick-up of the trip device.

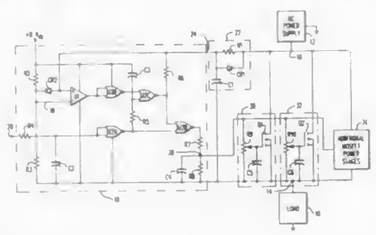
4,914,542

CURRENT LIMITED REMOTE POWER CONTROLLER

Robert G. Wagoner, Troy, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 27, 1988, Ser. No. 290,661
Int. Cl.[4] H02H *3/087*

U.S. Cl. 361—98 15 Claims



1. A direct current power controller comprising'

a first terminal for connection to an external power supply;

a second terminal for connection to an external load;

a first MOSFET, having a drain connected to said first terminal, a source connected to said second terminal and a gate;

a drive circuit connected to supply a gate voltage signal having a preselected magnitude to said gate in response to a control signal, thereby turning on said first MOSFET, wherein said preselected magnitude of gate voltage signal corresponds to a predetermined maximum drain current

for said MOSFET, said maximum drain current being substantially constant over an expected operating temperature range of the power controller;

means for producing an overload indicating signal representative of excessive power dissipation in said MOSFET; and

means for producing a trip signal when said overload indicating signal exceeds a predetermined magnitude, said drive circuit being responsive to said trip signal to remove said gate voltage signal from said gate.

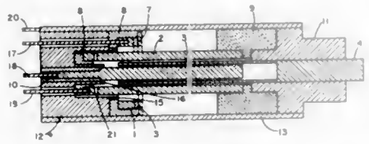
4,914,543

VARIABLE CAPACITANCE

Norman L. Carroll, 16 Circle Dr., Bakerstown, Pa. 15007; Gregory A. Bertone, 448 Blackberry Dr., Monroeville, Pa. 15146, and Willard L. Pearce, 2315 Big Rock Rd., Allison Park, Pa. 15101

Filed Jul. 20, 1989, Ser. No. 382,303
Int. Cl.[4] H01G *5/12, 4/02*

U.S. Cl. 361—294 7 Claims



1. A variable capacitance position transducer comprising support means;

a first and second electrode connected by the support means in a uniformly spaced relation with respect to one another;

a common electrode connected with the support means in a uniformly spaced relation between the first and second electrodes and electrically separating said first and second electrodes, thereby, to define a first and second capacitance between said common electrode and said first and second electrodes respectively;

and shield means connected with said support means for movement between the first and common electrodes to vary only said first capacitance,

Whereby the ratio of the first and second capacitance varies in accordance with the displacement of said shield means relative to said first electrode.

4,914,544

AIRFIELD MARKER LIGHT

Anders I. Dahlberg, Flyghamnsvägen 22, S-183 64 Täby, Sweden

PCT No. PCT/SE87/00322, § 371 Date Jan. 9, 1989, § 102(e) Date Jan. 9, 1989, PCT Pub. No. WO88/00157, PCT Pub. Date Jan. 14, 1988
PCT Filed Jul. 6, 1987, Ser. No. 297,281
Claims priority, application Sweden, Jul. 7, 1986, 8603027
Int. Cl.[4] F21V *5/04*

U.S. Cl. 362—153.1 10 Claims

1. An airfield marker light comprising a casing (1) to be flush-mounted in the ground and having

(a) at least one lower light source (4) adapted to emit a collected, upwardly directed light bundle; and

(b) an upper, at least partially transparent cover plate (8) with a lower saw-toothed surface (8c, 8d) and an upper, substantially planar surface (8a, 8b), said cover plate, upon lowering of said casing into the ground (M), being substantially flush with a plane of said ground; and

(c) optical means (7) adapted to direct light from said light source in such a way that two well-defined light beams (L_{12}, L_{34}) are emitted from said upper surface of said cover plate (8) in opposite directions at a small angle with said ground plane (M), said optical means comprising a light dividing prism in the form of a transparent plate body (7) located between said light source and said cover plate and having oppositely inclined, refractive planar surfaces (7a, 7b, 7c, 7d), whereby said upwardly directed light bundle from said light source (4), during its passage

through said light dividing prism, is divided into two obliquely upwardly directed light bundles propagating in opposite directions at right angles to respective saw-tooth surfaces (8c, 8d).

4,914,545

CASSETTE CASE LIGHT

Randy R. Price, RR1 Box 194, Stillwater, Okla. 74074

Filed Jun. 29, 1989, Ser. No. 372,795
Int. Cl.[4] F21V *33/00*

U.S. Cl. 362—155 11 Claims

1. A light for a lid closed container storing a plurality of cassette tapes in individual cassette containers juxtaposed in labeled edge upright position, comprising: an upwardly open opaque wall housing cooperatively nested in

juxtaposed relation within the closed container between adjacent cassette containers;

a lamp within said housing;

electrical circuit means including a normally open switch connecting a source of electrical energy with said lamp;

a light ray reflecting member vertically slidable within and normally closing the opening of said housing; and,

means biasing the major portion of the reflecting member above the upper limit of the housing walls defining the housing opening and closing said normally open switch when said closed container lid is opened.

4,914,546

STACKED MULTI-POLYSILICON LAYER CAPACITOR

Martin J. Alter, Los Altos, Calif., assignor to Micrel Incorporated, Sunnyvale, Calif.

Filed Feb. 3, 1989, Ser. No. 306,375
Int. Cl.[4] H01G *4/10;* **H01L** *27/02*

U.S. Cl. 361—313 19 Claims

1. A capacitor structure comprising:

a highly conductive diffused region formed in a substrate,

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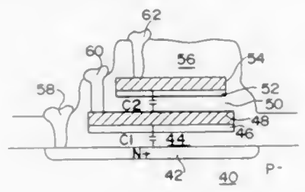
said diffused region and said substrate being of opposite conductivity types;

a first layer of insulation formed over said diffused region;

a first layer of highly conductive material formed over said first layer of insulation;

a second layer of insulation formed over said first layer of highly conductive material;



a second layer of highly conductive material formed over said second layer of insulation; and

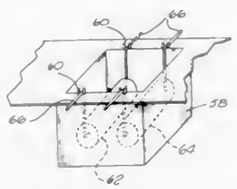
first, second, and third electrodes contacting said diffused region, said first layer of highly conductive material, and said second layer of highly conductive material, respectively.

4,914,547

PROCESS FOR MAKING CAPACITORS

Joseph A. Toro; Thomas G. Johnson, and Fred W. Olmsted, all of Ogallala, Nebr., assignors to American Shizuki Corporation, Canoga Park, Calif.

Filed May 6, 1988, Ser. No. 190,966
Int. Cl.[4] H01G 1/14, 7/00; H05K 1/04
U.S. Cl. 361—323 12 Claims



9. An ultrasonic energy curable capacitor suitable for surface mounting comprising:

a pair of ultrasonic energy curable ribbons, each ribbon defining a conductive ply and a dielectric ply wound together for forming a winding;

a first contact disposed at one end of said winding for electrical connection to one ribbon and a second contact disposed at the other end of said winding for electrical connection to the other ribbon;

a wire lead attached to each of said contacts; and

an epoxy housing encasing said winding wire leads extending from the epoxy housing for enabling electrical interconnection to the winding.

4,914,548

ELECTROLYTIC PAPER FOR ELECTROLYTIC CAPACITOR

Yoshiyo Kubo, 43-16, Tsukanohara, Kochi-shi, Kochi-ken; Tetsushi Tamura, 3123-1, Ino-cho, Agawa-gun, Kochi-ken, and Tomoko Sasaki, 314-9, Takaoka-cho, Tosha-shi, Kochi-ken, all of Japan

Filed May 9, 1988, Ser. No. 191,339
Int. Cl.[4] H01G 4/16
U.S. Cl. 361—324 15 Claims

1. A paper for being disposed between the anode and the cathode of an electrolytic capacitor, comprising:

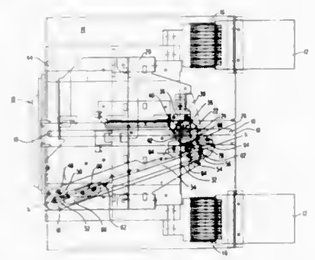
(a) cellulose fibers having at least some of the hydroxyl groups thereof substituted by organic substituents so that hydrogen bonding between adjacent fibers is reduced and the swelling degree attributable to an impregnating electrolyte is increased.

4,914,549

CIRCUIT BREAKER MOVEMENT MECHANISM

David A. Leone, Lawrenceville, Ga., and James H. Leonard, Albemarle, N.C., assignors to Siemens Energy & Automation, Inc., Atlanta, Ga.

Filed Sep. 28, 1988, Ser. No. 250,792
Int. Cl.[4] H02B 9/00
U.S. Cl. 361—336 17 Claims



1. A mechanism for moving and supporting a circuit breaker relative to a bus bar arrangement such that the circuit breaker can be engaged and disengaged from the bus bar arrangement, the mechanism comprising:

means for supporting the circuit breaker;

means for moving the circuit breaker relative to the bus bar arrangement;

means for restricting operation of the means for moving when the circuit breaker is not tripped; and

wherein the means for moving the circuit breaker relative to the bus bar arrangement comprises:

first means for supporting, the first means mounted to the circuit breaker;

a shaft rotatably mounted to the first means for supporting;

a drive wheel coupled to the shaft;

means for engaging the drive wheel;

means for moving the means for engaging the drive wheel, the means for moving being supported by the first means for supporting; and

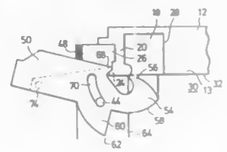
means for controlling the engagement of the means for engaging with the drive wheel such that the shaft is rotatable in a first direction to cause the circuit breaker to be moved toward the bus bar arrangement.

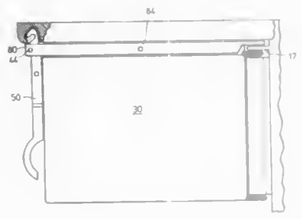
4,914,550

DEVICE FOR THE ARRANGING OF AN ELECTRONIC COMPONENT, PARTICULARLY A MODULE HAVING CIRCUIT BOARDS

Reinhard Filsinger, Plochingen; Arnold Mann, Biebergemünd, and Volker Sellner, Weilrod, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 4, 1988, Ser. No. 177,560
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1987, 3711341
Int. Cl.[4] H05K 7/20
U.S. Cl. 361—386 10 Claims





1. Apparatus for securing an electronic component, particularly a module in a housing, and wherein

a side wall of the module lies for purposes of cooling against a contact surface of the housing, there being an end wall of said module perpendicular to said side wall, there being electrical contacts in the end wall of the module connectable to mating contacts located in an abutting surface of the housing; the apparatus comprising

a pivot pin fixed to the module and oriented parallel to the contact surface;

a holding device disposed on the housing;

an outer support disposed on said housing at a distance from said pin;

a lever element, which is pivotable about said pin, said pin serving as a first point of pivoting during a securing of said electronic component, the lever element having two arms of which one arm serves as a connecting arm for interaction with said holding device, the other arm of said lever element serving as a handle, said holding device serving as a second point of pivoting by which said lever element is pivoted during the securing of said electronic component; and wherein

said lever element comprises a guide which contacts said pin and is displaceable relative to said pin, displacement of said guide about said pin shifting a point of pivot of said lever element, said guide having a first end point and a second end point opposite said first end point, said first and said second end points being spaced apart from said holding device, said first end point engaging with said pin at said first pivot in a fastening-in position of the lever element;

the module is tiltable about said outer support in a direction towards the contact surface, and

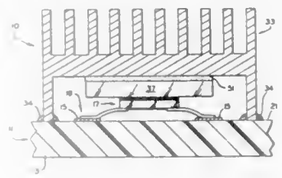
a point of pivoting of said lever element shifts from said first to said second point of pivoting upon interaction of said connecting arm with said holding device.

4,914,551

ELECTRONIC PACKAGE WITH HEAT SPREADER MEMBER

Morris Anschel, Binghamton, and Bahgat G. Sammakia, Johnson City, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 13, 1988, Ser. No. 218,725
Int. Cl.[4] H02B 1/00
U.S. Cl. 361—389 19 Claims



1. An electronic package comprising:

a first circuitized substrate;

a semiconductor device positioned above said first circuitized substrate and electronically coupled thereto;

a second, circuitized substrate of flexible nature electrically connected to said first substrate and said semiconductor device for providing said electrical coupling therebetween;

a heat sink for providing heat escape from said package; and

a heat spreader for providing an enhanced heat path from said semiconductor device to said heat sink, said heat spreader secured to said seminconductor device and said heat sink along first and second interfaces, respectively, using an adhesive, the coefficients of thermal expansion of said semiconductor device, said heat spreader, and said adhesive used to secure said heat spreader to said device along said first interface being within the range of from about 2.0 to about 5.0 ppm/degree Celsius ($\times 10^{-6}$ m/m degrees Kelvin).

4,914,552

PRINTED CIRCUIT BOARD INSTALLATION AND RETAINING APPARATUS

Robert P. Kecmer, Fair Lawn, N.J., assignor to Rexnord Holdings Inc., Torrance, Calif.

Filed Jun. 26, 1989, Ser. No. 371,213
Int. Cl.[4] H05K 7/14
U.S. Cl. 361—415 7 Claims

1 Retainer apparatus for use in installing and retaining a printed circuit board in a predetermined installation position within a first slot formed in a housing, wherein the printed circuit board is generally rectangular, with two opposite side edges, a lower edge, and an upper edge, and wherein the lower edge of the printed circuit board and the housing together carry mating electrical connectors that are guided into coupling with each other as the board is moved into its predetermined installation position, the retainer apparatus comprising:

clamping means adapted for clamping the board within the first slot of the housing, said clamping means including a rod adapted to be mounted along one side edge of the printed circuit board for rotation about a longitudinal axis to activate or deactivate said clamping means;

a lever having a pivot point pivotally secured to the rod at the end of the rod nearest the upper edge of the printed circuit board, wherein the lever is selectively pivotable between a raised position and a lowered position, and wherein the lever is selectively rotatable with the rod about the rod's longitudinal axis; and

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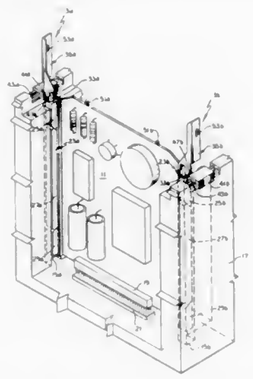
interlocking gear means carried by the lever and the housing and selectively operable while the lever is being pivoted



from its raised position to its lowered position to drive the printed circuit board into its predetermined installation position.

4,914,553

LIGHTING DEVICE

Hiroshi Hamada, Yamatokoriyama; Naofumi Kimura, Nara, and Fumiaki Funada, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 52,201, May 19, 1987, abandoned, which is a continuation of Ser. No. 756,821, Jul. 19, 1985, abandoned. This application Sep. 22, 1988, Ser. No. 249,222
Claims priority, application Japan, Jul. 26, 1984, 59-156731
Int. Cl.[4] F21V *7/04*
U.S. Cl. 362—32 11 Claims

1. A lighting device for backlighting a passive display device having a planar display surface and an acute optimum viewing angle θ defined from a perpendicular to said display surface, comprising:
a fluorescent lamp having a cylindrical light emitting surface;
a transparent cylindrical housing for said fluorescent lamp, said housing having a transparent surface spaced substantially equidistant from the cylindrical light emitting surface of said fluorescent lamp to form an air cavity therebetween, said air cavity forming a heat insulating layer to improve the luminous efficiency of said fluorescent lamp;
a light guide receiving light from said fluorescent lamp and providing said light to said planar display surface, said light guide being formed of a material having a refractive index n; and
diffusion means, disposed between said light guide and said planar display surface and having a low diffusion property, for scattering light between said light guide and said planar display surface to provide a uniform light distribution with a limited light loss;
said light guide including,
a first irradiating surface,
a second linear reflection surface generally intersecting said first irradiating surface at an acute intersecting angle X with respect thereto, and
an open guide end disposed at an opposite edge of said first irradiating surface and second linear reflection surface,
said open guide end acting to receive light from said lamp such that a portion is propogated through the light guide at various acute, nonparallel angles to said first irradiating surface,
said second linear reflecting surface having first and second alternating reflecting surface portions, said first reflecting surface portions being substantially parallel to said first irradiating surface, said second reflecting surface portions extending at an angle α to an adjacent first reflecting surface portion where

$$\alpha = \tfrac{1}{2}\,\mathrm{Sin}^{-1}(\mathrm{Sin}\,\theta/n) + 135°.$$

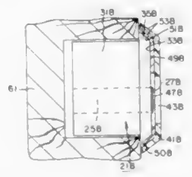
11. A lighting device for backlighting a passive display device comprising:
a fluorescent lamp having a cylindrical light emitting surface;
a transparent cylindrical housing for said fluorescent lamp, said housing having a transparent surface spaced substantially equidistant from the cylindrical light emitting surface of said fluorescent lamp to form an air cavity therebetween, said air cavity forming a heat insulating layer to improve the luminous efficiency of said fluorescent lamp;
a light guide, having a first irradiating surface, collecting light from the transparent surface of said housing and directing said light through said passive display device to be emitted therefrom at substantially an acute optimum viewing angle; and
diffusion means, disposed between said light guide and said passive display device and having a low diffusion property, for scattering light between said light guide and said passive display device to provide a uniform light distribution with a limited light loss;
said transparent surface acting to receive light from said lamp such that a portion is propogated through the light guide at various acute, non-parallel angles to said first irradiating surface.

4,914,554

PHOSPHORESCENT KEYHOLE LOCATOR

David A. Sowers, Coral Springs, Fla., assignor to BSD Enterprises, Inc., Pompano Beach, Fla.

Filed Aug. 29, 1988, Ser. No. 237,327
Int. Cl.[4] E05B *17/10*
U.S. Cl. 362—100 10 Claims



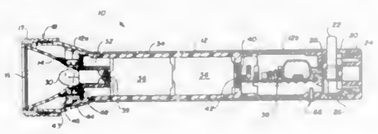
1. In combination, a tumbler-type lock having a keyhole and means for locating the keyhole of said lock, said tumbler-type lock comprising a cylindrical tumbler portion having an external circular tumbler end surface, said tumbler end surface having a keyhole therein, and a peripheral portion having an external peripheral end surface around said tumbler end surface, said locating means comprising a solid phosphorescent plastic body having a substantially circular open, unobstructed aperture therethrough, said body having a front body surface and a back body surface, said back body surface being adhesively attached directly to said peripheral end surface with said aperture positioned over said tumbler end surface, the diameter of said aperture being about as large as the diameter of said tumbler end surface, said aperture having unobstructed sides which are adapted to pass phosphorescent light from said plastic body for illuminating said tumbler end surface and said keyhole.

4,914,555

RECHARGEABLE FLASHLIGHT

Richard J. Gammache, 1564 Mission Rd., Lancaster, Pa. 17601

Filed Jul. 20, 1989, Ser. No. 382,401
Int. Cl.[4] H02J *7/00*; H01M *10/46*
U.S. Cl. 362—183 19 Claims



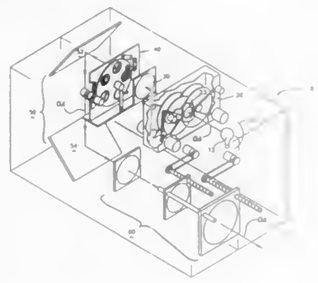
1. A rechargeable flashlight comprising:
a casing containing a battery and means for recharging said battery;
a bulb disposed in said casing;
a head assembly rotatably mounted on one end of said casing for completing an electrical circuit connecting said battery and said bulb thereby illuminating said bulb; and
a knob rotatably mounted adjacent the other end of said casing for extending and retracting a pair of prongs which may be plugged into an alternating current electrical receptacle in order to energize said recharging means and thereby recharge said battery.

4,914,556

SPECTRAL FILTER MODULE

Brian E. Richardson, San Jose, Calif., assignor to Morpheus Lights, Inc., San Jose, Calif.

Filed Jul. 26, 1988, Ser. No. 224,436
Int. Cl.[4] F21V *9/00*; G02B *5/22*
U.S. Cl. 362—293 20 Claims



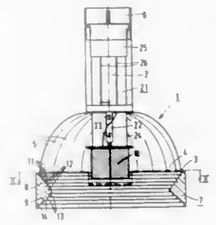
1. Spectral filter means for filtering light projected in a beam along an optical axis, comprising a component color filter element including substrate means having a patterned portion formed by discrete regions occupying interstices of a background region, either said discrete regions or said background region being coated with dichroic filtering material of a given characteristic in a pattern in which beam-size areas have average densities of filtering material chosen to attenuate, by predetermined proportions, the avrage color saturation of beams of light passing along said optical axis and intersecting those areas.

4,914,557

LUMINAIRE HAVING A LIGHT ABSORBING COLLAR

Egbertus J. P. Maassen, and Franciscus A. M. M. Van Meel, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 324,376, Mar. 16, 1989, abandoned. This application Jul. 28, 1989, Ser. No. 388,310
Claims priority, application Netherlands, Mar. 31, 1988, 8800821
Int. Cl.[4] F24V *7/00*
U.S. Cl. 362—305 13 Claims



1. A light fixture, comprising:
a reflector defining a focal axis, said reflector having an opening centered on the focal axis for receiving a light-source and a concave reflective surface terminating at a peripheral edge of said reflector opposite to said opening; and
a collar disposed at said peripheral edge, said collar having a circumferentially extending portion having a light absorbing surface extending stepwise from said peripheral edge radially inward and axially away from said opening and terminating at a diameter smaller than said peripheral edge.

4,914,558

SERIES RESONANT INVERTER AND METHOD OF LAMP STARTING

Jon Flickinger, 314 Irene St., Salina, Kans. 67401

Filed Mar. 6, 1989, Ser. No. 319,327
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—17 18 Claims

1. An efficient, high power factor series resonant inverter comprising:

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a source of rectified voltage coupled to a pair of output terminals,

first and second power rails, each rail fed from one of said output terminals,

a direct drive inverter with a series resonant circuit including first and second electronic switches, each with a main current conduction path terminating in first and second terminals and a control element including a control terminal, said main conduction paths of both said electronic switches coupled to said power rails,

said direct drive inverter further including:

saturable means to provide drive current to said first and second electronic switches for establishing a conduction condition for each of said first and second electronic switches, said drive current terminating on saturation of said saturable means, said saturable means including a four winding saturable inductor wound on a single core, all of said windings, wound on said single core, tightly coupled to each other, said four winding saturable inductor having a saturation period no greater than half a period corresponding to a resonant frequency of said series resonant circuit,

first means connecting said first electronic switch to a first pair of windings on said single core to provide positive feedback between said main conduction path of said first electronic switch and said control element of said first electronic switch,

second means connecting said second electronic switch to a second pair of windings on said single core to provide positive feedback between said main conduction path of said second electronic switch and said control element of said second electronic switch,

control means responsive to variations in current flow through a conducting one of said electronic switches for inhibiting forward biasing of a non-conducting one of said electronic switches.

4,914,560

PROTECTION CIRCUIT FOR SWITCHING MODE POWER SUPPLY CIRCUIT

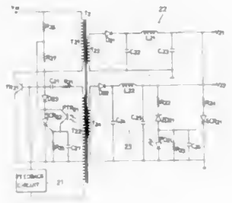
Yong H. Oh, Daeku, and Seong Han, Kyungsangbook-Do, both of Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

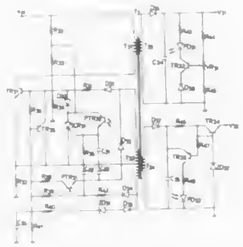
Filed Nov. 30, 1988, Ser. No. 277,786

Claims priority, application Rep. of Korea, Nov. 30, 1987, 20941

Int. Cl.[4] H02M *13/335*

U.S. Cl. 363—56 2 Claims





4,914,559

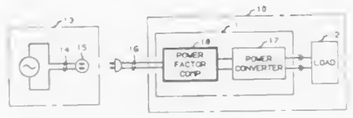
POWER FACTOR IMPROVING ARRANGEMENT

Cecil W. Deisch, Warrenville, Ill., assignor to American Telephone and Telegraph Company, New York, N.Y.

Continuation of Ser. No. 145,072, Jan. 19, 1988, abandoned. This application Mar. 27, 1989, Ser. No. 331,094

Int. Cl.[4] H02M *1/12*

U.S. Cl. 363—48 15 Claims



1. An arrangement for improving power factor of a rectifier drawing power from a power source having a substantially sinusoidal voltage with an operating frequency, comprising:

in combination, first inductive means and capacitive means connected in series with each other and for connection in series between a rectifier drawing power from a power source and the power source having a substantially sinusoidal voltage and tuned to resonate at a frequency higher than the frequency of the voltage to improve the power factor of the rectifier.

1. A protection circuit for a switching mode power supply circuit which a voltage from a voltage input terminal is induced in first and second secondary coils of a transformer and a voltage is induced in a third secondary coil of the transformer for controlling ON/OFF switching of a switching transistor through a feedback circuit, the voltage induced in the first and second secondary coils being rectified by first and second rectifiers and outputted with first and second constant voltages, comprising:

a photodiode being connected to the second rectifier through a zener diode,

a first thyristor having an anode connected to the first rectifier;

a phototransistor which senses light produced by said photodiode;

a capacitor being connected to said phototransistor; and

a second thyristor being connected to said phototransistor; being connected to the power input terminal;

said thyristor being connected to the power input terminal;

said switching transistor being connected to the power input terminal through a diode; wherein

said ON.OFF switching operation of said switching transistor is interrupted when an overvoltage is outputted from said second rectifier, said overvoltage being a voltage higher than a zener voltage of said zener diode.

4,914,561

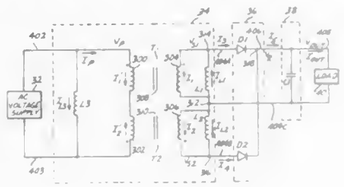
DUAL TRANSFORMER DEVICE FOR POWER CONVERTERS

Milton W. Rice, Seattle; Gary L. Bogue, Everett, and Jon P. Beutler, Arlington, all of Wash., assignors to Eldec Corporation, Lynnwood, Wash.

Filed Feb. 3, 1989, Ser. No. 306,443

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—126 15 Claims



1. A power converter comprising:

(a) a transformer device responsive to an AC voltage, said transformer device configured to function as both a transformer and as an energy storage device, said transformer device when functioning as said transformer acting to produce a plurality of substantially out-of-phase transformed voltages from said AC voltage and said transformer device when functioning as said energy storage device acting to store energy responsive to said AC voltage; and,

(b) switching means for rectifying said plurality of substantially out-of-phase transformed voltages and producing at lest one rectified voltage therefrom and for controlling said transformer device so that said transformer device discharges said energy stored therein through said switching means.

4,914,562

THERMAL JET RECORDING APPARATUS

Nobumasa Abe; Kiyoharu Momose; Koji Watanabe; Yuichi Nakamura; Tsuneo Handa, and Mitsutaka Nishikawa, all of Nagano, Japan, assignors to Seiko Epson Corporation, Japan

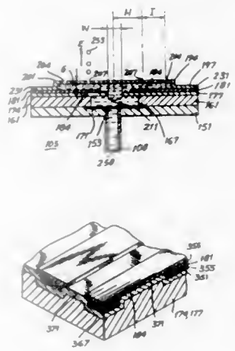
Filed Jun. 10, 1987, Ser. No. 60,206

Claims priority, application Japan, Jun. 10, 1986, 61-134187; Jun. 25, 1986, 61-148651; Jul. 15, 1986, 61-165751; Aug. 7, 1986, 61-185570; Sep. 11, 1986, 61-214322; Sep. 29, 1986, 61-230748

Int. Cl.[4] G01D *15/16;* **B41J** *3/04*

U.S. Cl. 346—140 R 1 Claim

1. A thermal ink jet recording apparatus comprising ink, heating elements for heating the ink and selected from the group of materials consisting of Ta-N-siO_2 and Ta-SiO_2 so that at least a portion of the entire surface of each heating element is disposed for direct contact with the ink, and a thin film



circuit including electrodes for supplying electricity to said heating elements, said heating elements disposed so as to cover said thin film circuit.

4,914,563

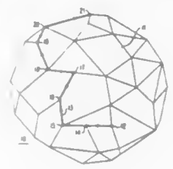
METHOD AND APPARATUS FOR OPTIMIZING SYSTEM OPERATIONAL PARAMETERS THROUGH AFFINE SCALING

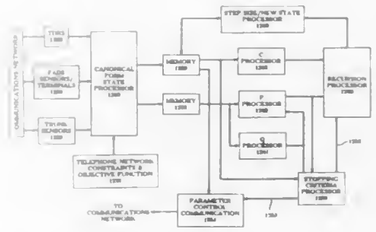
Narendra K. Karmarkar, North Plaintfield, and Jeffrey C. Lagarias, Summit, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 22, 1986, Ser. No. 899,046

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—148 14 Claims





1. Apparatus for optimizing the operational state of a system in accordance with a preselected operational criterion by adjusting values of operational parameters describing said state of

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said system, said operational parameters being adjustable within a preselected set of constraints, characterized by:

first means, responsive to a "true" activation control signal, for developing a tentative state-of-the-system signal representation based on said values of said operational parameters, and for scaling said tentative state-of-the-system signal representation in accordance with an affine scaling vector field that describes the direction of steepest descent in a transformed space to an optimum state of said system in consonance with said operational criterion;

second means responsive to said first means for developing a trajectory curve of order greater than one that approximates said vector field at said tentative state-of-the-system and for modifying said scaled tentative state-of-the-system signal representation to place said tentative state-of-the-system at a point along said curve to form a new tentative state-of-the-system;

third means responsive to said second means for developing said activation control signal, and setting it to "true" when said new tentative state of the system is not within a preselected stopping region, and setting it to "false" when said tentative state of the system is within said preselected stopping region; and

fourth means, responsive to said third means, for setting said operational parameters of said system in accordance with said tentative state-of-the-system when said activation control signal is "false".

4,914,564

ADAPTIVE CONTROL SYSTEM OF HIGH ACCURACY AND LOW CORRECTIVE ENERGY CONSUMPTION

Michael Surauer, Chieming, and Helmut Bittner, Munich, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschränkter Haftung, Ottobrunn, Fed. Rep. of Germany

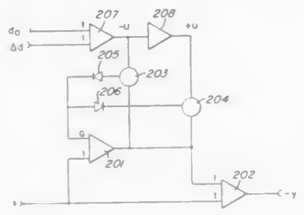
PCT No. PCT/DE87/00075, § 371 Date Oct. 28, 1987, § 102(e) Date Oct. 28, 1987, PCT Pub. No. WO87/05411, PCT Pub. Date Sep. 11, 1987

PCT Filed Feb. 27, 1987, Ser. No. 126,939

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1986, 3606640

Int. Cl.[4] G06F *1/00, 15/20*

U.S. Cl. 364—153 16 Claims



1. A control system comprising a main loop; said main loop comprising a controlled system generating an output in response to disturbances, comparison means connected to receive the output from the controlled system and a predetermined reference value and generate a deviation signal, a controller having an input connected to receive the deviation signal and having an output, a main deadband section connected to the controller output and having an input, and a final control element assembly connected to the deadband section and to the controlled system to reduce the effect on the controlled system of the disturbances; and an adaptive network connected between the controller output and the main deadband section input, said main deadband section having response threshold values adjustable between a preset fixed lower limit and a preset fixed upper limit; said adaptive network having means for deriving from the controller output signal or from the deviation signal and from averaging all signal components located within at least one selected frequency range thereof an adaptive signal, said adaptive network further having means for introducing said adaptive signal into the main deadband section for varying its threshold values in a continuous or discrete stepped manner between its lower and upper limits in accordance with a given functional relationship.

4,914,565

PIEZO-ELECTRIC TRANSDUCER HAVING ELECTRODES THAT ADHERE WELL BOTH TO CERAMIC AS WELL AS TO PLASTICS

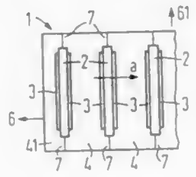
Manfred Schnoeller, Haimhausen; Jutta Mohaupt, Munich; Wolfram Wersing, Kirchheim, and Karl Lubitz, Ottobrunn, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 28, 1988, Ser. No. 187,337

Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717268

Int. Cl.[4] H04R *17/00*

U.S. Cl. 367—164 15 Claims



11. A piezo-electric transducer having a composite structure, which comprises at least the following sequence of layers: ceramic, electrode, plastic, and which

electrode material is an intrinsically conductive plastic and constructed from a monomer consisting of a compound chosen from the group of materials consisting of: five-membered heterocyclenes; aniline; azulene; derivatives of five-membered heterocyclenes, aniline, and azulene containing an element chosen from the group consisting of sulfur and nitrogen as heteroatom.

4,914,566

SHAFT POSITION DETECTOR AND CONTROL DEVICE

Edward M. Steutermann, 13305 Laurel Ct., Prospect, Ky. 40059

Continuation-in-part of Ser. No. 368,138, Jun. 14, 1989, which is a continuation-in-part of Ser. No. 258,165, Oct. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 78,639, Jul. 28, 1987, abandoned, which is a continuation-in-part of Ser. No. 917,419, Oct. 10, 1986, abandoned, which is a continuation-in-part of Ser. No. 653,288, Sep. 24, 1984, abandoned. This application Aug. 24, 1989, Ser. No. 398,383

Int. Cl.[4] G05B *11/00;* G01R *33/00*

U.S. Cl. 364—167.01 39 Claims

1. A control device to control the position of shaft means moveable between first and second limits to operate regulator means in a corrective direction to control a process condition within a control range including:

(a) feedback signal generator means to provide a process feedback signal reflective of said process condition;

(b) set point generator means to generate first and second set point signals defining said control range between said first and second set point signals within which it is desired to maintain said process condition;

(c) comparator means to compare said process feedback signal and said first set point signal and provide a first relation signal when said process feedback signal and said first set point signal are in selected relationship and compare said process feedback signal and said second set point signal to provide a second relation signal when said second set point signal and said process feedback signal are in selected relationship;

(d) counter means having counter output means to provide a counter generated multidigit binary number output signal; input means to receive said first and second signals; clock means to increase said counter generated multidigit binary number output at selected rate in response to receipt of one of said first and second signals and to decrease said multidigit binary number output signal at selected rate in response to the other of said first and second signals;

(e) binary number comparator means having first multidigit signal input means to receive said counter generated multidigit binary number output signal, second signal input means to receive a second mulitdigit binary number; first output means to provide an equal comparator signal when said counter generated multidigit binary number received at said first multidigit signal input means and said second multidigit binary number received at said second signal input means are equal, first mismatch comparator signal when said counter generated multidigit binary number received at said first signal input means exceeds said second multidigit binary number received at said second signal input means and second comparator mismatch signal when said counter generated multidigit binary number received at said first signal input means is exceeded by said second multidigit binary number received at said second signal input means;

(f) position indicator means to indicate the position of said shaft between said first and second limits in segments of the travel path of the shaft where a different multidigit binary number is generated for each segment of the travel path where said shaft is operated by actuator means and moves in said travel path in first direction toward said first limit to operate said regulator means to adjust said process condition in a first direction and said actuator moves said shaft in said travel path in a second direction toward said second limit to operate said regulator means to adjust said process condition in a second direction wherein said position indicator means includes output means to generate said second multidigit binary numbers to said second signal input means in binary sequential order to indicate the position of said element in said travel path;

(g) motive means to selectively operate said actuator to move said shaft and regulator means in said first and second directions;

(h) motive means control means to receive said equal signal, said first mismatch signal and said second mismatch signal and operate said motive means to move said shaft in said first direction in response to one of said first and second mismatch signals and operate said motive means to move said shaft in said second direction in response to the other of said first and said second mismatch signals;

4,914,567

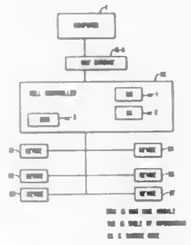
DESIGN SYSTEM USING VISUAL LANGUAGE

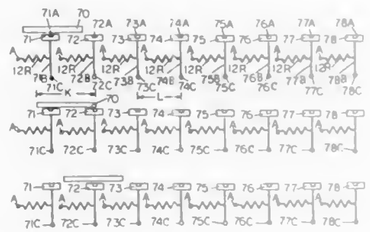
Thomas A. Lipkis, Topanga; William S. Mark, San Carlos, and Melvin W. Pirtle, Santa Monica, all of Calif., assignors to Savoir, Hayward, Calif.

Continuation-in-part of Ser. No. 115,473, Nov. 2, 1987, abandoned. This application Oct. 24, 1988, Ser. No. 261,953

Int. Cl.[4] G06F *15/00*

U.S. Cl. 364—188 15 Claims





1. An apparatus for designing and debugging a control system comprising in combination:

means for preparing a specification of said control system, including means for developing requirements for said control system and for documenting said control system requirements;

means coupled to said preparing means to receive said specification for designing and organizing said control system as an abstraction with abstraction documentation;

means coupled to receive said abstraction and said specification for developing said control system including means for implementing said abstraction as a design implementation and means for generating design implementation documentation to produce a developed system;

means for simulating and emulating said control system, including means coupled to receive said design implementation for activating said design implementation in an artificial environment to demonstrate control system dynamics;

means for debugging said system, including means for isolating and correcting cause of undesired behavior using simulation techniques to anticipate eventual behavior;

means coupled to receive said developed system for translating and transferring said developed system into an operational system;

means for integrating and checking out said control system in an operating environment, including means coupled to said operational system for verifying that each element of said operational system interacts and cooperates properly with the other ones of said elements;

means coupled to said operational system for monitoring and interacting with said operational system;

means coupled to said operational system for diagnosing malfunctions of devices and undesired behavior in said operational system; and

means coupled to said diagnosing means, to said monitoring means and to said debugging means to receive said specification for modifying said operational system by modification of said specification.

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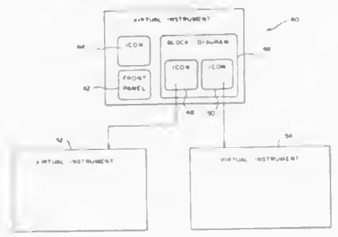
4,914,568

GRAPHICAL SYSTEM FOR MODELLING A PROCESS AND ASSOCIATED METHOD

Jeffrey L. Kodosky; James J. Truchard, both of Austin, Tex., and John E. MacCrisken, Palo Alto, Calif., assignors to National Instruments, Inc., Austin, Tex.

Filed Oct. 24, 1986, Ser. No. 923,127
Int. Cl.[4] G06F *15/46, 3/153*
U.S. Cl. 364—200 28 Claims



1. A method for programming a computer system including means for displaying images on a screen to control at least one of a virtual instrument and an instrument, the method comprising the steps of:

providing a class of respective function-icons that reference respective control means for controlling respective functions;

selecting from the class of function-icons at least one first function-icon that references at least one first control means for controlling a first function;

providing a class of respective variable-icons wherein each respective variable-icon references a respective variable, the class of variable-icons including a strip chart-icon that displays past and present values of a variable and that references strip chart control means for storing past and present values for a variable;

selecting at least one first input variable-icon from the class of variable-icons;

selecting the strip chart-icon from the class of variable-icons;

assembling on the screen a first front panel including the at least one first input variable-icon and the strip-chart-icon; and

assembling on the screen a first data flow diagram including the at least one first function-icon and the at least one first input variable-icon and the strip chart-icon, wherein the first diagram displays a first procedure for producing at least one value for the strip chart-icon from at least one value for the at least one first input variable-icon.

4,914,569

METHOD FOR CONCURRENT RECORD ACCESS, INSERTION, DELETION AND ALTERATION USING AN INDEX TREE

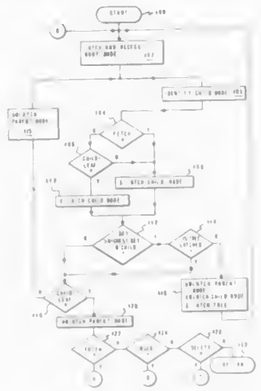
Frank E. Levine, Austin, Tex., and Chandrasekaran Mohan, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1987, Ser. No. 115,146
Int. Cl.[4] G06F *15/40*
U.S. Cl. 364—200 10 Claims

1. In a data processing system, a method executed by a data processor for fetching key record data stored in a data processing memory in a group of record keys by using a portion of a key record through an index tree during a transaction in the data processing system wherein other transactions may concurrently access said record keys through said index tree, said index tree having at least a root node, at least one intermediate level of at least one node, each node having a key record reference to one or more nodes in a next lower ordered level of nodes and having bottom nodes that provide access to said key record data, said method comprising the steps of:

(a) traversing across said nodes in said data processing memory from said root node through said intermediate level of nodes by accessing a node using said key record portion of the root node and traversing to a next node indicated by said key record portion of the accessed node until a bottom node is reached;

(b) limiting all but read accesses to the node being accessed and an immediate previously accessed node in said data



processing memory, to other concurrent transactions in said data processing system;

(c) identifying and accessing said key record in said bottom node;

(d) limiting all but read accesses to said key record;

(e) removing all access limitations to the accessed nodes including the bottom node except for the accessed key record;

(f) fetching key record data; and

(g) removing the access limitation to the key record after the record data has been fetched.

4,914,570

PROCESS DISTRIBUTION AND SHARING SYSTEM FOR MULTIPLE PROCESSOR COMPUTER SYSTEM

J. Kent Peacock, San Jose, Calif., assignor to Counterpoint Computers, Inc., San Jose, Calif.

Continuation of Ser. No. 907,568, Sep. 15, 1986, abandoned. This application Jul. 21, 1988, Ser. No. 223,729
Int. Cl.[4] G06F *13/00, 9/30*
U.S. Cl. 364—200 13 Claims

1. A computer system, comprising:

a multiplicity of distinct central processing units (CPUs), each having a separate, local, random access memory means to which said CPU has direct access;

at least one interprocessor bus coupling said CPUs to said multiplicity of memory means, so that each CPU can access both its own local memory means and the memory means of the other CPUs;

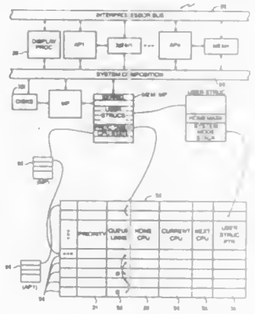
run queue means coupled to said CPUs for holding a separate run queue for each of said CPUs; each said run queue holding a list of the processes waiting to run on the corresponding CPU;

process creation means in at least one of said CPUs for creating new processes, for assigning one of said CPUs as the home site of each new process, and for installing said new process in the local memory means for said home site; and

cross processor call means in each of said CPUs for temporarily transferring a specified process from its home site to another one of said CPUs, for the purpose of performing a task which cannot be performed on said home site, said cross processor call means including means for:

(a) placing said specified process on the run queue of said other CPU;

(b) continuing the execution of said specified process on said other CPU, using the memory means for said specified process's home site as the resident memory for said



process and using said interprocessor bus means to couple said other CPU to said home site memory means, until a predefined set of tasks has been completed; and then

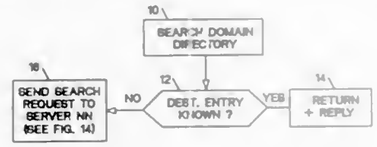
(c) upon completion of said predefined set of tasks, automatically returning said specified process to its home site by placing said specified process on the run queue of said specified process's home site, so that execution of the process will resume on said specified process's home site.

4,914,571

LOCATING RESOURCES IN COMPUTER NETWORKS

Alan E. Baratz, Chappaqua, N.Y.; Inder S. Gopal, Fort Lee, N.J.; James P. Gray, Chapel Hill, N.C.; George A. Grover, Mahopac; Jeffrey M. Jaffe, Monsey, both of N.Y.; Jean A. Lorrain; Melinda R. Pollard, both of Raleigh, N.C.; Diane P. Pozefsky; Mark Pozefsky, both of Chapel Hill, N.C., and Lee M. Rafalow, Durham, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 15, 1987, Ser. No. 62,269
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 24 Claims



1. In a computer network which includes a plurality of end nodes and at least one server node, each of said nodes having a directory of resources associated with the node and each of said end nodes being associated with a server node, a method of locating a resource in response to a request by a requesting node, said requesting node being either an end node or a server node, said method being performed by computers in the network and comprising the steps of:

(a) searching the directory of the requesting node for an entry indicating the requested resource is resident at the requesting node;

(b) if no such entry is found in the requesting node directory and if the requesting node is an end node, then searching the directory of the server node for the requesting node for any entry indicating the location of the resource; and

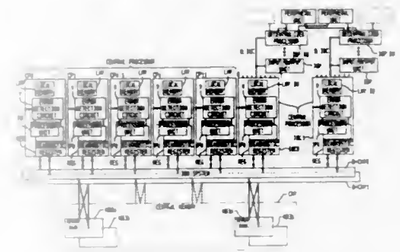
(c) if no such entry is found in the server node directory or of the requesting node is a server node, then searching the directories of end nodes associated with the server node for an entry indicating the resource is resident at one of said end nodes.

4,914,572

METHOD FOR OPERATING AN ERROR PROTECTED MULTIPROCESSOR CENTRAL CONTROL UNIT IN A SWITCHING SYSTEM

Rudolf Bitzinger, Munich; Walter Engl, Feldkirchen; Siegfried Hummel, Peuzberg, and Klaus Schreier, Peuzberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany and Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 11, 1987, Ser. No. 24,759
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608261; Jul. 28, 1986, 3625498
Int. Cl.[4] G06F *11/00, 15/16*
U.S. Cl. 364—200 10 Claims



1. A method of operating an error protected high availability multiprocessor serving as a central controller of a switching system providing inter-connections to subscribers, particularly a telephone switching system, the central controller comprising:

(a) a plurality of central processors (CP, IOC), each central processor including dual, apart from a possible tolerable timing slip, parallel synchronously driven processor units (PU) for carrying out the inter-connections to subscribers connected to said switching system, including at least one integral error detection circuit (V) for immediately checking instructions processed by both of the dual processor units (PU) of the respective processor, and including a local memory (LMY, LMY:10) having a ROM-section, storing test program sections for self testing of the respective processor (CP, IOC), and storing switching program sections required most frequently and most quickly by the respective processor (CP, IOC),

(b) a central main memory (CMY) including a ROM-area storing at least seldom and not immediately required (CP, IOC) switching program sections, and including a memory-area storing at least temporarily data accessible for a number of or for all processors (CP, IOC), whereby such data concern inter-connections between subscribers and concern peripheral system elements, and

(c) a central bus system (B:CMY) to which are connected in parallel the processors (CP, IOC) and the main memory (CMY), after detecting an error by at least one of the error detection circuits (V) or a processor (CPx, for example), at least if this error is not immediately correctable, the method comprising the steps:

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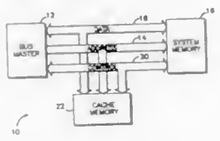
(a) isolating the respective processor (CPx) from the bus system (B:CMY);
(b) starting to read-out test program sections stored in ROM-section of its own local memory (LMY, LMY:IO) by the respective processor (CPx); and
(c) processing this test program for localization and identification of the error and a defect causing such errors by the respective processor (CPx).

4,914,573

BUS MASTER WHICH SELECTIVELY ATTEMPTS TO FILL COMPLETE ENTRIES IN A CACHE LINE

Hunter L. Scales, III, Austin; William C. Moyer, Dripping Springs, and Donald C. Anderson, Austin, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 5, 1987, Ser. No. 105,854
Int. Cl.[4] G06F *9/34, 12/04, 13/16*
U.S. Cl. 364—200 10 Claims



1. In a data processing system having a bus master for controlling transferring a predetermined operand from a system memory into an entry in a line of a cache memory via a data bus, wherein the predetermined operand or a portion thereof provided by the system memory during an initial bus cycle is insufficient in size or alignment to fill said entry, the bus master comprising:

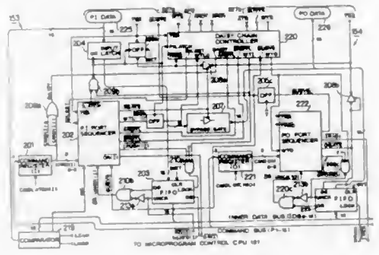
a data translator having a programmable logic device for indicating at least a portion of an address where the predetermined operand is to be written in the cache memory, for receiving a first size signal indicating bit size of the predetermined operand, and for receiving a second size signal indicating data port size between the bus master and system memory, and in response thereto, said programmable logic device providing an output control signal having a predetermined value corresponding to said input data and for use by the system, said output control signal indicating that an immediately subsequent bus cycle is an additional bus cycle line of the cache memory and which controls the subsequent filling of the entry by coupling data from the system memory which is required to fill the entry in the cache line, said data translator also detecting completion of the filling of the entry and providing an entry fill cycle complete signal in response thereto, said entry fill cycle complete signal being used by the system to set valid a predetermined valid entry bit in said cache line.

4,914,574

DATA TRANSMISSION APPARATUS HAVING CASCADED DATA PROCESSING MODULES FOR DAISY CHAIN DATA TRANSFER

Hiroaki Terada, Osaka; Katsuhiko Asada, Hyogo; Hiroaki Nishikawa, Osaka; Kenji Shima, Hyogo; Shinji Komori, Hyogo; Mitsuo Meichi, Hyogo; Masahisa Shimizu, Osaka; Soichi Miyata, Nara, and Hajime Asano, Osaka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo; Sharp Corporation, Osaka; Matsushita Electric Industrial Co., Ltd., Osaka and Sanyo Electric Co., Ltd., Osaka, all of, Japan

Division of Ser. No. 765,970, Aug. 15, 1985, Pat. No. 4,833,605. This application Dec. 20, 1988, Ser. No. 286,874
Claims priority, application Japan, Aug. 16, 1984, 59-172109; Nov. 20, 1984, 59-247501
Int. Cl.[4] G06F *13/42, 13/14, 15/16*
U.S. Cl. 364—200 11 Claims



1. A data transmission apparatus, comprising:

a plurality of data processing modules connected in cascade, each data processing module including,

a parallel input port connected to a parallel input data bus for receiving input data and an input control line for exchanging input control signals with the previously connected data processing module,

a parallel output port connected to a parallel output data bus for transmitting output data and an output control line for exchanging output control signals with the next connected data processing module,

gate means connected between said input port and said output port for bypassing data from said input port to said output port,

an input port sequencer coupled to said input port for determining and controlling data transfer sequencing from said input port in response to a received input control signal,

an output port sequencer coupled to said output port for determining and controlling data transfer sequencing from said output port and generating an output control signal,

a daisy chain controller coupled to said gate means for controlling the operation thereof, connected to said input and output control lines for receiving said input and output control signals from adjacently connected data processing modules and generating an input control signal and a daisy chain transfer control line, and

a command unit for generating and sending sequencing commands to said input and output port sequencers and daisy chain transfer commands to said daisy chain controller via said daisy chain transfer control line;

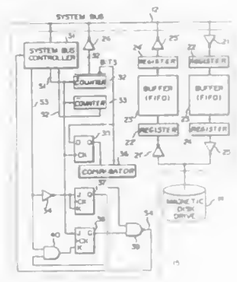
said plurality of data processing modules conducting daisy chain transfer of data or data blocks for selective, load distribution, and collective data transfer configurations.

4,914,575

SYSTEM FOR TRANSFERRING DATA BETWEEN AN INTERLEAVED MAIN MEMORY AND AN I/O DEVICE AT HIGH SPEED

Jun-ichi Kihara, and Hiroyuki Kaneko, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 27, 1987, Ser. No. 89,988
Claims priority, application Japan, Aug. 28, 1986, 61-202075
Int. Cl.[4] G06F *12/06, 13/28*
U.S. Cl. 364—200 13 Claims



1. A channel apparatus, connected by an m bit data bus to a memory section having a plurality of memory banks under interleaving control in units of m times n bits, each respective memory bank having predetermined memory addresses assigned to the respective memory bank, the memory banks for outputting data blocks in response to a sequence of memory addresses such that any moment in the sequence may be defined by a current memory address and a previous memory address in the sequence of memory addresses, said channel apparatus comprising:

address output means, connected to the plurality of memory banks for outputting the previous memory address in the sequence of memory addresses to said memory section in response to an address output instruction, for generating the current memory address in the sequence of the memory addresses, and for retaining the current memory address;

comparing means for comparing the current memory address with the previous memory address to determine whether the current memory address and the previous memory address are assigned to the same respective memory bank, and for generating a noncoincidence signal when the current memory address and the previous memory address are not assigned to the same respective memory bank;

counting means for counting a number of memory addresses output from said address output means, in response to the noncoincidence signal from said comparing means, for counting a number of the data blocks output by said memory section, and for generating an inhibition instruction until the counted number of data blocks reaches the counted number of memory addresses, whereby the channel apparatus determines that a full m times n bits of memory address have been read to the respective assigned memory bank;

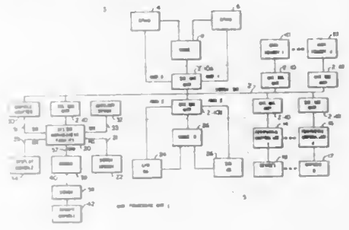
control means, connected to the address output means, the comparing means the counting means, for generating and outputting the address output instruction to said address output means in response to a data transfer command, and for inhibiting generation of the address output instruction in response to the inhibition instruction from said counting means, whereby each respective memory bank reads data in the same sequence as said sequence of the m times n bit memory addresses.

4,914,576

APPARATUS AND METHOD OF LOADING A CONTROL STORE MEMORY OF A CENTRAL SUBSYSTEM

Richard C. Zelley, North Chelmsford, Mass.; Mark J. Kenna, Jr., Merrimack, N.H., and Wallace A. Martland, deceased, late of Amherst, N.H. (by Sheila M. Martland, administratrix), assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Dec. 18, 1986, Ser. No. 943,980
Int. Cl.[4] G06F *9/30, 13/14*
U.S. Cl. 364—200 2 Claims



1. The method by which a system management facility subsystem (SMFS) of a data processing system (DPS) loads a volatile control store of a central processor unit (CPU) of a central subsystem (CSS) of the DPS with a firmware program to control the operation of the CPU, said CSS including an address counter said DPS further including a volatile main memory subsystem (MMS); a peripheral subsystem (PSS) which includes a nonvolatile disk storage unit; a system bus (SB); and a plurality of system bus interface units (SBIU)s which couple each subsystem of the DPS to the SB to permit communication between subsystems of the DPS; the SBIU of the CSS including a port, said port being coupled to the CPU of the CSS, said port including a syndrome register in which is stored a CPU present signal indicating that the CPU coupled to the port is operational, hardware revision number signals identifying the firmware program for the CPU, and a signal for indicating that an error has occurred in the loading of the control store; each of said subsystems and units of the DPS being assigned a unique identifying channel number; said method comprising the SMFS executing the steps of;

(1) obtaining from the syndrome register of the port of the SBIU of the CSS the signals stored in the syndrome register;

(2) checking the CPU present signal obtained from the syndrome register of said port to determine that the CPU of said port is operational, said port hereinafter being identified as the selected port;

(3) using the hardware revision number signals obtained from the syndrome register of the selected port to generate the channel number of the disk storage unit of the PSS in which the firmware program for the CPU of the selected port is stored;

(4) sending to the MMS the address of a starting memory location into which the firmware program for the CPU of the selected port stored in said disk storage unit is to be written;

(5) transferring said firmware program from the disk storage unit to the MMS and storing said firmware program in the MMS beginning at said starting memory location;

(6) sending a load mode command to the selected port;

(7) transmitting through the selected port to the address counter of the CSS a starting address of the control store of the CPU into which the firmware program stored in the MMS in step (5) is to be loaded;

(8) issuing commands to the MMS to transmit the firmware program written into it in step (5) to the selected port for loading the firmware program into the control store be-

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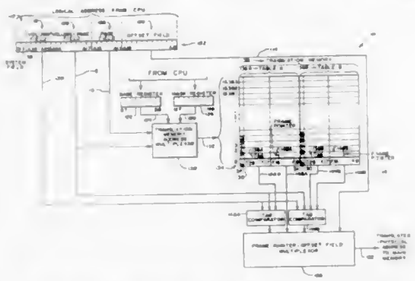
ginning at the starting address loaded into the address counter in step (7);
(9) checking to determine if an error occurred in loading the firmware program into the control store in step (8); and
(10) terminating the method if no error occurred in loading the firmware program into the control store in step (8).

4,914,577

DYNAMIC MEMORY MANAGEMENT SYSTEM AND METHOD

Darryl J. Stewart, Provo; Randall J. Rorden, and Mark Muhlestein, both of Orem, all of Utah, assignors to ICON International, Inc., Orem, Utah

Filed Jul. 16, 1987, Ser. No. 74,310
Int. Cl.[4] G06F *12/10*
U.S. Cl. 364—200 **43 Claims**



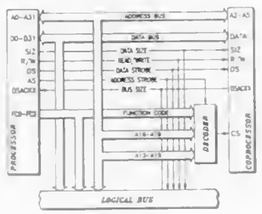
1. In a digital computing system for simultaneously processing a plurality of processes, which processes are of various sizes which require differing amounts of utilization of main memory within said digital computing system, and wherein said digital computing system comprises a logical address generating device and a system managing software program for controlling overall system operation, an improved memory management system comprising:
a translation memory means for storing a plurality of addressable entries each containing address information used in mapping logical addresses input from said logical address generating device into corresponding physical addresses which identifiy portions of said main memory, said translation memory means operating under control of said system managing software program so as to periodically group said entries into groups corresponding in size to the memory requirement of each said process that is actively being processed by said digital computing system each time a new process begins to be actively processed;
first register means, operating under control of said system managing software program, for temporarily storing and outputting the number of entries grouped for each said process;
second register means, operating under control of said system managing software program, for temporarily storing and outputting an entry address for each said process which identifies the location within said translation memory means at which a corresponding group of entries allocated to said process is to be found;
translation memory address means for selecting an address of a specific entry stored within said translation memory means in response to a first portion of said logical address input from said logical address generating device, and in response to the outputs from said first and second register means, said address of said specific entry being output from said translation memory address means to said translation memory means; and
means for receiving from said translation memory means the address information used in mapping logical addresses into corresponding physical addresses for said specific entry, and for receiving a second portion of said logical address and deriving from said second portion and said address information output from said translation memory means a corresponding physical address of said main memory.

4,914,578

METHOD AND APPARATUS FOR INTERRUPTING A COPROCESSOR

Douglas B. MacGregor; David Mothersole, and John Zolnowsky, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 485,811, Apr. 18, 1983, abandoned.
This application Jan. 31, 1986, Ser. No. 825,682
Int. Cl.[4] G06F *9/46, 15/16*
U.S. Cl. 364—200 **24 Claims**



1. A first data processor adapted for coordinating the execution by a second data processor of a selected instruction received by said first data processor for execution thereby, the first data processor comprising:
first means for receiving said instruction;
second means for commanding said second processor to execute said received instruction;
third means for selectively interrupting said second processor during said execution of said instruction by said second processor; and
fourth means for storing the state of said second processor at the time of said interruption.

4,914,579

APPARATUS FOR BRANCH PREDICTION FOR COMPUTER INSTRUCTIONS

Michael Putrino, Endicott; Stamatis Vassiliadis, Vestal; Ann E. Huffman, Johnson City, and Agnes Y. Ngai, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 17, 1988, Ser. No. 157,474
Int. Cl.[4] G06F *9/00, 9/32*
U.S. Cl. 364—200 **6 Claims**

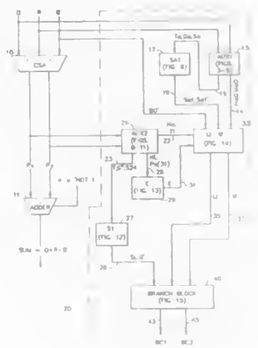
1. In a computing system which executes a multipath sequence of instructions including a branching instruction by producing and manipulating signed, N-bit operands, and includes an arithmetic/logic unit for executing said branching instruction by subtraction of a compare operand, B, having a sign bit **B(0)**, from the sum of a current value operand, Q, having a sign bit **Q(0)** and an operand, R, having a sign bit **R(0)**, wherein the improvement to said computing system is for predicting the outcome of the execution of said branching instruction concurrently with said execution, the improvement comprising:
first logic circuit means receiving said operands Q and R for determining a sign bit, **A(0)**, of the SUM of said operand Q and said operand, R;
means for providing said operand B in complement format;
a carry-save-adder receiving said operands Q and R and the one's complement of said operand B, said carry-save-adder for providing two N-bit output signals, Px and Py, said carry-save-adder including logic gates for producing Px and Py by executing the formula

$$Px(i) = Q(i) \vee R(i) \vee B(i)'$$

and the formula,

$$Py(i) = (Q(i).R(i)) \mid (Q(i).B(i)') \mid (R(i).B(i)')$$

where
Q(i) is the ith bit of operand Q,
R(i) is the ith bit of operand R,
B(i)' is the ith bit of the one's complement of operand B,
Px(i) is the ith bit of said output signal Px,
Py(i) is the ith bit of said output signal Py and



i is an integer, and $0 \leq i \leq N-1$;
second logic circuit means connected to said carry-save-adder and responsive to Px and Py for determining the sign bit SUM_0, resulting from the subtraction of said operand B from the SUM of said operands Q and R;
third logic circuit means connected to said carry-save-adder for determining when the SUM of operands Q and R is equal to operand B, said third logic circuit means including logic gates for executing the equation

$$E = (Px(0) \vee Py(1))\,(Px(1) \vee Py(2))\,\ldots\,(Px(N-2) \vee Py(N-1))\,Px(N-1)$$

where E is a logical one when said SUM is equal to operand B,
N is an integer equal to the numb of bits in Px and Py, and
0 is the most significant bit of Px and Py; and
branch block circuit means connected to said first, second, and third logic circuit means for determining if said third binary word subtracted from the SUM of said first and second binary words is less than or equal to zero, said means including logic gates for executing the formula:

$$(A \leqq B) = (A(0)'\cdot B(0)'\cdot SUM(0)) \mid (A(0)\cdot B(0)\cdot SUM(0)) \mid (A(0)\cdot B(0)') \mid E$$

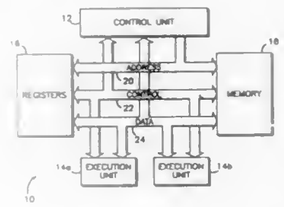
where $(A \leqq B)$ is a logical one when said third binary word being subtracted from the SUM of said first and second binary words is less than or equal to zero.
A(0)' is the inverse of A(0), and
B(0)' is the inverse of B(0).

4,914,580

COMMUNICATION SYSTEM HAVING INTERRUPTS WITH DYNAMICALLY ADJUSTED PRIORITY LEVELS

Craig W. Jensen, Aberdeen, and Frederick R. Keller, Jackson, both of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Oct. 26, 1987, Ser. No. 112,581
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **10 Claims**



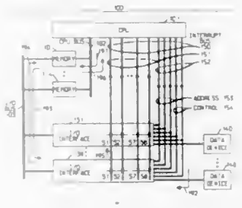
1. A communication system including a processor connected over an interrupt bus to a plurality of interfaces, wherein said bus comprises
a processor outbound bus for signaling a command from said processor to an addressed interface;
a processor inbound bus having a plurality of leads including one lead for each interface of said plurality of interfaces, each lead assigned a fixed priority level by said processor for signaling an interrupt from an interface to said processor;
said processor comprising
means for sending over said outbound bus a command to each interface specifying a connection between each interface and a different lead of said inbound bus; and
each interface comprising
switching means for connecting to anyone of said plurality of leads of said inbound bus,
means for detecting on said outbound bus a received command addressed to said each interface, and
means responsive to said received command for enabling said switching means to establish a connection to a lead of said inbound bus as specified in said received command.

4,914,581

METHOD AND APPARATUS FOR EXPLICITLY EVALUATING CONDITIONS IN A DATA PROCESSOR

Yoav Talgam, Tel Aviv, Israel; Mitch K. Alsup, Dripping Springs, and James A. Klingshirn, Austin, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 26, 1987, Ser. No. 112,597
Int. Cl.[4] G06F *7/38, 15/16*
U.S. Cl. 364—200 **2 Claims**



1. A method for comparing a first operand to a second operand comprising the steps of:

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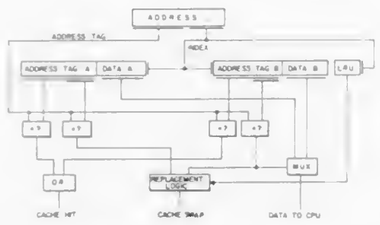
EXCLUSIVE ORing the first operand and the second operand;
subtracting the first operand from the second operand to provide a signed difference;
generating a first set of condition codes comprising:
ZERO (Z) if the first and second operands are logically identical
CARRY (C) if the second operand is larger than the first operand; and
SIGN (S) if the difference is positive; and
logically combining the first set of condition codes to produce a second set of condition codes, whereby said second set of condition codes represents a logical truth value of the combination of each of a number of different logical predicates, said second set of condition codes comprising:
Equal (EQ) if the first operand is equal to the second operand;
Not Equal (NE) if the first operand is not equal to the second operand;
Greater Than (GT) if the first operand is greater than the second operand;
Greater than or Equal (GE) if the first operand is greater than the second operand;
Less than or Equal (LE) if the first operand is less than or equal to the second operand; and
providing the second set condition codes, as respective bits of a data operand, to any one of a predetermined number of data registers, whereby execution of a subsequent explicit evaluate instruction will not overwrite a previously generated second set of condition codes.

4,914,582

CACHE TAG LOOKASIDE

William R. Bryg, Saratoga, and Russell Kao, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 27, 1986, Ser. No. 879,707
Int. Cl.[4] G06F *12/08*
U.S. Cl. 364—200 **7 Claims**



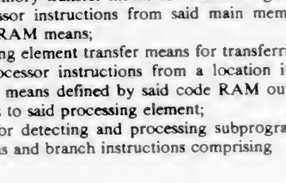
1. A method of retrieving requested data from a multi-set cache memory in a computer system comprising a processor, a main memory and a multi-set cache memory, said multi-set cache memory having a plurality of cache memory sets and said method comprising the steps of:
(a) presenting an address from the processor to the cache memory, said address including an index;
(b) accessing the cache memory utilizing said index to generate an output from each cache memory set of the plurality of cache memory sets, the output from each cache memory set comprising a block corresponding to said index from each cache memory set from the plurality of cache memory sets, said block from each cache memory set including an address tag and associated data;
(c) comparing a portion of a first address tag from a first block from a first cache memory set in the plurality of cache memory sets, with a corresponding portion of said address; and
(d) in the event said comparison results in a match, providing the associated data associated with the address tag for which there is a match, to the processor.

4,914,583

METHOD OF INDICATING PROCESSES RESIDENT WITHIN A CELL OF A DATA PROCESSING SYSTEM

Bernhard P. Weisshaar, Toronto, and Michael Barnea, Willowdale, both of Canada, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 13, 1988, Ser. No. 181,024
Int. Cl.[4] G06F *13/14*
U.S. Cl. 364—200 **12 Claims**



1. In a distributed data processing system comprising a plurality of individual cells, a method of determining whether a given process is resident within one of said cells, said method comprising the steps of:
(a) providing in each of said plurality of cells a table of resident processes, said table comprising the names of processes resident within said cell;
(b) sending a discovery message from a first cell to a second cell, said discovery message comprising the name of said given process and the location of said first cell; and
(c) determining whether the table of resident processes for said second cell contains the name of said given process;
(i) if said given process is resident within said second cell, informing said first cell of the location of said second cell; and
(ii) if said process is not resident within said second cell, sending said discovery message to successive different cells in said system, until one cell's table of resident processes contains the name of said given process, in which case said first cell is informed of the location of said one cell, or until said discovery message has been received by all other cells in the system without finding the name of said given process in any table of resident processes, in which case said first cell is informed that said given process is not located in any cell of said system.

4,914,584

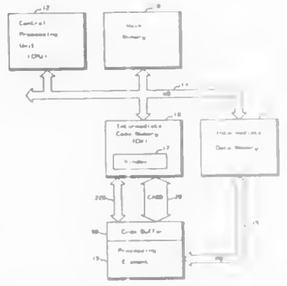
RULES AND APPARATUS FOR AN INTERMEDIATE CODE MEMORY THAT BUFFERS CODE SEGMENTS

Glenn A. Gibson, 4824 Ballerina, El Paso, Tex. 79922

Filed Oct. 17, 1988, Ser. No. 258,843
Int. Cl.[4] G06F *9/38, 9/40, 9/42*
U.S. Cl. 364—200 **12 Claims**

1. An intermediate code memory located between a main memory and a processing element of a computer, comprising:
code RAM means for temporarily storing processor instructions, said code RAM means having input addressing means and output addressing means;
main memory transfer means for transferring a segment of processor instructions from said main memory to said code RAM means;
processing element transfer means for transferring a stream of processor instructions from a location in said code RAM means defined by said code RAM output address means to said processing element;
means for detecting and processing subprogram calls and returns and branch instructions comprising

stack means for storing code RAM output addresses,
stack transfer means for transferring the contents of said code RAM output addressing means to said stack means,
code RAM address transfer means for transferring an output of said stack means to said code RAM output addressing means,
instruction transfer means for transferring an address within a branch instruction to said code RAM output addressing means,



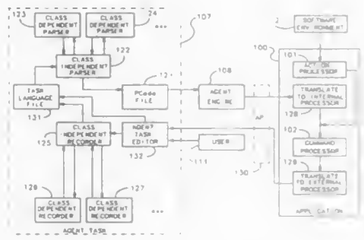
first control means for detecting subprogram call instructions and activating said stack transfer means, and
second control means for detecting subprogram return instructions and activating said code RAM address transfer means,
third control means for detecting branch instructions and activating said instruction transfer means; and
means for removing said subprogram call and said subprogram return and said branch instructions from said instruction stream before said processor instructions are transferred to said processing element.

4,914,585

MODULAR COMPLIER WITH A CLASS INDEPENDENT PARSER AND A PLURALITY OF CLASS DEPENDENT PARSERS

Barbara B. Packard, Los Altos Hills; Glenn Stearns, Scotts Valley, and Ralph T. Watson, San Jose, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 23, 1988, Ser. No. 197,795
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—200 **10 Claims**



1. In a computing system having a plurality of applications and a primary executing program, a modular compiler comprising:
a class independent parser for parsing program code which includes commands to be executed by the primary executing program;
a plurality of class dependent parsers, each class dependent parser for parsing program code which includes commands to be executed by one application from the plurality of applications, each class dependent parser being added to the modular compiler and logically coupled to the class independent parser when an application for which that class dependent parser parses program code which includes commands to be executed by the application is added to the computing system, and each class dependent parser being removed from the modulator compiler when the application is removed from the computing system.

4,914,586

GARBAGE COLLECTOR FOR HYPERMEDIA SYSTEMS

Daniel C. Swinehart, Palo Alto, and Douglas B. Terry, San Carlos, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 6, 1987, Ser. No. 118,493
Int. Cl.[4] G06F *12/00, 15/62*
U.S. Cl. 364—200 **1 Claim**

1 In a hypermedia distributed computing system including a communications medium,
a plurality of workstations coupled to said communications medium for enabling users to transfer digital textual data back and forth between said workstations,
a file server coupled to said communications medium for storing digital non-textual data files representing human perceivable information,
transducer means proximate certain of said workstations, said transducer means being coupled to said communications medium for enabling users to record uniquely named non-textual data files on said file server and to playback such files subject to access authorization, and
management means coupled to said communication medium and to said file server, said management means including a database system including a database of uniquely named reference entries referring by file name and time interval to said non-textual data files, whereby users may be given selective access to selected ones and selected parts of selected ones of said non-textual data files by embedding the reference entry names corresponding thereto in textual data distributed to selected users via said communication medium;
the improvement comprising
a database of user registered interest entries in said database system, with each of said interest entries identifying the reference entry to which it pertains, the user responsible for registering said interest entry, and a unique user assigned reference value,
means coupled to said database of user registered interest entries for periodically enumerating all of the registered interest entries and for deleting any interest entries found to be no longer valid,
means coupled to said database of reference entries for periodically enumerating said reference entries and for deleting any reference entries of more than minimum age that have no interests referring to them, and
means coupled to said file server for deleting from said file

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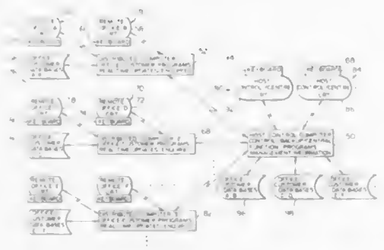
server any non-textual files that have no references referring to them, thereby reclaiming storage space occupied by obsolete files.

4,914,587

FINANCIAL DATA PROCESSING SYSTEM WITH DISTRIBUTED DATA INPUT DEVICES AND METHOD OF USE

Larry R. Clouse, Macurgie, Pa., assignor to Chrysler First Information Technologies, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 750,912, Jul. 1, 1985, Pat. No. 4,774,664. This application Aug. 7, 1987, Ser. No. 83,845
The portion of the term of this patent subsequent to Sep. 27, 2005, has been disclaimed.
Int. Cl.[4] G06F *15/30*
U.S. Cl. 364—408 **20 Claims**



1. A financial data processing system comprising:
central processing means, including a data bank into which data is written and from which data is read, said data including financial credit transaction information representing the balance outstanding for each credit transaction, the finance charge payable for each credit transaction, the amount due and payable for each periodic payment on said credit transaction, the identity of each obligor of said credit transaction, and the delinquency of payment, if any, on each credit transaction;
a first level of distributed processing means including plural first terminal means coupled to said central processing means selectively operable to write into said data bank updated financial credit transaction information;
a second level of distributed processing means including plural second terminal means coupled to the first level of distributed processing means, each second terminal means being operable by an operator to write to said first level of distributed processing means and thence into the data bank updated financial credit transaction information;
each second terminal means having means for writing during a single operation to said first level of distributed processing means a batch of credit transaction payment data representing payment amounts and the identities of respective obligors for a batch of credit transaction payments;
storage means associated with the first and second levels of distributed processing means, respectively, each of the first and second levels of distributed storage means being operable to store therein the updated financial credit transaction information written from the first or second plural terminal means; and
plural display means coupled to the second level of distributed processing means to display data stored in the central data bank and in the storage means associated with the first and second levels of distributed processing means, including credit transaction payment data and credit transaction application data written into the data bank or the respective level of storage means by the operator.

4,914,588

COMPUTER TOMOGRAPHY APPARATUS FOR GENERATING AN IMAGE OF A PORTION OF A SECTIONAL SLICE OF A SUBJECT FOR USE WITH A LITHOTRIPSY APPARATUS

Rudolf Schittenhelm, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 9, 1988, Ser. No. 242,222
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1987, 8713524
Int. Cl.[4] A61B *6/03, 17/22;* G01T *1/29*
U.S. Cl. 364—413.14 **8 Claims**

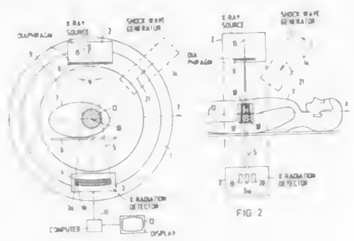


FIG 2

1. A computer tomography apparatus for examining a patient comprising:
x-ray means for generating a fan-shaped x-ray beam adapted for transirradiating a portion of a transverse slice of a patient;
means for detecting x-radiation attenuated by said patient including a row of detector elements disposed to subtend an angle to receive said x-radiation from only said portion of said slice of said patient, said detector elements respectively generating output signals corresponding to the x-radiation incident thereon;
means for mounting said x-ray means and said means for detecting in a fixed relation and for rotating said x-ray means and said means for detecting around an axis extending through said portion of said slice of said patient; and
means for constructing an image of only said portion of said slice of said patient from said output signals of said detectors.

2. A computer tomography apparatus as claimed in claim 1, further comprising:
means for gating said fan-shaped x-ray beam for generating a plurality of additional fan-shaped x-ray beams each offset in the direction of said axis and each irradiating a respective additional slice of said examination subject also offset in the direction of said axis; and
a plurality of additional rows of detector elements respectively disposed to receive radiation attenuated by said examination subject from one of said additional fan-shaped x-ray beams, and each disposed to subtend an angle so as to receive x-radiation from only a portion of a respective additional slice.

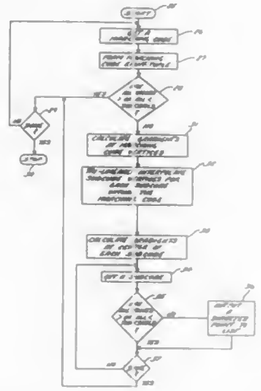
3. A computer tomography apparatus as claimed in claim 1, further comprising:
a shock wave generator for extracorporeal lithotripsy adapted for disintegrating a calculus in said patient, said shock wave generator having an axis along which shock waves propagate; and
means for mounting said shock wave generator in a fixed position relative to a plane containing said fan-shaped x-ray beam, said means for mounting allowing adjustment of said shock wave generator in a direction parallel to said axis of said shock wave generator.

4,914,589

THREE-DIMENSIONAL IMAGES OBTAINED FROM TOMOGRAPHIC DATA USING A VARIABLE THRESHOLD

Carl R. Crawford, Milwaukee, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Oct. 24, 1988, Ser. No. 261,533
Int. Cl.[4] G06F *15/72*
U.S. Cl. 364—43.17 **8 Claims**



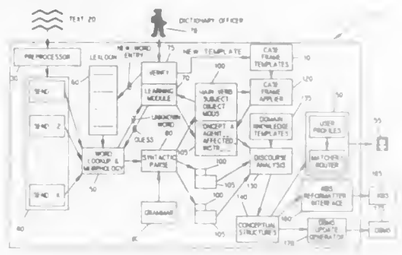
1. A method for extracting a surface within a plurality of two-dimensional tomographic slices, each slice including a plurality of voxels, said method comprising the steps of:
acquiring voxel densities within said slices such that all slices are substantially parallel and spaced along a z-axis; and
identifying at least portions of each voxel containing said surface according to an identification criterion, the criterion applied to each respective voxel being dependent on the location along said z-axis of the respective slice containing said voxel.

4,914,590

NATURAL LANGUAGE UNDERSTANDING SYSTEM

Robert B. Loatman, Vienna; Stephen D. Post, McLean, both of Va.; Chih-King Yang, Rockville, Md., and John C. Hermansen, Catharpin, Va., assignors to Embart Industries, Inc., Indianapolis, Ind.

Filed May 18, 1988, Ser. No. 195,237
Int. Cl.[4] G06F *15/21, 15/18;* G06K *9/62*
U.S. Cl. 364—419 **65 Claims**



1. A method of processing natural language text, comprising
providing electronically encoded data representative of the natural language text,
lexically processing the electronically encoded data with reference to a lexicon data base, said lexicon data base being comprised of lexical entries all including syntactic category data and semantically significant lexical entries including one or more concepts, to produce lexical specifications,
interpreting the lexical specifications with reference to an electronic representation of an Augmented Transition Network to produce configuration data, said configuration data including one or more concepts obtained from the lexical specifications, and
semantically processing the configuration data with reference to case frame templates each identified with a respective concept, to produce case frames in accordance with the concepts included in said configuration data.

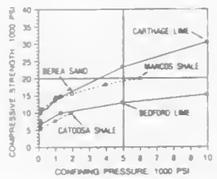
25. A method of processing natural language text, comprising
providing electronically encoded data representative of the natural language text,
lexically processing the electronically encoded data with reference to a lexicon data base, said lexicon data base being comprised of lexical entries all including syntactic category data and semantically significant lexical entries including one or more concepts, to produce lexical specifications,
interpreting the lexical specifications with reference to an electronic representation of a grammar specification to produce output data representative of a grammatical parse of the natural language text, said output data including concepts obtained from the lexical specifications, and
semantically processing the output data with reference to case frame templates each identified with a respective concept and including one or more roles associated with such concept, to produce case frames in accordance with the concepts included in said configuration data.

4,914,591

METHOD OF DETERMINING ROCK COMPRESSIVE STRENGTH

Tommy M. Warren, Coweta; Warren J. Winters, Tulsa, and Ernest C. Onyia, Broken Arrow, all of Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Mar. 25, 1988, Ser. No. 173,514
Int. Cl.[4] G01N *33/24;* E21B *7/04*
U.S. Cl. 364—422 **7 Claims**



1. A method of determining rock compressive strength of a subterranean formation penetrated by a wellbore comprising:
(a) obtaining a numerical model of a drill bit to be used to drill through the subterranean formation;
(b) obtaining an estimate of the rock ductility of the subterranean formation;
(c) measuring weight-on-bit (WOB) and bit rotational speed (RPM) as the drill bit drills through the subterranean formation; and
(d) determining the rock compressive strength of the subterranean formation from the numerical model of the drill bit, the estimate of rock ductility, and weight-on-bit (WOB) and bit rotational speed (RPM).

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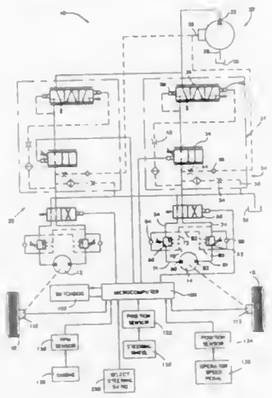
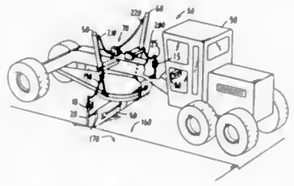
4,914,592
APPARATUS FOR CONTROLLING A STEERING-BY-DRIVING SYSTEM
William L. Callahan, Lafayette; Bruce C. Noah, W. Lafayette, both of Ind., and Jonathan B. Kulp, Terre Hill, Pa., assignors to TRW Inc., Lyndhurst, Ohio
Filed Dec. 3, 1987, Ser. No. 128,067
Int. Cl.[4] G05D 13/00; B00K 7/00
U.S. Cl. 364—424.05 17 Claims



1. An apparatus for controlling propelling rotation of at least two driven wheels of a vehicle in response to rotation of a steering wheel, said apparatus comprising:
a source of pressurized fluid;
hydraulic motors, each drive wheel having an associated hydraulic motor for, when pressurized with said pressurized fluid, driving such motor's associated wheel in propelling rotation;
means for generating an electrical control signal having a value responsive to the rotary position of the steering wheel, each rotary position of the steering wheel resulting in a different control signal value; and
means for separately controlling fluid flow rate from said source of pressurized fluid to each of the hydraulic motors in response to the value of said electrical control signal so as to control the propelling rotation speed of each driven wheel separately, the vehicle being steered as a result of the propelling rotational speed of the driven wheels, the steering angle of the vehicle being thereby functionally related to the rotary position of the steering wheel, said means for separately controlling fluid flow rate to each motor including electrically controlled valves, each motor having an electrically controlled valve connected in series between said ssource of pressurized fluid and such motor, and means for generating valve control signals responsive to the value of said electrical control signal so as to separately control the fluid flow rate from the source of pressurized fluid to each motor.

4,914,593
METHOD FOR AUTOMATIC DEPTH CONTROL FOR EARTH MOVING AND GRADING
Christopher O. Middleton, Capitola, and Colin L. Robson, San Jose, both of Calif., assignors to Spectra Physics, San Jose, Calif.
Filed Jun. 9, 1988, Ser. No. 204,386
Int. Cl.[4] A01B 63/114
U.S. Cl. 364—424.07 14 Claims

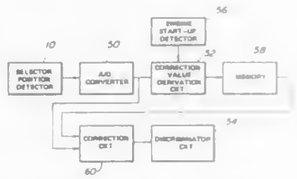
1. In a machine such as a paver or grader carrying a vertically adjustable blade at a chosen depth relative to a reference surface having a variable height, an apparatus for automatically adjusting the blade for maintaining the blade at the chosen depth, including:
a follower connected to the blade at a position above the reference surface;
means coupled to said follower for generating acoustic pulses toward the reference surface for reflection thereby;
processor coupled to said generating means and including means for controlling said generation of said acoustic pulses;
a memory coupled to said processor and storing control words relating to instructions for vertically adjusting the blade;
means for detecting said acoustic pulses at said follower after reflection by the reference surface;
a counter means coupled to said processor for generating a count related to a length of time taken by said acoustic pulses to be reflected back to said detecting means;
means for using said count to retrieve a control word stored in said memory;



means for calibrating said adjusting apparatus while said follower is at a selected height above said reference surface, such that, when the blade is at the chosen depth, said count related to a predetermined control word in said control table relating to a zero adjustment instruction for the blade;
means coupled to said processor for causing said generating means to repeatedly generate said acoustic pulses after said calibration for repeatedly generating further counts relating to lengths of time taken by said acoustic pulses to be reflected back to the follower, such that said further counts relate to control words stored at locations of said memory corresponding to variations in the height of the reference surface; and further including
means carried by the grader for vertically adjusting the blade; and
means for providing said control word as instructions to said adjusting means for automatically following said variations in the height of the reference surface.

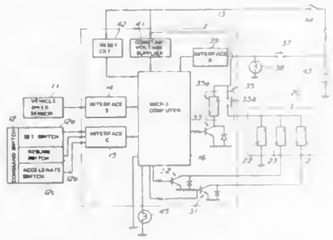
4,914,594
DETECTOR FOR DETECTING SELECTOR POSITION OF AUTOMATIC TRANSMISSION
Kunihiko Sano, Fuji, Japan, assignor to Japan Automatic Transmission Co., Ltd., Fuji, Japan
Filed Feb. 11, 1988, Ser. No. 154,839
Claims priority, application Japan, Feb. 12, 1987, 62-017825[U]; Jul. 27, 1987, 62-185440
Int. Cl.[4] B60K 23/02; G05G 9/00
U.S. Cl. 364—424.1 16 Claims

1. A selector position detector arrangement for an automotive automatic transmission, for detecting a position of a selector lever which is arranged to be manually shifted over a plurality of predetermined positions for selecting one of a plurality of gear positions of said automatic transmission, comprising:
a detector means, mechanically associated with said selector lever of said automatic transmission, for producing a variable level analog signal which has a signal level variable over a plurality of ranges depending upon the position of said selector lever, and each of said ranges being representative of the selected one of said gear positions of said selector lever;
an analog-to-digital converter circuit receiving said analog signal for converting said analog signal into a digital signal having a digital value corresponding to the level of said analog signal; and
discriminator means for deriving selector position discriminating data on the basis of said digital signal and a known



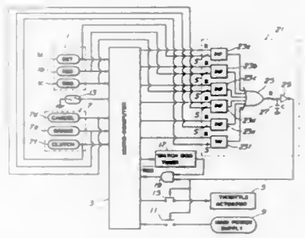
reference level at known selector positions, for comparing said discriminating data with a plurality of reference values, each of which is set to represent a border between adjacent ranges of signal levels and representative of criterion in discriminating signal level ranges corresponding to the selector lever positions for discriminating the selector position and for producing a selector position indicative signal.

4,914,595
SYSTEM AND METHOD FOR AUTOMATICALLY CONTROLLING VEHICLE SPEED TO A DESIRED CRUISING SPEED
Kouichi Suzuki; Kiyoshi Konishi; Toshio Iwaoka; Yuichi Yamaguchi; Eisaku Hori, and Satoru Sekiguchi, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan
Filed Mar. 16, 1988, Ser. No. 169,218
Claims priority, application Japan, Mar. 19, 1987, 62-62365
Int. Cl.[4] B60K 31/02; G05D 13/58
U.S. Cl. 364—426.04 11 Claims



1. A system for automatically controlling a vehicle speed to a desired cruise speed, comprising:
(a) first means for detecting a vehicle speed and outputting a speed signal indicative thereof;
(b) second means for actuating an engine speed adjusting mechanism to adjust the vehicle speed in response to an actuation command;
(c) third means for outputting a first command to accelerate the vehicle and for outputting a second command to cruise the vehicle at a speed when the third means outputs the second command;
(d) fourth means for outputting the actuation command to the second means so that the vehicle is accelerated at a constant rate of increase in the vehicle speed in response to the first command from the third means, the fourth means deriving a total duration of time during which the second means is actuated to accelerate the vehicle in response to the actuation command; and
(e) fifth means, responsive to the second command from the third means, for deriving a duration of time during which the second means is deactuated so that the vehicle is abruptly decelerated on the basis of the total duration of time derived by the fourth means and for deactuating the second means to abruptly decelerate the vehicle for the derived duration of time so that the vehicle is abruptly decelerated and cruises at the vehicle speed at the time when the second command is outputted from the third means without undershooting of the vehicle speed.

4,914,596
SYSTEM AND METHOD FOR AUTOMATICALLY CONTROLLING VEHICLE SPEED TO DESIRED CRUISE SPEED
Yoshiyuki Etoh; Hiroshi Inoue; Kazuyuki Mori; Koichi Suzuki; Kinichiro Nakano; Hiroyuki Nomura; Isso Yamamoto; Kiyoshi Yoshida; Yasuhisa Takeuchi, and Hiroshi Tanaka, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan
Filed Oct. 31, 1988, Ser. No. 264,731
Claims priority, application Japan, Oct. 29, 1987, 62-164514[U]; Oct. 29, 1987, 62-164515[U]; Oct. 29, 1987, 62-164517[U]
Int. Cl.[4] B60K 31/00
U.S. Cl. 364—426.04 17 Claims



1. A system for a vehicle, comprising:
(a) first means for detecting a current vehicle speed;
(b) second means for outputting command signals from a plurality of command switches;
(c) third means for outputting release signals from a plurality of release switches;
(d) fourth means for receiving and responding to said command signals from the second means, by outputting corresponding control command signals through each of a plurality of first output ports and outputting to a plurality of second output ports a plurality of receipt signals whose number corresponds to the number of said command and said release signals received, each receipt signal indicating that the corresponding command or release signal is correctly received by the fourth means;
(e) fifth means for controlling the vehicle speed in accordance with said control command signals received from the fourth means by controlling a plurality of engine control valves;
(f) sixth means for determining whether the fourth means outputs one of and receipt signals for each of said command and release signals output from the second and third means;
(g) seventh means for determining whether the control command signals output from the fourth means are equal to inverted signal levels at the respective control valves of the fifth means; and
(h) eighth means for interrupting the power supply to the

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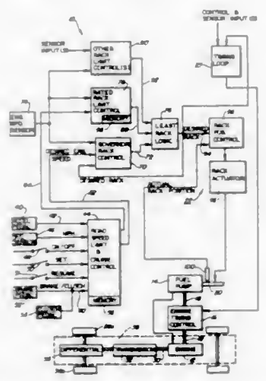
fourth means and fifth means when the determination of either the sixth and seventh means satisfies a predetermined condition.

4,914,597

ENGINE CRUISE CONTROL WITH VARIABLE POWER LIMITS

Michael E. Moncelle, Normal; Robert T. Schaar, Chillicothe, both of Ill., and Edward E. Londt, Fort Wayne, Ind., assignors to Caterpillar Inc., Peoria and Navistar International Corporation, Chicago, both of, Ill.

Filed Jul. 22, 1988, Ser. No. 222,786
Int. Cl.[4] B60K *31/00*
U.S. Cl. 364—426.04 12 Claims



7. A control (**10**) for operating a vehicle engine (**12**) coupled to a transmission (**32**) operable in a plurality of gear ranges wherein the engine is equipped with a cruise control (**44**) which is engageable to maintain the speed of the vehicle (**38**) at a desired speed and wherein the engine includes a fuel rack (**20**) which is positionable within a range of rack positions by a rack position control loop (**22**) which develops a position command signal to in turn control the rate of fuel delivery to the engine, comprising:

a memory (**86**) having stored therein four sets of data representing four different rack limit curves wherein each rack limit curve defines predetermined fuel rack position limits as a function of engine speed;

means (**130**) for determining when the cruise control is engaged;

means (**136, 142**) for determining whether the transmission is operating in a predetermined gear range;

means (**138**) for retrieving a first set of data from the memory representing one of the rack limit curves when the cruise control is engaged and the transmission is not operating in the predetermined gear range;

means (**140**) for retrieving a second set of data from the memory representing a second rack limit curve when the cruise control is engaged and the transmission is operating in the predetermined gear range;

means (**144**) for retrieving a third set of data from the memory representing a third rack limit curve when the cruise control is not engaged and the transmission is not operating in the predetermined gear range;

means (**146**) for retrieving a fourth set of data from the memory representing a fourth rack limit curve when the cruise control is not engaged and the transmission is operating in the predetermined gear range; and

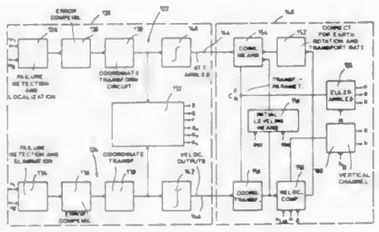
means (**96**) for developing the rack position command signal in response to the retrieved set of data whereby the first and second sets of data represent rack limit curves greater than the rack limit curves represented by the third and fourth sets of data.

4,914,598

INTEGRATED REDUNDANT REFERENCE SYSTEM FOR THE FLIGHT CONTROL AND FOR GENERATING HEADING AND ATTITUDE INFORMATIONS

Uwe Krogmann, and Jurgen Bessel, both of Überlingen, Fed. Rep. of Germany, assignors to Bodenseewek Geratetechnik GmbH, Fed. Rep. of Germany

Filed Oct. 6, 1987, Ser. No. 106,380
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1986, 3634023
Int. Cl.[4] G01C *19/00*; G05D *1/10*
U.S. Cl. 364—434 25 Claims



1. An integrated, redundant reference system providing angular rate and heading and attitude information for the flight control of aircraft by means of an autopilot, comprising

(a) at least four strap-down, dynamically tuned gyros, each of said gyros having a spin axis and two mutually orthogonal input axes normal to said spin axis, the directions of said axes being defined by respective direction vectors, each of said dynamically tuned gyros providing two angular rate signals indicative of angular rates about said two input axes,

(b) said gyros being oriented with the direction vectors of their spin axes extending radially with respect to a common reference axis, the direction vectors of said input axes of all gyros being different and located on a notional cone having a cone angle of 90°, the axis of said cone coinciding with said reference axis,

(c) means equally operatively connected to all gyros for detecting deficiencies of said gyros and for eliminating signals from deficient gyros, the angular rate signals from all said gyros being supplied to said deficiency detecting and eliminating means, said deficiency detecting and eliminating means, in normal operation, providing a set of selected angular rate signals from operative gyros,

(d) first signal processing means to which said set of selected angular rate signals is applied for providing a set of corrected angular rate signals referenced to a vehicle-fixed coordinate system, said corrected angular rate signals being applied to said autopilot for stabilizing said aircraft, and

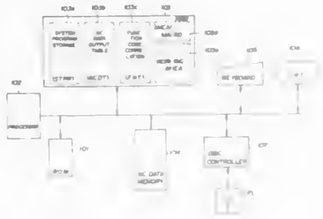
(e) second signal processing means to which said corrected angular rate signals are applied for providing heading and attitude reference signals.

4,914,599

METHOD OF CREATING NC PART PROGRAM LASER MACHINING

Masaki Seki; Takashi Takegahara, and Toru Matsunaka, all of Tokyo, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP87/00774, § 371 Date Jun. 8, 1988, § 102(e) Date Jun. 8, 1988, PCT Pub. No. WO88/02884, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 15, 1987, Ser. No. 207,154
Claims priority, application Japan, Oct. 15, 1986, 61-244473
Int. Cl.[4] G05B *19/407*
U.S. Cl. 364—474.08 6 Claims



1. A method of creating an NC part program for laser machining in which a figure definition statement for defining a figure and a motion definition statement for defining a laser beam path are inputted in an automatic programming language, and these definition statements are converted, by using an NC data output table, into a laser machining NC part program executable by an NC unit, which NC part program is then outputted, said method characterized by:

creating a machining condition modification definition statement which includes data specifying a machining condition modification interval at a corner portion of a part and machining conditions in said interval;

creating a figure definition statement and a motion definition statement without taking the machining condition modification interval and machining conditions into consideration;

dividing the corner portion into two or more machining condition modification intervals using said machining condition modification definition statement when a laser machining NC part program executable by the NC unit is created using the definition statements; and

creating the laser machining NC part program in such a manner that machining conditions set by the machining condition modification definition statement will prevail in each of the intervals.

4,914,600

PROGRAMMABLE FREQUENCY IDENTIFIER CIRCUIT

Cecelia Jankowski, East Norwich; David A. Giangano, Elmhurst, and Vincent T. Jovene, Jr., East Northport, all of N.Y., assignors to Gruman Aerospace Corporation, Bethpage, N.Y.

Filed Jun. 5, 1987, Ser. No. 58,445
Int. Cl.[4] G01R *23/02*
U.S. Cl. 364—484 8 Claims

1. A circuit for identifying the frequency of a digital contaminated signed signal comprising:

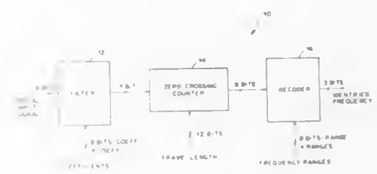
a filter for filtering the digital contaminated signed signal to produce a filtered signal;

a means for detecting the changes in sign of the filtered signal;

a means for counting the changes in the sign of the filtered signal within a programmable time period, thereby defining a representative count corresponding to the frequency of the filtered signal;

a means for storing a plurality of frequency range boundaries which define a plurality of contiguous frequency ranges which in turn define a frequency band; and

a means for decoding the representative count of the frequency of the filtered signal to identify whether the count is within the frequency band and to identify which specific frequency range within the frequency band includes the count.



4,914,601

METHOD FOR PROFILING WAFERS AND FOR LOCATING DIES THEREON

John B. Smyth, Jr., Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 25, 1988, Ser. No. 160,231
Int. Cl.[4] G06F *15/20*; G01B *7/00*
U.S. Cl. 364—490 8 Claims

1. A method for profiling the surface of a wafer having a plurality of dies formed thereon, comprising the steps of:

(a) locating a set of at least two reference points along the periphery of the wafer, relative to a predetermined coordinate system;

(b) determining the coordinates of said reference points;

(c) defining the equation of the periphery of the wafer passing through the coordinates of said reference points;

(d) locating the coordinates of an arbitrary target die on the wafer, relative to said equation of the wafer; and

(e) mapping the entire wafer surface with a die grid based on the physical placement and dimensions of the wafer, by utilizing predetermined stepping dimensions.

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4,914,602

METHOD FOR DETECTING THE MOLDING DEFECTIVENESS OF A PRESS-MOLDED WORKPIECE AND A TERMINAL PRESS-BONDING APPARATUS UTILIZING THE SAME

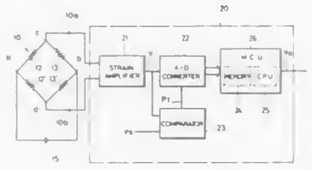
Fumihiko Abe, Chiba; Yoshio Yamamoto, and Shizuka Yamaguchi, both of Ichihara, all of Japan, assignors to Furukawa Electric Co., Ltd., Tokyo, Japan

Filed May 4, 1988, Ser. No. 190,101

Claims priority, application Japan, May 13, 1987, 62-114423; May 13, 1987, 62-114424; Dec. 30, 1987, 62-333808; Dec. 30, 1987, 62-333807; Jan. 21, 1988, 63-11177

Int. Cl.[4] H01R *43/48*; G06F *15/46*

U.S. Cl. 364—507 **25 Claims**



11. A terminal press-bonding apparatus wherein a terminal is placed on a terminal press-bonding table, and is press-molded by means of an applicator, which is driven by means of a drive unit, whereby said terminal is attached to the end of a covered wire so that a wire barrel and an insulation barrel of said terminal are press-bonded to an exposed conductor portion at the end of said covered wire and a covered portion of said covered wire, respectively, said apparatus comprising:

a coupling member disposed between said drive unit and said applicator and coupled directly to said applicator;

means for providing a reference time-based molding load profile;

sensor means for detecting a time-based profile of a press-bonding load acting on said terminal during a terminal press-bonding operation, said sensor means being attached to said coupling member; and

discrimination circuit means for comparing said press-bonding load profile detected by said sensor means with said reference press-bonding load profile, and for determining the press-bonding defectiveness of said terminal in accordance with the result of said comparison.

4,914,603

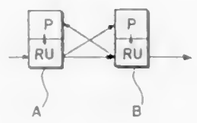
TRAINING NEURAL NETWORKS

Laurence F. Wood, Medway, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 14, 1988, Ser. No. 284,157

Int. Cl.[4] G06E *15/18*

U.S. Cl. 364—513 **2 Claims**



1. A method of training an artificial neural network comprising the steps of:

(a) providing a computer configured as a plurality of interconnected neural units arranged in a layered network including an input layer having a network input, and an output layer having a network output;

at least one of said neural units having a first subunit and a second subunit, said first subunit having one or more first inputs, and a corresponding first set of variables for operating upon said first inputs to provide a first output,

said first set of variables changeable in response to feedback representing differences between desired network outputs for selected network inputs and actual network outputs;

said second subunit having a plurality of second inputs, and a corresponding second set of variables for operating upon said second inputs to provide a second output, said second set of variables changeable in response to differences between desired network outputs for selected network inputs and actual network outputs, and means for providing an activating variable representing the difference between current second output and previous second outputs;

(b) providing a series of examples of data as network input to said network;

(c) adding said activating variable to said feedback to accelerate the change of said first set of variables;

(d) comparing the actual resulting network outputs to desired outputs corresponding to said examples; and

(e) iterating said examples until said network outputs converge to a solution.

4,914,604

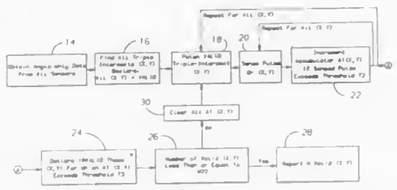
PROCESSOR FOR ANALYZING ANGLE-ONLY DATA

Patrick F. Castelaz, Yorba Linda, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 7, 1988, Ser. No. 255,205

Int. Cl.[4] G01S *9/56*

U.S. Cl. 364—517 **19 Claims**



1. In a processor for distinguishing real targets from ghosts with angle-only data from at least three sensors, said angle only data including multiple lines-of-bearing from each of said sensors, the improvement comprising:

a plurality of signal conducting lines, each of said lines oriented to represent one line-of-bearing from one of said sensors;

means for determining the points where at least three of said lines intersect;

means for initiating a pulse at each of said intersection points, one at a time, said pulse being conducted along said signal conducting lines;

means for counting conducted pulses received at each of said intersecting points;

means for determining whether the number of counted pulses at any of said intersecting points exceeds a predetermined number, wherein once said predetermined number is exceeded for a given intersecting point, that point no longer receives pulses and is identified as a ghost;

means for counting remaining intersecting points which have not exceeded said predetermined number; and

means for comparing the number of counted remaining intersecting points to the number of lines-of-bearing from one of said sensors each time said pulse is introduced, wherein when said number of remaining intersecting points is no longer greater than said number of lines-of-bearing from one of said sensors, the remaining intersecting points are identified as valid targets.

4,914,605

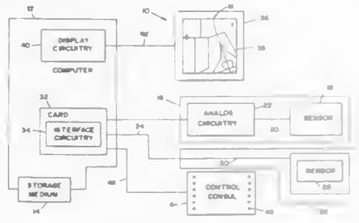
APPARATUS AND METHOD FOR DISPLAYING A MAP

George E. Loughmiller, Jr., Cupertino; Stanley K. Honey, Newark, and Kenneth A. Milnes, Fremont, all of Calif., assignors to ETAK, Inc., Menlo Park, Calif.

Continuation of Ser. No. 663,862, Oct. 22, 1984, abandoned. This application Feb. 8, 1989, Ser. No. 309,000

Int. Cl.[4] G09G *1/00, 3/00*

U.S. Cl. 364—518 **37 Claims**



1. Apparatus for displaying at selected scale levels a map of streets corresponding to an area over which a vehicle may move to assist a driver to navigate, comprising:

(a) a stored map data base having data identifying the location of streets of the area, a code identifying each street by a predetermined priority category and labels for the streets;

(b) means for selecting the scale levels;

(c) means, responsive to the data, for selecting certain streets of the map to display in dependence on one of the selected scale levels and said code;

(d) means, responsive to the data, for selecting certain labels to display in accordance with an ordering scheme dependent on the certain streets to display; and

(e) means for producing a map display showing the certain streets and the certain labels for the streets.

4,914,606

ELECTRONIC FRANKING MACHINE INCLUDING A LARGE NUMBER OF AUXILIARY METERS

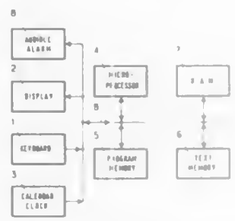
Bernard Vermesse, L'Hay les Roses, France, assignor to Societe Anonyme dite : SMH Alcatel, Paris, France

Filed Apr. 1, 1988, Ser. No. 176,521

Claims priority, application France, Apr. 1, 1987, 87 04577

Int. Cl.[4] G07B *17/00*

U.S. Cl. 364—518 **21 Claims**



1. A franking machine comprising a keyboard fitted with ten digit keys, an Enter key, a Cancel key, a star key, a menu key, and two scrolling keys constituted by an up arrow and a down arrow, a display of the alphanumeric type, a calendar/clock, a microprocessor, a program memory, a text memory, a working memory backed up by a battery, and an audible alarm, all interconnected by a bus, said working memory containing, in a "Meter" space, a plurality of auxiliary meters each of which is constituted by bytes of the working memory and each of which includes a money meter and a piece count meter themselves constituted by such bytes, said text memory storing a first set of messages for normal franking operations and a second set of messages for special operations, said program memory containing programs relating to each message in said first and second sets of messages, said second set of messages being accessible via the menu key, pressing said menu key causing a first or beginning-of-menu message to appear which includes numbered options, with each number corresponding to a digit key on the keyboard, one of the options giving access to the auxiliary meters, wherein the auxiliary meters are referenced by name and are stored one after the other in the Meter spaoe of the working memory in alphabetical order of their names.

4,914,607

MULTI-SCREEN DISPLAY CONTROL SYSTEM AND ITS METHOD

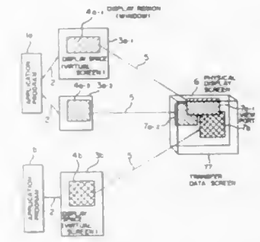
Katsuya Takanashi, and Kimitoshi Yamada, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 8, 1987, Ser. No. 35,982

Claims priority, application Japan, Apr. 9, 1986, 61-79919

Int. Cl.[4] G09G *1/16*

U.S. Cl. 364—521 **3 Claims**



1. A display control apparatus for simultaneously displaying portions of a plurality of virtual data windows on a display comprising:

(a) a first screen memory for storing a part of the data of virtual data windows in such a form that the data for only one virtual data window will be displayed for a region where more than one window overlaps on the display;

(b) a second screen memory for storing additional data to be displayed:

(c) means for writing the data of said second screen memory into the first screen memory so that the data of the first screen memory changes logical state when the second screen memory data is written;

(d) means for generating a display command stream from one of several types of display directives inputted to said display control apparatus;

(e) first buffer means for holding a first generated display command stream from a first type of display directive;

(f) second buffer means for holding a second generated display command stream from a second type of display directive;

(g) means for executing the display command stream held in said first buffer means to form the display data for said first screen memory, and for executing the display command stream held in said second buffer means to form the display data for said second screen memory; and

(h) said writing means including an exclusive OR operation with respect to data from said first and second memory screens and for supplying the exclusive OR operation result to said first screen memory.

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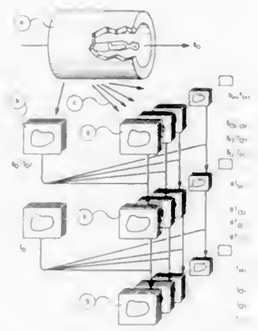
4,914,608

IN-VIVO METHOD FOR DETERMINING AND IMAGING TEMPERATURE OF AN OBJECT/SUBJECT FROM DIFFUSION COEFFICIENTS OBTAINED BY NUCLEAR MAGNETIC RESONANCE

Denis LeBihan, Rockville; Jose Delannoy, Chevy Chase, and Ronald L. Levin, Silver Spring, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Aug. 19, 1988, Ser. No. 234,101
Int. Cl.[4] G01K 7/00
U.S. Cl. 364—557 19 Claims



1. A method of determining and imaging the temperature or the temperature change of an object by nuclear magnetic resonance (NMR), comprising

(a) placing the object in a magnetic field B_o at a temperature T_o^i;

(b) subjecting the thus positioned object or a limited volume thereof to a first series of NMR imaging sequences and recording the first series of images to obtain first numerical values or images of molecular diffusion coefficients D_o^i for various points of the object or of the limited volume thereof;

(c) maintaining the object or limited volume thereof at a temperature T^i or waiting for a spontaneous change to said temperature to occur;

(d) subjecting the thus positioned object to a second series of magnetic resonance imaging sequences and recording the second series of images to obtain second numerical values or images of molecular diffusion coefficients D^i for the same points of the object or the limited volume thereof measured in step (b);

(e) comparing point-by-point the values or images of the diffusion coefficients D_o^i obtained in step (b) with the values or images of the diffusion coefficients D^i obtained in step (d) to generate a third series of values or images and recording the third series of images representing temperature changes dT_i between steps (b) and (d) for each point of the object or the limited volume thereof measured in steps (b) and (d) from the formula

$$dT_i=(dT_o^2/E)\ \mathrm{Log}\ (D^i/D_o^i)$$

wherein k is Boltzman's constant ($1.38\ 10^{-23}$ J/K), and E is the activation energy ($\simeq$0.2 eV at 20° C.), provided $dT << T_o^i$ and $E \simeq$ constant;

(f) repeating steps (c) to (e) so that temperature changes dT_i can be monitored; and

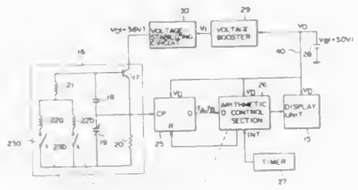
(g) determining the absolute temperature T_o^i for each measured point of the object or the limited volume of the object and obtaining the absolute temperature T^i for each measured point from the formula $T^i=T_o^i+dT_i$.

4,914,609

DISPLACEMENT MEASURING APPARATUS

Giichiro Shimizu; Toshiharu Okuyama, and Yoshio Wakatsuki, all of Tokyo, Japan, assignors to Man Design Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 223,356
Claims priority, application Japan, Jul. 30, 1987, 62-117097
Int. Cl.[4] G06F 15/36; G05B 19/28
U.S. Cl. 364—561 1 Claim



1. A displacement measuring apparatus comprising:

probe means brought into contact with an object to be measured;

oscillating means including a core member coupled to said probe means and a coil wound around said core member, said oscillating means outputting an oscillation frequency corresponding to a moving distance of said probe means when said core member is moved in said coil in response to a movement of said probe means;

counting means, coupled to said oscillating means, for counting the number of cycles of said oscillating means and for outputting a count signal representing the oscillation frequency;

arithmetic control means, coupled to said counting means, for computing the moving distance of said probe means based on a count from said counting means;

display means, coupled to said arithmetic control means, for displaying the moving distance computed by said arithmetic control means;

battery means for outputting a drive voltage;

voltage stabilizing means, coupled between said battery means and said oscillating means, for stabilizing the drive voltage output from said battery means, and for applying a predetermined stable voltage to said oscillating means; and

means, coupled to said battery means and said counting means, arithmetic control means, and display means, for directly applying the drive voltage from said battery means to said counting means, said arithmetic control means, and said display means.

4,914,610

DISPLACEMENT MEASURING APPARATUS

Giichiro Shimizu; Toshiharu Okuyama, and Yoshio Wakatsuki, all of Tokyo, Japan, assignors to Man Design Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 223,407
Claims priority, application Japan, Jul. 30, 1987, 62-117096[U]
Int. Cl.[4] G06F 15/36; G01F 25/00; G05B 19/28
U.S. Cl. 364—561 5 Claims

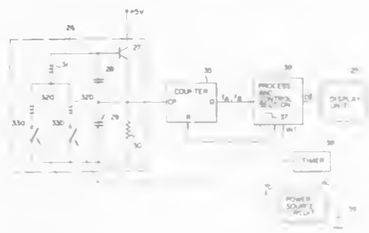
1. A displacement measuring apparatus comprising:

probe means for contacting to an object;

oscillator means for generating a signal having an oscillation frequency in accordance with a movement of said probe means;

counter means for counting the oscillation frequency of the signal generated in said oscillator means; and

process and control means for calculating a movement distance of said probe means in accordance with a change in the oscillation frequency and for correcting the calculated movement distance using a secondary transform equation representing a secondary curvature relationship between the amount of change in the oscillation frequency and the movement distance; and



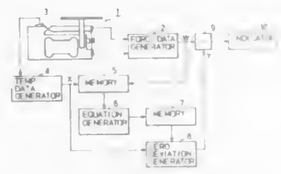
display means for displaying distance data representing the movement distance corrected by said process and control means.

4,914,611

FORCE MEASURING DEVICE

Masami Yamanaka, Miki, and Shinichi Inoue, Kobe, both of Japan, assignors to Yamato Scale Company, Limited, Akashi, Japan

Filed Jun. 1, 1987, Ser. No. 57,534
Claims priority, application Japan, Jun. 13, 1986, 61-139039
Int. Cl.[4] G01G 3/18, 23/48
U.S. Cl. 364—567 5 Claims



1. A force measuring device comprising means for detecting an applied force resulting from a loaded condition of said device to provide force data indicative of said applied force, means for detecting a temperature of said device to provide temperature data indicative of said temperature, and means for compensating for a temperature dependent change of said force data; wherein said compensating means comprising:

first means for receiving said temperature data indicative of various temperatures within a desired temperature range, for receiving said force data corresponding to said various temperatures when said device is in an unloaded condition and for determining, by regressive analysis of said indicative temperature data and said force data, coefficients of a zero deviation equation representing a relationship between said force data when said device is in the unloaded condition and said temperature data;

means for storing said zero deviation equation;

second means for receiving current temperature data when said device is in the loaded condition and for receiving said stored zero deviation equation and for calculating an amount of zero deviation at said current temperature using said stored zero deviation equation;

means for providing said force data at said current temperature representing said applied force resulting from said loaded condition with compensation corresponding to said amount of zero deviation;

third means for receiving said indicative temperature data and said force data corresponding to said various temperatures when the applied force results from a predetermined loaded condition of said device and for determining, by regressive analysis of said indicating temperature data and said force data, a span deviation coefficient equation representing a relationship between a span deviation coefficient of said device in the predetermined loaded condition and said temperature data;

means for storing span deviation coefficient equation;

fourth means for receiving, current temperature data when said device is in a loaded condition and for receiving said stored span deviation coefficient equation and for calculating the span deviation coefficient at said current temperature using said stored span deviation coefficient equation; and

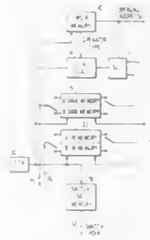
wherein said means for providing provides said force data at said current temperature when said device is in said loaded condition with compensation for span deviation using span deviation coefficient in addition to said compensation corresponding to said amount of zero deviation.

4,914,612

MASSIVELY DISTRIBUTED SIMULATION ENGINE

Daniel K. Beece, Carmel; Monty M. Denneau, Brewster; Peter H. Hochschild, New York; Allan Rappaport, New Hempstead, and Cynthia A. Trempel, Pleasantville, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1988, Ser. No. 175,879
Int. Cl.[4] G06F 9/02, 13/20
U.S. Cl. 364—578 12 Claims



3. A simulation engine, comprising:

a plurality of logic units, each of said logic units having a plurality of input terminals and a plurality of output terminals;

a plurality of switch units, each of said switch units comprising a switch memory, a plurality of input terminals and a plurality of output terminals, each location in said switch memory indicating a selective connection between one of said input terminals and one of said output terminals; and

a cabling network between said switch units and said logic units, wherein said cabling network connects input and output terminals of each respective one of said logic units with respective output and input terminals of each of said switch units;

wherein each of said logic units comprises a plurality of logic chips, an input bus connecting first inputs of said logic chips with said input terminals of said each logic unit, an output bus connecting first outputs of said said logic chips with said output terminals of said each logic unit, and a local bus connecting at least one second output of all of said logic chips of said each logic unit with second inputs of said all logic chips, each of said logic chips executing a program at each step of which a plurality of values received on said first and second inputs of said each logic chip are logically combined according to a selected function of said each step.

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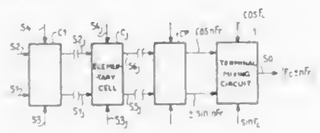
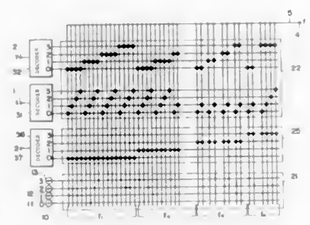
4,914,613
FREQUENCY SYNTHESIS METHOD AND A SYNTHESIZER APPARATUS USING THIS METHOD
Gérard Kantorowicz, Paris, France, assignor to Thomson-CSF, Paris, France
Filed Oct. 21, 1986, Ser. No. 922,301
Claims priority, application France, Oct. 22, 1985, 85 15662
Int. Cl.[4] G06F *1/02*
U.S. Cl. 364—721 7 Claims



4. A frequency synthesizer apparatus including:
a circuit for generating two in-quadrature signals relative to a frequency jump, said circuit being formed of a plurality P of elementary cells connected in cascade, each of the cells having:
(a) a first summing circuit connected as a subtracter,
(b) a first pair of balanced mixers connected by their outputs to said first summing circuit,
(c) a second summing circuit connected as an adder,
(d) a second pair of balanced mixers connected by their outputs to said second summing circuit,
(e) a first pair of inputs for receiving two in-quadrature jump signals of frequency mF_r, "m" being an integer equal to or greater than 1,
(f) a second pair of inputs for receiving two in-quadrature jump signals of frequency pF_r, "p" being an integer equal to or greater than 1, and
(g) two output means for delivering, after multiplication and summing by said two mixers and summing circuits, two in-quadrature jump signals of frequency $(m+p)F_r$ with a desired positive or negative value, said outputs being connected to a first pair of inputs of a next cell and so on, the values "m", "p" of the harmonics of a basic frequency F_r being chosen for each cell so as to obtain at the output of each of the P cells a harmonic value of rank "n" desired for the frequency jump,
said two in-quadrature jump signals of frequency $(m+p)f_r$ having a frequency equal to "n" times a basic frequency F_r, n being an integer greater than or equal to 1, depending on a jump value nF_r desired for use and which is chosen in a range of values between F_r and a predetermined maximum value NF_r;
a terminal circuit having two balanced mixers for multiplying said two in-quadrature jump signals of frequency $(m+p)f_r$ respectively by two in-quadrature signals relative to a carrier frequency Fc; and
a third summing circuit for adding outputs of the two balanced mixers and delivering a signal transposed in frequency by a value of the frequency jump ($F_c \pm nF_r$) by a positive or negative amount depending on an amount presented by said jump signals of frequency $(m+p)f_r$.

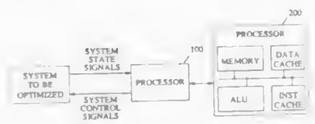
4,914,614
MULTIVALUED ALU
Takeshi Yamakawa, Kumamoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan
Filed Mar. 2, 1987, Ser. No. 21,005
Claims priority, application Japan, Mar. 4, 1986, 61-45464; Mar. 4, 1986, 61-45469; Mar. 4, 1986, 61-45470
Int. Cl.[4] G06F *7/00, 15/00*
U.S. Cl. 364—746.2 15 Claims

1. A multivalued ALU comprising:
a plurality of multivalued signal sources for generating signals respectively representing a plurality of logic values of applied multivalued logic;
a memory array including a plurality of signal lines connected to respective ones of said signal sources, and a plurality of address line groups provided for respective ones of different functions to be implemented, each group comprising a plurality of address lines each connected to any one of the signal lines at a node by being programmed in accordance with a truth table of each function;



first selecting means for selecting any one of the address line groups by a selection signal which is for selecting a function to be implemented;
second selecting means for selecting at least one of the address lines in the selected address line group by a multivalued input signal; and
an output circuit for outputting a signal representing a multivalued logic value obtained from the address line selected by said first and second selecting means.

4,914,615
CALCULATOR OF MATRIX PRODUCTS
Narendra K. Karmarkar, North Plainfield, and Kajamalai G. Ramakrishnan, Hillsborough, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Sep. 4, 1987, Ser. No. 94,634
Int. Cl.[4] G06F *15/349*
U.S. Cl. 364—754 4 Claims

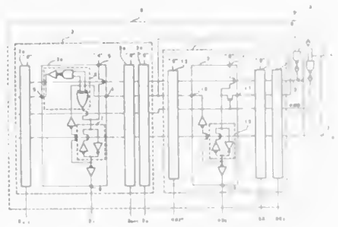


1. A calculator for developing a product Bw, where B is a sparse matrix and w is a vector, comprising:
means for entering signals representative of matrix B and vector w into said calculator;
memory means responsive to said means for entering for storing matrix B in sets of columns where one set comprises columns with at least two of non-zero valued entries in each column, said sets being stored with row references to said entries of non-zero values;
means for dividing each of said sets into subgroups of columns characterized by each column in each of said subgroups having a non-zero value in a common row;
means, responsive to said means for dividing, for deleting from said memory means duplicate instances of said common row references, to form a reduced stored list of row references;
means, responsive to said reduced stored list, for developing a product signal equal to

$$\sum_{i=1}^{n} w_i b_i,$$

where each b_i is a column in matrix B and each w_i is an element of said vector w; and
means for delivering said product signal out of said calculator.

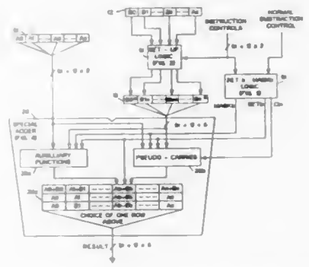
4,914,616
CODED INCREMENTER HAVING MINIMAL CARRY PROPAGATION DELAY
Taketora Shiraishi, and Yukihiko Shimazu, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Dec. 11, 1987, Ser. No. 131,864
Claims priority, application Japan, Dec. 15, 1986, 61-298007
Int. Cl.[4] G06F *7/50*
U.S. Cl. 364—770 4 Claims



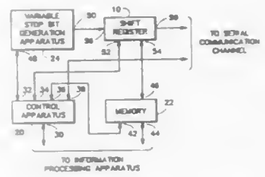
1. A binary digit incrementer for n (a chosen number) digits comprising:
a first incrementer for lower order m (a chosen number less than n) digits comprising a shift register including 2^m units of 1-bit shifters, from 0th bit to 2^m-1th bit, in which the shift output of the 1-bit shifter for the 2^m-1th bit is input to the shift input of the 1-bit shifter for the 0th bit. and
a second incrementer, coupled to said first incrementer, for higher order n−m digits which increments n−m digits each time after the shift output of the 1-bit shifter for the 2^m-1th bit of said shift register becomes a predetermined level.

4,914,617
HIGH PERFORMANCE PARALLEL BINARY BYTE ADDER
Michael Putrino, Endicott; Stamatis Vassiliadis, Vestal, and Eric M. Schwartz, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 26, 1987, Ser. No. 66,580
Int. Cl.[4] G06F *7/50*
U.S. Cl. 364—786 20 Claims

1. A method of processing a particular byte of a multibyte A-operand and a multibyte B-operand to produce a processed result, said method comprising the steps of:
operating on a first subset of consecutive bits of the particular byte of the A-operand and the B-operand yielding a first result;
operating on at least one further subset of consecutive bits of the particular byte of the A-operand and the B-operand, which further subset does not overlap said first subset, yielding at least one further result; and
concatenating said first result and said at least one further result together thereby producing said processed result without any carry-in effect from or a carry-out effect on adjacent bits not included in the particular byte of the multibyte operands



4,914,618
ASYNCHRONOUS SERIAL COMMUNICATIONS APPARATUS WITH VARIABLE LENGTH STOP BIT GENERATION CAPABILITY
Warren L. Dodge, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Filed Nov. 10, 1986, Ser. No. 928,767
Int. Cl.[4] G06F *5/06*
U.S. Cl. 364—900 16 Claims



1. Apparatus for processing units of information each comprising a countable number of bits from an information source prior to transmission over an associated communication channel at the same bit rate as the bits of the unit of information before processing and at a selected effective information transmission rate, said apparatus comprising:
control means coupled to the information source for generating control information;
memory means coupled to the information source and responsive to the unit of information from said control means for providing temporary storage of a unit of information from the information source without changing the format of the bits of the unit of information;
variable stop bit generation means coupled to said control means for generating a selected number of stop bits to be added to each unit of information stored in the memory means so that the unit of information will be transmitted at the selected effective information transmission rate with each bit being transmitted at the same bit rate as the bits of the unit of information before processing; and
shift means coupled to said memory means and variable stop bit generation means, and responsive to information from said control means, memory means and said variable stop bit generation means for coupling information serially from said memory means and the selected number of stop bits from said variable stop bit generation means to the associated communication channel at the same bit rate as the bits of the unit of information before processing and at

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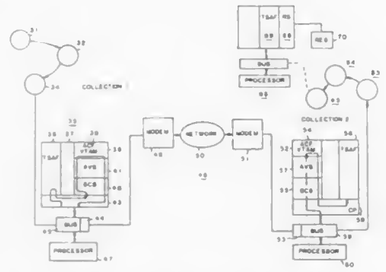
a selected effective information transmission rate without changing the format of the bits of the units of information.

4,914,619

APPARATUS AND METHOD FOR INTERCONNECTING AN APPLICATION OF A TRANSPARENT SERVICES ACCESS FACILITY TO REMOTE SOURCE

John F. Harris, Endwell; Frederick A. Schwartz, Binghamton, and Robert C. Will, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 19, 1987, Ser. No. 109,366
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—900 **12 Claims**



1. A method of communication between a first virtual machine in one collection of transparent services access facilities which communicate with each other using APPC/VM format and a resource of another collection comprising the steps of:
connecting said collections through first and second VTAM interfaces;
generating a request in APPC/VM format in an application program contained in said first virtual machine to access a resource manager contained in said another collection;
decoding in a second virtual machine in said one collection containing said first virtual machine said APPC/VM request to connect to said resource;
transforming said first virtual machine APPC/VM request through a gateway into a VTAM ALLOCATE REQUEST, and a VTAM message;
initiating said VTAM ALLOCATE REQUEST through said first VTAM interface to the second interface, whereby a session is established between said collections;
transferring said VTAM message over said session to said second interface;
transforming said transferred VTAM message to a virtual machine APPC/VM request; and,
executing in a second virtual machine of said another collection comprising said resource manager said transformed virtual machine APPC/VM request whereby said resource manager processes said virtual machine request.

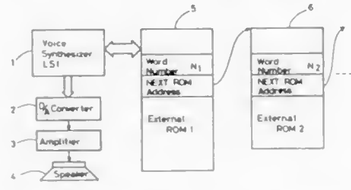
4,914,620

CAPACITY EXTENSIBLE DATA STORAGE FOR USE IN ELECTRONIC APPARATUS

Yoshiro Kihara, Nara, and Taiji Iizuka, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 165,387, Feb. 2, 1988, abandoned, which is a continuation of Ser. No. 9,088, Jan. 27, 1987, abandoned, which is a continuation of Ser. No. 563,176, Dec. 19, 1983, abandoned. This application Nov. 21, 1988, Ser. No. 274,680
Claims priority, application Japan, Dec. 20, 1982, 57-224755
Int. Cl.[4] G06F *12/06*
U.S. Cl. 364—900 **5 Claims**

1. A data storage and accessing system for a data processing device in which data storage can be increased readily and easily,
a plurality of accessible data storage means for storing data, arranged sequentially, wherein each of said data storage means includes,
a plurality of stored data word serial numbers and corresponding information data to be processed,
a total word number pointer for storing a number corresponding to the number of data word serial numbers stored in the data storage means, and
an address pointer for storing the address of the next data storage means in the sequence; and
means for accessing particular data information to be processed corresponding to a particular data word serial number stored in one of said plurality of accessible data storage means including,
means for comparing said particular data word serial number with a number corresponding to the total number pointer of the first of said sequentially arranged data storage means and accessing said particular information data, corresponding to said data word serial number stored in said first storage means, when said particular data word serial number is less than said number corresponding to said total word number pointer,
means for accessing said next of said sequentially arranged data storage means by accessing said address pointer of said previous data storage means when said particular data word serial number is greater than said number corresponding to said total word number pointer of said previous data storage means,
means for summing said number corresponding to said total word number pointer of the previous data storage means with the number corresponding to the total word number pointer of the next data storage means in the sequence and developing a number corresponding to a summation total of the word number pointers for the next data storage means in the sequence,
means for comparing said particular data word serial number with said number corresponding to said summation total of the word number pointers for the next data storage means in the sequence to determine whether said particular data word serial number is contained in the next data storage means in the sequence,
means for accessing said particular information data, corresponding to said data word serial number stored in the next data storage means in the sequence when said particular data word serial number is less than said number corresponding to said summation total of the word number pointers, and
means for accessing a subsequent next data storage means in the sequence from the address pointer of the next block if said particular data word serial number is not stored in the next data storage means, to access the data word serial number stored in said subsequent next data storage means, wherein data storage can be readily and easily increased by adding additional data storage means in a similar sequential manner.

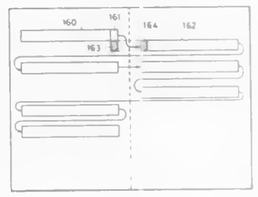


4,914,621

DOCUMENT PROCESSING SYSTEM

Tomio Mashiyama, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 10, 1986, Ser. No. 883,995
Claims priority, application Japan, Jul. 15, 1985, 60-154224
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—900 **12 Claims**



1. A document processing system comprising:
input means for inputting into said system document information, including line pitch information relating to lines of the document information, the document information being divided into at least two regions;
document memory means for storing said document information;
line pitch information memory means for storing a plurality of line pitch information relating to the lines of said document information in each of the regions;
first deriving means for deriving, in accordance with said line pitch information relating to one of the regions, a position of the line to be printed subsequently in said one of the regions;
second deriving means for deriving, in accordance with said line pitch information relating to the other one of the regions, a position of the line to be printed subsequently in said other one of the regions;
deciding means for deciding the sequence of printing of the lines in accordance with information each of said position information derived respectively by said first and second deriving means regardless of the region to which each line belongs, so as to minimize the time needed for printing the document information; and
printing means for effecting printing in accordance with the sequence decided by said deciding means.

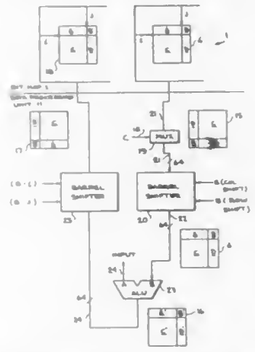
4,914,622

ARRAY-ORGANIZED BIT MAP WITH A BARREL SHIFTER

Adrian Sfarti, and Randy Goettsch, both of Sunnyvale, Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 17, 1987, Ser. No. 40,519
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—900 **18 Claims**

1. A graphics processor with means for realigning arrays of data being transferred between a memory and a data processing unit comprising:
a memory having a plurality of $2^{2(n-k)}$ planes of storage locations, where
n is an arbitrary number with the property that $n \geq k$;
$k = \log_2 AWS_x$,
$AWS_x = AWS_y \geq 2$, and
AWS_x and AWS_y are the number of pixels in an array on a screen in an x and a y direction, respectively;
a barrel shifter having a plurality of rows and columns of inputs and a plurality of rows and columns of outputs for providing a plurality of $2^{2(n-k)}$ arrays of inputs and $2^{2(n-k)}$ arrays of outputs, each of said arrays of inputs comprising 2^k rows and 2^k columns of said inputs and each of said arrays of outputs comprising 2^k rows and 2^k columns of said outputs;
means for transferring bits from said storage locations in said memory to said inputs of said barrel shifter such that each plane of said memory provides one bit for each $2^k \times 2^k$ array of inputs of said barrel shifter;
means responsive to a first control signal (A) for selectively coupling said inputs of said barrel shifter to said outputs of said barrel shifter such that said outputs of said barrel shifter correspond to a shift in a position of a predetermined number of said columns of said inputs relative to the remaining columns of said inputs; and
means responsive to a second control signal (B) for selectively coupling said inputs of said barrel shifter to said outputs of said barrel shifter such that said outputs of said barrel shifter correspond to a shift in a position of a predetermined number of said rows of said inputs relative to the remaining rows of said inputs.

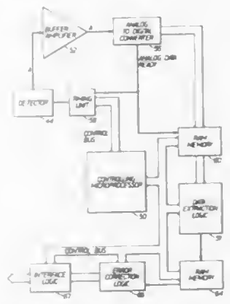


4,914,623

DIGITAL PROCESSING OF SENSOR SIGNALS FOR READING BINARY STORAGE MEDIA

Geoffrey M. Hudson, and Kingsley J. F. Allen, both of Victoria, Australia, assignors to Hudson-Allen Limited, Box Hill, Australia

Filed Sep. 18, 1987, Ser. No. 98,372
Claims priority, application Australia, Sep. 18, 1986, PHO8102
Int. Cl.[4] G06F *3/05*; G11B *7/09*
U.S. Cl. 364—900 **31 Claims**



11. Apparatus for reading information comprising a set of successive binary values stored in a medium as multiple ma-

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chine readable record entries arranged in frames which are themselves arranged in one or more channels, which record entries are indicative of values from a limited set of possible values, the apparatus comprising:

a holder to temporarily support or retain said medium;

a substantially known array of detector elements movable relative to said holder;

means to scan each frame with said array such that each record entry is at least partly within the field of observation of at least one detector element to produce a first set of observed values for each frame represented by the state and/or outputs of the detector elements;

means to output those states and/or outputs as an electrical signal comprising a sequence of observed values representing said stored binary values;

digital circuitry means for combining digital values which represent respective different plural selections of two or more samples of the electrical signal to produce intermediate digital representations of the samples of the respective selections; and

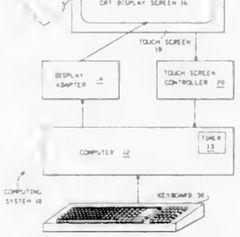
means for processing each said intermediate digital representation to derive a respective one of the said binary values.

4,914,624

VIRTUAL BUTTON FOR TOUCH SCREEN

David I. Dunthorn, 908 W. Outer Dr., Oak Ridge, Tenn. 37830

Filed May 6, 1988, Ser. No. 191,227
Int. Cl.[4] G06F *3/02*
U.S. Cl. 364—900 22 Claims



1. A method for creating a virtual push button at a touch sensitive orthogonal data field input device used in conjunction with a computing system in which a touch action at the device generates a stream of data related to a location within a field of the touch action, the method including the steps of:

sensing an onset of a first touch action at the device and monitoring a continuity thereof,

sensing an occurrence of a second predetermined condition,

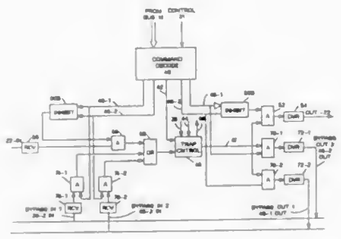
generating the virtual push button upon concurrence of sensed touch action continuation of the first touch action and sensed occurrence of the second predetermined condition.

4,914,625

BYPASS MECHANISM FOR DAISY CHAIN CONNECTED UNITS

Auguste F. J. Billian, Vence, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 129,126, Dec. 4, 1987, abandoned. This application Oct. 16, 1989, Ser. No. 423,737
Claims priority, application European Pat. Off., Dec. 16, 1986, 86430052.0
Int. Cl.[4] G06F *13/38, 11/00*
U.S. Cl. 364—900 4 Claims



1. A bypass mechanism for improving operation of a daisy chain line linking a plurality of units and used for propagating a signal which may be trapped by a first unit in the chain having a pending service request to be serviced by a common resource, said daisy chain line being connected to the units through input means (**56**) and the signal to be propagated, if not trapped by the unit, being sent through output means (**54**) to a next unit in the chain, said mechanism allowing a desired maximum number x of distinct not contiguous sets comprising a variable number of contiguous units to be disconnected from the chain, and being characterized in that it comprises:

x bidirectional lines (**26**) to which all units are attached, each unit having the capability to conditionally receive the signal to be propagated from said bidirectional lines and to conditionally provide the signal to be propagated to said bidirectional lines,

control logic means (**16, 12, 20**) for identifying the sets of units, if any, which have to be disconnected from the daisy chain and sending bypass out control signals to the units preceding a first unit in each identified set and bypass in control signals to the units following a last unit in each identified set, said bypass out control signals and bypass in control signals being indicative of selected lines among the x bidirectional lines to be used for bypassing each identified set of units,

first bypass control means (**50, 70-1, 70-2**) located in each unit and which are responsive to the bypass out control signal received from the control logic means to cause the signal to be propagated to be sent to the selected bidirectional line as indicated by the received bypass out control signal,

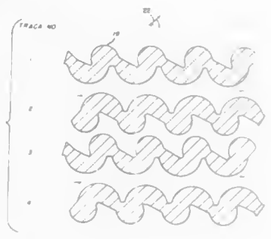
second bypass control means (**60,74-1, 74-2**) located in each unit and responsive to the bypass control in signal received from the control logic means to cause the signal to be propagated along the chain to be received from the selected bidirectional line as indicated by the received bypass in control signal so as to bypass each set of units by means of a selected bidirectional line.

4,914,626

MAGNETIC BUBBLE MEMORY DEVICE

Alfred A. Thiele, 262 N. Dithridge St., #306, Pittsburgh, Pa. 15213

Filed Aug. 21, 1987, Ser. No. 87,788
Int. Cl.[4] G11C *19/08*
U.S. Cl. 365—39 11 Claims



1. A magnetic bubble memory device in which a sheet of magnetic material is magnetized so as to produce a plurality of domains or bubbles, comprising:

a gapless overlay disposed on a first side of the sheet so as to produce a propagator pattern to allow a shifting of the plurality of domains along the sheet, said gapless overlay including a plurality of stacked, magnetically soft films, each magnetically soft film being alternately arranged with a layer of non-magnetic material,

said overlay further including an elongated propagator pattern having a pair of opposing boundary edges,

one of said edges being comprised of a plurality of generally convex semicircles serially coupled together in relatively close proximity to generate intermediate inwardly pointing cusps and thereby defining a respective plurality of domain propagation regions, and

the other edge of said edges being comprised of a plurality of generally convex relatively smaller semicircles offset from the semicircles of said one edge and being coupled together by generally non-circular intermediate edge segments and generating respective inwardly pointing cusps at the ends thereof with the semicircles coupled thereto and thereby defining a respective plurality of domain latching regions between adjoining pairs of propagation regions.

4,914,627

ONE TRANSISTOR MEMORY CELL WITH PROGRAMMABLE CAPACITANCE DIVIDER

S. Sheffield Eaton, Jr., and Michael Parris, both of Colorado Springs, Colo., assignors to Ramtron Corporation, Colorado Springs, Colo.

Division of Ser. No. 69,389, Jul. 2, 1987, Pat. No. 4,809,225.
This application Jan. 3, 1989, Ser. No. 292,776
Int. Cl.[4] G11C *11/22, 11/24*
U.S. Cl. 365—145 7 Claims

1. In a semiconductor memory having a bit line and a word line, the improvement comprising a memory cell and a voltage generator circuit coupled thereto, the memory cell consisting essentially of a transistor and a capacitance divider, said transistor coupling said divider to said bit line, said transistor being responsively coupled to said word line, said divider having first and second ferroelectric capacitors coupled together to form a common node between said capacitors and two poles, the voltage generator circuit providing a first variable signal and a second variable signal on first and second outputs respectively, said first output being coupled to one pole of said divider, said second output being coupled to the other pole of said divider, the ferroelectric capacitors having remanent polarizations which indicate the nonvolatile stored data.

3. A memory array comprising:

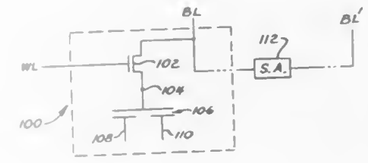
a plurality of bit lines defining columns;

a plurality of word lines defining rows orthogonal to said bit lines;

a plurality of memory cells located at crossings of word lines and bit lines, each memory cell comprising

(a) a ferroelectric capacitance divider formed by two ferroelectric capacitors coupled together to have a common node and two poles, and (b) a switching device coupling said common node to said bit line, said switching device being responsively coupled to said word line at said crossing;

a plurality of pairs of conductive common lines, one pair corresponding to each said word line, one of said common



lines in the pair being coupled to said first poles in said memory cells along the row, and the other of said common lines of the pair being coupled to said second poles in the memory cells along the row, whereby distinct voltages can be applied to the first and second poles separately along a selected row;

a voltage generator providing a first variable output and a second variable output, said first output being coupled to one of the conductive common lines in a pair, the second output being coupled to the other conductive common line of the pair;

the remanent polarizations of said ferroelectric capacitors indicating the nonvolatile stored data.

4,914,628

SEMICONDUCTOR MEMORY DEVICE HAVING SUBSTRATE ISOLATION OF A SWITCHING TRANSISTOR AND STORAGE CAPACITOR

Tadashi Nishimura, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1987, Ser. No. 124,429
Claims priority, application Japan, Nov. 19, 1986, 61-277032
Int. Cl.[4] G11C *11/34, 11/24;* H01L *29/78*
U.S. Cl. 365—149 7 Claims

1. In a dynamic semiconductor memory of a type forming an array of vertical integrated transistors within a common substrate having a major surface, wherein each of said vertical integrated transistors comprises vertically orientated semiconductor layers defining source and drain regions, and a trench extending into said substrate at said source and drain regions to define a channel region, a lowermost one of said layers of said vertical integrated transistor in said substrate formed of a polycrystal semiconductor layer and defining one of the source region and drain region:

the improvement comprising a first insulating layer underlying said polycrystal semiconductor layer and a second insulating layer formed on said polycrystal semiconductor layer above a portion of the substrate surrounding said

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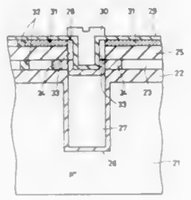
trench surrounding said trench, and extending outside said trench on the major surface of said substrate to isolate said vertical integrated transistor from said substrate and to



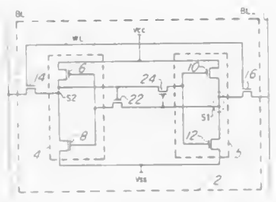
reduce soft errors of said transistor by electron-hole pairs produced in said substrate as a result of ambient alpha particles penetrating said substrate.

4,914,629

MEMORY CELL INCLUDING SINGLE EVENT UPSET RATE REDUCTION CIRCUITRY

Terence G. W. Blake, Dallas, and Theodore W. Houston, Richardson, both of Tex., assignors to Texas Instruments, Incorporated, Dallas, Tex.

Filed Sep. 7, 1988, Ser. No. 241,524
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—154 7 Claims



1. A bi-stable logic device comprising:
a set of cross-coupled inverters, said set of inverters including first and second inverters; and
a pair of transistors connected to the cross-coupling of the inverters so as to provide a time delay in effecting voltage changes at selected nodes within the cell via an impedance path through said pair of transistors which lies between said selected nodes, the gate of a first transistor of said pair being connected to a first source/drain of a second transistor of said pair in addition to the gate of a second transistor of said pair being connected to a first source/drain of said first transistor.

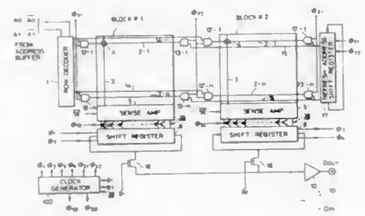
4,914,630

REFRESH ARRANGEMENT IN A BLOCK DIVIDED MEMORY INCLUDING A PLURALITY OF SHIFT REGISTERS

Kazuyasu Fujishima; Yoshio Matsuda, and Hideto Hidaka, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1988, Ser. No. 192,714
Claims priority, application Japan, May 15, 1987, 62-119213
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189.04 10 Claims

1. An improvement in a block access memory comprising a memory cell array having a plurality of memory cells arranged in rows and columns, a plurality of word lines each of which is connected to an associated row of said plurality of memory cells, a plurality of bit lines each of which is connected to an associated column of said memory cells, said memory capable of simultaneously accessing a plurality of said memory cells connected to one word line selected by an external address, the improvement comprising:
a plurality of memory blocks provided by dividing said memory cell array so that the memory cells associated with each of said word lines are divided into said blocks, thereby dividing each of said word lines into a plurality of segments;
detecting amplifying means provided corresponding to each of said plurality of memory blocks for detecting and amplifying a potential on respective bit lines in the associated block;
selective access means for activating a first divided word line segment contained in one block of said plurality of memory blocks in response to the external address and for accessing the memory cells of one row connected to said activated first divided word line by segment by activating the detecting amplifying means of said selected block;
selective refresh means for activating a second divided word line segment included in at least one block of the non-



selected blocks out of said plurality of memory blocks based on a separately generated row address in said block access memory and for refreshing the information of the memory cells connected to said activated second divided word line segment by activating the detecting amplifying means provided for the associated block;
said selective access means comprising a plurality of first word line driving means corresponding to each of the memory blocks for transmitting a word line driving signal generated in response to the external address to an associated block, said plurality of first word line driving means being activated at different timings for every block, and
said selective refresh means comprising a second word line driving means provided corresponding to each of the memory blocks for transmitting to an associated block a word line driving signal generated in response to said separately generated row address, wherein said second word line driving means activates a divided word line segment at different timing for each block and at a timing which allows one memory block to be accessed in response to said external address and at least one of the remaining memory blocks to be refreshed in parallel.

4,914,631

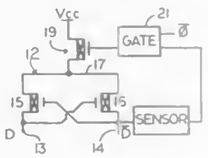
PULL UP CIRCUIT FOR SENSE LINES IN A SEMICONDUCTOR MEMORY

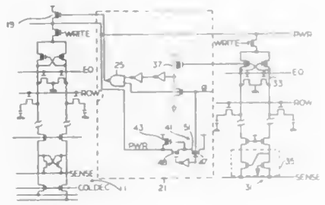
Gary M. Johnson; Zhitong Chen; Wen-Foo Chern; Ward D. Parkinson; Tyler A. Lowrey, and Thomas M. Trent, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Sep. 30, 1988, Ser. No. 252,585
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189.11 17 Claims

1. Semiconductor memory device having a memory array, the memory device comprising:
(a) a pullup circuit for conducting current from a high potential source to a high potential node of the memory array;

(b) a gate control circuit for controlling the current supplied to the high potential node of the memory array from the high potential source,
said gate control circuit including a potential maintenance circuit for providing sufficient current from the high potential source to maintain the high potential node of the memory array at a predetermined potential, the potential maintenance circuit being gated ON after receipt of a clock signal and being gated OFF at the predetermined potential;
(c) a pair of digit lines coupled to said high potential node and to a low voltage latch node;
(d) a first pull down transistor connected between the low voltage latch node and a circuit node, and gated ON in response to a first active signal;





(e) a second pull down transistor connected between the circuit node and a low potential source in response to;
(f) a voltage control transistor being responsive to a second active signal to conduct current from the low voltage latch node to a gate of the second pull down transistor;
(g) a precharge circuit to gate the second pulldown transistor ON prior to the voltage control transistor responding to the second active signal; and
(h) a threshold current supply transistor for providing sufficient current from the high potential source to float the low voltage latch node to a predetermined value above a potential of the low voltage source, wherein the threshold voltage supply transistor is gated ON in response to the second active signal.

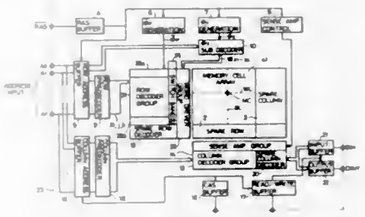
4,914,632

SEMICONDUCTOR DEVICES HAVING REDUNDANCY CIRCUITRY AND OPERATING METHOD THEREFOR

Kazuyasu Fujishima; Yoshio Matsuda, and Mikio Asakura, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1988, Ser. No. 271,492
Claims priority, application Japan, Mar. 8, 1988, 63-55250
Int. Cl.[4] G11C *11/34*
U.S. Cl. 365—200 18 Claims

1. A semiconductor memory device having a programmable redundant circuit, comprising:
a plurality of selection lines being divided into a plurality of first sets each comprising a prescribed plurality of selection lines, and divided into a plurality of second sets each comprising a prescribed plurality of selection lines;
a plurality of spare selection lines;
a plurality of memory cells each of which is connected to any of said plurality of selection lines; a plurality of spare memory cells each of which is connected to any of said plurality of spare selection lines;
a plurality of selection means, each being selectively coupled to the plurality of selection lines of each of said first sets or to the plurality of selection lines of each of said second sets and being activated in response to a prescribed selection



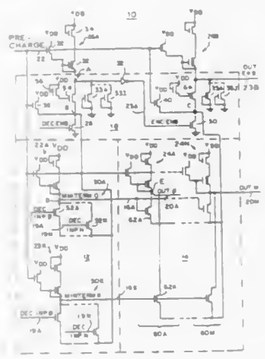
signal for selecting the plurality of selection lines of each of said first sets or the plurality of selection lines of each of said second sets;
spare selection means coupled to said plurality of spare selection lines and being activated instead of any of said selection means to select said plurality of spare selection lines; and
switching means which selectively couples each of said selection means to the plurality of selection lines of each of said first sets or to the plurality of selection lines of each of said second sets at the time of said selection.

4,914,633

SELF-TIMED PROGRAMMABLE LOGIC ARRAY WITH PRE-CHARGE CIRCUIT

Robert Rose, Hudson, and Jash Patel, Marlboro, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 165,456, Mar. 1, 1988, Pat. No. 4,794,570, which is a continuation of Ser. No. 881,079, Jul. 2, 1986, abandoned. This application Dec. 22, 1988, Ser. No. 288,671
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—203 7 Claims



1. A programmable logic array comprising an input decoder

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section and an output encoder section connected by a plurality of minterm conductors, said input decoder selecting a minterm conductor in response to the encoding of a plurality of input signals, and the output encoder section transmitting a plurality of output signals each on a respective output bit line and having an encoding determined by the selected minterm conductor,

A. said input decoder section including a plurality of decoder stages each connected to a node to which one of said minterm conductors is connected, at least some of said decoder stages including at least one control transistor connected to said respective node for controlling the selection of said minterm conductors under control of an input signal, and a decoder switch means connected to couple current from a decoder switch node in response to a decoder enabling signal, said control transistors in all of said decoder stages being connected to said decoder switch node so that current flows through said control transistors and said decoder switch means in response to said decoder enabling signal; and

B. said output encoder section including a plurality of stages each connected to a node to which one of said output conductors is connected, at least some of said stages including at least one control transistor connected to said respective node for controlling the transmission of an output signal on said output conductor in response to the selection of said minterm conductor, and an encoder switch means connected to couple current from an encoder switch node in response to an encoder enabling signal, said control transistors in said encoder stages being connected to said encoder switch node so that current flows through said control transistors and said encoder switch means in response to said encoder enabling signal, said programmable logic array further including precharge means for precharging the respective nodes.

4,914,634

REFERENCE VOLTAGE GENERATOR FOR CMOS MEMORIES

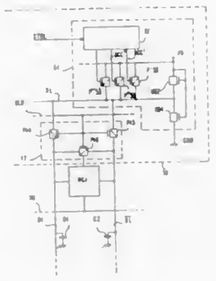
Chekib Akrout, Orangis; Pierre Coppens, Savigny le Temple; Bernard Denis, Mennecy, and Pierre-Yves Urena, Vence, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 14, 1988, Ser. No. 284,038

Claims priority, application European Pat. Off., Dec. 15, 1987, 87480024.6

Int. Cl.[4] G11C *13/00*

U.S. Cl. 365—233 **8 Claims**



1. In a semiconductor memory device including a pair of bit lines connected to a reference line, each bit line having a relatively high stray capacitance, a word line, a memory cell connected to said bit lines and word line for selection by an address signal, and a restore circuit comprising a coupling/equalizing circuit controlled by a bit line restore clock, and a reference voltage generator, the improvement comprising:

said generator including the combination of,

a static current source including a first MOS transistor of a first conductivity type operating as a resistor load connected between a first power supply and said reference line, and

a dynamic current source including a second MOS transistor of a second conductivity type connected in parallel with said first MOS transistor and gated with a signal derived from said bit line restore clock so that it is turned ON during the restore time.

4,914,635

APPARATUS FOR KNEADING RUBBER-LIKE MATERIAL

Kazuhisa Nishigai, and Juumei Harada, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed May 19, 1988, Ser. No. 195,756

Claims priority, application Japan, May 19, 1987, 62-121653

Int. Cl.[4] B01F *7/08*; B29B *7/20*

U.S. Cl. 366—97 **8 Claims**

1. An apparatus for kneading rubber-like material comprising:

a casing defining a rotor chamber having a cocoon shaped cross-section, said rotor chamber providing an inner surface;

a pair of confronting rotors rotatably mounted in said chamber, said pair of rotors being juxtaposed with each other, and each of said rotors integrally provided with at least two blades; said blades in one of said rotors being spacedly engaged with said blades in the other rotor, and said rubber-like material being subjected to kneading at a space defined between said confronting rotors, each of said blades continuously provided along a length of said rotor, each of said blades comprising a first blade portion oriented in a first direction at one end portion of said rotor, and a second blade portion oriented in a second direction and contiguous with said first portion, said first portion being provided at rotationally advanced position, and said second portion being provided at rotationally retarded position in circumferential direction of said rotor; and

said inner surface of said rotor chamber and a radially outer end face of said second blade portion defining a clearance which is larger than a clearance defined as between said inner surface and a radially outer end face of said first blade portion.

4,914,636

METHOD AND DEVICE FOR ACQUISITION OF SEISMIC DATA

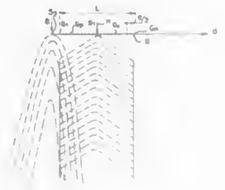
Robert J. Garrotta, Chatenay Malabry, France, assignor to Compagnie Generale De Geophysique, Massy, France

Filed Oct. 20, 1988, Ser. No. 260,279

Claims priority, application France, Oct. 20, 1987, 87 14437

Int. Cl.[4] G01V *1/20*

U.S. Cl. 367—56 **20 Claims**



1. Method of acquiring seismic data in a prospecting area comprising, in order to establish a trace, the steps of:

(a) disposing on or over the terrestrial surface in said prospecting area an array of vibration receivers, said array including at least one row of regularly spaced receivers,

(b) disposing in the vicinity of said array a plurality of vibration sources each adapted to emit vibrations with a frequency spectrum in a specific frequency band, the frequency bands of the spectra of said sources being adjacent and together covering the frequency band of seismic data signals, a high-frequency first source being placed at the center of said array and a low-frequency second source being placed near an end of said array, said first source emitting vibrations at a higher frequency than said second source, said first and second sources having adjacent vibration frequency spectra and being separated by a distance substantially equal to one half the length of said array,

(c) emitting vibrations with different frequency spectra from said first and second sources,

(d) recording said vibrations after reflection from strata beneath the terrestrial surface by means of said receivers,

(e) moving said sources relative to said array in an acquisition direction by a trace displacement increment, and

(f) repeated the above steps (c), (d) and (e) for a plurality of successive movements by said trace displacement increment.

4,914,637

MEASURE WHILE DRILLING SYSTEM

William G. Goodsman, Calgary, Canada, assignor to Positec Drilling Controls Canada Ltd., Canada

Continuation of Ser. No. 7,976, Jan. 29, 1987, abandoned. This application Jul. 25, 1989, Ser. No. 386,010

Claims priority, application Canada, Jan. 29, 1986, 500578

Int. Cl.[4] H04H *9/00*

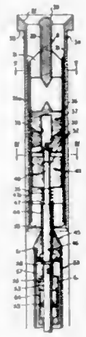
U.S. Cl. 367—83 **29 Claims**

1. A remote sensing system comprising a tool for positioning at a predetermined location in a conduit through which a flow of fluid is circulated, said tool including a pressure modulator adapted to transmit signals indicative of selected parameters existing at said location, such signals being in the form of positive pressure pulses transmitted through the fluid to a remote receiver, said pressure modulator comprising:

a stator co-axially arranged in said tool and having angularly spaced channels therein that extend from an upstream end of the stator to a downstream end thereof to define passage means through which at least a portion of said fluid flow is to be directed;

blocking means adjacent said stator and movable between an inoperative condition wherein it is positioned in non-restrictive relationship relative to said passage means, and an operative condition wherein it effects rapid, temporary, at least partial restriction of said passage means to generate said positive pressure pulses, said blocking means comprising a rotor element rotatably mounted in the path of fluid flow and having angularly spaced radially projecting ribs thereon, said ribs in said operative condition occluding said passage means;

impeller means interacting with the fluid flow to apply a driving torque to said rotor said impeller means being



directly coupled to said rotor so that the rotor is urged to follow angular movement of the impeller means;

latching means effective to retain said rotor in the inoperative condition against the driving torque applied to said rotor; and

electrical actuator means for said latching means said actuator means being selectively energizable to release said latching means and free said rotor to undergo incremental angular movements away from the inoperative condition to the operative condition and again to said inoperative condition under the influence of said driving torque.

4,914,638

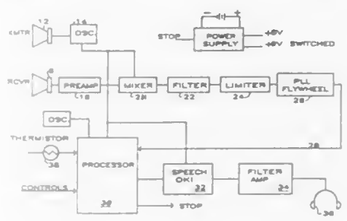
DOPPLER EFFECT SPEEDOMETER

Ronald E. Milner, Grass Valley, Calif., assignor to Applied Design Laboratories, Inc., Grass Valley, Calif.

Filed Feb. 28, 1984, Ser. No. 584,432

Int. Cl.[4] G01S *15/60*

U.S. Cl. 367—90 **9 Claims**



1 A reflecting Doppler effect speedometer comprising:

means for transmitting a first signal having a first frequency;

means for receiving a second signal having a second frequency, the second signal being a reflection of the first signal;

mixing means for generating a third signal having a fre-

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quency responsive to the difference between the frequencies of the first and second signals;

circuit means coupled to receive the third signal for providing a binary signal on a circuit means output, the circuit means output being adapted to change state from a high state to a low state when the voltage on the filter output drops below a first threshold value, the circuit means output being adapted to change state from a low state to a high state when the voltage on the filter output rises above a second threshold value, the second threshold value being greater than the first threshold value;

means for varying one of the threshold values in response to the peak value of the third signal; and

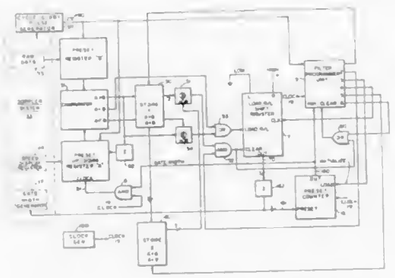
calculating means for calculating velocity in response to the frequency of the signal present on the circuit means output.

4,914,639

SONAR DOPPLER SYSTEM WITH A DIGITAL ADAPTIVE FILTER

Earl R. Lind, Portsmouth, and Francis C. Jarvis, Barrington, both of R.I., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 262, Jan. 2, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 287,709
Int. Cl.[4] G01S *15/58*
U.S. Cl. 367—91 11 Claims



1. In a doppler sonar speed measuring system of the type having a sequence of transmitted pulse signals and a corresponding sequence of reflected pulse signals and providing a doppler frequency as unfiltered raw speed data to an adaptive filter, the filter providing filtered speed data, the filter improvement comprising:

pulse generator means for transferring said unfiltered raw speed data to a first register of an adaptive filter;

means for providing said filtered speed data in a second register of said adaptive filter;

means for comparing said data in said first and second registers;

means for establishing a value of allowed speed change for said filtered data for each comparison;

said allowed speed change being determined by the magnitude and sign of each comparison;

said allowed speed change being reduced to a minimum predetermined value when the sign provided by the comparison of the first and second registers changes from the sign of the previous comparison; and

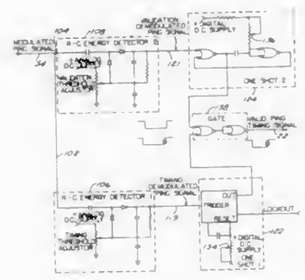
said second register thereby providing filtered speed data.

4,914,640

MEANS FOR IMPROVING TURNAROUND TIME STABILITY FOR R-C ENERGY DETECTORS

Victor A. Andersen, North Darmouth, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 3, 1989, Ser. No. 308,910
Int. Cl.[4] G01S *15/00*
U.S. Cl. 367—98 6 Claims



1. A signal processing device, having a stable turnaround time response period, comprising:

R-C energy detection means, for receiving a modulated analog electric signal and producing a digital timing threshold signal pulse and a later in time digital validation threshold signal pulse therefrom, said R-C energy detection means further comprising, a first R-C energy detector, for receiving said modulated analog electric signal and producing a timing demodulated analog electric signal therefrom, a second R-C energy detector, for receiving said modulated analog electric signal and producing a validation demodulated analog electric signal identical to said timing demodulated analog electrical therefrom, a timing threshold adjustor, connected to said first R-C energy detector, for receiving said timing demodulated analog electric signal therefrom and passing therethrough only a preselected portion of said analog timing demodulated signal, said timing adjustor being of a grounded voltage divider type, a validation threshold adjustor, connected to said second R-C energy detector, for receiving said validation demodulated analog electric signal therefrom and passing therethrough only a preselected portion of said analog validation demodulated signal, said validation adjustor being of a grounded voltage divider type, a first one shot, connected to said timing threshold adjustor, for receiving said analog timing demodulated signal portion therefrom and producing said digital timing threshold pulse only if said analog timing signal reaches a preset level, and a second one shot, connected to said validation threshold adjustor, for receiving said analog validation demodulated signal portion therefrom and producing said digital validation threshold pulse only if said analog validation signal reaches a preset level; and

AND gate means, conductively connected to said R-C energy detection means, for receiving said digital timing threshold pulse signal and said later digital validation threshold pulse signal from said R-C energy detection means, said AND gate means producing a digital, valid timing pulse signal therefrom at the instant both signals are present concurrently thereby ensuring that the turnaround time is always based on the timing threshold signal duration triggered by the validation threshold signal.

4,914,641

ULTRASONIC MEASURING DEVICE AND METHOD

John A. Dorr, Crofton, Md., assignor to Xecutek Corporation, Md.

Filed Nov. 10, 1988, Ser. No. 269,613
Int. Cl.[4] G01S *15/00*
U.S. Cl. 367—99 2 Claims

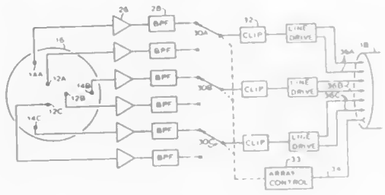
1. In an ultrasonic measuring transducer system in which an ultrasonic transducer transmits an ultrasonic pulses and receives return echoes from a target and an electronic circuitry means converts the received pulses to range information to said target, a plenum chamber, means mounting said transducer in a wall of said plenum chamber, means forming air outlet apertures surrounding said transducer, means supplying air under pressure to said plenum chamber, the improvement comprising, means in said plenum chamber for producing a signal corresponding to the speed of sound in the air in said plenum chamber, and a measuring chamber forming means mounted on the exterior of said wall of said plenum chamber and surrounding said air outlet apertures so as to provide a space in which air flow toward said target is maintained at a relatively constant rate and the temperature of the measuring path and space between said target and said ultrasonic transducer is maintained substantially the same as within said plenum chamber, said air outlet apertures being dimensioned such that the pressure drop of air between said plenum chamber and the space in front of said transducer does not affect operation of said transducer and said measuring chamber forming means is a cylindrical cowl having a length which is less than the ring-down distance for said transducer at its operating frequency.

4,914,642

REMOTE SONIC LOCATION SYSTEM

David W. Fraser, E. Falmouth; Allen B. Griswold, N. Falmouth; Francis C. Lowell, Jr., Falmouth, and Stanley I. Silverman, Rehobeth, all of Mass., assignors to Ferranti O.R.E., Inc., Falmouth, Mass.

Filed Jan. 20, 1988, Ser. No. 146,238
Int. Cl.[4] G01S *3/80*
U.S. Cl. 367—122 14 Claims



1. In a sonic location system comprising a remote unit for sensing pulsed sonic signals and producing therefrom processing-unit input signals from which a direction of a source of the sonic signals can be deduced, a processing unit for processing the processing-unit input signals to generate a display that indicates the direction of the sonic signal source, and a cable connected between the remote unit and the processing unit for carrying the processing-unit input signals from the remote unit to the processing unit, the sonic location system comprising:

A. a long-baseline transducer array and a short-baseline transducer array, each array being located in the remote unit and comprising a plurality of sonic transducers for receiving the sonic signals and for producing electrical transducer signals in response to received sonic signals, at least a pair of the transducers of the long-baseline array being spaced apart by a first, relatively long distance to resolve the direction of the sonic signal source, and at least a pair of the transducers of the short-baseline array being spaced apart by a second, relatively short distance to resolve angular ambiguities in the long-baseline array;

B. signal-detection means for generating a switch-state signal whose value depends on whether the first portion of a single pulse being received by the transducer arrays is of a predetermined type;

C. interruptible long-baseline and short-baseline signal channels located in the remote unit for receiving the transducer signals from the long- and short-baseline arrays, respectively, each signal channel processing its respective received transducer signals to produce respective channel signals, and each signal channel applying its respective channel signals to the cable as the processing-unit input signals when that signal channel is completed but not when that signal channel is interrupted; and

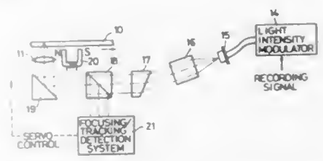
D. switching means, responsive to the switch-state signal, for selectively assuming first and second switch states and being interposed in the long-baseline and short-baseline signal channels, and to (i) in the first switch state, complete a first one of the long- and short-baseline signal channels and interrupt a second one thereof and (ii) in the second switch state, complete the second signal channel and interrupt the first signal channel, the switching means being responsive to the switch-state signal to assume one of the first or second switch states in accordance with the value of the switch-state signal.

4,914,643

OVERWRITING PHOTOMAGNETIC RECORDING APPARATUS HAVING SINGLE LIGHT SOURCE AND FIXED-FIELD GENERATOR

Ikuo Maeda, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 19, 1987, Ser. No. 122,444
Claims priority, application Japan, Nov. 20, 1986, 61-277732
Int. Cl.[4] G11B *11/12, 13/04*
U.S. Cl. 369—13 8 Claims



1. An overwriting recorder for use in photomagnetic recording apparatus in which a laser beam emitted from a single semiconductor laser is focused on a moving photomagnetic disk to increase the temperature of the disk and reduce the coercive force thereof for magnetizing the disk according to directions of externally applied magnetic fields thereby to record signals, said overwriting recorder comprising:

a light intensity modulator for modulating said laser beam with a signal to be recorded to obtain light intensities corresponding to the recorder signal; and

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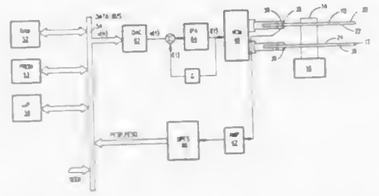
at least one fixed-field generator, having North and South magnetic poles which are disposed at two positions along the disk moving direction, wherein said field generator is disposed at a location displaced from a location of the focused laser beam on the disk, said generator is for applying said magnetic fields with permanently fixed intensities in mutually opposite directions to the disk at the two positions thereon, said two positions are determined by the light intensities of the modulated laser beam such that the coercive force of said disk varies with time according to the intensities of said modulated light beam and wherein overwriting of data can be achieved.

4,914,644

DISK FILE DIGITAL SERVO CONTROL SYSTEM WITH COIL CURRENT MODELING

James C. Chen; Shih-Ming Shih, and Mantle M. Yu, all of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 26, 1988, Ser. No. 249,619
Int. Cl.[4] G11B *21/08, 21/10, 5/55*
U.S. Cl. 369—43 **4 Claims**



1. An improved data recording disk file of the type having at least one rotatable disk with generally concentric data tracks thereon, the data disk or a separate servo disk having servo information recorded thereon, at least one head for reading the servo information during rotation of the disk, a voice coil motor (VCM) attached to the head for positioning the head relative, to the data tracks, means for deriving from the servo information a digital head position error signal (PES), a processor for estimating the state variables of the VCM and for generating, from the estimated state variables and the digital PES, a digital control signal, means for converting the digital control signal to an analog control signal, and a power amplifier for amplifying the analog control signal and generating an input current for use by the VCM, wherein the improvement comprises:

means for providing direct feedback of the VCM current to the input of the power amplifier;

means for determining if the power amplifier is saturated; and

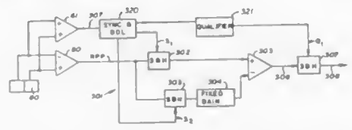
said processor including means for making a first estimate of VCM current and for making a second estimate of VCM current in response to a determination of power amplifier saturation.

4,914,645

OPTICAL DISK TRACKING AND SEEKING SYSTEMS AND SPECIFIC TRACK FORMATS USING SERVO AREAS

Kurt W. Getreuer, Colorado Springs, Colo.; Johannes J. Verboom, Berge h, Netherlands; David L. Schell, Colorado Springs, Colo.; David E. Lewis, Colorado Springs, Colo.; Gregory V. Hofer, Colorado Springs, Colo.; Kathleen M. Connelly, Colorado Springs, Colo.; James C. McDonald, Colorado Springs, Colo.; Pierre R. Sonneville, Weert, and Cees van Nimwegen, Eindhoven, both of Netherlands, assignors to Laser Magnetic Storage International Company, Colorado Springs, Colo.

Continuation of Ser. No. 760,450, Jul. 30, 1985, abandoned. This application Jan. 25, 1988, Ser. No. 147,690
Int. Cl.[4] G11B *7/09*
U.S. Cl. 369—44 **14 Claims**



1. A record carrier wherein said record carrier has an information layer having tracks for storage of data, each of said tracks including a longitudinally disposed sector, each sector having an associated sector header and a sector data area, said sector data area having associated therewith at least one servo area, said tracks being so arranged and disposed to form a diffraction grating for an incident radiation beam, said record carrier comprising:

a user area located in said sector data area and having a first length,

a first record carrier modulation means located in said servo area and having a second length equal to said first length, said first record carrier modulation means including at least one qualifier modulation means having a combination of pitted and unpitted areas different than that in said user data area, and

a second record carrier modulation means located in said servo area and having a third length equal to said first length, said second record carrier modulation means comprising at least one discontinuity extending across the track, and

at least one non-reflective timing pit, wherein said discontinuity and said non-reflective timing pit are positioned differently from any combination of pitted and unpitted areas in said user data area.

4,914,646

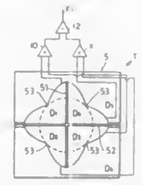
OPTICAL PICKUP DEVICE HAVING PARTICULARLY SHAPED PHOTODETECTORS FOR PROVIDING AN ACCURATE FOCUS ERROR

Takanori Maeda, Saitama, Japan, assignor to Pioneer Electric Corporation, Tokyo, Japan

Filed Apr. 5, 1988, Ser. No. 177,734
Claims priority, application Japan, May 22, 1987, 62-125321
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—45 **10 Claims**

1. In an optical pickup device of the type having a light source for generating a light beam, an objective lens for focusing said light beam, a recording medium for receiving and then reflecting the focused light beam, and photo-detector means for receiving the reflected light beam from the recording medium such that the reflected light beam falls on the photo-detector means, said photo-detector means comprising a plurality of separate regions, a logical combination of the outputs from said separate regions providing an indication of an out of focus condition of the reflected light beam falling on said photo-detector means,

the improvement comprising, said photo-detector means



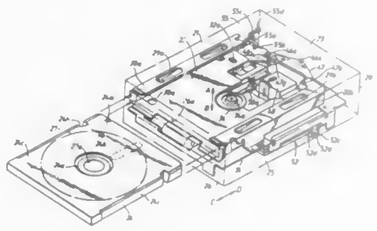
having a shape such that the logical combination of the outputs from said separate regions indicates an out of focus condition only if a part of the reflected light beam falls outside of the photo-detector means.

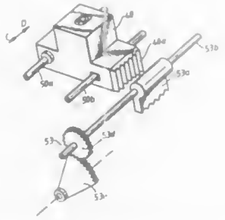
4,914,647

OPTICAL DISC PLAYER

Takuro Ono; Noboru Aoyama, and Kaoru Morinaga, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Aug. 25, 1987, Ser. No. 89,337
Claims priority, application Japan, Aug. 25, 1986, 61-198426; Aug. 25, 1986, 61-129071[U]
Int. Cl.[4] G11B *3/10, 7/00*
U.S. Cl. 369—77.2 **7 Claims**





1. An optical pickup locking mechanism for an optical disc player, the optical disc player including a disc compartment for accommodating an optical disc, the mechanism comprising:

disc holding means for holding the optical disc accommodated in the disc compartment, the disc holding means including a turntable for removably supporting and rotating the optical disc and a clamper for releasably holding the optical disc to said turntable, the disc holding means having a hold position when the optical disc is held by the clamper and the turntable and a release position when the optical disc is released by the clamper and the turntable;

optical pickup means for optically reading information stored on the optical disc, the optical pickup means being radially movable relative to the optical disc when the optical disc is disposed on said turntable;

optical pickup locking means for locking the optical pickup means in an unmovable state including a first engaging means fixed to said optical pickup means and a second engaging means capable of engaging the first engaging means, the second engaging means being fixed along the direction of movement of the optical pickup means and rotatable to fixedly engage the first engaging means when the disc holding means is in the release position; and

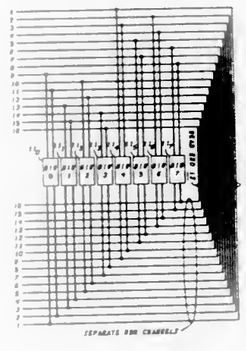
lever means for placing the disc holding means and the optical pickup locking means in mechanical communication, the lever means operating the optical pickup locking means to lock the optical pickup means in the unmovable state when the disc holding means is in the release position.

4,914,648

MULTICHANNEL, MULTIHOP LIGHTWAVE COMMUNICATION SYSTEM

Anthony Acampora, Freehold; Michael G. Hluchyj, Little Silver, and Mark J. Karol, Fair Haven, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 30,395, Mar. 26, 1987, abandoned. This application Mar. 29, 1989, Ser. No. 331,036
Int. Cl.[4] H04B *9/00*
U.S. Cl. 370—3 **11 Claims**



1. A communication network for providing communications between a plurality of user nodes, the network comprising:

a communication media section (10) for supporting a plurality of communication channels therealong; and

a plurality of N network interface units (NIUs)(11) where $N>2$, each NIU being coupled directly to the communication media section and to at least one user node of the network, the plurality of NIUs being arranged such that (a) at least one of the plurality of NIUs is arranged to transmit information directly over the communication media section via at least one communication channel to at least two other NIUs or to receive information over the media section from at least two other NIUs via at least one communication channel, and (b) at least one of the plurality of NIUs is not arranged to transmit information directly via a communication channel to a desired at least one of the other NIUs of the network and communicates with said desired at least one of the other NIUs by transmitting information to a second different NIU using a first communication channel and the second NIU then retransmits the information over the communication media section using a second different communication channel either directly, or via other NIUs and other communica-

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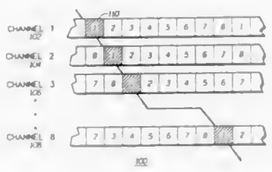
tion channels, to the desired at least one of the other NIUs, each NIU comprising at least one transmitter and at least one receiver and the transmitters and receivers of the plurality of NIUs are subdivided into a plurality of k separate groups of p^k NIUs per group, where p is a integer and $N=kp^k$, which groups are arranged in a predetermined sequence and interconnected in accordance with a recirculating generalized perfect shuffle pattern.

4,914,649

MULTIPLE FREQUENCY MESSAGE SYSTEM

Robert J. Schwendeman, Pompano Beach, and David F. Willard, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 12, 1988, Ser. No. 243,869
Int. Cl.[4] H04Q *7/00*
U.S. Cl. 370—50 **20 Claims**



1. A multiple frequency message system, comprising:
transmitter means, for transmitting coded message signals on a plurality of channels, in a plurality of geographic areas, the coded message signals including individual channel identification information assigned to each of the channels in each of the geogtaphic areas and message information being transmitted in a predetermined sequence of coded transmission slots on each of the plurality of channels in each geographic area, each coded transmission slot of the predetermined sequence being transmitted sequentially on each of the plurality of channels so as to preclude the simultaneous transmission of a correspondingly coded transmission slot on any two channels in each geographic area; and
receiver means, capable of receiving the coded message signals during a predetermined one of the coded transmission slots being sequentially transmitted on each of the plurality of channels,
said receiver means including channel selecting means responsive to the received channel identification information, for sequentially selecting the predetermined coded transmission slot on each of the plurality of channels, when the channel identification information received on each of the plurality of channels does not match predetermined channel identification information.

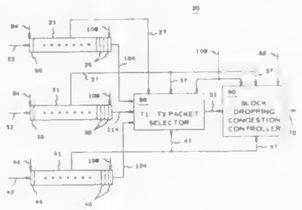
4,914,650

BANDWIDTH ALLOCATION AND CONGESTION CONTROL SCHEME FOR AN INTEGRATED VOICE AND DATA NETWORK

Kotikalapudi Sriram, Matawan, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 6, 1988, Ser. No. 280,606
Int. Cl.[4] H04J *3/26*
U.S. Cl. 370—60 **16 Claims**

1. A method for selecting information packets from plural queues in a multiplexer for transmission through an integrated voice and data network, the method comprising the steps of:
if at least one voice packet is stored in a voice queue in the multiplexer, transmitting voice packets from the voice queue for an interval T1 or until the voice packets are exhausted from the voice queue, whichever occurs first;
if at least one data packet is stored in a data queue in the multiplexer, transmitting data packets from the data queue



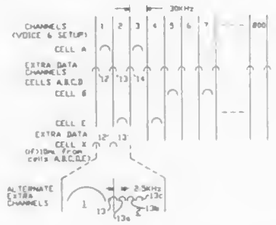
for an interval T2 or until the data packets are exhausted from the data queue, whichever occurs first; and
then repeat the first two steps.

4,914,651

CELLULAR DATA SYSTEM

Bruce Lusignan, Stanford, Calif., assignor to Cellular Data, Inc., Palo Alto, Calif.

Filed Sep. 20, 1988, Ser. No. 247,040
Int. Cl.[4] H04J *1/02*
U.S. Cl. 370—69.1 **12 Claims**



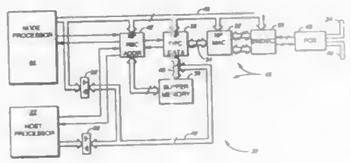
1. In an advanced mobile phone service system having a plurality of contiguous cells each with a cell site having a radio transceiver with voice and setup channels for communicating with mobile units within the cell, each of said standard voice and setup channels having a predetermined frequency bandwidth, a predetermined portion of said channels for each cell having alternate non-used channels between used channels to provide adequate adjacent channel separation while information is being transmitted on a used channel at a predetermined power level, a plurality of said cells being grouped in a cluster to provide a number of disjoint channel sets, such sets avoiding both adjacent channel and co-channel interference while providing for frequency re-use by geographical placement of cells in a cluster having adjacent channels in different cells with at least one intervening cell between them and channels of the same frequency separated by at least one intervening cell between them, characterized by additional data channels for carrying digital data, including means for transmitting said digital data to and from at least one field unit in a cell and said cell site, concurrently with information on a said used channel, each said additional channel having a frequency centered substantially midway between said used and unused channels of the same or adjacent cell and including means for transmitting on said additional channels at a power at least an order of magnitude lower than said predetermined power level and for controlling bandwidth spreading of said additional channels to prevent interference with adjacent used channels.

4,914,652

METHOD FOR TRANSFER OF DATA BETWEEN A MEDIA ACCESS CONTROLLER AND BUFFER MEMORY IN A TOKEN RING NETWORK

Hang Diem Nguyen, Fremont, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 1, 1988, Ser. No. 226,610
Int. Cl.[4] H04J *3/02*
U.S. Cl. 370—85.5 **12 Claims**



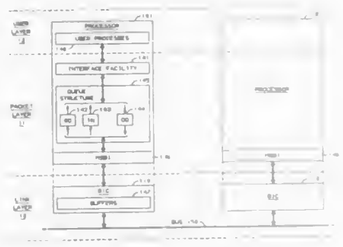
1. A method for use in a Token ring network including a plurality of stations serially connected by a transmission medium so as to form a closed loop on which packets of data are circulated, wherein each respective station includes media access controller means for scheduling and routing data transmissions on the transmission medium, buffer memory means for storage of information, and processor means for controlling operation of the respective station, the processor means having access to the buffer memory means, the method comprising the steps of:
transferring data of a respective packet from a media access controller means of a respective station to the buffer memory means of the respective station;
storing the data in a sequence of contiguous memory locations in the buffer memory means;
in the course of said step of transferring the data, generating status information for the data; and
after said step of storing the data, storing the status information in the buffer memory means contiguously with the stored data at the beginning of the sequence of memory locations in which the data are stored.

4,914,653

INTER-PROCESSOR COMMUNICATION PROTOCOL

Thomas P. Bishop, Aurora; Mark H. Davis, Warrenville, both of Ill.; David N. Horn, Rumson, N.J.; Grover T. Surratt, West Chicago, and Lawrence A. Welsch, Naperville, both of Ill., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Dec. 22, 1986, Ser. No. 941,702
Int. Cl.[4] H04J *3/02*
U.S. Cl. 370—85.6 **34 Claims**



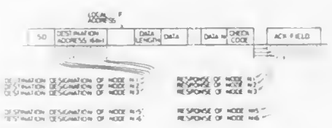
1. A communication system comprising:
an arbitrated-access communication medium; and
a plurality of stations communicatively connected to and sharing use of the medium, each station comprising
first means, for seeking exclusive access to the medium according to either one of a first and a second priority associated with the station, each station's associated first and second priority being different from the first and second priorities, respectively, of the other stations, and the second priority of every station being higher than the first priority of every station;
second means, responsive to gaining of sought access by the first means, for transmitting messages of either one of a first and a second predetermined type on the medium to other stations, and responsive to not gaining of sought access by the first means for forbearing transmitting on the medium;
third means, for storing messages of the first type received on the medium from other stations;
fourth means, for storing, separately from messages of the first type, messages of the second type received on the medium from other stations;
fifth means, for causing the first means to seek medium access according to the first priority and causing the second means to transmit a message of the first type; and
sixth means, responsive to a message stored in the third means and received from another station, for causing the first means to seek medium access according to the second priority and causing the second means to transmit a message of the second type to the other station.

4,914,654

MULTIPLEX TRANSMISSION SYSTEM

Yutaka Matsuda, Hiratsuka; Teruhisa Inoue, Ichikawa; Kyousuke Hashimoto, Hiratsuka; Kiyoshi Inoue, Atsugi, and Yusaku Himono, Tokyo, all of Japan, assignors to Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1988, Ser. No. 177,497
Claims priority, application Japan, Apr. 6, 1987, 62-84136
Int. Cl.[4] H04J *3/24, 3/02;* **H04L** *1/18*
U.S. Cl. 370—94.1 **5 Claims**



1. A multiplex transmission method, in which one of a plurality of nodes, as a transmitting node, mutually coupled together through a transmission path transmits data frame by frame to at least one of other nodes as at least one reception node, and said at least one of reception node returns a reception acknowledge signal to said transmitting node upon proper reception of said frame of data, said multiplex transmission method comprisiing the steps of:
providing a reception acknowledge signal area including a plurality of bits following said frame transmitted from said transmitting node;
dividing said reception acknowledge signal area into a plurality of bit areas;
respectively assigning said divided bit areas to said plurality of nodes; and
causing said at least one reception node to return said reception acknowledge signal to said transmitting node from one of said respectively assigned bit areas of said reception acknowledge signal area.

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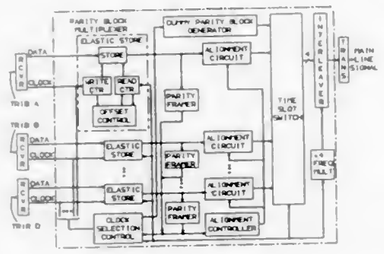
4,914,655

MULTIPLEXING ARRANGEMENT FOR A DIGITAL TRANSMISSION SYSTEM

Virgil I. Johannes; Frank J. Peragine, and Lowell D. White, all of Holmdel, N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 20, 1986, Ser. No. 876,720
Int. Cl.[4] H04J *3/06*
U.S. Cl. 370—112 **32 Claims**



1. A digital block multiplexer for interleaving blocks of bits from each of a plurality of input tributary lines, the multiplexer comprising

means for receiving sequences of blocks of digital bit streams in frames, respectively from first and second tributary lines, each frame including tributary line identification information and plural sequential blocks of digital bits, each block of digital bits including plural data bits and a block parity bit, the sequence of blocks from the second tributary line means including in a periodic one of the block parity bit positions, a complemented block parity bit containing control information; and

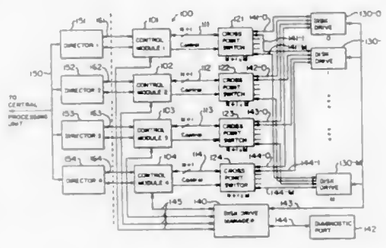
means for interleaving the blocks of digital bit streams from the first and second tributary line means into a multiplexed bit stream.

4,914,656

DISK DRIVE MEMORY

Robert H. Dunphy, Jr., Holland, Pa.; Robert Walsh, Boulder, Colo., and John H. Bowers, Clarksburg, N.J., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Jun. 28, 1988, Ser. No. 212,434
Int. Cl.[4] G06F *7/22*
U.S. Cl. 371—10.2 **64 Claims**



1. A disk memory system for storing data files for associated data processing devices comprising:

a plurality of disk drives;

means for assigning a subset of said plurality of disk drives into two or more parity groups, each parity group consisting of two or more disk drives;

means responsive to the receipt of a data file from said associated data processing devices for selecting one of said parity groups to store said data file thereon;

means for writing said received data file and parity data associated with said received data file in segments across said two or more disk drives in said selected parity group;

means for reserving one or more of said plurality of disk drives as backup disk drives, which backup disk drives are shared in common by said two or more parity groups;

means for identifying one of said disk drives in said subset that fails to function; and

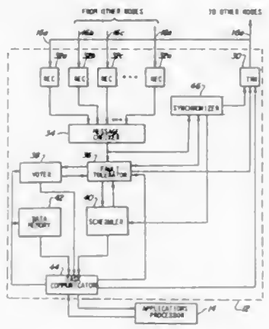
means responsive to said identifying means for switchably connecting one of said backup disk drives in place of said identified failed disk drive.

4,914,657

OPERATIONS CONTROLLER FOR A FAULT TOLERANT MULTIPLE NODE PROCESSING SYSTEM

Chris J. Walter, Columbia; Roger M. Kieckhafer, Ellicott City, both of Md., and Alan M. Fina, Anston, Conn., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 15, 1987, Ser. No. 38,813
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—11.3 **8 Claims**



1. In a fault tolerant multiple node processing system wherein each node has an applications processor for executing a predetermined set of tasks, wherein each task in said predetermined set of tasks is included in the predetermined set of tasks of at least one other node in the processing system and an operations controller for establishing and maintaining its own node in synchronization with every other node in the system, for controlling the operation of its own node, and for selecting from an active task list the tasks to be executed by its own application processor in coordination with all of the other nodes in the system through the exchange of inter-node messages with all of the other nodes in the system, said active task list containing a selected subset of said predetermined set of tasks, the operations controller comprising:

a transmitter for transmitting all of the inter-node messages generated by its own operations controller to all the nodes in the system including its own node over a private communication link, said transmitter having an arbitrator for deciding the order in which said inter-node messages are to be transmitted when two or more messages are ready for transmission at the same time;

a plurality of receivers, each receiver associated with a respective one of said multiple nodes and only receiving messages from that node;

a message checker connected to said plurality of receivers for checking each received message for physical and logical errors to generate an internal error report containing an error status byte identifying each detected error, said message checker polling each of said receivers to unloadd the received messages in a repetitive sequence;

a voter subsystem having a voter for voting on the content of all error free messages having a value produced by the execution of the same task in said at least one other node to generate a voted value and a deviance checker for generating an internal error report containing a deviance vector identifying each node which sent a message used in the generaion of said voted value whose value differed from the voted value by more than a predetermined deviance value;

a fault tolerator connected to said message checker, said voter subsystem and said transmitter for passing all error free messages received from said message checker to said voter subsystem, for generating an inter-node error message containing all of said error reports accumulated by all the subsystems which is sent to all of the nodes in the system by said transmitter, for generating a base penalty count message containing a base penalty count for each node in the system based on the number of errors detected and the severity of the detected errors identified in said internal error reports which is sent to all of the nodes in the system by said transmitter, for globally verifying the base penalty count for each node through the exchange of inter-node base penalty count messages, and for generating a system state vector identifying each node whose base penalty count exceeds a predetermined exclusion threshold;

a task scheduler connected to said fault tolerator for selecting the next task to be executed by the node's own applications processor from said active task list, for replicating the scheduling of other nodes in the system, for maintaining a global data base in the scheduling and execution of tasks by each node through the exchange of task completed/started messages received from the fault tolerator, and for generating an error report identifying each node whose scheduling process differs from the scheduling process replicated for that node, said task scheduler further having meand to reconfigure said active task list in response to said system state vector received from the fault tolerator indicating a change in the number of non-excluded nodes;

a data memory;

a task communicator connected to said voter subsystem, said data memory, said task scheduler, the transmitter and the applications processor for storing said voted values received from said voter subsystem in said data memory, for passing the identity of the task selected by the task scheduler to the applications processor, for extracting from said data memory the voted values required for the execution of the selected task and passing them to the applications processor, for generating said task completed/started messages identifying the task just completed and the new task started by the applications processor which is transmitted to all the nodes by said transmitter, and for generating inter-node data value messages containing the data values generated by the applicationsprocessor in the execution of the selected tasks which are also transmitted to all the nodes by said transmitter; and

a synchronizer connected to said message checker, said task scheduler and said transmitter for synchronizing the operation of its own node with all of the other non-faulty nodes in the system through the exchange of inter-node time-dependent messages, said synchronizer generating a time-dependent message which is transmitted by said transmitter to all the nodes in the system, storing a time stamp signifying the local time which each time-dependent message received from said message checker is and correcting the synchronization of said task scheduler of its own node based on the difference between the time stamp of its own time-dependent message and a voted time stamp derived from the time stamps for all the time-dependent messages received within a predetermined time window

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4,914,658

MODE-LOCKED LASER

Krassimir Stankov, and Fritz P. Schäfer, both of Goettingen, Fed. Rep. of Germany, assignors to Max-Plank-Gesellschaft zur Foerderung der Wissenschaften e.V., Goettingen, Fed. Rep. of Germany

Filed Oct. 27, 1988, Ser. No. 263,628
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1987, 3736881; Aug. 5, 1988, 3826716
Int. Cl.[4] H01S *3/098*
U.S. Cl. 372—18 **16 Claims**

1 A mode-locked laser comprising:

a first mirror and a second mirror, spaced from each other, each of said mirrors having predetermined reflection characteristics, said first and second mirrors defining an optical resonator;

an active laser medium, adapted to emit laser radiation at a predetermined fundamental frequency upon stimulation of the laser medium, positioned between said first and second mirrors; and

non-linear optical means, positioned in said resonator between said active laser medium and said second mirror, for reversibly converting said fundamental frequency radiation into radiation of a first frequency and radiation of a second frequency, with the ratio of the intensity of radiation at said second frequency relative to the intensity of radiation at said first frequency increasing with increasing intensity of said fundamental frequency radiation;

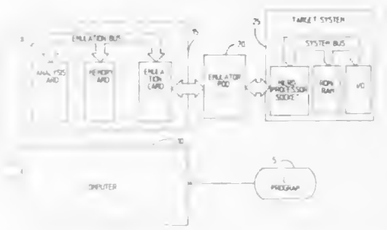
the reflectivity of said second mirror at said second frequency being greater than its reflectivity at said first frequency.

4,914,659

METHOD AND APPARATUS FOR SOFTWARE BRANCH ANALYSIS

Bruce A. Ericksen, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 10, 1988, Ser. No. 154,684
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—19 **2 Claims**



1. A tool for developing software, said software to be used to test a predetermined system which is designed so as to be controlled by a predetermined microprocessor, said microprocessor to be embedded in said system, said tool comprising:

emulation means for replacing and emulating said microprocessor of said system;

computer means, connected to said emulation means, for controlling said replacing and emulating and for compilation of said software;

preprocessing means, connected at least to said computer

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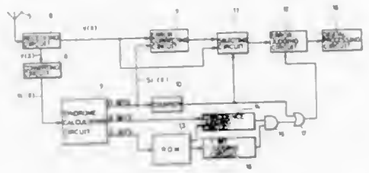
means, for inserting executable branch analysis statements in said software prior to compilation and execution of said software;
processing means, connected at least to said preprocessing means, for determining whether said branch analysis statements were executed during execution of said software;
report means, connected at least to said processing means, for reporting to a user of said tool whether said branch analysis statements were executed during execution of said software.

4,914,660

METHOD AND APPARATUS FOR DECODING ERROR CORRECTING CODE

Shintaro Hirose, Gifu, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Apr. 8, 1988, Ser. No. 179,420
Int. Cl.[4] H04L *1/00*
U.S. Cl. 371—37.1 13 Claims



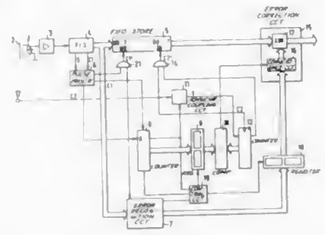
1. An error correcting code decoding apparatus comprising:
means for receiving a first digital signal train V(X) of (l +m) bits (l, m:positive integer) including an error correcting code of l bits calculated on the basis of a generator polynominal G(X) of degree l added to information bit of m bits, m being equal to or less than l,
means for producing a second digital signal train $V_I(X) = V(1/X) \cdot X^{(l+m)} - 1$ obtained by reversing an arrangement order from the most significant bit to the least significant bit in the first digital signal train V(X) received by said receiving means so that the least significant bit in V(X) is positioned in the most significant bit in $V_I(X)$, . . . , and the most significant bit in V(X) is positioned in the least significant bit in $V_I(X)$,
syndrome calculating means for dividing said second digital signal train $V_I(X)$ by an inverse generator polynominal $G_I(X) + G(1/X) \cdot X^l$ of said generator polynominal G(X) to obtain a syndrome $S_I(X)$ of l bits, being the remainder term,
counter means for detecting the number of "1"s in said l-bit syndrome $S_I(X)$ obtained by said syndrome calculating means,
means for applying an exclusive OR operation to l bits of most significant bits in the first digital signal train V(X) received by said receiving means with said l-bit syndrome $S_I(X)$ obtained by said syndrome calculating means,
means for selecting an output of said exclusive OR means if it is determined by said counter means that the number of "1"s in said l -bit syndrome $S_I(X)$ is one or zero while directly selecting the first digital signal train V(X) received by said receiving means if it is determined that the number is two or more,
data calculating means for calculating second data of remaining y =(l−x) bits (x:positive integer) corresponding to first data of arbitrary x bits in said l -bit syndrome $S_I(X)$ previously calculated in occurrence of a single-bit error of said first digital signal train V(X) on the basis of said first data of x bits in said l -bit syndrome $S_I(X)$ obtained by said syndrome calculating means,
means for judging coincidence of the second data of y =(l−x) bits obtained by said data calculating means and third date of y =(l −x) bits other than said first data of x bits in the l-bit syndrome $S_I(X)$ obtained by said syndrome calculating means, and
error judging means for judging that said first digital signal train V(X) includes a double-bit error or a multiple-bit error if an output of said counter means shows that the number of "1"s in said l-bit syndrome $S_I(X)$ is two or more and said coincidence judging means judges that said second data is not in coincidence with said third data.

4,914,661

METHOD AND APPARATUS FOR CORRECTING ERRORS IN DIGITAL SIGNALS HAVING PHASE FLUCTUATIONS

Roland Mester, Darmstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 24, 1988, Ser. No. 198,131
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1987, 3719404
Int. Cl.[4] G06F *11/10*; G11C *29/00*
U.S. Cl. 371—40.1 10 Claims



1. Method of correcting errors in digital signals having a data word rate and having phase fluctuation of said rate such as those occurring in digital signals reproduced from a magnetic tape record, comprising the steps of:
deriving a first data word rate signal from the digital signals;
writing the digital signals into a first intermediate storage unit;
generating, at said first data word rate, correction signals and related word identifying correction control signals for correctable erroneous data words among said digital signals;
generating a second data word rate signal free of phase fluctuations and equal in frequency to said first data word rate signal;
and reading said digital signals out of said first intermediate storage unit under control of said second data word rate signal at said second data word rate in the sequence in which they were written thereinto and, without disturbing the rate of readout, applying correction signals to correctable erroneous data words of said digital signals under control of said correction control signals and thereby correcting said erroneous data words.

4,914,662

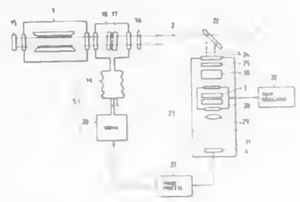
LASER WAVELENGTH STABILIZATION

Hajime Nakatani; Yoshibumi Minowa; Hitoshi Wakata; Haruhiko Nagai, and Kenyu Haruta, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1988, Ser. No. 248,900
Claims priority, application Japan, Sep. 26, 1987, 62-241067; Oct. 14, 1987, 62-259936
Int. Cl.[4] H01S *3/13*
U.S. Cl. 372—32 13 Claims

1. A method of stabilizing the laser wavelength of a laser source comprising the steps of:

supplying a laser beam from a laser light source having a controllable variable wavelength;
deriving a portion of said laser light beam emitted;
processing spectroscopically said derived portion of said laser light beam by means of a wavelength monitor mechanism into wavelength segments;
measuring the spatial intensity distribution of said wavelength segments of said spectroscopically processed beam portion;



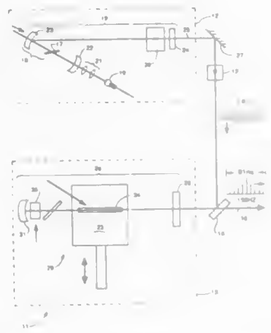
processing spectroscopically a light having a specific wavelength and measuring the spatial intensity distribution thereof;
analyzing said measured spatial intensity distribution of said spectroscopically processed laser light beam portion in response to said measured spatial intensity distribution of said spectroscopically processed light having said specific wavelength; and
controlling the wavelength of said laser oscillator in response to the result of said analysis.

4,914,663

GENERATION OF SHORT HIGH PEAK POWER PULSES FROM AN INJECTION MODE-LOCKED Q-SWITCHED LASER OSCILLATOR

Santanu Basu, Greenwich, Conn., and Robert L. Byer, Stanford, Calif., assignors to The Board of Trustees of Leland Stanford, Jr. University, Stanford, Calif.

Filed Apr. 22, 1983, Ser. No. 185,086
Int. Cl.[4] H01S *3/098*
U.S. Cl. 372—18 11 Claims



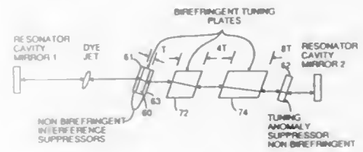
9. In an injection mode-locked laser oscillator for generating a train of high peak power pulses of optical lasant radiation:
a first optical resonator;
a first solid state laser gain medium disposed within said first optical resonator;
a first source of first optical pumping radiation disposed for directing optical pumping radiation into said first solid state laser gain medium for optically pumping same to excite optical lasant radiation emanating from said first gain medium and resonated by said first optical resonator;
an optical modulator for modulating the resonated optical lasant radiation at a modulation frequency corresponding to the round-trip time of said first optical resonator for mode-locking the resonated lasant radiation and producing a train of mode-locked pulses of said resonated lasant radiation to be amplified with a pulse timing corresponding to the round-trip time of said first optical resonator;
a second optical resonator disposed to receive said train of mode-locked pulses of lasant radiation and having a round-trip time generally equal to the round-trip time of said first optical resonator;
a second solid state laser gain medium disposed within said second optical resonator;
a second source of optical pumping radiation disposed to illuminate said second laser gain medium for optically pumping same to excite optical lasant radiation emanating from said second optically pumped laser gain medium and resonated by said second optical resonator and injection mode-locked by said train of mode-locked pulses of lasant radiation to be amplified for amplifying said train of pulses; and
a Q-switch member disposed in said second optical resonator for Q-switching the amplified train of pulses of optical lasant radiation resonated by said second optical resonator.

4,914,664

TUNABLE DYE LASER WITH SUPPRESSED FREQUENCY SHIFT ANOMALIES

Ben Woodward, Santa Clara, Calif., assignor to Spectra Physics, Inc., San Jose, Calif.

Filed Oct. 21, 1988, Ser. No. 260,909
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—20 23 Claims



1. A tuning apparatus for a dye laser having a resonator cavity with a beam of light therein comprising:
a tuning plate of birefringent material in the path of said beam of light, said birefringent material having an optic axis and having a thickness defined according to the following equation:

$$w = \frac{B\,T}{m \sin(Th)} \left[1 - \frac{\sin^2(Th)}{2\,\pi^2} (1 + \sin(2\,Ph)) \right]$$

where,
w = the wavelength of light which will have minimum loss for conditions defined by the values of the variables in said equation;
B = the birefringence of the plate as defined by the difference in the indices of refraction along two principal displacement directions in the anisotropic material at the wavelength w;
T = the thickness of the birefringent plate;
m = the integer or order number indicating the number of full wavelengths of phase retardation light will experience in passing through said birefringent plate;

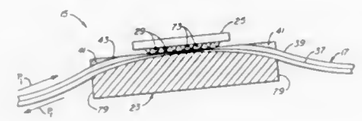
Th = the angle of incidence of said light beam on said birefringent plate;
n = the average index of refraction of the birefringent material at the wavelength w; and,
Ph = the tuning angle equal to alpha plus pi/4 where alpha is the angle between the projection of said optic axis of the birefringent plate on a surface of said birefringent plate upon which said beam of light is incident to the plane of incidence containing both the direction of propagation of the incident ray and the normal to said surface;
said thickness, T, selected such that a single order tuning curve covers a selected range of wavelengths of interest within a predetermined range of said tuning angles, Ph, where each tuning curve relates the wavelength of light experiencing minimum loss to a corresponding tuning angle Ph which causes said wavelength to suffer minimum loss, and
further comprising a means for imposing losses on any light in said light beam not having the polarization of light which can pass through said birefringent tuning plate without experiencing substantial losses.

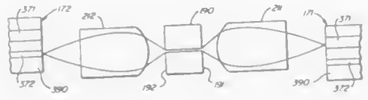
4,914,665

BROADBAND-TUNABLE EXTERNAL FIBER-CAVITY LASER

Wayne V. Sorin, Mountain View, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 20, 1987, Ser. No. 5,494
Int. Cl.[4] G02B 6/26; H01S 3/10
U.S. Cl. 372—20 29 Claims





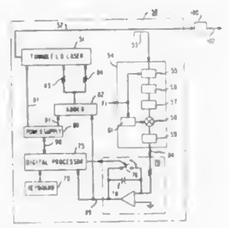
1. A tunable external fiber-cavity laser system comprising:
laser means for generating light within a predetermined wavelength range;
fiber means for the guided propagation of light within said predetermined wavelength range, said fiber means including at least one optical fiber;
laser-fiber coupling means for coupling said laser means and said fiber means so that they are in mutual optical communication;
adjustable filter means for in-fiber filtering of light being transmitted along said fiber means, said filter means being adapted for separating light of a predetermined maximum bandwidth within said predetermined wavelength range from light being transmitted along said fiber means, said filter means being adjustable over a tuning range substantially greater than said maximum predetermined bandwidth;
filter-fiber coupling means for coupling said filter means and said fiber means so that the field of light being transmitted along said fiber means can interact with said filter means to effect in-fiber filtering; and
tuning means for tuning said filter means over said tuning range, said filter-fiber coupling means, said fiber means, said laser-fiber coupling means and said laser means being mutually selected and arranged so that light selected by said tuning means for separation by said filter means is fed back to said laser means so that said laser means preferentially lazes at the frequency of said selected light.

4,914,666

RANDOM-ACCESS DIGITALLY -TUNED OPTICAL FREQUENCY SYNTHESIZER

B. Glance, Colts Neck, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 4, 1989, Ser. No. 347,122
Int. Cl.[4] H01S 3/10
U.S. Cl. 372—20 4 Claims



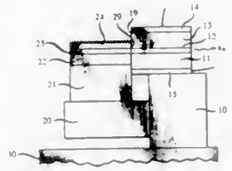
1. A laser control arrangement for tuning a laser, the arrangement comprising
a laser oscillating at a frequency, tunable via a control signal, to any one of a set of resonant frequencies, of a resonator, the resonant frequencies being spaced apart over a range of frequencies;
means, responsive to the oscillating frequency of the laser and to the set of resonant frequencies for determining a set of values of control signal for producing the desired set of oscillating frequencies;
means for storing the set of values of control signal; and
means for selecting one of the stored values of control signal for driving the laser to a desired one of the set oscillating frequencies.

4,914,667

HYBRID LASER FOR OPTICAL COMMUNICATIONS, AND TRANSMITTER, SYSTEM, AND METHOD

Greg E. Blonder, Maplewood; Charles H. Henry, Skillman; Rudolf F. Kazarinov, Martinsville; Nils A. Olsson, Summit, and Kenneth J. Orlowsky, Middlesex, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 5,672, Jan. 21, 1987, abandoned. This application May 30, 1989, Ser. No. 358,468
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—44 41 Claims



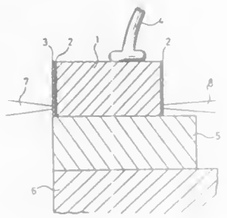
1. An optical communications laser comprising a first element and a second element,
said first element comprising an active layer and a cladding layer supported by a first substrate, said cladding layer being adjacent to said active layer, and said first element further comprising electrode means for supplying an electrical current to said active layer,
said second element comprising a grating structure on a second substrate,
said second element being aligned with respect to said first element such that light emitted by said active layer is diffracted by a grating in said grating structure, said grating structure thereby serving in forming an optical cavity,
said laser being designed for operation at a desired operating point which depends on a laser parameter,
the setting of said laser parameter being significantly different from a first value and from a second value, said first and second values being values at which said laser undergoes node instability, said first value being the value at which said laser undergoes mode instability nearest to and less than said setting, and said second value being the value at which said laser undergoes mode instability nearest to and greater than said setting.

4,914,668

SEMICONDUCTOR LASER INCLUDING A REFLECTION FILM

Yutaka Nagai; Yutaka Mihashi; Kenji Ikeda, and Yoichiro Ota, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 10, 1989, Ser. No. 308,744
Claims priority, application Japan, Feb. 12, 1988, 63-31201
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—49 12 Claims



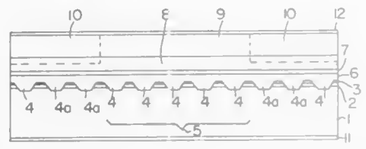
1. In a semiconductor laser device having two facets through which laser light is output, a multiple layer reflection film having a reflectivity of 45 to 65% including at least one layer of amorphous silicon (a-Si) and one layer of alumina (Al_2O_3) disposed on one of the laser output facets.

4,914,669

SEMICONDUCTOR LASER ARRAY APPARATUS

Sadayoshi Matsui, Tenri; Mototaka Taneya, Tsukuba; Mitsuhiro Matsumoto, Nara, and Hiroyuki Hosoba, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 22, 1988, Ser. No. 222,968
Claims priority, application Japan, Jul. 31, 1987, 62-193473
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—50 5 Claims



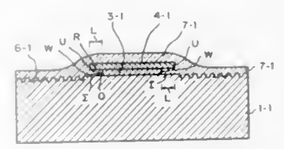
1. In a semiconductor laser array apparatus comprising a single substrate and a plurality of semiconductor laser devices that are disposed with a given pitch on said substrate, some of the semiconductor laser devices constituting laser devices of a laser oscillation-operating area of said semiconductor laser array apparatus and the other semiconductor laser devices constituting laser devices of the non-laser oscillation-operating areas that are positioned outside of said laser oscillation-operating area, wherein at least one of the semiconductor laser devices of each of said non-laser oscillation-operating areas that is the closest to said laser oscillation-operating area contains single or plural grooves and the oscillation threshold current level of at least one of the semiconductor laser devices of each of said non-laser oscillation-operating areas that is the closest to said laser oscillation-operating area is higher than those of the semiconductor laser devices of said laser oscillation-operating area.

4,914,670

DISTRIBUTED BRAGG REFLECTOR TYPE SEMICONDUCTOR LASER

Hideaki Nishizawa, 1-3, Shimaya 1-chome, Konohana-ku, Osaka; Mitsuo Takahashi, Osaka, and Yasuharu Suematsu, Kawasaki, all of Japan, assignors to Hideaki Nishizawa

Filed Aug. 31, 1988, Ser. No. 239,120
Claims priority, application Japan, Sep. 1, 1987, 62-218461
Int. Cl.[4] H01S 3/19, 3/08
U.S. Cl. 372—96 10 Claims



1. A distributed Bragg reflector type semiconductor laser comprising:
a p-type semiconductor monocrystalline substrate (1);
a non-doped active waveguide layer (3) which is formed by an epitaxial growth method as a stripe in a central portion of an upper surface of said substrate (1) with the interposition of a buffer layer (2);
a depression layer (4) having an electrical polarity opposite to that of the substrate formed on said active waveguide layer (3) by the epitaxial growth method;
a distributed Bragg reflector (6) formed on an upper surface of said buffer layer (2);
an external waveguide layer (7) having an electrical polarity opposite to that of the substrate (1) and formed by the epitaxial growth method on an upper surface and edge surfaces (U) of said depression layer (4), edge surfaces (W) of the active waveguide layer (3), and on the upper surface of the buffer layer (2) with said distributed Bragg reflector (6) formed thereon;
a clad layer (8) having an electrical polarity opposite to that of the substrate (1) and formed on said external waveguide layer (7) by an epitaxial growth method;
an electrode (10) formed on an upper surface of said clad layer (8); and
an electrode (9) formed on a lower surface of the substrate (1),
wherein the edge surfaces (U) of the depression layer (4) are projected to positions beyond the edge surfaces (W) of the active waveguide layer (3), and a distance (L) between the edge surfaces (U) and (W) falls within a range from 0.2 μm to 1.0 μm.

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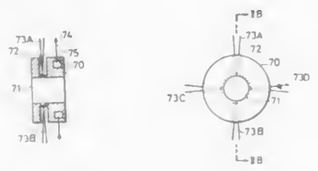
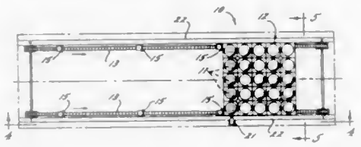
4,914,671
LASER DEVICE
Shigenori Yagi; Koji Yasui; Shuji Ogawa, and Masaki Kuzumoto, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 20, 1984, Ser. No. 602,584
Claims priority, application Japan, Apr. 20, 1983, 58-69532; Nov. 28, 1983, 58-223443; Dec. 5, 1983, 58-229663; Jan. 12, 1984, 59-3837
Int. Cl.[4] H01S 3/08
U.S. Cl. 372—103 33 Claims



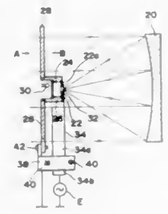
1. A laser device comprising: a pair of electrodes facing each other with a predetermined gap therebetween and adapted to receive a voltage thereacross produced by a voltage source; a laser medium gas flowing through said gap; an optical resonator including a total reflecting mirror and a partial reflecting mirror disposed at opposite ends of said gap; a ring-shaped aperture member disposed on an optical axis of said optical resonator between said mirrors, said aperture member having an opening extending therethrough whose axis coincides with said optical axis; and a plurality of laser beam detection elements arranged in a ring for detecting laser power of a peripheral portion of a laser beam passed through said aperture member for regulating angular positions of said mirrors with respect to said optical axis.

4,914,672
METHOD AND APPARATUS OF DISTINGUISHING BETWEEN LIVE AND DEAD POULTRY EGGS
John H. Hebrank, Durham, N.C., assignor to Embrex, Inc., Durham, N.C.
Filed Jul. 14, 1988, Ser. No. 219,205
Int. Cl.[4] G01K 13/06, 7/02, 7/22; G01J 5/00
U.S. Cl. 374—124 21 Claims



1. A method of distinguishing between live and dead poultry eggs, the method comprising:
(a) monitoring the individual temperatures of a selected group of eggs;
(b) using the monitored individual egg temperatures to determine a comparative egg temperature for the selected group of eggs;
(c) determining the difference between each individual egg temperature and the comparative egg temperature of the selected group; and
(d) identifying eggs as live or dead on the basis of the difference between their monitored individual temperatures and the comparative egg temperature of the selected group.

4,914,673
RADIATION THERMOMETER
Kenji Imura, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 915,621, Oct. 6, 1986, abandoned. This application Sep. 2, 1988, Ser. No. 241,815
Claims priority, application Japan, Oct. 7, 1985, 60-223223; Mar. 25, 1986, 61-66622; Mar. 25, 1986, 61-66623
Int. Cl.[4] G01J 05/08, 05/62
U.S. Cl. 374—130 21 Claims

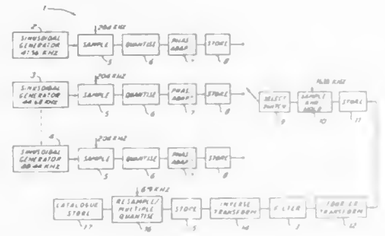


1. An optical chopper assembly for use in a radiation thermometer, comprising:
an optical system for directing infrared rays emitted from an object to be measured;
means for receiving said infrared rays to produce an electric signal corresponding to the received infrared rays;
processing means for receiving said signal from said receiving means for calculating the temperature of said object;
an optical chopper including a bimorph supported at its one end and having a shim electrode formed of an elastic thin metal plate and having a pair of outward electrodes holding said shim electrode therebetween and said chopper further including a shutter blade formed at another end of said bimorph of said metal plate without said outward electrodes, said shutter blade being arranged in front of said receiving means, and
control means for supplying an AC signal to said bimorph for causing the same to vibrate in a predetermined path so that said shutter blade alternatively prevents and allows passage of said infrared rays to said receiving means.

4,914,674
SIGNAL GENERATOR
Ian D. Kimber, Bracknell, and Nicholas A. Young, Worcester, both of England, assignors to EMI Limited, Hayes, United Kingdom
Filed Mar. 12, 1986, Ser. No. 838,787
Claims priority, application United Kingdom, Mar. 15, 1985, 8506811
Int. Cl.[4] H04B 15/00; H04K 1/00
U.S. Cl. 375—1 12 Claims

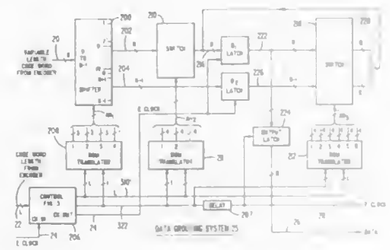
1. A spread spectrum signal generator for producing a spread-spectrum bandwidth signal ranged between specified frequencies, the generator characterised by:
means to produce a number of single-frequency signal waveforms, each having a distinctive frequency within the range of specified frequencies with frequencies at or closely adjacent one or more frequencies associated with common forms of interference being excluded;
means to sample each of the single-frequency signal waveforms at a sampling rate exceeding the frequency of that waveform;

means to quantise, between two or more levels, the sampling values of each waveform; and



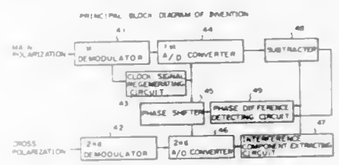
means to combine together the quantised sampling values for a plurality of the waveforms in a predetermined fashion.

4,914,675
APPARATUS FOR EFFICIENTLY PACKING DATA IN A BUFFER
Nicola J. Fedele, Kingston, N.J., assignor to General Electric Company, Schenectady, N.Y.
Filed Jan. 28, 1988, Ser. No. 149,556
Int. Cl.[4] H04B 14/04
U.S. Cl. 375—25 34 Claims



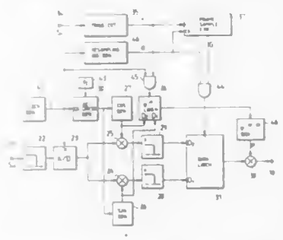
1. Apparatus for efficiently packing sequentially occurring variable length codeword data in an input signal into memory means for subsequent transmission over a channel, said memory means having a plurality of data storage locations each having a plurality of data storage locations each having an N-bit storage capacity; said apparatus comprising:
means for receiving the bits of said sequentially occurring codewords in parallel and for grouping the bits including portions of one or more codewords in accordance with the length of the codewords into a first group of parallel N-bits in order of occurrence of the bits in a plurality of said successively occurring codewords;
means for determining when said at least N-bits have been grouped and for outputting the bits of that N-bit group in parallel, the codewords forming said N-bit group at times having further bits; and
means for organizing said further bits into their order of occurrence and forming with said organized further bits, a second group of parallel N-bits with subsequently received codewords, said means for organizing repetitively forming subsequent groups of parallel N-bits regardless the length of the codewords in each group, said means for receiving and grouping, means for outputting and means for organizing each processing said bits only in parallel.

4,914,676
CROSS POLARIZATION INTERFERENCE CANCELLER
Takanori Iwamatsu, Otawara, and Yoshihiro Nozue, Nasu, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Sep. 16, 1988, Ser. No. 245,216
Claims priority, application Japan, Sep. 18, 1987, 62-232485
Int. Cl.[4] H04B 1/10
U.S. Cl. 375—102 14 Claims



11 A method for cancelling cross polarization interference in a transmission signal having main and cross polarizations, comprising the steps of:
(a) demodulating the main and cross polarizations;
(b) regenerating a clock signal from the main polarization to produce a regenerated clock;
(c) digitizing the main polarization to produce a digitized main polarization;
(d) digitizing the cross polarization utilizing the regenerated clock signal to produce a digitized cross polarization;
(e) extracting an interference wave component with respect to the main polarizatiion from the digitized cross polarization to produce an extracted interference wave component;
(f) subtracting the extracted interference wave component from the digitized main polarization to produce a subtracted digitized main polarization;
(g) detecting a phase difference between the extracted interference wave component and the subtracted digitized main polarization; and
(h) shifting a phase of the clock signal based on the detected phase difference.

4,914,677
DIGITAL LOCK-IN AMPLIFIER
Takahiro Yamaguchi, Kumagaya; Toru Nakanishi; Norio Arakawa, both of Gyoda, and Yoshio Takanaga, Ohsato, all of Japan, assignors to Advantest Corporation, Tokyo, Japan
Filed Oct. 3, 1988, Ser. No. 251,795
Claims priority, application Japan, Oct. 5, 1987, 62-251250; Oct. 19, 1987, 62-263292
Int. Cl.[4] H04L 7/00
U.S. Cl. 375—106 23 Claims



1. A digital lock-in amplifier, coupled to receive a reference signal, an analog input signal and a clock of a fixed period, comprising:
an A/D converter which receives the analog input signal and converts it, in synchronism with the clock of a fixed

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period, into a digital signal expressed by a sequence of digital waveform data;

local signal generating means for generating a digital sine wave local signal and a digital cosine wave local signal;

frequency converting means for shifting the digital signal from said A/D converter to the difference frequency region by mixing it with each of the sine wave local signal and the cosine wave signal, and for outputting the frequency-converted digital signals as complex waveform data;

trigger signal generating means for receiving the reference signal and generating a trigger signal when a predetermined requirement of the reference signal is met;

frame defining means, responsive to the trigger signal, for defining a frame composed of a sequence of N successive complex waveform data in a fixed positional relation to the trigger signal, where N is a positive integer;

phase latch means, responsive to the trigger signal, for latching and holding sample values of the sine wave local signal and the cosine wave local signal, as their phase information, in a fixed positional relation to the trigger signal; and

phase rotating means for rotating the phase angle of the complex waveform data of the defined frame to a fixed phase angle on the basis of the phase information latched in said phase latch means.

4,914,678

REACTOR CORE IN A NUCLEAR REACTOR AND INITIAL CORE IN A NUCLEAR REACTOR

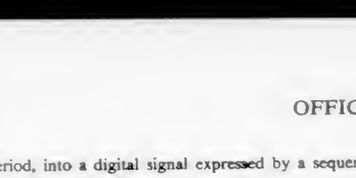
Junichi Koyama, Hitachi, and Motoo Aoyama, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 9, 1988, Ser. No. 230,171

Claims priority, application Japan, Aug. 12, 1987, 62-199773

Int. Cl.[4] G21C *1/00*

U.S. Cl. 376—267 23 Claims



1. In a reactor core in a nuclear reactor loaded with a plurality of fuel assemblies, the improvement wherein a region in the radial direction of said core is divided into a central region and an outer region in said radial direction except the outermost circumferential region occupied by fuel assemblies arranged along the outermost circumference which forms part of the region in the radial direction of said core, amounts of a fissible material contained in each of first fresh unirradiated fuel assemblies that are newly loaded onto said outer region are smaller than amounts of the fissible material contained in each of second fresh unirradiated fuel assemblies that are newly loaded onto said central region, and a relationship $a/b<c/d$ is satisfied, wherein a denotes the amount of said fissible material in the upper region of each of said first fuel assemblies, b denotes the amount of the fissible material in the lower region of each of said first fuel assemblies, c denotes the amount of the fissible material in the upper region of each of said second fuel assemblies, and d denotes the amount of the fissible material in the lower region of each of said second fuel assemblies.

4,914,679

FUEL ASSEMBLY

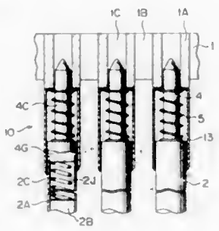
Akio Tomiyama, Hitachi; Osamu Yokomizo, Ibaraki; Yasuhiro Masuhara, Katsuta; Toshitsugu Nakao, Hitachi; Shin-ichi Kashiwai, Hitachi; Yoshishige Kawada, Hitachi; Hiromasa Hirakawa, Hitachi, and Shigeto Murata, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 223,639

Claims priority, application Japan, Jul. 27, 1987, 62-187244; Mar. 16, 1988, 63-60416; Jun. 10, 1988, 63-141739

Int. Cl.[4] G21C *15/00*

U.S. Cl. 376—440 15 Claims



1. A fuel assembly comprising:

an upper tie-plate having a plurality of cylindrical bosses and a plurality of ribs which connect each of said bosses;

a plurality of fhel rods having each of top and lower ends which is sealed by a corresponding end plug, which are filled with a plurality of fuel pellets, and in whcih said upper end plug is supported by said boss;

expansion springs secured to said upper end plugs of said fuel rods; and

cover means provided for either said fnel rod or said upper tie-plate surrounding said expansion spring and covering at least a part of the axial length of said expansion spring.

4,914,680

SIGNAL DISTINCTION CIRCUIT

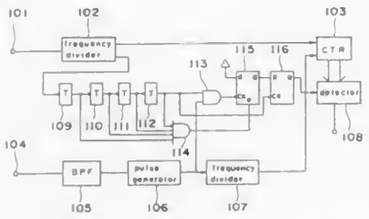
Masaya Tanno, Gunma, and Tsutomu Ishikawa, Ota, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed May 27, 1988, Ser. No. 199,935

Claims priority, application Japan, Jun. 3, 1987, 62-139238; Jun. 3, 1987, 62-139239; Jun. 3, 1987, 62-139240; Jun. 19, 1987, 62-153773

Int. Cl.[4] H03K *5/26*

U.S. Cl. 377—49 6 Claims



1. A signal distinction circuit having a pulse generating circuit for generating a pulse corresponding to a discrimination signal, a first clock signal generating circuit for generation first clock signals whose frequency is higher than that of a pulse outputted from said pulse generating circuit, a counter for counting said first clock signals in response to a pulse outputted from said pulse generating circuit, and a detecting circuit for detecting the presence of said discrimination signal according to a value counted by said counter, the signal distinction circuit comprising:

a second clock signal generating circuit for generating second clock signals whose frequency is lower than that of a pulse outputted from said pulse generating circuit; and

an arithmetic circuit for operating signals outputted from said pulse generating circuit and said clock signal generating circuit so as to generate an output signal;

said detecting circuit being forcibly driven by a signal outputted from said arithmetic circuit.

4,914,681

COMPUTER TOMOGRAPHY APPARATUS

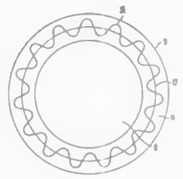
Klaus Klingenbeck, Hessdorf, and Arnulf Oppelt, Spardorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 16, 1987, Ser. No. 121,060

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1986, 3640195

Int. Cl.[4] H01J *35/30*

U.S. Cl. 378—12 8 Claims



1. A computer tomography apparatus for generating an image of a slice of an examination subject comprising:

an anode having a continuous surface substantially surrounding said examination subject;

means for generating an electron beam;

means for deflecting said electron beam so as to be incident on said anode surface in an uninterrupted undulating wave path orbiting said examination subject to substantially the same extent as said anode surrounds said examination subject, so as to generate an x-ray beam directed at said examination subject from different directions; and

control means connected to said means for deflecting for controlling orbital, sampling and sweep frequencies of said electron beam in synchronization so that one-fourth of the period of the sweep frequency, or a whole multiple of one fourth of the period, is less than the time between two samples for one projection of said examination subject.

4,914,682

PATIENT TABLE FOR COMPUTERIZED TOMOGRAPHIC SCANNER

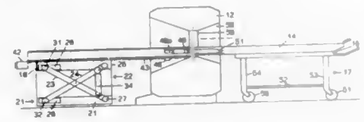
Rafael Blumenthal, Kiryat Tivon, Israel, assignor to Elscint, Ltd., Haifa, Israel

Filed Feb. 5, 1988, Ser. No. 152,555

Claims priority, application Israel, Feb. 16, 1987, 81581

Int. Cl.[4] A61B *6/04*

U.S. Cl. 378—20 15 Claims



1. A patient table arrangement for CT systems including a CT gantry, said gentry having a front side through which a patient is inserted into the gantry and a rear side opposite said front side, said arrangement comprising:

stretcher means for supporting the patient during scanning,

cart means for delivering said stretcher means to the front side of said gantry,

stretcher support means for supporting said stretcher means during scanning independently of any means at the front side of said gantry to leave the front side of said gantry unencumbered.

said stretcher support means comprising:

a table unit located to the rear side of said gantry, said table unit comprising:

guide means extendable into said gantry for supporting said stretcher means independently of any means located at the front side of said gantry and for removing said stretcher means from said cart means to enable the removal of said cart means from the front side of said gantry,

elevator means for varying the height of said guide means,

attaching means for attaching said stretcher means to be supported by and movable on said guide means, and moving means including said guide means and said attaching means for removing said stretcher means into the gantry from the front of the gantry for the scanning for ensuring that said attaching means does not interfere with said scan.

4,914,683

ANODE DRIVING APPARATUS OF ROTATING ANODE X-RAY TUBE

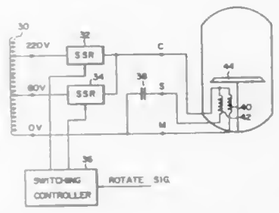
Shigeru Tanaka, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 5, 1987, Ser. No. 116,798

Claims priority, application Japan, Nov. 19, 1986, 61-277100

Int. Cl.[4] H05G *1/56*

U.S. Cl. 378—114 8 Claims



1. An anode driving apparatus of an X-ray tube having a rotating anode, comprising:

rotating means for rotating said rotating anode;

power source means for generating a first AC voltage for activation and a second AC voltage for constant speed rotation;

zero-crossing switching means connected between said power source means and said rotating means; and

control means for switching said zero-crossing switching means in a predetermined order, to sequentially apply the first and second AC voltages to said rotating means.

4,914,684

TITANIUM CARBIDE COATING OF BEARING COMPONENTS

Kamleshwar Upadhya, Glendale, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Mar. 31, 1989, Ser. No. 331,508

Int. Cl.[4] H01J *35/10*

U.S. Cl. 378—133 3 Claims

1. In an X-ray tube having a hollow anode stem having an inner surface and containing an anode shaft supported by one or more bearings having inner and outer races, a bearing retainer comprising:

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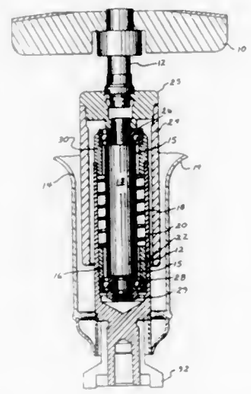
a retainer substrate means for slidably fitting coaxially within the hollow anode stem;

a bearing sleeve means coaxially affixed to the retainer substrate for holding an outer race of a bearing fixedly and coaxially with respect to the retainer substrate;



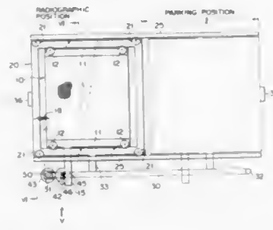
a coating means applied to the outer circumference of the retainer substrate for lubricating the sliding of the retainer means.

4,914,685

SPOT FILM DEVICE SUITABLE FOR USE WITH THE RADIOGRAPHIC SYSTEM

Masakatsu Yanome, Nishinasunomachi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 10, 1989, Ser. No. 335,323
Claims priority, application Japan, Apr. 12, 1988, 63-90071
Int. Cl.⁴ G21K *1/00*
U.S. Cl. 378—155 **10 Claims**



1. A spot film device suitable for use with a radiographic system and comprising a grid for absorbing X-ray scattered from an object to be examined when the object is radiographed and a grid carrier device for carrying the grid between a radiographic position, where the grid is located in an X-ray beam and a parking position, where the grid is located outside said X-ray beam,

said grid carrier device including:

frame means for supporting the grid such that it can oscillate;

guide rail means for supporting said frame means such that it can move between the radiographic and parking positions;

a source for generating rotation force;

carrying means for receiving the rotation force and for carrying the frame means between the radiographic and parking position;

oscillating means for receiving the rotation force and for oscillating the grid when said frame means is stopped at the radiographic positions; and

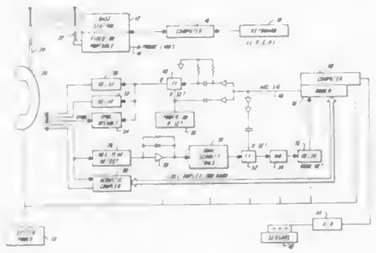
transmitting means for transmitting the rotation force from said source to said carrying means when it carries said frame means between the radiographic and parking positions, and for stopping the transmission of the rotation force to said carrying means and transmitting from said source to said oscillating means when said frame means has reached the radiographic position, so that said frame means is stopped at the radiographic position and the grid is oscillated.

4,914,686

CORDLESS PHONE DATA LOGGER

William G. Hagar, III, 28 Winchester St., Newton Highlands, Mass. 02161, and Richard Volpicelli, 236 Grove St., Lexington, Mass. 02173

Filed Nov. 28, 1986, Ser. No. 935,738
Int. Cl.⁴ H04Q *7/04*
U.S. Cl. 379—61 **26 Claims**



1. In a system for the remote logging of information and communication thereof via a wireless telephone communication link to a base station, a remote control system for interfacing the logging system and wireless telephone link comprising:

means responsive to a ring indication from the wireless telephone for identifying to the remote logging system an indication of a transmission from the base station;

means responsive to an on/off-hook signal from the remote logging system for enabling said wireless telephone to provide two-way signal transmission and reception with said base station; and

means for coupling two-way wireless communication between said wireless telephone and said remote logging system.

4,914,687

VOICE INFORMATION TRANSMISSION SYSTEM

Hiroshi Maeda, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

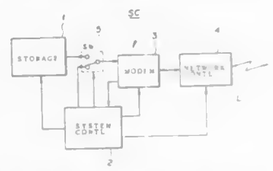
Filed May 4, 1989, Ser. No. 347,226
Claims priority, application Japan, May 9, 1988, 63-110595
Int. Cl.⁴ H04M *1/64, 11/00*
U.S. Cl. 379—88 **11 Claims**

1. A voice information transmission system for transmitting a responding voice information to a communication terminal device which has a voice responding function via a telephone line, said voice information transmission system comprising:

a center apparatus including responding voice data library means for storing one or a plurality of digitized responding voice data, first modem means for modulating and transmitting data to and receiving and demodulating data from the telephone line, and first control means for controlling an operation of said center apparatus; and

a communication terminal device including second modem means for modulating and transmitting data to and receiving and demodulating data from the telephone line, responding voice data storage means for storing a responding voice data which is received through said second modem means, and second control means for controlling an operation of said communication terminal device,

said first control means controlling said center apparatus to read out a designated responding voice data from said responding voice data library means in response to a



request for a responding voice data and an identification information for identifying the designated responding voice data which are received from said communication terminal device and controlling said first modem means to modulate the designated responding voice data and transmit the designated responding voice data to said communication terminal device via the telephone line,

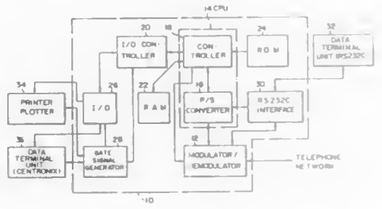
said second control means controlling said communication terminal device to store the designated responding voice data received from said center apparatus through said second modem means into said responding data storage means for use as a responding voice data of said communication terminal device.

4,914,688

MODEM SYSTEM

Tsunekazu Kobayashi, Kawasaki, and Satoshi Sakuragi, Yokohama, both of Japan, assignors to Murata Mfg. Co., Ltd., Nagaokakyo, Japan

Filed Aug. 26, 1983, Ser. No. 236,895
Claims priority, application Japan, Sep. 1, 1987, 62-219651
Int. Cl.⁴ H04M *11/00*
U.S. Cl. 379—93 **6 Claims**



1. In a modem system of the type having an RS232C interface and a modulator/demodulator connected for converting digital data in serial RS232C format to analog signals transmissble over the telephone network, the improvement comprising:

an input-output circuit for connection to the parallel data port of an external data handling device;

converter means connected between said input-output circuit and said modulator/demodulator for bi-directionally converting between parallel and serial data format;

controller means for controlling the flow of data between said modulator/demodulator and said input-output circuit; and

means for selecting an operating mode whereby said modulator/demodulator is operatively connected to either said RS232C interface or said bi-directional serial-to-parallel converter means;

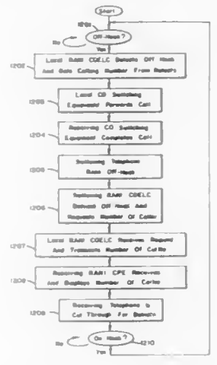
whereby bi-directional communication is selectable between the telephone network and either the RS232C interface or the parallel port.

4,914,689

REVERSE AUTOMATIC NUMBER IDENTIFICATION SYSTEM

Robert C. Quade, Lakewood, Colo.; Mark S. Bredesen, Incline Village, Nev.; Raymond L. Hauck, Randolph, Minn.; Scott R. Grabinger, Maple Grove, Minn., and John T. Pugaczewski, St. Paul, Minn., assignors to Bell Mountain States Telephone & Telegraph Co., Denver, Colo.

Filed Dec. 22, 1987, Ser. No. 136,742
Int. Cl.⁴ H04M *1/57*; H04Q *3/72*
U.S. Cl. 379—142 **9 Claims**



7. System according to claim 4 wherein said receiving means includes:

means, operatively associated with said called party telephone line, for decoding said identifying information; and

means, operatively associated with said decoding means, for displaying said identifying information to said called party.

4,914,690

UNIVERSAL PBX INTERFACE

Guenter E. Hagedorn, Minnetonka, Minn., assignor to Nicollet Technologies, Inc., Eden Prairie, Minn.

Continuation of Ser. No. 175,511, Mar. 31, 1988, abandoned. This application Apr. 7, 1989, Ser. No. 336,512
Int. Cl.⁴ H04M *3/50, 7/14*
U.S. Cl. 379—233 **9 Claims**

1. A central office-to-PBX standards conversion interface, comprising:

first connection means for connecting to a telephone line from the central office;

second connection means for connecting to a telephone line from the PBX;

separation relay means connected between said first connection means and said second connection means for selectively connecting and disconnecting the telephone line from the central office and the telephone line from the PBX;

a talk battery source selectively connected to said first connection means;

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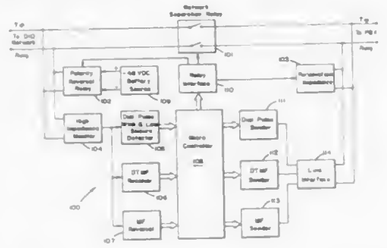
a termination impedance selectively connected to said second connection means;

first conversion means connected to said first connection means for converting dialing codes of a first mode received from the central office into binary digits;

second conversion means connected to said second connection means for converting binary digits into dialing codes of a second mode for transmission to the PBX;

control means, having memory, connected to said separation



relay means, said talk battery source, said termination impedance, said first conversion means and said second conversion means for converting the dialing codes of said first mode into dialing codes of said second mode and for storing said dialing codes in said memory; and

said control means also for communicating with the central office and the PBX to handle signalling and handshaking when said separation relay means has disconnected the telephone line from the central office and the telephone line from the PBX.

4,914,691

TELEPHONE DIALING ARRANGEMENT

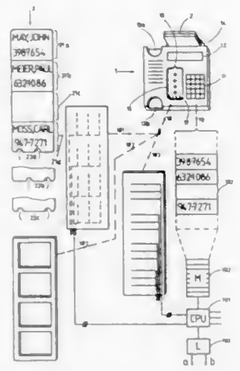
Stephan Berger, Oberbuchsiten, Switzerland, assignor to Ascom Autophon AG, Solothurn, Switzerland

Filed Dec. 21, 1988, Ser. No. 287,147

Claims priority, application Switzerland, Dec. 22, 1987, 4985/87; Dec. 1, 1988, 4455/88

Int. Cl.[4] H04M *1/27*

U.S. Cl. 379—357 **6 Claims**



1. A telephone dialing arrangement for the automatic dialing of previously stored telephone numbers, of the type having a plurality of data carriers in the form of individual discrete cards, each of the data carriers including a plurality of predetermined areas for inscription of data and individually distinctive machine readable identification means, a telephone set having receiving means for receiving at lest one of the data carriers, a plurality of repertory buttons, reading means, electronic memory means having at least as many storage locations as the sum of all the areas on the data carriers, the addresses of the storage locations being determined by the identification means and by signals transmitted by the repertory buttons, control means including a line unit and a speech unit for controlling reading, storage, dialing, and speech operations, means for causing said receiving means and said reading means simultaneously to receive and read any single one of said cards, means for causing said control means to act simultaneously with said receiving means and said reading means, said receiving means comprising an upwardly open recess having a bottom, said recess bottom having a top layer of material, a bottom layer of material, a spacer grid and a plurality of optical transmitter-receivers disposed between said top layer and said bottom layer, the spatial arrangement of said transmitter-receivers matching the spatial arrangement of said identification means on said cards, and said top layer of material including at least one translucent portion adjacent to said transmitter-receivers.

4,914,692

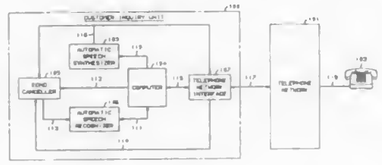
AUTOMATIC SPEECH RECOGNITION USING ECHO CANCELLATION

Walter T. Hartwell, St. Charles; Mark A. Johnson, Wheaton, both of Ill., and Joseph Picone, Richardson, Tex., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 29, 1987, Ser. No. 138,984

Int. Cl.[4] H04B *3/20*

U.S. Cl. 379—410 **5 Claims**



1. Apparatus for performing speech recognition in conjunction with a communication means and announcement means to decode a speech response received via said communication means to a speech message from said announcement means transmitted via said communication means, comprising:

means for adapting to said communication means in response to said message and an echo of said transmitted message only during a predefined amount of time after initiation of said message to generate parameters;

means responsive to said parameters for canceling said echo from the combination of the received speech response and said echo from said communication means to generate a modified signal; and

means for recognizing said speech response from said modified signal to generate an encoded signal representing said speech response.

4,914,693

TELEPHONE SUBSCRIBER CIRCUIT

Helmuth Beck, Klosterneuburg, and Erik Mally, Vienna, both of Austria, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 18, 1987, Ser. No. 51,441

Claims priority, application Austria, May 23, 1986, 1380/86

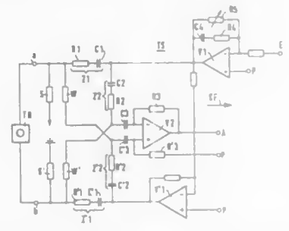
Int. Cl.[4] H04M *19/00*

U.S. Cl. 379—413 **1 Claim**

1. A telephone subscriber circuit of a telephone exchange comprising active circuit elements with a capacitively complex

input impedance, wherein an incoming signal which is to be transmitted from the exchange to the subscriber is amplified by two operational amplifiers operating in push-pull nd is fed via a first pair of coupling arms, each formed by a series arrangement of a capacitor and a resistor, into two respective ends of the subscriber loop, which two ends are also supplied with d.c. current via respective connection to a supply voltage through two supply resistors, whereas a symmetrical, outgoing signal to be transmitted from the subscriber to the exchange is supplied from the two ends of the subscriber loop to a subscriber amplifier via a compensation network which serves to directionally isolate the incoming and outgoing signals of the two transmission directions,

wherein the complex input impedance of said telephone subscriber circuit is sub-divided into a complex component provided by said first pair of coupling arms which serves to supply the incoming signal and to block the d.c. current from the operational amplifiers and into a real component provided by said supply resistors via which



the supply d.c. current is supplied to the subscriber loop, and

wherein the directional isolation of the incoming and outgoing signals to and from the subscriber loop is provided by the compensation network comprising said first pair of coupling arms Z1, Z"1) each having one end coupled to a respective end of the subscriber loop and its other end coupled to one of the operational amplifiers, a first pair of bridge arms each consisting of a coupling resistor (W, W") coupled between a respective end of the subscriber loop and an input of the subscriber amplifier, and a second pair of bridge arms each consisting of a compensation impedance (Z2, Z"2) formed by series-connected resistor and capacitor elements and coupled between a respective other end of one of said first pair of coupling arms and an input of the subscriber amplifier, wherein the impedance of the bridge arms of the compensation network is arranged to have a high impedance in comparison with the input impedance of the coupling arms to the subscriber loop.

4,914,694

MODIFYING A TELEVISION SIGNAL TO INHIBIT RECORDING/REPRODUCTION

Eugene Leonard, Sands Point; Bill Perlman, New York, both of N.Y.; Karoly Budai, Danbury, Conn., and William R. Dolson, New York, N.Y., assignors to Eidak Corporation, Cambridge, Mass.

Filed Apr. 11, 1988, Ser. No. 180,369

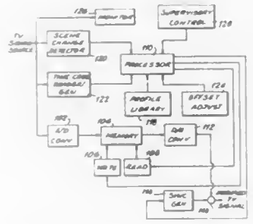
Int. Cl.[4] H04N *7/167*

U.S. Cl. 380—5 **57 Claims**

1. A method of modifying a composite television signal to inhibit reproduction of an unauthorized recording thereof by conventional video recorders but enable the display of a video picture therefrom on a television receiver, comprising:

increasing the time durations of horizontal line intervals included in a first predetermined number of frames of the television signal from a standard horizontal line duration to a pre-established maximum time duration and then decreasing said time durations from said pre-established maximum to said standard;

decreasing the time durations of the horizontal line intervals included in a second predetermined number of frames of the television signal from said standard to a pre-established minimum time duration and then increasing said



time durations from said pre-established minimum to said standard; and

limiting the increase and decrease in the time durations of said horizontal line intervals such that the accumulated increase or decrease over a vertical interval is less than 200 nsec.

4,914,695

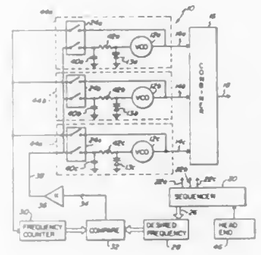
METHOD AND APPARATUS FOR FREQUENCY CONTROL OF MULTIPLE OSCILLATORS USING A SINGLE FREQUENCY-LOCKED-LOOP

Thomas F. Martin, Richardson, Tex., assignor to General Instrument Corporation, New York, N.Y.

Filed Nov. 3, 1988, Ser. No. 266,567

Int. Cl.[4] H04N *7/167*; H03L *7/00*

U.S. Cl. 380—7 **18 Claims**



1. Apparatus for providing jamming of a number, N, of cable TV channels, comprising:

a number, n, of variable frequency oscillators;

means for unswitchably coupling the outputs of each of said oscillators onto a line for input to a television set or the like;

means for tuning said oscillators to frequencies for jamming selected television channels; and

means for terminating the jamming of a particular television channel by retuning each oscillator jamming the particular channel to another frequency while the oscillators are coupled to said line;

wherein a jamming comb containing jamming signals from all of said oscillators is continuously present on said line during the operation of said apparatus.

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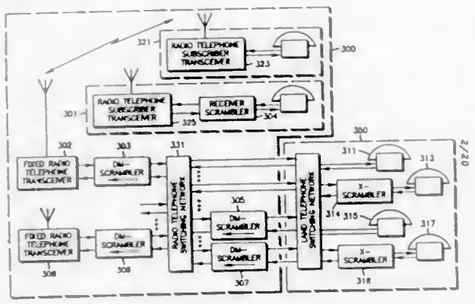
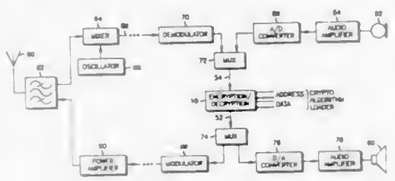
4,914,696
COMMUNICATIONS SYSTEM WITH TANDEM SCRAMBLING DEVICES
Cary M. Dudczak; Mark W. McGuire, both of Hoffman Estates, Ill., and David T. Tennant, Gary, Ind., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 15, 1988, Ser. No. 232,265
Int. Cl.[4] H04K *1/04*
U.S. Cl. 380—21 17 Claims



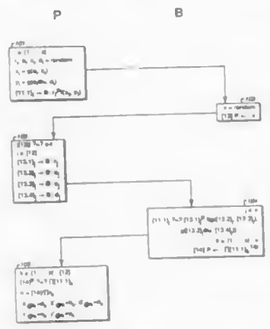
1. A method of establishing scrambled communications on a communications circuit which utilizes at least two communications links and has an originating scrambling terminal, an answering scrambling terminal, and at least one intermediate scrambler, comprising the steps of:
detecting, at the intermediate scrambler and the answering scrambling terminal, a first data message sent from the originating scrambling terminal;
determining, at the intermediate scrambler, if the answering scrambling terminal has sent a second data message in response to said first data message; and
placing the intermediate scrambler in a transparent non-scrambling mode if the answering scrambling terminal has sent said second data message.

4,914,697
CRYPTOGRAPHIC METHOD AND APPARATUS WITH ELECTRONICALLY REDEFINABLE ALGORITHM
Ezzat A. Dabbish, Buffalo Grove; John P. Byrns, Hoffman Estates; Michael J. McClaughry, Cary; Larry C. Puhl, Sleepy Hollow; Daniel P. Brown, Elmhurst; Eric F. Ziolko, Schaumburg, and Michael W. Bright, Arlington Heights, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Feb. 1, 1988, Ser. No. 150,876
Int. Cl.[4] H04L *9/04*
U.S. Cl. 380—28 19 Claims



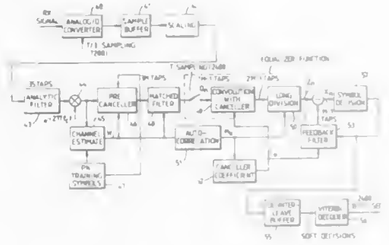
1. A two-way communication device comprising:
means for demodulating received encrypted signals to provide inbound encrypted digital information;
means for generating modulated signals corresponding to outbound encrypted digital information;
cryptographic means for decrypting said inbound encrypted digital information and generating said outbound encrypted digital information from non-encrypted digital information, said cryptographic means comprising:
random access memory means for storing the digital information, recursion intermediate data, and at least one key;
reprogrammable logic means, operably coupled to the random access memory means, for performing a plurality of Boolean functions on the digital information, the recursive intermediate data, and the at least one key to produce output data and the recursion intermediate data;
reprogrammable controller means, operably coupled to the reprogrammable logic means and the random access memory means, for controlling inputting the digital information to the random access memory means, for controlling transferring the digital information, the recursion intermediate data, and the at least one key from the random access memory means to the reprogrammable logic means, for controlling inputting the recursion intermediate data from the programmable logic means to the random access memory means, for controlling the performing of a plurality of the Boolean functions by the reprogrammable logic means, and for controlling outputting the output data from the reprogrammable logic means; and
communications means, operably coupled to the reprogrammable logic means, the random access memory means, and the reprogrammable controlling means, for providing input and output digital communication paths such that the digital information is inputted to the cryptographic apparatus and encrypted or decrypted information is outputted from the cryptographic apparatus and for providing communications paths such that the reprogrammable logic means and the reprogrammable controlling means are programmable by an external device.

4,914,698
ONE-SHOW BLIND SIGNATURE SYSTEMS
David Chaum, 14652 Sutton St., Sherman Oaks, Calif. 91403
Continuation of Ser. No. 168,802, Mar. 16, 1988, abandoned.
This application Jul. 24, 1989, Ser. No. 384,092
Int. Cl.[4] H04L *9/00*
U.S. Cl. 380—30 1 Claim



1. In a public key digital signature system, a method of digitally signing comprising the steps of:
issuing a plurality of signatures to ensure that each said signature contains identifying information divided between at least two parts;
showing and checking said digital signatures to reveal at least one of said at least two parts of each; and
performing a test on a set of said signatures shown, that would yield at least one of said identifiers if different parts of at least one of said issued signatures had been revealed in showing the at least one issued signature more than once.

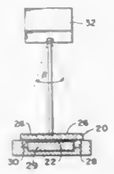
4,914,699
HIGH FREQUENCY ANTI-JAM COMMUNICATION SYSTEM TERMINAL
James G. Dunn, San Diego, Calif.; Bruce Lager, Fort Lee, and Dennis McCrady, Holmdel, both of N.J., assignors to ITT Corporation, New York, N.Y.
Filed Oct. 11, 1988, Ser. No. 256,342
Int. Cl.[4] H04K *1/00*
U.S. Cl. 380—34 21 Claims



1. In a high frequency communication system employing a high frequency terminal which terminal can transmit a processed signal in a transmitting mode or process a received signal in a receiving mode, which terminal includes a first subsystem for voice processing including a processor responsive to voice signals to provide a linear predictative coded voice signal at a given data rate, which signal is coupled to a data modem subsystem to digitally encrypt said voice signal which data modem subsystem is coupled to a modem processor subsystem for processing said encrypted signal for providing frequency hopping, feedback equalization, intersymbol interference cancellation, error correction and interleaving to provide a transmitted signal which is relatively immune to jamming during said transmitting mode the improvement therewith of apparatus for providing an improved transmitting operation comprising:
a convolutional encoder means included in said modem processor subsystem and responsive to said encrypted signal to provide a convoluted signal at a higher data rate than said encrypted signal at an output
an interleave buffer having an input coupled to said encoder output for interleaving said higher data rate signal according to an interleaving algorithm;
a symbol encoder having one input responsive to said interleaved signal and one input coupled to a source of PN training signals as stored to provide at an output an encoded signal encoded according to said PN signal which PN training signal differs for each transmitting frequency;
a transmitting filter means responsive to said encoded signal and operative to limit the bandwidth of said signal; and
a digital to analog converter means coupled to said transmitting filter means and operative to convert said limited bandwidth signal to an analog signal.

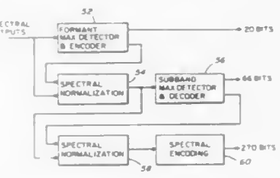
4,914,700
METHOD AND APPARATUS FOR SCRAMBLING AND UNSCRAMBLING BAR CODE SYMBOLS
Alfred V. Alasia, 146-07 Thirteenth Ave., Whitestone, N.Y 11357
Filed Oct. 6, 1988, Ser. No. 254,388
Int. Cl.[4] G09C *5/00;* **G02B** *27/00;* **G03B** *27/68;* **G06K** *7/10*
U.S. Cl. 380—54 26 Claims

1. Method of coding and decoding a bar code, said method comprising the steps of:
forming a parallax panoramagram that is a lineticular dissection of said bar code, by scrambling said bar code in accordance with a graticule formed of a plurality of parallel contiguous focussing elements at a spatial frequency greater than the modular spatial frequency of said bar code;
providing a light transparent screen having a plurality of elongated parallel line elements including focussing surfaces disposed in common along a first surface of said screen, the spatial frequency of said line elements being



matched to the spatial frequency of said focussing elements of said graticule;
positioning said panoramagram contiguous to the opposite surface of said screen with said line elements disposed substantially parallel to the lines in said lineticular dissection; and
examining said panoramagram through said screen.

4,914,701
METHOD AND APPARATUS FOR ENCODING SPEECH
Israel B. Zibman, Newton, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.
Continuation of Ser. No. 684,382, Dec. 20, 1984, abandoned.
This application Aug. 29, 1988, Ser. No. 239,042
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—36 29 Claims



1. A speech encoder comprising:
Fourier transform means for performing a Fourier transform of a window of speech with formants to generate a Fourier transform spectrum;
normalizing means for defining from the Fourier transform spectrum at least one curve of different magnitudes approximating different magnitudes of the Fourier transform spectrum across the spectrum, for digitally encoding the at least one defined curve and for defining the Fourier transform spectrum relative to the at least one defined curve to provide a normalized spectrum; and
means for encoding at least a portion of the normalized spectrum.

4,914,702
FORMANT PATTERN MATCHING VOCODER
Tetsu Taguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Jul. 3, 1986, Ser. No. 881,744
Claims priority, application Japan, Jul. 3, 1985, 60-147262
Int. Cl.[4] G10L *9/02*
U.S. Cl. 381—39 11 Claims

10. A formant pattern matching apparatus, comprising:
(a) a formant extractor for extracting first, second and third

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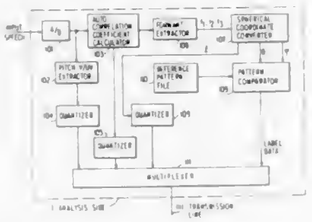
formant frequencies f_1, f_2 and f_3 from an input speech signal;

(b) a spherical coordinate converter for developing first and second mutual angular data of said first, second and third formant frequencies in spherical coordinates, defined by $X/\sqrt{f_1^2+f_2^2}$ and $Y/\sqrt{f_1^2+f_2^2+f_3^2}$, respectively, where X is f_1 or f_2 and Y is one of f_1, f_2 and f_3, and for developing a magnitude value defined by $\sqrt{f_1^2+f_2^2+f_3^2}$;

(c) a sound source extractor for extracting sound source data from said input speech signal;



(d) a reference pattern memory for storing reference patterns composed of third and fourth mutual angular data, defined as in (b) above, of previously analyzed speech signals; and

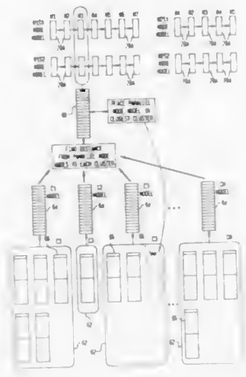
(e) a pattern comparator for comparing said first and second mutual angular data developed by said spherical coordinate converter with said third and fourth mutual angular data stored in said reference pattern memory, respectively, selecting a reference pattern most similar to said first and second mutual angular data, and outputting label data indicating said most similar reference pattern.

4,914,703

METHOD FOR DERIVING ACOUSTIC MODELS FOR USE IN SPEECH RECOGNITION

Laurence Gillick, Newton, Mass., assignor to Dragon Systems, Inc., Newton, Mass.

Filed Dec. 5, 1986, Ser. No. 938,545
Int. Cl.[4] G10L 5/06
U.S. Cl. 381—43 24 Claims



23. A method of deriving an acoustic model of each of a plurality of speech units as spoken by a first group of speakers, which acoustic models are to be compared against a portion of speech to be recognized to determine the likelihood that the portion of speech corresponds to those speech units, said method including;

having the one or more speakers from said first group speak one or more utterances of one or more vocabulary words;

generating a sequence of acoustic data representing each of such utterances;

time aligning the sequence of acoustic data from the utterances of a vocabulary word by said first group of speakers against an acoustic model of that vocabulary word which is comprised of a sequence of acoustic models representing the speech units normally contained in the word, each of which speech unit models includes a second statistic calculated from acoustic data derived from samples of its corresponding speech unit as spoken by a larger second group of speakers;

calculating a first statistic from the acoustic data time aligned against each of the acoustic models of a given speech unit;

calculating a combined statistic by taking a weighted combination of the first and second statistic for that speech unit; and

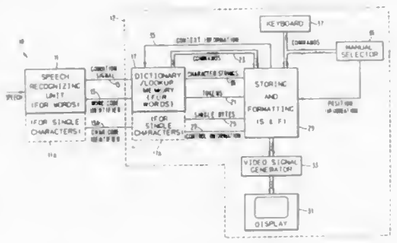
using said combined statistic as at least a part of said acoustic model of said speech unit.

4,914,704

TEXT EDITOR FOR SPEECH INPUT

Alan G. Cole, Katonah, and Robert H. Riekert, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1984, Ser. No. 666,212
Int. Cl.[4] G10L 7/08
U.S. Cl. 381—43 22 Claims



1. A system for editing information from a speech recognizing unit that provides coded identifiers of recognized speech segments, characterized in that the editing system includes:

dictionary and lookup means having inputs comprising said coded identifiers of speech segments each of which represents a word or punctuation word recognized by said speech recognizing unit, wherein said dictionary and lookup means is responsive to each coded identifier of a speech segment, to furnish for a speech segment a respective character string and a token associated with each character string, each token comprising a character count and concatenation indicia, the character count representing the number of characters in the character string, the concatenation indicia representing whether the character string is concatenated to a preceding or following character string,

editing means responsive to character strings and tokens furnished by said dictionary and lookup means, for generating formatted data including correct spacing and capitalization, and

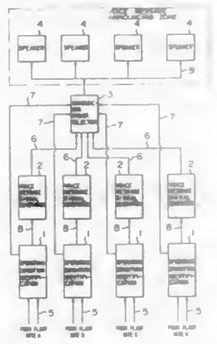
display means responsive to said formatted data for displaying the speech segments in standard text form. display means responsive to said formatted data for displaying the speech segments in standard text form.

4,914,705

VOICE MESSAGE ANNOUNCING METHOD AND SYSTEM FOR PLANT

Seiitsu Nigawara, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 3, 1987, Ser. No. 92,619
Claims priority, application Japan, Sep. 3, 1986, 61-205975
Int. Cl.[4] G10L 5/02
U.S. Cl. 381—51 11 Claims



1. A voice message announcing method for a plurality of plant sites, said method comprising the steps of:

(a) identifying the state of an operating condition at each of a plurality of plant sites;

(b) for each plant site selecting from among a plurality of voice message signals a voice message signal indicative of the identified state at the plant site;

(c) determining an order of announcement for the selected voice message signals in accordance with a predetermined priority order; and

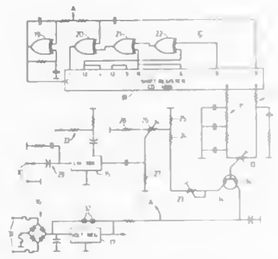
(d) announcing the selected voice message signals in accordance with the determined order of announcement.

4,914,706

MASKING SOUND DEVICE

Hans W. Krause, Oakville, Canada, assignor to 777388 Ontario Limited, Oakville, Canada

Filed Dec. 29, 1988, Ser. No. 290,375
Int. Cl.[4] A61F 11/02
U.S. Cl. 381—73.1 10 Claims



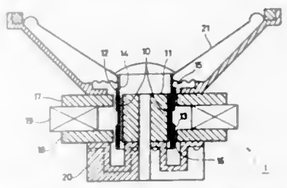
1. A masking sound source for a sound masking system comprising a random noise generating circuit having at least two incoherent outputs, first and second low pass filters having different frequency response characteristics each connected to a respective one of said outputs for deriving a noise signal having a predetermined spectral shape within the audio frequency range, continuously adjustable contour control means connected to the filters for deriving from said noise signals a composite noise signal having a spectral shape corresponding to the setting of the continuously adjustable contour control means, and an impedance transformer having an input coupled to said contour control means to receive the composite noise signal, and having an output circuit, and power amplification means having an input circuit coupled to the output circuit of the impedance transformer and an output circuit providing terminals for connection to a loudspeaker.

4,914,707

BALANCED VEHICULAR SPEAKER SYSTEM

Shinjiro Kato; Toshikazu Yoshimi; Hideo Yamamoto; Takeshi Sato, and Hisashi Kihara, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 902,893, Sep. 2, 1986, abandoned. This application May 6, 1988, Ser. No. 193,136
Claims priority, application Japan, Sep. 2, 1985, 60-134969[U]
Int. Cl.[4] H04B 1/00.
U.S. Cl. 381—86 7 Claims



1. An acoustic system for a vehicle comprising:

an amplifier for amplifying an audio signal;

a front speaker disposed in a front portion of an interior of a vehicle and forming a front speaker circuit;

a rear speaker disposed in a rear portion of said interior and forming a rear speaker circuit, said front and rear speaker circuits being connected in parallel to an output of said amplifier;

an impedance means having a predetermined value serially connected to said rear speaker in said rear speaker circuit such that the impedance of the rear speaker circuit is greater than the impedance of the front speaker circuit, the predetermined value of said impedance means being of such value to cause the sound pressure level received by a rear seat occupant of said vehicle from said rear speaker to be substantially equal to the sound pressure level received by a front seat occupant of said vehicle from said front speaker; and

means connected to said front speaker for causing the ratio of the high frequency impedance to the low frequency impedance of said front speaker to be smaller than the ratio of the corresponding high frequency impedance to the corresponding low frequency impedance of said rear speaker.

4,914,708

SYSTEM FOR SELF-ORGANIZATION OF STABLE CATEGORY RECOGNITION CODES FOR ANALOG INPUT PATTERNS

Gail A. Carpenter, and Stephen Grossberg, both of Newton Highlands, Mass., assignors to Boston University, Boston, Mass.

Filed Jun. 19, 1987, Ser. No. 64,764
Int. Cl.[4] G06K 9/62
U.S. Cl. 382—14 74 Claims

1. In a pattern recognition device comprising a short term feature representation field for receiving input signals defining an input pattern and template signals defining a long term memory template, means for selecting at least one category

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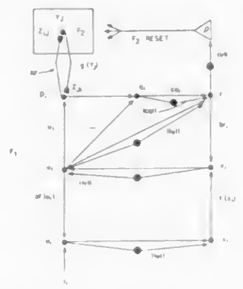
node based on a pattern from the short term field, means for generating the long term template based on the selected category and means for adapting category selection and the long term memory template to the input signals, a category selec-



tion being reset with an insufficient match between the input pattern and template, the improvement wherein the match is based on the closeness between a vector of the template and a vector of the short term field.

4,914,709

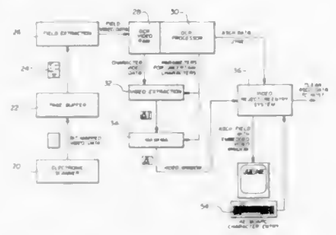
METHOD FOR IDENTIFYING UNRECOGNIZABLE CHARACTERS IN OPTICAL CHARACTER RECOGNITION MACHINES

Peter Rudak, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 2, 1989, Ser. No. 360,967

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—57 **14 Claims**



1. A method of processing documents having characters encoded thereon in a document reentry system comprising the steps of:

moving the documents along a path in serial flow;

reading data from said documents during said movement;

interpreting the data read and converting said data into readable characters;

establishing a threshold level of certainty below which the character is deemed unrecognizable;

identifying readable and unrecognizable characters on the basis of said threshold level;

displaying said readable characters in lines as they appear on the document;

generating a bit mapped image of each unrecognizable character;

inserting said bit mapped image of the unrecognizable character in place of the unrecognizable character on said display within a line of correctly read characters being adjacent thereto;

entering the correct character after viewing said bit mapped image in context with said readable characters.

4,914,710

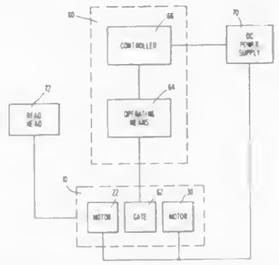
MICR DOCUMENT SMEAR TEST MACHINE

Leonard G. Ward; Joseph M. Ross, both of Melbourne, and Ronald R. Reidenauer, Palm Bay, all of Fla., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Nov. 20, 1987, Ser. No. 123,115

Int. Cl.[4] G06K *9/18*

U.S. Cl. 382—11 **24 Claims**



1. Diagnostic apparatus for simulating movement of a magnetic ink character recognition (MICR) coded document through a reader sorter, the MICR-coded document having magnetic ink characters printed thereon along a portion thereof, comprising:

a pair of read heads mounted upon said support plate in a predetermined relationship adapted to read the portion of the MICR-coded document having the magnetic ink characters printed thereon;

document transport means for moving the MICR-coded document past said pair of read heads, closely juxtaposed thereto;

means for varying a pressure exerted upon the MICR-coded document as it moves past said pair of read heads, wherein said pressure varying means comprises:

a pair of slots formed in said support plate, each said slot extending in a direction towards said document transport means:

means for coupling each of said pair of read heads respectively to one of said pair of slots, wherein each said read head is adjustably movable in directions towards and away from said document transport means; and

means for guiding said pair of read heads coupled to said slots; and

means for selectively controlling the number of times which the MICR-coded document moves through said document transport means past said pair of read heads.

4,914,711

INTEGRALLY MOLDED BEARING BLOCK ASSEMBLY

Leon Rubinstein, Natick, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 285,976, Jul. 23, 1981, abandoned. This application May 19, 1983, Ser. No. 496,235

Int. Cl.[4] F16C *13/00*; **B32B** *23/00*; **G03B** *9/00*

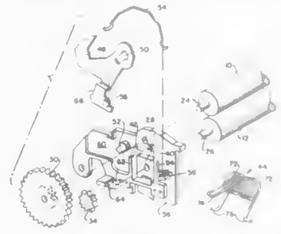
U.S. Cl. 384—419 **12 Claims**

1. A slide bearing assembly, of a support and a slide bearing carried by the support for translational movement relative thereto, made by the process of:

forming a support defining a slide opening having opposed side edge formations and end edges, respectively, with said side edge formations diverging slightly as they extend from one of said end edges to the other;

molding a slide bearing within said slide opening adjoining its said one end edge with a pair of side edge formations complementing adjoining portions of said side edge formations of said opening and with a length less than the

distance between said end edges such that the width of said slide bearing is substantially equal to the width of said opening adjoining its said one end edge, and



advancing said slide bearing from its molded position adjoining said one end edge to a bearing position adjoining said other end edge where a sliding clearance is provided in accordance with the divergence of said side edge formations of said opening.

4,914,712

DEVICE FOR SUPPORTING LIFT ROLL FOR FORK LIFT TRUCK

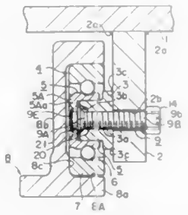
Yoshihiro Ikimi, and Masami Ochiai, both of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Mar. 27, 1989, Ser. No. 329,182

Claims priority, application Japan, Apr. 8, 1988, 63-87939; Apr. 8, 1988, 63-87940

Int. Cl.[4] F16C *23/06*

U.S. Cl. 384—449 **8 Claims**



1. A device for supporting a lift roll for a fork lift, comprising an annular inner race slidably fitted on a roll pin secured to a rear plate of a lift member, and an outer race rotatably fitted to said inner race, said outer race being adapted to roll along a flange section of an inner mast, with the lateral side of said outer race abutting on a web of said inner mast,

wherein the improvement resides in that it further comprises,

a protruding portion formed towards said inner mast of said inner race and protruding a predetermined length from an end of said roll pin,

an adjustment screw passed through and threaded engaged with said rear plate and roll pin, and

retaining means for engaging said adjustment screw with said protruding portion and for causing said inner race and said adjustment screw to be moved in unison,

the contact pressure of said outer race at said pressure-receiving section being adjusted by rotation of said adjustment screw.

4,914,713

ROTATION DETECTION OR SPEED PICKUP DEVICE FOR MINIATURE D-C MOTOR

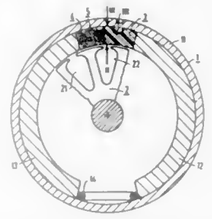
Hans-Joachim Mueller; Werner Seuffert, both of Bergrheinfeld, and Udo Winter, Kuernach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 9, 1988, Ser. No. 242,794

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730607

Int. Cl.[4] G05B *5/00*

U.S. Cl. 388—805 **9 Claims**



1. A rotation detection or speed pick-up device for a miniature d-c motor excited by a permanent magnet with magnet segments distributed over the inner circumference of the stator housing, said magnet segments being separated by pole gaps, and with a rotor which is slotted or serrated over its circumference, the device comprising:

an axially insertable non magnetic plastic support body held between the individual poles of the permanent magnet segments within the stator housing; and

a measuring coil coupled to said support body and disposed in one of said pole gaps for generating a signal induced by pulsation of the stray field when the rotor rotates and having a frequency corresponding to the speed of the rotor.

4,914,714

PORTABLE RADIO COMMUNICATION APPARATUS HAVING DIVERSITY RECEPTION FUNCTION

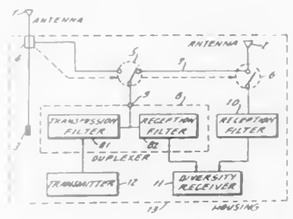
Yoshiharu Tamura, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Aug. 28, 1987, Ser. No. 90,673

Claims priority, application Japan, Aug. 30, 1986, 61-202656

Int. Cl.[4] H04B *1/44*

U.S. Cl. 455—78 **25 Claims**



1. A portable radio communication apparatus, comprising:

a housing for the apparatus;

transmitter means;

diversity receiver means;

transmission filter means connected to said transmitter means;

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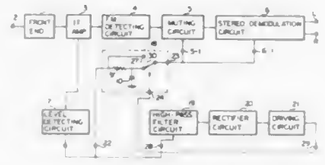
first and second reception filter means connected to said diversity receiver means;
first antenna means normally extending away from said housing but capable of being retracted towards said housing;
second antenna means mounted inside of or on an outer periphery of said housing; and
switch means for connecting said second antenna means to a node which, in turn, is connected to said transmission filter means and first reception filter means in a first condition in which said first antenna means is retracted towards said housing, and for connecting said first antenna means to said node and said second antenna means to said second reception filter means in a second condition in which said first antenna means is extended away from said housing.

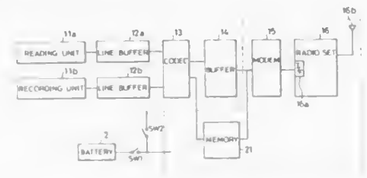
4,914,715
FM RECEIVING CIRCUIT
Shinji Miyata, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Dec. 12, 1988, Ser. No. 283,182
Claims priority, application Japan, Dec. 18, 1987, 62-320691
Int. Cl.[4] H04B *1/10*
U.S. Cl. 455—212 7 Claims



5. An FM receiving circuit for reproducing audio sounds, comprising:
(a) a level detecting circuit supplied with an intermediate frequency signal produced on the basis of a tuned FM signal for producing a voltage signal representative of an envelope of the intermediate frequency signal;
(b) a low-pass filter circuit providing a time constant for producing a first control signal on the basis of the voltage signal and, responsive to a second control signal, for varying the time constant, said first control signal being used for eliminating noises from said audio sounds;
(c) a high-pass filter circuit responsive to said voltage signal representative of the envelope of the intermediate frequency signal and operative to differentiate the voltage signal for producing a differential signal which is representative of an occurrence of a rapid variation in the electric field strength of the turned FM signal; and
(d) a rectifier circuit which is operative to rectify the differential signal for producing said second control signal.

4,914,716
BATTERY-OPERATED FACSIMILE MACHINE
Shuichi Takahashi, Sagamihara, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Jul. 6, 1987, Ser. No. 70,236
Claims priority, application Japan, Jul. 5, 1986, 61-157208; Jul. 7, 1986, 61-158025
Int. Cl.[4] H04B *1/16, 1/06*
U.S. Cl. 455—343 22 Claims

1. A facsimile machine comprising:
receiving means for receiving a data transmitted from a transmitter at a remote station, said receiving means having an automatic reception mode for receiving said data automatically;
storing means for storing said data received by said receiving means;
outputting means for outputting said data stored in said storing means; and
power distribution controlling means for supplying power only to said receiving means and said storing means during said automatic reception mode;
wherein said power distribution controlling means includes a first switch interposed between a rechargeable battery and said receiving means and said storing means, said first switch being operable so that power from said rechargeable battery is supplied to said receiving means and said storing means when said first switch is turned on and no



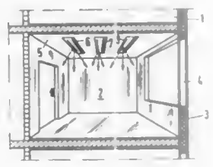
power is supplied from said rechargeable battery to said receiving means and said storing means when said first switch is turned off;
wherein said power distribution controlling means includes a second switch interposed between said first switch and said outputting means, said second switch being operable so that power from said rechargeable battery is supplied to said outputting means when said second switch is turned on and no power is supplied from said rechargeable battery to said outputting means when said second switch is turned off.

4,914,717
MICROWAVE ACTUABLE HEATING PAD AND METHOD
Robert M. Gibbon, Ft. Worth, Tex., assignor to JMK International, Inc., Fort Worth, Tex.
Filed Feb. 13, 1989, Ser. No. 309,242
Int. Cl.[4] H05B *6/80*
U.S. Cl. 219—10.55 M 5 Claims

1. A method of treating a localized area of pain in the human body, comprising the steps of:
applying a heating pad to the localized area, the heating pad comprising at least one layer of microwaveable silicone rubber which has been heated by exposure to microwave energy to a temperature above ambient prior to application to the localized area the microwaveable silicone rubber comprising a polyorganosiloxane gum having blended therein about 5 to 30 parts per 100 parts of gum of zinc oxide as an electromagnetic absorptive material and

from about 10 to 260 parts per 100 parts of gum of a filler material; and
wherein said one layer of microwaveable silicone rubber is sandwiched between an upper and a lower elastomeric layers formed from materials which are non-absorptive of microwave energy, said upper and lower elastomeric layers having a lower relative extending filler content than said microwaveable silicone rubber layer, whereby said heating pad is heatable to approximately 170°F. by exposure to a 700 watt microwave oven at 100% power for 3 minutes, the pad requiring approximately 45 minutes to return to 60°F.

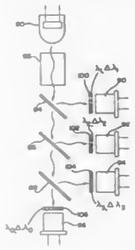
4,914,718
SYSTEM FOR COVERING THE ENERGY REQUIRED FOR LIGHTING AND HEATING A BUILDING
Peter Geilinger, Winterthur, and Bruno Keller, Zurich, both of Switzerland, assignors to Geilinger AG, Winterthur, Switzerland
Continuation of Ser. No. 878,985, Jun. 4, 1986, abandoned. This application Mar. 31, 1988, Ser. No. 178,855
Claims priority, application European Pat. Off., Oct. 8, 1984, 84810485
Int. Cl.[4] H05B *3/44*
U.S. Cl. 219—213 11 Claims



1. The combination of
a building having at least one room with an outside wall including a window having a heat transfer rate of at most 1 $W/m^2.K$ and an opaque wall part having a heat transfer rate of at most 1 $W/m^2.K$;
a plurality of electric lighting fixtures of predetermined power range in said room for providing artificial light; and
a plurality of electric heaters in said room for providing heat, said heaters having a power rating of from 50% to 150% of said lighting fixtures, each said heater being coupled with a respective lighting fixture for selective operation of said lighting fixture or said heater.

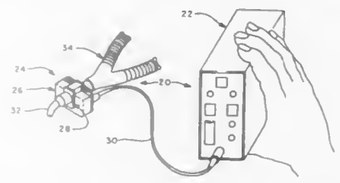
4,914,719
MULTIPLE COMPONENT GAS ANALYZER
Brendan Conlon, Elm Grove, and James Dittmar, Waukesha, both of Wis., assignors to Criticare Systems, Inc., Waukesha, Wis.
Filed Mar. 10, 1989, Ser. No. 321,897
Int. Cl.[4] G01N *21/61*
U.S. Cl. 250—339 14 Claims

1. In a gas analyzer for N gases having overlapping absorption spectra, where N is an integer greater than 1, said analyzer of the type comprising a sample cell adapted to contain a gas to be analyzed and a source operative to generate at least one measuring beam which passes through the sample cell, the improvement comprising:
means, responsive to the at least one measuring beam, for generating N measuring signals, each indicative of optical energy from the source transmitted through the sample cell in a respective optical region characterized by a respective optical center wavelength λ_i and a respective bandpass $\Delta\lambda_i$, where i is an integer greater than 0 and less than or equal to N;
means, responsive to the N measuring signals, for combining the N measuring signals to automatically determine which



of the N gases is present in the sample cell in the greatest concentration and the concentration thereof.

4,914,720
GAS ANALYZERS
Daniel W. Knodle, Seattle; Leslie E. Mace, Mercer Island, and Lawrence L. Labuda, Issaquah, all of Wash., assignors to Cascadia Technology Corporation, Redmond, Wash.
Continuation of Ser. No. 146,284, Jan. 20, 1988, abandoned, which is a division of Ser. No. 24,770, Mar. 11, 1987, Pat. No. 4,859,858, which is a continuation-in-part of Ser. No. 938,030, Dec. 4, 1986, abandoned. This application Nov. 21, 1988, Ser. No. 275,014
Int. Cl.[4] G01N *21/61*
U.S. Cl. 250—343 19 Claims



1. Apparatus for analyzing the concentration of a selected gas in a stream of gases containing the selected gas, said apparatus comprising: source means for emitting discrete pulses of radiant energy of a specified intensity and of such a wavelength that said energy is absorbed by said selected gas but not by the other gases present in the stream being analyzed, detector means for detecting the intensity of the radiant energy after said energy has passed through the gases being analyzed and providing a signal indicative of the intensity of the radiant energy detected by said detector means, and means for converting said signal to one indicative of the concentration of the selected gas in the stream of gases being analyzed, said detector means including a detector and said apparatus further comprising means for applying an electrical bias to said detector to improve the signal-to-noise ratio of said detector, said bias applying means comprising a flyback transformer having a primary winding and a secondary winding connected to said detector means, means connected to said secondary winding for providing an error signal, means for integrating said error signal with respect to a reference signal to thereby generate an integrated signal, and means employing said integrated signal to control the voltage across the primary winding of said transformer.

8. The combination of a transducer head for generating a signal indicative of the concentration of a designated gas in a mixture of gases containing the designated gas and an airway

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adapter for confining said mixture of gases to a particular path traversing said transducer head, said transducer head comprising an infrared radiation emitter on one side of said path, detector means comprising an infrared radiation detector on the opposite side of said path, and a filter means which is free of moving parts interposed between said emitter and said detector for transmitting to said detector only that infrared radiation in a band centered on a wavelength which is absorbed by said designated gas, said airway adapter comprising an elongated casing with first and second end sections, the means for confining said mixture of gases to said particular path being a passage extending from end-to-end through said elongated casing, and said adapter further comprising: integral mounting means for supporting said transducer head from said casing which are formed on said casing between and in an in-line relationship with said casing end sections and apertures in said elongated casing on diametrically opposed sides of the passage therethrough which are aligned along the path between said emitter and said detector and thereby so allow infrared radiation to pass from said emitter through said airway adapter and the mixture of gases flowing therethrough to said detector that said infrared radiation of the wavelength absorbed by said designated gas is attenuated before it reaches said detector so that the signal emitted by said detector reflects the concentration of the designated gas in said mixture of gases.

4,914,721

SAFETY DEVICE

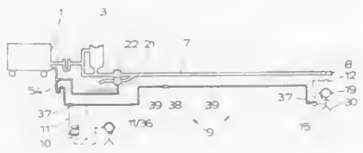
Karl C. Glaeser; Gerhard Buhr, both of Leverkusen; Joachim Cardinal, Bergisch-Gladbach; Klaus Genuit, Aachen; Detlef Lohmüller, Bonn, and Heinz Tilmans, Burscheid, all of Fed. Rep. of Germany, assignors to Ernst Peinlger GmbH Unternehmen fuer Bautenschutz, Fed. Rep. of Germany

Continuation of Ser. No. 123,424, Nov. 20, 1987, Pat. No. 4,814,632. This application Nov. 2, 1988, Ser. No. 266,483

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639628; Dec. 17, 1986, 3643060

Int. Cl.[4] H02H *3/16*

U.S. Cl. 307—116 17 Claims



1. A safety device for an apparatus connected to a power supply via a supply line said apparatus to be used by an operator, said apparatus comprising:

a handgrip grasped by the operator;

a power source controlling the operation of the apparatus;

a control device for control of the operation of the apparatus;

an electronic operating sensor disposed on the apparatus and having one electronic sensing element;

said operating sensor actuated by the operator;

said operating sensor being actuated by an actuating element, this actuating element being completely separate from said operating sensor;

said apparatus being switched off when the operator's action on the operating sensor stops;

at least said electronic sensing element of said operating sensor being disposed on the hand of the operator; and

said actuating element being the handgrip as such or some special element disposed on said handgrip, particularly a foil forming said actuating element postioned on said handgrip.

4,914,722

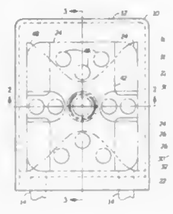
SHOCK ABSORBER FOR CERAMIC FILTERS

Harold Holden, Boca Raton, and Charles W. Mooney, Lake Worth, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 27, 1989, Ser. No. 316,206

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—345 8 Claims



1. In a ceramic electronic filter of the type wherein at least one ceramic plate having a first major surface contacted by a first metal plate is housed within a metallic enclosure, and wherein first spring means having at least one opening therethrough is positioned between a wall of said housing and said first metallic plate for urging said first metallic plate into contact with said at least one ceramic plate, a shock absorbing apparatus for protecting said at least one ceramic plate, comprising:

an elastomeric base material positioned between said first spring means and said wall; and

second spring means coupled to said base material for supporting said at least one ceramic plate through said at least one opening when said at least one ceramic plate is subjected to a force which is generally perpendicular to said at least on ceramic plate.

4,914,723

FLUORESCENT LAMP DISCHARGE TUBE HAVING ELECTROSTATICALLY COATED ENVELOPE

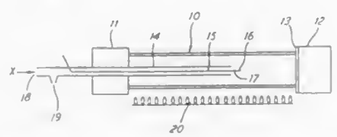
Roger P. Ellerbeck; Leslie J. George, both of Enfield; Peter W. Ranby, Harrow Weald, and Peter J. Clewer, Hertford Heath, all of England, assignors to Thorn EMI plc, London, England

Continuation-in-part of Ser. No. 813,241, Dec. 24, 1985, abandoned, which is a division of Ser. No. 586,754, Mar. 6, 1984, abandoned. This application Dec. 28, 1987, Ser. No. 137,916

Claims priority, application United Kingdom, Mar. 8, 1983, 8306375

Int. Cl.[4] H01J *1/64*

U.S. Cl. 313—493 5 Claims



1. A fluorescent lamp discharge tube electrostatically coated with a mixture comprising 100 parts by weight of phosphor, 0.01 to 3 parts by weight of an organic adhesion aid comprising a fatty acid having a melting point greater than 40° C. or the ammonium, aluminum or alkaline earth salts of such a fatty acid, and, in addition to said organic adhesion aid, an inorganic adhesion aid consisting solely of 0.05 to 5 parts by weight of finely divided aluminum oxide having a grain size smaller than 0.1 microns, wherein said discharge tube when subjected to an optical densitometry test comprising passing collimated light from a suitable source through said tube at right angles to the tube axis and along a diameter at points near each end and measuring the brightness of the transmitted light exhibits a percentage light transmission reading when compared with an uncoated tube of the same glass and dimension of less than 15 percentage units and wherein the reading taken near an end of the tube differs from that taken near the other end of the tube by no more than 1.2 of said units.

4,914,724

ELECTRON GUN FOR CATHODE RAY TUBE

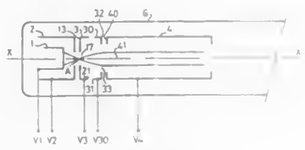
Jacques Chevalier, Jarrie, and Jean P. Sembely, St. Egreve, both of France, assignors to Thomson-CSF, Paris, France

Filed Nov. 28, 1988, Ser. No. 276,668

Claims priority, application France, Dec. 1, 1987, 87 16635

Int. Cl.[4] H01J *29/58, 29/46*

U.S. Cl. 315—382 5 Claims



1. An electron gun for cathode ray tubes, successively, comprising an electron source electrode or cathode, a control or Wehnelt electrode, a first acceleration electrode or anode having an adjustable voltage and at least one focusing or second acceleration electrode, comprising an additional electrode inserted between the first acceleration electrode or anode and the focusing or second acceleration electrode; wherein said additional electrode is carried to a fixed bias voltage V30, said additional electrode forming a first low-powered lens with the first acceleration electrode and forming a high-powered lens with the focusing electrode and wherein said bias voltage V30 is substantially equal, to within 30 percent, to the bias voltage to which the first acceleration electrode is raised.

4,914,725

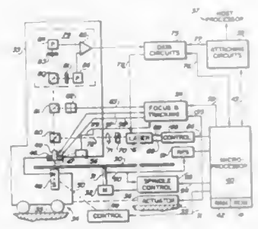
TRANSDUCER POSITIONING SERVO MECHANISMS EMPLOYING DIGITAL AND ANALOG CIRCUITS

Karl A. Belser, Los Gatos, Calif.; Paul J. Douma, Tucson, Ariz.; Ian E. Henderson, Tucson, Ariz.; Ronald J. Kadlec, Tucson, Ariz., and Spencer D. Roberts, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 10, 1989, Ser. No. 377,399

Int. Cl.[4] G05B *13/00*

U.S. Cl. 318—560 27 Claims



1. In a positioning system, a track-seeking servo for an optical recorder operatively supporting an optical medium having a plurality of signal-storing elongated tracks which are sensible by an optical beam of a sensing means and having a coarse positioning carriage mounted with respect to the optical medium for relative radial movements across the tracks for seeking access to a target track and relatively movably carrying a fine positioning carriage such that the fine carriage moves radially of the disk about a reference point on the coarse carriage, a relative sensor mounted on the coarse positioning carriage and being operatively coupled to the fine positioning carriage for sensing and supplying an RPE (Relative Position Displacement Error) indication of the relative displacement of the fine carriage from the reference point, said sensing means having lens means mounted on the carriage for supplying a TES (Tracking Error Signal) indication of an absolute position of the fine carriage with respect to a track on the optical medium which is being scanned by said optical beam;

the improvement including, in combination:

first and second track-seeking servo-control loops operatively coupled, respectively, to said fine and coarse carriages for effecting relative positioning motions between the carriages and the optical medium such that the carriages can radially cross the tracks on the optical medium, said second track-seeking loop being operatively coupled to said relative sensor for receiving said RPE indication and responding thereto to effect a relative motion of the coarse carriage to follow the track-crossing motions of the fine carriage, each of said loops independently and respectively having error means for generating first and second drive signals and said loops respectively including first and second output means, respectively responsive to the first and second drive signals and being coupled to said fine and coarse carriages, respectively to effect respective relative motions;

emphasis means in said first track-seeking loop and being coupled to said second track-seeking loop and receiving said first drive signal and being responsive to the first drive signal to supply an emphasized drive signal to said first and second output means; and

first circuit means in said first servo loop coupled to the sensing means for receiving said TES indication and being responsive thereto to generate said first drive signal and including capture means coupled to the first output means for supplying a track-capture signal to the first output means for adjusting operation of the first output means upon imminent arrival of the fine carriage to said target track to enable said fine carriage to stop at said target track and including track crossing means for correcting the seek operation to accommodate track runout of the record medium such that the number of tracks yet to be traversed for the fine carriage to reach said target track is faithfully indicated in the first loop.

4,914,726

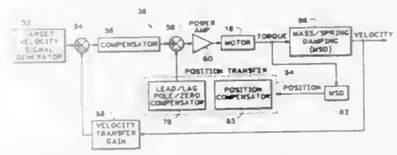
MASS VELOCITY CONTROLLER

Edward F. Burke, Lake Oswego, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 17, 1989, Ser. No. 297,202

Int. Cl.[4] G05D *15/00*

U.S. Cl. 318—646 14 Claims



1 A system for controlling the movement of a mass by a motor-driven flexible element means comprising:

a mass moveable along a predetermined path;

flexible element means coupled to the mass;

means for generating a target velocity signal following a

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predetermined velocity profile for the motor corresponding to a target velocity profile of the mass along the predetermined path;

motor means responsive to the target velocity signal and having a rotor coupled to the flexible element means for moving the mass along the path by applying force to the mass through a length of the flexible element means extending between the motor means and the mass;

first sensing means for sensing a physical characteristic representative of the variation in length of the flexible element means extending between the motor means and the mass; and

first feedback means posed between the generating means and the motor means, and responsive to the sensed physical characteristic for adjusting the target velocity signal in a manner reducing the variation in the length of the flexible element means.

4,914,727

METHOD OF MAGNETIC RESONANCE DYNAMIC IMAGING

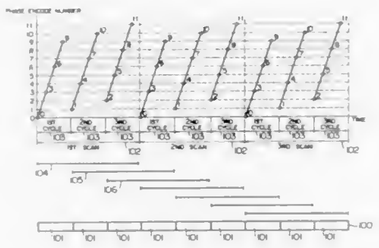
Koichi Sano, Sagamihara, Japan; Akira Maeda, Gardena, Calif.; Tetsuo Yokoyama, Tokyo; Shigenobu Yanaka, Kashiwa, and Hideaki Koizumi, Katsuta, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Feb. 22, 1989, Ser. No. 313,439

Claims priority, application Japan, Feb. 25, 1988, 63-40808

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 6 Claims



1. A method of MR dynamic imaging comprising the steps of:

(a) substantially uniformly dividing one scan which is a minimum measurement unit in generating one image data, into a plurality of cycles;

(b) distributing to each of said cycles a plurality of phase encoded pulses of different strengths to permit measurement from high frequency component to low frequency component of the image;

(c) generating the distributed phase encoded pulses and measuring MR signals;

(d) repeating said scan a plurality of times;

(e) sequentially extracting one-scan data staggered by a predetermined number of cycles from the data derived from the repetitive scan;

(f) rearranging the extracted data in the sequence of strength of the phase encoded pulses; and

(g) generating image data from the rearranged data.

4,914,728

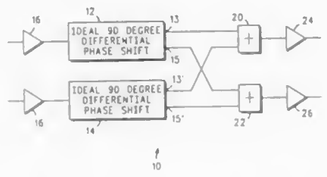
WIDEBAND MMIC ACTIVE QUADRATURE HYBRID

Craig L. Fullerton, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 23, 1989, Ser. No. 327,676

Int. Cl.[4] H03H *11/22*

U.S. Cl. 333—118 10 Claims



1. A wideband quadrature hybrid comprising:

a plurality of 90 degree phase shift means, each of said 90 degree phase shift means receiving a separate input signal;

each of said plurality of 90 degree phase shift means supplying output signals having a 90 degree phase differential with respect to each other;

a plurality of output amplifying means;

each of said plurality of 90 degree phase shift means having a first output coupled to a first of said plurality of output amplifying means to supply a first of said output signals thereto;

each of said plurality of 90 degree phase shift means having a second output coupled to a second of said plurality of output amplifying means to supply a second of said output signals thereto; and

said output amplifying means for combining and amplifying said plurality of output signals.

4,914,729

METHOD OF FILLING POLYGONAL REGION IN VIDEO DISPLAY SYSTEM

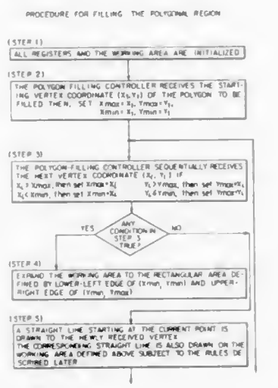
Mutsuhiro Omori, Atsugi; Hidefumi Terada, and Minoru Morimoto, both of Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Feb. 18, 1987, Ser. No. 16,071

Claims priority, application Japan, Feb. 20, 1986, 61-35539

Int. Cl.[4] G09G *1/00*

U.S. Cl. 340—703 2 Claims



1. A method of filling a polygonal region with valued pixels to display a polygon corresponding to the polygonal region on a display screen of a raster-scan type display unit which screen provides a matrix array of pixels comprising the steps of:

providing first memory means having a matrix array of addresses each for storing a value of a respective one of the pixels provided on the display screen, second memory means having a matrix array of memory locations corresponding respectively to said addresses of said first memory means, and control means for entering data into addresses of said first and second memory means and for sequentially reading the values from said addresses of said first memory means to display on the display screen a polygon represented by said values read from said addresses;

producing data representative of vertices of said polygon;

determining a minimum rectangle which includes said polygon based on said data representative of said vertices and clearing those memory locations of said second memory means corresponding to said minimum rectangle;

determining those addresses of said first memory means corresponding to constituent dots of straight lines each connecting a respective one of adjoining pairs of said vertices and determining those memory locations of said second memory means corresponding to said constituent dots of said straight lines;

storing said straight lines to said first memory means by storing a predetermined display data value for each constituent dot into said addresses of said first memory means, and sequentially storing said straight lines to said second memory means by storing data representative of "1" into said those memory locations of said second memory means in accordance with the following rules (a), (b) and (c):

(a) when the memory location to which the data representative of "1" is going to be stored has contained a "1", data representative of "0" is stored instead;

(b) a constituent dot representing the start of the straight line which is going to be stored is stored only when the straight line which is going to be stored has an inclination different in polarity from the precedingly stored straight line; and

(c) the constituent dot of each straight line which is going to be stored is stored only when the constituent dot which is going to be stored is shifted in a direction perpendicular to the scanning direction;

scanning those memory locations of said second memory means corresponding to said minimum rectangle to detect the memory locations containing "1" with respect to each scanning line for numbering with consecutive integers the detected memory locations, and

storing predetermined values into those addresses of said first memory means corresponding to each interval from the odd-numbered memory location to the even-numbered memory location of said second memory means on the corresponding scanning line.

4,914,730

DISPLAY DEVICE HAVING PLURAL GROUPS OF INTERCONNECTED SEGMENT ELECTRODES

Masanori Fujita, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan

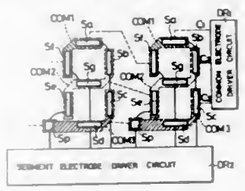
Filed Mar. 25, 1983, Ser. No. 478,886

Claims priority, application Japan, Apr. 2, 1982, 57-55867

Int. Cl.[4] G09G *3/00*

U.S. Cl. 340—756 10 Claims

1. A display device comprising: a plurality of segments composed of a plurality of segment electrodes, an electrooptic display substance, and three common electrodes, said segment electrodes being divided into groups each having, at most, three segment electrodes interconnected electrically and disposed in confronting relation respectively to different common electrodes such that the three segments in each group can exhibit at most four possible display modes excluding display modes in which two of the three segments of any group are rendered unresponsive and the remaining one responsive; and driver circuit means for supplying different electric signals to the respective common electrodes and for selectively supplying a plurality of electric signals different from each of said first-mentioned electric signals to said segment electrodes dependent on the display mode to be displayed by said segments.



4,914,731

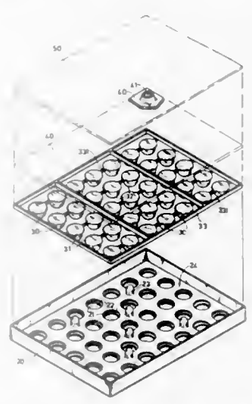
QUICKLY FORMED LIGHT EMITTING DIODE DISPLAY AND A METHOD FOR FORMING THE SAME

Shen-Yuan Chen, P.O. Box 10780, Taipei 10099, Taiwan

Filed Jul. 27, 1987, Ser. No. 78,318

Int. Cl.[4] G09G *3/32*

U.S. Cl. 340—815.2 1 Claim



1. Process of forming a light emitting display having a case facing upward, comprising the steps of:

putting a plurality of diaphaneity lenses maintained in a coplanar relationship by rib-shaped supports into the back of the case;

transporting the lenses to molding tools for punching and cutting apart the ribs between the lenses;

precisely encasing each of the diaphaneity lenses into respective pre-arranged holes on the case;

encasing a pre-formed reflector and a circuit board welded with light emitting chips in sequence onto the back of the case to effect a display.

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4,914,732

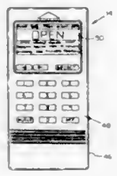
ELECTRONIC KEY WITH INTERACTIVE GRAPHIC USER INTERFACE

Walter G. Henderson, Corvallis; John Q. Archer, II, Salem; Gerald R. Daum, Salem; George A. Ellson, Salem; John E. Gray, Salem; Wayne F. Larson, Salem; Rockne M. Olds, Salem; Jerry P. Scansen, Portland; John W. Sberman, Corvallis, and Edgar J. Unrein, Newberg, all of Oreg., assignors to Supra Products, Inc., Salem, Oreg.

Continuation of Ser. No. 192,832, May 11, 1988, abandoned, which is a division of Ser. No. 15,864, Feb. 17, 1987, Pat. No. 4,766,746, which is a continuation-in-part of Ser. No. 831,601, Feb. 21, 1986, Pat. No. 4,727,368, which is a continuation-in-part of Ser. No. 814,364, Dec. 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 788,072, Oct. 16, 1985, abandoned. This application Sep. 8, 1989, Ser. No. 405,391

Int. Cl.[4] E05B *1/01*

U.S. Cl. 340—825.17 10 Claims



1. An electronic key capable of executing a plurality of functions in conjunction with an electronic lock comprising:

display means for displaying visual symbols representative of the plurality of functions;

function selection means for selecting one of said plurality of functions for execution by the electronic key in conjunction with the electronic lock; and

display driver means cooperating with the display means and the function select means for causing the visual symbol associated with the selected function to blink in the display means.

4,914,733

TRAFFIC ADVISORY-INSTANTANEOUS VERTICAL SPEED DISPLAY

Paul E. L. Grainick, Coral Springs, Fla., assignor to Allied-Signal, Inc., Morris Township, Morris County, N.J.

Filed Oct. 30, 1987, Ser. No. 115,687

Int. Cl.[4] G08G *5/04*

U.S. Cl. 340—961 17 Claims

1. A display for presenting symbolically to an aircraft flight crew the traffic advisory and resolution advisory information developed by a Traffic Advisory and Collision Avoidance System (TCAS) computer aboard an aircraft, comprising:

an electronic display panel

an instantaneous vertical speed sensor aboard the aircraft, said sensor providing output data containing rate of climb or descent information for the aircraft;

first means receiving output data from said TCAS computer for controlling said display panel to present thereon a first display indicating the locations of other aircraft relative to the aircraft, said other aircraft being characterized by particular symbols in accordance with their degree of collision threat to the aircraft,

second means receiving output data from said instantaneous vertical speed sensor for controlling said display panel to present thereon a second display indicating the vertical speed of the aircraft, said second display being located in an area of said panel adjacent said first display; and

third means receiving output data from said TCAS computer for controlling said display panel to cause said second display to indicate vertical speeds of the aircraft which comply with a particular resolution advisory generated by said TCAS computer,

said second display including a scale of climb and descent rates and a pointer, the information content of said sensory output data being indicated by the position of said pointer along said scale, said third means controlling said display panel to cause illumination of the backgrounds of different portions of said scale with light of contrasting colors in accordance with resolution advisories generated by said TCAS computer, wherein said first display is presented in PPI format and said second display is laid out about the outer periphery of said first display.

4,914,734

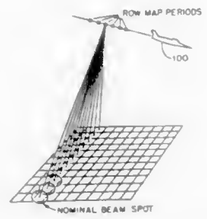
INTENSITY AREA CORRELATION ADDITION TO TERRAIN RADIOMETRIC AREA CORRELATION

Robert J. Love, San Francisco, and Richard I. Campbell, Saratoga, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 21, 1989, Ser. No. 388,796

Int. Cl.[4] G01S *13/86*

U.S. Cl. 342—64 6 Claims



1. A map-matching aircraft navigation system which provides an identification of an aircraft's position in latitude and longitude, said map-matching navigation system comprising:

a first radar system which is housed in said aircraft and which transmits radio frequency signals in a point beam which sequentially strikes terrain in a first rectangular matrix in a pattern of points in rows and columns on terrain beneath said aircraft, said radar system receiving terrain echo returns from said pattern of rows and columns to output a first sensed map of said terrain with varying reflectivity coefficients in each of the points in the rows and columns;

a radiometer which is housed in said aircraft and which detects a radiometric temperature image of the terrain in a second rectangular matrix in a pattern of points to output a second sensed map of said terrain with varying measures of thermal emissions and reflected energy; and

a means for comparing said first and second sensed maps respectively with first and second stored reference maps, said first stored reference map containing a third rectangular matrix of rows and columns indicative of expected terrain echo return signals from the terrain over which said aircraft is flying, said comparing means finding a maximum correlation between said first sensed map and said first stored reference map to position and first sensed map on said first stored reference map, said comparing means thereby locating said aircraft on said first stored reference map, said comparing means also identifying each point in said third rectangular matrix with a known corresponding latitude and longitude in order to extract and output said aircraft's position in latitude and longitude from its location on said first stored reference map, said comparing means containing a fourth rectangular matrix of rows and columns indicative of expected radiometric temperature image signals from the terrain over which the aircraft is flying, said comparing means finding a maximum correlation between said second sensed map and said second stored reference map to position said second sensed map on said second stored reference map to position said aircraft on said second stored reference map, said comparing means also identifying each point on fourth rectangular matrix with a known corresponding latitude and longitude in order to extract and output said aircraft's position in latitude and longitude from its location on said second stored reference map after said second sensed map has been positioned on said second stored reference map.

4,914,735

PROPAGATION TIME DETECTING SYSTEM WITH USE OF DETECTED PHASE DIFFERENCE OF TRANSMITTED AND RECEIVED SUBCARRIER

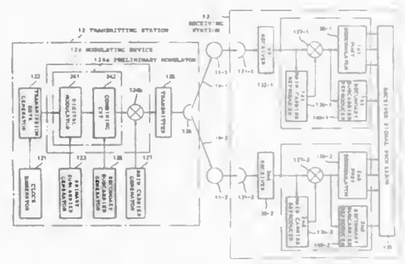
Osamu Ichiyoshi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 8, 1988, Ser. No. 241,626

Claims priority, application Japan, Sep. 8, 1987, 62-224876

Int. Cl.[4] G01S *13/32*

U.S. Cl. 342—125 20 Claims



1. In a transmitting station in a propagation time detecting system, said transmitting station comprising:

modulating means for modulating a main carrier signal having a main carrier frequency by a sequence of transmission data to produce a transmission modulated signal with said transmission data digitized by a reference clock signal having a reference clock frequency, and

transmitting means for transmitting said transmission modulated signal to a receiving station of said propagation time detecting system through first to M-th transmission paths with first through M-th propagation times as first through M-th transmission signals, respectively, where M represents a predetermined integer which is not less than two, said first to M-th transmission paths including respective repeated devices, said receiving station receiving said first through said M-th transmission signals to detect differences among said first through said M-th propagation times,

the improvement wherein said modulating means comprises:

preliminary modulating means for modulating a transmission subcarrier signal having a predetermined subcarrier frequency by said transmission data to produce a preliminary modulated signal, said predetermined subcarrier frequency being higher than said reference clock frequency and different from said main carrier frequency;

main modulating means for amplitude modulating said main carrier signal by said preliminary modulated signal to produce a main modulated signal; and

means for supplying said main modulated signal to said transmitting means as said transmission modulated signal.

4,914,736

LIQUID JET RECORDING HEAD HAVING MULTIPLE LIQUID CHAMBERS ON A SINGLE SUBSTRATE

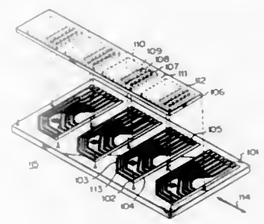
Hiroto Matsuda, Ebina, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 082,917, Aug. 10, 1987, abandoned, which is a continuation of Ser. No. 747,564, Jun. 21, 1985, abandoned. This application May 30, 1989, Ser. No. 361,772

Claims priority, application Japan, Jul. 5, 1984, 59-139421

Int. Cl.[4] G01D *15/16*; B41J *3/04*

U.S. Cl. 346—140 R 12 Claims



1. A liquid jet recording apparatus comprising:

an integral substrate member including a single substrate and a plurality of substantially identical electrode patterns providing a like plurality of heat generating element groups formed directly on one side of said single substrate, each said group including the same number of plural heat generating elements for generating thermal energy and each said group having associated therewith a supplying hole for supplying a recording liquid to said heat generating elements in said group; and

liquid chamber means attached to said integral substrate member to provide on said substrate a plurality of substantially identical separate liquid chambers prevented from fluid communication with each other for accommodating recording liquids having different colors or densities, each said separate liquid chamber being associated with one of said heat generating element groups and including a plurality of liquid paths, each terminating at a discharge orifice adjacent one of said heat generating elements in said associated group, so that recording liquid supplied to said liquid chamber by said supplying hole can be selectively discharged from said orifices by the thermal energy generated by said heat generating elements,

wherein said plurality of patterns of electrodes are substantially identically oriented and are arranged side-by-side on said substrate whereby there is provided a like plurality of discharge orifice groups, each being associated with a corresponding said electrode pattern and being precisely located with respect to the other said discharge orifice groups.

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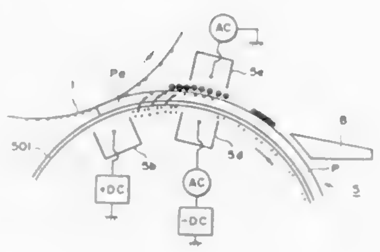
4,914,737
IMAGE FORMING APPARATUS

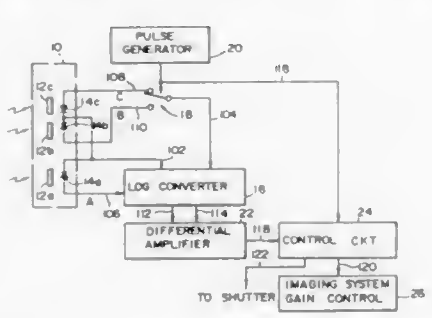
Koji Amemiya; Takeshi Menjo, both of Tokyo; Takashi Hasegawa, Warabi, and Hiroshi Satomura, Hatogaya, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 216,169, Jul. 7, 1988, abandoned. This application Aug. 4, 1989, Ser. No. 390,425
Claims priority, application Japan, Jul. 9, 1987, 62-171654
Int. Cl.[4] G03G *15/14, 15/16*
U.S. Cl. 355—276 20 Claims



1. An image forming apparatus, comprising:
movable image bearing means;
image forming means for forming an image on said image bearing means;
image receiving material carrying means for carrying and conveying an image receiving material to an image transfer station where the image formed by said image forming means is transferred from said image bearing means to the image receiving material;
image transfer means disposed at the transfer station in opposition to said image bearing means;
discharging means, disposed downstream of said image transfer means with respect to the movement direction of the image receiving material and in opposition to said image receiving material carrying means, and operative when a trailing edge of the image receiving material is substantially immediately before a transfer zone provided by said image transfer means or when it is in the transfer zone, during the period when the image receiving material is conveyed by said image receiving material carrying means.

4,914,738
APPARATUS FOR DISCRIMINATING LIGHT SOURCE HAVING SPECTRUM PEAKS

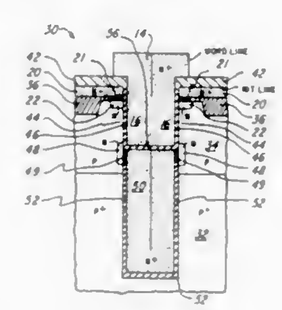
Kazuya Oda, and Kiyotaka Kaneko, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Sep. 8, 1988, Ser. No. 241,959
Claims priority, application Japan, Sep. 10, 1987, 62-225343
Int. Cl.[4] G01J *1/02*
U.S. Cl. 356—419 10 Claims



1. An apparatus for discriminating a light source emitting light having an energy spectrum peak at a specified wavelength from other light sources, said apparatus comprising:
first photosensitive means having first spectral sensitivity characteristics;
second photosensitive means having second spectral sensitivity characteristics exhibiting a peak at a wavelength range different from that of said first spectral sensitivity characteristics;
third photosensitive means having spectral sensitivity characteristics having a peak wavelength range in the proximity of that of said second spectral sensitivity characteristics;
computing means for receiving outputs from said respective photosensitive means for calculating a first ratio of the output from said first photosensitive means and the output from said second photosensitive means as well as a second ratio of the output from said first photosensitive means and the output from said third photosensitive means; and
light source determining means for determining the kind of the light source based on the first ratio and the second ratio outputted from said computing means;
said light source determining means comparing the first and second ratios to determine whether the light source is of the type emitting the light having an energy spectrum peak at the specified wavelength.

4,914,739
STRUCTURE FOR CONTACTING DEVICES IN THREE DIMENSIONAL CIRCUITRY

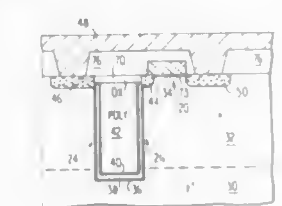
Satwinder S. Malhi, Garland, Tex., assignor to Texas Instruments, Incorporated, Dallas, Tex.
Continuation of Ser. No. 801,039, Nov. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 666,715, Oct. 31, 1984, abandoned. This application May 25, 1989, Ser. No. 357,658
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.6 5 Claims



1. A semiconductor device for contacting integrated circuit components comprising:
a substrate including a trench therein, wherein said trench surrounds a portion of said substrate;
said substrate further including a surface;
said trench including trench sides and a trench bottom;
a capacitor formed within said trench out of direct contact with said surface;
a field effect transistor including a drain, source and gate, said drain and source including majority dopants of the same type;
said drain and source, both surrounding said trench, being situated substantially along said trench sides, and defining a channel region, along said trench sides, which surrounds said trench;
said source contacting said capacitor;
a well region of the same majority carrier type throughout for accessing said capacitor;
said well region being located within said portion of said substrate surrounded by said trench thereby allowing electrical access to said transistor and said capacitor for testing purposes.

4,914,740
CHARGE AMPLIFYING TRENCH MEMORY CELL

Donald M. Kenney, Shelburne, Vt., assignor to International Business Corporation, Armonk, N.Y.
Filed Mar. 7, 1988, Ser. No. 164,764
Int. Cl.[4] H01L *29/78, 29/06, 27/02*
U.S. Cl. 357—236 8 Claims



1. A gain memory cell device, comprising:
a lower region of a high doping concentration of a first conductivity type;
a first surface region of a low doping concentration of a second conductivity type formed over said lower region;
a trench having a bottom and substantially vertical sidewalls, formed into said first surface region, and extending downward to at least contact said lower region;
a nodal layer formed on at least one sidewall of said trench and comprising a first insulating layer facing said first surface region, a first conductive layer facing said first insulating layer and a second insulating layer facing said first conductive layer;
a second conductive layer formed in said trench whereby a signal capacitance is formed between said second conductive layer and said first conductive layer;
a second surface region of a high doping concentration of said first conductivity type formed in a surface region of said first surface region adjacent said first insulating layer and electrically connected to said first conductive layer;
a third surface region of a high doping concentration of said first conductivity type formed in a surface region of said first surface region adjacent said first insulating layer and separated from said second surface region, said third surface region being electrically isolated from said first conductive layer, with said lower region, third surface region and first conductive layer collectively forming a transistor with one of said lower region and third surface region forming a source, the other of said lower region and third surface region forming a drain, and said first conductive layer forming a gate electrode;
a fourth surface region of a high doping concentration of said first conductivity type formed in a surface region of said first surface region separated from said first conductive layer by said second surface region and by another portion of said first surface region;
a gate electrode formed over said first surface region in an area of said another portion between said second and fourth surface regions.

4,914,741
TAPE AUTOMATED BONDING SEMICONDUCTOR PACKAGE

Kenneth M. Brown, North Andover; Robert J. Hannemann, Wellesley, both of Mass., and Stephen P. Hansen, Amherst, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Jun. 8, 1987, Ser. No. 59,051
Int. Cl.[4] H01L *23/54, 23/48*
U.S. Cl. 357—74 17 Claims

1. A semiconductor package for protecting a semiconductor chip, the chip having at least one bond point for electrical connection to an external conductive element, said package comprising:
(a) a housing enclosing the chip, said housing including an electrically insulating base on which the chip is seated and an electrically insulating cover with a protruding rim defining a space wherein said chip is contained, said base dimensioned to be mated to said rim; and
(b) section of tape automated bonding tape adjacent said housing, said tape automated bonding tape having a section of electrically insulating tape film adjacent at least a portion of said housing, a plurality of conductive leads on said tape film, each of said conductive leads having an inner lead portion that extends from said tape film into said housing between said housing rim and base and is connected to one of the chip bond points, each of said conductive leads further having an outer lead portion that extends beyond the outer perimeter of said tape film for bonding to an external conductive element, a conductive film opposite the surface of said tape film, and at least two of said conductive leads in electrical connection with said conductive film through said tape film; and
(c) an adhesive means extending continuously between said housing rim and base and surrounding said conductive lead inner portions that extend therebetween so as to provide a seal between said base and said cover.

4,914,742
THIN FILM ORTHOGONAL MICROSENSOR FOR AIR FLOW AND METHOD

Robert E. Higashi, Shorewood; James O. Holmen, Minnetonka; Steven D. James, Edina; Robert G. Johnson, Minnetonka, and Jeffrey A. Ridley, Burnsville, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Dec. 7, 1987, Ser. No. 129,204
Int. Cl.[4] H01L *29/84, 29/96*
U.S. Cl. 357—26 7 Claims

1. An intermediate structure formed in the fabrication process of a thin film microsensor for airflow comprising:
a single crystal (100) silicon wafer having a (100) planar surface and having a <110> direction lying in said (100) planar surface;
a sacrifical thin film layer of aluminum on said (100) planar surface, said aluminum having a thickness of about 400 angstroms, said aluminum being delineated in a rectangular shape having edges one of said edges of the aluminum rectangle being oriented substantially orthogonally to the <110> direction;
a thin film layer of silicon nitride on the aluminum and the remainder of the silicon surface;
a thin film resistive heater element on said silicon nitride layer and centered over said aluminum layer;
first and second thin film resistive flow detector elements on

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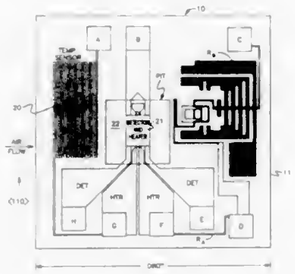
said silicon nitride layer, one one each side of said heater element, said detector elements being located over said aluminum layer;

another thin film layer of silicon nitride over said heater and detector elements and the earlier mentioned silicon nitride layer;



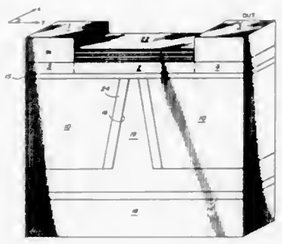
a plurality of narrow slots formed through said silicon nitride to said aluminum, said slots being positioned to be near but spaced from the edges of the aluminum and also positioned away from said heater element.

4,914,743

YOKED ORTHOGONALLY DISTRIBUTED EQUAL REACTANCE NON-COPLANAR TRAVELING WAVE AMPLIFIER

Max N. Yoder, Falls Church, Va., and Michael A. Morgan, Pacific Groves, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 27, 1987, Ser. No. 95,487
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—41 7 Claims



1. An FET device comprising:

one or more FET stages formed in a single monolith, each stage of said one or more stages comprising a source, a drain, a gate and a channel;

said source and said gate of each said stage constituting the input portion of said each stage;

said drain and said gate of said each stage constituting the output portion of said each stage;

said input portion and said output portion of each said stage having mirror image geometry with respect to one another;

said monolith comprising a first layer of semiconductor and a second layer heteroepitaxial with said first layer;

said first layer comprising said channel of said each stage;

said second layer being disposed in said monolith between said first layer and said gate of said each stage;

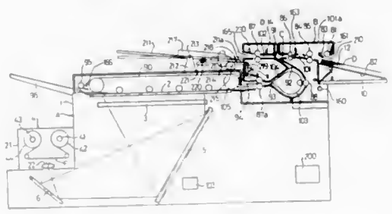
said mirror image geometry, and said stages being formed in said single monolith, being effective to substantially impedence match said input and said output portions, whereby said impedence match is effective to preclude phase cancellation between said input and said output portions.

4,914,744

MICROFILMING APPARATUS

Wataru Hamakawa, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 30, 1987, Ser. No. 126,910
Claims priority, application Japan, Nov. 29, 1983, 58-284498; Nov. 29, 1986, 61-284496; Nov. 29, 1986, 61-284497; Nov. 29, 1986, 61-284495; Nov. 29, 1986, 61-284499; Nov. 29, 1986, 61-284500; Apr. 17, 1987, 62-95799; Apr. 17, 1987, 62-95800
Int. Cl.[4] G03B *27/32, 27/52*
U.S. Cl. 355—57 9 Claims



1. A microfilm camera for automatically photographing images of document sheets one by one, which comprises:

a document tray for receiving a stack of document sheets to be photographed onto a film;

feeding means for feeding one document sheet after another of the documents sheets from said document tray onto an exposure position;

photographing means for photographing an image of the document sheet in the exposure position onto a film;

instructing means for issuing a start photographing instruction instructing said photographing means to start photographing upon the document sheet reaching the exposure position;

detecting means for detecting a size of the document sheet to be photographed by the photographing means;

varying means for varying a size of an exposure area of the photographing means in accordance with the size of the document sheet detected by said detecting means;

control means for controlling said photographing means to start a photographing operation of the photographing means in response to a start photographing instruction issued by said instructing means; and

means for preventing a photographing operation of the photographing means while said varying means is varying the exposure area of the photographing means even when the instructing means issues the start photographing instruction.

4,914,745

METHOD OF CORRECTING IMAGE ERRORS

Herbert Strehl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

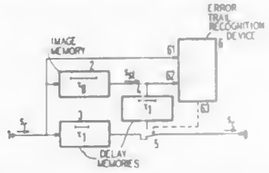
Continuation of Ser. No. 820,783, Jan. 22, 1986, abandoned. This application Jul. 12, 1988, Ser. No. 218,582
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1985, 3502317
Int. Cl.[4] H04N *5/21*
U.S. Cl. 358—166 13 Claims

1. A method of correcting image errors in a transmission of difference pulse code modulated image signal values comprising a television picture, said method comprising the steps of:

at a receiver, receiving said difference pulse code modulated image signal values, reconstructing regained image signal values from the received difference pulse code modulated image signal values, said regained image signal values including adulterated image signal values caused by adulteration of some of said difference pulse code modulated image signal values during transmission, and storing the regained image signal values of at least a half image;

recognizing error trails in at least said half image of stored regained image signal values, said error trails consisting of adulterated image signal values; and

replacing said adulterated image signal values in said error trail with other stored reconstructed image signal values.

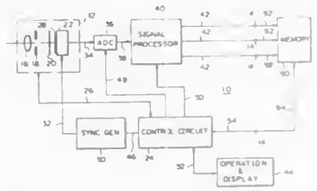


4,914,746

ELECTRONIC DIGITAL STILL CAMERA FOR SEPARATELY STORING COMPONENT VIDEO SIGNALS IN MEMORY

Seiki Nishi, and Mikio Watanabe, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 29, 1988, Ser. No. 188,403
Claims priority, application Japan, May 1, 1987, 62-106239
Int. Cl.[4] H04N *3/14, 5/76*
U.S. Cl. 358—334 11 Claims



1. A digital electronic still camera device to which a semiconductor memory module adapted to store digital data therein is detachably connected, comprising:

connecting means for detachably and electrically connecting said semiconductor memory module to said camera;

imaging means including a color imaging device having a color filter for imaging a scene through the color filter and producing video signals representative of a scene in the form of image signals associated with filter segments of the color filter;

signal processing means for converting the video signals produced by said imaging means into color component signals and delivering the color component signals to said connecting means in the form of digital signals; and

control means for controlling said imaging means to image the scene, and for controlling said signal processing means to convert the resultant video signals into the color components signals;

said signal processing means comprising color separator means for receiving the video signals produced from said imaging means and for separating the video signals into the color component signals associated with the video signals, producing the color component signals in parallel to each other;

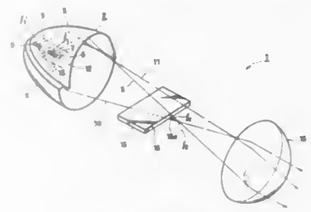
said control means supplying to said connector means, control signals allowing the color component signals to be stored in said semiconductor memory module independently of each other.

4,914,747

VEHICULAR HEADLAMP

Naoki Niwa, Shizuoka, Japan, assignor to Koito Seisakusho Co, Ltd., Japan

Filed Jun. 27, 1989, Ser. No. 371,765
Claims priority, application Japan, Jun. 28, 1988, 63-160406
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 362—61 16 Claims



1. A vehicular headlamp comprising:

a concave light reflector which includes upper and lower reflector parts, each part constituting a part of an ellipsoidal light reflecting surface and having first and second focuses, said upper and lower reflector parts having a common optical axis and having the second focuses located at a common point, the first focus of said upper reflector part being in front of that of said lower reflector part;

a first light source positioned at the first focus of said upper reflector part;

a second light source positioned at the first focus of said lower reflector part;

a shade plate positioned in front of said first and second light sources, said shade plate being arranged flat with respect to said optical axis and arranged in parallel with said optical axis having a front edge thereof positioned just behind said second focus;

a converging lens arranged in front of said shade plate, said lens having its focus located at said front edge of said shade plate.

4,914,748

IN COMBINATION, A NOVELTY FLASHLIGHT AND PIECE OF CANDY FOR ILLUMINATION

William K. Schlotter, IV, 175 Tobaca Rd., Stafford, Va. 22554, and Thomas J. Coleman, 89 Winding Way Rd., Bristol, Va. 24201

Filed Aug. 30, 1988, Ser. No. 238,106
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—109 20 Claims

1. A novelty flashlight which comprises;

a housing,

an electrical source in said housing,

a light bulb in and near an open end in said housing,

an electrical circuitry including said electrical source for operating said light bulb,

a switch means in said electrical circuitry for controlling current to said bulb,

a connector on an open end of said housing juxtaposed said bulb, and

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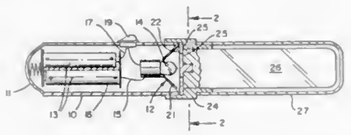
a light conducting piece of candy secured to said housing by said connector whereby light from said light bulb may be



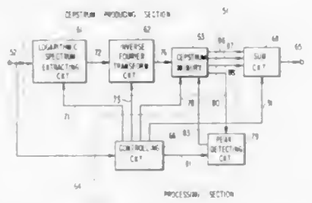
conducted into said piece of candy by operation of said switch means.

4,914,749

METHOD CAPABLE OF EXTRACTING A VALUE OF A SPECTRAL ENVELOPE PARAMETER WITH A REDUCED AMOUNT OF OPERATIONS AND A DEVICE THEREFOR

Yukio Mitome, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 29, 1984, Ser. No. 665,852
Claims priority, application Japan, Oct. 27, 1983, 58-201387
Int. Cl.[4] G10L *7/02*
U.S. Cl. 381—41 **5 Claims**



5. A device for use in extracting a value of an envelope parameter specifying a logarithmic frequency spectrum which is related to an input signal, said logarithmic frequency spectrum being variable and comprising a first frequency component which is variable in frequency and having an approximate envelope of said logarithmic frequency spectrum and a second frequency component which includes a preselected frequency superposed on said first variable frequency component and which varies said approximate envelope determined by said first variable frequency component, said device comprising:

cepstrum producing means, responsive to said input signal, for producing a cepstrum signal representative of a cepstrum which has a first and a second quefrency component corresponding to said first and said second variable frequency components, respectively, said first and said second quefrency components having a first peak at a predetermined quefrency and a second peak at an additional quefrency remote from said first peak by a quefrency distance determined by said preselected frequency, respectively; and

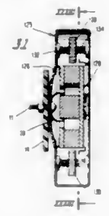
processing means, coupled to said cepstrum producing means, for processing said cepstrum signal, including means for shifting said second quefrency component in quefrency toward said first quefrency component so as to make said first peak coincide with said second peak and thereafter to calculate a sum of the first and the second quefrency components having the first and the second peaks coincident with each other, said processing means thereby specifying said value of said envelope parameter by said sum of said first and said second quefrency components.

4,914,750

SOUND TRANSDUCER

William C. Lawson, Prescott, Ariz., assignor to AVM Hess, Inc., Phoenix, Ariz.

Filed Jul. 13, 1987, Ser. No. 73,755
Int. Cl.[4] H04R *1/02, 7/00, 9/06*
U.S. Cl. 381—152 **48 Claims**



1. A sound transducer for converting electrical signals into mechanical motion, said transducer comprising:

(a) a transducer housing including a diaphragm section having an inner dished surface portion and an outer apex surface portion with an apex region,

(b) stem means projecting outwardly from the apex surface portion and having a structural configuration effective to penetrate a panel means,

(c) securing means adapted to cooperate with the stem means for fixing a panel means between the apex region of the surface portion and the securing means,

(d) whereby when a combination formed by the transducer housing fixed against a panel means, said combination defines a 360 degree acoustical horn with the panel means constituting one wall of the horn, and

(e) resilient mounting means secures an electromagnetic driver assembly to the inner, dished surface portion of the diaphragm section,

(f) the electromagnetic driver assembly includes a cylindrical ring magnet having a circular disk, rear pole member on a rear side facing in a direction away from the diaphragm section, a circular disk, front pole member on a front side facing the diaphragm section and a cylindrical bore member having an outer surface and extending through the ring magnet between the front and rear sides,

(g) an annular magnetic gap is located between one of the disk pole members and the outer surface of the cylindrical bore member, and

(h) the voice coil means including a coil member having a cylindrical voice coil portion at one end thereof disposed in the magnetic gap and the other end thereof connected to the stem means.

4,914,751

BIPOLAR DIESEL ENGINE GLOW PLUG HAVING A U-SHAPED CERAMIC HEATER

Mitsuke Masaka; Koji Hatasaka; Kenzi Maruta, and Hirohisa Suwabe, all of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd. and Hitachi Metals, Ltd., both of Tokyo, Japan

Continuation of Ser. No. 24,058, Mar. 10, 1987, abandoned. This application Apr. 22, 1988, Ser. No. 186,699
Claims priority, application Japan, Mar. 11, 1986, 61-35063[U]
Int. Cl.[4] F23Q *7/22;* **F02P** *19/02;* **H05B** *3/00*
U.S. Cl. 219—270 **3 Claims**

1. A glow plug for a diesel engine, comprising an elongated hollow metallic holder,

a ceramic heater having a U-shape as a whole and supported in said hollow holder by the legs of said U-shaped heater, with the U-shaped heating portion thereof projecting outwardly from one end of said hollow holder,

a pair of external electrical connecting terminals arranged coaxially and extending into the other end of said holder,

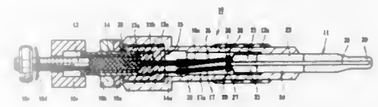
means for electrically connecting the free ends of the legs of said ceramic heater provided in said hollow holder and said external connecting terminals, respectively,

insulating member means supporting said external connecting terminals in an electrically insulated condition with respect to said hollow holder and with respect to each other,

said ceramic heater including a pair of lead portions being of a resistive ceramic material forming said legs and extending backward from both the ends of said U-shaped heating portion, parallel to each other, and extending into said one end of said hollow holder, said U-shaped heating portion being integral with said pair of lead portions and having a thickness smaller than that of said lead portions,

an electrically insulating sheet provided at least to a portion between said pair of lead portions and corresponding to the distal end of said holder and made of a material having substantially the same thermal expansion coefficient as that of the ceramic heater, said insulating sheet being bonded to said pair of lead portions,

said electrically insulating sheet filling and sealing the gap between said lead portions for preventing combustion products from the combustion chamber from reaching the interior of the holder, and



electrically insulating means constituted by an electrically insulating coating layer formed between said lead portions and said hollow holder, said lead portions being electrically insulated by said insulating means from said hollow holder and being connected to said external connecting terminals respectively through the interior of said hollow holder and via said connecting means.

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DESIGN PATENTS

GRANTED APR. 3, 1990

ERRATA

For CLASS	See PATENT NO.
D09-377	306,933
D10-046	306,976
D12-052	307,021
D28-049	307,066

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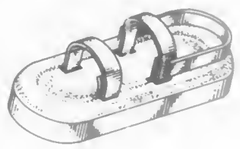
306,930
SANDAL
Robert Combs, 1403 Malborough Ave., Dallas, Tex. 75208
Filed Feb. 9, 1987, Ser. No. 12,202
Term of patent 14 years
U.S. Cl. D2—270

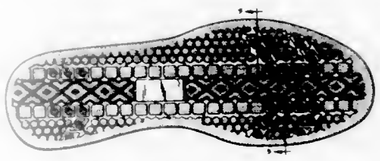


306,931
BOOT
Mark Itzkowitz, Boston, Mass., assignor to Medallion Shoe Corporation, Woburn, Mass.
Filed Feb. 4, 1987, Ser. No. 10,836
Term of patent 14 years
U.S. Cl. D2—272

306,932
LADY'S SHOE HEEL PROTECTOR
Roe A. Flanders, 9201 Eastwind Dr., Indianapolis, Ind. 46256
Filed Jul. 13, 1987, Ser. No. 72,589
Term of patent 14 years
U.S. Cl. D2—277

306,933
BOTTLE
Robert D. Holewinski, Lakeburst, N.J., assignor to Johnson & Johnson Consumer Products, Inc., New Brunswick, N.J.
Filed Mar. 10, 1986, Ser. No. 842,048
Term of patent 14 years
U.S. Cl. D9—377

306,934
SHOE SOLE
William C. Mann, Carlsbad, Calif., assignor to Items International Inc., Carlsbad, Calif.
Filed Dec. 1, 1986, Ser. No. 936,333
Term of patent 14 years
U.S. Cl. D2—320



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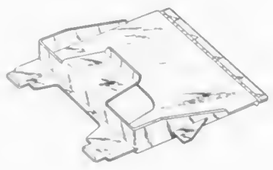
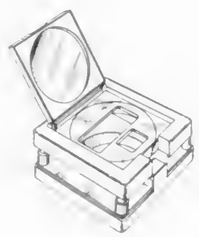
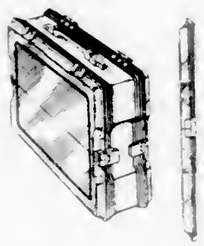
306,935
COMBINED CASSETTE HOLDER AND DIVIDER FOR A CASSETTE STORAGE TRAY
Balthasar Kirchner, and Siegfried Schleicher, both of Eferding, Austria, assignors to Ernst Stadelmann Gesellschaft MbH, Eferding, Austria
Filed Apr. 10, 1986, Ser. No. 851,385
Term of patent 14 years
U.S. Cl. D3—35



306,937
COMBINED CIGARETTE AND LIGHTER HOLDER, BEVERAGE HOLDER AND TRAY FOR AN AUTOMOBILE DASH
Marc R. Iacovelli, Miami, Fla., assignor to Rally Manufacturing, Inc., Miami, Fla.
Filed May 16, 1986, Ser. No. 864,126
The portion of the term of this patent subsequent to Jul. 19, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D3—40



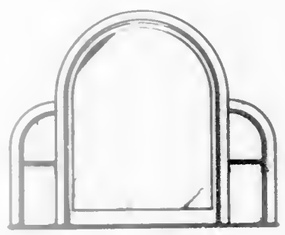
306,936
TACKLE BOX
Randolph W. McMillan, South Bend; George J. Tisten, Elkhart, both of Ind.; Robert J. Yunger; James S. Schumaker, both of Plano, Ill., and Robert E. Pierson, Sugar Grove, Ill., assignors to Plano Molding Company, Plano, Ill.
Filed Jul. 29, 1986, Ser. No. 890,273
Term of patent 14 years
U.S. Cl. D3—38



306,938
WET SUIT SIMULATING KEY CHAIN
V. Parker Overton, 111 Red Banks Rd., P.O. Box 8228, Greenville, N.C. 27834
Filed Nov. 5, 1987, Ser. No. 117,133
Term of patent 14 years
U.S. Cl. D3—65

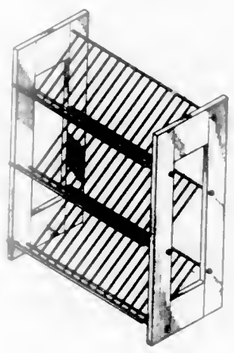
306,939
CHAIR
William E. Fink, Perrysburg, Ohio, assignor to MH Manufacturing, Toledo, Ohio
Filed May 13, 1985, Ser. No. 733,308
Term of patent 14 years
U.S. Cl. D6—366

306,941
HUTCH MIRROR
Jericho P. Paner, Onalaska, and Jane Proeschinske, Arcadia, both of Wis., assignors to Ashley Furniture Industries, Inc., Arcadia, Wis.
Filed Dec. 30, 1987, Ser. No. 139,426
Term of patent 14 years
U.S. Cl. D6—441



306,940
COMBINED FOLDABLE EASEL AND STORAGE CASE
Lynn Lambert, 3315 Ross Pl., NW., Washington, D.C. 20008
Filed Sep. 2, 1987, Ser. No. 92,331
Term of patent 14 years
U.S. Cl. D6—397

306,942
BOTTLE RACK OR SIMILAR ARTICLE
Bruce D. Patke, 19010 White Candle, Spring, Tex. 77388
Filed Feb. 14, 1989, Ser. No. 311,181
Term of patent 14 years
U.S. Cl. D6—463



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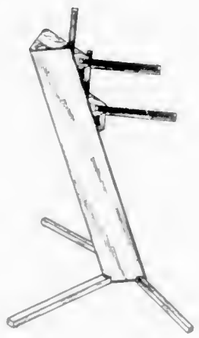
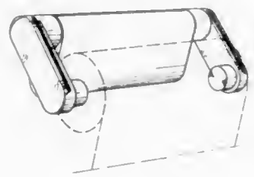
306,943
KEYBOARD STAND
Thurman F. Hodge, Chicago, Ill.; Jon L. Lindskog, and Darrell A. Schoenig, both of Fort Collins, Colo., assignors to Ultimate Support Systems, Inc., Fort Collins, Colo.
Filed Jun. 22, 1987, Ser. No. 65,492
Term of patent 14 years
U.S. Cl. D6—464



306,944
SHOWER SHELF
Aramando Urena, 10630 Shellyfield Rd., Downey, Calif. 90241
Filed Oct. 8, 1987, Ser. No. 106,311
Term of patent 14 years
U.S. Cl. D6—513

306,945
SUPPORT FOR ROLLS OF PAPER
Francesco C. Lacchini, Turin, Italy, assignor to Carrara & Matta S.p.A., Turin, Italy
Filed Aug. 3, 1987, Ser. No. 81,373
Term of patent 14 years
U.S. Cl. D6—518



306,946
DISPENSER FOR TOILET TISSUE ROLLS OR THE LIKE
Louis A. Merdic, 1110 Wilshire Dr., Youngstown, Ohio 44511
Filed Jun. 22, 1988, Ser. No. 210,306
Term of patent 14 years
U.S. Cl. D6—520

306,947
CONTAINER FOR A RESUSCITATION MASK
Robert M. Sanfilippo, 3424 Alice St., Los Angeles, Calif. 90065
Filed Dec. 29, 1987, Ser. No. 139,039
Term of patent 14 years
U.S. Cl. D6—559

306,948
BODY PILLOW
Chester L. Zollinger, 175 E. 200 North, Providence, Utah 84332
Filed Nov. 17, 1987, Ser. No. 121,771
Term of patent 14 years
U.S. Cl. D6—601

306,949
CHILD'S DINNER PLATE
Paul E. Gebhardt, Oneida, N.Y., assignor to Oneida, Ltd., Oneida, N.Y.
Filed Sep. 21, 1987, Ser. No. 98,910
Term of patent 14 years
U.S. Cl. D7—541

306,950
TUMBLER OR SIMILAR ARTICLE
Jean-Pierre Foucher, La Chapelle Saint-Mesmin, France, assignor to Verreries De Saint-Gobain, La Chapelle Saint-Mesmin, France
Filed Jun. 5, 1987, Ser. No. 970
Claims priority, application France, Jul. 8, 1986, 863660
Term of patent 14 years
U.S. Cl. D7—530

306,951
COMBINED FUNNEL AND ADAPTOR
Paul Brändström, and Runo Nord, both of Söderhamn, Sweden, assignors to Söderhamn Innovation AB, Söderhamn, Sweden
Filed Dec. 16, 1987, Ser. No. 133,873
Claims priority, application Sweden, Jun. 16, 1987, 87-1399
Term of patent 14 years
U.S. Cl. D7—590

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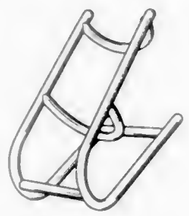
306,952
MICROWAVE BABY BOTTLE HOLDER
Rodney L. Goeman, P.O. Box 149, Madison, S. Dak. 57042
Filed Apr. 16, 1987, Ser. No. 38,912
Term of patent 14 years
U.S. Cl. D7—619

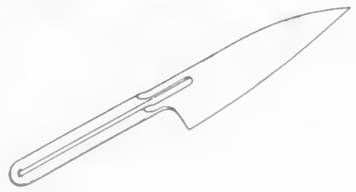


306,953
VACUUM BOTTLE
Yukiko Kase, Shoji Toida, and Hidetoshi Ohta, all of Niigata, Japan, assignors to Japan Oxygen Co., Ltd., Tokyo, Japan
Filed Oct. 9, 1987, Ser. No. 106,885
Claims priority, application Japan, Apr. 14, 1987, 62-14538
Term of patent 14 years
U.S. Cl. D7—608

306,954
CHRISTMAS STOCKING COOKIE CONTAINER
Steven Wasserman, Baltimore, Md., assignor to Artform Industries, Baltimore, Md.
Filed May 18, 1987, Ser. No. 50,383
Term of patent 14 years
U.S. Cl. D7—613

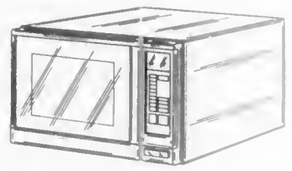
306,955
TONGS
Anil Mehta, Glendale, and Gary L. Friederichs, Wauwatosa, both of Wis., assignors to The Vollrath Company, Inc., Sheboygan, Wis.
Filed Aug. 13, 1987, Ser. No. 85,603
Term of patent 14 years
U.S. Cl. D7—683

306,956
KNIFE
Kazuo Kawasaki, Fukui, Japan, assignor to Ex-Design Corporation, Fukui, Japan
Filed Sep. 23, 1987, Ser. No. 99,990
Term of patent 14 years
U.S. Cl. D7—649

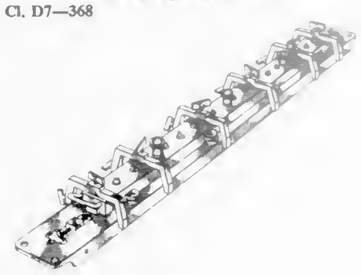


306,957
ADJUSTABLE CARVING KNIFE
Milton L. Cohen, Hewlett Bay Park, and Jeff Siegel, Great Neck, both of N.Y., assignors to Lifetime Cutlery Corporation, Brooklyn, N.Y.
Filed May 1, 1987, Ser. No. 44,976
Term of patent 14 years
U.S. Cl. D7—650

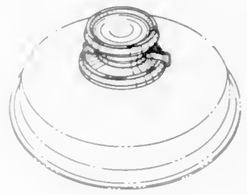
306,958
MICROWAVE OVEN
Hiromiti Yamada; Junichi Sakamoto, and Hiroshi Nishibori, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jul. 27, 1987, Ser. No. 78,480
Claims priority, application Japan, Feb. 6, 1987, 62-4520
The portion of the term of this patent subsequent to Jan. 23, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—351



306,959
DISCHARGE MANIFOLD FOR CHEESE CASTING MACHINE
Gerald J. Driessen, Little Chute, Wis., assignor to Hart Design & Mfg., Inc., Green Bay, Wis.
Filed Aug. 3, 1987, Ser. No. 80,698
Term of patent 14 years
U.S. Cl. D7—368

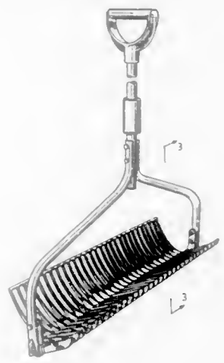


306,960
COOKWARE KNOB
Dennis Dricken, and Dan E. Gremonprez, both of West Bend, Wis., assignors to Dart Industries, Inc., Deerfield, Ill.
Filed Mar. 3, 1987, Ser. No. 21,064
Term of patent 14 years
U.S. Cl. D7—393



306,961
HERBICIDE DISPENSING ARM
Ronald E. A. Emms, West Beach, Australia, assignor to Manutec Pty. Ltd., Australia
Filed Oct. 19, 1987, Ser. No. 109,855
Term of patent 14 years
U.S. Cl. D8—2

306,962
RAKE
Otto H. Schuele, P.O. Box 36, Horseshoe Valley, R.R. #1, Barrie, Ontario, Canada L4M 4Y8
Filed Jan. 13, 1988, Ser. No. 143,602
Claims priority, application Canada, Sep. 10, 1987, 10-09-87-8
Term of patent 14 years
U.S. Cl. D8—13



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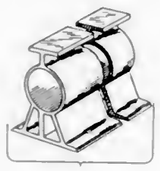
306,963
CONCRETE FINISHING SCREED BAR
Donald R. Morrison, 6228 Eagle Peak Dr., Charlotte, N.C. 28214
Filed Jan. 16, 1987, Ser. No. 3,913
Term of patent 14 years
U.S. Cl. D8—45



306,964
SLOTTED HANG BRACKET
Derek J. Zupancic, 7136 Owensmouth Ave., Canoga Park, Calif. 91303
Filed May 5, 1986, Ser. No. 859,775
Term of patent 14 years
U.S. Cl. D8—354

306,965
DISPENSER FOR SOAP, LOTIONS, OR CONDIMENTS
Mark Jaworski, 35 Oak St., Cambridge, Ont., Canada N1R 4K8
Filed Sep. 4, 1987, Ser. No. 93,392
Term of patent 14 years
U.S. Cl. D9—300

306,966
CONTAINER FOR CONFECTIONARY PRODUCTS
Pietro Ferrero, Brussels, Belgium, assignor to Ferrero S.p.A., Italy
Filed Nov. 14, 1986, Ser. No. 930,441
Claims priority, application Italy, May 16, 1986, 53419/86[U]
Term of patent 14 years
U.S. Cl. D9—317

306,967
BOTTLE
Masaru Matsuura, Kawanishi, and Masatsugu Fujii, Sakai, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan
Filed Dec. 2, 1987, Ser. No. 127,691
Claims priority, application Japan, Jun. 2, 1987, 62-22681
Term of patent 14 years
U.S. Cl. D9—351

306,968
BOTTLE
Graham J. Blair, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Apr. 15, 1987, Ser. No. 38,797
Claims priority, application United Kingdom, Oct. 16, 1986, 1037426
Term of patent 14 years
U.S. Cl. D9—376

306,969
BOTTLE
Alfred C. Alberghini, Dunwoody, and Stephen R. Lynn, Douglasville, both of Ga., assignors to Sewell Plastics, Inc., Atlanta, Ga.
Filed Aug. 19, 1987, Ser. No. 87,243
Term of patent 14 years
U.S. Cl. D9—378

306,970
BOTTLE
Klaus-Dieter Bauer-Secundus, Lichtentaler Strasse 90, D-7570 Baden-Baden, Fed. Rep. of Germany
Filed Feb. 12, 1987, Ser. No. 13,865
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1986, 5 MR II/77
Term of patent 14 years
U.S. Cl. D9—383

306,971
COMBINED DECANTER AND STOPER THEREFOR
Michel Ducourt, Cognac, France, assignor to Compagnie Viticole des Grands Armagnacs, Labastide d'Armagnac, France
Filed Jun. 15, 1987, Ser. No. 61,381
Term of patent 14 years
U.S. Cl. D9—384

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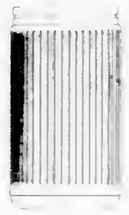
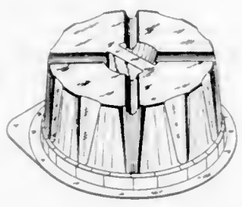
306,972
VERTICAL PANELED WALL FOR A CONTAINER
Thomas E. Moloney, Wheaton; Michael M. Shulski, Northfield; Nelson N. Chernikoff, Richton Park; Edward K. Cassidy, Palatine; Edward S. Traczyk, Lockport, and John M. Mann, Downers Grove, all of Ill., assignors to American National Can Company, Chicago, Ill.
Division of Ser. No. 594,610, Mar. 28, 1984, which is a continuation-in-part of Ser. No. 523,514, Aug. 15, 1983, Pat. No. Des. 283,011. This application Dec. 22, 1986, Ser. No. 945,314
Term of patent 14 years
U.S. Cl. D9—398



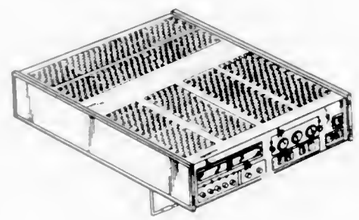
306,973
JEWELRY BOX
Myril Kaplan, 125 E. 144th St., Bronx, N.Y. 10451
Filed Apr. 3, 1986, Ser. No. 847,822
Term of patent 14 years
U.S. Cl. D9—423

306,974
CONTAINER WITH CLOSURE
Lars M. H. Tholstrup, Vedbaek, Denmark, assignor to Tholstrups Osteriers Salgsafdeling I/S, Copenhagen, Denmark
Filed Nov. 25, 1987, Ser. No. 125,061
Claims priority, application Denmark, Jun. 1, 1987, MA601/87
Term of patent 14 years
U.S. Cl. D9—424



306,975
FRENCH FRY HOLDER
James R. Brondyke, Finksburg, and Paul J. Dupont, Baltimore, both of Md., assignors to Sweetheart Cup Company Inc., Chicago, Ill.
Filed Aug. 14, 1986, Ser. No. 896,220
Term of patent 14 years
U.S. Cl. D9—431

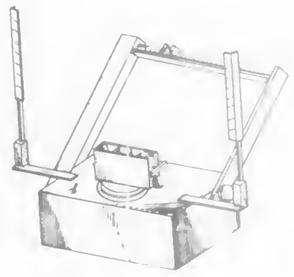
306,976
ELECTRIC OCULOGRAPHIC TESTING INSTRUMENT
Pavel A. Semenov, 10-1-38 Chernomorsky bul; Svyatoslav N. Fedorov, ul.Bestuzhevykh, 4-154; Emilia M. Mironova, ul.Bestuzhevykh, 4-154, and Eleonora V. Egorova, ul.Knusinena, 15-41, all of Moscow, U.S.S.R.
Filed Aug. 12, 1986, Ser. No. 895,746
Term of patent 14 years
U.S. Cl. D10—46



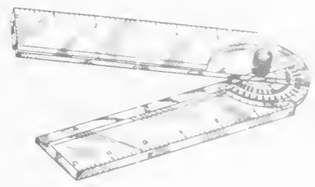
306,977
BOTTLE
Theodore V. Waterman, Milford, N.H., assignor to Pearson & Pearson, Lowell, Mass.
Filed Sep. 24, 1986, Ser. No. 911,312
Term of patent 14 years
U.S. Cl. D9—403

306,978
BOTTLE CAP WITH DIRECTIONAL DISPENSER
John M. Paulovich, Hewitt, N.J., assignor to Airwick Industries, Inc., Carlstadt, N.J.
Filed Jul. 13, 1987, Ser. No. 73,205
Term of patent 14 years
U.S. Cl. D9—447

306,979
GOLF CALIBRATION MACHINE
Viktor Cukon, 1902 Golden Circle Dr., Escondido, Calif. 92026
Filed Aug. 7, 1986, Ser. No. 894,037
Term of patent 14 years
U.S. Cl. D10—46



306,980
ANGLE MEASURING DEVICE
Morrie Pivovaroff, 15330 W. Olive Ave., Kerman, Calif. 93630
Filed Oct. 6, 1986, Ser. No. 915,614
Term of patent 14 years
U.S. Cl. D10—65



306,981
WRISTWATCH BRACELET
Marco Bettelini, Bienne, Switzerland, assignor to Swatch AG (Swatch SA), Bienne, Switzerland
Filed May 5, 1986, Ser. No. 859,738
Claims priority, application World Int. Prop. O., Nov. 4, 1985, DM/006 057
Term of patent 14 years
U.S. Cl. D11—3

306,982
NECKLACE
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Dec. 14, 1987, Ser. No. 132,116
Claims priority, application Italy, Jun. 22, 1987, 35871/87[U]
Term of patent 14 years
U.S. Cl. D11—18

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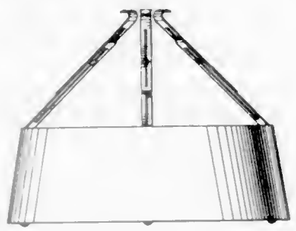
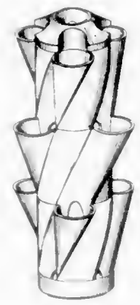
306,983
NECKLACE
Paolo Bulgari, Rome, Italy, assignor to Participazioni Bulgari S.p.A., Rome, Italy
Filed Apr. 30, 1987, Ser. No. 44,123
Claims priority, application Italy, Oct. 31, 1986, 36213/86[U]
Term of patent 14 years
U.S. Cl. D11—12

306,984
TREE STAND
Barbara E. Pany, Rte. 12, Box 265, Asheboro, N.C. 27203
Filed Jun. 22, 1988, Ser. No. 209,796
Term of patent 14 years
U.S. Cl. D11—130.1



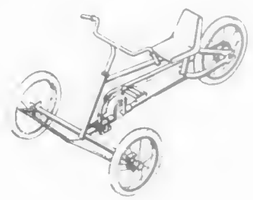
306,985
PLANT CONTAINER UNIT
Stanley I. Mason, Jr., 61 River Rd., Weston, Conn. 06883
Filed Feb. 5, 1987, Ser. No. 11,159
Term of patent 14 years
U.S. Cl. D11—143



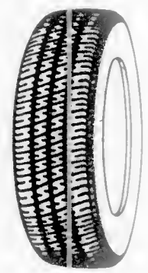
306,986
NOVELTY TROPHY
Randy Haddad, 401-C, N. Tustin Ave., Anaheim, Calif. 92807
Filed May 14, 1987, Ser. No. 49,463
Term of patent 14 years
U.S. Cl. D11—160

306,987
ZIPPER LOCKING CLIP
Jesse E. Dockery, 8053 Braile, Detroit, Mich. 48228
Filed Sep. 14, 1987, Ser. No. 96,324
Term of patent 14 years
U.S. Cl. D11—221

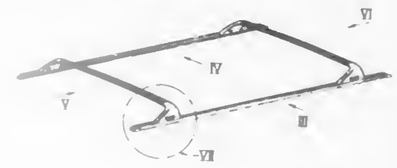
306,988
TRICYCLE
Darold B. Cummings, 5320 W. 124th Pl., Hawthorne, Calif. 90250
Filed Mar. 18, 1988, Ser. No. 169,759
Term of patent 14 years
U.S. Cl. D12—112



306,989
TIRE
Patrick Demaret, Ettelbruck; Leo J. Hitzky, Walferdange, and Bernard Jonette, Luxembourg, all of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Oct. 24, 1985, Ser. No. 791,028
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1985, URA 715/85
Term of patent 14 years
U.S. Cl. D12—147

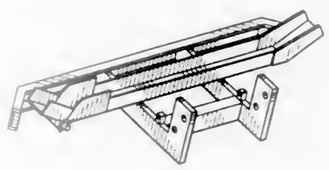


306,990
VEHICLE LUGGAGE CARRIER
John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236
Filed Mar. 19, 1987, Ser. No. 27,814
Term of patent 14 years
U.S. Cl. D12—157



306,991
MOUNTABLE AUTOMOBILE TRUNK
Richard D. Trezise, San Jose, Calif., assignor to Prolaunch, Inc., Fremont, Calif.
Filed Jul. 14, 1987, Ser. No. 73,212
Term of patent 14 years
U.S. Cl. D12—157

306,992
BIKE CARRIER
Thomas O. Morehouse, 3828 NE. 45th, Redmond, Oreg. 97756
Filed Dec. 18, 1987, Ser. No. 134,917
Term of patent 14 years
U.S. Cl. D12—158



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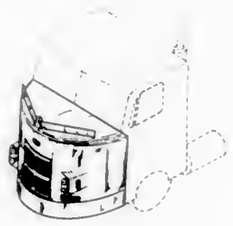
306,993
WIND FAIRING
Clyde Nitzke, 730 Robert, Pey Sippi, Wis. 54967
Filed Dec. 28, 1987, Ser. No. 139,035
Term of patent 14 years
U.S. Cl. D12—181

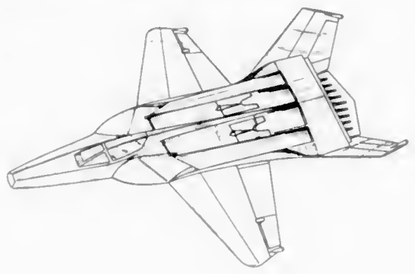


306,994
EQUIPMENT TRAILER
Keith Edwards, Jonesboro, Ga., assignor to Custom Trailer, Inc., Griffin, Ga.
Filed Feb. 5, 1987, Ser. No. 11,233
Term of patent 14 years
U.S. Cl. D12—101

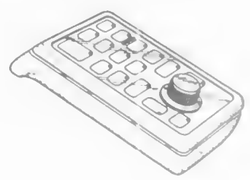
306,995
WHEEL COVER
William Reed, Jr., Star Rte.-Box 15-B, Weogufka, Ala. 35183
Filed May 11, 1987, Ser. No. 47,995
Term of patent 14 years
U.S. Cl. D12—202

306,996
OAR LOCK
Blayney J. Scott, 21 Erie Street, Victoria, British Columbia, Canada (V8V 1P8)
Filed Sep. 22, 1986, Ser. No. 910,778
Term of patent 14 years
U.S. Cl. D12—215

306,997
AIRPLANE
John J. Andrews, San Diego, Calif., assignor to The Testor Corporation, San Diego, Calif.
Filed Aug. 3, 1987, Ser. No. 80,692
Term of patent 14 years
U.S. Cl. D12—331

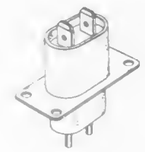


306,998
MOTOR CONTROL PENDANT
S. Stanley Mintz, Monrovia; Tsu-Hsun Ku, Rosemead, both of Calif., and Edward T. Liljenwall, Everett, Wash., assignors to Servo Products Company, Pasadena, Calif.
Filed Dec. 12, 1988, Ser. No. 283,753
Term of patent 14 years
U.S. Cl. D13—12

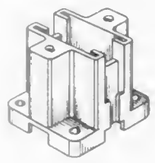


306,999
MARKED RETRACTILE TELEPHONE CORD
Douglas S. Moore, Phoenix; Theodore M. Trujillo, Glendale, and Charles L. Woods, Phoenix, all of Ariz., assignors to American Telephone and Telegraph Company, AT&T Technologies, Inc., Berkeley Heights, N.J.
Filed Feb. 24, 1987, Ser. No. 18,128
Term of patent 14 years
U.S. Cl. D13—13

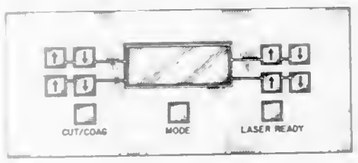
307,000
THROUGH-TYPE CAPACITOR
Setsuo Sasaki; Teruo Taguchi, and Yasutaka Oyamada, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan
Filed Jul. 2, 1986, Ser. No. 881,252
Claims priority, application Japan, Mar. 25, 1986, 61-11067; Mar. 25, 1986, 61-11068; Mar. 25, 1986, 61-11069
Term of patent 14 years
U.S. Cl. D13—125



307,001
FLUORESCENT LAMP HOLDER
Robert J. Zaklie, Madison, Conn., assignor to Tower Manufacturing Corporation, Providence, R.I.
Filed Dec. 23, 1986, Ser. No. 947,766
Term of patent 14 years
U.S. Cl. D13—134



307,002
INSTRUMENT PANEL FOR A LASER CONTROL CONSOLE
Richard M. Thomas, Norwood; Igino Lombardo, Sharon; Stanley P. Mickewicz, Wrentham, and Alan Coombes, Hingham, all of Mass., assignors to I. L. Med, Inc., Walpole, Mass.
Filed Apr. 11, 1988, Ser. No. 180,853
Term of patent 14 years
U.S. Cl. D13—164



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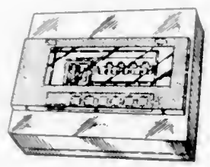
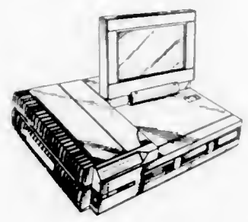
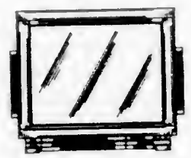
307,003
LOADCENTER
Anthony R. Cole, Swindon, United Kingdom, assignor to Square D Company, Palatine, Ill.
Filed Jun. 22, 1988, Ser. No. 209,804
Claims priority, application United Kingdom, Dec. 22, 1987, 1047306
Term of patent 14 years
U.S. Cl. D13—160

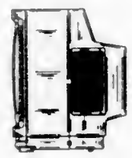


307,004
PORTABLE COMPUTER
Farad Azima, Huntingdon, England, assignor to Mission International Limited, Cambridge, England
Filed May 20, 1988, Ser. No. 196,461
Claims priority, application United Kingdom, Apr. 22, 1988, 1050185
Term of patent 14 years
U.S. Cl. D14—106

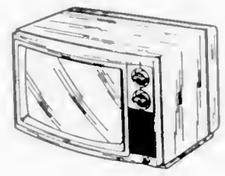


307,005
TELEVISION SET
Kouji Satake; Yasuo Matsdaira, and Tohru Ohtani, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jul. 6, 1987, Ser. No. 69,943
Claims priority, application Japan, Jan. 8, 1987, 62-320
Term of patent 14 years
U.S. Cl. D14—126

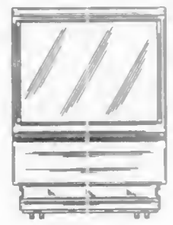


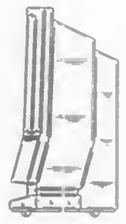


307,006
TELEVISION RECEIVER
Suk J. Lee, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Oct. 14, 1987, Ser. No. 108,972
Claims priority, application Rep. of Korea, Apr. 15, 1987, 5354/1987
Term of patent 14 years
U.S. Cl. D14—126

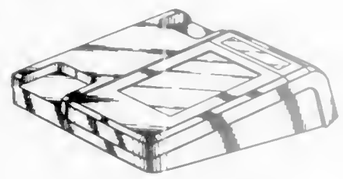


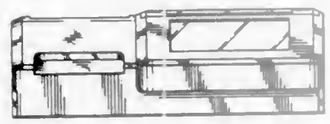
307,007
TELEVISION SET
Yoshikazu Umeno; Harumi Sakamoto, and Yoshito Fujii, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jul. 6, 1987, Ser. No. 69,940
Claims priority, application Japan, Jan. 8, 1987, 62-319
Term of patent 14 years
U.S. Cl. D14—133



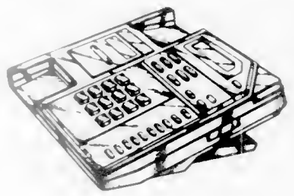


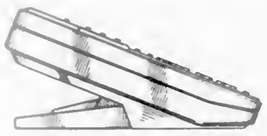
307,008
BASE FOR A TELEPHONE SET
Gad J. Shaanan, Westmount, and Jean P. Crepeau, Montreal, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Jan. 2, 1989, Ser. No. 305,359
Term of patent 14 years
U.S. Cl. D14—151



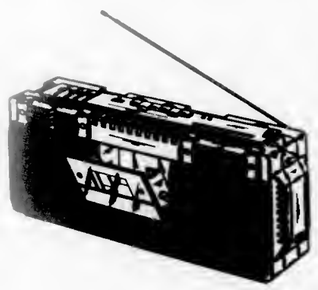


307,009
BASE FOR A TELEPHONE SET
Alan P. Boykiw, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Apr. 20, 1989, Ser. No. 341,110
Term of patent 14 years
U.S. Cl. D14—151





307,010
COMBINED TAPE RECORDER AND RADIO
Mitsutaka Fuke, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Apr. 9, 1987, Ser. No. 36,282
Claims priority, application Japan, Oct. 20, 1986, 61-41606
Term of patent 14 years
U.S. Cl. D14—163



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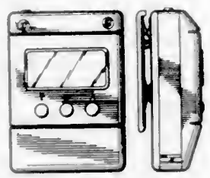
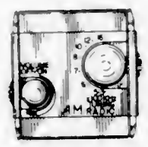
307,011
COMBINED RADIO RECEIVER AND TAPE PLAYER
Mitura Shinki, Gunma, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan
Filed May 18, 1987, Ser. No. 51,811
Claims priority, application Japan, Nov. 20, 1986, 61-45986
Term of patent 14 years
U.S. Cl. D14—163

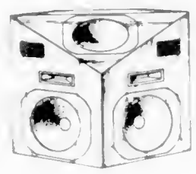
307,012
RADIO PAGER
Jan Berkhelj, Driebergen, Netherlands, assignor to Ericsson Paging Systems B.V., Emmen, Netherlands
Filed Jun. 2, 1987, Ser. No. 56,678
Claims priority, application Int'l Pat. Institute, Dec. 3, 1986, DM/007869
Term of patent 14 years
U.S. Cl. D14—191



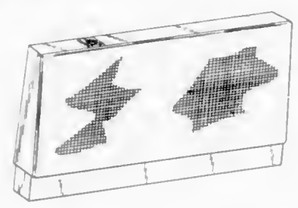
307,013
RADIO
William T. Y. Pang, Kowloon Bay, Hong Kong, assignor to Saple International Limited, Kowloon, Hong Kong
Filed Jun. 18, 1987, Ser. No. 63,522
Claims priority, application United Kingdom, Jan. 21, 1987, 1039426
Term of patent 14 years
U.S. Cl. D14—197



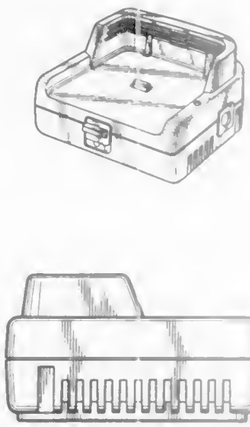
307,014
SPEAKER
Joel C. Newman, 110 Drury Rd., Shoals, Ala. 35630
Filed Jun. 10, 1987, Ser. No. 60,364
Term of patent 14 years
U.S. Cl. D14—210



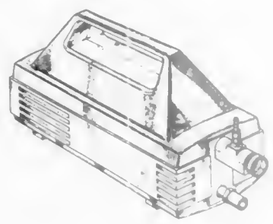
307,015
SPEAKER
Steven M. Irby, 1412 Eastern, Stillwater, Okla. 74074
Filed May 26, 1987, Ser. No. 54,472
Term of patent 14 years
U.S. Cl. D14—214



307,016
CHARGER FOR A PORTABLE RADIO TELEPHONE
Katsuhito Watanabe, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Mar. 13, 1989, Ser. No. 322,060
Claims priority, application Japan, Sep. 22, 1988, 63-37056
Term of patent 14 years
U.S. Cl. D14—240



307,017
HIGH PRESSURE WASHER
Gary C. Polk, Eden Prairie, and Leo F. Wildgen, Bloomington, both of Minn., assignors to Power Flo Products Corp., Minneapolis, Minn.
Filed Mar. 7, 1988, Ser. No. 164,720
Term of patent 14 years
U.S. Cl. D15—7



307,018
AQUARIUM PUMP CHAMBER
Heinz Turbanisch, Nuremberg, Fed. Rep. of Germany, assignor to Jet-Pumpen HT GmbH, Nuremberg, Fed. Rep. of Germany
Filed Jun. 18, 1987, Ser. No. 63,519
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1986, MR VII 324
Term of patent 14 years
U.S. Cl. D15—8

307,019
LAWN MOWER SEAT
Lars-Goran Rosenblad, Huskvarna, Sweden, assignor to Western International Incorporated, Jackson, Tenn.
Filed Dec. 30, 1988, Ser. No. 291,997
Term of patent 14 years
U.S. Cl. D15—17

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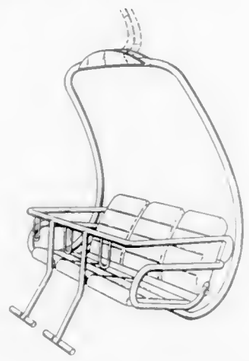
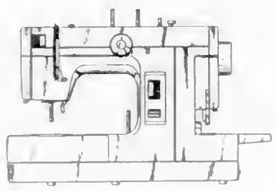
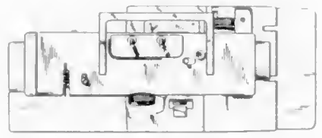
307,020
DRILL BIT
Bjorn Lyng, Vanvikan, and Hans Tronstad, Leksvik, both of Norway, assignors to Lyng Drilling Products A-S, Vanvikan, Norway
Filed Apr. 8, 1987, Ser. No. 35,722
Term of patent 14 years
U.S. Cl. D15—21

307,021
CHAIRLIFT UNIT
Konrad Bergius, Stans-Oberdorf, Switzerland, and Hans-Werner Mattis, Darmstadt, Fed. Rep. of Germany, assignors to Von Roll Transportsysteme AG, Thun, Switzerland
Filed Aug. 3, 1987, Ser. No. 80,598
Claims priority, application Switzerland, Feb. 12, 1987, 115754
Term of patent 14 years
U.S. Cl. D12—52

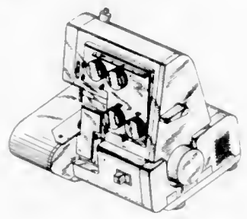


307,022
SEWING MACHINE
Yoshiaki Eguchi, Kodaira, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Sep. 2, 1986, Ser. No. 903,115
Term of patent 14 years
U.S. Cl. D15—69

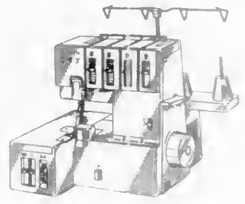




307,023
SEWING MACHINE
Yoshiaki Eguchi, Kodaira, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Jul. 14, 1986, Ser. No. 885,168
Term of patent 14 years
U.S. Cl. D15—69

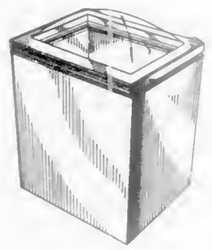


307,024
SEWING MACHINE
Kazuo Itoh, Aichi, and Yasuyo Isaji, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Dec. 28, 1987, Ser. No. 139,038
Claims priority, application Japan, May 15, 1987, 62-19304
Term of patent 14 years
U.S. Cl. D15—69



307,025
SEWING MACHINE
Nobufusa Kuroki, Machida, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Oct. 3, 1986, Ser. No. 915,316
Claims priority, application Japan, Aug. 22, 1986, 61-32472
Term of patent 14 years
U.S. Cl. D15—70

307,026
DISPLAY FREEZER
Allan H. Barish, 7 Vanwood Road, Thornhill, Ontario, Canada (L3T 2N1)
Filed Aug. 31, 1987, Ser. No. 91,210
Term of patent 14 years
U.S. Cl. D15—83



307,027
REFLECTOR FOR INFRARED RADIATION UNIT
Karl A. Hamrin, Kungsör, Sweden, assignor to Infrarodteknik AB, Vanersborg, Sweden
Filed Sep. 23, 1986, Ser. No. 910,618
Claims priority, application Norway, Mar. 25, 1986, 67152
Term of patent 14 years
U.S. Cl. D15—144.1

307,028
PULLING APPARATUS FOR STRAIGHTENING VEHICLE BODIES
Lowell K. Booker, McPherson, Kans., assignor to McPherson Manufacturing, Inc., McPherson, Kans.
Filed Sep. 14, 1987, Ser. No. 96,839
Term of patent 14 years
U.S. Cl. D15—199

307,029
SEWING MACHINE
Yoshiaki Eguchi, Kodaira, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Jul. 14, 1986, Ser. No. 885,167
Term of patent 14 years
U.S. Cl. D15—69

307,030
SEWING MACHINE
Yoshiaki Eguchi, Kodaira, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Jul. 14, 1986, Ser. No. 885,169
Term of patent 14 years
U.S. Cl. D15—69

307,031
SEWING MACHINE
Yoshiaki Eguchi, Kodaira, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Jul. 14, 1986, Ser. No. 885,170
Term of patent 14 years
U.S. Cl. D15—69

307,032
SEWING MACHINE
Yoshiaki Eguchi, Kodaira, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Jul. 14, 1986, Ser. No. 885,171
Term of patent 14 years
U.S. Cl. D15—69

307,033
SEWING MACHINE
Yoshiaki Eguchi, Kodaira, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Jul. 14, 1986, Ser. No. 885,172
Term of patent 14 years
U.S. Cl. D15—69

307,034
SEWING MACHINE
Yoshiaki Eguchi, Kodaira, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Jul. 14, 1986, Ser. No. 885,173
Term of patent 14 years
U.S. Cl. D15—69

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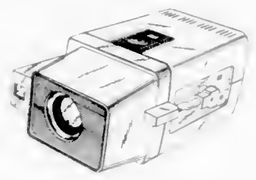
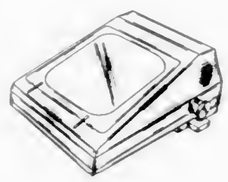
307,029
SURVEILLANCE CAMERA
Tomonori Tominaga; Toshio Aizawa, both of Kamakura, and Satoshi Shinya, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed May 20, 1987, Ser. No. 51,585
Claims priority, application Japan, Nov. 24, 1986, 46484/1986
Term of patent 14 years
U.S. Cl. D16—203



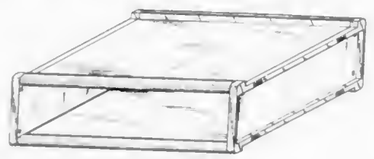
307,030
LIGHT BOX ASSEMBLY FOR AN OVERHEAD PROJECTOR
Henry Kyhl, Englewood, N.J., assignor to Buhl Industries, Fair Lawn, N.J.
Filed Apr. 10, 1987, Ser. No. 36,965
Term of patent 14 years
U.S. Cl. D16—235



307,031
ELECTRIC GUITAR
Charles H. Fisher, IV, 410 Main St., Coalport, Pa. 16627
Filed Mar. 27, 1987, Ser. No. 30,626
Term of patent 14 years
U.S. Cl. D17—14

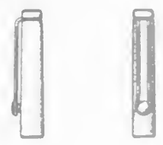
307,032
ELECTRONIC CALCULATOR WITH SOLAR CELL
Masaji Sawada, and Toshiya Takahashi, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jul. 6, 1987, Ser. No. 69,941
Claims priority, application Japan, Jan. 7, 1987, 62-192
Term of patent 14 years
U.S. Cl. D18—7

307,033
PRINTER STAND
Balthasar Kirchner, Eferding, Austria, assignor to Ernst Stadelmann Gesellschaft m.b.H., Eferding, Austria
Filed Feb. 28, 1986, Ser. No. 838,002
Claims priority, application Austria, Aug. 28, 1985, 25243
Term of patent 14 years
U.S. Cl. D18—23

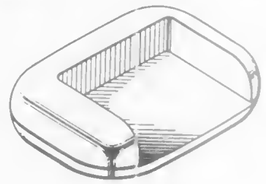


307,034
PEN
Tor Petterson, Ranchos Palos Verdes, Calif., assignor to Pentel of America, Ltd., Torrance, Calif.
Filed Dec. 11, 1986, Ser. No. 940,644
The portion of the term of this patent subsequent to Oct. 10, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D19—48

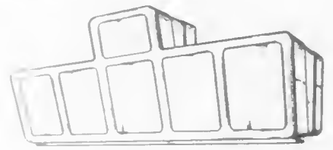
307,035
PEN CAP
Tor Petterson, Rancho Palos Verdes, Calif., assignor to Pentel of America, Ltd., Torrance, Calif.
Filed Dec. 11, 1986, Ser. No. 940,645
The portion of the term of this patent subsequent to Oct. 10, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D19—57



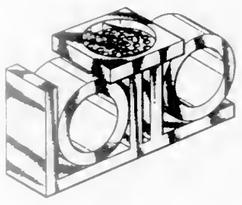
307,036
NOTE PAD HOLDER
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Aug. 26, 1985, Ser. No. 769,316
Term of patent 14 years
U.S. Cl. D19—92



307,037
ILLUMINATED SIGN
David G. Downing, Surrey, Canada, assignor to AD P.O.P., Vancouver, Canada
Filed Jul. 27, 1987, Ser. No. 78,073
Claims priority, application Canada, Jan. 27, 1987, 27-01-87-1
Term of patent 14 years
U.S. Cl. D20—10



307,038
LOTTERY NUMBER SELECTOR
William D. Rice, 1350 Limeridge Road East, Unit #52, Hamilton, Ontario, Canada L8W 1L6
Filed Jun. 30, 1987, Ser. No. 67,814
Term of patent 14 years
U.S. Cl. D21—37



307,039
TOY VEST
Wayne Molinare, Queens Village, N.Y., assignor to Superior Toy & Manufacturing Co., Inc., Chicago, Ill.
Filed Feb. 2, 1987, Ser. No. 10,233
Term of patent 14 years
U.S. Cl. D21—59

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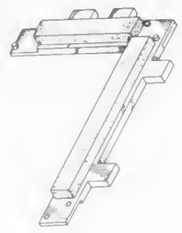
307,040
HAND HELD BASKETBALL GAME
Mahmood Helalian, 14706 Windlea, Houston, Tex. 77040
Filed Nov. 16, 1987, Ser. No. 121,590
Term of patent 14 years
U.S. Cl. D21—62

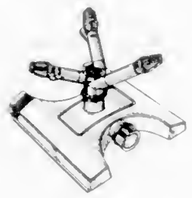
307,041
TOY DOLL
Maurizio Canavesi, Milan, Italy, assignor to Polistil Generale Giocattoli S.p.A., Milan, Italy
Filed Mar. 27, 1987, Ser. No. 30,478
Claims priority, application Italy, Jan. 22, 1987, 20582[U]
Term of patent 14 years
U.S. Cl. D21—150

307,042
BATTING PRACTICE TRAINING BOX
David L. Kathriner, and Frances R. Kathriner, both of 9782 Flora St., Overland, Mo. 63114
Filed Aug. 14, 1986, Ser. No. 896,252
Term of patent 14 years
U.S. Cl. D21—199

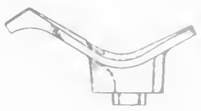


307,043
GOLF CLUB HEAD
Frank D. Werner, Box SR9, Jackson, Wyo. 83001
Filed Jan. 20, 1987, Ser. No. 5,142
Term of patent 14 years
U.S. Cl. D21—219

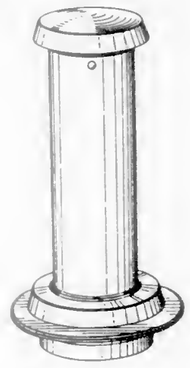
307,044
ROTARY SPRINKLER
Damon A. Johnston, Aurora, and Paul E. Papenhause, St. Charles, both of Ill., assignors to Suncast Corporation, Batavia, Ill.
Filed Feb. 10, 1987, Ser. No. 12,936
Term of patent 14 years
U.S. Cl. D23—220



307,045
FAUCET HANDLE
Holly K. Yost, North Hollywood, Calif., assignor to Price Pfister, Inc., Pacoima, Calif.
Filed Jan. 30, 1987, Ser. No. 9,382
Term of patent 14 years
U.S. Cl. D23—252



307,046
DRAIN FITTING
John D. Burgess, Loretto, and Thomas E. Taylor, Rexdale, both of Canada, assignors to Acriform Engineering Inc., Newmarket, Canada
Filed Mar. 13, 1986, Ser. No. 842,882
Claims priority, application Canada, Oct. 11, 1985, 11-10-85-9
Term of patent 14 years
U.S. Cl. D23—259



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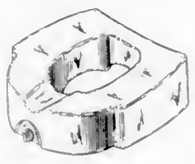
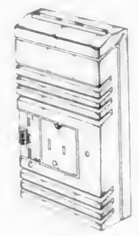
307,047
SHOWER HEAD RISER
James J. Watson, 11731 Doral St., Northridge, Calif. 91324
Filed Mar. 12, 1984, Ser. No. 588,441
Term of patent 14 years
U.S. Cl. D23—266

307,048
RAISED TOILET SEAT FOR INVALIDS
Alan M. Spiegel, New Rochelle, N.Y., assignor to Temco Home Health Care Products, Inc., Passaic, N.J.
Filed Apr. 22, 1987, Ser. No. 41,322
Term of patent 14 years
U.S. Cl. D23—311



307,049
AIR CONDITIONER
Hiroshi Moritani, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed May 23, 1988, Ser. No. 197,805
Claims priority, application Japan, Nov. 25, 1987, 62-48406
Term of patent 14 years
U.S. Cl. D23—353

307,050
AROMA DIFFUSER UNIT
Dov Z. Glucksman, Brookline, Mass., and Jorg Ratzlaff, New York, N.Y., assignors to Environmental Fragrance Technologies, Ltd., New York, N.Y.
Filed Jun. 12, 1987, Ser. No. 62,195
Term of patent 14 years
U.S. Cl. D23—366



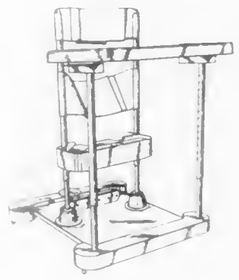
307,051
PORCELAIN MIXING TRAY FOR DENTAL USE
Dale C. Denny, 18422 NE. 15th Pl., Bellevue, Wash. 98008, and Salvatore A. Romeo, 2123 52nd SW., Seattle, Wash. 98116
Filed Oct. 5, 1987, Ser. No. 105,215
Term of patent 14 years
U.S. Cl. D24—10

307,052
SAMPLE VIAL
James A. Baxter, London, England, assignor to Chromacol Limited, London, England
Filed Nov. 19, 1985, Ser. No. 805,764
Claims priority, application United Kingdom, May 31, 1985, 1027111
The portion of the term of this patent subsequent to Dec. 12, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—29

307,053
SPECIMEN COLLECTOR KIT
Louis F. Muller, El Segundo, Calif., assignor to Davstar Industries, Inc., Newport Beach, Calif.
Filed Jul. 30, 1987, Ser. No. 79,506
Term of patent 14 years
U.S. Cl. D24—54

307,054
PATELLA BRACE
Glenn W. Johnson, Jr., Summit, N.J., assignor to Aircast Incorporated, Summit, N.J.
Filed May 19, 1987, Ser. No. 51,570
Term of patent 14 years
U.S. Cl. D24—64

307,055
STANDING FRAME FOR THE HANDICAPPED
Malcolm C. Johnston, 17 Devenport Road, London, England W12 8NZ
Filed Jun. 11, 1987, Ser. No. 62,046
Claims priority, application Canada, Feb. 12, 1987, 12-02-87-6
Term of patent 14 years
U.S. Cl. D24—64



307,056
BRICK
Kiyoshi Sakata, Tokyo, Japan, assignor to Park Kyung Hee, Tokyo, Japan
Filed Apr. 10, 1987, Ser. No. 38,889
Claims priority, application Japan, Oct. 15, 1986, 61-40560
Term of patent 14 years
U.S. Cl. D25—114

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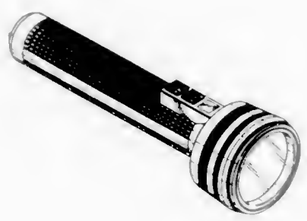
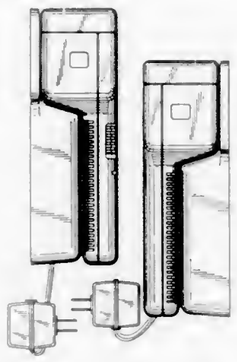
307,057
FLASHLIGHT
Chan-Bok Seok, 52-9-1, Sujin 1 Dong, Seongnam City, Kyeong-ki-Do, Rep. of Korea
Filed Apr. 7, 1987, Ser. No. 35,694
Claims priority, application Rep. of Korea, Oct. 8, 1986, 14250
Term of patent 14 years
U.S. Cl. D26—49



307,058
COMBINED EMERGENCY SPOTLIGHT AND RECHARGER THEREFOR
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Apr. 7, 1986, Ser. No. 850,405
Claims priority, application United Kingdom, Oct. 8, 1985, 1029685
Term of patent 14 years
U.S. Cl. D26—38



307,059
RECESSED LIGHTING FIXTURE
Donald D. Szymanek, Westlake Village, Calif., assignor to Thin-Lite Corporation, Camarillo, Calif.
Filed Jul. 18, 1986, Ser. No. 886,749
Term of patent 14 years
U.S. Cl. D26—74

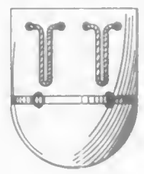
307,060
SUSPENDED LAMP
Simon Fraser, Zell Am See, Austria, assignor to Artemide Litech S.p.A., Pregnana Milanese Mi, Italy
Filed Mar. 9, 1987, Ser. No. 24,107
Claims priority, application Italy, Sep. 9, 1986, 22972/86[U]
Term of patent 14 years
U.S. Cl. D26—88

307,061
CIGARETTE LIGHTER
Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Yokohama, Japan
Filed Jun. 23, 1987, Ser. No. 65,521
Claims priority, application Japan, Dec. 24, 1986, 61-50782
Term of patent 14 years
U.S. Cl. D27—141

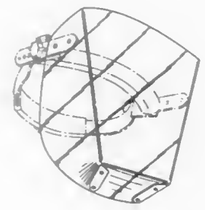
307,062
CIGARETTE LIGHTER
Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Yokohama, Japan
Filed Jun. 23, 1987, Ser. No. 65,524
Claims priority, application Japan, Dec. 24, 1986, 61-50783
Term of patent 14 years
U.S. Cl. D27—141

307,063
PERFUME AI'PLICATOR
Jacqueline Lin, Taipei, Taiwan, assignor to Jacqueline Promotion Inc., Taipei, Taiwan
Filed Dec. 7, 1987, Ser. No. 129,694
Term of patent 14 years
U.S. Cl. D28—7

307,064
SACK FOR RESCUING CHILDREN OR PETS FROM FIRE
Joyce E. Roberts, 18111 W. Stateline Rd., Antioch, Ill. 60002
Filed Sep. 30, 1987, Ser. No. 102,894
Term of patent 14 years
U.S. Cl. D29—1

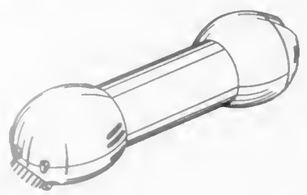


307,065
SHIELD FOR FACE MASK
Sidney Friedman, 3388 Ocean Harbor Dr., Oceanside, N.Y. 11572
Filed Nov. 9, 1987, Ser. No. 118,649
Term of patent 14 years
U.S. Cl. D29—17



307,066
DRY SHAVER
Hans T. Meeles, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 16, 1987, Ser. No. 74,437
Claims priority, application Benelux, Jan. 23, 1987, 81782-01
Term of patent 14 years
U.S. Cl. D28—49

307,067
VACUUM CLEANER FOR PETS
Lynn Kuhl, 1225 Fern Lake Ave., Brea, Calif. 92621, and Snezana B. Zdravkova, Bellflower, Calif., assignors to Lynn Kuhl, Brea, Calif.
Filed Jul. 7, 1987, Ser. No. 70,518
Term of patent 14 years
U.S. Cl. D30—158



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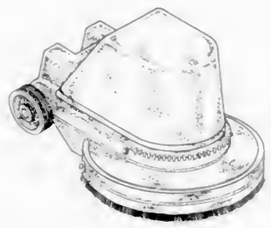
307,068
COMBINED FLOOR SCRUBBER AND POLISHER
Sidney H. Bradd, Solon, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Jul. 13, 1987, Ser. No. 72,611
Term of patent 14 years
U.S. Cl. D32—15



307,069
VACUUM CLEANER OR THE LIKE
Milton G. Kieft, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Jul. 14, 1986, Ser. No. 885,964
The portion of the term of this patent subsequent to Jun. 13, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—22

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McDonnell, Michael M.; and Dere, Donald P., to United States of America, Army. Reticle plate and method for establishment of a north-oriented or south-oriented line by circumpolar orientation. 4,912,853, Cl. 33-228.000.
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McNiff, Timothy K., to British Petroleum Company p.l.c., The. Catalyst composition. 4,914,074, Cl. 502-226.000.

McPhee, William A., to Western Atlas International, Inc. Method of increasing the detonation velocity of detonating fuse. 4,913,053, Cl. 102-275.800.

Meadows, Alan, to Coal Industry (Patents) Limited. Apparatus for locating a member in a borehole. 4,914,432, Cl. 340-853.000.

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Melnik, George; Amrein, Bruce; McCoy, Curtis L.; Martin, James A.; and Brucksch, Robert C., to United States of America, Army. Bypass electronic emergency fuel system. 4,913,110, Cl. 123-198.00D.

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Ohmura, Seiji; and Itoh, Yuji, to Toyota Jidosha Kabushiki Kaisha. Control device for hydraulically driven cooling fan of vehicle engine having relief passage for cold start. 4,913,102, Cl. 123-41.120.

Ohngemach, Jorg: *See—*
Kohler, Manfred; Poetsch, Eike; Ohngemach, Jorg; Dorsch, Dieter; Eidenschink, Rudolf; and Greber, Gerhard, 4,914,004, Cl. 430-272.000.

Ohno, Jiro: *See—*
Yashiro, Hirokatsu; Ohno, Jiro; Matsuo, Yoshiteru; Nishikawa, Hiroshi; Yui, Katsuhiko; and Kawamura, Hirotoshi, 4,912,987, Cl. 73-865.500.

Ohno, Kouji: *See—*
Miyazawa, Kazutoshi; Inukai, Takashi; Inoue, Hiromichi; Saito, Shinichi; and Ohno, Kouji, 4,913,838, Cl. 252-299.610.

Ohsako, Nagisa: *See—*
Yoshikawa, Kohta; Awaji, Naoki; Park, Kyung-ho; Ohsako, Nagisa; and Ri, Seigen, 4,914,080, Cl. 505-1.000.

Ohsawa, Yutaka: *See—*
Takami, Satoshi; Naruo, Teruhiko; and Ohsawa, Yutaka, 4,914,467, Cl. 354-413.000.

Ohta, Michihiko: *See—*
Mogami, Kimihiko; Ohta, Michihiko; Hatanaka, Kouki; Numakura, Noriaki; Kimura, Mamoru; Okada, Akira; and Okuno, Norihisa, 4,912,903, Cl. 52-648.000.

Ohta, Minoru; Miura, Kazuhiko; Huzino, Seizi; Kanehara, Kenji; and Hattori, Tadashi, to Nippon Soken, Inc. Direct-heated flow measuring apparatus having improved response characteristics. 4,912,975, Cl. 73-204.260.

Ohtaka, Keiji: *See—*
Akashi, Akira; Ishizaki, Akira; Hiramatsu, Akira; Suda, Yasuo; and Ohtaka, Keiji, 4,914,282, Cl. 250-201.800.

Ohtani, Hichiro: *See—*
Inada, Masanori; Ohtani, Hichiro; and Yamakawa, Tomoya, 4,912,974, Cl. 73-204.250.

Ohtsu, Shinki: *See—*
Utsumi, Hiromu; Kawakami, Yo; and Ohtsu, Shinki, 4,913,331, Cl. 227-10.000.

Ohtsuka, Hirohito: *See—*
Kubota, Naminosuke; Yano, Yutaka; Takagi, Yasumasa; Ninomiya, Kazuyoshi; Shimoguti, Nobuo; Terashima, Mituhiko; Nakano, Tooru; and Ohtsuka, Hirohito, 4,913,379, Cl. 244-52.000.

Ohtsuki, Kazuyuki; Kawamura, Yoshiaki; and Katougi, Yasuo, to Japan Tobacco, Inc. Sample supporting device having small contact region with sample suitable for ventilation-characteristics measuring apparatus. 4,912,964, Cl. 73-38.000.

Ohzu, Hayao: *See—*
Hashimoto, Seiji; Suzuki, Tsuneo; Ohzu, Hayao; and Harada, Tadanori, 4,914,519, Cl. 358-213.180.

Oi-Neg TV Products, Inc.: *See—*
Raether, Scott E., 4,913,716, Cl. 65-27.000.

Oishi, Hideo: *See—*
Hikita, Hiroshi; Shibata, Katsumi; Oishi, Hideo; and Yoshikawa, Hiroshi, 4,914,411, Cl. 335-128.000.

Okabe, Shotaro: *See—*
Sugita, Satoshi; and Okabe, Shotaro, 4,913,928, Cl. 427-39.000.

Okada, Akira: *See—*
Mogami, Kimihiko; Ohta, Michihiko; Hatanaka, Kouki; Numakura, Noriaki; Kimura, Mamoru; Okada, Akira; and Okuno, Norihisa, 4,912,903, Cl. 52-648.000.

Okada, Hisashi: *See—*
Inoue, Nobuaki; Okada, Hisashi; Hirano, Shigeo; Kameoka, Kimitaka, Yoshida, Tetsuo; and Yagihara, Morio, 4,914,002, Cl. 430-264.000.

Okada, Naofumi: *See—*
Murata, Mitsuhiro; Okada, Naofumi; Yamamoto, Kazutoshi; Tanimoto, Takuharu; and Inoue, Tokuyasu, 4,913,416, Cl. 271-186.000.

Okajima, Satoru: *See—*
Sawada, Seigo; Nokata, Kenichiro; Okajima, Satoru; Nagai, Hisako; Yaegashi, Takashi; Tezuka, Kenichi; and Miyasaka, Tadashi, 4,914,205, Cl. 546-70.000.

Okamoto, Yoshihisa: *See—*
Chiba, Shunichi; Inoue, Satoru; Matsui, Akio; and Okamoto, Yoshihisa, 4,913,991, Cl. 430-45.000.

Okaniwa, Kenichiro: *See—*
Arai, Kazumi; Koyama, Mikio; Kobayashi, Morio; Okaniwa, Kenichiro; Momose, Takasi; Furukawa, Kunihiro; and Zanma, Souichi, 4,914,020, Cl. 435-4.000.

Okazaki, Seiji: *See—*
Hatanaka, Koji; Aota, Takashi; Maruta, Kenji; Suwabe, Hirohisa, and Okazaki, Seiji, 4,914,274, Cl. 219-270.000.

Oke, George V. Stackable chair and method of manufacture. 4,913,496, Cl. 297-443.000.

Oki Electric Industry Co., Ltd.: *See—*
Koyama, Tatsuya; Yamada, Tetsuhiro; Ando, Hirokazu; and Kamimura, Katsuya, 4,913,569, Cl. 400-124.000.

Okuda, Jun: *See—*
Mochida, Ei; Kato, Kazuo; Kato, Katsuaki; Miwa, Ichitomo; and Okuda, Jun, 4,914,099, Cl. 514-390.000.

Okudaira, Hiroaki: *See—*
Kanda, Naoya; Sowa, Takayoshi; Yamazaki, Tetsuya; and Okudaira, Hiroaki, 4,913,769, Cl. 156-652.000.

Okumura, Katsuya, to Kabushiki Kaisha Toshiba. Method of manufacturing a semiconductor device having tapered pillars. 4,914,056, Cl 437-192.000.

Okumura, Katsuya: *See—*
Mori, Kazuya; Watanabe, Tohru; and Okumura, Katsuya, 4,912,963, Cl. 73-38.000.

Okumura, Mitsuhiro: *See—*
Miyoshi, Masanobu; Kajiwara, Makoto; Tanaka, Shigeo; and Okumura, Mitsuhiro, 4,914,016, Cl. 430-603.000.

Okuno, Akira: *See—*
Ishimura, Toshihiko; Seki, Reiji; Kuroda, Hirokazu, Izumi, Shuji, and Okuno, Akira, 4,914,459, Cl. 354-484.000.

Okuno, Norihisa: *See—*
Mogami, Kimihiko; Ohta, Michihiko; Hatanaka, Kouki, Numakura, Noriaki; Kimura, Mamoru Okada, Akira, and Okuno, Norihisa, 4,912,903, Cl. 52-648.000.

Okushio, Kazuo: *See—*
Hara, Yukihiko; Asai, Hajime; Kitamikado, Tadashi, Yamamoto, Hajimu; Okushio, Kazuo; and Nakamura, Kozo, 4,913,909, Cl 424-688.000.

Okuyama, Toshiharu: *See—*
Shimizu, Giichiro; Okuyama. Toshiharu; and Wakatsuki, Yoshio, 4,914,609, Cl. 364-561.000.
Shimizu, Giichiro; Okuyama. Toshiharu; and Wakatsuki, Yoshio, 4,914,610, Cl. 364-561.000.

Old Town Canoe Company: *See—*
Gilman Jr., Llewellyn A., 4,913,944, Cl. 428-36.500.

Olds, Rockne M.: *See—*
Henderson, Walter G.; Archer, John Q., II; Daum, Gerald R.; Ellson, George A.; Gray, John E.; Larson, Wayne F.; Olds, Rockne M.; Scansen, Jerry P.; Sherman, John W.; and Unrein, Edgar J., 4,914,732, Cl. 340-825.170.

Olesen, Paul, to Swingline Inc Sheath release device for stapler 4,913,332, Cl. 227-123.000.

Oliva, Oscar: *See—*
Castro, Felix; Jarrell, Shelby; and Oliva, Oscar, 4,913,254, Cl 180-287.000.

Olivieri, Oliviero, to Icaro Olivieri & C. S.p.A. Minuterie Metalliche Device for preventing a wheel from slipping off a spindle on which it is mounted in a freely rotatable manner. 4,913,610, Cl. 411-352.000.

Olmsted, Fred W.: *See—*
Toro, Joseph A.; Johnson, Thomas G.; and Olmsted, Fred W., 4,914,547, Cl. 361-323.000.

Oloff, Clarence M.; and Moore, Harry T., to United States of America, Air Force. Trephine assembly. 4,913,143, Cl. 606-170.000.

Olsen, Gordon E.: *See—*
Effland, Richard C.; Davis, Larry; Kapples, Kevin J.; and Olsen, Gordon E., 4,914,103, Cl. 514-250.000.
Helsley, Grover C.; Davis, Larry; and Olsen, Gordon E., 4,914,204, Cl. 544-360.000.

Olsson, Nils A.: *See—*
Blonder, Greg E.; Henry, Charles H.; Kazarinov, Rudolf F.; Olsson, Nils A.; and Orlowsky, Kenneth J., 4,914,667, Cl. 372-44.000.

Olympus Optical Co., Ltd.: *See—*
Azuma, Miyazawa; and Nakazawa, Hirotsugu, 4,914,464 Cl 354-400.000.
Takase, Hiroshi, 4,913,537, Cl. 350-422.000.

Omac, Inc.: *See—*
Vardaman, Billy G.; and Meyer, Corwin W., 4,913,380, Cl 244-135.00R.

Omomo, Naoki: *See—*
Shiraishi, Shuji; Nishihara, Takashi; Kiryu, Hironobu; and Omomo, Naoki, 4,912,967, Cl. 73-105.000.

Omori, Mutsuhiro; Terada, Hidefumi; and Morimoto, Minoru, to Nippon Gakki Seizo Kabushiki Kaisha. Method of filling polygonal region in video display system. 4,914,729, Cl. 340-703.000.

Omron Tateisi Electronics Co.: *See—*
Yamakawa, Takeshi, 4,914,614, Cl. 364-746.200.

O'Neal, Patrick E.: *See—*
Morgan, Timothy J.; and O'Neal, Patrick E., 4,913,654, Cl. 433-8.000.

Onishi, Masayoshi, to Mitsubishi Denki Kabushiki Kaisha. Electric circuit with limit switches for limiting rotatable range of electric drive unit. 4,914,362, Cl. 318-266.000.

Ono, Masao: *See—*
Sakurai, Hiroshi; Ono, Masao; and Mamiya, Atsushi, 4,913,258, Cl. 180-242.000.

Ono, Takuro; Aoyama, Noboru; and Morinaga, Kaoru, to Kabushiki Kaisha Toshiba. Optical disc player. 4,914,647, Cl. 369-77.200.

Ono, Tetsuji: *See—*
Nakahashi, Teruyoshi; and Ono, Tetsuji, 4,914,439, Cl. 341-131.000.

Onyia, Ernest C.: *See—*
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Ootaka, Masahiro: *See—*
Hayashi, Makoto; Ootaka, Masahiro; Naruse, Akisuke; and Takaku, Kazuo, 4,914,378, Cl. 324-696.000.

Oppelt, Arnulf: *See—*
Klingenbeck, Klaus; and Oppelt, Arnulf, 4,914,681, Cl. 378-12.000.

Oppelt, Dieter: *See—*
Miss, Helmut; Oppelt, Dieter; Heine, Diez; and Sipos, Reinhard, 4,914,186, Cl. 528-500.000.

O'Rarden, Patrick L. Piano moving apparatus. 4,913,614, Cl. 414-343.000.

Orec, Ilija; and Meyer, Erwin J., to Fisher & Paykel Limited. Float-controlled humidifier. 4,913,140, Cl. 128-203.160.

Orem, Michael W.: *See—*
Hayward, Jack; Orem, Michael W.; and Reafler, Gerald G., 4,913,970, Cl. 428-423.700.

Oru, Makoto; and Hayashi, Katsuhiko, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Door check. 4,912,806, Cl. 16-64.000.

Orlicki, David M.; Koppe, Bruce E.; and Palone, Thomas W., to Eastman Kodak Company. Transducer for determining the instantaneous relative angular positions between two members. 4,914,390, Cl. 324-207.170.

Orlowsky, Kenneth J.: *See—*
Blonder, Greg E.; Henry, Charles H.; Kazarinov, Rudolf F.; Olsson, Nils A.; and Orlowsky, Kenneth J., 4,914,667, Cl. 372-44.000.

Orr Felt Company, The: *See—*
Nicholas, Dimitri P.; and Diehl, Pieter S., 4,913,947, Cl. 428-60.000.

Orthopedic Designs, Inc.: *See—*
Azer, Samir N.; Salman, Naser N.; and Krause, William R., 4,913,137, Cl. 606-64.000.

Orton, Kevin R. RC servo. 4,914,368, Cl. 318-663.000.

Osada, Mototsugu: *See—*
Otsuka, Takashi; Terao, Masaru; Nose, Masahiko; Yamamoto, Kenji; and Osada, Mototsugu, 4,913,314, Cl. 222-590.000.

Osaki, Masaaki: *See—*
Oshiro, Yasuo; Osaki, Masaaki; and Kikuchi, Tetsuro, 4,914,094, Cl. 514-213.000.

Osawa, Izumi; Iino, Shuji; Hotomi, Hideo; and Nakamura, Mitsutoshi, to Minolta Camera Kabushiki Kaisha. Photosensitive member composed of charge transporting layer and charge generating layer. 4,913,993, Cl. 430-58.000.

Osawa, Izumi; Iino, Shuji; Hotomi, Hideo; and Nakamura, Mitsutoshi, to Minolta Camera Kabushiki Kaisha. Photosensitive member composed of charge transporting layer and charge generating layer. 4,913,994, Cl. 430-58.000.

Osawa, Masashi: *See—*
Shoji, Tadao; Takehara, Sadao; Fujisawa, Toru; Osawa, Masashi; Ogawa, Hiroshi; Arai, Yoshi; and Kurokawa, Jitsuo, 4,914,224, Cl. 560-65.000.

Osawa, Takashi; Murakami, Katsuo; Anzai, Yoshinori; Saikatsu, Takeo; Mitsuhashi, Seishiro; Ishikawa, Kazutoshi; Kamano, Yujiro; and Ito, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Hot-cathode discharge fluorescent lamp filled with low pressure rare gas. 4,914,347, Cl. 313-485.000.

Osborn, Paul V., to Mobil Oil Corporation. Rotary cutting apparatus. 4,913,013, Cl. 83-37.000.

Oseto, Seiichi: *See—*
Kameyama, Kenji; Oseto, Seiichi; Kageyama, Yoshiyuki; and Deguchi, Hiroshi, 4,914,348, Cl. 313-509.000.

Oshio, Hiromichi: *See—*
Nishikawa, Akira; and Oshio, Hiromichi, 4,913,725, Cl. 71-92.000.

Oshiro, Yasuo; Osaki, Masaaki; and Kikuchi, Tetsuro, to Otsuka Pharmaceutical Co., Ltd. Method for treating hypoxia. 4,914,094, Cl. 514-213.000.

Ostwald, Robert: *See—*
Bogenschutz, August F.; Jostan, Josef L.; and Ostwald, Robert, 4,913,784, Cl. 204-29.000.

O'Sullivan, Joseph: *See—*
Robinson, Gordon W.; O'Sullivan, Joseph; Meyers, Edward; Wells, Jerry S.; and Del Mar, Janice H., 4,914,245, Cl. 568-766.000.

Oswald, Alexis A.; Bhatia, Ram N.; Mozeleski, Edmund J.; Brownawell, Darrell W.; and Ashcraft, Thomas L., to Exxon Research & Engineering Company. Alkylphenols and derivatives thereof via phenol alkylation by cracked petroleum distillates. 4,914,246, Cl. 568-793.000.

Ota, Hiroyuki, to Pioneer Electric Corporation. Magnetic head device having a bridge core. 4,914,537, Cl. 360-108.000.

Ota, Tadaki, to Nissan Motor Co., Ltd. Fuel injection control apparatus. 4,913,099, Cl. 123-478.000.

Ota, Yoichiro: *See—*
Nagai, Yutaka; Mihashi, Yutaka; Ikeda, Kenji; and Ota, Yoichiro, 4,914,668, Cl. 372-49.000.

Otani, Asahiko: *See—*
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Otis Engineering Corporation: *See—*
Bayh, Russell I., III, 4,913,239, Cl. 166-385.000.
Setterberg, John R., Jr., 4,913,228, Cl. 166-118.000.
Otobe, Takashi: *See—*
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Otsuka Pharmaceutical Co., Ltd.: *See—*
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Oshiro, Yasuo; Osaki, Masaaki; and Kikuchi, Tetsuro, 4,914,094, Cl. 514-213.000.
Otsuka, Takashi; Terao, Masaru; Nose, Masahiko; Yamamoto, Kenji; and Osada, Mototsugu, to Shinagawa Refractories Co., Ltd. Opening element for an insert nozzle of a slide gate valve apparatus and a method of opening said apparatus. 4,913,314, Cl. 222-590.000.
Otsuka, Takashi; Kikuchi, Toshihiro; Yamashita, Katushiro; and Haga, Tomohiko, to Sony Corporation. Microwave antenna structure. 4,914,448, Cl. 343-872.000.
Otsuka, Takashi: *See—*
Fukuzawa, Keiji; Otsuka, Takashi; Tsurumaru, Shinobu; Kajikuri, Junichi; and Ito, Fumihiro, 4,914,449, Cl. 343-872.000.
Otten, Jay G.; Kinnaird, Michael G.; Greenough, Ronald E.; and Parker, Edward J., to BASF Corporation. Sterically hindered polyether polyols as chlorine bleach stable surfactants. 4,913,833, Cl. 252-99.000.
Otters, John L. Thrust to torque converter, particularly for coupling a reciprocating shaft to a rotary electrical generator or the like. 4,912,995, Cl. 74-127.000.
Ottersbach, Thomas V., to Emerson Electric Co. Ventilation air flow block in an electric motor. 4,914,329, Cl. 310-68.00C.
Otto, Klaus: *See—*
Moser, Thomas; Otto, Klaus; Kippenberg, Horst; and Krause, Ralf-Dieter, 4,913,932, Cl. 427-123.000.
Outboard Marine Corporation: *See—*
Borst, Gaylord M., 4,913,103, Cl. 123-41.150.
Bragenzer, Richard J.; and Wood, Donald H., 4,914,419, Cl. 340-459.000.
Overton, Bob J.; and Taylor, Carl R., to AT&T Bell Laboratories. Methods of curing optical fiber coatings. 4,913,859, Cl. 264-1.400.
Owens, Alexander H.: *See—*
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Owens, Mark J.: *See—*
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Ozaki, Seiji: *See—*
Naito, Osamu; Ozaki, Seiji; Mizuguchi, Hiromi; Shinozaki, Shigesaku; and Kanda, Tohei, 4,913,657, Cl. 439-192.000.
Ozato, Yukinori; Tamura, Nobuhiko; Masumori, Hiroaki; Yamamoto, Michihiro; Kojima, Atsuyuki; Nishikaku, Fumio; and Kimura, Yoshihiko, to Sumitomo Pharmaceuticals Company, Limited. Aminoazole derivatives and their production and use. 4,914,112, Cl. 514-326.000.
P & F Machine: *See—*
Davis, Walter F.; and Rickey, Wayne D., 4,912,904, Cl. 53-155.000.
Paal, Michael: *See—*
Hermentin, Peter; Paal, Michael; Kolar, Cenek; Kraemer, Hans P.; Hoffmann, Dieter; Berscheid, Hans G.; and Bottger, Dirk, 4,914,191, Cl. 536-6.400.
Pace University: *See—*
Bacchi, Cyrus J.; Berens, Randolph L.; Marr, J. Joseph; and Nathan, Henry C., 4,914,086, Cl. 514-45.000.
Packard, Barbara B.; Stearns, Glenn; and Watson, Ralph T., to Hewlett-Packard Company. Modular complier with a class independent parser and a plurality of class dependent parsers. 4,914,585, Cl. 364-200.000.
Packard, Thomas J., to Minnesota Mining and Manufacturing Company. Compressible ear tip. 4,913,259, Cl. 181-131.000.
Pagano, Daniel M., to Eastman Kodak Company. Metering defeat mechanism. 4,914,462, Cl. 354-213.000.
Page, Philip R.; and Heggie, William, to Hovione Inter Ltd. Preparation and use of new solvates of beclomethasone 17,21-dipropionate. 4,913,892, Cl. 424-45.000.
Palensky, Frederick J.: *See—*
Rasmussen, Jerald K.; Heilmann, Steven M.; and Palensky, Frederick J., 4,914,223, Cl. 560-49.000.
Palmer, John S., to Palmer Manufacturing & Supply, Inc. Flux injector lance for use in processing aluminum and method. 4,913,735, Cl. 75-683.000.
Palmer Manufacturing & Supply, Inc.: *See—*
Palmer, John S., 4,913,735, Cl. 75-683.000.
Palone, Thomas W.: *See—*
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Palumbo, Pacifico A., to Neon Modular Systems, Inc. Illuminated framework structures. 4,912,889, Cl. 52-28.000.
Pan, David S.: *See—*
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Pandrol Limited: *See—*
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Panousbek, Dale W.; Kreitzberg, Ernest A.; and DiMaggio, Frank F., to J. I. Case Company. Electronic powershift control system for an implement transmission. 4,913,004, Cl. 74-861.000.
Panzica, Ignatius J., to Custom Chrome, Inc. Carburetor usable with motorcycle engine. 4,913,855, Cl. 261-50.100.
Papadakis, Emmanuel P.: *See—*
Dixon, James R.; Gentle, Derek F.; Janotik, Adam M.; Kazyak, Lawrence P.; Mansour, Tahir M.; Papadakis, Emmanuel P.; and Strosberg, Gordon G., 4,912,826, Cl. 29-281.100.
Parent, Francois; Deambrosio, Carlos; and Gileta, John, to Electrovert Ltd. Cooling and exhaust unit for solder reflow system. 4,912,857, Cl. 34-148.000.
Park, Han K.: *See—*
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Park, Kyung-ho: *See—*
Yoshikawa, Kohta; Awaji, Naoki; Park, Kyung-ho; Ohsako, Nagisa; and Ri, Seigen, 4,914,080, Cl. 505-1.000.
Parkalova, Ekaterina I.: *See—*
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Parker, Edward J.: *See—*
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Parker, Frederick, to Dimensional Circuits Corporation. Methods of producing printed circuit boards. 4,912,844, Cl. 29-848.000.
Parker, Howard J. Record keeping folder and method. 4,913,462, Cl. 281-15.100.
Parker, Tim: *See—*
Miekka, Richard G.; Bushman, Thomas D.; Taylor, Arthur W.; Parker, Tim; and Benoit, Dennis R., 4,913,858, Cl. 264-1.300.
Parker, William A.; Bartos, Thomas E.; and Cowen, Ronald M., to Ford Motor Company. Weldless automotive shock absorber. 4,913,268, Cl. 188-322.190.
Parkinson, Martin. Solvent evaporator. 4,913,777, Cl. 202-205.000.
Parkinson, Ward D.: *See—*
Johnson, Gary M.; Chen, Zhitong; Chern, Wen-Foo; Parkinson, Ward D.; Lowrey, Tyler A.; and Trent, Thomas M., 4,914,631, Cl. 365-189.110.
Parks, Christopher J.; and Wolfe, Kenneth J., to Westvaco Corporation. Press applied susceptor for controlled microwave heating. 4,914,266, Cl. 219-10.55E.
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Parsons, James S. Disposable needleless injection system. 4,913,699, Cl. 604-68.000.
Parsons, Ralph L., Jr. Boom mower attachment for tractor adjustable for cutting at either side thereof. 4,912,916, Cl. 56-15.200.
Partain, Emmett; M., III: *See—*
Brode, George L.; Band, Philip A.; Goddard, Errol D.; Barbone, Arminda G.; Leshchiner, Adolf; Pavlichko, Joseph P.; Partain, Emmett; M., III; and Leung, Pak S., 4,913,743, Cl. 106-162.000.
Pasbol, John C., to Fr. Ditlevsens Eftr. A/S. Mop wringer. 4,912,804, Cl. 15-262.000.
Pasma, Tjebbe R.: *See—*
Bosch, Gerrit; Pasma, Tjebbe R.; and Sluyterman, Albertus A. S., 4,914,350, Cl. 315-8.000.
Pasqualucci, Joseph; and Schweitzer, Frederick F., to Sherwood Medical Company. Safety interlock system for medical fluid pumps. 4,913,703, Cl. 604-153.000.
Patel, Gautam A., to General Electric Company. Flexible silicone coatings for plastic substrates and methods for making thermoformable, abrasion-resistant thermoplastic articles. 4,914,143, Cl. 522-148.000.
Patel, Jash: *See—*
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Patel, Parbhubhai D.: *See—*
Arroyo, Candido J.; Fluevog, Jill B.; Kathiresan, Krishnaswamy; and Patel, Parbhubhai D., 4,913,517, Cl. 350-96.230.
Patterson, John C., to Atlantic Richfield Company. Liquid jet solids removal system for process vessels. 4,913,819, Cl. 210-523.000.
Patterson, Richard L.: *See—*
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Patton, Robert L.: *See—*
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Russell, Craig A., to Ludlow Industries, Inc. Radio frequency capacitance probe system for material detection. 4,914,377, Cl. 324-690.000.
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Romenets, Vladimir A.; Usachev, Alexandr B.; Ugarov, Alexei A.; Bystrov, Valentin P.; Valavin, Valery S.; Grebennikov, Vasily R.; Glovatsky, Anatoly B.; Gursky, Gennady L.; Ryzhonkov, Dmitry I.; Vaskevich, Alexandr D., Chizhikova, Valentina M.; Yatsenko-Zhuk, Alexandr D.; Guglya, Vladimir G.; Pozhivanov, Alexandr M.; Vegman, Evgeny F.; Tulin, Nikolai A.; Kremenevsky, Stanislav V.; and Vanjukov, Andrei V., deceased, 4,913,734, Cl. 75-501.000.

Yatsushiro, Akihiko: *See—*
Nagasaka, Youetsu; and Yatsushiro, Akihiko, 4,913,495, Cl. 297-284.000.

Yeamans, Robert C. Perimeter securement assembly for roof deck covering. 4,912,900, Cl. 52-273.000.

Yeh, Jarvis J. M.: *See—*
Rice, John N.; and Yeh, Jarvis J. M., 4,912,921, Cl. 60-39.040.

Yoda, Akira; and Sato, Yoshimitsu, to Fuji Photo Film Co., Ltd. Developing apparatus. 4,913,086, Cl. 118-647.000.

Yoder, Max N.; and Morgan, Michael A., to United States of America, Navy. Yoked orthogonally distributed equal reactance non-coplanar traveling wave amplifier. 4,914,743, Cl. 357-41.000.

Yobe, Philip K., to United States of America, Army. Cargo carriers for helicopters. 4,913,480, Cl. 294-81.100.

Yohe, Warren C., to GTE Valenite Corporation. Surface modified cemented carbides. 4,913,877, Cl. 419-13.000.

Yokoi, Takeshi, to Brother Kogyo Kabushiki Kaisha. Sheet feeding apparatus in a printer. 4,913,574, Cl. 400-605.000.

Yokomizo, Osamu: *See—*
Tomiyama, Akio; Yokomizo, Osamu; Masuhara, Yasuhiro; Nakao, Toshitsugu; Kashiwai, Shin-ichi; Kawada, Yoshishige; Hirakawa, Hiromasa; and Murata, Shigeto, 4,914,679, Cl. 376-440.000.

Yokosawa, Koichi: *See—*
Imai, Kazumichi; Tokinaga, Daizo; and Yokosawa, Koichi, 4,913,883, Cl. 422-82.010.

Yokosuka, Takehiko; Yamauchi, Osami; and Kato, Hiroshi, to Pilot Ink Co., Ltd. Liquid-applying tip assembly. 4,913,175, Cl. 132-317.000.

Yokoyama, Tetsuo: *See—*
Sano, Koichi; Maeda, Akira; Yokoyama, Tetsuo; Yanaka, Shigenobu; and Koizumi, Hideaki, 4,914,727, Cl. 324-309.000.

Yoneoka, Mikio; Furuta, Tomiyoshi; Yamamoto, Yasuo; Nozaki, Sadao; Takada, Kazuo; Watabe, Kumiko; and Ikarashi, Takeo, to Mitsubishi Gas Chemical Company, Inc. Steam reforming of methanol. 4,913,842, Cl. 252-373.000.

Yonezu, Ikuo: *See—*
Honda, Naojiro; Furukawa, Nobuhiro; Fujitani, Shin; and Yonezu, Ikuo, 4,913,879, Cl. 420-434.000.

Yonkers, Edward H., to Electro-Appliance Co., Inc. Hand tool for pressing wire connectors. 4,912,958, Cl. 72-410.000.

Yoshida, Akira: *See—*
Tanaka, Syozo; Yoshida, Akira; Shinobu, Yoshiharu; and Takushima, Akira, 4,913,622, Cl. 415-53.300.

Yoshida, Haruo; and Kume, Shoichi. Adhesive bandage for personal use. 4,913,138, Cl. 128-155.000.

Yoshida, Kazuhiko: *See—*
Fukushima, Norio; Serizawa, Yasunori; Yoshida, Kazuhiko; Suzuki, Shigeyasu; Masukawa, Masanobu; and Sakurai, Shoji, 4,913,406, Cl. 266-92.000.

Yoshida, Kiyoshi: *See—*
Etoh, Yoshiyuki; Inoue, Hiroshi; Mori, Kazuyuki; Suzuki, Koichi; Nakano, Kinichiro; Nomura, Hiroyuki; Yamamoto, Isao; Yoshida, Kiyoshi; Takeuchi, Yasuhisa; and Tanaka, Hiroshi, 4,914,596, Cl. 364-426.040.

Yoshida Kogyo K. K.: *See—*
Yamada, Yasuo, 4,912,819, Cl. 24-442.000.

Yoshida, Masaharu, to Mitsubishi Denki Kabushiki Kaisha. Method and apparatus for die bonding. 4,913,335, Cl. 228-103.000.

Yoshida, Noriyuki; and Takahashi, Kenichi, to Sumitomo Electric Industries, Ltd. Optical fiber connector. 4,913,523, Cl. 350-96.200.

Yoshida, Tadao; and Ohmori, Iwao, to Toagosei Chemical Industry Co., Ltd. 5'-O-Triorganostannyl derivatives of deoxynucleosides or deoxynucleotides and their uses. 4,914,193, Cl. 536-23.000.

Yoshida, Tetsuo: *See—*
Inoue, Nobuaki; Okada, Hisashi; Hirano, Shigeo; Kameoka, Kimitaka; Yoshida, Tetsuo; and Yagihara, Morio, 4,914,002, Cl. 430-264.000.

Yoshida, Tetsushi; and Kozima, Ken, to Casio Computer Co., Ltd. Liquid crystal composition and liquid crystal display device using the same. 4,913,532, Cl. 350-350.00R.

Yoshido, Koichi, to NEC Corporation. Accurately indicating a status of consumption of a battery by which an electronic circuit is controllably put into operation. 4,914,393, Cl. 324-428.000.

Yoshikai, Tamio; Asanuma, Masato; Kaneshige, Masatoshi; and Hagihara, Hideaki, to Sharp Kabushiki Kaisha. Developing apparatus. 4,914,481, Cl. 355-245.000.

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Yoshikawa, Hiroshi: *See—*
Hikita, Hiroshi; Shibata, Katsumi; Oishi, Hideo; and Yoshikawa, Hiroshi, 4,914,411, Cl. 335-128.000.

Yoshikawa, Kohta; Awaji, Naoki; Park, Kyung-ho; Ohsako, Nagisa; and Ri, Seigen, to Fujitsu Limited. Method for fabricating superconductive film. 4,914,080, Cl. 505-1.000.

Yoshimi, Toshikazu: *See—*
Kato, Shinjiro; Yoshimi, Toshikazu; Yamamoto, Hideo; Sato, Takeshi; and Kihara, Hisashi, 4,914,707, Cl. 381-86.000.

Yoshimura, Fumitaka; Nakano, Tomomasa; and Shigyo, Isamu, to Canon Kabushiki Kaisha. Molding method for optical element and apparatus therefor. 4,913,718, Cl. 65-104.000.

Yoshimura, Tatsushiro; Suzuki, Takeshi; Shimasaki, Shuhei; and Watada, Masashi, to Daikin Industries, Ltd. Granular powder of melt processable fluorine-containing resin and preparation of the same. 4,914,158, Cl. 525-199.000.

Yoshiya, Hayasaka, to Kokubu Inc. Braiding machine with synchro belt system. 4,913,028, Cl. 87-44.000.

Young, Nicholas A.: *See—*
Kimber, Ian D.; and Young, Nicholas A., 4,914,674, Cl. 375-1.000.

Young, Ralph H.: *See—*
Kung, Teh-Ming; Vreeland, William B.; and Young, Ralph H., 4,913,996, Cl. 430-59.000.

Young, Ronald G. Boat propulsion apparatus. 4,913,669, Cl. 440-14.000.

Young, Timothy J.; Jamzadeh, Fereidoon S.; and Reed, David J., to Eastman Kodak Company. Reproduction apparatus having an image member with timing indicia. 4,914,477, Cl. 355-208.000.

Young, William R.: *See—*
Rivoli, Anthony L.; and Young, William R., 4,914,501, Cl. 357-68.000.

Youngblood, Bernard J. Auto rack side panel support system. 4,913,061, Cl. 105-378.000.

Yu, Mantle M.: *See—*
Chen, James C.; Shih, Shih-Ming; and Yu, Mantle M., 4,914,644, Cl. 369-43.000.

Yu, Ying Ming. Disposable razor. 4,912,846, Cl. 30-81.000.

Yuasa, Yasuhiro; and Yamashita, Akira, to Kabushiki Kaisha SG. Positioning control system. 4,914,366, Cl. 318-612.000.

Yuasa, Yoshio: *See—*
Naruse, Kazuhiko; and Yuasa, Yoshio, 4,914,468, Cl. 354-415.000.

Yueh, William R.: *See—*
Kan, Philip T.; and Yueh, William R., 4,914,291, Cl. 250-231.120.

Yui, Kazuhiko: *See—*
Yashiro, Hirokatsu; Ohno, Jiro; Matsuo, Yoshiteru; Nishikawa, Hiroshi; Yui, Katsuhiko; and Kawamura, Hirotoshi, 4,912,987, Cl. 73-865.500.

Yui, Yasuji; Hitachi, Akio; Sato, Tatsuru; and Shirakura, Akira, to Sony Corp. Development of imaging sheets employing photosensitive microcapsules. 4,914,463, Cl. 354-304.000.

Yuki, Yoshiaki: *See—*
Imamaki, Teruo; Yuki, Yoshiaki; Ueda, Michio; and Hattori, Shigenori, 4,913,567, Cl. 400-120.000.

Yukime, Takumi: *See—*
Hayahara, Taknro; Kuratani, Keijiro; Yukiue, Takumi; and Inoue, Hiroshi, 4,913,198, Cl. 141-83.000.

Yukl, Tex, to Spatial Dynamics, Ltd. Non-perturbing cavity method and apparatus for measuring certain parameters of fluid within a conduit. 4,912,982, Cl. 73-861.050.

Yum, Su I.; and Balkie, Hans H., to Alza Corporation. Fluid imbibing pump with catheter. 4,913,702, Cl. 604-131.000.

Zaengerle, Eduard, to Vargus Ltd. Tool Manufacturing Co. Thread milling tool. 4,913,604, Cl. 409-74.000.

Zahnradfabrik Friedrichshafen, AG.: *See—*
Lang, Armin, 4,913,249, Cl. 180-79.100.

Zahradnik, Rudolf, to TET Holding Ges.m.b.H. Preheating and feeding apparatus for an extruder. 4,913,641, Cl. 425-204.000.

Zaidan Hojin Handotai Kenkyu Shinkokai: *See—*
Nishizawa, Jun-ichi; Tamamushi, Takashige; and Nonaka, Ken-ichi, 4,914,043, Cl. 437-2.000.

Zakai, Avi, to Aran Engineering Development Ltd. Portable weighing scale. 4,913,248, Cl. 177-210.00C.

Zambito, Arthur J.: *See—*
Budavari, John; Czaja, Robert F.; Grabowski, Edward J. J.; Shukis, William F.; and Zambito, Arthur J., 4,914,222, Cl. 560-40.000.

Zanma, Souichi: *See—*
Arai, Tazumi; Koyama, Mikio; Kobayashi, Morio; Okaniwa, Kenichiro; Momose, Takasi; Furukawa, Kunihiro; and Zanma, Souichi, 4,914,020, Cl. 435-4.000.

Zantel, Inc.: *See—*
Jurgensen, Bruce A., 4,912,892, Cl. 52-69.000.

Zborovsky, Ilya: *See—*
Sherman, Victor; Kowalenko, Wladimir; Zborovsky, Ilya; and Sanchez, William, 4,913,040, Cl. 99-372.000.

Zdeblick, Mark; and Albrecht, Thomas R., to Stanford University. Method of making an integrated scanning tunneling microscope. 4,912,822, Cl. 29-25.350.

Zeftek, Inc.: *See—*
Burke, Michael K., 4,913,062, Cl. 105-418.000.

Zelley, Richard C.; Kenna, Mark J., Jr.; and Martland, Wallace A., deceased (by Martland, Sheila M., administratrix), to Bull HN Information Systems Inc. Apparatus and method of loading a control store memory of a central subsystem. 4,914,576, Cl. 364-200.000.

Zeltner, Barry, to Barrick Partnership. Cleaning device for golfers and construction method therefor. 4,912,800, Cl. 15-114.000.

Zeman, William J., to Sherex Chemical Company, Inc. Alkaline tolerant sulfobetaine amphoteric surfactants. 4,913,841, Cl. 252-352.000.

Zhang, Xiaonan, to Unisys Corporation. Speed-up circuit for NPN bipolar transistors. 4,914,320, Cl. 307-443.000.

Ziaylek, Michael P.: *See—*
Ziaylek, Theodore, Jr.; and Ziaylek, Michael P., 4,913,398, Cl. 251-87.000.

Ziaylek, Theodore, Jr.; and Ziaylek, Michael P. High speed dumping valve apparatus. 4,913,398, Cl. 251-87.000.

Zibman, Israel B., to GTE Laboratories Incorporated. Method and apparatus for encoding speech. 4,914,701, Cl. 381-36.000.

Zielke, Henry: *See—*
Dixon, Daniel A.; Lee, Hsin; Mysiak, Eugene J.; and Zielke, Henry, 4,913,664, Cl. 439-607.000.
Shah, Hasmukh; Zielke, Henry; Patterson, Richard L.; and Pellegrino, Thomas P., 4,912,823, Cl. 29-33.00M.

Zinser Textilmaschinen GmbH: *See—*
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Ziolko, Eric F.: *See—*
Dabbish, Ezzat A.; Byrns, John P.; McClaughry, Michael J.; Puhl, Larry C.; Brown, Daniel P.; Ziolko, Eric F.; and Bright, Michael W., 4,914,697, Cl. 380-28.000.

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Zocholl, Stanley E., to ABB Power Distribution Inc. Method and apparatus for providing thermal protection for large motors based on accurate calculations of slip dependent rotor resistance. 4,914,386, Cl. 324-158.0MG.

Zodrow, Rudolf; Tomashauser, Josef; and Buchholz, Rainer, to Eti-Tec Maschinebau GmbH. Contact pressure element for metal foil blanks laid around the neck and head of bottles in a labelling machine. 4,912,905, Cl. 53-345.000.

Zoeller, Leon R., to Eastman Kodak Company. Control means for web scanning apparatus. 4,914,285, Cl. 250-205.000.

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Zorgiebel, Karl H.; Ackermann, Konrad; and Strassner, Ernst, to Carl Schenck AG. Transport device for redirecting piece goods in one plane. 4,913,277, Cl. 198-369.000.

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Zucchiatti, Ivano: *See—*
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Zukowski, Mark M.; Stabinsky, Yitzhak; and Levitt, Michael, to Amgen, Inc. Subtilisin analogs. 4,914,031, Cl. 435-222.000.

Zun, Hong-Fu. Caster-supporting device for a baby stroller. 4,913,452, Cl. 280-47.410.

Zunino, Michael J.: *See—*
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Zweig, Andrew M., to Allied-Signal Inc. Fluorinated diacrylates. 4,914,171, Cl. 526-246.000.

501 ICE Optic Limited: *See—*
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777388 Ontario Limited: *See—*
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF APRIL, 1990

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bainard, Dean R.; and Denton, Dennis N., to Garlock, Inc. Method of molding an elastomeric shaft seal with a polytetrafluoroethylene liner simultaneously formed thereon. Re. 33,192, Cl. 264-266.000.

Denton, Dennis N.: *See—*
Bainard, Dean R.; and Denton, Dennis N., Re. 33,192, Cl. 264-266.000.

Garlock, Inc.: *See—*
Bainard, Dean R.; and Denton, Dennis N., Re. 33,192, Cl. 264-266.000.

Hitachi, Ltd.: *See—*
Yamaguchi, Hiroshi; Miyauchi, Tateoki; Shimase, Akira; and Hongo, Mikio, Re. 33,193, Cl. 250-309.000.

Hongo, Mikio: *See—*
Yamaguchi, Hiroshi; Miyauchi, Tateoki; Shimase, Akira; and Hongo, Mikio, Re. 33,193, Cl. 250-309.000.

Matney, Arthur. Blister pack panel for face powder compact display. Re. 33,191, Cl. 206-470.000.

Miyauchi, Tateoki: *See—*
Yamaguchi, Hiroshi; Miyauchi, Tateoki; Shimase, Akira; and Hongo, Mikio, Re. 33,193, Cl. 250-309.000.

Shimase, Akira: *See—*
Yamaguchi, Hiroshi; Miyauchi, Tateoki; Shimase, Akira; and Hongo, Mikio, Re. 33,193, Cl. 250-309.000.

Stahlecker, Fritz, to Stahlecker, Hans. Attachment device for an opening roller and a method for using the attachment device. Re. 33,190, Cl. 57-408.000.

Stahlecker, Hans: *See—*
Stahlecker, Fritz, Re. 33,190, Cl. 57-408.000.

Yamaguchi, Hiroshi; Miyauchi, Tateoki; Shimase, Akira; and Hongo, Mikio, to Hitachi, Ltd. Ion beam processing apparatus and method of correcting mask defects. Re. 33,193, Cl. 250-309.000.

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Angenieux CLB S.A.: *See—*
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Araki, Toshiyuki: *See—*
Kyomasu, Mikio; Araki, Toshiyuki; Fukunaga, Shinobu; and Shindo, Masahiro, B1 4,617,649, Cl. 365-189.010.

Celanese Corporation: *See—*
Davenport, Kenneth G.; and Hilton, Charles B., B1 4,524,217, Cl. 564-223.000.

Ciba-Geigy Corporation: *See—*
Meyer, Willy; and Fory, Werner, B1 4,479,821, Cl. 71-93.000.

Daca International, B.V.: *See—*
Jandrell, Louis H. M., B1 4,468,702, Cl. 358-245.000.

Davenport, Kenneth G.; and Hilton, Charles B., to Celanese Corporation. Process for producing N-acyl-hydroxy aromatic amines. B1 4,524,217, 4-3-90, Cl. 564-223.000.

Egawa, Tsuneo: *See—*
Kurisu, Shingo; Omori, Shunji; Takenaka, Hiroyuki; Egawa, Tsuneo; Mitsunaga, Takuro; and Kiyama, Nobuo, B1 4,733,998, Cl. 409-132.000.

Fory, Werner: *See—*
Meyer, Willy; and Fory, Werner, B1 4,479,821, Cl. 71-93.000.

Fukunaga, Shinobu: *See—*
Kyomasu, Mikio; Araki, Toshiyuki; Fukunaga, Shinobu; and Shindo, Masahiro, B1 4,617,649, Cl. 365-189.010.

Hewson, John E.; and Schomer, Marion L., to Keystone International Holdings Corp. Pressure transmitter manifold. B1 4,319,492, 4-3-90, Cl. 73-756.000.

Hilton, Charles B.: *See—*
Davenport, Kenneth G.; and Hilton, Charles B., B1 4,524,217, Cl. 564-223.000.

Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, B1 4,208,256, Cl. 204-129.200.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Fluid pumping control method and apparatus for machine tools. B1 4,208,256, 4-3-90, Cl. 204-129.200.

Jandrell, Louis H. M., to Daca International, B.V. Radiation and static electricity suppression device. B1 4,468,702, 4-3-90, Cl. 358-245.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Yoshikazu, Fujino, B1 4,224,010, Cl. 415-199.200.

Keystone International Holdings Corp.: *See—*
Hewson, John E.; and Schomer, Marion L., B1 4,319,492, Cl. 73-756.000.

Kiyama, Nobuo: *See—*
Kurisu, Shingo; Omori, Shunji, Takenaka, Hiroyuki; Egawa, Tsuneo; Mitsunaga, Takuro; and Kiyama, Nobuo, B1 4,733,998, Cl. 409-132.000.

Kurisu, Shingo; Omori, Shunji; Takenaka, Hiroyuki; Egawa, Tsuneo; Mitsunaga, Takuro; and Kiyama, Nobuo, to Mitsubishi Jukogyo Kabushiki Kaisha. Method and apparatus for machining the side edge surface of a web plate. B1 4,733,998, 4-3-90, Cl. 409-132.000.

Kyomasu, Mikio; Araki, Toshiyuki; Fukunaga, Shinobu; and Shindo, Masahiro, to Ricoh Company, Ltd. Erasable FPLA. B1 4,617,649, 4-3-90, Cl. 365-189.010.

Lauzier, Rene , to Angenieux CLB S.A. Center-pull calliper brakes for bicycles and the like. B1 4,163,482, 4-3-90, Cl. 188-24.110.

Meyer, Willy; and Fory, Werner, to Ciba-Geigy Corporation. N-phenylsulfonyl-N'-triazinylureas. B1 4,479,821, 4-3-90, Cl. 71-93.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Kurisu, Shingo; Omori, Shunji; Takenaka, Hiroyuki; Egawa, Tsuneo; Mitsunaga, Takuro; and Kiyama, Nobuo, B1 4,733,998, Cl. 409-132.000.

Mitsunaga, Takuro: *See—*
Kurisu, Shingo; Omori, Shunji; Takenaka, Hiroyuki; Egawa, Tsuneo; Mitsunaga, Takuro; and Kiyama, Nobuo, B1 4,733,998, Cl. 409-132.000.

Omori, Shunji: *See—*
Kurisu, Shingo; Omori, Shunji; Takenaka, Hiroyuki; Egawa, Tsuneo; Mitsunaga, Takuro; and Kiyama, Nobuo, B1 4,733,998, Cl. 409-132.000.

Ricoh Company, Ltd.: *See—*
Kyomasu, Mikio; Araki, Toshiyuki; Fukunaga, Shinobu; and Shindo, Masahiro, B1 4,617,649, Cl. 365-189.010.

Rockwell International Corp: *See—*
Strathman, Lyle R., B1 4,200,866, Cl. 340-703.000.

Schomer, Marion L.: *See—*
Hewson, John E.; and Schomer, Marion L., B1 4,319,492, Cl. 73-756.000.

Shindo, Masahiro: *See—*
Kyomasu, Mikio; Araki, Toshiyuki; Fukunaga, Shinobu; and Shindo, Masahiro, B1 4,617,649, Cl. 365-189.010.

Strathman, Lyle R., to Rockwell International Corp. Stroke written shadow-mask multi-color CRT display system. B1 4,200,866, 4-3-90, Cl. 340-703.000.

Takenaka, Hiroyuki: *See—*
Kurisu, Shingo; Omori, Shunji; Takenaka, Hiroyuki; Egawa, Tsuneo; Mitsunaga, Takuro; and Kiyama, Nobuo, B1 4,733,998, Cl. 409-132.000.

Yoshikazu, Fujino, to Kawasaki Jukogyo Kabushiki Kaisha. Multistage turbocompressor with diagonal-flow impellers. B1 4,224,010, 4-3-90, Cl. 415-199.200.

Zachariades, Anagnostis E. Preparation of ultra high molecular weight polyethylene morphologies of totally fused particles with superior mechanical performance. B1 4,587,163, 4-3-90, Cl. 428-292.000.

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Downing, David G., 307,037, Cl. D20-10.000.
Aircast Incorporated: *See*—
Johnson, Glenn W., Jr., 307,054, Cl. D24-64.000.
Airwick Industries, Inc.: *See*—
Paulovich, John M., 306,978, Cl. D9-447.000.
Aizawa, Toshio: *See*—
Tominaga, Tomonori; Aizawa, Toshio; and Shinya, Satoshi, 307,029, Cl. D16-203.000.
Alberghini, Alfred C.; and Lynn, Stephen R., to Sewell Plastics, Inc. Bottle. 306,969, 4-3-90, Cl. D9-378.000.
American National Can Company: *See*—
Moloney, Thomas E.; Shulski, Michael M.; Chernikoff, Nelson N.; Cassidy, Edward K.; Traczyk, Edward S.; and Mann, John M., 306,972, Cl. D9-398.000.
American Telephone and Telegraph Company, AT&T Technologies, Inc.: *See*—
Moore, Douglas S.; Trujillo, Theodore M.; and Woods, Charles L., 306,999, Cl. D13-13.000.
Andrews, John J., to Testor Corporation, The. Airplane. 306,997, 4-3-90, Cl. D12-331.000.
Artemide Litech S.p.A.: *See*—
Fraser, Simon, 307,060, Cl. D26-88.000.
Artform Industries: *See*—
Wasserman, Steven, 306,954, Cl. D7-613.000.
Ashley Furniture Industries, Inc.: *See*—
Pauer, Jericho P.; and Pronschinske, Jane, 306,941, Cl. D6-441.000.
Azima, Farad, to Mission International Limited. Portable computer. 307,004, 4-3-90, Cl. D14-106.000.
Barish, Allan H. Display freezer. 307,026, 4-3-90, Cl. D15-83.000.
Bauer-Secundus, Kunz-Dieter. Bottle. 306,970, 4-3-90, Cl. D9-383.000.
Baxter, James A., to Chromacol Limited. Sample vial. 307,052, 4-3-90, Cl. D24-29.000.
Bergius, Konrad; and Mattis, Hans-Werner, to Von Roll Transportsysteme AG. Chairlift unit. 307,021, 4-3-90, Cl. D12-52.000.
Berkheij, Jan, to Ericsson Paging Systems B.V. Radio pager. 307,012, 4-3-90, Cl. D14-191.000.
Bettelini, Marco, to Swatch AG (Swatch SA). Wristwatch bracelet. 306,981, 4-3-90, Cl. D11-3.000.
Blair, Graham J., to Lever Brothers Company. Bottle. 306,968, 4-3-90, Cl. D9-376.000.
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Yu, Thomas C., to Hoechst Celanese Corp. Polyarylate compositions. H766, 4-3-90, Cl. 524-538.000.

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103 4,913,016
121 4,913,017
155 4,913,018
367 4,913,019
471 2 4,913,020
641 4,913,021
849 4,913,022

CLASS 84
21 4,913,026
280 4,913,027
711 4,913,025
723 4,913,023
726 4,913,024

CLASS 87
44 4,913,028

CLASS 89
8 4,913,029
4,913,030
14.3 4,913,031

CLASS 91
361 4,913,032

CLASS 92
73 4,913,033

CLASS 98
2.11 4,913,034
2.13 4,913,035
38.4 4,913,036

CLASS 99
286 4,913,037
331 4,913,038
4,913,046
339 4,913,039
372 4,913,040
403 4,913,041
404 4,913,042
441 4,913,047
450.6 4,913,043
494 4,913,044
519 4,913,045

CLASS 101
141 4,913,048
211 4,913,049
348 4,913,050
376 4,913,051

CLASS 102
202 4,913,052
275.8 4,913,053
439 4,913,054
4,913,056
470 4,913,055
476 4,913,057

CLASS 104
12 4,913,058
282 4,913,059

CLASS 105
96 4,913,060
378 4,913,061
418 4,913,062

CLASS 106
1.11 4,913,740
88 4,913,741
100 4,913,742
162 4,913,743
413 4,913,063

CLASS 110
229 4,913,064
239 4,913,065
246 4,913,066
281 4,913,067
342 4,913,068
346 4,913,069

CLASS 111
135 4,913,070

CLASS 112
84 4,913,072
152 4,913,071
235 4,913,073
262.1 4,913,074

CLASS 114
185 4,913,075
210 4,913,076
221 R 4,913,078
258 4,913,080
354 4,913,077
357 4,913,079

CLASS 116
308 4,913,083

CLASS 118
50 4,913,081
123 4,913,084
312 4,913,085
419 4,913,082
647 4,913,086
651 4,913,088
653 4,913,087
680 4,913,089
724 4,913,090

CLASS 119
1 4,913,091
4,913,092
3 4,913,093
4,913,094
28 4,913,095
53.5 4,913,096

CLASS 122
4 D 4,913,097

CLASS 123
25 P 4,913,098
26 4,913,100
41.1 4,913,101
41.12 4,913,102
41.15 4,913,103
41.54 4,913,107
90.4 4,913,104
90.46 4,913,105
90.49 4,913,106
196 R 4,913,109
196 S 4,913,108
198 D 4,913,110
198 E 4,913,112
256 4,913,111
300 4,913,113
339 4,913,114
373 4,913,115
425 4,913,116
4,913,117
435 4,913,118
456 4,913,119
478 4,913,099
489 4,913,120
4,913,121
4,913,122
609 4,913,123
631 4,913,124

CLASS 125
43 4,913,125

CLASS 126
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204 4,913,126
299 R 4,913,127
351 4,913,128
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451 4,913,129
544 4,913,131

CLASS 128
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62 A 4,913,133
69 4,913,134
78 4,913,135
80 A 4,913,136
155 4,913,138
200.11 4,913,139
203.16 4,913,140
419 P 4,913,147
419 PG 4,913,145
4,913,146
421 4,913,148
633 4,913,150
634 4,913,151
653 R 4,913,152
4,913,153
654 4,913,154
660.03 4,913,156
660.1 4,913,155
4,913,158
661.03 4,913,157
661.1 4,913,159
731 4,913,160
766 4,913,161
774 4,913,162
782 4,913,163
785 4,913,164
865 4,913,165

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94 4,913,167
194 4,913,168
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329 4,913,176

CLASS 134

9 4,913,177
12 4,913,178
113 4,913,179

CLASS 136

244 4,913,744

CLASS 137

1 4,913,180
12 4,913,181
15 4,913,183
71 4,913,184
241 4,913,185
516.13 4,913,187
544 4,913,188
560 4,913,189
596 4,913,191
601 4,913,186
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889 4,913,192

CLASS 139

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4,913,194
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CLASS 141

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3 4,913,197
83 4,913,198
98 4,913,199
217 4,913,200
258 4,913,202
334 4,913,201

CLASS 144

34 E 4,913,203
136 C 4,913,204
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371 4,913,206

CLASS 148

16 S 4,913,749
103 4,913,745
127 4,913,746
128 4,913,747
4,913,748
304 4,913,750
320 4,913,751
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CLASS 149

19.9 4,913,753

CLASS 152

209 R 4,913,207
4,913,208
504 4,913,209

CLASS 156

85 4,913,754
145 4,913,755
158 4,913,756
167 4,913,757
191 4,913,758
238 4,913,759
244.11 4,913,760
251 4,913,761
272.6 4,913,762
358 4,913,763
446 4,913,764
498 4,913,765
499 4,913,772
523 4,913,766
527 4,913,767
645 4,913,768
652 4,913,769

CLASS 157

1.17 4,913,770

CLASS 159

47.1 4,913,771

CLASS 160

84.1 4,913,210
4,913,211
105 4,913,212
107 4,913,213
168.1 4,913,214
207 4,913,215
236 4,913,216

CLASS 162

129 4,913,773
158 4,913,774
164.3 4,913,775

CLASS 164

340 4,913,217
358 4,913,218
463 4,913,219
4,913,220
489 4,913,221

CLASS 165

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61 4,913,223
89 4,913,224
104.31 4,913,225
163 4,913,226
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CLASS 166

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118 4,913,228
156 4,913,229
241 4,913,230
250 4,913,231
273 4,913,235
285 4,913,232
4,913,233
301 4,913,234
303 4,913,236
308 4,913,237
350 4,913,238
385 4,913,239

CLASS 171

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CLASS 172

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CLASS 173

12 4,913,242

CLASS 174

45 R 4,914,258
92 4,914,261
255 4,914,259
4,914,260

CLASS 175

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65 4,913,244
66 4,913,245
323 4,913,246
329 4,913,247

CLASS 177

210 C 4,913,248

CLASS 180

79.1 4,913,249
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175 4,913,251
208 4,913,252
210 4,913,253
227 4,913,255
229 4,913,256
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287 4,913,254
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254 4,913,260
287 4,913,261

CLASS 182

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CLASS 184

105.1 4,913,263

CLASS 187

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CLASS 188

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41 R 4,913,271
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84 T 4,913,274
85 CA 4,913,276
106.1 4,913,275

CLASS 198

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464.4 4,913,278
498 4,913,279
659 4,913,280
763 4,913,281

CLASS 200

8 R 4,914,262
61.45 M 4,914,263
83 S 4,914,264
306 4,913,285
330 4,914,265

CLASS 202

205 4,913,777

CLASS 203

29 4,913,778

CLASS 204

1.11 4,913,779
2.1 4,913,782
11 4,913,783
21 4,913,781
29 4,913,784
38.5 4,913,785
38.7 4,913,786
44.3 4,913,787
105 R 4,913,788
129.2 B1 4,208,256
153.14 4,913,780
192.13 4,913,790
192.3 4,913,789
299 R 4,913,791
412 4,913,792
433 4,913,793

CLASS 206

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224 4,913,283
232 4,913,284
329 4,913,286
387 4,913,287
455 4,913,288
470 Re.33,191
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597 4,913,290
602 4,913,291
611 4,913,292
620 4,913,293
621.6 4,913,294

CLASS 208

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46 4,913,795
4,913,796
89 4,913,797
4,913,799
108 4,913,800
111 4,913,798
121 4,913,801
207 4,913,802

CLASS 209

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44.2 4,913,804
164 4,913,805
273 4,913,806
461 4,913,807
583 4,913,295

CLASS 210

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98 4,913,809
169 4,913,810
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198.2 4,913,812
232 4,913,813
255 4,913,814
287 4,913,815
4,913,816
500.27 4,913,817
4,913,818
523 4,913,819
616 4,913,820
635 4,913,821
699 4,913,822
4,913,823
701 4,913,824
705 4,913,825
707 4,913,826
748 4,913,827

CLASS 211

41 4,913,296
96 4,913,297
162 4,913,298

CLASS 215

252 4,913,300
330 4,913,299

CLASS 219

10.55 E 4,914,266
10.55 M 4,914,717
85.1 4,914,267
121.14 4,914,268
121.48 4,914,271
121.63 4,914,272
121.64 4,914,269
121.68 4,914,270
213 4,914,718
222 4,914,273
270 4,914,274
4,914,751
275 4,914,275
390 4,914,276
506 4,914,277

CLASS 220

1 T 4,913,301
6 4,913,302
204 4,913,303
246 4,913,304
269 4,913,305
270 4,913,306
276 4,913,307
404 4,913,308
4,913,309
445 4,913,310

CLASS 221

1 4,913,316
22 4,913,311
45 4,913,312
131 4,913,313
200 4,913,315

CLASS 222

1 4,913,317
129 4,913,318
135 4,913,319
168 4,913,320
195 4,913,321
207 4,913,322
386 4,913,323
590 4,913,314
598 4,913,324

CLASS 223

99 4,913,325

CLASS 224

222 4,913,326
247 4,913,327

CLASS 226

21 4,913,328
97 4,913,329
196 4,913,330

CLASS 227

10 4,913,331
123 4,913,332

CLASS 228

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47 4,913,334
103 4,913,335
106 4,913,336
173.1 4,913,338
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CLASS 229

120.14 4,913,339
143 4,913,340

CLASS 232

1 D 4,913,341
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CLASS 235

10 4,914,278
449 4,914,279
472 4,914,280
492 4,914,281

CLASS 236

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CLASS 238

351 4,913,343

CLASS 239

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44 4,913,350
74 4,913,351
104 4,913,352
112 4,913,344
127 4,913,345
225.1 4,913,346
265.35 4,913,354
267 4,913,353
317 4,913,356
585 4,913,355
751 4,913,357

CLASS 241

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57 4,913,359
223 4,913,360
259.2 4,913,361

CLASS 242

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18.1 4,913,363
35.5 A 4,913,373
55.2 4,913,364
4,913,365
57 4,913,366
4,913,367
71.1 4,913,368
72 R 4,913,370
96 4,913,369
107 4,913,372
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155 R 4,913,374

CLASS 244

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6 4,913,376
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52 4,913,379
135 R 4,913,380
199 4,913,381

CLASS 248

27.1 4,913,382
4,913,383
27.3 4,913,384
56 4,913,385
68.1 4,913,386
125 4,913,388
156 4,913,389
176 4,913,390
214 4,913,391
231.9 4,913,392
238 4,913,394
283 4,913,393
516 4,913,395
649 4,913,396
918 4,913,387

CLASS 250

201.8 4,914,282
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206.01 4,914,283
206.2 4,914,284
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227.11 4,914,288
227.30 4,914,290
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369 4,914,300
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483.1 4,914,303
492.2 4,914,304
492.3 4,914,305
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560 4,914,307
572 4,914,308
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574 4,914,310
578.1 4,914,311

CLASS 251

61.1 4,913,397
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129.03 4,913,399
175 4,913,400
342 4,913,401

CLASS 252

8.75 4,913,829
49.6 4,913,830
70 4,913,831
88 4,913,828
99 4,913,832
4,913,833
104 4,913,834
190 4,913,835
299.01 4,913,836
4,913,839
299.61 4,913,837
4,913,838
313.2 4,913,840
352 4,913,841
373 4,913,842
408.1 4,913,843
582 4,913,844
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587 4,913,846
606 4,913,847
609 4,913,848
626 4,913,849
630 4,913,850

CLASS 254

93 R 4,913,402

CLASS 261

30.1 4,913,855
92 4,913,854
116 4,913,856

CLASS 264

1.1 4,913,857
1.3 4,913,858
1.4 4,913,859
16 4,913,860
23 4,913,861
36 4,913,862
40.6 4,913,863
41 4,913,864
81 4,913,865
83 4,913,866
104 4,913,867
135 4,913,868
182 4,913,869
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266 Re.33,192
294 4,913,871
320 4,913,872
516 4,913,873
564 4,913,874

CLASS 266

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45 4,913,404
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CLASS 267

140.1 4,913,409
141.5 4,913,411
153 4,913,410

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97 4,913,425
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CLASS 271

186 4,913,416
209 4,913,414
272 4,913,415
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CLASS 272

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71 4,913,418
76 4,913,419
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117 4,913,421
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144 4,913,424

CLASS 273

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26 A 4,913,427
29 BC 4,913,428
43 D 4,913,445
51 4,913,433
63 E 4,913,429
73 C 4,913,434
73 D 4,913,430
77 A 4,913,435
157 R 4,913,436
162 R 4,913,437
164 4,913,438
181 F 4,913,439
186 A 4,913,441
186 R 4,913,440
195 A 4,913,442
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244 4,913,443
408 4,913,444

CLASS 277

3 4,913,447
12 4,913,448
68 4,913,450

CLASS 279

60 4,913,449

CLASS 280

6.1 4,913,458
47.41 4,913,452
79.2 4,913,453
402 4,913,454
478.1 4,913,451
615 4,913,455
630 4,913,456
641 4,913,459
646 4,913,460
707 4,913,457
731 4,913,461

CLASS 281

15.1 4,913,462
49 4,913,463

CLASS 285

15 4,913,464
22 4,913,465
24 4,913,466
39 4,913,467
82 4,913,468
146 4,913,469
243 4,913,470

281 4,913,471
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423 4,913,473

CLASS 289

12 4,913,474

CLASS 292

144 4,913,475
196 4,913,476
216 4,913,477
259 R 4,913,478
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CLASS 294

81.1 4,913,480
88 4,913,481

CLASS 296

65.1 4,913,482
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CLASS 297

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250 4,913,490
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CLASS 299

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CLASS 301

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CLASS 307

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10.3 4,914,314
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137 4,914,315
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270 4,914,317
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353 4,914,319
443 4,914,320
446 4,914,321
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482 4,914,323
546 4,914,324
592 4,914,325
605 4,914,326
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CLASS 310

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68 C 4,914,329
82 4,914,330
90 4,914,331
4,914,332
91 4,914,333
154 4,914,334
207 4,914,335
316 4,914,336
4,914,337
323 4,914,338
345 4,914,722

CLASS 312

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211 4,913,501
4,914,340
214 4,914,341
233 4,913,502

CLASS 313

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139 4,914,343
141 4,914,344
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485 4,914,346
4,914,347
493 4,914,723
509 4,914,348
524 4,914,349

CLASS 315

8 4,914,350
12.1 4,914,351
169.3 4,914,353
169.4 4,914,352
247 4,914,354
307 4,914,355
4,914,356
309 4,914,357
364 4,914,358
382 4,914,724
410 4,914,359

CLASS 318

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266 4,914,362
560 4,914,725
568.1 4,914,363
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609 4,914,365
612 4,914,366
616 4,914,370
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4,914,368
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CLASS 320

61 4,914,372

CLASS 322

1 4,914,373
28 4,914,374

CLASS 323

206 4,914,375
352 4,914,376

CLASS 324

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690 4,914,377
696 4,914,378

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15 4,914,397
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CLASS 330

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252 4,914,400
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CLASS 331

3 4,914,403
11 4,914,404
25 4,914,405
116 R 4,914,406

CLASS 333

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161 4,914,407
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CLASS 335

41 4,914,409
80 4,914,410
128 4,914,411
172 4,913,503
215 4,914,412

CLASS 336

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CLASS 337

368 4,914,414
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CLASS 338

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310 A 4,914,418
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516 4,914,420
568 4,914,421
573 4,914,422
4,914,423
632 4,914,424
693 4,914,425
703 4,914,729
B1 4,200,866
736 4,914,426
756 4,914,730
764 4,914,427
815.2 4,914,731
825.17 4,914,732
825.620 4,914,428
825.690 4,914,431
825.79 4,914,430
825.800 4,914,429
853 4,914,432
854 4,914,433
906 4,914,434
961 4,914,733
970 4,914,436

CLASS 341

3 4,914,437
59 4,914,438
131 4,914,439
140 4,914,440

CLASS 342

64 4,914,734
125 4,914,735
161 4,914,441
162 4,914,442
361 4,914,443
460 4,914,444

CLASS 343

700 MS 4,914,445
704 4,914,446
713 4,914,447
872 4,914,448
4,914,449
895 4,914,450

CLASS 346

1 1 4,914,451
76 PH 4,914,452
140 R 4,914,453
4,914,562
4,914,736
150 4,914,454
154 4,914,455
4,914,456
155 4,914,457
160 4,914,458
4,914,459

CLASS 350

3.6 4,913,504
3.64 4,913,534
96.10 4,913,505
96.14 4,913,506
96.15 4,913,507
96.16 4,913,508
4,913,509
96.18 4,913,510
96.20 4,913,511
4,913,512
4,913,522
4,913,523
96.21 4,913,513
4,913,514
96.23 4,913,515
4,913,516
96.29 4,913,517
4,913,518
4,913,519
96.30 4,913,520
96.33 4,913,521
162.12 4,913,524
4,913,525
252 4,913,526
255 4,913,527
286 4,913,528
337 4,913,529
341 4,913,530
342 4,913,531
350 R 4,913,532
354 4,913,533
415 4,913,540
418 4,913,535
419 4,913,536
422 4,913,537
546 4,913,538
4,913,541
612 4,913,542
635 4,913,543

CLASS 351

163 4,913,544
205 4,913,545

CLASS 352

87 4,913,539

CLASS 354

64 4,914,460
149.1 4,914,461
213 4,914,462
304 4,914,463
400 4,914,464
412 4,914,465
4,914,466
413 4,914,467
415 4,914,468
484 4,914,469

CLASS 355

32 4,914,470
40 4,914,471
50 4,914,473
55 4,914,472
57 4,914,744
64 4,914,474
202 4,914,475
208 4,914,476
4,914,477
211 4,914,478
213 4,914,479
221 4,914,480
245 4,914,481
271 4,914,482
4,914,483
276 4,914,737
290 4,914,484
313 4,914,485
326 4,914,486

CLASS 356

1 4,913,546
35 4,914,487
349 4,913,547
350 4,913,548
354 4,913,549
4,913,550
383 4,913,551
419 4,914,738

CLASS 357

4 4,914,488
16 4,914,489
17 4,914,490
22 4,914,491
23.3 4,914,492
23.6 4,914,739
24 4,914,493
26 4,914,742
30 4,914,494
4,914,495
30 H 4,914,504
38 4,914,496
41 4,914,743
51 4,914,497
4,914,498
67 4,914,499
4,914,500
68 4,914,501
4,914,502
71 4,914,503
74 4,914,741
236 4,914,740

CLASS 358

2 4,914,505
10 4,914,506
11 4,914,507
13 4,914,508
22 4,914,509
60 4,914,510
4,914,511
98 4,914,512
101 4,914,513
107 4,914,514
141 4,914,515
166 4,914,745
183 4,914,516
191.1 4,914,517
213.15 4,914,518
213.18 4,914,519
214 4,914,520
229 4,914,521
245 B1 4,468,702
296 4,914,522
310 4,914,523
334 4,914,746
462 4,914,524
498 4,914,525

CLASS 360

8 4,914,526
10.3 4,914,527
46 4,914,528
48 4,914,529
4,914,530
64 4,914,531
66 4,914,532
67 4,914,533
69 4,914,534
72.2 4,914,535
96.3 4,914,536
108 4,914,537
113 4,914,538

CLASS 361

18 4,914,539
91 4,914,540
94 4,914,541
98 4,914,542
294 4,914,543
313 4,914,546
323 4,914,547
324 4,914,548
336 4,914,549
386 4,914,550
389 4,914,551
415 4,914,552

CLASS 362

32 4,914,553
61 4,914,747
100 4,914,554
109 4,914,748
153.1 4,914,544
155 4,914,545
183 4,914,555
293 4,914,556
305 4,914,557

CLASS 363

17 4,914,558
48 4,914,559
56 4,914,560
126 4,914,561

CLASS 364

43.17 4,914,589
148 4,914,563
153 4,914,564
167.01 4,914,566
188 4,914,567
200 4,914,568
4,914,569
4,914,570
4,914,571
4,914,572
4,914,573
4,914,574
4,914,575
4,914,576
4,914,577
4,914,578
4,914,579
4,914,580
4,914,581
4,914,582
4,914,583
4,914,584
4,914,585
4,914,586
4,914,587
408 4,914,588
413.14 4,914,598
419 4,914,590
422 4,914,591
424.05 4,914,592
424.07 4,914,593
424.1 4,914,594
426.04 4,914,595
4,914,596
4,914,597
434 4,914,598
474.08 4,914,599
484 4,914,600
490 4,914,601
507 4,914,602
513 4,914,603
517 4,914,604
518 4,914,605
4,914,606
521 4,914,607
557 4,914,608
561 4,914,609
4,914,610
567 4,914,611
578 4,914,612
721 4,914,613
746.2 4,914,614
754 4,914,615
770 4,914,616
786 4,914,617
900 4,914,618
4,914,619
4,914,620
4,914,621
4,914,622
4,914,623
4,914,624
4,914,625

CLASS 365

39 4,914,626
145 4,914,627
149 4,914,628
154 4,914,629
189.01 B1 4,617,649
189.04 4,914,630
189.11 4,914,631
200 4,914,632
203 4,914,633
233 4,914,634

CLASS 366

4 4,913,552
97 4,914,635
129 4,913,553
132 4,913,554
205 4,913,555
305 4,913,556

CLASS 367

56 4,914,636
83 4,914,637
90 4,914,638
91 4,914,639
98 4,914,640
99 4,914,641
122 4,914,642
164 4,914,565

CLASS 369

13 4,914,643
43 4,914,644
44 4,914,645
45 4,914,646
77.2 4,914,647

CLASS 370

3 4,914,648
50 4,914,649
60 4,914,650
69.1 4,914,651
85.5 4,914,652
85.6 4,914,653
94.1 4,914,654
112 4,914,655

CLASS 371

10.2 4,914,656
11.3 4,914,657
19 4,914,659
22.3 4,913,557
4,914,379
37.1 4,914,660
40.1 4,914,661

CLASS 372

18 4,914,658
4,914,663
20 4,914,664
4,914,665
4,914,666
32 4,914,662
44 4,914,667
49 4,914,668
50 4,914,669
96 4,914,670
103 4,914,671

CLASS 374

4 4,913,558
124 4,914,672
130 4,914,673

CLASS 375

1 4,914,674
25 4,914,675
102 4,914,676
106 4,914,677

CLASS 376

260 4,913,559
267 4,914,678
439 4,913,875
440 4,914,679
444 4,913,876

CLASS 377

49 4,914,680

CLASS 378

12 4,914,681
20 4,914,682
114 4,914,683
155 4,914,685

CLASS 379

61 4,914,686
88 4,914,687
93 4,914,688
142 4,914,689
233 4,914,690
357 4,914,691
410 4,914,692
413 4,914,693

CLASS 380

5 4,914,694
7 4,914,695
21 4,914,696
28 4,914,697
30 4,914,698
34 4,914,699
54 4,914,700

CLASS 381

36 4,914,701
39 4,914,702
41 4,914,749
43 4,914,703
4,914,704
4,914,705
73.1 4,914,706
86 4,914,707
152 4,914,750

CLASS 382

11 4,914,710
14 4,914,708
57 4,914,709

CLASS 383

71 4,913,560
94 4,913,561

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CLASS 384

276 4,913,562
312 4,913,563
419 4,914,711
449 4,914,712
518 4,913,564
617 4,913,565

CLASS 388

805 4,914,713

CLASS 400

63 4,913,566
120 4,913,567
124 4,913,568
4,913,569
4,913,570
196.1 4,913,571
207 4,913,572
489 4,913,573
605 4,913,574
638 4,913,575

CLASS 403

13 4,913,576
158 4,913,577
270 4,913,578
294 4,913,579
326 4,913,580

CLASS 404

117 4,913,581
119 4,913,582
123 4,913,584

CLASS 405

30 4,913,595
43 4,913,596
107 4,913,583
128 4,913,585
129 4,913,586
146 4,913,587
157 4,913,588
186 4,913,589
188 4,913,590
196 4,913,591
199 4,913,592
261 4,913,593
285 4,913,594

CLASS 406

39 4,913,597
112 4,913,598

CLASS 408

48 4,913,599
130 4,913,600
143 4,913,601
147 4,913,602
230 4,913,603

CLASS 409

74 4,913,604
132 B1 4,733,998
231 4,913,605
232 4,913,606
234 4,913,607

CLASS 410

103 4,913,608

CLASS 411

43 4,913,609
352 4,913,610
442 4,913,611

CLASS 414

343 4,913,614
403 4,913,612
537 4,913,615
697 4,913,616
729 4,913,617
751 4,913,613
789.7 4,913,618

CLASS 415

53.3 4,913,622
172.1 4,913,619
199.2 B1 4,224,010
211.1 4,913,620
215.1 4,913,621

CLASS 416

51 4,913,623

CLASS 417

2 4,913,624
18 4,913,625
222 4,913,626
4,913,627
273 4,913,628
309 4,913,629
313 4,913,630
355 4,913,631
462 4,913,632
499 4,913,633

CLASS 418

47 4,913,634
55 4,913,635
82 4,913,636

CLASS 419

13 4,913,877

CLASS 420

18 4,913,878
434 4,913,879

CLASS 422

15 4,913,880
56 4,913,881
58 4,913,882
82.01 4,913,883
190 4,913,637

CLASS 423

9 4,913,884
67 4,913,885
277 4,913,886
290 4,913,887
306 4,913,888
447.1 4,913,889
633 4,913,890

CLASS 424

11 4,913,891
45 4,913,892
47 4,913,893
49 4,913,894
57 4,913,895
59 4,913,897
69 4,913,896
70 4,913,898
72 4,913,900
78 4,913,901
85.8 4,913,902
426 4,913,903
427 4,913,904
449 4,913,905
450 4,913,907
499 4,913,906
501 4,913,908
688 4,913,909

CLASS 425

71 4,913,899
140 4,913,638
150 4,913,645
193 4,913,639
195 4,913,640
204 4,913,641
275 4,913,642
336 4,913,910
385 4,913,911
303 4,913,643
522 4,913,644
549 4,913,912

CLASS 426

46 4,913,914
72 4,913,915
80 4,913,916
92 4,913,917
4,913,918
94 4,913,919
283 4,913,920
321 4,913,921
417 4,913,922
533 4,913,923
578 4,913,924
599 4,913,925

CLASS 427

14.1 4,913,926
37 4,913,927
39 4,913,928
4,913,929
58 4,913,930
97 4,913,931
123 4,913,932
129 4,913,933
163 4,913,934
221 4,913,935
249 4,913,936
314 4,913,937
383.1 4,913,938
389 4,913,939

CLASS 428

7 4,913,940
31 4,913,941
35.2 4,913,942
36.1 4,913,943
36.5 4,913,944
36.92 4,913,945
38 4,913,946
60 4,913,947
64 4,913,948
4,913,949
4,913,950
76 4,913,951
87 4,913,952
131 4,913,953
213 4,913,954
236 4,913,955
285 4,913,956
286 4,913,957
292 B1 4,587,163
318.6 4,913,958
329 4,913,959
332 4,913,961
345 4,913,960
372 4,913,962
379 4,913,963
4,913,964
4,913,965
402 4,913,966
411.1 4,913,967
418 4,913,968
420 4,913,969
423.7 4,913,970
424.8 4,913,971
425.5 4,913,972
469 4,913,973
480 4,913,974
4,913,975
4,913,976
494 4,913,977
516 4,913,978
551 4,913,979
577 4,913,980
632

CLASS 429

1 4,913,981
12 4,913,982
13 4,913,983
50 4,913,985
90 4,913,986
92 4,913,987
97 4,913,984
194 4,913,988
218 4,913,989

CLASS 430

30 4,913,990
45 4,913,348
4,913,991
4,913,992
58 4,913,993
4,913,994
4,913,995
59 4,913,996
76 4,913,997
96 4,913,998
138 4,913,999
143 4,914,039
157 4,914,000
264 4,914,002
4,914,003
270 4,914,001
272 4,914,004
331 4,914,006
372 4,914,007
4,914,008
377 4,914,005
378 4,914,009
399 4,914,010
422 4,914,011
528 4,914,018
536 4,914,012
555 4,914,013
569 4,914,014
572 4,914,015
603 4,914,016
604 4,914,017

CLASS 431

12 4,913,647
13 4,913,648
116 4,913,646

CLASS 432

3 4,913,649
59 4,913,650
156 4,913,652
209 4,913,651

CLASS 433

3 4,913,653
8 4,913,654

CLASS 434

16 4,913,655
171 4,914,019

CLASS 435

4 4,914,020
7 4,914,021
4,914,022
4,914,023
41 4,914,024
69.4 4,914,026
69.6 4,914,027
69.8 4,914,025
88 4,914,028
101 4,914,029
172.3 4,914,030
222 4,914,031
240.2 4,914,032
252.3 4,914,033
296 4,914,034

CLASS 436

98 4,914,036
106 4,914,037
132 4,914,038
175 4,914,040
509 4,914,041

CLASS 437

2 4,914,042
4,914,043
4,914,044
4 4,914,045
6 4,914,046
24 4,914,047
29 4,914,049
31 4,914,048
33 4,914,050
38 4,914,051
59 4,914,052
81 4,914,053
90 4,914,054
183 4,914,055
192 4,914,056
4,914,057
193 4,914,058
203 4,914,059
235

CLASS 439

67 4,913,656
185 4,913,658
192 4,913,657
318 4,914,060
349 4,914,061
395 4,913,659
396 4,913,660
438 4,913,661
498 4,913,662
509 4,913,663
607 4,913,664
608 4,914,062
677 4,913,665
709 4,913,666
733 4,913,667
736 4,913,673
755 4,913,668
879 4,913,678

CLASS 440

14 4,913,669
49 4,913,670
83 4,913,671

CLASS 441

40 4,913,672

CLASS 445

24 4,913,674

CLASS 446

36 4,913,675
300 4,913,676
453 4,913,677
486 4,913,149

CLASS 455

78 4,914,714
212 4,914,715
343 4,914,716

CLASS 460

112 4,913,679
129 4,913,680

CLASS 464

154 4,913,681

CLASS 474

12 4,913,684
49 4,913,685
69 4,913,686
167 4,913,687
170 4,913,688
4,913,689
250 4,913,690

CLASS 475

52 4,913,002
121 4,913,003

CLASS 493

2 4,913,691
133 4,913,692
194 4,913,693
356 4,913,694

CLASS 494

2 4,913,695
10 4,913,696

CLASS 501

92 4,914,063

CLASS 502

4 4,914,064
52 4,914,065
62 4,914,066
63 4,914,067
74 4,914,068
107 4,914,069
178 4,914,070
185 4,914,071
208 4,914,072
209 4,914,073
226 4,914,074
330 4,914,075
407 4,914,076

CLASS 503

227 4,914,077
4,914,078
4,914,079

CLASS 505

1 4,914,080
4,914,081

CLASS 512

7 4,914,082
12 4,914,083

CLASS 514

4,914,084
6 4,914,085
25 4,914,086
45 4,914,087
50 4,914,088
76 4,914,089
170 4,914,090
171 4,913,852
179 4,914,091
206 4,914,092
211 4,914,093
4,914,094
213 4,914,095
219 4,914,096
220 4,914,101
229.8 4,914,102
232.8 4,914,103
250 4,914,097
255 4,914,104
258 4,914,098
274 4,914,105
4,914,106
284 4,914,100
288 4,914,107
4,914,108
303 4,914,109
4,914,110
312 4,914,111
326 4,914,112
4,914,113
333 4,914,114
339 4,914,115
346 4,914,116
369 4,914,117
370 4,914,118
372 4,914,119
383 4,914,099
390 4,914,120
400 4,914,121
406 4,914,122
422 4,914,126
438 4,914,123
445 4,914,127
460 4,914,124
478 4,914,125
520 4,914,128
532 4,914,129
616 4,914,131
626 4,914,130
634 4,914,132
643 4,914,133
654 4,914,134
665 4,914,135
711

CLASS 518

700 4,914,136

CLASS 521

107 4,914,137

CLASS 522

148 4,914,143

CLASS 523

111 4,914,140
122 4,914,141
500 4,914,139
511 4,914,142

CLASS 524

139 4,914,144
285 4,914,145
449 4,914,146
495 4,914,147
507 4,914,148
4,914,149
701 4,914,150

CLASS 525

54.1 4,914,151
68 4,914,152
4,914,153
71 4,914,138
80 4,914,154
89 4,914,155
113 4,914,248
166 4,914,156
192 4,914,157
199 4,914,158
328.2 4,914,159
329.3 4,914,160
403 4,914,161
420.5 4,914,162
452 4,914,163
523 4,914,164
528 4,914,165

CLASS 526

61 4,914,166
65 4,914,167
127 4,914,168
228 4,914,169
240 4,914,170
246 4,914,171
318.3 4,914,172

CLASS 528

49 4,914,173
68 4,914,174
102 4,914,185
173 4,914,175
205 4,913,697
220 4,914,176
229 4,914,177
272 4,914,178
4,914,179
348 4,914,180
353 4,914,181
4,914,182
392 4,914,183
4,914,184
500 4,914,186

CLASS 530

317 4,914,187
4,914,188
324 4,914,189

CLASS 534

859 4,914,190

CLASS 536

6.4 4,914,191
7.1 4,914,192
18.1 4,914,196
18.6 4,914,035
23 4,914,193
4,914,233
53 4,914,195
117 4,914,197

CLASS 540

62 4,914,198
357 4,914,199
4,914,200
494 4,914,201

CLASS 544

163 4,914,202
298 4,914,203
360 4,914,204
376 4,914,206

CLASS 546

70 4,914,205
167 4,914,207

CLASS 548

201 4,914,208
262.4 4,914,209
413 4,914,210
453 4,914,211
461 4,914,212
469 4,914,213
492 4,914,214

CLASS 549

3 4,914,215
267 4,914,216
398 4,914,217

CLASS 552

309 4,913,851

CLASS 556

132 4,914,219
436 4,914,220
4,914,221

CLASS 560

40 4,914,222
49 4,914,223
65 4,914,224
103 4,914,228
145 4,914,225
157 4,914,226
4,914,227
259 4,914,229

CLASS 562

113 4,913,853
416 4,914,230

429 4,914,231
507 4,914,232

CLASS 564

12 4,914,234
223 B1 4,524,217
241 4,914,235
334 4,914,236
409 4,914,237
420 4,914,238
450 4,914,239
478 4,914,240
485 4,914,241

CLASS 568

321 4,914,242
433 4,914,243
585 4,914,244
766 4,914,245
793 4,914,246

CLASS 570

208 4,914,247

CLASS 585

443 4,914,249
452 4,914,250
453 4,914,251
500 4,914,252
523 4,914,253
530 4,914,254
661 4,914,255
726 4,914,256
814 4,914,257

CLASS 604

1 4,913,682
8 4,913,683
22 4,913,698
68 4,913,699
93 4,913,700
103 4,913,701
131 4,913,702
153 4,913,703
171 4,913,704

CLASS 606

7 4,913,142
64 4,913,137
75 4,913,144
108 4,913,141
170 4,913,143

CLASSIFICATION OF DESIGNS

D2—	270	306,930		608	306,953	D10—	46	306,976		125	307,000
	272	306,931		613	306,954			306,979		134	307,001
	277	306,932		619	306,952		65	306,980		160	307,003
	320	306,934		649	306,956	D11—	3	306,981		164	307,002
D3—	35	306,935		650	306,957		12	306,983	D14—	106	307,004
	38	306,936		683	306,955		18	306,982		126	307,005
	40	306,937	D8—	2	306,961		130.1	306,984			307,006
	65	306,938		13	306,962		143	306,985		133	307,007
D6—	366	306,939		45	306,963		160	306,986		151	307,008
	397	306,940		354	306,964		221	306,987			307,009
	441	306,941	D9—	300	306,965	D12—	52	307,021		163	307,010
	463	306,942		317	306,966		101	306,994			307,011
	464	306,943		351	306,967		112	306,988		191	307,012
	513	306,944		376	306,968		147	306,989		197	307,013
	518	306,945		377	306,933		157	306,990		210	307,014
	520	306,946		378	306,969			306,991		214	307,015
	559	306,947		383	306,970		158	306,992		240	307,016
	601	306,948		394	306,971		181	306,993	D15—	7	307,017
D7—	351	306,958		398	306,972		202	306,995		8	307,018
	368	306,959		403	306,977		215	306,996		17	307,019
	393	306,960		423	306,973		331	306,997		21	307,020
	530	306,950		424	306,974	D13—	12	306,998		69	307,022
	541	306,949		431	306,975		13	306,999			307,023
	590	306,951		447	306,978						

		307,024			266	307,047					
	70	307,025			311	307,048					
	83	307,026			353	307,049					
	144.1	307,027			366	307,050					
D14—	199	307,028	D24—	10	307,051						
D16—	203	307,029		29	307,052						
	235	307,030		54	307,053						
D17—	14	307,031		64	307,054						
D18—	7	307,032			307,055						
	23	307,033	D25—	114	307,056						
D19—	48	307,034	D26—	38	307,058						
	57	307,035		49	307,057						
	92	307,036		74	307,059						
D20—	10	307,037		88	307,060						
D21—	37	307,038	D27—	141	307,061						
	59	307,039			307,062						
	62	307,040	D28—	7	307,063						
D22—	150	307,041		49	307,066						
	199	307,042	D29—	1	307,064						
	219	307,043		17	307,065						
D23—	220	307,044	D30—	158	307,067						
	252	307,045	D32—	15	307,068						
	259	307,046		22	307,069						

CLASSIFICATION OF PLANTS

P—	1	7,212		7,213		34	7,209	51	7,210	68	7,208	74	7,211

STATUTORY INVENTION REGISTRATIONS

29—	123	H771		513	H770	264—	3.1	H761	357—	34	H763	430—	264	H760	525—	75	H758
60—	264	H765		529	H768	307—	151	H772									
102—	334	H769	128—	432	H759	342—	145	H767	426—	112	H762	524—	538	H766	536—	38	H764

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GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 4,913,089 4,913,582 4,913,596 4,913,753 4,913,869 4,913,873 4,914,296
04 4,912,862 4,912,931 4,913,024 4,913,106 4,913,135 4,913,164 4,913,393 4,913,418 4,913,458 4,913,461 4,913,573 4,913,656 4,913,897 4,914,049 4,914,444 4,914,728 4,914,750
05 4,913,010 4,913,095 4,914,342
06 4,912,782 4,912,783 4,912,789 4,912,797 4,912,822 4,912,836 4,912,844 4,912,851 4,912,859 4,912,865 4,912,883 4,912,885 4,912,887 4,912,904 4,912,907 4,912,927 4,912,976 4,912,980 4,912,994 4,912,995 4,913,027 4,913,044 4,913,054 4,913,129 4,913,155 4,913,159
4,913,171 4,913,173 4,913,174 4,913,176 4,913,184 4,913,192 4,913,196
4,913,201 4,913,234 4,913,235 4,913,236 4,913,290 4,913,304 4,913,311 4,913,318 4,913,328 4,913,351 4,913,352 4,913,356 4,913,438 4,913,442 4,913,443 4,913,475 4,913,483
4,913,507 4,913,519 4,913,520 4,913,531 4,913,533 4,913,535 4,913,547 4,913,551 4,913,586 4,913,589 4,913,605 4,913,608 4,913,618 4,913,648 4,913,653 4,913,682 4,913,699 4,913,702 4,913,713 4,913,719 4,913,722 4,913,762 4,913,793 4,913,803 4,913,807 4,913,809 4,913,815 4,913,831 4,913,855
4,913,875 4,913,929 4,913,939 4,913,942 4,913,982 4,913,983 4,914,026 4,914,031 4,914,041 4,914,055 4,914,058 4,914,063 4,914,087 4,914,115 4,914,210 4,914,267 4,914,270 4,914,291 4,914,318 4,914,320 4,914,322 4,914,368 4,914,398 4,914,426 4,914,435 4,914,437 4,914,450 4,914,451 4,914,495 4,914,508 4,914,520 4,914,529 4,914,530 4,914,538 4,914,546 4,914,556 4,914,567 4,914,570 4,914,582 4,914,585 4,914,586 4,914,593 4,914,604 4,914,605 4,914,622 4,914,638 4,914,644 4,914,651 4,914,652 4,914,664 4,914,665 4,914,699 4,914,725
4,914,734 4,587,163
08 4,912,800 4,912,849 4,912,850 4,912,971
4,913,210 4,913,424 4,913,956 4,914,022 4,914,042 4,914,330 4,914,396 4,914,445 4,914,521 4,914,627 4,914,645 4,914,659 4,914,689
09 4,912,805 4,912,841 4,912,909 4,913,008 4,913,133 4,913,209 4,913,394 4,913,395 4,913,421 4,913,503 4,913,504 4,913,524 4,913,663 4,913,696 4,913,706 4,913,791 4,913,862 4,913,893 4,913,953 4,913,962 4,914,101 4,914,137 4,914,164 4,914,207
4,914,264 4,914,278 4,914,287 4,914,306 4,914,387 4,914,429 4,914,663
10 4,912,983 4,913,110 4,913,212
4,913,261 4,913,726 4,913,756 4,913,998 4,914,062 4,914,156
12 4,912,788 4,912,924 4,912,925 4,912,973 4,913,000 4,913,003 4,913,034 4,913,075 4,913,141 4,913,146 4,913,153 4,913,178 4,913,211 4,913,254 4,913,312 4,913,326 4,913,341 4,913,410 4,913,430 4,913,432 4,913,444 4,913,445 4,913,446 4,913,472 4,913,672 4,914,131 4,914,262 4,914,281 4,914,289 4,914,321 4,914,460 4,914,501 4,914,554 4,914,649 4,914,710 4,914,722 4,914,733
13 4,912,807 4,912,854 4,912,868 4,912,910 4,912,984 4,913,316 4,913,349 4,913,380 4,913,407 4,913,417
4,913,479 4,913,517 4,913,584 4,913,707 4,913,859 4,913,947 4,913,957 4,914,310 4,914,339 4,914,549
16 4,912,949 4,913,776 4,914,269 4,914,631
17 4,912,784 4,912,799 4,912,823 4,912,855 4,912,898 4,912,921 4,912,939 4,912,943 4,912,950 4,912,958 4,912,970 4,913,004 4,913,011 4,913,032 4,913,043 4,913,062 4,913,103 4,913,113 4,913,136 4,913,161 4,913,181 4,913,182 4,913,299 4,913,302 4,913,313 4,913,317 4,913,428 4,913,447 4,913,576 4,913,580 4,913,654 4,913,664 4,913,695 4,913,802 4,913,824 4,913,825 4,913,886 4,913,900 4,913,912

4,913,917 4,913,924 4,913,940 4,913,941 4,913,981 4,914,075 4,914,084 4,914,088 4,914,108 4,914,171 4,914,230 4,914,249 4,914,257 4,914,290 4,914,313 4,914,377 4,914,420 4,914,434
26 4,914,559 4,914,597 4,914,653 4,914,692 4,914,696 4,914,697
18 4,912,809 4,912,833 4,912,942 4,913,050 4,913,273 4,913,303 4,913,422 4,913,478 4,913,963 4,913,974 4,913,976 4,914,028 4,914,030 4,914,100 4,914,107 4,914,275 4,914,413 4,914,516 4,914,517 4,914,592
19 4,912,872 4,912,915 4,913,094 4,913,190 4,913,213 4,913,383 4,913,492 4,913,548 4,913,581
20 4,200,866 4,913,131 4,913,353 4,913,910
21 4,914,558 4,912,779 4,912,796 4,912,878 4,913,037
27 4,913,078 4,913,169 4,913,233 4,913,987 4,914,566
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23 4,913,944
24 4,913,029 4,913,152 4,913,204 4,913,295 4,913,391 4,913,514 4,913,710 4,914,266 4,914,442 4,914,608
28 4,914,641
29 4,914,657
25 4,912,786 4,913,132 4,913,142 4,913,157 4,913,286 4,913,296 4,913,481 4,913,708 4,913,816 4,913,858
30 4,913,425
31 4,914,547
4,914,021 4,914,025 4,914,305 4,914,441 4,914,491 4,914,513 4,914,535 4,914,576 4,914,603 4,914,633 4,914,640 4,914,642 4,914,686 4,914,701 4,914,703 4,914,708 4,914,711 4,914,741
26 4,912,808 4,912,816 4,912,826 4,912,879 4,912,888 4,912,895 4,912,901 4,912,959 4,912,961 4,912,997 4,913,009 4,913,061 4,913,084 4,913,123 4,913,126 4,913,268 4,913,340 4,913,365 4,913,382 4,913,390 4,913,423 4,913,454 4,913,484 4,913,486 4,913,585 4,913,615 4,913,620 4,913,636 4,913,644 4,913,668 4,913,688 4,913,700 4,913,720 4,913,761 4,913,821 4,913,833 4,913,877 4,913,927 4,913,930 4,914,263 4,914,341 4,914,369 4,914,384
27 4,912,781 4,912,852 4,912,933 4,912,940 4,912,957 4,913,020 4,913,183 4,913,259 4,913,309 4,913,339 4,913,344 4,913,471 4,913,473 4,913,476 4,913,597 4,913,642 4,913,647 4,913,728 4,913,767 4,913,856 4,913,898 4,913,921 4,913,937 4,913,968 4,913,986 4,914,015 4,914,139 4,914,165 4,914,223 4,914,340 4,914,392 4,914,690 4,914,742
28 4,913,076
29 4,912,785 4,912,886 4,912,953 4,913,655 4,913,853 4,914,329 4,914,331 4,914,332 4,914,418 4,914,425 4,914,547
4,912,839 4,913,387 4,913,437 4,914,299 4,914,346 4,914,357 4,914,522
34 4,912,827 4,912,876 4,912,932 4,912,999 4,983,036 4,913,082 4,913,220 4,913,325 4,913,350 4,913,375 4,913,385 4,913,436 4,913,441 4,913,488 4,913,508 4,913,629 4,913,658 4,913,659 4,913,675 4,913,711 4,913,723 4,913,724 4,913,743 4,913,794 4,913,797 4,913,805 4,913,826 4,913,827 4,913,830 4,913,836 4,913,844 4,913,845 4,913,851 4,913,863 4,913,894 4,913,918 4,913,954 4,913,965 4,913,973 4,914,000 4,914,039 4,914,081 4,914,082 4,914,083 4,914,090 4,914,096 4,914,102 4,914,103 4,914,175 4,914,177 4,914,201 4,914,204 4,914,217 4,914,220 4,914,222 4,914,234 4,914,243 4,914,245 4,914,246 4,914,252 4,914,254 4,914,256 4,914,276 4,914,286 4,914,423 4,914,430 4,914,443 4,914,500 4,914,502 4,914,507 4,914,552 4,914,563 4,914,580 4,914,615 4,914,648
35 4,912,923 4,913,237 4,913,451 4,913,985
36 Re.33,191
4,912,780 4,912,825 4,912,828 4,912,830 4,912,863 4,912,874 4,912,889 4,912,944 4,912,991 4,913,012 4,913,013 4,913,021 4,913,040
4,913,067 4,913,074 4,913,083 4,913,091 4,913,092 4,913,149 4,913,160 4,913,165 4,913,187 4,913,206 4,913,284 4,913,289 4,913,305 4,913,332 4,913,348 4,913,368 4,913,369 4,913,414 4,913,427 4,913,498 4,913,509 4,913,518 4,913,526 4,913,527 4,913,529 4,913,539 4,913,553 4,913,560 4,913,562 4,913,593 4,913,595 4,913,599 4,913,638 4,913,701 4,913,703 4,913,760 4,913,777 4,913,798 4,913,799 4,913,888 4,913,891 4,913,896
40 4,913,916 4,913,926 4,913,951 4,913,970 4,913,992 4,913,996 4,914,005 4,914,011 4,914,014 4,914,067 4,914,077
41 4,914,086 4,914,091 4,914,143 4,914,203 4,914,209 4,914,285 4,914,308 4,914,335 4,914,390 4,914,427 4,914,455 4,914,462 4,914,474 4,914,477 4,914,482 4,914,483
42 4,914,505 4,914,510 4,914,511 4,914,551 4,914,571 4,914,579 4,914,600 4,914,612 4,914,617 4,914,619 4,914,694 4,914,700 4,914,704 4,914,709
37 4,912,848 4,913,168 4,913,301 4,913,361 4,913,439 4,913,440 4,913,571 4,913,687 4,913,813 4,913,902 4,914,672
39 4,912,787 4,912,818 4,912,829 4,912,847 4,912,867 4,912,900 4,912,916 4,912,922 4,912,929 4,912,951 4,912,966 4,912,985
4,913,038 4,913,042 4,913,065 4,913,069 4,913,104 4,913,143 4,913,189 4,913,208 4,913,217 4,913,225 4,913,253 4,913,292 4,913,310 4,913,319 4,913,342 4,913,376 4,913,388 4,913,420 4,913,429 4,913,501
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45 4,913,716 4,913,717 4,913,735 4,913,741 4,913,748
47 4,913,772 4,913,781 4,913,782 4,913,823 4,913,828 4,913,867 4,913,988 4,914,060 4,914,138 4,914,157 4,914,166 4,914,232 4,914,345 4,914,354
48 4,914,542
40 4,912,814 4,912,880 4,912,979 4,913,007 4,913,180 4,913,554 4,913,637 4,913,677 4,913,755 4,914,545 4,914,591
41 4,912,801 4,912,892 4,912,982 4,913,205 4,913,279 4,913,411 4,913,639 4,913,740 4,913,931 4,914,280 4,914,431 4,914,506 4,914,601 4,914,618 4,914,726 4,914,732
42 4,912,831 4,912,864 4,912,894 4,912,902 4,912,906 4,912,918 4,912,989 4,913,022 4,913,066 4,913,093 4,913,098 4,913,177 4,913,398 4,913,401 4,913,408 4,913,419 4,913,485 4,913,510 4,913,512 4,913,552 4,913,559 4,913,561 4,913,563 4,913,579 4,913,619 4,913,625 4,913,673 4,913,678 4,913,709 4,913,729 4,913,731 4,913,746 4,913,795 4,913,796 4,913,810 4,913,822 4,913,843
4,913,880 4,913,935 4,913,936 4,913,972 4,914,034 4,914,051 4,914,111 4,914,149 4,914,170 4,914,218 4,914,237 4,914,238 4,914,255 4,914,328 4,914,386 4,914,543 4,914,555 4,914,587 4,914,626 4,914,656 4,914,180 4,914,639 Re.33,192 4,912,914 4,913,193 4,913,194 4,913,952 4,912,810 4,912,955 4,913,101 4,913,127 4,913,200 4,913,462 4,913,480 4,913,617 4,913,666 4,913,979 4,914,024 4,914,179 4,914,215 4,914,624 4,912,778 4,912,873 4,912,893 4,912,938 4,913,053 4,913,070 4,913,096 4,913,111 4,913,145 4,913,228 4,913,229 4,913,231 4,913,238 4,913,239 4,913,245 4,913,252 4,913,308 4,913,357 4,913,463 4,913,464 4,913,465 4,913,469 4,913,591 4,913,598 4,913,614 4,913,630 4,913,661 4,913,758 4,913,801 4,913,819 4,913,919 4,913,958 4,914,037 4,914,045 4,914,046 4,914,053 4,914,061 4,914,068 4,914,069 4,914,072 4,914,118 4,914,130 4,914,132 4,914,134 4,914,176 4,914,183 4,914,185 4,914,253 4,914,268 4,914,317 4,914,399 4,914,407 4,914,433 4,914,514 4,914,568 4,914,569 4,914,573 4,914,578 4,914,584 4,914,629 4,914,695 4,914,717 4,914,739 4,319,492 4,524,217

49	4,913,244		4,912,853		4,914,743		4,913,680		4,913,039		4,913,835
	4,913,247		4,913,137		4,914,748		4,913,693		4,913,049		4,913,841
	4,913,263		4,913,378	53	4,912,860		4,914,019		4,913,109		4,913,943
	4,913,371		4,913,496		4,912,899		4,914,135		4,913,162		4,913,967
	4,913,396		4,913,534		4,912,990		4,914,436		4,913,224		4,914,297
	4,913,778		4,913,594		4,913,139		4,914,539		4,913,264		4,914,383
	4,913,884		4,913,934		4,913,150		4,914,561		4,913,392		4,914,388
	4,913,922		4,913,961		4,913,151		4,914,720		4,913,397		4,914,389
	4,913,990		4,914,066		4,913,297	54	4,912 948		4,913,616		4,914,419
	4,914,577		4,914,109		4,913,389		4,913,402		4,913,671		4,914,589
50	4,913,323		4,914,394		4,913,487		4,914,174		4,913,683		4,914,684
	4,914,740		4,914,422		4,913,505	55	4,912,981		4,913,773		4,914,719
51	4,912,824		4,914,590								

DESIGN PATENTS

01	306,995		306,998	13	306,969		307,050		307,039	46	306,952
	307,014		307,034		306,994	26	306,987		307,048	48	306,930
04	306,999		307,035	17	306,943		306,990		307,065		306,942
06	306,934		307,036		306,972	27	307,017	37	306,938		307,040
	306,944		307,045		307,044	29	307,042		306,963	49	306,948
	306,947		307,047		307,064	33	306,977		306,984	53	307,051
	306,964		307,053	18	306,932	34	306,933	39	306,939	55	306,941
	306,979		307,059		306,936		306,978		306 946		306,955
	306,980		307,067	20	307,028		307,030		307,368		306,959
	306,986	09	306,985	24	306,934		307,054		307,069		306,960
	306,988		307,001		306,975	36	306,949	40	307,015		306,993
	306,991	11	306,940	25	306,931		306,957	41	306,992		
	306,997	12	306,937		307,002		306,973	42	307,031	56	307,043

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	H767	34	H764		H768		H771		H763	48	H758

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April 10, 1990 Volume 1113 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of March 1, 1990, and was announced in the *Official Gazette* at 1111 O.G. 24 on Feb. 20, 1990.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1242.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Jan. 26, 1990

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on April 7, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,654,893 through 4,656,666
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on April 5, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,378,606 through 4,379,348
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years. the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JANUARY 21,1990 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,310,956	06/226,438	1/19/82
4,311,242	06/229,343	1/19/82
4,311,563	06/249,324	1/19/82
4,311,679	06/225,907	1/19/82
4,311,696	06/233,770	1/19/82
4,311,755	06/220,951	1/19/82
4,311,756	06/217,835	1/19/82
4,311,838	06/262,014	1/19/82
4,311,844	06/241,897	1/19/82
4,311,845	06/219,247	1/19/82
4,564,957	06/614,212	1/21/86
4,564,959	06/616,134	1/21/86
4,564,962	06/741,726	1/21/86
4,564,973	06/545,732	1/21/86
4,564,979	06/618,860	1/21/86
4,564,980	06/467,240	1/21/86
4,564,986	06/436,560	1/21/86
4,564,988	06/651,132	1/21/86
4,564,992	06/513,279	1/21/86
4,564,994	06/544,081	1/21/86
4,564,998	06/662,653	1/21/86
4,564,999	06/625,757	1/21/86
4,565,009	06/683,050	1/21/86
4,565,013	06/685,868	1/21/86
4,565,014	06/613,698	1/21/86
4,565,016	06/628,390	1/21/86
4,565,021	06/637,835	1/21/86
4,565,036	06/577,060	1/21/86
4,565,037	06/638,263	1/21/86
4,565,042	06/571,200	1/21/86
4,565,045	06/473,111	1/21/86
4,565,054	06/539,575	1/21/86
4,565,055	06/652,217	1/21/86
4,565,068	06/573,498	1/21/86
4,565,074	06/557,487	1/21/86
4,565,077	06/321,915	1/21/86
4,565,079	06/503,516	1/21/86
4,565,080	06/557,850	1/21/86
4,565,084	06/550,467	1/21/86
4,565,098	06/648,933	1/21/86
4,565,100	06/491,305	1/21/86
4,565,103	06/376,349	1/21/86
4,565,105	06/534,978	1/21/86
4,565,109	06/565,713	1/21/86
4,565,116	06/541,797	1/21/86
4,565,117	06/279,948	1/21/86
4,565,118	06/597,542	1/21/86
4,565,128	06/626,734	1/21/86
4,565,134	06/594,920	1/21/86
4,565,144	06/557,054	1/21/86
4,565,148	06/445,077	1/21/86
4,565,152	06/562,749	1/21/86
4,565,161	06/721,154	1/21/86
4,565,165	06/633,199	1/21/86
4,565,173	06/333,011	1/21/86
4,565,176	06/648,935	1/21/85
4,565,183	06/428,250	1/21/86
4,565,187	06/647,242	1/21/86
4,565,192	06/599,640	1/21/86
4,565,193	06/531,905	1/21/86
4,565,196	06/668,387	1/21/86
4,565,198	06/566,105	1/21/86
4,565,214	06/616,959	1/21/86
4,565,223	06/666,236	1/21/86
4,565,232	06/535,932	1/21/86
4,565,236	06/347,023	1/21/86
4,565,251	06/593,715	1/21/86
4,565,253	06/574,296	1/21/86
4,565,256	06/493,325	1/21/86
4,565,258	06/638,396	1/21/86
4,565,263	06/743,090	1/21/86
4,565,278	06/492,682	1/21/86
4,565,283	06/593,680	1/21/86
4,565,285	06/562,395	1/21/86
4,565,286	06/679,596	1/21/86
4,565,293	06/630,214	1/21/86
4,565,294	06/704,971	1/21/86
4,565,304	06/485,642	1/21/86
4,565,334	06/670,668	1/21/86
4,565,335	06/648,675	1/21/86
4,565,337	06/657,613	1/21/86
4,565,339	06/571,583	1/21/86
4,565,342	06/630,369	1/21/86
4,565,345	06/709,605	1/21/86
4,565,346	06/529,484	1/21/86
4,565,355	06/624,985	1/21/86
4,565,356	06/541,443	1/21/86
4,565,360	06/575,183	1/21/86

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4,565,364	06/634,054	1/21/86
4,565,366	06/576,021	1/21/86
4,565,367	06/515,306	1/21/86
4,565,368	06/522,634	1/21/86
4,565,373	06/626,220	1/21/86
4,565,379	06/691,436	1/21/86
4,565,381	06/603,343	1/21/86
4,565,385	06/570,977	1/21/86
4,565,391	06/588,395	1/21/86
4,565,396	06/710,707	1/21/86
4,565,367	06/649,269	1/21/86
4,565,398	06/659,888	1/21/86
4,565,401	06/621,507	1/21/86
4,565,402	06/545,836	1/21/86
4,565,403	06/579,309	1/21/86
4,565,413	06/577,586	1/21/86
4,565,417	06/708,449	1/21/86
4,565,418	06/689,441	1/21/86
4,565,420	06/543,180	1/21/86
4,565,436	06/549,314	1/21/86
4,565,440	06/603,211	1/21/86
4,565,451	06/653,494	1/21/86
4,565,453	06/674,017	1/21/86
4,565,455	06/573,008	1/21/86
4,565,457	06/281,933	1/21/86
4,565,459	06/615,923	1/21/86
4,565,460	06/586,427	1/21/86
4,565,465	06/573,879	1/21/86
4,565,473	06/579,289	1/21/86
4,565,477	06/617,837	1/21/86
4,565,480	06/415,548	1/21/86
4,565,482	06/427,507	1/21/86
4,565,487	06/413,791	1/21/86
4,565,488	06/544,218	1/21/86
4,565,502	06/708,987	1/21/86
4,565,510	06/694,207	1/21/86
4,565,521	06/498,373	1/21/86
4,565,523	06/493,949	1/21/86
4,565,530	06/557,832	1/21/86
4,565,535	06/632,049	1/21/86
4,565,541	06/601,394	1/21/86
4,565,552	06/669,578	1/21/86
4,565,553	06/614,101	1/21/86
4,565,556	06/456,987	1/21/86
4,565,558	06/642,583	1/21/86
4,565,566	06/752,214	1/21/86
4,565,569	06/494,453	1/21/86
4,565,579	06/545,695	1/21/86
4,565,598	06/527,516	1/21/86
4,565,600	06/492,368	1/21/86
4,565,605	06/476,527	1/21/86
4,565,611	06/729,314	1/21/86
4,565,637	06/562,010	1/21/86
4,565,638	06/534,676	1/21/86
4,565,646	06/584,638	1/21/86
4,565,648	06/523,300	1/21/86
4,565,650	06/633,122	1/21/86
4,565,659	06/543,149	1/21/86
4,565,664	06/476,274	1/21/86
4,565,678	06/680,037	1/21/86
4,565,679	06/661,892	1/21/86
4,565,682	06/698,737	1/21/86
4,565,699	06/515,077	1/21/86
4,565,705	06/711,009	1/21/86
4,565,707	06/731,919	1/21/86
4,565,717	06/543,758	1/21/86
4,565,721	06/379,313	1/21/86
4,565,745	06/649,109	1/21/86
4,565,754	06/621,923	1/21/86
4,565,757	06/562,696	1/21/86
4,565,771	06/525,509	1/21/86
4,565,786	06/599,147	1/21/86
4,565,788	06/624,780	1/21/86
4,565,807	06/512,793	1/21/86
4,565,810	06/603,332	1/21/86
4,565,829	06/679,181	1/21/86
4,565,848	06/478,530	1/21/86
4,565,888	06/691,032	1/21/86
4,565,906	06/696,551	1/21/86
4,565,911	06/521,536	1/21/86
4,565,926	06/564,125	1/21/86
4,565,935	06/400,688	1/21/86
4,565,949	06/672,955	1/21/86
4,565,983	06/493,561	1/21/86
4,565,989	06/547,787	1/21/86
4,565,995	06/524,897	1/21/86
4,566,008	06/393,452	1/21/86
4,566,035	06/476,460	1/21/86
4,566,059	06/516,146	1/21/86
4,566,061	06/532,316	1/21/86
4,566,065	06/487,517	1/21/86
4,566,087	06/613,082	1/21/86
4,566,099	06/510,329	1/21/86
4,566,112	06/580,763	1/21/86
4,566,135	06/564,096	1/21/86

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,543,535, Re. S. N. 06/927,777, Filed Nov. 5, 1986, Cl. 330/53, DISTRIBUTED POWER AMPLIFIER, Yalcin Ayasli, Owner of Record: *Raytheon Co., Lexington, Mass.*, Attorney or Agent: Denis G. Maloney, Ex. Gp.: 252

4,701,388, Re. S. N. 07/486,874, Filed Feb 20, 1990, Cl. 430/209, INSTANT FILM UNIT WITH COLORING MEANS, Kazuyuki Yoshimura, et al., Owner of Record: *Fuji Photo Film Co., Ltd., Minami-Ashigarashi*, Attorney or Agent: Robert J. Patch, Ex. Gp.: 156

4,711,977, Re. S. N. 07/448,041, Filed Dec. 8, 1989, Cl. 178/18, ELECTRONIC BLACKBOARD APPARATUS, Nobuyuki Miyamori, Owner of Record: *Inventor*, Attorney or Agent: Alan M. Lowe, Ex. Gp.: 261

4,746,900, Re. S. N. 07/486,389, Filed Feb. 28, 1990, Cl. 341/133, SIGNAL PROCESSING CIRCUIT, Toshifumi Shibuya, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan*, Attorney or Agent: Carl 1. Brundidge, Ex. Gp.: 217

4,750,250, Re. S. N. 07/488,236, Filed Mar. 2, 1990, Cl. 29/156, METHOD OF FASTENING DRIVE ELEMENTS OF A HOLLOW SHAFT, Wolfgang Maus, et al., Owner of Record: *Emitec Gesellschaft Fur Emissionstechnologie GmbH*, Attorney or Agent: Laurence A. Greenburg, Ex. Gp.: 326

4,788,724, Re. S. N. 07/485,901, Filed Jan. 25, 1990, Cl. 2/422, MOTORCYCLE HELMET MICROPHONE MOUNT AND PLUG MOUNT, John J. Lazzaroni, et al., Owner of Record: *Inventors*, Attorney or Agent: Janelle F. Raupp, Ex. Gp.: 240

4,804,953, Re. S. N. 07/487,482, Filed Mar. 2, 1990, Cl. 340/784, REDUNDANT CONDUCTOR STRUCTURES FOR FILM FET DRIVEN LIQUID CRYSTAL DISPLAYS, Donald E. Castlebury, Owner of Record: *General Electric Co., Schenectady, N.Y.*, Attorney or Agent: Charles L. Moore, Jr., Ex. Gp.: 266

Request for Reexamination Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

4,569,444, Reexam. No. 90/001,948, Requested Feb. 28, 1990, Cl. 209/510, EGG PROCESSING SYSTEM, John C. McEvoy, Owner of Record: *Diamond Automation Inc., Framington, Mich.*, Attorney or Agent: Kenyon & Kenyon, Ex. Gp.: 310, Requester: Apparatenbouw Moba B.V., Barneveld, Netherlands

4,591,689, Reexam. No. 90/001,947, Requested Feb. 26, 1990, Cl. 219/124.340, ADAPTIVE WELDING GUIDANCE APPARATUS, Ronald D. Brown, Owner of Record: *Caterpillar Tractor Co., Peoria, Ill.*, Attorney or Agent: Unknown, Ex. Gp.: 210, Requester: B.V. Optische Industrie de Oude Delft, Delft, Holland

4,621,185, Reexam. No. 90/001,946, Requested Feb. 26, 1990, Cl. 219/124.340, ADAPTIVE WELDING APPARATUS HAVING FULL CONTROL CORRECTION FOR CURVILINEAR WELD GROOVES, Ronald D. Brown, Owner of Record: *Caterpillar Tractor Co., Peoria, Ill.*, Attorney or Agent: Unknown, Ex. Gp.: 210, Requester: B.V. Optische Industrie de Oude Delft, Delft, Holland

4,643,293, Reexam. No. 90/001,949, Requested Mar. 1, 1990, Cl. 198/497, CONVEYOR BELT CLEANER, Robert T. Swinderman, Owner of Record: *Martin Engineering Co., Neponset, Ill.*, Attorney or Agent: Unknown, Ex. Gp.: 310, Requester: Arch Environmental Equipment Co., Inc., Paducah, Ky.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished the Director, Office of Enrollment and Discipline on or before May 2, 1990:

Ammen, Edward S, 1920 Pohick Creek Ct., Woodbridge, Va. 22192
Deck, Randall E., 2810 Ivydale St., Silver Spring, Md. 20902
Erratt, Judy A., 550 Foxview Pl., Ottawa, Ont., K1K 4C4, Canada
Hardcastle, Ian, 224 Avila St., San Francisco, Calif. 94123
Kerr, James W., 97 Fox Mill Crescent, London Ont., N6J 2B6, Canada
Kimms, Lyle K., 1312 S. Pollard St., Arlington, Va 22204
Marquez, Juan C.A., 3627 Malibu Circle, #203, Falls Church, Va. 22041
McDowell, Robert L., 393 Aldrich Rd., Fairport, N.Y. 14450
Rollins, Alton D., 3515 N. Washington Blvd., #504, Arlington, Va. 22201
Smith, Dallas F., 9 Tulane Crescent, Nepean, Ont., K2J 2G2, Canada
Tracey, Emery L., 5828 Covington Ter., Minnetonka, Minn. 55345

CAMERON WEIFFENBACH,
Director of Enrollment and Discipline

Erratum

"Patent No. 4,900,323 to Glen A. Dickson, et al., of Tex. for CHEMICAL METHOD FOR BLEACHING TEXTILES appearing in the Official Gazette of February 13, 1990 issued on February 20, 1990"

Patents Available for License or Sale

4,266,112, WEB-CUTTING PROCESS, William P. Niedermeyer, 1024 Mount Mary Drive, Green Bay, Wis. 54301
4,482,939, DIRECTIONALLY VARIABLE LIGHTING ASSEMBLY, Andrew Tishman, 170 East 88 Street #8B, New York, N.Y. 10128
4,576,178, AUDIO SIGNAL GENERATOR, David Johnson, Box 68, 436 East 69th St., New York, N.Y. 10021
4,702,704, TETRAHEDRAL CODON STEREO-TABLE, Leonard R. Svensson, Birch, Stewart, Kolasch & Birch, 301 N. Washington St., P.O. Box 747, Falls Church, Virginia 22046
4,863,083, SKIS AND BOOTS CARRYING WAIST BELT, Douglas E. White, 101 California St., Suite 980, San Francisco, Calif. 94111

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PATENT NOTICES

Certificates of Correction For Week of April 10, 1990

D. 303,370	4,804,769	4,832,533	4,841,025
4,634,709	4,806,604	4,832,938	4,841,040
4,646,265	4,806,699	4,833,026	4,841,432
4,665,218	4,807,542	4,833,043	4,841,675
4,684,406	4,807,912	4,833,795	4,841,835
4,706,212	4,808,462	4,833,891	4,841,837
4,727,028	4,809,214	4,833,972	4,841,958
4,747,103	4,809,447	4,834,184	4,842,100
4,751,077	4,811,329	4,834,211	4,842,150
4,756,007	4,813,808	4,834,788	4,842,154
4,761,001	4,814,207	4,834,816	4,842,514
4,762,885	4,816,252	4,834,869	4,842,972
4,763,191	4,817,172	4,835,252	4,843,203
4,766,964	4,818,031	4,835,287	4,843,213
4,768,490	4,818,882	4,835,334	4,844,093
4,771,100	4,819,497	4,835,589	4,844,276
4,772,327	4,820,028	4,835,658	4,844,841
4,774,870	4,820,374	4,835,675	4,844,867
4,776,288	4,820,707	4,835,741	4,845,374
4,776,696	4,822,146	4,836,034	4,846,243
4,777,286	4,822,297	4,836,059	4,846,274
4,779,478	4,822,378	4,836,062	4,846,426
4,780,855	4,823,160	4,836,374	4,846,728
4,782,920	4,823,242	4,836,514	4,847,116
4,783,024	4,823,282	4,837,269	4,847,387
4,784,316	4,823,409	4,837,282	4,847,664
4,788,650	4,824,017	4,837,290	4,847,904
4,789,196	4,824,094	4,837,509	4,848,798
4,790,193	4,824,769	4,837,740	4,849,885
4,791,814	4,825,416	4,837,763	4,852,981
4,794,553	4,825,700	4,838,028	4,858,505
4,794,790	4,827,664	4,838,284	4,859,176
4,794,796	4,827,715	4,838,916	4,859,751
4,795,493	4,827,937	4,839,011	4,860,333
4,795,911	4,828,819	4,839,292	4,864,504
4,796,227	4,830,499	4,839,464	4,866,176
4,798,254	4,830,597	4,839,770	4,866,603
4,799,750	4,831,394	4,840,128	4,869,367
4,801,607	4,831,581	4,840,200	4,873,116
4,802,480	4,832,181	4,840,345	4,875,129
4,804,662	4,832,387	4,840,377	4,884,810

Dedication

3,948,797.—*Mary-Louise Vega*, Califon, N.J. PROCESS FOR RESTORATION OF PERFORMANCE OF A CHEMICAL LIGHT SYSTEM. Patent dated Apr. 6, 1976. Dedication filed Dec. 21, 1989, by the assignee, American Cyanamid Company.

Hereby dedicates to the Public all claims of said patent.

Dedication

4,064,064.—*Michael McKay Rauhut*, Bridgewater; *Andrew Milo Semsel*, Somerville, both of N.J. STABILIZATION OF HYDROGEN PEROXIDE SOLUTIONS. Patent dated Dec. 20, 1977. Dedication filed Dec. 21, 1989, by the assignee, American Cyanamid Company.

Hereby dedicates to the Public all claims of said patent.

Disclaimer and Dedication

4,234,447.—*Robert A. Hay, II; Harold E. St. Louis*, both of Midland, Mich. MIXING METHOD AND CONTAINER THEREFOR. Patent dated Nov. 18, 1980. Disclaimer and Dedication filed Dec. 18, 1989, by the assignee, The Dow Chemical Company.

Hereby disclaims and dedicates to the Public all claims of said patent.

Disclaimer and Dedication

4,253,985.—*Harold E. Filter*, Midland; *Keith Roberson*, Freeland, both of Mich. PROCESS FOR HANDLING AND SOLIDIFICATION OF RADIOACTIVE WASTES FROM PRESSURIZED WATER REACTORS. Patent dated Mar. 3, 1981. Disclaimer and Dedication filed Dec. 18, 1989, by the assignee, The Dow Chemical Company.

Hereby disclaims and dedicates to the Public all claims of said patent.

Disclaimer and Dedication

4,284,751.—*Jack W. Hutt*, Tarzana; *Fernando E. Blanco*, Arleta, both of Calif. POLYURETHANE SEALANT SYSTEM. Patent dated Aug. 18, 1981. Disclaimer and Dedication filed Dec. 18, 1989, by the assignee, Essex Chemical Corporation.

Hereby disclaims and dedicates to the Public the remaining term of said patent.

Disclaimer and Dedication

4,400,313.—*Keith Roberson*, Freeland; *Harold E. Filter*, Midland, both of Mich. PROCESS FOR WASTE ENCAPSULATION. Patent dated Aug. 23, 1983. Disclaimer and Dedication filed Dec. 18, 1989, by the assignee, The Dow Chemical Company.

Hereby disclaims and dedicates to the Public all claims of said patent.

Disclaimer and Dedication

4,405,512.—*Harold E. Filter; Stevens S. Drake*, both of Midland, Mich. PROCESS FOR ENCAPSULATING RADIOACTIVE ORGANIC LIQUIDS IN A RESIN. Patent dated Sept. 20, 1983. Disclaimer and Dedication filed Dec. 18, 1989, by the assignee, The Dow Chemical Company.

Hereby disclaims and dedicates to the Public all claims of said patent.

Disclaimer and Dedication

4,410,989.—*Elwyn R. Berlekamp*, Berkeley, Calif. BIT SERIAL ENCODER. Patent dated Oct. 18, 1983. Disclaimer and Dedication filed Dec. 22, 1989, by the assignee, Cyclotomics, Inc.

Hereby disclaims and dedicates to the Public all claims of said patent.

Disclaimer and Dedication

4,459,211.—*Pietro T. Carini*, Horgen, Switzerland. PROCESS FOR WASTE ENCAPSULATION. Patent dated July 10, 1984. Disclaimer and Dedication filed Dec. 18, 1989, by the assignee, The Dow Chemical Company.

Hereby disclaims and dedicates to the Public all claims of said patent.

Disclaimer and Dedication

4,459,212.—*Pietro T. Carini*, Horgen, Switzerland. PROCESS FOR WASTE ENCAPSULATION. Patent dated July 10, 1984. Disclaimer and Dedication filed Dec. 18, 1989, by the assignee, The Dow Chemical Company.

Hereby disclaims and dedicates to the Public all claims of said patent.

Disclaimer and Dedication

4,633,470.—*Lloyd R. Welch*, La Canada; *Elwyn R. Berlekamp*, Berkeley, both of Calif. ERROR CORRECTIONS FOR ALGEBRAIC BLOCK CODES. Patent dated Dec. 30, 1986. Disclaimer and Dedication filed Dec. 22, 1989, by the assignee, Cyclotomics, Inc.

Hereby disclaims and dedicates to the Public all claims of said patent.

Disclaimer and Dedication

4,647,213.—*Robert A. Hay, II*, Midland, Mich. WASTE DISPOSAL APPARATUS. Patent dated Mar. 3, 1987. Disclaimer and Dedication filed Dec. 18, 1989, by the assignee, The Dow Chemical Company.

Hereby disclaims and dedicates to the Public all claims of said patent

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	Sunnyvale Patent Clearinghouse	(408) 730-7290
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New Jersey	Newark Public Library	(201) 932-2895
	Piscataway: Library of Science and Medicine, Rutgers University	(505) 277-4412
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North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(513) 369-6936
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	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF February 24, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	7-7-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-5-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	1-13-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX,Director	11-9-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	2-11-88
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 STEWART LEVY, Acting Director	11-17-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	10-21-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	6-23-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	5-19-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-2-89

Expiration of patents: The patents within the range of numbers indicated below expire during February 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,714,668 to 3,718,936 inclusive
Plant Patents ..... 3,297 to 3,313 inclusive

REEXAMINATIONS

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Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,842,432 (1242nd)

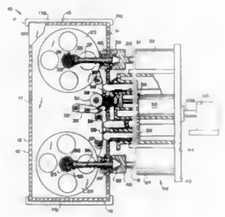
MAGNETIC TAPE TRANSDUCING SYSTEM

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Reexamination Request No. 90/001,607, Sep. 26, 1988.
Reexamination Certificate for Patent No. 3,842,432, issued Oct. 15, 1974, Ser. No. 449,602, Mar. 11, 1974.
Continuation-in-part of Ser. No. 295,807, Oct. 10, 1972, which is a continuation of Ser. No. 224,131, Feb. 7, 1972, Pat. No. 3,699,266, which is a continuation-in-part of Ser. No. 142,748, Aug. 28, 1961, Pat. No. 3,646,258, which is a division of Ser. No. 515,417, Jun. 14, 1955, Pat. No. 3,003,109.

Int. Cl.[4] G11B *5/54, 19/20*

U.S. Cl. 360—105



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–4 are cancelled.

[1. A magnetic transducing apparatus comprising in combination:

a magazine containing magnetic tape and including supply and take-up means for a length of elongated magnetic tape;

said magazine having sidewalls and end walls surrounding said tape,

an opening in an end wall of said magazine,

means for guiding a portion of said tape in a fixed path past said end wall opening,

a first cylindrical member rotatably supported behind said portion of said tape which is guided in said fixed path,

a second cylindrical member,

a magnetic transducer,

a common support for supporting said second cylindrical member and said magnetic transducer,

a base having means for removably and predeterminately supporting said magazine at a location on said base whereby said second cylindrical member and said magnetic transducer are in direct alignment with said end wall opening in said magazine,

means for guiding said common support in movement towards and away from said magazine along a path wherein said transducer may engage said portion of said tape disposed at said end wall opening and may clear said magazine,

power operated means for driving said common support from a first location wherein said second cylindrical member is out of operable contact with said tape and is disposed away from said magazine to a second location wherein said second cylindrical member is engaged against and is pinching said tape against said first cylindrical member and said transducer simultaneously engages said tape,

means for causing said transducer to move towards and operatively engage said portion of said tape aligned with said opening in said end wall of said magazine, and

means for power rotating one of said first and second cylindrical members when said first and said second cylindrical members are engaging and pinching tape therebetween to drive said tape between said supply and said take-up means.]

B1 3,872,462 (1243rd)

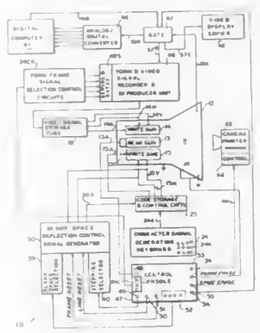
FORM FILLING SYSTEM AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Reexamination Request No. 90/001,652, Nov. 29, 1988.
Reexamination Certificate for Patent No. 3,872,462, issued Mar. 18, 1975, Ser. No. 333,119, Feb. 16, 1973.
Continuation-in-part of Ser. No. 225,173, Aug. 27, 1962, Pat. No. 4,213,163, and a continuation-in-part of Ser. No. 325,934, Jan. 22, 1972.

Int. Cl.[4] G06F *3/153*

U.S. Cl. 340—705



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 3–7, 10–12, 15 and 16 is confirmed.

Claims 1, 2, 8, 9, 13 and 14 are cancelled.

[1. A system for generating forms comprising:

a viewing screen,

first means for generating an image on said screen of a form containing fixed information and having locations indicated therein where it is desired to provide variable information,

second means for generating images of characters on said screen,

third means for electrically controlling said second means to generate selected character images along selected portions of said screen defining said locations of said form where it is desired to provide variable information so as to generate a composite monitorable image on said screen composed of said fixed and variable information, and

fourth means for scanning the information defined by said

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composite image and generating information defining said fixed and variable information in another form.]

6. A system in accordance with claim 1 wherein said first means comprises an image writing cathode ray tube having a viewing screen and a write-beam generating and deflection control means, and first input means to said beam generating and deflection control means, means for generating a full-frame video picture signal of an incompleted form and applying same to said first input means to intensity modulate and deflection control said write-beam generating and deflection control means so as to cause the write-beam to generate an image of a form on said screen, said second means comprising a keyboard having a plurality of manually actuatable keys and signal generating means associated with the keys of said keyboard for generating character information signals, means for applying said character information signals to said write-beam generating and deflection control means to generate characters on said screen, and selectively operable auxiliary means for predeterminately locating the write-beam of said cathode ray tube at a first location of said screen defining the start of an area along which area variable character information is to be written as characters by said write-beam, said selectively operable auxiliary means being operable after predetermined characters have been selectively written on said screen for predeterminately locating said write-beam at a selected location defining the start of a new area of said screen along which further variable information is to be displayed.

B1 3,976,295 (1244th)
GAME BALL
Jesse H. Heald, Jr., Tullahoma, Tenn., assignor to Lannom Manufacturing Co. Inc.
Reexamination Request No. 90/001,755, Apr. 20, 1989.
Reexamination Certificate for Patent No. 3,976,295, issued Aug. 24, 1976, Ser. No. 659,705, Feb. 20, 1976.
Continuation of Ser. No. 487,203, Jul. 10, 1974, abandoned.
Int. Cl.[4] A63B *37/00*
U.S. Cl. 273—60 R

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–15** is confirmed.

1. A composite ball having the appearance, physical characteristics and dimensions of a conventional baseball including a cork and rubber center, yarn windings, and a leather cover comprising a spherical core member formed of flexible and resilient molded polyurethane foam and a cover portion comprising a leather member stitched over and enclosing said core member wherein said core member is formed of polyurethane foam of such density and resilience as to give said composite ball essentially the same rebound qualities, hardness, size, feel and sound as said conventional baseball so as to be usable in organized league play of baseball under the rules of baseball.

B1 4,335,271 (1245th)
ELECTRICAL BOX
Joseph Hasibeck, West Vancouver, Canada, assignor to Hubbell Incorporated
Reexamination Request No. 90/001,734, Mar. 27, 1989.
Reexamination Certificate for Patent No. 4,335,271, issued Jun. 15, 1982, Ser. No. 113,850, Jan. 21, 1980.
Claims priority, application Canada, Feb. 20, 1979, 321962
Int. Cl.[4] H02G *3/08*
U.S. Cl. 174—65 R

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **7** are determined to be patentable as amended.

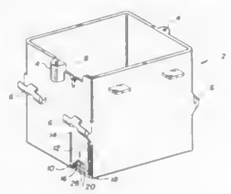
Claims **2–6**, dependent on an amended claim, are determined to be patentable.

New claims **8** and **9** are added and determined to be patentable.

1. An electrical box molded in one piece from a plastic material and comprising:

a cable inlet opening formed in the box;

a *plastic* flap *integrally molded with said box and* positioned within the opening and resiliently hingely mounted at a



first edge of the opening to tend to resile to the closed position;

stops positioned within the box to restrict the inward movement of the flap;

an indent in the edge of the flap, remote from the hinged mount, to contact and grip a cable when such a cable is positioned in the inlet opening; *and*

a lip projecting into the box from that edge of opening remote from the first edge of the opening, the flap acting to force the cable against the lip; **[**and**]**

the edge of the opening adjacent said indent being substantially non-deformable by a cable forced into the inlet;

wherein said flap and said lip coact to substantially close off said inlet opening when said cable is in said inlet.

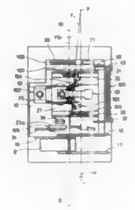
B1 4,349,601 (1246th)
PROTECTIVE SKIN ON INTRICATELY MOLDED PRODUCT
Walter H. Brueggemann, Chagrin Falls, and John A. Brenner, Independence, both of Ohio, assignors to Ferro Corporation, Cleveland, Ohio
Reexamination Request Nos. 90/000,732, Mar. 1, 1985 and 90/001,277, Jul. 1, 1987.
Reexamination Certificate for Patent No. 4,349,601, issued Sep. 14, 1982, Ser. No. 106,032, Dec. 21, 1979.
Division of Ser. No. 2,658, Jan. 11, 1979, Pat. No. 4,205,028.
Int. Cl.[4] B29C *41/08;* **B29D** *9/00;* **B29K** *67/00*
U.S. Cl. 428—323

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1 to 8 are cancelled.

[1. A molded product comprising an inner body of an organic thermosetting resin and a substantially continuous resinous film or skin substantially covering said body and comprising a polyester resin that is cross-linked and chemically reacted with said organic resin, said product having intricate, curving surface contours and said film being smooth and free of surface tears and blemishes.**]**

B1 4,411,128 (1247th)
METHOD AND APPARATUS FOR SPLICING SPUN YARNS
Hiroshi Mima, Joyo, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan
Reexamination Request No. 90/001,801, Jun. 26, 1989.
Reexamination Certificate for Patent No. 4,411,128, issued Oct. 25, 1983, Ser. No. 304,348, Sep. 23, 1981.
Claims priority, application Japan, Sep. 26, 1980, 55-134986
Int. Cl.[4] D01H *15/00*
U.S. Cl. 57—22



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **1** is confirmed.

Claims **2**, **5** and **9** are determined to be patentable as amended.

Claims **3**, **4** and **6–8**, dependent on an amended claim, is determined to be patentable.

New claims **10** and **11** are added and determined to be patentable.

1. A method for splicing spun yarns in an automatic winder by sucking yarn ends on both the bobbin and package side into yarn end control nozzles respectively, inserting yarn ends into a yarn splicing nozzle and being subjected to an air jet to splice them in the yarn splicing nozzle, characterized in that the sucking action of the yarn end control nozzle is stopped when or after the treatment of the yarn ends is completed, and then a compressed fluid is jetted from the splicing nozzle to effect splicing.

B1 4,509,773 (1248th)
PUMP-MECHANICAL SEAL CONSTRUCTION WITH AXIAL ADJUSTMENT MEANS
Robert S. Wentworth, Murrieta, Calif., assignor to BW/IP International, Inc.
Reexamination Request No. 90/001,680, Dec. 28, 1988.
Reexamination Certificate for Patent No. 4,509,773, issued Apr. 9, 1985, Ser. No. 608,527, May 9, 1984.
Int. Cl.[4] F16J *15/38*
U.S. Cl. 277—82

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–4** are cancelled.

Claim **5** is determined to be patentable as amended.

Claim **6**, dependent on an amended claim, is determined to be patentable.

New claims **7**, **8** and **9** are added and determined to be patentable.

5. A pump-mechanical seal assembly **[**as recited in claim 4, further**]** comprising:

a pump housing;

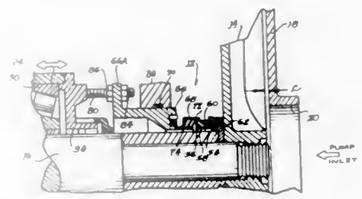
a rotating assembly in said housing comprising a shaft, a pump impeller connected to said shaft and a bearing supporting said shaft;

means supporting said bearing;

said rotating assembly and said means supporting said bearing having a fixed spacial relationship and being axially movable with respect to said housing to adjust a spacing of the impeller and the housing;

means permitting axial movement of said rotating assembly and said means supporting said bearing with respect to said housing;

a mechanical seal assembly operatively associated with said rotating assembly and axially movable therewith positioned between said impeller and said means supporting said bearing; said means supporting said bearing comprising a cylindrical bracket; said mechanical seal assembly comprising a pair of seal rings surrounding said shaft with seal faces opposing one another, one seal ring being rotatable with said shaft and said impeller and the other seal ring being stationary and connected to said means supporting said bearing;



a cylindrical sleeve member positioned between said stationary seal ring and said bracket and forming the connection therebetween;

means for applying a resilient force to said stationary seal ring to urge it toward said rotatable seal ring and thereby determine the setting of said seal assembly;

means to initially locate said stationary seal ring with respect to said rotatable seal ring and to adjust the force applied comprising bolt means extending from said bracket and received in said sleeve member and nut means on said bolt means positioning the sleeve member with respect to the bracket;

said means for applying said resilient force including means connecting said stationary seal ring to said means supporting said bearing; and

means for sealing said stationary seal ring to said housing, while permitting axial movement of said rotating assembly and said means supporting said bearing with respect to said housing without change of the setting of said mechanical seal assembly.

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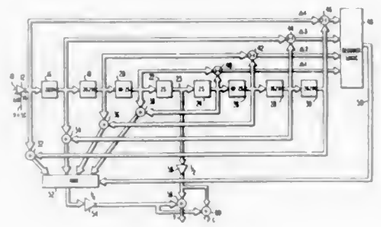
B1 4,626,895 (1249th)

SAMPLED DATA VIDEO SIGNAL CHROMINANCE/LUMINANCE SEPARATION SYSTEM

Glenn A. Reitmeier, Trenton, N.J., assignor to RCA Licensing Corporation, Princeton, N.J.

Reexamination Request No. 90/001,724, Mar. 1, 1989.
Reexamination Certificate for Patent No. 4,626,895, issued Dec. 2, 1986, Ser. No. 736,970, May 22, 1985.
Continuation-in-part of Ser. No. 639,094, Aug. 9, 1984, abandoned.
Int. Cl.[4] H04N *9/64*
U.S. Cl. 358—31



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 5–7, 9 and 11–15 is confirmed.

Claims 1–4, 8 and 10 are cancelled.

New claims 16, 17 and 18 are added and determined to be patentable.

11. A system for separating the video signal components from composite video signal comprising:

a signal input port for applying said composite video signal;

a plurality of cascade connected delay elements serially connected with said signal input port, having a central output tap and pairs of further output taps, said central output tap being disposed centrally between the taps of each pair;

filter means coupled to each output tap for attenuating the relatively higher frequency spectrum of composite video signal;

a plurality of signal differencing means respectively coupled to the filter means of each of said pairs of taps and to said center tap for producing signals corresponding to the magnitude of the differences of the average of signal from respective pairs of taps and said center tap;

decoder circuitry coupled to said plurality of signal differencing means and responsive to said magnitudes for generating control signals indicating the pair of taps that produce the smallest difference;

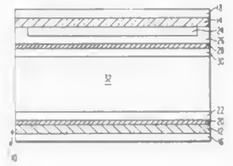
means responsive to said control signals and coupled to said taps for producing an output signal corresponding to one of said video signal components, said output signal being the linear combination of signal from said center tap and signals from one of said pairs of taps.

B1 4,726,659 (1250th)

DISPLAY DEVICE HAVING DIFFERENT ALIGNMENT LAYERS

Neal D. Conrad, Ewing Township, Mercer County; Sandra K. McClelland, Bordentown Township, Burlington County, and William R. Roach, Rocky Hill, all of N.J., assignors to RCA Corporation

Reexamination Request No. 90/001,718, Feb. 21, 1989.
Reexamination Certificate for Patent No. 4,726,659, issued Feb. 23, 1988, Ser. No. 832,214, Feb. 24, 1986.
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—341



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–8 are cancelled.

[1. A display device comprising:
first and second opposing substrates having first and second electrodes respectively thereon; and
first and second alignment layers overlying said first and second electrodes, respectively, each of said first and second alignment layers comprising a different material.]

B1 4,769,435 (1251st)

PROCESS FOR THE MANUFACTURE OF THERMOPLASTIC POLYURETHANES

Gianflavio Lunardon, Padua; Lino Credali, Casalecchio di Reno; Ermanno Benetti, Mirano, and Carlo Mulas, Mestre, all of Italy, assignors to Ausimont S.p.A., Milan, Italy

Reexamination Request No. 90/001,715, Feb. 13, 1989.
Reexamination Certificate for Patent No. 4,769,435, issued Sep. 6, 1988, Ser. No. 74,353, Jul. 16, 1987.
Claims priority, application Italy, Jul. 21, 1986, 21193 A/86
Int. Cl.[4] C08G *18/30*
U.S. Cl. 528—28

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 6 is cancelled.

Claims 1 and 7 are determined to be patentable as amended.

Claims 2–5 and 8–13, dependent on an amended claim, are determined to be patentable.

1. A process for the manufacture of thermoplastic polyurethanes showing improved physical properties, by reacting [an organic polyisocyanate] *toluene diisocyanate* with a polyol reactive with said [polyisocyanate] *toluene diisocyanate* having an average functionality at least equal to 2 and a molecular weight higher than 400 in the presence of a chain extending agent having a molecular weight lower than 400, characterized in that the reaction is carried out under continuous stirring, at a temperature higher than 150° C., [at least in the final step of the process] *before the shaping and curing of the product*, and for a time sufficient to obtain a product having a melt flow

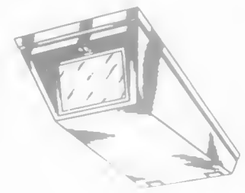
index (MFI) lower than 25 g/10' (at 200° C. and 2.16 kg), wherein the reaction temperature is from 200° to about 250° C., and wherein the mixture of the organic compounds (polyols+-chain extending agent) containing hydrogen reactive with the isocyanate, according to the Zerewitinoff method, has a molecular weight lower than 500.

B1 Des. 273,012 (1241st)

SURVEILLANCE CAMERA HOUSING

Edward Kozloski, Babylon Village, N.Y., assignor to Vicon Industries, Inc., Plainview, N.Y.

Reexamination Request No. 90/001,597, Sep. 2, 1988.
Reexamination Certificate for Patent No. Des. 273,012, issued Mar. 31, 1984, Ser. No. 325,488, Nov. 27, 1981.
U.S. Cl. D16—203



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT

The patentability of the claim is confirmed.

REISSUES

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,194

[ADJUSTABLE ORTHOPEDIC SHOE FOR TREATING FOOT MALFORMATIONS IN INFANTS] *ORTHOPEDIC DEVICE FOR ALIGNING JOINTS*

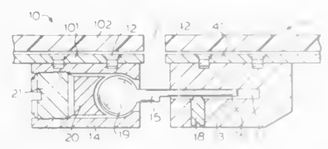
Thierry Marck, Le Clos des Bax Quai Warrens, and Gerard M. Dumoutier, 13 Rue des Allobroges, both of 74700 Sallanches, France

Original No. 4,608,970, dated Sep. 2, 1986, Ser. No. 711,571, Jul. 2, 1984. Application for reissue Sep. 2, 1988, Ser. No. 239,694

Claims priority, application France, Jul. 4, 1983, 83 11779

Int. Cl.[4] A61F *5/00*

U.S. Cl. 128—80 J **9 Claims**



1. An orthopedic shoe for correcting foot malformations in infants, comprising:

(a) a rigid [posterior] *first* part;

(b) a rigid [anterior] *second* part [separate] *separated* from said [posterior] *first* part *by a clearance without overlapping*;

(c) a connecting [piece] *rod* interconnecting and securing with respect to one another said [posterior] *first* and [anterior] *second* parts, said connecting [piece being in the form of a] rod having [a first end associated with said posterior part and a second end associated with said anterior part; and,

(d) means associated with said rod which, without deforming the rod, permits relative displacement with at least three degrees of freedom of said posterior and anterior parts and which is securable to immobilize said parts in position] *at its both ends a spherical part which cooperates with a spherical cup disposed in the one of said rigid first or second parts associated with said rod end and forming a ball and socket joint therein.*

Re. 33,195

FABRICS FOR PAPERMAKING MACHINES

Robert L. McDonald, and Frank Biasone, both of Appleton, Wis., assignors to Asten Group, Inc., Charleston, S.C.

Original No. 4,184,519, dated Jan. 22, 1980, Ser. No. 931,290, Aug. 4, 1978. Application for reissue Jul. 21, 1980, Ser. No. 170,403

Int. Cl.[4] D03D *15/00*; **D21F** *1/10*; **B01D** *39/10*

U.S. Cl. 139—425 A **13 Claims**

1. A papermaking fabric comprising interwoven first machine direction and second cross-machine direction strands, the improvement in which the fabric constitutes a five-shed weave pattern wherein at least said second strands are woven in a repetitive pattern of passing [at cross-over points] under at least three adjacent first strands and then passing [at cross-over points] over at least two next adjacent first strands *and adjacent parallel second strands are offset one strand in the repetitive pattern* so as to form a § *twill* type weave pattern, said second strands at one surface of the fabric being exposed [between said cross-over points thereat] as knuckles each having a length equal to [a group of five] *said at least three* adjacent first strands to thereby render said one surface substantially rough and wear resistant, and said second strands at the opposite surface of the fabric being exposed [between said cross-over points thereat] as knuckles each having a length equal to [a group of four] *said at least two next* adjacent first strands to

thereby render said opposite surface likewise substantially rough and wear resistant, whereby the fabric at both said surfaces has improved paper pick-up characteristics as well as an improved working life.

Re. 33,196

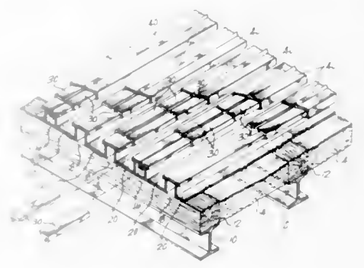
RECIPROCATING CHANNEL FLOOR CONVEYOR

Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741

Original No. 4,611,708, dated Sep. 16, 1986, Ser. No. 680,070, Dec. 10, 1984. Application for reissue Aug. 29, 1988, Ser. No. 238,537

Int. Cl.[4] B65G *25/04*

U.S. Cl. 198—750 **44 Claims**



36. A reciprocating floor conveyor for moving garbage or a like material, comprising:

a plurality of laterally spaced apart support beams;

a plurality of slide bearings on said support beams, each said slide bearing including a top part situated above its support beam;

a plurality of floor members, said floor members being mounted on said support beams, each floor member comprising a top and a pair of sidewalls depending from opposite side edges of the top, wherein the tops of the floor members rest on the top parts of the slide bearings;

said support beams and said slide bearings supporting the floor members for movement in one direction to convey the material, and individual retraction in the opposite direction,

a bottom wall portion between adjacent support beams;

an open channel space defined above the bottom wall portion,

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and by and between adjacent sidewalls of adjacent pairs of floor members, each open channel space being closed at its bottom; and

each said open channel space being wide enough to allow the material being conveyed to enter into it and being narrow enough so that the material in the open channel space will be moved by contact with the sidewalls of the floor members bounding the space during movement of the floor members in the material-conveying direction.

Re. 33,197

VIBRATOR WAVE SOLDERING

Carlos A. Deambrosio, Montreal, Canada, assignor to Electrovert Limited, Ontario, Canada

Original No. 4,684,056, dated Aug. 4, 1987, Ser. No. 830,962, Feb. 19, 1986. Application for reissue Apr. 15, 1988, Ser. No. 182,479

Claims priority, application United Kingdom, May 3, 1985, 8511280

Int. Cl.[4] B23K *31/02*

U.S. Cl. 228—180.1 **39 Claims**

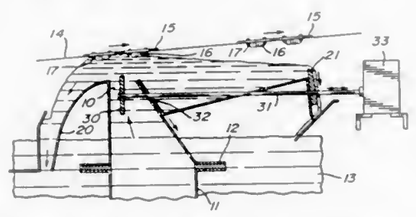
21. An apparatus for wave soldering surface mounted devices on a *prefluxed* printed wiring board comprising:

a reservoir adapted to contain molten solder;

a discharge nozzle facing upwards positioned above the reservoir;

pump means for forming a solder wave *having a predetermined configuration* from the nozzle;

means for moving the wiring board in a path so the underside of the wiring board passes through the solder wave; and



oscillating means to produce oscillations in the solder wave *in the range of about 20 to 400 Hz* during the passage of the wiring board therethrough, *the oscillations not substantially chonging the predetermined configuration of the solder wave.*

PLANT PATENTS

GRANTED APRIL 10, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,214

ROSE PLANT — AUSBUFF

David C. H. Austin, Albrighton, England, assignor to David Austin Roses, Albrighton, England

Filed Oct. 18, 1988, Ser. No. 259,277

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—1 **1 Claim**

1. A new and distinct variety of rose plant of the shrub class, characterized as to novelty by its fully double, soft apricot-yellow flowers with abundant and continual blooming the unusual blend of colouring and shaping of the flower being substantially as shown and described.

7,215

ROSE PLANT 'AUSCOT'

David C. H. Austin, Albrighton, England, assignor to David Austin Roses, Albrighton, England

Filed Oct. 18, 1988, Ser. No. 259,281

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—1 **1 Claim**

1. A new and distinct variety of rose plant of the shrub class, characterised as to novelty by its fully double, apricot-yellow flowers with abundant and continual blooming the unusual blend of colouring and shaping of the flower being substantially as shown and described.

7,216

FLOWERING CRAB APPLE TREE

John L. Fiala, Medina, Ohio, assignor to J. Frank Schmidt & Son Co., Boring, Oreg.

Filed Apr. 19, 1988, Ser. No. 183,708

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of flowering crab apple tree substantially as herein shown and described, characterized particularly as to novelty by its large, white, double flowers and yellow fruit.

7,217

***ACER PALMATUM* "CRIMSON PRINCE"**

William Flemer, III, Princeton, N.J., assignor to Newplant Associates, Princeton, N.J.

Filed Jun. 13, 1988, Ser. No. 206,411

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—51 **1 Claim**

1. An *Acer palmatum* tree substantially as herein shown and described, characterized particularly as to novelty by its deeper red summer color, stronger growth, growing one third taller and broader than sister "Bloodgood" grafts of the same age, greater cold hardiness than other purple leafed *Acer palmatum* clones and resistance to injury by cold winters as compared with other clones than suffer from considerable tip die-back of a previous summer's growth.

7,218

***ERYNGIUM PLANUM* PLANT NAMED FLUELA**

Floris Vletter, Rijnsburg, Netherlands, assignor to Gebr. Vletter & J.A. den Haan, Netherlands

Filed Oct. 21, 1988, Ser. No. 260,694

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of *Eryngium planum* named Fluela, as illustrated and described.

7,219

LILIUM "ETCHINGS"

Judith Freeman-McRae, Boring, Oreg., assignor to Columbia-Platte Lilies, Inc., Boring, Oreg.

Filed Dec. 16, 1988, Ser. No. 286,752

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described, characterized by its high resistance to disease; its tolerance of virus; its vigorous growth and rapid natural propagation; the excellence of its flower form; and in particular by its exceptionally large and broad-tepalled flowers of pale cream to pure white enriched by delicate "etched" spotting at the tepal base, a color pattern and form unique among Asiatic hydrid lilies suited to forcing and to mass commercial cultivation.

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GRANTED APR. 10, 1990

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004-612	4,914,770
073-038	4,914,810
049-025	4,914,859
056-018	4,914,894
056-001	4,914,909
074-574	4,914,949
475-071	4,914,978
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357-015 4,916,716
379-088 4,916,726
382-059 4,916,740

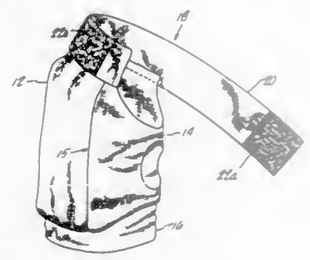
GRANTED APRIL 10, 1990

GENERAL AND MECHANICAL

4,914,752
TEMPERATURE-REGULATED GARMENT UTILIZING A VORTEX TUBE
Thomas L. Hinson, Dix Hills, N.Y., and William A. Blackburn, Chapel Hill, N.C., assignors to Abandaco, Inc., Decatur, Ala.
Filed Jan. 27, 1989, Ser. No. 303,539
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—2 12 Claims

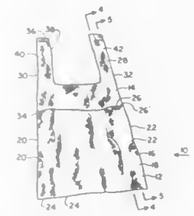
1. A garment for receiving temperature-regulated air from an external air source, comprising:
(a) an outer impermeable, protective torso covering layer having an interior surface, an exterior surface, a neck area, a waist area and an orifice;
(b) a single diffuser layer having; peripheral edges, said edges attached to the interior surface of said outer covering layer, said diffuser layer extending around a wearer's torso and coextensive with the outer covering layer at least from approximately the shoulder regions to the waist area, said diffuser layer being made of a diffuser material; and
(c) a means of attachment of the orifice to an exit port of a vortex tube, said vortex tube connectable to the external air source.

4,914,753
ATHLETIC KNEE PAD
Cheng-Shung Chang, #43, Alley 18, Lane 131, Tahu Street, Taipei, Taiwan
Filed Jul. 8, 1988, Ser. No. 217,007
Int. Cl.[4] A41D *13/06*
U.S. Cl. 2—24 6 Claims



3. An athletic knee pad comprised of:
a padded front section;
an elastic rear section wherein said padded front section and elastic rear section are joined together to form an elongated sleeve;
an elastic lower sleeve connected to the bottom of the elongated sleeve, said lower elastic sleeve being of a smaller diameter than the elongated sleeve; and
an elastic strap, one end of which is connected to the knee pad, said elastic strap including fastening means for fastening the free unconnected end of the strap to the end of the strap connected to the knee pad.

4,914,754
DISPOSABLE CAP AND CAPE FOR CHEMICAL PROCESSING OF HAIR
Michael Ruth, 12130 Ventura Blvd., Studio City, Calif. 91604
Filed Sep. 12, 1988, Ser. No. 243,461
Int. Cl.[4] A41D *23/00, 27/00*
U.S. Cl. 2—174 12 Claims



1. A disposable cap and cape, comprising:
a first flexible sheet having first and second sides and first and second ends;
a second flexible sheet having first and second sides and first and second ends;
as third flexible sheet having first and second sides, first and second ends, and a cut between said sides extending from said second end toward said first end defining a first tie between said first side and said cut and a second tie between said cut and said second side;
said first sides of said first and second sheets coupled together;
said second sides of said first and second sheets coupled together;
said first ends of said first and second sheets coupled together; and
said first end of said third sheet coupled to said second end of said first sheet.

4,914,755
LETTER AND FIGURE CAP
Robert L. Motley, P.O. Box 369, Madison, Conn. 06443
Filed Dec. 29, 1988, Ser. No. 291,775
Int. Cl.[4] A42C *5/00*
U.S. Cl. 2—185 R 4 Claims

1. An article of headwear comprising a peripheral crown portion adapted to receive and be mounted on the crown portion of the head of a wearer, said crown portion including an annular lower end opening downwardly to provide access into the interior of the crown portion, said crown portion including a top member at the upper end thereof, and indicia supported from the crown portion in the form of letters, numerals, symbols and the like, said crown portion being continuous from the open lower end to the top member, and a peripheral brim supported from the crown portion adjacent the open lower end thereof, said brim forming means supporting the letters, numerals, symbols and the like, said brim including upper and lower layers spaced vertically from each other around the peripheral edge thereof, said indicia including a plurality of indicia forming members having a peripheral por-

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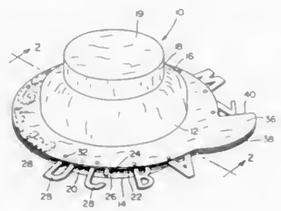
tion pivoted between the layers of the brim for movement of the indicia forming members between a concealed position totally between the layers of the brim and a revealed position



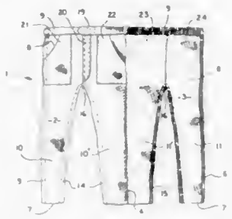
having the major portion thereof extending laterally outwardly from the brim to enable observation of the indicia forming members, said indicia forming members being in the form of letters, numerals, symbols and the like.

4,914,756

ARTICLE OF CLOTHING FOR THE HANDICAPPED

Betty Grassick, 19279 Arrowhead La., North Ft. Myers, Fla. 33903

Filed Feb. 3, 1989, Ser. No. 305,776
Int. Cl.[4] A41D *1/06*
U.S. Cl. 2—227 **6 Claims**



1. A one-piece garment adaptable for self-donning and for donning by another onto a wearer having difficulty executing normal dressing movements comprising, in combination:

a first panel having a waistband section, a hip portion and leg sections applicable to the front of a wearer's lower body;

a second panel having a waistband section, a hip portion and leg sections applicable to the rear of the wearer's lower body;

said first panel being integral with and permanently joined to said second panel by a seam extending vertically along the entire length of an integral edge of the panels to define an outer seam of the garment;

a continuous strip of cooperating fastening material permanently affixed vertically along the entire length of an outer border of each of said first and second panels for releasably connecting corresponding sections of the panels to form an opposite outer seam of the garment; and

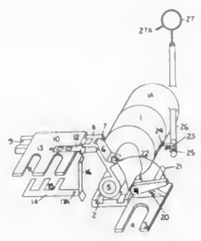
a continuous strip of cooperating fastening material permanently affixed along interior borders of said leg sections of each of said first and second panels for releasably joining corresponding sections of the panels to form leg inseams and a crotch area of the garment in a completed configuration.

4,914,757

AUTOMATIC TOILET LID/SEAT CONTROL DEVICE

Ortz W. Johnson, 7086 Butterwood Dr., Cincinnati, Ohio 45241

Filed Jan. 6, 1989, Ser. No. 294,105
Int. Cl.[4] E03D *9/02;* **A47K** *13/10;* **F16F** *9/14*
U.S. Cl. 4—224 **10 Claims**



1. In a toilet apparatus for use with domestic toilets, the combination of a horizontal cylindrical housing slidably attached to a mounting assembly adapted to be secured to the toilet bowl, said housing comprising a liquid filled chamber defined by a first side wall bound by first and second end walls of said housing, said chamber including a pressure barrier wall sealingly secured to said end walls and along a length of said side wall, said pressure barrier wall extending radially inward between said side wall and the longitudinal axis of said housing; a lid control shaft sealingly and rotatably attached to said first end wall and extending along said longitudinal axis through an aperture in said second end wall terminating in a free end portion of said shaft, said shaft being in sealing engagement with said pressure barrier wall and including sealing means for sealing engagement with said second end wall, said shaft further including a liquid flow inhibitor blade extending radially from said shaft and in sealing engagement with said end walls and said side wall, said blade being fitted with a bleed port and a check valve, said free end portion of said shaft having cam means mounted thereto for operating toilet bowl disinfecting and deodorizing means; a hinged arm having a first end portion slidably secured to a mounting bracket adapted to be secured to the toilet lid, and a second end portion fixedly attached to the free end portion of said shaft whereby said shaft is rotated in a first direction when the lid is raised to a substantially vertical position; initiator spring means mounted in said liquid chamber and biasing said blade in a second opposite direction; and, operating means connected between the cam means and the toilet flush handle for holding the lid in the substantially vertical position prior to the flush handle being actuated, and causing said initiator spring means to initiate rotation of the shaft in said second direction when the flush handle is actuated causing the lid to descend by gravitational force toward the toilet bowl being dampened by inhibited liquid flow through said bleed port of said blade, and further said cam means simultaneously operates said toilet bowl disinfecting and deodorizing means.

4,914,758

FRESH WATER CONTROL SYSTEM AND METHOD

Daniel C. Shaw, Geneva, Fla., assignor to Bauer Industries Inc., Orlando, Fla.

Filed Jun. 27, 1988, Ser. No. 212,405
Int. Cl.[4] G05D *7/00*
U.S. Cl. 4—304 **53 Claims**

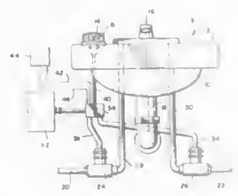
1. The method of controlling operation of a plurality of liquid operable fixtures, each fixture having a liquid flow rate and the liquid flow rate of at least one fixture differing from the liquid flow rate of at least one other fixture, comprising the steps of:

(a) establishing a maximum liquid flow rate;

(b) determining which of the fixtures requires operation;

(c) determining the liquid flow rate of the fixture requiring operation;

(d) calculating whether operation of the fixture requiring operation will cause the maximum flow rate to be exceeded; and



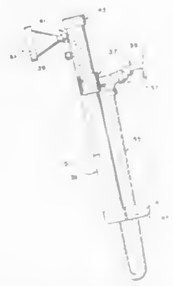
(e) causing the fixture requiring operation to operate if the maximum flow rate will not be exceeded and preventing operation of the fixture requiring operation until sufficient liquid capacity is available if the maximum flow rate will be exceeded.

4,914,759

ADJUSTABLE SHOWER HOLDER

Daniel C. Goff, 3808 Claridge Rd. North, Mobile, Ala. 36608

Continuation-in-part of Ser. No. 93,754, Sep. 8, 1987, abandoned. This application Jan. 3, 1988, Ser. No. 201,907
Int. Cl.[4] A47K *3/02*
U.S. Cl. 4—605 **1 Claim**



1. An apparatus for adjustably holding a showerhead assembly comprising:

an elongated housing having a hollow interior and including a slot formed therein opening said hollow interior to the exterior of said housing;

said elongated housing further having elastic qualities;

a showerhead extending through said slot and having a water inlet end disposed within said hollow interior;

a friction holding means extending through said slot and connected to said showerhead proximate said water inlet end;

said friction holding means being wider than the width of said slot; whereby

said showerhead is adjustably positioned by said friction holding means contacting the opposite inside faces of said slot in said elongated housing;

a mounting bracket connected to said elongated housing for mounting said housing on a shower water pipe;

a hose having a first connection to said water inlet end of said showerhead and

a second connection adapted to be secured to the shower water pipe; and,

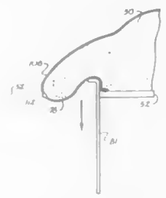
said mounting bracket and second hose connection singly constructed.

4,914,760

FLUIDIZED BED WITH COLLAPSIBLE SIDE

Thomas S. Hargest; Sohrab Soltaninassab, and Robert C. Novack, all of Charleston, S.C., assignors to SSI Medical Services, Inc., Charleston, S.C.

Continuation-in-part of Ser. No. 288,071, Dec. 20, 1988. This application Jul. 7, 1989, Ser. No. 377,427
Int. Cl.[4] A61G *7/06, 7/04;* **A47C** *27/10*
U.S. Cl. 5—453 **27 Claims**



1. A patient support system, comprising:

(a) a frame;

(b) means for supporting a mass of fluidizable material, said supporting means being permeable to air through a predetermined section thereof;

(c) a mass of fluidizable material supported by said supporting means, said supporting means being impermeable to passage of said fluidizable material therethrough;

(d) collapsible means for laterally retaining at least a portion of said fluidizable material over said predetermined air permeable section of said supporting means, said retaining means being selectively at least partially collapsible to facilitate ingress and egress of the patient to and from the support system; and

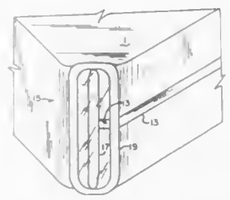
(e) an air permeable sheet having a periphery connected to said retaining means so as to prevent passage of fluidizable material between said retaining means and said sheet, said sheet being impermeable to passage of said fluidizable material therethrough.

4,914,761

REINFORCED CORNER FOR WATERBED MATTRESS

Dennis Boyd, 14457 Rouge River, Chesterfield, Mo. 63017

Filed Oct. 20, 1988, Ser. No. 260,452
Int. Cl.[4] A47C *27/08*
U.S. Cl. 5—451 **3 Claims**



1. In a waterbed mattress having a seam along at least one corner thereof, an improved corner comprising:

a first layer of plastic material such as vinyl forming said corner of the waterbed mattress with the seam disposed generally vertically along said corner and running generally from the top of the waterbed mattress to the bottom,

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said seam being formed of two portions of said plastic layer welded together along the seam; and

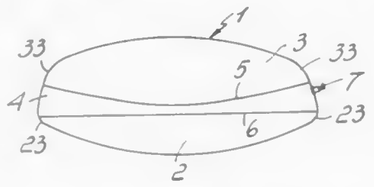
a second layer of plastic material such as vinyl welded to the first layer of vinyl by a weld which encircles and is spaced from the seam in the first layer, and a third layer of plastic material such as vinyl, said third layer being generally the same size as the vertically disposed seam in the first layer and being welded to the vertically disposed seam in the first layer to reinforce said seam.

4,914,762

INFLATABLE CUSHION

Luigi Perali, and Costanza Perali, both of Largo Marzabotto 27, 37100 Verona, Italy

Filed Sep. 2, 1988, Ser. No. 239,737
Claims priority, application Italy, Sep. 11, 1987, 63298/87[U]
Int. Cl.[4] A47C *27/08*
U.S. Cl. 5—449 4 Claims



1. An inflatable cushion having:

a front larger cloth and a rear narrower cloth each having a major and a smaller base and two sides which define a substatially trapezoidal border outline,

an intermediate band extending between, and tightly sealed to, the borders of said front cloth and rear cloth to delimit therewith a sealed enclosure for a fluid, said band having a narrower width along said major and said smaller base and a larger width along the two sides of said flexible sheets,

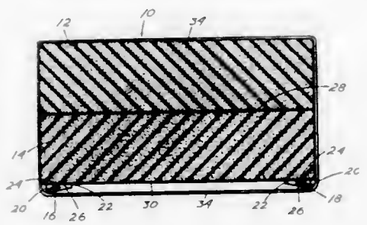
and a check valve means for supplying a fluid to said enclosures, to erect the cushion to a biconvex lens-like configuration where it comprises an intermediate wider transverse portion and an upper portion and a lower portion growing thiner from the intermediate portion outwards.

4,914,763

NON-TILT THERAPEUTIC PILLOW

Randall S. Clark, 6469 Clark Rd., Paradise, Calif. 95969

Continuation-in-part of Ser. No. 147,250, Jan. 19, 1988, abandoned. This application Jul. 3, 1989, Ser. No. 376,227
Int. Cl.[4] A47C *20/00*
U.S. Cl. 5—440 4 Claims



1. A therapeutic pillow for use in a bed adapted to support a human's head and neck in general alignment with said human's spine with said human positioned on his side, said pillow further adapted to restrict tilting and displacement of said pillow on said bed, comprising:

a cushion having a generally flat first side manufactured of soft resilient plastic foam;

said cushion having a generally flat second side oppositely disposed from said first side manufactured of a more firm resilient plastic foam than said first side, said second side adapted for downward placement against said bed;

a first runner;

a second runner

said runner attached to said second side adjacent and in general parallel alignment with one edge of said second side, said second runner affixed to said second side adjacent and in general parallel alignment with an oppositely disposed edge of said second side from that of said first runner;

said first and said second runners being of rigid structure adapted to cause said restriction of tilting and displacement of said pillow on said bed during use;

said soft first side of said cushion adapted to support said human's head and neck depressed to a comfortable degree in said cushion;

said cushion and both said runners being encased with a covering of soft, pliable material;

said second side of said cushion adapted to limit said degree of depression of said human's head and neck in said first side;

said cushion being of a height when supporting said human's head and neck to maintain said alignment of said spine with said head and neck of said human positioned on his side.

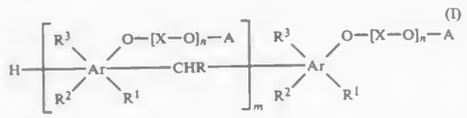
4,914,764

BATH PIGMENTATION OF LEATHER

Jan H. Mast, Hünfelden; Lothar Schlösser, Frankfurt am Main, and Rainer Winter, Oberursel, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 12, 1989, Ser. No. 379,574
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1988, 3823826
Int. Cl.[4] D06P *3/32*
U.S. Cl. 8—436 7 Claims

1. A process for the bath pigmentation of leather, which comprises dyeing the leather with pigment dispersions which contain a compound of the formula (I)



where

Ar is benzene or naphthalene,

X is $—CH_2—CH_2—$and/or $—CH_2—CH(CH_3)—$,

0 to (m—1) of the radicals A are hydrogen,

1 to m of the radicals A are benzoyl and/or naphthoyl,

1 to m of the radicals A are —CO—CH=CH—COOM and/or —CO—CH_2—CH(SO_3M)—COOM, where M is a cation,

R^1, R^2 and R^3 are hydrogen or alkyl of 1 to 14 carbon atoms,

R is hydrogen and/or alkyl of 1 to 9 carbon atoms,

n is a number from 1 to 150 and

m is a number from 2 to 12,

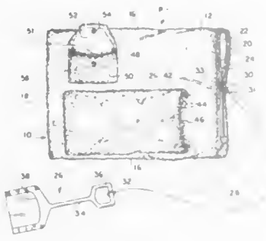
the pigment having an average particle size of 50 to 500, preferably 80 to 300, nm.

4,914,765

PILLOW AND SHOVEL ASSEMBLY

Shayne H. Smith, 2108 Morgantor Rd., Fayettsville, N.C. 28305

Filed Sep. 21, 1988, Ser. No. 247,378
Int. Cl.[4] A47C *20/00*
U.S. Cl. 5—434 4 Claims



1. A pillow assembly fillable with granular material comprising:

a pillow including substantially rectangular and congruent overlying top and bottom panels each having inner and outer faces and a plurality of peripheral edges including a pair of major longitudinal edges and one each minor transverse and opposite end edge,

means joining together all of the edges exclusive of at least a portion of said end edge of each said panel to provide a cavity between said panels and an end opening adjacent said unjoined end edges of said panels to permit access to said cavity,

zipper closure means on said unjoined end edges including a slidable zipper actuator body having a pull tab operable to selectively open and close said end opening defined by said unjoined end edges of said pillow panels,

stowage means on said outer face of said bottom panel including an elongated patch affixed thereto parallel to said longitudinal edges and defining a pocket having an end opening parallel and adjacent said pillow end opening, a flexible tether having opposite first and second ends,

an elongated shovel having a handle, said shovel defining an overall length no greater than that of said elongated patch pocket,

said tether first end affixed to said zipper actuator body pull tab and said tether second end affixed to said shovel handle, whereby

said tethered shovel is insertable and removable from said storage means both before and after filling said cavity with particulate material.

4,914,766

CONTOURABLE PNEUMATIC CUSHION

Boyd S. Moore, 4396 Robinwood Drive, Victoria, British Columbia, V8N 3G8, Canada

Filed Jul. 17, 1989, Ser. No. 380,287
Int. Cl.[4] A47C *20/02, 27/10*
U.S. Cl. 5—432 14 Claims

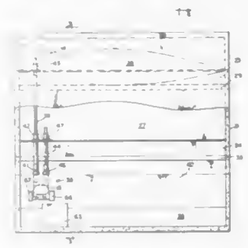
1. A pneumatic cushion comprising, in combination;

a bladder,

means within said bladder forming a plurality of hermetically sealed cells,

charging valve means for admitting a pneumatic charge to one of said cells,

contour control valve means in another of said cells, and pneumatic communication means connecting said control valve means with each said cells,



said control valve means having a first position for interconnecting said cells and a second position for pneumatically isolating said cells.

4,914,767

SUN DIAL BEACH BLANKET WITH PILLOW

Raymond J. Balicki, Dania, and Nelson J. Perez, Ft. Lauderdale, both of Fla., assignors to Walnel Corporation, Fort Lauderdale, Fla.

Filed Sep. 5, 1989, Ser. No. 402,232
Int. Cl.[4] A47G *9/06*
U.S. Cl. 5—419 10 Claims

1. In combination, a flexible, foldable beach blanket of a sufficient size to support fully the body of a sunbather in any horizontal position on said blanket, including the longitudinal and transverse positions, said blanket having a plurality of spaced tabs of a hook and loop type fastener adjacent to and surrounding the perimeter of said blanket, and a pillow having on at least one of its sides a tab of hook and loop type material for releasable attachment of said pillow to any one of the plurality of hook and loop type fastener tabs along the perimeter of said beach blanket, whereby as the sun changes its position, a sunbather can reposition and releasably fasten the pillow, relative to the blanket, and rool over to a new position on the blanket, thereby eliminating the task of repositioning the blanket relative to the sun as the sun changes its position.

4,914,768

PORTABLE SHELTER

Jerald R. Howard, 5413 N. 46th Pl., Phoenix, Ariz. 85018

Filed Dec. 7, 1988, Ser. No. 280,977
Int. Cl.[4] A47C *29/00*
U.S. Cl. 5—113 14 Claims

1. A portable shelter for use with a foldable cot of the type having a frame with a center section and opposite end sections pivotally secured to said center section to enable the sections to be compactly folded from an open extended position to a closed position and with the section generally overlapping,

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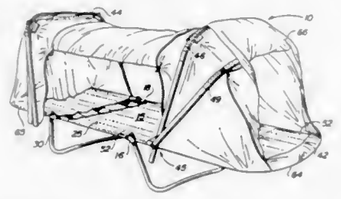
said cot having spaced-apart support legs pivotally attached to said frame, said shelter comprising:

(a) an integral flexible enclosure having a top, floor, opposite sides and opposite ends, said floor being substantially continually secured to said ends and sides, said floor having panels attached to its underside at, said opposite ends, said panels and floor defining pockets at opposite ends of the enclosure adapted to receive and engage at least a portion of said frame end sections;

(b) a first brace member extending transverse of said cot frame having opposite legs and a bight portion, said legs being pivotally connected to said frame at pivot means;



(c) a second brace member extending transverse of said cot frame having opposite legs and a bight portion, said legs being pivotally connected to said frame at pivot means at a location spaced from said first brace member;

(d) means for detachably securing said enclosure to said first and second brace members whereby movement of said braces to an upright position with respect to said frame will move said enclosure to an erected taut position and whereby said braces may be folded to a compact position with said enclosure retained in a collapsed condition on said frame.

4,914,769

APPARATUS FOR CONVEYING INCUMBENT PERSON

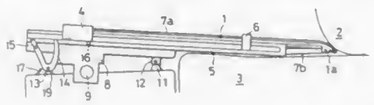
Masao Kume; Kazuo Matsumoto, both of Osaka; Yukinobu Yao, Hyogo, and Naoya Ishikawa, Osaka, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Feb. 22, 1989, Ser. No. 313,450

Claims priority, application Japan, May 31, 1988, 63-131629

Int. Cl.[4] A61C *7/08*

U.S. Cl. 5—81 B **5 Claims**



1. An apparatus for conveying a person lying on a support member, comprising:

a main body;

a plate member onto which a person is loaded for conveyance by inserting it into a gap between the person and the support member and on which a belt is wound;

slide means for accommodating said plate member therein and causing said plate member to slide therealong toward and away from the person;

support means rotatable on said main body about a shaft for supporting said plate member; and

control means for controlling said plate member so that said plate member is rotated about said shaft to slide along said slide means toward the person until a forward edge of said plate member abuts on the person, whereupon said forward edge follows the contour of the person and advances into said gap.

4,914,770

SHOWER-PARTITION

Heinz G. Baus, Hünibach-Thun, Switzerland, assignor to Altura Leiden Holding B.V., Maastricht, Netherlands

Filed Apr. 5, 1988, Ser. No. 178,020

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1987, 3711609

Int. Cl.[4] A47K *3/22*

U.S. Cl. 4—612 **6 Claims**

1. A shower partition comprising a wall-element and adapted to be secured thereby to a wall of a room, said shower-partition further comprising:

a crosspiece having a horizontally arranged bottom-plate, and vertical edge-parts arranged upon said bottom-plate, a first of said edge-parts comprising a first vertical support-surface facing said wall-element, and a second of said edge-parts comprising a second vertical support-surface facing said wall of the room,

said wall-element comprising an elongated hole through which is passed a connecting element for connecting said wall-element to said crosspiece;

said crosspiece comprising a peripheral edge comprising said first and second edge-parts with said support-surfaces;

said wall-element having a first vertical longitudinal edge which is arranged adjustable against the wall of the room by means of a frame-profiled-rail and a wall-profiled-rail;

said frame-profiled-rail being connected by means of a transverse strut to a corner-profiled-rail which is arranged, at a second vertical longitudinal edge of the wall-element, opposite said first vertical longitudinal edge, said crosspiece being secured below the upper edge of said wall element, and

said bottom-plate being substantially triangular in shape and comprising an extension, also lying in the horizontal plane, which points towards said wall-element and comprises said first edge-part with said first support-surface against which said wall-element bears directly.

4,914,771

AIR MATTRESS

Levon Afeyan, Hampstead, Canada, assignor to Afeyan Industries Inc., Montreal, Canada

Filed Jan. 31, 1989, Ser. No. 304,317

Int. Cl.[4] A61G *7/08*

U.S. Cl. 5—453 **15 Claims**

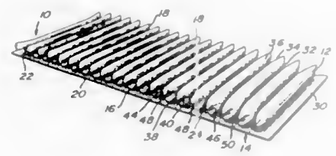
10. An air inflatable mattress comprising:

an upper layer of flexible air impervious material and a lower layer of flexible air impervious material,

an air impervious, continuous, peripheral seam joining material of said upper and lower layers together at outer edges thereof, said peripheral seam defining a pair of opposed side seams and a pair of opposed end seams,

a plurality of elongate, generally parallel, air-inflatable pillow-forming portions defined in said upper layer, said pillow-forming portions being in side-by-side spaced apart relationship extending laterally of said mattress,

a pair of elongate, spaced apart plenums defined between said upper and lower layers, extending between said opposed end seams, one of said plenums being adjacent each of said side seams,



said pillow-forming portions being in air flow communication at their opposed extremities with the spaced apart plenums,

air inlet means for continuous introduction of inflating air under pressure into the mattress, and

air outlet means for continuous escape of air from the inflated mattress.

4,914,772

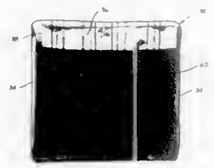
DRAINABLE CUSHION AND FURNITURE SEATING

Donna M. Difloe, 1225 Lake Charles Dr., Roswell, Ga. 30075

Filed Oct. 17, 1988, Ser. No. 258,736

Int. Cl.[4] A47C *27/12*; **A47G** *9/00*

U.S. Cl. 5—461 **18 Claims**



1. A cushion which drains liquid and dries through its bottom, comprising:

(a) an inner core of drainable filling material comprising a filling core and a core wrap surrounding said core, both said filling core and said core wrap comprising non-resinated synthetic fibers; and

(b) an outer covering surrounding said inner core, said outer covering comprising:

(i) a top portion comprising air and water permeable fabric material and

(ii) a bottom portion of a mesh-like material having a plurality of openings larger in size than any opening of said top portion for promoting air circulation and draining of liquid from said cushion.

4,914,773

CLEANING APPARATUS

Yong S. Ham, Jangmi Apt 12-1105, 7 Shinchun-Dong, Kangnam-Ku, Seoul, Rep. of Korea

Continuation-in-part of Ser. No. 19,120, Feb. 26, 1987, abandoned. This application Feb. 29, 1988, Ser. No. 162,253

Claims priority, application Rep. of Korea, Feb. 26, 1986, UM 86-2334

Int. Cl.[4] E01H *1/00*

U.S. Cl. 15—3 **7 Claims**

1. A cleaning apparatus for use in cleaning a floor which comprises:

a housing,

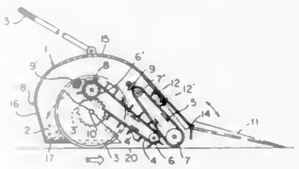
rear wheels having wheel gears coaxial therewith, being disposed in said housing,

first guiding rollers disposed in said housing, being operatively connected to driving gears, said driving gears being operatively engaged with said wheel gears,

second guiding rollers disposed in said housing near the floor relative to said first guiding rollers, being operatively associated with said first guiding rollers,

a conveyor belt, disposed in said housing, having a plurality of conveying members disposed thereon which rotates about said first guiding rollers and second guiding rollers, wherein said conveyor belt is driven by said wheels through engagement of said wheel gears, driving gears, and first and second rollers,

third guiding rollers disposed near said first guiding rollers and fourth guiding rollers disposed adjacent to said second guiding rollers in said housing,



a wiping belt disposed adjacent and parallel to said conveyor belt in said housing, said wiping belt operatively rotating about said third and fourth guiding rollers, and rotating in the opposite direction of said conveyor belt so as to cooperate with said conveyor belt,

a wet sponge disposed in said housing so as to operatively contact said wiping belt,

trash collecting means disposed in said housing for receiving trash which is conveyed from said conveyor belt, and

a handle for pushing the cleaning apparatus whereby as the cleaning apparatus is pushed the wheels cause said first rollers to rotate through said gears and the conveyor belt and wiping belt are cooperatively driven so as to perform the functions of sweeping by rotation of the conveyor belt, wiping by rotation of the wiping belt, and collecting of trash by the movement of the plurality of conveying members for effectively retaining the trash in the cleaning apparatus.

4,914,774

LEAF LOADING MACHINE FOR USE WITH TOWING MACHINE

Ronald T. Sheehan; Robert M. VanGinhoven, both of Lancaster, and John B. Crego, New Holland, all of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Division of Ser. No. 111,468, Oct. 22, 1987, Pat. No. 4,771,504. This application Aug. 5, 1988, Ser. No. 228,644

Int. Cl.[4] E01H *1/04*

U.S. Cl. 15—5 **10 Claims**

1. A leaf loading machine for use in combination with a towing vehicle, said leaf loading machine comprising:

a mobile frame having a tongue extending forwardly thereof for connection to said towing vehicle;

a rotary beater extending transversely of said frame and including a plurality of lifting elements;

a rotary broom extending transversely of said frame and including a plurality of bristles, said broom being disposed rearwardly of and in tandem relationship to said beater;

said beater and said broom each having a lower side thereof disposed adjacent the ground and operable to counterrotate relative to one another to deliver material from the ground upwardly between said beater and said broom;

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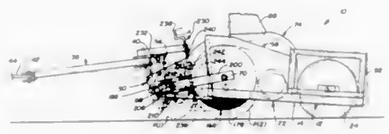
an auger extending transversely of said frame rearwardly of said broom for receiving material from said broom; and



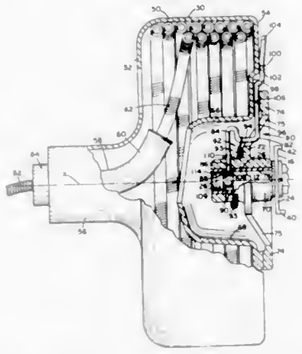
a thrower mounted on said frame for receiving material from said auger and for discharging said material into said towing vehicle.

4,914,775

RETAINER MECHANISM FOR DRAIN CLEANER DRUM

Karl L. Kirk, Elyria, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 19, 1988, Ser. No. 286,044
Int. Cl.[4] B08B *9/02*
U.S. Cl. 15—104.33 18 Claims



1. A drain cleaner machine including a cable storage drum, a chassis on which the said drum is adapted to be removably rotatably mounted on an axle fixedly mounted on said chassis, said drum including a hub portion for journaling the drum on said axle, and a retainer mechanism on said drum and engageable with shoulder means on said axle for detachably locking the said drum in place on said axle for rotation thereon.

4,914,776

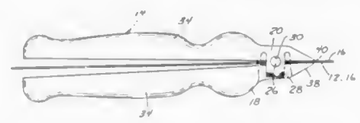
TUBE-CLEANING APPARATUS

Diane M. Kaye, Racine, Wis., assignor to Lewisan Products, Inc., Racine, Wis.

Filed Jan. 3, 1989, Ser. No. 293,180
Int. Cl.[4] B08B *9/02*
U.S. Cl. 15—104.33 23 Claims

1. In tube-cleaning apparatus of the type having a flat longitudinally-bendable progressively insertable and retractible strip and a grip handle slidable along and engageable with the strip, the improvement wherein:

the grip handle is formed by a pair of opposed half handles on opposite surfaces of the strip and pivotably interconnected about an-axis transverse to the strip; and



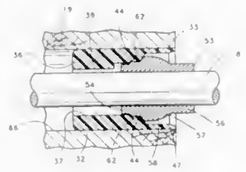
the half handles have hand portions rearward of the axis, means for gripping contact with the strip, and front portions forward of the axis terminating in opposed wiper edges engaged with the strip.

4,914,777

VACUUM CLEANER BRUSH BEARING ASSEMBLY

Mark A. Cartellone, Rocky River, Ohio, assignor to The Scott Fetzer Company, Westlake, Ohio

Filed Sep. 26, 1988, Ser. No. 249,377
Int. Cl.[4] A46B *9/02, 13/02;* A47L *5/10;* F16C *23/08*
U.S. Cl. 15—182 12 Claims



1. A rotary vacuum cleaner brush comprising a tubular cylinder body having carpet agitating means along the exterior thereof, bearing means at each end of said body adapted to support and journal said body in a vacuum cleaner for rotation of said body about the axis thereof, said bearing means each including a sleeve formed of deformable material and a bearing insert providing a through-bore, a shaft in said through-bore journaling said bearing insert, said bearing insert providing an outer surface having an outer spherical portion, said sleeve providing an interior having an inner spherical socket portion mating with said outer spherical portion supporting said bearing insert within said sleeve for limited relative swiveling movement so that said insert moves into alignment with said shaft, said sleeve and bearing insert providing interfitting projections and recesses preventing relative rotation therebetween around the axis of said body, said recesses being peripherally spaced around said axis at sufficiently close intervals and said recesses and projections being shaped to cause automatic mating engagement with said projections when said bearing insert is assembled in said sleeve regardless of initial rotational orientations of the sleeve and bearing insert during assembly.

4,914,778

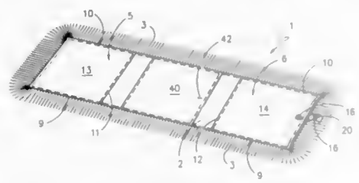
TWO WAY MOP

Dewey T. Thompson, LaGrange, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Dec. 8, 1988, Ser. No. 281,290
Int. Cl.[4] A47L *13/253*
U.S. Cl. 15—229.4 4 Claims

1. A mop head comprising: a backing having a plurality of yarns secured to one face thereof, the other face of said backing having oppositely facing pockets adjacent the ends thereof, said pockets being substantially the same size and being open at their inner ends for receipt of the ends of either a slip-through

or breakdown-type of mop frame, one of said pockets having its outer end open and means operably associated with said



open outer end to selectively block off a portion of said outer end to prevent a mop frame from slipping therethrough.

4,914,779

AUTOMOTIVE OUTER DOOR OPERATING MEMBER

Masakazu Nakai, and Naotoshi Inamura, both of Shizuoka, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Sep. 26, 1988, Ser. No. 248,840
Claims priority, application Japan, Oct. 9, 1987, 62-255916
Int. Cl.[4] E05B *3/00*
U.S. Cl. 16—124 10 Claims

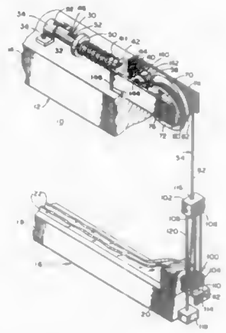
4. An automotive outer door operating member as claimed in claim 1, wherein the resin is polybutylene phthalate.

4,914,780

COMPOUND COUNTERBALANCE AND WINDING SYSTEMS WITH ZERO TORQUE SPIRALS

Tracy G. Rogers, Rochester, N.Y., and Michael R. Nier, Harrisburg, Pa., assignors to Schlegel Corporation, Rochester, N.Y.

Filed Aug. 2, 1988, Ser. No. 227,191
Int. Cl.[4] E05F *1/16*
U.S. Cl. 16—193 20 Claims



1. A compound counterbalance system for a load such as a window sash and the like, comprising:

biasing means for easing operation of the load, the biasing means being characterized by an inherently variable rate of force;

a first biasing force transmission means having a fixed rate of movement means connected to the biasing means and variable rate of movement means connected to the load, the variable rate of movement means having a variable rate of operation predetermined to automatically compensate for the variability of the biasing means to provide substantial constancy of the biasing force as applied to the load, throughout an operating range; and,

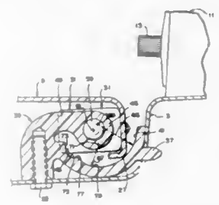
a second biasing force transmission means, connected between the first biasing force transmission means and the load, for increasing the operating range of the biasing means, the second biasing force transmission means including a block and tackle assembly.

4,914,781

HINGE ASSEMBLY FOR A CLOSURE MEMBER

Erick L. Soka, Carbondale, and Willis E. Harlow, Herrin, both of Ill., assignors to Maytag Corporation, Newton, Iowa

Filed Dec. 27, 1988, Ser. No. 289,679
Int. Cl.[4] E05D *1/04*
U.S. Cl. 16—225 14 Claims



1. A hinge assembly for pivotally connecting a closure member provided with a bearing section along an edge thereof to an associated cabinet and maintaining the closure member in a releasable self-sustaining open position, which assembly comprises:

a) a first hinge portion for attachment to the cabinet and including a base, a beraing surface and a hub;

b) a pivot pin for attachment to the closure member;

c) the hub being connected to the base by a resilient hinge means for pivotal movement and including a passageway for receiving the pivot pin and permitting the closure member to pivot about an axis of rotation defined by the pivot pin between closed and open positions;

d) the bearing surface including an interference portion engageable by the bearing section for creating an interference fit therebetween during pivoting of the closure member; and

e) wherein when the bearing section engages the interference portion, the hub is pivoted outwardly against the restoring force of the hinge means until the bearing section passes the interference portion, thereby causing the hub to pivot back inwardly under the restoring force for either sustaining the closure member in the open position or permitting the closure member to be disposed in the closed position.

4,914,782

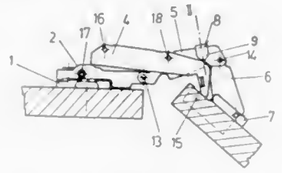
WIDE-ANGLE HINGE

Helmut Rupprechter, Lauterach, Austria, assignor to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Nov. 17, 1988, Ser. No. 272,247
Claims priority, application Austria, Dec. 23, 1987, 3406/87
Int. Cl.[4] E05D *11/10*
U.S. Cl. 16—319 5 Claims

1. In a wide-angle hinge for use in mounting a door to an article of furniture, said hinge including a hinge boss to be mounted on the door, a hinge arm to be mounted on a side wall of the article of furniture, and hinge links connecting said hinge boss and said hinge arm and crossing in a scissorlike manner,

the improvement comprising means, removably mounted on a first of said hinge links, for abutting against a second of said hinge links and thereby for limiting the opening angle of said hinge, said means comprising:



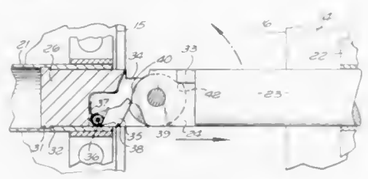
a bracket fittable over a selected position of said first hinge link, said bracket and said first hinge link having engaging means retaining said bracket on said first hinge link at said selected position thereof.

4,914,783

SLIDING HINGE WITH LOCKING

Frank T. Jackson, Corona, and Bernard W. Henrichs, Villa Park, both of Calif., assignors to The Hartwell Corporation, Placentia, Calif.

Filed Dec. 5, 1988, Ser. No. 279,495
Int. Cl.[4] E05D *15/00*
U.S. Cl. 16—363 12 Claims



1. In a sliding hinge for joining two members, the combination of:

a slide block for sliding engagement with one of said members;

a slide arm for attachment to the other of said members;

said block and arm including interengaging pivot means, for pivoting of said arm relative to said block between an extended position and an open position; and

a first locking means carried on one of said arm and block and engageable with said one member for limiting sliding of said block when said block and arm are in said open position,

said block and arm including first interengaging cam means for releasing said first locking means when said arm is pivoted to said extended position, said first locking means includes:

a first cam pivotally mounted on said block and having a first shoulder engageable with said one member when said arm is in said open position; and

first spring means engaging said block and first cam for urging said first cam shoulder into engagement with said one member;

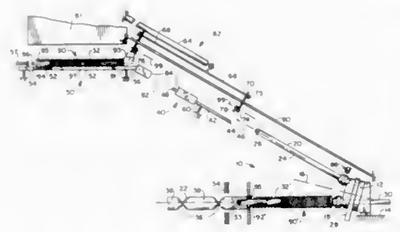
with said arm having a first cam surface engageable with said first cam as said arm pivots from said open position to said extended position for moving said first cam shoulder out of engagement with said one member, said first cam and first cam surface forming said first interengaging cam means.

4,914,784

SHIRRED CASING ARTICLE LOADER/UNLOADER

Joseph A. Nausedas, Oak Forest, Ill., assignor to Viskase Corporation, Chicago, Ill.

Filed Jan. 27, 1989, Ser. No. 302,281
Int. Cl.[4] A22C *11/02*
U.S. Cl. 17—42 21 Claims



1. Apparatus for loading a shirred casing article onto an upwardly tilted stuffing horn comprising:

(a) a chute arranged to support a said casing article in longitudinal alignment with said upwardly tilted horn, said chute having upper and lower ends with said lower end and the horn discharge end defining a space therebetween which is shorter than the length of a said casing article to be loaded;

(b) pusher means movable along an inclined path of travel extending generally parallel to the longitudinal axis of said chute; and

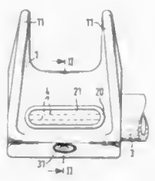
(c) a first member carried by said pusher and engageable with a said casing article for ushering a said casing article down said chute and across said space and onto said upwardly tilted stuffing horn.

4,914,785

DEVICE TO FEED FIBER SILVERS

Friedrich Hauner, and Heinrich Spangenberger, both of Ingolstadt, Fed. Rep. of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Fed. Rep. of Germany

Filed Aug. 2, 1988, Ser. No. 227,350
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1987, 3725904
Int. Cl.[4] D01G *31/00*; D01H *13/16*; B65H *57/00*
U.S. Cl. 19—0.25 14 Claims



14. A sliver guiding and monitoring device, comprising:

(a) a housing, adapted to be supported on a textile fiber sliver processing machine, adjacent to a supply of sliver;

(b) a silver guiding surface disposed on said housing for guiding sliver from said sliver supply en route to said sliver processing machine;

(c) an elongated slit in said guiding surface, extending transversely of the direction said slivers cross said guiding surface;

(d) a cavity within said housing, extending from said slit to a surface opposite said guiding surface;

(e) sliver monitoring means disposed within said cavity, extending, at least partially into said slit; and

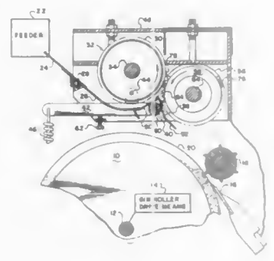
(f) a hardened casting compound disposed within said cavity and said slit, surrounding said monitoring means and maintaining said monitoring means in a predetermined position in said cavity and said slit.

4,914,786

FEEDER FOR COTTON GIN

Arvel L. Vandergriff, Visalia, Calif., assignor to Consolidated HGM Corporation, Lubbock, Tex.

Filed Mar. 8, 1989, Ser. No. 320,478
Int. Cl.[4] D01B *1/04*
U.S. Cl. 19—64.5 17 Claims



1. A process of feeding seed cotton in the form of locks with seed therein to a roller gin having:

a. a gin roller with a peripheral surface,

b. drive means connected to the gin roller for rotating the gin roller so that the peripheral surface has a gin speed;

c. wherein the improved method comprises:

d. moving the locks of seed cotton at a spacing speed of less than about half the gin speed,

e. increasing the speed of the seed cotton to a feeding speed of at least about 80% of the gin speed,

f. holding the locks while increasing the speed so that the locks are stretched, thereby

g. increasing the spacing between the seed, and

h. feeding the seed cotton moving at the feeding speed onto the gin roller.

4,914,787

METHOD OF AND APPARATUS FOR BLENDING TEXTILE FIBERS

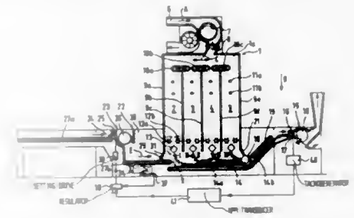
Ferdinand Leifeld, Kempen, and Karl Röttgering, Wegberg-Dalheim, both of Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Moochen-Gladbach, Fed. Rep. of Germany

Filed Dec. 1, 1988, Ser. No. 278,473
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1987, 3740616
Int. Cl.[4] D01G *13/00*
U.S. Cl. 19—145 16 Claims

1. A method of blending textile fibers, comprising the following consecutive steps:

(a) depositing a layer of waste fibers on a moving conveyor;

(b) depositing, in succession, a plurality of layers of useful fibers on the layer of waste fibers from a plurality of fiber hoppers arranged spaced in a direction of travel of the moving conveyor, whereby on said moving conveyor a fiber layer stack is formed, constituted by a lowermost waste fiber layer and a plurality of superposed useful fiber layers arranged on said waste fiber layer; and



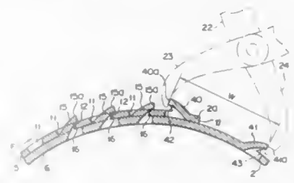
(c) simultaneously ablating all said layers by simultaneously removing the fibers therefrom.

4,914,788

CLAMP STRUCTURE

Jujl Ojima, Aikawa, Japan, assignor to NHK Spring Co., Ltd., Yokohama, Japan

Filed Dec. 23, 1988, Ser. No. 290,144
Claims priority, application Japan, Dec. 28, 1987, 62-330095; Mar. 18, 1988, 63-66526
Int. Cl.[4] F16L *33/02*
U.S. Cl. 24—20 R 4 Claims



1. A clamp structure mounted on a surface to be fastened by using a crimping tool having a pair of first and second openable arms, comprising:

an elongated metal band body having a pair of ends which are separated when the clamp structure is in an unclamped state, said band body being formed in a ring-like or C shape so as to surround the surface to be fastened and being provided with outer and inner lap portions which overlap when said band body is mounted on the surface to be fastened, and an intermediate portion located between said inner and outer lap portions, said outer lap portion being provided with a longitudinal end having a first end face, and said inner lap portion being provided with a longitudinal end having a second end face;

a plurality of retaining holes formed in said outer lap portion, said retaining holes having substantially the same shape and being arranged at a constant pitch along the longitudinal direction of said band body, said outer lap portion being provided with a support wall which is located in each of said retaining holes near said first end face;

a plurality of hooks extending from an outer surface of said inner lap portion, said hooks have substantially the same shape and being arranged along the longitudinal direction of said band body at the same pitch as that of said retaining holes, each of said hooks having a sliding surface portion for allowing smooth sliding of said outer lap portion when said outer and inner lap portions are relatively moved in a direction for reducing a diameter of said band body, and each of said hooks having a pair of overhanging, right and left inclined hook edges directed in said longitudinal di-

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rection toward said first end face and hooked on said support wall of said retaining hole against a force for increasing the diameter of said band body to fix said outer and inner lap portions relative to each other, each of said hooks having a shape which bulges such that a cross sectional plane thereof has an arcuate outline;

a first crimping tool-hooking projection formed between said first end face of said outer lap portion and one of said retaining holes, said first crimping tool-hooking projection having an overhanging shape and being curved such that a cross section thereof has an arcuate shape similar to that of said plurality of hooks, said first crimping tool-hooking projection being directed in said longitudinal direction away from said first end face, so that said first crimping tool-hooking projection can be hooked by a distal end portion of the first arm of said crimping tool; and

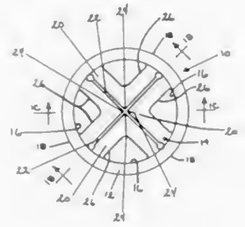
a second crimping tool-hooking projection formed in said intermediate portion of said band body, said second crimping tool-hooking projection having an overhanging shape and being curved such that a cross section thereof has an arcuate shape similar to that of said plurality of hooks, said second crimping tool-hooking projection being spaced from said first crimping tool-hooking projection by a distance which is shorter than a distance between spread arms of the crimping tool, and being directed in said longitudinal direction toward said first end face, so that said second crimping tool-hooking projection can be hooked by a distal end portion of the second arm of said crimping tool.

4,914,789

CLOSURE CLIP MEMBER FOR FLEXIBLE BAGS AND THE LIKE

Oliver L. Pedersen, 14050 Madison Ave. NE., Bainbridge Island, Wash. 98110

Filed Oct. 18, 1988, Ser. No. 259,162
Int. Cl.[4] B65D *77/10*
U.S. Cl. 24—30.5 S **7 Claims**



1. A closure member for flexible bags, sacks and the like, comprising:

(a) a generally flat, planar, disk-like plastic body of predetermined, uniform thickness, said body being made of plastic material which is resilient, flexible and springy and which can be repeatedly flexed without fatigue stress and cracking, said body being of predetermined shape and having a perimeter,

(b) said body being divided into a predetermined number of triangular leaf sections defined by slot means formed in said body, said slot means being formed generally on diameter lines radiating generally from the center of said body to a point near the edge perimeter portion thereof and so that each leaf section has a point adjacent to said center separated by the width of said slot means, said slot means defining two side edges for each of said triangular leaf sections,

(c) an enlarged edge rim formed on the perimeter of said body such that said edge rim is of greater thickness than said body and has a predetermined cross sectional shape, said edge rim having an outer surface and also having an inner surface which is integrally formed with said body, and

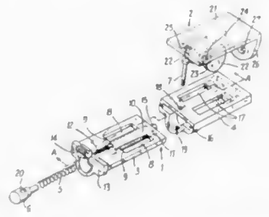
(d) each of said triangular leaf sections having void areas therein between the inner surface of said edge rim and the two side edges of said leaf section such that each said leaf is generally "L" shaped and such that each end of said "L" shape is integrally formed with and attached to said edge rim.

4,914,790

DEVICE FOR THE MOVABLE MOUNTING OF AN OBJECT, IN PARTICULAR OF A JEWEL ON A SUPPORT

Alain Foubert, Montigny-Les-Cormeilles, France, assignor to Cartier International B.V., Amsterdam, Netherlands

Filed Feb. 28, 1989, Ser. No. 316,619
Claims priority, application France, Feb. 29, 1988, 88 02449
Int. Cl.[4] A44B *11/25*
U.S. Cl. 24—658 **11 Claims**



1. A device for providing for the removable attachment of an object to a support comprising a first and a second member, said first member having means for attachment to an object and said second member having means for attachment to a supporting object, said first member having slot means, said second member having tab means for insertion into said slot means, said first member having locking means for releasably engaging said tab means, said locking means being movable between a first position wherein said tab means is securely engaged by said locking means to hold said second member attached to said first member and a second position wherein said tab means is released to allow detaching of said second member from said first member, wherein said first member including elastic means for constantly urging said locking means toward said first position, said locking means including a tongue and said first member including a receptacle means having an interior slidably receiving a portion of said tongue, said slot means including a slot in said tongue and a slot in said receptacle means alignable with said slot of said tongue, said tab means being insertable through said slot of said receptacle and through said slot of said tongue, said tongue being inserted into the receptacle means when said locking means is in said first position.

4,914,791

PLASTIC PAPER CLIP

Kurt Lorber, Schurwaldstrasse 114, D-7307 Aichwald 2, Fed. Rep. of Germany

Continuation of Ser. No. 127,450, Dec. 2, 1987, abandoned. This application Apr. 26, 1989, Ser. No. 344,495
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1987, 3700322
Int. Cl.[4] A44B *21/00*
U.S. Cl. 24—67.9 **7 Claims**

1. A plastic paper clip, comprising:

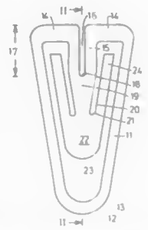
two outer clamping legs, splayed at an angle of approximately 15 to 20 degrees to define an approximate V-shape

having a longitudinal axis, the outer clamping legs having constant width and thickness along their entire length;

a pair of transverse webs, each connected to one of the clamping legs and leading inwardly toward the longitudinal axis;

two parallel clamping portions separated by a slot, the parallel clamping portions being attached to the transverse webs;

a connecting plate and two V-shaped splayed clamping arms, the clamping arms having constant width and thickness along their entire length, defining parallel side edges



of the clamping arms and being attached to the connecting plate such that the clamping arms are parallel to the clamping legs, the slot separating the clamping portions at most extending over approximately one third of a length of the clip, the clamping portions being connected to the connecting plate by an extension element clear of the longitudinal slot, the extension element having a length approximately equal to a length of the slot separating the clamping portions, and a gap being defined between the extension element and the clamping arms in the form of a slot with substantially parallel side edges, sloping at least partly relative to the longitudinal axis of the clip.

4,914,792

LINE SECURING DEVICE

Jeffrey A. Bradt, 1989 E. Kenwood Dr., Maplewood, Minn. 55117

Filed Dec. 16, 1988, Ser. No. 285,019
Int. Cl.[4] F16G *11/00*
U.S. Cl. 24—129 R **1 Claim**

1. A fishing accessory for securing a fishing book to a flexible knotted fishing line comprising:

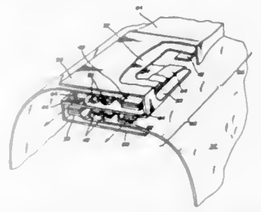
an elongated, cylindrical tube with a slit at one end thereof to accommodate a variety of flexible knotted fishing line sizes which extends parallel to the sides of the cylindrical tube and tapers in width to a terminal point near the middle of said cylindrical tube; said device having an inside diameter twice the diameter of the largest line to be used; said slit having an initial width equal to at least 1.5 times the diameter of the largest line and a final width no greater than the diameter of the smallest line to be used; said slit having a length equal to not less than 5 times its initial width; said flexible knotted fishing line having a plurality of knots at one end thereof; said fishing line having a diameter not less than the final width of said slit nor greater than 67% of the initial width of said slit, with one of said knots selectively seated against the outside of the device and said line passed through the slit into the device, then exiting and reentering the device at the unslit end, after being passed through or around the object to be secured, thereby forming an adjustable loop in the line at the unslit end of said cylindrical tube by one of said knots, and then exiting the device at the slit end for releasably securing said hook to said line.

4,914,793

QUICK-SEALING DESIGN FOR RADIOLOGICAL CONTAINMENT

Donald S. Rampolla, Pittsburgh, and Elmer Speer, Ruffsdale, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 9, 1987, Ser. No. 118,084
Int. Cl.[4] A44B *19/32*
U.S. Cl. 24—389 **6 Claims**



1. A sealing assembly for joining two elongated edges of flexible sheet material to form a hermetic barrier comprising:

an elongated mechanical slide fastener having opposing engaging members affixed at a predetermined distance from each of said elongated edges, the respective elongated edges overlapping upon engagement of said slide fastener thereby forming first and second flaps;

a first adhesive layer formed on said first flap;

a second adhesive layer formed on said second flap; and

peel-off strip means formed over each of said first and second adhesive layers prior to formation of said barrier;

whereby said slide fastener and said first and second flaps combine to form said hermetic barrier, and wherein said slide fastener includes a slide and interlocking channel means for forming a mechanical seal as said slide passes over said interlocking channel means, said slide including:

a bottom plate, a center plate, and a top plate in an inverted block "S " configuration,

a head end formed by said bottom, center, and top plates,

a tail end formed by said bottom and top plates, wherein the overall height of said slide tapers from head to tail,

said center plate having a rounded back edge adjacent said tail end and separator slots formed on opposing diagonal surfaces of said center plate and parallel to said interlocking channel means, said separator slots being formed for feeding said peel off strip means away from said first and second adhesive layers near the tail end of said slide and

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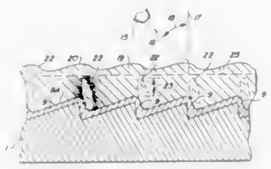
preventing said peel-off strip means from interfering with said interlocking channel means.

4,914,794

METHOD OF MAKING AN ABRADABLE STRAIN-TOLERANT CERAMIC COATED TURBINE SHROUD

Thomas E. Strangman, Phoenix, Ariz., assignor to Allied-Signal Inc., Phoenix, Ariz.

Division of Ser. No. 894,409, Aug. 7, 1986, Pat. No. 4,764,089. This application Nov. 25, 1987, Ser. No. 125,310
Int. Cl.[4] B23P *9/00*
U.S. Cl. 29—889.2 11 Claims



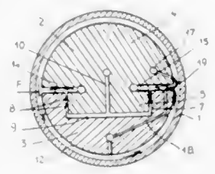
1. A method of making a gas turbine comprising the steps of:
(a) providing a shroud substrate having a smooth inner surface;
(b) forming an array of steps on the inner surface so that each step includes a first face having a small slope and a second face adjoining the first face at a corner and having an approximately vertical slope, and also forming an array of intersecting grooves which separate the steps;
(c) performing a line of sight deposition of ceramic material uniformly over the steps at a spray angle that prevents ceramic from being directly deposited on the second faces so that a plurality of shadow gaps are formed in the ceramic layer as it is deposited, each shadow gap extending above an edge of a step through a substantial portion of the ceramic layer; and
(d) machining a major exposed surface of the ceramic layer to provide an abradable ceramic liner on the inner surface of the shroud substrate.

4,914,795

MILL ROLL WITH A DEFORMABLE CASING

Michel Morel, Chelles, and Marc Valence, Courbevoie, both of France, assignors to Clecim, Courbevoie, France

PCT No. PCT/FR86/00151, § 371 Date Dec. 28, 1987, § 102(e) Date Dec. 28, 1987, PCT Pub. No. WO87/06660, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 30, 1986, Ser. No. 154,253
Int. Cl.[4] B21B *27/00*
U.S. Cl. 29—116.2 7 Claims



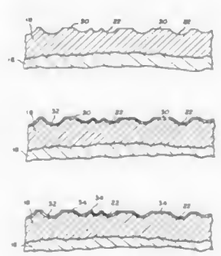
1. A milling roll with a deformable casing comprising
(a) a fixed support (2) having an upper part (4) and a lower part (5);
(b) a tubular casing (1) surrounding said support (2) with radial play and having a cylindrical inner surface;
(c) a set of holding elements (3*a*, 3*b*, 3*c*) interposed between the lower part of the support (2) and an inner surface of said tubular casing (1);
(d) each holding element (3*a*, 3*b*, 3c) having on one side thereof a cylindrical outer surface sliding on the inner surface of the tubular casing (1) and delimiting an annular space (12) in the form of an angular circular sector having two ends;
(e) each holding element bearing on the other side thereof on the lower part of the fixed support (2) by means of at least one hydraulic jack (5, 7) having a chamber (9);
(f) means (10) for feeding the chambers (9) of the hydraulic jacks (5, 7) of said holding elements (3) with high-pressure fluid, said means for feeding comprising a separate circuit (10*a*, 10*b*, 10c) for the jack (5, 7) of each holding element (3*a*, 3*b*, 3c);
(g) means for pouring an hydraulic fluid film in the spaces (12) between the inner surface of the tubular casing (1) and the outer surface of each holding element (3), said means for pouring a fluid film comprising for each holding element (3*a*, 3*b*, 3c) means of circulating said fluid from one end of the space (12) in the form of a circular sector to the other end, said means comprising for each holding element (3*a*, 3*b*, 3c) (i) at least one feed duct (14) and at least one fluid recovery duct (15) opening out respectively at the two ends of the said space (12) in the form of a circular sector, said feed duct (14) being fed with low-pressure oil which flows in said space (12) so as to form a hydrodynamic bearing, in which the circulation of the fluid takes place completely independently of the supply of high-pressure fluid to the chamber (9) of the associated jack (5, 7).

4,914,796

PROCESS FOR MANUFACTURING NICKEL COATED SHOT BLASTED WEB CONVEYING ROLLER

Daniel C. Lioy; Edward F. Hurtubis, both of Rochester, and Edward R. Schickler, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 12, 1988, Ser. No. 282,661
Int. Cl.[4] B21B *28/02*; B05D *3/12, 5/02*
U.S. Cl. 29—121.8 8 Claims



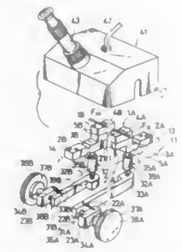
1. A process for manufacturing a roller used for conveying a web, the process comprising the steps of:
applying a layer of nickel onto a metal roller of substantially cylindrical configuration,
blasting the surface of the nickel layer with steel shot to create on the surface a deep texture with a patern of (1) well rounded down features having a substantially uniform depth with many of the down features at least partially overlapping and (2) very sharp up features, and
grinding the blasted surface to remove the sharp up features and thereby produce plateaus on the surfaces but without removing more than 50% of the pattern depth formed by the blasting step so that the plateaus are surrounded by interconnected channels resulting from the overlapping down features.

4,914,797

AXIALLY CENTERING APPARATUS FOR FUSION-BONDING OPTICAL FIBERS

Yoshio Tauchida; Tomoki Takahashi, both of Hiratsuka, and Shuji Kajitani, Matsue, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1987, Ser. No. 114,659
Claims priority, application Japan, Oct. 27, 1986, 61-254958; Oct. 27, 1986, 61-254959; Oct. 27, 1986, 61-254960
Int. Cl.[4] B25B *27/14*
U.S. Cl. 29—281.1 18 Claims



1. An axially centering apparatus for fusion-bonding optical fibers comprising:
a pair of guides having long grooves on the upper surfaces thereof for engaging optical fibers,
a pair of fulcra formed in parallel with the long grooves of the guides for supporting the guides,
a pair of centering stands having substrates for supporting the fulcra,
a pair of centering mechanisms having adjusting mechanism sections having telescopic output ends,
load imparting mechanism sections, and
transmitting mechanism sections for the adjusting mechanism sections so that the long grooves of said centering stands are disposed adjacent to each other to align in a rectilinear line, said transmitting mechanism section comprising a lever which is rotatable about an axis of the load imparting mechanism section and abuts a portion of the adjusting mechanism section, said centering mechanisms are associated with the centering stands such that the output ends of the centering mechanisms contact the guides of the centering stands,
wherein an imaginary diagonal line on each centering stand from a fulcrum to an associated long groove makes a 45° angle with an imaginary vertical line through the long groove and the imaginary diagonal lines on each centering stand are perpendicular to each other, and the output ends of the pair of centering mechanisms are disposed on the same plane to be contacted with the guides of the centering stands.

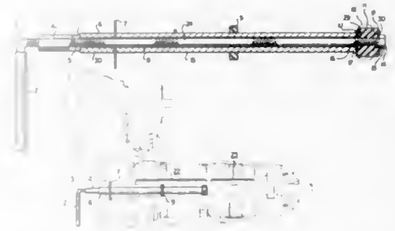
4,914,798

METHOD FOR REMOVING GEAR TRAIN ASSEMBLY OR FINAL DRIVE ASSEMBLY FROM A POWER TRANSMISSION CASING

Charles I. Gentile, 7342 Woodthrush, Dallas, Tex. 75230-4238

Division of Ser. No. 209,847, Jun. 22, 1988, abandoned. This application Jun. 2, 1989, Ser. No. 360,542
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—426.5 3 Claims

1. A method for removing the gear train assembly or final drive assembly from a power transmission casing, comprising the steps of:
providing a gear puller comprising a tube having a threaded rod therein with an expandable member located on a first end of the rod beyond a first end of said tube and a nut threaded on the other end of said rod adjacent the other end of said tube, said other end of said rod also having a handle thereon outwardly of said nut,
inserting said tube and expandable member into said assembly up to a depth gauge positioned on said tube,



holding said nut while rotating said handle or holding said handle while rotating said nut to cause said tube to expand the expandable member radially, providing a seat on which an assembly rests, and then pulling said handle to remove said assembly from the transmission casing.

4,914,799

METHOD OF FORMING, ASSEMBLING, AND FILLING A VISCOUS DAMPER

Robert J. Kyle, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 12, 1988, Ser. No. 256,816
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—429 6 Claims

1. A method of assembling and filling a viscous damper including annular housing and clutch assemblies adapted for relative rotation about a common axis; the housing assembly including first and second sidewalls defining an interior compartment containing drivingly interconnected radially inner and outer portions of the clutch assembly, the compartment including a radially outer portion defining a viscous shear chamber formed by closely spaced apart axially facing annular flat shear surfaces of the sidewalls and the outer portion, and a reservoir chamber disposed radially inward of the shear chamber and having a principle volume formed by an annular bulge in at least the first sidewall; the clutch assembly having at least one opening therethrough, the inner portion including an axially facing surface having a face seal affixed thereto and extending axially therefrom into dynamic sealing relation with a flat annular seal surface defined by a portion of the first sidewall radially inward of the annular bulge; the method comprising:
positioning the first sidewall on a support with the shear and seal surfaces thereof facing upward and in a horizontal plane;
positioning the clutch assembly inner portion with the seal resting on the first sidewall seal surface and the outer portion with one of the shear surfaces thereof axially facing the first sidewall shear surfaces;
injecting a predetermined volume of viscous shear liquid through the opening in the clutch assembly in excess to the volume of the annular bulge and less than an amount capable of overflowing the upward surfaces of the inner and outer portions;

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positioning the second sidewall over the clutch assembly with a spacer sealingly secured to one of the sidewalls, axially spacing the sidewall shear surfaces apart and defining a radially outer extent of the viscous shear chamber; and

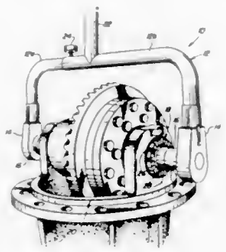
sealingly securing the spacer to the other sidewall.

4,914,800

DIFFERENTIAL SIDE QUILL ADJUSTMENT TOOL

Michael S. Cook, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jan. 13, 1988, Ser. No. 143,433
Int. Cl.[4] B23P *11/00*; B25B *13/46*
U.S. Cl. 29—434 **5 Claims**



2. A method for adjusting the drive shaft pinion/ring gear backlash of a differential assembly having two adjustable side quills, each side quill being adjustable in and outer of a differential housing by rotation of the side quill, with a tool comprising:

engagement means for engaging each side quill to rotate the side quill in either direction;

positioning means for holding said engagement means in engagement with said side quills, said positioning means being rotatable to rotate said engagement means and said side quills;

ratchet means for mounting said engagement means to said positioning means, said ratchet means transmitting rotational portion of said positioning means through said engagement means to at least one of said side quills when said positioning means rotates in one direction, but not when it rotates in the other direction, and being adjustable to allow ratcheting in either rotational direction;

the method comprising:

engaging the side quills of the differential with the engagement means to the tool;

adjusting the ratchet means of the tool to ratchet in the same direction; and

rotating the positioning means to rotate said engagement means and quills, thereby adjusting the backlash by adjusting the position of said quills.

4,914,801

METHOD OF MANUFACTURING A DISC BRAKE PAD

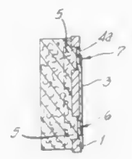
Roy Sweetmore, Buxton, and Roy A. Eastham, Hadfield, both of United Kingdom, assignors to Ferodo Limited, Manchester, England

Division of Ser. No. 165,468, Mar. 8, 1988, Pat. No. 4,846,312. This application Apr. 18, 1989, Ser. No. 339,723
Claims priority, application United Kingdom, Mar. 10, 1987, 8705659
Int. Cl.[4] B21D *35/00*
U.S. Cl. 29—469.5 **8 Claims**

1. A method of manufacturing a disc brake pad and shim assembly comprising the steps of:

(a) providing a back plate having a plurality of spigot holes formed therein;

(b) moulding a pad of friction material onto one side of the back plate, permitting said friction material to only partially fill at least two of said spigot holes; and



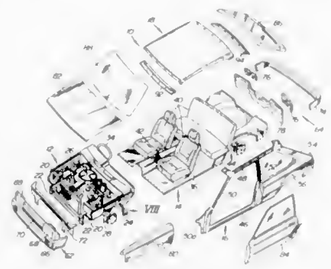
(c) bonding a preformed shim to the other side of said back plate and deforming portions of said shim into unfilled space in said at least two of said spigot holes to resist slippage of the shim across the back plate.

4,914,802

METHOD OF ASSEMBLING AUTOMOTIVE BODY STRUCTURE HAVING PRE-ASSEMBLED INNER COVER MEMBER ON EACH BODY UNIT.

Koji Takao, Atsugi; Hiroshi Kuriyama, and Norio Kazama, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 25, 1988, Ser. No. 160,435
Claims priority, applicatioo Japan, Feb. 26, 1987, 62-27788[U]; May 13, 1987, 62-116445
Int. Cl.[4] B23P *21/00*
U.S. Cl. 29—469 **16 Claims**



1. A method of producing an automotive body structure comprising:

(a) preparing an engine compartment unit, a floor assembly unit, and a pair of body side assembly units, each unit having been preassembled and having an inner decorative cover member laid on an inner surface of each unit;

(b) joining said units together in such a manner that a peripheral edge portion of the inner decorative cover member of each unit is intimately received in a restricted clearance which is defined between actually joined portions of the respective units; and

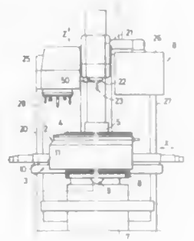
(c) securing the respective units in such a manner that each peripheral edge portion is fixed in each clearance.

4,914,803

MACHINE TOOL

Koichiro Kitamura, Takaoka, and Shigeru Yamada, Fukuoka, both of Japan, assignors to Kitamura Machinery Co., Ltd., Takaoka, Japan

Filed Aug. 30, 1988, Ser. No. 238,189
Claims priority, application Japan, Aug. 23, 1988, 63-207252
Int. Cl.[4] B23Q *3/157*
U.S. Cl. 29—568 **10 Claims**



9. A machine tool comprising:

a support;

a spindle head movably mounted on the support between a tool changing position and an operating position;

a spindle mounted for rotation in the spindle head, the spindle head being movable in a direction parallel to the axis of rotation of the spindle;

a tool changer mounted on the spindle head for moving tools between the spindle and magazine means; and

magazine means for holding at least one tool;

said tool changer comprising means for moving a tool from a first position, in which the tool is connected to the spindle, to a second position, in which the tool is retained by the magazine means, in a motion consisting of two components:

a first component in a direction parallel to the axis of rotation of the spindle for drawing a tool out of the spindle when the spindle head is in its tool changing position; and

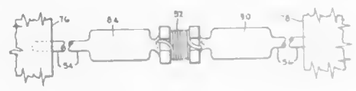
a second component in a plane substantially orthogonal to the axis of rotation of the spindle.

4,914,804

METHOD OF MAKING A SURFACE MOUNTABLE ELECTRONIC DEVICE

Donald C. McElheny, Delevan, and Dale A. Ponivas, West Seneca, both of N.Y., assignors to American Precision Industries Inc., Buffalo, N.Y.

Filed Mar. 29, 1989, Ser. No. 329,973
Int. Cl.[4] H01F *41/02*
U.S. Cl. 29—602.1 **14 Claims**



1. A method of making a surface mountable electronic device comprising the steps of:

(a) providing a discrete electronic device comprising a body and a pair of spaced apart leads each of substantially circular cross-section and extending axially outwardly from said body in generally opposite directions;

(b) shaping each of said leads to provide a plate-like section in each of said leads at a location axially outwardly from said body;

(c) encapsulating said device body in electrical insulation material in a manner shaping said material to provide a body having first and second spaced apart ends and a mounting surface extending between said ends, said plate-like sections of said leads extending from said ends; and

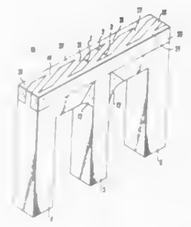
(d) shaping each of said plate-like sections of said leads to have a contact portion extending along said mounting surface for making electrical connection to a circuit having a portion defined on a surface to which said device is mountable.

4,914,805

METHOD OF MANUFACTURING A MAGNETIC HEAD HAVING A PLURALITY OF MAGNETIC GAPS

Masahiro Kawase, 74-5, Ohaza Kamikagemori, Chichibo-shi, Saitama-ken, Japan

Division of Ser. No. 151,430, Feb. 2, 1988, abandoned. This application Jan. 12, 1989, Ser. No. 365,096
Claims priority, application Japan, Feb. 10, 1987, 62-029050
Int. Cl.[4] G11B *5/42*
U.S. Cl. 29—603 **12 Claims**



1. A method of manufacturing a magnetic head, comprising:

(a) a first step of forming a magnetic circuit structure having a surface for sliding contact with a recording medium and first and second magnetic gaps disposed at positions different in a sliding direction;

(b) a second step of forming a plurality of grooves on the surface of said magnetic circuit structure for sliding contact with the recording medium, said grooves extending in oblique direction relative to the direction of sliding and in parallel with each other at constant pitches, thereby forming a plurality of divided parts of the second magnetic gap on said surface of sliding contact with the recording medium; and

(c) a third step of cutting the magnetic circuit structure, on which said plurality of grooves is formed, into a plurality of magnetic head chips, whereby the plurality of parts of said first magnetic gap are caused to disappear in alternate manner, while the number of the plurality of parts of said second magnetic gap is held unchanged.

4,914,806

METHOD OF MANUFACTURING CONTACT BLOCK

Jisei Taguchi, Atsugi, and Masabu Tada, Hiratsuka, both of Japan, assignors to Anritsu Corporation, Tokyo, Japan

PCT No. PCT/JP88/00528, § 371 Date Jan. 18, 1989, § 102(e) Date Jan. 18, 1989, PCT Pub. No. WO88/10003, PCT Pub. Date Dec. 15, 1988
PCT Filed May 30, 1988, Ser. No. 304,850
Claims priority, application Japan, May 30, 1987, 62-136151
Int. Cl.[4] H01H *11/04*
U.S. Cl. 29—622 **2 Claims**

1. A method of manufacturing a contact block, comprising the steps of:

forming a predetermined number of make contact pieces, break contact pieces, base pieces, and terminal pieces in a

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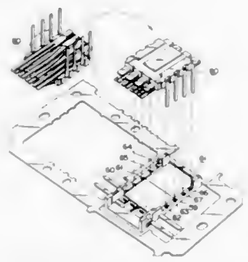
first hoop member by blanking, said pieces being coupled to said first hoop member through coupling portions;

forming first and second insulating blocks in which said make contact pieces, said break contact pieces, said base pieces, and said terminal pieces are integrally embedded by molding, thereby obtaining a first subcontact block including at least said break contact pieces, and a second subcontact block including at least said make contact pieces;

forming movable contact spring pieces in a second hoop member by blanking, said movable contact spring pieces



being coupled to said second hoop member through coupling portions, and tension-bending said movable contact spring pieces;

aligning said second hoop member with said first hoop member and welding said movable contact spring pieces to said base pieces, respectively;

cutting off said movable spring contact pieces from said second hoop member; and

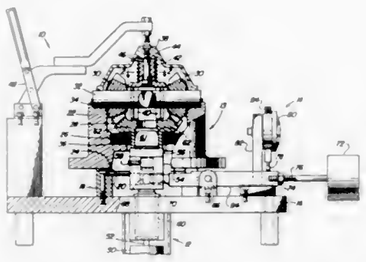
cutting off one of said first and second subcontact blocks from said first hoop member, and aligning and coupling said first and second subcontact blocks to each other.

4,914,807

APPARATUS FOR ADJUSTING THE BACKLASH ON A DIFFERENTIAL

Michael S. Cook, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Division of Ser. No. 172,153, Mar. 23, 1988, Pat. No. 4,821,395.
This application Feb. 9, 1989, Ser. No. 308,290
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—700 **10 Claims**



1. An apparatus for adjusting the backlash between the bevel gears and pinion gears of a bevel-type differential having:

at least one differential housing half;

at least one bevel gear rotatably mounted in said housing half; and

a plurality of pinion gears rotatably mountable in said housing half meshing with said bevel gear; the apparatus comprising:

means for holding the pinion gears in the differential housing half while allowing the pinion gears to rotate;

means for selectively pressing the bevel gear along its axis of rotation in said housing half towards the pinion gears; and

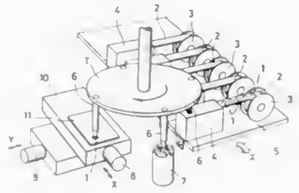
means for measuring the extent of displacement of said bevel gear when it is pressed towards said pinion gears.

4,914,808

AUTOMATIC ELECTRONIC PARTS MOUNTING APPARATUS FOR REPEATEDLY MOUNTING IN FORWARD AND REVERSE SEQUENCES

Toshikatsu Okumura, Obta; Atsushi Kura, Saitama; Yoshio Tanabe, Gunma, and Kazuyoshi Obyama, Tochigi, all of Japan, assignors to Sanyo Electric Co., Ltd, Osaka, Japan

Filed Oct. 14, 1988, Ser. No. 257,959
Claims priority, application Japan, Oct. 16, 1987, 62-262247; Nov. 12, 1987, 62-286220
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—740 **9 Claims**



1. An automatic electronic parts mounting apparatus which has means for sucking chip parts having different shapes and sizes from a reciprocating tape moving table and for mounting the chip parts repeatedly in a plurality of identical mounting patterns on a single printed board placed on an X-Y table moving at high speed in the X-Y directions, the apparatus comprising:

pattern storage means for storing, in mounting sequence, mounting data regarding kinds of chip parts in predetermined mounting patterns and positions on the printed board where the chip parts are mounted;

pattern position storage means for storing data regarding positions on the printed board where the mounting patterns based on the mounting data stored in the pattern storage means are formed;

sequence designating means arranged in correspondence with the pattern position storage means for designating a forward sequence where the chip parts in the mounting patterns are mounted in a forward direction in accordance with the mounting sequence of the pattern storage means, so as to constitute a forward mounting sequence, and a reverse sequence where the chip parts are mounted in a reverse direction in accordance with the mounting sequence of the pattern storage means so as to constitute a reverse mounting sequence; and

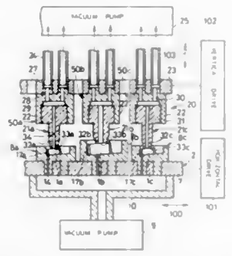
means for moving the tape moving table so that the chip parts can be sucked in accordance with the mounting data in the pattern storage means, and for moving the X-Y table so that the chip parts can be repeatedly mounted at predetermined positions stored in the pattern position storage means in accordance with the sequence designating means in the plurality of mounting patterns in the pattern storage means.

4,914,809

CHIP MOUNTING APPARATUS

Kikuji Fukai, Takasaki; Takaliro Tanaka, Maebashi, and Makoto Mineno, Takasaki, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Feb. 7, 1989, Ser. No. 307,899
Claims priority, application Japan, Feb. 15, 1988, 63-18495; Apr. 28, 1988, 63-108065
Int. Cl.[4] H05K *3/30*
U.S. Cl. 29—740 **26 Claims**



1. An apparatus for mounting a set of chips on a circuit board in any of a plurality of different arrangements, comprising:

(a) template means for holding a set of chips in an arrangement corresponding to a desired arrangement of the chips on a circuit board;

(b) suction head means for transferring the set of chips from the template means to the circuit board, the suction head means comprising:

(1) a planar head carrier having a plurality of mounting holes formed therein;

(2) a set of suction head assemblies for engagement in selected ones of the mounting holes in the head carrier, which engagement is in any of a plurality of different arrangements according to the desired arrangement of the chips on the circuit board;

each suction head assembly of the suction head means comprising:

i. a suction head having an end face to which a chip is to be attached by suction; and

ii. a head holder holding the suction head and having at least one mounting pin for engagement in a selected one of the mounting holes in the head carrier,

(3) vacuum means for creating a partial vacuum in the suction head assemblies in order to cause the chips on the template means to be attached thereto by suction; and

(c) drive means for relatively moving the template means and the suction head means toward and away from each other.

4,914,810

APPARATUS FOR MEASURING THE PORE SIZE OF ENHANCED TUBES

Steven R. Zohler, Manlius, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

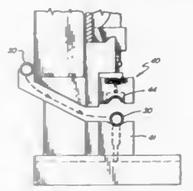
Filed Dec. 2, 1985, Ser. No. 803,378
Int. Cl.[4] B21D *53/02*
U.S. Cl. 73—38 **3 Claims**

1. A device for determining the average pore size on a portion of a circumferential section of the exterior surface of an enhanced tube having subsurface channels connected by pores on the exterior surface, comprising:

a support member for supporting a section of the exterior surface of the enhanced tube therein;

at least one body member having a single longitudinal recess in said body member aligned axially of said enhanced tube;

a sealing member connected to said body member, said sealing member sealingly engageable around the portion of the circumferential section of the exterior surface of the enhanced tube; and



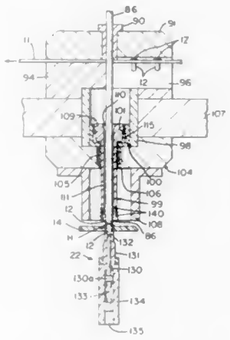
a compressed air fluid pressure source connected to said recess to that a constant fluid pressure is maintained at an inlet to said recess whereby the fluid pressure is discharged for said recess through the pores on the exterior surface of the enhanced tube and through the connected subsurface channels to the surroundings outside the body member.

4,914,811

MACHINE FOR MINISPRING SOCKET INSERTION

Edward P. Nolte, Jr., Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 21, 1986, Ser. No. 866,181
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—747 **13 Claims**



1 A machine for inserting electrical terminals mounted to a carrier strip into holes in a circuit board, the apparatus comprising:

a frame;

a carrier strip feed track on the frame;

a terminal driving insertion ram mounted to the frame for reciprocating movement towards and away from a terminal insertion station at one end of said feed track, for driving a terminal from said carrier strip into a hole in said circuit board;

a circuit board support aligned with said insertion station and the ram, for positioning the circuit board to receive a terminal to be driven into said hole in the circuit board by the ram;

a carrier strip advancing mechanism on the frame, for advancing the carrier strip intermittently towards said insertion station to position one terminal at a time at said insertion station, to be driven by the ram into said hole in the circuit board when positioned by said support; and

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an elongate tubular guide connected to the frame and through which the ram passes, for guiding said one terminal when driven by said ram from the insertion station into said hole, said tubular guide being longitudinally divided into a plurality of parts pivotally connected proximate to said insertion station, resilient means engaging said parts at a position remote from said insertion station and urging said parts towards each other against the action of said one terminal when driven towards the circuit board by said ram.

4,914,812

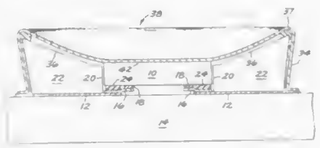
METHOD OF SELF-PACKAGING AN IC CHIP

Harold F. Webster, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 235,087, Aug. 23, 1988, which is a division of Ser. No. 128,847, Dec. 4, 1987, Pat. No. 4,796,156. This application Feb. 17, 1989, Ser. No. 312,849

Int. Cl.[4] H05K *3/20*

U.S. Cl. 29—831 4 Claims



1. A method of self packaging an integrated circuit chip on a printed circuit board wherein conductive leads extending from terminals on said chip form a pressure-fit electrical connection with interconnect leads positioned on said printed circuit board, comprising the steps of:

securing conductive leads to an integrated circuit chip;

cementing said conductive leads to a compliant backing member disposed about a periphery of said integrated circuit chip;

aligning said conductive leads with corresponding interconnect leads on a printed circuit board; and

applying a cap over said integrated circuit chip onto said printed circuit board, said cap forcing said conductive leads and said interconnect leads to form pressure-fit electrical connections.

4,914,813

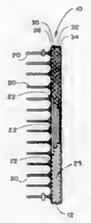
REFURBISHING OF PRIOR USED LAMINATED CERAMIC PACKAGES

Francis W. Layber, Tuscon, Ariz., and Napoleon Fulinara, San Diego, Calif., assignors to Innovative Packing Technology, San Diego, Calif.

Filed Nov. 25, 1988, Ser. No. 276,238

Int. Cl.[4] H05K *3/06*

U.S. Cl. 29—843 10 Claims



1. A process for remanufacturing of the ceramic substrates used for the packaging of semiconductor devices recovered from laminated ceramic packages which have failed to properly operate after the manufacturing process is complete, said laminate ceramic packages include one or more layers of conductors each of which have continuity from the outer edge of the substrate to one of a plurality of bonding fingers located at a central opening in said substrate, a lid adhered to the surface of the substrate sealing over said central opening, a die interconnected by thin wires to said bonding fingers and said die being adhered to a surface covering the bottom of said central opening, a plurality of connector pins braze bonded to metal pads on the outer surface of said substrate each being connected to a separate one of said plurality of conductors, said bonding fingers, pads and pin are first nickel plated and then plated with gold, said lid and pins are adhered by suitable bonding material said remanufacturing comprising the steps of:

unsealing and removing of said lid;

removing said die;

removing said bonding material, pins, wires, gold and nickel from said substrate;

replating said bonding fingers and pads with a material selected from a group consisting of electrodes gold or palladium activator;

replating said bonding fingers and pads with electroless nickel;

firing said substrate to densify Ni;

aligning and brazing one of said pins to each of said pads;

interconnecting all of said conductors together by applying a conductive material to the outer edges of said substrate to provide a conductor electrically common to said bonding fingers, pads and pins;

plating the bonding fingers, pads and pins with nickel;

plating the bonding fingers, pads and pins with gold; and

disconnecting said conductors form each other.

4,914,814

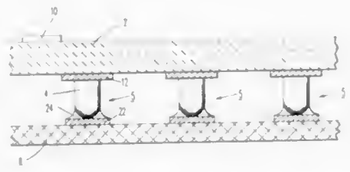
PROCESS OF FABRICATING A CIRCUIT PACKAGE

John R. Behun; William R. Miller, both of Poughkeepsie; Bert H. Newman, Carmel, and Edward L. Yankowski, Hyde Park, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 4, 1989, Ser. No. 347,305

Int. Cl.[4] H01R *9/09*

U.S. Cl. 29—843 20 Claims



1. A process for fabricating a circuit package comprising the steps of:

providing a carrier having on one side thereof a first array of conductive pads;

placing a pin mold having a corresponding array of pin holes in alignment with said carrier such that said corresponding array of pin holes is in substantial registration with said first array of conductive pads;

filling said array of pin holes in said pin mold with a first solder having a given melting point;

heating said first solder in said pin mold such that said first solder becomes molten and coalesces with said first array of conductive pads, thereby forming an array of miniature pins bonded to said first array of conductive pads of said carrier;

joining circuit components to the other side of said carrier;

placing a supporting substrate having on one side thereof a second corresponding array of conductive pads, screened with a second solder having a melting point substantially lower than said given melting point, in alignment with said carrier such that said second corresponding array of conductive pads is in substantial registration with the free ends of said array of miniature pins of said carrier; and

reflowing said second solder to bond the free ends of said array of miniature pins to said second corresponding array of conductive pads, thereby forming solder column connections between said carrier and said supporting substrate.

4,914,815

METHOD FOR MANUFACTURING HYBRID INTEGRATED CIRCUITS

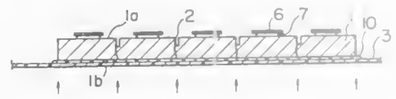
Mitsuyuki Takada; Hayato Takanago, and Yoshiyuki Morihiro, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 21, 1989, Ser. No. 312,929

Claims priority, application Japan, Feb. 23, 1988, 63-40001; Nov. 29, 1988, 63-302848

Int. Cl.[4] H05K *3/39*

U.S. Cl. 29—840 22 Claims



1. A method for manufacturing hybrid integrated circuits comprising the steps of:

forming a plurality of circuit patterns on a first surface of a board having opposed first and second surfaces;

applying a connecting film to said second surface of said board;

dividing said board into portions by forming grooves in said board on said first side, each portion including one of said circuit patterns thereon, while leaving said connecting film intact;

mounting component parts on said first surface of said board on said respective portions; and

separating said portions having said component parts mounted thereon by cutting said connecting film.

4,914,816

LIVE-ACTION BLADE SHAVER

Lawrence E. Fenn, 101 Landsdowne, Westport, Conn. 06880, and Leo Chateauneuf, 16 Russ Rd., Trumbull, Conn. 06611

Continuation-in-part of Ser. No. 104,502, Oct. 5, 1987, Pat. No. 4,819,330. This application Mar. 23, 1989, Ser. No. 327,724

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.[4] B26B *19/28*

U.S. Cl. 30—45 13 Claims

1. An electric shaver comprising, in combination:

(a) a handle and an elongate, relatively slender hollow neck extending from one end of the handle,

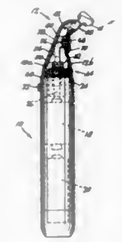
(b) a shaver blade mount on said neck, said blade mount and neck being rigidly affixed to each other against relative movement,

(c) a cutting blade normally fixedly carried by the blade mount to move therewith and with said neck,

(d) attachment means for movably mounting said neck on the handle,

(e) an electric motor in said handle, having a driving member,

(f) drive means connected with said movably-mounted neck and with said driving member and extending within said neck, for imparting oscillatory, essentially straight-line movement to the neck, shaver blade mount and the blade carried thereby with respect to said handle in a direction



longitudinally of the blade and in response to powered movement of said driving member.

4,914,817

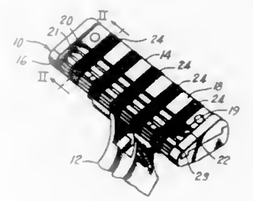
RAZOR HEAD WITH RIBLETS

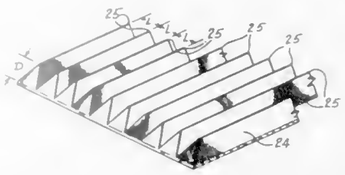
John Galligan, Weston, and John Thompson, Medfield, both of Mass., assignors to The Gillette Company, Boston, Mass.

Filed Jul. 1, 1988, Ser. No. 214,464

Int. Cl.[4] B26B *21/16*

U.S. Cl. 30—77 7 Claims





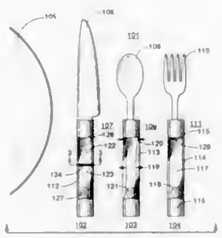
1. A razor head comprising a guard surface and a cap surface disposed in spaced relation, blade means disposed in the space between said guard and cap surfaces, said blade means having an outwardly extending cutting edge, and a plurality of parallel riblets disposed on said shaving head for contacting a surface when said surface is contacted by said blade cutting edge, said riblets being formed on the outwardly facing surface of a plurality of strips of substantially thin material extending from said guard surface to said cap surface across the space between said surfaces.

VOL 1113 ISS 2 AP 10 1990 UMI

4,914,818
COAXIAL CABLE CUTTER
Leslie C. Hall, Grandview, and Robert S. Hedges, Belton, both of Mo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Aug. 23, 1988, Ser. No. 235,079
Int. Cl.[4] H02G *1/12*
U.S. Cl. 30—90.1 10 Claims

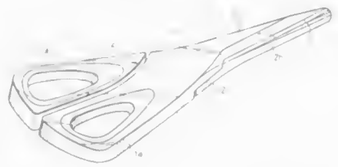
1. A cutting device for trimming a coaxial cable, comprising:
a hollow, cylindrical-shaped housing member having a longitudinal axis and two ends;
a thumbpiece positioned at a first end of said housing member;
a transfer shaft, attached to said thumbpiece, positioned within said hollow housing member;
a spring member, attached to said housing member and said transfer shaft, positioned within said hollow housing member;
jaw members, attached to said transfer shaft and said spring member, positioned at a second end of said housing member; and
a cutting member, attached to said jaw members, for providing the cutting action needed for trimming the coaxial cable;
whereby said thumbpiece, upon receiving pressure, transfers said pressure to said jaw members through said transfer shaft, thereby permitting said jaw members to open;
and said spring member, upon release of said pressure from said thumbpiece, transfers a force to said jaw members, thereby causing said jaw members to close.

4,914,819
EATING UTENSIL FOR INDICATING WHEN FOOD MAY BE EATEN THEREWITH AND A METHOD FOR USING THE UTENSIL
Stephen R. Ash, 3736 Pershing, Lafayette, Ind. 47905
Filed May 17, 1989, Ser. No. 352,977
Int. Cl.[4] A47J *43/00, 43/28;* G04F *5/00, 1/04*
U.S. Cl. 30—147 19 Claims



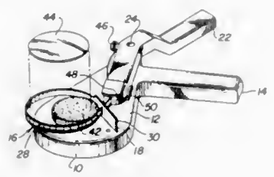
1. An eating utensil for indicating when food may be eaten therewith, comprising:
an instrumentality for engaging said food; and
a handle for manipulating said instrumentality and including an elongated chamber for viewing a visible signal at a predetermined position along said chamber for indicating when said food may be eaten, said chamber having first and second ends for containing first and second immiscible fluids having different densities, one of said fluids forming said visible signal and moveable to said predetermined position when one of said ends is elevated above the other.

4,914,820
STRUCTURE FOR ROTATION CENTER OF SCISSORS
Tatsuya Saito, Seki, Japan, assignor to Kai R&D Center Co., Ltd., Seki, Japan
Filed Jan. 5, 1989, Ser. No. 293,926
Claims priority, application Japan, Jul. 22, 1988, 63-184414
Int. Cl.[4] B26B *13/00*
U.S. Cl. 30—254 7 Claims



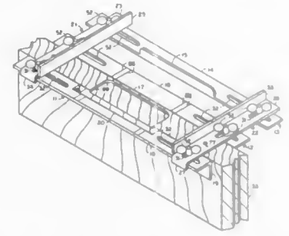
1. A structure for rotation center of scissors comprising;
a projection provided on a first surface of a first scissor segment, said projection including a stem portion and an engage portion provided on a tip of said stem portion and having a larger diameter than a diameter of said stem portion,
a concave portion provided on a second surface, opposite to said first surface of said first scissor segment, of a second scissor segment, said concave portion having a stopper preventing said projection from being released from said concave portion at any open-close angle of both said scissor segments,
both said scissor segments being connectable mutually so as to be opened and closed by engagement of said projection and said concave portion, said concave portion has a first opening, having a first width at least larger than the diameter of said engage portion and accommodating said engage portion, and a second opening connected with said first opening, having a second width smaller than the diameter of said engage portion and larger than the diameter of said stem portion, and accommodating said stem portion.

4,914,821
SIZER
Robert D. Hurt, Burlington, Iowa, assignor to Burlington Optical, Inc., Burlington, Iowa
Filed Feb. 3, 1989, Ser. No. 305,573
Int. Cl.[4] G01B *3/02*
U.S. Cl. 33—555.4 8 Claims



1. A sizer comprising a base, a flexible dimension-measuring element having a first end fixed to the base, a second end spaced from the first end and a portion intermediate the ends forming a variable-dimension loop overlying the base, a handle connected to the second end of the element and carried by the base for selective movement in one direction to contract the loop and in the opposite direction to expand the loop, and object-receiving means associated with the base for receiving within the expanded loop an object to be peripherally measured via contraction of the loop and including a member affixed to the base and having a substantially flat surface normal to the axis of the loop and exposed through the loop in a direction outwardly from the base.

4,914,822
HINGE JIGS
Earl Wetherington, 3445 Jacona Dr., Jacksonville, Fla. 32211
Continuation of Ser. No. 177,374, Apr. 4, 1988, abandoned. This application Sep. 1, 1989, Ser. No. 402,212
Int. Cl.[4] B27G *23/00*
U.S. Cl. 33—197 8 Claims



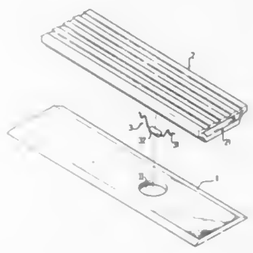
1. A hinge jig for use with routers, comprising three longitudinal members and two transverse members, where both of said transverse members are releasably attached to each of said longitudinal members so that all of said longitudinal and transverse members can be repositioned relative to each other;
one of said longitudinal members being an outer gripping support member comprising a planar upper surface, a gripping flange extending perpendicularly below said planar upper surface, and a clearance aperture positioned centrally along an interior edge of said outer gripping support member;
another of said longitudinal members being a central gripping support member comprising a planar upper surface and a gripping edge;
another of said longitudinal members being an outer limiting member comprising a stop flange extending perpendicularly above a base;
and each of said transverse members being a limiting member comprising a stop flange extending perpendicularly above a base, wherein each of said stop flanges of said transverse members is located at an interior position in said jig.

4,914,823
FLOAT BIASED LEVEL APPARATUS
Kenneth W. Harris, 4830 Allegheny, San Antonio, Tex. 78229
Division of Ser. No. 60,453, Jun. 11, 1987, Pat. No. 4,843,725. This application Apr. 18, 1989, Ser. No. 340,069
Int. Cl.[4] G01C *9/12*
U.S. Cl. 33—378 4 Claims

1. A level apparatus, comprising:
an axial container having a central axis;
an indicator including a rigid means and a float, rotatably mounted by means of a shaft within said container and movable throughout a 360° arc about said central axis, for indicating a direction; and
a liquid contained within said container, which liquid has a certain average density; and
said float being connected to said rigid means for utilizing the force of gravity to bias said rigid means coplanar with a vertical plane through said central axis, said float comprising a fluid-filled enclosure suspended in said liquid and having an average density less than the average density of said liquid for inducing an upward force, which upward force is operatively conveyed to said rigid means for biasing said rigid means co-planar with said vertical plane, said enclosure further comprising:
first and second rectangular planar sections joined to one another along a line of joinder in the proximity of said central axis;

an arcuate section joined at opposite ends to said first and second rectangular planar sections, said arcuate section having a concave surface facing each of said rectangular planar sections; and
a first side section and a second side section sealingly joined with each of said first and second rectangular planar sections and said arcuate section to sealingly enclose a space for containing the fluid which fills said enclosure, said first side section being parallel with said second side section, and said shaft being connected to each of said first and second side sections coaxially with said container.

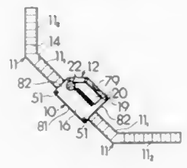
4,914,824
PARALLEL RULE
Otis M. Lee, No. 96, Shou Tien Rd., Kang Shan Chen, Kao Hsiung Hsien, Taiwan, Taiwan
Filed May 4, 1989, Ser. No. 347,194
Int. Cl.[4] B43L *13/02*
U.S. Cl. 33—449 1 Claim



1. A parallel rule comprising an elongated rule body having an opening provided at each end thereof, an elongated gripping means attached to a top surface of said rule body and a rolling device located within each opening;
each said rolling device having a cylindrical roller and a pair of anchorage portions, each inner section of said anchorage portion being rotatably connected to a respective side of said cylindrical roller;
a groove extending along a bottom surface of said gripping means so as to receive each of said anchorage portions therein, each respective outer section of said anchorage portions being secured by said groove and said top surface of said rule body, each said cylindrical roller projecting

through said opening beyond a lower surface of said rule body.

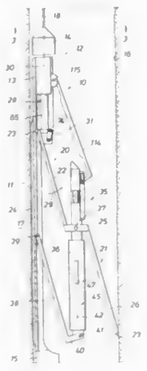
4,914,825
SQUARING TOOL
Johnny V. Howard, P.O. Box 1357, Douglasville, Ga. 30133
Filed Jan. 26, 1989, Ser. No. 302,549
Int. Cl.[4] B43L *13/00*; G01B *5/24*
U.S. Cl. 33—464 18 Claims



1. A squaring tool comprising:
a pair of squaring members, each said squaring members including two blades joined together so that said blades lie in a common plane and are oriented with a 45° angle therebetween;
a frame assembly defining a blade passage therethrough having a cross-sectional shape and size such that one of said blades of both of said squaring members is slidably received through said blade passage in a juxtaposed relationship, said frame assembly defining a common edge surface along said blade passage to slidably support both of said blades in said blade passage therethrough;
a metal wear member replaceably mounted in said frame assembly and defining said common edge in said blade passage to slidably support said blades thereon and
locking and alignment means mounted on said frame and adapted to engage each of said blades in said passage to force said blades against said common edge surface to maintain alignment therebetween and to selectively fix said blades axially of said passage whereby said squaring members are adjustably mounted in said frame so that the other of said blades of both of said squaring members located outside said opening can be selectively located normal to each other and parallel to each other.

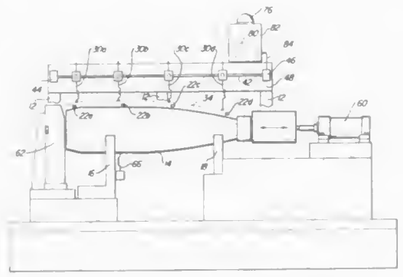
4,914,826
DECENTRALIZED WELL LOGGING APPARATUS FOR MEASURING THE DIAMETERS OF A BOREHOLE ALONG ITS PERPENDICULAR DIAMETRICAL AXES
Raymond V. Nold, III, Seabrook, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.
Filed May 19, 1989, Ser. No. 354,331
Int. Cl.[4] G01B *3/00*
U.S. Cl. 33—544 42 Claims

1. A well tool for passage along a well bore and including:
a tool body for suspension from a cable in a well bore;
means for decentralizing said tool body including a decentralizer on said tool body and movable to an extended position for engaging said decentralizer and tool body with a first set of well bore surfaces on opposite sides of that well bore;
first measurement means operable on engagement of said tool body and decentralizer with said first set of well bore surfaces for measuring the spacing therebetween;
first and second caliper arms coupled to opposite sides of said decentralizer and outwardly movable therefrom for engaging said caliper arms with a second set of well bore surfaces on opposite sides of that well bore; and



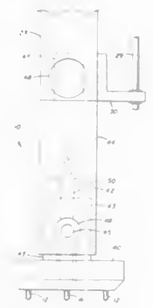
second measurement means operable on engagement of said caliper arms with said second set of well bore surfaces for measuring the spacing therebetween.

4,914,827
PROTECTION TECHNIQUE FOR GAGE HEADS
Kenneth J. Cook, Troy, Mich., assignor to GTE Valenite Corporation, Troy, Mich.
Filed Dec. 28, 1988, Ser. No. 291,058
Int. Cl.[4] G01B *5/20, 7/28*
U.S. Cl. 33—552 14 Claims



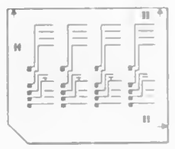
1. In a gaging system for measuring a part, the system having a gage head carrying a plurality of sensing devices thereon, a support for the part, and means for moving the gage head relative to the part so that the sensing devices come into contact with the part to provide measurements thereof, the improvement comprising:
a plurality of feelers carried hy the gage head in front of the sensing devices;
means for stopping relative movement of the gage head with respect to the part if the feelers contact the part; and
whereby the feelers define an envelope through which the part must pass without touching the feelers, the envelope being of sufficiently large dimension that a properly positioned normal part on the support will pass through the envelope without touching the feelers, the envelope being small enough that part abnormalities or improper positioning of the part on the support will result in at least one of the feelers touching the part prior to potentially damaging contact between the sensors and the part.

4,914,828
SURFACE INSPECTION DEVICE AND METHOD
Robert J. Fiedor, Lower Burrell, and Aloysius W. Farabaugh, Verona, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Aug. 9, 1988, Ser. No. 230,206
Int. Cl.[4] G01B *7/34*
U.S. Cl. 33—554 17 Claims



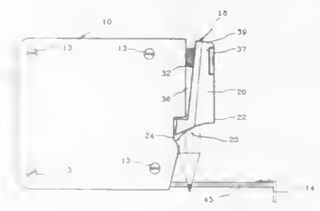
1. A method for measuring surfce irregularities on a curved surface of an article comprising
contacting the curved surface with two tips fixed on a sensor head thereby defining an arc segment on the surface between the two points of contact and a corresponding straight line chord between the two points of contact;
contacting the curved surface with a probe between the two contact tips, the probe being free to reciprocate normal to the surface;
generating a first signal proportional to the elevation of the probe contact point from the chord and processing the first signal to generate a second signal proportional to the radius of curvature of the arc segment;
scanning the sensor head along a predetermined path with the tips and probe in contact with the article surface; and
exhibiting a sequence of readings derived from a series of the second signals so as to indicate the degree of surface irregularity in the curved surface.

4,914,829
IMAGE ALIGNMENT INDICATORS
William R. Keaton, Genoa, Ill., assignor to AG Communication Systems Corporation, Phoenix, Ariz.
Filed Dec. 16, 1988, Ser. No. 285,558
Int. Cl.[4] G01B *5/24*; H05K *3/36*
U.S. Cl. 33—613 6 Claims



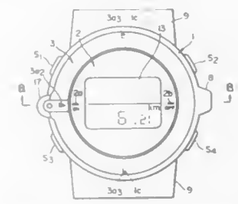
1. Positioning means for projecting a precision location of a screen artwork pattern as used in printing a thick film circuit on a ceramic substrate base, said positioning means comprising:
a plurality of registration marks on said artwork pattern, said artwork pattern going to be projected onto a ceramic substrate base, and said plurality of registration marks being located immediately adjacent to a location determined as an edge of said substrate base when said substrate is in correct register with said artwork pattern.

4,914,830
TAPE MEASURING DEVICE
Marcel Legaré, 6310 Du Griffon #3, Charlesbourg, Quebec, Canada G2J 1C6
Filed Oct. 24, 1988, Ser. No. 261,397
Claims priority, application Canada, Nov. 17, 1987, 552020
Int. Cl.[4] G01B *3/10*; B43L *9/04*
U.S. Cl. 33—668 14 Claims



1 A tape measuring device comprising:
a hollow housing defining a front wall having a lower portion formed with a slot therein;
an elongated tape wound into said housing, having at least one longitudinal graduated edge, and having a free end protruding outside the hollow housing through the said slot; and
a holder for a marking device having a marking tip, said holder including an arm hingedly mounted on said housing outside the same and facing said front wall above said slot, said arm and front wall defining between them a seat for receiving the marking device, and said seat comprising means for so positioning said marking device that its marking tip lies against said graduated edge in front of said slot but remotely therefrom when said tape is at least partially pulled out of said housing.

4,914,831
ROTATION DETECTING APPARATUS
Takanobu Kanezashi, Kawasaki, and Kazuo Kato, Hamura, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Feb. 24, 1989, Ser. No. 315,526
Claims priority, application Japan, Mar. 4, 1988, 63-28207[U]; May 21, 1988, 63-67318[U]
Int. Cl.[4] G01B *7/02*
U.S. Cl. 33—780 22 Claims



14. A rotation detecting apparatus comprising:
a casing;
a first wheel mechanism disposed inside said casing;
rotation detecting means for detecting rotation of said first

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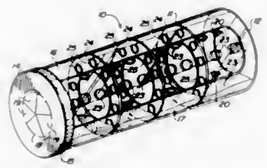
wheel mechanism and outputting a signal for each predetermined rotational angle;
a second wheel mechanism for measurement disposed at said casing such that a periphery of said second wheel mechanism does not protrude from an outer surface of said casing;
a moving member for moving said second wheel mechanism to such a location that rotation thereof is transmitted to said first wheel mechanism and part of said second wheel mechanism is exposed from said outer surface of said casing;
distance data computing means for acquiring data of an amount of rotation of said second wheel mechanism from said signal from said rotation detecting means and providing distance data corresponding to said data of said amount of rotation; and
display means for display said distance data acquired by said distance data computing means.

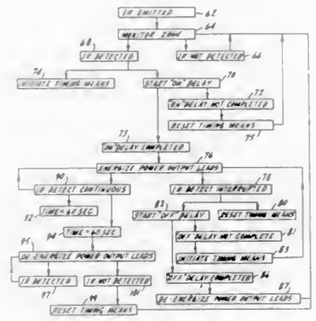
4,914,832
GRIP DEMOISTURIZER
James A. Cuthbert, 125 Cumberland Cir. East, Longwood, Fla. 32779
Filed Feb. 8, 1989, Ser. No. 308,304
Int. Cl.[4] B08B *15/04*; F26B *5/16*
U.S. Cl. 34—9 **20 Claims**



1. A device for applying a moisture absorbent powdery substance to an elongated grip, such as the grip of a sports racquet or the like, comprising:
a container defining a normally closed internal chamber;
a quantity of moisture absorbent powder stored within said chamber; and
self-closing valve means cooperating with said container for opening said chamber to admit the grip for inserting therein, and for reclosing the same upon withdrawal of the grip to prevent dispensing of the powder out of said chamber other than by attachment to inserted surfaces of the grip.

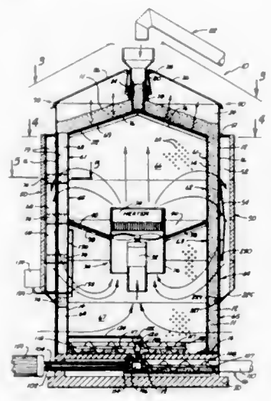
4,914,833
AUTOMATIC HAND DRYER
Joseph J. Pilolla, Elmhurst, and John R. Wilson, Naperville, both of Ill., assignors to 501 Sloan Valve Company, Franklin Park, Ill.
Filed Feb. 19, 1988, Ser. No. 157,606
Int. Cl.[4] F26B *13/10*
U.S. Cl. 34—44 **16 Claims**

1. An automatic hand dryer, comprising:
a mounting plate adapted for attachment to a wall parallel to the surface of the wall;
a fan housing attached to the mounting plate and having an air inlet and a downwardly-directed air outlet for directing air into a zone;
a motor attached to the fan housing;
a squirrel cage fan mounted in the fan housing so as to be driven by the motor, the axis of rotation of the fan being perpendicular to said mounting plate;
a heating element disposed in the fan housing for heating the air exhausted through the outlet into the zone;
sensor means for sensing the presence of a user at the zone outside the outlet of the hand dryer; and



control circuit means responsive to the sensor means to control operation of the motor and heating element.

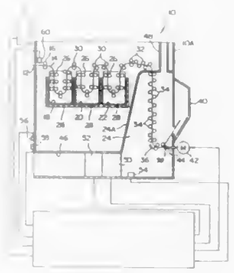
4,914,834
GRAIN DRYER
Sylvan H. Sime, P.O. Box 38, Walters, Minn. 56092
Filed Apr. 11, 1989, Ser. No. 336,135
Int. Cl.[4] F26B *17/12*
U.S. Cl. 34—169 **14 Claims**



1. In a grain dryer and conditioner:
(1) including a base partially defined by a horizontal upper surface,
(2) wherein a column of grain to be dried and conditioned is at least partially confined by a pair of ring-like, congruent, concen- tric, upright, spaced-apart, inner and outer pervious walls supported on and above the upper horizontal surface of the base, the inner wall effectively terminating at a ring-like, generally horizontal upper end surface,
(3) wherein a top cone is positioned above the upright inner pervious wall to direct grain deposited on it to flow by gravity to the space between the upright pervious walls,
(4) wherein means is provided to deliver grain to be dried and conditioned to fall on the top of the top cone,

(5) wherein a grain side board extends upwardly from the outer pervious wall in position to support grain above the grain column so that grain falling from the top cone cannot get beyond the outer pervious wall,
(6) wherein an upwardly blowing heater/blower assembly includes an impervious outer duct which is supported by bulkhead means at an intermediate position between the top and bottom of the upright pervious walls to be within and concentric with those walls,
(7) wherein said bulkhead means includes a bulkhead baffle extending between a ring-like portion of the heater/-blower assembly duct and a ring-like portion of the inner upright pervious wall in position to tend to block the return flow of heated air from the top of the heater/-blower assembly duct back to the bottom of the duct inside of the inner pervious wall, the presence of bulkhead baffle thereby creating within the inner upright pervious wall a positively pressured upper heated plenum above the bulkhead baffle and a relatively negatively pressured lower plenum below the bulkhead baffle, and
(8) wherein means is provided to receive grain discharging from between the pervious walls at the bottom of the grain column and to deliver it to a place of storage and use;
the improvement wherein:
(a) the top cone is pervious to allow heated air to pass through a grain layer on top of the cone to begin the heating of the grain and to carry moisture from the grain into the atmosphere;
(b) a vertically adjustable grain inlet tube skirt is positioned above, concentric with, and relatively closely spaced from the pervious top cone in position to receive and encompass grain delivered to be dried and conditioned and to direct it to the top of the cone to form a conical layer of grain on the cone when a full grain column is established, the thickness of the conical grain layer being a function of the height of the skirt above the pervious top cone;
(c) an upright impervious outer wall is supported in outwardly spaced concentric relation to said upright outer pervious wall to define, with at least part of that outer pervious wall, a recycle chamber for heated air, the upright impervious wall being partially defined by a ring-like top end effectively no higher than the height of the top end of the inner upright pervious wall and by a ring-like bottom end terminating at an intermediate location vertically positioned between the outer edge of the bulkhead baffle and the upper surface of the base;
(d) an impervious hottest air recycle collar extends from its top end in initial contact with a ring-like portion of the outer pervious wall at an intermediate location vertically positioned between the top end of the inner pervious wall and the outer edge of the bulkhead baffle to its bottom end which is at a location vertically positioned below the outer edge of the bulkhead baffle and above the effective bottom end of the impervious outer wall, said collar, between its top and bottom ends, being in spaced relation to both the outer pervious wall and the impervious outer wall;
(e) the plane of the top end of the inner pervious wall and the plane of the top end of the recycle collar define between them a first section of the grain column;
(f) the plane of the top end of the recycle collar and the plane of the ring-like connection of the outer edge of the bulkhead baffle to the inner pervious wall define between them a second grain column section;
(g) the plane of the ring-like connection of the outer edge of the bulkhead baffle to the inner pervious wall and the plane of the bottom end of the recycle collar define between a third grain column section;
(h) the plane of the bottom end of the recycle collar and the plane of the effective bottom end of the impervious outer wall define between them a fourth grain column section;
(i) the plane of the effective bottom end of the impervious outer wall and the plane of the bottom of the upright outer pervious wall define between them a fifth grain column section;
(j) the positioning of the recycle collar is such as to insure that the hot air leaving the top of the heater/blower duct and passing through the pervious walls of the second grain column section will have access to the pervious walls of the third grain column section and will pass through those walls due to the pressure differential between the upper and lower plenums; and
(k) the heated air leaving through the top of the dryer and conditioner due to the action of the heater/blower assembly will result in unheated ambient air being drawn into the lower plenum through the pervious walls of the fifth grain column section to mix with the recycled partially moisture laden air passing into the lower plenum through the third and fourth grain column sections, that mixture then being drawn into the heater/blower assembly.

4,914,835
METHOD OF AND APPARATUS FOR DRYING PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL IN PHOTOGRAPHIC PROCESSING MACHINE
Junichi Kose; Yoshiyasu Matsuzaki; Motoharu Komori; Nobuyuki Seto; Miyuki Endo; Kimitaka Kameoka; Takashi Naoi; Yasunobu Tanaka, and Tomoyuki Takise, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Mar. 23, 1988, Ser. No. 172,687
Claims priority, application Japan, Mar. 23, 1987, 62-68530; Mar. 25, 1987, 62-71126; Mar. 25, 1987, 62-71127; May 6, 1987, 62-109984
Int. Cl.[4] F26B *19/00*; G03D *3/13*
U.S. Cl. 34—31 **20 Claims**



1 A method of drying photographic light-sensitive material by use of drying air after said photographic light-sensitive material has been processed in a processing machine for photographic light-sensitive material, comprising the steps of:
(a) setting drying temperature of said drying air necessary for drying a predetermined amount of said processed light-sensitive material within a predetermined time;
(b) periodically performing arithmetic operations concerning the totalized amount of said light-sensitive material to be actually dried within said predetermined time; and
(c) making a comparison between said predetermined amount of said light-sensitive material and said totalized amount, thereby adjusting said set temperature of the drying air on the basis of the result of said comparison.

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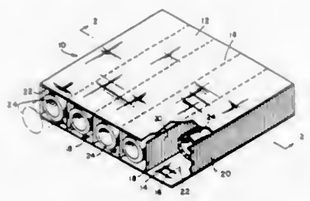
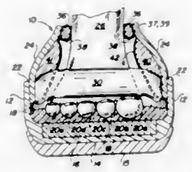
4,914,836
CUSHIONING AND IMPACT ABSORPTIVE STRUCTURE
Zvi Horovitz, 21 Marie Dr., Andover, Mass. 01810
Filed May 11, 1989, Ser. No. 350,304
Int. Cl.[4] A43B *13/18, 13/20, 13/40*
U.S. Cl. 36—28 10 Claims



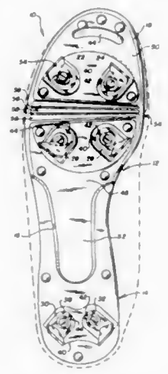
1. A structure means resistant to the transmission of forces of impact for use with articles subjected to impact forces by the user of the articles, said structure means comprising:
a first layer of interlaced flexible stretch-resistant strand material;
a second layer of interlaced stretch-resistant flexible strand material positioned adjacent said first layer and defining an intermediate space between said first layer and said second layer;
a plurality of elongated partitions disposed between said first and second layers and dividing said intermediate space into a plurality of elongated generally parallel channels;
said partitions each comprising a plurality of stretch-resistant strand material connecting with said first and second layers in a plane generally perpendicular to said first and second layers;
said channels having a generally rectilinear configuration; and
a resiliently-compressible single cell fluid-impermeable tubular member disposed within at least a majority of said chambers and adaptable to be inflated under fluid pressure to within the confining limits of the chambers to provide cushioning and impact absorption to impact forces.

4,914,837
SANDAL WITH CONTAINED GRANULAR MATERIAL TO PROVIDE A PAD FOR A PERSON'S FOOT
Donald W. Rieffel, 3402 E. Seneca, Tucson, Ariz. 85716
Filed Jan. 3, 1989, Ser. No. 293,010
Int. Cl.[4] A43B *1/00, 11/00*
U.S. Cl. 36—88 10 Claims



1. An improvement in footwear providing an natural environment walking surface for the bottom of a person's foot as the person lifts and lowers their feet, the footwear of the type having: a lower shell defining an elongated cup-like structure having a front end, upraised heel portion, flat bottom sole with perpendicularly up extending sides, said sides partially enclosing the person's toes, heel, and portion of the ankle, and an enclosed mid-sole; an upper cover attached to the lower shell, the upper cover enclosing the person's toes and instep, the upper cover together with the lower shell forming an open mouthed container encompassing the person's foot; and granular material within the container interposed the lower shell mid-sole and the bottom of the person's foot, the improvement comprising:
means situated within the formed open mouthed container to intermittently engage the person's foot in the footwear, said means including:
(a) a toe pad of resilient material having a thickness operably attached to the upper cover and situated proximate the person's toes, said toe pad engaged by the person's toes within the footwear when the foot is lifted to bring the footwear along with the foot, said toe pad spaced away from the person's toes when the person stands in the footwear;
(b) an annularly shaped ankle pad of resilient material having a thickness operably attached to the upper cover and to the lower shell heel portion at the formed container open mouth, said annular ankle pad adapted to be engaged by the person's instep when the foot is lifted to bring said footwear along with the foot, said annular ankle pad loosely engaged by the person's upper ankle when the person is standing in the footwear and allowing the ankle to rotate upward and forward when the person walks.

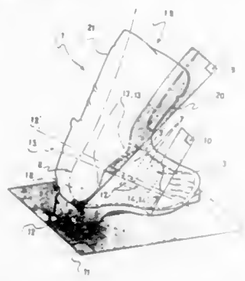
4,914,838
SPORT SHOE WITH METATARSAL CRADLE AND DRAG TOE
Frederick H. Ihlenburg, Lake Oswego, Oreg., assignor to Ringor Inc., Lake Oswego, Oreg.
Filed Aug. 18, 1988, Ser. No. 233,469
Int. Cl.[4] A43B *13/18, 5/00*
U.S. Cl. 36—114 11 Claims



1. A sole for a sport shoe comprising:
a molded main sole member having a longitudinal axis, a rearward heel portion and a forward portion for underlying the ball of the foot and the toes including a curved leading edge;
a plurality of cleat receiving elements formed in a bottom surface of said sole in a shaped array defined on said forward portion of said main sole member, said elements being disposed so as to be spaced from a portion of said main sole member coincident with the metatarsal joints of the foot of the wearer;
said portion of said main sole member coincident with the metatarsal joints including a plurality of ribs extending substantially transversely relative to the axis of said sole said ribs being provided at least on a bottom surface of said main sole member so that said portion of said main sole member defines a cradle for the metatarsal joints of the wearer's foot; and

an upwardly extending flange extending about a portion of the periphery of the sole on the instep side thereof from a location adjacent said ribs to a point about one third around the leading edge.

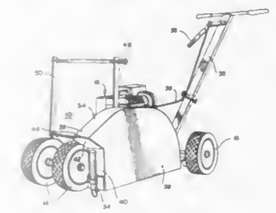
4,914,839
SKI BOOT
Jean Paris, Sevrier, and Claude Perrissoud, Saint-Jorioz, both of France, assignors to Salomon S.A., Annecy Cedex, France
Filed Nov. 30, 1987, Ser. No. 126,337
Claims priority, application France, Nov. 28, 1986, 86 17104
Int. Cl.[4] A43B *5/04*
U.S. Cl. 36—119 23 Claims



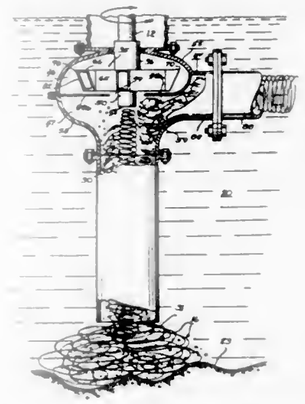
1. Ski boot comprising a rigid shell base below a top portion of a boot and provided with an opening and closing system to allow a foot of a skier to be inserted, said shell base having inner sides and at least partially enveloping said foot from a front end of said boot to approximately the area corresponding to an instep of said foot, said boot comprising
(a) at least one tongue (3, 3'), (25, 25'), (28, 28'), (34, 34'), (40, 40'), (45), (55), (58, 58'), (72, 72'), (75, 75'), (79, 79'), (84, 84'), (90, 90'), (97, 97') transverse with respect to a longitudinal axis of said boot, said at least one tongue being integral with at least one of said inner sides of said shell base (6), (27), (30) (33), (37), (44), (48), (60), (67), (74), (77), (82), (87), (92), and at least partially surrounding the top of said skier's foot, said tongue being adapted to fold down with respect to said shell base along a drop line (15, 15') that is longitudinal to said boot and elevated with respect to a plane (11) of a sole (12) of said boot, in a plane that passes approximately over heads of bones of said foot corresponding to metatarsals (14, 14') and approximately under heads of bones of said malleoli (13, 13'), respectively, and limited along the length of said foot by two planes (9, 10) secant to said plane of said sole and passing through said heads of said bones (13, 13'; 14, 14') respectively; and
(b) tensioning means coupled with said transverse tongue and located on an exterior of said boot so as to actuate said tongue with respect to said foot once said foot is in said boot.

4,914,840
TRENCH DIGGING, CABLE LAYING AND TRENCH FILLING APPARATUS
Roger D. Porter, Rt. 3, Box 626, Loris, S.C. 29569
Continuation of Ser. No. 195,308, May 17, 1988, Pat. No. 4,825,569. This application Apr. 28, 1989, Ser. No. 344,921
The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.
Int. Cl.[4] E01F *5/22*
U.S. Cl. 37—142.5 11 Claims

1. A trench digger, cable laying and trench filling apparatus which comprises:
a main frame;
front and back wheels supporting said frame and rotatble about respective axles;
a handle secured to said frame for moving said apparatus relative to a surface;
a cutter blade secured to a rotary axle supported by said frame;
drive means secured to said main frame for rotating said rotary axle and said cutter blade;
control means for controlling rotational engagement of said drive means with said rotary axle for controlled rotation of said rotary axle and said cutter blade;
a safety shield secured to said frame relative to said cutter blade for protection from said cutter blade, said safety shield including inner and outer spaced plates on opposite sides of said cutter blade and an upper enclosure for closing an area upwardly of said cutter blade;
an opening in said safety shield through which loose dirt is thrown by said cutter blade during use; and
said safety shield and said cutter blade being disposed to one side of said main frame.



4,914,841
DREDGING WITH A PRESSURIZED, ROTATING LIQUID STREAM
Harry P. Weiarib, Chicago, Ill., assignor to Eddy Pump Corporation, Lincolnwood, Ill.
Filed Dec. 24, 1986, Ser. No. 946,582
The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.
Int. Cl.[4] E02F *3/88;* F01D *1/08*
U.S. Cl. 37—195 13 Claims



1 A method of dredging with a pump comprising the steps of:
creating a pressurized traveling stream of liquid within a pump casing,
directing the pressurized traveling stream of liquid through the pump inlet and dissipating the traveling stream into the pool of liquid around the inlet,
flowing a liquid stream bearing solids into the inlet and about

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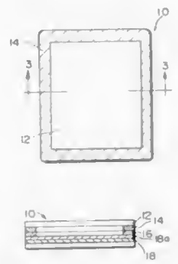
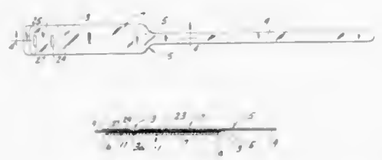
the pressurized traveling stream and in a direction counter to the direction of the pressurized traveling stream,
directing the solid bearing stream of liquid into the pump casing, and
discharging the solid bearing stream of liquid from the pump casing.

4,914,842
LAMINATED FRAME ASSEMBLY AND METHOD FOR USING SAME
Aaron Lieberman, 1945 Callowhill St., Philadelphia, Pa. 19130
Filed Aug. 30, 1988, Ser. No. 238,489
Int. Cl.[4] B44C *5/02*
U.S. Cl. 40—158.1 28 Claims



1. A framing assembly comprising:
a single unitary, substantially flat transparent flexible sheet;
framing means formed on said flexible sheet about the perimeter thereof and defining a framed viewing area surrounded by said framing means;
an adhesive layer arranged on one face of said flexible sheet and being substantially coextensive with said framing means so as to similarly frame said viewing area which is the devoid of any adhesive;
a unitary, single release sheet having a release surface, said release sheet covering the entire surface of said flexible sheet containing said adhesive layer with said release surface engaging the surface of said flexible sheet having the adhesive layer and being releasably secured to said adhesive layer to protect both the adhesive layer and the viewing area framed by said adhesive layer preparatory to use of the flexible sheet and being adapted to be completely peeled away from said transparent flexible sheet in one piece preparatory to mounting a graphic sheet thereon.

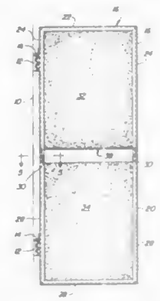
4,914,843
IDENTIFICATION BAND
Irvin S. DeWoskin, Barnhart, Mo., assignor to Barnhart Industries, Inc., Barnhart, Mo.
Continuation-in-part of Ser. No. 108,448, Oct. 15, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 297,178
Int. Cl.[4] G09F *3/14*
U.S. Cl. 40—633 14 Claims



1. An identification band, as for hospital patients, adapted to extend around a person's wrist or ankle and to carry an insert, such as a paper label, having identification data pre-printed on one face thereof, said band comprising:
a backing strip having pressure-sensitive adhesive on one face thereof covering the strip from one end thereof to the other,
a first release strip overlying the adhesive on an insert-receiving portion of the backing strip,
a second release strip overlying the adhesive on a tab portion of the backing strip adjacent one end of the backing strip,
said strips being spaced lengthwise of the backing strip with a gap therebetween presenting an area of the adhesive between said strips,
said backing strip being of elongate rectangular shape, the adhesive thereon covering it from one side edge thereof to the other as well as from said one end thereof to the other,
said first release strip having a width corresponding to the width of the backing strip,
said first release strip and said insert-receiving portion of the backing strip extending from the other end of the backing strip toward but terminating at said gap short of the said one end of the backing strip,
said tab portion of the backing strip extending from one end of the backing strip to the gap,
a transparent plastic strip having a generally elongate rectangular portion having a width corresponding to the width of the backing strip and a length corresponding generally to the length of the backing strip overlying the first and second release strips, extending from adjacent the said one end of the backing strip to said other end of the backing strip, and generally permanently adhered to the backing strip by the adhesive in said area between the release strips, said generally elongate rectangular portion of said transparent plastic strip comprising a window portion overlying the first release strip and an integral end portion overlying the second release strip on said tab portion of the backing strip,
said transparent plastic strip further having an elongate strap portion narrower than said generally elongate rectangular portion extending endwise from said window portion at said other end of the backing strip, said integral end portion of said generally elongate rectangular portion of the transparent plastic strip having at least one opening for passage therethrough of said strap portion,
the first release strip being removable by peeling it off said insert-receiving portion of the backing strip to expose the adhesive on said insert-receiving portion of the backing strip for application of the insert thereto with the printed face thereof facing out, the insert being smaller than said insert-receiving portion for securement of said window portion of the transparent strip by said adhesive to the backing strip around the insert,
the band being adapted to encircle the wrist or ankle with the transparent strip on the outside for display of the printed face of the insert through said window portion, and the second release strip being removable by peeling it off the backing strip to expose the adhesive on said tab portion of the backing strip for generally permanent securement of the strap portion to the tab portion by the adhesive on the tab portion after passage of the strap portion through said opening.

4,914,844
DISPLAY ATTACHMENT FOR DOORS
Terence J. Seery, 940 22nd St., Moline, Ill. 61265
Filed Sep. 25, 1989, Ser. No. 411,778
Int. Cl.[4] G09F *3/18*
U.S. Cl. 40—642 7 Claims

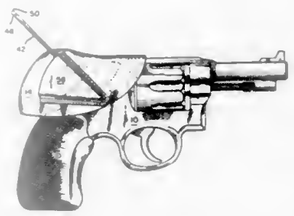
1. A display structure for attachment to a typical door mounted on upper and lower hinges including removable hinge pins, comprising a rectangular frame made up of opposite upright channels cross-connected by upper and lower cross channels, all channels having their open sides facing inwardly, rectangular panel means within and carried by the frame with edges of the panel means fitting the channels, said panel means being formed of relatively rigid, light-weight porous material capable of being penetrated by pins and fasteners so as to function as a bulletin board and upper and lower mounting ears carried by one of the upright channels and projecting outwardly, said ears being apertured in vertical alinement to be received respectively by the upper and lower hinge pins.



4,914,845
BREECH LOAD PISTOL AND CONVERSION
Robert R. Reese, Colona, Ill., and Robert A. Knehl, Davenport, Iowa, assignors to Springfield Armory, Inc., Geneseo, Ill.
Filed Dec. 31, 1987, Ser. No. 139,920
Int. Cl.[4] F41C *21/22*
U.S. Cl. 42—40 28 Claims

12. A pistol conversion assembly adapted to be mounted to a pistol frame having a trigger/hammer assembly, a grip, and a longitudinal slide mount comprising:
a longitudinal slide including means adapted for mounting to the longitudinal slide mount, said slide including a receiver body;
means for securing said longitudinal slide against longitudinal movement with respect to the frame during firing of the pistol;
a barrel assembly including a barrel having a muzzle end and a breech end;
said barrel assembly being seated on said longitudinal slide by a pivot means for pivoting said barrel with respect to said longitudinal slide between a firing position and a loading position; and
a breech latch means for preventing said barrel assembly from pivoting between said firing position and loading position, said breech latch means having a latched position wherein said barrel assembly is prevented from pivoting between said firing position and loading position and an unlatched position wherein said barrel assembly is not prevented by said breech latch means from pivoting between said firing position and loading position.

4,914,846
GUN HAMMER COCKING APPARATUS USABLE WITH A HAMMER LOCKING DEVICE EXTENDING ABOUT THE HAMMER
Horace L. Shivers, 21 Fillmore St., Trenton, N.J. 08638
Filed Jul. 24, 1989, Ser. No. 383,487
Int. Cl.[4] F41C *27/00, 17/08*
U.S. Cl. 42—65 22 Claims



1. A gun hammer cocking apparatus, being usable with a hammer locking device extending about the hammer preventing direct access thereto, which comprises:
(a) a casing attached with respect to the gun, said casing being hollow to define an interior chamber therein extending about the hammer thereof, said casing further defining a left cocking slot and a right cocking slot therein;
(b) a cocking bar means positioned within said casing above the gun hammer and extending generally horizontally through said left cocking slot and through said right cocking slot, said cocking bar means comprising:
(1) an interior cocking bar extending generally horizontally between said left cocking slot and said right cocking slot at a position above the gun hammer;
(2) a left cocking bar arm extending from said interior cocking bar through said left cocking slot to facilitate movement therealong;
(3) a right cocking bar arm extending from said interior cocking bar through said right cocking slot to facilitate movement therealong;
(c) a left biasing means mounted with respect to said casing adjacent said left cocking slot, said left resilient biasing means adapted to abut said left cocking bar arm to urge said cocking bar means to a steady state position above the gun hammer;
(d) a right biasing means mounted with respect to said casing adjacent said right cocking slot, said right resilient biasing means adapted to abut said right cocking bar arm to urge said cocking bar means to a steady state position above the gun hammer;
(e) a cocking lever means pivotally mounted externally with respect to said casing and further including:
(1) a left cocking lever arm pivotally mounted with respect to said casing and being adapted to abut said left cocking bar arm to move same to facilitate cocking of the gun hammer;
(2) a right cocking lever arm pivotally mounted on said casing and being adapted to abut said right cocking bar arm to move same to facilitate cocking of the gun hammer; and
(3) a lever cocking section extending between said left cocking lever arm and said right cocking lever arm to control movement thereof and to facilitate cocking of the gun hammer.

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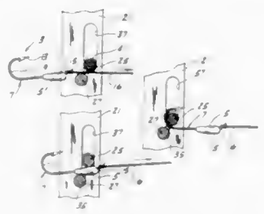
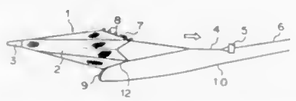
4,914,847
DEVICE FOR TESTING THE HOOKING EFFECTIVENESS OF A FISHING LURE
Larry A. Sheehan, 1002 Plaza Towers, Springfield, Mo. 65804
Filed Aug. 4, 1989, Ser. No. 390,240
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—4 9 Claims



1. A device for testing the hooking effectiveness of a fishing lure, comprising
a frame,
a pair of jaws representative of the jaws of a fish mounted on the frame for movement of the jaws toward and away from a closed position, and
resilient means urging said jaws toward said closed position, the arrangement being such that a fishing lure comprising a head and a trailing hook is adapted to be pulled, head first, through the jaws with the jaws moving away from said closed position as the head passes between the jaws and thereafter moving under the bias of said resilient means back toward said closed position, said trailing hook being adapted either to hook one of said jaws indicating that the lure is generally effective for hooking fish or to pass between the jaws without hooking one of the jaws indicating that the lure is less effective for hooking fish.

4,914,848
TRAWL NET
Hiromi Kinoshita, Shimonoseki, Japan, assignor to Nichimo Co., Ltd., Tokyo, Japan
Filed Oct. 17, 1988, Ser. No. 258,653
Claims priority, application Japan, Feb. 8, 1988, 63-27006
Int. Cl.[4] A01K *73/04*
U.S. Cl. 43—9.1 9 Claims



1. A trawl net having a sheet or membrane shaped buoyant-force generating means whose angle of elevation in the vertical direction is adjustable while said trawl net is being dragged or towed.

4,914,849
FISHING LINE CONNECTING SYSTEM AND METHOD OF CONNECTING A FISHING LINE TO A LURE OR WEIGHT TO BE MOVED THROUGH THE WATER AND COMPONENTS OF SUCH A SYSTEM
Dan L. Hook, 6535 Seaview Ave. NW., Seattle, Wash. 98117
Filed Nov. 19, 1987, Ser. No. 123,046
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.08 21 Claims

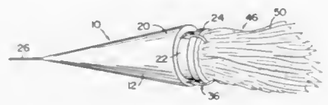
1. A fishing lure system which enables the action of a lure to be varied or the lure changed to suit the species of fish being fished and the conditions of speed and depth at which the lure is being fished, comprising:
a lure body;
at least one line-holding insert for slidably receiving a fishing line and being insertable within the lure body for slidably securing a fishing line to the lure body; and

means for releasably connecting the line-holding insert to the lure body, whereby the line is slidably connected through the insert with the lure body and becomes disconnected from the lure body by removing the insert, and with the line being held in the insert outside of the lure body when the insert is connected to the lure body.

4,914,850
FISHING LURE
Mont Rice, Rte. 7, Box 340A, Greeneville, Tenn. 37743
Filed Feb. 15, 1989, Ser. No. 311,109
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.24 8 Claims

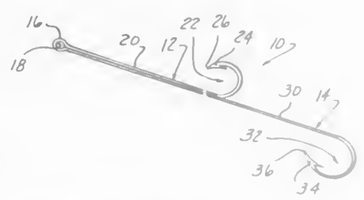
1. A fishing lure body adapted to be rigged on a hook comprising:
an elongated body of soft, flexible, polymeric material including a head portion at one end and a tail portion at the other end;
the head portion being generally cylindrical in shape and the tail portion having a cross-section which is generally semi-cylindrical to provide a curved upper surface and a flat lower surface.
the transition between the head and tail portions defining a generally straight line which extends transversely over the flat surface of said tail portion; and
the cross-section of said head section forward of said line being substantially greater than the cross-section of said tail portion.

4,914,851
FISH LURE
Thomas W. Acker, 11870 62nd St. North, Largo, Fla. 33540
Continuation-in-part of Ser. No. 605,055, Apr. 30, 1984, abandoned. This application Sep. 16, 1985, Ser. No. 776,709
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.41 7 Claims



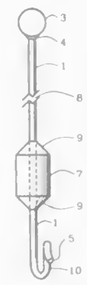
1. A fish lure comprising (1) an elastic flexible conical body, bendable along its linear axis, having a pointed apex and having a small diameter passageway extending from the apex of the body through a major portion of the length of the body and terminating in a cavity in the opposite end of the body thus providing a skirt, (2) a hook member including one or more barb elements, each of which includes radially outwardly and rearwardly extending portions terminating radially inward with barbs, and having a shank with an eyelet adjacent one end thereof opposite the barb element thereof, (3) a sinker mounted on either the interior of said conical body or on the shank of said hook member, and (4) a tail mounted on the hook member with the free ends thereof extending axially beyond the barb elements, the body having an annular groove in its outer surface adjacent the skirt end, and wherein the shank and eyelet of the hook member, the sinker and a portion of the tail are normally confined within the cavity of the body with the eyelet adjacent the junction of the passageway and cavity with the barbs received in the groove.

4,914,852
TANDEM DOUBLE OFFSET FISHHOOK
Thomas A. Hnizdor, 9164 Brady, Redford, Mich. 48239
Filed Feb. 16, 1989, Ser. No. 310,965
Int. Cl.[4] A01K *83/00*
U.S. Cl. 43—44.82 4 Claims



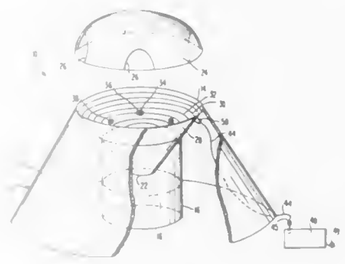
1. A fishhook comprising:
an eye;
a first hook including a first shank having a predetermined length extending from and connected to the eye;
a second hook including a second shank having a predetermined length longer than the length of the first hook extending from and connected to the eye;
the shanks of the first and second hooks disposed side-by-side in parallel;
a first offset bottom curved bend formed in the first hook and terminating in a first hook point; the first offset bend curving concavely from a first plane formed by the first and second shanks, the curving forming a second plane at an angle to the first plane and causing the bottom curved bend of the first offset bend to be on one side of the first plane and the first hook point to be on the opposite side of the first plane;
a second offset bottom curved bend formed in the second hook and terminating in a second hook point, the second offset bend curving concavely from the first plane, the curving of the second offset bend forming a third plane at an angle to the first plane symmetrically opposite to the second plane relative to the first plane and causing an opposite planar effect with the first offset bend wherein the bottom curved bend of the second offset bend is on one side of the first plane and the second hook point is on an opposite side of the first plane;
the angles of the second and third planes formed by the bottom curved bends of the first and second hooks relative to the first plane being equal; and
a gap space between the first hook point and the first shank being equal to a gap space between the second hook point and the second shank.

4,914,853
FISH DEHOOKING DEVICE
Raymond L. Swindle, Palm Coast, Fla., assignor to DeHooker, Inc., South Daytona, Fla.
Filed Nov. 7, 1988, Ser. No. 267,827
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—53.5 4 Claims



1. A fish dehooking device comprising:
a rod having a handle perpendicular to the rod and attachable to one end of the rod;
an angled portion at the opposite end of the rod from the handle containing one sideways bend to form approximately a thirty-degree angle between the angled portion and the rod;
a blunt, non-pointed end on the angled portion of the rod; and
a fixed spreader sleeve positioned in the proximity of the angled portion of the rod at a distance from the angled portion that would engage the vicinity of teeth of fish from which hooks were being removed with the device.

4,914,854
INSECT TRAP
Peng-Wei Zhou, 3704 Emily St., and Henry Wong, 3704 Emily St., both of Kensington, Md. 20895
Filed Jul. 12, 1988, Ser. No. 217,858
Int. Cl.[4] A01M *1/10*
U.S. Cl. 43—112 2 Claims



1 An insect trap, comprising:
a continuous conical housing having an upwardly inclined, generally conical outer surface and a circular, open top;
container means within said housing for receiving a supply of water;
a downwardly inclined inner conical wall having a top vertical rim portion connected at an upper edge to said housing at said open top and extending longitudinally downwardly and inwardly into said container;

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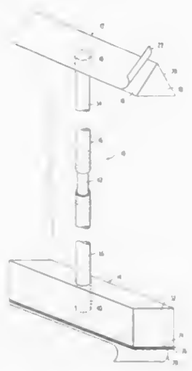
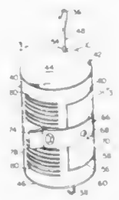
removable cover means for closing said open top of said bousing, said cover including at least one entry hole to permit insects to enter said housing to reach said wall;
a pair of electrically conductive thin foil conductor mounted on said inclined wall, said conductors being parallel to each other and closely spaced to each other, said conductors extending around said conical wall in a continuous spiral from near the top thereof to near the bottom thereof with said parallel conductors covering substantially the entire surface of said wall;
means securing food bait on said inner conical wall within said housing to attract insects onto said wall and into contact with one or more of said conductors; and
electrical switching means connected to said conductor means for periodically supplying electrical a.c. potential across said pair of conductors on said wall to electrically shock insects in contact with said adjacent conductors, said electrical potential being sufficiently high to injure insects, and said wall being inclined at a slope sufficiently steep to cause injured insects to slide down said wall and to fall into said container; and
microswitch means responsive to removal of said removable cover means from said housing for disabling said supply of electrical potential to said conductors.

4,914,855
INSECT PICKUP DEVICE
Ronald Sherman, 19330 Frenchton Pl., Gaithersburg, Md. 20879
Filed Apr. 10, 1989, Ser. No. 335,328
Int. Cl.[4] A01M *1/16*
U.S. Cl. 43—136 3 Claims



1. An insect pickup device comprising:
elongated handle means,
a first head comprised of an elongated three-sided member having a triangular cross-section with a hole in one of said sides in which one end of said handle means is secured,
a second head comprised of an elongated four-sided member having a rectilinear cross-section with a hole in one of said sides in which another end of said handle means is secured, and
adhesive means detachably secured to at least one side of each of said heads.

4,914,856
BAIT CONTAINER FOR CRUSTACEAN TRAPS
Garrett R. Kennedy, 1118 Second St., Kirkland, Wash. 98033
Filed Nov. 28, 1988, Ser. No. 277,025
Int. Cl.[4] A01K *97/04*
U.S. Cl. 43—55 7 Claims

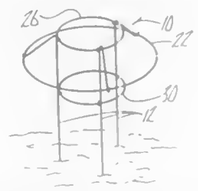


1. A bait container for crustacean traps, comprising:
(a) a hollow cylindrical body having:
(i) closed ends;
(ii) some first cylindrical portions in turn having multiple narrow slots; and
(iii) other second cylindrical portions in turn having a bait loading entry;
(b) a cover for closing the bait loading entry, which is originally part of the other second cylindrical portions, which are removed to form the bait loading entry;
(c) hinge pins are installed between the cover and the other cylindrical portions, whereby the cover is pivotally opened and then closed to continue the continuity of the hollow cylindrical body;
(d) a securement means to keep the cover closed, comprising:
(i) a partial cylindrical strip extending between the cover and some first cylindrical portions;
(ii) a fastening means to secure the partial cylindrical strip to the cover;
(iii) a receiving depression in some first cylindrical portions;
(iv) a protruding portion in partial cylindrical strip adapted to fit into the receiving depression in some first cylindrical portions; and
(e) positioning means adapted to receive holding means used for positioning the bait container within the crustacean trap.

4,914,857
TOMATO VINE SUPPORTING DEVICE
John N. Dodgen, Fort Dodge, Iowa, assignor to Dodgen Industries, Inc., Humboldt, Iowa
Filed Jan. 9, 1989, Ser. No. 294,775
Int. Cl.[4] A01G *17/06*
U.S. Cl. 47—47 9 Claims

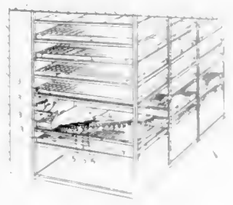
1. A vine support device, comprising,
a plurality of spaced vertical elongated rods equally spaced in a circular configuration, with each of said rods having upper ends terminating in outwardly and downwardly extending arms with outer ends terminating in upwardly extending first hook elements,
a first circular horizontal ring removably nested in said first hook elements,

second hook elements extending inwardly from the upper ends of said rods,
third hook elements extending inwardly from said rods intermediate the upper and lower ends of said rods,



and second and third rings removably nested in said second and third hook elements, respectively.

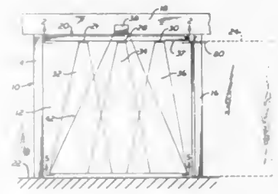
4,914,858
METHOD AND DEVICE FOR LIGHTING SEEDS OR PLANTS
Cornelis T. M. Nijssen, Leiderdorp; Otto A. Kühn, and Willem Verbeek, both of Wageningen, all of Netherlands, assignors to Nijssen Light Division B.V., Netherlands
Filed Sep. 2, 1988, Ser. No. 242,337
Claims priority, application Netherlands, Sep. 16, 1987, 8702216
Int. Cl.[4] A01C *1/00*; A01G *9/20*
U.S. Cl. 47—58 5 Claims



1. A method of fostering growth of plant propagative material which comprises the steps of
(a) providing a nursery area containing plant propagative material in a substrate,
(b) positioning a plurality of light-emitting diodes (LEDs) closely proximate to said nursery area so that irradiating light emitted from said LEDs can strike said plant propagative material to foster plant growth, and
(c) energizing said LEDs so that they emit irradiating light on said plant propagative material having a wavelength of between 400 to 800 nm.

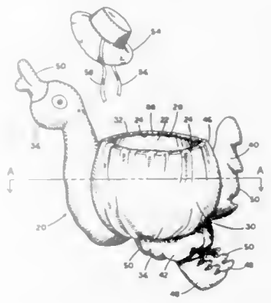
4,914,859
AUTOMATIC DOOR SAFETY SYSTEM
Daniel C. Glonet; Lance Wikkerink, and Harry V. Nguyen, all of St. Petersburg, Fla., assignors to Lanson Electronics, Inc., Pinellas Park, Fla.
Continuation of Ser. No. 38,957, Apr. 16, 1987, abandoned. This application Sep. 23, 1988, Ser. No. 248,133
Int. Cl.[4] E05F *15/20*
U.S. Cl. 49—25 18 Claims

1. An automatic door structure having doorway comprising a door mounted for movement in said doorway, a plurality of stationary and moving object presence sensing detectors arranged to produce stationary and moving object presence sensing beams in overlapping relation to one another such that the beams, in alignment, fully span the doorway along the path of movement of the door and extend at least a predetermined distance on each side of the doorway, power means for actuating the door, and means arranged on the door operative upon movement of the door to open position to successively switch



on each detector as it passes along its path to open position and effective upon reverse movement of the door to closed position to successively shut off each detector.

4,914,860
FLOWER POT COVER
Michael-Anne Richardson, 50 Bluestone Drive, Nashua, N.H. 03060
Filed Feb. 26, 1988, Ser. No. 161,030
Int. Cl.[4] A47G *7/00*
U.S. Cl. 47—72 2 Claims



2. A cover from a flower pot, said cover comprising:
a first, inner layer comprising a flexible waterproof material, and a second, outer layer comprising a flexible material,
said first layer further comprising:
a first pocket having a bottom and a top, the top being open for receiving the flower pot, the bottom being sealed against leakage of water from the cover, the pocket being large enough to loosely enclose the pot,
said second layer comprising a water permeable material defining a second pocket generally enclosing the inner layer and further defining a decorative form of,
a portion of an animal including a trunk and a body extremity of said animal,
said second pocket of said second layer defining said trunk of said animal, and
said second layer extending from said trunk and defining said body extremity,
material for cushioning against impact, included between said first and second layer in said extremity so that said extremity is a semi rigid cushioned protuberance,
means for reducing the size of the top opening of the pocket for securing the cover on the pot.

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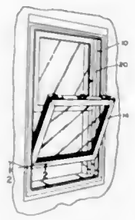
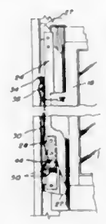
4,914,861
WINDOW TILT CLUTCH SYSTEM
Michael M. May, Stillwater, Minn., assignor to Intek Weatherseal Products Inc., Stillwater, Minn.
Filed Aug. 30, 1989, Ser. No. 400,501
Int. Cl.[4] E05D *15/22*
U.S. Cl. 49—181 30 Claims



1. A window tilt clutch system for use with a tiltable window sash slidably mounted in a window frame jamb liner, comprising:
(a) window tilt clutch locking means operably connected to a tiltable window sash and slidably mounted within inner facing surfaces of a window frame jamb liner sash guide pocket for locking the sash in place along a vertical axis of the jamb liner when the sash is tilted away from the vertical axis of the jamb liner; and
(b) a layer of high friction resilient material attached to portions of the jamb liner sash guide pocket inner surfaces facing the locking means, the layer of high friction resilient material being constructed and arranged for providing a braking surface to prevent vertical movement of the window sash when the sash is tilted away from the vertical axis of the jamb liner and when the high friction resilient material is contacted by the locking means.

4,914,862
SAFETY DEVICE FOR SASH WINDOWS
J. Lee Gregory, 319 Lee Industrial Blvd., Austell, Ga. 30001
Filed Sep. 22, 1988, Ser. No. 237,093
Int. Cl.[4] E05D *13/00*
U.S. Cl. 49—322 6 Claims

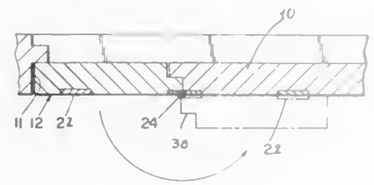


1. In a window system comprising an upwardly and downwardly movable window sash supported in a window frame and jam in which there is installed a window tension system, the improvement comprising: a safety member normally retracted by the tension in said window tension system from engagement with the window jam during normal operation of the window sash but being operable into position upon the abnormal relaxation of tension in the tension system which would occur when the tension is abnormally relaxed as when the tension system breaks or malfunctions, thereby preventing said sash from falling free, said safety member having a portion thereof for engagement with part of the window frame, means for movably supporting said safety member, and spring means operable to move said safety member, said safety member being pivotally mounted on said window sash and a fulcrum member on said window sash having said safety member engaged for operation there against.

4,914,863
TRUCK CAB DOOR SYSTEM FOR IMPROVED RIGHT SIDE VISION
Rodney A. Laukhuf, Haviland, Ohio, assignor to Navistar International Transportation Corp., Chicago, Ill.
Filed Apr. 19, 1989, Ser. No. 340,304
Int. Cl.[4] B60J *5/04*
U.S. Cl. 49—502 10 Claims

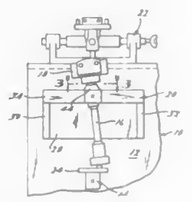
1. A truck cab door system for increased right side viewing area including:
a truck cab door having an inner skin panel and an outer skin panel, said panels being spaced apart but joined together along end edges of said panels, said door having a relatively large opening in an upper portion of said door skin panels;
a glass panel of a dropping glass window assembly received between said skin panels and within and closing off said opening when in a raised position thereof;
means for supporting said dropping glass window against vertical movement;
means operatively connected to said window support means for causing selective dropping or raising of said glass panel of said dropping glass window assembly;
a second, comparably large opening in a lower portion of said door skin panels;
a window panel fixed within said second opening of said outer skin panel;
and a clear panel removably mounted over said second opening of said inner skin panel;
said glass panel of said dropping window assembly passing between said fixed window panel and said clear panel when in a dropped position thereof;
said means for causing dropping or raising of said glass panel of said dropping glass window assembly being positioned between said inner and outer door skin panels at a hidden location adjacent said large lower opening;
and said means for supporting said glass panel extending away from said means for causing dropping and raising of said glass panel and under half of said glass panel to a point of attachment thereto.

4,914,864
FIRE DOORS AND METHOD OF LOCATING FIRE HOSE
Jeffrey A. Hohenfeld, 13296 Jacqse Rd., Strongsville, Ohio 44136
Filed Sep. 13, 1988, Ser. No. 243,980
Int. Cl.[4] E06B *3/00*
U.S. Cl. 49—506 1 Claim



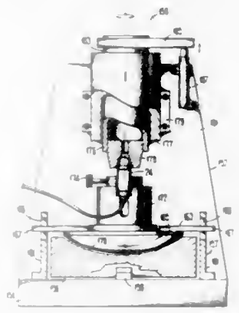
1. The method of laying fire hose through a fire door which comprises opening the fire door, laying hose through the doorway, placing the hose adjacent the outermost portions of the door, closing the door, the hose passage limited to passage through a lowermost outer opening in the door.

4,914,865
CYLINDER MACHINE WITH IMPROVED SPHERICAL BEARING
Ronald C. Wiand, Detroit; Joel M. Selman, Southfield, and Scott W. Stay, New Baltimore, all of Mich., assignors to The Standard Products Company, Cleveland, Ohio
Continuation of Ser. No. 170,669, Mar. 18, 1988, abandoned, which is a continuation of Ser. No. 947,978, Dec. 31, 1986, abandoned, which is a continuation-in-part of Ser. No. 909,476, Sep. 19, 1986, abandoned. This application Feb. 16, 1989, Ser. No. 311,450
Int. Cl.[4] B24B *13/00*
U.S. Cl. 51—55 13 Claims



1. An apparatus for lapping a curved surface of an ophthalmic lens or the like comprising:
an elongated rod;
lapping means supported on one end portion of said rod;
a spherical bearing pivotally supporting a middle portion of said rod;
drive means for imparting movement to said abrading means;
said spherical bearing having a race and a ball pivotally supported in said race, one of said ball and race having an elongated channel therein, the other of said ball and race having a guide pin slidably extending into said channel, said channel and guide pin cooperating to allow pivotal movement of said ball with respect to said race about one axis but only selected rotational movement therebetween about another axis to compensate for rotational deviation from said another axis caused by said pivotal movement.

4,914,866
APPARATUS FOR ADJUSTING OPTICAL FIBER CONNECTOR COMPONENTS
Kenneth W. Jackson, Lawrenceville; Norman R. Lampert, Norcross, and Harold F. Muth, Jr., Roswell, all of Ga., assignors to American Telephone and Telegraph Co., Murray Hill and AT&T Technologies, Inc., Berkeley Heights, both of, N.J.
Continuation-in-part of Ser. No. 146,067, Jan. 20, 1988, abandoned, which is a division of Ser. No. 929,444, Nov. 12, 1986, Pat. No. 4,738,055, which is a continuation of Ser. No. 676,113, Nov. 29, 1984, abandoned. This application Jan. 27, 1989, Ser. No. 303,110
Int. Cl.[4] B24B *15/00*
U.S. Cl. 51—72 R 6 Claims



1. An apparatus for adjusting associated, conically shaped alignment surfaces of a sleeve and of two plugs which are used to cause the sleeve to hold the plugs and two fibers aligned coaxially with each other and to cause two fibers terminated by plugs seated in the sleeve to have a predetermined end separation, said apparatus including:
tool means including a truncated conically shaped surface which is provided with an abrasive material for abrading one of associated conically shaped alignment surfaces of a first conically shaped plug, which terminates an optical fiber, and of a wall, which defines one conically shaped cavity of a sleeve adapted to receive the first plug, and for abrading one of associated conically shaped alignment surfaces of a second truncated conically shaped plug, which terminates an optical fiber, and of a wall, which defines another conically shaped cavity of the sleeve opposed to said one cavity and adapted to receive the second plug, said tool means being such that relative motion about an axis of rotation thereof may be caused to occur between said tool means and each alignment surface, the truncated conically shaped surface of said tool means being defined by a diameter and by an angle between a longitudinal axis thereof and the truncated conically shaped surface relative to a diameter and a corresponding angle of an alignment surface which are such as to cause an end portion of the truncated conically shaped surface of each plug which is adapted to engage a wall of the sleeve to have a diameter which is greater than that of an opening between the opposed cavities, and disposed in a plane which is common to the opposed cavities, and to cause an angle between a longitudinal axis extending through the opposed cavities of the sleeve and a wall which defines a cavity of the sleeve to be greater than the angle between said longitudinal axis and a truncated surface of each plug; and
means for causing relative motion between said tool means and each alignment surface about the axis of rotation to cause said tool means to abrade and remove material from one of each pair of alignment surfaces of the plugs and the sleeve while adjusting the distance between a reference

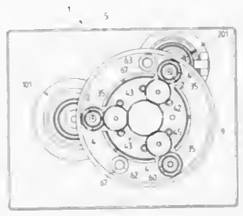
circumference of one of the associated alignment surfaces of the first plug and sleeve to a reference circumference of one of the associated alignment surfaces of the second plug and sleeve to be a predetermined value which results in the fibers being aligned coaxially and having the predetermined end separation, said means for causing relative motion between said tool means and each alignment surface being such that the axis of rotation of said tool means is determined by and is coaxial with axes of revolution of the alignment surfaces to be abraded and such that the axes of revolution of the alignment surfaces which are abraded by said tool means are maintained while the alignment surfaces are abraded by said tool means.

4,914,867

APPARATUS FOR PROCESSING END FACE OPTICAL FIBER CONNECTOR

Kazuharu Saito, Nagano; Junji Watanabe, Tokyo; Tadao Saitoh, Tokyo, and Kazuo Matsunaga, Tokyo, all of Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakushi, Nagano and Nippon Telegraph and Telephone Corp., Tokyo, both of, Japan

Filed Mar. 3, 1989, Ser. No. 318,407
Claims priority, application Japan, Mar. 4, 1988, 63-49494
Int. Cl.[4] B24B *5/32*
U.S. Cl. 51—134 11 Claims



1. Apparatus for processing an end face of an optical fiber connector comprising:

(a) a rotatable index shaft mounted on a frame;

(b) a mounting-reference member disposed at a first index position for providing a reference for mounting the optical fiber connector;

(c) a grinding unit disposed at a second index position for grinding the end face of the optical fiber connector;

(d) a finishing unit disposed at a third index position for finishing the end face of the optical fiber connector;

(e) a plurality of chucks for holding optical fiber connectors, respectively, said chucks being mounted on said index shaft so that each chuck can be moved sequentially from one of said indexed positions to another, and each said chuck being rotatable together with the optical fiber connector;

(f) a rotatable drive gear disposed coaxially with said index shaft;

(g) a driven gear fixedly mounted on each said chuck;

(h) a pair of first and second intermediate gears connected to said drive and driven gears, respectively;

(i) a clutch means interposed between said pair of intermediate gears and normally connecting them together to transmit the rotation of said drive gear to said driven gear to rotate said each chuck; and

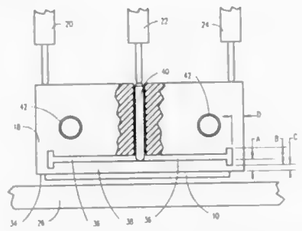
(j) a clutch disengagement means for disengaging said clutch means to disconnect said two intermediate gears when said each chuck is indexed to said first index position.

4,914,868

LAPPING CONTROL SYSTEM FOR MAGNETIC TRANSDUCERS

Mark A. Church, Los Gatos; Annayya P. Deshpande, San Jose; Alain M. Desouches, Santa Cruz; George S. Pal, Saratoga; Michael P. Salo, San Jose, and Muhammad I. Ullah, Morgan Hill, all of, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 28, 1988, Ser. No. 250,685
Int. Cl.[4] B24B *49/00*
U.S. Cl. 51—165.71 8 Claims



1. A lapping control system for accurately obtaining a desired element height of each of a plurality of batch fabricated thin film magnetic transducers comprising:

a row of thin film magnetic transducers formed on a substrate each comprising a magnetoresistive element having a height defining edge and at least two terminals;

means for mounting said row of thin film magnetic transducers in a position to lap said height defining edge of each of said magnetoresistive elements;

means for measuring the resistance of said magnetoresistive elements during lapping of said height defining edge;

means responsive to said measured resistance of said magnetoresistive elements to calibrate resistance versus height characteristics of said magnetoresistive elements during lapping of said height defining edge;

means responsive to said calibrated resistance versus height characteristics for controlling the degree of lapping for each of said magnetoresistive elements in said row; and

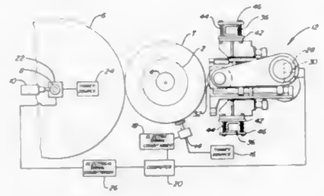
means for terminating said lapping process when a predetermined element height is reached for each of said magnetoresistive elements.

4,914,869

METHOD FOR CORRECTING AND BUFFING TIRES

Jack L. Bayonnet; Bernard T. Zuk, both of Summit County, and Robert L. Brown, Portage County, all of Ohio, assignors to General Tire, Inc., Akron, Ohio

Filed May 16, 1988, Ser. No. 194,652
Int. Cl.[4] B24B *49/00*
U.S. Cl. 51—165 R 6 Claims



1. A method of improving the uniformity of a tire as affected by variations in forces generated in the tread area of the tire while the tire rotates under load against a surface, including the steps of measuring the magnitudes and locations of the force variations and cutting material from the tread surface in response to these measurements, wherein the improvement comprises,

(a) calculating from the measured force variation magnitudes and locations the depth of cutting required in each of a plurality of incremental segments of the tire circumference;

(b) measuring the radial run-out of the tire,

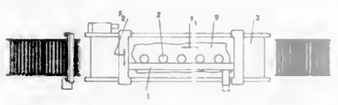
(c) in response solely to the radial run-out measurement and cutting depth calculations, moving a cutting device while the tire is rotating to locate the cutting device at the calculated cutting depth relative to the run-out measurement at each increment of the tire circumference.

4,914,870

PROCESS FOR AUTOMATICALLY SMOOTHING AND POLISHING SLABS OR MARBLE, GRANITE, STONES AND THE LIKE

Marcello Toncelli, Via Giovanni XXIII, 2, Bassano del Grappa, Vicenza, Italy

Filed Sep. 7, 1988, Ser. No. 241,507
Claims priority, application Italy, Sep. 15, 1987, 85600 A/87
Int. Cl.[4] B24B *7/06, 7/22*
U.S. Cl. 51—283 R 2 Claims



1. In a method of automatically smoothing and polishing a slab of marble, granite, stone or the like (9) by means of an apparatus which comprises a conveyor belt (3) for the slab, a plurality of chucks (2) supported by a movable beam (1), said chucks having a diameter, said beam being disposed longitudinally with respect to the direction of advance of the belt and being capable of inverting the direction of its motion, said chucks carrying out a transversal and alternating motion with respect to the direction of advance of the slab, and controlling means for controlling the advance of said belt, the improvement which consists of advancing said slab on said conveyor belt in a discontinuos manner, and when said slab (9) is still, the beam (1) which carried said chucks (2), performs its transversal motion, polishing a first area of said slab over the entire width of the slab with the chucks advancing said slab a predetermined amount with respect to the diameter of said chucks (2), halting polishing during the advance of the slab, halting the advance of the slab, polishing the slab by inverting the transversal motion of the beam across the slab, while the slab is still, said chucks operate on a second area of said slab (9), said second area being parallel to the first area, repeating the above steps until the slab is completed such that the chucks carry out a fret motion, and uniform polishing is achieved while obtaining an increase in the hourly production with equal esthetic properties.

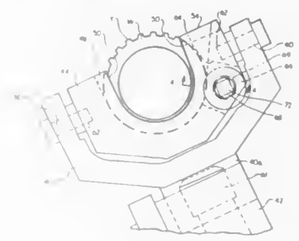
4,914,871

METHOD FOR HONING THIN WALL GEAR PARTS

Paul Fitzpatrick, Holland, Mich., assignor to Micromatic Textron Inc., Holland, Mich.

Division of Ser. No. 516,624, Jul. 25, 1983, Pat. No. 4,680,894, and a continuation-in-part of Ser. No. 53,712, May 26, 1987, abandoned. This application Sep. 12, 1988, Ser. No. 244,540
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—290 2 Claims

1. A method for honing the internal diameter of a plurality of thin wall annular gear parts which are torque sensitive during honing and prone to out-of-roundness of the internal diameters after honing, comprising positioning the gear parts in stacked relation such that the internal diameter of each gear part can align itself to a honing tool, engaging each gear part with a driving gear, and reciprocating and rotating the honing tool through the internal diameters while concurrently driving



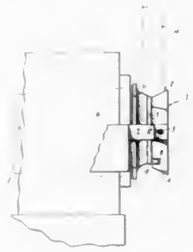
each gear part individually in rotation by rotating each driving gear engaged therewith so as to minimize out-of-roundness of the honed internal diameters.

4,914,872

APPARATUS AND METHOD FOR SELECTIVELY CONTOURING AN AIRFOIL ROOT

Kurt R. Snyder, Colchester, and Randy M. DiNallo, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 56,336, May 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 16,165, Feb. 19, 1987, abandoned. This application Nov. 3, 1988, Ser. No. 266,315
Int. Cl.[4] B24B *19/14, 1/00*
U.S. Cl. 51—328 12 Claims



1. A method for radiusing an edge of an article using a pliable buffing means, said method comprising:

securing said article to prevent movement thereof;

providing a buffing guide which includes a mating surface shaped to engage a surface of said article, and at least one guide surface which slopes toward said edge at an angle sufficient to counteract any inclination of the pliable buffing means to skip off the edge, providing precise contact of the pliable buffing means with said edge where radiusing is desired;

placing said buffing guide on an engagement means for moving the buffing guide into and out of engagement with the surface of the article;

directing said engagement means to move the buffing guide into contact with the surface of said article;

directing said pliable buffing means into simultaneous contact with said guide surface and said edge of said article such that precise contact is achieved between said buffing means and said edge of said article; and,

maintaining said simultaneous contact until the desired radiusing is achieved.

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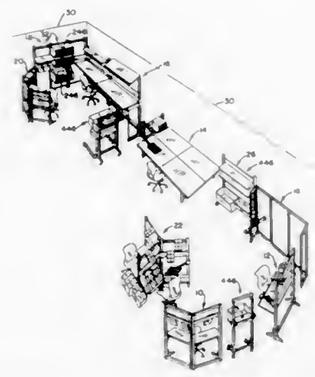
4,914,873

WORK ENVIRONMENT SYSTEM

Thomas J. Newhouse, Grand Rapids, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.

Filed Mar. 5, 1987, Ser. No. 21,973
Int. Cl.[4] A47B *5/02*; B04F *19/06*
U.S. Cl. 52—36 35 Claims



1. A modular factory work space management system comprising freestanding frame modules and freestanding tables, all of which are selectively arranged around a room in a preplanned configuration;

mobile carts movable about said room between said frame modules and said freestanding tables;

said frame modules and said tables being adapted to mount horizontal work surfaces;

said mobile carts, said freestanding tables and said freestanding frame modules having in common interchangeable structural components comprising;

rigid open rectangular frames having vertical frame members and horizontal frame members, each of said vertical frame members being tubular and rectangular in cross-section and having a series of slots for hanging function components thereon;

said horizontal frame members having ends rigidly joined to said vertical frame members, said horizontal frame members further being substantially H-shaped in cross-section and defining upper and lower vertical lips extending longitudinally of said horizontal frame members for retaining functional components above and below said horizontal frame members.

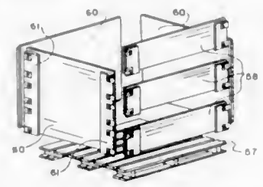
4,914,874

SYSTEM FOR INTERCONNECTING PANELS OF CONTAINERS

Andrew S. Graham, Jr., 2802 Jefferson Ct., Ambler, Pa. 19002

Division of Ser. No. 117,215, Nov. 4, 1987, Pat. No. 4,796,392, which is a continuation-in-part of Ser. No. 841,477, Mar. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 710,492, Mar. 11, 1985, Pat. No. 4,584,806. This application Jan. 5, 1989, Ser. No. 293,828
Int. Cl.[4] E04G *13/02*
U.S. Cl. 52—79.1 6 Claims

1. A container having walls defining an interior container volume of rectangular shape, the walls including four upright side walls meeting at upright corners of the container and a substantially rectangular base, each of a plurality of walls being formed of superimposed interchangeable panels extended horizontally between the upright corners, the lower horizontal edge of each of the superimposed panels having portions vertically overlapping the horizontal edge of a subadjacent panel and the lower panel horizontal edge having portions overlapping the adjacent marginal edge of the rectangular base and thereby provide guided vertical stacking and interchangeability of superimposed panels, an end portion of a first panel at one side of a corner being positioned and extended to overlap the end surface of a second panel at the other side of that corner, a spring clip fastening device for interconnecting panels adjacent each upright corner, said device including apertured plates mounted on the outer sides of the vertically overlapping portions of the panels adjacent the ends of the panels an a spring clip having end portions positioned to engage the apertures of said plates, the plate mounted on said second panel



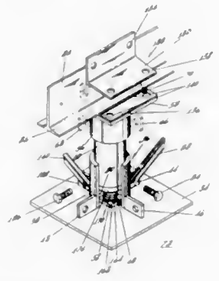
having an end abutment portion projecting beyond the end of the second panel in a position overlying the end of the first panel, and the ends of the panels adjacent each of the upright corners of the container being relatively positioned to overlap each other at said upright corner being interconnected by one of said spring clip fastening devices, with the ends of the panels overlapping each other at each corner in a first series extended around the upright corners of the container in one direction and further with the abutment portions of the plates of the fastening devices at each corner projecting in a second series extended around the upright corners of the container in a direction opposite to said first series.

4,914,875

SUPPORT MEMBER FOR A BUILDING STRUCTURE SUPPORT SYSTEM

Harold L. Gustafson, Battleground, Wash., assignor to Russell Lorenz and Wilma Lorenz, both of Battleground, Wash.

Continuation of Ser. No. 40,548, Apr. 17, 1987, Pat. No. 4,761,924. This application Aug. 8, 1988, Ser. No. 229,607
Int. Cl.[4] E04C *3/10*
U.S. Cl. 52—126.6 1 Claim



1. A support member for use in a support system for a building structure having a foundation formed of a plurality of spaced, parallel support beams wherein the support member is adapted to be positioned under one of said beams, the support member comprising:

a planar base having a preselected cross-sectional area;

a bottom member fixed to the planar base, the bottom member having an upwardly extending hollow cylindrical portion of a predetermined inside diameter and having an open top end;

a top member including a stabilizing plate and having a cylindrical extended lower portion of a second predetermined inside diameter, said top member including gripping means adapted to be fixedly attached to said stabilizing plate and to one of said beams;

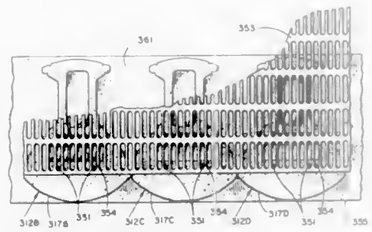
an intermediate member interposed between the base and the top member, the intermediate member having a cylindrical top portion sized for nesting engagement within the lower extended portion of the top member and having a cylindrical bottom portion sized for nesting engagement within the upwardly extended portion of the bottom member, the intermediate member comprising two elongate members, threadably interconnected so that rotational movement of the elongate members relative to each other adjusts the overall length of the intermediate member, thereby allowing adjustment of the intermediate member independently of the bottom member.

4,914,876

RETAINING WALL WITH FLEXIBLE MECHANICAL SOIL STABILIZING SHEET

Paul J. Forsberg, Richfield, Minn., assignor to Keystone Retaining Wall Systems, Inc., Edina, Minn.

Continuation of Ser. No. 53,757, May 26, 1987, Pat. No. 4,825,619, which is a continuation-in-part of Ser. No. 907,077, Sep. 15, 1986, abandoned. This application Dec. 20, 1988, Ser. No. 287,286
The portion of the term of this patent subsequent to Feb. 7, 2006, has been disclaimed.
Int. Cl.[4] E02D *29/00*
U.S. Cl. 52—169.4 23 Claims



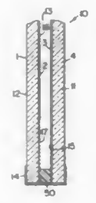
1. A retaining wall construction comprising: a first row of blocks having a plurality of wall blocks arranged side-by-side with adjacent blocks each other, a second row of wall blocks having a plurality of wall blocks arranged side-by-side with adjacent blocks anchored together, said second row of wall blocks being located on top of the first row of wall blocks, each of said blocks having vertical hole means, pin means located in the hole means in the blocks of the first and second rows of blocks to interlock the blocks of the first and second rows of blocks together, and flexible generally flat sheet means anchored on said pin means adapted to be retained within soil located behind said retaining wall construction, each of said blocks having a body including a convex curved front face having opposite ends, a top surface, a bottom surface, and side walls extended rearwardly from opposite ends of the front face, said body having said hole means for said pin means, said sheet means comprising a sheet member having a portion located between top and bottom surfaces of wall blocks of the first and second rows of blocks to space said top and bottom surfaces from each other whereby water can flow between said top and bottom surfaces, said portion including holes, said pin means when located in the hole means in the blocks of the first and second rows of blocks extended through said holes in the portion of the sheet member to anchor the sheet means to said first and second rows of blocks and secure the retaining wall construction to soil behind the retaining wall construction.

4,914,877

TRANSLUCENT GLASS CURTAIN WALL

David J. Bennett, Minneapolis, Minn., assignor to Bennett-Ringrose-Wolfsfeld-Jarvis-Gardner, Inc., Minneapolis, Minn.

Continuation of Ser. No. 84,574, Aug. 11, 1987, abandoned. This application Nov. 15, 1988, Ser. No. 274,700
Int. Cl.[4] E04C *2/54*; E04B *2/88*
U.S. Cl. 52—171 8 Claims



1. A glass curtain wall for a building, comprising:

(a) a plurality of inboard sheets having an inner and an outer surface, wherein at least a portion of said outer surface of said inboard sheets has a coating thereon;

(b) a plurality of outboard sheets made of clear glass, said outboard sheets having an interior and an exterior surface, at least a portion of said interior surface being roughened, wherein said roughened portion of said outboard sheets corresponds to said coated portion of said inboard sheets, wherein said interior surface of said outboard sheet has a reflective coating on the portion of said outboard sheet which has not been roughened; and

(c) frame means which interconnect each inboard sheet in a spaced apart and parallel relationship with an outboard sheet so as to form an individual panel, said panels being interconnected side-by-side by said frame means.

4,914,878

MOVABLE PARTITION WALL

Shoji Tamaki, and Hisami Matusato, both of Osaka, Japan, assignors to Kokuyo Co., Ltd., Osaka, Japan

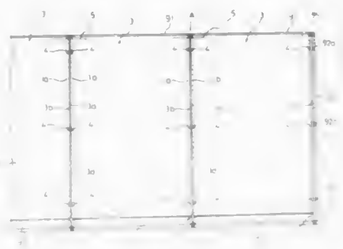
PCT No. PCT/JP88/00261, § 371 Date Dec. 29, 1988, § 102(e) Date Dec. 29, 1988, PCT Pub. No. WO88/07113, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 12, 1988, Ser. No. 296,049
Claims priority, application Japan, Mar. 14, 1987, 62-59222
Int. Cl.[4] E04B *2/74*
U.S. Cl. 52—239 10 Claims

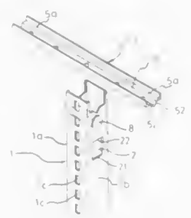
1 A movable partition wall comprising:

a plurality of panels, wherein each said panel is provided with a groove formed in an upper horizontal surface thereof, and wherein said groove has tapered side surfaces;

connector means for connecting at least two of said plurality of panels, wherein said connector means bridges the upper horizontal surfaces of said at least two panels, and wherein said connecter means is provided with a tapered portion

which communicates with said tapered side surfaces of the grooves of said at least two panels; and





fastener means for fastening said connector to said upper horizontal surfaces of said at least two panels.

4,914,879

PREFABRICATED BUILDING SYSTEM

Howard Goldberg, 211 Chestnut Ridge Rd., Woodcliff Lake, N.J. 07675

Filed Jun. 17, 1988, Ser. No. 208,346
Int. Cl.[4] E04B *2/76, 1/18;* E04C *1/10*
U.S. Cl. 52—242 14 Claims

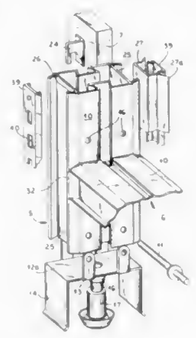
1. A building system comprising a plurality of prefabricated wall panels formed from steel studs having inner and outer sides and top and bottom edges, said panels being provided with supporting runners along said bottom edges on said inner and outer sides, said runners interconnecting said steel studs and having a first web lying along said edges of the sides of said studs and a second web forming an extension of said sides of said studs, and a cooperating shoe constructed to be secured to a supporting surface and having a body received between the second webs of said runners.

4,914,880

INTERNAL PARTITION WALL FOR MASONRY STRUCTURES

Alberto Albertini, Traversetolo, Italy, assignor to Coopsette S.C.R.L., Castelnovo Sotto, Italy

Filed Jul. 18, 1988, Ser. No. 220,525
Claims priority, application Italy, Aug. 6, 1987, 21595
Int. Cl.[4] E04H *1/00;* E04B *2/82*
U.S. Cl. 52—243 14 Claims



1. An internal partition wall for a masonry structure having a ceiling, a floor and masonry walls extending between the ceiling and the floor, said internal partition wall comprising:

perimetral steel profile members affixed to said ceiling, said floor and said masonry walls to define a generally rectangular perimetral frame;

a plurality of horizontally spaced vertical steel posts secured to said profile members affixed to said ceiling and said floor, each of said posts being provided on opposite sides of the respective post with a plurality of respective oppositely outwardly projecting locking studs, each of said posts being formed with undercut narrow grooves defined between outwardly convergent flanks;

a plurality of horizontal steel crossbars of substantially the same width as said posts secured between pairs of said posts and defining a partition-support skeleton of a grid pattern therewith;

interlocking means composed of steel for coupling said crossbars with said posts and including elastic elements operatively connected with respective ends of said crossbars and secured thereto, said elastic elements at each of said ends being insertable into the respective undercut narrow groove of a respective one of said vertical posts;

panels mounted on said locking studs on opposite sides of said partition-support skeleton and defining between themselves an internal space having a thickness equal to the widths of said posts and said crossbars, said posts and said crossbars having configurations providing sealing locations between neighboring edges of adjoining panels;

sealing elements secured to said posts and crossbars at said locations and sealingly engaging said panels to substantially seal said space; and

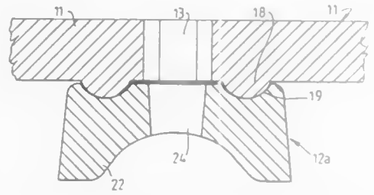
a nonflammable packing of low thermal conductivity filling said internal space between said panels and, together with said posts, said panels, said sealing elements and said members, effectively separating external spaces on opposite sides of said partition wall against penetration through said wall of a damaging factor acting in one of said external spaces, while providing locations for cables and utility lines.

4,914,881

ACCESS FLOORING SYSTEM

Leo Spork, Ascot, Australia, assignor to Techfloor Pty. Ltd., Indooroopilly, Australia

PCT No. PCT/AU87/00007, § 371 Date Sep. 7, 1988, § 102(e) Date Sep. 7, 1988, PCT Pub. No. WO87/04210, PCT Pub. Date Jul. 16, 1987
PCT Filed Jan. 12, 1987, Ser. No. 242,193
Claims priority, application Australia, Jan. 10, 1986, PH4169; Mar. 17, 1986, PH5053
Int. Cl.[4] E04B *5/00*
U.S. Cl. 52—263 11 Claims



1. An access flooring system including a plurality of free-standing support pedestals spaced apart over a base floor, and a plurality of floor panels removably supported on said pedestals, wherein:

each said panel has a substantially triangular shape in plan view, with a substantially planar top surface and a bottom surface;

said pedestals each have three spaced apart supporting legs for providing stable free-standing support for said pedestals on said base floor; and

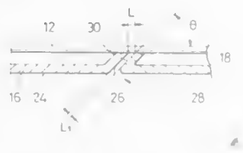
complementary interlocking means on the top of said pedestals and on the underside of said panels at the corners thereof for locating said panels on said pedestals, said interlocking means comprising generally hemispherically shaped projections and recesses on the panels and pedestals, respectively, providing ball and socket type connections between the panels and the pedestals, whereby the panels and pedestals are self-aligning.

4,914,882

BUTT ARRANGEMENT OF TRIM PARTS FOR A VEHICLE

Masahiro Tamamushi, Machida, and Masamitsu Matsuki, Sagamihara, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 9, 1983, Ser. No. 465,206
Claims priority, application Japan, Feb. 16, 1982, 57-23150
Int. Cl.[4] B62D *25/04*
U.S. Cl. 52—287 3 Claims



1. A trim assembly for the compartment of a motor vehicle adapted to accommodate a passenger at a predetermined vantage point comprising:

a first trim part attached on an inner surface of a body panel in the vehicle and forward of said vantage point extending partially and generally along the inner surface to one side and above said vantage point and terminating at a first position forward of said vantage point;

a second trim part attached on the inner surrface of the body panel for extending along the inner surface from said first position and past said vantage point;

said first part being bent toward the inner surface of the body panel at an obtuse angle in order to form a first trim part face at sadi first position;

said second tirm part initiating in a second trim part face which is bent in order to be opposed to and parallel with said first trim part face; and

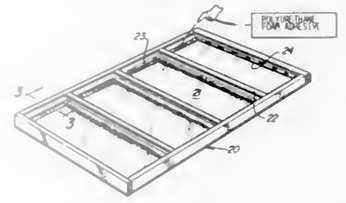
said first and second trim part faces being transverse at about a right angle to a line of sight passing from said vantage point through said first position so that the line of sight is directed from said vantage point to the first trim part face beyond the inner surface of the body panel.

4,914,883

METHOD OF BONDING STRUCTURAL SUPPORT CHANNELS TO A PANEL

Stanley E. Weasley, Rochester, Mich., assignor to Foamseal, Inc., Oxford, Mich.

Continuation of Ser. No. 921,443, Oct. 22, 1986, Pat. No. 4,748,781. This application Mar. 24, 1988, Ser. No. 172,683
The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.
Int. Cl.[4] E04C *1/00*
U.S. Cl. 52—309.5 15 Claims



1 A method of forming a prefabricated structurally reinforced building panel, including the following steps:

(a) laying the panel on a relatively flat surface;

(b) laying linear reinforcing members over one side of said panel;

(c) spacing said linear reinforcing members from said one side of said panel with small, individual spacer elements or a plurality of integral tabs punched out and displaced outwardly of one planar surface of the linear reinforcing member at predetermined intervals along the length of said linear reinforcing member to form a continuous space at the junction between said one planar surface and said panel;

(d) directing a continuous stream of a foamable liquid resin under high pressure into said space between said panel and said linear reinforcing members, forming a substantially continuous layer of foam between said panel and said linear reinforcing members; and

(e) allowing said foamable liquid resin to fully set-up and permanently bond said linear reinforcing members to said panel in said spaced relation, thereby forming said prefabricated structurally reinforced building panel having a flat exposed surface.

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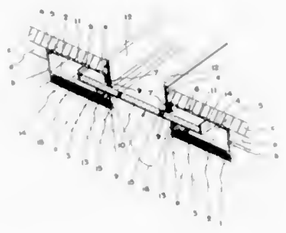
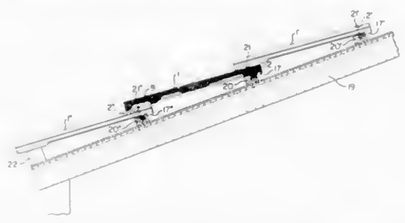
4,914,884
EXPANSION JOINTS
Toshikazu Ohmatsu, 178-1, Bonsai-cho, Ohmiya, Saitama, Japan
Filed Nov. 22, 1988, Ser. No. 274,891
Int. Cl.[4] E04B *1/62*; E04C *11/02*
U.S. Cl. 52—396 6 Claims



1. An expansion joint for disposition within a gap defined between two building structures, comprising:
a pair of channel-shaped means, each of which has an opening along one side thereof, fixedly secured to respective ones of said two building structures such that said open sides thereof are disposed opposite each other upon opposite sides of said gap;
a first surface dressing structure disposed atop said pair of channel-shaped means and said two building structures so as to substantially extend to edge portions of said two building structures which define said gap;
a cover plate having a width greater than said gap defined between said two building structures such that laterally disposed side portions of said cover plate are slidably disposed within said openings of said channel-shaped means so as to span said gap during expansion and contraction conditions of said expansion joint; and
a second surface dressing structure, substantially identical to said first surface dressing structure, disposed atop said cover plate and substantially throughout said width thereof so as to also be disposed within said openings of said channel-shaped members,
whereby regardless of said expansion and contraction conditions experienced by said building structures, visual continuity of said building structures, across said gap and said expansion joint, will be effectively preserved by means of said first and second surface dressing structures.

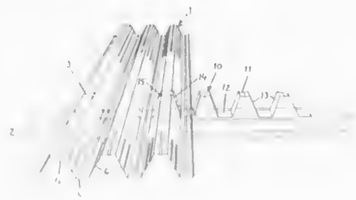
4,914,885
ROOFING TILE
Philip S. Baker, Coral Springs, and Steven T. Collette, Del Ray Beach, both of Fla., assignors to Gory Associated Industries, Inc., Pompano Beach, Fla.
Filed Aug. 29, 1988, Ser. No. 237,958
Int. Cl.[4] E04D *1/00*
U.S. Cl. 52—520 4 Claims

1. A flat shingle style concrete roofing tile adapted to be laid over either an underlayment including horizontally disposed battens or an underlayment without battens, in a series of courses on a roof, the tile when laid having a generally planar skywardly facing top surface, a bottom surface facing the underlayment, side edges, and upper and lower edges, a first flange disposed along one side edge of said top surface and extending between said upper and lower edges and a second flange disposed along the opposite side edge of said bottom surface and extending between said upper and lower edges, each said flange forming at least one ridge and at least one groove, the groove of an underlying flange being adapted to receive the ridge of the overlying flange of an adjacent tile, said tile having the same thickness at its upper and lower edges and having an elongated batten support beam molded in said bottom surface at the upper edge thereof extending from near one side edge to near the opposite side edge and protruding a predetermined first distance from the bottom surface for engaging an upper edge of a batten in the event the tile is laid over an underlayment including battens, the downwardly



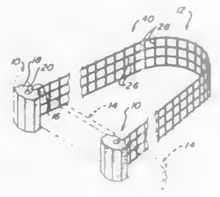
facing surface of said batten support beam being angled in the direction of its width so as to be substantially parallel to and in contact with an underlayment not having battens, and having a cutout formed therein located intermediate its ends for providing a weep hole for allowing runoff of any water that may accumulate between the batten support beam and the underlayment.

4,914,886
DEVICE FOR LAYING OUT PROFILED SHEET
Anders Eriksson, and Jan Strömberg, both of Luleå, Sweden, assignors to Plannja AB, Luleå, Sweden
Filed Feb. 12, 1988, Ser. No. 155,529
Claims priority, application Sweden, Feb. 16, 1987, 8700622
Int. Cl.[4] E04D *1/00*
U.S. Cl. 52—537 9 Claims



1. In a roofing structure wherein profiled roofing sheets are supported on at least one roof structural member by profiled supporting members between the at least one roof structural member and roofing sheets, and the roofing sheets and supporting members are attached to the at least one roof structural member, each roofing sheet having an inner surface facing the at least one roof structural member and an outer surface on the opposite side of said roofing sheet, the improvement comprising:
a plurality of roofing sheets each having a cross-sectional profile formed by valley portions for positioning adjacent the at least one roof structural member, crest portions spaced outwardly from said valley portions relative to the at least one roof structural member, sidewall portions between said crest portions and valley portions, and first and second end valley portions extending from end sidewall portions at opposite ends of each roofing sheet, said first end valley portion of one roofing sheet overlapping said second end valley portion of an adjacent roofing sheet;
a plurality of supporting members each having a cross-sectional profile for interfitting between at least one of said roofing sheets and the roof structural support member and in engagement with at least part of the inner surface of said at least one roofing sheet; and
end portions on each supporting member, one of said supporting member end portions overlapping said second end valley portion, end sidewall portion adjacent to said second end valley portion and end crest portion adjacent to the overlapped end sidewall portion of an adjacent roofing sheet.

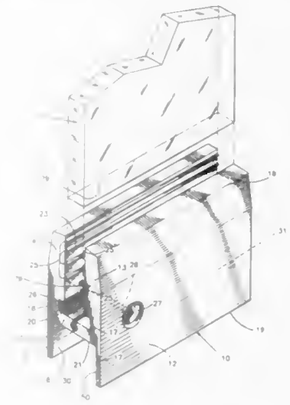
4,914,887
METHOD AND APPARATUS FOR ANCHORING BACKFILLED WALL STRUCTURES
H. Joe Meheen, 1250 Humboldt - Apt. 1004, Denver, Colo. 80218
Filed Dec. 12, 1988, Ser. No. 282,597
Int. Cl.[4] E04B *1/02*
U.S. Cl. 52—565 10 Claims



1. An anchor subassembly for use with a wall panel to define a retaining wall for a backfilled embankment and the like which comprises: means defining a pair of short pillar-like concrete endpieces each of which has a front face and a rear face, a vertically-extending keyslot having an entrance thereto opening onto the rear face thereof and a pair of seats in said rear face disposed on opposite sides of said keyslot positioned and adapted to receive and retain complementary shaped front corners on the side margins of a generally rectangular wall panel bridging the gap between two of said endpieces arranged in transversely-spaced substantially parallel relation; and, a wire mesh web having top and bottom strands spaced apart vertically a distance no greater than the height of said endpieces and opposite end portions adapted to be received in the entrances to said keyslots, and means carried by said end portions defining vertically-disposed longitudinally-spaced parallel enlargements sized for insertion and retention within said keyslots, said web when buried in a backfilled embankment cooperating with endpieces attached to the enlarged ends thereof to anchor at least one of said endpieces in embankment-supporting relation on the exposed surface thereof, and a transversely-spaced substantially parallel pair of said anchored embankment-supporting endpieces cooperating with one another and with a wall panel bridging the gap therebetween to define a retaining wall.

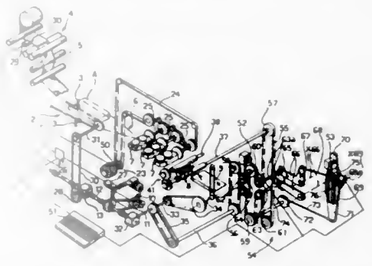
4,914,888
SUPPORT FRAME FOR GLASS PANEL
Laurence B. Hanson, Sandy, Utah, assignor to Capitol Glass & Aluminum Corporation, Salt Lake City, Utah
Filed Aug. 29, 1988, Ser. No. 237,829
Int. Cl.[4] E04B *01/60*
U.S. Cl. 52—768 18 Claims

1. A support frame for receiving and retaining a panel of glass as part of a wall or door assembly, said frame comprising:
an integrally formed substantially straight unibody support member of uniform cross section having (i) a pair of opposing side walls joined by (ii) an interconnecting support bridge which extends between opposing inner faces of the side walls and includes an upper and a lower face;
said opposing inner faces of the side walls and upper face of the support bridge defining a channel configured in size to receive an edge of the panel of glass;
said support bridge including a recessed slot cut into one of the faces of the support bridge to a sufficient depth to form a hinge axis operable with respect to the opposing side walls and enabling rotational displacement of the inner faces of the side walls against the inserted glass in gripping manner;



means for causing the rotational displacement of the side walls to grip the inserted glass;
said unibody member being fabricated of a material having sufficient rigidity to cause the side walls to form a substantially continuous clamp against and retain the inserted glass upon frictional contact therebetween; and
said sidewall displacing means including means for adjusting the amount of gripping pressure applied to the inserted glass by said side walls.

4,914,889
AUTOMATIC PACKAGING MACHINE, PARTICULARLY FOR THE PRODUCTION OF PACKAGES OF THE FLOW-PACK TYPE
Renzo Francioni, Prato Sesia, Italy, assignor to Jacobacci-Casetta & Perani, Italy
Filed Dec. 7, 1988, Ser. No. 281,094
Claims priority, application Italy, Jul. 1, 1988, 67625 A/88
Int. Cl.[4] B65B *57/00*
U.S. Cl. 53—51 11 Claims



1. A packaging machine comprising a plurality of movable elements intended to be activated with predetermined kinematic relationships, and control means for selectively and automatically varying the kinematic relationships in depen-

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dence on various operating conditions of the machine, wherein it includes:

positive entrainment means for coupling at least two of the movable elements in a kinematic relationship;

adjustment means associated with the positive entrainment means and movable to vary the kinematic relationship, and

actuator means responsive to the control means for causing, in a controlled manner, the movement of the adjustment means in order to vary automatically and in a controlled manner the kinematic coupling relationship between the at least two movable elements,

wherein the positive entrainment means comprises:

a first shaft and a second shaft connected respectively to one and to the other of the at least two movable elements;

a flexible-element transmission interposed between the first shaft and the second shaft, the transmission comprising a plurality of pulleys over which a flexible element passes, the plurality of pulleys including at least one pair of movable pulleys, each of which defines one of two respective opposed loops of the flexible element in an arrangement such that the movement of the at least one pair of movable pulleys causes the contraction and the extension respectively of the one and of the other of the two loops of the flexible element with a consequent variation in the relative angular positions of the first shaft and the second shaft, the actuator means being adapted for selectively moving the at least one pair of movable pulleys.

4,914,890

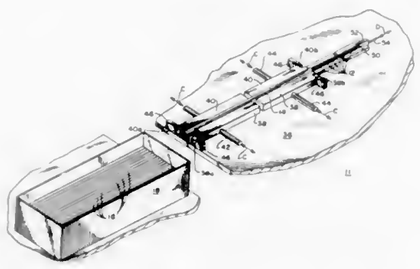
UNIVERSAL PACKAGING SYSTEM FOR ELECTRICAL COMPONENTS AND THE LIKE

Thorwald F. Olson, Wheaton, Ill., assignor to Molex Incorporated, Lisle, Ill.

Division of Ser. No. 123,004, Nov. 19, 1987, Pat. No. 4,815,594, which is a continuation-in-part of Ser. No. 44,386, Apr. 30, 1987, abandoned. This application Feb. 24, 1989, Ser. No. 315,070

Int. Cl.[4] B65B *11/00, 5/10*

U.S. Cl. 53—397 **18 Claims**



1. A method for the packaging within an elongated tube of an array of separate electrical components, each having a given profile, said method comprising the steps of:

deflecting at least one wall portion located adjacent an open end portion of said tube in a direction generally transversely of a longitudinal axis thereof by pressure applied to opposite sides of said tube from relatively pivotally movable members acting about a pivot axis parallel of said longitudinal axis while supporting said tube aligned above said pivot axis;

aligning components of the array near said deflected wall portion adjacent said end portion of said tube with their profiles in registration with the interior of said tube;

relatively moving said components and said tube to insert said components within said tube; and

releasing said deflected end portion of said wall portion of said tube to permit said wall portion to return to a non-deflected state for stopping engagement with said components to prevent longitudinal movement with respect to said tube.

4,914,891

METHOD AND APPARATUS FOR EXCHANGING FILM ROLLS IN A WRAPPING MACHINE

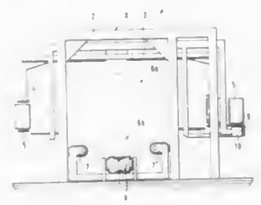
Yrjö Suolahti, Mynämäki, Finland, assignor to Oy M. Haloila AB, Finland

Filed May 26, 1988, Ser. No. 198,973

Claims priority, application Finland, May 27, 1987, 872358

Int. Cl.[4] B65B *11/02, 41/12*

U.S. Cl. 53—399 **11 Claims**



10. A method for exchanging film rolls in a machine for wrapping film around a product to be packaged, said wrapping machine including a rotatable wrapping crank, a film distribution sledge provided with tension rolls mounted on said wrapping crank, said film distribution sledge adapted to carry a roll of wrapping film which is wrapped around the product as said wrapping crank rotates, comprising the steps of:

moving a set of press rolls carried on a frame coupled to said film distribution sledge from a closed position in which said press rolls are pressed against said tension rolls to an open position in which said press rolls are spaced from said tension rolls;

shifting a new film roll into said film distribution sledge through the space between the set of press rolls and the tension rolls;

passing a leading end region of the film from the new film roll over the tension rolls to a grasping member in which said leading end region is locked; and

moving said set of press rolls carried on said frame to said closed position so that the film remains between said tension rolls and said press rolls for adjusting the tension of the film.

4,914,892

PROCESS FOR PACKAGING ARTICLE WITH FILM

Tsutomu Saito, and Yukio Hosaka, both of Tokyo, Japan, assignors to Kabushiki Kaisha Fuji Seisakusho, Japan

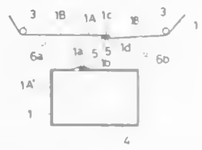
Continuation of Ser. No. 48,414, May 11, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,155

Claims priority, application Japan, May 12, 1986, 61-107846

Int. Cl.[4] B65B *9/02, 11/08*

U.S. Cl. 53—399 **8 Claims**

1. A process for continuously packaging an article with a shrinkable synthetic resin film comprising the steps of winding said film on a pair of rollers so as to be extended between the two rollers, wrapping an article by moving it into an intermediate region of the film, between the two rollers, overlapping end portions of the intermediate region of the film extending behind the article, cutting the resultant overlapped end portions, fusing together the cut overlapped end portions in the lateral direction of the film to form a fused adhesion line comprising a plurality of segments and having a summed length greater than the width of the film, fusing the cut overlapped separate opposite side regions of the film connected to the two rollers together, to obtain a seam within a new intermediate region to be extended between the two rollers which is ready for the next packaging operation, and shrinking the wrapped film so that the fused end portions of said overlapped portions lie adjacent to and parallel to a surface of the article being wrapped, wherein the film is first wrapped around the article



while kept in a tensioned state, and the overlapped portions thereof are thereafter put in an untensioned state, and said overlapping comprises the folding of the foremost end portion of one of the overlapped portions upon itself so as to be inserted between said overlapped portions, and said foremost end portion and both of said overlapped portions then being fused together to form each said achesion line and said seam from three layers of film with said folded portion being in the center.

4,914,893

LARGE SIZE CONTAINER BANDING APPARATUS

Eric W. Strub, 235 Rockbill Rd., Vista, Calif. 92038, and Kenneth M. Strub, 25670 Gesmond Dene, Escondido, Calif. 92025

Filed Feb. 26, 1988, Ser. No. 160,848

Int. Cl.[4] B65B *9/10*

U.S. Cl. 53—567 **26 Claims**

1. A banding apparatus for automatically applying a band to large objects or containers, comprising:

forming means for receiving and for opening flattened tubular banding material of a predetermined diameter, said material having a sidewall with a circumference larger than a perimeter length around individual containers, and for pressing out creases in said sidewall;

feed means for advancing predetermined lengths of said banding material from said forming means to a position vertically adjacent said containers;

cut-off means for receiving and cutting said predetermined lengths of banding material so as to form separate bands of predetermined height; and

suspension means positioned adjacent to said forming means for receiving said bands and for engaging and holding one side portion only of said bands in a fixed vertical position above the containers with the opposite side portion tilting downwardly in an open configuration for engagement by said containers.

4,914,894

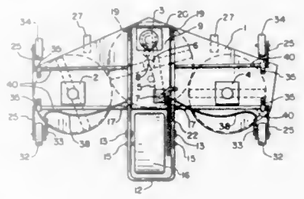
SHORT TURN IMPLEMENT OR VEHICLE

Ervin D. Geiger, 11346 Avery Rd., Palm Beach Gardens, Fla. 33410

Continuation-in-part of Ser. No. 771,242, Feb. 19, 1987, abandoned. This application Feb. 20, 1987, Ser. No. 28,340

Int. Cl.[4] A01D *34/66*

U.S. Cl. 56—14.7 **37 Claims**



1 An energy propelled implement comprising;

a generally horizontal transverse work performing apparatus;

a means, including at least one drive wheel, mounted to the apparatus to self-propel the implement;

means connecting the drive wheel to the apparatus allowing a floating vertical pivotal motion of the drive wheel relative to the apparatus,

means to provide locomotor power to the drive wheel; and

a sufficient number of mobilizing ground engaging support means embodied on the implement to enable it to operate on the ground while performing work;

a steering and operating means mounted to the implement to steer and operate the implement which includes at least one of the mobilizing ground engaging support means, and at least one said pivotally attached drive wheel.

4,914,895

DEVICE FOR FILLING AND CLOSING SACKS, IN PARTICULAR PAPER SIDE FOLDING SACKS

Gustav Kuckhermann, Achern; Klaus Tolle, Sasbach; Eduard Turnwald, Durmersheim; Peter Zink, Kappelrodeck; Rainer Schäfer, Willstatt, and Josef Hodapp, Kappelrodeck-Waldulm, all of Fed. Rep. of Germany, assignors to Icoma Packtechnik GmbH, Achern, Fed. Rep. of Germany

Filed May 11, 1988, Ser. No. 192,557

Claims priority, application Fed. Rep. of Germany, May 11, 1987, 3715702

Int. Cl.[4] B65B *43/26*

U.S. Cl. 53—571 **15 Claims**

1. An apparatus for filling and closing sacks or bags, in particular paper side folding sacks, having a plurality of processing stations positioned at a distance from each other and including a filling station in which a weighed quantity of the goods to be filled can be poured out of a bin into a sack, said apparatus comprising stationary clamping elements for holding said sack in an open position, a slide movable cyclically between two successive processing stations, and outside grippers

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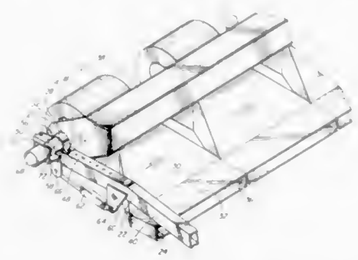
mounted on said slide for grasping at least the partially filled sack at its side folding by clamping said folding from the out-

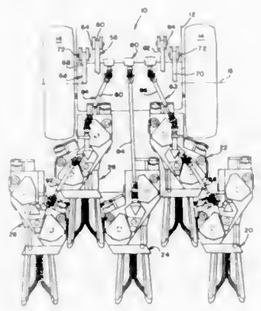
side in said filling station and transporting said sack by means of said slide to a subsequent processing station.

4,914,896
CROP BLOWER APPARATUS
M. Roy Gullickson, Box 70, Barons, Alberta, Canada T0L 0G0
Filed Dec. 2, 1988, Ser. No. 279,124
Int. Cl.[4] A01D *45/20*
U.S. Cl. 56—12.9 20 Claims



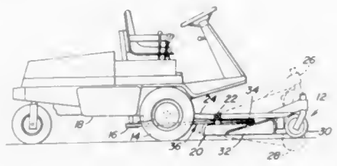
1. A crop blower apparatus comprising:
a plurality of blowers for providing a stream of forced air;
means for powering the blowers;
discharge means connected to the blowers for providing a direct current of air, the discharge means including discharge ducts of the blowers, said ducts being juxtaposed to provide a substantially continuous curtain of air, the discharge ducts being aligned along an axis, each of the ducts being relatively elongated along the axis and relatively narrow perpendicular to the axis;
means for regulating the curtain of air comprising means for adjusting the heights of the discharge ducts;
means for mounting said blower on a crop harvester, said means for powering and said discharge means being mounted forwardly of the crop receiving portion of the crop harvester so the curtain of air is directed towards a crop receiving portion thereof; and
means for adjustably rotating the blowers about the axis to angularly adjust the curtain of air.

4,914,897
NARROW ROW COTTON HARVESTER
Jesse H. Orsborn, Hinsdale, Ill., assignor to J.I. Case Company, Racine, Wis.
Filed Jan. 13, 1989, Ser. No. 297,183
Int. Cl.[4] A01D *45/18*
U.S. Cl. 56—13.2 16 Claims



1. A narrow row cotton harvester for use in a field with parallel rows of cotton, comprising:
a fore-and-aft extending main frame supported for movement across the field by pairs of frame carrying wheels, at least one pair of said wheels being adapted for rotation about a common axis;
first and second cotton harvesting units supported at a forward end of said frame, each cotton harvesting unit including forward and rear picker rotors and defining a fore-and-aft plant passage for receiving one of the rows of cotton; and
means for supporting said cotton harvesting units forwardly of and for vertical movement relative to said frame, said supporting means arranging said harvesting units in an adjacent relationship relative to each other at different distances from the common axis of said wheels such that the picker rotors of said first cotton harvesting unit are offset in a fore-and-aft direction relative to the picker rotors of said second cotton harvesting unit to facilitate nesting of the cotton harvesting units and thereby improve operability of the cotton harvester in harvesting narrow row cotton.

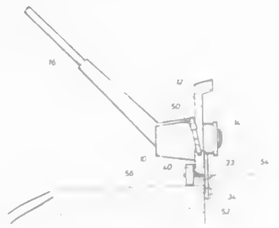
4,914,898
V-BELT GUIDE
Michael J. Jenkins, Milwaukee, and Jack E. Arfstrom, Beaver Dam, both of Wis., assignors to Deere & Company, Moline, Ill.
Filed Apr. 27, 1989, Ser. No. 344,193
Int. Cl.[4] A01D *35/26*
U.S. Cl. 56—15.2 11 Claims



1. For use in a vehicle having an engine and a generally horizontal drive pulley powered by the engine, said vehicle being adapted to have an implement connected to the vehicle,

that implement having a generally horizontal driven pulley and the vertical displacement of said implement relative to the vehicle varying during operation; an endless belt adapted to be trained over the drive and driven pulleys; and belt guiding means carried by the vehicle and positioned such that it would be between the drive and driven pulleys and extend generally horizontally to the drive pulley and be spaced just above the path of the endless belt; said means adapted to contact the guide an upper edge of the belt before it enters the drive pulley and limit the entry angle of the belt into the pulley to approximately 9° from horizontal as the vertical displacement of the implement and its driven pulley would vary relative to the vehicle and the drive pulley.

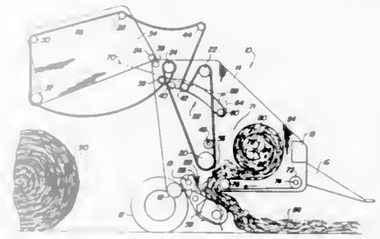
4,914,899
ATTACHMENT TO A LAWN TRIMMER
Benjamin C. Carmine, 415 Shadow Creek Dr., Seabrook, Tex. 77586
Continuation-in-part of Ser. No. 72,790, Jul. 13, 1987, Pat. No. 4,803,831, which is a continuation-in-part of Ser. No. 812,757, Dec. 23, 1985, Pat. No. 4,679,385. This application Jun. 17, 1988, Ser. No. 208,249
Int. Cl.[4] A01D *34/84*
U.S. Cl. 56—16.7 11 Claims



1. An attachment for converting a lawn trimmer into a lawn edger, the lawn trimmer including a housing enclosing a motor, a debris shield mounted to the motor housing and a spool and line housing projecting outwardly from the motor housing substantially perpendicular to the housing base and the debris shield, the attachment comprising
(a) a body detachably mounted to the motor housing, said body including a profiled cavity defined by a plurality of plate members for receiving a portion of the motor housing therein, said profiled cavity including means for supporting the motor housing received therein;
(b) an edge guide depending downwardly from a bottom edge of said body for guiding the lawn trimmer along a path;
(c) wheel means mounted to said body for rolling the lawn trimmer along the path; and
(d) means for mounting said body to the lawn trimmer housing.

4,914,900
BALING MACHINE FOR FORMING CYLINDRICAL BALES OF CROP
Jean Vlaud, Sarreguemines, France, assignor to Deere & Company, Moline, Ill.
Filed Apr. 6, 1989, Ser. No. 334,615
Claims priority, application United Kingdom, Apr. 11, 1988, 8808468
Int. Cl.[4] A01D *39/00*
U.S. Cl. 56—341 8 Claims

1. In a large round baler including a baling chamber, a storage chamber and a crop delivery unit for delivering crop selectively to the baling or storage chamber, the improvement comprising: said storage chamber containing a winder mechanism including a belt support shaft extending transversely across said storage chamber, belt material wrapped upon said support shaft, and a drivable coiling mechanism including a coiling shaft extending transversely across said storage chamber in spaced relationship to said support shaft; said belt material including an end fixed to said coiling shaft and including a

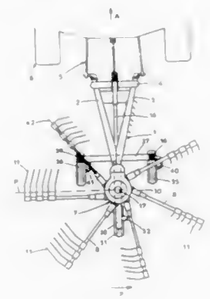


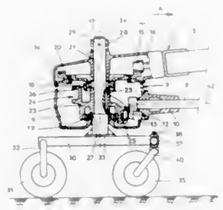
portion extending between said support and coiling shafts and located for receiving crop thereon from the delivery unit; and said winder mechanism being drivable for coiling the belt material into a spiral so that the crop is sandwiched in the spiral for storage and for uncoiling he belt material so that the crop is released for delivery to the baling chamber.

4,914,901
HAYMAKING MACHINE WITH AT LEAST ONE RAKING WHEEL EQUIPPED WITH CONTROLLED TOOL-CARRYING ARMS
Jérôme Aron, Bouxwiller, France, assignor to Kuhn S.A., Saverne, France
Filed Nov. 3, 1988, Ser. No. 267,089
Claims priority, application France, Nov. 17, 1987, 87 16048; Jun. 16, 1988, 88 08339
Int. Cl.[4] A01D *78/00*
U.S. Cl. 56—370 15 Claims

1. Haymaking machine comprising:
a frame having at least one raking wheel and plural tool-carrying arms directed outward from said raking wheel;
a support pin freely rotatable in relation to said frame and coupled to said raking wheel so that said raking wheel is rotatable about said support pin;
a control cam fixedly connected to said support pin and having a cam surface coupled to said tool-carrying arms so that during work the tool-carrying arms rotate due to rotation of said raking wheel around the support pin, with the tool-carrying arms pivoting by means of said cam surface around their respective longitudinal axes so that the arms lift the respective tools carried by said arms in a predetermined zone of a path of said respective tools for the depositing of raked products;
at least a first support adapted to move over the ground during work, said first support offset from said support pin in a direction of movement of said machine; and
connecting means for connecting said first support to said support pin, said connecting means being stationary in relation to said first support in a horizontal plane during work, said support pin and said cam fixedly connected to said support pin rotating in relation to changes in orienta-

tion of said first support due to a change in the direction of movement of said haymaking machine to maintain said





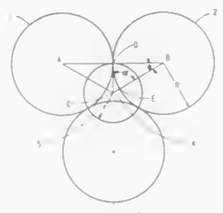
cam surface in a predetermined orientation with respect to the direction of movement.

4,914,902

HIGH STRENGTH CORED CORDS

Robert L. Keefe, Jr., Chadsford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 14, 1989, Ser. No. 324,531
Int. Cl.[4] D02G *3/48, 3/02, 3/36;* B60C *9/00*
U.S. Cl. 57—210 6 Claims



1. A cord comprising a core yarn and a plurality of ply yarns equally spaced around the core yarn to form a sheath, wherein:
(i) the core yarn is made from a multitude of filaments and has a radius, r;
(ii) each of the ply yarns are made from a multitude of filaments and have a radius, R; and
(iii) the core yarn and the ply yarns are related in accordance with the following formulae

$$r_{core} > R\left[\frac{n}{\pi}\,\mathrm{Tan}\left(90-\frac{180}{n}\right)-\left(\frac{n-2}{2}\right)\right]^{1/2} \quad [125\%]$$

-continued

$$r_{core} < R\left[\mathrm{Tan}\left(90-\frac{180}{n}\right)\right] [125\%]$$

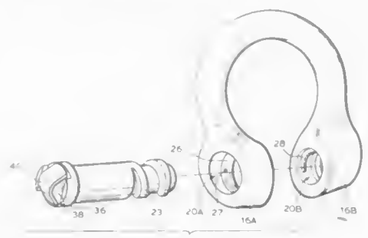
wherein n is the number of ply yarns in the cord.

4,914,903

LINK SHACKLE

Jorgen O. Bernt, Oakville, and Barry C. Forster, Mississauga, both of Canada, assignors to J. O. Bernt & Associates Limited, Burlington, Canada

Filed Apr. 26, 1989, Ser. No. 344,660
Int. Cl.[4] F16G *15/06*
U.S. Cl. 59—86 8 Claims



1. Shackle comprising,
elongate case metal body defining a generally circular outline and substantially circular cross-section and defining a gap in said circular outline for the admission of a link or shackle of similar section,
each end of the body, adjacent each side of the gap, defining ears which, in turn, define aligned bores for the reception of a pin extending across said gap,
one of said bores being shaped by the casting to define a spiral thread, and the other of said bores being unthreaded,
a pin of cast metal shaped and dimensioned to be inserted through the other said bore and into said one bore and having at one end a cast spiral thread complementary to that in said bore and adapted to make a loose fit therewith;
wherein the end of said pin remote from the thread is located at a location within the other of said bores, a groove surrounds said unthreaded bore just outwardly of said location whereby a diametrically extending strip having opposite ends may have its ends inserted in said bores outward of the so located end to retain said pin in said bore.

4,914,904

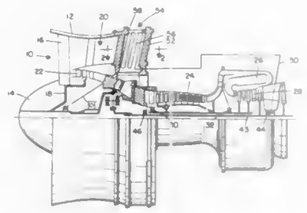
OIL COOLER FOR FAN JET ENGINES

Marvin J. Parnes, Norwalk, and Herman Vogel, Newtown, both of Conn., assignors to Avco Corporation, Providence, R.I.

Filed Nov. 9, 1988, Ser. No. 269,772
Int. Cl.[4] F02K *3/04*
U.S. Cl. 60—226.1 5 Claims

1. In a turbo fan gas turbine engine including a central engine and a shroud enclosed fan, the combination comprising:
a plurality of structural struts, each said strut extending from said central engine to said shroud;
a plurality of tubes, internal to each said strut, each said tube being directly thermally connected along its length to said strut by a solid high thermal conductivity pathway;

means for connecting said tubes to a source of heated hydrocarbon liquid; and



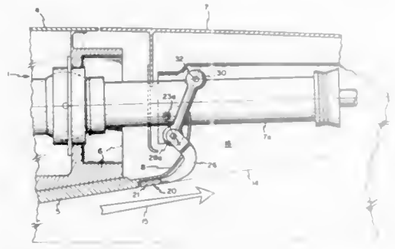
means for providing a return from said tubes to said source of hydrocarbon liquid whereby said tubes provide cooling for said liquid.

4,914,905

AIR DEFLECTOR FOR A TURBOFAN ENGINE THRUST REVERSER

Claude A. G. Dubois, Honfleur; Jean-Marie L. Gely, and Guy B. Vauchel, both of Le Havre, all of France, assignors to Societe anonyme dite Hispano-Suiza, Saint-Cloud, France

Filed Feb. 17, 1989, Ser. No. 311,858
Claims priority, application France, Feb. 25, 1988, 88 02283
Int. Cl.[4] F02K *1/64*
U.S. Cl. 60—226.2 2 Claims



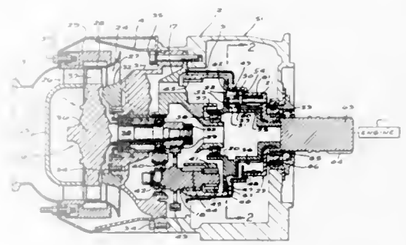
1. An air deflector for a thrust reverser of a turbofan-type turbojet engine having a generally annular outer housing having an inner surface defining an outer boundary of an air flow duct, at least one thrust reverser door movable between opened and closed positions, the thrust reverser door having an inner door panel defining a cavity with respect to an extension of the inner surface when the door is in its closed position, and an actuator to move the door between its opened and closed posiitons, the deflector comprising:
(a) a deflector with a generally arcuate segment shape having a deflector surface;
(b) means to move the deflector between a first position wherein the deflector surface is adjacent to and aligned with the inner surface such that air flowing through the air flow duct passes along an extension of the inner surface and not into the cavity, and a second position wherein the deflector is displaced away from the inner surface so as to allow air to enter the cavity, wherein the means to move the deflector comprises linkage means interconnecting the deflector and the actuator such that the deflector is in its first position when the thrust reverser door is closed and in its second posiiton when the thrust reverser door is opened, the linkage means comprising:
(i) a first link arm pivotally attached to the actuator;
(ii) a second link arm having a first end fixedly attached to an arcuate segment and a second end; and
(iii) second pivot means pivotally attaching the second end of the second link arm to the first link arm such that the first and second link arms may pivot with respect to each other about a second pivot axis extending generally parallel to, but non-coincident with the first pivot axis; and,
(c) means to pivotally attach each arcuate segment to the outer housing comprising:
(i) bracket means fixedly attached to the outer housing;
(ii) arm means fixedly attached to the arcuate segment; and,
(iii) pivot means pivotally attaching the arm means to the bracket means such that each arcuate segment pivots about a first pivot axis extending generally transverse to a longitudinal axis of the outer housing.

4,914,906

TURBINE STARTER DEVICE

Darrel W. Burch, Phoenix, Ariz., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed May 24, 1988, Ser. No. 197,945
Int. Cl.[4] F02C *7/277*
U.S. Cl. 60—39.142 16 Claims



1. A starter for a gas turbine engine comprising:
turbine means adapted to receive motive gas flow and for producing high speed low torque output;
gear transmission means associated with said turbine means, for changing said high speed low torque output of said turbine means to a low speed high torque output;
drive shaft means for transmitting rotational power from the starter to the gas turbine engine;
gear assembly adapted to be supported on bearings and rotatably driven by said gear transmission means;
a driven assembly attached to said drive shaft means; a double pawl and ratchet clutch assembly having primary pawls carried on said driven assembly, secondary pawls carried on said gear assembly, an external ratchet cylinder carried on said driven assembly, and an internal ratchet cylinder carried on said gear assembly, said driven assembly and said gear assembly configured to have said primary pawls operative with said external ratchet cylinder and said secondary pawls operative with said internal ratchet cylinder; and
resilient biasing means associated with each of said primary and secondary pawls for biasing said primary and second pawls radially inward against centrifugal forces, and for allowing running engagements of said driven assembly while preventing said driving assembly from attaining a rotational speed in excess of said driven assembly.

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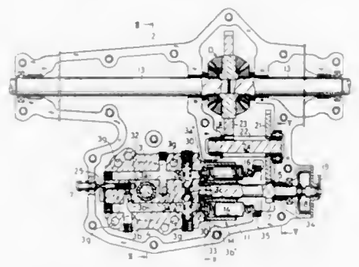
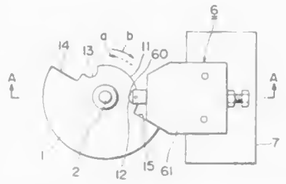
4,914,907
AXLE DRIVING APPARATUS
Hideaki Okada, Takarazuka, Japan, assignor to Kanzaki Kokyukoki Mgf. Co. Ltd., Japan
Filed Feb. 1, 1989, Ser. No. 304,582
Claims priority, application Japan, Feb. 3, 1988, 63-24193; Mar. 9, 1988, 63-55828
Int. Cl.[4] F16D *39/00*
U.S. Cl. 60—487 5 Claims



1. An axle driving apparatus characterized in that:
left and right axles provided at a butt joint therebetween with differential gears, a counter shaft and a motor shaft, are journalled in a transmission casing extending in parallel relationship to each other and longitudinally of said transmission casing;
first deceleration means is provided between said motor shaft and said counter shaft;
second deceleration means is provided between said counter shaft and said differential gears;
said transmission casing is formed of an upper half casing and a lower half casing superposed with each other, and bearings for supporting both axial ends of said axles and counter shaft, and one axial end of said motor shaft, are constituted at said butt joint;
said motor shaft is supported at the other axial end by the side surface of a center section fixed in said transmission casing so that a hydraulic motor is attached to the side surface of said transmission casing; and
a hydraulic pump is attached to the upper surface of said center section and a pump shaft of said hydraulic pump is supported at one end to said upper half casing.

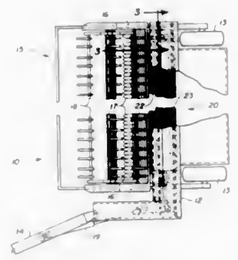
4,914,908
ACTUATOR USED SHAPE MEMORY ALLOY AND DISPLAY CONVERSION DEVICE OF SIGNS
Masashi Sugiyama, Hiratsuka; Isamu Ohishi, Yokohama; Morio Handa, and Junichi Ulyama, both of Hiratsuka, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan
Filed Jan. 27, 1989, Ser. No. 302,203
Claims priority, application Japan, Jan. 30, 1988, 63-19761; Feb. 3, 1988, 63-23609
Int. Cl.[4] F03G *7/06*
U.S. Cl. 60—527 22 Claims

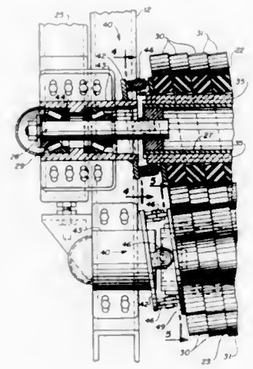
1. An actuator used shape memory alloy characterized in that, in the actuator equipped with a shape memory alloy allowing a movable body to work in one direction by the restoration force to the memorized shape at the time of temperature rising, a control base standing opposite to at least part of said movable body is provided, concave portions are provided to one of said movable body and control base and, at the same time, a control element is provided to the other thereof to guide said control element into said concave portion and to



press said concave portion and control element against one another by a fixed resilience.

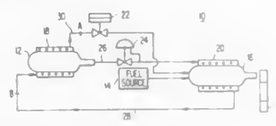
4,914,909
LOBED RING CONDITIONING ROLL
Gilbert W. Linde, and Shaun A. Seymour, both of New Holland, Pa., assignors to Ford New Holland, Inc., New Holland, Pa.
Filed Mar. 17, 1989, Ser. No. 324,792
Int. Cl.[4] A01D *82/00*
U.S. Cl. 56—1 22 Claims





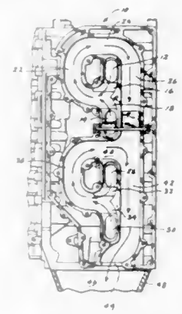
1. A conditioning mechanism operable in a crop harvesting machine to condition crop material fed thereto, comprising:
a first conditioning roll having a core concentric about an axis of rotation and a plurality of lobed rings axially stacked on said core, each said lobed ring having an outer peripheral surface defining a multi-lobed circumferential configuration, said plurality of lobed rings being aligned on said core to define a multi-lobed conditioning roll, said lobed rings being mounted for oscillating movement relative to said core so that each said lobe moves between a first position and a second position axially displaced along said core from said first position as said lobes rotate around said axis of rotation;
a second conditioning roll having an outer peripheral surface with a multi-lobed circumferential configuration similar to said first conditioning roll, said first and second conditioning rolls being rotatably mounted adjacent to one another such that said lobes are in intermeshing registry to condition crop material passing therebetween during rotation thereof;
an oscillating mechanism operably engaged with said first conditioning roll to effect said oscillating movement of said lobed rings during rotation o said first conditioning roll so that the outer peripheral surface of each said lobed ring moves transversely relative to the outer peripheral surface of said second conditioning roll while in engagement with said crop material; and
drive means operatively associated with said first and second conditioning rolls to effect a respective counter-rotation of said conditioning rolls.

4,914,910
EMERGENCY POWER UNIT OXIDIZING GAS BOTTLE HEATING APPARATUS
Malcolm J. McArthur, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.
Filed Jul. 14, 1988, Ser. No. 218,875
Int. Cl.[4] F02C *7/10*
U.S. Cl. 60—39.511 6 Claims



1. An emergency power unit for providing emergency on board power to an aircraft comprising:
a fuel supply source for supplying fuel;
an oxidizing gas bottle containing pressurized oxidizing gas;
an oxidating gas heating device, thermally coupled to a combustor and to said pressurized oxidizing gas bottle, for heating said pressurized oxidizing gas within said oxidizing gas bottle by using heat energy generated by said combustor; and
said combustor, coupled to said fuel supply source and said oxidizing gas bottle, for combusting a mixture of fuel and heated oxidizing gas heated by said oxidizing gas heating device to produce hot gases resulting from the combustion of said mixture of fuel and heated oxidizing gas to drive blades of a turbine to produce emergency on board power for the aircraft;
wherein said oxidizing gas heating device includes:
a heat exchanger for transferring heat energy from said combustor to said oxidizing gas bottle to cause said pressurized oxidizing gas contained within said oxidizing gas bottle to become heated;
said heat exchanger including
a combustor heat exchanger thermally coupled to said combustor and an oxidizing gas bottle heat exchanger thermally coupled to said oxidizing gas bottle and communicating with said combustor heat exchanger; and
wherein a heat carrying fluid circulates between said combustor heat exchanger and said oxidizing gas bottle heat exchanger.

4,914,911
MARINE ENGINE EXHAUST SYSTEM WITH DIVERTER VALVE AND ALTERNATE EXHAUST DISCHARGE
Francis E. Bertram, Malone, Wis., assignor to Brunswick Corporation, Skokie, Ill.
Filed Mar. 13, 1989, Ser. No. 322,544
Int. Cl.[4] F02B *27/02*
U.S. Cl. 60—313 10 Claims



1. An internal combustion engine, comprising:
an engine block;
two or more cylinders disposed within said engine block;
a first internal exhaust passage in said engine block for receiving exhaust from one of said cylinders;
a second internal exhaust passage in said engine block for receiving exhaust from another of said cylinders;
said first and second exhaust passages being arranged so as to merge into a common exhaust discharge passage in said engine block for discharging exhaust therefrom;
a third internal exhaust passage in said engine block having an inlet in communication with one of said first and second exhaust passages upstream of the merger of said first and second exhaust passages into said common discharge passage; and
valve means actuable between an open position and a closed position for selectively controlling the flow of exhaust through said third exhaust passage, said valve means in its open position allowing flow of exhaust through said third exhaust passage, and in its closed position cutting off exhaust flow through said third passage so that exhaust flowing through said first passage communicates with exhaust flowing through said second passage prior to discharge.

4,914,912
EXHAUST-MANIFOLD HEAT INSULATING BOARD
Nobuyuki Akatsuka, Shizuoka, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan
Filed Apr. 28, 1989, Ser. No. 345,466
Claims priority, application Japan, May 19, 1988, 63-66138[U]
Int. Cl.[4] F01N *7/10*
U.S. Cl. 60—323 3 Claims

1. An exhaust-manifold heat insulating board comprising a heat insulating material provided between an inside material layer and an outside material layer, said inside and outside layers being laminated together and defining an interior area and a peripheral edge area, said inner area having a depression formed therein, said depression forming an end wall portion disposed adjacent but spaced inwardly from said peripheral edge area, and said peripheral edge area having a connecting tab portion formed integrally on a peripheral edge of one said layer and overlapping and being fixedly secured to a peripheral

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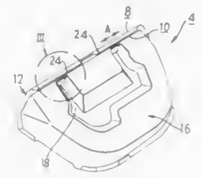
edge of the other said layer, said connecting tab portion being positioned directly adjacent said end wall portion and having a

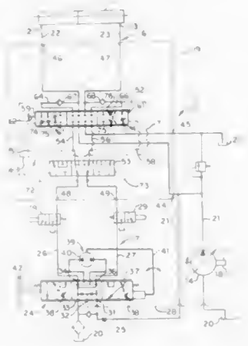


length along the peripheral edge area greater than the width of the adjacent said end wall portion.

4,914,913
LOAD RESPONSIVE FLOW AMPLIFIED CONTROL SYSTEM FOR POWER STEERING

Gene R. St. Germain, Plainfield, and John B. Waggoner, Shorewood, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed May 3, 1989, Ser. No. 346,965
Int. Cl.[4] B62D *5/08, 5/097;* F15B *13/042*
U.S. Cl. 60—384 10 Claims

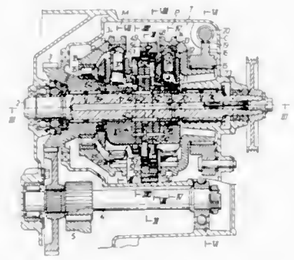


4. A load responsive flow amplified steering control system comprising:
a bidirectional steering motor having a pair of operating ports at opposite sides thereof;
first and second motor conduits individually connected to the operating ports;
a source of pressurized fluid having a variable flow rate;
a supply conduit connected to the source of pressurized fluid;
first and second pilot lines;
a steering control valve connected to the supply conduit and to the pilot lines and having a valve element movable between a neutral position and infinitely variable left and right turn positions at which the valve element establishes first and second variable orifices between the supply conduit and the first and second pilot lines in the left and right turn positions respectively and means for directing a regulated volume of pressurized control fluid from the supply conduit through the respective variable orifice and into the respective pilot line when the valve element is moved to the left or right turn position;
means for maintaining a substantially constant pressure differential between the fluid in the supply conduit and the control fluid downstream of the respective variable orifice when the valve element is in the left or right turn position;
a pressure compensated directional control valve having a supply port connected to the supply conduit, a pair of motor ports connected to the motor conduits, a pair of control fluid passages in communication with the pilot lines, a pair of fluid combiner passages, an elongate valve element having opposite ends and being movable between a neutral position at which the supply port is blocked from the motor ports and the control fluid passages are blocked from the fluid combiner passages and an infinitely variable turn position at which a first variable orifice is established between one of the control fluid passages and one of the fluid combiner passages and a second variable orifice is established between the supply port and one of the motor ports, check valve means for combining the fluid in the one combining passage with the fluid in the one motor port when the valve element is at a turn position, a pair of pilot passages connected to the control fluid passages and the ends of the valve element, and spring means for resisting movement of the valve element toward the turn position;
means for communicating one of the fluid combiner passages with one end of the valve element when the valve element is at said turn position.

4,914,914
HYDROSTATICALLY OPERATED CONTINUOUSLY VARIABLE TRANSMISSION

Kazuo Inoue, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 202,105
Claims priority, application Japan, Jun. 3, 1987, 62-139562
Int. Cl.[4] F16D *39/00*
U.S. Cl. 60—489 11 Claims

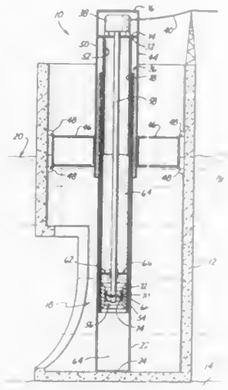


1. A hydrostatically operated continuously variable transmission comprising:
a fixed casing;
an input shaft rotatably supported in said casing;
a hydraulic pump coupled to said input shaft;
an output shaft rotatably supported in said casing;
a hydraulic motor coupled to said output shaft;
a cylinder block rotatable with one of said input and output shafts;
a closed hydraulic circuit disposed in said cylinder block and interconnecting said hydraulic motor and said hydraulic pump;
one of said hydraulic pump and said hydraulic motor comprising a plurality of first plungers reciprocably disposed radially in said cylinder block, and a first eccentric ring engaging outer ends of said first plungers and supported in said casing eccentrically with respect to the center of rotation of said cylinder block for imparting reciprocating movement to said first plungers in response to rotation of said cylinder block;
the other of said hydraulic pump and said hydraulic motor comprising a plurality of second plungers reciprocably disposed radially in said cylinder block, and a second eccentric ring engaging outer ends of said second plungers and supported relatively rotatably on the other of said input and output shafts eccentrically with respect to the center of rotation of said cylinder block for imparting reciprocating movement to said second plungers in response to relative rotation between said cylinder block and said other of the input and output shafts; and
means for causing at least one of said first and second eccentric rings to be eccentrically displaced from said center of rotation of said cylinder block by a variable amount of eccentricity.

4,914,915
WAVE POWERED TURBINE

Hal R. Linderfelt, 5540-A Avenida Soselga, Laguna Hills, Calif. 92653

Filed Jun. 20, 1989, Ser. No. 368,772
Int. Cl.[4] F03B *13/12*
U.S. Cl. 60—502 23 Claims

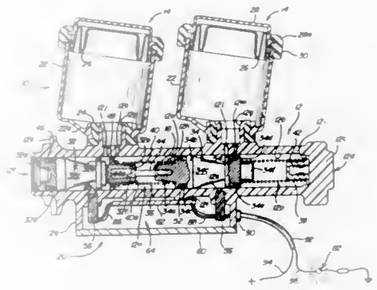


1. A device for harvesting wave energy comprising.
a hollow vertical tube means having an open top and a closed bottom, said vertical tube means located in a body of water with its bottom located beneath said surface of said body of water;
a hollow turbine tube means having a top and an open bottom, said turbine tube means sized and shaped with respect to said vertical tube means such that at least a portion of said turbine tube means including said open bottom of said turbine tube means is located in and is movable within said vertical tube means;
a float means, said float means operatively connected to said turbine tube means for raising and lowering said turbine tube means with respect to said vertical tube means in response to wave motion of said body of water with at least said portion of said turbine tube means which is located in said vertical tube means being raised and lowered in said vertical tube means in response to said wave motion;
a liquid contained in said vertical tube means, said liquid present in an amount to at least partially fill the interior of said vertical tube means from said bottom of said vertical tube means upwardly to a level at least above said open bottom of said turbine tube means with at least a portion of said liquid located within the interior of said turbine tube means above said open bottom of said turbine tube means; and
a turbine means, said turbine means rotatable in response to relative movement with respect to a fluid, said turbine means located in said turbine tube means and connected to said turbine tube means to move with respect to said vertical tube means and fluid contained therein in conjunction with said raising and lowering of said turbine tube means in said vertical tube means whereby movement of said turbine means with respect to fluid contained in said vertical tube means rotates said turbine means.

4,914,916
TANDEM MASTER CYLINDER WITH ELECTROMAGNETIC POSITION SENSORS FOR EACH PISTON

Keith V. Leigh-Monstevens, Troy, and Brian D. Mabee, Warren, both of Mich., assignors to Automotive Products plc, Warwickshire, England

Filed Apr. 4, 1988, Ser. No. 177,312
Int. Cl.[4] B60T *17/22*
U.S. Cl. 60—534 19 Claims



7. A hydraulic master cylinder assembly comprising:
(A) a cylindrical defining an axial bore;
(B) first and second pistons mounted for stroking reciprocal joint axial movement in said bore and coacting with said cylindrical to define first and second pressure chambers in said cylinder;
(C) first and second discharge ports in said cylinder communicating respectively with said first and second pressure chambers so that pressurized fluid is delivered through said first and second discharge ports in response to stroking axial movement of said pistons in said bore; and
(D) sensing means operative to sense the individual axial positions of each piston in said bore as the pistons move linearly in said bore;
(E) said cylinder being formed of a non-ferrous material;
(F) said pistons each including a portion formed o ferrous material;
(G) said sensing means including a magnetic sensor associated with each piston;
(H) said magnetic sensors being mounted on said cylinder in axially spaced relation with each sensor adjacent said ferrous portion of a respective piston; and
(I) said ferrous portion of each piston having a cross-sectional configuration that varies along the axis of said ferrous portion so that the signal generated by the respective sensor varies as the respective piston moves axially in said bore

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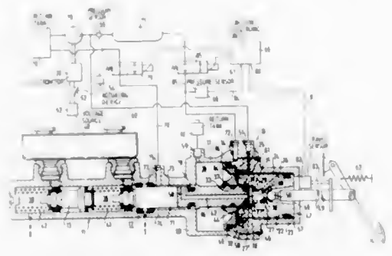
4,914,917
BRAKE ACTUATING DEVICE FOR AUTOMOTIVE VEHICLES

Juergen Schonlau, Walluf, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 24, 1988, Ser. No. 198,033
Claims priority, application Fed. Rep. of Germany, May 25, 1987, 3717547
Int. Cl.[4] F15B 7/00
U.S. Cl. 60—545 23 Claims



1. A brake actuating device for automotive vehicles comprising a hydraulic brake force booster and a hydraulic master cylinder to which pressure is applied by the brake force booster and which is in communication with the hydraulic wheel brake circuits, with a hydraulic piston of the brake force booster applying pressure to a primary master piston of said hydraulic master cylinder, wherein pressure is applied to the hydraulic piston of the hydraulic brake force booster by a hydraulic pressure source through a normally closed opening valve which, through a function electronic unit receiving, by way of a control input forming a guide quantity, an input control signal representative of brake pedal travel and derived from a travel sensor is alternately opened and closed so that the hydraulic brake pressure build-up is effected in accordance with a predetermined function stored in the function electronic unit between pedal travel and brake pressure with no lost motion of the brake pedal, and wherein the function electronic unit includes another regulation input through which the actual pressure factually prevailing in the pressure chamber of the hydraulic brake force booster is reported by a pressure sensor connected to the pressure chamber to the function electronic unit.

4,914,918
COMBUSTOR SEGMENTED DEFLECTOR

Dennis J. Sullivan, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

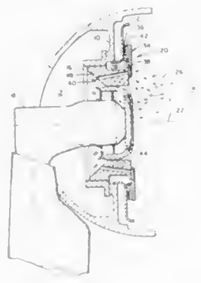
Filed Sep. 26, 1988, Ser. No. 248,676
Int. Cl.[4] F23R 3/00
U.S. Cl. 60—756 11 Claims

1. In a gas turbine engine including a combustor, a bulkhead interposed between an air supply chamber and said combustor, at least one opening through said bulkhead, a fuel injector located in said opening and arranged to inject fuel into said combustor, a heat shielded deflector assembly comprising:

a deflector base secured to said bulkhead within said opening and surrounding said fuel injector;

said base having an annular plate portion extending radially outward from said fuel injector and substantially parallel to said bulkhead within said combustor;

a plurality of circumferentially divided heat shield segments secured to said annular plate portion and located on the combustor side thereof; and

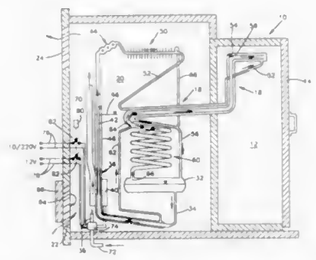


retention means for axially restraining each segment to said annular plate portion.

4,914,919
ARRANGEMENT FOR PREVENTING FREEZING OF THE WORKING MEDIUM IN AN ABSORPTION REFRIGERATING APPARATUS

Magnus T. Walfridson, Sollentuna, and Stig H. Färndahl, Farsta, both of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Jan. 6, 1989, Ser. No. 294,111
Claims priority, application Sweden, Jan. 8, 1988, 8800041
Int. Cl.[4] F25B 27/00
U.S. Cl. 62—236 3 Claims

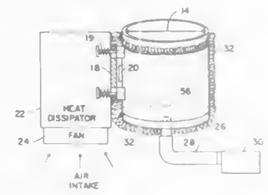


1. In a refrigerator cabinet arrangement having an absorption refrigerating apparatus, an electric heating cartridge and a gas burner, a control apparatus which automatically starts the gas burner when the supply of current to the heating cartridge ceases, said refrigerating apparatus with the exception of its evaporator being enclosed in a heat insulated chamber in which surrounding air circulates to cool the refrigerating apparatus, the improvement comprising adjustable means for limiting the air circulation in said chamber, and temperature sensing means located in said chamber for interrupting the current flow to said cartridge at a predetermined low temperature in the chamber so that the gas burner can be made operative.

4,914,920
DEVICE FOR HEATING AND COOLING A BEVERAGE

Jeffrey C. Carnagie, Owenton, Ky., and Robert Strauch, Dearborn Heights, Mich., assignors to Q-Branch Technologies, Inc., Dearborn Heights, Mich.

Filed Jun. 30, 1988, Ser. No. 213,348
Int. Cl.[4] F25B 21/02
U.S. Cl. 62—3.3 12 Claims



1. A device for actively heating and cooling a beverage in a beverage container, said device comprising:

(a) a housing with at least one compartment that is closed at its bottom and sides and is opened at its top, said compartment configured to receive a beverage container, an intermediate portion of said compartment being composed of a thermoconductive material;

(b) heat pump means mounted in said housing, said heat pump means having mutually exclusive heating and cooling cycles for selectively heating and cooling a beverage in the beverage container, thermal energy being transferred between said heat pump means and the beverage container via said thermoconductive material;

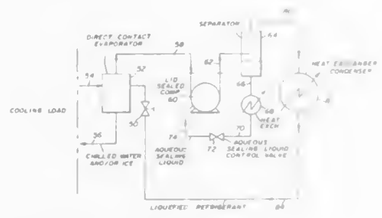
(c) switch means connected to said heat pump means for selectively energizing said heat pump means into said heating and cooling cycles; and

(d) temperature sensor means responsive to temperature changes, said temperature sensor means connected to said heat pump means for controlling the temperature in said compartment and selectively controlling energization of said heat pump means for controlling the heating and cooling cycles as a function of the temperature in said compartment.

4,914,921
REFRIGERATION METHOD AND APPARATUS USING AQUEOUS LIQUID SEALED COMPRESSOR

Bryan D. Knodel, Plainfield, Ill., assignor to CBI Research Corporation, Plainfield, Ill.

Filed Aug. 16, 1988, Ser. No. 232,869
Int. Cl.[4] F25D 3/00
U.S. Cl. 62—59 41 Claims



12. A refrigeration method comprising:

feeding refrigerant vapor to an aqueous liquid sealed compressor to compress the vapor;

removing a mixture of compressed refrigerant vapor and compressor sealing aqueous liquid from the compressor and separating the refrigerant vapor from the aqueous liquid;

cooling the aqueous sealing liquid and returning it to the compressor;

condensing the separated refrigerant vapor to liquid;

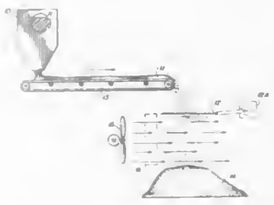
feeding the liquid refrigerant through a nozzle to thereby obtain refrigeration and produce refrigerant vapor; and

returning the so-produced refrigerant vapor to the compressor.

4,914,922
METHOD OF TEMPERATURE TREATING GRANULAR MATERIAL

Dino Talavera, P.O. Box 871690, Wasilla, Ak. 99687

Filed Feb. 21, 1989, Ser. No. 313,016
Int. Cl.[4] F25D 13/06
U.S. Cl. 62—63 6 Claims



1. A process for preconditioning a granular material by altering its temperature to maintain it in a granular form for use in sub freezing temperature comprising the steps of:

screening the material,

causing the screened granular material to drop through the air under the action of gravity, and

freezing the granules of the material as they drop through the air by the movement of air therethrough at a velocity high enough to invoke forced convection as an aid in accomplishing the freezing function,

said freezing being accomplished by a fan flowing ambient freezing air laterally through the screened granular material as it drops through the air.

4,914,923
METHOD OF COVERING ARTIFICIAL ALPINE- OR NORDIC-SKIING TRACKS WITH SNOW AND MEANS FOR IMPLEMENTING THE METHOD

Max Duplan, Champagne Au Mont D'Or, and Pierre Girardin, Saint-Herblain, both of France, assignors to Le Froid Industriel York, S.A., Carquefou, France

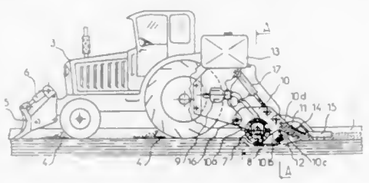
PCT No. PCT/FR87/00483, § 371 Date Aug. 5, 1988, § 102(e) Date Aug. 5, 1988, PCT Pub. No. WO88/04394, PCT Pub. Date Jun. 16, 1988
PCT Filed Dec. 3, 1987, Ser. No. 246,667
Claims priority, application France, Dec. 5, 1986, 86 17242
Int. Cl.[4] F25C 3/04
U.S. Cl. 62—71 25 Claims

1. A process for producing artificial snow from ice comprising:

(a) providing a network of tubes with refrigerant maintained at a temperature sufficiently low to freeze water over a predetermined area;

(b) forming a layer of ice having a predetermined thickness over said network of tubes as a base of a ski run;

(c) disrupting at least a portion of said layer of ice to produce particles of said ice; and



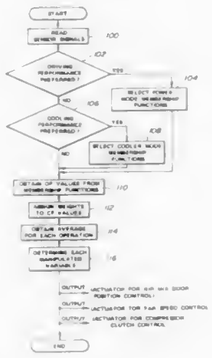
(d) removing said particles of ice from a remaining portion of said layer of ice and distributing said particles of ice as artificial snow over said base of said ski run.

4,914,924

VEHICLE AIR CONDITIONING SYSTEM BASED ON FUZZY INFERENCE

Hiroshi Takahashi, Zushi, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Jul. 12, 1988, Ser. No. 217,857
Claims priority, application Japan, Jul. 17, 1987, 62-178658
Int. Cl.[4] B60H 1/32
U.S. Cl. 62—133 13 Claims



1. A vehicle air conditioning system comprising:

air conditioning equipment comprising air conditioning means for discharging conditioned air into a compartment of a vehicle, a temperature control actuator for varying the temperature of discharge air discharged from said air conditioning means into the vehicle compartment in accordance with a temperature control signal, and a restraining actuator for restraining the operation of said air conditioning means to prevent a decrease in the driving power of the vehicle in accordance with a restraint control signal;

an inside temperature sensor for sensing the inside air temperature of the vehicle compartment;

a vehicle condition sensor for sensing the condition of the vehicle;

intention sensing means for sensing a driver's intention to accelerate the vehicle and determining a command variable representing the driver's intention;

variable determining means for determining a first sensed variable which is the deviation of the inside temperature sensed by the inside temperature sensor from a desired value, a second sensed variable which is dependent on the condition sensed by said vehicle condition sensor, a third sensor variable which is proportional to the command variable determined by said intention sensing means, and a fourth sensed variable which is proportional to the variation of the command variable during a predetermined time interval;

fuzzy inference means for storing a first membership function of the first sensed variable, a second membership function of the second sensed variable, a third membership function of the third sensed variable, and a fourth membership function of the fourth sensed variable and for determining a first output variable which is the value of the first membership function corresponding to the first sensed variable, a second output variable which is the value of the second membership function corresponding to the second sensed variable, a third output variable which is the value of the third membership function corresponding to the third sensed variable, and a fourth output variable which is the value of the fourth membership function corresponding to the fourth sensed variable;

averaging means for determining a first average of the first and second output variables and a second average of the third and fourth output variables; and

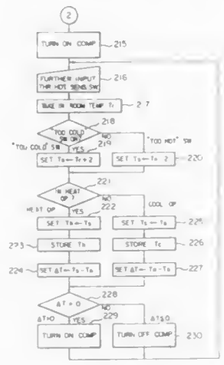
control signals producing means for producing the temperature control signal in accordance with the first average and the restraint control signal in accordance with the second average.

4,914,925

CONTROL DEVICE FOR AN AIR CONDITIONER

Hiroyuki Umemura; Kenji Matsuda; Tetsuji Okada; Hidenori Ishioka, and Katsuyuki Aoki, all of Shizuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1989, Ser. No. 302,342
Claims priority, application Japan, Jan. 27, 1988, 63-16240
Int. Cl.[4] F25B 13/00
U.S. Cl. 62—160 13 Claims



1. A control device for an air conditioner which is capable of operating in a heating and a cooling operation mode, comprising:

hotness sensation input means for inputting sensations of hotness of a person in a room conditioned by the air conditioner;

mode selector means, coupled to said hotness sensation input means, for selecting an operation mode of the air conditioner from the heating and cooling operation modes thereof, in response to a first input of a sensation of hotness which is effected by said person through said hotness sensation input means for a first time in a period of time in which the air conditioner has been suspended;

room temperature detector means for detecting a temperature of a room conditioned by the air conditioner;

setting temperature determining means, coupled to said hotness sensation input means, for determining a setting temperature of the air conditioner in accordance with sensations of hotness inputted through said hotness sensation input means by said person in the room conditioned by the air conditioner;

error computation means, coupled to said room temperature detector means and said setting temperature determining means, for computing a deviation of the room temperature, detected by said room temperature detector means, from the setting temperature determined by said setting temperature determining means; and

control means, coupled to said error computation means, for controlling an output of said air conditioner in accordance with said deviation of the room temperature from the setting temperature, computed by said error computation means, in such a way that said room temperature may approach said setting temperature, wherein said control means is activated in response to said first input of a sensation of hotness effected by said person; and

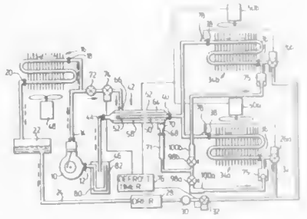
wherein said hotness sensation input means comprises two switches: a first switch which is to be operated by said person when he feels that it is too hot in the room conditioned by the air conditioner, and a second which is to be operated by said person when he feels that it is too cold in the room conditioned by the air conditioner.

4,914,926

HOT GAS DEFROST SYSTEM FOR REFRIGERATION SYSTEMS AND APPARATUS THEREFOR

Charles Gregory, 1348 #5 Highway, Burlington, Ontario, Canada L7R 3X4

Continuation-in-part of Ser. No. 78,950, Jul. 29, 1987, Pat. No. 4,802,339. This application Jun. 13, 1988, Ser. No. 205,773
The portion of the term of this patent subsequent to Feb. 7, 2006, has been disclaimed.
Int. Cl.[4] F25B 47/00
U.S. Cl. 62—196.4 116 Claims



1. A liquid refrigerant vaporizer for use in a refrigeration system employing hot refrigerant fluid to defrost a coil or coils thereof, the vaporizer comprising:

first, second and third chambers the interiors of which constitute respective first, second and third flow passages, the first and second passages having a first wall in common and the second and third passages having a second wall in common;

wherein the first flow passage is connected at one end into the refrigeration system so as to receive refrigerant fluid exiting from the coil under defrost, is closed at the other end, and is provided in the said first common wall with a plurality of bores distributed along its length so that the refrigerant fluid flowing therein exits therefrom through the bores to impinge against the said second common wall for heat exchange therewith;

the total flow area provided by all of the said bores being at least 0.5 times the cross-sectional flow area of the first flow passage;

wherein the said second common wall is of heat conductive material, the second flow passage is closed at one end and is connected at its other end into the refrigeration system for delivery of the refrigerant fluid therefrom;

wherein the cross-sectional flow area of the said second flow passage is at least 0.5 times the cross-sectional flow area of the first flow passage; and

wherein the third flow passage has an inlet thereto and an outlet therefrom to the remainder of the refrigeration system for the hot refrigerant fluid, the inlet and the outlet being spaced from one another for the hot refrigerant fluid to contact the said second common wall for heat exchange therewith; and

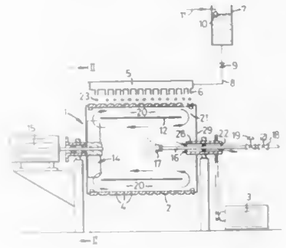
a refrigerant fluid flow restriction at or connected to the third flow passage outlet for producing an increase in back pressure of the refrigerant fluid in the second flow passage.

4,914,927

METHOD AND APPARATUS FOR FREEZING PRODUCTS

Jeremy P. Miller, Oxon, and Colin D. Smith, Surrey, both of United Kingdom, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 25, 1989, Ser. No. 301,567
Claims priority, application United Kingdom, Feb. 1, 1988, 8802142
Int. Cl.[4] F25D 25/02
U.S. Cl. 62—381 19 Claims



1. A freezer which comprises a drum, characterized in that a cylinder is disposed in said drum, and a fan is provided for circulating cryogen through the space between the outer surface of said cylinder and the inner surface of said drum, said freezer including means to inject and vent cryogen into and from said drum.

4,914,928

MANUAL AIR DAMPER CONTROL FOR A REFRIGERATOR

Charles G. Fellwock, Scott Township, Vanderburgh County, and David A. Biggs, Knight Township, Vanderburgh County, both of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 29, 1988, Ser. No. 237,377
Int. Cl.[4] F25D 17/04
U.S. Cl. 62—408 14 Claims

1. A refrigeration apparatus comprising:

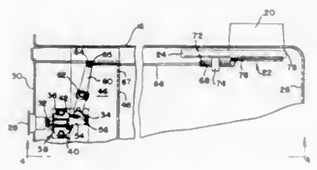
a freezer compartment;

a refrigerator compartment separated from said freezer compartment by a partition wall and having a front panel extending generally perpendicular to the partition wall;

an air flow passageway disposed in said partition wall between said freezer and refrigerator compartments with an outlet in the partition wall a distance in back of said front panel;

an air damper mounted for slidable movement over said air flow passageway outlet to regulate the amount of air flow into said refrigerator compartment;

a connecting rod coupled to said air damper and extending towards said front panel;
a pivot arm having a first end engaging said connecting rod, a second end having a cam following surface and a pivot point between said first and second ends;
a cam having a cam surface engaged by the second end of said pivot arm; and



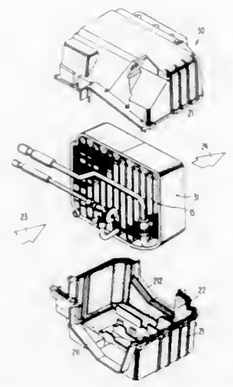
a control knob mounted for rotation on said front panel and coupled to said cam to impart rotation thereto pivoting said pivot arm to move said connecting rod and said air damper back and forth to regulate the amount of air flow into said refrigerator.

4,914,929

COOLING UNIT INCLUDING AN EVAPORATOR AND A VIBRATION ABSORPTION MECHANISM THEREFOR

Shimazaki, Seiji, Isesaki, Japan, assignor to Sanden Corporation, Japan

Filed Mar. 17, 1989, Ser. No. 324,706
Claims priority, application Japan, Mar. 17, 1988, 63-34439[U]
Int. Cl.⁴ F25B *39/02*
U.S. Cl. 62—515 **20 Claims**



1. A cooling unit suitable for use in an automotive air conditioning system, said cooling unit comprising a casing and an evaporator disposed within said casing, said casing including air inlet and air outlet opening to permit air flow through said evaporator, the improvement comprising:
vibration absorbing means for absorbing vibration produced by said evaporator, said vibration absorbing means comprising an elastic member surrounding a peripheral surface of said evaporator.

4,914,930

JEWELED MESH FOR JEWELRY

Robert B. Bielka, 317 E. 75th St., Apt. #12, New York, N.Y. 10021

Filed Jul. 12, 1988, Ser. No. 217,659
Int. Cl.⁴ A44C *17/02*
U.S. Cl. 63—28 **16 Claims**

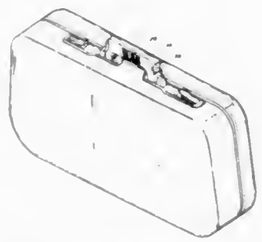
1. A jeweled mesh, comprising:
a plurality of stones each having a hexagonal cross-section, said stones being immediately adjacent to each other and having sides facing each other, each of said stones also having corners;
a plurality of settings respectively mounting said stones; and
means for flexibly connecting said settings together and for preventing said corners of said stones from chipping against each other during flexible movements of said settings, said flexibly connecting and preventing means including a connector holding at least three of said settings against each other so that said sides of said stones remain facing each other.

4,914,931

HANDLE TYPE COMBINATION LOCK FOR A SUITCASE

Shung-Chung Shu, 29, Lu-hsin Rd., Din-Tsu Dis., Lu-Kang Township, Chang-Hwa County, Taiwan

Filed Nov. 16, 1988, Ser. No. 271,870
Int. Cl.⁴ B60R *25/02*
U.S. Cl. 70—213 **2 Claims**



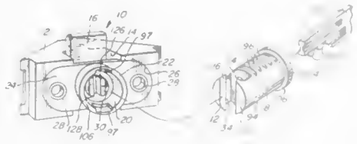
1. A handle type combination lock assembly for a suitcase, comprising a combination lock with an unlocking changeable number wheel set, this combination lock is housed inside the handle of the suitcase with its numbered wheels exposed, a pressing plate inside the handle with left and right ends rested against movable push buttons in the left and right ends of the handle and connected so that when the combination lock is unlocked and the handle is turned 90° with respect to the broadside plane of the suitcase these left and right push buttons can be pushed while bosses on the lower ends of the push buttons will push the protruded ends of sliding plates to unlock locking fasteners adjacent to the left and right sides of the handle.

4,914,932

LOCK WITH KEY OPERATED REMOVABLE PLUG

Gregg W. Walla, Lake Bluff, Ill., assignor to Timberline Supply Ltd., Lake Bluff, Ill.

Filed Aug. 15, 1985, Ser. No. 765,843
Int. Cl.⁴ E05B *27/00*
U.S. Cl. 70—367 **7 Claims**



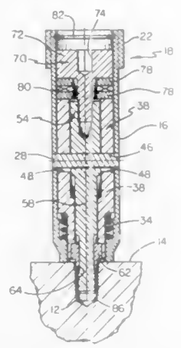
1. An improved lock of the type having a lock cylinder with an internal cavity having an axial extent, a key operated lock plug for removable placement in said lock cylinder cavity for rotation relative to the lock cylinder, and a coupling rotatably mounted with respect to the lock cylinder and cooperating with a lock member to move the lock member upon rotation of the coupling between a locked state and an open state, the improvement comprising:
means for snap-fitting the plug into operative relationship with the coupling upon directing the plug axially into the cavity with the plug and coupling in a first relative rotational position; and
means for releasing the snap-fit plug from the coupling upon the plug being rotated relative to the coupling from said first relative rotational position to a second relative rotational position wherein the snap-fit plug can be separated from the coupling by withdrawing the plug axially with respect to the lock cylinder,
whereby the plug can be simply press fit into operative relationship with the lock cylinder and coupling.

4,914,933

INSTALLATION AND SWAGING TOOL FOR INSERTS

Wilhelm F. Schepergerdes, El Toro, Calif., assignor to Rexnord Holdings Inc., Torrance, Calif.

Filed Sep. 29, 1988, Ser. No. 251,127
Int. Cl.⁴ B21D *41/02*
U.S. Cl. 72—114 **6 Claims**



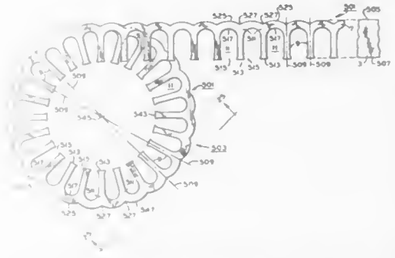
1. A tool for swaging a portion of a threaded insert into a base material, the tool comprising:
a shaft member extending longitudinally and having a thread end for holding an insert at the end;
movable swage means split into at least two portions and disposed about and guided by the shaft member for swaging into the base material the top of an insert held on the end of the shaft member;
retaining means for retaining the movable swage means about the shaft during normal operation and wherein the swage means are removable from the retaining means and removable from the shaft by separating the split portions;
a first threaded member fixed relative to the shaft member;
moving means for moving the movable swage means relative to the shaft member wherein the moving means moves relative to the first threaded member through threaded engagement with the first threaded member;
a second member longitudinally fixed relative to the shaft member and including a stop surface;
transmission means for transmitting movement of the moving means to the movable swage means and including a transmission means stop surface wherein the transmission means stop surface contacts the stop surface on the second member after movement of a predetermined amount thereby stopping further swaging of the insert by the swage means;
a body for enclosing and retaining at least a substantial portion of the shaft member, the first threaded member and the moving means, and having a first end wherein the first end includes means for rotating the body; and
an end surface between a second end portion on the body and the threaded end on the shaft member for contacting the base material and for use in determining when the insert is sufficiently inserted into the base material.

4,914,934

METHOD OF FORMING AN EDGEWISE WOUND CORE

Harold L. Fritzsche, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 329,285, Mar. 27, 1989, which is a division of Ser. No. 237,042, Aug. 26, 1988, which is a division of Ser. No. 904,140, Sep. 4, 1986, Pat. No. 4,796,451, which is a division of Ser. No. 660,211, Oct. 12, 1984, Pat. No. 4,613,780. This application Aug. 23, 1989, Ser. No. 397,750
Int. Cl.⁴ B21D *11/06;* **H02K** *15/02;* **B21C** *47/00*
U.S. Cl. 72—135 **7 Claims**



1. A method of forming an edgewise wound core from a lanced strip of generally thin ferromagnetic material, the lanced strip including a continuous yoke section, a plurality of teeth extending from the yoke section on preselected pitch axes, a plurality of slots between adjacent teeth, and a plurality of sets of generally arcuate inner and outer edges on the yoke section with the arcuate inner edges defining closed ends of the slots and with adjacent arcuate outer edges intersecting with each other at the pitch axes of the teeth, respectively, the method comprising the sets of:
deforming the lanced strip into a plurality of helical convolutions thereof and disposing the teeth and the arcuate outer edges on the yoke section of the deformed lanced strip generally radially inwardly and outwardly of the helical convolutions thereof, respectively;

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accumulating the helical convolutions in a generally annular stack thereof; and

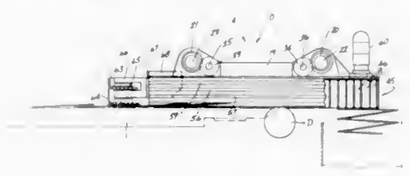
arranging at least the teeth and the intersections between the adjacent arcuate outer edges generally in axial row formation across the annular stack of the helical convolutions and extending thereby the teeth and the intersections between the adjacent arcuate outer edges generally in radial alignment with each other on the pitch axes of the teeth, respectively.

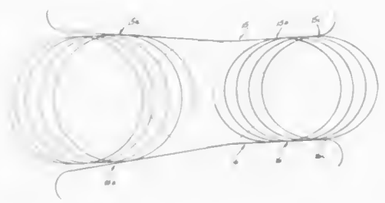
4,914,935

METHOD AND APPARATUS FOR LAYING COILED ROD STOCK

George R. Fryer, Warren, Conn., assignor to Fryer Corporation, Oxford, Conn.

Filed Dec. 28, 1988, Ser. No. 291,284
Int. Cl.[4] B21F *3/00*; B21B *43/00*
U.S. Cl. 72—201 **23 Claims**





1. Apparatus for use in conjunction with a rod mill of the type where metal is reduced down to rod stock and formed in loops and then transported on a horizontal conveyor to a collection device where the loops drop from the conveyor comprising compressing means disposed on either side of the conveyor adjacent the drop-off end thereof and spaced a distance apart which is less than the width of said loops for compressing said loops in one direction and elongating said loops in another direction as the helices pass through said compressing means.

4,914,936

FOLLOW-ON TOOL FOR STAMPING PRESS

Gerard Lavorel, Pringy, France, assignor to Ateliers de Decoupage Emboutissage Et Mecanique de la Vallee de L'Arve ADEMVA, Cluses, France

Filed Jan. 3, 1989, Ser. No. 293,138
Claims priority, application France, Jan. 4, 1988, 88 00222
Int. Cl.[4] B21D *45/08*
U.S. Cl. 72—345 **4 Claims**

1. A follow-on tool for a stamping press having a press table and a press slide, said tool comprising for each unit stamping station of said stamping press:

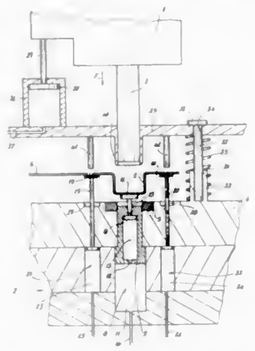
a punch carried by an upper base plate which is fastened to the press slide;

a lower base plate fastened to the press table, said lower base plate including a plate member for receiving a die and at least one vertical stamping orifice;

a first support means, for supporting a prestamped metal strip, having a retractable piston member located in said vertical stamping orifice and positioned to extend above said plate member to engage a bottom portion of such prestamped metal strip when such strip is plumb with said punch and said stamping orifice and elastic means for maintaining said piston in such extended position above said plate member;

a second support means having first and second rod members extending above said plate member on opposed sides of said die and stamping orifice for engaging such prestamped metal strip at a second and third location when said strip is engaged by such first support means, said first and second rod members being elastically supported in the extended position and vertically retractable into said plate member;

an intermediate rigid plate member positioned for vertical movement between said upper base plate and said prestamped strip, said rigid plate member being engaged between a first stop and a second stop, which stops are located to allow said intermediate plate member to move vertically between said upper base plate and said prestamped strip between said stops, said rigid member including a resilient means for maintaining said rigid plate member positioned against said first stop located adjacent said upper base plate and a resilient engagement member fixed between said rigid plate member and said upper base plate to maintain spacing between said upper base plate



and said rigid plate during the downward stroke of said punch until said rigid plate member engages said second stop adjacent said prestamped strip, said rigid plate member further including a centering tube having an orifice aligned with said punch and through which said punch is passed in its downward vertical stroke and a first push rod and a second push rod vertically aligned with said first and second rod members respectively for engaging said rod members and pushing said rod members against such elastic support into engagement with said plate member;

wherein said prestamped strip is supported by said first and second support means as said upper base plate, said punch, and said rigid plate begin to descend vertically until said rigid plate engages said second stop and said centering tube engages said prestamped strip and said first and second push rods have pressed said first and second support rods into engagement with said plate member, said punch continuing its downward descent to press the prestamped strip into said die and stamping orifice thereby causing said piston to retract downwardly against said elastic means, and wherein as said punch retracts from said stamping orifice it removes such stamped strip from said die thereby allowing said piston member and said first and second rod members to extend fully above said plate member and such stamped strip engages said centering tube and first and second push rods and is extracted from said punch as said punch continues to retract upward.

4,914,937

METHOD FOR FORMING TALL TAPERED CONTAINERS

Joseph D. Bulso, Jr., Canton, and James A. McClung, North Canton, both of Ohio, assignors to Redicon Corporation, Canton, Ohio

Division of Ser. No. 129,482, Dec. 7, 1987, Pat. No. 4,782,685.
This application Jan. 15, 1988, Ser. No. 206,765
Int. Cl.[4] B21D *22/20*
U.S. Cl. 72—349 **13 Claims**

1. A method of forming a tall tapered container from a blank of material, comprising the steps of:

(A) drawing an inverted cup having a substantially straight sidewall;

(B) reverse drawing the inverted cup while maintaining said substantially straight sidewall;

(C) redrawing the cup to form a cup having first and second straight sidewall portions and a transition portion interconnecting said first and second sidewall portions and providing a radially inwardly extending pressure receiving surface;

(D) further redrawing the cup to its final length while pulling material from the transition portion, maintaining said radially inwardly extending pressure receiving surface and imparting a tapered configuration to the sidewall; and

(E) holding pressure on said radially inwardly extending pressure receiving surface by fluidly activated pressure means during steps C and D.

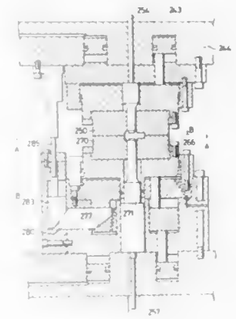
4,914,938

FULLY ENCLOSED DIE FORGING APPARATUS

Nobuyuki Ishinaga, Saganihara, Japan, assignor to Aida Engineering, Ltd., Kanagawa, Japan

Filed Jul. 1, 1988, Ser. No. 214,305
Claims priority, application Japan, Jul. 6, 1987, 62-168319; Apr. 28, 1988, 63-105813
Int. Cl.[4] B21J *13/02*
U.S. Cl. 72—354 **6 Claims**

1. A fully enclosed die forging apparatus comprising a slide having an upside die set plate, a bolster having an underside die set plate, an upside die and an underside die disposed opposedly in a vertical direction between said slide and said bolster, a support member for supporting the underside die, an upside cylinder mechanism disposed on said upside die set plate which urges said upside die downward, an underside cylinder mechanism disposed on said underside die set plate which urges said support member with said underside die upwardly, an upside punch inserted in said upside die that moves synchronously with the movement of said slide, an underside punch inserted in said underside die and supported by said bolster, an underside die moving mechanism having a support member disposed between said underside die and said underside cylinder mechanism, a cam mechanism, an intermediate member independent of said support member and said underside die for engaging said support member in response to actuation of the cam mechanism, a push pin adapted to move synchronously for actuation of the cam mechanism with the movement of said slide, said push pin extending between said slide and said bolster for actuating the cam mechanism so as to

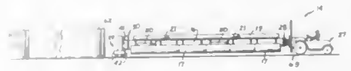


cause the support member to be driven downwardly with descending movement by the intermediate member at a speed slower than the speed of said slide for causing both of said punches to be accelerated into said dies by moving said upside die and said underside at a slower speed than the moving speed of said slide.

4,914,939

SELF PROPELLED INTERNAL PIPE ARCHING APPARATUS

O'Dell Brinegar, Middletown, Ohio, assignor to Contech Construction Products, Inc., Middletown, Ohio

Filed Jun. 3, 1988, Ser. No. 201,753
Int. Cl.[4] B21D *39/20*
U.S. Cl. 72—392 **6 Claims**

1. A self propelled pipe arching apparatus comprising,

a self propelled unit for ground supporting an elongated beam along its length, said self propelled unit adapted to drive said beam into a pipe along its axis and locate said beam into a pipe arching position,

internal pipe arching means mounted upon said beam and adapted to forcibly arch the pipe when said beam is in said arching position,

said unit having means for transporting and controlling said pipe arching means;

first wheeled drive means for supporting a first end of said base, and

second wheeled means for supporting said beam at an end opposite said first end, thereby enabling said beam to be driven into said pipe.

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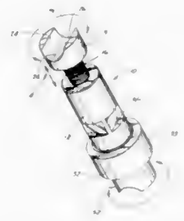
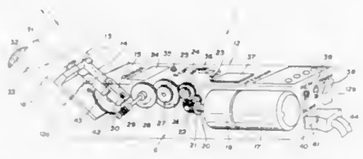
4,914,940
EXHAUST MANIFOLD EXPANDER AND METHOD OF USING SAID EXPANDER
Merrill Hebert, 1454 E. Bridge St., P.O. Box 344, Breaux Bridge, La. 70517
Continuation of Ser. No. 143,218, Jan. 6, 1988, abandoned, which is a continuation of Ser. No. 836,724, Mar. 6, 1986, abandoned. This application Aug. 23, 1989, Ser. No. 398,294
Int. Cl.[4] B21D *3/16, 3/12, 19/04;* B66F *3/36*
U.S. Cl. 72—392 10 Claims



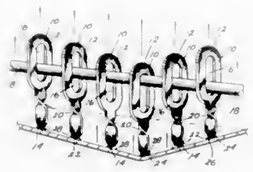
1. A method of spreading the arms of an exhaust manifold utilizing an apparatus comprising:
(a) a central body portion having a recess at a first end therein;
(b) a first manifold engaging member rotatably disposed within the recess;
(c) a wrench-engaging surface recessed in the central body portion; and
(d) a second manifold engaging member threadably attached to a second end of the central body portion such that rotating the central body portion in a first direction causes the second manifold engaging member to move outwardly away from the central body portion when the first and second manifold engaging members are held in non-rotating relationship;
said method comprising:
(i) positioning said apparatus between arms of a manifold which are to be spread; and
(ii) rotating the central body portion to cause said second manifold engaging member to extend axially away from the first manifold engaging member and spread said arms of said manifold.

4,914,941
POWER TOOL FOR CRIMPING TERMINAL ELEMENTS FOR CONNECTING LEAD WIRES THERETO
Tomoya Ijiri, Kyoto, and Koji Soeda, Takatsuki, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan
Filed Mar. 9, 1988, Ser. No. 166,029
Claims priority, application Japan, Mar. 14, 1987, 62-59897
Int. Cl.[4] B21J *9/18*
U.S. Cl. 72—449 7 Claims



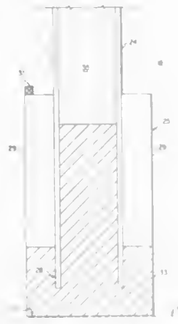
1. A powered crimping tool for crimping a metallic terminal upon a wire lead for accomplishing both electric and mechanical connection therebetween, comprising:
a casing having a die member attached thereto, said casing having a first portion extending in a first longitudinal direction and a second end portion extending from an end of said first portion, said second end portion being upwardly inclined relative to said first portion;
an electric motor locating in said casing having an output shaft;
a reduction unit located in said casing and operationally connected to said electric motor for reducing the rotational speed of the output shaft of the electric motor, said reduction unit having a rotating output end;
means located in said casing and operationally connected to said reduction unit for converting the rotary motion of the output end of the reduction unit into a rectilinear motion; and,
a crimping punch member operationally connected to said converting means, said crimping punch member cooperating with the die member, said die member being attached to said upwardly inclined second end portion of said casing and said punch member being provided in said upwardly inclined second end portion of said casing, whereby an operator can easily observe a crimping operation conducted between said die member and punch member.

4,914,942
WELD WASHER FOR VEHICULAR BODY DENT REPAIR
Kosei Ishihara, 755 E. 8th St., Chico, Calif. 95928
Filed Jan. 27, 1989, Ser. No. 302,662
Int. Cl.[4] B21D *1/12*
U.S. Cl. 72—463 6 Claims



1. An improved weld washer for vehicular body dent repair comprises a plate member apertured generally centrally, said aperture adapted for attachment to a dent pulling device; a tab-like arm member affixed generally centrally to one edge of said plate member and extending generally linearly therefrom said tab-like arm member formed in angle helical half twist structure immediately below said affixment to said plate member and having substantially rectangular weld tip extending in right angled relationship to a plane of said plate member with said weld tip being for attachment of said improved weld washer by welding to damaged surfaces in said vehicular body, and said weld washer being removable after said repair and reuseable in subsequent repairs.

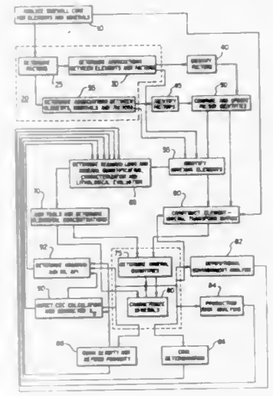
4,914,943
APPARATUS FOR ELIMINATING MEASURING INACCURACIES IN A STORAGE TANK LEAK DETECTION SYSTEM
Peter J. Lagergren, Dallas, Tex., assignor to Pandel Instruments, Inc., Grand Prairie, Tex.
Filed Feb. 21, 1989, Ser. No. 312,864
Int. Cl.[4] G01M *3/32*
U.S. Cl. 73—49.2 6 Claims



1. Apparatus for substantially eliminating measuring inaccuracies in a storage tank leak detection system caused by temperature-induced volumetric changes in the fluid product stored in the storage tank, comprising:
an elongated tube supported in the storage tank and having first and second ends and a substantially hollow core;
a housing supported in the storage tank for receiving the second end of the elongated tube and being vented to the fluid product such that a portion of the fluid product enters the housing;
a medium supported in the substantially hollow core of the elongated tube, the medium having a temperature coefficient substantially lower than the temperature coefficient of the fluid product; and
a flourinated liquid seal completely immiscible to both the medium and the fluid product supported in the housing between the medium and the fluid product for supporting the medium in static equilibrium with respect to the fluid product, wherein the large disparity between the temperature coefficients of the medium and the fluid product insures that temperature-induced volumetric changes in the fluid product do not vary the level of the medium in the tube when the tube.

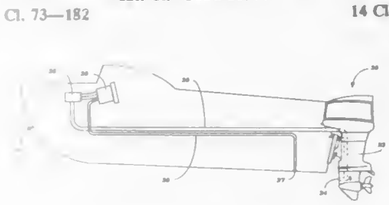
4,914,944
SITU DETERMINATION OF HYDROCARBON CHARACTERISTICS INCLUDING OIL API GRAVITY
Michael M. Herron, Danbury, and Jeffrey S. Schweitzer, Ridgefield, both of Conn., assignors to Schlumberger Technology Corp., New York, N.Y.
Filed Jan. 26, 1984, Ser. No. 574,753
Int. Cl.[4] E21B *49/00*
U.S. Cl. 73—152 28 Claims

1. A method for investigating in situ the characteristics of oil in an earth formation traversed by a borehole, comprising:
(a) determining the formation vanadium content for at least one depth of said borehole in said formation; and



(b) deriving from said formation vanadium content an oil vanadium content for at least one borehole depth.

4,914,945
VESSEL SPEED DETECTING DEVICE
Kazuhiro Nakamura; Tatsuya Yoshioka, both of Hamamatsu; Ryoji Sawada, and Tomoji Nakamura, both of Iwata, all of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan
Filed Oct. 14, 1988, Ser. No. 257,765
Claims priority, application Japan, Oct. 16, 1987, 62-259563
Int. Cl.[4] G01C *21/10*
U.S. Cl. 73—182 14 Claims

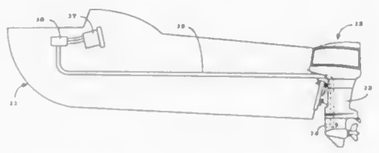


1. A running speed detector for a watercraft comprising a hull, a first speed sensor responsive to dynamic water pressure at a point to provide an output signal indicative of speed, said output signal have one range where the speed indication signal is less accurate than at other ranges, a second speed sensor having a high degree of accuracy in said one range, and display means for receiving signals from said first and said second speed sensors and displaying the output of said second speed sensor when in said one speed range and the output from said first speed sensor at other ranges.

4,914,946
VESSEL SPEED DETECTING DEVICE
Kazuhiro Nakamura; Tatsuya Yoshioka, both of Hamamatsu; Ryoji Sawada, and Tomoji Nakamura, both of Iwata, all of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan
Filed Oct. 14, 1988, Ser. No. 257,709
Claims priority, application Japan, Oct. 16, 1987, 62-259565
Int. Cl.[4] G01C *21/10*
U.S. Cl. 73—182 6 Claims

1. A vessel speed detecting device for a watercraft including

dynamic pressure sensing means for providing an output signal indicative of dynamic pressure, speed calculating means for processing the output signal of said dynamic pressure sensing



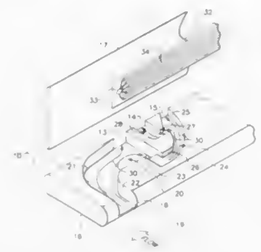
means to determine a watercraft speed, and means for providing an output signal indicative of a condition when the watercraft speed is so low that the speed signal is not accurate of actual watercraft speed.

4,914,947

SAMPLING PROBE FLOW SENSOR

Robert M. Davidson, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 30, 1988, Ser. No. 252,230
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—202.5 13 Claims



1. A flow sensor comprising:

a probe body having a flow entrance opening aligned with an axis and a first flow exit opening offset from the axis, the exit opening being connected to the entrance opening by a first arcuate passageway partially bounded by an outer wall generally characterized by a first curvature and an inner wall generally characterized by a second curvature greater than the first curvature, said probe body further having a first sampling port in the inner wall of said first arcuate passageway; and

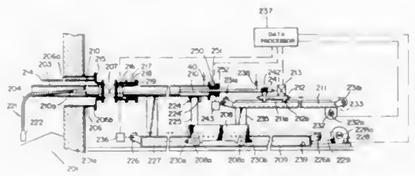
detector means connected to the first sampling port, said detector means including a flow detector subject to impact damage from contaminants suspended in the fluid whose flow is to be sensed, the first arcuate passageway creating centrifugal force which tends to carry the contaminants away from the sampling port.

4,914,948

APPARATUS FOR MONITORING BURDEN DISTRIBUTION IN FURNACE

Shigemi Murakawa; Seiji Taguchi; Makoto Nomura; Ryoji Takabe; Yoshiharu Iwashita, and Masahiro Ishii, all of Chiba, Japan, assignors to Kawasaki Steel Corp.

Continuation of Ser. No. 20,586, Mar. 2, 1987, abandoned, which is a division of Ser. No. 751,088, Jul. 2, 1985, Pat. No. 4,697,453. This application Nov. 23, 1988, Ser. No. 275,687
Claims priority, application Japan, Jul. 5, 1984, 59-137868; Jul. 6, 1984, 59-140340
Int. Cl.[4] G01F *23/00*; C21B *7/24*
U.S. Cl. 73—290 R 11 Claims



5. An apparatus for monitoring a burden condition in a shaft furnace comprising:

a hollow cylindrical tubular member insertable into an upper internal space of said furnace and being movably arranged for movement radially of said furnace, said cylindrical tubular member having a first radially extending section and a second vertically extending section, said first section opening to the outside of said furnace and said second section opening toward the top of the burden in said furnace, and said first and second sections adjoining each other;

a sensor assembly having a flexible tubular section extending through said first and second sections of said cylindrical tubular member along the axes thereof, said second section having an end opening, said flexible tubular section carrying a sensor for monitoring at least one characteristic selected from the group consisting of distribution of mutually different materials of burden in said furnace and grain distribution of the top layer of the burden, said sensor assembly comprising a first sensor assembly including a first sensor carried by a first flexible tubular section for monitoring burden distribution and a second sensor assembly including a second sensor carried by a second flexible tubular section for monitoring grain distribution of the top layer of the burden, said first and second sensor assemblies selectively insertable into said cylindrical member for selectively performing burden distribution monitoring and grain distribution monitoring steps,

control means associated with said sensor assembly and connected to said flexible tubular section for controlling the position of said sensor relative to the end opening of said second section of said cylindrical tubular member; and

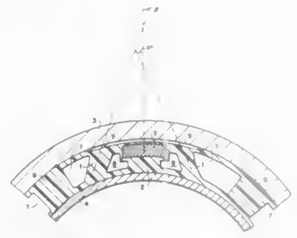
receiving means electrically connected to said sensor connected for receiving a signal from said sensor and processing the received signal for producing data indicative of at least one of the foregoing distribution characteristics.

4,914,949

TORSIONAL VIBRATION DAMPER

Rainer Andrä, Limburg; Günter Ullrich, Hemsbach; Werner Bauer, Weinheim; Friedrich Reinhold, Heddesheim, and Georg Schäfer, Weinheim, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Continuation of Ser. No. 55,602, May 29, 1987, abandoned. This application Oct. 28, 1988, Ser. No. 266,229
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1986, 3633414; Nov. 8, 1986, 3638020
Int. Cl.[4] F16F *15/10*
U.S. Cl. 74—574 6 Claims



1. In a torsional vibration damper comprising a hub ring and a flyring which are interconnected through basic resilient elements that are uniformly distributed around the circumference and are capable of angular displacement relative to each other, and further comprising first resilient elements and second resilient elements which are fastened to the hub ring mechanically in parallel with the basic resilient elements and which are spaced at their outer surfaces from the inner surface of the flyring by an air gap when the device is not rotating and are adapted to be cause by the centrifugal force generated at a desired rotational speed to bear immovably against the flyring, the first and second resilient elements being integrally joined together at their outer extremities to form a unit and consisting of vulcanized-in rubber bodies, the improvement wherein the first and second resilient elements are columnar in shape; wherein at least one first resilient element is associated with each second resilient element on both sides thereof in the circumferential direction; and wherein the first and second resilient elements of every resilient unit so formed are circumferentially spaced from one another at their inner extremities.

4,914,950

CERAMIC CONDUIT ASSEMBLY WITH METAL OUTER TUBE

Ikuo Uematsu; Masao Fukunaga, both of Katsuta, and Akiomi Kohno, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 18, 1988, Ser. No. 259,321
Claims priority, application Japan, Oct. 23, 1987, 62-267757
Int. Cl.[4] G01F *1/58*
U.S. Cl. 73—861.12 12 Claims

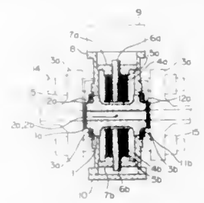
7. An electromagnetic flow meter comprising:

a ceramic conduit having outer peripheral fitting portions respectively provided at two longitudinal ends of an outer peripheral portion of said conduit, and annular bonding surfaces disposed along said outer peripheral fitting portions, said annular bonding surfaces extending in a direction which is not parallel to longitudinal axis of said ceramic conduit, said conduit including a pair of electrodes which extend from an outside of said conduit to an inner periphery thereof in such a manner that a longitudinal axis of said electrodes is perpendicular to the longitudinal axis of said conduit;

two bonding rings, each having a bonding end surface which is has a configuration corresponding to said annular bonding surface of said ceramic conduit, an outer peripheral fitting surface, an outer end surface which is a reverse surface of said bonding end surface, and a bonding ring annular protrusion provided along said outer peripheral fitting surface of the bonding ring, said annular protrusion of the bonding ring protruding from said outer end surface;

a metal outer tube having a first inner peripheral fitting portion which is fitted on said outer peripheral fitting portion of said

a metal outer tube having a first inner peripheral fitting portion which is fitted on said outer peripheral fitting portion of the conduit, second inner peripheral fitting portions which are fitted on said outer peripheral fitting surfaces of said bonding ring, two outer tube end surfaces,



and two annular protrusions provided along said second inner peripheral fitting portions of said outer tube, said annular protrusions of said outer tube respectively protruding from said outer tube and surfaces, said metal outer tube being joined to said bonding rings through welded portions arranged at the longitudinal outer ends of fitted portions formed between said annular protrusions of said outer tube and said annular protrusions of the bonding ring; and

two insert members, each being inserted between said annular bonding surface of said conduit and said bonding end surface of said bonding ring, said insert members being welded to both of said annular bonding surfaces of said conduit and said bonding end surfaces of said bonding rings so that said conduit and said bonding rings are bonded to each other.

4,914,951

APPARATUS FOR REMOTE DISTANCE MEASUREMENT

Thomas Koelpin, Amberg, and Alfred Forster, Schwandorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 9, 1988, Ser. No. 282,441
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1987, 3742137
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—597 4 Claims

1. An apparatus for remote distance measurement, especially for motor vehicles, comprising:

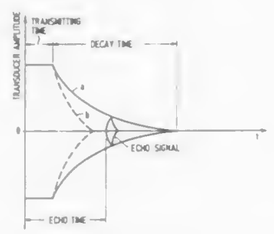
at least one electroacoustic transducer for transmitting an ultrasonic signal and for subsequently receiving an ultrasonic echo signal reflected by an object;

an electric generator for activating the transducer at a transmission frequency;

a receiving stage for the echo signals received by the transducer; and

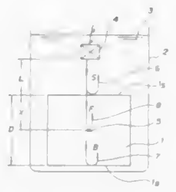
a control unit for activating the generator for a transmission time and for providing a subsequent decay time for the transducer to subsequently form a reception window for receiving reflected echo signals, the control unit further comprising means for selecting a transmission frequency

at which the generator activates the transducer and for adjusting the transmission frequency for short object



distances to make the decay time of the transducer oscillation less than for larger distances.

4,914,952
ULTRASONIC METHOD FOR MEASUREMENT OF SIZE OF ANY FLAW WITHIN SOLID MASS
Takeshi Miyajima; Yukio Ogura, and Sadahisa Tomita, all of Ibaraki, Japan, assignors to Hitachi Construction Machinery, Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 57,896, Jul. 2, 1987, abandoned. This application Jul. 6, 1988, Ser. No. 215,752
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—598 1 Claim



1. A method for measuring a size of any flaw with ultrasonic waves wherein the ultrasonic waves are transmitted perpendicularly to a searching surface of a solid mass being the object under measurement through a liquid, comprising the following steps of:
detecting the echo height of a first reflected wave from the searching surface of the solid mass and that of a second reflected wave from the flaw in the solid mass, respectively, to obtain a ratio in echo height between said first and second reflected waves;
detecting the difference in propagation time between said first and second reflected waves, to obtain the depth of the flaw from the solid-mass surface, which corresponds to the detected difference; and
determining the size of the flaw from the obtained echo-height ratio and the obtained flaw depth based on a predetermined correlation among the echo-height ratio between the first and second reflected waves, the depth of the flaw from the solid-mass surface, and the size of the flaw, the predetermined correlation being pre-established from standard test pieces of the same material as the material of the solid mass under measurement, wherein the predetermined correlation is expressed as follows:

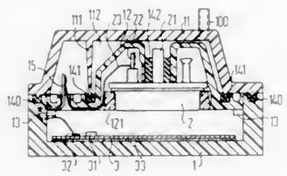
$$hF/s = -10^{-a1 \log d + b1} \log X - 10^{-a2 \log d + b2}$$

where
hF/S: ratio in echo height between the first and second reflected waves,
X: depth of the flaw from the solid-mass surface,
d: size of the flaw, and
a1, a2, b1, and b2: constants,
said predetermined correlation being obtained by determining the constants a1, a2, b1, and b2 beforehand using standard test pieces of the same material as the material of the solid mass under measurement and having different flaw sizes.

4,914,953
TURBINE BLADE VIBRATION MONITOR FOR NON-MAGNETIC BLADES
Paul W. Viscovich, Longwood, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Nov. 7, 1988, Ser. No. 268,140
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—660 12 Claims

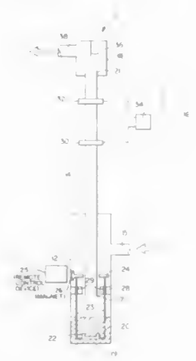
1. A vibration monitor for monitoring the vibration of the rotating portion of a turbine, comprising:
certain of the atoms of a rotating portion of the turbine being activated to form radioactive nuclides;
sensor means positioned in a fixed location with respect to the rotating portion of the turbine, said sensor means being responsive to the movement of said activated atoms of the rotating portion past said sensor means for producing an input signal; and
processor means responsive to said input signal or extracting vibration information therefrom.

4,914,954
CONTROL DEVICE
Vlastimil Zlamal, Regensburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Sep. 23, 1988, Ser. No. 248,115
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1987, 3732192
Int. Cl.[4] G01L *19/14*
U.S. Cl. 73—756 6 Claims



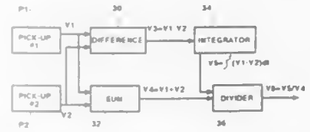
1. A control device, comprising:
a housing having a lower part and an upper part, said housing having an interior which is pressure tight when said lower and upper parts are fixed together;
at least one contact at an inside of said lower part;
a printed circuit board secured inside and on a bottom of said lower part in a heat conducting manner;
an adjustable element secured on said printed circuit board;
a pressure sensor having a pressure connection and an electrical terminal; and
a retaining part fixing said pressure sensor in said lower part at a distance from said printed circuit board, said retaining part giving access to said adjustable element,
said upper part of said housing closing access to said adjustable element when fixed to said lower part after adjustment of said adjustable element.

4,914,955
SOAPFILM FLOWMETER DEVICE FOR MEASURING GAS FLOW RATES
David A. Stonestrom, Palo Alto, Calif., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.
Filed Aug. 29, 1988, Ser. No. 258,955
Int. Cl.[4] G01F *1/708*
U.S. Cl. 73—861.05 5 Claims



1. A device for measuring flow rates of gases over a range of absolute pressures comprising:
a soapfilm generating chamber having gas inlet means for directing a flow of gas into said chamber, the lower end of said chamber providing a reservoir for soap solution;
a flow-metering tube positioned with its lower end in said soapfilm generating chamber so that a soapfilm capable of traveling the length of said tube can be formed at the lower end of the tube, said tube having flow measuring means so that the rate of flow of the gas directed through the tube can be measured by measuring the rate of flow of said soapfilm traveling through said tube;
a cup positioned inside of said soapfilm generating chamber movable from a first position wherein said cup is immersed in the soap solution reservoir so that the cup is filled with soap solution to a second position wherein the soap solution in the cup is brought into contact with the lower end of said flow-metering tube so that a soapfilm capable of traveling the length of the tube is made to form at the lower end of said tube, the movement of said cup being controlled by a remote control means exterior to said soapfilm generating chamber which controls the movement of the cup without creating any additional passageways into the soapfilm generating chamber; and
a soapfilm trap positioned at the upper end of said flow-metering tube having gas outlet means for allowing escape of the flow of gas exiting from said tube and puncturing means for puncturing the soapfilm after it has passed through said flow measuring means.

4,914,956
METHOD AND CIRCUIT FOR PROCESSING SENSORY INPUT SIGNALS OF THE TYPE OBTAINED FROM CORIOLIS MASS FLOW RATE SENSORS AND THE LIKE
Alan M. Young, Los Gatos, and E. Ronald Blake, San Jose, both of Calif., assignors to Exac Corporation, Campbell, Calif.
Filed Jul. 22, 1987, Ser. No. 76,512
Int. Cl.[4] G01F *1/84*
U.S. Cl. 73—861.38 16 Claims



1 Apparatus for measuring the mass flow rate of material flowing through at least one vibrating conduit comprising:
a pair of motion detectors disposed at separate points along the conduit for detecting motion thereof and for developing first and second motion responsive analog voltage signals;
differencing means responsive to said first and second analog voltage signals and operative to generate a difference signal which is proportional to the voltage difference therebetween;
summing means responsive to said first and second analog voltage signals and operative to generate a sum signal which is proportional to the sum of the voltages thereof;
integrating means for integrating said difference signal; and
dividing means for dividing the integrated difference signal by said sum signal to develop an output signal proportional to the mass flow rate of material flowing through said conduit.

4,914,957
LEAK TEST ADAPTOR APPARATUS FOR FACILITATING LEAK TESTING FACE MASK RESPIRATORS
William Dougherty, Glassboro, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Continuation of Ser. No. 182,276, Apr. 15, 1988, abandoned. This application Jun. 26, 1989, Ser. No. 372,147
Int. Cl.[4] G01M *3/04*
U.S. Cl. 73—40 23 Claims

1. An apparatus for sampling a gas or a particulate aerosol, the apparatus connected to a face mask having an exhaust port, comprising:
(a) an outer member having a bore therethrough, the bore having a first end and a second end, said outer member

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connected to the face mask and spaced-apart from the exhaust port;

(b) an inner member disposed in the bore of said outer member, said inner member having a channel therethrough for passage of the gas or aerosol through the channel;

(c) means connected to said inner member for regulating the flow of the gas or aerosol through the channel; and

(d) a sampling port formed through said outer member, said sampling port in communication with the bore for sampling the gas or aerosol in the bore, said sampling port having an obstruction-free passageway therethrough for passage of the gas or aerosol.

4,914,958

APPARATUS FOR INVESTIGATING THE BEHAVIOR OF CONTRAFORM CONTACTS

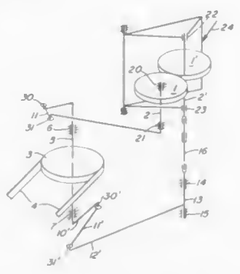
Eric van Damme, Braine l'Alleud, Belgium, assignor to Optimol Instruments GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 9, 1987, Ser. No. 12,447

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1986, 3604653

Int. Cl.⁴ G01M *13/00*; G01N *3/56*

U.S. Cl. 73—866.4 **14 Claims**



1. Testing apparatus for simulating the behavior of contact moving under normal force loading in machine components with at least two test objects including a second test object and at least one first test object which performs a rolling movement on the second test object, characterized in that at least the first test object (**1, 1'**) during testing is driven by means of an eccentric arrangement, the latter comprising a first crank (**10, 10'**) revolving at a substantially constant speed about a first spindle (**5**), as well as a second crank (**11, 11'**), which is articulated to the first crank (**10, 10'**) on a second spindle (**30**) at a distance from the first spindle (**5**), together with a third crank (**12, 12'**), which is longer than the first and second cranks and is articulated to the second crank (**11, 11'**) on a third spindle (**31**) at a distance from the second spindle and is provided with a spatially fixed spindle (**2, 13**) at a distance from said third spindle and the fixed spindle is connected in a non-rotary manner with spindles of the test objects.

4,914,959

ULTRASONIC FLOW METER USING OBLIQUELY DIRECTED TRANSDUCERS

Kanagasaba Mylvaganam, Skjoldtun, and Erling Hammer, Mjolkeraen, both of Norway, assignors to Den Norske Stats Oljeselskap A.S., Stavanger, Norway

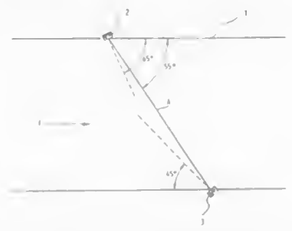
PCT No. PCT/NO88/00030, § 371 Date Feb. 3, 1989, § 102(e) Date Feb. 3, 1989, PCT Pub. No. WO88/08540, PCT Pub. Date Nov. 3, 1988

PCT Filed Apr. 20, 1988, Ser. No. 312,588

Claims priority, application Norway, Apr. 24, 1987, 871701

Int. Cl.⁴ G01F *1/66*

U.S. Cl. 73—861.28 **9 Claims**



9. A method of ultrasonic measurement of flow velocity of a fluid along a flow axis in a pipe, comprising the steps of:

mounting at least a first and second transducer on opposite sides of said pipe, said second transducer being mounted downstream from said first transducer;

alternately transmitting and receiving sonic pulses about center axes of said transducers, said center axes being deviated upstream from an imaginary line connecting said transducers; and

calculating the velocity of the fluid using the formula:

$$U = \frac{D}{\sin 2\theta} \cdot \frac{t_{32} - t_{23}}{t_{23} \cdot t_{32}},$$

where:

$\bar{U}$ is the mean flow velocity along the flow axis of the pipe,

D is the pipe diameter,

θ is the angle between the imaginary connecting line and the flow axis,

t_{23} is the downstream transit time, and

t_{32} is the upstream transit time.

4,914,960

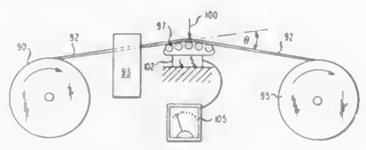
MULTI-ROLLER DYNAMOMETER AND TEST METHOD

Maurice E. Kordahl, Navesink, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 20, 1988, Ser. No. 287,420

Int. Cl.⁴ G01L *5/10*

U.S. Cl. 73—862.48 **7 Claims**



2. A method for measuring tension in an elongate element, the method comprising the steps of:

pulling the elongate element and rolling it over a multi-roller sheave;

at the multi-roller sheave, changing the direction of the center axis of the elongate element;

in response to the change of direction and to the tension, moving the multi-roller sheave a distance related to the magnitude of the tension in the elongate element;

straining a strain gauge in proportion to the distance related to the magnitude of the tension and indicating the magnitude of the tension in response to the strain in the strain gauge; and

flexibly constraining side-to-side movement of the multi-roller sheave while dividing a force, caused by changing the direction of the center axis of the elongate element and by the tension in the elongate element, into parts proportional to the magnitude of the tension.

4,914,961

DEVICE FOR FASTENING A VIBRATING WIRE TO A COMPONENT OF A METER

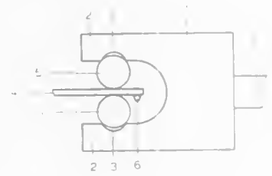
Johannes Wirth, Zurich, Switzerland, assignor to Wirth Gallo Messtechnik AG, Zurich, Switzerland

Filed Aug. 11, 1987, Ser. No. 84,331

Claims priority, application European Pat. Off., Aug. 19, 1986, 86 810369.8

Int. Cl.⁴ G01L *1/10*; F16G *11/04*

U.S. Cl. 73—862.59 **16 Claims**



1. An apparatus for fastening a vibrating wire to a component of a meter, characterized by a body (1) with two prongs (2) and two retainers (5) made of electrically insulated material, in which the retainers (5) are in contact with the prongs (2) on one side and, due to the clamping action of the prongs (2), hold the full width of the wire (4) by a friction on the other side, insulating it electrically.

4,914,962

VIBRATING STRIP TRANSDUCER

David J. Clements, Sussez, England, assignor to The Slope Indicator Co., Seattle, Wash.

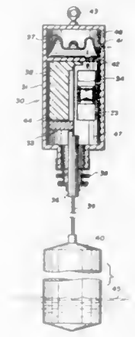
Filed Sep. 28, 1988, Ser. No. 250,157

Int. Cl.⁴ G01L *1/10*; G01N *9/08*; G01F *23/30*

U.S. Cl. 73—862.59 **13 Claims**

1. A vibrating strip transducer comprising:

a body, having a substantially fixed mount; a thin metal strip attached to said fixed mount; a relatively moveable mount attached to the opposite end of said strip, said moveable mount connected to a hanger for mechanical interaction with an externally applied force; a hinge interconnecting said moveable mount and said body, said hinge for resisting transfer of twisting forces from said hanger to said strip; and an excitation means for exciting the strip into



vibration at its resonant frequency and generating a frequency based signal output.

4,914,963

DOUBLE TUNING FORK TYPE LAMINATED FORCE TRANSDUCER, MANUFACTURING METHOD THEREFOR AND APPLICATION THEREOF IN A LOAD CELL

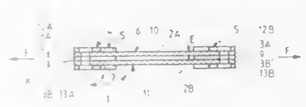
Gérard F. Sabiron, Saint Maur, France, assignor to Esselte Morean S.A., Saint Maur, France

Filed Oct. 27, 1988, Ser. No. 263,073

Claims priority, application France, Nov. 5, 1987, 87 15352

Int. Cl.⁴ G01L *1/10*

U.S. Cl. 73—862.59 **19 Claims**



1 Double tuning fork type force transducer of laminated structure comprising:

two identical metal leaf springs of constant thickness forming two identical parallel elastic branches and provided with respective ends of larger width than said branches;

two metal spacers of same thickness holding respective ends said leaf springs apart;

said spacers and said respective ends having substantially a same external profile and being fastened to each other so as to form coupling members;

said branches being adapted to vibrate in bending mode and in phase opposition in response to imposed vibrational loads with an intrinsic frequency representative of amplitude of a force applied longitudinally to said coupling members.

4,914,964

ALIGNMENT MEASURING SYSTEM AND METHOD

Benjamin T. Speiser, San Francisco, Calif., assignor to Apquip Corporation, Carmel Valley, Calif.

Filed Aug. 4, 1988, Ser. No. 228,371

Int. Cl.⁴ B65G *43/00*

U.S. Cl. 73—865.9 **15 Claims**

1. An apparatus for measuring the alignment of two or more adjacent targets having alignment reference indicia while the targets are in motion, the alignment measuring apparatus comprising:

a first alignment scanner for detecting a first target;

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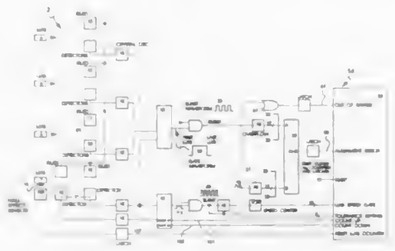
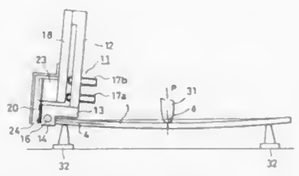
a second alignment scanner for detecting a second target;
a speed scanner spaced apart from the first scanner for detecting said first target;
an oscillatory timing clock for running at a selected frequency, the clock generating a continuous train of clock pulses;
first timing means for measuring a first time differential indicative of the time delay between detection of the first and second targets by said alignment scanners to provide a measurement proportional to the misalignment between said first and second targets, the first timing means including a first counting means for determining the number of clock pulses that occur during said first time differential measurement; and
second timing means for measuring a second time differential indicative of the time delay between detection of the first target by said first alignment scanner and said speed scanner to provide a measurement that is proportional to the speed at which the targets are traveling and determining whether adjacent targets are within alignment tolerances based in part upon the time differential measurements detected by said first and second timing means.

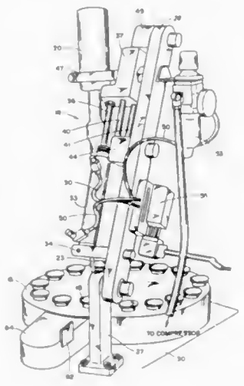


4,914,965
CRACK SHEAR DISPLACEMENT GAGE
Kazuo Kageyama, Tsukuba, Japan, assignor to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan
Filed Mar. 28, 1989, Ser. No. 329,935
Claims priority, application Japan, Mar. 31, 1988, 63-80078
Int. Cl.[4] G01N *19/08*
U.S. Cl. 73—799 3 Claims



1. A crack shear displacement gage comprising a frame, a fixing member having one end fixed on said frame and having at its other end a fixing head which can be detachably fixed in a clamping manner on a first end portion of a test specimen whose end portion is divided into first and second end portions by a crack, a contact for contacting an end face of said second end portion of said test specimen, a spring member whose one end is fixed on said frame and whose other end supports said contact for urging said contact against said end face of said second end portion, and a strain gage mounted on said spring member for detecting the strain of the spring member.

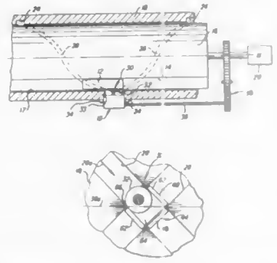
4,914,966
AUTOMATED ULTRASONIC PROBE HOLDER FOR A SAMPLE FEEDER
Ralph T. White, Jr., Pfafftown; Dewey L. Holt, Winston-Salem, and Jerry S. Simmons, Rural Hall, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Dec. 15, 1988, Ser. No. 284,889
Int. Cl.[4] G01N *35/06*
U.S. Cl. 73—863.01 15 Claims



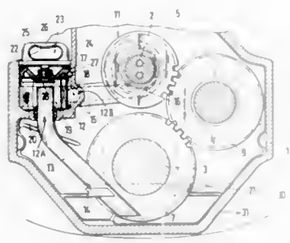
1. Apparatus for analyzing the elemental content of a slurry having solid particles containing elements to be analyzed suspended in a liquid carrier, the apparatus comprising
(i) cup means for receiving a sample of the slurry to be analyzed,
(ii) positioning means for moving the cup means to a location for analysis,
(iii) a first sample analysis probe means for withdrawing a portion of the sample from the cup means when in said location, for analysis thereof,
(iv) a second sample agitation probe means for agitating the sample, and
(v) means for (a) automatically introducing the second probe means into the cup means when in said location, to maintain the solid particles in suspension therein, and (b) removing the second probe means from the cup means substantially immediately prior to the withdrawal of said sample portion by the first probe means.

4,914,967
CROSSOVER MECHANISM FOR GUIDING A CAM FOLLOWER THROUGH A CAM TRACK INTERSECTION
Edward A. Proulx, Burlington, and Glenn E. Rossier, Vergennes, both of Vt., assignors to General Electric Company, Burlington, Vt.
Filed Dec. 23, 1988, Ser. No. 289,333
Int. Cl.[4] F16H *25/12*
U.S. Cl. 74—57 14 Claims

1. A crossover mechanism for guiding a cam follower through an intersection of right and left hand thread portions of a helical cam track, wherein the cam follower is carried by a reciprocating member mounted by one of a rotating member and a stationary member and the cam track is carried by the other of the rotating and stationary members, said crossover mechanism comprising, in combination:
A. a housing affixed to the one of the rotating and stationary members carrying the cam track;
B. a first crossover cam member mounted for reciprocation within said housing and having first cam segments;
C. a second crossover cam member mounted for reciprocation within said housing and having second cam segments; and
D. an actuator introduced into said housing, said actuator carrying a first actuating element for reciprocating said first crossover cam member relative to the cam track intersection and a second actuating element for reciprocating said second crossover cam member relative to the cam track intersection, whereby said first actuating element inserts said first cam segments into the intersection to guide the cam follower therethrough while the cam follower is moving in the right hand thread portion of the cam track and said second actuating element inserts said second cam segments into the intersection to guide the cam follower therethrough while the cam follower is moving in the left hand thread portion of the cam track

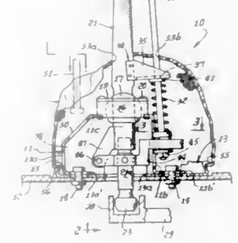


4,914,963
OIL SUPPLY ARRANGEMENT FOR GEAR-SHIFT MECHANISM
Fritz Diermeier, Munich; Johann Eichinger, Vaterstetten, and Max Bartl, Munich, all of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen-und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany
Continuation of Ser. No. 169,938, Mar. 18, 1988, abandoned. This application Aug. 8, 1989, Ser. No. 391,661
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1987, 3709626
Int. Cl.[4] F16H *57/04*
U.S. Cl. 74—467 7 Claims



1. In a gear-shift mechanism, an oil supply arrangement comprising a housing with plural gears therein and at least one hydraulically operated friction clutch adapted to be supplied with pressurized oil by a pump, said pump being arranged above a sump oriented at a bottom of said housing, from which sump oil is sucked by said pump, the improvement wherein:
filter chamber means is provided on said housing for holding a designated quantity of oil separate from said sump, said filter chamber means being oriented above an oil level of oil within said sump, said filter chamber means having an oil inlet port means and an oil outlet port means, said oil inlet port means including a terminal end that is at an elevation higher than the elevation of said outlet port means, said outlet port means being connected through a first conduit means to a suction port on said pump;
a hollow fine-mesh filter located in said filter chamber means, a second conduit means being supported in said housing and extending from an inlet end located beneath said oil level in said sump to said terminal end of said inlet port means, said oil outlet port means being located on an exterior side of said fine-mesh filter, said terminal end terminating inside said hollow fine-mesh filter at an elevation that is higher than the elevation of said outlet port means, said designated quantity of oil being oriented between said outlet port means and said terminal end so that said outlet port means will always be immersed in oil even after prolonged periods of inoperativeness of said pump; and
access means on said housing for facilitating access to said fine-mesh filter without necessitating a removal of oil from said sump.

4,914,969
GEAR SHIFTER APPARATUS
Philip T. Lieb, Manhattan Beach, Calif., assignor to Scat Enterprises, Inc., Redondo Beach, Calif.
Filed Jul. 7, 1988, Ser. No. 215,984
Int. Cl.[4] F16H *57/06*; G05G *9/00, 13/00*
U.S. Cl. 74—476 13 Claims



1. In a gear shifter, a frame, a first upright shaft and a universal pivot connecting the shaft to the frame, to allow shaft pivoting relative to the frame, a second shaft extending generally parallel to the first shaft, and T-shaped handles on the upper ends of the two shafts, mechanism on the frame connected with lower ends of the shafts to be manipulated in response to one-handed manipulation of both shafts, the improvement comprising:
(a) bracket means connecting the second shaft to the first shaft to allow endwise movement of the second shaft relative to the first shaft,
(b) said bracket means including ear means rigidly attached to and lengthwise along the side of the first shaft, and a first guide member connected to the ear means and offset sidewardly relative to the first shaft,
(c) the first guide member passing the second shaft and allowing said endwise movement thereof,
(d) the frame including a base plate and bracket plate structure attached to and extending over the base plate to form a chamber, the first upright shaft having a lowermost portion extending below the universal pivot and into the chamber, the second shaft having a lowermost portion

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extending proximate the chamber, and gear actuator means attached to said shaft lowermost portions, the base plate having upstanding peripheral anchor lip means, and there being a flexible shroud extending over the bracket plate structure and having a looping bead retained by said anchor lip means, and fastener means carried by the base plate at substantially the level of said lip means for attaching the base plate to a floor below which said lowermost portion of the first shaft then projects, the ear means located above the shroud.

4,914,970

AUTOMOTIVE STEERING COLUMN MOUNTING ASSEMBLY

Luigi Mastrofrancesco, and Gary M. Sopko, both of Livonia, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 1, 1988, Ser. No. 226,913
Int. Cl.[4] B62D *1/18*
U.S. Cl. 74—492 14 Claims

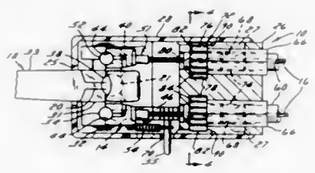
1. A mounting assembly for releasably securing a steering column of a motor vehicle to the chassis of said vehicle, comprising:
a bracket adapted to be attached to said steering column, with said bracket having a plurality of rearwardly opening primary apertures therein; and
a plurality of modules molded in place upon said bracket, with each of said modules registered with one of said rearwardly opening apertures, and with each of said modules comprising a solid body having an annular groove which (i) is formed during the molding of said module; and (ii) which circumscribes a portion of said module.

4,914,971

ANTI-ROTATIONAL ASSEMBLY FOR A CABLE TENSION ADJUSTER FOR A LEVER OPERATED BRAKE ACTUATOR

George H. Hinkens, and James J. Dimsey, both of Milwaukee, Wis., assignors to Hayes Industrial Brake, Inc., Mequon, Wis.

Filed Nov. 21, 1988, Ser. No. 274,175
Int. Cl.[4] F16C *1/10*
U.S. Cl. 74—502.2 4 Claims



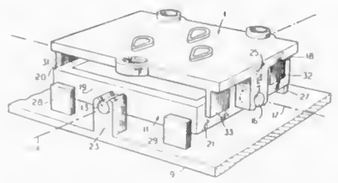
1. An anti-rotation device for a lever operated brake actuator for an all terrain vehicle of the type having brake cables connected to the brakes for the wheels of the vehicle, the actuator including:
a housing mounted on the vehicle;
a lever arm pivotally mounted in said housing and being operatively connected to
the brake cables;
a sheath enclosing each of the brake cables and having one end secured to the vehicle in close proximity to the brakes;
said device comprising means for adjusting the length of the cables;
said means including a member connected to the other end of said sheath and mounted for axial movement in said housing;
said member including a threaded bore and a cable adjusting member mounted for rotary motion in said housing and having a threaded stud matingly engaging said threaded bore and
a thumb wheel mounted on said threaded stud for adjusting the length of said sheath;
and a cover mounted on said housing, said cover including a number of ribs for preventing rotation of said thumb wheel.

4,914,972

DEVICE INCORPORATING THREE CABLES FOR CONTROLLING A MIRROR SUPPORT FOR A VEHICLE REARVIEW MIRROR

Bernard Manzoni, Saint-Claude, France, assignor to Societe Manzoni Bouchot, France

Filed Sep. 7, 1988, Ser. No. 241,340
Claims priority, application France, Sep. 9, 1987, 87 12503
Int. Cl.[4] F16C *1/10*; B60R *1/06*
U.S. Cl. 74—502.1 6 Claims



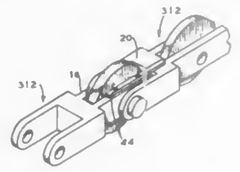
1. In a device incorporating three cables for controlling a mirror support for a rearview mirror, said mirror support comprising:
a fixed plate having a first pair of spatially separated bearings defining a first pivot axis;
a mirror support member having a second pair of spatially separated bearings defining a second pivot axis perpendicular to said first pivot axis;
a rectangular crosspiece disposed between said fixed plate and said mirror support member, said crosspiece having a first pair of bearing surfaces generally parallel to said second pivot axis and a second pair of bearing surfaces generally parallel to said first pivot axis, each bearing surface of said first pair of bearing surfaces having a journal received in a respective one of said first pair of bearings to permit said crosspiece to pivot relative to said fixed plate about said first pivot axis, each bearing surface of said second pair of bearing surfaces having a journal received in a respective one of said second pair of bearings to permit said mirror support member to pivot relative to said crosspiece about said second pivot axis;
means for connecting at least one of said three cables to said crosspiece;
means for connecting the remaining of said three cables to said mirror support member;
at least two friction tabs provided on said fixed plate offset from said first pivot axis, one of said at least two friction tabs frictionally engaging one bearing surface of said first pair of bearing surfaces and the other of said at least two friction tabs frictionally engaging the other bearing surface of said first pair of bearing surfaces to reduce the vibration of said crosspiece about said first pivot axis; and
at least two friction tabs provided on said mirror support member offset from said second pivot axis, one of said at least two friction tabs provided on said mirror support member frictionally engaging one bearing surface of said second pair of bearing surfaces and the other friction tab of said at least two friction tabs engaging the other bearing surface of said second pair of bearing surface to reduce the vibration of said mirror support member about said second pivot axis.

4,914,973

SERPENTINE TUBE INSPECTION POSITIONING SPINE

William E. Bailey; John H. Flora, both of Lynchburg, and Robert E. Womack, Forest, all of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 260,161, Oct. 21, 1988, Pat. No. 4,896,555.
This application Aug. 28, 1989, Ser. No. 399,035
The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.
Int. Cl.[4] F16C *1/20*
U.S. Cl. 74—502.5 4 Claims



1. A positioning spine, comprising:
a. a plurality of identical links;
b. each link having a longitudinal axis and first and second bifurcated ends spaced along the axis;
c. said second bifurcated end having a substantially oval bore therethrough perpendicular to the longitudinal axis;
d. said first bifurcated end being sized to fit within said second bifurcated end of an adjacent link for mating therewith and having a bore therethrough perpendicular to the longitudinal axis;
e. a pivot pin accepted in said bores of said first and second bifurcated ends of adjacent links for mating adjacent links together;
f. means for maintaining rigid straightness of said mated links when under longitudinal compressive forces comprising two straight springs attached to opposite sides of said first bifurcated end and extending over the central portion of an adjacent link; and
g. means for allowing pivoting of one link relative to an adjacent link.

4,914,974

SERPENTINE TUBE INSPECTION POSITIONING SPINE

William E. Bailey; John H. Flora, both of Lynchburg, and Robert E. Womack, Forest, all of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 260,161, Oct. 21, 1988, Pat. No. 4,896,555.
This application Aug. 28, 1989, Ser. No. 399,034
Int. Cl.[4] F16C *1/20*
U.S. Cl. 74—502.5 6 Claims

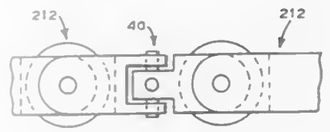
1. A positioning spine, comprising:
a. a plurality of identical links;
b. each link having a longitudinal axis and first and second bifurcated ends spaced along the axis and rotated about the longitudinal axis 90 degrees to each other;
c. said second bifurcated end having a substantially oval bore therethrough perpendicular to the longitudinal axis;
d. said first bifurcated end being sized to fit within said second bifurcated end of an adjacent link for mating therewith and having a bore therethrough perpendicular to the longitudinal axis;
e. a pivot pin accepted in said bores of said first and second bifurcated ends of adjacent links for mating adjacent links together;
f. means for maintaining rigid straightness of said mated lines when under longitudinal compressive forces comprising flat inner alignment faces on said second bifurcated end and corresponding flat end alignment faces on said first bifurcated end; and
g. means for allowing pivoting of one link relative to an adjacent link.

4,914,975

SERPENTINE TUBE INSPECTION POSITIONING SPINE

William E. Bailey; John H. Flora, both of Lynchburg, and Robert E. Womack, Forest, all of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 260,161, Oct. 21, 1988, Pat. No. 4,896,555.
This application Aug. 28, 1989, Ser. No. 399,036
The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.
Int. Cl.[4] F16C *1/20*
U.S. Cl. 74—502.5 4 Claims



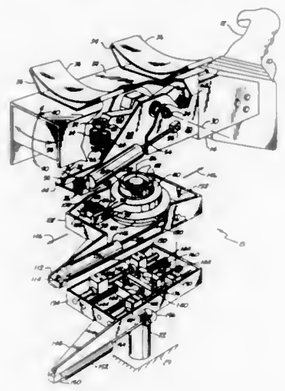
1. A positioning spine, comprising:
a. a plurality of identical links;
b. each link having a longitudinal axis and first and second bifurcated ends spaced along the axis and rotated about the longitudinal axis 90 degrees to each other in the form of a U-joint;
c. said second bifurcated end having a substantially oval bore therethrough perpendicular to the longitudinal axis;
d. said first bifurcated end having a bore therethrough perpendicular to the longitudinal axis;
e. a U-joint drive pin accepted in said bores of said first and second bifurcated ends of adjacent links for mating adjacent links together;
f. means for maintaining rigid straightness of said mated links when under longitudinal compressive forces comprising flat inner alignment faces on said second bifurcated end and corresponding flat end alignment faces on said first bifurcated end; and
g. means for allowing pivoting of one link relative to an adjacent link.

4,914,976

FIVE AND SIX DEGREE OF FREEDOM HAND CONTROLLERS

Charles E. Wyllie, Largo, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 13, 1988, Ser. No. 181,398
Int. Cl.[4] G05G *1/00, 1/04;* B64C *13/04*
U.S. Cl. 74—523 36 Claims



1. Apparatus for use with a wrist motion hand controller comprising:
stationary means;
arm support means fixedly connected to the hand controller and mounted for movement with respect to the stationary means;
first relative movement responsive means connected to the stationary means and to the arm support means to produce a first output indicative of a first movement between the arm support means and the stationary means; and
second relative movement responsive means connected to the arm support means to produce a second output indicative of a second movement between the arm support means and the stationary means.

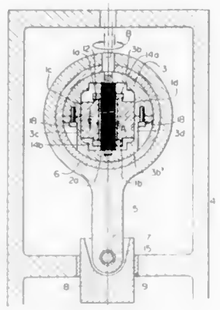
4,914,977

STROKE CONTROL DEVICE FOR USE IN PRESS

Heizaburo Kato, Shizuoka, Japan, assignor to Sankyo Manufacturing Company, Ltd., Tokyo, Japan

Filed Dec. 28, 1988, Ser. No. 291,164
Claims priority, application Japan, Dec. 29, 1987, 62-333165
Int. Cl.[4] G05G *1/00;* B30B *5/00*
U.S. Cl. 74—571 L 1 Claim

1. A stroke control device comprising:
a drive shaft adapted to be rotatingly driven and having an eccentric member mounting portion;
an eccentric member fitting on said eccentric member mounting portion, said eccentric member having an outer peripheral surface which is at an eccentricity with respect to said drive shaft and sliding surfaces which are in vertical sliding engagement with both side surfaces of said eccentric mounting portion;
a connecting rod having an upper end portion rotatably carried by the outer peripheral surface of said eccentric member and a lower end portion swingably connected to a slide;
a gear shaft vertically extending through said eccentric member mounting portion and provided with spline-type gear teeth on upper and lower end portions thereof, said gear shaft being rotatably supported at its upper and lower ends thereof by said eccentric member;
a plurality of screw rods arranged on both sides of said gear shaft such as to extend in parallel with said gear shaft through said eccentric member mounting portion, said screw rods being fixed at their upper and lower ends to said eccentric member; and
gears screwed to upper and lower end portions of said screw rods and meshing with said spline type gear teeth on the upper and lower end portions of said gear shaft, said gears contacting upper and lower end surfaces of said eccentric member mounting portion;



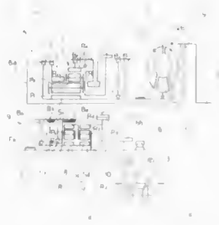
whereby, when said gear shaft is rotated, said gears rotate to cause said screw rods to move up and down relative to said drive shaft together with said gear shaft and said eccentric member so as to cause a change in the amount of eccentricity of said eccentric member with respect to said drive shaft, thereby allowing a control of the length of stroke of said slide.

4,914,978

AUTOMATIC TRANSMISSION

Shuzo Moroto, Handa; Masakatsu Miura, Kariya, and Masahiko Ando, Okazaki, all of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

Filed Dec. 1, 1987, Ser. No. 127,331
Claims priority, application Japan, Dec. 9, 1986, 61-293665
Int. Cl.[4] F16H *37/08, 37/00*
U.S. Cl. 475—71 17 Claims



1. An automatic transmission having a first axle for constituting an input member, and a second axle for constituting an output member and extending parallel to the first axle, comprising:
a main transmission mechanism situated on the first axle, said main transmission mechanism including a single planetary gear unit having a sun gear, a ring gear, a carrier pinion, and a carrier for supporting the carrier pinion, and a dual planetary gear unit having a sun gear, a ring gear, first and second carrier pinions, and a carrier for supporting the first and second carrier pinions of the dual planetary gear unit, said carriers of the single and dual planetary gear units being integrally connected together, and said sun gears of the single and dual planetary gear units being integrally connected together,
a first clutch for selectively connecting and disconnecting between the input member and the ring gear of the single planetary gear unit,
a second clutch for selectively connecting and disconnecting between the input member and the sun gears of the single and dual planetary gear units integrally connected together,
first restraining means connected to the sun gears for selectively restraining movement of the sun gears,
second restraining means connected to the ring gear of the dual planetary gear unit for selectively restraining movement of the same,
a counter drive gear connected to the carriers integrally connected together and situated in the center of the main transmission mechanism,
a sub transmission mechanism situated on the second axle, said sub transmission mechanism including a first single planetary gear unit and a second single planetary gear unit, said first and second single planetary gear units having sun gears, ring gears, carrier pinions and carriers for supporting the carrier pinions, respectively, said sun gears of the first and second single planetary gear units being integrally connected together, and said carrier of the first single planetary gear unit being connected to said ring gear of the second single planetary gear unit and to the second axle constituting the output member of the carrier,
a third clutch for selectively connecting and disconnecting between the sun gears of the first and second single planetary gear units and the carrier of the second single planetary gear unit,
third restraining means connected to the carrier of the second single planetary gear unit for selectively restraining movement of the same,
fourth restraining means connected to the sun gears of the first and second single planetary gear units for selectively restraining movement of the same,
a counter driven gear connected to the ring gear of the first single planetary gear unit and engaging said counter drive gear to transfer power from the main transmission mechanism to the sub transmission mechanism,
an output gear fixed to the second axle, said output gear being located at a side of the counter driven gear opposite to the first and second single planetary gear units,
a transaxle case for receiving the main and sub transmission mechanisms, and a rear cover fixed to a rear of the transaxle case so that an axial length of said sub transmission mechanism and the output gear located on the second axle is within an axial length of the main transmission mechanism, and said third clutch and third and fourth restraining means are enclosed in the transaxle case and covered by the rear cover.

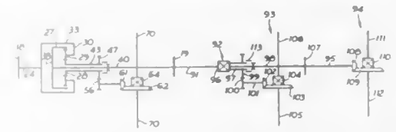
4,914,979

AXLE DRIVE UNIT

Harry Balmforth, Leeds, United Kingdom, assignor to GKN Axles Limited, Birmingham, England

Filed Jun. 14, 1988, Ser. No. 206,509
Claims priority, application United Kingdom, Aug. 7, 1987, 8718782
Int. Cl.[4] F16H *37/06;* B62D *61/10*
U.S. Cl. 475—221 6 Claims

1. An axle drive unit comprising:
a casing having opposite first and second ends;
an input member at the first end of the casing, the input member comprising an input coupling flange having a tubular spigot;
bearing means supporting said spigot at said first end of the casing;
a spur gear epicyclic first differential gear in the casing and comprising:
an annulus gear;
a sun gear;
planet gears meshing with the annulus gear and the sun gear; and
a planet carrier on which the planet gears are rotatably mounted;
a generally U-section driving connection between the input member and the planet carrier, the connection comprising a shaft received within said spigot and having a flange within the casing and a sleeve connecting said last-mentioned flange to a flange on the planet carrier, the sleeve extending around the outside of the annulus gear so that



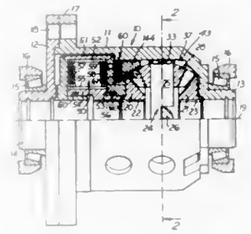
the planet carrier is driven from the side of said first differential gear remote from said first end of the casing;
an equal-torque split inter-wheel second differential gear in the casing and having an input element;
first driving means interposed between said sun gear of the first differential gear and said input element and including a tubular shaft connected to said sun gear;
an output member at the second end of the casing; and
second driving means connecting said annulus gear of the first differential gear to said output member, said second driving means including a driving shaft within and rotatable with respect to said tubular shaft.

4,914,980

LIMITED SLIP DIFFERENTIAL ASSEMBLY

Herbert Taureg, Hennef, and Christian Gasch, Lohmar, both of Fed. Rep. of Germany, assignors to Viscodrive GmbH, Lohmar, Fed. Rep. of Germany

Filed Apr. 13, 1989, Ser. No. 337,736
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1988, 3814206
Int. Cl.[4] F16H *1/38, 1/44*
U.S. Cl. 475—89 13 Claims



1 A bevel gear differential assembly comprising:
a housing;
a carrier rotatable in the housing about an axis;
first and second side gears mounted within the carrier for rotation about said axis;
a planet-gear pin support mounted within the carrier for limited rotation with respect to the carrier from a rest position and about said axis;
a plurality of planet gears rotatably carried by said support and each meshing with the first and second side gears;
a pressure ring mounted within the carrier for axial movement with respect thereto from a rest position;

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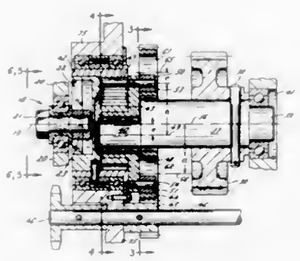
co-operating cam surfaces on said support and said ring so that rotation of the support from its rest position moves said ring axiallyfrom its rest position;
a viscous shear coupling having first and second parts;
a friction coupling interposed between the carrier and the first part of said viscous shear coupling, the friction coupling being operable by movement of the pressure ring from its rest position to connect the carrier to said first part of the viscous shear coupling;
the second part of the viscous shear coupling being connectable to one of the side gears when the assembly is in use.

4,914,981

INTERMEDIATE TRANSMISSION FOR CONVERTING A ROTATION INTO THE RECIPROCATION OF A ROLLER IN INKING AND/OR DAMPING UNITS OF OFFSET PRINTING PRESSES

Peter Hummel, Offenbach am Main, and Roland Höll, Weiterstadt, both of Fed. Rep. of Germany, assignors to Man Roland Druckmaschinen AG, Fed. Rep. of Germany

Filed May 3, 1989, Ser. No. 346,809
Claims priority, application Fed. Rep. of Germany, May 3, 1988, 3814927
Int. Cl.[4] F16H *35/08, 1/28*
U.S. Cl. 74—837 5 Claims



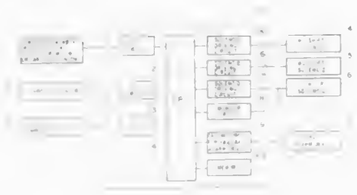
1. An intermediate transmission with a variable input-to-output phase relationship for converting rotary motion to reciprocal motion of a member disposed outside the transmission for reciprocating an inking or damping roller or the like in an offset printing press having a support frame, comprising in combination,
a drive shaft having an axis and a main portion journalled in a coaxial bearing at one end and having an eccentric crank pin with a pin axis at the other end,
an externally toothed ring rotatably mounted on said main shaft portion,
means disposed on the press frame for rotatably adjusting and locking said ring in selected positions,
said ring being formed with a plurality of circular bores each having a center disposed at a predetermined equal spacing from said drive shaft axis and angularly offset from one another by the same angle,
a disc having an axially extending collar rotatably mounted on said eccentric pin,
a plurality of rollers each having a roller axis disposed on said disc at said predetermined equal spacing measured from said pin axis and angularly offset from one another by said same angle so that said rollers each roll on the inner surfaces of said respective circular bores,
the distance between each roller axis and the respective bore center being equal to the distance between the main shaft axis and the eccentric pin axis,
an externally toothed satellite gear mounted on said collar, and
an internally toothed sunwheel engaged by said satellite and rotatably mounted in said press frame whereby said sunwheel rotates at the reduced integral speed ratio of $1-Z_2/Z_1$, with respect to said main drive shaft where Z_1 is the number of teeth on the sunwheel and Z_2 is the number of teeth on the satellite gear.

4,914,982

DEVICE AND METHOD OF FAIL-SAFE CONTROL FOR ELECTRONICALLY CONTROLLED AUTOMATIC TRANSMISSION

Yasunobu Ito; Kenji Suzuki, and Muneo Kusafuka, all of Aichi, Japan, assignors to Aisin-AW Kabushiki Kaisha, Japan

Filed Dec. 9, 1988, Ser. No. 282,276
Claims priority, application Japan, Dec. 28, 1987, 62-329509
Int. Cl.[4] B60K *41/18*
U.S. Cl. 74—844 4 Claims



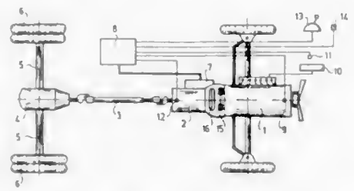
1. A fail-safe control system for an electronically controlled automatic transmission including a plurality of gear stages, a lock-up clutch and a lock-up solenoid, said system comprising:
(a) monitor circuit means for detecting a failure state of said lock-up solenoid;
(b) means for preventing engagement of the lock-up clutch when said failure state is detected;
(c) an oil temperature sensor provided for
(d) means for determining if the oil temperature of said transmission detected by said oil temperature sensor exceeds an allowable level; and
(e) means for prohibiting gear shift to the maximum gear stage when (1) said failure state is detected and (2) said determining means determines that the oil temperature of said transmission exceeds said allowable level.

4,914,983

SYSTEM FOR FREEING A MOTOR VEHICLE BY REPEATED FORWARD-REVERSE OPERATION

Sándor Simonyi, Salgótarján; László Töröcsik, Budapest, and György Válóczi, Salgótarján, all of Hungary, assignors to Csepel Autogyar, Szigetszentmiklos, Hungary

Filed Sep. 23, 1988, Ser. No. 248,813
Claims priority, application Hungary, Oct. 14, 1987, 2251-4626/87
Int. Cl.[4] B60K *41/22*
U.S. Cl. 74—866 3 Claims



1. An automatic auxiliary control system for freeing a vehicle having an engine and driving wheels by means of repeated forward/rearward operation, involving shifting alternately between forward and reverse directions, and wherein the vehicle includes an engine provided with a foot-controlled

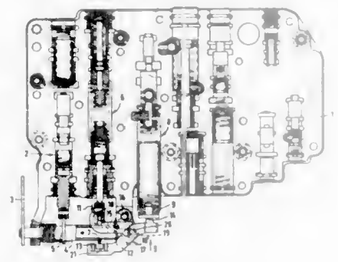
throttle movable between released and depressed positions, an automatic transmission, and electrically controlled valve means for shifting said transmission, which comprises,
(a) a main on/off control switch for said control system,
(b) first speed sensing means for sensing a speed value related to the speed of the driving wheels of the vehicle.
(c) second speed sensing means for sensing a speed value related to the speed of the vehicle engine,
(d) throttle sensing means for sensing when said foot-controlled throttle is in a released position,
(e) control means operative upon the simultaneous presence of (i) a signal representing near-zero speed of said wheels, (ii) idle speed of said engine, and (iii) released position of said foot controlled throttle, to provide a shift command signal, and
(f) said control means including a flip-flop type control element operative upon receiving successive command signals to effect shifting of said automatic transmission alternately between forward and reverse gears.

4,914,984

CONTROL VALVE FOR BELT-DRIVE CONTINUALLY VARIABLE TRANSMISSION

Josef Fuss, Elsdorf, and Ernst Kohl, Cologne, both of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1988, Ser. No. 290,327
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1988, 3803201
Int. Cl.[4] B60K *41/12*
U.S. Cl. 74—867 14 Claims



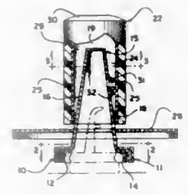
1. A system for controlling operation of a continually variable transmission comprising:
a flexible, endless drive belt;
a primary shaft driven by an engine, said shaft rotatably supporting a fixed conical pulley and an axially displaceable conical pulley moveable along said shaft, the pulleys engaging the drive belt at a radial position relative to the axis of the shaft that varies with the position of the displaceable pulley;
a secondary shaft driven by the belt, the second shaft rotatably supporting a fixed conical pulley and an axially displaceable conical pulley moveable along the second shaft, the pulleys on the second shaft engaging the drive belt at a variable radial position relative to the axis of the second shaft;
first valve means for regulating pressure that causes displacement of the pulleys and sets the operating transmission gear ratio including a valve element whose position determines a magnitude of pressure;
second valve means responsive to the position of said valve element for producing pressure that sets tension in the drive belt;
means for producing a first variable reference responsive to the magnitude of torque delivered to the transmission;
means for producing a second variable reference responsive to the operating gear ratio of the transmission; and
means for regulating pressure produced by the second valve means responsive to the first variable reference and the second variable reference including a first lever having a first arm actuated by the first reference producing means and a second arm contacting the element of the second valve means, and a second lever having a first arm actuated by the second reference producing means and a second arm carrying a first pivot on which the first lever is supported, the second lever being mounted on a second pivot and connected to the first lever eccentric of the first pivot.

4,914,985

RADIATOR CAP REMOVING TOOL

Walter E. Proctor, 834 Sherwood Cir., Forest Park, Ga. 30050

Filed Mar. 24, 1989, Ser. No. 328,300
Int. Cl.[4] B67B *7/00*
U.S. Cl. 81—3.44 5 Claims



1. A cap remover for removing automobile radiator caps, said cap remover including a plurality of gripping members selectively engageable with the edges of the cap to be removed, means for urging said gripping members towards one another for gripping said cap to be removed and simultaneously urging said cap to be removed downwardly, and means for rotating said gripping members for removal of said cap to be removed, and further including a plurality of legs, each leg of said plurality of legs carrying one of said gripping members, said legs being movable towards one another for urging said gripping members towards one another, and further including a handle defining an opening therein, said plurality of legs being receivable within said opening in said handle, the lower ends of said legs being separated by a distance greater than the width of said opening in said handle while the upper ends of said legs are received within said opening in said handle, the arrangement being such that downward movement of said handle towards said gripping members causes said lower ends of said legs to move inwardly to be received within said opening in said handle.

4,914,986

SHIELD WIRES REMOVING MACHINE

Takashi Masaki, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed May 26, 1989, Ser. No. 357,293
Claims priority, application Japan, Jul. 26, 1988, 63-184540
Int. Cl.[4] H02G *1/12*
U.S. Cl. 81—9.51 6 Claims

1. A shield wires removing machine having a cable holder with a holding aperture, a sleeve movable through a blade body, and a clamp with a variable opening all arranged concentrically around an axial line for receiving and removing a length of exposed shield wires from a cable which has core wires, soft shield wires, and a sheath, which comprises:
said cable holder being movable along said axial line, and said holding aperture has a diameter sufficiently large to receive a cable;

a pressure bar provided at right angles to said holding aperture for holding by pressure said cable in place within said holding aperture;
a shielding wires guide communicating with said holding aperture via a shoulder portion and having a diameter substantially equal to a diameter of exposed shield portion;
a cylindrical flange provided at an end of said shielding wires guide and able to abut said sleeve;
said blade body has an opening whose edge forms a circular blade in which said cylindrical flange is able to fit;

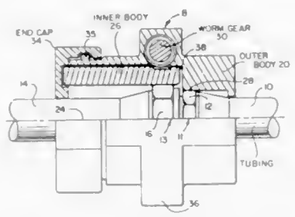
said sleeve has a diameter sufficiently large to receive said exposed shield portion; and
said clamp is movable along said axial line and has elements which are movable in radial directions to at least two positions; a first position where they catch said exposed shield portion with core wires therein and a second position where they catch an exposed shield portion with no core wires therein.

4,914,987

TUBE COUPLING TIGHTENING TOOL

Mathew J. Isler, Port Jefferson, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Sep. 20, 1988, Ser. No. 246,715
Int. Cl.[4] B25B *13/00*
U.S. Cl. 81—57.46 **2 Claims**



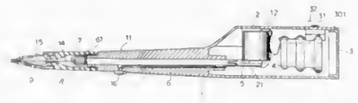
1. A tool for tightening first and second fittings of a tube coupling comprising:
an outer body having a longitudinally extending slot for removably receiving the first and second fittings and their respectively attached tube sections, an interior surface of the outer body being planar to contact a flat of a nut-shaped first fitting to maintain the fitting in a fixed position;
an inner body coaxially disposed within the outer body and having a longitudinally extending slot alignable with the outer body slot, the inner body further having
(a) a radially inner surface with a substantially polygonal profile for engaging the second fitting, and
(b) a radially outer surface area with gear means formed thereon;
a worm gear disposed in the outer body and extending into the inner body for meshing with the gear means formed on the inner body which enables rotation of the second fitting upon driving of the worm gear thus resulting in tightening of the coupling; and
closure means removable for permitting axial displacement of the inner body thereby creating sufficient space for insertion of the fitting and attached tube sections through the aligned slots, replacement of the inner body and closure means allowing engagement between the polygonal profile and the second fitting, the closure means urging the gear means of the inner and outer bodies together to ensure their continued meshing.

4,914,988

EYEBROW TATTOOING MACHINE

Meng-Cheng Chang, Rm. 10, 9th Fl., Sec. A, No. 255, Yen Piog N. Rd., Sec. 2, Taipei, Taiwan

Filed Aug. 8, 1988, Ser. No. 240,551
Int. Cl.[4] B43K *5/00*
U.S. Cl. 81—9.22 **2 Claims**



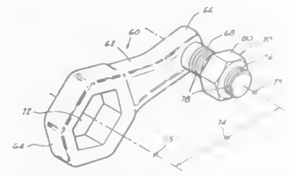
1. An electrically operated eyebrow tattooing machine, comprising:
a casing;
a small motor having an output shaft;
a rear cover detachably engaged with said casing;
a connecting member having a first and second end;
a drive rod having a first end engaged with the first end of said connecting member;
a fixing head detachably engaged by threads with a front end of said drive rod;
a first cap of cone shape having a small bore at a front end and a threaded portion at a second end;
a second cap having an extended threaded end for the engagement of the same to the threaded portion of said first cap; and
an elongate needle;
a rechargeable battery;
an eccentric cam having a shaft pin engaged with the second end of said connecting member;
a plug inlet;
a motor-control button for controlling the start and stop of said small motor;
wherein said casing includes a hollow interior member and an extended tube member integrally structured with said hollow interior member, said tube member having a threaded end having a smaller diameter than said tube member so that said second cap can be engaged therewith; said small motor and said rechargeable battery are housed within said hollow interior member; on the top wall of said casing are disposed an on/off switch and said plug inlet for use in electrical charge of said rechargeable battery; said drive rod is disposed within said extended tube member; and said eccentric cam is mounted on the output shaft of said small motor; a second end of said drive rod is provided with a clamping claw, and said fixing head is in cooperation with said clamping claw to hold said elongate needle in place which is partially inserted in said clamping claw; the first cap and second cap are adapted to be connected to each other as one unit and further joined with the casing, and the needle held in place by said drive rod actuated to move in reciprocation by said eccentric cam is received in the interior of said first and second cap and said tube member; said conical first cap is stuffed with cotton material therein so that a dye substance can be contained therein; said needle is adapted to selectively extend out of the small bore of said first cap so that tattooing on the eyebrow can be performed by the tip of the elongate needle.

4,914,989

WRENCH FOR REMOVAL OF A STUD-NUT FROM AN OUTER NUT

Donald R. Hendricks, 2272 E. 34th, Tulsa, Okla. 74105, and James M. McClanahan, 4328 E. 66th St., Tulsa, Okla. 74136

Filed Jun. 3, 1988, Ser. No. 202,972
Int. Cl.[4] B25B *23/08*
U.S. Cl. 81—462 **6 Claims**



6. A hand implement for use in combination with a lug wrench to remove a stud-nut from a wheel assembly wherein the wheel assembly includes a rim having a shoulder portion formed about a central hub opening and a plurality of equally spaced stud-receiving openings disposed about the central hub opening therein, and wherein the stud-nut is secured to the wheel assembly by an outer nut of a double cap nut assembly, the hand implement comprising:
an elongated body member having a first end portion and an opposed second end, the first end portion defining a nut-receiving opening therein having a configuration corresponding to the circumferential configuration of the outer nut of the double cap nut assembly;
a leg member supported by the body member near the opposed second end thereof such that the leg member extends substantially normal to an elongated axis of the body member, the leg member having a length such that a threaded distal end portion thereof extends along the shoulder portion of the rim when the outer nut is disposed in the nut-receiving opening of the body member; and
means supportable by the distal end portion of the leg member for engaging the shoulder portion of the rim and preventing rotation of the hand implement when torque is applied to the stud-nut by the lug wrench, the means comprising:
a nut threadably positionable on the threaded distal end portion of the leg member, the nut forming a shoulder portion adapted to frictionally engage a portion of the rim of the wheel assembly so as to secure the hand implement in a stable, non-rotatable position.

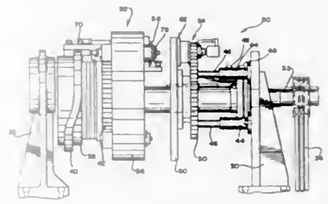
4,914,990

APPARATUS FOR TRIMMING FLANGED CANS

Siegfried Hellweg, Mount Prospect, and Jay E. Melind, Arlington Heights, both of Ill., assignors to H. L. Fisher Mfg. Co., Inc., Des Plaines, Ill.

Filed Apr. 13, 1988, Ser. No. 181,209
Int. Cl.[4] B23B *5/14*
U.S. Cl. 82—54 **11 Claims**

1. An apparatus for trimming flanged cans comprising:
a headstock assembly supported by a shaft and rotatable about a horizontal axis;
at least one trimmer unit rotatably mounted in the headstock assembly on an axis radially spaced from the rotatable axis of the headstock assembly, the trimmer unit including a ball spline assembly that includes a spindle having an annular cutting element secured to one end thereof, the spindle being axially movable within the trimmer unit;
a tailstock assembly supported by the shaft and rotatable coaxially with the headstock assembly;
at least one can base holder rotatably mounted in the tailstock assembly along the same axis as the trimmer unit, the can base holder supporting the lower end of a can so that the open flanged end of the can is positioned between the spindle and the can base holder and is disposed over the annular cutting element;
means for moving the spindle axially within the trimmer unit;
a rotatable cutting element positioned in the path of the axially moving spindle; and
means for rotating the shaft to rotate the headstock and the tailstock assemblies and means for rotating the spindle and the can base holder about the same horizontal axis while the headstock and the tailstock assemblies are jointly rotated;
whereby, upon axial movement of the spindle, the annular and rotatable cutting elements cooperate to trim a flanged end portion from the open end of a can disposed between the annular and rotatable cutting elements.

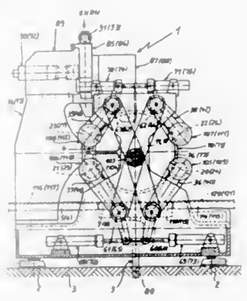


4,914,991

LATHE FOR MACHINING THE BRAKE DISKS IN A SET OF WHEELS DISMANTLED FROM A RAILROAD VEHICLE

Kurt Bathelt; Wolfgang Beck, both of Dortmund; Dirk Brinkmann, Lünen-Niederaden, and Wilfried Reske, Schwerte, all of Fed. Rep. of Germany, assignors to Hoesch Maschinenfabrik Deutschland AG, Dortmund, Fed. Rep. of Germany

Filed Mar. 9, 1989, Ser. No. 321,520
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1988, 3809250
Int. Cl.[4] B23B *5/02, 5/28*
U.S. Cl. 82—104 **7 Claims**



1. A lathe for machining brake disks in a set of wheels removed from a railroad vehicle, comprising: two tail stocks in said lathe and having lathe centers for securing a set of wheels between said lathe centers; said lathe centers defining an axis therebetween, and said set having an axis; wheel-set raising and lowering means for raising and lowering said axis of said set with respect to said axis between said lathe centers; at least one swivel head and one cutting tool for recontouring said brake disks, said set having two wheels; a plurality of driven friction rollers pivoting and engaging the two wheels in said set; each

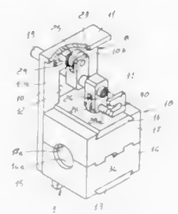
wheel in said set having a tread; each wheel in said set being driven by four friction rollers; means for forcing said four friction rollers against said tread, said four friction rollers being positioned substantially diametrically opposite one another in pairs for transmitting peripheral forces to said wheels sufficient to recontour said brake disks in one step.

4,914,992

DEVICE FOR IMPROVING THE FEED OF A BAR IN AN AUTOMATIC LATHE FOR MACHINING BARS

Vladimiro Fabbri, Faenza, Italy, assignor to I.E.M.C.A. S.P.A., Faenza, Italy

Filed Sep. 30, 1988, Ser. No. 252,481
Claims priority, application Italy, Oct. 14, 1987, 3650 A/87
Int. Cl.[4] B23B *13/02*
U.S. Cl. 82—127 2 Claims



1. A device for improving guiding of a bar and a bar-pusher in a bar loader assembly for feeding bars to an automatic lathe comprising

a box-like body fixed to said bar loader assembly;

an entry and an exit opening for the bar formed in said box-like body;

a sliding plate vertically guided inside said box-like body and having a lower end;

a first bracket fixed to said lower end and projecting from said plate;

an opening formed in said plate and defining a vertical sliding guide;

a gib in sliding engagement with said opening and having a top end;

a second bracket fixed to said top end;

a first and a second jaw rigidly connected to said first and second bracket respectively, said jaws having semicylindrical cavities facing one another;

means for moving said jaws in opposite directions between a closure position wherein said jaws abut together to define a duet for guiding the bar and an open position wherein said jaws are spaced one another to define a passage for guiding the bar-pusher, said bushing and passage being in alignment with said entry and exit openings.

4,914,993

DEVICE FOR CONTROLLING BAR FACING ON AUTOMATIC LATHES FOR MACHINING BARS

Vladimiro Fabbri, Faenza, Italy, assignor to I.E.M.C.A. S.P.A., Faenza Ra, Italy

Filed Oct. 11, 1988, Ser. No. 255,698
Claims priority, application Italy, Oct. 16, 1987, 3656 A/87
Int. Cl.[4] B23B *13/02*
U.S. Cl. 82—127 3 Claims

1. Device for controlling the facing position of a bar on an automatic lathe for machining bars comprising

an advancement element arranged for moving in an advancing direction toward said lathe;

a bar pusher rigidly connected to said advancement element;

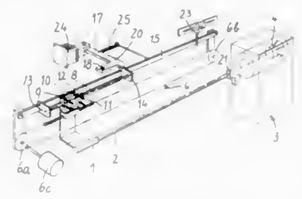
a guide parallel to said advancing direction;

a carriage slidingly supported on said guide;

rod means arranged on said carriage and extending parallel to said advancing direction;

intercepting means controlled between an interception position of said carriage corresponding to a bar loading position and a release position;

clutch means for frictionally connecting said bar-pusher to said rod means so as to cause entrainment of said carriage along said guide toward said lathe when said intercepting means is in said release position and to allow sliding of said



bar-pusher relative to said rod means when said intercepting means are in said interception position;

first sensor means arranged to detect the front end of a bar to be machined at a predetermined distance from said facing position of a bar and to activate said intercepting means from said interception position to said release position; and

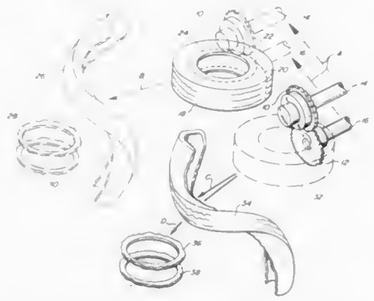
second sensor means arranged along said guide and controlling stopping of said advancement element when said front end has covered said predetermined distance.

4,914,994

AUTOMATED APPARATUS FOR DEBEADING OF SCRAP TIRES

Randel L. Barclay, 5616 Carpenter Rd., Stockton, Calif. 95205

Continuation-in-part of Ser. No. 1,686, Jan. 9, 1987, Pat. No. 4,738,172. This application Apr. 15, 1988, Ser. No. 181,967
The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.
Int. Cl.[4] B02C *18/06, 23/02*
U.S. Cl. 83—18 17 Claims



1. A method of removing the bead wires from a tire of a type having an inside diameter, a tire axis and opposed side walls, comprising,

elongating the portion of a tire associated with bead wires disposed within the tire by applying a stretching force within an inside diameter of the tire,

flattening the portion of a tire associated with bead wires disposed within the tire by applying a compression force upon a side wall of the tire at said bead wires,

providing relative motion between the compressed tire and a shearing device, said relative motion being a linear

advancement of said shearing device drawing together the tire and said shearing device,

effecting a first shear into the compressed tire by said linear advancement, said first shear being in a direction that is at least closely tangential to the bead wires within the tire,

ceasing linear advancement of the tire when the bead wires are adjacent said shearing device, and

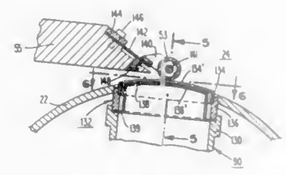
effecting a second shear of the tire by rotating the tire about a tire axis.

4,914,995

ROTARY CUTTING APPARATUS

Paul V. Osborn, Webster, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 38,079, Apr. 14, 1987, abandoned. This application Sep. 22, 1988, Ser. No. 248,283
Int. Cl.[4] B26D *1/56*
U.S. Cl. 83—100 10 Claims



1. Apparatus for cutting a moving plastic film web at predetermined locations:

a die having a cutting surface;

means supporting said die for rotating said cutting surface along a circular arc; and

roller means positioned at a stationary location along said circular arc for cylicly contacting and rolling across said cutting surface for cutting a plastic film web passing between said roller means and said cutting surface at the predetermined locations in the web, said roller means comprising a roller mounted on a support member by an assembly including a bracket mounting a shaft supporting said roller, said bracket being attached to one end of a leaf spring member and the other end of the leaf spring member being attached to said support member to provide a leaf spring cantilever arm supporting said roller at said one end, and adjustable means carried by said support member and contacting said leaf spring member to preload the spring to minimize inertia forces on said roller and adjust the height of said roller with respect to said cutting surface of said die.

4,914,996

PRESSING TOOL FOR STAMPING APPARATUS

Gerard Lavorel, Pringy, France, assignor to Atelier de Decoupage Emboutissage et Mecanique de La Vallee de L'Arve ADEMVA, Thyes, France

Filed Jan. 3, 1989, Ser. No. 293,137
Claims priority, application France, Jan. 4, 1988, 88 00221
Int. Cl.[4] B26D *7/18, 1/06;* **B21D** *28/02*
U.S. Cl. 83—151 3 Claims

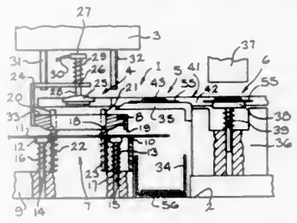
1. A pressing tool for a stamping apparatus comprising:

means for cutting a blank from a strip fed longitudinally through said tool, said blank cutting means including a stationary lower punch carried by a press table and a mobile upper die located above said lower punch, said mobile upper die adapted and constructed to be moved in the direction of said lower punch by a mobile press slide;

means for cutting end scrap from such strip, said end scrap cutting means including shears having a stationary blade engaged with and supported by said lower punch and press table and a mobile blade engaged with and carried by said upper die and press slide;

means for transferring a blank from a first station to a second station positioned above said mobile upper die; and,

means for lifting each cut blank to said transfer means;



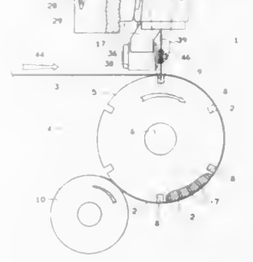
wherein said blank cutting means and said end scrap cutting means both operate during movement of said mobile press slide toward said press table and said lifting means operates to place a cut blank into said transfer means during movement of said mobile press slide away from said press table.

4,914,997

TRANSVERSE CUTTING DEVICE FOR CUTTING INTO LENGTHS A STRIP TRAVELING CONTINUOUSLY ALONG A PREDETERMINED PATH

Bruno Belvederi, S. Martino Di Monte S. Pietro, Italy, assignor to G.D. Societá Per Azioni, Bologna, Italy

Filed Jul. 20, 1988, Ser. No. 221,889
Claims priority, application Italy, Jul. 22, 1987, 3564 A/87
Int. Cl.[4] B26D *1/58*
U.S. Cl. 83—156 6 Claims



1. A transverse cutting device (1,51) for cutting into lengths (2) of a predetermined size a strip (3) traveling continuously along a predetermined first path, said device comprising means (4) for feeding and guiding said strip (3) along said first path and through a cutting station (9); and a cutting unit (11) for successively cutting said strip (3) transversely; said cutting unit (11) comprising at least one cutting element (39,57); supporting and actuating means (12,17,24,52) for moving said cutting element (39,57) along an endless second path (46) laying on a plane extending substantially transversely to said first path, and intersecting said first path in said cutting station (9), and along

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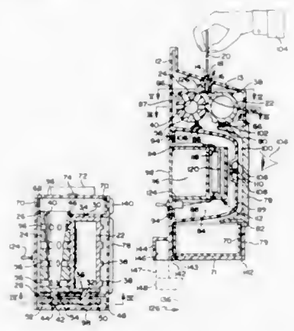
a given cutting line, the first path having a line (45) forming a given angle (A) with a line perpendicular to said cutting line; a means (18,19) for adjusting the position of the plane of said second path in such a manner that, for a given speed of said strip (3) along said first path, said angle (A) depends on the size of said lengths (2) and traveling speed of said cutting element (39,57) along said cutting line; said feeding and guide means (4) comprising a roller (5) turning about an axis perpendicular to said first path, and at least one longitudinal groove formed alng a peripheral surface of said roller (5); said cutting element (39,57) moving, in use, along said groove (8) as said groove (8) is advanced by said roller (5) through said cutting station (9).

4,914,998
SECURITY DOCUMENT PROCESSOR
John R. Barla, 19715 Parkside, St. Clair Shores, Mich. 48080
Filed Aug. 12, 1988, Ser. No. 231,460
Int. Cl.[4] B02C *4/02*
U.S. Cl. 83—165 19 Claims



1. An apparatus for obliteration of confidential information imprinted upon a disposable planer portion of a multi-part security document of standard dimensions by an embossed printer at a retail point of sale, said apparatus comprising:

a generally rectangular upstanding vertically elongate housing defining a laterally extending document receiving slot in a top surface of said housing, first and second optically transparent viewing windows in a front surface of said housing, and a frangible bottom section in a bottom surface of said housing which, when removed creates a waste discharge opening, said slot dimensioned for receiving said disposable document portions, one at a time, in a predetermined orientation;

a guide member fixedly disposed within said housing means in a closely spaced generally parallel relationship with said first window, said guide member and first window coacting to define a vertically extending guide chute having an inlet at the upper end thereof and an outlet at the lower end thereof, said guide chute dimensioned whereby a document portion will freely pass therethrough in said fixed orientation generally parallel to said first viewing window;

a waste storage receptacle disposed beneath said guide chute outlet for receiving fully oblitered document portions;

a document portion processor enclosed within said housing means vertically intermediate said document receiving slot and guide chute inlet, said processor including at least two horizontally disposed tangentially abutting rollers and means operative to selectively drive said rollers counter-rotationally to engage a leading edge of a document portion inserted into said slot, to feed said document portion downwardly between said rollers, said rollers carrying a plurality of chisels and chisel receiving recesses disposed for mutual complimentary engagement to punch a predetermined pattern of holes in said document portion to serially obliterate selected confidential information imprinted on said document portion, beginning at said leading edge as said document portion passes between said rollers, and to feed said leading edge of said document portion containing said obliterated information into said guide chute inlet retaining said document portion in said fixed orientation adjacent said first viewing window whereby an apparatus operator can visually verify said information obliteration prior to said disposal of said document portion and said document portion remains entirely enclosed within said housing during said obliteration verification;

a document inlet guide disposed intermediate said document receiving slot and document processor, and a drive actuator circuit including at least one light source and at least two photo sensitive receivers laterally disposed adjacent said inlet guide on one side of said document receiving slot and an opposed reflective surface on the other side of said slot to sense the presence of an opaque object within said inlet guide and energize said drive means in response to the presence of said opaque object, said opaque object having a lateral dimension sufficient to simultaneously obstruct line of sight between said light source and both said photo sensitive receivers to energize said drive means, said light source, when illuminated, being visible to the apparatus operator;

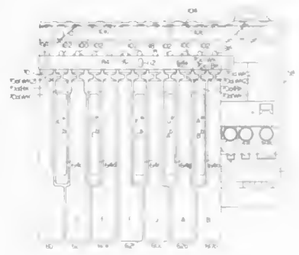
means operative to back light said document portion as it passes before said viewing window; and

guide portions depending from said guide member operative to reposition and stack oblitered documents within said storage receptacle in a second predetermined orientation and means to prevent operator access to said obliterated security documents, said storage receptacle disposed for receiving said chaff from a chaff discharge chute disposed behind said second viewing window whereby said operator can simultaneously view said obliterated document portion and chaff,

said chisel receiving recesses comprising generally radially extending passageways communicating the outer circumferential surface of said roller with a single interior cavity whereby chaff punched from said document portion is progressively urged radially inwardly and discharged into said cavity for intermixing with chaff from earlier-obliterated document portions, said radially extending passageways have characteristic varying lengths to effect a time delayed discharge of said chaff into said interior cavity, said interior cavity being generally conically shaped having a closed end of minor radial diameter and an open end of major diameter, said open end communicating with said chaff discharge chute enclosed within said housing laterally adjacent said document portion discharge chute whereby upon rotation of said rollers, chaff contained within said interior cavity is simultaneously intermixed with chaff from earlier-oblitered document portions and urged toward said chaff discharge chute, and

said document processor being further operative to indefinitely suspend an oblitered document portion within said guide chute in a position viewable by said operator until another security document is placed within said document receiving slot to reenergize said roller drive.

4,914,999
KEYBOARD ASSEMBLY FOR FORMING KEYBOARD APPARATUS OF ELECTRONIC MUSICAL INSTRUMENT
Takamichi Masubuchi, and Jun-ichi Mishima, both of Shizuoka, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan
Filed Sep. 2, 1988, Ser. No. 239,798
Claims priority, application Japan, Sep. 4, 1987, 62-222752; Sep. 21, 1987, 62-237857; Oct. 1, 1987, 62-249500; Oct. 1, 1987, 62-249501; Oct. 1, 1987, 62-151295[U]; Nov. 30, 1987, 62-303889; Dec. 25, 1987, 62-332960; Dec. 25, 1987, 62-332958
Int. Cl.[4] G10C *3/12;* G10H *1/34*
U.S. Cl. 84—423 R 53 Claims



40. A keyboard assembly for forming a keyboard apparatus of an electronic musical instrument, the keyboard assembly including

(a) at least one combination of at least two unitary key units consisting of first and second key units each comprising a plurality of key members and an elongated bracket portion integrally interconnecting the key members of each key unit together, and

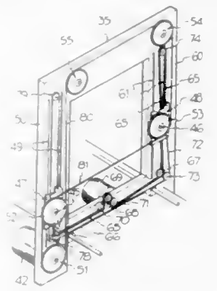
(b) a frame structure to which said key units are assembled together,

characterized by

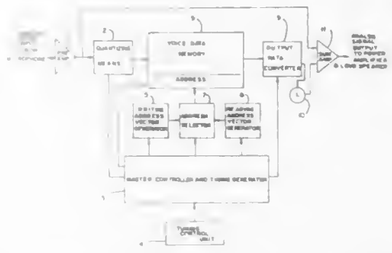
(c) position restricting means establishing a predetermined positional relationship between said first and second key units for enabling the first and second key units to be positioned in said predetermined relationship with respect to each other before the key units are assembled to said frame structure.

4,915,000
CUTTING MACHINE
Richard O. MacFarlane, 4 Ladner Street, O'Connor, Western Australia, Australia 6163
Filed May 24, 1988, Ser. No. 197,988
Claims priority, application Australia, May 25, 1987, PI02099
Int. Cl.[4] B26D *1/46;* B27B *13/00;* B23D *55/08*
U.S. Cl. 83—651.1 8 Claims

1. A cutting machine having an endless wire supported by a plurality of rollers to travel a fixed length continuous path, drive means operable to cause the wire to travel the continuous path, a first portion of the wire that extends between a first pair of the rollers providing a first cutting element as the wire travels the continuous path, the first pair of rollers being arranged to rotate in a first common plane when the wire is traveling the continuous path and being displaceable in synchronism to move the path of the first cutting element in the first plane whilst maintaining the length of the continuous path substantially constant, a second pair of rollers arranged to rotate in a second plane with a portion of the endless wire extending between the second pair of rollers providing a second cutting element as the endless wire travels the continuous path, the second cutting element being inclined to the direction of the first cutting element, and the second pair of rollers being displaceable in synchronism to move the second cutting element in the second common plane, while maintaining the length of the continuous path substantially constant.



4,915,001
VOICE TO MUSIC CONVERTER
Homer Dillard, 12667 Lonsdale, Bridgeton, Mo. 63044
Filed Aug. 1, 1988, Ser. No. 226,957
Int. Cl.[4] G10H *1/00, 1/02, 3/03*
U.S. Cl. 84—600 27 Claims



9. In a apparatus for electrically changing an input waveform of a musical instrument or the human voice comprising:

means for generating an input waveform from said musical instrument or said voice;

means for quantizing said input waveform into a plurality of component waveforms;

means for generating a process waveform comprising means for generating contra-rotating read and write vectors through said input waveform rotating at equal angular velocities or address change rates through a controlled periodicity;

said process waveform being comprised of a plurality of harmonics, each having an integar harmonic relationship with respect to the combination of said input waveform, and said controlled periodicity.

4,915,002
MUSIC SYNTHESIZER ADJUNCT
John Dornes, 69 Mercer St., New York, N.Y. 10012
Continuation of Ser. No. 2,233, Jan. 12, 1987, abandoned. This application Feb. 28, 1989, Ser. No. 318,419
Int. Cl.[4] G10H *1/02, 3/06, 1/46*
U.S. Cl. 84—692 7 Claims

1. A variable control device accessory for a music synthesizer having an electric variable switch and having a horizontally disposed keyboard, the variable control device accessory being adapted and constructed to be positioned in front of the

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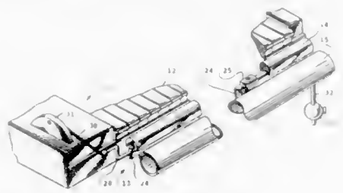
horizontally disposed keyboard and displaced therefrom comprising.

an elongated relatively slender bar dimensioned approximately the width of the horizontally disposed keyboard and being disposed at a plane approximately parallel therewith whereby at least one wrist of a player may rest on the elongated relatively slender bar while the player fingers the horizontally disposed keyboard in order to play the music synthesizer,

said elongated relatively slender bar slidably mounted on a pivotable frame which is mountable with respect to said



music synthesizer adapted and constructed to be displaceable in arcuate movement or in horizontal slidable movement parallel to the front of the horizontally disposed keyboard in response to the wrist action of the player,

said elongated relatively slender bar having linkage means for mechanically operating said electric variable switch of said music synthesizer, and an adjustable counterweight mounted to said elongated relatively slender bar for returning said elongated relatively slender bar to a preselected normal position when said elongated relatively slender bar is released from a given position.

4,915,003

BODY FOR AN ELECTRONIC STRINGED INSTRUMENT

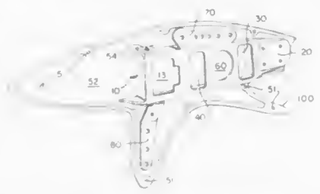
Eric Clough, Berkley, Mich., assignor to EMC2, Inc., Akron, Ohio

Continuation-in-part of Ser. No. 215,218, Jul. 5, 1988. This application Dec. 30, 1988, Ser. No. 292,119

The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.

Int. Cl.[4] G10D *3/00, 1/08;* G10H *3/00*

U.S. Cl. 84—291 26 Claims



1. A body for an electronic stringed instrument comprising.

(a) a rigid chassis means for enhancing sustain properties and resonance of said stringed instrument, said chassis means having a first end adapted to receive and secure a neck of the stringed instrument and an opposite end adapted to receive and secure a bridge of the stringed instrument, said chassis means having at least one opening in an upper surface thereof, adapted to receive and secure an electric pickup, and

(b) an outer body shell, said outer shell having a lower portion removably secured to said rigid chassis means and an upper portion removably secured to said lower portion, said outer shell creating a cavity into which various electronic components may be secured.

4,915,004

BODY FOR AN ELECTRONIC STRINGED INSTRUMENT

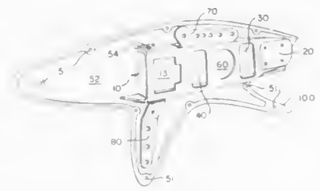
Eric Clough, Berkley, Mich., assignor to EMC2, Inc., Akron, Ohio

Filed Jul. 5, 1988, Ser. No. 215,218

The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.

Int. Cl.[4] G10D *3/00, 1/08;* G10H *3/00*

U.S. Cl. 84—291 11 Claims



1. A body for an electronic stringed instrument comprising.

(a) a metal chassis of a fixed shape, having an upper surface having a first end adapted to receive and secure a neck of the stringed instrument and an opposite end adapted to receive and secure a bridge of the stringed instrument, two side panels and a pair of end panels attached to the upper surface, each end panel attached to the side panels, said end panels, side panels and upper surface defining an open box-like structure, said chassis having at least one opening in the upper surface thereof,

(b) an outer body shell, said outer shell having a lower portion removably secured to said metal chassis and an upper portion removably secured to said lower portion, said outer shell creating a cavity into which various electronic components may be secured.

4,915,005

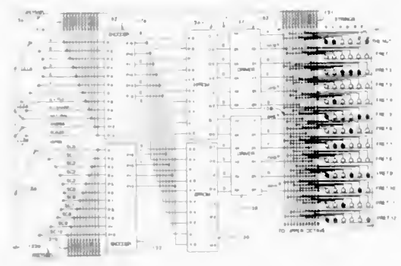
FINGERING DISPLAY FOR MUSICAL INSTRUMENT

John R. Shaffer, 4691 Albany Cir. #136, San Jose, Calif. 95129, and Robert W. Gorry, Jr., 17 Pendleton St., New Haven, Conn. 06511

Filed Aug. 25, 1988, Ser. No. 236,509

Int. Cl.[4] G10D *3/06;* A63J *17/00*

U.S. Cl. 84—314 R 19 Claims



1. Analyzing and teaching apparatus to be used in reference to a musical instrument of the type having at least one tone-selecting element manually operable in a range of configurations, comprising:

manually operable input means including an electrically powered circuit for entering the conventional musical designation of a predetermined set of tones;

said electrically powered circuit including a note-switch means having a first plurality of output lines, said note-switch means being manually operable to cause not more than two of said note-switch output lines to be selected at one time;

said circuit also including a mode-switch means having a second plurality of output lines, said mode-switch means being manually operable to cause one and only one of said mode-switch output lines to be selected at one time;

said circuit also including a type-switch means having a third plurality of output lines, said type-switch means being manually operable to cause one and only one of said type-switch output lines to be selected at one time; and

indicating means coupled to said input means and responsive to the designation entered therein to give simultaneous indications of all the elements and all the configurations thereof corresponding to said predetermined set of tones.

4,915,006

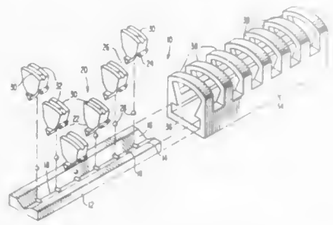
SUPPORT FOR DEFINING AN END POINT OF THE VIBRATING PORTION OF THE STRINGS OF A STRINGED MUSICAL INSTRUMENT

Ned Steinberger, New Windsor, N.Y., assignor to Steinberger Sound Corporation, Newburgh, N.Y.

Filed Jan. 18, 1989, Ser. No. 310,795

Int. Cl.[4] G10D *3/06*

U.S. Cl. 84—314 N 16 Claims



1. A support for defining an end point of the vibrating portion of the strings of a stringed musical instrument comprising.

a base having a slot with walls which converge to an apex line; and

at least one rocker having walls which converge to a knife edge complementary to the apex line, the angle between the walls of the base being larger than the angle between the walls of the rocker to allow the rocker to rock in the slot while the knife edge engages the apex line, said at least one rocker having contacting means for contacting at least one of said strings and moving with said at least one string in a direction along the length of said at least one string while maintaining the end point of the vibrating portion of said at least one string at a constant position relative to the base in the direction along the length of said at least one string.

4,915,007

PARAMETER SETTING SYSTEM FOR ELECTRONIC MUSICAL INSTRUMENT

Masatada Wachi; Kosei Terada; Naota Katada; Tsuyoshi Futamase, and Toshiaki Sato, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Feb. 11, 1987, Ser. No. 13,559

Claims priority, application Japan, Feb. 13, 1986, 61-29749; Feb. 13, 1986, 61-29750; Feb. 13, 1986, 61-29752; Feb. 13, 1986, 61-29777

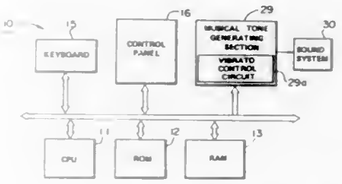
Int. Cl.[4] G10H *1/06, 1/42, 7/00*

U.S. Cl. 84—622 28 Claims

1. A parameter setting system for an electronic musical instrument having tone generating means for generating a musical tone of a selectable characteristic, wherein selection of a selectable characteristic causes the selectable characteristic to be imparted to the musical tone, comprising:

first memory means for storing a parameter of certain value for controlling a first characteristic of the musical tone which corresponds to the selectable characteristic;

parameter value changing means, automatically responsive to the selection of the selectable characteristic, having a



manually operable member for causing said parameter in said first memory means to change in value in accordance with an operation of said member;

reading means for reading said parameter from said first memory means; and

tone control means responsive to said read parameter for cooperating with the tone generating means to control said first characteristic of the musical tone.

4,915,008

AIR FLOW RESPONSE TYPE ELECTRONIC MUSICAL INSTRUMENT

Shigeo Sakashita, Hamura, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1988, Ser. No. 256,770

Claims priority, application Japan, Oct. 14, 1987, 62-259294; Dec. 31, 1987, 62-200109[U]

Int. Cl.[4] G10H *1/14, 1/46*

U.S. Cl. 84—658 22 Claims

1. An electronic instrument comprising:

air flow sensor means for detecting an air flow state induced by a player and for producing a corresponding analog detection signal;

analog-to-digital conversion means for converting the analog detection signal detected by said air flow sensor means to a corresponding digital detection signal;

time-counting means for counting a first time instant when the value of the digital detection signal from said analog-to-digital conversion means exceeds a preset value and for counting a second time instant when a predetermined time is elapsed from said first time instant;

tone generation commencement designation means for pro-

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viding a tone generation commencement designation signal for designating the commencement of tone generation in response to said first time instant counted by said counting means;

initial data generation means for generating initial data at the commencement of the tone generation according to the value of said digital detection signal at said second time instant counted by said time-counting means; and

tone parameter control means for providing initial data generated by said initial data generation means and for controlling a tone parameter at the commencement of the tone generation according to said initial data.

4,915,009

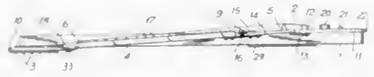
STRINGED ELECTRIC MUSICAL INSTRUMENT WITH INDEPENDENTLY SUSPENDED SET-UP MODULE

Robert M. Kunstadt, 470 W. End Ave., New York, N.Y. 10024

Filed May 18, 1988, Ser. No. 195,509

Int. Cl.[4] G10H *3/00, 1/32, 3/18;* **G10D** *3/00*

U.S. Cl. 84—743 **11 Claims**



1. An electric stringed musical instrument comprising:

at least one string;

first means for tensioning said string, said first means being resiliently deformable by string tension at levels encountered in normal use;

second means for positioning a nut, bridge, fingerboard and pickup in predetermined spatial relation with respect to each other and with respect to an axis defined by the portion of said tensioned string intermediate said nut and bridge;

third means for urging said string against said nut;

fourth means for urging said string against said bridge;

said first means being structurally connected to said second means substantially only in the regions of said nut and said bridge; and

said predetermined spatial relation of said nut, bridge, fingerboard and pickup being maintained regardless of the resilient deformation of said first means, due to the relative independent action of said first means with respect to said second means.

4,915,010

BARRELED WEAPON WITH REGENERATIVE PROPELLANT INJECTION

Sonke Bleickert, Ruckersdorf; Gunther Lochner, Altdorf, and Klaus Schluter, Erlangen, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

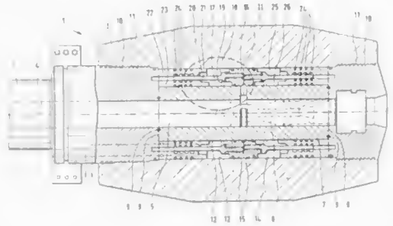
Filed May 15, 1989, Ser. No. 351,726

Claims priority, application Fed. Rep. of Germany, May 17, 1988, 3816663

Int. Cl.[4] F41F *1/04*

U.S. Cl. 89—7 **10 Claims**

1. Barreled weapon with regenerative propellant injection; comprising an annular cylindrical space extending coaxially about the barrel of said weapon and about a projectile chamber formed in a cylindrical wall component; two facing and oppositely moveable annular pistons being located in said cylindrical space, said annular pistons each having a piston shaft dividing space available rearwardly of a piston head into two selectively interconnectable charging spaces, each said piston head including passageways extending from the charging spaces and connecting with the end surfaces of the piston head, said passageways being spaced relative to each other so as to be sealed off upon contacting the oppositely located end surfaces of the piston heads, and radial break-throughs being formed in the cylinder component wall facing towards the projectile chamber in the region of the contacting plane of said oppositely located end surfaces of the pistons heads.



4,915,011

BREECH LOCKING SYSTEM FOR SELF LOADING FIREARMS

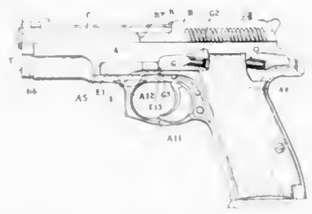
David E. Smith, Wootton, England, assignor to Victory Arms Co., Ltd., London, England

Filed Sep. 7, 1988, Ser. No. 241,501

Claims priority, application United Kingdom, Sep. 11, 1987, 8721385; Oct. 26, 1987, 8724995

Int. Cl.[4] F41C *5/06*

U.S. Cl. 89—176 **8 Claims**



1. A self loading firearm of the locked breech, short recoil pistol type having a frame, a barrel having an underside, a breech block slide and hold open means operative to hold the slide in a fully retracted position relative to the frame, said firearm being provided with a locking block accommodated in part beneath the underside of the said barrel, said locking block being provided with means for positively locking the barrel to the slide during the high pressure period of the firing cycle of the firearm and means for enabling release of the slide from the barrel during the remainder of the firing cycle, means being provided for permitting release of the locking block only when the breech block slide is held to the fully retracted position by said hold open means to disengage the barrel to permit the barrel to be removed from the firearm without need for further disassembly of the firearm without need for further disassembly of the firearm, said means for permitting release of the locking block comprising a rotary catch which is rotatable between a position to hold the locking block in its barrel retaining position and a position in which the locking block is able to release the barrel, said catch being axially moveable between a position in which it is non-rotatable to a position in which it is rotatable to its position in which it permits the locking block to release the barrel.

4,915,012

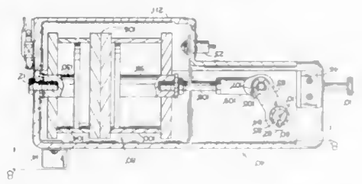
CONTROL SCHEME FOR APPARATUS WITH MOVEABLE RAIL SECTION

Harold L. Osthus, West Willington; John F. de Raismes, Simsbury, and Lawrence S. Wolfson, West Hartford, all of Conn., assignors to Gerber Garment Technology, Inc., Tolland, Conn.

Division of Ser. No. 117,433, Oct. 29, 1987, Pat. No. 4,840,123, which is a continuation-in-part of Ser. No. 937,927, Dec. 4, 1986, abandoned. This application Mar. 29, 1989, Ser. No. 330,154

Int. Cl.[4] F01B *15/02;* **F15B** *15/24;* **E01B** *25/24*

U.S. Cl. 91—217 **18 Claims**



1. An apparatus for selectively generating controlled movements to a pivotal member comprising:

a housing assembly;

said housing assembly supportingly mounting actuator means and torque transmission means;

said actuator means being slidably fixed to said housing assembly to generate linear movement at one end of said actuator means in response to said actuator means being energized and deenergized.

said torque transmission means comprising torque shaft means rotatably mounted to said housing assembly and being connected to said pivotal member,

said torque transmission means being connected with said one end of said actuator means by crank means to generate rotational movement about said torque shaft means in response to said linear movement generated by said actuator means;

stop means for limiting said axial movement of said actuator means; and

wherein said actuator means comprises a first piston rod means operatively attached with said crank means, said stop means including a downwardly depending portion of said first piston rod means.

4,915,013

CONTROL VALVE MEANS FOR PRESSURIZED AIR-OPERATED DEVICES FOR DRIVING FASTENERS INTO WORKPIECES

Roland Moraht, and Manfred Bühnke, both of Hamburg, Fed. Rep. of Germany, assignors to Joh. Friedrich Behrens AG, Ahrensburg, Fed. Rep. of Germany

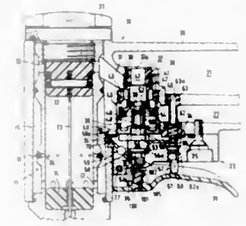
Filed Jul. 11, 1988, Ser. No. 217,613

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1988, 8801114

Int. Cl.[4] F01L *25/02*

U.S. Cl. 91—307 **15 Claims**

1. Control valve means for pressurized air-operated devices for driving fasteners into a workpiece by which a working cycle of a working piston is effected each working cycle having a single working stroke of the piston for driving-in a fastener which is followed by a return stroke, said device having further a piston return chamber to return said piston from a lower deadpoint position to an upper deadpoint position, said control valve comprising a pressure and vent passage connected to a working stroke chamber above said piston, a main control space, a pressure-controlled stepped main valve spool located in said pressure and vent passage and having a smaller effective area and a larger effective area, said smaller effective area selectively subjected to the pressure of a reservoir for compressed air in said device, said larger effective area in selective communication with said main control space for the control of subsequent working cycles alternatingly pressurized or vented, an auxiliary valve spool supported for movement coaxial of said main valve spool including a first effective area and a second effective area opposite to said first effective area, a trigger valve, said first effective area of said auxiliary valve spool being selectively connected to said pressure passage or to atmosphere by the actuation of said trigger valve, said second effective area of said auxiliary valve spool being connected to



a passage through which a reverse pulse is supplied in order to displace said auxiliary valve spool into a second position, wherein said main control space is connected to said pressure passage in order to displace said main valve spool into its closed position, said auxiliary valve spool being returned into its first position by the pressure of said pressure passage if the pressure on said second effective area falls below a predetermined value, characterized in that said second effective area of said auxiliary valve spool is connected to said piston return chamber through a short passage including a throttle.

4,915,014

DISK HARROW HYDRAULIC WING BALANCING SYSTEM

Ronnie F. Burk, Waterloo; Larry M. Delfs, Cedar Falls; Michael R. Gilmore, Davenport, all of Iowa, and Warren L. Thompson, Colona, Ill., assignors to Deere & Company, Moline, Ill.

Division of Ser. No. 731,699, May 8, 1985, Pat. No. 4,630,526. This application Aug. 1, 1986, Ser. No. 891,837

Int. Cl.[4] E15B *13/06;* **A01B** *73/00*

U.S. Cl. 91—420 **4 Claims**

1. In an implement having a first frame part and a second frame part movable with respect to the first frame part, one of the frame parts supporting a ground-engaging tool and a hydraulic cylinder connected between the frame parts to move the second frame part with respect to the first frame part, a control system for controlling said hydraulic cylinder, said control system comprising:

a pump;

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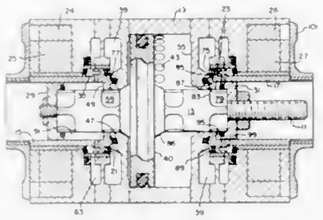
a reservoir;
a control valve for controlling fluid communication between the pump, reservoir and head and rod ends of the cylinder, the control valve having first and second control ports;
a first pressure-reducing valve between the first control port and the head end of the cylinder, the first pressure-reducing valve having pressure-adjusting means for adjusting the fluid pressure communicated to the head end of the cylinder and having means for returning fluid from the head end of the cylinder to the control valve when the rod end of the cylinder is pressurized, the first pressure-reducing valve comprising a three-position, two-way valve having first and second inlets communicated with the first and second control ports, respectively, of the control valve, an outlet port communicated with the head end of the cylinder, a valve member movable from a first position wherein the first inlet is communicated to the outlet port and wherein the second inlet is blocked, to a second position wherein the second inlet is blocked and wherein the first inlet is communicated to the outlet port via a restriction and to a third position wherein the first inlet is blocked and wherein the outlet port is communicated to the second inlet, a first pilot communicated with the outlet port for urging the valve member to its third position, a second pilot communicated with the second inlet for urging the valve member to its first position, and adjustable biasing means to urging the valve member toward its first position; and
a second pressure-reducing valve between the second control port and the rod end of the cylinder, the second pressure-reducing valve having pressure-adjusting means for adjusting the fluid pressure communicated to the rod end of the cylinder and having means for returning fluid from the rod end of the cylinder to the control valve when the head end of the cylinder is pressurized.

4,915,015

PNEUMATIC ACTUATOR

William E. Richeson, and Frederick L. Erickson, both of Fort Wayne, Ind., assignors to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Jan. 6, 1989, Ser. No. 294,727
Int. Cl.[4] F01L *9/00*; F15B *13/044*
U.S. Cl. 91—459 16 Claims



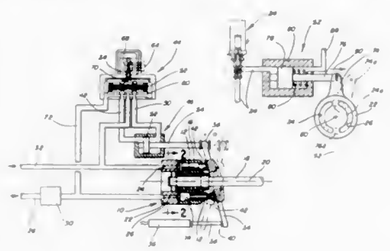
1. A pneumatically powered valve actuator comprising a valve actuator housing; a piston reciprocable within the housing along an axis, the piston having a pair of oppositely facing primary working surfaces; a pressurized high pressure air source, an intermediate pressure air pressure source, and a Low pressure air outlet; a pair of air control valves reciprocable along said axis relative to both the housing and the piston between open and closed positions; means for selectively opening one of said air control valves to supply pressurized air from the air source to one of said primary working surfaces causing the piston to move; means operable subsequent to initial piston movement and responsive to continued piston motion for compressing a trapped volume of air thereby slowing piston movement; means for returning some of the trapped air which has been compressed to a pressure greater than the pressure of the high pressure source to the high pressure source; and means for selectively controlling the quantity of trapped air which is returned to the high pressure source.

4,915,016

HYDROMECHANICAL CONTROL SYSTEM FOR A POWER DRIVE UNIT

Wesley A. Burandt, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Apr. 7, 1988, Ser. No. 179,025
Int. Cl.[4] F01B *13/04*
U.S. Cl. 91—482 11 Claims



1. A method of controlling a hydromechanical power drive unit having a hydraulic motor of the axial piston type, including a cylinder block defining a plurality of cylinders each having one of said pistons reciprocally movable therein, a wobbler to vary the axial displacement of the pistons of the motor, and a port plate at one end of the cylinder block having port means in alignment with the cylinders and in communication with fluid supply and return means, comprising the steps of:
varying the angular position of the wobbler; and
adjusting the position of the port plate to adjust the position of the port means relative to an incline plane of the wobbler independently of the functioning of the hydraulic motor and the varying of the angular position of the wobbler.

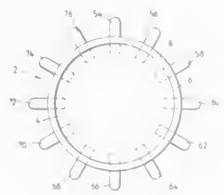
4,915,017

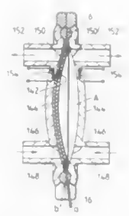
DIAPHRAGM AND A DIAPHRAGM-ACTUATED FLUID-TRANSFER CONTROL DEVICE

Gena Perlov, Haifa, Israel, assignor to D. F. Laboratories Ltd., Haifa, Israel

Filed Oct. 13, 1988, Ser. No. 256,976
Claims priority, application Israel, Oct. 26, 1987, 84286
Int. Cl.[4] F01B *25/26, 19/00*; F16J *3/00*
U.S. Cl. 92—5 R 12 Claims

1. A diaphragm for a diaphragm-actuated fluid-transfer control device, comprising a flexible, substantially non-stretchable, substantially circular imperforate body surrounded and delimited by a beaded rim, said body having a first surface and an oppositely disposed second surface, and said body having a substantially dish-like, bi-stable shape invertible from a first stable state in which the first body surface is convex and the second body surface is concave to a second stable state in which said first body surface is rendered concave and said second body surface is rendered convex; and at least one substantially rigid, elongated arm fixedly embedded in said body





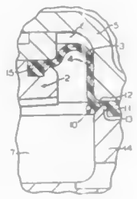
to a depth exceeding the radial width of said beaded rim, the free end of said arm projecting beyond said beaded rim.

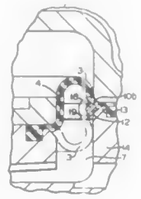
4,915,018

DIAPHRAGM PISTON ASSEMBLY

Daniel G. Scott, Swissvale, and Theodore B. Hill, North Versailles, both of Pa., assignors to American Standard Inc., Wilmerding, Pa.

Filed Sep. 13, 1988, Ser. No. 243,875
Int. Cl.[4] F01B *19/00*; F16J *3/00*
U.S. Cl. 92—98 D 31 Claims





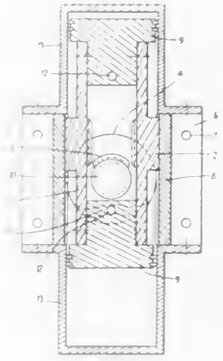
1. A diaphragm piston assembly comprising:
(a) an annular diaphragm having an inner periphery and an outer periphery;
(b) a piston in which said inner periphery of said diaphragm is clamped;
(c) a housing having clamping faces between which said outer periphery of said diaphragm is clamped, said piston being movable relative to said housing,
(d) a first fluid pressure chamber on one side of said piston and a second fluid pressure chamber on the opposite side of said piston;
(e) said diaphragm having a convolution in the space between said piston and said housing, said convolution having a preferred direction of formation and a non-preferred direction of formation in which said convolution is inverted from said preferred direction of formation; and
(f) annular ring means interposed between one side of said diaphragm and one of said housing and said piston for directing said diaphragm in said preferred direction of formation at a location between said outer periphery and said convolution, and for forming a bend in said diaphragm at said location between said outer periphery and said convolution when said convolution is inverted to said non-preferred direction of formation to thereby create such internal diaphragm stress as to urge said convolution to revert to said preferred direction of formation.

4,915,019

MECHANISM FOR TRANSFORMING THE RECIPROCAL MOVEMENT OF A PISTON INTO A CIRCULAR MOVEMENT OF A SHAFT

Jacques Hovaguimian, 11 avenue Ollivary, F-13008 Marseille, France

PCT No. PCT/FR86/00283, § 371 Date Apr. 10, 1987, § 102(e) Date Apr. 10, 1987, PCT Pub. No. WO87/01167, PCT Pub. Date Feb. 26, 1987
PCT Filed Aug. 8, 1986, Ser. No. 50,128
Claims priority, application France, Aug. 13, 1985, 85 12436
Int. Cl.[4] F01B *9/00*
U.S. Cl. 92—136 4 Claims



1. A device for transforming a reciprocal movement of a piston into a continuous rotary movement of a shaft, which comprises:
(a) a pair of pistons, each said piston providing a stroke in an opposite direction;
(b) two racks, each rack integral with and travelling uniformly in response to a stroke from both of pistons;
(c) said shaft;
(d) a circular grear having a toothed sector fixed to said shaft and disposed between said two racks, said toothed sector being in meshing engagement with one of said racks during a stroke from one of said pistons in one direction and

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in meshing engagement with the other of said racks during a piston stroke from the other of said pistons in the opposite direction;

(e) two rollers disposed and fixed on opposite faces of each of said pistons, on the longitudinal axis thereof; and

(f) two cams fixed on said shaft, each cam having a groove having five different zones co-acting with one of said rollers one said zone being concentric with the rotational axis of said shaft and corresponding to the termination of the stroke of one of said pistons, said cams guiding said rollers.

4,915,020

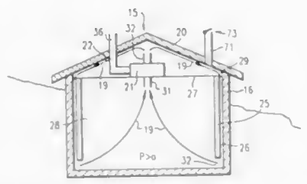
RADON CONTROL IN DWELLINGS

Robert F. Dumbeck, P.O. Box 548, Elgin, Tex. 78621

Continuation-in-part of Ser. No. 576,431, Feb. 2, 1984, abandoned. This application Sep. 15, 1986, Ser. No. 906,945

Int. Cl.[4] F24F *7/00*

U.S. Cl. 98—1.5 5 Claims



3. Apparatus for reducing radon gas concentration within a dwelling seeping thereinto through radon porous dwelling walls from the earth adjacent to the dwelling to a level of less than four picocuries per liter of air comprising in combination,

blower means, and

control means for operating the blower as a function of varying ambient pressures outside the dwelling for forcing fresh air into the dwelling to establish and maintain air pressure within the dwelling on said walls sufficiently greater than outside ambient air pressure to thereby constitute means for preventing seepage of radon gas through the walls into the dwelling from the earth adjacent the dwelling at a concentration above said level,

a housing for installation through a wall of said dwelling which contains said blower means.

an outlet path through said housing for removal of the air in response to the blower means.

means operable to differential pressure sensing means effecting a control signal when the air pressure within the dwelling exceeds the ambient air pressure outside the dwelling enough to insure reduction of seepage of radon through dwelling walls thereby to remove air through said outlet path, and

means for operating the blower in response to the control signal to maintain the pressure within the dwelling sufficient to prevent the radon gas concentration in the dwelling above said level.

4,915,021

AIR OUTLET FOR AN INTERIOR SPACE, ESPECIALLY FOR THE INTERIOR SPACE OF A MOTOR VEHICLE

Freddie Soethout, Pulheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

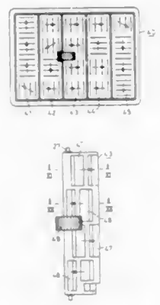
Filed Jun. 20, 1989, Ser. No. 368,848

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1988, 3821110

Int. Cl.[4] B60H *1/34;* F24F *13/15*

U.S. Cl. 98—2 10 Claims

1. An air outlet for an interior space, the air outlet including a housing having a plurality of rectangular pivoted vanes which are coupled to each other and swivel together in the housing between a closed position and an open position, wherein the vanes comprise plates having a width equal, at the most, to the inside width of the air outlet divided by the number of plates, such that the plates can lie in a common plane when in the closed position, and each plate is provided with several duct-type openings having axes that form an angle (α) of between 30° and 60° with the plate plane.



4,915,022

VENT ASSEMBLIES

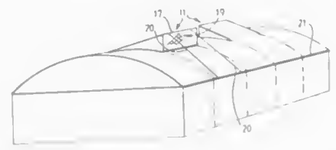
Gary M. Lynch, M/S 1020, Fernvale Queensland, Australia 4305

Filed Sep. 6, 1988, Ser. No. 241,043

Claims priority, application Australia, Sep. 8, 1987, PI4214

Int. Cl.[4] A01G *15/00;* F24F *7/02*

U.S. Cl. 98—42.2 6 Claims



1. A vent assembly adapted to be mounted to a building of the type having a roof defined by a plurality of spaced apart arcuate roof frame members, said vent assembly including a pair of opposite end frame members defining the general profile of a sawtooth, said end frame members being adapted to be mounted, in longitudinal alignment, to respective said roof frame members to extend upwardly therefrom, each said frame member including a first inclined portion adapted to be secured at one end to said roof frame member and extend generally tangentially thereto, and a second generally upright portion adapted to be secured at its lower end to said roof frame member, elongated frame means adapted to extend longitudinally of said building and secured to the respective said end frame members adjacent the junction of said first and second portions, sheet material covering said end frame portions so as to define a vent opening between said second portions, and roller screen means secured to said elongated frame means and selectively movable between a first position wherein said screen means substantially closes said vent opening and a second opening position wherein said screen means permits air to be vented through said opening.

4,915,023

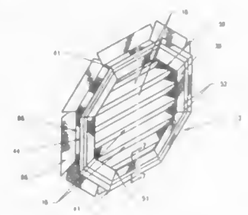
ALUMINUM AIR VENT OF LOUVER

Bryant E. Porter, 553 West, 9400 South, Sandy, Utah 84070

Filed May 17, 1989, Ser. No. 352,968

Int. Cl.[4] F24F *13/08*

U.S. Cl. 98—121.1 13 Claims



1. An aluminum-faced air vent or louver which is adapted to be flush-mounted to an exterior wall of a building, said louver comprising

a wood frame consisting of a plurality of elongated wooden members attached end to end to form an enclosed polygonal frame;

a plurality of spaced aluminum fins extending from one side edge of the wood frame to the opposite side edge thereof, each of said fins having a substantially flat front portion lying substantially in the plane of the front face of said wood frame, with each of said fins further having a substantially flat sloping portion which slopes from the front face of said frame to the back face thereof;

means for anchoring the respective front corners of each of said fins to the edge of said wood frame at the front face thereof;

means for anchoring the respective back corners of each of said fins to the edge of said wood frame at the back face thereof;

an aluminum face molding made from an elongated sheet of aluminum which has been bent several times along its longitudinal length to form an elongated C channel, with a hem bend to accommodate an integrated decorative face, said molding having a nailing flange on the back side, said molding further being cut at an angle into sections somewhat longer than the length of the polygonal sides at the perimeter of the wood frame, said sections further being cut with two small slices cut at the bottom of the channel on the non-miter end of each section to allow folding at the corners of the wooden frame, said sections further being bent and formed around the wooden frame with the decorative face extending inward from the perimeter of the hem bends in the plane of the front face of the wood frame; and

means are provided for interlocking the outside part of the decorative face at the channeling area, said means comprising of hem bends formed at the outside front portion of the face moldings, whereas a hem bend of one section receives a flange of the adjacent section, thus the hem bends are abutted up closely, forming a sturdy junction.

4,915,024

PRESS ROLL OF ADJUSTABLE SAG

Wilbelm Wanke, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 222,134, Jul. 21, 1988, abandoned. This application Aug. 11, 1989, Ser. No. 393,864

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1987, 3728389

Int. Cl.[4] B30B *3/04*

U.S. Cl. 100—162 B 32 Claims

1. A press roll with adjustable sag comprising:

a yoke for extending the length of the press roll and for defining a support;

a respective support pedestal at each end of the press roll and means at each end of the yoke for resting on the pedestal for supporting the yoke there;

a hollow roll shell disposed around the yoke and rotatable around and with respect to the yoke, the roll shell having an exterior for forming a nip with a mating roll extending parallel to the roll shell, and the press roll having a press plane which is the plane joining the axis of the press roll and the axis of a mating roll;

a respective self-aligning bearing disposed at each end of the roll shell for supporting the end of the roll shell for rotation;

a guide part for the end of the roll shell on which each roll shell bearing is supportable;

means inside the roll shell and extending between the roll shell and the yoke for supporting the roll shell on the yoke, and the roll shell being rotatable past the supporting means at the yoke;

a respective force producer at each end of the press roll, located radially outside of the roll shell and at axial locations along the roll shell coinciding with axial locations of the roll shell bearings, and the force producer being disposed between the guide part for the bearing, on the one hand, and the support pedestal, on the other hand; the force producer being connected with the guide part for displacing the guide part and the roll shell supported thereby generally along the press plane and relative to the yoke;

the guide part for the roll shell bearing comprising a bearing housing for the roll shell bearing and further comprises guide elements connected with the guide part for guiding the guide part to move under the influence of the force producer; and

the guide elements comprising linear guide elements for guiding the guide part to move linearly at least approximately in the press plane; the linear guide elements being arranged outside the roll shell.

4,915,025

ANVIL CYLINDER FOR PROCESSING MACHINE

Hidetaka Miyazaki, Kasugai, Japan, assignor to Isowa Industry Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 22,127, Mar. 5, 1987, abandoned. This application Jan. 12, 1989, Ser. No. 296,891

Claims priority, application Japan, Mar. 7, 1986, 61-032885[U]

Int. Cl.[4] B41F *23/04*

U.S. Cl. 101—424.1 1 Claim

1. A cardboard processing machine for subjecting a sheet of cardboard material fed along a conveyance path therethrough to a plurality of processing operations comprising:

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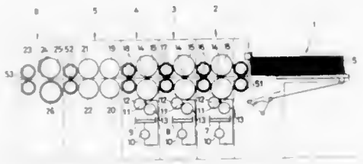
means for printing on a sheet of cardboard material fed along the conveyance path;
means for punching and ruling a sheet of cardboard material including a rotary die cutter downstream of said means for printing;
an anvil cylinder mounted downstream of said printing means along said conveyance path, said anvil cylinder being mounted for rotation about a longitudinal axis thereof for supporting the sheet of cardboard fed along the conveyance path in opposition to said means for punching and ruling the sheet, said anvil cylinder being provided so as to contact a printed surface of the printed cardboard sheet printed by said means for printing; and



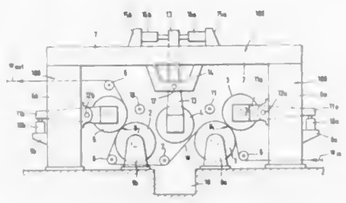
means for preventing smudging of the next conveyed cardboard sheet by ink transferred to said anvil cylinder by a previous cardboard sheet including
means for directly heating the outer surface of said anvil cylinder by means of a heater provided in the interior wall of said anvil cylinder whereby printing ink transferred to said anvil cylinder when the printed sheet of cardboard is conveyed between said anvil cylinder and said punching and ruling means is quickly heated and dried thereon by the heat directly transmitted by means of said heater from the interior wall of said anvil cylinder to the outer surface of said anvil cylinder thereby preventing the transference of said transferred printing ink to a next conveyed cardboard sheet.

4,915,026

ON-MACHINE CALENDER FOR A PAPER MACHINE WITH ELASTIC RESERVE ROLL

Matti Halme, Helsinki, Finland, assignor to Valmet Paper Machinery Inc., Finland

PCT No. PCT/FI88/00063, § 371 Date Nov. 21, 1988, § 102(e) Date Nov. 21, 1988, PCT Pub. No. WO88/08468, PCT Pub. Date Nov. 3, 1988
PCT Filed Apr. 27, 1988, Ser. No. 278,438
Claims priority, application Finland, Apr. 28, 1987, 871871
Int. Cl.[4] D21G *1/00*
U.S. Cl. 100—162 R 19 Claims



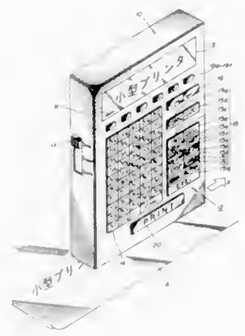
1. An on-machine calender which can be directly connected to a paper machine for finishing treatment of a fiber web, said calender including
a first hard roll and a second hard roll substantially fixedly mounted on bearings at a distance from said first hard roll,
at least first, second, and third elastic rolls mounted on bearings in movable support means, such that said elastic rolls can be arranged into working position so as to define calendering nips with said hard rolls, there being only said two hard rolls and said three elastic rolls in the calender for defining the calendering nips, and
a plurality of guiding rolls which lead a run of a web through said calendering nips, wherein
all said hard rolls are situated at substantially the same horizontal level,
all said elastic rolls are situated at substantially the same horizontal level with respect to one another, and above said level of said hard rolls, said third elastic roll constitutes a reserve roll which is structured and arranged to be movable into nip contact with either of said first and second hard rolls and is situated between said first and second elastic rolls, and said support means for said third elastic roll comprises a turnable supporting arm upon which said third elastic or reserve roll is mounted, arranged to support said third elastic or reserve roll substantially vertically from above, said arm pivotally mounted for pendular movement, and force means for moving said arm, and in turn said third elastic or reserve roll, in order to achieve loading of a respective nip with said reserve roll.

4,915,027

HAND-HELD MANUALLY OPERABLE PRINTING APPARATUS

Norio Ishibashi, Akishima; Kazuki Yamauchi, Hino; Satoshi Aso, Chofu, and Atsushi Sagisaka, Hino, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1988, Ser. No. 170,714
Claims priority, application Japan, Mar. 28, 1987, 62-74866; Apr. 10, 1987, 62-80769; Apr. 20, 1987, 62-96848; Apr. 20, 1987, 62-96851
Int. Cl.[4] B41F *1/34;* B41J *3/36*
U.S. Cl. 101—486 37 Claims



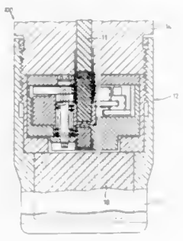
1. A hand-held electronic printing, apparatus comprising:
a manually manipulatable housing means which is manually sweepable across a printing medium;
printing means carried by said housing means for printing information on a printing medium positioned outside of said housing means, when said housing means is manually swept across said printing medium;
position-detecting means for detecting a position of said printing means relative to said printing medium as said housing means is manually swept across said printing medium, and for producing position-detecting signals every time said housing means is swept over a predetermined distance, said position-detecting signals representing the position of said housing means with respect to said printing medium;
signal source means for storing information which is segmented into a plurality of information items, and for generating information signals corresponding to information to be printed;
selecting means for selecting one of said segmented information items stored in said signal source means;
display means having a display area for successively displaying information contained in said segmented information item selected by said selecting means, said display means displaying said information beginning at a position corresponding to a head position of said display area;
signal supplying means for sequentially supplying information signals corresponding to information contained in said information item selected by said selecting means from said signal source means to said printing means;
control means for controlling said printing means in response to said position-detecting signals and for causing said printing means to print said information contained in said selected information item on said printing medium in response to said information signals supplied thereto from said signal source means;
detecting means for detecting the end of said information signals of said information items which are sequentially supplied from said signal source means and for outputting a detection signal responsive to detection of the end of said information signals of said information items; and
stopping means coupled at least to said detecting means for stopping a printing operation of said printing means in response to said detection signal output from said detecting means, thereby always stopping printing at the end of a segmented information item regardless of further sweeping of said housing means relative to said printing medium.

4,915,028

DUD DE-ARMING DEVICE OR INSERT FOR A PROJECTILE FUZE

Robert Apotheloz, Greifensee, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle, Zürich, Switzerland

Filed May 12, 1989, Ser. No. 350,913
Claims priority, application Switzerland, May 16, 1988, 01827/88
Int. Cl.[4] F42C *15/44*
U.S. Cl. 102—238 7 Claims



1. A dud de-arming device for a projectile fuze of a projectile containing a firing train leading to a booster charge, the dud de-arming device being located in the firing train leading to the booster charge, said dud de-arming device comprising:
a rotor carrying a lead charge which is a member of the firing train leading to the booster charge of the projectile;
said rotor selectively assuming either one of two rotational positions, namely (i) a de-armed position in which said lead charge is located out of alignment with said firing train and the firing train is interrupted, and (ii) an armed position in which said lead charge is located in alignment with the firing train and the firing train is completed;
said rotor being rotationally moved from said de-armed position into said armed position upon firing of the projectile;
said rotor being rotationally movable from said armed position back into said de-armed position in the event the projectile is present as a dud;
an escapement device which moves the rotor, after a delay time, out of its armed position into its de-armed position;
means for enabling said escapement device in the presence of an impact deceleration of a projectile provided with the dud de-arming device;
a substantially cylindrical housing; and
said dud de-arming device being located in said substantially cylindrical housing.

4,915,029

SHAPED CHARGE CARRIER ASSEMBLY METHOD

Roger C. Appledorn, Katy; Lary G. Ratliff, Columbus, both of Tex.; William C. Behling, Duncan, Okla., and Michael L. Oestreich, Peoria, Ariz., assignors to Halliburton Company, Duncan, Okla.

and a continuation-in-part of Ser. No. 22,158, Mar. 5, 1987, Pat. No. 4,800,815. This application Nov. 14, 1988, Ser. No. 271,553
Int. Cl.[4] F42B *1/02, 3/00*
U.S. Cl. 102—310 7 Claims

1. A method of assembling a shaped charge carrier apparatus for use in a perforating gun, said method comprising the steps of
(a) providing at least one shaped charge having a generally cylindrical outer surface and having first and second oppositely facing shoulders defined thereon;
(b) providing a thin wall carrier having a substantially circular charge opening disposed therethrough large enough to receive said generally cylindrical outer surface of said shaped charge, said carrier further including deformable retaining means integrally formed therewith adjacent a periphery of said charge opening, and a tool receiving aperture, proximate said charge opening, disposed therethrough;
(c) inserting said shaped charge into said charge opening until said first shoulder abuts said carrier;
(d) inserting a thin bladed tool into said tool receiving aperture; and
(e) deforming said deformable retaining means inwardly into said charge opening to thereby retain said shaped charge in said charge opening of said carrier.

4,915,030

APPARATUS FOR CONVEYING ARTICLES

Yukito Matsuo; Tsuyoshi Ishida; Hiromi Miyaji, all of Yokohama, and Masanori Iwamoto, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Aug. 27, 1987, Ser. No. 90,006
Claims priority, application Japan, Sep. 5, 1986, 61-207756
Int. Cl.[4] B61B *7/00*
U.S. Cl. 104—88 18 Claims

1. An apparatus for conveying articles between a plurality of stations, said apparatus comprising:
main conveyance means including a main conveyance path

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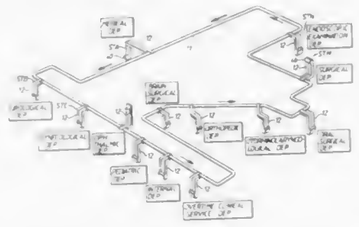
for conveying said articles between an origin station and a destination station, any of said plurality of stations capable of serving as either an origin station or a destination station, the destination station of said articles input into said apparatus at said origin station;

each of said plurality of stations including a branch conveyance path extending from said main conveyance path, said branch conveyance paths conveying articles from or to said main conveyance path;



detecting means for detecting a malfunction in said branch conveyance paths and for generating a signal indicating a malfunction; and

central control means for controlling said main conveyance means to convey articles between said stations and for independently controlling each said station, said central control means controlling said main conveyance path to operatively disconnect any of said stations from said apparatus in response to a signal transmitted by said detecting means.

4,915,031

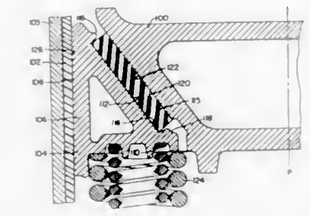
RAILWAY TRUCK DAMPING ASSEMBLY

Donald Wiebe, Sewickley, Pa., assignor to Hansen, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 741,299, Jun. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 467,565, Feb. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 278,755, Jun. 29, 1981, abandoned. This application Dec. 23, 1988, Ser. No. 291,428

Int. Cl.[4] B61F *5/12*

U.S. Cl. 105—198.2 49 Claims



1. In a railway truck assembly having a pair of elongated, laterally spaced metal side frames each having a longitudinally central open area and an elongated metal bolster having the ends thereof extending at least into said open areas, respectively, and supported therein by upwardly extending spring arrangements carried by said side frames with the upper ends thereof in engagement with the undersurfaces of said ends of said bolster, respectively, to support said bolster for movement relative to said side frames, wherein each end of said bolster has opposed downwardly open and open ended pockets with sloping inner surface means converging downwardly with respect to each other and each of said side frames has at the longitudinally spaced ends of said open area thereof essentially vertically extending first surfaces spaced outwardly of the open end of the one of said pockets adjacent thereto, a friction assembly comprising:

a metal friction member adapted to be disposed at least partially within a given one of said pockets adjacent a respective one of said first surfaces with a vertically extending second surface thereof in slidable engagement with said one of said first surfaces, said friction member having a surface extending in spaced confronting relationship to the said sloping inner surface means of said one of said pockets to provide a pair of spaced confronting surfaces;

an elastomeric means comprised of a pair of laterally spaced elastomeric portions located between said pair of spaced confronting surfaces with each of said portions having a pair of spaced exterior surfaces which are engageable, respectively, with said pair of spaced confronting surfaces;

at least one of said exterior surfaces of said elastomeric means being slidable with respect to the one of said pair of spaced confronting surfaces in engagement therewith;

helical coil spring means engageable with said friction assembly;

means for supporting said helical coil spring means with respect to said friction assembly in a manner to maintain said friction assembly in continuously biased engagement with the respective said first surface and inner surface means;

said elastomeric means having an elastic characteristic that said vertically extending second surface of said friction member is in stationary engagement with the respective said first surface during an initial extent of relative movement of said bolster with respect to said side frames in either one of opposite vertical directions and in sliding engagement with said first surface cooperable therewith after said initial extent, with said initial extent being of relatively constant magnitude throughout repeated cycles of said relative movement in said opposite directions and said continuously biased engagement being maintained at a relatively uniform magnitude of bias during the transition from said stationary engagement to said sliding engagement.

4,915,032

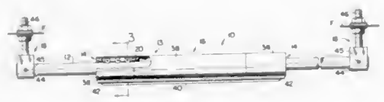
DOOR HANGER ASSEMBLY

Walter Drews, 422 Field St., Naugatuck, Conn. 06770

Filed Mar. 29, 1989, Ser. No. 330,412

Int. Cl.[4] B16D *1/00;* **E05D** *15/00*

U.S. Cl. 105—329.1 11 Claims



1. A door hanger assembly for a railway passenger car and comprising an axially elongated cylindrical support member, a pair of bearing modules, each of said bearing modules having a body and including a bore receiving said support member therethrough and a plurality of roller bearings mounted on said body and disposed in rolling engagement with said support member, an axially elongated tubular sheath received on said support member, each of said bearing modules being disposed within an associated end portion and said tubular sheath, said bearing modules being maintained in axially spaced apart relation to each other by said sheath, at least one door hanger depending from said sheath, and means for adjustably securing said support member in fixed position relative to the frame of an associated railway car such as aforesaid with the axis of said shaft generally horizontally disposed.

4,915,033

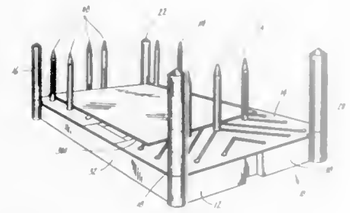
PARTS STACKING PALLET

Irvin D. Bond, 1027 Allen Rd., Clarkston, Mich. 48016

Filed Aug. 1, 1988, Ser. No. 227,099

Int. Cl.[4] B65D *19/44*

U.S. Cl. 108—55.1 11 Claims



1. A pallet for supporting a plurality of similarly shaped parts, such as metal stampings, piled one above the other, in a stacked position, said parts each having a border with a common configuration, said pallet comprising:

a base having a planar upper supporting surface for receiving the parts in said stacked position;

the base having a plurality of slots disposed adjacent the border of the parts in said stacked position, said slots extending parallel to the plane of the supporting surface of the base;

a plurality of similarly-shaped locating pins;

each of said locating pins having a hollow body, an elongated insert received in the body, and means for connecting one end of the insert to the body;

fastener means mounted on the base for releasably connecting the other end of the insert of each locating pin to the base to support the locating pin in an upright position in an adjusted location along a corresponding one of said slots, and

said locating pins being mounted on the base generally parallel to one another and being spaced around the stacked position of the parts adjacent the border thereof to prevent movement of the parts in a direction parallel to the plane of the base,

whereby a part may be lowered on the base and guided to said stacked position by the locating pins.

4,915,034

TABLE SYSTEM

Rainer Grabe, and Erich Becker, both of Springe, Fed. Rep. of Germany, assignors to Wilkhahn Wilkening & Hahne GmbH & Co. KG, Fed. Rep. of Germany

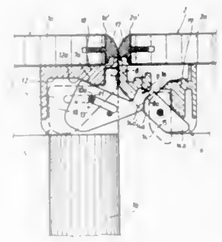
Filed Sep. 4, 1987, Ser. No. 92,947

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1986, 3635288

Int. Cl.[4] A47B *1/00*

U.S. Cl. 108—65 16 Claims

1. Table units adapted for separable connection to one another comprising a first table unit having a top surface; a second table unit having a top surface; first connecting means carried by one of said units at one side thereof and below the level of its top surface; and second connecting means carried by the other of said units at one side thereof and below the level of its top surface, said first and second table units being arranged so that said one side of one unit confronts said one side of the other unit, said first connecting means comprising a lever terminating at one end in a hook means mounting said lever on one of said units for sliding and pivoting movements along a path between retracted and projected positions relative to said one side of said one of said units, said mounting means including pivot means fixed to said one of said units about which said lever pivots, said first connecting means further including means for stablizing said lever against selected pivoting movement when said lever is in its projected position, said second connecting means having means forming a recess for the accommodation of said hook when said lever is in its projected position, and securing means carried by one of said units for releasably engaging said lever and locking said hook in said recess.



4,915,035

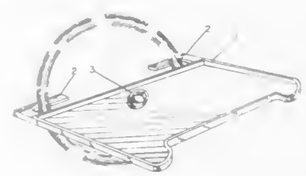
AUTOMOBILE FOOD SERVICE TRAY

Bobby D. Clark, and Shirley J. McMillan, both of P.O. Box 1821, Riverton, Wyo. 82501

Filed Jan. 23, 1989, Ser. No. 299,611

Int. Cl.[4] A47B *23/00*

U.S. Cl. 108—44 1 Claim



1 A flat rectangular service tray for use on vehicle steering wheels having rims in a plane angularly to the horizontal wherein the improvement comprises:

a. two right angle frame members each with the horizontal portions approximately one third the length of the vertical portions;

b. the frames slidably supported by the vertical portions engaging longitudinal slots on each side of the bottom of the tray;

c. the horizontal portions of the frame turned towards each other providing clamping action for attaching the tray to the steering wheel;

d. the longitudinal slots having means for adjusting the transverse spacing between the vertical portions of the frame members;

e. a beverage container support well located on the top front center of the tray; and,

f. the beverage container well being water proof to prevent condensation on the beverage containers from leaking through to the bottom of the tray.

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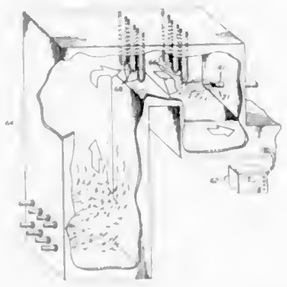
4,915,036

BOILER AND INJECTOR FOR REDUCING THE CONCENTRATION OF POLLUTANTS IN AN EFFLUENT

Vincent A. DeVita, Stamford, Conn., assignor to Fuel Tech, Inc., Stamford, Conn.

Continuation of Ser. No. 160,684, Feb. 26, 1988, abandoned.
This application May 18, 1989, Ser. No. 353,704
Int. Cl.[4] B01F *3/04*
U.S. Cl. 110—215 12 Claims



1. A boiler for the combustion of a carbonaceous fuel, said boiler comprising:
(a) a combustion chamber;
(b) a passage extending from said combustion chamber, said passage capable of containing an effluent from the combustion of a carbonaceous fuel;
(c) an injector apparatus for supplying an atomized treatment fluid into said passage comprising:
(i) an atomization conduit having an injector nozzle at one end thereof extending into said passage;
(ii) at least one jet penetrating the wall of said atomization conduit upstream of said nozzle at a distance equal to about sixteen to up to about thirty-two times the inner diameter of said atomization conduit;
(iii) a supply conduit for supplying an effluent treatment fluid to said at least one jet, said supply conduit being coaxial with and disposed around said atomization conduit;
(d) means for supplying a flow of atomization fluid in said atomization conduit at a velocity of about 200 to about 800 feet per second;
(e) means for supplying said effluent treatment fluid through said supply conduit, and through said at least one jet at a velocity of between about two to about sixty feet per second.

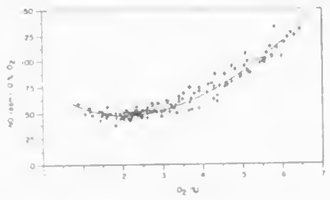
4,915,037

CIRCULATING FLUID BED COMBUSTION WITH CO COMBUSTION PROMOTER

Amos A. Avidan, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 14, 1988, Ser. No. 270,931
Int. Cl.[4] F23B *7/00*
U.S. Cl. 110—342 18 Claims

1. In a circulating fluidized bed combustion zone wherein a carbon-containing material is burned by contact with an oxygen-containing gas in a generally vertical combustor comprising a fast fluidized bed of particulates wherein at least a majority of the particulate matter in the fast fluidized bed has a particle diameter in excess of 100 microns, to generate a flue gas/particulate stream which is discharged from the top of the combustor, said flue gas stream comprising flue gas, fines having a particle diameter less than about 100 microns, and circulating particles having an average particle size within the range of about 100–400 microns, which flue gas stream passes through a separation means to recover from the flue gas at least a majority of the 100–400 micron particles which are recycled to the circulating fluidized bed combustion zone, the improvement comprising adding to the combustor a CO combustion promoter in an amount equal to 0.001 to 100 wt. ppm, based on



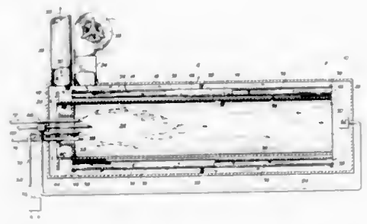
the weight of circulating particles, of a promoter selected from the group of Pt, Pd, Ir, Rh, Os and compounds and mixtures thereof, and wherein said promoter is on a support having an average particle diameter within the range of about 400 to 1200 microns.

4,915,038

SUDDEN EXPANSION (SUE) INCINERATOR FOR DESTROYING HAZARDOUS MATERIALS AND WASTES AND IMPROVED METHOD

Mark L. Sujata, Agoura Hills; Raymond E. Wieveg, Ventura, and Robert Wills, Torrance, all of Calif., assignors to The Marquardt Company, Van Nuys, Calif.

Filed Jun. 22, 1989, Ser. No. 369,880
Int. Cl.[4] F23G *7/04*
U.S. Cl. 110—346 11 Claims



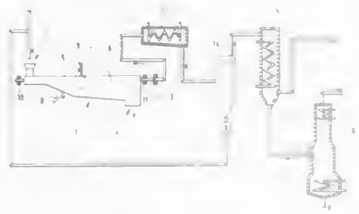
1. An improved incinerator for hazardous and other waste materials, said incinerator comprising, in combination:
(a) a generally tubular elongated, outer housing having a sidewall, a closed front end, and an opposite closed rear end;
(b) a generally tubular elongated heat exchanger open at opposite front and rear ends, releasably disposed in said outer housing and spaced inwardly from said housing sidewall and end walls to provide an annular air passageway therebetween and front and rear spaces;
(c) a generally tubular combustion chamber releasably disposed within said heat exchanger, said combustion chamber being open at opposite front and rear ends thereof, including a narrow diameter front inlet end extending into said front space, and a combustion zone therein adjacent to said inlet end, said housing heat exchanger and combustion chamber being concentric;
(d) a fluidized waste material supply line connected to said housing and passing into said combustion zone through said inlet end;
(e) at least one fuel line and a fuel ignition device connected to said housing and passing into said combustion zone through said inlet;
(f) air blower means connected to the front portion of said housing for forcing air into said annular passageway and over and around said heat exchanger and thereafter in a heated condition to and through said front inlet end to said combustion zone, for efficient combustion of fluidized waste therein, exhaust gases from said combustion passing into the rear end of said heat exchanger and forwardly therethrough to the front end thereof; and,
(g) exhaust gas exit means connected to said front portion of said housing for passing exhaust gases from said incinerator.

4,915,039

PROCESS FOR HEAT-TREATING REFUSE AND EQUIPMENT TO CARRY OUT THE PROCESS

Helmut Ringel, Niederzier-Hambach, Fed. Rep. of Germany, assignor to Kernforschungsanlage Juelich GmbH, Juelich, Fed. Rep. of Germany

Filed Jul. 20, 1988, Ser. No. 221,593
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1987, 3724563
Int. Cl.[4] F23D *3/00*
U.S. Cl. 110—346 18 Claims



1. A process for heat-treating refuse, comprising the steps of
(a) decomposing in a combustion chamber a quantity of refuse into slag, emitted gas and fly dust;
(b) separating the fly dust into a fine dust fraction and a coarse dust fraction;
(c) feeding only the coarse dust fraction back to the combustion chamber; and,
(d) separating the fine dust fraction into desired constituents

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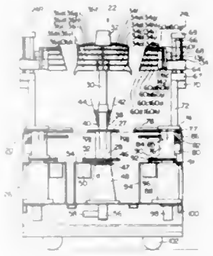
4,915,040

SUIT MATERIAL SUPPORT DEVICE

Kuniharu Sakuma, Saitama; Hiroshi Honda; Koukichi Machata, both of Tokyo, and Takayuki Aikawa, Tokyo, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jan. 18, 1989, Ser. No. 299,568
Claims priority, application Japan, Jan. 1, 1988, 63-132866
Int. Cl.[4] D05B *23/00, 21/00, 3/00*
U.S. Cl. 112—2 3 Claims

1. A suit material support device, comprising:
a suit coat body support member mounted for rotation about an axis from a suit coat mounting position to respective right and left hand sleeve sewing positions, a plurality of suit body bars displacably mounted on said body support member for displacement in the direction of the shoulder length of a body and substantially radially of said direction in a plane intersecting said direction of the shoulder length at right angles, said suit body bars having suit sleeve support faces and clamp needles for clamping suit sleeves against said suit sleeve support faces, and suit body bar displacement means for displacing said suit body bars;
a pair of suit sleeve support members disposed on opposite sides of said suit coat body support member and each mounted for rotation of the corresponding sleeve support member about an axis parallel to said axis about which said body support member is rotatable and from a suit sleeve attaching position to a suit sleeve placing position, a plurality of suit sleeve bars on each of said suit sleeve support members and movable in a lateral direction of the axis of rotation of the corresponding sleeve support member and movable substantially radially of said lateral direction for accommodating different size sleeves, and sleeve bar moving means for moving said suit sleeve bars radially for accommodating different size sleeves and for moving said suit sleeve bars laterally; and
motor means for rotating said suit coat body support member and said suit sleeve support members around the respective axes of rotation,



whereby after the pair of suit sleeve support members in suit sleeve placing positions have had suit sleeves placed thereon, said suit sleeve support members can be rotated to said suit sleeve attaching positions and said suit sleeve bars can be moved laterally toward said suit coat body supporting member for positioning the sleeves on said suit body bars, and then moved radially inwardly to release the sleeves, and after a suit coat body is placed on said body support member over the sleeves, said body support member can then be rotated to one of the right and left hand sleeve sewing positions for sewing the corresponding sleeve to the suit coat body, and can then be rotated to the other of the right and left hand sleeve sewing positions for sewing the corresponding sleeve to the suit coat body.

4,915,041

COMPUTER OPERATED EMBROIDERING MACHINE FOR STITCHING PATTERNS ALONG A CIRCULAR ARC

Hideaki Takenoya, Tokyo, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Nov. 16, 1987, Ser. No. 121,350
Claims priority, application Japan, Nov. 14, 1986, 61-269721
Int. Cl.[4] D05B *21/00*
U.S. Cl. 112—121.12 4 Claims

1. An apparatus for use in a computer operated embroidering machine to stitch predetermined patterns along a circular arc, comprising means for storing a plurality of patterns as groups of coordinate data whereby each group is defined in its own rectangular coordinate system; means for selecting patterns to be stitched; means for inputting operational data for the arc stitching, means for retrieving the selected groups of data and transforming their own coordinate systems into a common rectangular coordinate system; means for transforming the common coordinate system into a new R-X coordinate system defined only by an arcuate X-coordinate whose radius of cur-

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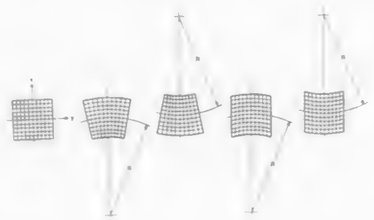
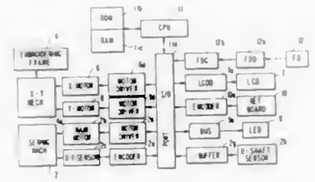
vature corresponds to the radius of the arc; means for modifying the groups of data according to said new coordinate system





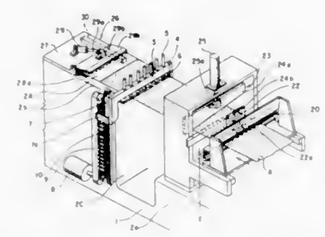
to match the curvature of said arc; and means for stitching the modified patterns along said arc.

4,915,042

DEVICE FOR CORRECTING BENDING OF TOWEL CLOTH

Kenichi Sotome, Tochigi, and Munetaka Nagasaki, Osaka, both of Japan, assignors to SSMC Inc., Fairfield, N.J.

Filed Apr. 17, 1989, Ser. No. 338,702
Claims priority, application Japan, Jun. 7, 1988, 63-74795
Int. Cl.[4] D05B *21/00, 37/04*
U.S. Cl. 112—121.26 **8 Claims**



1. A device for correcting misalignment of towel cloth adapted for use with an automatic sewing machine and comprising:

a pair of first and second working tables integrated with said sewing machine and respectively disposed oppositely and defining a space therebetween;

a detector located at an end of the first working table for distinguishing a plain fabric portion from a pile fabric portion of a towel cloth delivered to the first working table, said towel cloth having a plain fabric portion and a pile fabric portion which is continuous one after the other;

a cutting unit disposed across the first working table and spaced from the detector in a predetermined interval, said cutting unit including means for cutting the towel cloth;

a towel cloth drawing unit composed of a bar member disposed over the space between the first and the second working tables and extending across the width of the upper surface of the towel cloth and means for moving the bar vertically for drawing the towel cloth from a towel material; and

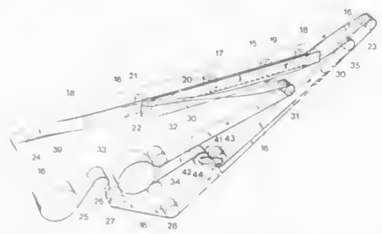
a clamping unit mounted on a base plate which is provided on the second working table, said clamping unit including means movable toward the second working table for clamping and drawing the towel cloth.

4,915,043

DEVICE FOR FOLDING AN EDGE OF A FABRIC FOR MAKING A HEM

Lars Bolander, Borås, Sweden, assignor to Akab of Sweden AB, Sweden

Filed Oct. 7, 1988, Ser. No. 255,155
Claims priority, application Sweden, Oct. 9, 1987, 8703900
Int. Cl.[4] D05B *35/02*
U.S. Cl. 112—147 **9 Claims**



1. A device for folding a first edge of a fabric to form a hem, said device comprising:

(A) a table, said table having a top, said top having a side;

(B) feeding means for feeding the fabric along said top of said table with the first edge of the fabric hanging over said side;

(C) folding means, comprising:

(1) a fixed rule; and

(2) a pair of cooperating endless bands for cooperating with said fixed rule to form the hem by gradually folding the first edge of the fabric as the fabric is fed along said top of said table, one of said cooperating endless bands having a twist which corresponds to the gradual folding of the first edge of the fabric; and

(D) means for temporarily varying the speed of one of said cooperating endless bands relative to the other of said cooperating endless bands so that an end of the hem is located even with or within a second edge of the fabric.

4,915,044

CLOTH PRESSER MECHANISM WITH RACK AND PINION NEEDLE ROD-DRIVE

Tetsuo Kambara; Hideyuki Kobayashi, and Masao Tajima, all of Tochigi, Japan, assignors to SSMC Inc., Fairfield, N.J.

Filed Apr. 17, 1989, Ser. No. 338,669
Claims priority, application Japan, Jun. 7, 1988, 63-74793[U]
Int. Cl.[4] D05B *3/02, 55/14*
U.S. Cl. 112—236 **3 Claims**

1. A cloth presser mechanism adapted for connection to the arm of a sewing machine and comprising a cloth presser vertically movably supported by said arm;

a needle rod vertically movably supported by said arm having a needle at the lower end thereof;

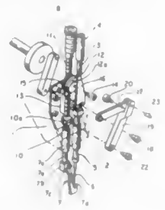
a rack secured to the needle rod;

a pinion rotatably supported by the arm of the sewing machine and engaged with the rack;

a cam integral with the pinion;

a first link having a first end pivotally mounted on the arm of the sewing machine, a middle portion and a second end;

a second link having one end pivotally supported by the cloth presser and an opposite end pivotally connected to the second end of the first link, and



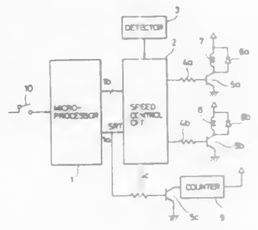
means connected to the middle portion of the first link and engaging the surface of the cam.

4,915,045

SEWING MACHINE CONTROL DEVICE

Katsuhiro Fujikawa, c/o Mitsubishi Denki Kabushiki Kaisha Nagoya Works, No. 1-14, Yadaminami 5-chome, Higashi-ku, Nagoya-shi, Aichi, Japan

Filed Sep. 5, 1986, Ser. No. 904,127
Claims priority, application Japan, Sep. 5, 1985, 60-196209
Int. Cl.[4] D05B *69/26*
U.S. Cl. 112—275 **8 Claims**



1. A sewing machine control device comprising;

a switch for instructing a machine to operate or to stop;

control means for producing a first speed control signal and a running signal having a duration indicative of actual operating time of said machine, said control means being responsive to machine operating instructions received from said switch;

stopping means for stopping said machine;

a driving source for driving said machine;

speed control means for producing and supplying a second speed control signal to said machine driving source and a stop signal to said stopping means in accordance with said first speed control signal from said control means; and

means for detecting said duration of said running signal and for accumulating a count representative of said duration and of the actual accumulated operating time of said machine.

4,915,046

SEAM CONSTRUCTION FOR CONNECTING ELASTOMERIC FOAM SHEETS

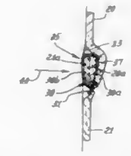
William R. Meistrell, Manhattan Beach, Calif., assignor to Dive N'Surf, Inc., Hermosa Beach, Calif.

Filed Nov. 18, 1988, Ser. No. 272,924
Int. Cl.[4] B32B *7/08;* **A41D** *27/24*
U.S. Cl. 112—419 **7 Claims**

1. Means for retaining and confining the side-by-side edges and edge portions of stretchable elastomer sheets, comprising, in combination with the sheets, edges and edge portions:

(a) a stretchable smooth surfaced band folded into U-shape over said edges to define band portions extending at opposite outer sides of the sheet side-by-side edge portions,

(b) and stitching extending through said folded band portions and through the sheet edge portions in spaced relation to the sheet edges, the stitching tightened to locally compress the sheets along a linear zone extending parallel to said edges and spaced therefrom, the edges and edge



portions then everywhete confined and covered by said U-shaped band,

(c) each sheet resiliently compressed along said zone to less than ½ the sheet thickness in normally uncompressed state, whereby a hinge is created for folding, along said linear zone, of the confined sheet edge portions and edges, and the bulk of the U-shaped band,

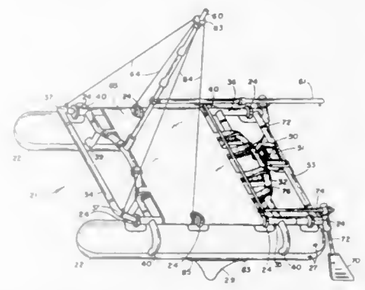
(d) each sheet and the band being bidirectionally stretchable, whereby the hinge is also stretchable along said linear zone.

4,915,047

KNOCK DOWN CATAMARAN WITH INFLATABLE PONTOONS

Christopher P. Lord, Bel Air, and Tracy B. Collins, Towson, both of Md., assignors to Kris-Jen Import Export Incorporated, Bel Air, Md.

Filed Aug. 15, 1988, Ser. No. 231,388
Int. Cl.[4] B63B *1/10*
U.S. Cl. 114—39.1 **39 Claims**



1. In a catamaran boat, especially intended for knockdown disassembly and relatively rapid assembly, the combination which comprises a generally rectangular frame including a pair of spaced-apart longitudinal frame members, the frame further including a pair of spaced-apart yoke members disposed substantially transversely of the longitudinal frame members and fore and aft of the boat, respectively, means for releasably connecting each yoke member to the longitudinal frame members, respectively, a pair of inflatable pontoons disposed below

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the longitudinal frame members, respectively, and having respective side portions, a pair of spaced-apart supporting pontoon locks for each pontoon, arranged fore and aft of the boat, respectively, wherein the pontoon lock is substantially "U" shaped and arranged transversely with respect to the pontoon, the pontoon lock including a pair of leg portions which are substantially parallel, an upper leg portion and a lower leg portion;

the leg portions connected by an intermediate bight portion, the upper leg portion and the bight portion external to the pontoon, the lower leg portion passing transversely through the pontoon, and means for releasably connecting the pontoon lock to the yoke member such that a pair of supporting structural loops is provided for each pontoon and fore and aft thereof.

4,915,048

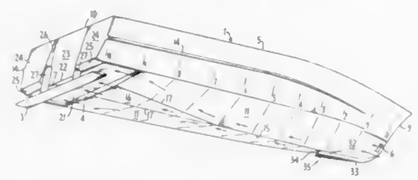
VESSEL WITH IMPROVED HYDRODYNAMIC PERFORMANCE

Ulf H. Stanford, San Anselmo, Calif., assignor to Corwin R. Horton, Kentfield, Calif., a part interest

Continuation-in-part of Ser. No. 43,677, Apr. 28, 1987, abandoned. This application Oct. 27, 1988, Ser. No. 264,708

Int. Cl.[4] B63B *1/32*

U.S. Cl. 114—56 **55 Claims**



1. A vessel of improved performance comprising a hull having planing surfaces aft of the entrance capable of generating a substantial dynamic lifting force on the hull, a fine, deep entrance with steeply sloped surfaces capable of generating in the water flow dynamic downward forces on the bow sufficient at speed to counter aftward lifting forces to maintain the hull at a small trim angle and means spaced from said hull and responsive to the flow passing the hull for applying an aftward downward force on the hull with a locus in the transverse direction of the vessel that is substantially at the longitudinal centerline plane thereof, which downward force, together with said dynamic downward force at the bow, is of sufficient at speed to offset a substantial portion of the dynamic lifting forces on the hull, thereby to substantially restrict the rise in the water of the hull caused by the planing forces.

4,915,049

STEERING HANDLE DEVICE FOR JET-PROPELLED SMALL-SIZED BOATS

Yukio Nakamura, 5-6, 1-Chome, Tengachayakita, Nishinari-Ku, Osaka-Shi, Osaka-Fu, Japan

Filed Oct. 31, 1988, Ser. No. 265,375

Int. Cl.[4] B63B *35/56;* **B62K** *21/16*

U.S. Cl. 114—144 R **4 Claims**

1. A steering handle device for jet-propelled small-sized boats of the type in which:

the stern of the boat is adapted for use as a floor deck on which the rider stands, with an engine mounted on the front portion of said floor deck;

a handle post is pivotally connected at its front lower end to the bow of the boat by a horizontal shaft so that it is swingable;

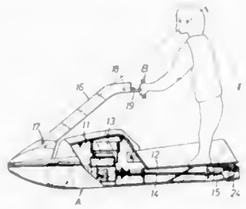
a base board for attaching a handle bar is integrated with a rear upper end of the handle post overhanging the floor deck, and an attaching plate for the handle bar is pivotally connected to the base board by a vertical shaft;

a rider holding the handle bar steers the boat to freely slide over water surface while changing the position at which the rider's foot pressure is applied to the boat;

said steering handle device being characterized in that:

said handle bar is constructed in a substantially H-shape in a front view consisting of a handle bar body horizontally extending transversely of the boat, and a pair of grips generally vertically extending from the opposite ends of said handle bar body;

a middle portion of the handle bar body is integrally fixed to the rear end of the attaching plate,



mouth pieces each extending through the center of the associated grip at a right angle with respect to the generally vertical extent of the associated grip, and fixed thereto, the mouthpieces are fitted on the opposite ends of the bar body and fixed in position such that they can be removed and refitted thereon for angular tilt adjustment of the grips, whereby,

the tilt angle of the grip with respect to a horizontal plane containing the bar body can be adjusted by tilting the grip forward or rearward by turning it around the horizontal longitudinal axis of the handle bar body

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4,915,050

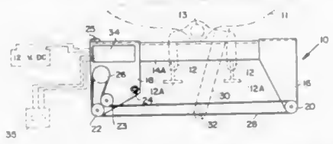
STEERING MECHANISM FOR OUTBOARD MOTOR

Ronald E. Wicker, 308 Yellowstone, Glendo, Wyo. 82213, and Willis J. Patterson, 5224 Ridge Rd., Cheyenne, Wyo. 82009

Filed Nov. 14, 1988, Ser. No. 270,959

Int. Cl.[4] B63H *21/26*

U.S. Cl. 114—144 RE **12 Claims**



1. Apparatus for connection to a marine craft having an outboard motor pivotally mounted on a mounting surface on said marine craft by means of a clamp, said apparatus being adapted to pivot said outboard motor relative to said mounting surface in order to steer said marine craft; wherein said apparatus comprises:

(a) an elongated frame member having first and second ends; said frame member being supported and carried by said clamp;

(b) a support arm having first and second ends; wherein said first end is adapted to be attached to said outboard motor; wherein said second end projects forwardly of said outboard motor;

(c) a D.C. motor carried by said second end of said support arm; said D.C. motor being adapted to be driven selectively in clockwise and counterclockwise directions;

(d) a capstan carried by said support arm and being rotatably driven by said D.C. motor,

(e) a flexible connection member connection between said first and second ends of said frame member;

(f) actuation means operably connected to said D.C. motor and being adapted to cause said D.C. motor to be driven selectively in clockwise and counterclockwise directions;

wherein said capstan engages said connection member in a manner such that rotation of said capstan by said D.C. motor causes said outboard motor to pivot with respect to said mounting surface, whereby said marine craft is steered.

4,915,051

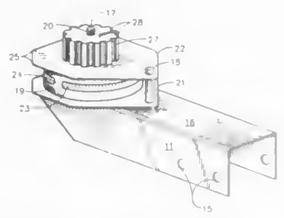
BOAT GUIDANCE STABILIZER

Joseph R. Martinek, 4613 S. Kalispell Way, Aurora, Colo. 80015

Filed Feb. 29, 1988, Ser. No. 162,286

Int. Cl.[4] B63H *25/38*

U.S. Cl. 114—170 **17 Claims**



1. A stabilizer for assisting in controlling the steering of a boat comprising an attachment plate means adapted for attachment to at least one of the boat, the tiller, and rudder and extensions of either, friction controller means adapted for connection to the attachment plate means through spool post means and adapted for movement toward and away from the attachment plate means, spool means mounted between the attachment plate means and the friction controller means and having, on its edge, a groove having at least one modification for the purpose of increasing frictional contact with and between a line means.

4,915,052

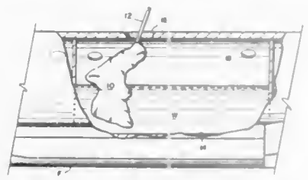
METHOD FOR RESTORING AND MAINTAINING BUOYANCY AND APPARATUS FOR PREVENTING LOSS OF BUOYANCY FOR FLOATPLANES

Gregory C. Reeser, and Terry Welgamot, both of 1600 Kapiolani Blvd., Suite 616, Honolulu, Hi. 96814

Filed Nov. 30, 1988, Ser. No. 278,615

Int. Cl.[4] B63B *43/12*

U.S. Cl. 114—267 **3 Claims**



1. A method for restoring and maintaining buoyancy of a leaking floatplane float having multiple compartments with access hatches and pump-out ports to allow the floatplane to taxi and take-off, comprising the steps of:

ascertaining which compartment in said float is leaking;

inserting an inflatable air bag through an access hatch into said leaking compartment;

opening the pump-out ports for said leaking compartment; and

inflating said air bag until sufficient water is displaced from said leaking compartment through said pump-out ports that said float is sufficiently buoyant to allow said floatplane to taxi and take-off and until said air bag is sufficiently inflated that said leak is sufficiently sealed to maintain such buoyancy during said taxiing and take-off.

4,915,053

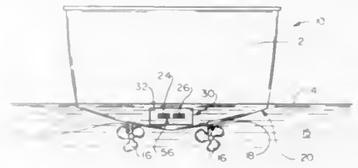
METHOD AND APPARATUS FOR CATHODIC PROTECTION OF MARINE VESSELS

Wendell Goodwin, 9632 Remer St., South El Monte, Calif. 91733

Filed Sep. 9, 1988, Ser. No. 242,155

Int. Cl.[4] B63B *17/00*

U.S. Cl. 114—343 **10 Claims**



1. An improved anodic protection device for marine installation comprising a flat slab formed of a sacrificial metal and having an inner surface for facing the hull of a marine vessel and an opposite, outer surface, and defining entirely within its periphery at least a pair of separate, longitudinally aligned elongated slots having ends located proximate to each other and spatially separated from each other by a distance of at least two inches and having ends located remote from each other and separated by a distance no less than about six and three quarter inches, and a bearing core formed of a material anodically less active than said slab embedded in said slab and exposed at said outer surface of said slab so as to surround said slots.

4,915,054

WARNING DEVICE FOR A BICYCLE

Ninoslav Vidovic; Aleksandra Vidovic, both of 5032 Centre Ave. #201, Pittsburgh, Pa. 15213, and Arnold J. Cook, 5508 Baywood St., Pittsburgh, Pa. 15206, assignors to Arnold J. Cook; Ninoslav Vidovic and Aleksandra Vidovic, all of Pittsburgh, Pa.

Filed Nov. 30, 1988, Ser. No. 277,997

Int. Cl.[4] G10K *9/04;* **B60Q** *5/00*

U.S. Cl. 116—142 FP **6 Claims**

1. A warning device with respect to a bicycle comprising:

a modular grip comprising a first element having a first opening that receives a bicycle handle bar, a platform at a first end of the first element, a hand conforming area disposed essentially parallel to the first opening, and a second opening disposed essentially parallel to the first opening;

a second element having means for signaling and means for actuating the signaling means, said second element removably attached to the platform; and

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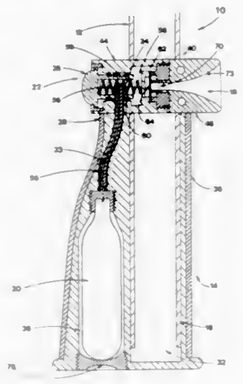
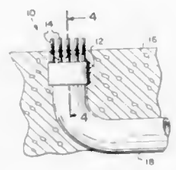
means for powering the signaling means, said powering means being controlled by the actuating means to power



the signaling means, said powering means disposed in the second opening of the first element.

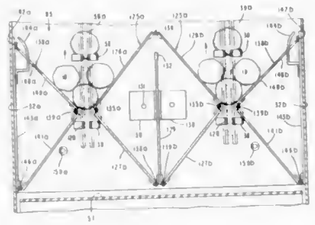
4,915,055
CONDUIT LOCATOR
Edmund J. Ptashinski, Rt. 1, Box 184-F, Banks, Oreg. 97106
Filed Dec. 2, 1988, Ser. No. 278,770
Int. Cl.[4] F16L *55/00*
U.S. Cl. 116—209 3 Claims



1. A conduit locator which comprises:
(a) an adhesive tape adhesively attachable to an end of a plugged conduit prior to covering said conduit with concrete and other material; and
(b) a plurality of springy rods secured to said tape so as to protrude upwardly through a top surface of said concrete and other material after said concrete and other material is poured, thereby serving to indicate the location of said end of said conduit beneath said top surface.

4,915,056
AUTOMATIC DOUGH BALL FEEDING MACHINE
Gonzalo M. Martinez, 9312 Rush St., South El Monte, Calif. 91733
Filed Apr. 5, 1989, Ser. No. 333,303
Int. Cl.[4] B05C *1/02*
U.S. Cl. 118—13 15 Claims

11. A dough ball feeding machine comprising:
a main housing having front and rear ends;
an endless input conveyor belt having its rear end pivotally mounted on the front end of said main housing such that it can be disposed to horizontally extend forwardly of the front end of the main housing;
an endless second conveyor belt having a rear end and mounted to extend through said main housing with at least its front end located below the level of the rear end of said input conveyor belt;
aligning and transferring means located below the rear end of said input conveyor belt and above the front end of the second conveyor belt;
a flour trough having perforations on its bottom mounted within said main housing above said second conveyor belt;
an elevator housing mounted within the rear end of the main housing so as to vertically extend thereabove, said elevator housing having on the top thereof rearwardly directed side elbow enclosures and having on the bottom thereof a rectangular opening formed by a front transverse wall, a rear transverse wall and sidewalls;
a pair of chutes provided in the spacing between the side elbow enclosures on the top of said elevator housing;
a pair of side-by-side V shaped hoppers comprised of opposing linkages residing within each half of said rectangular opening; and



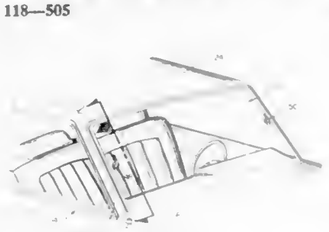
a pair of endless elevator chains carrying cups thereon, each elevator chain mounted within said elevator housing to ride on vertical guide channels provided on the rear wall of each half of said rectangular opening which extends up into the elevator housing and into the spacing between said side elbow enclosures;
whereby dough balls being carried on said input conveyor belt upon dropping off the rear end thereof are aligned and deposited in a transverse row on said second conveyor belt by the aligning and transferring means, whereby the dough balls being carried by the second conveyor belt after being sprinkled with flour on passing under the flour trough are dropped off the rear end of the second conveyor belt into the side-by-side V shaped hoppers, and whereby each of the cups of the elevator chains upon passing through the opposing linkages of each of the V shaped hoppers lift the dough balls one at a time therefrom and drop them into the chutes for delivery to a place of use.

4,915,057
APPARATUS AND METHOD FOR REGISTRATION OF SHADOW MASKED THIN-FILM PATTERNS
Robert A. Boudreau, Hampton, N.H., and Robert J. Wilkie, South Berwick, Me., assignors to GTE Products Corporation, Danvers, Mass.
Division of Ser. No. 790,695, Oct. 23, 1985, Pat. No. 4,746,548.
This application Nov. 14, 1986, Ser. No. 930,844
Int. Cl.[4] B05C *13/02*
U.S. Cl. 118—505 9 Claims

1. An apparatus for alignment of thin-film structure patterns on a substrate formed with the use of an apertured mask in a vacuum deposition system, said apparatus comprising:
a mask frame;
a mask assembly affixed to said mask frame, said mask assembly including said apertured mask and mask alignment apertures disposed on either side of said mask;
a mask holder frame positioned adjacent said mask assembly and affixed to said mask frame to form a mask holder assembly, said mask holder assembly having primary datum pins affixed thereto and protruding from the side of said holder assembly opposite said mask assembly; and
a substrate carrier having a substrate supported therein, said substrate carrier being positioned adjacent to and in operative contact with said mask holder assembly, said substrate

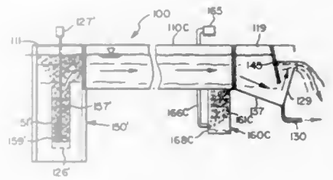
carrier having primary datum apertures disposed about its periphery, said primary datum apertures being located to engage with said primary datum pins of said mask holder assembly, said substrate carrier further having secondary datum pins protruding therefrom that engage with said mask alignment apertures of said mask assembly.

4,915,058
WINDOW MASK WITH RELEASABLE SECURING MEANS
Douglas A. Murray, 425 N. Pershing, Wichita, Kans. 67208
Filed Nov. 21, 1988, Ser. No. 274,457
Int. Cl.[4] B05C *1/05, 21/00*
U.S. Cl. 118—505 9 Claims



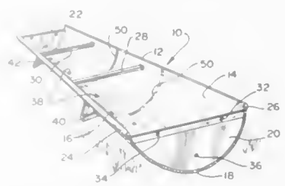
1. A spray painting accessory for preventing paint from contacting a vehicular window and trim peripherally bounding the latter, said accessory comprising a mask plate having a periphery and being of substantial spatial configuration integrity that is adapted to overlie an outer exposed vehicular window surface in a nearly coextensive fashion, said mask plate having inner and outer sides and including an integral relatively upstanding peripheral margin portion about its entire periphery serving to contribute to the spatial integrity of the mask and defining a surface for masking tape application thereto, with controllable suction cup means adapted for releasable attachment to a window being carried by and extending through the mask plate at a position spaced inwardly from the margin portion, said suction cup means including a suction cup on the inner side of the plate and a manually rockable suction cup control handle on the outside of the plate, the arrangement being such that a user can grasp the handle to support the mask plate while orienting the latter for use with respect to a vehicular window, and then manually rock the handle to actuate the suction cup for suction engagement with a window.

4,915,059
RACEWAY CULTURING OF FISH
Clifford W. Long, Olympia, Wash., assignor to Fisheries Engineering Research and Development Co., Inc., Olympia, Wash.
Continuation-in-part of Ser. No. 48,859, May 12, 1987. This application Nov. 22, 1988, Ser. No. 274,096
Claims priority, application PCT Int'l Appl., May 11, 1988, PCT/US88/01600
Int. Cl.[4] A23L *1/325;* A01K *61/00*
U.S. Cl. 119—3 16 Claims



1 Pisciculture process comprising the steps of
confining numerous substantially uniformly sized fish within a flumelike watercourse so closely as to preclude them from exercising territorial rights "to yield substantially uniformly sized fish", and
flowing water therethrough from end to end at a rate of at least about one and not more than about two fish lengths per second,
requiring and enabling the fish to swim substantially continuously to maintain position.

4,915,060
FEED TROUGH WITH ROCKING ACTION
Kim W. Kling, and Chris A. Kling, both of R.R. 1, Box 410, Belle Fourche, S. Dak. 57717
Filed Sep. 22, 1988, Ser. No. 247,701
Int. Cl.[4] A01K *39/00*
U.S. Cl. 119—61 8 Claims



1. A trough for feeding livestock, comprising:
a frusto-cylindrical body member forming a horizontally disposed channel having an elongated opening, two side walls, each side wall having a top edge adjacent the elongated opening of the channel, and a rounded bottom wall in contact with the ground;
a pair of end walls operably connected to the body member at opposite ends of the body member to close the ends of the channel; and
at least one roll stop affixed to each of the side walls below the top edge such that the roll stop is not in contact with the ground when the body member is an upright position with the rounded bottom wall in contact with the ground;
whereby when a stepping force is exerted on the body member by an animal, the body member will rock in the direction of the stepping force until the roll stop comes into contact with the ground and operate to return the body member to the upright position.

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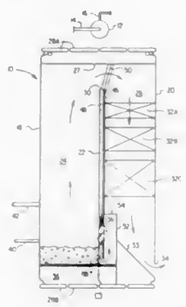
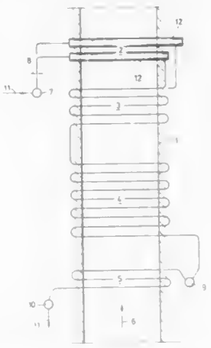
4,915,061
FLUIDIZED BED REACTOR UTILIZING CHANNEL SEPARATORS
Juan A. Garcia-Mallol, Morristown, N.J., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.
Filed Jun. 6, 1988, Ser. No. 202,642
Int. Cl.[4] F22B *1/00*
U.S. Cl. 122—4 D 7 Claims



1. A reactor comprising a vessel; means for forming a furnace section and a heat recovery section in said vessel; means in said furnace section for supporting a bed of solid particulate material including fuel; means for introducing air into said bed at a velocity sufficient to fluidize same and support the combustion or gasification of said fuel; means for directing to said heat recovery section a mixture of said air, the gaseous products of said combustion, and the particulate material entrained by said air and said gaseous products of combustion; a plurality of channel beams disposed in said heat recovery section for separating the particulate material from said mixture; a trough registering with said channel beams and extending between said furnace section and said heat recovery section for receiving the separated particulate material from said channel beams; an enclosure extending in said heat recovery section and registering with said trough to receive said separated particulate material, said enclosure extending over said means for supporting a bed of solid particulate material whereby said separated particulate material is fluidized by said means for introducing air into said bed whereby said separated particulate material builds up in said enclosure; and means connecting said enclosure to said furnace section for returning the separated particulate material back to said bed after said separated particulate material reaches a predetermined level in said enclosure.

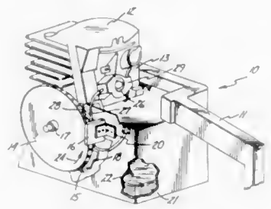
4,915,062
ONCE-THROUGH STEAM GENERATOR
Richard Dolezal, Stuttgart, Fed. Rep. of Germany, assignor to GEA Luftkühlergesellschaft Happel GmbH & Co., Fed. Rep. of Germany
Filed Dec. 8, 1988, Ser. No. 281,850
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1987, 3741881
Int. Cl.[4] E22D *7/00*
U.S. Cl. 122—406 ST 12 Claims

1. A once-through steam generator comprising: a boiler pass defining a flow path for a hot gas mass flow flowing in a first direction; an economizer, evaporator and superheater connected in series in said boiler pass for leading a flow of water which progressively evaporates into superheated steam flowing in said economizer, evaporator and superheater, in a second direction which is opposite to said first direction; and starter means acting as a high-temperature heat accumulator and connected to said economizer upstream of said economizer in said second direction for preheating cold water before it is supplied to said economizer for hot startup of said economizer, evaporator and superheater without thermal shock thereon,



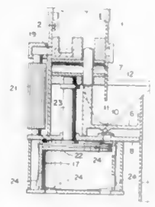
after said starter, economizer, evaporator and superheater have been heated to the temperature of the hot gas mass flow.

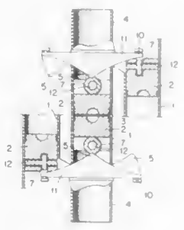
4,915,063
VAPOR LOCK PREVENTION SYSTEM
Marvin D. Stumpf, St. Paul, Minn., assignor to Tilton Equipment Company, St. Paul, Minn.
Continuation of Ser. No. 918,371, Oct. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 787,631, Oct. 15, 1985, abandoned. This application May 16, 1989, Ser. No. 355,031
Int. Cl.[4] F02B *77/00*
U.S. Cl. 123—41.31 1 Claim



1. A kit for converting engine power operated carburetors used on engines on chain saws and brush cutters to a system preventing vapor lock, wherein the carburetor has a conventional fuel pump mounted on a mounting surface of the carburetor, which surface has an inlet passageway and a fuel inlet valve in the carburetor inlet passageway, comprising:
surface adapted to mount on the carburetor surface when the conventional fuel pump is removed, the fitting having an unobstructed passageway with one end aligning with the inlet passageway on the carburetor when mounted on the mounting surface and having means to receive a fuel inlet line at its opposite end;
a separate fuel pump assembly having a bracket for mounting the fuel pump at a location remote from a carburetor on which the fitting is to be mounted and substantially thermally isolated from an engine on which the carburetor is mounted; and
means for coupling the fuel pump to a power source for powering the fuel pump, and line means for coupling an inlet of the fuel pump to a fuel tank and for coupling an outlet of the fuel pump to the opposite end of the unobstructed passageway of the fitting.

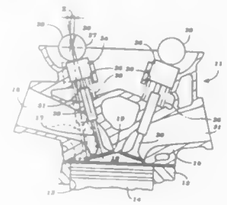
4,915,064
INTERNAL COMBUSTION ENGINE WITH OPPOSED PISTONS
Folke K. E. Mannerstedt, deceased, late of Bromma, and by Margareta Zinnerström, executrix, Minnebergsvägen 3, 161 34 Bromma, both of Sweden
PCT No. PCT/SE87/00056, § 371 Date Dec. 5, 1988, § 102(e) Date Dec. 5, 1988, PCT Pub. No. WO88/05858, PCT Pub. Date Aug. 11, 1988
PCT Filed Feb. 6, 1987, Ser. No. 254,474
Int. Cl.[4] F02B *75/26*
U.S. Cl. 123—58 AM 8 Claims

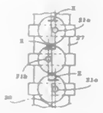




1. A combustion engine comprising:
a plurality of cylinders each containing a pair of aligned pistons displaceable toward and away from one another, said cylinders including inlet and outlet ports for admitting fuel and discharging exhaust gas, each piston carrying a cam roller;
a drive shaft; and
rotary cam disc means connected to said drive shaft and arranged to be contacted by said cam rollers of said pistons for transferring motion between said rotary cam disc means and said pistons, said rotary cam disc means including cam curves arranged to be engaged by cam rollers of respective pistons of each said pair of pistons, each cam curve having circumferentially spaced peaks and valleys whereby a cam roller travels from a peak to a valley during a power stroke of said piston, each peak being connected with a successive valley by an interconnecting surface of said cam curve along which a respective cam roller travels during a power stroke, said interconnecting surface presenting a slope which progressively decreases from adjacent said peak to adjacent said valley.

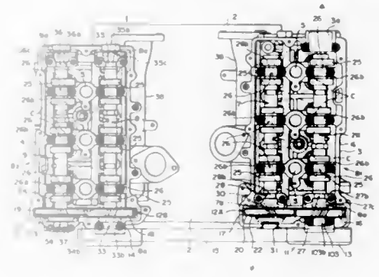
4,915,065
VALVE ACTUATION DEVICE FOR MULTI-VALVE TYPE ENGINE
Tetsuro Yamada, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Filed Jan. 10, 1989, Ser. No. 295,551
Claims priority, application Japan, Jan. 11, 1988, 63-2415
Int. Cl.[4] F01L *1/02*
U.S. Cl. 123—90.27 4 Claims





1. In a cylinder head construction for an internal combustion engine comprising a rotatable camshaft journaled about an axis, a pair of valves having their stem portions slidably supported in the cylinder head for reciprocation about respective non-parallel reciprocal axes that lie in planes that intersect at a line spaced further from the tips of said valves than said camshaft axis, and thimble tappets interposed between said camshaft and said valve tips for operating said vlaves from said camshaft, said thimble tappets having respective central axes of reciprocation offset from the respective reciprocal axes of said valve stems

4,915,066
VALVE TRAIN FOR V-TYPE DOUBLE-OVERHEAD-CAMSHAFT ENGINE
Naohide Koshimoto, and Shigeki Nakatani, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Jul. 14, 1989, Ser. No. 379,975
Claims priority, application Japan, Jul. 20, 1988, 63-180658; Jul. 29, 1988, 63-190101
Int. Cl.[4] F01L *1/02;* F01M *9/10*
U.S. Cl. 123—90.27 11 Claims



1. A valve train for a V-type double overhead camshaft engine which has first and second cylinder heads respectively

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forming first and second cylinder banks whose cylinder rows are offset from each other in the direction of the crankshaft so that the end of the cylinder row in the first cylinder bank on one end of the engine retracts from that of the cylinder row in the second cylinder bank, and in which a first camshaft in each cylinder bank is drivingly connected to the crankshaft of the engine by a first power transmission mechanism which is disposed on the end of the respective cylinder banks on said one end of the engine, and the first camshaft in each cylinder bank is drivingly connected with a second camshaft by a second power transmission mechanism which is disposed between the first power transmission mechanism and the cylinder row of the cylinder bank, characterized in that the end portion of said first camshaft in the first cylinder bank which extends beyond the end of the cylinder row on said one end of the engine is supported by a pair of bearings one disposed between the first and second power transmission mechanisms and the other disposed between the second power transmission mechanism and the cylinder row in the first cylinder bank, the end portion of said second camshaft in the first cylinder bank which extends beyond the end of the cylinder row on said one end of the engine is supported by a bearing disposed between the second power transmission mechanism and the cylinder row in the first cylinder bank, and the end portion of the first camshaft in the second cylinder bank which extends beyond the end of the cylinder row on said one end of the engine is supported by a bearing disposed between the first and second power transmission mechanisms, the end portion of said second camshaft in the second cylinder bank which extends beyond the end of the cylinder row on the one end of the engine is supported by a bearing disposed beyond said second power transmission mechanism on a side opposite said cylinder row.

4,915,067

VALVE OPERATING SYSTEM OF INTERNAL COMBUSTION ENGINE

Minoru Imajo, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 12, 1989, Ser. No. 299,545
Claims priority, application Japan, Jan. 14, 1988, 63-3570[U]
Int. Cl.[4] F01M *9/10*
U.S. Cl. 123—90.34 5 Claims

1. A valve operating system of an internal combustion engine, comprising:

a camshaft by which an engine valve is driven, said camshaft having a bearing journal section; and

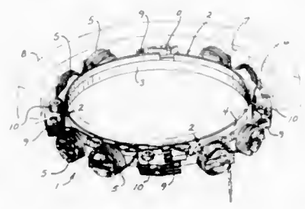
a bearing section for rotatably supporting said camshaft, said bearing section having a generally cylindrical bearing surface defining a bore in which said camshaft bearing journal section is disposed, the peripheral surface of said camshaft bearing journal section being slidably contactable with said bearing section bearing surface, said generally cylindrical bearing surface having, in a cross-section to which a central longitudinal axis of said camshaft is perpendicular, a first diametrical distance in a first direction in which reaction of a valve spring for the engine valve is applied, and a second diametrical distance in a second direction perpendicular to the first direction, said first diametrical distance being smaller than said second diametrical distance.

4,915,068

INTERNAL COMBUSTION ENGINE WITH INTEGRAL STATOR AND REGULATOR

Paul A. Tharman, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Mar. 22, 1989, Ser. No. 327,510
Int. Cl.[4] F02P *1/00*
U.S. Cl. 123—149 R 24 Claims



1. An alternator assembly for an internal combustion engine, comprising:

stator means including at least one coil means cooperable with a moving magnetic field for producing an electric output current in said coil means and a stationary annular ring member having an inner radial surface and an outer radial surface;

regulator means connected to said coil means for regulating said output current; and

mounting means for mounting said regulator means on said stator means outer radial surface.

4,915,069

METERING VALVE STEM SEAL

Edward E. Lafever, Hagerstown; Kelly E. Duvall, Greensfork, and Dean S. Bunce, Losantville, all of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Dec. 21, 1988, Ser. No. 287,795
Int. Cl.[4] F16J *15/447;* **F01L** *3/24, 5/24, 15/20*
U.S. Cl. 123—188 P 10 Claims

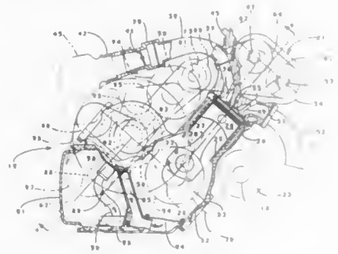
1. In a valve stem seal having an annular main valve body defining an axis and adapted to sealingly engage a valve stem, said main body defining a pair of axially spaced extremities and a through passageway defining a central helically threaded internal region adapted to control oil flow between said valve body and said valve stem; an improvement comprising said threaded region being bounded by a non-threaded end portion comprising a plurality of axially extending ribs defining a plurality of axially oriented grooves, each groove comprising an oil flow passageway, each groove spaced circumferentially from the others about said internal valve body, each groove providing direct oil flow communication between said central threaded internal region of said through passageway and one of said pair of extremities of said main valve body, wherein said oil is metered through said seal by the combination of said grooves and said threaded region, said axially extending ribs supporting said threaded region against collapse and consequent reduction of oil flow through said valve body.

4,915,070

ENGINE UNIT FOR MOTOR VEHICLE

Kaoru Okui, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Nov. 14, 1988, Ser. No. 270,260
Claims priority, application Japan, Mar. 31, 1988, 63-78538; Mar. 31, 1988, 63-78537; Mar. 31, 1988, 63-78536; May 11, 1988, 63-112573
Int. Cl.[4] F01M *1/00*
U.S. Cl. 123—196 R 19 Claims



1. An internal combustion engine comprising a cylinder block having a plurality of aligned cylinder bores defining a first plane inclined to a vertically extending plane, a crankshaft rotatable about an axis lying substantially within said first plane and driven by pistons reciprocating within said cylinders, a dry sump crankcase in which said crankshaft rotates, a shaft driven by said crankshaft and rotatable about an axis parallel to and offset from crankshaft axis for providing a power output from said engine, said output shaft axis and said crankshaft axis defining a second plane, inclined with respect to the vertically extending plane and perpendicularly intersecting said first plane, and an oil reservoir for said engine lying within a space defined between said first and said second planes.

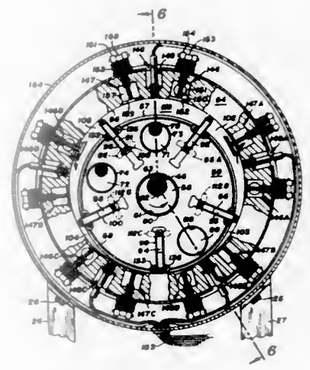
4,915,071

ORBIT INTERNAL COMBUSTION ENGINE

Craig N. Hansen, Minnetonka, Minn., assignor to Hasen Engine Corporation, Minnetonka, Minn.

Continuation of Ser. No. 93,884, Sep. 8, 1987, abandoned. This application Oct. 5, 1988, Ser. No. 253,973
The portion of the term of this patent subsequent to Sep. 8, 2004, has been disclaimed.
Int. Cl.[4] F02B *53/00*
U.S. Cl. 423—242 22 Claims

1. An orbit internal combustion engine comprising: housing means having a body with a cylindrical inner wall surrounding a plurality of combustion chambers, means for providing a combustible air and fuel mixture to each combustion chamber, a plurality of pairs of intake and exhaust valve means mounted on the body for controlling the flow of said air and fuel mixture into and out of said combustion chambers, said pairs of intake and exhaust valve means being located around the body with one pair of intake and exhaust valve means in communication with each combustion chamber, shaft means rotatably mounted on the housing means, a piston surrounded by said housing means, said piston having surfaces in each combustion chamber and movable in a compression stroke and an expansion stroke relative to each combustion chamber, a first eccentric member secured to the shaft means, means mounting the piston on the first eccentric member, a second eccentric member rotatably mounted on the housing means, means mounting the piston on the second eccentric member, a third eccentric member rotatably mounted on the housing means, means mounting the piston on the third eccentric member, said second and third eccentric members being spaced from each other and radially spaced from the first eccentric member whereby the first eccentric member causes the piston to move about an axis offset from the axis of rotation of the shaft means, said second and third eccentric members limiting the amount of angular movement of the piston as the piston moves within the combustion chambers in its compression stroke and expansion stroke, means for operating said intake and exhaust valves in timed relation with the rotation of the shaft to allow said air



and fuel mixture to flow into the combustion chambers and allow exhaust gases to flow out of the combustion chamber, a plurality of seal assemblies mounted on the piston, said seal assemblies being arranged around said piston to provide separate arcuate combustion chambers and located a seal assembly between each pair of intake and exhaust valve means, said piston having circumferentially spaced slots for each seal assembly whereby the piston moves relative to each seal assembly during movement of the piston, each seal assembly having a seal means located in sealing engagement with said cylindrical inner wall, each of said seal assemblies and housing means having cooperating means for allowing limited arcuate movement of the seal assembly and restrict radial movement thereof during movement of the piston, and fuel ignition means mounted on the housing means in communication with each combustion chamber operable to ignite the fuel in said combustion chambers to thereby cause the piston to have orbit movement and rotate the shaft.

4,915,072

ELECTRONIC GOVERNOR INTERFACE MODULE

Laverne A. Caron, Naperville, and Maciej Labowicz, Elk Grove Village, both of Ill., assignors to Navistar International Transporation Corp., Chicago, Ill.

Filed Jul. 14, 1988, Ser. No. 219,013
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—357 21 Claims

1. In an internal combustion engine which has a governor that comprises a fuel control mechanism which includes a fuel injection pump, a proportional solenoid actuator, having a solenoid portion and an actuator portion, for selectively modulating fuel flow from the injection pump to the engine by

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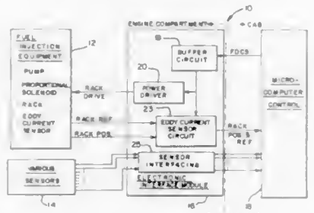
selectively positioning said actuator portion in accordance with a solenoid-energizing signal that is delivered to said solenoid portion, and a sensor for sensing position of said actuator portion, the improvement which comprises a microcomputer control for operating said governor through an electronic interface between the two, said electronic interface serving to interface the microcomputer control in closed loop control of said governor by causing said actuator portion to be positioned in accordance with a pulse width modulated fuel deliver control signal issued by said microcomputer control, said electronic interface comprising means to cause the solenoid-energizing signal to be pulse width modulated in the same fashion as said fuel deliver control signal, and means to couple said sensor to the microcomputer control in a feedback circuit which comprises means to create and deliver to the microcomputer control a pulse width modulated feedback signal that is indicative of the position of said actuator portion and that is synchronized in phase in a predetermined manner with the pulse width modulated solenoid-energizing signal delivered to said solenoid portion, in which said sensor is an eddy current



sensor characterized by a parameter that can influence the sensor's accuracy, said eddy current sensor comprising a reference coil for correlating change in said parameter affecting sensor accuracy and a measuring coil for measuring the position of said actuator portion, means connecting each coil in a corresponding L/R monostable circuit, and means for triggering both L/R monostable circuits in predetermined relationship to the fuel deliver control signal to cause said monostable circuits to produce respective output pulses representing a reference signal and a measurement signal respectively, and means for deriving said feedback signal from said reference and measurement signals, and said electronic interface comprises a buffer circuit that receives the fuel deliver control signal as an input and a power driver circuit that is operated through said buffer circuit by the fuel deliver control signal, and said means for triggering both L/R monostable circuits in predetermined relationship to the fuel deliver control signal comprises means for triggering said last-mentioned circuits via said buffer circuit in response to a leading edge portion of each pulse of the fuel deliver control signal.

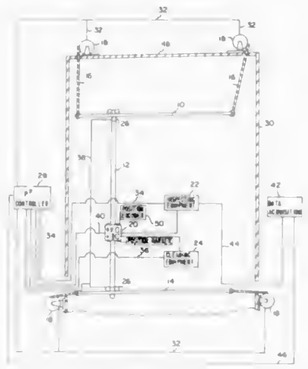
4,915,073

BOILER TUBE WALL INSPECTION SYSTEM

George H. Harth, 340 High Point, Wadsworth, Ohio 44281; Daniel M. Schlader, 117 Locksley Pl., and Robert E. Womack, Rte. 2, Box 908, both of Forest, Va. 24551

Division of Ser. No. 198,430, May 25, 1988, abandoned. This application May 26, 1989, Ser. No. 358,988
Int. Cl.[4] F22B *37/18, 37/48*
U.S. Cl. 122—379 5 Claims

1. An apparatus for cleaning a boiler tube wall, comprising:
an upper rail;
a lower rail situated substantially parallel with said upper rail;
a middle rail pivotally attached to said upper end lower rails, said middle rail having a first collapsed position being situated immediately between and approximately parallel with said upper and lower rails for entry into a boiler tube, said middle rail further having a second expanded position being situated transversely between said upper and lower rails after entry in the boiler tube, said middle rail being situated in the second position between said upper and lower rails for movement lengthwise along said upper and lower rails;



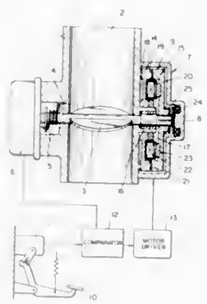
a carriage moveably connected to said middle rail;
means for remotely controlling movement of said carriage;
means for cleaning the boiler tube wall connected to said carriage on said middle rail; and
means for moving said rails within the boiler tube.

4,915,074

THROTTLE VALVE CONTROL SYSTEM OF ENGINE

Katsumi Arai, Ibaraki, Japan, assignor to Kyosan Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1989, Ser. No. 319,151
Claims priority, application Japan, Mar. 11, 1988, 63-56018
Int. Cl.[4] F02D *11/10*
U.S. Cl. 123—399 2 Claims



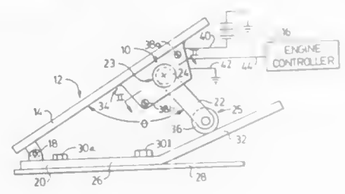
1. A throttle valve control system of an engine comprising:
a throttle body forming a suction passage;
a throttle valve positioned in a throttle body and rotatably fixed to a rotary shaft; said rotary shaft is rotatably fixed to the throttle body at both ends thereof;
a return spring mounted on one end of the rotary shaft for urging the throttle valve in the direction to close;
an ultrasonic motor for driving the throttle valve, said ultrasonic motor composed of a stator mounted on one side of the throttle body and provided with an elastic member having a plurality of piezoelectric elements and a travelling wave generator surface respectively disposed on the elastic member, and a rotor positioned at the outside of the stator and fixed to an extension of the rotary shaft, said rotor being rotatable by receiving the travelling wave generated by the travelling wave generator surface;
a valve opening ratio detector for detecting an opening ratio of the throttle valve and providing a valve opening ratio signal;
a depression ratio detector for detecting a depression ratio of the acceleration pedal and providing a depression ratio signal;
a comparator for receiving the valve opening ratio signal and the depression acceleration signal and comparing both signals on the basis of acceleration/rotary angle characteristic and providing a control signal to compensate the difference between both the signals, said control signal is supplied to the ultrasonic motor for driving the ultrasonic motor.

4,915,075

ACCELERATOR PEDAL POSITION SENSOR

Richard L. Brown, Pekin, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Mar. 20, 1989, Ser. No. 326,129
Int. Cl.[4] F02D *11/10*; H01C *10/00*
U.S. Cl. 123—399 7 Claims



1. A signal generating apparatus for delivering a pulse-width-modulated signal responsive to the position of a movable mechanical member, comprising:
a circuit board having first and second sides;
a potentiometer having a movable wiper and a stationary portion, said movable wiper being in movable contact with said stationary portion, said movable wiper and said stationary portion being positioned on said circuit board first side and said movable wiper being connected to and movable with said movable mechanical member; and,
a conditioning circuit being positioned on said circuit board second side, electrically connected to said potentiometer stationary portion and adapted to deliver said pulse-width-modulated signal responsive to the position of said movable wiper on said potentiometer stationary portion.

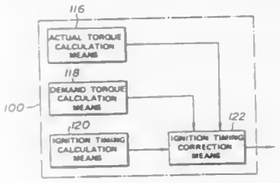
4,915,076

INTERNAL COMBUSTION ENGINE OUTPUT TORQUE CONTROL SYSTEM

Satoshi Takizawa, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 169,452, Mar. 17, 1988, abandoned, which is a division of Ser. No. 773,003, Aug. 29, 1985, Pat. No. 4,732,125. This application Dec. 23, 1988, Ser. No. 289,450
Claims priority, application Japan, Dec. 29, 1983, 58-245993; Dec. 29, 1983, 58-245994; Dec. 29, 1983, 58-245997
Int. Cl.[4] F02P *5/15*
U.S. Cl. 123—418 4 Claims

1. An internal combustion engine output torque control system comprising:
first means for determining a basic spark advance angle based upon predetermined control parameters, the first means being operable to determine an ignition timing in accordance with the relationship between said spark advance angle and the reference position of the engine crankshaft;
second means for calculating a difference between the torque demanded for the engine and the actual torque actually produced by the engine based on engine operating parameters including engine revolution speed, the second means being operable to determine a correction value used in correcting the ignition timing in a manner to reduce the difference between the actual torque and the demand torque;
third means for correcting the ignition timing determined by the first means for the correction value determined by the



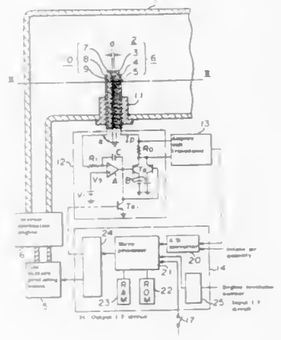
second means to determine a corrected ignition timing, the third means being operable to generate an ignition signal at a predetermined timing corresponding to the corrected ignition timing;
an engine revolution speed sensor for producing an engine revolution speed signal indicative of the engine revolution speed, and wherein the second means is operable to calculate the engine demand torque and the actual torque in accordance with the engine revolution speed signal, the second means being operable to determine the ignition timing correction value based upon a difference between the reciprocal of the demand torque and the reciprocal of the actual torque.

4,915,077

AIR-FUEL RATIO CONTROL APPARATUS

Masanobu Uchinami; Toshihisa Takahashi, both of Himeji; Hitoshi Inoue, Amagasaki, and Shinichi Nishida, Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1988, Ser. No. 249,736
Claims priority, application Japan, Oct. 22, 1987, 62-268457
Int. Cl.[4] F02D *41/14*; G01N *27/58*
U.S. Cl. 123—440 3 Claims



1. An air-fuel control apparatus which comprises:
an air-fuel ratio sensor comprising a gap portion for intro-

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ducing exhaust gas generated from an engine, a solid electrolyte oxygen pump for controlling a partial pressure of oxygen in said gap portion and a solid electrolyte oxygen sensor producing an electromotive force in response to a proportion of the partial pressure of oxygen in the gap portion and a partial pressure of oxygen in other than said gap portion,

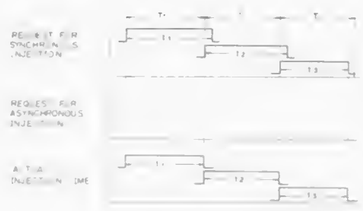
an electronic control device including a pump current stopping means which controls a pump current from said solid electrolyte oxygen pump so that the electromotive force generated by said solid electrolyte oxygen sensor is maintained at a constant value, and controls not to feed the pump current when said engine is stopped, and a control device which operates the optimum quantity of fuel supply to thereby effect an air-fuel control by a gas mixture producing mean in an operational condition that said engine is not subjected to a feed-back control on the basis of an output signal from said air-fuel ratio sensor, and controls not to feed a pump current by the actuation of said pump current stopping means when the revolution number of said engine is determined to be lower than a predetermined value, i.e. the engine is stopped in an operational condition that said engine is subjected to the feedback control on the basis of the pump current.

4,915,078

FUEL INJECTION CONTROL DEVICE OF AN INTERNAL COMBUSTION ENGINE

Yukihiro Sonoda, and Kouichi Osawa, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 20, 1988, Ser. No. 221,732
Claims priority, application Japan, Jul. 21, 1987, 62-181847
Int. Cl.[4] F02D *41/34, 41/10*
U.S. Cl. 123—478 **10 Claims**



1. A fuel injection control device of an engine comprising:

synchronous injection time period calculating means for calculating a synchronous injection time period in accordance with an operating state of the engine;

injection starting means for starting an actual synchronous injection at a predetermined crank angle;

maximum time period calculating means for calculating a maximum time period which is not longer than the period between the starting times of successive synchronous injections and which changes to follow said period between the starting times of successive synchronous injections;

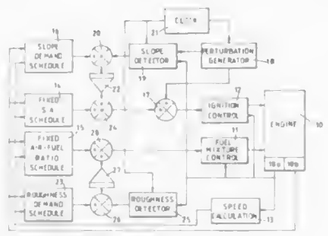
injection completing means for completing said actual synchronous injection when said synchronous injection time period has elapsed after said actual synchronous injection is started, when said synchronous injection time period is shorter than said maximum time period, and for completing said actual synchronous injection when said maximum time period has elapsed after said actual synchronous injection is started when said synchronous injection time period exceeds said maximum time period.

4,915,079

ADAPTIVE CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE AND METHOD OF OPERATING AN INTERNAL COMBUSTION ENGINE

Michael Holmes, Solihull, Great Britain, assignor to Lucas Industries public limited company, Birmingham, England

Filed May 1, 1989, Ser. No. 347,116
Claims priority, application United Kingdom, May 7, 1988, 8810878
Int. Cl.[4] F02P *5/15*
U.S. Cl. 123—419 **21 Claims**



1. An adaptive control system for an internal combustion engine having a combustion performance indicating parameter with a desired value, said system comprising a mixture composition control device having a first control input, an ignition timing control device having a second control input, measuring means for measuring the combustion performance indicating parameter, variation applying means for applying a variation to said first control input so as to achieve the desired value of the combustion performance indicating parameter, and compensating means for compensating said second control input for the variation applied to said first control input.

4,915,080

ELECTRONIC AIR-FUEL RATIO CONTROL APPARATUS IN INTERNAL COMBUSTION ENGINE

Shinpei Nakaniwa, and Akira Uchikawa, both of Isesaki, Japan, assignors to Japan Electronic Control Systems Co., Ltd., Gunma, Japan

Filed Sep. 20, 1988, Ser. No. 246,746
Claims priority, application Japan, Sep. 22, 1987, 62-236300; Sep. 25, 1987, 62-238957
Int. Cl.[4] F02D *41/14*
U.S. Cl. 123—489 **11 Claims**

1. An electronic air-fuel ratio control apparatus in an internal combustion engine with a ternary catalyst disposed in an exhaust system which is effective in oxidation reaction of carbon oxide and hydro carbon and in reduction reaction of nitrogen oxides when an air-fuel mixture sucked into the engine is in a theoretical air-fuel ratio, which comprises:

an engine driving state-detecting means for detecting a driving state of the engine;

a nitrogen oxides concentration detecting means for detecting nitrogen oxides concentration in the exhaust gas;

an oxygen sensor disposed in the exhaust system of the engine to detect the air-fuel ratio of the air-fuel mixture through the oxygen concentration in the exhaust gas, said oxygen sensor comprising an oxidizing catalyst layer and

a nitrogen oxides-reducing catalyst layer for promoting the reaction of reducing nitrogen oxides and emitting a voltage signal with the point of the theoretical air-fuel ratio corresponding to the oxygen concentration in the exhaust gas including the oxygen in the nitrogen oxides;

an air-fuel ratio feedback control means for controlling the air-fuel ratio of the air-fuel mixture by increasing or decreasing a fuel injection quantity to be supplied to the engine based on the engine driving state detected by said engine driving state-detecting means and the air-fuel ratio detected by said oxygen sensor so as to eliminate the deviation of the air-fuel ratio detected by said oxygen sensor from a target air-fuel ratio;

a fuel-injecting means for injecting and supplying a fuel to the engine in an on-off manner according to a driving pulse signal emitted from said air-fuel feedback control means; and

said air-fuel ratio feedback control means in which the target air-fuel ratio has first and second target air-fuel ratios and comprising:

a first target air-fuel ratio setting means for setting the first target air-fuel ratio based on the engine driving state detected by said engine driving state detecting means and the air-fuel ratio detected by said oxygen sensor;

a second target air-fuel ratio setting means for changing the first air-fuel ratio to set the second target air-fuel ratio richer than the first air-fuel ratio at least when the high nitrogen oxides concentration is detected by said nitrogen oxides concentration detecting means; and

a fuel injection quantity computing means for computing and setting a fuel injection quantity to be injected from said fuel-injecting means to the engine to attain the first target air-fuel ratio or the second target air-fuel ratio of the air-fuel mixture based on the engine driving state, the air-fuel ratio of the air-fuel mixture and the nitrogen oxide concentration.

4,915,081

METHOD OF DETERMINING ACTIVATION OF EXHAUST GAS INGREDIENT-CONCENTRATION SENSORS FOR INTERNAL COMBUSTION ENGINES

Sachito Fujimoto, and Shunji Takahashi, both of Wako, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Mar. 15, 1989, Ser. No. 324,221
Claims priority, application Japan, Mar. 18, 1988, 63-65324
Int. Cl.[4] F02D *41/14*
U.S. Cl. 123—489 **9 Claims**

1. A method of determining the activation of an exaust gas ingredient-concentration sensor for use in an internal combustion engine having an exhaust system in which said sensor is arranged, wherein the air-fuel ratio of a mixture being supplied to said engine is controlled in a feedback manner by the use of a coefficient varying with an output of said sensor during operation of said engine in an air-fuel ratio feedback control region, and the activation of said sensor is determined based on said output of said sensor,

the method comprising the steps of:

(1) determining whether or not said engine has shifted from said air-fuel ratio feedback control region to a predetermined decelerating region;

(2) when it is determined that said engine has shifted from said air-fuel ratio feedback control region to said predetermined decelerating region, calculating an average value of values of said coefficient obtained by the feedback control immediately before said shifting;

(3) leaning the air-fuel ratio of said mixture by the use of said average value thus calculated; and

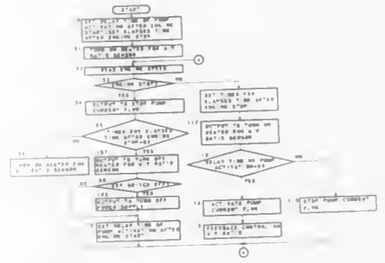
(4) determining whether or not said sensor is activated when the air-fuel ratio has thus been leaned.

4,915,082

AIR-FUEL RATIO CONTROLLER OF INTERNAL COMBUSTION ENGINE

Masanobu Uchinami; Toshihisa Takahashi; Kenji Ogawa, all of Himeji; Hitoshi Inoue, Amagasaki, and Shinichi Nishida, Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1989, Ser. No. 318,881
Claims priority, application Japan, Mar. 8, 1988, 63-55245
Int. Cl.[4] F02D *41/14*
U.S. Cl. 123—489 **7 Claims**



1 An air-fuel (A/F) ratio controller of an internal combustion engine comprising:

a wide-range A/F ratio sensor having a clearance for introducing engine exhaust gas inside, an oxygen sensor for generating a specific electromotive force in response to the relationship between the oxygen partial pressure inside and outside of said clearance, an oxygen pump for controlling the oxygen partial pressure inside of the clearance by allowing a pump current to flow such that an electromotive force generated by said oxygen sensor is maintained at a predetermined value, and a heater for heating said oxygen sensor and said oxygen pump;

a controller for executing feedback control of the A/F ratio of a fuel-mixed vapor to be supplied to said engine in accordance with the pump current so that the A/F ratio can be at an objective value;

engine-stop detection means for detecting engine speed and for detecting when the engine stops from the detected engine speed;

pump-current stopping means for stopping the flow of the pump current when the engine stops as indicated by said engine-stop detection means; and

heater stopping means for stopping power supply to said heater when the engine stops as indicated by said engine-stop detection means.

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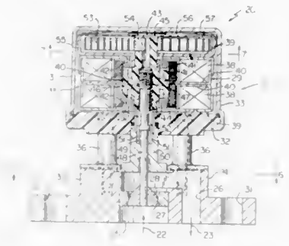
4,915,083

EXHAUST GAS RECIRCULATION VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Chip Hewette, Knoxville, and Jay L. Lewis, Knox County, both of Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 215,244, Jul. 5, 1988, Pat. No. 4,825,840, which is a division of Ser. No. 32,509, Mar. 30, 1987, Pat. No. 4,782,811. This application Jan. 30, 1989, Ser. No. 303,902
The portion of the term of this patent subsequent to Nov. 8, 2005, has been disclaimed.
Int. Cl.[4] F02M *25/06*; F16K *31/04*
U.S. Cl. 123—571 6 Claims



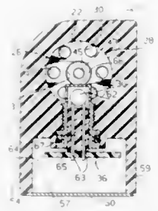
1. In an exhaust gas recirculation valve construction comprising a housing means provided with an inlet and an outlet separated by a valve seat, an axially movable valve member carried by said housing means for opening and closing said valve seat, and electrically operated stepper motor means carried by said housing means and being operatively interconnected to said valve member for axially positioning said valve member relative to said valve seat, said motor means having a rotatable rotor threadedly interconnected to said valve member to cause axial movement of said valve member upon rotatable movement of said rotor, said valve member and said valve seat being arranged so as to be reverse acting, the improvement wherein said valve construction has a spider spring-like plate disposed between said stepper motor means and said housing means to apply an assembly load on said stepper motor means.

4,915,084

COMBUSTION ENGINE WITH MULTI-FUEL CAPABILITY

Eugene V. Gonze, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 8, 1988, Ser. No. 268,431
Int. Cl.[4] A02B *13/00*
U.S. Cl. 123—575 4 Claims



1. A combustion engine having a combustion chamber, a fuel tank, a fuel delivery line from the fuel tank to the engine, air/fuel delivery means for pumping a mixture of one or more liquid fuels in an unknown combination from the fuel tank through the fuel delivery line to the combustion chamber in combination with air in a controlled A/F ratio and apparatus for automatically controlling the A/F ratio in response to the dielectric constant of the fuel mixture to provide a desired A/F ratio for combustion of the fuel mixture, the apparatus for automatically controlling the A/F ratio comprising, in combination:

a capacitor in the fuel line adapted for fuel flow therethrough so that the fuel pumped to the combustion chamber comprises the dielectric which determines the capacitance thereof;

an impedance in series with the capacitor;

an oscillator providing an oscillating voltage of fixed peak-to-peak value across the impedance and capacitor, the oscillating voltage having a frequency of oscillation of at least 1 MHz but less than a frequency requiring microwave components; and

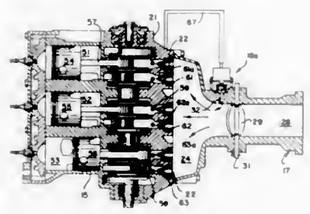
an electric circuit responsive to a capacitively determined electrical parameter of the capacitor to determine the capacitance thereof and therefore the dielectric constant of the fuel mixture, whereby the A/F ratio is adapted for combustion regardless of the constituents and concentrations thereof in the fuel mixture.

4,915,085

STARTING ENHANCER AND STABILIZER

Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jun. 27, 1989, Ser. No. 372,000
Int. Cl.[4] F02M *23/08*
U.S. Cl. 123—587 18 Claims



1. A starting enhancer and stabilizer for two-cycle engines, comprising:

intake valve means for selectively introducing supplemental air into an air intake throat of a two-cycle internal combustion engine, said intake valve means being positioned at a location downstream of throttle valve means for regulating primary air flow into and through the air intake throat;

means for biasing said intake valve means in an opened orientation during which said supplemental flow of air passes into the throat at the downstream location;

means for overcoming said biasing means and for permitting movement of the intake valve means to a closed orientation during which said supplemental flow of air into the throat substantially ceases; and

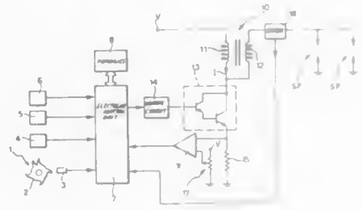
said biasing means and overcoming means cooperate to form means for providing said supplemental flow of air into the throat during a start-up mode of the engine and for substantially ceasing said supplemental flow of air into the throat during an open throttle mode of the engine.

4,915,086

VARIABLE-ENERGY-SPARK IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES, PARTICULARLY FOR MOTOR VEHICLES

Giuseppe Ciliberto, and Guido Scollo, both of Turin, Italy, assignors to Marelli Autronica S.p.A., Milan, Italy

Filed Mar. 2, 1988, Ser. No. 163,333
Claims priority, application Italy, Mar. 2, 1987, 67153 A/87
Int. Cl.[4] F02P *3/05*
U.S. Cl. 123—609 6 Claims



1. An ignition system for an internal combustion engine, comprising:

at least one spark plug;

at least one ignition coil whose secondary winding is connectible to the at least one spark plug to induce the generation of a spark;

commutator means adapted to assume first and second conditions which respectively permit and interrupt the flow of a current in the primary winding of the ignition coil;

electrical sensor means for providing electrical signals indicative of operating conditions of the engine, and

control means coupled to the commutator means and the electrical sensor means and adapted to pilot the commutator means so as to vary, in accordance with the signals provided by said sensor means, the energy applied to said at least one spark plug for the generation of the sparks;

wherein the control means include

monitoring means for monitoring the current flowing in the primary winding of the ignition coil, and

an electronic control unit arranged to pilot the commutator means in a predetermined manner in accordance with the signals provided by the sensor means and by the monitoring means;

the said electronic control unit being provided with memory means in which there are stored data indicative of predetermined final values of the current in the primary winding of the ignition coil, associated with various operating conditions of the engine identifiable from the signals from the sensor means, the electronic control unit being further arranged to pilot the commutator means so that, each time a spark needs to be generated, the current flow in the primary winding of the ignition coil is interrupted when its intensity has reached a value associated in the memory means with the operating conditions of the engine indicated by the sensors; and

wherein the monitoring means are arranged to supply the electronic control unit with a signal when the intensity of the current in the primary winding of the ignition coil reaches a threshold value less than the minimum final value stored in the memory means, and in that this unit is arranged to monitor the time taken by the current to reach the threshold value,

to calculate the further period of time necessary for the current to reach the final value associated with the operating conditions of the engine registered by the sensor means and stored in the memory means, and

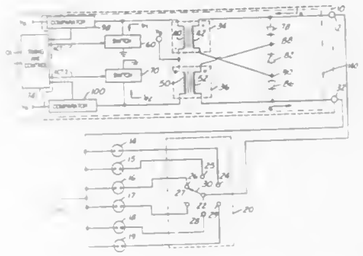
to maintain the commutator means in the first condition for the further period of time.

4,915,087

IGNITION SYSTEM WITH ENHANCED COMBUSTION AND FAULT TOLERANCE

Wesley D. Boyer, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 29, 1988, Ser. No. 250,668
Int. Cl.[4] F02P *3/04*, *3/55*
U.S. Cl. 123—620 17 Claims



1. An ignition system for providing ignition energy to the spark plugs coupled to the combustion chambers of an internal combustion engine, comprising:

first and second output terminals for coupling the ignition energy to electrodes of at least one spark plug;

first and second primary coils each being magnetically coupled to respective first and second secondary coils, said first secondary coil being connected between said first output terminal and a first node, said second secondary coil being connected between said second output terminal and a second node; and

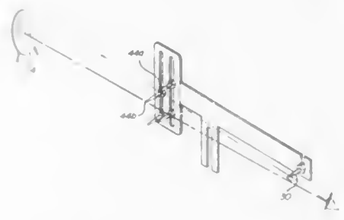
circuit means comprising a first diode circuit having an anode connected to said first output terminal and a cathode connected to said second node, a second diode circuit having a cathode connected to said second output terminal and an anode connected to said first node, and a third diode circuit having an anode connected to said first node and a cathode connected to said second node.

4,915,088

BOW SIGHT AND METHOD OF USE

Reginald G. Powers, 5838 Bowers Rd., Imlay City, Mich. 48444

Continuation-in-part of Ser. No. 153,926, Feb. 9, 1988, abandoned. This application Apr. 11, 1989, Ser. No. 336,092
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—87 7 Claims



1. A bow sight for use with a bow comprising:

a frame having a rear end and a front end;

means for mounting the frame on the bow with the front end positioned closer to a target than the rear end;

a single rear V-notch sight means mounted on the frame adjacent the rear end; and

a front sight means mounted on the frame adjacent the front

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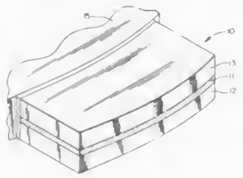
end including a plurality of vertically arrayed sight pins, the sight pins being disposed at locations on the front sight means such that, when sighting the bow at a target at a particular range, an uppermost of the sight pins is aligned with the V-notch rear sight, and one of the plurality of front sight pins being selectively aligned with various preselected farther ranges for shooting at the farther ranges while maintaining the alignment of the uppermost sight pin with the V-notch for all ranges.

4,915,089

TOOL FOR TRUEING AND DRESSING A GRINDING WHEEL AND METHOD OF USE

William W. Ruark, Westerville; Joseph A. Zahorchak, Columbus, both of Ohio, and Glenn A. Johnson, Gotenba, Japan, assignors to General Electric Company, Worthington, Ohio

Continuation of Ser. No. 149,274, Jan. 28, 1988, abandoned. This application Jan. 10, 1989, Ser. No. 296,291
Int. Cl.[4] B24B *53/00*
U.S. Cl. 125—11 CD 14 Claims



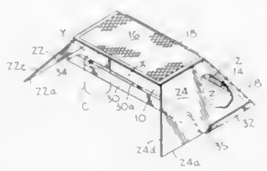
1. A tool for trueing and dressing a grinding wheel, comprising a wheel having a thin layer of mesh size diamonds in a plane perpendicular to the rotational axis of said wheel.

4,915,090

RELECTOR STOVE

Paul W. Hait, Los Gatos, Calif., assignor to Pyromid, Inc., Redmond, Oreg.

Filed Feb. 9, 1983, Ser. No. 465,311
Int. Cl.[4] F24C *1/16*
U.S. Cl. 126—9 R 7 Claims



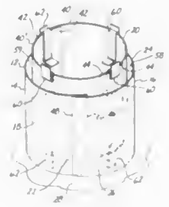
1. A collapsible stove comprising a base panel, a rear wall panel of trapezoidal configuration pivoted at one parallel side to an edge of said base panel, a side panel of trapezoidal configuration pivotally connected to each of the non-parallel sides of said rear wall panel, and a grill panel pivoted to the other parallel side of said rear wall panel, said grill panel being pivotally connected to the upper edge of said rear wall panel and adapted to seat on the upper edges of said side panels when pivotally extended to form a stove.

4,915,091

HIGH EFFICIENCY COMBUSTION HEATER

J. Arnold Varney, 7326 Ogelsby Ave., Los Angeles, Calif. 90045

Continuation-in-part of Ser. No. 187,049, Apr. 27, 1988, abandoned. This application Jan. 23, 1989, Ser. No. 300,616
Int. Cl.[4] F24B *3/00*
U.S. Cl. 126—65 36 Claims



1. A fuel burning heater comprising:
inner shell means,
outer shell means surrounding said inner shell means,
said inner shell means and said outer shell means defining therebetween air intake flue means,
means closing the lower end of said outer shell means to define a combustion zone within said shell means,
said combustion zone being in communication with said air intake flue means, and
said outer shell means comprising a plurality of segments movable to selected positions relative to each other and said inner shell means whereby said air intake flue means may be varied in cross-sectional area for adjustably controlling the flow of air reaching said combustion zone during burning of the fuel therein.

4,915,092

FLEXIBLE IMPLANTS FOR STABLE FLEXIBLE OSTEOSYNTHESIS OF FEMORAL TIBIA FRACTURES AND WORKING INSTRUMENTATION

Andrei Firică; Alexandru I. B. Manov, and Dragos Gheorghiu, all of Bucharest, Romania, assignors to Interprinderea Industria Technico-Medicala, Bucharest, Romania

Continuation of Ser. No. 97,968, Jun. 16, 1987, abandoned. This application Jun. 13, 1989, Ser. No. 366,304
Claims priority, application Romania, Nov. 5, 1985, 120633
Int. Cl.[4] A61F *5/04*
U.S. Cl. 606—67 1 Claim

1. A set of flexible bone implants for repair of a femural fracture, said set comprising:
a short pin of generally serpentine shape having an elongated, straight central portion with oppositely directed shorter-length bends at opposite ends thereof, one of said bends terminating in a generally triangular point, the other of said bends terminating in a bent-wire, closed circular eye lying in a plane and through which a bone nail can be inserted to hold said eye flush against a shank of a femur bone below an upper condyle thereof when said short pin is inserted through a neck of said femur into a head thereof;
an intermediate-length pin having a bowed central portion formed at one end with a generally triangular point, and at an opposite end with a second bent-wire, closed circular eye connected thereto through an S-curved bend, said intermediate length pin being of a length sufficient to enable insertion through said femur and said neck into said head and disposed below said short pin, and can be anchored flush to said femur by another bone nail or screw inserted through the second eye of said intermediate-length pin; and
a long pin of a length sufficient to enable it to pass through the full length of said shank of said femur from a region adjacent a lower condyle thereof into said upper condyle or said femoral head, said long pin having a body formed

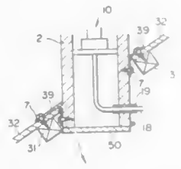
by an elongated, straight portion terminating respectively at a forward end in a generally triangular point and at an opposite rear end, through a second S-curved bend, in a widened spade-shaped, non-perforated formation having a forwardly directed barb disposed on either side of a longitudinal axis of said formation, said formation being arcuately bent about said longitudinal axis thereof to conform to the curvature of the femur at said region and adapted to rest thereon, said second S-curve formed by a pair of oppositely directed curves each having a respective inner curve lying tangent to a line running substantially transverse to a longitudinal direction of said body.

4,915,093

CONTAINER FOR ACCOMMODATING A SOLAR RAY-COLLECTING DEVICE

Kei Mori, 3-16-3-501, Kamiooge, Setagaya-ku Tokyo; Hakaru Akaishi, Osaka; Kenji Kakihara, Osaka, and Yoshiro Kitayama, Osaka, all of Japan, assignors to Kei Mori, Tokyo, Japan

Division of Ser. No. 246,565, Sep. 19, 1988. This application Aug. 21, 1989, Ser. No. 397,062
Claims priority, application Japan, Sep. 28, 1987, 62-243254
Int. Cl.[4] F24J *2/56*
U.S. Cl. 126—450 8 Claims



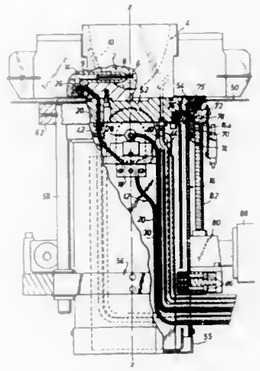
1. A solar ray-collecting device mountable within an opening in a roof of a building in which said roof is inclined relative to horizontal, comprising a cylindrical body having a longitudinal axis and upper and lower longitudinal ends, a transparent dome mounted on said upper longitudinal end of said cylindrical body, solar ray-collecting means disposed within said transparent dome and within said cylindrical body, securing means on said cylindrical body for mounting said cylindrical body in said opening in said roof with said longitudinal axis of said cylindrical body disposed vertically upright and with said upper longitudinal end of said cylindrical body extending above said roof and said lower longitudinal end of said cylindrical body extending below said roof and into said building, a bottom closure member mounted on said lower longitudinal end of said cylindrical body and movable between open and closed positions to thereby provide for inspection of said solar ray-collecting means.

4,915,094

APPARATUS FOR GENERATING HIGH FREQUENCY SHOCK WAVES OF WHICH THE ELECTRICAL SUPPLY CONNECTION IS DISPOSED INSIDE A TUBULAR ELEMENT, LIMITING OR PREVENTING ELECTRO-MAGNETIC LEAKAGES

Bernard Lacruche, Chelles; Gérard Hascoet, Paris; Dominique Cathignol, Genas, and Jean-Louis Mestas, Chassieu, all of France, assignors to Technomed International, Paris and Inserm, Lyons, both of, France

Continuation of Ser. No. 919,225, Oct. 15, 1986, abandoned. This application Nov. 17, 1988, Ser. No. 273,611
Claims priority, application France, Jun. 30, 1986, 86 09474
Int. Cl.[4] A61B *17/22*
U.S. Cl. 128—24 A 22 Claims



1. An apparatus for generating high frequency shock waves for the remote destruction of targets, preferably constituted by biliary concretions, kidney stones or the like, comprising a shock wave generator device comprising at least two electrodes disposed at least partly in a chamber filled with a liquid; a source of high-voltage electric current; an electric current supply connection means for intermittently supplying said electrodes with electric current from said source of electric current, said supply connection means comprising at least one condenser and electric conductors connecting said condenser to said electrodes for supplying intermittent electric current to the electrodes; and a substantially closed tubular element, at least a part of said supply connection means, said part including said condenser, being disposed inside said tubular element in order to limit or prevent electromagnetic leakages.

4,915,095

CARDIAC CPR MECHANISM

Newton Chun, 2095 John F. Kennedy Rd., Dubuque, Iowa 52001

Filed May 2, 1988, Ser. No. 189,070
Int. Cl.[4] A61H *31/00*
U.S. Cl. 128—28 6 Claims

1. A cardiopulmonary resuscitator device for a patient formed of two separable components which will facilitate the immediate institution of resuscitation by an additive effect of both heart and lung compression comprising:

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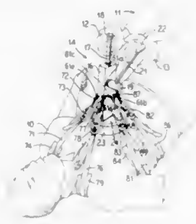
(1) a multibelted strong soft cloth-backed cuirass harness consisting of encircling strap means for ensuring lateral and vertical stability of an attachable chest compressor, a plurality of quick release means on each of said strap means;

(2) a portable attachable chest compressor with a padded compressor head which is operated manually by a multi-positional rack and pinion drive, wherein said rack and pinion drive is actuated by an adjustable lever handle, and wherein said chest compressor can be quickly attached to said strap means by said quick release means, a plurality of tension-tightening sliding buckles attached to said strap



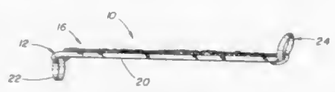
means which can be adjusted to adequate tension to stabilize said padded compressor head over the lower, slightly leftward portion of the sternum of said patient so that actuation of said manual lever handle will cause simultaneously compression of the heart of said patient against the spine and portion of the adjacent posterior chest wall and, simultaneously said harness will compress the lungs and arrested heart of said patient with each chest compression stroke so that by compressing the lungs blood will move through the uncompressed heart, and an upright stabilizing handle attached to said chest compressor so as to stabilize said chest compressor as said lever handle is actuated.

4,915,096

COMBINATION BACK SCRATCHER AND BODY MASSAGER

Violet M. Winstone, 1845 Bonita Ave., La Verne, Calif. 91750, and Gloria Grassi, 1511 E. Highland Ct., Ontario, Calif. 91764

Filed Oct. 17, 1988, Ser. No. 258,664
Int. Cl.[4] A61H *7/00*
U.S. Cl. 128—63 **10 Claims**



1. A product for use as a back scratcher and body massager, comprising:

a main, elongated backing structure having a greater length than width, and defining a front surface face and a rear surface face;

a hook-and-pile fastener comprising aa first elongated hook-portion strip, and a second pile-portion strip;

said hook-portion strip of said hook-and-pile fastener being fixedly secured along the length thereof to said rear surface face along at least a substantial portion of the length thereof;

said pile-portion strip of said hook-and-pile fastener being fixedly secured along the length thereof to said front surface face and extending along at least a substantial portion of the length thereof;

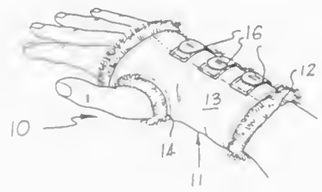
said elongated backing structure defining a first end region and a second end region by which a person's hands may hold said backing structure for massaging and scratching the body by using either said pile-portion strip or said hook-portion strip, respectively, and whereby said backing structure may be secured about a portion of a person's body by interconnecting said hook-portion strip and said pile-portion strip together, the width of each said strips is greater than half of said width of said backing structure.

4,915,097

JOINT SUPPORT DEVICE OF SHEEPSKIN TO INHIBIT MOVEMENT

Karen L. West, New South Wales, Australia, assignor to Victor L. West, New South Wales, Australia, a part interest

Filed May 18, 1988, Ser. No. 195,565
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—77 **10 Claims**



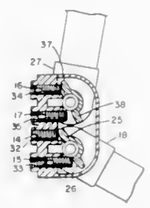
1. A supportive cover to enclose a patient's wrist joint, knee joint or elbow joint, said cover including means to inhibit movement of the joint without immobilizing the joint, said means consisting of a sheet of sheep skin having a resilient fleece layer between 5 and 15 mm thick and backed by a skin layer, said sheet having opposite edges which are brought together about the joint so as to encompass the joint, securing means attached to the skin portion to tightly secure the sheet in a wrapped position to produce a circumferential tension about the joint with the fleece layer adjacent the skin of the patient, said securing means holding adjacent portions of opposing edges together to apply firm pressure to inhibit without immobilizing movement of the joint without restricting the patient's blood circulation, the fleece having a resiliency which cooperates with said circumferential tension to provide longitudinal and torsional support for the joint.

4,915,098

ORTHOPAEDIC HINGE MECHANISM

David E. Young, Oxfordshire, and Kenneth P. Davis, Hillingdon, both of England, assignors to Protectair Limited, Abingdon, England

Continuation-in-part of Ser. No. 853,962, Apr. 21, 1986, abandoned. This application Apr. 3, 1987, Ser. No. 34,023
Int. Cl.[4] A61F *3/00*
U.S. Cl. 128—88 **5 Claims**



1. An orthopaedic and orthotic hinge mechanism comprising a hinge body; a first hinge arm having one end thereof pivotally connected to said body for flexion and extension of said arm in a plane of movement about a first pivot axis; said body having a first pair of threaded holes extending along said plane of movement on opposite sides of, and at generally right angles to, said pivot axis; said first hinge arm including an anterior raised portion having one end providing one of a first pair of abutment stops and having a second end providing the other one of said first pair of abutment stops; said first pair of abutment stops being adjacent to said first pivot axis on opposite sides thereof; said first and second adjustment screws threadedly received in said first pair of holes for engaging said first pair of abutment stops and for selectively and adjustably controlling flexion and extension of said first hinge arm in a continuously variable manner over a clinically useful range; said first pair of threaded holes being located along one side of said body; a second hinge arm is pivotally connected to said body for movement about a second pivot axis; said body having a second pair of threaded holes extending on opposite sides of, and at generally right angles to, said second pivot axis; said second hinge arm providing a second pair of abutment stops adjacent to said second pivot axis and on opposite sides thereof; and third and fourth adjustment screws threadedly received in said second pair of holes for engaging said second pair of abutment stops and for selectively and adjustably controlling flexion and extension of said second hinge arm in a continuously variable manner over a clinically useful range.

4,915,099

MOULDED SPEECH TRANSMITTER

Ronald E. Davis, Kanata, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ontario, Canada

Filed Aug. 12, 1988, Ser. No. 231,397
Claims priority, application Canada, Feb. 10, 1988, 558639
Int. Cl.[4] A62B *18/08*
U.S. Cl. 128—201.19 **13 Claims**

1. A speech transmitter, comprising:

a disc shaped body member halving a concentric, central circular recess in one end thereof and an outer, axially extending marginal rim surrounding said recess;

a disc shaped cover member having a concentric, central, circular recess in one end thereof and an outer, axially extending marginal rim being lockingly engageable with said body member marginal rim in axial relation thereto, said body recess and said cover recess being in coaxially aligned face-to-face relation and defining a membrane chamber; and

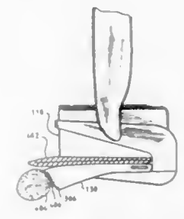
a thin, circular, membrane having a main body portion disposed in said membrane chamber and a marginal edge portion secured between said outer marginal rims of said body member and said cover member, said marginal rims having mating surface means comprising an annular projection and a corresponding recess for receiving said annular projection, said annular projection and mating recess having inclined surfaces, arranged such that when the marginal edge portion of said membrane is placed therebetween and said members are assembled by being telescoped into axial interengagement with one another, said inclined surface cooperate during said assembly to securely grip said marginal edge and radially outwardly pull said membrane to subject said membrane to uniform radial tension.

4,915,100

SURGICAL STAPLER APPARATUS WITH TISSUE SHIELD

David T. Green, Westport, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Dec. 19, 1988, Ser. No. 286,506
The portion of the term of this patent subsequent to Nov. 21, 2006, has been disclaimed.
Int. Cl.[4] A61B *17/04*
U.S. Cl. 227—176 **20 Claims**



1. In an improved surgical stapler for substantially simultaneously applying a plurality of surgical fasteners to body tissue comprising a handle, a gripping lever, a frame with a U-shaped distal portion, an anvil assembly mounted at the distal leg of the U-shaped distal portion, a fastener holder pivotally connected to the anvil assembly adjacent one end of the anvil assembly thereby defining a gap between them and containing a plurality of surgical fasteners and optionally including a knife means for cutting body tissue, the stapler mechanism further including a fastener driving means for substantially simultaneously driving all of the fasteners from the fastener holder, and means for actuating the fastener holder, the improvement comprising:

shield means mounted on the sides of the anvil assembly for preventing extraneous body tissue from being operated upon the surgical stapler, said shield means having a wedge means for separating extraneous tissue from the body tissue to be fastened and having deflecting means for deflecting the extraneous tissue from entering the gap between the anvil assembly and the fastener holder.

4,915,101

ROTATABLE TREATMENT TABLE HAVING ADJUSTABLE SUPPORT ASSEMBLIES

David F. Caccia, 227 Jackson Ave., Syosset, N.Y. 11791

Continuation-in-part of Ser. No. 3,811, Jan. 16, 1987, abandoned. This application Nov. 27, 1987, Ser. No. 125,973
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—73 **23 Claims**

1. A rotatable treatment table for effecting extension and distraction of the spine of a patient, the table comprising:

(a) a weighted platform, adapted to rest upon a floor, having a pivot means;

(b) a rigid elongate support means having a lower end and an upper end, said lower end secured to a fixed point on said platform;

(c) extensible elongate elevation means having a lower end and an upper end, said lower end rotationally secured to said pivot means of said weighted platform, in which reciprocal movement of said upper end of said extensible elevation means relative to said lower end may occur;

(d) a rigid rectangular support frame, having a head end and a foot end, said rigid support frame pivotally secured,

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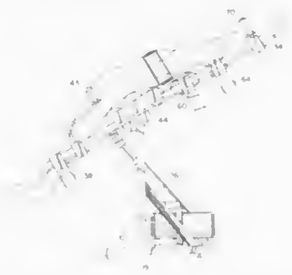
proximally to its center of gravity, to the upper end of said rigid support means and, further, pivotally secured, footwardly of said center of gravity of said frame, to the upper end of said extensible elevation means, wherein said pivotal securement of said support frame defines a selectable curved path of said framr relative to said weighted platform;

(e) a center and lower back support assembly transversely mounted to said rectangular frame proximally to said upper end of said elevation means, in which the center of gravity of the patient is within the longitudinal dimension of said center and lower back assembly, said assembly



further comprising a plurality of pads having axes disposed transversely to said rigid rectangular frame, said axes being positionally adjustable to positions below the plane of said rigid frame, wherein a desired correction of the curvature of the back of the patient may be imparted;

(f) a head support assembly transversely mounted to said rectangular frame headwardly of said back support assembly, and positionally adjustable in a plane normal to said rigid frame, said adjustability having a range extending above and below the plane of said rigid frame; and

(g) patient gripping means for permitting the patient to be held on to the treatment table during a dynamic uplift thereof.

4,915,102

HINGED DERMAL APPLICATOR

Alfred Kwiatek, Swanton, and John J. Wick, Williston, both of Vt., assignors to Bertek, Inc., Swanton, Vt.

Filed Sep. 1, 1988, Ser. No. 239,592
Int. Cl.[4] A61L *15/00*
U.S. Cl. 128—156 **153 Claims**

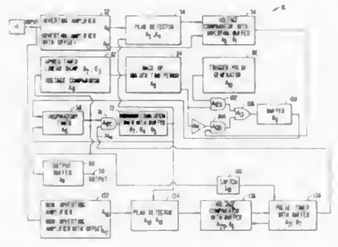
1. A device for applying a film layer to the skin or mucosa of a patient comprising a liner layer including a first surface and a second surface, said first surface of said liner layer comprising a releasable surface, a carrier layer for said film layer, said carrier layer including a first surface and a second surface, hinge means permanently affixing said first surface of said liner layer to said first surface of said carrier layer at a predetermined location thereon, said film layer being located on said first surface of said carrier layer at a location displaced from said hinge means, first adhesive means interposed between said first surface of said carrier layer and said film layer for maintaining said film layer in contact with said carrier layer when said portion of said carrier layer other than said hinge means is separated from said liner layer, and second adhesive means interposed between said first surface of said liner layer and said first surface of said carrier layer including said film layer, for releasably maintaining said first surface of said carrier layer including said film layer in contact with said first surface of said liner layer, said second adhesive means covering at least the entire periphery of said film layer, said first adhesive means having a first coefficient of adhesion and said second adhesive means having a second coefficient of adhesion, said first coefficient of adhesion of said carrier layer to said film layer being less than said second coefficient of adhesion of said film layer to said skin or mucosa of said patient, whereby upon application of said film layer to said skin or mucosa of said patient with said second adhesive means therebetween, said film layer adheres to said skin or mucosa of said patient and said film layer can simultaneously be removed from said carrier layer.

4,915,103

VENTILATION SYNCHRONIZER

Nadarasa Visveshwara, and Bruce J. Freeman, both of Fresno, Calif., assignors to N. Visveshwara, M.D., Inc., Fresno, Calif.

Filed Dec. 23, 1987, Ser. No. 137,517
Int. Cl.[4] A62B *7/00*
U.S. Cl. 128—204.23 **6 Claims**



1. An apparatus for supplying gas under pressure to a patient at desired times to aid patient breathing, said apparatus comprising: a respirator

means for generating an impedance signal having at least one rising edge indicative of the electrical impedance between two selected locations on the patient's chest, said locations being spaced apart from each other; and

inspiration detecting means for deriving an inspiration control signal from the impedance signal to indicate spontaneous patient inspiration and for triggering the respirator to supply gas under pressure to at least one of the patient's lungs by the respirator upon detection of spontaneous patient inspiration, wherein said inspiration detecting means comprises:

means for inverting the impedance signal;

means for adding to the inverted impedance signal a selected DC offset to obtain a sum signal;

a peak detector including means for generating an output signal for detecting the peaks of the inverted impedance signal; and

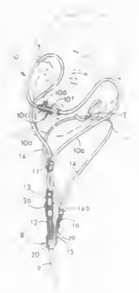
means for comparing the peak detector output signal with the sum signal for generating the inspiration control signal, wherein the DC offset determines the point on the rising edge of the impedance signal at which the triggering of the respirator is synchronized.

4,915,104

NASAL OXYGEN TUBE SUPPORT AND METHOD

Lloyd J. Marcy, Chisago City, Minn., assignor to Cynthia L. Vogt, White Bear Lake, Minn.

Filed Jan. 9, 1989, Ser. No. 294,779
Int. Cl.[4] A62B *9/04*
U.S. Cl. 128—207.18 **8 Claims**



8. A method of providing dual support for a nasal oxygen tube assembly having an oxygen supply tube to supply oxygen from an oxygen source to a patient, a pair of nasal oxygen tubes connected to the oxygen supply tube at one end and connected at the other end to a nasal manifold to supply oxygen from the tubes to the nose of the patient; said method comprising, maintaining the oxygen tubes sufficiently long to extend from the oxygen supply tube to behind the ears of a patient and thence forwardly proximate to the patient's nose, placing the nasal manifold adjacent the nose of the patient, placing the oxygen tube adjacent the patient's breast, placing one oxygen tube over each ear of the patient during use to define a first support means for the assembly and to hold the nasal manifold in contact with the patient's nose, providing a neck sling, connecting the neck sling to the portion of the nasal oxygen tube assembly adjacent the patient's breast, placing the neck sling around the neck of the patient to define a second support means for the assembly that transfers downward forces applied to the supply tube and the oxygen tubes to the neck of the patient, thereby providing greater safety, stability and comfort for the user.

4,915,105

MINIATURE RESPIRATORY APPARATUS

Tien-Chu Lee, P.O. Box 10160, Taipei, Taiwan

Filed Oct. 28, 1988, Ser. No. 257,640
Int. Cl.[4] A62B *7/00, 9/04, 23/02, 7/10*
U.S. Cl. 128—205.27 **9 Claims**

1. A respiratory apparatus comprising:

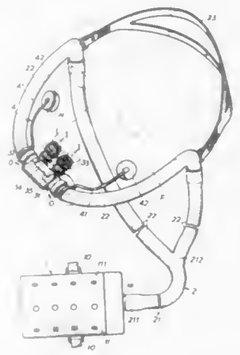
an air filtering means having a filtering medium formed therein secured to a wearer's chest, waist or neck;

an air delivery hose having a main hose connected to an outlet of said filtering means and two fiburcate boses branched from the main hose; and

a nose-connected breathing means including a horizontal pipe having two side openings of the pipe connected to said two bifurcate hoses, two inhaling valves one in each said side opening of said pipe, two nostril connectors formed on a rear portion of said pipe poking into a wearer's nostrils fluidically communicated with a wearer's nostrils, said pipe, said hose and said filtering means, an exhaling valve formed in a front portion of said pipe opposite to said nostril connectors, and a wind shield mounted on said horizontal pipe in front of said exhaling valve,

the improvement which comprises:

said wind shield including a wedge portion tapered frontwardly having a cross section of V-shape, two clamps protruding rearwardly from said wedge portion clampingly mounted on said horizontal pipe in front of said exhaling valve, and two said openings for discharging exhaust air, each side opening being defined between said wedge portion and the partial circumferential surface of said horizontal pipe,



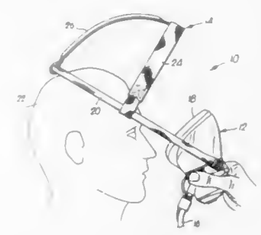
whereby upon an inhaling by a wearer, a clean air stream, after being filtered through said filtering means, is inhaled into a wearer's nostrils through said hoses, said inhaling valves, said pipe and said nostril connectors; whereas upon an exhaling by a wearer, the exhaust air is discharged outwardly through said nostril connectors, said pipe and said exhaling valve.

4,915,106

CREW OXYGEN MASK WITH PNEUMATIC COMFORT ADJUSTMENT

Charles C. Aulgur, Raytown, Mo.; David A. DiPasquale, Overland Park, Kans.; Thomas K. McDonald, Lees Summit, and Alan E. Kidd, Kansas City, both of Mo., assignors to Puritan-Bennett Corporation, Lenexa, Kans.

Filed Feb. 26, 1988, Ser. No. 160,658
Int. Cl.[4] A62B *18/08*
U.S. Cl. 128—207.11 **9 Claims**



7. Safety apparatus for use in an airplane or the like, comprising:

mask means adapted to be fit against the face of a person and including structure presenting, when so fitted, a chamber adjacent the nose and mouth region of said person for reception of a breathable gas mixture;

means for delivery of said breathable gas mixture to said chamber, including means operably coupled with said mask means for delivery of pressurized oxygen thereto, and regulator means for mixing atmospheric air with said pressurized oxygen to form the gas mixture;

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an extensible, inflatable strap element operably connected with said mask means and extendable from a fully deflated position corresponding to a relatively low pressure therewithin which is substantially ambient pressure to a fully inflated position corresponding to full inflation pressure therewithin; and

inflation control means operatively interconnecting said oxygen delivery means and said strap element, comprising manually controlled structure for selective inflation of the strap element to said full inflation pressure in order to extend the strap element to said fully inflated position to permit fitting thereof over the head of the person, and for establishing an intermediate gas pressure less than said full inflation pressure and greater than said relatively low pressure in said strap element after the element is fitted over the head of the person,

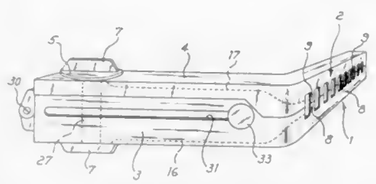
said inflation control means further including fine adjustment structure for selective fine adjustment of the pressure within the strap element after said intermediate gas pressure is established and over a pressure adjustment range substantially less than the pressure difference between said full inflation pressure and said relatively low pressure.

4,915,107

AUTOMATIC INSTRUMENT FOR PURSE-STRING SUTURES FOR SURGICAL USE

Carlo Rebuffat, and Riccardo Rosati, both of Milan, Italy, assignors to Harley International Medical Ltd., London, United Kingdom

Filed Feb. 27, 1989, Ser. No. 316,299
Claims priority, application Italy, Mar. 9, 1988, 19712 A/88
Int. Cl.[4] A61B *17/06*
U.S. Cl. 606—144 12 Claims



1. An automatic instrument for purse-string sutures for surgical use, including two jaws (**1**, **2**) having teeth (**8**, **9**) provided with openings (**10**, **11**) having a side slot (**12**), each of said openings (**10**, **11**) being adapted to receive a needle (**13**) passing therethrough, the ends of a suture thread (**14**) being fastened to said needles (**13**), said jaws (**1**, **2**) being integral with support members (**3**, **4**) adapted to be opened in order to be able to introduce the part to be sutured between said jaws, characterized in that said support members (**3**, **4**) are provided with a pair of control means which at one end thereof are fastened to a knob (**7**) while at the opposite end they are each fastened to a needle (**13**) in such a way that, by actuating said knob (**7**), needles (**13**) are pushed by said means along openings (**10**, **11**) provided through jaws (**1**, **2**), all the way to make needles (**13**) to project out of the free ends (**29**) of said jaws (**1**, **2**).

4,915,108

HOT AND COLD COMPRESS DEVICE

Shin-Ching Sun, 3F., No. 32, 132nd Lane, Hu-Lin St., Taipei, Taiwan

Filed Jun. 6, 1988, Ser. No. 202,251
Int. Cl.[4] A61F *7/00*
U.S. Cl. 128—402 3 Claims

1. A hot and cold compress device, comprising:

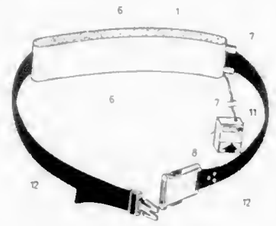
a wide, thick and elongated adiabatic tie formed of a porous material for placement adjacent a portion of a patient's body;

a heat transmitted element disposed within said adiabatic tie such that said adiabatic tie forms a sleeve surrounding said heat transmitted element;

two heat conducting elements disposed within said adiabatic tie and connected, respectively, to an end of said heat transmitted element;

a plurality of radiating ribs connected to surface portions of said heat conducting elements and said heat transmitted element passing through said adiabatic tie;

radiating films disposed on outside surfaces of said adiabatic tie connected to said plurality of radiating ribs, said radiating films being made of a mixture of aluminized lead and silicone jelly;



at least one thermometer connected to an end of said radiating films for showing the temperature of said radiating films;

a control box for controlling said compress device, said control box comprising at least one battery and a temperature adjusting set device for controlling the temperature of said radiating films;

power wires connected between said heat transmitted element and said control box, and

wherein said control box controls the temperature of said radiating films to cause said films to grow hot or cold to provide, respectively, a hot or cold compress for the patient.

4,915,109

DEFIBRILLATOR ELECTRODE ADAPTOR

John C. Daynes, Redmond; Harry R. Settle, Seattle, and Steven A. Chennault, Mukilteo, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.

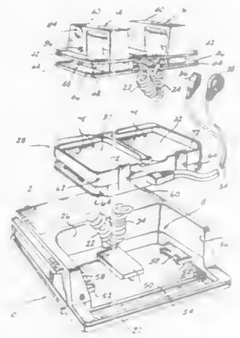
Filed Sep. 23, 1988, Ser. No. 248,794
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 D 7 Claims

1. An adaptor for use with a defibrillator of the type that includes a pair of paddle electrodes, said adaptor for converting the defibrillator for alternative use of the defibrillator with a pair of disposable electrodes other than the paddle electrodes, said adaptor comprising:

an adaptor body, said adaptor body including means for receiving and retaining in a predetermined position the paddle electrodes of the defibrillator;

first and second adaptor contact means, said first adaptor contact means being mounted to provide electrical contact with the first one of the pair of paddle electrodes when that paddle electrode is received and retained by said adaptor body, said second adaptor contact means being mounted to provide electrical contact with the second one of the pair of paddle electrodes when that paddle electrode is received and retained by said adaptor body; and

conductor means for electrically connecting said first adaptor contact means to a first of said disposable electrodes



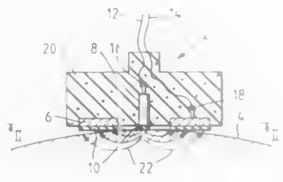
and for electrically connecting said second adaptor contact means to a second of said disposable electrodes.

4,915,110

THERAPEUTIC ELECTROSTATIC DEVICE

Zeev Kitov, Jerusalem, Israel, assignor to Theri-Teck, Inc., Annapolis, Md.

Continuation-in-part of Ser. No. 84,178, Oct. 12, 1987, abandoned. This application Jul. 25, 1988, Ser. No. 223,349
Claims priority, application Israel, Aug. 21, 1986, 79788
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—783 17 Claims



An electrode device for making contact with a living body surface, comprising: an electrical current conductive element configured to have a surface with a restricted cross-sectional area and including a current insulating material affixed to said surface and an electrical terminal means affixed to said element, an electrical current conductive member having a first surface and a second surface, a current insulating material affixed to said first surface and an electrical terminal means located on said second surface, and means for supporting said element and said member in proximity to each other with said insulating material forming a surface adapted for body contact with selected points on said living body surface.

4,915,111

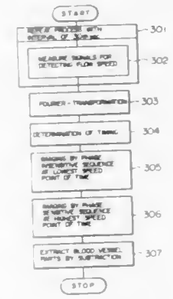
BLOOD FLOW IMAGING METHOD

Koichi Sano, Sagamihara; Tetsuo Yokoyama, Tokyo, and Ryuzaburo Takeda, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1988, Ser. No. 170,342
Claims priority, application Japan, Mar. 20, 1987, 62-63763
Int. Cl.[4] A61B *5/05*
U.S. Cl. 128—653 AF 7 Claims

1. A blood flow imaging method using a nuclear magnetic resonance imaging apparatus comprising means for generating a static magnetic field and gradient magnetic fields, means for generating a high frequency magnetic field, detecting means for detecting nuclear magnetic resonance signals from an examined body, and means for effecting various operations including image reconstruction, based on signals thus detected, comprising the following steps of:

repeatedly measuring speed information relating to a selected cross-sectional slice of the examined body with a pulse sequence carried out repeatedly and successively with a predetermined interval during a pulsation period,



said predetermined interval being an interval sufficient for detecting a change in blood flow;

determining timings for measuring image signals and imaging pulse sequences on the basis of said repeatedly measured speed information;

carrying out the imaging pulse sequences

detecting nuclear magnetic resonance signals, using said carried out imaging pulse sequences; and

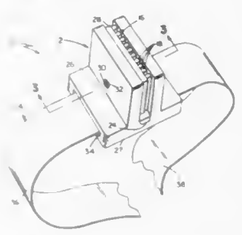
determining blood vessel images based on the detected nuclear magentic resonance signals.

4,915,112

RADIOGRAPHIC MEASUREMENT DEVICE

Stuart J. Singer, Cambridge, Mass., assignor to The Children's Medical Center Corporation, Boston, Mass.

Continuation of Ser. No. 913,340, Sep. 30, 1986, abandoned. This application Oct. 19, 1988, Ser. No. 262,197
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—653 R 3 Claims



1. A device for aiding accurate measurement of the distance between two points within the body of a patient in conjunction with an imaging technique which produces a two-dimensional image that includes a representation of said distance, said two-dimensional image being produced by a beam passing through said body in a predetermined direction, said two points lying in a plane generally perpendicular to said predetermined beam direction, said device comprising:

a planar scale having a series of opaque regions along the length of said scale, a boundary between each opaque

region and the next opaque region being perpendicular to said length of said scale, and wherein there is a difference in opacity between each opaque region and the next adjacent opaque region, whereby distances along the length of said scale are accurately represented with reference to said boundaries, and

a support attached to said scale and adapter for affixing said scale on the outside of said body, said support including a rigid member having a contact surface that is perpendicular to said plane of said opaque regions and adapted to rest against an external surface of said body so that, notwithstanding motion of said body, said opaque regions on said planar scale are held in the same plane as said two points and in a location such that said scale will be represented in said image, and

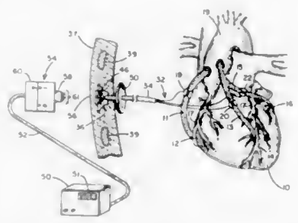
a means for imparting in said image a visual indication of whether or not the orientation of the plane of said scale relative to the plane of said two-dimensional image is greater than a predetermined amount.

4,915,113

METHOD AND APPARATUS FOR MONITORING THE PATENCY OF VASCULAR GRAFTS

Daniel G. Holman, Phoenix, Ariz., assignor to Bio-Vascular, Inc., St. Paul, Minn.

Filed Dec. 16, 1988, Ser. No. 285,529
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—691 **15 Claims**



1. Implantable flow meter apparatus for monitoring vascular graft patency comprising:

(a) at least one ring member for surrounding a blood vessel graft intermediate its ends, said at least one ring member supporting transducer means thereon to define an axis extending internal of said blood vessel graft when said at least one ring member is installed on said blood vessel graft;

(b) implantable electrical means positionable subcutaneously at a predetermined access site displaced from said one at least one ring member;

(c) conductor means coupling said transducer means to said electrical means; and

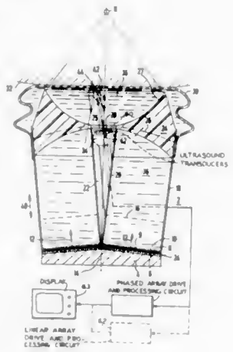
(d) barrier patch means having an area much greater than the cross-sectional area of said conductor means, said conductor means passing generally through the center of said patch means for inhibiting passage of infection producing organisms from said access site along said conductor means.

4,915,114

SHOCK WAVE SOURCE HAVING CENTRAL LOCATING SYSTEM & DISPOSED IN A CAVITY FREE OF SHOCK WAVES

Dietrich Hassler, Uttenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 29, 1988, Ser. No. 250,846
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1987, 3735345
Int. Cl.[4] A61B *8/00, 17/22*
U.S. Cl. 128—660.03 **14 Claims**



1. A shock wave generator for lithotripsy treatment of a calculus comprising:

a housing filled with a shock wave propagating medium;

a centrally disposed cavity in said housing;

means disposed in said cavity for locating said calculus;

means including a shock wave source for emitting shock waves into said medium, said means for emitting having an emission surface disposed in said housing, said emission surface being outwardly angled to diverge said shock waves away from said cavity so that said cavity is free of shock waves; and

means for focusing said shock waves at said calculus and for compensating for the divergence of said shock waves by said emission surface.

4,915,115

ULTRASONIC IMAGING APPARATUS FOR DISPLAYING B-MODE AND DOPPLER-MODE IMAGES

Hiroshi Sasaki, and Takahisa Okazaki, both of Ootawara, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 27, 1987, Ser. No. 7,355
Claims priority, application Japan, Jan. 28, 1986, 61-14632
Int. Cl.[4] A61B *8/00*
U.S. Cl. 128—660.05 **8 Claims**

1. An ultrasonic imaging apparatus comprising:

an ultrasonic transducer, said transducer transmitting and receiving a high-frequency ultrasonic wave suitable for obtaining a B-mode image and a low-frequency ultrasonic wave suitable for obtaining a Doppler-mode image, said transducer outputting a high-frequency echo signal corresponding to the high-frequency ultrasonic wave and a low-frequency echo signal corresponding to the low-frequency ultrasonic wave;

transmitting means for driving said ultrasonic transducer to output the high-frequency ultrasonic wave and the low-frequency ultrasonic wave therefrom;

receiving means for processing the high-frequency echo signal and the low-frequency echo signal and for outputting a B-mode image signal and a Doppler-mode image signal; and

display means for displaying the B-mode image signal and the Doppler-mode image signal output from said receiving means as the B-mode and Doppler-mode images,

said ultrasonic transducer including

a first piezo-electric ceramic having a center frequency 2f0 that is twice resonance frequency and a thickness corresponding to about ½ of the wavelength at the frequency 2f0,

a pair of electrodes formed on the front and rear surfaces of said first piezo-electric ceramic,

a second piezo-electric ceramic formed on said electrode provided on said rear surface of said first piezo-electric ceramic and having the same thickness as that of said first piezo-electric ceramic,

said first and second piezo-electric ceramics having only said pair of electrodes as their output leads

an acoustic matching layer formed on said electrode formed on said front surface of said first piezo-electric ceramic and having a thickness corresponding to ¼ of a wavelength at the frequency 2f0, and

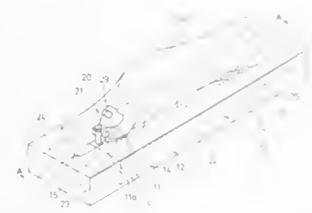
said first and second piezo-electric ceramics serving as a transducer having resonance frequency 2f0 to output the high-frequency ultrasonic wave and said acoustic matching layer serving as a transducer having resonance frequency f0 to output the low frequency ultrasonic wave.

4,915,116

FINGERTIP PULSE WAVE SENSOR

Norboru Hasebe, Kunitachi, and Shoji Ito, Tokyo, both of Japan, assignors to Misawa Homes Institute of Research & Development, Tokyo, Japan

Filed Mar. 28, 1989, Ser. No. 329,535
Claims priority, application Japan, Jul. 6, 1988, 63-1667890; Sep. 24, 1988, 63-237533; Sep. 24, 1988, 63-237534; Sep. 24, 1988, 63-237536
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—666 **7 Claims**



1. A fingertip pulse wave sensor, comprising:

a fingertip supporting base having a fingertip cushion supporting surface on which a fingertip cushion is set;

a slider having a nail contact surface which is disposed in opposed relationship with said fingertip cushion supporting surface at an interval smaller than the standard thickness of fingertips inserted, said slider being guided on said fingertip supporting base in such a manner as to be slidable in the direction in which said nail contact surface is moved away from or toward said fingertip cushion supporting surface;

an elastic body for urging said slider in the direction in which said nail contact surface is moved toward said fingertip cushion supporting surface, in such a manner that said elastic body applies a substantially fixed amount of pressure to said slider with respect to variations in the slide stroke caused by variations in the position of said nail contact surface where it makes contact with a nail; and

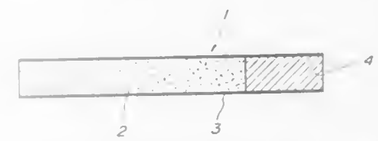
a light-emitting element disposed in either of said fingertip cushion supporting surface and said nail contact surface and a light-receiving element disposed in the other of said fingertip cushion supporting surface and said nail contact surface in opposed relationship with said light-emitting element.

4,915,117

CIGARETTE

Midori Ito, 16-go, 1-ban, Kyomachi 1-chome, Takefu-shi, Fukuiken, Japan

Filed Aug. 5, 1988, Ser. No. 228,616
Claims priority, application Japan, Aug. 5, 1987, 62-195490
Int. Cl.[4] A24D *1/02*
U.S. Cl. 131—365 **13 Claims**



1. A cigarette comprising a thin sheet for holding tobacco, wherein the thin sheet comprises a ceramic sheet of a woven or nonwoven fabric of ceramic fiber thermally decomposed at a high temperature, which produces no harmful organic substance with heat occurring with smoking of the cigarette.

4,915,118

SMOKING ARTICLE WRAPPER AND METHOD OF MAKING SAME

Clifford M. Kaufman, Asheville, and Richard H. Martin, Brevard, both of N.C., assignors to P. H. Glatfelter Company, Spring Grove, Pa.

Filed Apr. 20, 1988, Ser. No. 183,988
Int. Cl.[4] A24D *1/02*
U.S. Cl. 131—365 **42 Claims**

1. A wrapper for smoking articles such as cigarettes, cigars and the like comprising a cellulosic fiber sheet containing, as filler, freshly precipitated magnesium hydroxide filler from a controlled reaction based on reagent addition at essentially equal stoichiometric rates applied to the cellulosic fibers.

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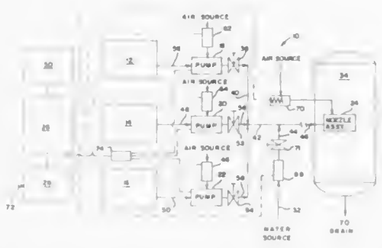
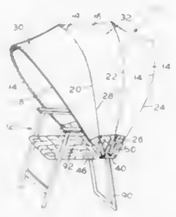
4,915,119
CLEANING APPARATUS AND METHOD
Robert V. Franklin, Burbank, Ill., assignor to Dober Chemical Corporation, Midlothian, Ill.
Filed Apr. 21, 1986, Ser. No. 853,860
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—57 R 12 Claims



6. An apparatus useful for providing a plurality of different chemical composition useful to treat an item comprising:
a plurality of reservoir means each of which being capable of containing a concentrated form of a different one of said chemical compositions, each of said reservoir means having an outlet means acting to provide an exit from the associated reservoir means for the concentrated form of the chemical composition contained in said associated reservoir means;
means for providing diluent to said concentrated forms of said chemical compositions exiting from said plurality of reservoir means to form said chemical compositions;
electronic control means including a keyboard and a display module associated with each of said plurality of reservoir means and said means for providing diluent and structured to be preset by control information imputed through said keyboard to automatically and independently of the diluent flow control the time during which said concentrated form of chemical composition exits from each individual reservoir means and to automatically and independently control the flow of diluent from said means for providing diluent, said display module being capable of providing a visual display of said control information imputed through said keyboard and;
nozzle means acting to contact said chemical compositions and diluent with said item to be treated.

4,915,120
BONNET FOR LAWN CHAIRS
Philip C. Ziolkowski, 1167 N. 34th St., Springfield, Oreg. 97478
Filed Mar. 20, 1989, Ser. No. 325,885
Int. Cl.[4] E04H *15/58*
U.S. Cl. 135—90 3 Claims



1. A bonnet for lawn chairs and the like, which comprises:
a. a plurality of flexible resilient bows of generally U-shaped configuration;
b. a flexible covering attached to and interconnecting said bows along a substantial portion of their length;
c. two bow assembly bars, each having a separate attachment location, in linear spaced relationship, for each bow;
d. means for connecting, with individually adjustable tension, one of the ends of each bow to one of said bow assembly bars and the other end of each bow to the other of said bow assembly bars, so as to permit each of the bows, extending between the bow assembly bars, to be pivotable relative to the bow assembly bars and to each other a separate spaced locations, thereby permitting variation in canopy coverage and location; and
e. means for attaching the bow assembly bars to a chair framework.

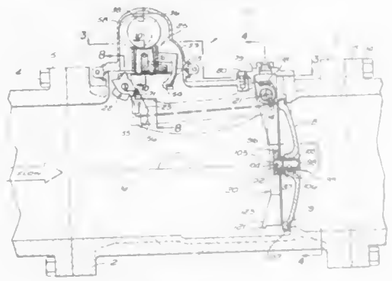
4,915,121
COAXIAL PIPING SYSTEM
Robert L. Rains, 2135 Napoli Dr., Oxhard, Calif. 93030
Division of Ser. No. 122,537, Nov. 12, 1987, which is a continuation of Ser. No. 937,441, Dec. 3, 1986, abandoned, which is a continuation of Ser. No. 809,584, Dec. 16, 1985, abandoned.
This application Jun. 21, 1989, Ser. No. 369,112
Int. Cl.[4] F16L *9/18*
U.S. Cl. 137—15 4 Claims

1. A method for purging gas in a coaxial piping system having an outer substantially non-expandable conduit, an inner conduit having a uniform outer diameter and a spring coil comprised of resilient unitary material having a thickness approximately equal to the difference in diameter between the inner conduit and the outer conduit such that when the inner conduit, outer conduit and spring coil are combined, the spring coil is securely fitted between the inner diameter of the outer conduit and the outer diameter of the inner conduit, the coils of the spring being sufficiently spaced apart from one another to permit fluid flow in a helical path about said coils through the volume between the inner conduit and the outer conduit, said method comprising the steps of:
injecting a purging gas into a first location in the volume between the outer conduit and the inner conduit for dispersing any gas escaping from said inner conduit;
permitting said purging gas to travel in a helical path along said coils within the volume between the outer conduit and the inner conduit and to create turbulence therebetween which evenly mixes any of said escaping gas with said purging gas to form a combination thereof; and
exhausting said combination of purging and any escaping gas from a second location in the volume between the outer conduit and the inner conduit.

4,915,122
SHOCK ACTUATED VALVE
Takashi Ikegaya, Tokyo, Japan; Richard D. Sibley, Anaheim, and William F. Keller, San Dimas, both of Calif., assignors to Koso International, Inc., Santa Fe Springs, Calif.
Filed Apr. 24, 1989, Ser. No. 342,330
Int. Cl.[4] F16K *17/36*
U.S. Cl. 137—38 24 Claims

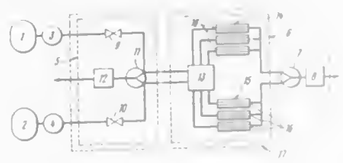
1. The combination comprising:
a first structure mounted for swinging movement about a first axis;
first yielding means urging said first structure about said first axis from a first position toward a second position;

first latch means for releasably retaining said first structure in said first position;
shock actuated mechanism responsive to shock forces to release said first latch means for movement of said first structure by said yielding means to said second position;
a second structure including a valve and which is mounted to swing about a second axis;
second yielding means urging said second structure toward a position in which the valve is closed; and



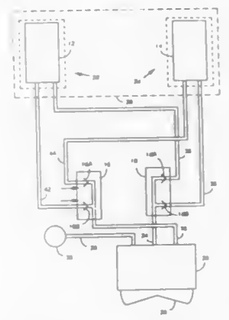
second latch means releasably retaining said second structure in a position in which the valve is open and actuable by movement of said first structure toward said second position upon release of said first latch means to automatically release said second structure for valve closing movement;
said first structure in moving from said second position to said first position thereof swinging generally toward said second structure and said second axis.

4,915,123
APPARATUS FOR PREPARING GAS MIXTURES FROM CONSTITUENTS TAKEN IN A GIVEN PROPORTION
Grigory A. Morgovsky, ulitsa Dneprovskaya naberezhnaya, 9a, kv. 390, Kiev; Evgeny P. Pistun, ulitsa Kulparkovskaya 141, kv. 184; Zenovy N. Tepljuh, ulitsa Ordzhonikidze 1, kv. 19, both of Lvov, and Yakov L. Sankin, Brest-Litovsky prospekt, 164a, kv. 14, Kiev, all of U.S.S.R.
Filed May 2, 1988, Ser. No. 189,471
Int. Cl.[4] G05D *11/03*
U.S. Cl. 137—599 7 Claims



1. An apparatus for preparing gas mixtures from constituents taken in a given proportion comprising
sources of gas mixture constituents, each having an outlet;
pressure-reducing valves connected to said outlets from said sources of gas mixture constituents;
stabilizing means for stabilizing the absolute pressure of the gas constituents and having inlets and outlets, each of said inlets of said stabilizing means being connected to an associated one of said pressure-reducing valves;
proportion setting means for setting the proportion between the gas mixture constituents and having inlets and outlets, the inlets of said proportion setting means being connected to associated outlets of said stabilizing means, said proportion setting means having a distributor having inlets and outlets and at least two, depending on the number of the gas mixture constituents, sets of capillary tubes connected to said outlets of said distributor and said inlets of said distributor forming said inlets of said proportion setting means;
a main mixer of the gas mixture constituents, having inlets and an outlet, the inlets of said main mixer being connected to the outlets of said proportion setting means; and
a controller of the absolute pressure of the gas mixture connected to the outlet of said main mixer.

4,915,124
BLADDER PRESSURE CONTROL SYSTEM AND METHOD
Joseph A. Sember, III, Glendale, Calif., assignor to Jasco Products, Inc., Glendale, Calif.
Filed Mar. 30, 1988, Ser. No. 175,069
Int. Cl.[4] F16K *15/20*; A47C *27/10*
U.S. Cl. 137—223 2 Claims



1. A control system for an inflatable/deflatable seat bladder system that includes at least a pair of bladders configured for mounting in a seat cushion comprising:
a source of pressurized fluid;
a first input tube connected to a first one of the bladders;
a second input tube connected to a second one of the bladders;
an inflation valve for permitting fluid flow into the first and second bladders from the first and second input tubes while preventing fluid flow out of each of the bladders;
a first output tube connected to the first bladder;
a second output tube connected to the second bladder;
a deflation valve for permitting fluid flow out of each bladder while preventing cross flow between the bladders; and
a switch assembly connected to the source of pressurized fluid, the inflation valve means and to the deflation valve means, the switch assembly including a rocker switch that is biased to be in a neutral position in which no fluid flow to or from any of the bladders, the rocker switch being rotatable in a first direction from the neutral position to a first switching position wherein fluid is supplied from the source of pressurized fluid to the bladders through the input tubes, the rocker switch being rotatable in a second direction from the neutral position to a second switching position wherein fluid flows from the bladders through the output tubes.

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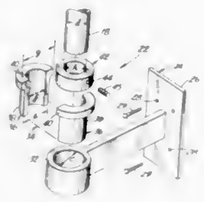
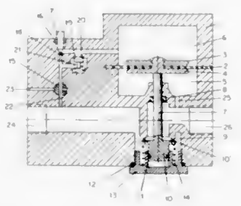
4,915,125
VALVE STEM EXTENSION ASSEMBLY
Leo M. Lester, Medford, Mass., assignor to Asahi/America, Inc., Medford, Mass.
Filed Oct. 12, 1989, Ser. No. 420,570
Int. Cl.[4] F16L *5/00, 3/08*
U.S. Cl. 137—368 20 Claims



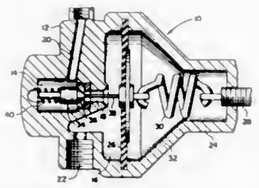
1. A valve stem support assembly for use with a valve, said assembly comprising:
an elongated valve stem extension operatively connected to said valve;
a rigid casing supported in spaced relationship to said valve stem extension;
at least one support bracket rigidly connected to said casing and extending therefrom, said support bracket including an end disposed in proximity to said valve stem extension; and
a collar disposed at a fixed longitudinal position on said valve stem extension and in proximity to the end of the support bracket, such that weight loads of said valve stem extension are at least partly transmitted to the support bracket through the collar for preventing excessive loads on the valve.

4,915,126
METHOD AND ARRANGEMENT FOR CHANGING THE PRESSURE IN PNEUMATIC OR HYDRAULIC SYSTEMS
Lars Gyllinder, Stockholm, Sweden, assignor to Dominator Maskin AB, Jookoping, Sweden
PCT No. PCT/SE87/00016, § 371 Date Jul. 12, 1988, § 102(e) Date Jul. 12, 1988, PCT Pub. No. WO87/04499, PCT Pub. Date Jul. 30, 1987
PCT Filed Jan. 19, 1987, Ser. No. 222,919
Claims priority, application Sweden, Jan. 20, 1986, 8600227-6
Int. Cl.[4] F16K *31/14, 31/38*
U.S. Cl. 137—495 4 Claims



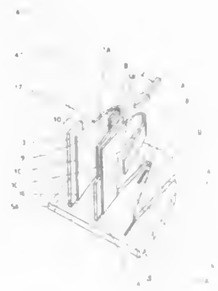
1. Apparatus for changing the pressure in a fluid pressure system to produce a slow rise in pressure, comprising a delivery channel having an inlet side and an outlet side,
valve means in said delivery channel between said inlet side and said outlet side, said valve means comprising a valve seat and a valve member movable between a closed position in which it is seated on said valve seat and an open position,
means for elastically biasing said valve member toward closed position,
said valve member having a valve spindle connecting said valve member with a diaphragm dividing a chamber into a first chamber portion in which fluid pressure exerts a force on said diaphragm in a direction to move said valve member toward closed position and a second chamber portion in which fluid pressure exerts a force on said diaphragm in a direction to move said valve member to open position,
a first passageway connecting said first chamber portion with said delivery channel on the outlet side of said valve means,
a second passageway connecting said second chamber portion with a three-way valve means for connecting said second chamber portion alternatively with said delivery channel on the inlet side of said valve means or with an outlet passageway,
variable throttling means in said second passageway between said three-way valve means and said second chamber portion and a non-return valve connected in parallel with said variable throttling means.

4,915,127
COMPRESSED GAS REGULATOR WITH PRESSURIZED SEALED BONNET
Barry L. Werley, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.
Continuation of Ser. No. 169,810, Mar. 18, 1988, abandoned. This application May 26, 1989, Ser. No. 357,752
Int. Cl.[4] G05D *16/06*
U.S. Cl. 137—505.42 11 Claims



1. A compressed gas regulator comprising: a housing having high pressure chamber, a low pressure chamber spaced from the high pressure chamber and an orifice extending between the high pressure chamber and the low pressure chamber;
a valve plug in the high pressure chamber and movable toward and away from the orifice;
a completely sealed bonnet mounted on said housing across the low pressure chamber;
a movable pressure sensing/control element extending across the low pressure chamber and separating the low pressure chamber from the bonnet;
means connecting the pressure sensing/control element to said valve plug;
a gas at a uniform pressure filling said bonnet and applying a uniform pressure on said pressure sensing/control element, said gas being an inert or fire extinguishing gas so as to extinguish any fire which may occur in the regulator; and
adjustable biasing means for applying a force on said pressure sensing/control element in a direction opposite to the force applied by the gas in the bonnet and to permit variation of the applied force.

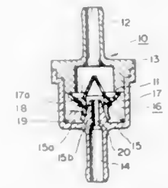
4,915,128
AUTOMATIC CHAMBERED FLAP VALVE FOR CONTROLLING GAS PASSAGE, PARTICULARLY FOR FEEDING TWO-STROKE INTERNAL COMBUSTION ENGINES
Massimo Masserini, via A. Manzoni, 61, 24025 Gazzaniga (Bergamo), Italy
Filed Nov. 1, 1988, Ser. No. 265,574
Claims priority, application Italy, Feb. 26, 1988, 2912 A/88
Int. Cl.[4] F16K *15/16*
U.S. Cl. 137—512.15 21 Claims



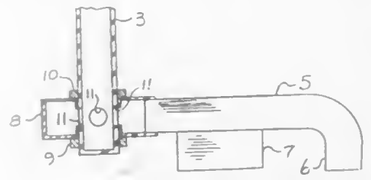
1. An automatic valve for controlling gas passage through a duct, such as a feed duct of a two-stroke internal combustion engine, comprising
a chamber communicating with said duct and arranged to determine opening and closing of said duct,
at least one dihedron-shaped flap situated in said chamber and mounted to move towards or away from an inner contact surface of said chamber,
said flap thereby opening or closing rectangular slot-shaped flow ports defined between the same and said inner contact surface of said chamber,
said flap comprising edges arranged substantially parallel to the flow which are arranged to graze, when in movement, flat surfaces of recesses provided in end walls parallel to said edges of said at least one flap and perpendicular to said contact surface of said chamber, and
a support wall positioned between dihedral wings of said at least one dihedral-shaped flap and downstream of an edge joining said wings to form said dihedral flap in said flow direction,
said support wall having at least one flat, smooth surface

4,915,129
CHECK VALVE
Akio Takayama, Ibaraki, Japan, assignor to Kyosan Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 3, 1989, Ser. No. 319,152
Claims priority, application Japan, Mar. 24, 1988, 63-37658[U]
Int. Cl.[4] F16K *15/02*
U.S. Cl. 137—514 2 Claims

1. A check valve comprising:
a first valve body provided with an inlet port at the upper portion thereof for introducing fluid and a valve seat at the lower end thereof;
a second valve body having an oulet port extending downward therefrom at the lower portion thereof for discharging the fluid;
a valve chamber defined by fixing the first valve body to the second valve body;
a valve positioned in the valve chamber;
springs positioned in the valve chamber for allowing the valve to be brought into contact with the valve seat by a resiliency of the springs, wherein the valve is released from the valve seat by fluid pressure for allowing the fluid introduced from the inlet port to flow in the valve chamber and discharge from the outlet port;
characterized in that the check valve further comprises a frustoconical projection extending upwardly from a bottom surface of the second valve body within the valve chamber and an elastic member incorporated into the valve and provided with a plurality of elastic pieces extending downwardly from the valve for slidingon an outer surface of the frustoconical projection and in contact with the outer surface of the frustoconical projection.



4,915,130
REVOLVING FUEL PICK-UP TUBE
Robert L. Dowler, New Haven, Ind., assignor to Navistar International Transportation Corp., Chicago, Ill.
Filed Oct. 26, 1988, Ser. No. 263,110
Int. Cl.[4] F16L *27/08*
U.S. Cl. 137—579 1 Claim



1. A fuel line pickup in a vehicle fuel tank comprising a vehicle fuel tank, a fuel line including a centrally mounted fuel tube in said fuel tank, a horizontal fuel pickup tube having a downturned portion terminating in a fuel inlet, a swivel carried on the lower end of said centrally mounted fuel tube supporting said fuel pickup tube for rotation about said centrally mounted fuel tube, means defining a sealed passage in said swivel for transferring fuel from said fuel pickup tube to said centrally mounted tube, and a wing mounted to the bottom side of said horizontal pickup tube and extending downwardly to a distal end disposed above said fuel pickup tube inlet, said wing being mounted slightly angular to said horizontal pickup tube thereby causing said fuel pickup tube to swivel responsive to fuel movement in said tank to move said fuel pickup to an area of greatest fuel depth in said tank.

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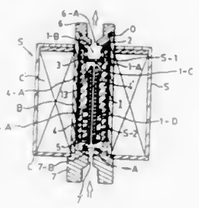
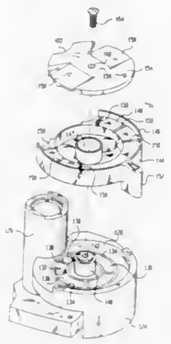
4,915,131
HILL-HOLDER
Ho H. Cha, 533-36 Suyu 2-dong, Dobong-ku, Seoul, Rep. of Korea
Filed May 10, 1989, Ser. No. 350,620
Claims priority, application Rep. of Korea, Jul. 12, 1988, UM11412
Int. Cl.[4] F16D *65/24;* B60K *41/20*
U.S. Cl. 137—598 1 Claim



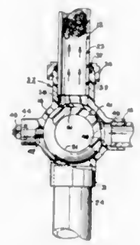
1. In a vehicle provided with a clutch mechanism having a solenoid valve assembly, said solenoid valve assembly comprising a housing, an exciting coil, a master plate, a bobbin secured to said master plate, a cylinder having two opposing outer grooves and a valve rod, said cylinder and valve rod having a coaxial passage through or in which the fluid pressure passes or is trapped, said bobbin defining a small intermediate diameter section, a first large diameter section, a middle diameter section and a second large diameter section, said valve rod having a conical-shaped head for engaging a first valve, a central-through passage, a second valve in the bottom thereof for engaging a valve seat formed in a closure nut, a first spring being provided in said first large diameter section, a second spring being provided in said second large diameter section, a C-ring being provided on the upper portion of said bobbin for retaining said first valve within said first large diameter section, and two closure nuts engaging said bobbin.

4,915,132
GAS REGULATOR SELECTOR VALVE
Colin G. Hodge, Columbia, Md., and Douglas D. Carden, Barneveld, Wis., assignors to The BOC Group, Inc., New Providence, N.J.
Filed Jan. 23, 1989, Ser. No. 300,662
Int. Cl.[4] F16K *11/08*
U.S. Cl. 137—625.41 17 Claims



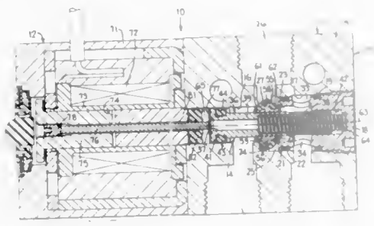
1. A gas regulator selector valve, said selector valve comprising a regulator body having a vacuum outlet port adapted to be connected to an end utilization means of vacuum and at least one inlet port, a selector dial affixed to said regulator block and having one face thereof overlying said ports, said one face of said selector dial having a sealing material affixed thereto and having at least one recess formed therein, said selector dial being moveable between a first position wherein said at least one recess overlies and allows communication between said vacuum outlet port and said at least one inlet port, and at least a second position wherein said vacuum outlet port is blocked, said selector dial having a plurality of detents formed in the other face thereof with at least one detent corresponding to each of said at least two positions, and a switch plate affixed to said regulator body contacting said other face of said selector dial, said switch plate body having at least one flexible arm including a projection generally shaped to fit within said plurality of detents, said projection being biased toward said other face by said flexible arm to cause said projection to enter a corresponding detent in each of said at least two positions to hold said selector dial in one of said at least two positions.

4,915,133
VALVE DEVICE FOR PIPING SYSTEMS
C. L. Scott Harrison, 31 Riverside Dr., Wilmington, Del. 19809
Filed Mar. 15, 1989, Ser. No. 324,206
Int. Cl.[4] F16K *5/06, 11/087*
U.S. Cl. 137—625.47 9 Claims



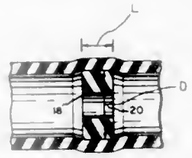
1. A device for selectively applying pressure from a source of pressure fluid to different sections of a piping system providing a conduit for fluid flow, comprising:
a valve housing having a through bore and means to couple said housing into said piping system at a selected location between said sections so as to connect the opposite ends of said through bore respectively with the conduits of said different piping system sections, a pressure fluid chamber separated from said bore, and means to connect said source of pressure fluid to said chamber;
a valve element mounted in said housing for selective movement, said valve element having a first though passage and a second pressure-fluid passage;
means to selectively position said valve element in three positions: an open position, a first closed position and a second closed position;
in the open position of said valve element, said first passage being in registry with said through-bore, and said second passage isolating said pressure chamber from either of said opposite ends of said through bore;
in the first closed position of said valve element, said first passage being out of registry with said through-bore, and said second passage connecting said chamber with one of said opposite ends of said through-bore to thereby connect said one end of the through-bore with said source of pressure fluid; and
in the second closed position of said valve element, said first passage being out of registry with said through bore, and said second passage connecting said chamber with the other of said opposite ends of said through-bore to thereby connect said other end of the through-bore with said source of pressure fluid.

4,915,134
THREE-WAY POPPET VALVE WITH HOLLOW STEM
Vytautas J. Toliusis, Paw Paw Township, Van Buren County, and Thomas Tinholt, Galesburg, both of Mich., assignors to Humphrey Products Company, Kalamazoo, Mich.
Filed Jul. 27, 1989, Ser. No. 386,871
Int. Cl.[4] F15B *13/044*
U.S. Cl. 137—625.65 6 Claims



1. A solenoid-operated, single-stem, three-way valve assembly, comprising:
housing means including a valve body having stepped cylindrical bore means formed therein and extending therethrough between opposite end faces of the valve body, said cylindrical bore means including a first cylindrical bore extending inwardly from one end face and coaxially communicating with a second cylindrical bore which is of larger diameter and which extends outwardly through the other end face, said first and second bores at their point of communication being joined together by an annular shoulder defined on said valve body, said annular shoulder defining thereon a first annular valve seat in surrounding relationship to said first cylindrical bore;
said housing means including an end cap stationarily and sealingly seated within an outer end of said second cylindrical bore, said end cap having a sleeve part which projects coaxially inwardly into said second cylindrical bore and which defines therein a third cylindrical bore of a diameter substantially equal to that of said first cylindrical bore, said sleeve part terminating in a free inner axial end which is opposed but spaced axially from said shoulder and which defines thereon a second annular valve seat in surrounding relationship to said third cylindrical bore,
a load port formed in said valve body and communicating with said stepped bore through an annular gap defined between said first and second valve seats;
a first port formed in said valve body and communicating directly with said first cylindrical bore at a location disposed axially on one side of said first and second valve seats;
a second port formed in said valve body and communicating directly with said second cylindrical bore at a location disposed axially on the other side of said first and second valve seats;
a single elongated and axially shiftable valve positioned within said cylindrical bore means for controlling flow of fluid between said ports, said valve including an elongated rod like stem disposed within and extending substantially coaxially through said bore means, said stem having a first end portion which is axially slidably supported within said first cylindrical bore at a location disposed axially outwardly from said first port, and said stem having a second end portion which is axially slidably supported within said end cap;
said valve including a single annular poppet-type valve member fixedly mounted on said stem in encircling relationship therewith, said poppet-type valve member projecting radially outwardly into the annular gap between said first and second valve seats and being axially movable therebetween for alternate sealing engagement therewith;
first elastomeric seal ring means mounted on said first end portion of said stem in surrounding relationship thereto and disposed in sliding and sealing engagement with the wall defining said first cylindrical bore;
electric solenoid means for effecting axial shifting of said valve from a first end position to a second end position, said solenoid means including a plunger-type actuator projecting coaxially into engagement with said one end portion of said stem;
second elastomeric seal ring means sealingly cooperating between said actuator and the wall surrounding said first cylindrical bore, said second seal ring means being disposed axially outwardly from said first seal ring means so as to define an annular chamber therebetween; and
a pressure balancing passageway extending through said stem and having one end thereof in continuous communication with said annular chamber and the other end thereof in continuous communication with said second port.

4,915,135
FLOW RESTRICTING HOSE ASSEMBLY
Harry G. Kellenbarger, Lincoln; Roy W. Olsen, Seward, and Alfred H. Renard, Lincoln, all of Nebr., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Continuation of Ser. No. 892,525, Jul. 31, 1986, abandoned. This application Sep. 28, 1987, Ser. No. 101,624
Int. Cl.[4] F15D *1/02*
U.S. Cl. 138—44 7 Claims



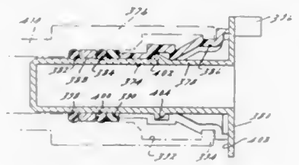
1. A two piece flow restricting hose assembly comprising:
(a) a one piece flexible tubular conduit having a length considerably greater than its diameter and having two ends and having a permanently expanded cylindrical portion therein proximate to one end thereof and
(b) a cylindrical insert having a longitudinal aperture along its axis and having an outside diameter and being coaxially disposed entirely within said expanded portion of said tubular conduit, wherein said expanded portion has an inner diameter which is slightly smaller than said outside diameter to provide a tight fit about said insert.

4,915,136
STUFFER PLUG QUICK CONNECTOR ASSEMBLY
Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Mt. Clemens, Mich.
Continuation of Ser. No. 127,532, Dec. 2, 1987, abandoned, which is a continuation of Ser. No. 748,307, Jun. 24, 1985, abandoned, which is a division of Ser. No. 360,201, Mar. 22, 1982, Pat. No. 4,601,497, which is a division of Ser. No. 201,711, Oct. 29, 1980, Pat. No. 4,423,892. This application Sep. 26, 1988, Ser. No. 251,038
Int. Cl.[4] F16L *35/00*
U.S. Cl. 138—89 7 Claims

1. In combination with a connector assembly comprising; a tubular conduit adapted to convey fluid and formed with an annular projection disposed a predetermined distance from the

end of the conduit to be connected, a housing formed with an axial bore for receiving the conduit at a first end and for providing a fluid path at a second end, sealing means for providing a fluid tight seal between confronting portions of the conduit and the housing, a retainer element including at least one relatively deformable portion extending substantially parallel to the axis of the conduit, at least one relatively non-axially deformable portion extending between the axially outerside of the annular projection of said conduit and a radially-extending surface of the housing and thereby maintaining the retainer element within the axial bore and preventing withdrawal of the conduit from the housing, and the relatively deformable portion of the retainer element being sufficiently long and deformable to allow sufficient radial movement of said relatively non-axially deformable portion to permit the non-axially deformable portion to be biased radially outwardly by the annular projection of the conduit as the conduit is inserted into the axial bore, and to cause the relatively non-axially deformable portion to snap radially inwardly adjacent the axially outer side of the annular projection when the conduit is positioned in place within the axial bore; the improvement comprising:

a disposable stuffer-plug adapted to install the sealing means in the axial bore of the housing and detachably secure the retainer element to the housing generally at the first end thereof and said stuffer-plug being removable from the



housing to enable connection of the conduit, the conduit coupled with the sealing means and retainer element positioned in the housing by said stuffer-plug, said stuffer-plug having

a body formed with a rod-shaped portion adapted to support the sealing means and the retainer element in a generally coaxial assembly relationship thereon and be inserted into the axial bore of the housing to seal the axial bore, and means disposed adjacent one end of said rod-shaped portion for allowing withdrawal of said rod-shaped portion from the axial bore of the housing, said rod-shaped portion being formed with positioning means for maintaining the sealing means and the retainer element in said assembly relationship on said body until said stuffer-plug body is removed from the axial bore of the housing, and

said rod-shaped portion including means forming an inclined surface spaced axially between said positioning means and said withdrawing means for cooperating with the retainer element to prevent the retainer element from slipping off said body before said rod-shaped portion is inserted into the axial bore of the housing and for facilitating removal of said body from the axial bore of said housing by causing a gradual outward deflection of said non-axially deformable portion as said body is pulled out of the axial bore of the housing.

4,915,137

SHEET PLASTIC FLANGE PROTECTOR

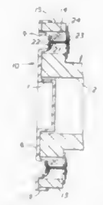
James A. Hall, 1519 Hill Rd., Houston, Tex. 77039, and Clyde M. Robinson, 12810 Aste La., Houston, Tex. 77065

Filed Aug. 15, 1988, Ser. No. 231,958
Int. Cl.[4] B65D *59/06*
U.S. Cl. 138—96 R **1 Claim**

1. The combination of a temporary, removable flange protector with a flanged pipe or pressure vessel having a circular peripheral connecting flange with an outer peripheral surface and an end face with a central opening for the pipe or vessel and having holes in the flange for receiving bolts, said protector comprising

a sheet-form plastic cover member having a cylindrical protrusion fitted into the central opening of said flange,

said cover member having a portion extending radially outward a distance sufficient to cover the entire end face of said flange and the holes therein and an edge portion extending normal thereto to cover at least part of and fit flush against the entire periphery of said flange,



said cover member radially extending portion having a plurality of hollow protrusions aligned with and fitting into each of said flange holes,

at least some of said protrusions having apertures through the wall thereof, and

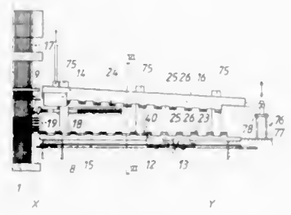
fasteners positioned in said protrusion apertures having head portions retained therein and extending through said apertures and the flange holes to secure said cover member on said flange with said protrusions secured in said holes.

4,915,138

INCREASED PICKING FREQUENCY OF PILE WIRE LOOMS

Carlos Derudder, Heule, Belgium, assignor to N.V. Michel van de Wiele, Kortrijk-Marke, Belgium

Filed Aug. 18, 1988, Ser. No. 233,459
Claims priority, application Belgium, Aug. 27, 1987, 8700952
Int. Cl.[4] D03D *39/14*
U.S. Cl. 139—40 **16 Claims**



1. Method for weaving pile fabrics by means of pile wire looms, wherein the fabric has a pile loop every n wefts, n being greater than or equal to 2, and wherein pile wires are each inserted into a shed in an insertion cycle which occurs during one weft cycle and are each extracted from the shed, one after the other, in an extraction cycle, characterized in that an extraction cycle takes place over n succesive weft cycles and that the insertion cycle of one pile wire takes place during an extraction cycle of another pile wire.

4,915,139

HEAT SHRINKABLE TUBING ARTICLE

Louis G. Landry, Somersworth, and Benoit L. Poulin, Hudson, both of N.H., assignors to Essex Group, Inc., Fort Wayne, Ind.

Continuation of Ser. No. 115,289, Nov. 2, 1987, abandoned. This application Oct. 17, 1988, Ser. No. 259,462
Int. Cl.[4] F16L *11/12;* **H02G** *13/06*
U.S. Cl. 138—125 **4 Claims**

1. A unitary expanded fiber reinforced heat recoverable tubular article comprising:

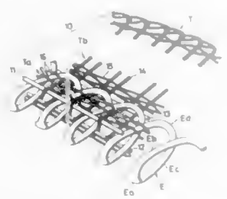
a dimensionally expanded heat recoverable tube having an inner surface and an inner dimension, a non-cross linked thermoplastic tube having an outer surface and an outside diameter smaller than the inner diameter of the heat recoverable tube and a braided non-heat recoverable fiber reinforcement positioned between the heat recoverable tube and the thermoplastic tube wherein the braided non-heat recoverable fiber reinforcement is bonded to the heat recoverable tube by the thermoplastic tube at a temperature sufficient to cause the thermoplastic tube to flow through the braided non-heat recoverable fiber reinforcement but insufficient to cause the expanded heat recoverable tube to recover and thereby providing a means to allow the thermoplastic tube to melt and flow at the temperature at which the heat recoverable tube recovers, thereby permitting the heat recoverable tube to move relative to the braided fiber reinforcement.

4,915,140

WOVEN SLIDE FASTENER STRINGER

Masaatsu Ofusa, Kurobe, and Muchiji Shimono, Namerikawa, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Mar. 13, 1989, Ser. No. 322,494
Claims priority, application Japan, Mar. 22, 1988, 63-37325
Int. Cl.[4] A44B *19/10*
U.S. Cl. 139—384 B **4 Claims**



1. A woven slide fastener stringer comprising:

(a) a woven stringer tape having a web portion and a longitudinal edge portion;

(b) a row of continuous filamentary coupling elements disposed on said longitudinal edge portion and each including a head portion, a pair of superimposed upper and lower leg portions and a heel portion; and

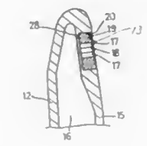
(c) an element anchoring weave system anchoring said row of coupling elements in place on the tape edge and comprising an upper clemping warp thread extending substantially in a straight run over substantially a midpoint of said upper leg portion, a first lower clamping warp thread extending substantially in a straight run under substantially a midpoint of said lower leg portion, a second lower clamping warp thread extending substantially in a straight run under said lower leg portion immediately adjacent to said heel portion, an anchoring weft thread extending from said tape web portion and interlacing with said three clamping warp threads to form a substantially triangular thread structure, and a plurality of binding warp threads alternately overlying and underlying said row of coupling elements between said upper clamping thread and said second lower clamping thread and interlacing with said anchoring weft thread.

4,915,141

AUXILIARY NOZZLE FOR AIR JET LOOM

Yoshio Nitta, Tokorozawa; Hiroshi Suzuki, Yokohama, and Masayuki Muramatsu, Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 23, 1988, Ser. No. 248,074
Claims priority, application Japan, Sep. 25, 1987, 62-241892
Int. Cl.[4] D03D *47/30*
U.S. Cl. 139—435.5 **13 Claims**



1. An auxiliary nozzle for an air jet loom, comprising:

a nozzle body formed with an air passage through which auxiliary air flows, said nozzle body having a side wall defining the air passage; and

means defining a nozzle opening formed in said nozzle body and communicated with said air passage, the auxiliary air being ejected through said nozzle opening, said nozzle opening extending in the direction of the thickness of said nozzle body side wall and having the same cross-sectional shape in planes perpendicular to the direction of thickness of said nozzle body side wall, said nozzle opening defining means including means defining a first opening section forming part of said nozzle opening, and means defining a second opening section forming part of said nozzle opening, said first and second openings being generally perpendicular to each other, said second opening section connecting with said first opening section at its intermediate part so that said first and second opening sections are contiguous with each other, with the width of said first opening section being smaller in dimension than the length of said nozzle opening in the direction of the thickness of said nozzle body side wall.

4,915,142

WEFT INSERTION CONTROL SYSTEM FOR JET LOOM RESPONSIVE TO INSERTED WEFT END BEHAVIOR

Jotaro Uehara, Higashikurume, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 20, 1989, Ser. No. 340,746
Claims priority, application Japan, Sep. 5, 1988, 63-220527
Int. Cl.[4] D03D *47/36*
U.S. Cl. 139—435.2 **11 Claims**

1. A weft insertion control system for a jet loom, comprising:

weft inserting means for inserting a weft yarn in a weft inserting direction from a picking side to a receiving side across a shed by a fluid jet,

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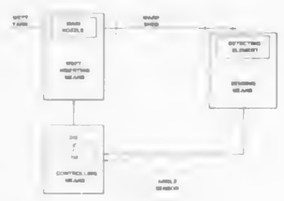
controlling means for adjusting said weft inserting means in accordance with a sensor signal, and

sensing means provided on said receiving side for sensing positions of the forward end of a weft yarn inserted through said shed, said sensing means producing said



sensor signal, said sensing means comprising a detecting element at said receiving side extending along said weft yarn inserting direction and being capable of sensing back and forth movements of said forward end of said weft yarn along said weft inserting direction.

4,915,143

SELECTIVELY FEEDING ONE OF A PLURALITY OF WEFT THREADS TO A GRIPPER PROJECTILE

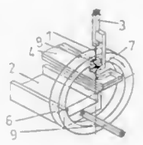
Hans Grossmann, Heidenheim, Fed. Rep. of Germany, assignor to Hermann Wangner GmbH & Co. KG, Reutlingen, Fed. Rep. of Germany

Filed Mar. 16, 1989, Ser. No. 324,112

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1988, 3808777

Int. Cl.[4] D03D *47/24*

U.S. Cl. 139—438 4 Claims



1. An apparatus for selectively feeding one of a plurality of weft threads (1) to a gripper projectile (5), which moves along a projectile path (2), comprising a plurality of displaceable feed means (3) each of which is adapted to supply one weft thread (1) and includes a feed means clamp (7) for retaining said weft thread (1) in position for pick up, knife means (4) for cutting said weft thread (1) after it has been drawn into a weaving shed by said gripper projectile (5), and clamping means for picking up and retaining the weft thread (1) from said feed means (3) and for extending the weft thread (1) transversely across the projectile path (2) until it is grasped by said gripper projectile (5), wherein said clamping means is comprised of a rotatably mounted ring (6) having a ring clamp (8) mounted thereon and disposed in a plane perpendicular to said projectile path (2) which extends through said ring whereby upon rotation of said ring the ring clamp will pick up the weft thread (1) released by said feed means clamp (7) and draw the thread transversely across said projectile path (2).

4,915,144

DELIVERING YARNS WITH AN EXCESS LENGTH FROM A YARN STORE IN AN AIR JET MULTICOLOR LOOM

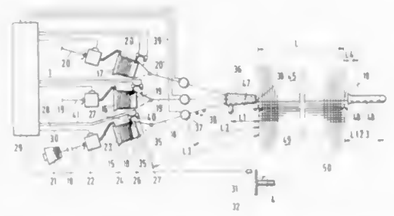
Robert Bucher, Frick, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 22, 1988, Ser. No. 209,898

Claims priority, application Switzerland, Jun. 25, 1987, 02391/87

Int. Cl.[4] D03D *47/36*

U.S. Cl. 139—453 13 Claims



1. A method of picking weft yarns into an air jet multicolor loom in which there is a yarn store for each weft color, a weft yarn of a particular color which is to be picked being retained before picking and being maintained stretched by a retaining air flow in a picking channel of a picking nozzle, characterized in that a weft yarn having a long repeat is released by its corresponding weft yarn store to the picking channel in an excess of length at least equal to the yarn length maintained stretched in its picking channel before picking by said retaining air flow.

4,915,145

MONITORING SYSTEM FOR THE FILLING OF CONTAINERS

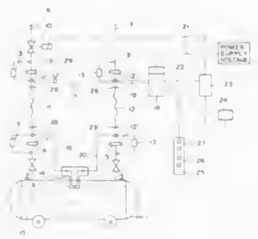
Manfred Schirmacher, Bergkamen, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Bergkamen, Fed. Rep. of Germany

Filed Jan. 6, 1989, Ser. No. 294,764

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1988, 3806899

Int. Cl.[4] B65B *1/30*; B67D *5/00*

U.S. Cl. 141—95 5 Claims



1. A monitoring system for monitoring the filling of containers from a tank station; at least one fluid product connecting line for connecting the tank station to a container being filled with a fluid product through said at least one fluid product connecting line; a shut-off element for said at least one fluid product connecting line; an electrical measuring means in said at least one fluid product connecting line for determining the maximum permissible level of fluid product being filled into the container; said at least one connecting line being an electrically conductive connecting line connected through an electrically insulated connection at one end to the container, and connected through an electrically insulated connection at the opposite end to the tank station; and electrical monitoring circuit means for monitoring the electrical impedance of a series electrical circuit of said measuring means and said at least one fluid product connecting line, which characterizes the filling condition of the container and the condition of the connections between the tank station and the container.

4,915,146

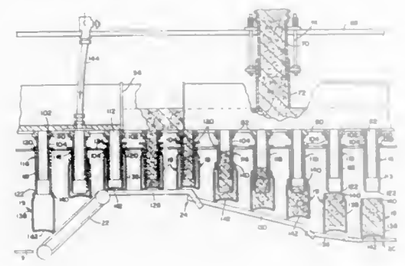
MEASURING FLASK FOR USE IN A FILLING MACHINE

Graeme W. Warner, Hinsdale, Ill., assignor to John R. Nalbach Engineering Co., Inc., Cicero, Ill.

Continuation-in-part of Ser. No. 167,389, Mar. 14, 1988, abandoned. This application Mar. 10, 1989, Ser. No. 322,417

Int. Cl.[4] B65B *1/22*

U.S. Cl. 141—144 13 Claims



1. In an apparatus for filling like containers with a like measured amount of divided matter having; an apparatus housing, a drive connected to said housing, a filling turret mounted in said housing, said filling turret having a rotatable portion connected to said drive, said rotatable portion being rotated by said drive, said filling turret including a filling tank, said filling tank having a rotatable floor connected to said drive, said rotatable floor rotating with said rotating portion of the filling turret, a plurality of measuring flasks arranged in a circle concentric with the circle of rotation of said rotating portion of the filling turret, each of said measuring flasks of said plurality of measuring flasks connected to said rotatable floor of the filling tank for receiving divided matter from the filling tank and measuring the amount of said matter; the improvement comprising; each of said measuring flasks including an open ended tube having one end connected to the rotatable floor and the other end extending downward, a sleeve telescopically mounted on each tube and being movable axially along the respective tube, each of said sleeves having one end adapted to be engageable with an interior at the bottom of a container while the respective measuring flask is being filled with divided matter to be delivered into the container, and means connectable to the sleeve for limiting movement of the sleeve downward relative to the tube allowing free movement of the sleeve until either connection of the means to the sleeve or the sleeve to the bottom of the container.

4,915,147

APPARATUS FOR FILLING CONTAINERS WITH LIQUIDS

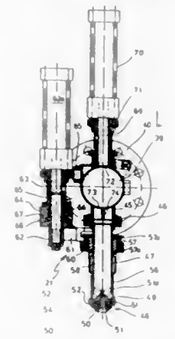
Hubert Skibowski, Hamburg, Fed. Rep. of Germany, assignor to Dover Corporation, New York, N.Y.

Filed Jan. 21, 1988, Ser. No. 146,344

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1987, 3702109

Int. Cl.[4] B65B *3/04*; B67D *3/00*

U.S. Cl. 141—181 20 Claims



1. In an apparatus for filling containers comprising

a feed line having a portion for connection with a source of a liquid product, and

a filling valve having an inlet connected to the feed line, wherein

the filling valve comprises

a tubular portion connected at one end with the feed line and having a lateral end wall with an aperture therein, at an opposite, discharge end,

a slide sleeve telescoped over said tubular portion,

valve seal means effective between said tubular portion and said sleeve for closing said end wall aperture,

said slide sleeve being movable axially relative to the tubular portion and having an upper, closed position wherein the end wall aperture is closed and a lower, open, discharge position wherein the aperture is open for flow of product therethrough.

means for reciprocating the slide sleeve between its closed and discharge positions, and

means for positioning the filling valve immediately above an opening of a container positioned therebeneath,

the improvement wherein

the slide sleeve, in its discharge position, is projected beyond the lateral end wall of the tubular portion and into the container opening, and

passageway means are provided for flow of fluid from the tubular portion through the discharge end of the sleeve.

4,915,148

JOINTER ATTACHMENT FOR MULTIPURPOSE POWER TOOL

Anthony Fox, Bloomington, Minn., assignor to TFC Corporation, Bloomington, Minn.

Filed Feb. 27, 1989, Ser. No. 315,931

Int. Cl.[4] B21C *9/02*

U.S. Cl. 144—1 C 4 Claims

1. In a multipurpose power tool of the type including an elongated bench having a first pedestal attached to said bench at one end thereof and a second pedestal attached to said bench at a location intermediate said one end and the opposed end thereof, a pair of spaced parallel elongated tubular ways pivotally secured at one end of each to said first pedestal for rotation

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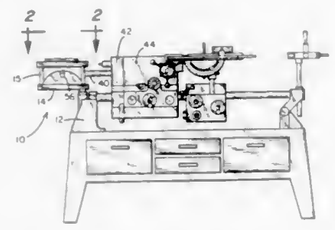
between a horizontal disposition and a vertical disposition, a power head assembly including motor means disposed therein for driving a spindle assembly projecting from one end of said power head and including a power take-off shaft projecting from the opposite end of said power head, said power head being attached to said pair of tubular ways for axial movement therealong, a jointer attachment for said multipurpose power tool comprising:

(a) a base plate removably attached to said second pedestal, said base plate including a pair of parallel spaced-apart side members projecting vertically upward therefrom, said side members including a ramp surface over a predetermined portion thereof;

(b) a first table secured to said side members having an upper planar, horizontal surface of a given fixed elevation;



(c) a second table secured to said side members and cooperating with said ramp surface, said second table having an upper planar horizontal surface of an adjustable height relative to said fixed elevation;

(d) a roller having a splined drive shaft, said roller journaled for rotation between said pair of side members;

(e) a jointer cutting blade mounted on said roller and extending longitudinally thereacross the cutting edge of said blade being at the same elevation as said horizontal surface of said first table; and

(f) means for coupling said roller to said power take-off shaft of said power head when said tubular ways are in said horizontal disposition.

4,915,149

APPARATUS FOR PRODUCING FURNITURE

Karolyne Herenyi, Bezeredy u. 4, 1081 Budapest, and Gabor Toth, Csanyi u. 14, 1203 Budapest, both of Hungary

Filed Jun. 3, 1988, Ser. No. 201,921
Int. Cl.[4] B27F *5/00*
U.S. Cl. 144—84 4 Claims

1. An apparatus for the production of furniture elements from cut and debarked tree trunks or branches, said apparatus comprising

means to retain one said tree trunk or branch in a position rotatable about its longitudinal axis, said retaining means including first and second gripping means disposed at each end of said cut tree trunk or branch, at least one of said first and second gripping means being capable of movement along the longitudinal axis of said tree trunk or branch;

said first gripping means being adapted to fixedly retain one end of said cut tree trunk or branch and said second gripping means being adapted to permit an adjacent end of said cut tree trunk or branch to rotationally engage said second gripping means;

screw means for both rotating said first gripping means and moving said first gripping means along said axis; and

cutting means positioned adjacent said tree trunk or branch to cut thereon a tenon of circular cross section upon rotational and longitudinal movement of said tree trunk or branch.

4,915,150

PNEUMATIC TIRES WITH ROUND AND SQUARE SHOULDERS

Takashi Takusagawa, Ohme; Akira Kurima, Higashimurayama; Yuji Tateo, Kodaira, and Nobuyuki Kasahara, Hachioji, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed May 17, 1988, Ser. No. 195,066
Claims priority, application Japan, May 20, 1987, 62-121007
Int. Cl.[4] B60C *11/01*
U.S. Cl. 152—209 B 3 Claims

1. A pneumatic tire having plural lugs defined at an approximately equal interval in a circumferential direction of a tread by plural notches formed in at least a side region of the tire tread, said lugs comprising in cross-section an alternate structure of a square shoulder lug and a round shoulder lug protruding outward from said square shoulder lug in the axial direction of the tire and separated by a mutual adjoining notch, said lug with the square shoulder having a tread width to that of said lug with the round shoulder in the range of 0.8～0.98, and wherein said lug with a round shoulder has a radius of curvature larger than the radius of curvature of said square shoulder.

4,915,151

HEAVY DUTY RADIAL TIRE CARCASS PROFILE

Kiyoshi Sato; Kuninobu Kadota, both of Kodaira; Tatsuro Shimada, Musashimurayama, and Hiroyuki Koseki, Kodaira, all of Japan, assignors to Bridgestone, Tokyo, Japan

Filed Nov. 9, 1987, Ser. No. 118,127
Claims priority, application Japan, Dec. 25, 1986, 61-308054
Int. Cl.[4] B60C *3/00*
U.S. Cl. 152—454 16 Claims

1. In a heavy duty radial tire including at least one radial carcass extending from one bead portion to the other bead portion and using inextensible cords and a belt arranged outwardly of the radial carcass for reinforcing a tread of the tire, the improvement comprising; an outer profile of the tire in radial crossections mounted on an approved rim, said rim having a width which is not wider than that of a design rim and under no load condition during filling of said tire inner pressure from 5% to 100% of a normal inner pressure, a said outer profile of the tire comprising a first profile portion expanding during filling radially outwardly in a tread zone form one end of said tread through a crown center to the other end of said tread, the ends of said tread also expanding outwardly, a second profile portion depressing axially inwardly of the tire at least in a part of a radially outer zone of a sidewall from said one end of said tread to a tire maximum width position when said tire is filled with the normal inner pressure, and a third

profile portion expanding during filling axially outwardly of the tire in a radially inner zone of said sidewall from said tire maximum width position to parting point of the sidewall from the rim flange when said tire is filled with the normal inner pressure, thereby properly distributing strains occurring in the tire when inflated to a normal inner pressure,

said tire mounted on a rim having a bead seat engaging said bead portions of said tire, said bead seat being inclined at a degree of 5° relative to a rotating axis of the tire, wherein a carcass profile in the radial cross-section of the tire mounted on the approved rim and filled with an inner pressure 5% of the normal inner pressure and under no load condition is a composite curve smoothly passing through points B, A and D, where the point A is a point of contact of a carcass line C of the carcass profile with tangent mm' in a radial direction to the carcass line at a carcass line maximum width position and the points B and D are intersections of the carcass line C and a perpendicu-

lar pp' to a bead base line RL, said perpendicular pp spaced apart axially outwardly from an equatorial plane M of the tire by a distance of 0.45 times a rim width W corresponding to a distance between flanges of the rim, and said carcass profile fulfills three relations in millimeters, a first relation $5<240/H\times u<35$, where u is a distance from the point A to a point E, where the point E is a point of contact where said tangent mm' contacts the maximum width point of an equilibrium configuration curve N passing through the points B and D, and H is a maximum height of the carcass line C from the bead base line RL, a second relation $5.0<240/H\times S<13.0$, where S is a maximum distance of the carcass line C spaced inwardly from the equilibrium configuration curve N in the radial inner zone of the sidewall, and a third relation $2.0<240/H\times t<10.0$, where t is a maximum distance of the carcass line C spaced outwardly from the equilibrium configuration curve N in the radial outer zone of the sidewall.

4,915,152

CARTRIDGE SHADE ASSEMBLY

Sean P. Magee, 1110 Seventh Ave., San Mateo, Calif. 94402

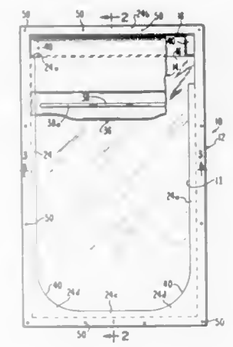
Continuation of Ser. No. 947,202, Dec. 29, 1986, abandoned.
This application Aug. 26, 1988, Ser. No. 240,373
Int. Cl.[4] E05B *9/08*
U.S. Cl. 160—31 7 Claims

1. A cartridge shade assembly comprising:

a frame adapted to be removably mounted to a support in fixed position, said frame being formed from a number of molded parts bonded together to form a unitary construction, said parts having respective webs spaced apart to form a pair of side grooves;

means on the frame for defining a shell-like recess therein; a flexible shade member of a material having an inherent bias so as to be normally in the form of a scroll, said shade member being free of any structure connecting the shade member to the frame, whereby the shade member is loosely receivable in the form of a scroll in the recess, said shade member being an opaque laminated composite of plastic sheets; and

a pull bar having a pair of opposed ends and being secured to



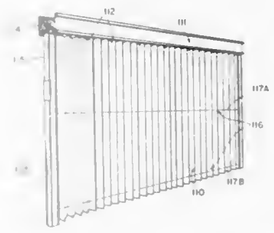
one end of the shade member, said grooves being located for shiftably receiving the ends of the bar for guiding the bar and thereby the shade member longitudinally of the frame as the bar moves along the path, the frame and the shade member being movable as a unit into and out of said fixed position to provide a cartridge-like replaceability for said assembly.

4,915,153

VERTICAL WINDOW COVERING SYSTEMS

Andrew J. Toti, 311 W. River Rd., Modesto, Calif. 95351

Continuation-in-part of Ser. No. 920,704, Oct. 17, 1986, which is a continuation-in-part of Ser. No. 888,462, Jul. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 788,460, Oct. 17, 1985, abandoned. This application Jul. 6, 1987, Ser. No. 70,844
The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.
Int. Cl.[4] E06B *3/94*
U.S. Cl. 160—84.1 48 Claims



1. In a vertical window covering system, a window covering material portion having a plurality of sections disposed in a generally vertical orientation, said portion being adaptable to being traversed between open and closed conditions and having inherent distortion characteristics causing non-vertical hanging of left and right edge portions thereof in an open or partially open condition and misalignment out of the plane of traverse when traversing from an open to a closed condition; a traverse track adapted to be mounted in a horizontal orientation; a plurality of track mounting means for mounting a plural-

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ity of sections of said window covering material intermediate said left and right edge portions thereof for bidirectional traverse relative to said traverse track; first and second edge carrier means mounted to said traverse track with at least one of said carrier means adapted for bidirectional traverse on said track; edge stabilizer means mounted on each of said carrier means and including a housing holding said edge portions of said window covering material in a substantially straight vertical orientation when said material is traversed toward an open condition, a bracket operatively coupled to the upper end of said housing, and a stabilizer rod means mounted to said carrier means at one end and to said bracket at the opposite end and supporting said housing in an accurate vertical orientation and with a degree of rigidity sufficient to overcome said inherent distortion characteristic; said housings extending at least substantially the entire length of said edge portions of said window covering material and being secured thereto along said length; traverse alignment means for maintaining the alignment of said vertical material sections during said traverse toward said closed condition, said traverse alignment means including guide apertures formed in said vertical material sections at a prearranged position, an extendible guide cord routed through said guide apertures and tensioning means operatively connected to said guide cord for maintaining said guide cord in substantial tension throughout the traverse of said material portion between said open and closed conditions; and said edge stabilizer means further comprising a ball detent release mechanism providing the operative coupling between the bracket and the stabilizer rod means; said ball detent release mechanism being oriented for released pivotal movement about a pivot axis through the bracket to allow the bracket and housing to pivot relative to the stabilizer rod means approximately parallel to the plane of the fabric and having a release threshold such that upon exceeding said threshold the bracket and housing pivot in the direction of applied force in the plane of the material.

4,915,154

COUNTER REFLECTOR AND METHOD OF DRYING A WEB WITH THE AID OF SAME

Per Persson, Trollhättan, Sweden, assignor to Infrarodteknik AB, Sweden

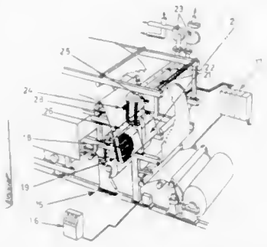
PCT No. PCT/SE87/00214, § 371 Date Dec. 23, 1987, § 102(e) Date Dec. 23, 1987, PCT Pub. No. WO87/06636, PCT Pub. Date Nov. 5, 1987

PCT Filed Apr. 27, 1987, Ser. No. 141,602

Claims priority, application United Kingdom, Apr. 28, 1986, 8610302

Int. Cl.[4] F26B *13/20*

U.S. Cl. 162—207 **10 Claims**



1. A counter reflector, for use in drying a moving web, comprising:

a longitudinally extending frame;

at least one reflective shield element, having openings therein, being attached to a front face of said frame and a plate member being attached to a rear face of said frame;

an interior chamber being defined by said frame, said at least one shield element and said plate member; and

gas supply means, communicating with said interior chamber, for supplying gas to the interior of the counter reflector for removing excess absorbed radiated heat therefrom, the heat gas being exhausted from said interior chamber through said openings in said at least one reflective shield element for assisting in drying of a moving web;

the improvement wherein said at least one reflective shield element has an insulating backing layer, disposed on its surface adjacent said interior chamber, for preventing undesired cooling of said shield element.

4,915,155

INTEGRAL CASTING FLASK AND VACUUM CHAMBER

Richard A. Martin, 105 N. Union St., Alexandria, Va. 22314

Filed Nov. 3, 1988, Ser. No. 266,581

Int. Cl.[4] B22C *21/00*

U.S. Cl. 164—255 **13 Claims**

1. A casting flask and vacuum chamber unit comprising:

an inner tube having a bottom opening and a circumferential sidewall, said circumferential sidewall having a top edge and a bottom edge, said inner tube forming a casting flask portion;

an outer tube having a bottom opening and a circumferential sidewall, said circumferential sidewall having a top edge and a bottom edge;

said bottom opening of said circumferential sidewall of said inner tube having a diameter extending between diametrically opposite points on said bottom edge of said circumferential sidewall of said inner tube;

said bottom opening of said circumferential sidewall of said outer tube having a diameter extending between diametrically opposite points on said bottom edge of said circumferential sidewall of said outer tube; and

a ring shaped shoulder being integrally and non-removably connected to each of said inner and outer tubes and having an inner edge and an outer edge, said inner edge of said shoulder being fixedly attached to said circumferential sidewall of said inner tube intermediate said top and bottom edges of said circumferential sidewall of said inner tube, said outer edge of said shoulder being fixedly attached to said circumferential sidewall of said outer tube at said top edge of said circumferential sidewall of said outer tube.

4,915,156

GATE BREAKER

August Sandstad, Möllebakken 59, N-3250 Larvik, Norway

Filed Sep. 21, 1988, Ser. No. 247,363

Claims priority, application Norway, Jan. 21, 1987, 870246; PCT Int'l Appl., Dec. 16, 1987, PCT/NO87/0080

Int. Cl.[4] B22D *31/00*

U.S. Cl. 164—265 **12 Claims**

1. In a gate breaker for finishing cast iron, consisting of a tool unit with a first hydraulic cylinder, a processing unit operatively connected to the first cylinder and extended from one end of the first cylinder, said first hydraulic cylinder being

mounted in a linked system and having a handle to facilitate the maneuvering of it, the improvement comprising:

a means for suspending the tool unit, including a circular clamp with an internal semicircular track, at least two

rollers mounted with respect to the tool unit and movable along said track to permit rotation of said tool unit about a longitudinal axis thereof, and a pivot means between the tool unit and the rollers for permitting pivoting of said tool unit about a transverse axis.

4,915,157

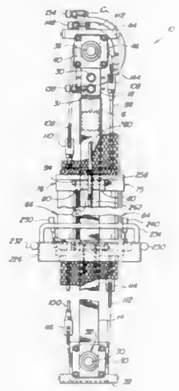
CORE HANDLING APPARATUS

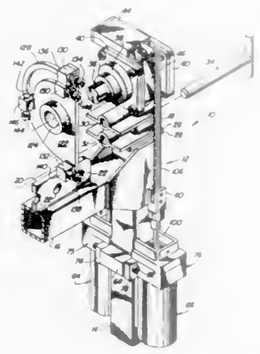
Larry D. Durchenwald, Cedar Falls, Inwa, assignor to Deere & Company, Moline, Ill.

Filed Jun. 12, 1989, Ser. No. 364,780

Int. Cl.[4] B22C *23/00*

U.S. Cl. 164—412 **16 Claims**





1. A core handling apparatus comprising: an upright main frame; means for suspending the frame in an upright orientation from an overhead hoist; upper and lower, parallel shafts rotatably mounted to said frame; drive means coupled between the shafts for effecting simultaneous oscillation thereof; a mandrel plate being fixed to said lower shaft for oscillation therewith; a core handling attachment releasably secured to said mandrel plate; and a stop means including (a) a first member fixed to said upper shaft for oscillation therewith and including a first pair of abutment surfaces located at a first radial distance from the upper shaft and being spaced apart a first angular distance from each other about the upper shaft, and a second pair of abutment surfaces located at a second radial distance from the upper shaft and being spaced apart a second angular distance from each other about the upper shaft, and (b) a second member adjustably mounted to said frame for being selectively positionable either in a first location between and in the path of movement of the first pair of abutment surfaces or in a second location between and in the path of movement of the second pair of abutment surfaces whereby the range of oscillation of the lower shaft and hence the mandrel plate and core handling attachment is delimited so as to aid an operator in controlling the positioning of an engaged core.

4,915,158

BELT COMPOSITION FOR IMPROVING PERFORMANCE AND FLATNESS OF THIN REVOLVING ENDLESS FLEXIBLE CASTING BELTS IN CONTINUOUS METAL CASTING MACHINES

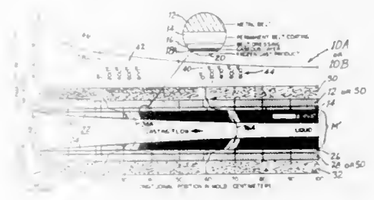
Jerome B. Allyn; Woitek Szczypiorski, both of Colchester; J. F. Barry Wood, Burlington, and James G. Villa, Winooski, all of Vt., assignors to Hazelett Strip-Casting Corporation, Colchester, Vt.

Continuation of Ser. No. 118,404, Nov. 9, 1987, Pat. No. 4,749,027. This application Jun. 6, 1988, Ser. No. 203,249

The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.

Int. Cl.[4] B22D *11/06*

U.S. Cl. 164—431 **7 Claims**



1. A wide, thin, endless, flexible twin-belt-casting-machine casting belt for use in continuously casting metal product directly from molten metal in a continuous metal casting machine, said casting belt having a high Copper Alloy belt composition containing at least 85% Copper by weight and having a Young's modulus of elasticity in the range of about 15 to about 18×10^6 lbs. per square inch.

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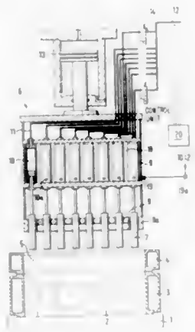
4,915,159

METHOD AND APPARATUS FOR COMPACTING FOUNDRY MOLD MAKING MATERIAL ABOUT A FOUNDRY MOLD PATTERN

Norbert Damm, Karlsdorf-Neuthard; Ernst Schmitt, Malsch, and Thomas Parr, Karlsruhe, all of Fed. Rep. of Germany, assignors to BMD Badische Maschinenfabrik Durlach GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jun. 10, 1988, Ser. No. 205,436
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719846; Nov. 27, 1987, 3740185
Int. Cl.[4] B22C *15/08, 15/28*
U.S. Cl. 164—456 40 Claims



1. Method of compacting foundry molding material utilizing a molding machine,
said molding machine having
a mold box (3);
a mold pattern (2) in the mold box;
foundry molding material (5) surrounding the pattern and filling the mold box;
a pressure plate (8);
a plurality of press plungers (7), respective press plungers being located spaced from each other on the pressure plate in a predetermined pattern for penetration into the molding material in accordance with the shape of the mold pattern (2)
wherein the sum of the cross-sectional areas of the press plungers is between 20% to 70% of the cross-sectional area of the mold box (3); and
pressure means (12) acting on the press plungers,
said method comprising the steps of
applying pressure by said pressure means (12) individually, to the press plungers (7) in accordance with the shape of the mold pattern (2) for compacting the molding material around the pattern in accordance with the shape of the pattern;
then applying the pressure plate (8) against the molding material for compacting the molding material, by moving the pressure plate to about the upper edge of the mold box (3); and
wherein said step of applying pressure on the press plungers comprises
applying said pressure at a level to generate, at the end of the step of compacting the molding material by the pressure plate, on at least one of the press plungers (7) a maximum difference (ΔH) in level of penetration or stroke of movement between individual press plungers (7) which is at least 30% of the height (H) of the mold box (3).

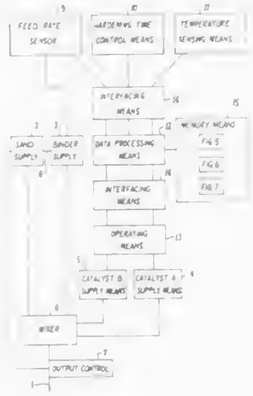
19. A molding machine for compacting foundry molding material having
a mold box (3);
a mold pattern (2) in the mold box;
foundry molding mold material (5) surrounding the pattern and filling the mold box;
a pressure plate (8);
a plurality of press plungers (7), respective press plungers being located spaced from each other on the pressure plate in a predetermined pattern for penetration into the molding material in accordance with the shape of the mold pattern (2),
wherein the sum of the cross-sectional areas of the press plungers is between 20% to 70% of the cross-sectional area of the mold box (3); and
pressure means (12) acting on the press plungers,
said machine comprising
a plurality of pressure cylinders (10), one each coupled to a respective press plunger (7);
individual valve means (14, 15, V_1, V_2...V_A, V_B...) interposed between at least those pressure cylinders which are located in a central region of the pressure plate and the fluid pressure means for individual control of penetration of the plungers into said molding material (5) in accordance with the shape of the mold pattern (2);
power means (13) coupled to said pressure plate (8, 308), to move the pressure plate in compacting direction toward said molding material (5) in the mold box (3); and
control means (20) for controlling said valve means (14, 15, V_1, V_2...V_A, V_B...) and said power means (13) for sequentially applying fluid pressures to the respective press plungers (7) to engage the plungers with said molding material (5) and then engage the pressure plate (8, 308) with the molding material.

4,915,160

APPARATUS FOR AND A METHOD OF PRODUCING MOULDING SAND FOR MOULDS

Herbert W. Reynolds, Launceston, Australia, assignor to Monica Diana Reynolds, Launceston, Australia, a part interest

Filed Nov. 7, 1988, Ser. No. 268,050
Claims priority, application Australia, Nov. 12, 1987, PI5383
Int. Cl.[4] B22C *5/04, 5/18*
U.S. Cl. 164—456 11 Claims



1. Apparatus for producing a mould forming mix of ingredients including a matrix material, a binder, and a catalyst blend comprised of first and second catalysts, said apparatus including feed rate determining means for determining the rate at which at least one of those ingredients is fed to a mixing chamber, at any one time, temperature sensing means operative to sense the temperature on a continuing basis of said matrix material as that material is being supplied, hardening time control means operable to select a hardening time for said mix, first and second catalyst feed means operable to feed said first and second catalysts at variable rates, and catalyst mix control means responsive to information gained from said feed rate determining means, said temperature sensing means and said hardening time control means to automatically establish and control the relative rates at which said first and second catalyst feed means supply said first and second catalysts respectively to result in a ratio of ingredients which will harden at a rate compatible with said selected hardening time.

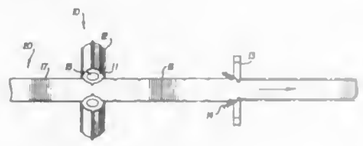
7. A method of producing a mould forming mix including the steps of:
separately feeding each of a plurality of mix ingredients to a mixing chamber, said ingredients including a matrix material, a binder, and at least first and second catalysts, said first catalyst being a relatively fast acting catalyst and said second catalyst being a relatively slow acting catalyst,
determining the rate at which at least the binder or matrix material is fed to said mixing chamber,
determining on a continuing basis the temperature at which said matrix material is fed to said mixing chamber,
selecting a hardening time for said mould forming mix with a hardening time control means, and automatically controlling the rate and proportion at which each of said first and second catalysts are fed to said mixing chamber by means of a catalyst mix control means,
said catalyst mix control means being automatically responsive to said rate, temperature and hardening time information so that the resultant mix in said mixing chamber will harden at a rate compatible with said selected hardening time.

4,915,161

FIN REMOVING METHOD AND APPARATUS

Vernon J. Miller, and Covert E. Fender, both of Carroll County, Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Jul. 25, 1988, Ser. No. 223,315
Int. Cl.[4] B22D *11/126*
U.S. Cl. 164—460 18 Claims



1. An apparatus consisting of a plurality of substantially identical elements, each element for notching and removing a fin from a continuously cast bar comprising:
a carrying means comprising a cylindrical body having an axial bore, said body being rotatably mounted and positioned such that said cylindrical body rotates about its axis while tangentially contacting a fined corner of a continuously cast bar,
a plurality of notching blades secured to said carrying means for notching a fin on a continuously cast bar, and
a removing blade for removing said notched fin from said continuously cast bar.

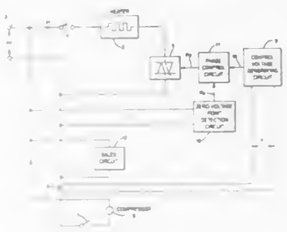
10. A method for notching and removing a fin from a continuously cast bar comprising the use of:
a carrying means comprising a cylindrical body having an axial bore, said body being rotatably mounted and positioned such that said cylindrical body rotates about its axis while contacting a finned corner of a continuously cast bar,
a plurality of notching blades secured to said carrying means for notching a fin on a continuously cast bar, and
a removing blade for removing said notched fin from said continuously cast bar.

4,915,162

METHOD AND APPARATUS FOR HEATER CURRENT CONTROL FOR AUTOMATIC VENDING MACHINE

Yasuhiro Ikura, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Continuation of Ser. No. 905,400, Sep. 10, 1986, abandoned. This application Aug. 3, 1989, Ser. No. 393,098
Claims priority, application Japan, Sep. 10, 1985, 60-198595
Int. Cl.[4] F25B *29/00*; H02J *1/00, 3/00, 3/14*
U.S. Cl. 165—2 2 Claims



1. A method for controlling a heater current in an automatic vending machine including a heater, and a motor-driven compressor for refrigeration, characterized by:
detecting an amount of current flowing in said compressor;
determining when said compressor is being started, based on the amount of detected current flowing in said compressor;
terminating a flow of current to said heater when an effective value of the detected current flowing in said compressor exceeds a predetermined value; and
phase controlling the current flowing in said heater when said compressor is being operated stably, such that the sum of an effective current flowing in said compressor and an effective current flowing in said heater does not exceed a predetermined value.

4,915,163

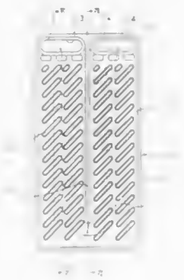
PLATE TYPE HEAT EXCHANGER

Ken Matsunaga, Kariya; Yoshiyuki Yamauchi, Chita; Masatoshi Sudo, Kariya; Masami Ohshita, Chiryu, and Kiyomitsu Tsuchiya, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 9, 1988, Ser. No. 230,030
Int. Cl.[4] F28D *1/03*
U.S. Cl. 165—153 7 Claims

1. A plate type heat exchanger comprising:
a plurality of tube units having an inlet tank portion, a passage portion and an outlet tank portion, with a plurality of corrugated fins provided between adjacent pairs of said tube units, wherein;
each of said tube units is formed by a pair of plates,
each of said plates has a connecting portion at a periphery thereof and an elongated center rib disposed along the center axis thereof so that said pair of plates are connected to each other by brazing material at said connecting portion said center rib having a bottom end contiguous with said connecting portion and a top end opposite said bottom end, wherein said center rib, and

the width at the top end of said center rib is in the range from 1.2 times to twice the width at the remaining portion of



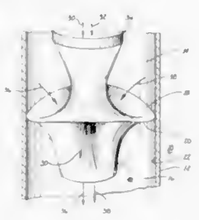
said center rib so as to form an enlarged portion at the top end of said center rib.

4,915,164

HEAT EXCHANGER

William H. Harper, Jr., 1454 Amon Dr., Richland, Wash. 99352

Filed Jun. 27, 1988, Ser. No. 211,862
Int. Cl.[4] F28D *7/10*
U.S. Cl. 165—164 18 Claims



1. A heat exchanger for transferring heat between two fluids segregated from one another, said heat exchanger comprising in combination:

(a) section for maintaining the flow of a first fluid enveloped with the flow of a second fluid; and

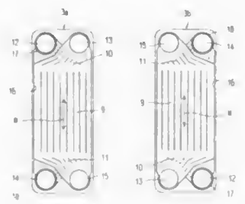
(b) means for enveloping the flow of the first fluid with the flow of the second fluid said enveloping means including a complete embedded minimal surface.

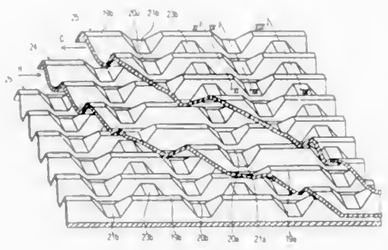
4,915,165

PLATE HEAT EXCHANGER

Arthur Dahlgren, Lund, and Ralf Blomgren, Skanör, both of Sweden, assignors to Alfa-laval Thermal AB, Tumba, Sweden

PCT No. PCT/SE88/00146, § 371 Date Dec. 12, 1988, § 102(e) Date Dec. 12, 1988, PCT Pub. No. WO88/08508, PCT Pub. Date Nov. 3, 1988
PCT Filed Mar. 25, 1988, Ser. No. 285,880
Claims priority, application Sweden, Apr. 21, 1987, 8701634
Int. Cl.[4] F28F *3/08*
U.S. Cl. 165—166 8 Claims





1. Plate heat exchanger comprising a package of thin heat exchange plates, which have been provided by pressing with ridges on both sides, through which ridges the plates abut against each other while forming plate interspaces, and further comprising means for conducting a heat exchange medium through every second plate interspace and another heat exchange medium through the other plate interspace in a way such that the heat exchange media flow in parallel with each other in a predetermined main direction—countercurrently or concurrently—through their respective plate interspaces, the heat-exchange plates being formed such that they provide in the plate interspaces a larger flow resistance for the one heat exchange medium than for the other, characterized in that

each of at least two adjacent plate interspaces (C, H) in the heat exchanger are formed by heat exchange plates, each of which on each side has parallel ridges (**19***a;* **19***b*) which across a substantial part of the heat exchange portion of the heat exchange plate extend in said main direction for the flow of the heat exchange media and which between themselves form parallel valleys (**20***a;* **20***b*) for the flow of the respective heat exchange medium, the plate portions between the ridges (**19***a;* **19***b*) on one side of the plate forming ridges on the other side of the plate,

the ridges on opposing sides of adjacent heat exchange plates abut against each other in each of said two plate interspaces (C, H) such that said valleys (**20***b*) between the ridges (**19***b*) of one heat exchange plate (**26**) are situated opposite to corresponding valleys of the other heat exchange plate (**24**) and forming therewith parallel flow passages for the respective heat exchange medium,

at least the heat exchange plate (**24**) forming a wall of the two said adjacent plate interspaces is provided with depressions (**21***a*) at least in its ridges (**19***a*) situated on one side of the beat exchange plate, which depressions form thresholds in the mutually parallel valleys on the other side of the heat exchange plate, and

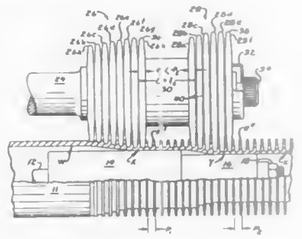
depressions (**21***a*) of the said kind are dimensioned and located such that during operation of the heat exchanger the flow resistance for one heat exchange medium in the flow passages of one (C) of the plate interspaces is substantially larger than the flow resistance for the other heat exchange medium in the flow passages of the adjacent other plate interspace (H).

4,915,166

TITANIUM HEAT EXCHANGE TUBES

James L. Cunningham, and Bonnie J. Campbell, both of Decatur, Ala., assignors to Wolverine Tube, Inc., Decatur, Ala.

Continuation of Ser. No. 520,265, Aug. 4, 1983, abandoned. This application Oct. 30, 1985, Ser. No. 792,959
Int. Cl.[4] F28F *1/36, 21/08*
U.S. Cl. 165—184 5 Claims



1. A heat exchange tube made of titanium or an alloy thereof containing at least 50% titanium comprising at least one integral helical fin with a fin density of at least 26 fins per inch of tube, a fin height of at least 0.034" and a surface area ratio between its outer surface and its inner surface which is greater than 3.0, said at least one fin and the tube wall which is under said at least one fin being strain hardened to a greater extent in the tube wall under said at least one fin than in the tip of said at least one fin, said at least one fin being formed in a single pass, without intermediate annealing, by at least two spaced apart sets of finning discs, the strain hardening of the tip of said at least one fin being produced substantially completely by the first of said sets of finning discs and the strain hardening in the tube wall under said at least one fin being produced substantially completely by the last of said sets of finning discs.

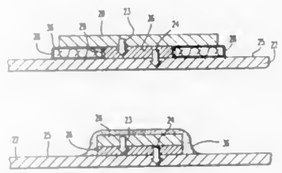
5. A heat exchange tube made of titanium or an alloy thereof containing at least 50% titanium comprising at least one integral helical fin with a fin density of at least 26 fins per inch of tube, a fin height of at least 0.034" and a surface area ratio between its outer surface and its inner surface which is greater than 3.0, said tube having a wall thickness under the fins which is no greater than the height of the fins, said at least one fin being characterized in that it is formed in a single pass without intermediate annealing by spaced apart sets of finning discs which sequentially cause the tip portion of said at least one fin to be formed to its final outer diameter and then cause the root to be formed to its final depth.

4,915,167

THERMAL COUPLING TO ENHANCE HEAT TRANSFER

Frank E. Altus, Catonsville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 5, 1988, Ser. No. 228,409
Int. Cl.[4] F28F *7/00*
U.S. Cl. 165—185 13 Claims



1. A thermal coupling to promote heat transfer between a heat source and a heat sink with facing surfaces comprising:

(a) a deposition of a thermally conductive substance having a melting point temperature less than the temperature of the heat source such that the substance when heated will be in a liquid state capable of effectively transferring heat between the heat source and the heat sink, the deposition being situated between and contacting the facing surfaces of the heat source and the heat sink; and

(b) a sealant and adhesive means enveloping the heat source and the deposition and bonded to the heat sink such that the deposition and the heat source are sealed and are secured to the heat sink.

8. A thermal coupling to promote heat transfer between a heat source and a heat sink with facing surfaces comprising:

(a) a deposition of a eutectic alloy having a melting point less than the temperature of the heat source such that the alloy when heated will be in a liquid state capable of effectively transferring heat between the heat source and the heat sink, the deposition having a top side, a bottom side and an outer edge and being placed between the heat source and the heat sink with the top side being in contact with the heat source and the bottom side being in contact with the heat sink; and

(b) a sealant and adhesive means comprised of a preform positioned and compressed between the heat source and the heat sink, the preform being made of a layer of fabric material saturated with an ultraviolet heat-curable urethane acrylate and the preform having a cutout forming a cavity in which the eutectic alloy deposition is located.

4,915,168

MULTIPLE WELL TOOL CONTROL SYSTEMS IN A MULTI-VALVE WELL TESTING SYSTEM

James M. Upchurch, Sugarland, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 243,565, Sep. 12, 1988, Pat. No. 4,856,595, which is a division of Ser. No. 198,968, May 26, 1988, Pat. No. 4,796,699. This application Jan. 10, 1989, Ser. No. 295,614
Int. Cl.[4] E21B *34/10, 49/08*
U.S. Cl. 166—250 27 Claims

15. A system adapted to be disposed in a borehole for operating one or more apparatus, comprising:

one or more control systems connected respectively to said one or more apparatus; and

controller means connected to said one or more control systems and responsive to an input stimulus for storing information and for generating an output signal in accordance with said input stimulus and at least a part of said information stored in said controller means,

said output signal from said controller means energizing said one or more control systems, said one or more control systems operating said one or more apparatus.

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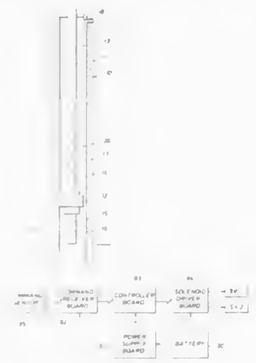
22. A method of operating one or more apparatus embodied in a system adapted to be disposed in a borehole, said system storing information, comprising the steps of:

(a) receiving an input stimulus in said system;

(b) generating one or more output signals in accordance with



said input stimulus and said information stored in said system;

(c) receiving said one or more output signals in one or more control systems; and

(d) operating said one or more apparatus using said one or more control systems to perform the operating step.

4,915,169

METHOD FOR CONTROLLING THE PH OF STEAM FLUIDS USING HETEROCYCLIC, MULTIFUNCTIONAL, NITROGEN-CONTAINING COMPOUNDS

Rong J. Hwang, Hacienda Heights; Andrew Nigrini, La Habra Heights, and Marion G. Reed, Hacienda Heights, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jan. 13, 1989, Ser. No. 297,229
Int. Cl.[4] E21B *43/24, 47/00, 43/22*
U.S. Cl. 166—252 18 Claims

1. A method for controlling pH in the liquid and vapor phases of wet steam having such phases formed in a steam generation system from feedwater having therein at least one carbonate species which in the presence of steam forms a vapor phase component tending to lower the pH of the vapor phase of the steam upon condensation and a liquid phase component tending to raise the pH of the liquid phase of the steam, comprising:

(a) converting the feedwater in a steam generation system to steam having a vapor phase and a liquid phase; and

(b) adding to the steam generation system a heterocyclic, multifunctional, nitrogen-containing compound capable of forming a nonvolatile anionic component and a cationic component that, in the presence of said steam, yields hydrogen ions for reducing the pH of the liquid phase of said steam and an alkaline component for increasing the pH of the vapor phase of said steam upon condensation.

4,915,170

ENHANCED OIL RECOVERY METHOD USING CROSSLINKED POLYMERIC GELS FOR PROFILE CONTROL

Dennis H. Hoskin, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 10, 1989, Ser. No. 322,330
Int. Cl.[4] E21B *33/138, 43/22, 43/24*
U.S. Cl. 166—252 20 Claims

1. A method of enhancing the amount of oil recovered from a subterranean oil-bearing formation having zones of varied permeability by controlling the profile thereof, comprising the steps of:

(a) determining an amount of polymeric gel required for controlling the profile of the formation;

(b) introducing a first aqueous gel-forming composition in a non-gelatinous state into the formation, said first composition introduced in an amount which is a portion of the amount required for profile control; and

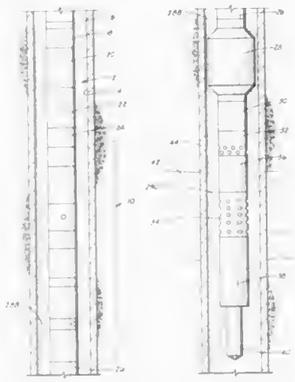
(c) introducing into the formation in a non-gelatinous state at least a second aqueous composition capable of forming a gel under subterranean formation conditions at a rate in excess of that of the first aqueous gel-forming composition, said composition introduced in an amount which is the remaining portion required for controlling the profile of the formation; wherein the gelation of said aqueous compositions proceeds in timed relation such that each composition gels at substantially the same point in time.

4,915,171

ABOVE PACKER PERFORATE TEST AND SAMPLE TOOL AND METHOD OF USE

Michael E. McMahan, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Nov. 23, 1988, Ser. No. 276,492
Int. Cl.[4] E21B *34/10, 43/117, 49/08*
U.S. Cl. 166—264 20 Claims



1. A valve for use above a packer in a well testing string, said valve comprising:

housing means for connecting to said testing string, said housing means defining a substantially longitudinally extending central opening therethrough;

bypass means on said housing means for providing communication between said central opening and a well annulus portion above said packer, whereby annulus pressure may be communicated to a testing string portion below said packer, said bypass means having selectable open and closed positions; and

sliding valve means disposed above said bypass means in said housing means for providing communication between said central opening and a portion of said testing string above said housing means, said valve means having selectable open and closed positions.

17. A method of testing a well formation in a well bore, said method comprising the steps of:

positioning guns on a tool string in said well bore adjacent to said formation;

actuating a packer on said tool string for sealingly engaging said well bore above said formation such that an upper well annulus portion is defined between said well bore and said tool string above said packer;

providing pressure in said upper annulus portion, through a bypass in a tester tool above said packer, to a firing device adjacent to said guns for firing said guns and perforating said formation; and

flowing a sample of fluid from said formation through said tester valve to a sampling chamber positioned above said packer.

4,915,172

METHOD FOR COMPLETING A NON-VERTICAL PORTION OF A SUBTERRANEAN WELL BORE

Joseph F. Donovan, Spring; Edward C. Spatz, Houston; John V. Salerni, Kingwood; Elmer R. Peterson, The Woodlands, and John B. Weirich, Tomball, all of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Continuation of Ser. No. 172,025, Mar. 23, 1988, Pat. No. 4,856,591. This application May 25, 1989, Ser. No. 357,173
Int. Cl.[4] E21B *23/04, 23/06, 43/04, 43/08*
U.S. Cl. 166—278 3 Claims

1. A method of completing a well bore having a deviated configuration including an entry portion communicating with a curved portion extending downwardly in the well from said entry portion and a generally linear end portion traversable with a production formation, comprising the steps of:

forming a conduit including well isolation means, at least one screen element and at least one stabilizer means having at least one movable stabilizer portion movable from a first retracted position to a second expanded position;

running the conduit into the well bore and manipulating the conduit to facilitate passage of the conduit through the curved portion of the well bore;

setting the well isolation means to position the tubular screen means approximate said linear portion of the well bore; and

actuating the stabilizer members to the second expanded position to engage the adjacent wall of the well bore and position said screen means away from said adjacent wall, whereby production fluids can flow through at least one of said screen means to the well surface.

4,915,173

METHOD FOR STAGED PLACEMENT OF GRAVEL PACKS

Bruce E. Davis, Houston, Tex., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Dec. 7, 1988, Ser. No. 281,151
Int. Cl.[4] E21B *43/04*
U.S. Cl. 166—278 5 Claims

1. A process for gravel packing in a wellbore annulus including a well screen and perforations extending into a producing formation comprising providing an initial gravel pack carrier fluid at below formation fracturing pressure and having a gravel loading of up to about five pounds gravel per gallon of carrier fluid within the wellbore annulus and, providing additional amounts of carrier fluid at below fracturing pressure and having gravel loadings which are successively higher than a preceding and the initial gravel loading to the wellbore annulus and continually increasing the gravel loading in the carrier fluid to a range of ten to twenty pounds of gravel per gallon of carrier fluid until the gravel packing of the wellbore annulus is completed.

4,915,174

CONCENTRATED SUSPENSIONS OF WATER SOLUBLE POLYMERS

Gerard Berrod, Villeurbanne, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Continuation of Ser. No. 576,759, Feb. 3, 1984, abandoned. This application Jan. 17, 1989, Ser. No. 298,313
Claims priority, application France, Feb. 14, 1983, 83 02289
Int. Cl.[4] C09K *7/00*; E21B *43/16*
U.S. Cl. 166—305.1 18 Claims

1. A suspension of water soluble polymer comprising by weight 10 to 60% of a particulate high molecular weight water soluble polymer, 10 to 45% of a non-polymer solvating organic diluent, 10–75% of a swelling agent and 1 to 15% of a low molecular weight water soluble polymer having a molecular weight in the range of between about 2,000 an about 100,000 and having functional carboxylic groups thereon, said suspension being a concentrated suspension of said high molecular weight water soluble polymer.

4,915,175

WELL FLOW DEVICE

Howard R. Mashaw, Jr., Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Feb. 21, 1989, Ser. No. 313,598
Int. Cl.[4] E21B *34/14*
U.S. Cl. 166—332 5 Claims

1 A sliding sleeve valve for connection in a tubing string of a well for controlling flow between the annulus of said well and the bore of said tubing string comprising:

a tubular nipple having a longitudinal bore therethrough and threads at opposite ends thereof for connection with and between adjacent pipe joints forming said tubing string, said nipple having side flow ports for flow from said annulus of said well into said bore of said nipple, internal seal surfaces along said bore of said nipple on opposite sides of said ports, an equalizing port through said nipple into said bore toward an input end of said nipple from said side flow ports, an internal annular stop shoulder in said nipple toward said input end from said equalizing port, and an internal annular latch recess toward said input end of said nipple from said stop shoulder;

a guide lug secured through said nipple extending into said bore of said nipple between said stop shoulder and said equalizing port; and

a retrievable pack-off sleeve sized to fit in said bore of said nipple, said pack-off sleeve having radially movable collet fingers formed along a lower end portion of said sleeve and engageable with said latch recess in said nipple for releasably locking said sleeve in said nipple, an external annular stop shoulder on said sleeve engageable with said

stop shoulder in said nipple for limiting downward movement of said sleeve in said nipple, an external latching and operating recess means formed in the outer surface of said sleeve for coaction with said guide lug of said nipple for rotating said sleeve and operating said sleeve between insertion, pack-off, equalizing, and release positions in said nipple; and

annular seal assemblies on said sleeve positioned to engage said seal surfaces of said nipple bore at a location in said nipple bore at which said flow ports and said equalizing port of said nipple are between said seal assemblies on said sleeve and said sleeve is provided with equalizing port means alignable with said equalizing port in said nipple at said equalizing position of said sleeve and misaligned from said nipple equalizing port on the side of one of said annular seal assemblies on said sleeve toward said stop shoulder when said sleeve is in said pack-off position in said nipple.

4,915,176

METHOD OF TRANSPORTING A HYDRATE FORMING FLUID

André Sugier; Paul Bourgmayer, both of Rueil Malmaison; Emmanuel Behar, Cergy, and Edouard Freund, Ruell Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Dec. 23, 1988, Ser. No. 288,985
Claims priority, application France, Dec. 30, 1987, 87 18435
Int. Cl.[4] E21B *37/06, 41/02, 43/01;* F17D *1/14*
U.S. Cl. 166—371 14 Claims

1. A method of transporting in a duct a fluid comprising gas and water, and being under conditions where at least one hydrate is formed, the hydrates being formed from said gas and said water, wherein, before or during the formation of the hydrate or hydrates, an additive is injected into said fluid for reducing the tendency to agglomeration of the hydrate so as to obtain one or more hydrates in dispersed form, and said fluid is transported containing said hydrate or hydrates in dispersed form.

4,915,177

BLAST JOINT FOR SNUBBING INSTALLATION

Jack R. Claycomb, 8226 Waynemer, Houston, Tex. 77040

Filed Jul. 19, 1989, Ser. No. 382,898
Int. Cl.[4] E21B *17/10;* F16L *55/00*
U.S. Cl. 166—380 14 Claims

1. A blast joint apparatus for insertion into a well through a snubber unit, comprising:

a production tube;

a concentric sub attached to a lower end of the production tube, threaded for connection to production tubing in the well;

erosion resistant rings on the outer surface of the production tube, stacked upwardly from the concentric sub;

a pressure jacket attached at a lower end thereof to the concentric sub and extending upwardly along the production tube outside the erosion resistant rings;

first support means attached to an upper end of the production tube, to support the production tube;

second support means attached to an upper end of the pressure jacket, to support the pressure jacket;

third support means attached to the erosion resistant rings, to support the erosion resistant rings;

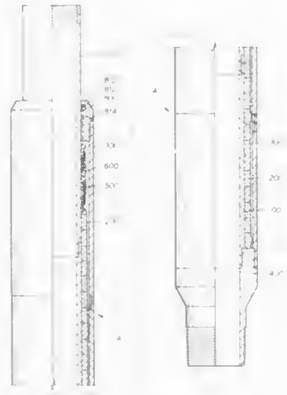
anchor means for preventing relative vertical movement between the erosion resistant rings and the production tube; and

load compensating means for maintaining a vertical load on the erosion resistant rings to prevent separations between rings.

7. A method for attaching a blast joint to installed production tubing and inserting the blast joint into a well through a snubber unit, comprising the steps of:

assembling a first length of a blast joint having a first length of production tube, a concentric sub attached to a lower end of the production tube, a first set of erosion-resistant rings stacked vertically on the outside of the production tube, and a first length of pressure jacket extending vertically outside the erosion-resistant rings;

attaching the first length of blast joint to a lifting means which independently supports the first length of production tube, the first length of pressure jacket, and the first



set of erosion-resistant rings, so that the tube, the jacket, and the rings can move vertically independently and swivel independently about a vertical axis;

lifting the first length of blast joint to a vertical position such that a lower end of the first set of erosion resistant rings is above a lower end of the first length of production tube, and a lower end of the first length of pressure jacket is above the lower end of the first set of erosion-resistant rings;

threading the concentric sub into the installed production tubing which protrudes from the snubber unit;

lowering the lifting means until the first set of erosion-resistant rings rests upon the concentric sub;

releasing the erosion-resistant rings from the lifting means;

further lowering the lifting means until the first length of pressure jacket contacts the concentric sub;

threading the first length of pressure jacket onto the concentric sub;

snubbing the first length of blast joint into the well; and

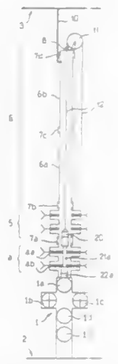
releasing the pressure jacket and the production tube from the lifting means.

4,915,178

METHOD OF INSERTING A TOOL INTO A WELL UNDER PRESSURE

Pierre Goldschild, Vulaines sur Seine, France, assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed May 12, 1989, Ser. No. 351,514
Claims priority, application France, May 19, 1988, 88 06686
Int. Cl.[4] E21B *33/072*
U.S. Cl. 166—385 8 Claims



1. A method of inserting a tool into a well under pressure, the tool to be suspended from the end of a cable having a given diameter and comprises a plurality of sections interconnected end-to-end by cylindrical couplings, said method comprising the steps of:

sequentially inserting each of said sections into the well via pressure control equipment including a blow-out preventor suitable for being hermetically sealed around each of said sections and said cable,

inserting at least some of said sections by means of a first cable having a diameter smaller than said given diameter so as to ensure that the weight of said sections is sufficient to overcome the pressure in the well head; and

interconnecting said inserted sections with said previously inserted sections,

replacing said first cable by a second cable having said given diameter after the weight of said interconnected sections has exceeded a predetermined value.

4,915,179

DOUBLE-ACTION ARTICULATED CULTIVATING TOOL

Ernest D. Hawk, 7463 Canyon Dr., Yucca Valley, Calif. 92284

Filed Aug. 9, 1988, Ser. No. 230,473
Int. Cl.[4] A01B *1/06, 1/20*
U.S. Cl. 172—375 9 Claims

8. A double-action articulated cultivating tool, which comprises:

(a) an elongate handle,

(b) right and left arms mounted on said handle at one end thereof,

each of said arms extending outwardly from said handle and having a distal portion that is generally parallel to a plane containing the axis of said handle,

each of said distal portions having a slot therein,

(c) a tined portion mounted on said distal portions and extending therefrom in a direction away from a second plane containing said axis and perpendicular to said first-mentioned plane, and

(d) a generally rectangular metal blade portion mounted on said distal portions in articulated relationship,

the metal forming said blade portion being flexible and springy,

said blade portion extending away from said second-mentioned plane in a direction generally opposite to the direction of extension of said tined portion,

said blade portion having sides that flex and that connect to bent-over end portions adapted to be inserted inwardly through said slots after said sides have flexed apart,

said end portions being maintained in inserted condition in said slots due to inward flexing of said sides,

the sizes of said end portions relative to the sizes of said slots being such that said blade portion may pivot through a small angle in directions generally parallel to said first-mentioned plane,

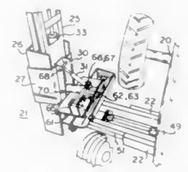
said blade portion having substantially the same dimension as said tined portion in a direction parallel to said second-mentioned plane.

4,915,180

POST DRIVER

Ralph T. Schisler, 2548 Marston Rd., New Windsor, Md. 21776

Filed Nov. 7, 1988, Ser. No. 267,928
Int. Cl.[4] E21C *11/02*
U.S. Cl. 173—22 15 Claims



15. A mechanical device for the adaption of a tractor to the driving of posts, in soils of terrain that slope away from the horizontal plane, from an adjustable offset line of travel of said tractor away from and parallel to a prescribed fence line for said posts, which comprises:

(a) a means of extracting power from the engine of said tractor for the operation of said device;

(b) a structural framework for attachment to said tractor;

(c) a first mechanical subassembly affixed to said structural framework comprising:

a first orthogonal carriage for effecting lateral offset positioning, responsive to control by an attending operator, of an intermediate equipment mounting fixture; and

a second orthogonal carriage for effecting fore-and-aft positioning, responsive to control by said attending operator, of said intermediate equipment mounting fixture; and

(d) a second mechanical subassembly affixed to said intermediate equipment mounting fixture, comprising:

a first angular carriage for effecting lateral tilting, responsive to control by said attending operator, of a post driver mounting fixture; and

a second angular carriage for effecting fore-and-aft tilting, responsive to control by said attending operator, of said post driver mounting fixture.

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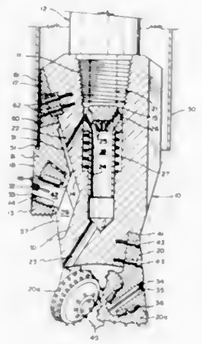
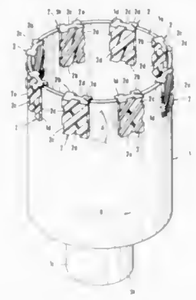
TUBING BIT OPENER
Jerome Labrosse, 1030 boul. Lajeunesse, R.R. 2, Bellefeuille, Quebec J0R 1A0, Canada
Filed Oct. 24, 1988, Ser. No. 261,158
Claims priority, application Canada, Dec. 14, 1987, 554249
Int. Cl.[4] E21B *10/34*
U.S. Cl. 175—263 17 Claims



1. A tubing bit opening comprising:
a drill body having lower and upper rotary cutter assemblies;
said lower rotary cutter assembly including a plurality of mounting blocks, each receivable in said drill body and supporting an independently rotatable cutter thereon, said lower cutter assembly being readily dismountable from said drill body;
said upper rotary cutter assembly comprising a plurality of arms, each arm supporting an independently rotatable cutter and being slidable between upper and lower stop means within a corresponding inclined pocket in said drill body for outward movement relative to said drill body when said independently rotatable cutter supported thereby is pressing against an earth foundation; and
wherein said upper stop means comprises an inner member supported in a recessed portion of said drill body, and an outer, v-shaped member having a base, a rectangular gap between vertical legs, a curved outer surface, inwardly v-shaped side surfaces and an inclined surface having a recessed area through which a plurality of bores pass, said outer member being slidable within said corresponding inclined pocket, and said inner and outer members being secured in a removable manner to said drill body.

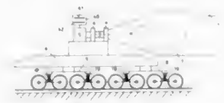
4,915,182
CUTTER ELEMENTS FOR HOLLOW DRILL BIT
Eugen Magyari, Vorburg, Liechtenstein, and Walter Ritt, Schnifis, Austria, assignors to Hilti Aktiengesellschaft, Liechtenstein
Filed Jun. 30, 1989, Ser. No. 374,362
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1988, 3822249
Int. Cl.[4] E21B *10/02, 10/44*
U.S. Cl. 175—403 6 Claims

1. Hollow drill bit comprises an axially extending tubularly-shaped support member having a first end leading in the drilling direction and a second end trailing in the drilling direction, said support member has a circumferentially and axially extending outer surface and a circumferentially and axially extending inner surface, a plurality of cutter elements located at the first end of said support member, wherein the improvement comprises said cutter elements project at least radially from the outer surface of said support member, each said cutter element has a radially outer surface and a radially inner surface, the radially outer surface projecting outwardly from the outer surface of said support member has at least one channel for receiving drillings from the base of a borehole, said channel



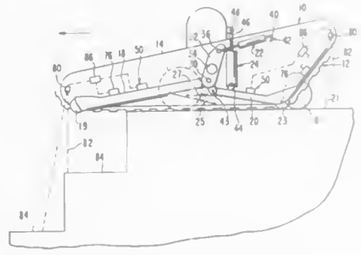
inclined relative to the axis of said support member, said channel extending generally circumferentially and being open at opposite ends thereof in the circumferential direction and also being open in the radially outer surface of said cutter elements.

4,915,183
WEIGHING APPARATUS FOR MEASURING THE WEIGHT OF A LOAD
Ronald N. Molenaar, Heemskerk, and Johannes Vermeij, Helloo, both of Netherlands, assignors to Hoogovens Groep B.V., IJmuiden, Netherlands
Filed Jun. 23, 1989, Ser. No. 369,837
Claims priority, application Netherlands, Jun. 30, 1988, 8801656
Int. Cl.[4] G01G *19/08;* G06K *7/10*
U.S. Cl. 177—137 15 Claims



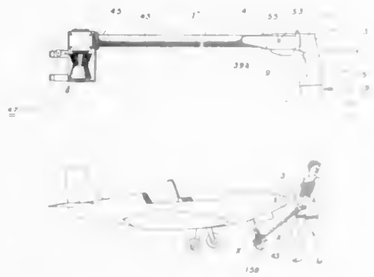
1. Weighing apparatus for measuring the weight of a load of a load-carrier of at least one vehicle, which load-carrier is supported by at least one spring unit on a mobil substructure of the vehicle, said weighing apparatus having means for measuring the elastic deformation of the spring unit or units under the load, said measuring means comprising a reference object mounted on the load-carrier and electrical observation means for non-contact observation of the position of the reference object, said electrical observation means being free of the vehicle.

4,915,184
CUSHIONING MECHANISM FOR STAIR-CLIMBING WHEELCHAIR
Baxter R. Watkins, Foster City, Calif., assignor to Quest Technologies Corp., Sunnyvale, Calif.
Filed Jun. 10, 1988, Ser. No. 205,404
Int. Cl.[4] B62D *55/04*
U.S. Cl. 180—8.2 13 Claims



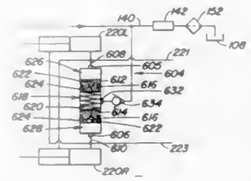
11. In a stair-climbing wheelchair capable of moving along an inclined path or a horizontal path;
a support;
means coupled with the support for cushioning the movements of the support as the wheelchair moves between horizontal and inclined positions, said cushioning means including an arm having a retracted position and an operative position;
actuatable means on the support for releasably latching the arm in its retracted position; and
a sensor coupled to the support near the outer end of the arm and coupled with the latching means for actuating the latching means, said sensor being operable for sensing a surface along the path of travel of the wheelchair.

4,915,185
PORTABLE AIRCRAFT MOVING DEVICE
Peter J. Olson, 4513-10 Cove Dr., Carlsbad, Calif. 92008
Filed Apr. 25, 1988, Ser. No. 185,495
Int. Cl.[4] B62D *51/04*
U.S. Cl. 180—19.2 2 Claims



1. A portable aircraft moving device comprising:
(a) a portable electric drill including a rotating output shaft and shaft end powered by an electric motor housed in a covering body and mounted on a piston grip-shaped handle containing a finger-actuated switch to activate the drill motor;
(b) first means for powering said drill;
(c) an elongated tube of terminal length having spaced-apart first and second ends wherein said first tube end is attached to said hand drill to support it rigidly on said tube;
(d) an elongated drive shaft of terminal length having spaced-apart first and second ends wherein said shaft is attached at said first end to said drill output shaft for rotation therewith in response to actuation of the drill motor;
(e) second means attached to said elongated tube and said drive shaft for reducing the rotary speed of said drive shaft and directing the input rotation thereof to an output rotation at an angle thereto;
(f) an axle attached to said second means having an axis of rotation substantially parallel to the axis of rotation of the front wheel of the aircraft;
(g) a drive wheel mounted on said axle for rotation therewith; and,
(h) pivotal means for temporarily attaching said device to the aircraft such that said drive wheel is in close tangential contact with the front wheel of the aircraft and said drill is cantilevered out in front of the aircraft is an acute angle with the surface over which the aircraft is to be moved so that by raising said drill said device is pivoted upward and by lowering said drill said device is pivoted downward and said drive wheel is brought into contact with the front wheel for moving the aircraft when said drill switch is actuated;
(i) wherein said connection between said first end of said drive shaft and said drill output shaft comprises:
(i) a washer-shaped insert having a threaded circumference for mutual engagement with threads formed on the inside wall of said first tube end;
(ii) said insert having formed therein a smoothbore central aperture for receipt therethrough of the threaded shaft of a bolt whose bolt head is positioned on the opposite side of said insert from said drill forward shaft end;
(iii) the threads of said bolt shaft being in the opposite direction from the threads of said threaded insert circumference and said tube wall threads; and wherein matching threads are formed about said drill forward shaft end for receipt thereover of said threaded portion of said first tube end and a separate thread reinforcing coil inserted between said matching threads and said threads of said first tube end for locking therebetween; and,
(iv) a central bore formed in said forward shaft end and threaded in the same direction and diameter as said bolt shaft for threaded receipt therein to lock said tube end into rigid connection with said output shaft.

4,915,186
HYDRAULIC STEERING SYSTEMS DAMPENING DEVICES
Douglas M. Gage, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.
Filed Oct. 25, 1988, Ser. No. 262,399
Int. Cl.[4] B62D *5/06*
U.S. Cl. 180—132 8 Claims



4. A self-propelled work vehicle, the vehicle having a supporting structure to which is mounted ground engaging means for propelling the vehicle, the supporting structure is also

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provided with a prime mover which is operatively coupled through a suitable transmission to the ground engaging means for propelling the vehicle, the vehicle comprising:

a hydraulic steering system having a source of hydraulic pressure which is directed to a steering valve, the steering system is also provided with two steering hydraulic motors for positively turning the vehicle; and

mechanical hydraulic pressure dampening device hydraulically positioned between the two steering hydraulic motors, the pressure dampening device comprising a cylinder having a hollow interior and two endwalls, two pistons positioned in the hollow interior of the cylinder, defining three spaces, the first space being located between the pistons, the second space being defined by one of the endwalls of cylinder and the first piston, and the third space being defined by the other endwall of the cylinder and the second piston, three hydraulic fittings each in hydraulic communication with one of the spaces, means for biasing the pistons into a normal position inside the cylinder, and two hydraulic passageways, the first passageway is formed in the first piston and is provided with a check valve providing one way hydraulic flow from the first space to the second space and the second passageway is formed in the second piston and is provided with a check valve providing one way hydraulic flow from the first space to the third space, whereby when hydraulic pressure is applied to the second space, the first piston is moved from its normal position overcoming the means for biasing, and the hydraulic fluid in the first space passes from the first space to the third space through the second passageway, and when hydraulic pressure is applied to the third space, the second piston is moved from its normal position overcoming the means for biasing, and hydraulic fluid in the first space passes from the first space to the second space through the first passageway.

4,915,187

MOTORCYCLE ARMREST MOUNTING ACOUSTICAL UNIT

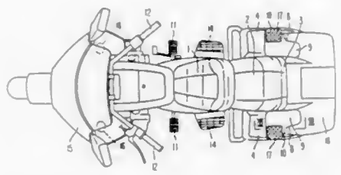
Tai Nakashima, Tokyo, and Hideaki Nebu, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1987, Ser. No. 113,454

Claims priority, application Japan, Oct. 29, 1986, 61-165079[U]

Int. Cl.[4] B62D *61/02*

U.S. Cl. 180—219 **7 Claims**



1. A motorcycle comprising:

a frame;

a front seat, a rear seat and a trunk disposed in longitudinally spaced relation on said frame;

said trunk including a hollow body portion having an opening and a removable closure cover closing said opening;

armrests attached to said closure cover on opposite sides thereof and in laterally opposed relation with respect to said seat, said armrests each including shell means defining a hollow compartment having an arm-supporting portion thereover;

a perforate grille formed in said arm-supporting portion of said shell means; and

audio equipment disposed in said armrest compartment including speaker apparatus fixedly disposed in facing relation with respect to said perforate grille.

4,915,188

STORAGE COMPARTMENT FOR A MOTORCYCLE

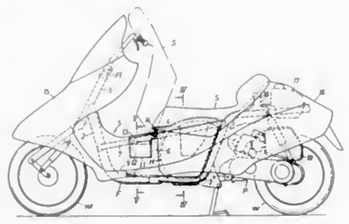
Kozo Ota; Masahiro Sato, both of Saitama, and Kenichi Sueda, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1987, Ser. No. 104,997

Claims priority, application Japan, Oct. 14, 1986, 61-157046[U]

Int. Cl.[4] B62D *39/00*; B62J *9/00*

U.S. Cl. 180—219 **12 Claims**



1. A motorcycle of the sitting-type comprising:

a body frame mounting a seat;

a front wheel rotatably mounted at a forward part of said body frame;

a power unit drivingly connecting a rear wheel in longitudinally spaced relation from said front wheel, said power unit being pivotally connected at its forward end to said body frame for vertically pivoted movement;

said body frame including generally horizontally extending support means disposed supporting forwardly of said power unit and supporting footrests; and

means forming a luggage storage compartment disposed forwardly of said power unit and extending vertically from a level substantially coincident with said footrest support means to said seat.

4,915,189

SYSTEM FOR CONTROLLING A TRANSFER CLUTCH OF A FOUR-WHEEL DRIVE VEHICLE

Yasuhito Sakai, Higashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1989, Ser. No. 320,751

Claims priority, application Japan, Mar. 9, 1988, 63-055515

Int. Cl.[4] B60K *23/08*

U.S. Cl. 180—247 **4 Claims**

1. A control system for a four-wheel drive vehicle having an engine, a hydraulically operated transmission, and a fluid operated transfer clutch for transmitting an output of the transmission to auxiliary drive wheels, the system comprising:

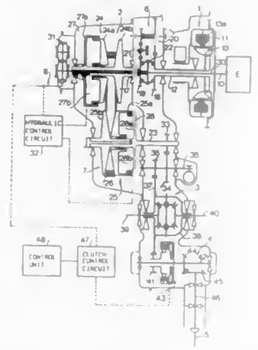
a hydraulic circuit having a pump for supplying oil to the transfer clutch;

a transfer control valve having a spool and provided in the hydraulic circuit;

a solenoid operated control valve for controlling oil for shifting the spool of the transfer control valve for changing amount of oil supplied to the transfer clutch to selectively engage the clutch;

the solenoid operated control valve having a first port communicated with the pump, a second port communicated with the transfer control valve for applying oil to shift the spool, a drain port, a valve body selectively closing the first port and the drain port and a solenoid for operating the valve body;

a control unit for applying a pulse train to the solenoid, the control unit being arranged to control the duty ratio of the pulse train for rendering the amount of drain oil from



the drain port to be a minimum at the changing of the oil to the transfer clutch between the engagement and disengagement of the clutch.

4,915,190

CONTROL SYSTEM FOR SPLIT AXLE DRIVE MECHANISM IN PART-TIME FOUR-WHEEL DRIVE VEHICLE

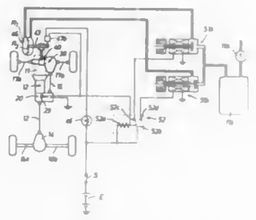
Hideyuki Iwata, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jan. 13, 1989, Ser. No. 296,600

Claims priority, application Japan, Jan. 13, 1988, 63-2866[U]

Int. Cl.[4] B60K *23/08*

U.S. Cl. 180—247 **5 Claims**



1. In a part-time four-wheel drive vehicle equipped with a transfer device adapted to change the operating mode of the vehicle drive system from a two-wheel drive mode to a four-wheel drive mode in response to engagement of a hydraulically operated clutch mechanism provided therein and with a split axle drive mechanism in the form of a differential, which includes a clutch mechanism disengageable for disconnecting a side shaft of the differential from a non-driven split axle part when the two-wheel drive mode is selected at the transfer device and engageable for connecting the side shaft to the non-driven split axle part when the four-wheel drive mode is selected at the transfer device,

a control system for the split axle drive mechanism comprising:

a pressure switch arranged to detect a hydraulic pressure applied to the clutch mechanism of said transfer device to be operated when applied with a predetermined hydraulic pressure after engagement of the clutch mechanism of said transfer device; and

means responsive to operation of said pressure switch for effecting engagement of the clutch mechanism of said differential and for disengaging the clutch mechanism of said differential when said pressure switch is rendered inoperative.

4,915,191

TRANSFER DEVICE FOR A FOUR-WHEEL DRIVE VEHICLE

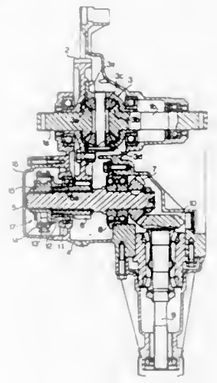
Takao Kotajima, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 271,038

Claims priority, application Japan, Dec. 16, 1987, 62-190965[U]

Int. Cl.[4] B60K *17/344, 17/35*

U.S. Cl. 180—248 **5 Claims**



1. A transfer device for transmitting power of an engine from a final reduction gear of a transmission to driving wheels of a four-wheel drive vehicle, comprising:

a transfer shaft rotatably mounted in a case by first and second bearings;

a transfer gear rotatably mounted on the transfer shaft at a portion between the bearings and engaged with said final reduction gear;

means comprising a coupling device mounted on said transfer shaft outside the first bearing for jointly rotatably engaging the transfer gear with the transfer shaft;

a drive bevel gear secured to the transfer shaft outside the second bearing; and

a driven bevel gear engaged with the drive bevel gear, for transmitting the power to the driving wheels.

4,915,192

ARRANGEMENT FOR OIL COOLER FOR FINAL DRIVE UNIT

Tsutomu Haynshida, Sagamihara, and Atsushi Shizuta, Okada, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Sep. 8, 1988, Ser. No. 241,897

Claims priority, application Japan, Sep. 17, 1987, 62-140907[U]

Int. Cl.[4] B60K *17/16*

U.S. Cl. 180—309 **6 Claims**

1. An oil cooler arrangement for a vehicle comprising:

a rear seat;

a vehicle floor having a rear elevated portion on which said rear seat is installed;

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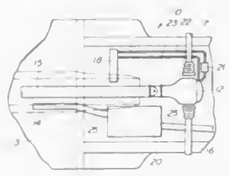
a propeller shaft which has a rear end and which is disposed under said vehicle floor;

an exhaust system which is disposed under said vehicle floor on one side of said propeller shaft;

a final drive unit which is connected to the rear end of said propeller shaft; and



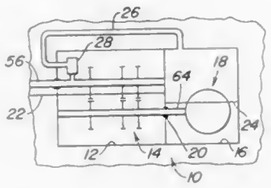
an oil cooler for said final drive unit, said oil cooler being disposed under said vehicle floor on the opposite side of said propeller shaft from the exhaust system and being supported by said rear elevated portion.

4,915,193

AIR/OIL LEVEL CONTROL FOR TRANSMISSION LUBRICATION

Gordon L. Marquart, Jesup, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jul. 3, 1989, Ser. No. 374,885
Int. Cl.[4] F01M 9/10
U.S. Cl. 184—6.12 14 Claims



1. A system for regulating oil level in a transmission, comprising:

a. a transmission housing having first and second chambers formed therein, each chamber being partially filled with oil and partially filled with air, and at least the first chamber being substantially sealed from atmosphere;

b. an oil passage interconnecting said first and second chambers at points thereof normally covered by the oil within the chambers;

c. a seal in said oil passage allowing oil to flow between said chambers but substantially preventing the flow of air between said chambers;

d. an air passage interconnecting said first and second chambers at points thereof normally exposed to the air within the chambers;

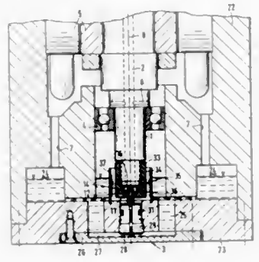
e. an air pump for forcing air through said air passage from said second chamber to said first chamber, such that oil is forced through said oil passage from said first chamber to said second chamber.

4,915,194

LUBRICATING OIL FEED SYSTEM

Heinrich Engländer, Jülich; Frank Fleischmann, Berghelm-Glessen; Hans-Peter Kabelitz, Cologne; Winfried Kaiser, Cologne; Friedrich Schmaus, Cologne; Günter Schütz, Cologne; Ralf Steffens, Cologne, and Dietrich Urban, Cologne, all of Fed. Rep. of Germany, assignors to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 1, 1988, Ser. No. 265,483
Claims priority, application European Pat. Off., Nov. 12, 1987, 87116704.5; Sep. 20, 1988, 88115390.2
Int. Cl.[4] F01M 9/00
U.S. Cl. 184—6.18 11 Claims



1. An oil lubricating system for supplying oil to the bearings of a shaft having a central oil pumping passage with an opening at one end, said system comprising

an oil delivery tube extending through said opening, said tube having a mouth in said passage,

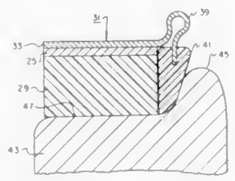
a cross-piece adjoined to said shaft in said passage immediately adjacent the mouth of the oil delivery tube.

4,915,195

APPARATUS FOR LUBRICATING RAILROAD VEHICLE WHEEL FLANGES

Darrell D. Dial, 11255 Hwy. 80 W., Ste. 105, Aledo, Tex. 76008

Filed Mar. 11, 1988, Ser. No. 167,027
Int. Cl.[4] B61K 3/00
U.S. Cl. 184—3.2 8 Claims



1. In a railroad vehicle having a plurality of wheels, each wheel having a cylindrical tread and a flange, the vehicle having a braking system with a brake shoe mounted for contact with the tread, an improved apparatus for applying lubricant to the flange, comprising in combination:

a support member having a first portion connected to the brake shoe and a second portion extending from the first portion; and

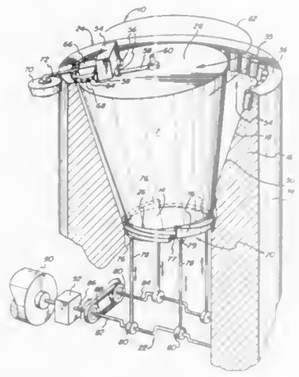
a lubricant member mounted to the second portion in contact with the flange.

4,915,196

HIGH OUTPUT POWER GENERATOR

Peter Krisko, 199 Willow St., Bridgeport, Conn. 06610

Filed Apr. 27, 1989, Ser. No. 343,733
Int. Cl.[4] F03G 7/08
U.S. Cl. 185—27 11 Claims



1. A high output power generator, comprising:

a weighted load member having a substantially circular base;

a structural support means having an enclosure for receiving said weighted load member;

lever means being disposed at the base of the enclosure, the lever means being operatively attached to a rotatable power shaft;

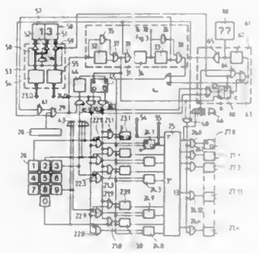
means for tilting said weighted load member on the edge of its circular base and rolling said weighted load member over the lever means for rotating said power shaft.

4,915,197

ELEVATOR CALL REGISTERING AND INDICATING DEVICE

Joris Schroder, Lucerne, Switzerland, assignor to Inventio AG, Switzerland

Filed Dec. 5, 1988, Ser. No. 280,158
Claims priority, application Switzerland, Aug. 10, 1988, 04949/87
Int. Cl.[4] B66B 1/14
U.S. Cl. 187—121 14 Claims



1. A call registering and indicating device for elevators with immediate assignment of calls of destination, including a keyboard for the input of calls for desired floors of destination, call memories and an indication panel in which at least a first indicating element signaling the selected floor of destination is located, and where a first control circuit connected with the keyboard and the first indicating element is provided, by means of which the first indicating element can be activated on input of the call, comprising:

a switching device connected with a call input keyboard for releasing the keyboard for the input of calls and thereafter blocking the keyboard, whereby an entered call is only processed further after the blocking;

a second indicating element for indicating an incorrect call input located in an indication panel and connected through a second control circuit to the keyboard, to call memories for storing the calls, and to a delay circuit, whereby said second indicating element is activated by said second control circuit and an incorrectly entered call is automatically cancelled;

a third indicating element signaling the selected elevator and a fourth and fifth indicating element signaling the position of the selected elevator in relation to the actuated keyboard are located in the indication panel; and

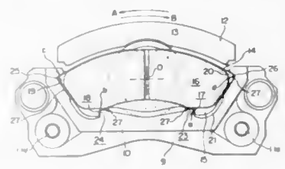
further control circuits connect said third, fourth and fifth indicating elements with a group control device, whereby on the assignment of calls, said third and one of said fourth and fifth indicating elements are activated and light up together with a first indicating element located in the indication panel and which has already been activated on the input of the call.

4,915,198

FRICTION PAD SUPPORT MECHANISM FOR DISC BRAKE

Hiroshi Hirashita, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Sep. 3, 1987, Ser. No. 95,368
Claims priority, application Japan, Sep. 3, 1986, 61-135349[U]
Int. Cl.[4] F16D 65/09
U.S. Cl. 188—73.39 6 Claims



1. A disc brake having a disc rotor, a friction pad assembly engagable with said disc rotor, said friction pad assembly comprising a radially inward edge face and a radially outward edge face with respect to a radial direction of said disc rotor, a pair of side edges on opposite sides with respect to a circumferential direction of said disc rotor, a pad assembly support member fixed to a vehicle body, and a drive means for drivingly moving said friction pad assembly in an axial direction of said disc rotor, said disc brake comprising:

first engaging means provided on said radially inward edge face of said friction pad assembly for transmitting brake torque applied from said friction pad assembly, said first engaging means being disposed on both end portions of said radially inward edge face of said friction pad assembly;

first retaining means provided on said support member for receiving said brake torque from said first engaging means in engagement with said first engaging means;

second engaging means provided on a radially outward portion of said friction pad assembly for transmitting the brake torque applied from said friction pad assembly, said second engaging means being disposed on both end corners of said radially outward portion of said friction pad assembly;

said second engaging means including radial engaging faces formed on said pair of side edges of said friction pad assembly, and circumferential engaging faces formed on

said radially outward edge face of said friction pad assembly, in spaced relation to each other in the circumferential direction of said disc rotor, said radial engaging faces of said second engaging means extending, respectively, in the radial direction of said disc rotor; and

second retaining means provided on said support member, said second retaining means including radial retaining faces spaced in the circumferential direction of said disc rotor from each other, for receiving said brake torque, and circumferential retaining faces provided radially outward from said disc rotor in spaced relation to each other in the circumferential direction of said disc rotor, for suppressing motion of said friction pad assembly in the radially outward direction of said disc rotor, said radial retaining faces of said support member extending in the radially outward direction of said disc rotor,

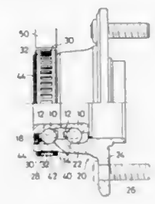
said radial engaging faces and said circumferential engaging faces of said friction pad assembly being located corresponding to and in confronted relation to said radial retaining faces and said circumferential retaining faces, respectively, of said support member.

4,915,199

ROTARY MEMBER SUPPORTING APPARATUS

Yoshitaka Hayashi, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1988, Ser. No. 265,567
Claims priority, application Japan, Nov. 6, 1987, 62-279373
Int. Cl.[4] B60T *17/22*
U.S. Cl. 188—181 A **18 Claims**



1. A sensor rotor unit mounted on a rotary member which is susceptible to rust formation, and cooperating with a sensor to detect the number of rotations of said rotary member, said sensor rotor unit including:

an annular sensor rotor formed of a magnetic material and having a plurality of concavities and convexities provided at intervals in the circumferential direction thereof; and

an annular rust preventing member integrally connected with said sensor rotor and having a first peripheral surface fitted to and surrounding a peripheral surface of said sensor rotor and a second peripheral surface fitted to said rotary member such that said rust preventing member is interposed between said sensor rotor and said rotary member and thereby prevents rust formed on said rotary member from propagating to said sensor rotor.

4,915,200

AIRFRAME MOUNTED ACCESSORY DRIVE GEARBOX MANUAL DECOUPLER SYSTEM

David L. Jacques, Rockford, and Nell L. Brown, Stillman Valley, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

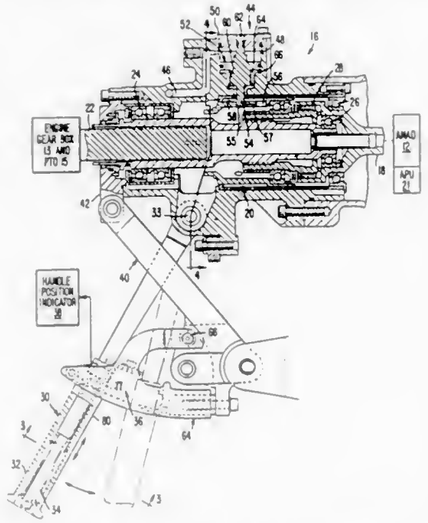
Filed Jun. 22, 1988, Ser. No. 209,957
Int. Cl.[4] F16D *11/00, 23/14*
U.S. Cl. 192—30 W **16 Claims**

1. In jet aircraft having a drive which rotatably drives an airframe mounted accessory drive, a system for controlling the connection of the drive to the airframe mounted accessory drive comprising;

a movable member which is pivotal at a pivot point between first and second positions;

means for locking the movable member in the first and second positions;

an axially movable carrier which is movable between first and second positions, the movable carrier carrying a shaft which is positioned in first and second axial positions respectively when the carrier is in the first and second axial positions, the shaft having a first end which is coupled to the airframe mounted accessory drive and a second end which is connectable to a shaft drive by a propulsion turbine of the aircraft when the carrier is in the first axial position and decoupled from the airframe mounted accessory drive when the carrier is in the second position, the first position of the movable member corresponding to the first position of the carrier and the second position of the movable member corresponding to the second position of the carrier and rotation of the movable member between the first and second positions causing axial movement of the carrier from the first axial position to the second axial position and axial movement of the shaft carried by the carrier from the first axial position to the second axial position;



a rotatably mounted shaft which is connected to the movable member at the pivot point;

a fork having a first end which is connected to the rotatably mounted shaft and a second end which is connected to the carrier with rotation of the shaft causing the fork to rate between first and second rotary positions which correspond to the first and second axial positions of the carrier;

a pump driven through the airframe mounted accessory drive to produce pressurized lubrication fluid in response to a rotational drive applied to the pump; and

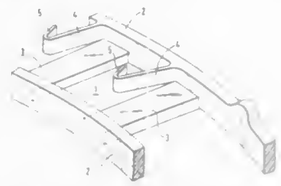
movable locking means which is in fluid connection with the pump with the movable locking means being biased in a first position when pressurized lubrication fluid is not connected thereto and being positioned in a second position by pressurized lubrication fluid from the pump for locking the carrier in either the first or second position as long as the pressurized fluid is connected to the movable locking means.

4,915,201

PLASTIC CAGE FOR USE IN OVERRUNNING ROLLER CLUTCHES

Johann Stark, Höchstadt, and Leo Müntnich, Aurachtal, both of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Sep. 5, 1985, Ser. No. 772,640
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1984, 3434499
Int. Cl.[4] F16D *15/00*
U.S. Cl. 192—45 **4 Claims**



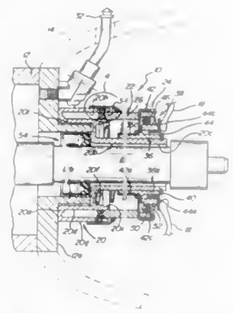
1. A plastic cage for the clamping rollers of an overrunning roller clutch, comprising at least one annular rim; a plurality of bars extending from one side of the rim and defining therewith a plurality of windows for the clamping rollers; and a leaf spring provided on said rim and integral therewith for each of said bars to engage the clamping roller in the corresponding window, said springs and said bars being radially offset relative to each other so that each of said springs is movable circumferentially of the rim to and from a position of at least partial overlap with the adjoining bar, wherein said rim has a predetermined radial height, and each of said springs has a radial height which approximates or equals half said predetermined height.

4,915,202

CONCENTRICALLY MOUNTED HYDRAULIC CLUTCH ACTUATOR

Keith V. Leigh-Monstevens, Troy, and Paul M. Regula, Sterling Heights, both of Mich., assignors to Automotive Products plc, Warwickshire, England

Continuation-in-part of Ser. No. 153,512, Feb. 18, 1988, which is a continuation of Ser. No. 921,762, Oct. 22, 1986, abandoned.
This application Oct. 13, 1988, Ser. No. 257,064
Int. Cl.[4] F16D *25/08, 13/58*
U.S. Cl. 192—85 CA **11 Claims**



7. A hydraulic actuator for use with a clutch having a clutch housing and a transmission input shaft mounted for rotation within the clutch housing, said actuator including:

(A) a plastic housing structure adapted to be positioned within the clutch housing concentrically around the transmission input shaft and defining a rearward mounting section, a quill shaft extending forwardly from said rearward mounting section in concentrically surround relation to the input shaft, and an annular piston bore defined by concentric inner and outer annular housing walls and having an open forward end and an inner diameter greater than the outer diameter of said quill shaft by a predetermined radial distance;

(B) an annular piston having its rear end positioned in said piston bore and extending at its forward end out of said piston bore; and

(C) a bearing assembly including a bearing carrier having a hub portion slidably mounted on said quill shaft and having a maximum radial thickness less than said predetermined radial distance so that said hub portion may be disposed concentrically within said annular piston; and

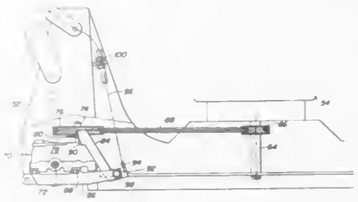
(D) a metal ring positioned in tightly surrounding relation to said outer annular housing wall.

4,915,203

TRANSMISSION CONTROL FOR SELF-PROPELLED IMPLEMENT

Kenneth D. Schweitz, Oconomowoc, and James T. Dowe, Beaver Dam, both of Wis., assignors to Deere & Company, Moline, Ill.

Filed Feb. 10, 1989, Ser. No. 310,190
Int. Cl.[4] F16D *21/08*
U.S. Cl. 192—48.5 **8 Claims**



1. For use in a walk-behind self-propelled implement having a housing with a powered drive shaft and sheave;

a transmission rockably supported by the housing, the transmission having

an axle,

an input shaft and sheave, and

clutch means operatively interposed between the input shaft and the axle;

at least one ground-engaging drive wheel operatively coupled to the transmission axle;

flexible drive means operatively coupling the drive shaft sheave with the transmission sheave; and

an improved drive wheel control comprising:

a first link means carried by the transmission;

a second link means for selectively actuating the clutch means and carried for movement with the first link means, the second link means being swingable between a first position where it first causes the clutch means to be engaged and the first link means and transmission to rock about a support and lengthen the distance between the two sheaves and a second position where it causes the clutch means to become disengaged and the transmission to rock about the support to shorten the distance between the two sheaves; and

means connected with the second link for moving it between its first and second position.

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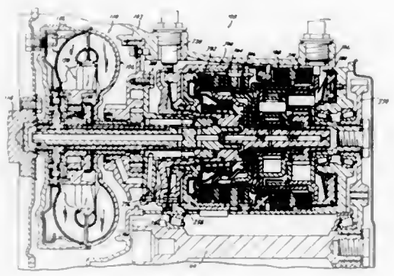
4,915,204

PUSH/PULL CLUTCH APPLY PISTON OF AN AUTOMATIC TRANSMISSION

James R. Klotz, Mt. Clemens; Howard L. Benford, Bloomfield Hills, and Gerald L. Holbrook, Rochester Hills, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 29, 1988, Ser. No. 189,493
Int. Cl.[4] F16D *25/10*
U.S. Cl. 192—87.17 1 Claim



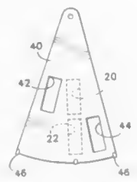
1. A vehicle transmission comprising:
a transmission housing;
a rotatable input member;
an output member;
a gear assembly for changing the ratio of torque between said input member and said output member;
a rotating piston member having a non-applied position and being movable axially in one direction to apply a first clutch assembly and axially in an opposite direction to apply a second adjacent clutch assembly;
a clutch hub member connected to said input member and spaced axially from said piston member and forming a clutch cavity therebetween;
a clutch retainer member connected to said clutch hub member and spaced axially in said opposite direction from said piston member and forming a clutch cavity therebetween whereby the fluid pressure in either clutch cavity moves the piston member;
said piston member extending radially outwardly to an outer periphery and having an integral and axially extending flange at the outer periphery thereof, at least one pressure plate retained to said flange, and means for retaining said at least one pressure plate at a predetermined position axially along said flange between said first and second clutch assemblies;
said first and second clutch assemblies each comprising a plurality of axially-spaced clutch plates connected to said clutch retainer member and at least one clutch disc connected to a member of said gear assembly; and
a reaction plate connected to said clutch retainer member and disposed between the adjacent pair of clutch assemblies to allow said pressure plate to sandwich said clutch plates and said at least one clutch disc between said reaction plate and said pressure plate.

4,915,205

APPARATUS FOR DISPENSING AND RECEIVING RENTED ARTICLES

John N. Reid, Great Wakerling; Keith B. Glanvill, West Mersea, and Peter R. Hodgetts, Colchester, all of England, assignors to Sovereign Technical Services Ltd., Onchan, United Kingdom

PCT No. PCT/GB86/00468, § 371 Date Jun. 5, 1987, § 102(e) Date Jun. 5, 1987, PCT Pub. No. WO87/00948, PCT Pub. Date Feb. 12, 1987
PCT Filed Aug. 4, 1986, Ser. No. 42,949
Claims priority, application United Kingdom, Aug. 6, 1985, 8519701
Int. Cl.[4] G07F *7/06, 7/10*
U.S. Cl. 194—205 21 Claims



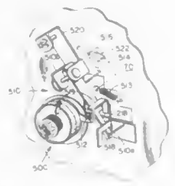
1. Apparatus capable of dispensing articles for rental and accepting returned articles, comprising:
means for enabling a user to enter a unique identification code,
means for verifying the code entered to inhibit dispensing to unauthorized users,
means for enabling payment for rental to be made,
means for enabling a user to select from amongst the articles available for rental,
a magazine having a plurality of compartments each for receiving a respective one of the articles for rental, the magazine being constructed as a cylindrical drum with two radially spaced rows of radially extending compartments for the individual articles,
means defining two separate dispensing apertures formed in line with one another,
a sector shaped plate for controlling the dispensing apertures, the sector shaped plate being formed with offset apertures and being pivotable between three positions, both apertures being closed in one position, and a respective one of the apertures being open in each of the other two positions,
means for moving the magazine relative to the dispensing apertures to align with a dispensing aperture the magazine compartment containing the selected article, and
means for recording data indicating the identity of the user and the selected article,
the apparatus further comprising:
means for reading from the recorded data the article previously hired to an identified user,
means for moving the magazine to align with a dispensing aperture the empty compartment for containing the article previously hired to the identified user,
means operative after insertion of the article into the compartment by the user to read a code on the article identifying the returned article, and
means for recording the return of the rented article when the article code corresponds with that read from the recorded data.

4,915,206

MULTIPRICE SETTING SPLIT RING COIN CONTROL MECHANISM

Harvey G. Kresta, Rt. 2, Box 222, Hallettsville, Tex. 77964, and Ralph J. Ullman, Rt. 2, Box 193, Shiner, Tex. 77984

Continuation-in-part of Ser. No. 154,870, Feb. 11, 1988, Pat. No. 4,828,097. This application May 27, 1988, Ser. No. 200,076
Int. Cl.[4] G07F *5/08, 11/04*
U.S. Cl. 194—227 18 Claims



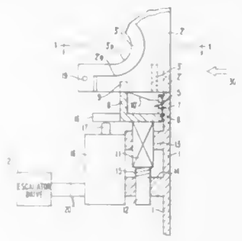
1. A coin mechanism device for use with a dispensing machine accessible from the outside for quickly changing the value of coins required to activate the coin mechanism between resetable high and low values of coins, the coin mechanism having a totalizer that advances from a non-dispensing position to a dispensing position as coins are inserted into the coin mechanism, the device comprising:
rotation means rotatable between a first angular position and a second angular position, said rotation means being accessible from the outside of said coin mechanism;
a price control unit comprised of at least a first ring, a second ring, and a release bar in operative association with said rotation means, said first ring and said second ring rotatably mounted to said totalizer and advancing therewith from the non-dispensing position to the dispensing position as coins are inserted into the coin mechanism;
said release bar having a first end and a second end, said first end being fixed and said second end being movable for positioning against said first ring when said rotation means is in the first angular position, and against said second ring when said rotation means is in the second angular position, wherein said release bar of said price control unit further comprises a release bar bracket, said release bar bracket attached to a housing of the coin mechanism device and to said first end of said release bar for allowing said release bar to pivot in a plane perpendicular to the plane of said totalizer and also pivot in a plane parallel to the plane of said totalizer;
said first ring having a first ring slot therein, the position of the first ring slot being changeable with respect to said release bar by rotating said first ring, the position of said first ring slot determining a lower limit of the totalizer;
said second ring having a second ring slot therein, the position of the second ring slot being changeable with respect to said release bar by rotating said second ring, the position of said second ring slot determining an upper limit of the totalizer;
wherein said totalizer causes said first ring and said second ring to rotate from a non-dispensing position to a dispensing position in response to the insertion of coins into said coin mechanism, said release bar is urged against said first ring when said rotation means is rotated to said first angular position, or said second ring when said rotation means is rotated to said second angular position, said release bar engages the desired ring slot when the desired ring slot reaches the dispensing position and the engagement releases means which allow access to the dispensing machine.

4,915,207

SAFETY DOOR FOR THE HANDRAIL-ENERGY OF AN ESCALATOR

Gunter Henning, Oststeinbek, Fed. Rep. of Germany, assignor to Thyssen-M.A.N. Aufzüge GmbH, Neuhausen/Filder, Fed. Rep. of Germany

Filed Jan. 17, 1989, Ser. No. 297,569
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1988, 3802983
Int. Cl.[4] B65G *43/00*
U.S. Cl. 198—323 6 Claims



1. A safety door at the entry opening of an escalator handrail into the handrail housing comprising
first and second pairs of pivotally mounted openable wings mounted on an entry wall on opposite sides of the entry opening,
each pair of wings including an inner wing and an outer wing mounted on a common hinge pin and being sequentially inwardly pivotable between a closed position and an open position,
said wings having recesses at the distal edges thereof to permit passage of the handrail with the wings in their closed positions;
a slider having inclined surfaces extending upwardly and away from said entry wall;
means for supporting said slider below said wings for reciprocatory movement in directions parallel to said hinge pin with said inclined surfaces in position to be contacted by said wings and urged downwardly as said wings are opened, said means for supporting including
a guide support mounted on said entry wall below said wings,
a central guide pin attached to said slider at the lateral center thereof and slidably extending into said guide support, and
spring means urging said slider upwardly toward said wings; and
a safety switch operable by said slider as said slider is urged downwardly by contact of said wings with said inclined surfaces, said switch being electrically connected to deenergize said escalator when operated.

4,915,208

CONTAINER-RECEIVER MAGAZINE WITH TWO WORK STATIONS

Harald Juenkersfeld, Wuppertal; Georg Fischer, Velbert, and Lutz Langenhahn, Ettlingen, all of Fed. Rep. of Germany, assignors to Benz & Hilgers, GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 12, 1987, Ser. No. 84,535
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1986, 3632691
Int. Cl.[4] B65G *37/00*
U.S. Cl. 198—346.1 3 Claims

1. In a filling machine for filling containers with food or beverage products, an improved arrangement for exchanging cellular members having container receiving means, said filling

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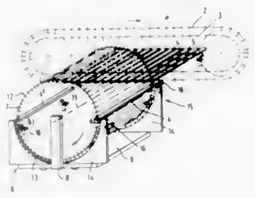
machine having endless driven transport means in which there are detachably mounted cellular members of a first format which are exchanged with cellular members of a second format, the improvement comprising,

said cellular members having said first format and said cellular members having said second format are operatively mounted in a rotatable storage drum means, said transport means and said drum means operatively moving in synchronization, said transport means having an upper run plane and a parallel lower run plane, said cellular members having said first format being successively removed from said lower run of said transport means and moved onto said storage drum means moving in cadence therewith by a first pair of gripper means while essentially simultaneously said cellular members having said second format being successively removed from said storage drum means by a second pair of gripper means and inserted into said lower run of said transport means;



said storage drum means being in the form of a magazine which is rotatable about an axis which is parallel to said upper and lower plane runs of said transport means, said drum means having a first peripheral portion in which said cellular members having said first format are operatively mounted and having a second peripheral portion in which said cellular members having said second format are operatively mounted;

said drum means having a cellular member receiving station for those cellular members having said first format which are being removed from said transport means and a cellular member delivery station for those cellular members having said second format which are being inserted into said transport means, said receiving station and said delivery station being disposed in a horizontal plane diametrically opposite each other.

4,915,209

METHOD FOR CONTROLLING THE EXACT POSITIONING OF THE ITEMS TO BE SORTED IN AN AUTOMATIC SORTING PLANT

Francesco Canziani, via Contardo Ferrini 21, San Macario (Varese), Italy

Filed Sep. 6, 1988, Ser. No. 240,920

Claims priority, application Italy, May 23, 1988, 20695 A/88

Int. Cl.[4] B65G *43/00*

U.S. Cl. 198—357 **19 Claims**

1. A method of controlling the position of items (1) to be loaded onto a plurality of receiving units (5) which move at a first velocity (Vm) in a feed path, each receiving unit having a driven belt (12) thereon which is moveable orthogonally to the feed path, and utilizing at least one induction station (6) having a plurality of driven belts extending in series at an angle to the feed path, comprising:

loading an item (1) onto the induction station (6);

using the driven belts of the induction station to move the loaded item at a second velocity (Vo) toward a selected one of the units (5) for loading the loaded item onto the selected one of the units; and

moving the driven belt of the selected one of the units at a third velocity (Vm1) in a direction orthogonal to the feed path, the third velocity being a function of the angle and of the second velocity equal to a component of the second velocity which is orthogonal to the feed path so that the

loaded item moves onto the driven belt of the selected one of the units at null relative velocity.

4,915,210

POSITIONING A CAN ON A ROTATING TURRET

Frederick W. Jowitt; Robert H. Harrison; Keith West, and Kevin J. Pope, all of Oxfordshire, United Kingdom, assignors to CMB Packaging (UK) Limited, Reading, United Kingdom

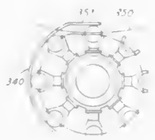
PCT No. PCT/GB87/00453, § 371 Date May 6, 1988, § 102(e) Date May 6, 1988, PCT Pub. No. WO88/00254, PCT Pub. Date Jan. 14, 1988

PCT Filed Jun. 26, 1987, Ser. No. 193,451

Claims priority, application United Kingdom, Jul. 7, 1986, 8616514

Int. Cl.[4] B65G *29/00*

U.S. Cl. 198—476.1 **9 Claims**



1. Transfer apparatus for transferring articles to a rotating table for cooperation there with successive, circumferentially-spaced article treatment means carried on said table comprising:

(a) a turret member mounted for rotation about a fixed axis parallel with an axis of rotation of the rotating table;

(b) a plurality of article holders extending radially from the turret member at positions spaced around the periphery thereof and arranged for movement toward and away from said fixed axis;

(c) holder operating means including a stationary annular cam disposed generally concentrically about said fixed axis, and for each such holder, a cam follower coupled to the holder and spring biasing means adapted to bias each holder into contact with said stationary cam;

(d) an article guide rail extending around a part of said turret member and spaced radially therefrom, said guide rail having a first arcuate part which is generally concentric with the turret, and a second arcuate part which is continuous with said first part and which is generally concentric with said rotating table;

characterized in that:

(i) said turret member comprises a transverse wall, and an annular side wall extending from the periphery of said transverse wall;

(ii) said cam is disposed radially within said side wall;

(iii) a plurality of circumferentially-spaced radial shafts

are slidably mounted in said side wall for reciprocatory sliding movement toward and away from said guide rail, each said radial shaft carrying outside said side wall one said article holder and inside said side wall one said cam follower; and

(iv) said spring biasing means are carried within said side wall and are arranged to urge the respective cam followers radially outwards against said cam.

4,915,211

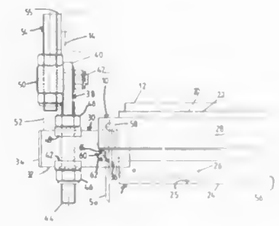
CONVEYOR BELT SCRAPER

Hans-Otto Dohmeier, Johannesburg, South Africa, assignor to Karl-Heinz Erdmann, Johannesburg, South Africa, a part interest

Filed Feb. 18, 1988, Ser. No. 157,732

Int. Cl.[4] B65G *45/00*

U.S. Cl. 198—499 **18 Claims**



1. A conveyor belt scraper comprising:

an elongate supporting frame;

means for mounting the supporting frame with respect to a conveyor belt;

elongate blade means mounted in the frame and guided to move laterally with respect to the frame toward and away from a conveyor belt with respect to which the frame is mounted;

at least one elongate strip element in engagement with the blade means for biasing the blade means with respect to the frame, the elongate strip element being at least partly flexible and at least partly longitudinally resilient and having its length extending substantially along the direction of the length of the blade means; and

means for tensioning the elongate strip element longitudinally by extending the longitudinally resilient part of the elongate strip element along the length of the strip element to urge the blade means against the conveyor belt.

4,915,212

APPARATUS FOR TRANSPORTING COPS AND COP TUBES

Josef Derichs, Mönchengladbach, and Heinz Kamp, Wegberg, both of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Mönchengladbach, Fed. Rep. of Germany

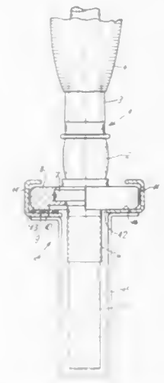
Filed Aug. 31, 1988, Ser. No. 238,914

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1987, 3729130

Int. Cl.[4] B64H *67/06*

U.S. Cl. 198—803.01 **14 Claims**

1. Apparatus for transporting cops and cop tubes, comprising a plurality of circular-disk-type carriers, each of said carriers having an upper and a lower planar surface, a spindle bearing assembly having a bearing portion penetrating the upper and the lower surfaces and protruding beyond the lower surface, a spool spindle being rotatably supported on said bearing assembly and protruding beyond the upper surface for carrying a cop or a tube, a transport apparatus movable in a given transport direction having a surface operatively engaging said carrier, and guide means for slidingly guiding the



lower surface of said carrier, said guide means having an opening formed therein through which said bearing portion passes.

4,915,213

ARRANGEMENT IN A BELT CONVEYOR

Jan A. T. Loodberg, Nyhamnsläge; Arne E. Wall, Landskrona, and Olle L. Siwersson, Helsingborg, all of Sweden, assignors to AB Scanialnventor, Helsingborg, Sweden

PCT No. PCT/SE86/00552, § 371 Date May 19, 1988, § 102(e) Date May 19, 1988, PCT Pub. No. WO87/03565, PCT Pub. Date Jun. 18, 1987

PCT Filed Dec. 4, 1986, Ser. No. 194,111

Claims priority, application Sweden, Dec. 9, 1985, 8505793

Int. Cl.[4] B65G *15/10*

U.S. Cl. 198—819 **9 Claims**

1 Arrangement in a belt conveyor having at least one endless belt (1, 1'; 7, 7') and two tensile force (longitudinal)-absorbing members (3, 4, 3', 4', 8, 8', 9, 9') extending throughout the entire length of the belt conveyor and being each connected to a respective edge portion (6, 5) of the belt and projecting from the plane of said portion for cooperation with guide rollers determining the path of travel of the belt conveyor which is sealed over at least part of its length at a longitudinal edge thereof, characterized in that one edge portion (6) of the belt, along said sealed part of the length of the belt conveyor, overlaps and extends outside the other edge portion (5) of the belt, with its tensile force (longitudinal)-absorbing member (3) projecting in the same direction as the tensile force (longitudinal)-absorbing member (4) of the other edge portion (5) of the belt.

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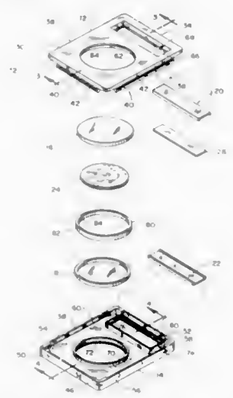
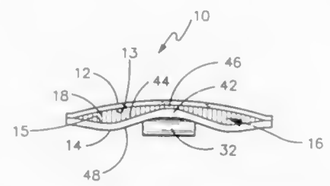
4,915,214
HOLDER FOR NUMISMATIC ITEMS
Horst K. Wieder, 1002 S. 12th St., Watertown, Wis. 53904
Filed Oct. 31, 1988, Ser. No. 265,058
Int. Cl.[4] B65D *25/54*
U.S. Cl. 206—0.82 14 Claims



1. A holder for protecting and displaying a numismatic item having two opposing sides, the holder comprising:
(a) a top housing having an interior surface and an exterior surface, one side of the numismatic item being viewable from the exterior surface of the top housing through a first window located in the top housing;
(b) a bottom housing having an interior surface and an exterior surface the opposing side of the numismatic item being viewable from the exterior surface of the bottom housing through a second window located in the bottom housing;
(c) a finger on the interior surface of the top housing;
(d) a finger on the interior surface of the bottom housing which interlocks with the finger on the interior surface of the top housing to seal and confine the numismatic item in a chamber formed between the first and the second windows when the top and bottom housings are pressed together; and,
(e) an additional window located in each of the housings between which a label may be sealed and confined, the label being viewable from the exterior surface of at least one of the housings.

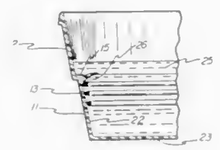
4,915,215
CARD CARRIER DEVICE AND ATTACHMENT MECHANISM
Robert Brekke, Littleton, Colo., assignor to Leo M. Oser and Betty Oser, both of Hamilton, Ind.
Filed Apr. 18, 1988, Ser. No. 182,789
Int. Cl.[4] A45C *11/18*
U.S. Cl. 206—39 37 Claims

1. A carrying case for business cards and the like securable to a piece of material or fabric, said case comprising:
a flexible body having first and second side members defining a cavity therebetween communicating with an opening at one end thereof, said body being sized and shaped to receive said cards through said opening into said cavity;
means for accessing and removing said cards from said cavity including a slot disposed along said first side member depending from said one end toward the center portion of said first side member;
means for removably securing said case to said piece of material; and
means in the form of a fixed raised ridge projecting from the interior surface of said second side member opposite said slot to create a narrowed neck portion at the center of said cavity for constricting the width of said cavity along the



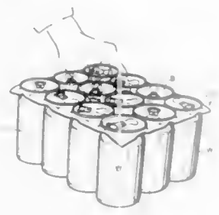
center portion thereof to assist in maintaining said cards within said case while providing a leverage area for removal of said cards.

4,915,216
SURGICAL BOWL
Paul E. Magers, c/o Alpha Industries, Inc., P.O. Box 808, 701 North Greenwood Ave., Clearwater, Fla. 33517-0808
Continuation of Ser. No. 290,554, Dec. 27, 1988, abandoned. This application Jun. 14, 1989, Ser. No. 366,334
Int. Cl.[4] B61B *17/04*; B65D *21/02*
U.S. Cl. 206—520 6 Claims



1. Temporary storage means for retaining a coiled guide wire for introducing a catheter into the heart of a patient, comprising:
(a) a bowl having a wall of cylindrical section, predetermined height and an inner radius which will accommodate such guide wire in coiled form,
(b) lug means projecting inwardly from the inner surface of said bowl wall at a position intermediate the top and bottom of said wall to define a space therebelow,
(c) said lug means being of sufficient radial extent to retain such coiled wire therebelow immersed in a treating solution of a depth reaching said lug means while providing ready access to such wire for removal and use, the upper portion of said bowl wall above the level of said lug means is of a sufficiently larger inner diameter than the outer diameter of the lower portion of said wall below said lug means to provide for nesting of a plurality of said bowls for shipment and/or storage; and
(d) means on the outer surface of said lower portion of said bowl for preventing said lower portion of the upper of two nesting said bowls from entering said lower portion of the lower of said two nesting bowls.

4,915,217
CONTAINER PACKAGE
James A. Karabedian, Toledo, and David A. Pratt, Waterville, both of Ohio, assignors to Owens-Illinois Plastic Products Inc., Toledo, Ohio
Continuation-in-part of Ser. No. 319,775, Mar. 7, 1989. This application Jul. 26, 1989, Ser. No. 385,635
Int. Cl.[4] B65D *75/00*
U.S. Cl. 206—150 22 Claims



1. A container package for cans having a body portion, a peripheral bead at the upper end thereof, and an inclined portion extending upwardly and inwardly from the body portion toward the bead comprising
an array of cans,
a sheet of flexible plastic material having a plurality of openings for receiving the upper ends of the cans,
said cans extending upwardly through the openings in the sheet with the periphery of the openings flexing upwardly and inwardly beneath the bead,
the modulus of elasticity of said sheet, the thickness of said sheet, and the spacing and size of said openings being such that the cans are maintained in abutting relationship of the bodies thereof, the plane of the sheet remains substantially undisturbed, and the upper ends of the cans are maintained in substantially the same plane when the package is lifted by engaging the carrier,

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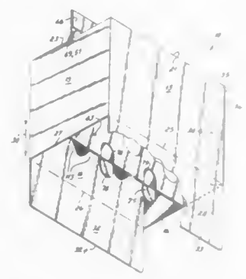
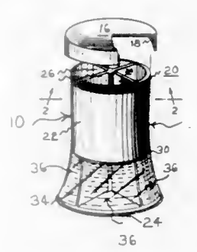
4,915,218
BASKET CARRIER WITH TWO PIECE BLANK
Elmoe Crouch, Franklin, Ohio; Norbert Hoell, Southgate, Ky., and Jeffrey A. Lashyro, Crosby, Minn., assignors to Minnesota Automation Inc., Crosby, Minn.
Filed May 23, 1989, Ser. No. 354,338
Int. Cl.[4] B65D *85/72*
U.S. Cl. 206—178 4 Claims



1. A basket carrier comprising
a body comprising opposed side walls, opposed end walls and a floor, said body being fabricated from a separate one piece body blank in which said walls' end edges are all parallel one to the other, said body blank thereby incorporating said walls on a longitudinal axis oriented normal to said walls' end edges,
each end wall comprising two end wall panels formed integral one with the other, said end wall panels being joined in a fold line parallel to said end wall's end edges, at least one of said end wall panels being foldably connected to an end edge of an adjacent side wall, and a glue flap foldably connected to an end edge of one of a side wall and an end wall, said side and end walls thereby being joined in body configuration at a seam in a corner of said body,
said floor comprising a first floor panel foldably connected to one side wall and a second floor panel foldably connected to the other side wall, said first and second floor panels being sized to overlap one another, said first and second floor panels being glued to one another where same overlap,
a center wall comprising a cell divider panel section and a handle, said center wall being fabricated from a separate one piece center wall blank having an end wall connector flap at each end edge thereof, said end wall connector flaps being fixed to said end walls to retain said body and center wall in assembly as a basket carrier, and
at least one connector tab foldably connected to said center wall, said connector tab being located between the overlap of said first and second floor panels, a first surface of said connector tab being glued to one of said floor panels and a second surface of said connector tab being glued to the other of said floor panels, said center wall thereby being securely glued to said floor which enhances the vertical support for bottles positioned within said cells and also which aids in maintenance of squared corners for said carrier during use.

4,915,219
DISINFECTING TOOTHBRUSH CONTAINER
Anthony Ottimo, 75 Kristin Ln., Hauppauge, N.Y. 11788
Filed Oct. 24, 1988, Ser. No. 261,493
Int. Cl.[4] B65D *81/00*
U.S. Cl. 206—209.1 14 Claims



1. A disinfecting toothbrush container comprising:
a container body having a substantially flat base and side wall flared circumferentially outward toward said base so that the container is prevented from tipping over; and
a flexible transverse partition in said container body, said flexible transverse partition cooperating with said base and said side wall to form a disinfecting chamber in a first interior portion of said container body, said transverse partition being flexible enough to allow insertion of a toothbrush therethrough into said chamber and to reseal said chamber when the toothbrush is removed so that said chamber is substantially liquid-tight and dirt from the air is prevented from entering said chamber.

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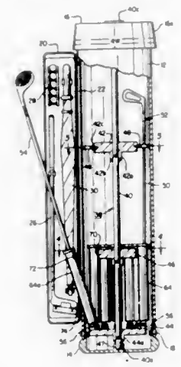
4,915,220
GARMENT BAG WITH MOUNTING FOR HOOK
John V. Pulichino, Jr., Providence, R.I., assignor to American Tourister, Inc., Warren, R.I.
Filed Mar. 8, 1989, Ser. No. 320,525
Int. Cl.[4] A45C *5/06, 5/12, 13/10, 13/34*
U.S. Cl. 206—278 3 Claims

3. A garment bag comprising:
an elongated fabric bag having an upper end and a lower end,
a retaining loop fixed to said lower end,
an elongated rigid strap fixed to said upper end,
a flexible loop of webbing having overlapping ends lying on the center of said strap,
a J-shaped receptacle having a plate overlying said overlapped ends and rivetted through said loop ends to said strap,
said plate having a lip on the edge of said plate nearest said lower end when said bag is folded upon itself,
a slide having a T-shaped opening presenting a stem portion and a cross portion, the slide having a rod-like member defining said cross portion,
said flexible loop received in the cross portion of said opening,
a hook connected through the stem portion of said slide opening,
the rod-like member being captured in said lip to provide a short throw of said hook to said retaining loop when said bag is lightly filled,
said slide being at the end of said flexible loop remote from its ends to provide a long throw of said hook to said retaining loop when said bag is fully packed.

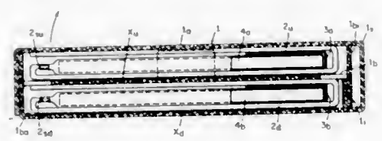
4,915,221
CARRIER WITH ROTARY DISPENSER FOR GOLF CLUBS
Stacy F. Spangler, 15 Spring Lake Estates, Quincy, Ill. 62301
Filed Aug. 28, 1989, Ser. No. 398,363
Int. Cl.[4] A63B *55/00*
U.S. Cl. 206—315.6 16 Claims

1. An enclosed container for golf clubs;
a club dispenser disposed interiorly of said container;
said dispenser comprising a frame and means for rotatably mounting the same within said container;
multiple elongated cylinders carried by said frame;
said cylinders being open at one end for receiving the handles of said clubs; and



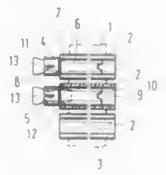
the other end of said cylinders including means for pivotal attachment to said frame.

4,915,222
ELECTROMAGNETICALLY AND ELECTROSTATICALLY PROTECTED SEE-THROUGH PACKAGING UNIT FOR PRINTED CIRCUIT BOARDS
Deborah L. Reidinger, El Toro, and Michael S. Freitas, Irvine, both of Calif., assignors to Unisys Corporation, Blue Bell, Pa. and Conceptual Design Industries, Irvine, Calif.
Filed Aug. 1, 1988, Ser. No. 226,916
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—328 16 Claims



1. A physically protective container having capability for holding one or more printed circuit boards comprising, in combination:
(a) movable lid means for opening said protective container;
(b) a transparent anti-electrostatic anti-electromagnetic primary plastic bag having capability of encompassing a first said printed circuit board wherein said plastic bag provides protection from electrostatic discharges and from electromagnetic radiation when a printed circuit board is located therein; and
(c) cushioning means fixedly attached to the interior of said container, for encompassing said transparent primary plastic bag;
(d) said protective container including:
(d1) an upper compartment having capability for holding said first printed circuit board encompassed by said primary plastic bag and cushioning means; and
(d2) a lower compartment, having an internal protective lid, for holding a second printed circuit board encompassed by an auxiliary one of said anti-electrostatic anti-electromagnetic plastic bags and an auxiliary layer of said cushioning means said auxiliary plastic bag being fixedly sealed at one end to said cushioning means;
(d3) said first printed circuit board being located in said primary plastic bag; and
(d4) said second printed circuit board being located in said auxiliary plastic bag.

4,915,223
EXPANSIBLE PLUG DEVICE
Artur Fischer, Waldachtal, Fed. Rep. of Germany, assignor to fischerwerke, Artur Fischer GmbH & Co.KG, Tumlingen/-Waldachtal, Fed. Rep. of Germany
Filed Mar. 7, 1989, Ser. No. 320,229
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1988, 3807368
Int. Cl.[4] F16B *13/06;* B65D *85/24*
U.S. Cl. 206—345 8 Claims

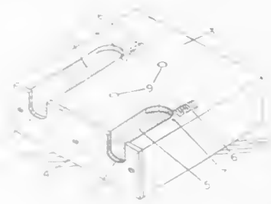


1. An expansible plug device, comprising a magazine provided with a plurality of trough-shaped holders which are arranged near one another and have elastic walls, each of said holders having at least one projection; and a plurality of expansible plugs each arranged in a respective one of said holders and having an annuler groove in which said projection of a respective one of said holders engages, each of said expansible plugs having an expansion sleeve and a shaft with an end facing away of said expansion sleeve, each of said holders extending outwardly beyond said end of said shaft.

4,915,224
CONTAINER FOR PACKAGING A FLOWER
Barbara J. Wulf, Grafton, and Eric H. Olsen, Brown Deer, both of Wis., assignors to beKind, Inc., Thiensville, Wis.
Filed Jun. 20, 1989, Ser. No. 369,317
Int. Cl.[4] B65D *85/52;* A01G *9/02*
U.S. Cl. 206—423 45 Claims

1. A container for packaging a flower having a stem communicating with a vial containing nutrient and including a lip and a body, said container comprising:
a pedestal including a closed end, an open end opposite said closed end, a sidewall extending generally obliquely between said closed end and said open end, said sidewall and said closed end defining a cavity between said closed end and said open end, said pedestal including an inner surface and an outer surface defined by said closed end and said sidewall, at least one of said outer surface and said sidewall defining a first support portion supportable by a planar, horizontal support surface, said pedestal including an alternate support portion different from said first support portion and supportable by a planar, horizontal support surface, said outer surface including a flange adapted to support the lip of a vial, with the body of a vial in the cavity of said pedestal, when said alternate support portion is supported by a planar, horizontal support surface; and
a generally hollow, elongated sleeve having an open end selectively slideably joined in telescopic relation with said pedestal to contain a flower and vial with said first support portion supported by a planar, horizontal support surface, said sleeve being removable relative to said pedestal so that said alternate support portion can be supported by a planar, horizontal support surface and a vial can be positioned with said flange supporting the lip thereof.
16. A container for packaging a flower having a stem, said container comprising:
a vial adapted to contain nutrient and to house at least a portion of the stem of a flower;
a generally hollow pedestal having a base adapted to be supported by a planar, horizontal support surface, said base including a perforated portion which is selectively removable to define an aperture for housing the vial, a sidewall extending generally obliquely from said base; and said pedestal including an open end opposite said base, said open end defining an alternate surface supportable by a planar, horizontal support surface; and
a generally hollow, elongated, sleeve having an open end selectively slideably joined in telescopic relation with said pedestal, and an inner surface having a lower flange, said pedestal and said sleeve when joined selectively containing a flower and said vial, with said vial supported by said lower flange and with said base being selectively supported by a support surface with said pedestal supporting said sleeve in generally vertically upward disposition, said sleeve further being removable from said pedestal, and said pedestal being invertible such that said vial can be supported in the aperture in said base for generally vertically upward disposition of said vial and a flower when said open end of said pedestal is supported by a planar, horizontal support surface.

4,915,225
SAFETY NEEDLE CAP HANDLER
William D. Tabor, Jr., 205 Danville Ave., and James V. Blackwell, 19503 Foxbrook Dr., both of Colonial Heights, Va. 23834
Filed May 9, 1988, Ser. No. 192,180
Int. Cl.[4] B65D *83/10*
U.S. Cl. 206—368 1 Claim



1. A device for removing the protective cover from a dental syringe unit, the syringe unit including a syring needle and a protective cap consisting of a generally cylindrical body adapted to removably cover said needle and thereby provide a protective cover for the needle, said cylindrical body defined by a first and second end axially disposed from one another, a

rim circumferentially disposed on the cap body at a point axially disposed between the two ends of the cap, said device comprising:

(a) a housing;

(b) at least one opening in the housing to accomodate at least a portion of the cylindrical cap; and

(c) means on the housing engaging at least a portion of the rim whereby the cap can be removed from the syringe unit when a force is applied axially to the syringe needle.

4,915,226

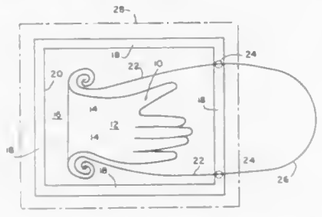
HYGIENIC DONNING PACKAGING SYSTEM FOR SURGICAL GLOVES

Robert Keenan, P.O. Box 178, Dardanelle, Ark. 72834

Filed Aug. 29, 1988, Ser. No. 237,050

Int. Cl.[4] B65D *85/18*

U.S. Cl. 206—438 10 Claims



1. A surgical glove donning system comprising:

a sterile glove with a rolled up cuff; a package in which said glove is contained, said package having a sterile interior;

means for opening said package to provide access to said glove by the intended wearer;

unrolling means intertwined with the rolled up cuff of said glove to effect unrolling without touching the glove itself, the unrolling means forming a loop located outside of the package, said unrolling means also attached to the package; whereby the glove is donned by removing it from the package and pulling it in a direction in which the cuff is to be unrolled.

4,915,227

ONE STEP DRESSING DELIVERY SYSTEM

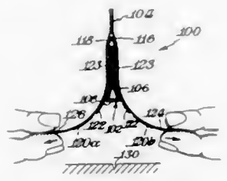
Owen L. Johns, Madeira Beach, Fla., assignor to Smith & Nephew United, Inc., Largo, Fla.

Continuation of Ser. No. 228,074, Aug. 4, 1988, which is a continuation of Ser. No. 137,218, Dec. 23, 1987, Pat. No. 4,781,293. This application Jul. 28, 1989, Ser. No. 387,179

The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.

Int. Cl.[4] A61F *15/00;* **B65D** *85/67*

U.S. Cl. 206—441 12 Claims



1. A dressing having a delivery system to facilitate application of the dressing onto a human which comprises:

(a) a thin flexible backing layer having a suitable adhesive on substantially all of one surface thereof and a central pad on the adhesive coated surface of the backing layer, the adhesive being impermeable to liquids, but permeable to water vapor and oxygen, and a pair of ends and a transverse fold such that at least a portion of the non-adhesive coated side of the backing layer is adjacent itself;

(b) a protective package enclosing the dressing comprising a pair of layers releasably sealed to each other outside the periphery of the dressing;

(c) a release layer between the adhesive of the folded backing layer and the package fixedly attached to the package and split along a line adjacent the fold, the release layer having a substantially greater stiffness and resistance to wrinkling than the dressing;

(d) opening means on the package adjacent the fold; and

(e) dressing release-retarding means at each end of the dressing.

4,915,228

ONE STEP DRESSING DELIVERY SYSTEM

Owen L. Johns, Madeira Beach, Fla., assignor to Smith & Nephew United, Inc., Largo, Fla.

Continuation of Ser. No. 137,218, Dec. 23, 1987, Pat. No. 4,781,293. This application Aug. 4, 1988, Ser. No. 228,074

The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.

Int. Cl.[4] A61F *15/00;* **B65D** *85/67*

U.S. Cl. 206—441 6 Claims

1. A dressing having a delivery system to facilitate application of the dressing onto a human which comprises:

(a) a thin flexible backing layer having a suitable adhesive on substantially all of one surface thereof, the backing layer and the adhesive being impermeable to liquids but permeable to water vapor and oxygen, and a pair of ends and a transverse fold such that at least a portion of the non-adhesive coated side of the backing layer is adjacent itself;

(b) a protective package enclosing the dressing comprising a pair of layers releasably sealed to each other outside the periphery of the dressing;

(c) a release layer between the adhesive of the folded backing layer and the package fixedly attached to the package and split along a line adjacent the fold, the release layer having a substantially greater stiffness and resistance to wrinkling than the dressing;

(d) opening means on the package adjacent the fold; and

(e) dressing release-retarding means at each end of the dressing, said dressing having a water vapor transmission rate of at least 250 $g/m^2/24$ hrs/40° C./80% RH.

6. A dressing having a delivery system to facilitate application of the dressing onto a human which comprises:

(a) a breathable dressing comprising a substantially rectangular backing layer of a thin flexible transparent polyurethane film having an acrylic copolymer adhesive on substantially all of one surface thereof and having a pair of ends and a transverse fold dividing the dressing into two equal portions such that the uncoated side of the polyurethane film is adjacent itself with ends aligned;

(b) a protective package enclosing the dressing comprising a pair of layers of sterilizable paper releasably sealed to each other with a suitable contact adhesive outside the periphery of the dressing;

(c) a release layer of silicon release coated paper having a substantially greater stiffness and resistance to wrinkling than the dressing disposed between the adhesive coating of the dressing and the package fixedly attached to the package with a suitable contact adhesive and split along a line adjacent the fold;

(d) a pair of opening tabs adjacent the fold integral with the package; and

(e) release-retarding means at each end of the dressing in the form of a strip of the dressing parallel with the fold in contact with the dressing layer.

4,915,229

SHEET FILM PACKAGE AND BUFFER SHEET MEMBER

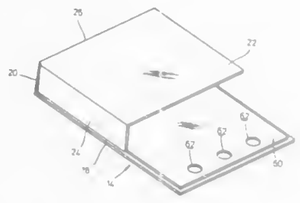
Sadami Yamada, Kanagawa, and Mutsuo Akao, Minamiashigara, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 27, 1988, Ser. No. 149,246

Claims priority, application Japan, Jan. 28, 1977, 62-15984; Jan. 29, 1987, 62-18921; May 7, 1987, 62-109700; Aug. 7, 1987, 62-198794

Int. Cl.[4] B65D *81/30*

U.S. Cl. 206—455 10 Claims



1. A sheet film package comprising a flexible light-shielding member, a stack of sheet films stored in said light-shielding member, and a protective board disposed in said light-shielding member for protecting said sheet films, said protective board having upper and lower panels lying substantially parallel to each other in sandwiching relation to the sheet films, and pivot means associated with said upper panel for securing said upper panel such that said upper panel is swingable in a direction in which the sheet films will be fed out, said protective board including at least one holder portion intergrally joined to one side edge of said upper panel and/or said lower panel for preventing the sheet films from being displaced in a direction transverse to said direction in which the sheet films will be fed out, and further including a buffer sheet member disposed on said lower panel of the protective board, said buffer sheet member having means for leaking suction air.

4. A sheet film package comprising a flexible light-shielding member, a stack of sheet films stored in said light-shielding member, and a protective board disposed in said light-shielding member for protecting said sheet films, said protective board having upper and lower panels lying substantially parallel to each other in sandwiching relation to the sheet films, and pivot means associated with said upper panel for securing said upper panel such that said upper panel is swingable in direction in which the sheet films will be fed out, said protective board including at least one holder portion integrally joined to one side edge of said upper panel or said lower panel for preventing the sheet films from being displaced in a direction transverse to said direction in which the sheet films will be fed out, wherein said protective board is of a substantially bent configuration, said upper panel being shorter than said lower panel in said direction in which the sheet films will be fed out.

8. A sheet film package comprising a flexible light-shielding member, a stack of sheet films stored in said light-shielding member, and a protective board disposed in said light-shielding member for protecting said sheet films, said protective board having upper and lower panels lying substantially parallel to each other in sandwiching relation to the sheet films, and pivot means associated with said upper panel for securing said upper panel such that said upper panel is swingable in direction in which the sheet films will be fed out, said protective board including at least one holder portion integrally joined to one side edge of said upper panel or said lower panel for preventing the sheet films form being displaced in a direction transverse to said direction in which the sheet films will be fed out, wherein said upper and lower panels are separate from each other and arranged in interdigitated relation to each other, defining therebetween a space accommodating said sheet films, and further including a buffer sheet member disposed on said lower panel of the protective board, said buffer sheet member having means for leaking suction air.

4,915,230

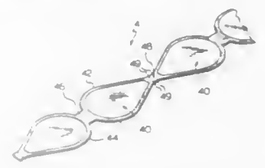
STRIP MATERIAL FOR USE IN THERMOFORMING CONTAINERS

Derek Mancini, Uxbridge, Canada, assignor to Inoform Equipment Ltd., Scarborough, Canada

Division of Ser. No. 98,863, Sep. 21, 1987, Pat. No. 4,809,852, which is a continuation-in-part of Ser. No. 886,726, Jul. 18, 1986, Pat. No. 4,704,844. This application Nov. 28, 1988, Ser. No. 276,808

Int. Cl.[4] B65D *75/42*

U.S. Cl. 206—459 7 Claims



1 Strip material for use in thermoforming containers comprising a series of interconnected paired container blanks symmetrically disposed, and made of a thin plastic thermoformable material, each container blank being connected to adjacent container blanks of the series at connection segments forming an extension of the blanks in the length of the strip material which connecting segments are to be severed to separate the blanks, each container blank having a curved body portion generally of a semi-circular shape smoothly merging with an elongage throat portion tapering inwardly to one of the connecting segments, said curvedbody portion opposite said throat portion including at an edge thereof a further connecting segment, each container blank being orientated to be the mirror image of blanks immediately either side thereof such that the orientation of the blanks continuously alternates in the length of the strip material and said throat portions extend in the length of the strip.

4,915,231

PACKAGING FOR PACKAGING OF PRODUCTS UNDER A TRANSPARENT FILM, PROCESS FOR PERFORMING THIS PACKAGING AND DEVICE FOR USING THIS PROCESS

Gerard Perbet, and Daniel Perbet, both of Villeurbanne, France, assignors to Societe Villeurbannaise D'Emballages Modernes SVEM, Villeurbanne, France

Filed Mar. 17, 1988, Ser. No. 169,589

Claims priority, application France, Mar. 17, 1987, 87 04182

Int. Cl.[4] B65B *11/52*

U.S. Cl. 206—461 6 Claims

1 A packaging for packaging products, comprising:

a plate of rigid material intended to serve as a support for at least one product to be packaged, said plate having a lower face and an upper face, said upper face adapted to receive said at least one product, said plate having a coating of a layer of synthetic material and having means for passing air through side plate and said coating in response to a partial vacuum across said plate;

a first upper sheet of synthetic material for covering and adhering to the upper face coating of said plate and said at least one product resting on it,

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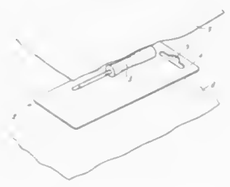
adapted to be attached to said plate coating and said at least one product under the action of heat and said means for passing air through said plate in response to application of said partial vacuum across said plate, and

projecting beyond a peripheral edge of said plate; and



a second lower sheet of synthetic material for covering the lower face of said plate and being attached to said first upper covering sheet by a peripheral sealing to said first upper covering sheet beyond the edge of said plate.

4,915,232

PICNIC MAT AND CARRYING BAG ASSEMBLY

David T. Hill, Rt. 4 Box 198; Pamela L. Cass, and William E. Cass, III, both of P.O. Box 671, all of Warrenton, Va. 22186

Filed May 18, 1989, Ser. No. 354,786
Int. Cl.[4] A47G *9/06, 11/20*
U.S. Cl. 206—541 4 Claims

1. A picnic mat, multipurpose tote bag and securing means assembly comprising:

a. a picnic mat constructed of a top ply of woven fabric; a center ply constructed of polyester batting sandwiched between an upper and a lower layer of woven fabric; a bottom ply of acrylic or similar fabric treated to be sun, water and mildew resistant, the top and center plys being stitched together throughout the mat and the bottom ply stitched to the top and center ply around the periphery only; strips of fabric placed diagonally across each corner on the underside of the mat and sewn to form loops;

b. a multipurpose tote bag constructed of acrylic fabric treated to be sun, water and mildew resistant with carrying strap, the bag being of adequate inner volume to contain the mat in a folded position; an inner pouch, means attaching said inner pouch to the bag, a loop, means attaching said loop to the tote bag;

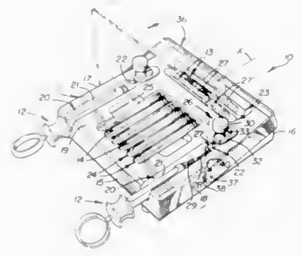
c. ground securing devices or pins in a U shape, of sufficient size to snugly hold said mat loops and allow pin ends to penetrate ground and hold mat; and a pin manipulating tool of appropriate size, to be used to insert and remove pins from the ground.

4,915,233

DENTAL ANESTHESIA ORGANIZER

Richard A. Smith, Kentfield, Calif., assignor to The Regents of the University of California, Alameda, Calif.

Filed Nov. 2, 1988, Ser. No. 266,121
Int. Cl.[4] B65D *77/22, 79/00*
U.S. Cl. 206—571 12 Claims



1. An organizer for use as an armamentarium to retain at least one syringe, a needle encased within a protective sheath, and a hermetically sealed cartridge, containing a liquid adapted to be administered to a patient by said syringe, said organizer comprising

a portable tray disposed on a longitudinal axis thereof and having proximal and distal ends, lateral sides and an upper surface,

first compartment means defined in said tray and sized for receiving and retaining said syringe therein, said first compartment means comprising an elongated and exposed first compartment portion formed as a groove on the upper surface of said tray to terminate at an open end at the proximal end of said tray and an elongated and closed second compartment portion formed generally as a bore aligned with a distal end of said groove and adapted to retain a said needle and protective sheath therein,

second compartment means defined in said tray and sized for receiving and retaining said needle and protective sheath therein, and

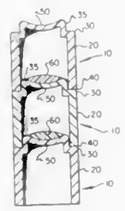
third compartment means defined in said tray and sized for retaining said cartridge therein.

4,915,234

COSMETIC DEMONSTRATOR

Randall L. Boeller, Richardson, Tex., assignor to Mary Kay Cosmetics, Inc., Dallas, Tex.

Filed Mar. 13, 1989, Ser. No. 322,365
Int. Cl.[4] B65D *69/00*
U.S. Cl. 206—581 8 Claims



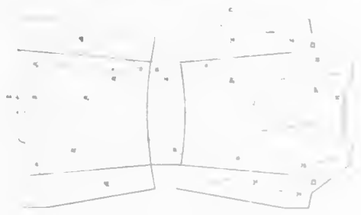
6. A disposable cosmetic demonstrator comprising a plurality of stackable hollow substantially cylindrical containers having cylindrical sidewalls of a predetermined size, first and second ends connected to the cylindrical sidewalls, the first end having a substantially circular extruded tip connected thereto and outward-extending edges of predetermined size, the extruded tip having a concave depression of predetermined size for storing the cosmetic, the second end having a central opening extending throughout the container and defined by the cylindrical sidewalls and first end for allowing manipulation of the containers, and the cylindrical sidewalls at the second end capable of stacking upon the outward-extending edges of the first end of a second of the plurality of containers.

4,915,235

TEAR PANEL FRENCH FRY CARTON

Paul D. Roosa, Saugerties, N.Y., assignor to International Paper Company, Purchase, N.Y.

Filed May 12, 1989, Ser. No. 350,965
Int. Cl.[4] B65D *5/54*
U.S. Cl. 206—611 7 Claims



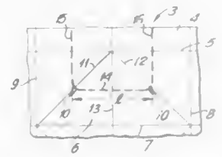
1. A unitary blank of sheet paperboard for forming a french fry scoop/container, the blank including fold and perforated lines, the blank having a longitudinal axis of mirror symmetry, the blank having a central, bottom forming panel of generally rectangular form, a pair of sidewall forming panels foldably connected to the longitudinal edges of said central panel, one of said sidewall panels provided with a main perforated line to define a top closure sub-panel, the other of said sidewall panels being a tear panel and having a pair of generally parallel, longitudinally extending tear lines extending to that edge of said other sidewall panel remote from said central panel, each sidewall panel provided with a pair of endwall forming flaps running generally parallel to said longitudinal axis.

4,915,236

CARDBOARD AND PLASTIC COMPOSITE PARALLELOPIPEDAL CONTAINER FOR LIQUID

Klaus O. K. Kamin, Stuttgart, and Karl-Heinz Ladwig, Julich-Broich, both of Fed. Rep. of Germany, assignors to PKL Verpackungssysteme GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 15, 1988, Ser. No. 219,966
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1987, 8710092[U]; Feb. 1, 1988, 8801139[U]
Int. Cl.[4] B65D *5/74*
U.S. Cl. 206—621.6 9 Claims



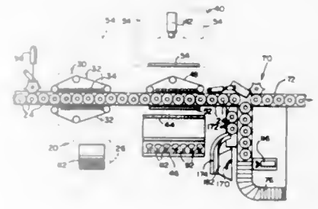
1. In a parallelopipedal container for liquid formed from a blank composed of a composite of cardboard and plastic with a ridged-seam closure having a base line and that extends along the upper surface and continues at each side along fold-down triangles, disposed against walls of the container, wherein the triangles are demarcated by scores slanted from an upper edge of the walls to the ridged-seam closure, and at least one of the fold-down triangles is provided with a rippable pouring aperture comprising material-weakening lines, the improvement wherein the material-weakening lines in the area of one fold-down triangle are U-shaped on the blank with a basic line that parallels the base line of the ridged-seam closure and with leg-like lines that extend perpendicular to the basic line and encounter same in the vicinity of the slanting scores and wherein the basic and leg-like lines are connected at each corner by a curve.

4,915,237

COMPREHENSIVE CONTAINER INSPECTION SYSTEM

Roger Chang, Ft. Lauderdale; Donald Darling, Palm Beach Gardens; Jaime Periera, North Palm Beach; Mark Filipowski, Lake Worth; Tyce Fitzmorris, Lake Park; Trent Francis, Ft. Lauderdale; Dale Kline, Palm Beach; Russell Mortenson, West Palm Beach; Steven R. Rowley, West Palm Beach, and Timothy Wagner, West Palm Beach, all of Fla., assignors to Inex/Vistech Technologies, Inc., Clearwater, Fla.

Filed Sep. 11, 1986, Ser. No. 906,299
The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.
Int. Cl.[4] B07C *5/00*
U.S. Cl. 209—524 16 Claims



1. An inspection system for analyzing images of continuously moving, closely-spaced bottles, containers and like bodies, comprising:

triggering means operable to detect the passage of each of the bodies past a predetermined positioned;

a flash lamp responsive to the triggering means and operable to momentarily illuminate each of the bodies in turn at the predetermined position, and also to illuminate at least one additional body adjacent said each of the bodies in turn;

a video detector having a solid state planar array and optics to focus and record on the array an image of the body at the predetermined position, a plurality of individual pixels being defined by the image thus focused on the array;

control means responsive to the triggering means, operative to address the individual pixels in the image recorded in the array;

memory means defining an image buffer connected to the video detector and operable responsive to the control means to store data representing a single image, said image being collected substantially synchronously with a trigger signal from the triggering means;

data processing means operable asynchronously with the triggering means, the data processing means being operable to read the data in the image buffer, and to analyze said data asynchronously with the trigger means; and,

a random access memory connected to the data processing means and operable to store successive ones of the images, each successive image having data representing plural ones of the bodies, the data processing means associating portions of the image of a given body from the plural

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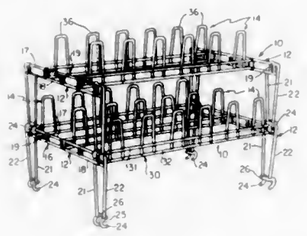
bodies in successive images, as the given body advances along a conveying path.

4,915,238

STACKABLE SHOE RACK

Timothy S. Cassel, Boxborough, Mass., assignor to Tucker Housewares, Leominster, Mass.

Filed Aug. 22, 1988, Ser. No. 235,034
Int. Cl.[4] A47F *7/08*
U.S. Cl. 211—37 12 Claims



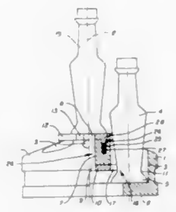
1. An article holding rack comprising:
a pair of end members of identical construction, each of said end members having:
a. an elongated mounting frame which is to be located generally horizontally;
b. a downwardly extending leg at each end of the mounting frame, each leg having a curved foot portion defining an open pocket and whose bottom extremity is to rest on a supporting surface, the open pocket of the curved foot adapted to fit over a part of another mounting frame,
c. a plurality of integral fastening means spaced across the length of the mounting frame and integral therewith,
at least one elongated cross piece for extending between the two end members in a vertical orientation, said cross piece having a plurality of upwardly extending article holding members,
and an integral fastener at each end of a said cross-piece to mate with a fastening means of a said end member to connect the cross-piece to said two end members.

4,915,239

BOTTLE DISPENSER FOR SETTING ON TABLES

Johannes Persch, Waldschmidtstr. 6, D-8130 Starnberg, Fed. Rep. of Germany

Filed Jan. 6, 1989, Ser. No. 294,127
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1988, 3825360
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—74 13 Claims



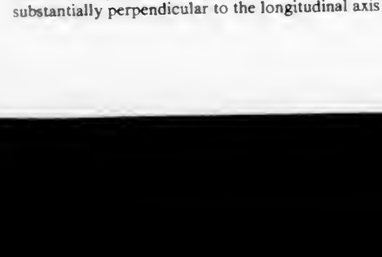
1. A bottle dispenser for removably supporting bottles while standing on a table comprising a base which has at least two upwardly open receptacles (**3**) for bottles (**4**) into which receptacles the bottles can be placed from above and from which they can be removed in an upward direction, said dispenser having a locking device (**16**) comprising projecting members (**17,20**) which are constructed and arranged to engage simultaneously with recesses or cross-sectional taperings (**11**) of all bottles in said receptacles, said locking device being movable between a locking position in which it engages the bottles to prevent them from falling out of the dispenser and a removal position in which it is disengaged from the bottles so that the bottles can be placed into and removed from the bottle dispenser.

4,915,240

MULTIPLE PALLET RACK

Anthony N. Konstant, Winnetka, Ill., assignor to Konstant Products, Inc., Skokie, Ill.

Filed Feb. 16, 1989, Ser. No. 310,880
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—151 9 Claims



1. In a pallet rack which comprises at least one pair of spaced, parallel rails having rolling rail surfaces and first and second wheeled carts mounted in rolling relation with said pair of rails, said second cart being capable of rolling over said first cart to overlie said first cart, the improvement comprising, in combination,
the wheels of said first and second carts respectively rolling on the same rail surfaces, the front wheels of said second cart being positioned between the front and rear wheels of the first cart, whereby said second cart can roll between a first vertically overlying position relative to said first cart and a second position where most of said second cart is spaced along said rails from said first cart.

4,915,241

SYNTHETIC RESIN BOTTLE FURNISHED WITH HANDGRIP AND METHOD FOR MANUFACTURING THE SAME

Akihito Morimura, Tokyo; Shinichi Miyazaki, Tokyo; Yosuke Yasuda, Tokyo, and Masaki Miura, Kawasaki, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

Filed Mar. 2, 1988, Ser. No. 163,108
Claims priority, application Japan, Mar. 9, 1987, 62-52061; Jul. 16, 1987, 62-175966; Jan. 11, 1988, 63-2522
Int. Cl.[4] B65D *23/10, 25/28*
U.S. Cl. 215—100 A 3 Claims

1. A synthetic resin bottle with a handgrip, comprising:
a hollow, molded, biaxially oriented, synthetic resin main body, said main body including a top, middle, and bottom portion;
a concavity defined in said middle portion of said main body for receiving a handgrip therein;
at least one button-like projection integrally attached to said main body in said concavity, said at least one button-like projection having a first and second subportion, said first subportion being integrally attached to said main body, said first subportion having a longitudinal axis extending substantially perpendicular to the longitudinal axis of said main body, said second subportion being integrally attached to said first subportion, said second subportion being substantially disk-shaped and extending substantially parallel to the longitudinal axis of said main body, and said second subportion having a substantially larger outer periphery than the outer periphery of said first subportion for attaching a handgrip to said main body; and
an injection molded handgrip attached to said at least one button-like projection, said injection molded handgrip being separately injection molded relative to said synthetic resin main body by a fluid injected resin, attaching

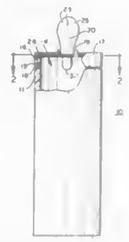
means on said handgrip injection molded around said first subportion of said button-like projection and completely encircling said first subportion by means of the fluidity of said fluid injected resin when said handgrip is separately injection molded relative to said main body, said attaching means having a predetermined shape for engaging said second subportion for preventing said second subportion of said button-like projection from passing thereby for retaining said attaching means on said first subportion between said main body and said second subportion for attaching said handgrip to said main body.

4,915,242

DISPENSING INSERT FOR DISPENSING SOLID OR LIQUID MATERIAL FROM A BABY BOTTLE

Frank W. Marte, 54 Four Leaf Rd., Levittown, Pa. 19058

Filed Sep. 5, 1989, Ser. No. 402,476
Int. Cl.[4] A61J *9/00*
U.S. Cl. 215—11.1 4 Claims



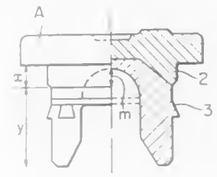
1. In combination with a baby bottle for feeding liquids to babies which is of hollow construction, closed off at one end and open at the other end with a removable nipple and cap, a dispenser for dispensing material into said nipple and located between said nipple and said bottle open end which comprises
an outer circular flange,
a plurality of ribs extending inwardly from said flange,
a centrally located receptacle connected to said ribs to receive material to be dispensed, and
a plurality of openings between said ribs, said flange and said receptacle through which said liquids pass.

4,915,243

RESIN-LAMINATED RUBBER CLOSURE FOR A MEDICAL VIAL

Yutaka Tatsumi; Hideo Yoshitaka; Tatsuya Matsunaga, all of Yaizu; Denpei Sudo, Sunida, and Tamotsu Okuda, Noda, all of Japan, assignors to Daikyo Gomu Seiko, Ltd. and Yamanouchi Pharmaceutical Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 867,677, May 28, 1986, abandoned.
This application Apr. 19, 1988, Ser. No. 185,363
Claims priority, application Japan, May 28, 1985, 60-113255[U]; Jul. 15, 1985, 60-106875
Int. Cl.[4] B65D *39/00*
U.S. Cl. 215—247 3 Claims



1 A resin-laminated rubber closure for a medical vial comprising an annular leg part to be inserted into the mouth of the vial, the leg part being notched at least at one position, and a flange part to be contacted with the front surface of the vial mouth, in which the outer and inner surfaces of the annular leg part are laminated with a chemical-resistant resin film except for the outer circumference of the upper end of the leg part to expose a rubber surface at this upper end leg part and to form an upper edge of the laminated portion and the leg part has a central ceiling part inside and one or more protrusions on the outer surface of the laminated portion, wherein the rubber surface above the upper edge of the laminated portion has a length (x) of 0.1 to 5 mm and wherein the height (m) of the central ceiling part inside the annular leg part from the upper edge of the laminated portion is in the range of 0.1 to 5 mm said chemical-resistant resin film being of a material selected from the group consisting of tetrafluoroethylene polymers, trifluorochloroethylene polymers, tetrafluoro-ethylene-hexafluoropropylene copolymers, vinylidene fluoride polymers, vinyl fluoride polymers, tetrafluoroethylene-ethylene copolymers and trifluorochloroethylene-ethylene copolymers and the central ceiling part inside the annular leg part having a height greater than that of the upper edge of the laminated portion.

4,915,244

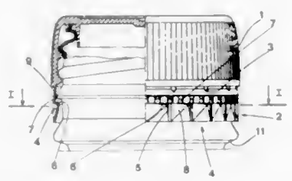
ONE-PIECE BOTTLE TOP WITH DEFORMABLE BREAK-OPEN SEAL

Giovanni Celaschi, Parma, and Emilio Morini, Colorno, both of Italy, assignors to Bormioli Metalplast, S.p.A., Parma, Italy

Filed Apr. 7, 1989, Ser. No. 334,899
Claims priority, application Italy, Apr. 13, 1988, 40058 A/88
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—252 8 Claims

1. A one-piece bottle top with a deformable break-open seal, comprising a screw cap (**1**), the bottom edge of which is connected by way of easily broken fillets (**3**) with an annular break-open seal (2) the lateral surface of which appears as a

plurality of recesses (4) each exhibiting the shape of an oblique pyramid disposed with the axis connecting its vertex and the



center of its base angled in the direction of the join between the seal (2) and the cap (1).

4,915,245

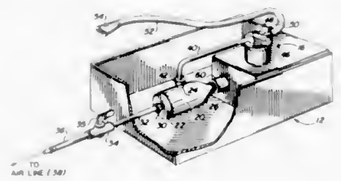
ELECTROSTATIC-SAFE, AIR-POWERED, MINIATURE VACUUM GENERATOR

Alfred Wouters, San Dimas; Suzan D. Weber, Ontario, and Michael J. Maciocia, Rancho Cucamonga, all of Calif., assignors to General Dynamics Corp., Pomona Div., Pomona, Calif.

Filed May 12, 1988, Ser. No. 193,861

Int. Cl.[4] A47L *5/18*

U.S. Cl. 215—326 **13 Claims**



1. A miniaturized, air-powered, vacuum source apparatus comprising:

a vacuum generator having a first inlet for pressurized air, a second inlet comprising a venturi inlet for developing a vacuum at a vacuum port of the vacuum generator during the flow of pressurized air through the generator, and an outlet for air from both of said inlets;

tube means for coupling the first inlet to a pressurized air line;

exhaust means coupled to said outlet for exhausting to the environment air entering the generator from both of said inlets; and

a housing for installing the above-mentioned elements in said apparatus, said housing containing a block of static dissipative material having a hollowed out chamber therein inn communicative flow relationship with said exhaust means for muffling air exhaust noise.

4,915,246

NON-VENT TYPE FULLY OPENABLE EASY-OPENING END

Shoji Nosaka; Tsuyoshi Kawano; Hidenobu Anami, and Shinji Tanimoto, all of Kitakyushu, Japan, assignors to 501 Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 3, 1988, Ser. No. 266,956

Claims priority, application Japan, Nov. 4, 1987, 62-279965; Nov. 4, 1987, 62-279966; Nov. 25, 1987, 62-298047

Int. Cl.[4] B65D *17/34*

U.S. Cl. 220—270 **3 Claims**

1. An easily removable non-vent type fully openable easy-opening end, comprising:

a principal score impressed around the periphery of said end,

a pair of first beads formed symmetrically at both sides of a tab securing portion of said end which is proximate to said principal score, said pair of beads running along a tearing direction, said tab securing portion having a center and a forward end and each of said pair of first beads having respective starting and finishing ends;

a pair of second beads formed on the periphery of a removable portion of said end defined by said principal score for running along said principal score, said pair of second beads being located symmetrically at both sides of said tab securing portion, each of said pair of second beads having respective starting and finishing ends;

wherein the forward end of said tab securing portion is connected to the starting end of each of said first beads and the starting end of each of said second beads along straight lines inclining with respect to the tearing direction at angles having a range between 45 degrees and 85 degrees; and

wherein the finishing ends of said first beads and the center of said tab securing portion are separated along said tearing direction by a distance which is equivalent to or larger than the diameter of said tab securing portion and is not less than 4 mm.

4,915,247

PACKING FOR PACKAGED GOODS STACKED OR PROVIDED WITH STRAIGHT EDGES

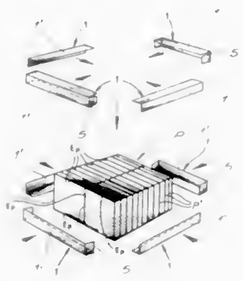
Heinz F. Odenthal, Zülpich, Fed. Rep. of Germany, assignor to Ostma Maschinenbau GmbH, Zulpich, Fed. Rep. of Germany

Filed Sep. 2, 1988, Ser. No. 240,255

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1987, 8714373

Int. Cl.[4] B65D *6/00*

U.S. Cl. 220—4 F **6 Claims**



1. A packing for packaged goods which goods have straight edges, said packing comprising:

a pair of first packing bars, each bar folded along a longitudinal direction thereof separating an upper from a lower area, said areas lying perpendicular to one another and being of equal length, and a pair of end flaps each hingedly attached to opposite ends of said upper area, each of said flaps folded to reside perpendicular to both said upper and lower areas;

a pair of second packing bars, each bar folded along a longitudinal direction thereof separating an upper from a lower area, said areas lying perpendicular to one another and being of equal length;

wherein said first and second pairs of packing bars are arranged into a supporting framework one type bar each alternating and connecting at right angles to one another, said end flaps each overlying a section of a respective upper area of said second packing bars, each of said lower areas of said second packing bars having portions at opposite ends thereof overlying respective portions of said lower areas of said first packing bars, and said supporting framework having at least one open frame area.

4,915,248

BASKET ASSEMBLY WITH STORAGE MEANS

John P. Chap, Lemont, Ill., assignor to Selfix, Inc., Chicago, Ill.

Filed Dec. 31, 1987, Ser. No. 139,989

Int. Cl.[4] A63B *55/04*

U.S. Cl. 220—19 **4 Claims**

1. A basket assembly adapted to be mounted on a support member comprising:

a plurality of spaced apart, interconnected, elongated, members defining a basket having a front, sides, and a bottom, including:

a pair of vertically spaced apart, generally U-shaped frames generally defining the upper and lower reaches of the front and sides of said basket, each of said U-shaped frames having a base portion interconnecting first and second leg portions, said base portions lying generally in a plane defining said front, said first leg portions lying generally in a plane defining one of said sides, and said second leg portions lying generally in a plane defining another of said sides, and

a plurality of wall members defining the front and bottom of said basket, said wall members extending between and connected to said base portions of said frame members and having bottom defining leg portions lying generally in a plane transverse to the aforesaid front and side planes defined by said frame members and disposed between the aforesaid side planes; and

one-piece article support means, said article support means including means integral therewith for coupling said article support means to said bottom defining leg portions of selected ones of said wall members, said coupling means interacting with said selected wall members to retain said article support means coupled to said leg portions, said article support means being reciprocably translatable with respect to said basket between a retracted position limited by engagement of said article support means with said front wall, and an extended position limited by the interaction of said coupling means with said selected ones of said wall members.

4,915,249

FILLER PIPE FOR A FUEL TANK OF A MOTOR VEHICLE

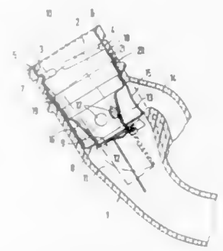
Sigmund Anhegger, Reutlingen; Josef Oesterle, Rammingen, and Erwin Goetz, Weil der Stadt, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Weissach, Fed. Rep. of Germany

Filed Oct. 14, 1988, Ser. No. 260,730

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1987, 3734782

Int. Cl.[4] B65B *31/06*

U.S. Cl. 220—86 R **17 Claims**



1 A filler pipe for a fuel tank of a motor vehicle which is provided at its cap end with a metallic cylindrical insert means, comprising elastic sealing ring means provided between an outer surface of the insert means and an inner surface of the filler pipe formed from a plastic material, the sealing ring means having a profiled elongated cross-sectional shape and being mounted on the insert means under prestress, and the sealing ring means and the insert means being imbedded in the plastic material of the filler pipe during forming of the filler pipe and fixed by the plastic material of the filler pipe disposed externally thereof.

4,915,250

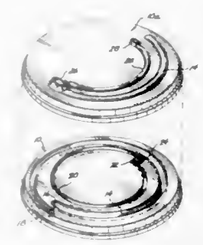
NONVENTED SPILL-PROOF LID

George W. Hayes, Jr., P.O. Box 764, Suquamish, Wash. 98392

Continuation-in-part of Ser. No. 88,860, Aug. 24, 1987, abandoned. This application Dec. 15, 1987, Ser. No. 133,016

Int. Cl.[4] A47G *19/22*

U.S. Cl. 220—90.4 **7 Claims**



1. A spill-proof lid for use with a container for liquids, said lid including:

a cover plate for covering an open end of said container, said plate having a periphery constructed to sealingly engage the wall of said container; and

a closed tubular liquid chamber formed entirely in said plate, said chamber having an inlet opening below the lower surface of said plate in communication with the interior of said container when said lid is in place on said container

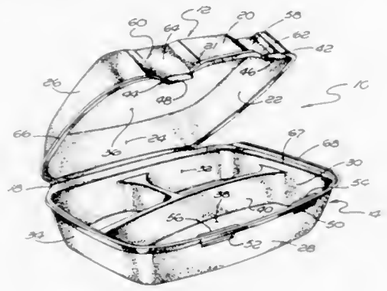
and an outlet opening in the upper surface of said plate, in communication with the space outside said container, said inlet and outlet being closely adjacent one another and said liquid chamber being constructed and arranged such that when the container is tilted from the vertical, liquid moving from the inlet to the outlet of said chamber must rise above the level of liquid in the container, thereby preventing autosiphoning of the liquid from said container.

4,915,251

SNAPLOCK THERMOFORMED CONTAINER

Joe R. Payne, La Habra, Calif., assignor to Dolco Packaging Corporation, Sherman Oaks, Calif.

Continuation of Ser. No. 75,797, Jul. 20, 1987, abandoned. This application Nov. 4, 1988, Ser. No. 267,700
Int. Cl.[4] B65D *41/16*
U.S. Cl. 220—306 20 Claims



1. A thermoplastic carton comprising::

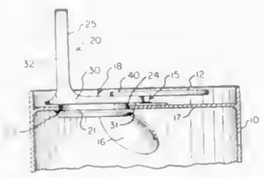
a cover section and a base section which are integrally connected by a hingable joint along a common side, said cover section and base section having a top wall and floor wall, respectively, each of said walls facing upward when said sections are in a fully open, side-by-side position, one of said sections being formed with at least one hook-shaped latch means which is resiliently movable in two opposing directions, said latch means having an extending portion which extends up from and is integral with a side edge of said section when said carton is in the fully open position, a jutting head which extends downward in the fully open position and a curved portion integrally connecting said extending portion and said jutting head, said other of said sections including at least one receptacle formed to receive said jutting head of said latch means when said jutting head is brought into engagement therewith, said latch means being formed to cam against and along a camming surface of said other section as said sections are folded upon one another whereby said latch means is moved in a first opposing direction away from said other section, and wherein said latch means will move in a second opposite direction when said jutting head reaches said receptacle upon which said jutting head becomes lodged in said receptacle.

4,915,252

BEVERAGE CAN STOPPER

Joel L. Schaffer, 2880 Folsom, #202, Boulder, Colo. 80304

Filed Mar. 28, 1989, Ser. No. 329,912
Int. Cl.[4] B65D *39/00*
U.S. Cl. 220—307 10 Claims



1. A stopper for use in sealing the opening that is left in the lid of a metal can upon operation of an integral metal tab or ring member that is attached to the top side of said lid in a manner to allow the tab to pivot about a lid attachment member, thereby breaking a seal by which a metal lid portion is attached to the remaining portion of said lid, thereby bending said lid portion down into said can and generally under the top side of said lid, while leaving an opening in the plane of said lid that is in the shape of said lid portion, said lid portion remaining attached to said lid by a small section of unsevered metal, the stopper comprising;

a resilient, generally uniform thickness plug having a thickness greater than the thickness of said lid, and having

a top portion of a planar size considerable greater than the planar size of said opening, so as to prevent said top portion of said plug from entering said opening, said top portion being adapted to surround said opening so as to sealingly engage the top side of said lid, and including a recessed area at one end thereof to accommodate said section of unsevered metal by which said lid portion remains attached to said lid,

a bottom portion of a planar size that is a predetermined size greater than the planar size of said opening, so as to permit manual insertion of said bottom portion into said opening as said resilient bottom portion yields during insertion into said opening, said bottom portion being adapted to surround said opening so as to sealingly engage the bottom side of said lid,

said bottom portion having an extended area located in spaced coincidence with the recessed area of said top portion, so as to force said section of unsevered metal up and generally against the under side of said lid when said bottom portion is inserted into said opening, and

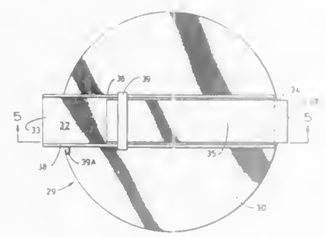
a mid-portion interconnecting said top and bottom portions, said mid-portion having (1) a thickness that approximates the thickness of said lid, (2) a planar size that is smaller than the planar size of said bottom portion, and (3) a planar size which approximates the size of said opening, said mid-portion thereby defining a groove generally in the planar shape of said opening that encircles said plug at a position intermediate said top and bottom portions, said mid-portion being adapted to sealingly engage said opening, including said section of unsevered metal, throughout the thickness of said lid.

4,915,253

REMOVABLE CENTER-POINT COMPRESSION SEALING LID MEMBER

Bruce R. Sharp, 22375 Edgewater Dr., Unit 241, Charlotte Harbor, Fla. 33980

Continuation-in-part of Ser. No. 66,701, Jun. 26, 1987, which is a continuation-in-part of Ser. No. 50,696, May 18, 1987, Pat. No. 807,675, which is a continuation-in-part of Ser. No. 858,656, May 1, 1986, abandoned. This application Feb. 28, 1989, Ser. No. 316,796
Int. Cl.[4] B65D *45/28*
U.S. Cl. 220—314 19 Claims



1. A completely removable center-point compression sealing lid member for use on a container having a top opening and retainer means near the opening, comprising:

(i) a cover dimensioned to completely overlie the opening in the container with a spacer permanently positioned in the approximate center of the cover;

(ii) a force transfer bar permanently positioned over the spacer and extending across the cover from one outer extremity to the other outer extremity, said force transfer bar having means on its first extremity to engage, when properly aligned, a first retaining means found on the container; and

(iii) a lever bar pivotably mounted on the force transfer bar's second extremity to engage a second retaining means found on the container and said lever bar being sufficiently long enough so that when the lid member is positioned on the container's top opening with the means on the first extremity of the force transfer bar aligned with the first retaining means of the container and the means on the second extremity of the lever bar aligned with the second retaining means of the container and downward force is exerted on the lever bar, the downward force is transmitted through the spacer to the cover so as to result in substantially equal pressure being exerted by the cover's peripheral edges onto the edges of the container's top opening to form a liquid-tight seal.

4,915,254

CLOSURE UNIT MADE OF SHEET METAL OR PLATING, METHOD OF MANUFACTURING SUCH A CLOSURE UNIT AND CONTAINER HAVING A CLOSURE UNIT OBTAINED THEREBY

Horst Zumsteg, Rorschach, Switzerland, assignor to Alcan Rorschach AG, Rorschach, Switzerland

Filed Dec. 5, 1988, Ser. No. 280,304
Claims priority, application Switzerland, Dec. 14, 1987, 48678/76
Int. Cl.[4] B65D *41/00*
U.S. Cl. 220—359 10 Claims

1. A closure unit formed of sheet metal for sterilizable containers, comprising:

a holding ring having a ring area;

said ring area having a sealing surface;

said holding ring being flangeable to an associated sterilizable container;

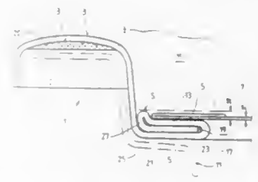
said ring area defining a closure opening having a cut edge;

said cut edge of said closure opening being bent over into said ring area;

a membrane having a tear-back tab;

said membrane covering said closure opening and being sealed onto said sealing surface of said ring area;

said ring area comprising three substantially parallel, superjacent and folded material sections;



said three substantially parallel, superjacent and folded material sections defining a top material section forming said sealing surface of said ring area, an intermediate material section and a bottom material section; and

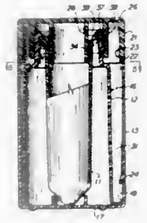
said cut edge being located at said intermediate material section between said top material section and said bottom material section.

4,915,255

TRANSPORTABLE SPECIMEN CONTAINER INCLUDING REMOVABLE CENTRIFUGE TUBE

Robert E. Curtis, San Jose, Calif., assignor to CytoSciences, Inc., San Jose, Calif.

Filed Sep. 22, 1988, Ser. No. 247,818
Int. Cl.[4] B65D *3/04, 3/24*
U.S. Cl. 220—408 4 Claims



1. A specimen container comprising an elongated centrifuge tube having one open end;

a centrifuge tube support including a neck with internal projections for releasably engaging the upper end of the centrifuge tube and supporting same within said support whereby it is surrounded by and spaced therefrom;

an outer housing having an open end for receiving the support and a bottom; and

a cap threadably received by said support and adapted to seal the upper end of said tube and to cooperate with said housing to completely house the centrifuge tube for transport.

4,915,256

DISPENSER

Dereck Tump, Lebanon, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Jun. 28, 1985, Ser. No. 749,693
Int. Cl.[4] B65D *83/04*
U.S. Cl. 221—5 1 Claim

1. A tablet dispenser comprising:

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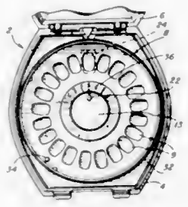
a substantially flat support having a single tablet dispensing aperture therein;

a tray rotatably disposed relative to said support and having an upstanding wall defining a notch, said tray having a plurality of openings disposed in a circular orientation and spaced substantially equally apart and arranged to individually align in registration with said aperture in said support upon rotation of said tray relative to said support, a periodicity indicator mounted on said tray and associated with each of said openings, interengaging means defined by said support and tray whereby said tray is rotatably positioned relative to said support; and a removable annular tablet package disposed on said tray comprising a plurality of collapsible pockets each containing a tablet therein, said pockets arranged in a circular orientation and substantially equally spaced apart to thereby correspond



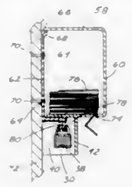
with the orientation of said openings in said tray so that a tablet is disposed in alignment with each of said openings, said pockets being covered with a frangible membrane interposed between said pockets and said openings, said package defining a plurality of tabs wherein one of them will fit in said notch to positively locate said package with respect to said tray and rotatable therewith, whereby the starting period for the first tablet of a regimen can be preset to any starting day desired by moving the tray and associated periodicity indicator to the desired day, locating the tablet package in position by bending down all the tabs but the preselected first day and dispensing the tablets in the desired sequence by collapsing the pocket which is in registry with said aperture, thereby urging said tablet to fracture said membrane and pass through its corresponding opening and then through said aperture in said support for collection by the user thereof.

4,915,257

ROUGH SERVICE PAPER DISPENSERS

Curtis C. Bailey, P.O. Box 55, Chico, Calif. 95927

Filed Apr. 11, 1988, Ser. No. 180,145
Int. Cl.[4] B65H *19/04*
U.S. Cl. 221—48 6 Claims



1. A vandal resistant rough service rest room paper dispenser adapted by internally concealed retainers for attachment to a vertical surface and being comprised of detachable members with said members interlocking and maintained interlocked temporarily by a locking means shielded in a shrouded compartment, said interlocking members forming

a housing, said housing having a frontal containment member attachable by said interlocking to a backing member with said backing member provided with said retainers for attaching said dispenser to said vertical surface;

an opening in said frontal housing compartment member for dispensing said rest room paper therefrom with said opening sized according to said rest room paper dispensing requirements;

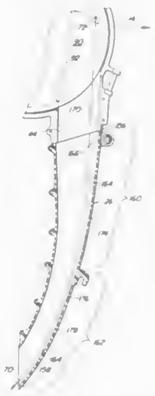
said shrouded lock compartment being formed by walls of said housing extending below a rest room paper support flooring in said housing with said extending walls providing an opened bottom skirting having cooperative components arranged shielded inside said skirting for attachment of a padlock providing said locking means for maintaining said members temporarily interlocked forming said housing.

4,915,258

SEED METER SEED TUBE

Jay H. Olson, Rock Island, Ill., assignor to Deere & Company, Moline, Ill.

Filed Feb. 28, 1985, Ser. No. 707,043
Int. Cl.[4] B65H *3/08*
U.S. Cl. 221—211 6 Claims



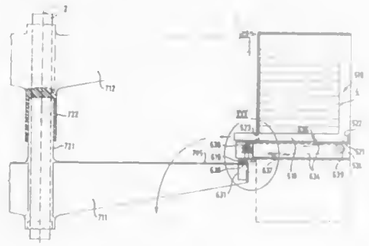
1. In a seed meter in which seeds are periodically released for deposit on the ground below, a seed tube for receiving the released seeds and directing the seeds toward the ground in controlled fashion comprising a hollow, elongated member extending generally downwardly from an upper end thereof at the seed meter toward the ground and terminating at a lower end opposite the upper end, the seed tube having a curvature which increases with increasing distance from the upper end thereof along at least a portion of the length thereof and following a logarithmic curve along a first portion of the length thereof extending downwardly from the upper end thereof and an exponential curve along a second portion of the length thereof downwardly from the first portion to the lower end.

4,915,259

DEVICE FOR STORING AND DISPENSING OBJECTS

Jean Guigan, 9, rue Jean Mermoz, 75008 Paris, and Franck Guigan, 100, rue St Dominique, 75007 Paris, both of France

Division of Ser. No. 68,396, Jul. 1, 1987, Pat. No. 4,846,367.
This application May 10, 1989, Ser. No. 351,132
Claims priority, application France, Jul. 1, 1986, 86 09531; Mar. 3, 1987, 87 02841; Mar. 30, 1987, 87 04403
Int. Cl.[4] G07F *11/10*
U.S. Cl. 221—120 4 Claims



1. A device for storing and dispensing objects, comprising:

a plurality of superposed fixed annular magazines having a common axis of symmetry, each magazine including a top portion having radial housings each suitable for containing a stack of objects of a given type, each housing having a wall closest to said axis having an opening for passing the bottom object of the stack, each housing having a bottom portion, a slot opening out into said opening and into said bottom portion for each of said housings, extraction means for extracting the bottom object of the corresponding stack disposed in said bottom portion of each of said housing, each said extraction means including a mechanical device for transmitting motion and being provided with a chain including pegs for passing through said slot;

a unitary assembly for controlling the extraction means situated in a cylindrical space inside the annular magazines and rotatable about said common axis of symmetry, a motor rotatably driving said unitary assembly, said assembly bearing at least one arm at each level corresponding to a magazine, each arm having a first end with a shaft disposed about said axis of symmetry and received in the shaft of an arm situated adjacent thereto, each said arm having an opposite end bearing a controllable mechanical member including a retractable finger describing a circular trajectory during the rotary movement of said unitary assembly and capable during its motion of optionally driving one of said mechanical devices for transmitting motions; and

a programmed computer controlling said mechanical member as a function of its angular position relative to said housings, said angular position being defined by said motor.

4,915,260

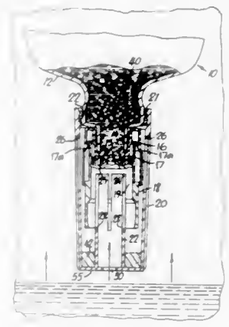
FLOAT CONTROLLED DISPENSER

Gregg R. Jones, Cincinnati, Ohio, assignor to The Drackett Company, Cincinnati, Ohio

Continuation of Ser. No. 156,136, Feb. 16, 1988, abandoned.
This application Aug. 21, 1989, Ser. No. 396,840
Int. Cl.[4] E03D *9/02*
U.S. Cl. 222—1 5 Claims

1. In a dispenser for dispensing a measured amount of fluid into a toilet tank, the dispenser having a container portion and an open neck portion, a shroud mounted concentrically over the neck portion and extending outwardly therefrom having an inner restricting means which engages and restricts the container neck portion to form an orifice; a float member slidably and concentrically mounted on the shroud having upper and lower segments, the upper of which being adjacent to the container neck portion; an air bell constructed in the lower segment of the float member; a measuring chamber constructed in the upper segment of the float member in communication with said orifice, said measuring chamber having a discharge outlet and means for engaging said orifice in a sealed relation at the uppermost position of the float member's sliding motion; and means for mounting the dispensing package on the wall of a fluid tank in an inverted position so that the float member rises and falls with the fluid level in the tank, the improvement comprising a cap means connected to the neck of said bottle portion, said cap means comprising:

a hollow cylindrical body surrounding said shroud and float member, said body being open at one end for mateable



engagement with a portion of said neck adjacent said orifice, said body being provided with an axial aperture at the other, closed end and with at least one first aperture in the cylindrical surface of said body;

an axially aligned hollow cylindrical projection within said cylindrical body, said projection connected at one end thereof to said other, closed end of said hollow cylindrical body around said axial aperture and having a predetermined length, said projection provided with at least one second aperture in the cylindrical surface thereof; and

a water-soluble dye situated adjacent the closed end of said cylindrical body between the interior surface thereof and the surface of said cylindrical projection and below said second aperture.

4,915,261

BEVERAGE DISPENSING SYSTEM

Marshall C. Strenger, Lake Forest, Ill., assignor to Hays MacFarland & Associates, Glen Ellyn, Ill.

Division of Ser. No. 14,927, Feb. 13, 1987, Pat. No. 4,808,346, which is a continuation-in-part of Ser. No. 724,944, Apr. 28, 1985, abandoned, which is a continuation of Ser. No. 453,148, Dec. 27, 1982, abandoned, which is a continuation of Ser. No. 309,834, Oct. 8, 1981, abandoned, which is a continuation of Ser. No. 578,169, May 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 482,981, Jun. 25, 1974, abandoned, which is a continuation of Ser. No. 273,509, Jul. 20, 1972, abandoned. This application Jan. 13, 1989, Ser. No. 296,665
The portion of the term of this patent subsequent to Jul. 26, 2005, has been disclaimed.
Int. Cl.[4] B65D *35/02, 35/28*
U.S. Cl. 222—92 16 Claims

1. A sealed container for use in a beverage dispensing system having an actuating unit for applying a rupturing pressure to said container for dispensing a substance packaged therein, said container comprising walls of flexible material having mating peripheral edges, means forming a seal along a marginal area of

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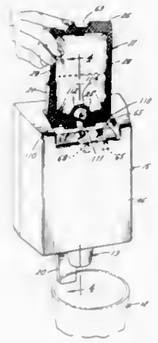
said edges to define a fluid-tight internal packaging compartment, said marginal area seal including relatively strong permanently sealed areas which define an unsealed discharge spout, and an arcuate shaped sealed area surrounding said discharge spout for defining an unsealed chamber communicating with said discharge spout, whereby upon application of predetermined external pressure to the container by a beverage dispensing system actuating unit said arcuate sealed area will rupture to permit the controlled discharge of the packaged substance through said unsealed chamber and discharge spout.

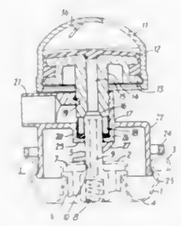


4,915,262

HEAD FOR DISPENSING REGULATED AMOUNTS OF MATERIAL FOR USE WITH A PRESSURIZED CONTAINER WITH A CONTINUOUS VALVE

Catherine Suck, Sceaux; Pierre Bret, Vetraz-Monthoux, and Jacques Pozzi, Meudon, all of France, assignors to Societe de Promotion Recherche et Innovation Technologique, Sceaux, France

Filed Mar. 23, 1988, Ser. No. 182,351
Claims priority, application France, Mar. 25, 1987, 87 4180
Int. Cl.[4] B65D *37/00*
U.S. Cl. 222—207 7 Claims



1. A dispensing head for a pressurized container using a continuous valve, comprising

a plug adapted for sealing engagement with the pressurized container, said plug having a central platform with an opening going therethrough for receiving said continuous valve;

a measuring cap having a resilient diaphragm supported by a diaphragm support, said diaphragm support having a central foot, an axial passage passing through said central foot, a connecting sleeve having a first engaging rib extending from said diaphragm support,

a coupling connecting said diaphragm support with said plug, said coupling having a dispensing port in a central chamber extending in the direction of the diaphragm support, said central chamber having a second engaging rib,

whereby in an assembled condition of the dispensing head said first engaging rib of the connecting sleeve engages said second engaging rib of the central chamber in a locking manner to keep the assembly together, said coupling having a disk defined by at least inner and outer surfaces, an axial passage passing through the disk, an engaging member extending outwardly from said outer surface and surrounding said axial passage, said receiving element of the central foot being adopted to receive said engaging member; and

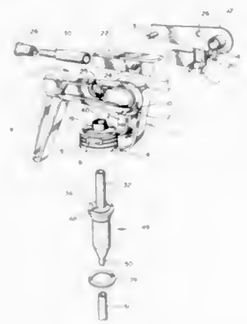
a supporting member extending from the inner surface and surrounding said axial passage, said supporting member being adopted for cooperation with the continuous valve of the pressurized container.

4,915,263

TRIGGER SPRAYER DEVICE

Robert E. Corba, Racine, Wis., assignor to S. C. Johnson Son, Inc., Racine, Wis.

Continuation of Ser. No. 165,220, Mar. 8, 1988, abandoned. This application Oct. 11, 1989, Ser. No. 420,654
Int. Cl.[4] B67D *5/40*
U.S. Cl. 222—321 29 Claims



1. A trigger sprayer comprising:

a frame having a trigger handle movable from a first position to a second position;

a flexure mounted on said frame, providing rotational freedom for said trigger handle;

a delivery arm mounted for rotational movement relative to said frame in response to movement of said trigger handle from the first to the second position; and

constraint means for constraining said delivery arm to move along a movement axis;

wherein said flexure distorts both angularly and laterally in response to movement of said trigger handle from the first to the second position.

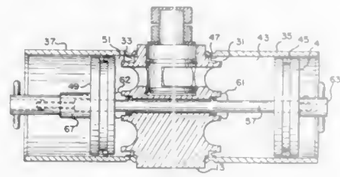
4,915,264

PORTION CONTROL APPARATUS

David C. Curtis, Box 2801 RFD, Long Grove, Ill. 60047

Continuation of Ser. No. 152,802, Feb. 5, 1988, abandoned. This application Feb. 24, 1989, Ser. No. 316,546
Int. Cl.[4] G01F *11/06*
U.S. Cl. 222—250 3 Claims

1. A portion control apparatus for receiving a food product and discharging the product in separate portions of predetermined size, said apparatus comprising: a main body member including a four-way valve, first and second food product receiving chambers joined to each side of the main body member, reciprocating means in each food product receiving chamber joined by a rod which slides in a bore in the main body member, the main body member also defining an inlet and outlet and a passageway connecting said inlet, outlet and first and second chambers; the four-way valve means disposed in said passageway and movable between a first and a second position for controlling communication between said first and second chamber and said inlet and outlet, said valve means allowing food product to flow from said inlet to said first chamber and from said second chamber to said outlet when disposed in a first position, and allowing food product to flow



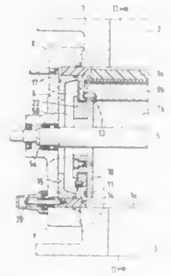
from said inlet to said second chamber and from said first chamber to said outlet when disposed in a second position; and reciprocating means for limiting the amount of food product said first and second chambers receive and for moving said food product from said first and second chamber, said reciprocating means moving said food product out of said second chamber and through said outlet as said first chamber fills with food product and moving said food product out of said first chamber and through said outlet as said second chamber fills with food product.

4,915,265

APPARATUS FOR FEEDING BULK MATERIAL

Dieter Heep, Bergatreute; Paul Vogel, Weingarten, and Anton Mutscheller, Hohentengen-Eichen, all of Fed. Rep. of Germany, assignors to Waeschle Maschinenfabrik GmbH, Ravensburg, Fed. Rep. of Germany

Filed Dec. 6, 1988, Ser. No. 280,705
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1987, 3742521
Int. Cl.[4] G01F *11/20*
U.S. Cl. 222—368 15 Claims



1. Apparatus for feeding bulk material; comprising:

a housing having inlet means and outlet means and being provided with lateral bearing covers;

a rotor accommodated in said housing and having a shaft supported in said bearing covers and a plurality of radially extending vanes mounted on said shaft to define compartments for transporting the bulk material from said inlet means to said outlet means;

first sealing means for axially sealing said rotor in said housing, said first sealing means including lateral disk members confining axial extension of said vanes and a slide ring axially slidable in non-rotational manner in each bearing cover and bearing against the periphery of the adjacent disk member, each disk member including a plate fixedly mounted on said shaft and a slide disk arranged at the outside of said plate and rotatably supported thereto wherein said slide ring bears against said slide disk, each of said slide disks having an inner end face provided with slant grooves facing said vanes and having in rotational direction of said rotor a leading end spaced at a greater radial distance from said shaft than the trailing end thereof;

force-applying means acting on said slide ring for providing a contact force by which said slide ring is pressed against said slide disk; and

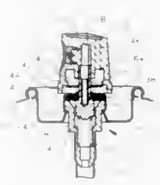
second sealing means disposable in at least each second one of said vanes at the peripheral end face thereof facing said housing and extending parallel to said shaft for radially sealing said vanes against said housing, said second sealing means being provided at their lateral end faces with axial retaining bolts which engage said grooves of said slide disks so as to allow radial displacement of said second sealing means when said slide disk is rotated relative to said plate.

4,915,266

AEROSOL ASSEMBLY FOR FILLING

Michael G. Knickerbocker, McHenry, Ill., assignor to Seaquist Valve Company, Pittway Corp., Cary, Ill.

Continuation-in-part of Ser. No. 347,886, Feb. 11, 1982, abandoned. This application Aug. 29, 1983, Ser. No. 527,040
Int. Cl.[4] B65B *1/04*
U.S. Cl. 222—402.16 12 Claims



11. In an aerosol container comprising an aerosol valve and a mounting cup turret having a turret aperture for receiving a valve stem therethrough, the aerosol container receiving an aerosol product therein for discharge through the valve stem upon opening the aerosol valve, the improvement comprising:

a valve button having a terminal orifice established for communication with the valve stem for spraying the aerosol product upon depression of the valve button;

said valve button including a filling aperture extending from an outer surface of said valve button to a button portion disposed adjacent the mounting cup turret; and

resilient sealing means integrally depending inwardly from said button portion for resiliently sealing with the mounting cup turret concurrently with the opening of the aerosol valve upon depression of said valve button enabling pressurization of the aerosol container through the filling aperture and for enhancing the seal of said resilient sealing means with said mounting cup turret during pressurization of the aerosol container.

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DISPENSING STORAGE CONTAINER FOR A LAUNDRY TREATMENT MATERIAL

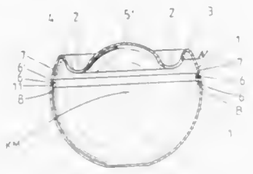
Herbert Buecheler, Erkrath; Peter Kittscher, Kaarst, and Paul-Otto Weltgen, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellshaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 7, 1988, Ser. No. 203,657

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1988, 3804667

Int. Cl.[4] B67D *5/64*

U.S. Cl. 222—463 9 Claims



1. A dispensing storage container for accommodating and dispensing a laundry treatment liquid within a washing machine or other washing compartment, said container comprising a walled housing forming a storage compartment designed to contain a supply of said liquid, said housing having an inlet/outlet portion designed to permit introduction of said liquid during filling and to permit uniform dispensing of said liquid and displacement thereof with washing water during use of the container within a washing machine or compartment, said inlet/outlet portion being a groove comprising a portion of said housing which is depressed to form an annular recess located between an outer elevated portion of said housing, forming an outer rim of said groove, and a central elevated portion of the housing, and a plurality of recessed openings spaced along the base of said groove so as to be recessed below said elevated central portion of the outer surface of said housing, said annular recess comprising inner and outer walls which taper down to form the base of said groove containing said openings, and said openings extending from said base up into said outer wall to cause the laundry treatment liquid to be dispensed onto said tapered outer wall during use, and to permit displaced air to escape from said container during the step of filling the container with laundry treatment liquid, said groove permitting laundry treatment liquid to be poured therein for free entry into the storage compartment through said recessed openings, and said recessed openings being protected against blockage for the free dispensing of the laundry treatment liquid during use.

4,915,268

CLOSURE WITH DISPENSING APPLICATOR

Dieter F. Lay, Hawthorn Woods, Ill., and Michael H. Lombardi, Stamford, Conn., assignors to Pittway Corporation, Crystal Lake, Ill. and Chesebrough-Pond's Inc., Greenwich, Conn.

Filed Nov. 2, 1988, Ser. No. 266,374

Int. Cl.[4] B67D *3/00*

U.S. Cl. 222—498 11 Claims

1. A container closure for use on a container defining an opening communicating with the container interior, said closure comprising:

a body for being mounted to said container over said container opening and defining a dispensing orifice for communicating through said container opening with said container interior;

a cover disposed on said body for being pivoted about an axis between a closed position occluding said dispensing orifice and an open position spaced away from said dispensing orifice;

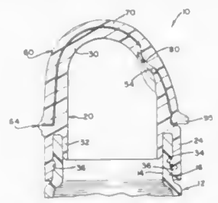
a hinge connecting said cover to said body for pivoting movement about said axis;

said body having a generally smooth applicator surface around said dispensing orifice;

said cover having an inwardly projecting sealing protrusion for entering at least partially into said dispensing orifice and sealinging engaging said body at the periphery of said dispensing orifice when said cover is in said closed position;

said body and cover defining cooperating latching means for releasably holding said cover in said closed position;

said dispensing orifice including a bore defined in said body by a generally cylindrical peripheral surface;



said sealing protrusion including a plug member with a generally cylindrical side wall having a diameter greater than the diameter of said bore whereby said plug member is adapted to be matingly engaged with said bore peripheral surface to effect a leak-tight seal when said cover is in said closed position;

said body being thinner around a portion of the periphery of said bore to permit flexing to accommodate insertion of said plug member; and

said body being even thinner at the edge of said bore in said peripheral portion to facilitate subsequent removal of said plug member.

4,915,269

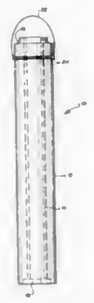
BOTTOM POURING TUBE FOR STEEL PROCESSING

John K. Harabedian, 3600 Ridge Park Blvd., Broadview Hts., Ohio 44147

Filed Sep. 6, 1988, Ser. No. 240,521

Int. Cl.[4] B22D *41/00*

U.S. Cl. 222—590 11 Claims



5. A method of erecting a pouring stack for a metal pouring process, comprising the steps of:

lifting and positioning a tubular ceramic member above a trumpet;

lowering said tubular ceramic member into said trumpet; and

temporarily supporting said tubular member by said trumpet, thereby maintaining said tubular member within said trumpet.

4,915,270

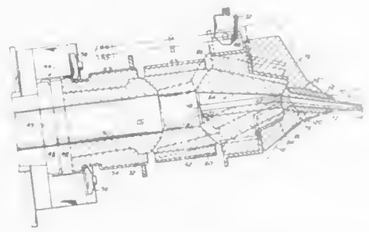
LOW-HEAD FEEDING SYSTEM FOR THIN SECTION CASTINGS

Sabah S. Daniel; Thomas R. Kleeb; Thomas W. Lewis; John F. McDermott, all of Allegheny County; Mustafa R. Ozgu, Northhampton County; Ralph C. Padfield; Donovan N. Rego, both of Lehigh County, and Achilles Vassilicos, Allegheny County, all of Pa., assignors to USX Corporation, Pittsburgh, Pa.

Filed Jul. 13, 1988, Ser. No. 218,689

Int. Cl.[4] B22D *11/10*

U.S. Cl. 222—606 7 Claims



1. A feed system for conveying molten metal to a thin section caster having movable mold surfaces moving exclusively in the direction of casting, said feed system comprising:

a refractory conduit having a plurality of sections connected to end-to-end relationship, said refractory conduit having a longitudinal passage for receiving molten metal at one end thereof and delivering molten metal to the caster at an opposite end thereof, said longitudinal passage being of circular cross section adjacent to the receiving end thereof and substantially rectangular adjacent to the delivery end thereof, said longitudinal passage including a transition portion intermediate between the opposed ends thereof, said transition portion having a circular cross section at a receiving end thereof and a rectangular cross section at an opposed delivery end thereof, said transition portion having an upper surface containing the point of highest elevation in the passage of the feed system, said point of highest elevation being at a level with respect to the centerline of an exit opening of the feed system which is at a level less than the pressure of the molten metal at said exit opening as measured in inches and which is within the range of 0.5 to 3.0 inches above the centerline of said exit opening when the feed system is in position for conveying molten metal into the caster, wherein said upper surface of the transition portion is substantially planar and of isosceles triangular shape, the apex of said isosceles triangular surface being at the receiving end of said transition portion.

4,915,271

APPARATUS FOR DRYING ARTICLES OR CLOTHING

Laura B. Champagne, 626 Ethel St., Lockport, La. 70374

Continuation of Ser. No. 110,378, Oct. 20, 1987, abandoned.

This application May 19, 1989, Ser. No. 355,801

Int. Cl.[4] D06F *59/02*; A47G *25/40*

U.S. Cl. 223—69 8 Claims

1. An apparatus for hanging articles of clothing, having neck and arm portions, the apparatus comprising:

a. an elongated body portion;

b. first and second loop portions attached to first and second ends of the elongated body portion;

c. a pair of arm members hingedly engaged to the elongated body portion for moving from a first storage position in parallel relation to the body portion, to a second garment support position perpendicular to the body portion;

d. means for allowing a garment, having arm portions and a neck portion, to be placed upon the apparatus while the pair of arm members are moved from the first position parallel to the body portion, to the extended perpendicular position so that upon positioning of the garment on the apparatus, the pair of arm members extend through and

beyond the ends of the arms of the garment in perpendicular relationship to the body portion, and the first loop portion extends out of the neck of the garment, for hanging the apparatus while the garment dries; and

e. upon removing the garment from the apparatus, the second loop portion providing a means for storing the apparatus in the inverted position while the pair of arm members are in the first position in parallel relation to the body portion.

4,915,272

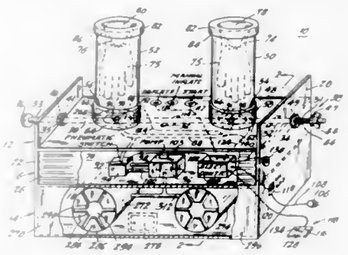
GLOVE DONNING AND REMOVING MACHINE

Richard S. Vlock, Gloversville, N.Y., assignor to David G. Vlock and Lawrence Rosen, both of New York, N.Y.

Filed Jul. 13, 1988, Ser. No. 218,646

Int. Cl.[4] A47G *25/90*

U.S. Cl. 223—111 35 Claims



1. A glove donning machine, comprising:

at least one glove inflation cylinder defined about an axis and having a hand insertion opening;

a rim at the hand insertion opening for mounting a cuff portion of a glove thereon;

inflating means for producing a negative pressure in the cylinder to inflate a glove mounted to the rim;

a support for supporting the at least one cylinder on a surface; and

a pivoting mechanism secured to the support, the cylinder being coupled to the pivoting mechanism in a manner that enables pivoting of the cylinder about its axis.

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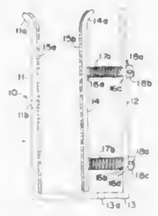
BOW AND GUN HOLDERS FOR OFFROAD VEHICLES
John M. Allen, 1310 Roosevelt, Silsbee, Tex. 77656
Filed Feb. 24, 1989, Ser. No. 314,845
Int. Cl.[4] B62J *11/00*; B60R *7/04, 9/08*
U.S. Cl. 224—30 A 9 Claims

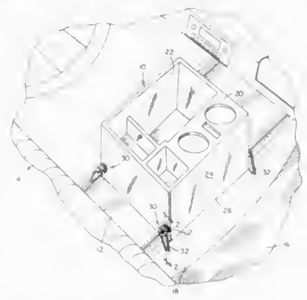


1. A device for holding a rifle or shotgun having a butt portion and a forearm portion in a firmly mounted position on an ATV or motorcycle comprising a pair of brackets and a horizontal bar upon which the brackets are mounted, the bar including means adapted to be mounted upon appropriate portions of the ATV or motorcycle, the first of said brackets comprising a U-shaped member having a back plate, front plate, and bottom plate, bridging said front and back plates and a bolding plate substantially parallel to the back plate and front plate and suspended therebetween by a pair of spring-biased shafts connected thereto and passing through apertures in said front plate and terminating in locking means on the exterior of the said front plate of a second of said brackets comprising a U-shaped member having a back plate, and a front plate and a bottom plate bridging said front and bottom plates and a holding plate which is configured in it lower portion to correspond to the configuration of the forearm of the weapon placed therein, said holding plate being suspended between said front and back plates by pair of shafts connected thereto and passing through apertures in said front plate and terminating in locking means on the exterior of said front plate, the shafts being encompassed by compressible springs, said horizontal bar having apertures therethrough located along the length thereof, the brackets having apertures on the bottom plates thereof, said horizontal bar having apertures for a attaching said first and second brackets to said horizontal holding bar which in turn is attachable to a respective portion of the ATV or motorcycle.

4,915,274
SPARE WHEEL MOUNTING BRACKET
Lee G. Oliver, 1919 W. 10th Pl., Gary, Ind. 46404
Filed Apr. 25, 1988, Ser. No. 185,913
Int. Cl.[4] B62D *43/02*
U.S. Cl. 224—42.24 7 Claims

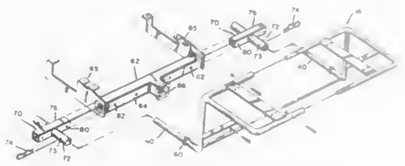
1. A mounting bracket for a spare wheel adapted to be attached to a vehicle having an underside and a chassis, said wheel having a hub hole and at least two bolt holes, said bracket comprising:
a shaft support structure having a first side and a second side;
a first shaft affixed to said shaft support structure and having a first portion extending from said first side, wherein said first portion is capable of receiving the hub hole of the wheel;
at least two second shafts affixed to said shaft support structure and extending from said first side, wherein said second shafts are capable of receiving the bolt holes of the wheel;
means located on said second shafts for controlling the tilt of said wheel with respect to the support structure;
means downwardly extending from said shaft support structure for connecting said shaft support structure to the underside of the vehicle;
means for attaching said shaft support structure to a preexisting hole of said vehicle, said means comprising a second portion of said first shaft extending from said second side of said shaft support structure through the preexisting hole located on said vehicle and nuts located on said second portion for securing said first shaft to said vehicle.

4,915,275
MULTI-PURPOSE STABILIZING CLEATS FOR AUTOMOBILE HUMP MOUNTED TRAY
Wilbur C. Brown, P.O. Box 2690, San Angelo, Tex. 76902
Filed Nov. 3, 1988, Ser. No. 266,870
Int. Cl.[4] B60R *7/00*
U.S. Cl. 224—42.42 6 Claims



1. A stabilizing cleat for attachment to an article to be supported from a supporting surface comprising a mounting member having a surface adapted to engage a surface of an object to be supported, means securing the mounting member to the surface of an object to be supported, an arm extending laterally from the mounting member, means rotatably connecting the mounting member to the arm for pivotal movement of the arm about an axis perpendicular to the longitudinal axis of the arm, and a plurality of projecting points on the arm to grippingly engage a supporting surface to provide a stable support for the object, said means connecting the arm to the mounting member including opposed faces on the mounting member and arm with each of said faces including radial serrations defined by radially extending ridges and valleys which interlockingly engage when forced into contact and a bolt and nut assembly extending through the mounting member and arm for tightening and loosening to releasably secure the serrations in interlocking engagement to enable the arm to be adjusted to angular position when the bolt and nut is loosened and securely locked in place after adjustment, said bolt including a head countersunk into the surface of the mounting member that is adapted to engage the surface of an object to be supported, said nut being a wing nut disposed externally of the arm to enable manipulation thereof.

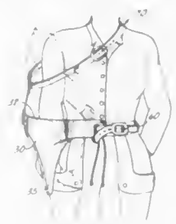
4,915,276
MOUNTING ASSEMBLY FOR A CARRIER ACCESSORY FOR VANS AND AUTOMOBILES
Ermin Devito, 123 Jefferson Ave., Green Brook, N.J. 08812
Filed Sep. 22, 1988, Ser. No. 247,490
Int. Cl.[4] B60R *9/08*
U.S. Cl. 224—42.43 2 Claims



1. A mounting assembly for a carrier accessory for vans or automobiles adapted to be removable secured to a standard tow hitch, said tow hitch having a horizontal member mounted beneath said vehicle, said horizontal member running parallel to the rear bumper of said vehicle, said horizontal member being opened at each end, defining an inner cross sectional area, said mounting assembly comprising:
a pair of mounting brackets each having first and second cross members, the cross sectional area of said first cross member being substantially identical to the cross sectional area of said inner cross sectional area of said tow hitch cross member, said first cross member slidably insertable into each end of said tow hitch cross member and having an aperture therethrough for alignment with an aperture through said tow hitch cross member for receipt of a securing means to secure said mounting bracket to said ends of said tow hitch cross member;
said second cross member, substantially perpendicular to said first cross member and extending horizontally rearwardly toward said rear bumper of said vehicle, said second cross member defines a channel having an aperture therethrough perpendicular to said channel;
a carrier assembly comprising a support frame and container secured to said support frame, said support frame having Z-shaped outer legs, said Z-shaped outer legs having a first horizontal member having an aperture therethrough, said first horizontal member having a cross sectional area substantially identical to the inner cross sectional area of said channel of said second cross member of said mounting bracket, said first horizontal member of said Z-shaped legs of said frame slidably insertable to said second cross member of said mounting bracket, said aperture on said mounting bracket and said aperture on said first horizontal member of said Z-shaped leg alignable for receipt of a securing means; said first horizontal member of said Z-shaped leg of said frame having secured thereto an aligning stopper, said aligning stopper contacting said second cross member of said mounting bracket to limit the slidable insertion of said horizontal member of said Z-shaped leg, prealigning the apertures in said second cross member of said mounting bracket with said apertures in said first horizontal member of said Z-shaped leg for receipt of said securing means.

4,915,277
CHILD HOLDER
Fred E. Larreategui, P.O. Box 541-A, Quito, Ecuador
Filed Feb. 27, 1989, Ser. No. 315,976
Int. Cl.[4] A61G *1/00*
U.S. Cl. 224—159 4 Claims

1. A holder for children removably mounted on a person, comprising:
A. saddle seat means having a downwardly extending leg member that is positioned against the person's upper thigh and having two slightly curved arm members, substantially perpendicular to said leg member, that conform and embrace the waistline of the person; and one of said arm members conforms to the contour of the lower back area of the person and it has a less pronounced curvature than the other arm member.
B belt means for removably securing said saddle seat means



to said person's waist and said belt means being rigidly mounted to the ends of said arms; and
C. strap means for partially supporting the weight of said saddle seat means and said strap means being of sufficiently large dimensions to extend over the neck and shoulder area opposite to the side of the person where said saddle seat means is mounted.

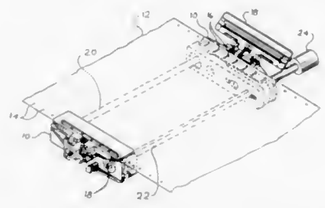
4,915,278
PORTABLE CONTAINER
Kenneth W. Smith, 2808 Highway 90, Gautier, Miss. 39553
Filed Nov. 3, 1988, Ser. No. 266,688
Int. Cl.[4] A45F *3/02*
U.S. Cl. 224—205 3 Claims

1. A support device comprising:
(a) a container having a planar base surface, a rear vertical extension perpendicular to said base surface and means for supporting said base surface against substantial bending;
(b) a counter brace cover affixed to said rear vertical extension of said container at a fold line defined thereby;
(c) said counter brace cover having a first position, substantially covering said container, and a second position, contactingly abutting said vertical extension, perpendicular to said base;
(d) said cover when in said second position, extending substantially below a level defined by said base surface;
(e) a flexible strap for suspending said container from the neck of a wearer, said strap being fastened to said cover and said vertical extension when said cover is in said second position;
(f) whereby when said support device is positioned on the neck of the wearer said cover is in said second position and provides a brace to prevent tipping of said base surface.

4,915,279
POCKET CADDY
Terry L. Galbraith, 8392 Holly Rd., Avoca, Mich. 48006
Filed Apr. 12, 1988, Ser. No. 180,763
Int. Cl.[4] A45F *5/02*
U.S. Cl. 224—230 9 Claims

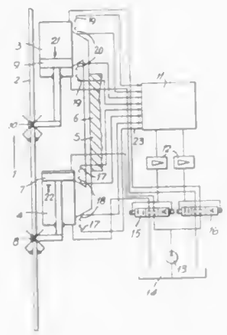
1. A golf club retaining apparatus to be worn on the person, comprising:
a substantially rectangular main body having a unitary construction and fabricated of substantially resilient material;
said main body having a U-shaped slot formed therein so as to define a center flap and a peripheral support;
said peripheral support being adapted to be affixed to a portion of the apparel of the user;
means formed in said flap for holding a golf club, said means including:
a hole formed in said flap with a second slot joining said hole with one side of the outer edge of said flap, giving said flap a hooked appearance and thereby allowing a golf club shaft to pass through said second slot and into said hole of said flap such that when said apparatus is affixed to said apparel portion of the user said golf club depends from said flap.

4,915,280
FORMS FEED TRACTOR
James K. Howes, and Jeffrey H. Paterra, both of Charlotte, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 22, 1988, Ser. No. 209,767
Int. Cl.[4] B65H *20/20*
U.S. Cl. 226—74 26 Claims



2. A tractor mechanism for moving a record medium having edge perforations, said tractor mechanism comprising:
inner and outer side frames;
a drive sprocket mounted between said side frames;
an idler sprocket assembly, adjustably mounted between said side frames, having a ramp, a sprocket mount arranged in a fixed space relationship to said ramp, for receiving an idler sprocket and a shaft, and an idler sprocket mounted on said sprocket mount;
a belt support shoulder between said side frames in alignment with said ramp; and
an endless belt having pin means for engaging said edge perforations, drive teeth means for engaging sajd drive and idler sprockets, and supported by said ramp and said belt support shoulder, said ramp being adapted for guiding the drive teeth means downwardly, thereby withdrawing the pin means from the edge perforations.

4,915,281
ARRANGEMENT FOR A METHOD OF CONVERTING A STEPWISE TRANSLATION MOVEMENT INTO A CONTINUOUS TRANSLATION MOVEMENT
Bernd Berger, Karl-Marx-Stadt; Matthias Schlieder, Oederan, and Siegfried Stowasser, Falkenau, all of German Democratic Rep., assignors to Bauakademie Der DDR, Berlin, German Democratic Rep.
Continuation-in-part of Ser. No. 176,883, Apr. 4, 1988, abandoned. This application Jul. 29, 1988, Ser. No. 226,404
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1987, 3810966; German Democratic Rep., Apr. 3, 1987, 301482
Int. Cl.[4] B65H *20/24*
U.S. Cl. 226—112 10 Claims

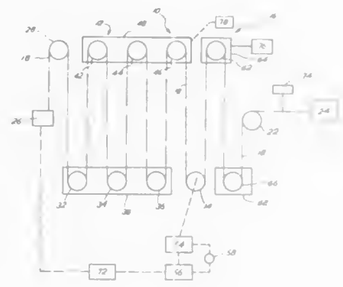


1. An arrangement for converting a stepwise translation movement into a continuous translation movement, comprising at least two fluid-operated cylinder-piston units having cylinders which are rigidly mechanically connected with one another, pistons movable in said cylinders between end positions, and piston rods connected with said pistons; at least two clamping mechanisms each releasably arranged on said piston rod of a respective one of said cylinder-piston units; two end position sensors arranged in the regions of said end positions of said piston of each of said cylinder-piston units; and two end position pre-signal sensors which are axially offset from said end position sensors; electronic control means connected with said sensors and producing signals which are supplied to said cylinder-piston units so that said pistons are supplied with a working fluid in an alternating order.

4,915,282
INERTIA COMPENSATED FESTOON ASSEMBLY
John R. Martin, Rockford; Roger Cederholm, Loves Park, and Larry E. Curtin, Rockford, all of Ill., assignors to Martin Automatic, Inc., Rockford, Ill.
Filed Jan. 26, 1989, Ser. No. 302,475
Int. Cl.[4] B65H *23/18, 23/182, 23/188*
U.S. Cl. 226—119 5 Claims

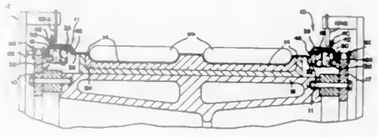
1. An improved inertia compensated festoon assembly usable for controlling the tension in a moving web that is run downstream from the improved festoon assembly at a relatively high speed and under relatively constant, relatively low tension to

and through web processing means and that is subject to abrupt tension changes upstream from the improved festoon assembly, the improved festoon assembly comprising:
a first, inertia compensated festoon having multiple floating dance rollers and multiple fixed idler rollers, with the moving web being adapted to pass alternatively about the idler rollers and the dancer rollers of the first inertia compensated festoon, with the first, inertia compensated festoon providing the web storage capacity needed during the abrupt web tension changes upstream from the festoon assembly and course tension control for the moving web;
an isolation driven roller disposed in the path of the moving web downstream from the first festoon and adapted to drive the moving web as the moving web passes about the isolation driven roller;
a second, inertia compensated festoon disposed in the path of the moving web downstream from the isolation driven roller and having a floating dancer roller and an idler roller, the moving web being adapted to pass alternatively about the dancer and idler rollers of the second inertia compensated festoon, with the second inertia compensated festoon and the isolation driven roller providing fine tension control of the moving web and preventing the



hunting of the dancer rollers in the first and second inertia compensated festoons;
means for sensing the speed of the moving web downstream from the second inertia compensated festoon;
means for sensing the position of the dancer rollers of the first inertia compensated festoon with respect to a first preselected position;
means for sensing the position of the dancer roll in the second inertia compensated festoon with respect to a second preselected position;
means for driving the moving web upstream from the first inertia compensated festoon;
means for driving the isolation driven roller at a speed that relates to the speed of the moving web downstream of the second inertia compensated festoon, and the position of the dancer roller of the second inertia compensated festoon with respect to its second preselected position; and
means for driving the web upstream from the first inertia compensated festoon at a speed that relates to the speed of the moving web downstream of the second inertia compensated festoon and the position of the dancer rollers of the first inertia compensated festoon with respect to their first preselected position.

4,915,283
CLAMPING ARRANGEMENT FOR GRIPPING AND CARRYING WEB MATERIAL
Raymond G. Buchko, Appleton, and John A. Halgren, Neenah, both of Wis., assignors to Curwood, Inc., Oshkosh, Wis.
Filed Oct. 6, 1988, Ser. No. 254,413
Int. Cl.[4] B65H *29/04, 70/16*
U.S. Cl. 226—173 16 Claims



1. A clamping arrangement for gripping and carrying a web in a packaging machine, said clamping arrangement including a pair of aligned drive chains formed of interconnected links pivotal upon a pitch line of said chain, and adapted to continuously travel a predetermined path, a plurality of clamps spaced from each other, attached to each one of said chains in facing relation to clamps on the other of chains each said clamp having:
(a) a first jaw member connectable to said drive chain, defining at one edge thereof a plurality of gripper teeth;
(b) a second jaw member disposed adjacent and pivotally mounted to said first jaw member, said second jaw member movable between an open position and a closed position, and defining at one edge thereof a plurality of gripper teeth which are disposed in complemental, intermediate relation to said gripper teeth of said second jaw member when said second jaw member is in said closed position;
(c) resilient biasing means disposed between said first and second jaw members to bias said second jaw member to said closed position;
(d) actuation means associated with said second jaw member which, when actuated, urge said second jaw member to said open position;
(e) attachment means on said first jaw member for fastening said first jaw member to one of said drive chains such that said clamp extends laterally outwardly from said drive chain, said attachment means positioned such that when said second jaw member is in said closed position said web which is gripped between said first and second jaw members lies in a horizontal plane which passes through said pitch line of said chain.

4,915,284
STRIP METAL FEEDING MECHANISM
Ben T. Goda, 24302 S. Berendo Ave., Harbor City, Calif. 90710
Continuation of Ser. No. 715,055, Mar. 22, 1985, abandoned, which is a continuation of Ser. No. 527,981, Aug. 31, 1983, abandoned. This application Jun. 17, 1986, Ser. No. 876,281
Int. Cl.[4] B65H *20/02*
U.S. Cl. 226—177 10 Claims

1. A gear driven roller drive system for feeding strips of material of various thicknesses between a predetermined maximum thickness and a predetermined minimum thickness therethrough with a minimal unmeshing of the drive gears with differences in the thicknesses of the strips comprising,
a lower housing (12);
an upper housing (14);
means (50, 52, 54, 56) for supporting the upper housing solely for slidable linear vertical movement relative to the lower housing, the upper housing being restrained against movement relative to the lower housing except for said vertical movement;
first roller means (21) supported solely for rotatable motion on said lower housing for rotation about a first axis;

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second roller means (31) supported solely for rotatable motion on said upper housing directly opposite and above said first roller means for rotation about a second axis parallel to said first axis;

first gear means (22) attached to said first roller means for rotation therewith about said first axis;

second gear means (32) attached to said second roller means for rotation therewith about said second axis; and

gear train means (20, 30) for rotatably interconnecting said first and second gear means, said gear train means, including a drive gear (30) mounted solely for motion rotatably on said lower housing and which engages said second gear means and rotates about an axis parallel to said second axis;

the spacing between said rollers automatically changing to adjust for strips of different thicknesses, the center of said second gear means being at the same level as the center of said drive gear when feeding strips of predetermined intermediate thickness between said predetermined maximum and minimum thicknesses, the center of said second gear means being at a higher level than the center of said drive gear when feeding material of a greater thickness than said intermediate thickness and at a lower level than at the center of said drive gear when feeding material of a lesser thickness than said intermediate thickness;

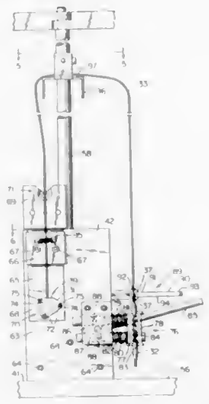
whereby when strips of material of various thicknesses are fed between said first and second roller means, the vertical spacing between said first and second roller means automatically adjusts in accordance with the thicknesses of said strips of material without significantly unmeshing said second gear means and said drive gear, the horizontal distance between the centers of the second gear means and the drive gear remaining constant, the vertical distance between the centers of the second gear means and the drive gear varying by a small fraction of the horizontal distance between the centers of the second gear means and the drive gear.

4,915,285

APPARATUS FOR MAKING A DIAPHRAGM ASSEMBLY AND METHOD OF MAKING THE APPARATUS

Ledu Q. Nguyen, 109 Stan Ave., New Stanton, Pa. 15672

Division of Ser. No. 239,548, Sep. 1, 1988, Pat. No. 863,092. This application Jul. 12, 1989, Ser. No. 378,751
Int. Cl.[4] B23K *1/12, 31/02*
U.S. Cl. 228—212 20 Claims



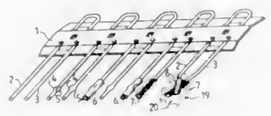
1. In an apparatus for automatically brazing the opposed end means of a capillary tube respectively to connecting parts of a bulb and a diaphragm means, said apparatus comprising a rotatable table and a plurality of work stations disposed in spaced apart relation about said table and each having an operating device, said table having a plurality of fixture means each being adapted to hold an assembly of said bulb and diaphragm means in a fixed relation relative to each other with its said capillary tube assembled to said connecting parts thereof, each said fixture means having two positions thereof each of which has holding means for holding a different diaphragm means, each said fixture means having an elongated member provided with opposed end means and structure for holding said elongated member, said end means of said elongated member respectively having said holding means thereon, said table having means to index said table through said work stations so that said devices at said work stations can each perform its specific operation on the respective assembly disposed at that particular station during a predetermined dwell time in the movement of said table, said device of one of said stations comprising a movable arm means for applying a flux means to each said assembly, said device of another of said stations comprising a movable arm means for preheating each said assembly in an area thereof that is to be brazed, said device of still another of said stations comprising movable arm means for soldering each said assembly at said connecting parts thereof so that said end means of said capillary tube are respectively brazed to said connecting parts of said bulb and said diaphragm means thereof, each said device having moving means for moving its said arm means thereof from an out position to an in position so as to perform its said operation on the assembly disposed at its respective work station, the improvement wherein said moving means of each said device is adapted to move its respective arm means from its said out position to its said in position in a substantially straight-line manner, each said structure for holding its said elongated member having means intermediate said opposed end means of its said elongated member for holding its said capillary tube as it extends from its said diaphragm means and leads to its said bulb of its said assembly.

4,915,286

METHOD FOR THE SOLDERING OF EXTERNAL CONNECTION WIRES TO AN ELECTRONIC COMPONENT

Régis Mentzer, Savigny-Le-Sec, and Michel Henry, Marsannay-La-Cote, both of France, assignors to Compagnie Europeenne de Composants Electroniques LCC, Courbevoie, France

Filed Jul. 10, 1989, Ser. No. 377,417
Claims priority, application France, Jul. 13, 1988, 88 09546
Int. Cl.[4] B23K *1/20, 35/14*
U.S. Cl. 228—173.5 3 Claims



1. A method for the soldering of external connection wires to an electronic component provided with surfaces that can be soldered, wherein the sequence of the following operations is performed:

(a) at least one connection wire is stamped at its end to be soldered, to give it a dissymmetry of revolution.

(b) a solder strip is crimped on the deformed end of the wire with deformation of said strip so as to make a solder preform from it, leaving a portion of the surface of the wire exposed;

(c) the component to be soldered is presented against the wire provided with its solder preform, the surface, capable of being soldered, of the component, facing that part of the wire which is not coated with the solder preform;

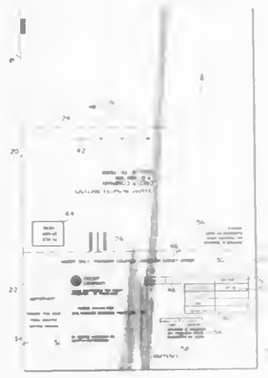
(d) Fluxing and soldering by reflow process.

4,915,287

INTELLIGENTLY IMAGED ENVELOPES WITH INTELLIGENTLY IMAGED INTEGRAL TEAR-OFF FLAPS

Steven Volk, Birmingham, Mich., and Kenneth R. Greulich, Youngstown, N.Y., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Nov. 3, 1988, Ser. No. 266,766
Int. Cl.[4] B65D *27/00*
U.S. Cl. 229—70 11 Claims



1. A set of communication documents, comprising:

a plurality of integrated envelope and return coupon documents;

each of said documents comprising an elongated paper sheet having first and second foldlines spaced longitudinally one from the other to define first, second and third panels, said first and second panels being foldable relative to one another about said first foldline such that said first panel overlies said second panel;

means for adhesively securing said first and second panels one to the other along longitudinally extending margins thereof when said first panel overlies said second panel such that said first and second panels define an envelope;

means defining a coupon in said third panel and including a line of transversely extending perforations for separating said coupon from said sheet whereby said coupon may be received in said envelope:

said third panel being foldable about said second foldline to overlie said first panel;

first and second information substantially simultaneously imaged on at least one side of one of said first, second and third panels and at least on said second prior to folding said sheet about said first and second foldlines;

one of said second and third panels defining a flap foldable to overlie said first panel, said flap carrying a transversely extending line of adhesive for sealing the flap and said first panel one to the other to seal the envelope, said flap being defined in part by said line of perforations;

said documents being provided in a predetermined number thereof and juxtaposed in generally parallel relation one to the other to define a set of documents, said first information being non-variable in informational content and location on each of said documents and said second information being variable in informational content from document to document within said set; and

means for retaining said documents juxtaposed relative to one another in said set thereof.

4,915,288

ENVELOPE WITH SINGLE PEEL-OFF BACKING SHEET TO FACILITATE PRINTING AND COPYING

Kim Y. Kao, Irvine; Stefan C. Wegdell, Tustin, both of Calif., and Wayne L. Rutkowski, South Wales, N.Y., assignors to Avery International Corporation, Pasadena, Calif.

Filed Apr. 27, 1989, Ser. No. 344,615
Int. Cl.[4] B65D *27/14*
U.S. Cl. 229—80 20 Claims

1. An envelope comprising:

a paper panel having a top, bottom and two sides, said panel having a strip of adhesive extending along each of said sides;

an elongated strip of paper integrally joined to said top of said panel, said elongated strip having a strip of adhesive extending parallel to said top of said panel;

a strip of material covering said strip of adhesive on said elongated strip of paper; and

a backing sheet covering said strips of adhesive at said sides of said panel, said backing sheet being substantially a same size as said panel, said panel having a first, fold line where said elongated strip of paper is integrally joined to said top of said panel and a second fold line disposed parallel to said first fold line and located approximately half way down said panel between said first fold line and said bottom of said panel, said panel capable of being folded about said first and second fold lines to form said envelope after said backing sheet and said strip of material on said elongated strip of paper are peeled from said strips of adhesive.

4,915,289

EASILY OPENABLE SEALED CONTAINER

Yasushi Hatano, Yokohama; Tamio Fujiwara, Izumi-Sano; Michio Watanabe, Yokohama; Hideo Kurashima, Yokosuka; Kazuo Taira, Tokyo, and Kazuma Kuse, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

PCT No. PCT/JP88/00481, § 371 Date Mar. 8, 1989, § 102(e) Date Mar. 8, 1989, PCT Pub. No. WO88/09292, PCT Pub. Date Dec. 1, 1988
PCT Filed May 20, 1988, Ser. No. 354,315
Claims priority, application Japan, May 20, 1987, 62-121185; Oct. 22, 1987, 62-265313
Int. Cl.[4] B65D *51/00*
U.S. Cl. 229—123.1 7 Claims

1. A container composed of a plurality of container materials the opposing parts of which are sealed by heat sealing, wherein

at least an opening start part of the sealed portion is of a laminated structure consisting of the plurality of container materials and an intermediate material inserted therebetween,

the intermediate material and one of the container materials are tightly sealed,

the intermediate material and another of the container materials are sealed easily peelably,

the inside end edge of the easily peelable seal portion is positioned more toward the center of the container than the inside end edge of the tight seal portion, and

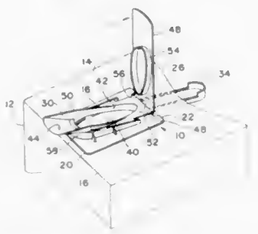
at an opening start position, the outside end edge of the easily peelable seal portion is positioned more toward the center of the container than the outside end edge of the tight seal portion.

4,915,290

PACKAGE CLOSURE

Arthur W. Robichaud, Worthington, Ohio; Charles D. Miller, Rockford, Ill., and Frank R. Wilgus, Powell, Ohio, assignors to Combibloc, Inc., Columbus, Ohio

Filed Feb. 27, 1989, Ser. No. 315,601
Int. Cl.[4] B65D 5/74
U.S. Cl. 229—125.08 20 Claims



1. A closure for opening and reclosing a package having a top which includes a scored area to be opened and a pouring edge, the closure comprising:

a base attachable to the top of the package over the scored area and having a rearward portion and a forward portion juxtaposed the pouring edge of the top, and a central open area opening from the rearward portion and extending longitudinally towards the forward portion; and

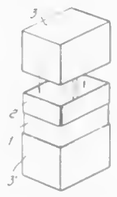
a lever pivotally connected to the rearward portion of the base and having a forward portion and a rearward portion, the forward portion being disposed over the central open area of the base prior to opening the package and being pivotally movable through the scored area to open the package, the rearward portion being movable into a seated position over the central open area of the base after opening the package.

4,915,291

PACKAGING MODULAR ENVELOPE INCLUDING SELF-SEALING CLOSURE MEANS

Maria A. Galber, Via Biancamano, 14, 20052 Monza (Milano), Italy

Filed Jun. 2, 1988, Ser. No. 201,535
Claims priority, application Italy, Jun. 4, 1987, 20796 A/87
Int. Cl.[4] B65D 5/32
U.S. Cl. 229—125.26 3 Claims



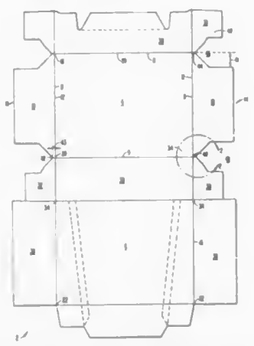
1. A self-sealing packaging envelope comprising a tubular body of given polygonal cross-section and height, provided with outwardly turned edges having a first height, therewith two top and bottom cover bodies cooperate having mating cross-sections and being provided with inwardly turned edges having a second height, wherein said first and second height sum substantially corresponds to a half of said tubular body height, and wherein said tubular body and cover bodies are made by folding along die cut lines a respective tubular body sheet materials and a respective cover body sheet material.

4,915,292

END FILL CARTON

Angelo Ielmini, Patterson, Calif., assignor to Del Puerto Marketing, Patterson, Calif.

Filed Nov. 23, 1988, Ser. No. 275,258
Int. Cl.[4] B65D 5/40, 5/20
U.S. Cl. 229—132 6 Claims



1. An improved microwave container of the type including a foldable body for forming a box having an opening at an end of the box, the foldable body having a first surface and an adjoining side surface, each surface defining at least one corner, a first flap extending from an edge of the first surface along a first fold and a side flap extending from an edge of the side surface adjacent to the first flap along a second fold, a hold formed at the corners when the flaps are folded, said flaps closing opening of the box, a second surface parallel to and spaced from the first surface, and a covering flap extending from the second surface, wherein the improvement comprises:

a common seam delineated in line with the folds of the box defined by an overlap of the first flap and the side flap to form a first seal, said seam connecting the corner and hole by joining the first flap and the side flap together for a slight distance such that the hole is spaced from the corner when the box is folded to form a second seal, said seam, first flap, side flap and corner together defining a sealing region; and

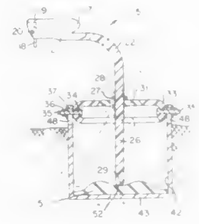
the covering flap substantially covering the hole to provide a third seal.

4,915,293

SHELTERED AND REPOSITIONABLY MOUNTED ENCLOSURE

Walter P. Paramski, Libertyville, Ill., assignor to Drake Construction Company, Antioch, Ill.

Filed Jul. 27, 1988, Ser. No. 224,720
Int. Cl.[4] B65D 91/00
U.S. Cl. 232—39 29 Claims



1. A sheltered and repositionably mounted enclosure comprising:

a housing, a mounting post, said housing secured to and supported by said mounting post;

a mounting sleeve, said mounting post positioned within said mounting sleeve, upper retaining means for supporting said mounting post within said mounting sleeve, said upper retaining means attached to said mounting sleeve; and

lower retaining means for supporting said mounting post in an approximately vertical position within said mounting sleeve, said mounting post repositionable within said mounting sleeve and with respect to said lower retaining means after being displaced from said lower retaining means.

4,915,294

SYSTEM FOR MONITORING AND EQUALIZING TEMPERATURE IN MULTI-STORY BUILDINGS

Calvin R. Wylie, Fair Oaks, Calif., assignor to Beutler Heating and Air Conditioning, Inc., Sacramento, Calif.

Filed May 1, 1989, Ser. No. 345,728
Int. Cl.[4] F24F 7/00
U.S. Cl. 236—49.3 7 Claims

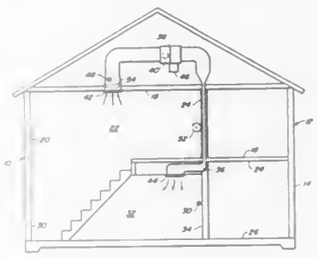
1. Apparatus for use in a building including lower and upper levels, each level including a floor, a ceiling, and walls between the floor and ceiling to define an interior, said apparatus being adapted to lessen the temperature differential between said level interiors and comprising, in combination:

duct means having an inlet end and an outlet end, said duct means extending between said upper and lower levels and defining an air flow path between the upper and lower level interiors, said duct means inlet end being located at the upper level ceiling and communicating with said upper level interior, said duct means outlet end being in communication with said lower level interior;

first temperature sensing means for sensing the temperature of said lower level interior;

second temperature sensing means for sensing the temperature of said upper level interior;

air delivery means for delivering air between said upper level interior and said lower level interior through the flow path defined by said duct means, said air delivery means adapted to deliver air within said duct means from



said duct means inlet end to said duct means outlet end; and

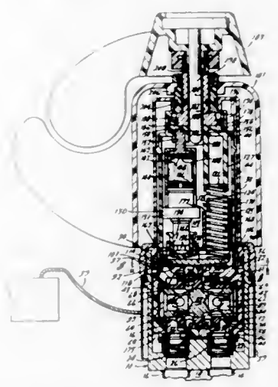
control means for activating said air delivery means when a temperature differential of a predetermined magnitude is sensed by said first and second sensing means to deliver air between said upper level interior and said lower level interior.

4,915,295

THERMOSTATIC PRESSURE BALANCED VALVE ASSEMBLY

Eric V. Pullen, deceased, late of Ormond Beach, Fla. (by Antoinette D. Pullen, legal representative), and James R. Nicklas, Noblesville, Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.

Filed Aug. 7, 1985, Ser. No. 763,445
Int. Cl.[4] G05D 23/13
U.S. Cl. 236—12.16 25 Claims



1. A mixing valve for fluids such as hot and cold water, said valve characterized by:

a housing having a cavity therein defining a mixing chamber, said mixing chamber having an outlet and a first inlet for unheated fluid and a second inlet for heated fluid;

a lever having a first section forming a valve for said first inlet and a second section forming a valve for said second inlet; said lever being pivotably mounted about a fulcrum;

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a thermally responsive means mounted within said mixing chamber and operably connected to said lever, said thermally responsive means being responsive to the temperature within said mixing chamber for pivoting said lever to a position that determines the proportion of flow from said first and second inlets;

said thermally responsive means includes:

a thermally responsive element being interposed between said lever at a position spaced from the fulcrum of said lever and a first seat in said mixing chamber opposing said lever;

said element changing its length in response to a change in ambient temperature; and

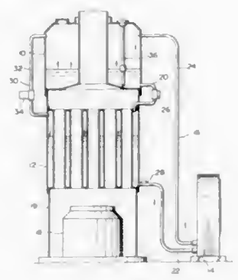
a spring mounted between said lever spaced from said fulcrum point and a second seat in said mixing chamber to bias said lever for pivotal movement when said element shortens.

4,915,296

HOT WATER CIRCULATING SYSTEM

Motoki Matsumoto, and Kouichi Watanabe, both of Aichi, Japan, assignors to Toyotomi Kogyo Co., Ltd., Japan

Filed Jan. 29, 1988, Ser. No. 150,110
Int. Cl.[4] F24D *3/00*
U.S. Cl. 237—8 R 14 Claims



1. A hot water circulating system comprising:

an open tank;

a water boiler arranged below said open tank;

a radiator to which hot water is supplied from said water boiler;

a circulating pipe system comprising a first circulating pipe means for communicating said open tank and water boiler with each other, a second circulating pipe means for communicating said water boiler and radiator with each other and a third circulating pipe means for communicating said radiator and open tank with each other;

an on-off valve arranged at said first circulating pipe means, closing of said on-off valve causing said hot water in said water boiler to be forcibly supplied through said radiator to said open tank and opening of said on-off valve causing water in said open tank to flow into said water boiler so that repeating of operation of said on-off valve may result in water being continuously circulated through said system; and,

emptiness detecting means for detecting when said water boiler is substantially occupied by only water vapor because said water boiler starts to be empty of liquid water while being heated, said emptiness detecting means being arranged at or near said water boiler;

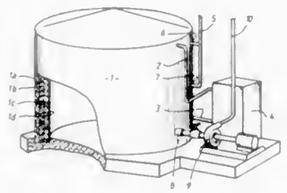
said emptiness detecting means being operatively connected to said on-off valve so that said on-off valve may be opened when said emptiness detecting means detects said start of emptying due to the forcible supply of substantially all hot liquid water out of said water boiler being heated.

4,915,297

LIQUID HEATING SYSTEM FOR CONCRETE PLANTS

Robert D. Norman, Research, and Robert G. Sinclair, Eltham, both of Australia, assignors to Heat-Crete, Pty. Ltd., Victoria, Australia

Filed Aug. 12, 1988, Ser. No. 231,504
Claims priority, application Australia, Aug. 13, 1987, P13762
Int. Cl.[4] F24D *3/00*
U.S. Cl. 237—8 A 9 Claims



1. In a concrete batching plant, a liquid heating system comprising a closed tank having low heat transfer properties for containing a volume of liquid to be heated, a heat exchanger having conduit means for carrying liquid connected by liquid carrying conduits to said tank, first pump means for transferring the heated liquid from the tank to a concrete batching plant, second pump means for circulating the liquid from the tank to the heat exchanger while the liquid is being heated by said heat exchanger, the capacity of said tank and the heating capacity of said heat exchanger being selected to enable the production of the desired volume of hot liquid required by the batching plant, and means for controlling the operation of the liquid heating system including means for determining and displaying the liquid volume in said tank, means for monitoring the volume of water delivered by said second pump means, means for sensing and displaying the temperature of the liquid in the tank, means for sensing and displaying the ambient temperature to enable determination of a predetermined temperature necessary to achieve a desired temperature in a concrete mix produced by said concrete batching plant, and programmable means for controlling said heat exchanger to heat said liquid to said predetermined temperature.

4,915,298

RAIL MOUNT FOR RAILWAY-TYPE RAILS

Elisabeth Ortwein, Cologne, Fed. Rep. of Germany, assignor to Hermann Ortwein, Cologne, Fed. Rep. of Germany

Filed Jun. 10, 1988, Ser. No. 205,428
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1987, 8708155[U]
Int. Cl.[4] E01B *9/38*
U.S. Cl. 238—283 6 Claims

1. A rail mounting, comprising: a continuous metal frame lying generally in a horizontal plane and having vertical sides of uniform height completely surrounding an opening;

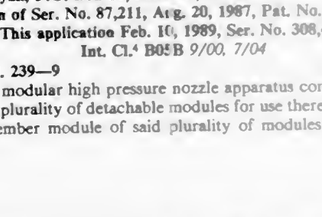
a yieldable elastic plate received in said opening, spanning said sides and having a height less than that of said sides;

a metal mounting plate resting on said elastic plate and having vertical flanks defining a clearance with said sides all around said mounting plate, said mounting plate partly extending into said opening projecting above said opening, said mounting plate being provided with formations for securing a vehicle-traveling rail thereon; and

a yieldable elastic strip received in said clearance, flush with an upper surface of said frame, and bridging between said sides of said frame and said flanks of said mounting plate,

said yieldable elastic plate having a thickness (d) which is one-eighth to one-third of a thickness (D) of said mounting plate,

the thickness (D) of said mounting plate being two-thirds to seven-eighths of a height (H) of said frame, and



said strip having a width (B) as measured between the inner surfaces of said sides and an outer periphery of said mounting plate which is 0.5 to 0.8 times the height (h) of said strip as measured between an upper edge of said frame and a lower edge of said mounting plate.

4,915,299

FASTENING RAILWAY RAILS

Lance Harkus, Carlingford, Australia, assignor to Pandrol Limited, London, United Kingdom

Filed Oct. 19, 1988, Ser. No. 260,176
Claims priority, application Australia, Oct. 19, 1987, 79914/87
Int. Cl.[4] F01B *9/28*
U.S. Cl. 238—351 13 Claims

13. A method of making a railway rail-and-fastening assembly comprising bending an initially straight rod approximately to the shape of a letter e having an upper arm, a center arm and a lower arm, the axes of all parts of the clip, except the free end of the lower arm, lying in a single plane, standing a rail, having a flange at its base, on a foundation from which projects a clip-retaining arrangement having an opening above the foundation beside the rail flange, and driving said clip so that both its center arm and its upper arm enter said opening and its lower arm bears downwardly on the rail flange.

4,915,300

HIGH PRESSURE MIXING AND SPRAY NOZZLE APPARATUS AND METHOD

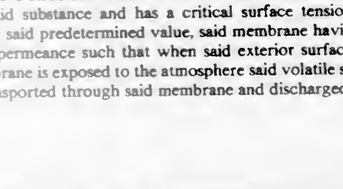
John Ryan, P.O. Box 20, Morenci, Ariz. 85540

Division of Ser. No. 87,211, Aug. 20, 1987, Pat. No. 4,809,911.
This application Feb. 10, 1989, Ser. No. 308,480
Int. Cl.[4] B05B *9/00, 7/04*
U.S. Cl. 239—9 10 Claims

1. A modular high pressure nozzle apparatus comprising:

(a) a plurality of detachable modules for use therewith, each member module of said plurality of modules having at least one secondary inlet means for providing a primary component of a fluid mixture with a flow of a secondary component of said fluid mixture for adding forwardly directed momentum and pressure to said fluid mixture;

(b) one of said plurality of modules includes an expulsion chamber module adapted for receiving said primary component and said secondary component and accelerating and wave shaping said fluid mixture, said expulsion chamber module comprising:



(i) secondary inlet means provided with an orifice means for introducing said secondary component into said expulsion chamber module and pushing forwardly said fluid mixture; and

(ii) a hemispherically-shaped means for developing said fluid mixture being pushed into a linearly compressed and accelerated wave of said fluid mixture prior to exiting said expulsion chamber module.

4,915,301

CONTAINER WITH SORBENT MEMBER AND MICROPOROUS MEMBRANE FOR DISPENSING VAPOR FROM VOLATILE LIQUID

Marina A. Munteanu, New York, N.Y., assignor to International Flavors & Fragrances, Inc., New York, N.Y.

Filed Nov. 15, 1988, Ser. No. 271,628
Int. Cl.[4] A61L *9/04*
U.S. Cl. 239—45 30 Claims

29. Apparatus for packaging and dispensing a volatile substance that is liquid at atmospheric pressure and room temperature and has a surface tension in its liquid phase that is above a predetermined value, said substance being stored in a liquid phase and dispensed in a vapor phase, said apparatus comprising a container, at least one body within said container having a porous structure within which said volatile substance is at least partially sorbed, said container having walls at least a portion of which consists of a microporous membrane located inbetween said body and the atmosphere surrounding said container, said microporous membrane having interior and exterior surfaces with the exterior surface exposable to the atmosphere surrounding said container, said membrane having an active structure formed from a material that lacks affinity for said substance and has a critical surface tension that is below said predetermined value, said membrane having an air flow permeance such that when said exterior surface of said membrane is exposed to the atmosphere said volatile substance is transported through said membrane and discharged into the

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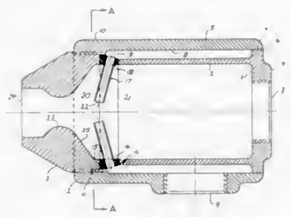
atmosphere as a vapor while said exterior surface of said membrane remains dry to the touch.

4,915,302

DEVICE FOR MAKING ARTIFICIAL SNOW

Robert A. Kraus, and Edmund J. Kraus, both of 1636-T E. Edinger, Santa Ana, Calif. 92705

Filed Mar. 30, 1988, Ser. No. 175,324
Int. Cl.[4] A01G *15/00*
U.S. Cl. 239—14.2 1 Claim



1. A device for making artificial snow comprising:

a. a housing means having a substantially elongated, first cylindrical member being provided with a longitudinally axially disposed air inlet port at an upstream end, and being provided with a radially disposed, planar surface at a downstream end and an inwardly recessed outer surface intermediate the upstream and downstream ends;

said housing means further having an outer substantially elongated, second cylindrical member being at one end connected to said upstream end of said first cylindrical member so as to form an annular space between said first and said second cylindrical members;

said second cylindrical member further being provided with an internally disposed threaded portion protruding axially, substantially beyond said planar surface of said first cylindrical member;

said second cylindrical member further being provided with a laterally extending water inlet port communicating with said annular space;

b. an annular member for the radial inward distribution of water being of ring like construction having first and second radial disposed planar surfaces, and being provided with a series of slightly downstream angled radially inwardly protruding tubular members of different specific length, said tubular members being in fluid communication with said annular space;

said ringlike member being axially disposed within said second cylindrical member so as to abut with its first radial planar surface against said radial planar surface of said first cylindrical member;

c. a nozzle having at its upstream end an externally threaded portion, a radial disposed surface, and having a converging portion followed by a well rounded constriction, and a diverging portion;

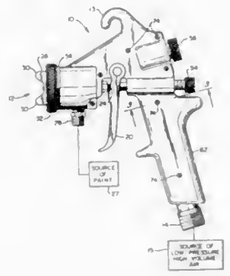
said externally threaded portion being in threaded engagement with said internally threaded portion of said second tubular member so that said radial end surface of said nozzle is in an abutted engagement with said second radial disposed surface of said ringlike member, thereby forming means for the transfer of water from said water inlet port through said series of tubular members into the cavity formed by said first cylindrical member, said ringlike member, and said constrictive member.

4,915,303

PAINT SPRAY GUN

John W. Hufgard, Novelty, Ohio, assignor to AccuSpray, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 101,563, Sep. 28, 1987. This application Jan. 17, 1989, Ser. No. 297,128
Int. Cl.[4] B05B *1/28*
U.S. Cl. 239—300 14 Claims



1. A spray gun for use with air atomizable liquid comprising;

means forming an air chamber having an outlet end;

a liquid nozzle valve having a conical taper penetrating said air chamber and extending to and coaxially aligned with a central circular aperture in the outlet end of said air chamber;

means for delivering a liquid to said central aperture for atomization by air exiting said air chamber through said central aperture;

at least two pattern adjusting nozzles disposed adjacent to the central aperture of said air chamber;

means for conducting air to said chamber and separate means for conducting air to said nozzles;

means for adjusting the flow rate of air to said nozzles; and

the outlet end of said air chamber having a converging down stream frusto-conical shape which terminates at said central aperture,

said liquid nozzle valve including external means combined with said frusto-conical shape for providing an increasing down stream cross-sectional area in said air chamber toward said frusto-conical shape;

said gun being formed as parts bolted together, said parts having internal passages which are mirror images of each other, said passages comprising said air conducting means extending from an air inlet into said gun to said chamber and said nozzles, and when said parts are bolted together said passages combine to form paths for air delivered to said air inlet from an air source connected to said gun, there being no additional passage means in said gun for conducting said air to said air chamber and said pattern adjusting nozzles.

4,915,304

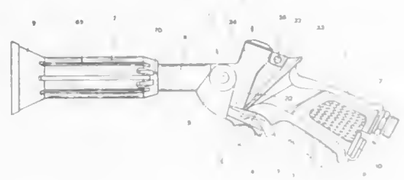
GUN, PARTICULARLY FOR CROP-SPRAYING

Ferdinando Campani, Modena, Italy, assignor to ARAG S.p.A., Emilia, Italy

Filed Nov. 1, 1988, Ser. No. 265,222
Claims priority, application Italy, Nov. 9, 1987, 40143 A/87
Int. Cl.[4] B05B *1/34*
U.S. Cl. 239—473 3 Claims

1. A gun, for crop spraying in particular, comprising a hollow handgrip, a housing including normally-closed sub-vertical spring-loaded ball type on-off valve operated by a lever recessed into the hollow grip, a horizontal rotary control valve with a cylindrical element affording transverse passages that connect an inlet in the grip with two outlet ducts formed in a

barrel, one peripheral and incorporating an atomizing means, the other central and discharging freely by way of chamber, said rotary control valve located uppermost in the on-off valve housing and a sleeve with radial openings located beneath a seat of the on-off valve ball, and a diffuser fitted to a downstream end of the barrel; wherein the rotary valve element is operated by a relative lever and a butt of the grip affords means of retaining the recessed on-off lever in a stable position, characterized in that the rotary element of the control valve comprises a central section with two sets of holes arranged in crossed formation, said two sets offset through 45° in relation



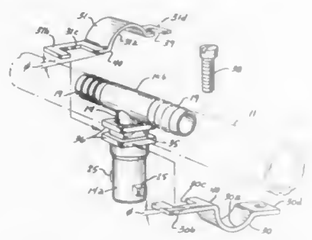
to one another and disposed with their relative axes lying in two parallel vertical and longitudinal planes, of which the one set connects a longitudinal inlet gallery at a side downstream from the on-off valve with a corresponding longitudinal outlet gallery serving the peripheral duct and the atomizing means, and the remaining set connects a longitudinal gallery at the on-off valve side with a corresponding longitudinal outlet gallery serving the freely discharging central duct; and in that the element of the control valve is perpetually rotatable and driven by lever-operated means for generating unidirectional angular movement against the action of a torsion spring.

4,915,305

SPRAY NOZZLE BOOM MOUNTING ARRANGEMENT

Edward J. O'Brien, Barrington; Ted Butterfield, Naperville, and Lyle Emory, Darien, all of Ill., assignors to Spraying Systems Co., Wheaton, Ill.

Continuation of Ser. No. 428,786, Sep. 30, 1982, abandoned. This application Mar. 14, 1986, Ser. No. 840,981
Int. Cl.[4] B05B *1/14*
U.S. Cl. 239—550 14 Claims



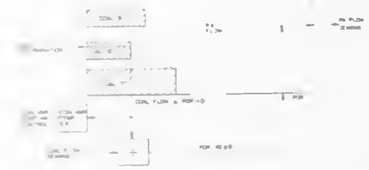
1. An apparatus for mounting a spray nozzle on a support boom comprising a pair of individual and unattached clamping elements, said clamping elements each having first and second cooperating means and being relatively positionable with respect to each other during mounting to permit selective positioning said first cooperating means of said clamping elements on opposed sides of said boom with said boom interposed therebetween and selective positioning the second cooperating means of said clamping elements on opposed sides of said nozzle, said second cooperating means each being formed with a nozzle receiving slot which upon mounting of said clamping elements are in opposed relation for receiving and captively retaining said nozzle in interposed relation between said second cooperating means, a fastening elements carried by one of said clamping elements, a fastening element slot formed in the other of said clamping elements, said fastening element being positionable into operative relation with said fastening element slot of said other clamping element as an incident to positioning of said clamping elements in mounted position on said boom and without removal of said fastening element from the clamping element in which it is carried, and said fastening element being operable without utilization of an auxiliary fastening element for securing said clamping elements in mounted position on the boom with the nozzle captively retained within the second cooperating means of said clamping elements.

4,915,306

ON-LINE PULVERIZER COORDINATION ADJUSTMENT FOR MULTIPLE COALS

William J. Peet, Cambridge, Canada, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 14, 1989, Ser. No. 323,578
Int. Cl.[4] B02C *19/00, 25/00*
U.S. Cl. 241—18 4 Claims



1. A method of controlling the operation of a pulverizer for use in pulverizing a plurality of types of fuels, the pulverizer having a constant primary air flow to percent of rating curve, comprising:

feeding one of the fuels to the pulverizer to be pulverized;

feeding primary air to the pulverizer for conveying the pulverized fuel;

determining at least one characteristic of the fuel being fed, which characteristic is indicative of the fuel type; and

selecting a mass flow demand from the curve according to the determination of the type of fuel being fed; and

controlling the feeding of the fuel according to the mass flow demand selected from the curve.

4,915,307

MILL, IN PARTICULAR AGITATING MILL

Norbert Klimaschka; Wolfgang Schmidt, both of Selb, and Udo Enderle, Marktredwitz, all of Fed. Rep. of Germany, assignors to Erich Netzsch GmbH & Co. Holding Kg, Fed. Rep. of Germany

Filed Jul. 14, 1988, Ser. No. 219,327
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1987, 3723558
Int. Cl.[4] B02C *17/16*
U.S. Cl. 241—65 16 Claims

1. A grinding container for a mill comprising

an inner tubular wall of abrasion-resistant material,

an outer tubular wall surrounding said inner wall,

and a coolant passage formed between said inner and outer walls,

said inner tubular wall being made up of a plurality of ceramic rings which have interengaging end faces, said coolant passage being separated from said interengaging

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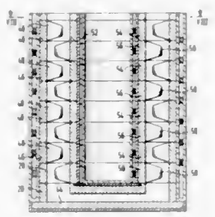
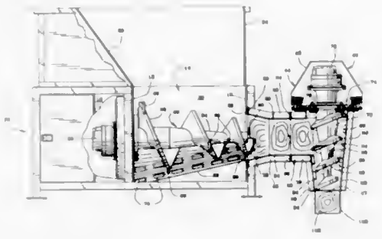
end faces by an enclosure tightly enclosing at least the end portions of each pair of adjoining ceramic rings,



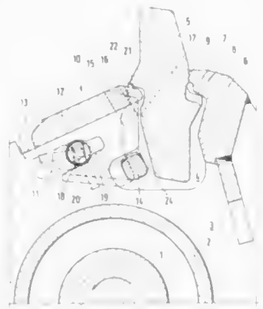
wherein at least the end portions of said ceramic rings are subjected to circumferential compressive forces by said enclosure.

4,915,308
BARREL INJECTOR SCREW
Larry Koenig, 4425 Marketing Pl., Groveport, Ohio 43125
Filed May 1, 1989, Ser. No. 345,386
Int. Cl.[4] B02C *19/22*
U.S. Cl. 241—152 R 11 Claims



1. An auger shredder and feeder system comprising:
a primary housing having an open top for receiving material, a rear wall, a front wall having a central discharge opening, opposing downwardly and inwardly slanted side walls and an arcuate bottom, said side walls and bottom tapering toward said discharge opening and defining a grinding chamber;
a primary auger rotatably mounted on said rear wall within said grinding chamber and having a central shaft and flight extending through said discharge opening, said flight tapering in diameter from said rear wall to said discharge opening in conformity with said grinding chamber;
said flight including tooth means and said bottom including breaker bar means, meshing with said tooth means, for grabbing and breaking up material;
an extrusion tube communicating with said discharge opening and sized such that material ground, shredded and compressed in said grinding chamber is pumped beyond said primary auger to form a plug in said tube;
a secondary housing having a generally tubular side wall with an inlet opening connected to said extrusion tube at an angle thereto, a rearward closed end and an open forward end;
a secondary auger rotatably mounted rearwardly of said secondary grinding chamber and extending through said secondary housing, said secondary auger having a flight sized such that a plug in said tube urged forwardly by said primary auger is sheared by said flight and pumped along said secondary housing; and
means for rotating said primary and secondary augers.

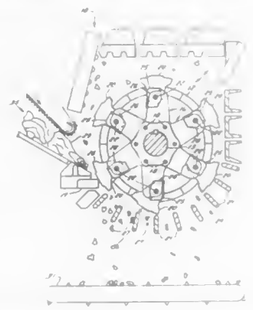
4,915,309
ROTOR FOR A REBOUND CRUSHER
Horst H. Schmidt, Bergisch-Gladbach, Fed. Rep. of Germany, assignor to Deutscher SBM Vertrieb Franz Wageneder, Hagen, Fed. Rep. of Germany
Filed Dec. 13, 1988, Ser. No. 283,636
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1987, 3742395
Int. Cl.[4] B02C *13/26, 13/28*
U.S. Cl. 241—191 5 Claims



1. A rotor for a rebound crusher, comprising a shaft, axially spread apart discs mounted on the shaft and having marginal recesses therein, beater blades having front and rear sides disposed in the marginal recesses and means for securing the blades in the marginal recesses, comprising position locking means disposed between the rear sides of the blades and the discs for preventing radial displacement of the blades, protective caps disposed on the discs at the front sides of the blades and means for mounting the protective cap in a locking position to prevent axial displacement comprising a locking recess in the front side of each blade, a nose on each protective cap engaging in the locking recess with clearance, a bearing surface on each protective cap and facing the marginal recess and means forming an abutment in the marginal recess for the bearing surface.

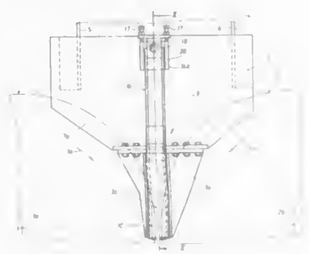
4,915,310
REPLACEABLE END CAP ASSEMBLY FOR THE SPIDER ARM OF A HAMMERMILL
John C. Stelk, Betendorf, Iowa, assignor to Sivyer Steel Corporation, Bettendorf, Iowa
Filed Nov. 2, 1988, Ser. No. 266,119
Int. Cl.[4] B02C *13/28*
U.S. Cl. 241—197 2 Claims

1. A replaceable, protective end cap assembly for protecting a curved end and sides of a spider arm for a hammer mill, said assembly comprising:
a side plate assembly including a pair of side plates having curved edges conforming to the curved end of the spider arm and overlying the sides of the spider arm, and
a protective cap mounted on the curved end of the spider arm in abutting engagement with said side plates,
said cap including a contoured shroud having a curvature corresponding in shape to the curved edges of said side plates,
and a web matingly engaging a correspondingly configures slot in the end curved of the spider arm, wherein said side plate assembly includes means for aligning said side plate assembly on the sides of the spider arm, said aligning means including a U-shaped member interconnecting said



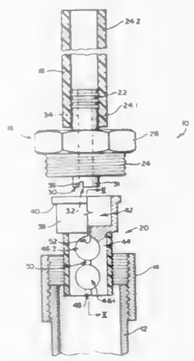
side plates at their bottoms and a cross member interconnecting said side plates at their tops.

4,915,311
ROLLER MILL
Heinz Grachtrup; Otto Heinemann, both of Ennigerloh; Helmut Krumme, Wadersloh; Helmut Lücke, Beckum; Werner Schössler, Ahlen, and Karl von Greiffenstern, Beckum, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany
Filed Feb. 16, 1989, Ser. No. 310,904
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1988, 3806159
Int. Cl.[4] B02C *4/02*
U.S. Cl. 241—226 7 Claims



1. A roller mill for high pressure comminution of material for subsequent grinding comprising a pair of rotatable rollers arranged to define a grinding gap therebetween, material delivery means having wall portions arranged to cover opposite ends of said grinding gap adjacent opposite end face portions of said rollers, each of said wall portions including carrier plate means, positioning means associated with said carrier plate means to position and releasably mount said carrier plate means relative to said roller end face portions, a plurality of wear plates arranged in edge-abutting mosaic pattern mounted on each of said carrier plate means with outer wearing surfaces thereof facing said roller end face portions and said grinding gap ends and inner connection surfaces thereof facing said carrier plate means, and individual releasable wear plate connection means extending between said inner connection surface of each of said wear plates into connecting engagement with a carrier plate for selective and individual mounting and dismounting thereof.

4,915,312
SPRINKLING DEVICE
Lourens A. V. Hiemstra, Somerset West, South Africa, assignor to Silkbell Ltd., Hong Kong, Hong Kong
Filed Jul. 29, 1988, Ser. No. 226,238
Claims priority, application South Africa, Jul. 31, 1987, 87/5691; Oct. 19, 1987, 87/7840
Int. Cl.[4] B05B *3/00, 15/10*
U.S. Cl. 239—229 9 Claims



1 A sprinkling device for liquids, which comprises an emitter tube of resiliently flexible material having a mounted inlet end and an unmounted outlet end, the arrangement being such that, with liquid flowing at a sufficient rate through the emitter tube from the inlet end to the outlet end and being discharged from the outlet end, hydraulic forces exerted by the flowing liquid on the emitter tube cause the outlet end continuously to move about, the device further comprising a fitting having a nipple onto which the inlet end of the tube is mounted, the fitting being provided with means upstream of the inlet end for imparting swirling motion to the liquid entering the emitter tube

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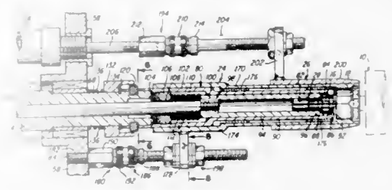
4,915,313
ARMATURE WINDING MACHINE WITH QUICK-CHANGE TOOLING
Alvin C. Banner, Kettering; Philip C. Morgan, New Paris, and Ballard E. Walton, Dayton, all of Ohio, assignors to Globe Products Inc., Dayton, Ohio
Filed Nov. 25, 1987, Ser. No. 125,289
Int. Cl.[4] H02K *15/09*
U.S. Cl. 242—7.05 B 14 Claims



5. In a flier-type armature winder of the type having a commutator shielding assembly comprising an inner shield assembly having an inner shield and inner shield mounting means for mounting said inner shield on a first fixed part of the winder, and an outer shield assembly having a movable outer shield, drive means for moving said outer shield including an outer shield actuator having a linearly movable output shaft and

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outer shield mounting means for mounting said outer shield actuator on a second fixed part of the winder; the improvement wherein said inner shield mounting means comprises a first manually operable quick release coupling means releasably connecting said inner shield assembly to said first fixed part and wherein said outer shield mounting means comprises second manually operable quick release coupling means releasably connecting said outer shield assembly to said output shaft so that said outer shield may be moved by operation of said actuator along a predetermined axis, and wherein said first quick release coupling means enables manual disconnection of said inner shield assembly from said first fixed part and said second quick release coupling means enables manual disconnection of said outer shield assembly from said output shaft so that said inner shield and said outer shield may be quickly removed and replaced without the use of tools.

4,915,314

DEVICE AND PROCESS FOR THE REGULATION OF THE DRIVE MEANS IN THE WINDING OF THREADS ON TEXTILE MACHINERY

Luigi Colli; Roberto Badiali, and Nereo Marangone, all of Pordenone, Italy, assignors to Savio, S.p.A., Pordenone, Italy

Continuation of Ser. No. 111,013, Oct. 20, 1987, abandoned. This application Aug. 22, 1989, Ser. No. 396,764
Claims priority, application Italy, Oct. 22, 1986, 22077 A/86
Int. Cl.[4] B65H *54/02*
U.S. Cl. 242—18 R **8 Claims**

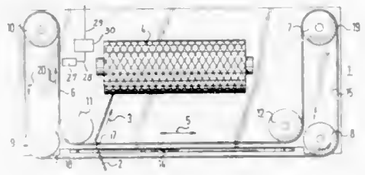
1. Apparatus for regulating the rotation of a thread guide roll in a winding station comprising:
(a) a rotatable drive source operatively coupled to the thread guide roll, wherein rotation of the drive source rotates the thread guide roll;
(b) inverter means coupled to the drive source for supplying variable frequency alternating current electrical power to the drive source;
(c) control means coupled to the inverter means for varying the frequency of the current supplied by the inverter means to the drive source for thereby alternately accelerating and decelerating the drive source;
(d) a power supply; and
(e) circuit means interconnecting the power supply and the drive source for delivering to the power supply at least a portion of the electrical power available from the drive source due to generation of back electromotive force during deceleration of the drive source.

4,915,315

YARN TRAVERSING-WINDING APPARATUS WITH AN ENDLESS BELT HAVING SENSOR DETACHABLE INLAYS

Heinz Kamp, Wegberg, and Rolf Becker, Moenchen-Gladbach, both of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Moenchen-Gladbach, Fed. Rep. of Germany

Filed Nov. 25, 1988, Ser. No. 276,058
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1987, 3739693
Int. Cl.[4] B65H *63/00, 54/28, 57/28*
U.S. Cl. 242—43 A **12 Claims**



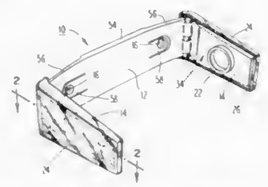
1. Yarn traverse-winding apparatus of a textile machine producing cross-wound bobbins having a given traversing width, comprising an endless yarn traversing belt having a belt body, means for continuously driving said yarn traversing belt in one given yarn travel direction at a given traversing speed, yarn drivers spaced apart along said belt body, inlays formed of a given material being spaced apart within said belt body throughout said yarn traversing belt at intervals smaller than said given traversing width, a sensor aimed at said yarn traversing belt for detecting said given material and individually counting said inlays, and an evaluation unit connected between said sensor and said driving means, said unit adjusting said given traversing speed in response to said sensor.

4,915,316

PAPER ROLL HOLDER

Lehyman J. Bastian, Media, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Sep. 12, 1985, Ser. No. 775,458
Int. Cl.[4] B65H *75/00*
U.S. Cl. 242—55.2 **5 Claims**



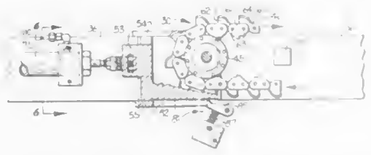
1. A paper roll holder and decorating system comprising:
(a) a back bar adapted to be mounted to a surface;
(b) a pair of brackets each having an interior face an exterior face and edges and each having a journal that can extend into a core of the paper roll for supporting the paper roll;
(c) means for hingedly connecting each bracket to one end of the back bar;
(d) a transparent cover removably secured to each bracket for overlaying the exterior face and the edges of each bracket; and
(e) two decorative inserts each placed between a cover and its respective bracket so as to decorate the exterior face and edges of each bracket.

4,915,317

WEB WINDING APPARATUS HAVING AN AUTOMATIC CHAIN CUTTER TENSIONER AND RELATED METHOD

Steven W. Birch, Monroe, N.C., assignor to Birch Brothers Southern, Waxhaw, N.C.

Filed Feb. 15, 1989, Ser. No. 310,691
Int. Cl.[4] B26D *1/48;* **B65H** *19/26*
U.S. Cl. 242—56 R **15 Claims**



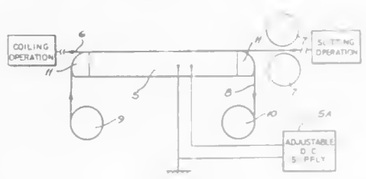
1. A method of winding a web material into successively wound rolls comprising the steps of: successively winding the web material into rolls of a desired roll size, transversely severing the web between successive rolls by moving an endless cutter chain into engagement with the web material, adjusting the tension of the endless cutter chain during winding of successive rolls of web material so as to prevent the cutter chain from becoming unduly slack from successive severing steps during the winding of successive rolls, and lockingly maintaining the cutter chain in its adjusted state through use of a mechanical latch means.

4,915,318

ELECTROMAGNETIC DRAG MECHANISMS FOR FERROUS STRIP

Bruce R. Morrison, Jamberoo, Australia, assignor to John Lysaght (Australia) Limited, Sydney, Australia

Continuation-in-part of Ser. No. 780,381, Sep. 26, 1985, abandoned. This application Feb. 5, 1988, Ser. No. 157,213
Int. Cl.[4] B65H *23/10, 35/02;* **H01F** *7/20*
U.S. Cl. 242—56.2 **41 Claims**



1. Apparatus for slitting and coiling ferrous strip, the apparatus comprising:
(a) means for supplying the ferrous strip;
(b) means for slitting the ferrous strip longitudinally,
(c) means for coiling the slit strips separately from one another,
(d) a drag means located upstream of the coiling means for applying a drag force to the strips to facilitate the formation of a stable coil at the coiling means as a result of back tension applied to the strips
and the improvement comprising:
(e) said drag means being substantially solely in the form of an electromagnet extending across a zone through which the strips pass for attracting magnetically the strips with sufficient force to permit coiling of the strips at the coiling means,
(f) the electromagnetic having an electric winding, an electric power supply, a core extending at least about 500 mm along the direction in which the strips move, the core comprising at least about 50 elongated, spaced-apart, substantially parallel pole elements defining therebetween gaps which accommodate said electric winding for connection to said electric power supply which energizes the electromagnetic to attract the strips towards the electromagnet,
(g) said pole elements having respective pole faces which upon energization of the electromagnet provide an alternating array of north and south poles, and
(h) drag friction material covering said pole faces for contacting the strips on one face only of each strip, whereby the strips are urged into contact with the drag friction material and the drag force is thereby applied sufficiently to permit satisfactory coiling of said strips.

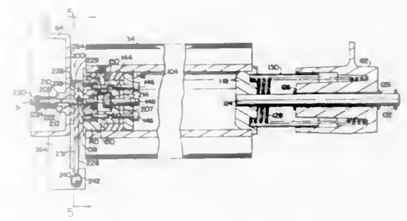
38. An electromagnet adapted for use in a drag mechanism of an apparatus for slitting said coiling a thin ferrous web into strips, the drag mechanism being adapted to be located upstream of coiling means of the apparatus for applying a drag force to the slit ferrous strips whereby the strips can be wound into a stable coil at the coiling means as a result of back tension applied to the strips, the drag mechanism comprising a panel of drag friction material supported over the electromagnet for engaging frictionally with the strips and applying the back tension and force application means for urging the strips into frictional engagement with the panel of drag friction material whereby the drag force is provided for an electromagnet, said electromagnet being adapted to operate as said force application means and the electromagnet comprising a core of the order of 1 m long and 1 m wide and having of the order of 100 elongated, spaced-apart, substantially parallel pole elements which extend across the electromagnet, the pole elements defining therebetween gaps, a single turn, low voltage electric winding accommodated in said gaps and extending sequentially therethrough, a low voltage power supply, said low voltage electric winding being connected to said low voltage electric winding being connected to electromagnet to attract the ferrous strips towards the electromagnet, said pole elements having respective pole faces which upon energization of the magnet provide an alternating array of north and south poles.

4,915,319

PROGRESSIVE PLOTTER WITH BRAKE FOR SUPPLY ROLL

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., Tolland, Conn.

Filed Oct. 21, 1988, Ser. No. 260,822
Int. Cl.[4] B65H *23/08*
U.S. Cl. 242—67.3 R **18 Claims**



13 In a progressive plotter where sheet material is advanced from a supply roll to a take-up roll, the combination comprising:
a table providing a support surface;
means supporting a take-up roll of paper and a supply roll of paper adjacent said support surface so that the paper passes from said supply roll over said support surface to said take-up roll;
a take-up motor for rotating said take-up roll;

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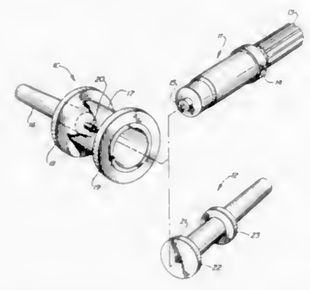
a sensor sensing the displacement of the paper relative to said support surface during a paper advancement;
a control means responsive to said sensor for stopping said take-up motor at the end of an advancement; and
a brake releasably coupled with said supply roll by friction means for applying a reverse bias to said supply roll during an advancement to resist unwinding of the paper from said supply roll and to tension the paper existing between said supply roll and said take-up roll, and for continuing to apply a reverse bias to said supply roll at the end of an advancement after said take-up motor is stopped.

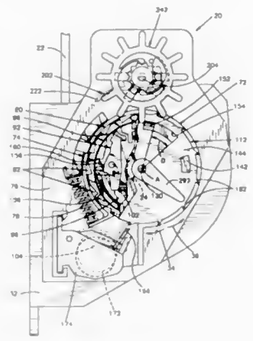
4,915,320
KITE STRING REEL
Terry K. Neal, 2796 Shaw Rd., Compton, Ill. 61318
Filed Jun. 5, 1989, Ser. No. 361,269
Int. Cl.[4] B65H *75/40;* F41J *9/08*
U.S. Cl. 242—96 3 Claims



1. A kite string reel suitable for manual operation and also suitable for power-driven operation by reason of its adaptation for use with a cordless screwdriver having a mouth for accepting interchangeable screwdriver bits, the kite string reel comprising:
(a) a spool-handle assembly comprising a hollow spool with flanges on each end for storing kite string, the spool having an inside diameter sufficient to accommodate a cordless screwdriver, one flange being an annular ring having an inside diameter about the same as the inside diameter of the spool and the other flange being a solid disc with a centrally located handle extending away from the spool on one side of the flange an a centrally located screwdriver bit extending inward on the other side of the flange, such that a cordless screwdriver can be inserted through the annular flange into the spool where its mouth couples with the bit; and
(b) a removable handle containing means for coupling with the spool-handle assembly; such that the removable handle is coupled to the spool for manual operation and a cordless screwdriver having a mouth for accepting interchangeable screwdriver bits is coupled to the spool for power-driven operation.

4,915,321
RETRACTOR WITH CINCH MECHANISM
Richard E. Asfour, New Baltimore, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio
Filed Sep. 20, 1988, Ser. No. 246,629
Int. Cl.[4] B65H *75/48;* A62B *35/02*
U.S. Cl. 242—107.4 A 11 Claims

1. An apparatus comprising:
a spindle having belt webbing wound thereon, said spindle being supported for rotating in belt withdrawal and belt retraction directions;
spindle rotation blocking means including a pivotally mounted pawl member movable from a first position allowing rotation of said spindle in the belt withdrawal direction to a second position blocking rotation of said spindle in the belt withdrawal direction;
an inertia member supported for rotation with and relative to said spindle, said inertia member having a plurality of teeth extending from said inertia member;
means for pivotally moving said pawl member to its second position in response to rotation of said spindle in the belt withdrawal direction relative to said inertia member; and
means for blocking rotation of said inertia member in response to rotation of said spindle a predetermined amount in the belt withdrawal direction to thereby enable said spindle to rotate in the belt withdrawal direction relative to said inertia member to thereby effect pivotal movement of said pawl member to its second position, said means for blocking rotation including:

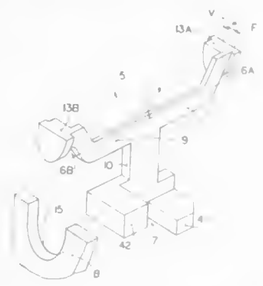


a rotatable member;
means for intermittently rotating said rotatable member upon rotation of said spindle in the belt withdrawal direction including a drive arm connected to and rotatable with said spindle and continuously rotating in the belt withdrawal direction during belt withdrawal, said drive arm intermittently rotating said rotatable member in a first direction of rotation upon rotation of said drive arm in the belt withdrawal direction; and
a blocking arm supported for pivotal movement and having a portion for engaging one of a plurality of teeth on said inertia member to block rotation of said inertia member, said blocking arm portion being pivotable toward said inertia member to engage one of said plurality of teeth on said inertia member in response to rotation of said rotatable member by a predetermined amount in said first direction of rotation.

4,915,322
CASSETTE AND LOCKING ELEMENT FOR THE SAME
Klaus Schoettle, Heidelberg, and Lothar Gliniorz, Frankenthal, both of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Oct. 13, 1988, Ser. No. 257,013
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1987, 8713865
Int. Cl.[4] G11B *23/087*
U.S. Cl. 242—198 10 Claims

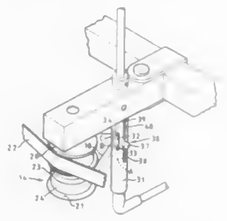
1. A locking element for a cassette, which comprises a mounting means and a locking means connected to the mounting means, the locking means being provided at a distance from an axis of the mounting means and the locking means having at least one spring element that produces a spring stress for actuation of the locking means, and wherein the locking means has in the region of the mounting means a resiliently flexible part,

on which a rigid connecting part to the locking means is provided, so that, when the locking means is actuated on the cassette, the resiliently flexible part is resiliently deformed and pivoting movement of the locking element about the axis at least close to the resiliently flexible part takes place wherein



the locking element has a substantially T shape, the locking means is located at the base of the T shape, the resiliently flexible part constitutes at least one of the arms of the T shaped locking element, said at least one arm having a mounting element at the end thereof, nonrotatably mounted with respect to the cassette and a middle part is substantially rigid.

4,915,323
YARN FEED APPARATUS
William E. A. Shelton, Leicester, England, assignor to Alan Shelton Limited, Leicester, England
Filed Oct. 7, 1988, Ser. No. 255,139
Claims priority, application United Kingdom, Oct. 10, 1987, 8723843; Feb. 6, 1988, 8802712
Int. Cl.[4] B65H *51/00;* D04B *15/50*
U.S. Cl. 242—47.01 17 Claims



1. Apparatus for feeding yarn from a cone or package or the like to an end use point at a processing machine, said apparatus comprising:
a positive yarn feed device,
tubing defining a closed path for the yarn substantially over the whole distance from the cone or package to the end use point,
the tubing including a section adjacent to said yarn feed device, the section being moveable between an open position and a closed position,
said section in the closed position defining a path for threading the yarn past said yarn feed device, and
said section in the open position providing access to the yarn, thereby enabling the yarn to be engaged with said yarn feed device when the section is in the open position

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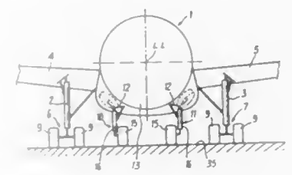
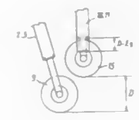
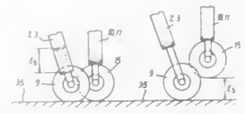
4,915,324
AUXILLARY ROLLING SYSTEM FOR AIRCRAFT
Bernard Foreau, Blagnac; Alain Pichon, Tournefeuille, and Claude Nazair-Blanc, Toulouse, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France
Filed Apr. 19, 1988, Ser. No. 183,230
Claims priority, application United Kingdom, Apr. 24, 1987, 8705835
Int. Cl.[4] B64C *25/10*
U.S. Cl. 244—102 R 8 Claims







1 A rolling system for aircraft, comprising telescopic landing gears which abut on the ground via wheels and which present a variable length as a function of the load which is applied thereto by said aircraft;
wherein it comprises at least one jack assembly capable of outwardly pressing at least one rolling member having a constant force and said jack assembly is capable of communicating to said rolling member at least two relative positions of retraction with respect to the wheels of said telescopic landing gears, the first of these positions being such that such rolling member is maintained spaced apart from the ground wherever the compression of said telescopic landing gears under the load that is applied thereto by the aircraft, whilst the second of said positions is such that said rolling member is placed in contact with the ground when the length of said telescopic landing gears corresponds to a predetermined load threshold applied thereto, said threshold being less than the load corresponding to take-off;
wherein said jack assembly comprises a cylinder the cavity of which is provided with a projection separating said cavity into two communicating chambers, one of said chambers containing a piston provided with a rod opposite said projection and hermetically passing through the corresponding bottom of said cylinder, a first orifice for passage of fluid disposed in the vicinity of said projection and in simultaneous communication with the two communicating chambers, a second orifice in the vicinity of the bottom of said cylinder for passage of fluid disposed in said chamber containing said piston, and a line for supply of hydraulic fluid at constant pressure and a line for return of hydraulic fluid, capable of being alternately connected to said first and second orifices via a valve.

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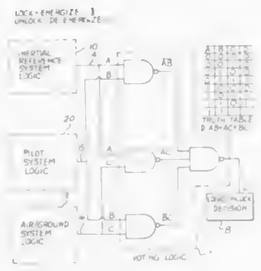
4,915,325
FULL BODY RESTRAINT SYSTEM
Susan Ryder, Sunnyvale, Calif., assignor to United States of America as Represented by the Administrator, National Aeronautics and Space, Washington, D.C.
Filed Nov. 29, 1988, Ser. No. 277,829
Int. Cl.[4] B64D *11/00*
U.S. Cl. 244—118.5 21 Claims

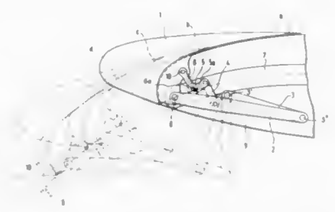
1. A body restraint system for a zero or microgravity environment, which comprises a waist restraint having a housing with a curved front, shaped to engage a user's waist, said housing containing a retractable belt having a buckle extendable from the front of said housing, a catch configured to engage said buckle, said catch being connected to a means for attaching said catch to the user's waist, and a pair of foot restraints with pads of a two part attaching material positioned to engage mating pads of the two part attaching material on the user's shoes.

4,915,326
AIRCRAFT EXIT DOOR LOCKING SYSTEM
Leo W. Plude, Woodinville, Wash., assignor to The Boeing Company, Seattle, Wash.
Continuation of Ser. No. 135,218, Dec. 21, 1987, abandoned. This application Jul. 31, 1989, Ser. No. 387,387
Int. Cl.[4] B64C *1/14*
U.S. Cl. 244—129.5 3 Claims



1. An aircraft cabin exit door lock control system comprising in combination:
an exit door locking mechanism having lock and a closing motor;
means for removing power from said closing motor after the exit door is locked;
electromagnetic means for holding said closing motor after said exit door is locked; and,
said control system further including lock-unlock voting logic.

4,915,327
SLAT ACTUATION AND STEERING
Wilfried Ellmers, Achim, and Wilhelm Martens, Delmenhorst, both of Fed. Rep. of Germany, assignors to MBB GMBH, Bremen, Fed. Rep. of Germany
Filed Jun. 30, 1988, Ser. No. 213,335
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1987, 3721479
Int. Cl.[4] B64C *9/24*
U.S. Cl. 244—210 6 Claims

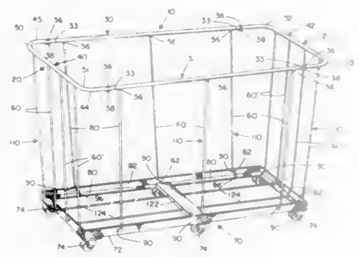


1. Actuation device for a slat being held on rail means for guiding and moving the slat into and out of an aircraft wing comprising:
the slat being pivoted on the rail means in a particular point (8);
a thrust rod having a first end hinged to the slat at a first hinge point;
a crank on the wing and connected to a second end of the thrust rod, there being drive means for the crank; and
lever means connecting the rail means additionally to the slat at another point on the rail means different from the particular point and for pivoting and steering the slat relative to the particular point, for holding the rear end of the slat against the wing in a first protraction range and opening a gap upon further protraction.

4,915,328
CONTROL METHOD OF ELECTRIC VEHICLE
Noriaki Nakamoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 31, 1989, Ser. No. 304,032
Claims priority, application Japan, Apr. 5, 1988, 63-82274
Int. Cl.[4] B60T *8/58*; B61L *3/14*
U.S. Cl. 246—186 4 Claims

1. A control method for an electric vehicle having wheels and frictional contact with rails, comprising the steps of:
sensing the rotation of the wheels;
producing a variable related to the sensed rotation of the wheels;
comparing said variable to a detection level;
determining the existence of a slip condition if said variable exceeds said level; and
changing said detection level in accordance with the sum of the vehicle acceleration due to the rotation of driving motors and the vehicle acceleration due to the slope of the rails.

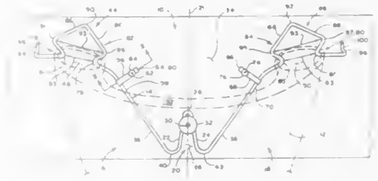
4,915,329
HAMPER FRAME
Michael B. Doninger, 1815 Yale Rd., Merrick, N.Y. 11566
Filed Mar. 14, 1989, Ser. No. 323,434
Int. Cl.[4] B65B *67/12*
U.S. Cl. 248—98 15 Claims



1 A hamper frame adapted to support a liner formed of canvas or like material in combination with a base adapted to be mounted on caster wheels, said combination comprising:
(a) a generally rectangular shaped, tubular frame formed of two separable end members and two separable side members, each of said side members being substantially straight and each of said end members having substantially straight mid-portions and transverse, substantially parallel, opposed, end portions extending in the same general direction, each said mid-portion being joined to its opposed end portions by a pair of arcuate segments, and each of said end portions being detachably engaged with the side members to form a generally rectangular shaped ring;
(b) a plurality of spaced apart resilient rods attached to the underside of said ring at spaced apart locations along the end members and along the side members, said resilient rods respectively terminating in base portions having step-shaped configurations which extend toward the interior of said ring; and
(c) a base assembly which includes a generally rectangular peripheral member having
(i) a plurality of horizontal ledge portions engaging ends of the base portions of said rods
(ii) side portions substantially transverse to said ledge portions having apertures receiving and supporting horizontal portions of the stepshaped base configurations of the resilient rods

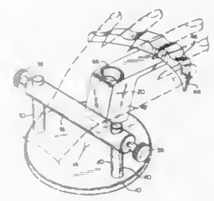
4,915,330
APPARATUS FOR HOLDING A BAG
Paul B. Buckley, Suite #3- 444 West 12th Avenue, Vancouver, British Columbia, Canada V5Y 1V3
Filed Jun. 30, 1988, Ser. No. 213,887
Int. Cl.[4] B65B *67/04*
U.S. Cl. 248—99 18 Claims

1. An apparatus for holding a bag, the apparatus being securable to a surface, the apparatus comprising:
(a) first and second supporting means for supporting the bag;
(b) first and second bag holders connected to the first and second supporting means respectively, the first and second bag holders being operable to hold first and second portions of the bag;
(c) first and second resilient portions cooperating with the first and second supporting means respectively to resiliently support the first and second portions of the bag to facilitate bending of the first and second supporting means;
(d) first means for fastening the first and second supporting means to the surface;



(e) first and second elastic links extending from the first and second supporting means respectively, and second and third fastening means cooperating with the first and second elastic links respectively to fasten the links to the surface.

4,915,331
MANICURE AID
Bernard C. Becker; Daniel H. Becker, both of 1720 NE. 80th Ave., Portland, Oreg. 97213, and Cherie C. Nadon, 1906 SE. 20th Ave., Portland, Oreg. 97214
Continuation of Ser. No. 166,007, Mar. 9, 1988, abandoned. This application Feb. 22, 1989, Ser. No. 314,327
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—118 4 Claims



1 A device for holding the wrist and palm of a customer's hand and thereby aiding manicurists comprising;
a base having a bottom surface adapted to rest on a table top, said bottom surface provided with a table-gripping surface that resists sliding movement of the device on the table top, a round wrist supporting crossbar, a pair of spaced apart posts attached to said base and supporting said crossbar in an adjustable elevated position above the base, and a palm supporting pedestal having an upper palm supporting surface supported above the base, said upper palm supporting surface spaced laterally from the length of the crossbar and centrally of the posts and spanning the distance between the wrist and center of the palm of a hand, and said crossbar and support surface being generally at the same heighth whereby the palm of a customer's hand will engage the palm supporting surface while the wrist of that same hand is supported on the crossbar to be thereby held in place and in position as desired by the manicurist;
the palm supporting pedestal having a rounded top surface forming the palm supporting surface, said palm supporting pedestal configured to provide a hand gripping shaft and having the additional function to be gripped by the customer's hand in a manner that positions the thumb of the hand on the palm supporting surface for manicure treatment.

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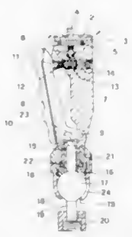
4,915,332
PORTABLE POOL CUE HOLDER
Daniel P. Quellette, 5184 Merle St., Las Vegas, Nev. 89119
Filed Apr. 27, 1989, Ser. No. 345,096
Int. Cl.[4] F16M *11/38*
U.S. Cl. 248—171 59 Claims

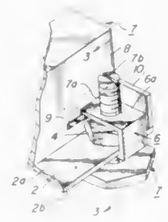
1. A portable pool cue holder comprising:
(a) a hollow member open at one end for receiving a pool cue to be held therein, and
(b) a support assembly for supporting the hollow member in an upright position, and
(c) a hollow collar attached to the lower end of the hollow member, and
(d) a retaining plate attached to the interior of the hollow collar for retaining the support assembly within the hollow member, said retaining plate having a plurality of plate slots spaced around the periphery of the retaining plate and an annular ring attached to the retaining plate to guide the support assembly
whereby a pool cue inserted into the hollow member is maintained in the holder.

4,915,333
EASILY ORIENTABLE SUPPORT FOR OPTICAL AND PHOTOGRAPHIC INSTRUMENTS AND THE LIKE
Ivano Bolondi, Via A. Volta, 2, Montecchio (Reggio Emilia), Italy
Filed Dec. 11, 1987, Ser. No. 131,825
Claims priority, application Italy, Dec. 23, 1986, 34952/86[U]
Int. Cl.[4] F16M *11/14*
U.S. Cl. 248—181 4 Claims



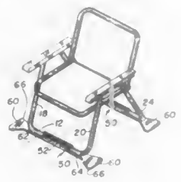
1. An adjustable supporting device suitable for an optical instrument and the like which has a body having a longitudinal axis, the device comprising a block for a hinge, said hinge having a fixed part and a movable part, said fixed part being formed by a ball (**17**), a stem (**19**) connected with said ball, said stem (19) being connected to an anchoring ringnut (**20**) at the bottom of the device, said movable part consisting of springing means (**16, 18**) and a handgrip (**7, 8**) mounted along said longitudinal axis, said handgrip comprising two levers articulated on a fulcrum (**9**) on one of said levers, the other lever having a projection (**10**) in the lower part thereof, said projection serving as a cam, a compressed spring (**12**) located in a seat (**13**) in said handgrip, a tooth (**11**) engaging one end of said spring (**12**), the closing force of said springing means on the surface of said ball being exerted by said compressed spring **912**) by means of said handgrip, a piston (**15**) slidable within said handgrip along said longitudinal axis, said piston forming a bell (**16**) which engages the upper part of said ball, the lower part of said ball engaging with a bonnet (**18**) formed in the lower border of said device, said bonnet having a vertical slit (**24**), whereby when the device is blocked, said tooth (**10**) engages one end of said spring (**12**), said cam (**10**) exerts pressure on said piston and on said bell and the ball (**17**) is locked in position and when said levers (**7**) and (**8**) are pressed together, said spring (**12**) is compressed, the pressure of said cam (**10**) on said piston is released and said ball is free to move, said handgrip rotates on its axis and the device is articulated forwardly or rearwardly or on the side, at any angle, when the bonnet is in the vertical as well as the horizontal position.

4,915,334
CAPTIVE NUT BASE ADJUSTING DEVICE
O. Timothy White, Carnesville, Ga., assignor to Royston Corporation, Royston, Ga.
Filed Jul. 28, 1989, Ser. No. 387,509
Int. Cl.[4] A47B *91/02*
U.S. Cl. 248—188.4 10 Claims



1. In an article of furniture, a height and leveling adjuster comprising:
a base beam rigidly secured to the article of furniture, the base beam having a horizontal flange with upper and lower surfaces and a hole extending vertically through the flange from the upper to the lower surface;
a nut having a threaded hole aligned with the hole in the flange;
a retainer having two substantially parallel plates held in rigid, spaced relationship to each other and having a hole in each of the parallel plates, the plates being situated on opposite sides of the flange of the base beam and the holes in the parallel plates being aligned with each other and with the hole in the horizontal flange, one of the two substantially parallel plates lying against one of the upper and lower surfaces of the horizontal flange, and the nut fitting in a space between the other of the upper and lower surfaces and the other of the two substantially parallel plates;
a foot having a threaded shank extending through all three of said holes and threaded into the nut: and
cooperating means on the retainer and base beam preventing removal of the retainer from the base beam while the nut is situated in said space, but permitting removal of the retainer from the base beam when the nut is not present in said space.

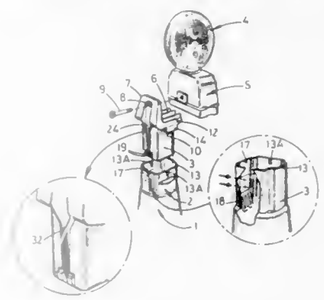
4,915,335
LAWN CHAIR STABILIZER
Virgil P. Miles, P.O. Box 342, Etna, Calif. 96027
Filed Mar. 27, 1989, Ser. No. 328,613
Int. Cl.[4] F16M *11/20*
U.S. Cl. 248—188.8 15 Claims

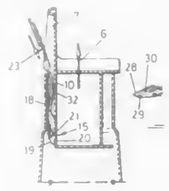


1. In a chair comprising a main frame having a front lower frame member, and a rear lower frame member, a pair of front upright members connected to the ends of said front lower frame member, and a pair of rear upright members connected to the ends of said rear lower frame member, each of said upright members being connected to a respective end of a respective said lower frame member by a curved transition portion, the improvement comprising:
at least one stabilizing adapter secured to at least one of said front and rear lower frame members for stabilizing said main frame in the lateral directions for helping to prevent the toppling of said main frame by a person seated thereon;
said stabilizing adapter comprising a first right-angle member coupled to one said curved transition region of said at least one lower frame member, and a second right-angle member coupled to another said curved transition region of said at least one lower frame member, said one and said another transition regions being connected to the same one of said front and rear lower frame members.

4,915,336
ADAPTOR AND SUPPORTING CONTAINER PRIMARILY FOR A LAMP UNIT
Keith Handy, Blackburn, United Kingdom, assignor to Glasdon Group Limited, England
Filed Aug. 18, 1988, Ser. No. 234,348
Claims priority, application United Kingdom, Aug. 18, 1987, 8719505
Int. Cl.[4] G09F *7/02*
U.S. Cl. 248—222.1 10 Claims

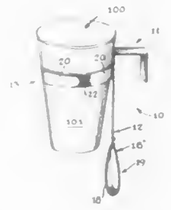
1. An adaptor in combination with a supporting container, the adaptor comprising support means for a lamp unit or other warning mechanism and the supporting container having an open end into which a portion of the adaptor normally located beneath the support means can be inserted, locking means comprising engageable elements being provided on the aforesaid portion of the adaptor and the interior of the supporting container such that said elements engage one with another some distance within the container from said open end when the unit is inserted so as to prevent removal of the unit, a lug through which a fastening means is passed to secure the adaptor to the lamp unit or warning mechanism, and said locking means being arranged to be unlocked by key means insertable into the tubular container to cause disengagement of aforesaid





engage elements one from another so that the unit can be removed.

4,915,337
FLEXIBLE CUP HOLDER
Mark H. Iwasaki, 739 Hausten St. #901, Honolulu, Hi. 96826
Filed Feb. 17, 1989, Ser. No. 319,767
Int. Cl.[4] A47K *1/08*
U.S. Cl. 248—311.2 5 Claims



1. A flexible cup holder for drink receptacles including tapered cups and cylindrical containers wherein the cup holder comprises:
a rigid support unit comprising a relatively rigid support hook having an inverted generally L-shaped configuration and including a downwardly depending lip portion and an outwardly projecting ledge portion and a downwardly depending stem portion;
a flexible vertical support unit comprising an elongated flexible strap member connected on one end to said downwardly depending stem portion of the relatively rigid support hook; and
a flexible horizontal support unit comprising a pair of opposed horizontally disposed flexible arm members operatively connected to the rigid support unit.

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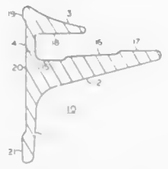
4,915,338
WALL SHELF SYSTEM
David C. Guth, Salt Lake City, Utah, assignor to Futura Industries Corporation, Boise, Id.
Filed May 3, 1989, Ser. No. 347,077
Int. Cl.[4] A47G *29/02*
U.S. Cl. 248—250 7 Claims



1. A wall shelf system which comprises:
an elongated support bracket having an elongated vertical back panel for attachment to a vertical surface, an upper support member and a lower support member formed integral with said vertical panel and forwardly extending horizontally out therefrom, to form, together with a portion of the back panel, an elongated slot for receiving and supporting in cantilevered fashion substantially all of the rearward portion of an elongated wall shelf, said vertical back panel further having a plurality of screw holes interspace along the portion of said vertical back panel which forms the back of the elongated slot;
said lower support member further having an elongated lock strip notch formed integral therewith along the length of the rear section of the upper surface of said lower support member for receiving the downwardly extending snap plate of a resilient snap lock strip;
an elongated wall shelf having a rearward portion adapted for insertion into the elongated slot formed between the upper support member, back panel and the lower support member of the bracket; and
a plurality of resiliently polypropylene V-shaped snap lock strips being adhesively attached along the length of the rearward portion of the elongated wall shelf with their vertexes pointing rearwardly and having forwardly and downwardly extending snap plates for snap interfitting within the lock strip notch.

4,915,339
MINE PROP
Hagen Halbich, Transvaal, South Africa, assignor to H L & H Timer Products (Proprietary) Limited, Transvaal, South Africa
Filed Apr. 11, 1983, Ser. No. 483,483
Claims priority, application South Africa, Aug. 6, 1982, 82/5699
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—351 7 Claims

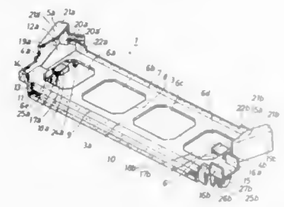
1. A mine prop comprising a timber pole having a pole axis and formed with four planar cut slots adjacent one end of said pole and over a portion of its length to form a core having a rectangular cross-section which is of reduced cross-section with respect to said pole, and which is one piece with remaining uncut portions of the timber pole each on an outside of each cut slot respectively, and at least one hoop surrounding the pole over the core and over the uncut portions of the pole to restrain expansion of the core and the uncut portions of the pole in a direction transverse to the pole axis when the prop is under a compressive load in its axial direction, said cut slots including two pairs of parallel cut slots with a cut slot in one pair being at right angles to a cut slot in another pair, each slot sloping from the pole end, away from the pole axis so that each uncut portion forms a wedge having decreasing cross-section in a direction away from said pole one end, the core having an increasing cross-section in a direction away from the pole one end.

4,915,340
POWER SEAT APPARATUS HAVING A LOW FRICTION TRANSMISSION CABLE
Hiroshi Nawa, Chiryu, and Takami Terada, Toyota, both of Japan, assignors to Asin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Jul. 12, 1988, Ser. No. 217,788
Claims priority, application Japan, Jul. 24, 1987, 62-112640; Sep. 15, 1987, 62-140665
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—429 5 Claims

1. A power seat apparatus comprising:
a seat member;
a seat driving mechanism supporting said seat member and fixedly mounted on a vehicle body floor;
a motor;
a cable having an outer circumference constituted by twisting a plurality of metal wires and transmitting a rotational torque from said motor to said seat driving mechanism;
a protection tube through which said cable is passed, and
a flexible intermediate member having an inner circumference, interposed between said cable and said protection tube so as to decrease friction therebetween, said inner circumference of said intermediate member disposed to completely adjoin the outer circumference of the cable.

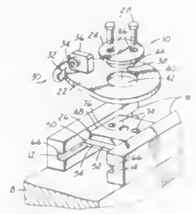
4,915,341
FIXATION DEVICE FOR AN ELECTRONIC DISPLAY
Katsumasa Takahashi, Nagoya, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan
Filed Jul. 28, 1988, Ser. No. 225,200
Claims priority, application Japan, Oct. 8, 1987, 62-154347
Int. Cl.[4] H05K *5/00*
U.S. Cl. 248—500 9 Claims

1. A fixation device for an electronic display, comprising:
a rectangular flat plate-like rest for supporting a lower surface of the electronic display said rest having front and back surfaces and two opposed sides;
a pair of holding members, each holding member provided along a respective, opposite side of the rest, each holding member having a side frame;
a pair of hinges, each hinge provided on a respective, opposite side of the rest and connected to an end of the side frame of the holding member provided along that respective side of the rest, for swinging the holding member horizontally; and
a pair of holding plates, a holding plate provided on an upper surface of each side frame of the holding members, for holding an upper surface of the electronic display, wherein the holding plates project from the side frames



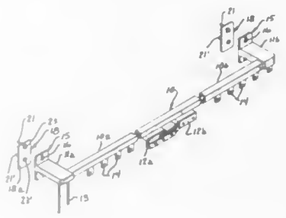
toward the rest and the width of each holding plate diminishes toward its respective hinge and the length of each holding member is less than the width of the rest.

4,915,342
CHAIN ANCHOR CLAMP DEVICE
Lars-Erik Nilsson, St. Sundby, Sweden, assignor to Car-O-Liner Company, Wixom, Mich.
Filed Oct. 11, 1988, Ser. No. 255,666
Int. Cl.[4] B61D *45/00*; B60P *7/08*
U.S. Cl. 248—500 5 Claims



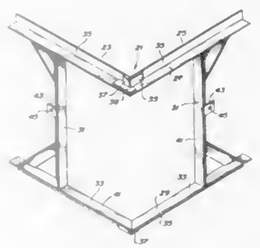
3. A chain anchor clamp device for a vehicle straightening bench having a pair of opposed guide tracks, said clamp device comprising:
an anchor plate;
a retainer cap retaining said anchor plate;
means journaling said anchor plate and retainer cap for relative rotation;
a fastening device connected to said anchor plate and constructed and arranged to secure a chain; and
a lock plate engagable in said guide tracks of said vehicle chassis straightening bench, said lock plate having a central island receivable between said pair of opposed tracks of said bench, and a peripheral flange which projects into grooves of said opposed tracks, said peripheral flange is generally parallelogram shaped, has a pair of parallel guide flange portions with beveled lower edges and a pair of parallel lock flange portions having a transverse spacing greater than said guide flange portions, said lock plate being removable from said guide track, and
means releasably securing said lock plate to said retainer cap so that said lock plate can be urged into locking engagement with the guide tracks, whereby a damaged vehicle can be held to said bench by a chain secured to said chain anchor clamp device when said lock plate is engaged in and secured to the guide tracks.

4,915,343
ARRANGEMENT FOR MOUNTING A DEVICE ON A WALL
Mark J. Terlecke, Madison, Wis., assignor to Graber Industries, Inc., Middleton, Wis.
Filed May 5, 1986, Ser. No. 859,495
Int. Cl.[4] A47H *1/14*
U.S. Cl. 248—546 12 Claims



1 An arrangement for mounting a device on a wall, the device including a wall mounting pad having a rear face and a front face and at least first and second fastener receiving openings extending through the mounting pad at preselected spaced locations, a base plate formed of plastic and having a front side adapted to engage the rear face of the mounting pad and a rear side adapted to engage a wall surface and at least first and second axially elongated screw anchors integral with the base plate with their lengthwise axes extending transverse to the rear side of the base plate at locations corresponding to said preselected spaced locations of the first and second fastener receiving openings in the mounting pad, the base plate having first and second screw receiving passage means opening at the front side of the base plate and extending through the base plate and into the respective first and second axially elongated screw anchors, a screw fastener individual to each screw receiving passage and each having a head at one end and a shank with screw threads, each screw fastener being adapted to be screwed into a respective one of the screw receiving passages and the screw anchors being adapted to expand when the screw fastener is threaded thereinto.

4,915,344
QUOIN MOLD
Thomas L. Polak, 1625 Wassergass Rd., Hellertown, Pa. 18055
Filed Jun. 3, 1988, Ser. No. 202,214
Int. Cl.[4] E04F *21/04*
U.S. Cl. 249—15 7 Claims



1 A quoin mold for forming artificial quoins on the corners of buildings, said mold comprising:
first and second mold sections, each section including first and second arms each having first and second ends, said second ends being connected by a third arm, said arms of

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each section defining a plane and each arm having a mold surface transverse to said respective plane; and

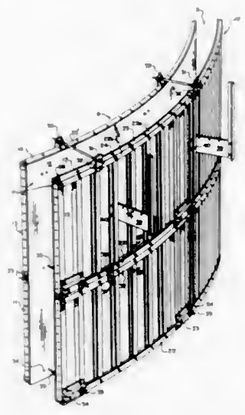
interlocking means provided on each first end of said first and second arms of the first mold section for engagement with respective interlocking means provided one each first end of said first and second arms of said second mold section for interengagement of the first ends of the respective arms of the sections thereby connecting said sections together, said interlocking means preventing movement both parallel to said planes and angular movement between said planes to an angle greater than substantially perpendicular, while allowing angular movement between said planes to an angle less than substantially perpendicular.

4,915,345

CONCRETE FORMING SYSTEM FOR CURVED WALLS

Larry W. Lehmann, New Braunfels, Tex., assignor to Symons Corporation, Des Plaines, Ill.

Filed Dec. 18, 1987, Ser. No. 135,024
Int. Cl.[4] E04G *11/10*
U.S. Cl. 249—18 **37 Claims**



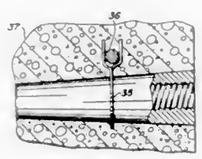
1. In a curved concrete forming structure to provide a system for forming curved walls and including a series of arcuately curved metallic panels secured in stacked side-by-side assembly, the improvement wherein each panel includes a flexible metallic skin plate, spaced vertically extending ribs secured along the length of the plate on one side thereof, the ribs and the skin plate having essentially the same vertical dimensions, a pair of vertically spaced arcuately curved angles having identical radii of curvature corresponding to the radii of curvature of the concrete wall to be poured using the concrete forming structure, the curved angles being substantially stiffer and inflexible compared to the flexible skin plate, said curved angles each having an upright angle leg and a horizontal angle leg, and means securing the curved angles in abutment with said panel, an outer terminal end of the horizontal leg being free of any upright angle leg, said outer terminal end being remote from the upright angle leg, said upright angle leg being flatwise engaged against said ribs spaced from the skin plate and said outer terminal end being positioned for continuous edgewise engagement against said skin plate when said means causes said flexible skin plate to be flexed from a flat form into a curved form and then engaged in reinforced abutment with the relatively stiffer arcuately curved angle, the curved panels being assembled in stacked assembly providing a smooth continuous radius free of chords or flat spots.

4,915,346

SPACERS FOR USE IN FORMING MODULAR BUILDINGS

Harold D. Burdett, P.O. Box 30549, Mesa, Ariz. 85275

Filed Jan. 3, 1989, Ser. No. 292,840
Int. Cl.[4] E04G *17/06*
U.S. Cl. 249—91 **4 Claims**



1. An assembly for supporting and spacing a supplemental form from a primary form,

said assembly comprising a conically shaped housing having a hole extending axially therethrough,

at least a part of said hole being threaded for receiving a threaded bolt in either end thereof, and

a flat circular shaped clamp having an aperture extending laterally therethrough,

said aperture having a diameter slightly larger than an outside diameter of said housing at a point between opposite ends of said housing

said clamp snugly engaging said housing at said point when said housing is inserted into said aperture, and

means on said clamp for securing said clamp to a rebar,

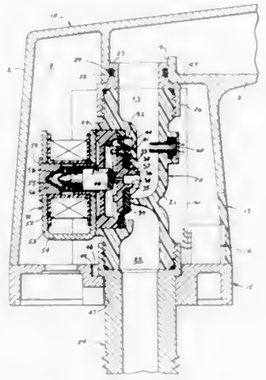
said means comprising a pair of fingers extending laterally of the periphery of said clamp in a common direction.

4,915,347

SOLENOID OPERATED FAUCET

Muhammad Iqbal; Jeffery J. Kreutzer, both of Sheboygan, and Carl R. Schwartz, Mequon, all of Wis., assignors to Kohler Co., Kohler, Wis.

Filed May 18, 1989, Ser. No. 353,569
Int. Cl.[4] E03C *1/05*; F16K *31/02, 31/126*
U.S. Cl. 251—30.03 **10 Claims**



8. A faucet comprising:

a base member;

a faucet body, attached to said base member, having an inner chamber and a spout which opens into the inner chamber at an aperture;

a valve housing, within the inner chamber of said faucet body and separable therefrom, having a inlet chamber opening into an external annular channel and an outlet chamber having a first opening centrally located relative to said annular channel, said housing having an annular surface between the channel and the outlet chamber first opening thereby defining a valve seat, said valve housing also having a first end portion extending into the aperture of said faucet body thereby sealing the inner chamber from the spout with the first end portion having a aperture therethrough to provide a passage between the outlet chamber and the spout, and having a second end portion;

a tube attached to the second end portion of said valve housing in communication with the inlet chamber;

one of said valve housing and said tube abutting said base thereby retaining said valve housing within said faucet body and holding said first end portion in the aperture of said faucet body;

a resilient diaphragm having a first surface that releasably engages the valve seat and has a periphery which sealably engage said valve housing, said diaphragm including a central aperture and a metering aperture communicating with the inlet chamber;

a tapered pin extending from said valve housing into the metering aperture;

a diaphragm retainer in the central aperture of said diaphragm and having an aperture therethrough which communicates with the outlet chamber;

a solenoid assembly mounted on said valve housing to form a cavity between said diaphragm and said solenoid assembly into which the metering aperture communicates, said solenoid assembly including a plunger biased by a spring against said diaphragm retainer to releasably seal the aperture in said diaphragm retainer and including a electrical coil around the plunger; and

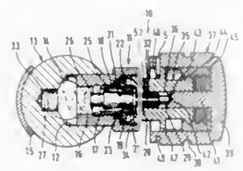
a means for sensing the presence of a user adjacent the faucet and in response thereto for energizing said electrical coil.

4,915,348

EXHAUST VALVE FOR BLOOD PRESSURE MEASURING APPARATUS

Blasius Speidel, Jungingen, Fed. Rep. of Germany, assignor to Speidel + Keller GmbH & Co. KG, Jungingen, Fed. Rep. of Germany

Continuation of Ser. No. 115,508, Nov. 3, 1987, abandoned. This application Jan. 18, 1989, Ser. No. 298,851
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637271
Int. Cl.[4] F16K *1/38, 31/50*
U.S. Cl. 251—122 **11 Claims**



1. An exhaust valve comprising:

a valve housing defining an outlet channel with an annular valve seat arranged along the course of said outlet channel, said valve seat facing toward the interior of said valve housing;

a conical valve body formed as a slender conical frustum having its larger diameter end oriented toward the interior of said valve housing and disposed in said outlet channel adjacent said valve seat so as to be axially movable into and out of contact with said valve seat, said conical valve body forming a gas-tight seal at the point of contact when it is in contact with said valve seat;

a closing spring arranged in said valve housing having one end supported against the valve housing and its other end supported against the valve body and exerting a closing force on said valve body in the direction toward the valve seat; and

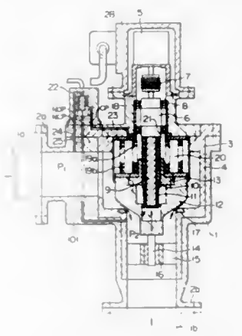
a screw cap mounted by two-stage steep threads on said valve housing so as to move axially along said valve housing when turned, said screw cap contacting said valve body through a support bearing, which rotatably axially and radially supports the outwardly oriented end of the valve body, to move said valve body axially within said valve housing.

4,915,349

GAS GOVERNOR APPARATUS AND GAS PIPING SYSTEM

Tomoaki Inoue, Mito; Yoshiaki Chiba, Hitachi; Kazuhiko Kawaike; Seishi Watahiki, both of Katsuta, and Shinji Sonoda, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 7, 1988, Ser. No. 280,934
Claims priority, application Japan, Dec. 9, 1987, 62-309631
Int. Cl.[4] F16K *31/04*; G05D *16/00*
U.S. Cl. 251—129.03 **11 Claims**



1. A gas governor apparatus comprising:

an outer casing fixed to a piping structure;

an inner casing received into said outer casing;

a valve body slidably supported by said inner casing for controlling pressure and flow rate of fluid between said valve body and a valve seat provided in said inner casing;

a drive mechanism including a drive shaft for driving said valve body, and a drive motor connected to said drive shaft through a coupling;

a ball bearing means for supporting the drive shaft;

bearing case means for receiving said ball bearing means and covering an opening of said outer casing; and

wherein said drive motor is arranged above said bearing case means, and said outer casing is formed of a generally L-shaped configuration and is provided at its upper end with an opening for mounting said inner casing therein.

4,915,350

ELECTROMAGNETICALLY ACTUATABLE VALVE

Rudolf Babitzka, Kirchberg-Neuhof, and Ferdinand Reiter, Markgroeningen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 23, 1989, Ser. No. 397,801
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1988, 3831196
Int. Cl.[4] F16K *31/06*; B05B *1/32*; F02M *51/06*
U.S. Cl. 251—129.15 **9 Claims**

1. An electromagnetically actuatable fuel injection valve for fuel injection systems of mixture-compressing internal combus-

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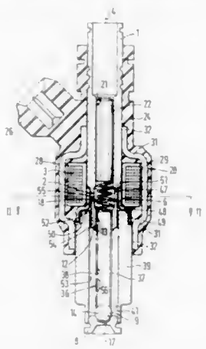
tion engines having externally supplied ignition, comprising a first housing element having means defining a core on one end around which a magnet coil is disposed, an armature adjacent an end of the core, a second housing element connected to said first housing element, a connecting tube (36) having a first and a second end, said connecting tube provided with a tube wall disposed concentrically with a longitudinal axis of said valve,



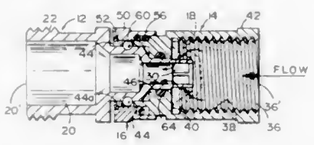
said connecting tube being disposed within said second housing element, said connecting tube being joined at a first end to the armature and at a second end to a valve closing element, a valve seat body supported within an end of said second housing element, a valve seat on said valve seat body, said valve closing element arranged to cooperate with said valve seat, said connecting tube having a longitudinal slit (37) penetrating the tube wall along its entire length.

4,915,351

HOSE COUPLING VALVE

Albert R. Hoffman, 14255 Terry Trails, Grand Haven, Mich. 49417

Filed Jun. 30, 1989, Ser. No. 374,053
Int. Cl.[4] F16L *37/28*
U.S. Cl. 251—149.1 5 Claims



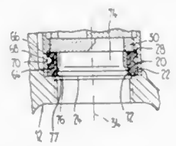
1. A hose coupling comprising:
a first hollow generally cylindrical body having a central passage for fluid flow therethrough, and first and second ends;
hose connector male threads on the outer periphery of said first end for connection to female threads of a hose;
said second end having a reduced diameter portion and a further reduced diameter projection;
said reduced diameter portion having a peripheral detent means for quick disconnect coupling to a second generally cylindrical body;
said further reduced diameter projection having an axial abutment end and having a lateral passage communicating with said central passage;
a second hollow, generally cylindrical body having a central passage, and first and second ends;
said second end having female threads on the inner periphery thereof for connection to male threads of a hose or faucet;
a spring biased detent collar around and retained on said first end of said second body, having means for engaging said detent means on said first body for quick connect and disconnect coupling of said bodies;
said first end of said second body having a cylindrical guide surface;
a cylindrical passage in said cylindrical guide surface having an internal diameter matching the diameter of said further reduced diameter projection to receive such, and an annular seal in said cylindrical passage to form a seal between said first and second bodies;
said second body having an annular transverse shoulder between said female threads and said cylindrical passage;
said further reduced diameter projection of said first body extending into said second body sufficiently to protrude beyond said shoulder;
a combination washer and valve disc of a resilient deformable material, said disc being on said annular shoulder positioned to have its outer portion sealingly pressed against said shoulder by the annular end of a hose or faucet male fitting connected to said second body female threads;
the central portion of said disc being engaged by said abutment end of said first body to deform said disc;
said central portion being imperforate; and
said disc having orifices radially between its said central portion and its said outer portion but aligned with said shoulder, whereby when said first and second bodies are connected, and said abutment end engages said disc, it will deform said disc and shift said orifices away from said shoulder and enlarge said orifices for flow therethrough, and when said first and second bodies are disconnected, fluid pressure will assist the inherent resiliency of said disc to shift said disc fully against said shoulder to stop fluid flow through said disc orifices and to shift said central imperforate disc portion over said cylindrical passage to close off said cylindrical passage.

4,915,352

SEALING ARRANGEMENT HAVING AN ANNULAR ELASTICALLY DEFORMABLE SEAL AND EMPLOYMENT OF SUCH SEALING ARRANGEMENT

Ferdinand Hochstrasser, Auenstein, Switzerland, assignor to KWC AG, Unterkulm, Switzerland

Filed Jan. 23, 1989, Ser. No. 299,604
Claims priority, application Switzerland, Jan. 27, 1988, 280/88
Int. Cl.[4] F16K *3/02*
U.S. Cl. 251—175 9 Claims



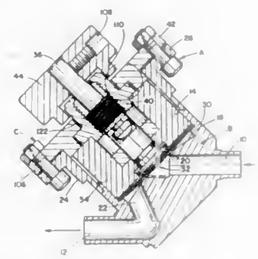
1. A sealing arrangement, comprising:
an annular elastically deformable seal through which flows a free-flowing medium;
said annular seal having end sealing surfaces and an essentially cylindrical internal side;
said annular seal comprising circumferential supporting ribs arranged at the regions of said end sealing surfaces and projecting outwardly in a radial direction;
a supporting ring;
said supporting ribs being supported at said supporting ring; and
a resilient inner ring which bears at said internal side against said annular seal.

4,915,353

DIAPHRAGM VALVE

Oliver L. Danko, Chesterland, Ohio, assignor to Nupro Company, Willoughby, Ohio

Filed Sep. 26, 1988, Ser. No. 249,386
Int. Cl.[4] F16K *7/16, 31/50, 43/00*
U.S. Cl. 251—331 10 Claims



7. A diaphragm valve comprising:
a body having an inlet and outlet operatively communicating across a valve seat defined in an enlarged recess in the body; and,
a diaphragm subassembly adapted for receipt in said body recess, said subassembly including
(i.) a sleeve dimensioned for close receipt in said body recess,
(ii.) a flexible composite diaphragm having a solid, generally circular configuration received adjacent one end of said sleeve and being clampingly engaged along a peripheral portion between said sleeve and body to define a primary seal,
(iii.) an actuating stem received through said sleeve and having a first end fixedly secured to said diaphragm without extending therethrough, said stem having a first portion adapted for selective, reciprocative movement relative to said sleeve, a second portion adapted for both rotational and reciprocative movement relative to said sleeve, and means interconnecting said stem first and second portion for limiting transfer of torque from said stem first portion to said stem second portion,
(iv.) a closure ring receiving said stem second portion therethrough, said closure ring including a threaded portion for advancing and retracting said stem,
(v.) a secondary seal interposed between said stem and sleeve, and
cap means for securing said diaphragm subassembly to said body, said closure ring having a portion extending into said sleeve and an intermediate radial portion being supported by said sleeve, said cap means having a portion extending into engagement with said sleeve and a radial portion of said cap means being in engagement with said closure ring radial portion, said radial portions defining gaps therebetween to permit radial adjustment of the closure ring prior to final tightening of the cap means so that the axis of the actuating stem is accurately aligned relative to the valve seat.

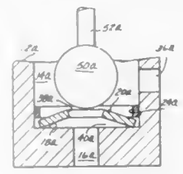
4,915,354

CUSHIONED VALVE SEAT

Dewey M. Sims, Jr., Wayne, and Lawrence McAuliffe, Jr., Southfield, both of Mich., assignors to Colt Industries Inc., New York, N.Y.

Filed Apr. 10, 1989, Ser. No. 335,796
Int. Cl.[4] F16K *1/14, 1/42*
U.S. Cl. 251—334 7 Claims

1. In a valve including a valve housing, means in said housing defining a chamber and a fluid flow passage entering said chamber through an inlet opening in a planar wall of said chamber, annular valve seat means in said chamber disposed around the periphery of said inlet opening, a valve member in said chamber movable into and out of engagement with said valve seat means to respectively block or permit flow of fluid between said passage and said chamber, and valve actuating means operable to drive said valve member into engagement with said valve seat means;
the improvement wherein said valve seat means comprises an annular washer having an outer periphery, opposite side surfaces and a central opening therethrough, said washer being resiliently deformable from a normally maintained frusto conical configuration into a substantially flat planar configuration, locating means locating said washer in said chamber with one of said side surfaces



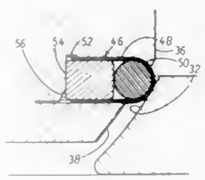
of said washer engaged at its outer periphery with said planar wall of said chamber in concentric relationship with said inlet opening, said washer when so engaged defining, when in its normal configuration, an annular fluid receiving recess between said one of said side surfaces and said wall in fluid communication with said inlet opening, and head means on said valve member engageable with the other side surface of said washer to block fluid communication between said central opening and said chamber, said valve actuating means being operable to drive said valve member into engagement with said other side surface with a force sufficient to deform said washer into said substantially flat configuration against said wall while expelling fluid from said recess into said flow passage.

4,915,355

SEAL

Edward S. Fort, Chitheroe, England, assignor to Fort Vale Engineering Limited, Lancashire, United Kingdom

Continuation of Ser. No. 4,886, Jan. 20, 1987, abandoned. This application Dec. 9, 1988, Ser. No. 281,996
Claims priority, application United Kingdom, Jan. 23, 1986, 8601640
Int. Cl.[4] F16J *15/16;* **F16K** *25/00*
U.S. Cl. 251—357 8 Claims



1. A seal arrangement comprising:
a resiliently deformable sealing member;
a separately formed, substantially undeformable support member having a plurality of faces, one of said faces being in abutment with said resiliently deformable member; and
a separately formed, protective envelope comprising a fold

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of flexible material having two opposed flaps joined by, and contiguous with, an arcuate linking portion;

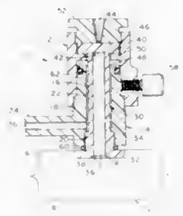
said opposed flaps of said envelope being releasably engageable with respective second and third faces of said substantially undeformable support member, thereby defining between said support member and said envelope a void of greater cross-sectional area than said resiliently formable sealing member and in which void said resiliently deformable sealing member, in use, is located, said arcuate portion of said protective envelope abutting said resiliently deformable member which is thereby held in abutment with said first face of said substantially undeformable support member.

4,915,356

FLUID VALVE

Lloyd V. Guild, 337 Thomas Rd., and Daniel L. Guild, 345 Thomas Rd., both of McMurray, Pa. 15317

Filed Jun. 20, 1988, Ser. No. 209,053
Int. Cl.[4] F16K *31/00*; G01N *30/02*
U.S. Cl. 251—340 7 Claims



1. A fluid valve comprising a valve body having an end adapted to be in fluid flow communication with a container, and a flow control element movably supported by the valve body for controlling fluid flow through the valve body, the flow control element having a first surface in communication with the fluid in the container and a second surface which does not communicate with fluid in the valve body when the flow control element is controlling fluid flow through the valve body and is aligned with the first surface, the second surface disposed in communication with the atmosphere around the valve.

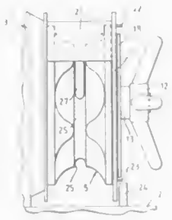
4,915,357

ANCHOR WINCH PERMITTING QUICK ANCHOR DROPPING

John Valentinsen, Oslo, Norway, assignor to Industri Lambertseter A/S, Oslo, Norway

PCT No. PCT/NO88/00022, § 371 Date Nov. 18, 1988, § 102(e) Date Nov. 18, 1988, PCT Pub. No. WO88/07021, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 18, 1988, Ser. No. 275,060
Claims priority, application Norway, Mar. 18, 1987, 871110
Int. Cl.[4] B66D *1/00*
U.S. Cl. 254—266 6 Claims

1. An anchor winch for pleasure craft comprising a reversible drive pulley (5) for an anchor cable which engages a sector of said drive pulley, the drive pulley (5) having an axis and a circumference, part of said circumference being spanned by a lifting member (21), means for rotatable mounting of the lifting member (21) about the axis of said drive pulley (5), means (17–19) for slip coupling of said lifting member (21) with said drive pulley (5), stop means (22–24) for limiting the rotational movement of said lifting member (21) between a first position outside said sector of engagement of the anchor cable on the drive pulley (5) and a second position whereat the lifting member spans a portion of the circumference of the pulley coincident with the sector of engagement of the anchor cable, and wherein said lifting member (21) comprises lifting means for



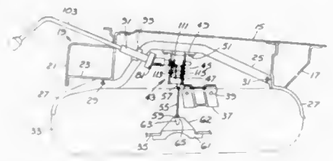
lifting the anchor cable out of drive cooperation with the drive pulley in said second position.

4,915,358

COMPOUND ANGLE DRIVE FOR RAISING AND LOWERING VEHICLE SPARE TIRE

Hulon D. Stallings, 8730 Sarah La., Grosse Isle, Mich. 48138

Filed Jul. 5, 1988, Ser. No. 214,161
Int. Cl.[4] B66D *1/00*
U.S. Cl. 254—323 9 Claims



1. A spare wheel lift and drive assembly for a vehicle having a frame, a downwardly facing mount bracket secured upon the underside of the frame adapted to receive a spare wheel, a lift mechanism centrally underlying the bracket and secured thereto, including a cable extending therefrom and a rotative drive arranged upon a first axis connected to the cable for selectively extending and retracting said cable and a spare wheel support connected to said cable, the improvement comprising:

a compound angle drive extending through said bracket upon a second axis intersecting and selectively arranged at an angle between 150 and 180 degrees relative to said first axis, and at one end universally connected to said rotative drive, whereby on selective rotation of said drive means the cable and wheel support retract against said spare wheel holding said wheel support and wheel in compressive retaining engagement with said mount bracket, and upon rotation in the opposite direction lowering said wheel to the ground surface;

said compound angle drive including an elongated drive tube arranged on said second axis, extending through said bracket and open at one end;

said compound angle drive means including a drive cup upon the other end of said tube;

a plurality of parallel angularly spaced drive pins arranged in a circle around said second axis and secured within said drive cup;

a drive sleeve coaxially mounted upon said rotative drive and secured thereto; and

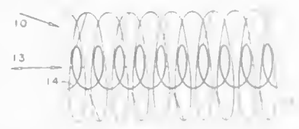
a drive disc upon one end of said drive sleeve and secured thereto, said drive disc being nested within said cup and including a plurality of spaced peripheral radial slots cooperatively receiving said drive pins respectively, said drive sleeve and said drive tube rotating in unison, an end plate fixed to said drive cup, said end plate closing said cup and enclosing said drive disc, said drive pins being secured in said end plate.

4,915,359

SECURITY APPARATUS

Richard B. Cochrane, Steeledale, South Africa, assignor to Cochrane Steel Products (proprietary) Limited, Johannesburg, South Africa

Filed Mar. 21, 1989, Ser. No. 326,796
Claims priority, application South Africa, Mar. 22, 1988, 88/2017
Int. Cl.[4] A01K *3/00*
U.S. Cl. 256—10 13 Claims



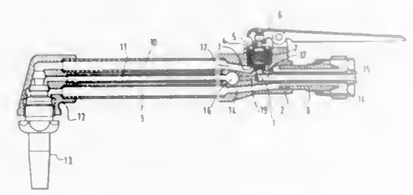
1. Security apparatus which includes a barrier coil having a plurality of side-by-side turns defining a tubular space extending along the coil within the turns, at least one electrically uninsulated electrical conductor which is located inside said tubular space, and which extends in the axial direction of, the barrier coil, and electrical insulating means connected between the electrical conductor and the coil and supporting the conductor within the tubular space of the barrier coil.

4,915,360

CUTTING TORCH HAVING POPPET METERED CUTTING OXYGEN FLOW CONTROL VALVE

Richard Goulet, Montreal, and Tom J. Dixon, Baie D'Urfe, both of Canada, assignors to Canadian Liquid Air Ltd - Air Liquidecanada Ltee, Montreal, Canada

Filed Jan. 3, 1989, Ser. No. 293,078
Claims priority, application Canada, Jul. 13, 1988, 571906
Int. Cl.[4] B23K *7/00*
U.S. Cl. 266—48 7 Claims



1. In a cutting torch having a cutting head connected to an oxygen inlet passageway via a cutting oxygen passageway and a combustion oxygen flow control valve having a combustion oxygen passageway connected to said oxygen inlet passageway for metering oxygen for combustion with a fuel gas in the cutting head, a manually operated cutting oxygen flow control valve positioned in said cutting oxygen passageway downstream of a point where said combustion oxygen passageway connects to the oxygen inlet passageway in an oxygen flow direction, said cutting oxygen flow control valve comprising:

means for defining a valve seat in said cutting oxygen passageway;

a diaphragm positionable in said cutting oxygen passageway and normally seated on said valve seat to close said cutting oxygen passageway;

manual means for selectively lifting said diaphragm from said valve seat to open said cutting oxygen passageway; and

a poppet movably positioned in said cutting oxygen passageway upstream of said valve seat, said poppet having orifice means for varying a passage area of said cutting oxygen passageway as a function of a position of said poppet in said cutting oxygen passageway such that said sectional area increases with downstream movement of said poppet,

whereby said poppet is moved downstream by cutting oxygen gas pressure to increase said sectional area as said manual means for selectively lifting lifts said diaphragm from said seat, so that a flow rate of oxygen past said oxygen flow control valve is substantially proportional to a lifting of said diaphragm from said seat.

4,915,361

RAPID THERMOCHEMICAL TREATMENT AUTOMATIC INSTALLATION

Oliver Schwebel, Courcouronnes, and Denis Lebeaupin, Charenton, both of France, assignors to Stein Heurty, RIS Orangis, France

Filed Sep. 23, 1988, Ser. No. 248,139
Claims priority, application France, Sep. 24, 1987, 87 13217
Int. Cl.[4] C21D *9/00*
U.S. Cl. 266—249 16 Claims

1. A treatment apparatus for parts comprising:

(a) a fixed plate including at least one treatment module suspended from the lower surface thereof, and a loading station, said fixed plate including at least one opening for the introduction of parts to be treated into the at least one treatment module;

(b) a movable plate being mounted above and movable relative to said fixed plate; and

(c) transfer means mounted on said movable plate, whereby said movable plate is moved to bring the transfer means successively above the loading station and said at least one opening for introducing the parts to be treated into said at least one treatment module.

4,915,362

CARBON DIOXIDE SNOW NOZZLE FOR METALLURGY

Raymond Borasci, Chatenay Malabry, France; Jean-Michel Charles, Tokyo, Japan, and Sylvain Windels, Aulnay-sous-Bois, France, assignors to Carboxyque Francaise and L'Air Liquide, Paris, France

Filed Nov. 16, 1988, Ser. No. 271,925
Claims priority, application France, Nov. 26, 1987, 87 16399
Int. Cl.[4] B05B *9/00*
U.S. Cl. 266—266 16 Claims

1. A carbon dioxide snow nozzle for rendering a molten metal inert, said nozzle comprising a T-shaped element having a first end for connection to a source of liquid carbon dioxide and a second end and a third end, a first liquid carbon dioxide

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conveying line having a first controlled valve with a first outlet and connected to said second end of the T-shaped element, a second liquid carbon dioxide conveying line having a second controlled valve with a second outlet and connected to said

third end of the T-shaped element, a V-shaped connecting element having a first branch and a second branch respectively connected to said outlets of the valves and an outlet end, and a snow discharge pipe connected to said outlet end of the V-shaped element.

4,915,363

IMPACT DAMPER

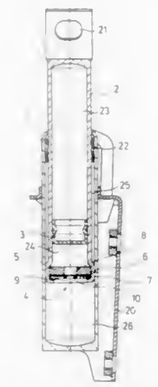
Ernst Prozeller, Schweinfurt, and Werner Christel, Hambach, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Jun. 27, 1989, Ser. No. 372,028

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1988, 3822322

Int. Cl.[4] B60R *19/32, 19/34*

U.S. Cl. 267—64.15 13 Claims



1. An impact damper for positioning a bumper member of a motor vehicle with respect to the framework of said motor vehicle, said impact damper comprising two damper elements (1,2) movable with respect to each other, one (1) of said damper elements (1,2) being connectable with said framework, the other (2) of said damper elements (1,2) being connectable with said bumper member, said damper elements (1,2) being biased towards a first relative terminal position by substantially elastic biasing means, at least two fluid chambers (28,24) being defined within said impact damper, said fluid chambers (28,24) being interconnected by throttled passage means (9,8), said damper elements (1,2) being movable towards a second relative terminal position in response to an impact to be absorbed, said fluid chambers (28,24) having respective volumes in said first terminal position, the relationship of said respective volumes being variable in response to a relative movement of said damper elements (1,2) towards said second relative terminal position, a fluid flow through said throttled passage means (9,8) resulting from variation of said relationship of volumes of said fluid chambers (28,24) in response to said relative movement, said throttled passage means (9,8) comprising a sandwich arrangement of at least two discs (6,5), namely a support disc (5) and a throttling disc (6), said support disc (5) and said throttling disc (6) having substantially aligned holes (8,9), said holes (8,9) defining the cross-sectional area of said throttled passage means (9,8), the cross-sectional area of said hole (9) in said throttling disc (6) being smaller than the cross-sectional area of said hole (8) in said support disc (5), said support disc (5) following said throttling disc (6) in the direction of said fluid flow, a preset breaking line (27) being defined for said throttling disc (6), said throttling disc (6) being broken along said preset breaking line (27) in response to a predetermined pressure difference between said fluid chambers (28,24) resulting from said relative movement such as to increase the cross-sectional area of said hole (9) in said throttling disc (6).

4,915,364

FLUID SUSPENSION UNIT, PARTICULARLY FOR HEAVY MOTOR VEHICLES

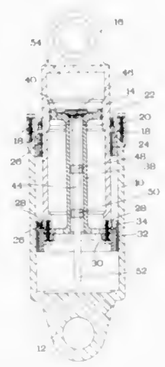
Roberto Perlini, Corso Venezia 93, 37047 San Bonifacio, Italy

Continuation of Ser. No. 414,063, Sep. 2, 1982, abandoned, which is a continuation of Ser. No. 178,606, Aug. 15, 1980, abandoned. This application Nov. 18, 1987, Ser. No. 122,281

Claims priority, application Italy, Oct. 17, 1979, 69018-A/79

Int. Cl.[4] F16F *5/00*

U.S. Cl. 267—64.26 19 Claims



1. A fluid suspension unit, particularly for heavy motor vehicles, comprising an outer cylinder and an inner cylinder sealingly mounted for sliding movement within said outer cylinder and defining a chamber of variable volume containing a hydraulic fluid and a gas in predetermined proportions, characterized in that the gas containing portion of said chamber is divided into first and second sub-portions, respectively of low and high pressure, by a diaphragm provided with an opening normally closed by means controlled by the relative position between the two cylinders to open by mechanical action exerted on said means when the suspension unit reaches a predetermined degree of compression and to maintain said opening open as long as said suspension unit is compressed to an extent equal or greater than said predetermined degree of compression, such as to make the pressure equal in said first and second sub-portions, the gas in said first sub-portion being operative to support a load and the gas in said second sub-portion being in direct communication with and cooperative with the gas in said first sub-portion to support a load only when said opening is open upon the suspension unit having reached such predetermined degree of compression, and wherein said first and second sub-portions of said chamber contain respective portions of said gas, and said respective portions of said gas are in the same proportion after each closing of said opening in said diaphragm, whereby the mechanical action exerted on said means to open is not operative to change said proportion of said gas portions for effecting height adjustment.

4,915,365

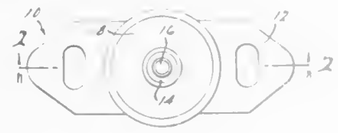
ELASTOMERIC ENGINE MOUNT WITH HYDRAULIC DAMPING

Ping Lee, Kitchener, Canada, assignor to The Standard Products Company, Cleveland, Ohio

Filed Sep. 4, 1987, Ser. No. 93,291

Int. Cl.[4] F16F *9/10*

U.S. Cl. 267—140.1 2 Claims



1. A hydraulic mounting device for resiliently supporting an engine on a frame, said device comprising:
- attachment means for attachment to a vehicle frame and for attachment to an engine;
- first chamber means forming a first chamber;
- second chamber means forming a second chamber;
- partition means forming a partition between said first and second chamber means;
- said partition means including first aperture means forming a first aperture therein to allow fluid flow between said first and second chamber means.
- said partition means including a third chamber means forming a third chamber therein between said first and second chamber means;
- said partition means including a second aperture means forming a second aperture in said third chamber means to allow fluid flow between said first and second and third chamber means;
- said third chamber means including a plug means disposed therein for floating in said third chamber means and for opening said second aperture means in response to high frequency and low amplitude engine movements to allow fluid flow through said second aperture means between said first and second chamber means and for closing said second aperture means in response to low frequency and high amplitude engine movements to prevent fluid flow through said second aperture means to allow fluid flow between said first and second chamber means solely through said first aperture means;
- a channel means to communicate with said first aperture means and said second chamber means for allowing fluid flow between said first and second chamber means when said second aperture means is closed;
- attachment means comprising a support bracket to be attached to a vehicle frame and core insert having one end threaded for attachment to the engine;
- an elastomeric support interconnecting said support bracket and the engine;
- said attachment means including a chamber insert disposed within said elastomeric support to strengthen said elastomeric support;
- said first chamber means comprising a first chamber formed within said elastomeric support and between said partition means;
- a cover member connected to said chamber insert and disposed opposite said elastomeric support;
- an elastomeric bellows disposed between said cover member and said partition means;
- said second chamber means comprising a second chamber formed between said elastomeric bellows and said partition means;
- said partition means comprising a first plate having "C"-shaped ends disposed between said elastomeric support and said elastomeric bellows;
- said third chamber means comprising a third chamber formed between said ends of said first plate and between a shoulder on said chamber insert;
- said plug means comprising a second plate movably disposed within said third chamber;
- said channel means comprising an annular conduit having a circular cross-section and being disposed above and connected to said second plate and having a third aperture to communicate with said first chamber and a fourth aperture to communicate with said second chamber;
- said first aperture means comprising a slot formed in said second plate; and
- a first gasket member formed about the periphery on one side of said second plate and a second gasket member formed about the periphery on the other side of said second plate.

4,915,366

OUTSIDE BACK ANGLE CANTED COIL SPRING

Peter J. Balsells, P.O. Box 15092, Santa Ana, Calif. 92705, assignor to Peter J. Balsells and Joan C. Balsells, both of Santa Ana, Calif.

Continuation of Ser. No. 186,016, Apr. 25, 1988, abandoned. This application Sep. 18, 1989, Ser. No. 408,686

Int. Cl.[4] F16F *1/06*

U.S. Cl. 267—167 5 Claims

1. A garter-type axially resilient coiled spring comprising:
- a plurality of coils canted in a counterclockwise direction along a centerline thereof;
- back angle means for both defining the disposition of a trailing portion of each coil with respect to a line normal to the centerline and for determining the force-deflection characteristics of the garter-type axially resilient coiled spring, said back angle means being less than 25 degrees;
- front angle means for defining the disposition of a leading portion of each coil with respect to the normal line, said front angle means being greater than said back angle means;
- said coils being interconnected in a manner forming a garter-type axially resilient coiled spring with the trailing portion along an outside diameter of the garter-type axially resilient coiled spring and the leading portion along an inside diameter of the garter-type axially resilient coiled spring.

4,915,367

CLAMPING APPARATUS FOR PARTS TO BE MACHINED

Andre Carossino, Louveciennes, France, assignor to Carossino Freres, Saint-Ouen-l'Aumone, France

Filed Sep. 14, 1988, Ser. No. 244,693

Claims priority, application France, Sep. 15, 1987, 87 12756

Int. Cl.[4] B23Q *3/02*

U.S. Cl. 269—101 21 Claims

1. Clamping apparatus for clamping a part to be machined to a work station, comprising a bed-plate presenting a working surface, and parallel grooves of generally T-section in said working surface and at least one slider for cooperating with

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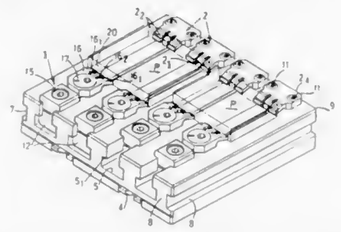
said grooves, said slider comprising a slider body including locking means for locking said slider body on said bed-plate, wherein said slider including a cramp presenting at least one elastically deformable finger, said cramp being mounted displaceably on said body, and eccentric means for displacing said cramp into engagement with a first side of the part to be ma-



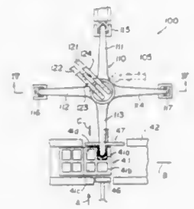
chined, the apparatus also including at least one abutment for fixing relative to said bed-plate, said abutment comprising at least one cramp presenting at least one elastically deformable finger for engaging a second side of the part to be machined opposite to said first side, whereby to clamp said part between said cramps on said bed plate, and fixing means for securing said bed-plate to said work station.

4,915,368

METHOD OF AND APPARATUS FOR ARRANGING SHEETS

Yuzo Tsunekawa; Yukio Ishida, and Tatsuo Shiino, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Feb. 5, 1988, Ser. No. 153,297
Claims priority, application Japan, Feb. 6, 1987, 62-26126
Int. Cl.[4] B65H *39/02*
U.S. Cl. 270—58 5 Claims



1. An apparatus for arranging a plurality of sheets side by side in a predetermined pattern on a sheet receiving member comprising

means for feeding the sheets to a receiving position one by one,

first to fourth rotatable arm members which extend radially from a pivot shaft at intervals of 90°,

first to fourth suction means which are respectively mounted on the rotatable arm members and adapted to pick up the sheet under vacuum force, said first to fourth rotatable arm members being rotated together about the pivot shaft alternately counterclockwisely and clockwisely by 90°, the first suction means being adapted to be rotated from the receiving position to a first relay position in response to counterclockwise rotation of the first rotatable arm member to transfer the sheet in the receiving position to the first relay position, and to be rotated from the first relay position to the receiving position in response to clockwise rotation of the same, the second suction means being adapted to be rotated from the first relay position to a delivery position in response to counterclockwise rotation of the second rotatable arm member to transfer the sheet in the first relay position to the delivery position, and to be rotated from the delivery position to the first relay position in response to clockwise rotation of the same, the third suction means being adapted to be rotated from the delivery position to a second relay position in response to counterclockwise rotation of the third rotatable arm member and to be rotated from the second relay position to the delivery position in response to clockwise rotation of the same to transfer the sheet in the second relay position to the delivery position, and the fourth suction means being adapted to be rotated from the second relay position to the receiving position in response to counterclockwise rotation of the fourth rotatable arm member and to be rotated from the receiving position to the second relay position in response to clockwise rotation of the same to transfer the sheet in the receiving position to the second relay position,

first to fourth flexible suction hoses for connecting the suction means to a vacuum source,

a support means for movably supporting the sheet receiving member in the delivery position, and

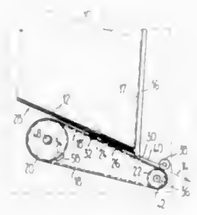
a drive means for moving the sheet receiving member in synchronization with rotation of the rotatable arm members along a predetermined path corresponding to said predetermined pattern so that a new part of the sheet receiving member is brought to the delivery position each time the sheet receiving member is moved.

4,915,369

APPARATUS FOR SEPARATING AND FEEDING ENVELOPES TO AN OFFICE MACHINE

Albert Rutishauser, Uerikon, Switzerland, assignor to Rutishauser Data AG

Filed Aug. 5, 1988, Ser. No. 229,147
Claims priority, application Switzerland, Aug. 11, 1987, 03093/87
Int. Cl.[4] B65H *5/16*
U.S. Cl. 271—2 7 Claims



1. An apparatus for separating and feeding envelopes having folded parts, in a feed direction toward an office machine, comprising a stacking magazine for containing a stack of envelopes, said magazine having a removal side from which envelopes are to be removed from said magazine, at least one conveying belt having a portion movable along said removal side of said magazine in the feed direction for conveying an envelope from said magazine, said conveying belt also having a portion positioned within said magazine and below said magazine for initially contacting an envelope in said magazine, at least one carrier means connected to and movable by said belt for force-locking engagement with the folded part of an envelope at said removal side of said magazine, for engaging and conveying the envelope in the feed direction out of said magazine to an office machine, drive means operatively connected to said at least one conveying belt for moving said belt, and a base plate extending substantially parallel to and adjacent said

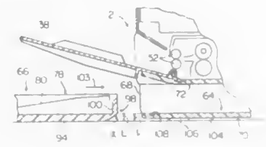
portion of said belt for initial contact with an envelope in said magazine, said base plate having a shoulder therein separating an upper surface of said base plate upstream in said feed direction from a lower surface of said base plate downstream in said feed direction, said lower surface sloping upwardly toward said magazine in said feed direction.

4,915,370

PAPER FEEDING DEVICE

Tooru Himeji, Sakai; Kiyotaka Arai, Osaka, and Masahiro Murakami, Shijonawate, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Feb. 19, 1988, Ser. No. 158,239
Claims priority, application Japan, Mar. 2, 1987, 62-30159[U]; Mar. 3, 1987, 62-30686[U]
Int. Cl.[4] B65H *1/00*
U.S. Cl. 271—162 7 Claims



1. In a paper feeding device for use in a machine including a housing to be supported on a support surface, said paper feeding device including a cassette-receiving section formed in a portion of said housing, a cassette-loading opening formed in said housing and leading to said cassette-receiving section, and a cassette detachably loadable into said cassette-receiving section through said cassette-loading opening in a loading direction, the improvement comprising means for, upon placing said cassette on the support surface and mounting said cassette in said loading direction, automatically ensuring that a leading end of said cassette, with respect to said loading direction, is conducted to and through said cassette-loading opening into said cassette-receiving section, said means comprising:

an inclined portion formed on said leading end of said cassette, said inclined portion extending in an upwardly and forwardly inclined manner relative to said loading direction, and the vertical dimension between the lower end of said inclined portion and the upper end thereof being greater than the vertical dimension between the support surface and the lower edge of said cassette-loading opening.

4,915,371

DEVICE FOR SORTING AND STACKING PAPER SECURITIES, NOTABLY BANKNOTES

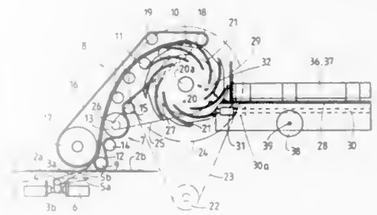
Brian Quinton, Lausanne, Switzerland, assignor to De La Rue Giori S.A., Switzerland

Filed Nov. 3, 1988, Ser. No. 266,833
Claims priority, application Switzerland, Dec. 4, 1987, 04743/87
Int. Cl.[4] B65H *29/58*
U.S. Cl. 271—280 8 Claims

1. A device for sorting and stacking paper securities (*2a*, *2b*), notably banknotes, for separating and stacking those paper securities which are provided with a distinguishing mark and forming part of a sequence of paper securities transported continuously in succession along a first conveyor track (1), which comprises a second conveyor track (7, 8) for the marked paper securities (*2a*) which overlies the first conveyor track (1), a detector reacting to said distinguishing marks, switching means (3) disposed after said detector in the conveyor direction, controlled by said detector and, in its operative conditions, adapted to divert the marked paper security (*2a*) from said first conveyor track (1) to said second conveyor track (7, 8), together with a stacking magazine (28–31) for the marked paper securities (*2a*), characterized in that:

said switching means comprises a deflector (*3a*) underlying the inlet end of said second conveyor track (7, 8), tiltable about a horizontal axis (4) perpendicular to the direction of, and underlying, said first conveyor track (1), from an inoperative condition (*5a*) in which said deflector is disposed beneath said first conveyor track (1) and an operative condition (*5b*) in which said deflector is inclined and projects above the plane of said first rack (1),

said second conveyor track (7, 8) extends tangentially to said deflector (*3a*) in its operative condition, the second conveyor track (7, 8) consisting of at least one pair of endless belts (12, 16) of which one portion bears against the other to provide a path along which said belts (12, 16) contact each other, each belt (12, 16) being supported by several rollers (9, 10, 11, 13, 14, 17, 18, 19), and that at least one (13) of said rollers is adapted to drive said belts (12, 16), the initial end of said path being so close to said deflector (*3a*) that the paper securities (*2a*) diverted by said deflector are pinched by the nip formed between said belts in mutual contact (12, 16); the second conveyor track (7, 8) comprises in close proximity of said deflector (*3a*) a curved guide plate (34) providing a path tangent to said deflector (*3a*) in the operative condition thereof so as to direct the diverted paper security (*2a*) towards the nip formed between said pair of endless belts (12, 16),



stacking wheel is provided at the outlet end of said second conveyor track (7, 8) and adapted to rotate about a shaft (*20a*) perpendicular to said second conveyor track (7, 8) and consisting of a plurality of axially spaced disks (20) provided with spiral-shaped slots (21) opening out at least substantially tangentially to the periphery of the stacking wheel and extending from said periphery of the stacking wheel to the centre as a prolongation of the second track (7, 8) for receiving the paper securities (*2a*) emerging from said second track (7, 8), that the circumferential velocity of said wheel is synchronous with the rate of feed of said paper securities (*2a*), that between said disks fixed inclined stacking deflectors (*32a*) intersecting said slots (21) are provided for extracting the paper securities from said slots after an angular movement impressed to said paper securities by said wheel until they are disposed substantially vertically, and guiding said paper securities toward said stacking magazine (28, 29, 30, 31, 36, 37),

said stacking magazine comprises an at least substantially horizontal bottom tray (28) and an abutment (29) extending upwardly substantially or right angles to said tray (28), said abutment plate being adapted to slide along said tray and responsive to spring means constantly urging said abutment plate toward the periphery of said wheel, and to recede when pushed by the paper securities disposed on edge and delivered by said stacking wheel.

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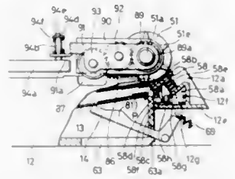
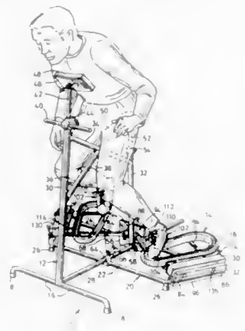
4,915,372
PAPER FEEDING DEVICE
Atsushi Kano, Amagasaki; Masayuki Mizuno, Osaka; Manabu Kajiwara, Takasago; Kenji Sakaue, Gojo; Yuji Abe, Hirakata, and Kazuo Nakamura, Sakai, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan
Division of Ser. No. 177,903, Apr. 1, 1988, Pat. No. 4,813,612, which is a continuation of Ser. No. 866,505, May 23, 1986, abandoned. This application Oct. 28, 1988, Ser. No. 264,066
Claims priority, application Japan, May 24, 1985, 60-112399; May 30, 1985, 60-117175; Sep. 9, 1985, 60-197621; Sep. 10, 1985, 60-139322; Feb. 28, 1986, 61-299501
Int. Cl.[4] B65H *1/22*
U.S. Cl. 271—164 10 Claims



1. A paper feeding device for an image-forming machine, to feed a sheet of paper into the image-forming machine from a paper cassette, said device comprising:
paper feeding means positioned to be adjacent one end of the paper cassette when the paper cassette is mounted in the image-forming machine;
means for moving said paper feeding means in a paper-feeding direction to feed a sheet of paper from the cassette into the image-forming machine;
a driving force transmitting mechanism responsive to movement of the paper cassette over a first distance during removal of the paper cassette from the image-forming machine for moving said paper feeding means in the direction opposite the paper-feeding direction to withdraw a sheet of paper partially fed into the image-forming machine away from the image-forming machine a second distance greater than the first distance;
whereby upon removal of the paper cassette from the image-forming machine, the sheet of paper is withdrawn from the machine and returned into the paper cassette.

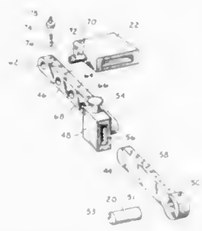
4,915,373
EXERCISING MACHINE FOR ICE SKATING
Kevin W. Walker, R. R. #1, Shelburne, Ontario, Canada L0N 1S0
Filed Oct. 26, 1988, Ser. No. 262,909
Int. Cl.[4] A63B *1/00, 21/00*
U.S. Cl. 272—70 9 Claims

9. A power skating exercise machine comprising:
(a) a frame having a front end and back end
(b) a pair of endless guide tracks arranged one on either side of the frame, each endless guide track having a power section and a return section which are connected to one another at opposite ends thereof by arcuate shaped end sections whereby the endless guide track follows a path which approximates the path of the power and return stroke of a skate of a skater when the skater is accelerating forwardly,
(c) a pedal for each guide track, each pedal having a track follower mounted in one of the endless guide tracks for movement therealong, the track follower being proportioned to pass freely along the return section, track mounting means supporting the guide tracks on the frame in a position in which the power sections are arranged to diverge in a direction toward the back end of the frame and the return sections are located laterally inwardly from the power sections,



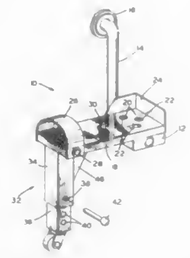
(d) drag means along the power section of each track for applying a load to the follower which resists the movement of the follower therealong.

4,915,374
RECUMBENT EXERCISE CYCLE WITH ARTICULATED PEDALS
K. Richard Watkins, San Diego, Calif., assignor to MEDmetric Corporation, San Diego, Calif.
Filed Feb. 2, 1989, Ser. No. 305,949
Int. Cl.[4] A63B *21/00;* G05G *1/00*
U.S. Cl. 272—73 13 Claims



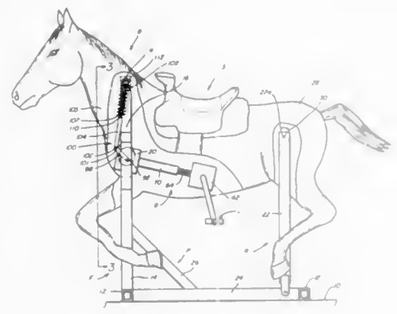
6. A recumbent exercise cycle which comprises:
a frame;
a rotatable crankshaft mounted on said frame, said crankshaft having a first end and a second end;
a first pedal and a second pedal;
a first crank arm and a second crank arm each fixedly attached to said respective first and second ends of said crankshaft substantially perpendicular thereto; and
a first extension arm and a second extension arm, each having an offset shaft with means for joining to said respective crank arms at selected points thereon, and said pedals being attached to said respective extension arm for movement of said pedals in a circular path about the selected point on said respective crank arms.

4,915,375
PEDAL ATTACHMENT FOR AN EXERCISE BIKE
Charles R. Ginsburg, 4545 S. Detroit Ave., Toledo, Ohio 43614
Filed Jul. 12, 1989, Ser. No. 378,657
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—73 8 Claims



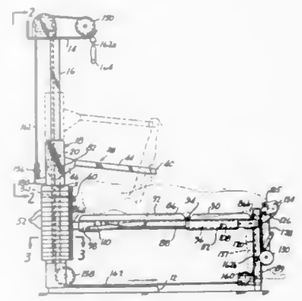
1. An L-shaped attachment for a pedal and crank arm linkage of an exercise bike comprising:
a foot support for accommodating the foot of a user;
means secured to said foot support for limiting relative movement between the foot of a user and said support;
means for attaching said foot support to the pedal of the exercise bike generally at the perpendicular rotation; and
roller means connected generally perpendicular to said foot support in spaced relation from said means for attaching said foot support to the pedal, and depending from said foot support to effect contact with a supporting surface during a portion of the rotation of the pedal and crank arm linkage thereby flexing the user's foot upon contact with said surface.

4,915,376
ANIMATED EXERCISER APPARATUS
Bill D. St. Clair, Rte. 1, Box 158-D, Ingleside, Tex. 78362
Filed Apr. 28, 1988, Ser. No. 187,279
Int. Cl.[4] A63G *17/00;* A63B *21/00*
U.S. Cl. 272—73 18 Claims



1. A stationary exerciser apparatus, comprising:
(a) body means for stimulating a movable body;
(b) said body means having a surface thereon where a rider may sit;
(c) support means for supporting said body means for movement above a floor or surface, said support means comprising:
(1) front support means mounted within a front portion of said body means; and
(2) rear support means mounted within a rear portion of said body means;
(d) pedal means engageable by the rider's feet for being driven thereby;
(e) said pedal means being mounted extending externally from said body means; and
(f) gear means mounted internally within said body means and responsive to said pedal means for causing rotary movement of said body means with respect to said front support means to simulate a movable body.

4,915,377
EXERCISE APPARATUS
Parker Malake, Fall Brook, and Ron Sheltra, Upland, both of Calif., assignors to Marcy Fitness Products, Ontario, Calif.
Continuation-in-part of Ser. No. 916,639, Oct. 8, 1986, Pat. No. 4,793,608, which is a continuation-in-part of Ser. No. 608,372, May 9, 1984, abandoned. This application Oct. 17, 1988, Ser. No. 258,772
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—118 5 Claims



1. An exercising apparatus for the performance of exercises by a trainee, comprising:
(a) a vertically reciprocative carriage, including roller means;
(b) a frame comprising a substantially vertically disposed guide column having guide means for guiding vertical travel of said roller means of said carriage;
(c) first body engaging means projecting from said carriage for engagement by the trainee to move said carriage upwardly relative to said guide column;
(d) a plurality of weights disposed substantially directly below said carriage, each of said weights having an aperture therethrough comprising first and second portions, said first portion being adapted to receive a portion of said guide column;
(e) at least one substantially vertically disposed connecting column connected to said carriage and adapted to be selectively connected to at least one of said weights whereby said carriage is biased in a vertically downward direction, said connecting column being closely receivable in said second portions of the aperture formed in said weights;
(f) an elongated user support bench having first and second end portions, said first end portion being disposed proximate said frame;
(g) second body engaging means mounted proximate said second end portion of said bench, said means including a pivotally movable portion adapted to pivot about a first pivot point and being movable from a first lowered position relative to the surface of said, bench wherein said pivotally movable portion is movable by the legs of the

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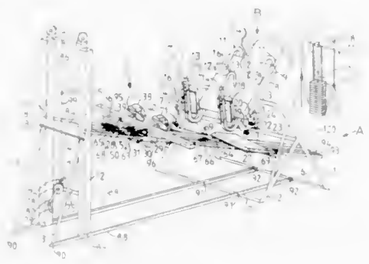
trainee through a prescribed arc, to a second elevated position relative to said bench wherein said pivotally movable portion is adapted to pivot about a second pivot point elevated with respect to said first pivot point and being movable through a prescribed arc by the arms of a trainee sitting on said bench proximate said second end portion thereof; and

(h) means for interconnecting said second body engaging means with at least one of said weights.

4,915,378
EXERCISING APPARATUS
Alexander Abrahamian, and Joseph Abrahamian, both of Lot 2, Addison Street, Thirlmere, New South Wales 2572, Australia
Filed Aug. 25, 1988, Ser. No. 236,594
Claims priority, application Australia, Aug. 26, 1987, PI3989
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 19 Claims



1. An exercising apparatus comprising a frame having an upper body support which is pivotable about a horizontal axis and is supported by said frame, an adjustable resistance means for providing a variable resistance to pivotal movement of said upper body support a feet support slideably engageable with a linear track supported by said frame, said track having a slope inclined relative to a horizontal plane and extending forwardly of said upper body support so that it faces towards the upper body support, wherein a user is able to be positioned between said upper body support and said feet support and slide said feet support along said track and pivot said upper body support as required to stretch and exercise.

4,915,379
APPARATUS FOR EXERCISE AND PHYSICAL THERAPY
William E. Sapp, Rte. 5, Box 39 B, Riverside, Wash. 98849
Filed Jul. 21, 1988, Ser. No. 222,721
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 8 Claims

1. An apparatus for exercising, comprising:

an elongated base having opposed ends and a bench attached thereto spacedly above the base;

an elongate upright mast having an upper end and a lower end, said mast being rigidly attached to the base;

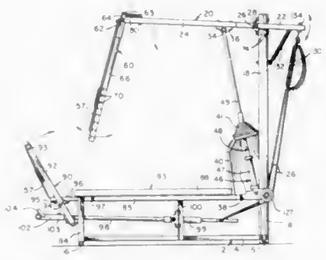
a longitudinal boom assembly having opposed first and second ends, the boom assembly being pivotally attached intermediate its ends to the mast, adjacent the upper end of the mast, and the boom assembly being capable of pivotable movement about an axis perpendicular to the elongate axis of the mast;

adjustable pressure means having a first end pivotally attached to the boom intermediate the boom first end and its attachment to the mast and a second end pivotally attached to the base, the pressure means being adapted to apply a continuous force on the boom;

handle means attached to the first end of the boom assembly, the handle means adapted to be grasped by a user for imparting pivotal movement to the boom assembly;

a longitudinal pull shaft carrier pivotally mounted to a carrier support rigidly attached to the base, the pull shaft carrier defining a medial channel therethrough;

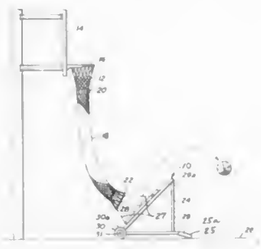
a pull shaft with opposed first and second ends slidably carried in the medial channel defined in the pull shaft carrier;



an arm assembly pivotally attached to the base and to the second end of the pull shaft to impart reciprocating movement to the shaft responsive to pivotal motion of the arm assembly; and

cable means attached between the first end of the pull shaft and the second end of the boom to pivot the boom assembly when the pull shaft is moved away from the mast.

4,915,380
BASKETBALL REBOUNDER
Bob J. Ackerman, Rural Route #1, Cedar Street, Canton, Ill. 61520
Filed Dec. 7, 1988, Ser. No. 280,875
Int. Cl.[4] A63B *69/00*
U.S. Cl. 273—15 A 15 Claims



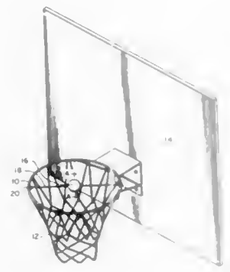
1. An apparatus for use in combination with a basketball rim for returning a basketball passing through the rim to a preselected location on a playing surface, said apparatus comprising:

a portable deflection means positioned on said playing surface for deflecting the basketball to the preselected location on the playing surface; and

transport means connectable to the rim and to said deflection means for transporting the basketball from the rim to impact against said deflection means, said deflection means being positionable and selectively orientable in position to change the preselected location on the playing surface; and

said transport means, when connected to said rim and deflection means, operating such that a basketball passing through the rim enters said transport means, travels through said transport means, and exits said transport means in a direction toward said deflection means, the basketball deflecting off of said deflection means to the preselected location.

4,915,381
BASKETBALL TARGET DEVICE
Mark C. Hackett, 37 Moon Ave., Brewer, Me. 04412
Filed Nov. 3, 1988, Ser. No. 267,453
Int. Cl.[4] A63B *63/08*
U.S. Cl. 273—1.5 A 3 Claims



1. In combination with the hoop of a basketball goal an aiming device for attachment to the hoop to assist in basketball shooting practice which comprises

a single elastic cord,

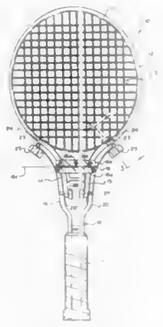
means at both ends of said cord for detachable fastening to said hoop so that the cord spans the center of the hoop opening and lies in the plane of the circle defined by the hoop, and

a visible aiming target on said cord centered on the axis of said opening,

said opening being free of obstructions other than said cord and target

whereby a ball will pass unimpeded through the hoop but will deflect the target so as to provide feedback to the player as to how to improve his shooting.

4,915,382
COMPACTIBLE TENNIS RACQUET
Erik H. Madsen, 2405 Camino Way, Salt Lake City, Utah 84121
Filed Jun. 6, 1988, Ser. No. 202,520
Int. Cl.[4] A63B *49/08*
U.S. Cl. 273—73 G 5 Claims



1. A compactible tennis racquet comprising a racquet head including a frame and a webbing within the frame, and head extensions extending from the periphery of the frame, at opposite sides thereof to a common central area;

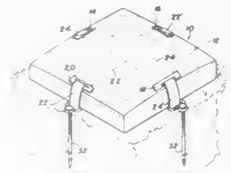
a handle, said handle including a gripping portion and extensions projecting therefrom and shaped to be tangential to the periphery of the frame of the head;

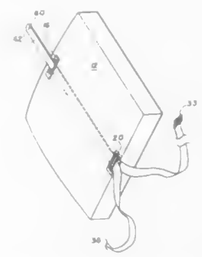
means for releasably coupling each of said handle extensions to the frame of the head, at the periphery thereof; and

means to releasably pivotally interconnect the head extensions and the handle extensions, at a neck of the racquet;

wherein the means to releasably couple the handle extensions and the frame of the head comprise bolts carried by the head and pivotable into slots in the handle extensions, and nuts threaded onto the bolts.

4,915,383
BASE FOR LITTLE LEAGUE BASEBALL FIELD
Betty F. Yamakuchi, and Muneyoshi Yamakuchi, both of 3434 N. Hamilton Ave., Chicago, Ill. 60618
Filed Sep. 8, 1988, Ser. No. 241,695
Int. Cl.[4] A63C *69/40*
U.S. Cl. 273—25 7 Claims





1. In an improved base assembly for use in a baseball field, wherein said base assembly comprises a base having a core and an outer covering surrounding said core, said outer covering comprising an upper surface defining a plurality of slots, and a bottom surface, two of said slots forming a first pair of oppositely-disposed slots, and another two of said slots forming a second pair of oppositely-disposed slots, and at least a pair of straps, one said strap inserted through one said pair of slots and the other said strap inserted through the other said pair of slots, each of said straps defining a first end and a second end, one of said first and second ends having means for fastening said respective strap together so that said first and second ends of said respective strap are secured together opposite said bottom surface of said outer covering, such that said respective strap forms a loop having a first longitudinal portion extending interiorly of said upper surface of said base, and a second longitudinal portion extending outwardly across said bottom surface of said base, each said strap defining a first loop-end portion and a second loop-end portion and a plurality of stak-

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ing pins for securing the base to the ground via said strap loop-end portions, wherein the improvement comprises:

a plurality of clip means for joining said plurality of staking pins to said strap loop-end portions, one said clip means for one said strap loop-end portion and one said staking pin, each said clip means spacing a respective said staking pin in the lateral direction from the associated said strap loop-end portion;

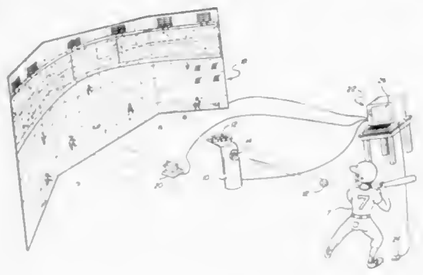
each said clip means comprising a first loop portion for slidingly receiving therethrough a respective said securing pin, and a second loop portion for receiving therein a respective said strap loop-end portion, said first loop portion and said second loop portion being connected together and spaced apart by an intermediate section; said second loop portion comprising an entrance channel allowing for the insertion therethrough of a respective said strap loop-end portion for inserting said strap loop-end portion into said second loop portion; said second loop portion being substantially wider than said first loop portion, and said first loop portion being a relatively closed loop for retaining a said staking pin therein.

4,915,384

PLAYER ADAPTIVE SPORTS TRAINING SYSTEM

Robert A. Bear, 12997 Merriman Rd., Livonia, Mich. 48150

Filed Jul. 21, 1988, Ser. No. 222,047
Int. Cl.[4] A63B *69/40*
U.S. Cl. 273—26 R 30 Claims



1. An adaptive sports training system for simulating play of a game, said system including:

means for delivering a ball to a player;

target means disposed so as to be struck by a ball projected by the player and operative to provide a signal indicative of the skill with which the target is struck; and

a signal processor comprising means for (1) receiving signals from the target means and (2) controlling at least one of said ball delivery means or said target means in response to said signals so as to increase or decrease the difficulty of the game in proportion to the skill with which the target is struck so that the system adapts to and accommodates the skill level of the player.

4,915,385

GOLF CLUB

Donald A. Anderson, 19281 Tobago La., Huntington Beach, Calif. 92646

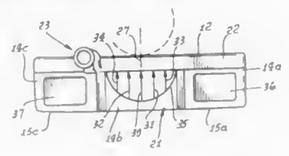
Continuation of Ser. No. 7,097, Jan. 27, 1987, Pat. No. 4,762,324. This application May 9, 1988, Ser. No. 191,574
The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—164 6 Claims

1. In a golf club having a head defining a ball striking front face, a bottom surface, a top surface, a rear surface, a heel and a toe, the improvement comprising:

(a) the top surface having first, second and third regions respectively near the toe, mid-extent of the head and heel,

(b) each of the first and third regions having a recess sunk downwardly therein,

(c) and metallic weights received downwardly in said recesses, each recess intersecting the corresponding region top surface so that the outlines of said recesses and weights are substantially polygon shaped, in horizontal cross section, with said outlines visible from above said top surface, the recesses having bottom walls everywhere spaced above the bottom surface of the head,



(d) the head defining a ledge proximate said second region, the ledge having a top surface extending generally at the levels of the lowermost portions of said weights, and including a main marker on the ledge directed toward the front face of the head, said marker being located at the mid-point between said recesses, the head being vertically open above the ledge top surface to enable downward viewing of the main marker,

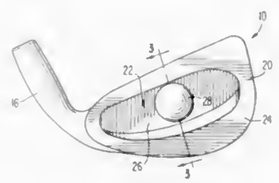
(e) and the head defining a forward upright wall that extends between and forwardly of said first and third regions and above their levels, the club having a hosel intergral with said wall at a location above the top levels of said first and third regions.

4,915,386

PERIMETER WEIGHTED IRON TYPE GOLF CLUB HEAD WITH CENTRALLY LOCATED COMPLEMENTARY WEIGHT

Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204

Filed Oct. 25, 1988, Ser. No. 261,884
The portion of the term of this patent subsequent to Mar. 13, 2007, has been disclaimed.
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—167 F 3 Claims



1. A weighting system for an iron type golf club head having a loft angle of at least 12 degrees including a hosel, heel, toe, ball striking face, a center of percussion on said ball striking face, and a complementary rear face; the weighting system comprising:

a peripheral mass formed on at least the heel, toe and lower surface portions of the outer periphery of said rear face of the club head;

said peripheral mass defining a cavity centrally located on said rear face of the club head and providing a perimeter weighting for the club head; said cavity having side walls extending outwardly from said complementary rear face; and

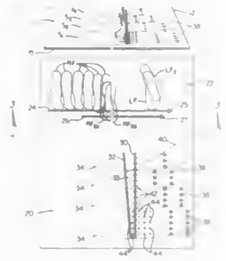
a centrally located, rounded, concentrated weight member formed completely within said cavity and spaced from said cavity side walls and located on said complementary rear face at said center of percussion; said weight member being further characterized by a raised surface extending rearwardly from said rear face to substantially in alignment with the rearmost surface the outer of said peripheral mass and in the same direction as said side walls of said peripheral mass, the extremities of said weight member being spaced radially about said center of percussion.

4,915,387

GOLF PRACTICE AND TRAINING DEVICE

Gary D. Baxstrom, Aurora, Colo., assignor to Bax-Go, Inc., Denver, Colo.

Continuation-in-part of Ser. No. 89, Jan. 2, 1987, abandoned. This application Nov. 30, 1988, Ser. No. 278,794
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—187 A 11 Claims



1. In a golf swing training and practice aid wherein a mat is adapted to be placed on a ground surface, said mat having an upper surface including a foot alignment portion, a target line extending parallel to the intended line of flight of the golf ball, and at least one ball position line extending perpendicular to and away from said target line across said upper surface, the improvement comprising:

a series of foot position indicia on said upper surface portion and in proximity to said target line designating a series of different foot positions for placement of each of the left and right feet of a player in accordance with the length and type of golf club being swung;

a shoulder alignment line disposed in closely spaced parallel relation to and in front of said target line; and

a plurality of target-aiming lines spaced along an end of said mat nearest the target and extending parallel to said target line for indicating the intended path of flight of a ball toward the target when placed in alignment with one of said lines.

4,915,388

GOLF TRAINING APPARATUS

Frédéric Serin, 7, rue Bridaine, 75017 Paris, France

PCT No. PCT/FR86/00393, § 371 Date Mar. 31, 1988, § 102(e) Date Mar. 31, 1988, PCT Pub. No. WO88/00851, PCT Pub. Date Feb. 11, 1988
PCT Filed Nov. 19, 1986, Ser. No. 193,651
Claims priority, application France, Aug. 5, 1986, 86 11339
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—196 27 Claims

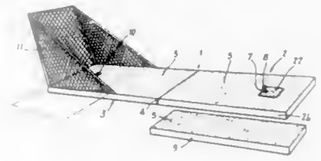
1. Golf training apparatus, comprising:

a substantially rectangular casing adapted for placement onto the ground, said casing having an upper face provided with an opening through which passes a cable fixed to a golf ball adapted to be placed onto the upper surface of said casing for hitting by a player;

a cable return mechanism for said cable disposed inside said casing, including at least one electric motor driving said cable, said cable return mechanism returning the cable for storing it in an accumulated form, said mechanism for returning the cable comprising means to permit the free unrolling of the cable when the ball is hit by the player, and a pair of parallel cylinders between which said cable passes, one of said cylinders being a lower driving cylinder having a fixed position and being coupled to said electric motor, and the other of said cylinders being an upper back-pressure cylinder with a movable position for movably clamping said cable therebetween in one position of said upper cylinder and for permitting free movement of said cable between said cylinder on another position of said upper cylinder;

an actuator for coupling a power supply to said electric motor for control thereof, said upper face including plate means associated with said actuator mechanism actuatable by a player;

a magazine housed within said casing for housing said cable in a random fashion;



a cable return means responsive to said plate means and said actuator for pulling the cable back into said magazine for housing therein in a random manner, said cable being accumulated by freely coiling up onto itself, in a random manner, when the player presses said upper face and said actuator, said plate means including a movable plate forming a pedal actuatable by the player, said plate being movably mounted in an opening of said horizontal upper face of the casing and carrying under it said back-pressure cylinder mounted above said driving cylinder;

a spring urging said movable plate upwardly for keeping said two cylinders apart from each other and to leave the cable free between them; and

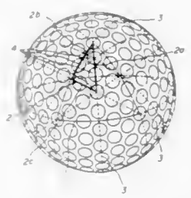
said activator being placed under said movable plate for actuation when the player presses on said plate forming said pedal.

4,915,389

GOLF BALLS

Keisuke Ihara, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Nov. 16, 1988, Ser. No. 271,837
Int. Cl.[4] A63B *37/14*
U.S. Cl. 273—232 8 Claims



1 A golf ball having a plurality of dimples formed in its spherical surface, characterized in that all of said dimples are arranged in a dimple pattern on all great circles depicted on said spherical surface.

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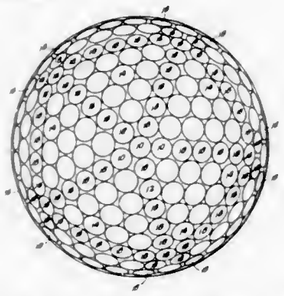
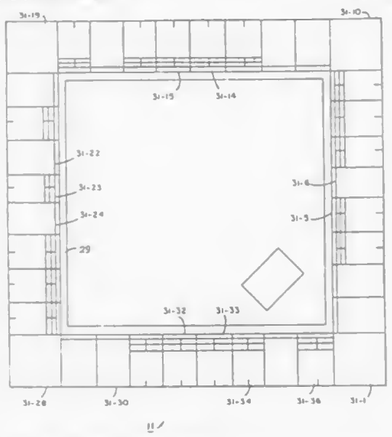
4,915,390
GOLF BALL
William Gobush, North Dartmouth, Mass.; Raymond A. Berard, Portsmouth, R.I.; Robert A. Brown, Mattapoisett, and John W. Jepson, Marion, both of Mass., assignors to Acushnet Company, New Bedford, Mass.
Division of Ser. No. 207,017, Jun. 14, 1988, Pat. No. 4,858,923, which is a continuation of Ser. No. 18,840, Feb. 24, 1987, abandoned, which is a continuation of Ser. No. 544,780, Oct. 24, 1983, abandoned. This application Mar. 3, 1989, Ser. No. 320,216
Int. Cl.[4] A63B *37/14*
U.S. Cl. 273—232 9 Claims



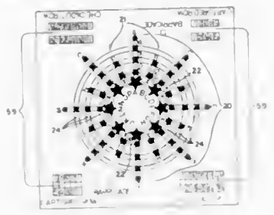
1. A golf ball having a surface with dimples arranged in a substantially icosahedron pattern thereon, said icosahedron pattern having a plurality of substantially equilateral triangles, each of said equilateral triangles having three side lines and a center area, said dimples being divided into two sets, each set of dimples having a different diameter, said dimples being arranged on said surface such that dimples selected from the first set of dimples are positioned on said three side lines of a plurality of said equilateral triangles and dimples selected from the secind set of dimples are positioned in said center area of a plurality of said equilateral triangles.

4,915,391
BOARD GAME
Aharon G. Aharonian, P.O. Box 67, Shrewsbury, Mass. 01545
Filed Dec. 15, 1988, Ser. No. 284,997
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—256 6 Claims



1. A board game comprising:
a. a game board having an endless path of contiguous blocks, some of the blocks representing property which is purchasable and a plurality of the blocks each displaying two alternative directions,
b. a plurality of destiny cards, each card describing an event,
c. a plurality of ownership cards, each card describing commercial transactions for a different piece of property,
d. a device operable by the players for determining randomly between said two directions,
e. a plurality of tokens, one for each player,
f. a plurality of property markers for identifying ownership of property, and
g. means for determining a numerical value.

4,915,392
BOARD GAME
Elmer L. Swartz, 9490 Harbor Greens Way, #C-203, Seminole, Fla. 34646
Filed Jun. 6, 1988, Ser. No. 202,415
Int. Cl.[4] A63F *3/02, 3/00*
U.S. Cl. 273—258 8 Claims



1. Apparatus for a board game, the apparatus comprising:
a board which is marked with a pattern for maneuver, said maneuver pattern further comprising three or more concentric rings, the innermost of which is marked at regular intervals with four or more points around its circumference and one or more of the other said concentric rings being connected by a marked circular path;
three diverging paths extending radially out from each said innermost ring point such that one said diverging path extends directly out along the radius of said concentric rings from each said innermost ring point through the other said concentric rings with the other two surrounding diverging paths extending out from each said innermost ring point to one or more other said concentric rings in curved or oblique paths and such that each said curved or oblique path joins with the said curved or oblique path from an adjacent said innermost ring point at another said concentric ring and from said other concentric ring merge together and terminate or alternatively form a common path which extends generally radially outward from said other concentric ring through at least one said surrounding concentric ring;
said innermost ring points being marked in one way and each said point at which any said diverging path intersects a said concentric ring being marked another way;
each said diverging path being marked or labeled with a symbol and each said concentric ring being marked or labeled with another symbol such that each said point of intersection of a diverging path and a concentric ring can be identified by marking reference to the said path symbol and the said concentric ring symbol;
at least one playing piece for each said point of intersection, each said playing piece being marked with the same designation as each said corresponding point of intersection designation and each said playing piece further adapted to rest upon any said point of intersection or any said innermost ring point in a manner so as to display either one color or another color, each said playing piece further being adapted with the same two colors on said ends;

two additional said playing pieces which are of any color and unlabeled and are further adapted to rest upon any said point of intersection or any said innermost ring point; and
a containing and mixing chamber into which each said marked playing piece may be enclosed and thoroughly mixed together and from which said mixed marked playing pieces may be randomly distributed.

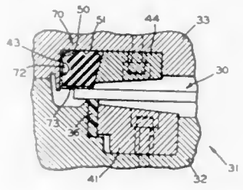
4,915,393
CARD GAME METHOD
Earl Oliver, Mesa, Ariz., assignor to Alfred E. Hall, Dallas, Tex.
Continuation of Ser. No. 183,063, Apr. 19, 1988, Pat. No. 4,846,480. This application Mar. 16, 1989, Ser. No. 324,107
Int. Cl.[4] A63F *1/00*
U.S. Cl. 273—292 4 Claims

2. A method of increasing the uncertainty and excitement in the playing of a card game with a card deck having a plurality of cards for play by a plurality of players, said cards including at least one penalty card which, when played by a first player, requires a second player to take a predetermined number of cards from a reserve card supply, the improvement comprising the step of designating at least one card in the deck having identifying indicia thereon which, when played by the second player, allows the second player to escape the penalty by transferring the penalty required by the penalty card to the succeeding player thereby requiring the succeeding player to take the predetermined number of cards.

4,915,394
AERIAL HOOK AND LOOP GAME
Edward F. Kramer, Manchester, N.H., assignor to Davis, Bujold & Streck, Manchester, N.H.
Filed Dec. 9, 1988, Ser. No. 282,444
Int. Cl.[4] A63F *9/00*
U.S. Cl. 273—330 10 Claims

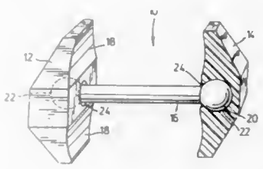
1. An aerial hook and loop game comprising an elongate carriage means having a transverse opening adjacent one end, by which it may be captively suspended on an elongate flexible member for free movement there along under the influence of gravity, and means adjacent the other end for engaging and supporting a target means for conveyance along the elongate flexible member by means of the free movement there along; a length of the elongate flexible member, having a fixable first end and a second end remote from said first end, on which the carriage means may be captively suspended for the free movement there along when the elongate flexible member is connected at its first end to a support while its second end is manipulated by a player to adjust the configuration and tension of the elongate flexible member; and said target means adapted for engagement by said engaging and supporting means for said conveyance, wherein the mobile end of the flexible elongate member is attached to one end of a wand means, said wand means providing an improved manner by which the player can manipulate the configuration and tension of the flexible elongate means and its side-to-side and vertical position.

4,915,395
SEAL CONSTRUCTION FOR A MOLD STRUCTURE FOR ENCAPSULATING GLASS WITH A GASKET
Werner W. Barteck, La Salle, Mich., assignor to Libbey-Owens-Ford Co., Toledo, Ohio
Division of Ser. No. 88,123, Aug. 21, 1987, Pat. No. 4,854,599. This application Jun. 9, 1989, Ser. No. 364,796
Int. Cl.[4] B29C *39/18, 39/28*
U.S. Cl. 277—12 10 Claims



1. A seal assembly for a mold for encapsulating a window assembly, comprising:
a first seal element formed of a non-deformable, non-compressible material and having a first surface adapted to sealingly contact a window assembly and a second surface; and
a second seal element formed of a deformable, non-compressible material and having a first surface abutting said second surface of said first seal element and responsive to pressure applied to said first seal element for adjusting the position of said first seal element in a mold to accommodate thickness variations in a window assembly contacting said first surface, said first seal element being generally L-shaped with said first surface thereof being an outer surface of one of its legs and said second surface being an inner surface of the other one of its legs.

4,915,396
GRIPPING DEVICE FOR USE IN EXERCISING OR DANCING
Joseph L. Chaisson, 36 Ranee Avenue, Toronto, Ontario M6A 1M9, Canada
Continuation of Ser. No. 163,579, Mar. 3, 1988, abandoned. This application Mar. 31, 1989, Ser. No. 332,437
Claims priority, application Canada, Mar. 5, 1987, 531209
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—93 6 Claims



1 An exercising or dancing device comprising:
first and second graspable handles;
an elongate strut extending between said first and second handles;

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said device having swivel means for enabling said first handle to rotate unlimitedly with respect to said second handle; and,

at least one of said handles having a first surface extending generally laterally of said strut and a second surface generally opposite to said first surface, said first surface extending on generally opposite sides of said strut and said second surface being spaced from said first surface and generally convex relative thereto wherein said handle may be grasped by a human hand with the palm of the hand against said second surface and at least one finger against said first surface on each of said opposite sides of said strut.

4,915,397

HOLLOW METALLIC SEALING RINGS

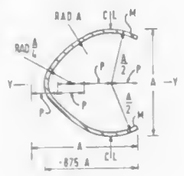
Terence P. Nicholson, Durham, England, assignor to Specialist Sealing Limited, United Kingdom

Filed Jun. 27, 1986, Ser. No. 879,490

Claims priority, application United Kingdom, Feb. 7, 1986, 8603034

Int. Cl.[4] F16J *15/08*

U.S. Cl. 277—206 R 3 Claims



1. A hollow, annular metallic sealing ring surrounding a central longitudinal axis generally perpendicular to a median plane of said ring, and comprising:

radially spaced inner and outer portions of said ring, at least one of which portions is closed;

said ring having a cross-sectional configuration of modified parabolic form when in a relaxed state, with a maximum depth along a center line of compression of said ring in a direction generally parallel to said axis, a width between said inner and outer portions along a radius from said axis and equal to substantially ⅛ of said maximum depth, each arm of said modified parabolic form diverging symmetrically on each side of said median plane from said closed portion and having a radius of curvature substantially equal to one-fourth of said maximum depth to the other of said inner and outer portions having a radius of curvature substantially equal to one-half of said maximum depth such that said arms converge, said inner and outer portions being joined on each arm by an intermediate portion having a radius of curvature substantially equal to said maximum depth.

4,915,398

METALLIC GASKET FOR USE IN AN INTERNAL COMBUSTION ENGINE

Junichi Kitagawa, Utsunomiya, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1987, Ser. No. 134,749

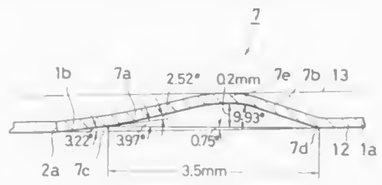
Claims priority, application Japan, Dec. 19, 1986, 61-301575

Int. Cl.[4] F16J *15/08*

U.S. Cl. 277—207 R 7 Claims

1. A metallic gasket for use in an internal combustion engine comprising:

an embossment formed in a main body of said metallic gasket along a smooth closed loop, said embossment having an opening edge portion, an inner circumferential portion substantially concentrically aligned with said opening edge portion and disposed toward an inside of the loop, and an outer circumferential portion adjoining said main body and substantially concentrically aligned with said inner circumferential portion and disposed toward an outside of the loop and a crest portion located between and joined to both the inner circumferential portion and the outer circumferential portion, characterized in that



said inner circumferential portion is inclined toward said crest portion at a first angle and said outer circumferential portion is inclined toward said crest portion at a second angle, the first angle being smaller than the second angle and said opening edge portion is inclined with respect to said main body at a third angle, said third angle being smaller relative to said first angle.

4,915,399

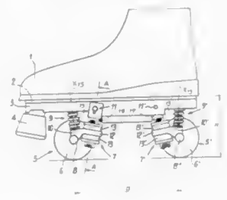
SUSPENSION SYSTEM FOR ROLLER SKATES AND SIMILAR DEVICES

Jean-Bernard Marandel, 4, rue de la République, 93450 L'ile Saint-Denis, France

Filed Apr. 5, 1988, Ser. No. 177,732

Int. Cl.[4] A63C *17/02*

U.S. Cl. 280—11.28 9 Claims



1. Roller skate of the type having a shoe (1) fixed onto a sole (2) secured to a base (3), a brake (4) secured to the front part of said base, front and rear undercarriages (5, 5') each with a pair of wheels (6, 6'), a pivoting system (7, 7') for each pair of wheels, and an axle (8, 8') for rotatably supporting each pair of wheels, characterized: in that the front and rear axles are pivoting axles (8, 8') each of which is provided with a suspension system (9, 9'), the latter being secured at one end thereof on a central part (10, 10') of the pivoting axle, right to the axis of the wheels (6, 6'), and the opposite end thereof being guided by a centering barrel (17) located inside the base (3); and in that each pivoting axle is provided with a pivoting system (7, 7') pivotally secured at an upper end thereof to the base (3) by pivot means (11, 11') while a lower end thereof is secured to an integral arm (12, 12') of the pivoting axle by resilient means (13, 13'); and in that the upper end of the pivoting system (7) of the front pivoting axle (8) comprises: two pivot pins (25); a U-shaped cover (22), two parallel flanges of which are in close contact with respective external faces of the base, these two flanges of the cover being provided with two oblong openings (33) which allow a vertical clearance movement of the pivoting system (7) in relation with the two axles pins (25); and a pull-back spring (27) for the U-shaped cover (22).

4,915,400

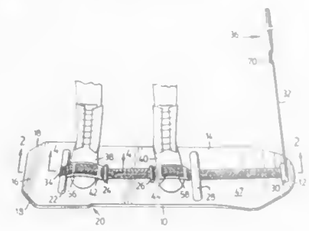
SNOWBOARD TOY

David W. Chambers, 4 Almond Lane, Ottawa, Ontario, Canada (K2L 3T2), assignor to David W. Chambers, Ottawa, Canada

Filed Apr. 19, 1989, Ser. No. 340,353

Int. Cl.[4] B62B *15/00*

U.S. Cl. 280—14.2 10 Claims



1. A snowboard toy comprising:

a semi-rigid ski platform having an upturned front end, a main body portion extending rearwardly from the front end and a plurality of strap: retainers, with at least one strap retainer located generally towards the rear of said main body portion, and at least one strap retainer located generally towards the front of said main body portion, and

a strap, secured at one end to the board and having a free end, said free end passing through said strap retainers,

said strap, having means for pulling on said free end to create tension to secure a person's feet to said snowboard toy beneath said strap, said feet being released from said toy upon the release of tension from said strap.

4,915,401

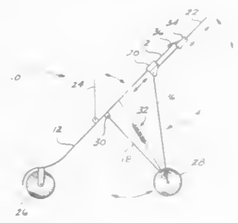
CHILD CARRIER USABLE AS BACKPACK, STROLLER AND RECLINER

William C. Severson, 2633 Boyer Ave. E., Seattle, Wash. 98102, and William H. Hamilton, Seattle, Wash., assignors to William C. Severson, Seattle, Wash.

Filed Mar. 8, 1988, Ser. No. 165,583

Int. Cl.[4] B62B *7/12*

U.S. Cl. 280—30 22 Claims



1. A child carrier usable as a backpack and as a stroller, the carrier comprising:

a frame having upper and lower ends and a longitudinal axis extending therebetween;

front ground support means rotatably supported by the frame adjacent to the lower end;

child support means connectable to the frame;

back support means connectable to the frame for securing the carrier to a person's back, such that the carrier can be used as a backpack;

a rear support assembly connected to the frame, the rear support assembly comprising connection means connected to the frame such that the connection means is moveable along the longitudinal axis of the frame, a first member pivotally connected to the connection means, and a second member pivotally connected to the first member and to the frame;

rear ground support means rotatably mounted by the rear support assembly;

the rear support assembly being movable to a first position in which the rear ground support means is adjacent to the frame, for permitting use of the carrier as a backpack, and to a second position in which the rear ground support means is positioned away from the frame such that the front and rear ground support means are spaced apart fromt one another, for use of the carrier as a stroller.

a handle and means for mounting the handle such that the handle is pivotable with respect to the frame to a collapsed position in which the handle is adjacent to the frame and to an extended position in which the handle extends away from the frame; and

coupling means for coupling the movement of the handle between the collapsed and extended positions to the movement of the rear support assembly between its first and second positions, such that movement of the handle to the extended position causes movement of the rear support assembly to the second position.

4,915,402

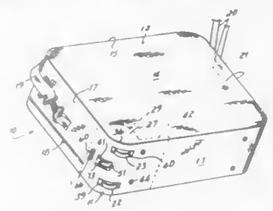
LUGGAGE WITH RETRACTABLE WHEEL SYSTEM

Barry Brinker, Cincinnati, Ohio, assignor to 'totes', incorporated, Loveland, Ohio

Filed Oct. 19, 1988, Ser. No. 260,189

Int. Cl.[4] B62B *1/12*

U.S. Cl. 280—37 12 Claims



1 A container comprising

a case with a floor,

at least one wheel mounted to said case adjacent said floor, said wheel being retractable interiorly of said case into a storage position and extendable exteriorly of said case into a use position where said case can roll on said wheel, and said wheel being continually biased to the storage position

a retract operator operably connected to said wheel, said retract operator being manually movable in one of generally parallel and normal directions relative to said floor in order to cause said wheel to retract into said storage position,

an extend operator operably connected to said wheel, said extend operator being manually movable in the other of said generally parallel and normal directions relative to said floor in order to cause said wheel to extend into said use position, both of said retract and extend operators being manually accessible and operable from exteriorly of said case,

a wheel mount assembly connected to said case, said wheel mount assembly being operable to retract and extend said wheel between storage and use positions, said assembly comprising

a drum and a crank arm connected to said drum, said

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crank arm also being connected to said wheel, pivotable motion of said drum relative to the drum's axis causing said wheel to move between wheel storage and use positions,

a drum motor connected with said drum, said drum motor operating to continually bias said drum to one of the wheel storage and use positions, and

a stop having one component partially carried on said drum and having another component partially carried by said latch assembly, said stop components cooperating to locate said drum in that position to which it is biased by said drum motor, and

a latch assembly connected to said case, said latch assembly being operable to latch said wheel mount assembly in an attitude where said wheel is located in one of its storage and use positions, said latch assembly comprising

a latch cooperable with said drum to hold said drum in that one of wheel storage and use positions to which said drum is not continually biased, and

a latch motor connected with said latch, said latch motor continually biasing said latch to that position at which it will cooperate with said drum to hold said drum in that position to which said drum is not continually biased whenever said drum is moved into that position.

4,915,403

SKATEBOARD WITH MECHANICAL DRIVE

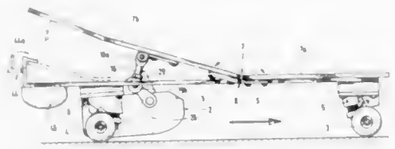
Charles Wild, 20, Chemin des Ormeaux, Epalinges, and Antoine Bregger, Rue du Lac 26b, Renens, both of Switzerland

Filed Dec. 30, 1988, Ser. No. 292,445

Claims priority, application Switzerland, Jul. 15, 1988, 2726/88

Int. Cl.[4] B62M *1/08*

U.S. Cl. 280—221 **4 Claims**



1. A skateboard comprising:

an elongated frame disposed horizontally having a front end, a rear end and a midpoint;

two free rollers mounted to the front end of said frame for free rotation;

a plate adapted to form a standing surface and divided into a fixed board and a pedal having a first end and a second end, said fixed board being rigidly attached to said frame between the midpoint and the front end, said pedal being located between the midpoint and the rear end of said frame and having its first end pivotably mounted to the midpoint of said frame for movement between a horizontal position and an inclined position located generally above the horizontal position;

an elastic return member adapted to urge said pedal from the horizontal position to the inclined position, whereby, after said pedal has been depressed from the inclined position to the horizontal position and then released, it is automatically urged back to the inclined position by said elastic return member;

a transmission located underneath said frame between the midpoint and the rear end thereof and including a drive shaft, a drive shaft housing surrounding said drive shaft and allowing said drive shaft to rotate therein in a first direction and a second direction which is opposite to the first direction, two drive rollers located at opposite ends of said drive shaft and attached thereto for conjoint rotation therewith when said drive shaft rotates in the first direction and for free rotation thereabout when said drive shaft rotates in the second direction, and a gear box attached to said drive shaft housing and including a rotatable input gear and a rotatable output gear which rotates in response to the rotation of said input gear, said output gear rotating said drive shaft in the first direction and the second direction;

elastic fixing members which suspend said drive shaft housing from said frame such that said drive shaft extends transversely across said frame, said elastic fixing members allowing said frame and said transmission to tilt with respect to said pedal when said skateboard is riding around a curve; and

linkage elements including a crank arm having a first end and a second end, a toothed segment having one side fixedly attached to the first end of said crank arm and the other side rotatably attached to said transmission, said toothed segment being operative to rotate said input gear of said gear box, a pin attached to the second end of said crank arm and extending away from said toothed segment, said pin being operative to rotate said crank arm about said first end thereof, and a push rod having a first ball-and-socket joint located at one end and connected to said pedal and a second ball-and-socket joint located at an opposite end and connected to said pin, said first and second ball-and-socket joints allowing said push rod to act on said pin in an unimpeded manner and adapt to the sloping positions of said pedal caused by riding the skateboard around curves, thereby allowing said transmission to tilt with respect to said frame, whereby the depression of said pedal causes said push rod to push on said pin and rotate said toothed segment such that said drive shaft and said drive wheels rotate conjointly in the first direction to propel said skateboard and whereby said drive shaft rotates in the second direction upon the release of said pedal such that the motion of the skateboard is unaffected.

4,915,404

FRAME FOR A BICYCLE

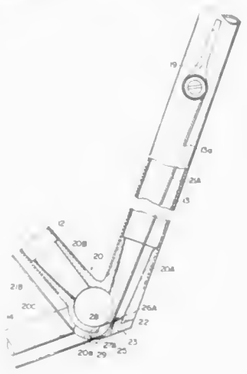
Yoshiya Chonan, Toride, Japan, assignor to Sakae Ringyo Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1989, Ser. No. 367,575

Claims priority, application Japan, Dec. 16, 1988, 63-163277

Int. Cl.[4] B62K *19/34, 19/30*

U.S. Cl. 280—288.3 **1 Claim**



1. A frame of a bicycle including a down tube through which an operation cable passes and a bottom bracket mounted to a lower end of said down tube so that said bottom bracket communicates with said down tube, comprising a cable takeout opening formed in a bottom of said bottom bracket to be used to take out the operation cable and a cable guide member attached detachably to the bottom of the bottom bracket to close said cable take-out opening and including a leading-out hole through which the operation cable extends out of the frame.

4,915,405

BINDING WITH DOUBLE-ACTING RELEASE MECHANISM

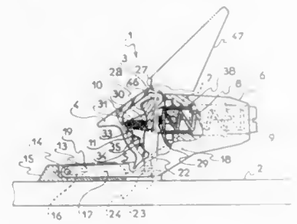
Pierre Rullier, Annecy, and Jean-Claude Brischoux, Seynod, both of France, assignors to Salomon S.A., Annecy Cedex, France

Filed May 21, 1987, Ser. No. 52,414

Claims priority, application France, May 22, 1986, 86 07838

Int. Cl.[4] A63C *9/08*

U.S. Cl. 280—634 **75 Claims**



1. A safety binding adapted to releasably hold a boot on a ski, said binding comprising:

a) means for securing said binding to said ski;

b) movable body having spaced lateral arms pivotably connected to said securing means along a first axis which is substantially transverse to the longitudinal extent of a ski on which said binding is adapted to be positioned;

c) a jaw pivotably connected to said body along a second axis which is substantially transverse to the longitudinal extent of said ski, said jaw comprising means for engaging and holding a portion of said boot on said securing means in a retention position when said boot is positioned on said securing means and said binding is attached to said ski, said jaw being pivotable about said second axis from said retention position to a release position by movement of said jaw relative to said body during skiing; and

d) means comprising common elastic energy storing means for biasing said jaw towards said body and for biasing said body towards said ski and means for increasing the biasing force of said jaw towards said ski in response to upward movement of said body.

4,915,406

RAISED METALON

Gerard Graillat, Annecy, France, assignor to Salomon S. A., Annecy Cedex, France

Filed Mar. 19, 1987, Ser. No. 27,970

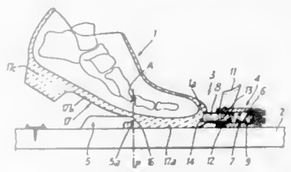
Claims priority, application France, Mar. 19, 1986, 86 03923

The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.

Int. Cl.[4] A63C *9/18*

U.S. Cl. 280—615 **16 Claims**

1. System comprised of a cross country ski boot and a holding device for fastening said boot on a ski, said holding device (3) retaining a front portion (17*a*) of a sole (17) on an underside of said boot (1) flat on an upper surface of said ski, in a holding zone between a front end of said sole and a rear limit (P, P1) thereof, said boot (1) being so shaped that, at rest, when a foot of a skier is not engaged in said boot held on said ski (2) or when said skier is not applying his foot at least in a vertical direction, a rear portion (17*b*) of said sole extending from said rear limit of said holding zone of said front portion (17*a*) is engaged obliquely to said upper surface of said ski, i.e., it is inclined upwards and towards the rear so that a heel (17c) of said boot is normally raised a certain distance above said ski (2).



4,915,407

BINDING WITH INDEPENDENTLY ACTING RELEASE AND RETENTION FEATURES

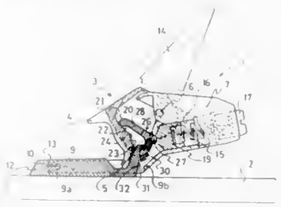
Jean-Claude Brischoux, Seynod, France, assignor to Salomon S.A., Annecy Cedex, France

Filed Jun. 19, 1987, Ser. No. 64,113

Claims priority, application France, Jul. 4, 1986, 86 10236

Int. Cl.[4] A63C *9/084*

U.S. Cl. 280—626 **71 Claims**



1 A safety binding adapted to releasably hold a boot on a ski, said boot comprising:

(a) means for securing the binding to said ski;

(b) a movable body having spaced lateral arms pivotably connected to said securing means along a first axis which is substantially transverse to the longitudinal extent of a ski on which said binding is adapted to be positioned;

(c) a jaw pivotably connected to said body along a second axis which his substantially transverse to the longitudinal extent of said ski, said jaw comprising means for engaging and holding a portion of said boot on said securing means when said boot is positioned on said securing means and said binding is attached to said ski; and

(d) means for biasing said jaw and said body toward said ski and for increasing the release threshold of said binding in response to upward movement of said body, said biasing force increasing means including a rocking lever.

4,915,408

COLLAPSIBLE TROLLEYS

John W. H. Clemence, Ickenham, and Terence L. Dunkley, South Ruislip, both of England, assignors to Norland Gazelle (Travel Goods) Limited, England

Filed Oct. 13, 1988, Ser. No. 257,110

Claims priority, application United Kingdom, Oct. 15, 1987, 8724201

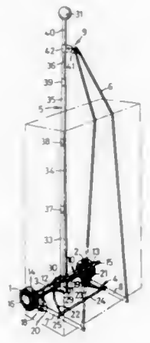
Int. Cl.[4] B62B *1/04*

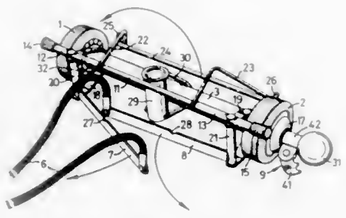
U.S. Cl. 280—655 **12 Claims**

1 In a collapsible trolley comprising a wheel assembly that includes two wheels mounted spaced apart on a common axis

of wheel rotation, and an elongate handle that is detachable from the wheel assembly for collapse of the trolley, the improvement wherein:

(a) the wheel assembly includes means defining a stowage location for said handle in the collapsed condition of the trolley, said stowage location locating the handle to extend substantially parallel to said axis of wheel rotation, and





(b) said means includes means defining an entrance aperture for admission of the handle to said stowage location, said aperture being located within the diameter of one of said wheels,

and wherein the trolley includes means for releasably retaining the handle stowed in said location.

4,915,409

MULTI-PIVOT VEHICLE SUSPENSION

Johannes Schuit, 1433 Camilo Trillado, Carpinteria, Calif. 93013

Continuation-in-part of Ser. No. 34,611, Apr. 6, 1987, abandoned. This application Dec. 12, 1988, Ser. No. 282,739

Int. Cl.[4] B60F *11/18*

U.S. Cl. 280—721 13 Claims

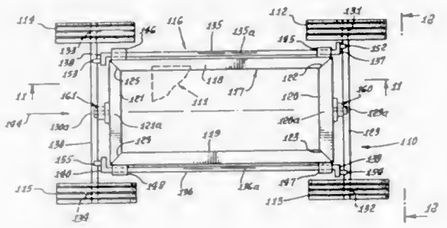
1. In a vehicle suspension, the combination comprising:

(a) a main frame extending forwardly,

(b) front and rear pairs of wheels, and transverse axles for the wheels of said pairs,

(c) two transversely spaced and forwardly and rearwardly elongated members pivotally carried by the frame to pivot about length axes defined by the members, each member having front and rear turned end portions,

(d) four supports transmitting loading to the axles near the wheels, the supports terminally supporting said turned end portions, respectively, and the supports located in offset relation to said member length axes for transverse



movement relative to said axles during pivoting of said members.

4,915,410

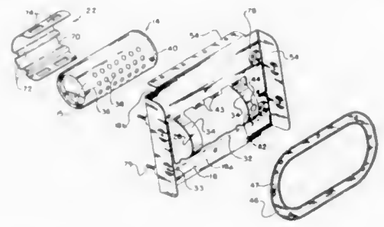
VEHICLE AIR BAG MODULE AND METHOD OF ASSEMBLY

Theodore J. Bachelder, Pontiac, Mich., assignor to TRW Vehicle Safety Systems Inc., Washington, Mich.

Filed Nov. 28, 1988, Ser. No. 276,860

Int. Cl.[4] B60R *21/20*

U.S. Cl. 280—732 24 Claims



1. Apparatus comprising an air bag module for an air bag and an inflator,

said module comprising,

(i) an air bag container having a wall defining part of an air bag cavity with an air bag completely contained therein, said wall having a surface for engagement with a portion of said air bag,

(ii) means defining an inflator cavity outside of, and in communication with, said air bag cavity, for receiving said inflator when said air bag is disposed in said air bag cavity, and

(iii) alignment means for aligning said inflator in a predetermined position in said inflator cavity when said air bag is disposed in said cavity.

4,915,411

CRASH SENSOR WITH IMPROVED ACTIVATION FOR STABBING PRIMER

Peter Norton, 1 S. **Lakeside, Lake Hopatcong, N.J. 07849**

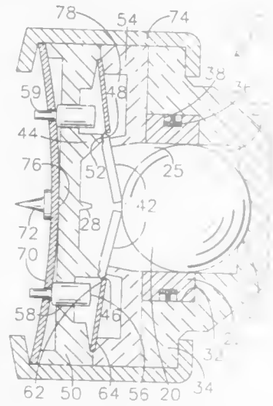
Filed Jan. 25, 1988, Ser. No. 148,083

Int. Cl.[4] B60R *21/32*

U.S. Cl. 280—734 13 Claims

1. In a crash sensor of the type comprising a first resilient means for storing energy, an element movable in response to deceleration forces during a crash, and release means adapted to release the energy stored in said first resilient means upon movement of said element to a predetermined position, the improvement comprising:

said release means coacting with said first resilient means for constraining it in a stressed state for storing energy,



and said first resilient means having a negative spring rate for some range of stored energy.

4,915,412

TILTING COLLAPSIBLE STEERING COLUMN

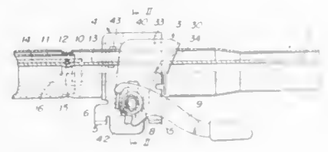
Naoki Yuzuriha, Kanagawa, and Yoshimi Yamamoto, Shizuoka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Fuji Kiko Co., Ltd., Tokyo, both of, Japan

Filed Mar. 28, 1989, Ser. No. 330,344

Claims priority, application Japan, Mar. 31, 1988, 63-79304; Mar. 31, 1988, 63-79305; Mar. 31, 1988, 63-79306

Int. Cl.[4] B62D *1/18*

U.S. Cl. 280—775 9 Claims



1. A tilting collapsible steering column comprising:

an upper clamp secured to a vehicle body;

a tilt bracket installed on said upper clamp in such a way as to be movable upwardly and downwardly relative to said upper clamp;

a column jacket;

said tilt bracket having an upstanding wall section secured to said column jacket and a pair of side wall sections formed with cuts near said column jacket for encouraging said side wall sections to shear in a collision;

fastening means for releasably securing said tilt bracket to said upper clamp;

stopper means for preventing said tilt bracket from rotating about said fastening means relative to said upper clamp in a collision; and

means for encouraging said side wall sections to bend and flow toward said upstanding wall section in a collision.

4,915,413

THREE-POINT SAFETY RESTRAINT SYSTEM WITH SHOULDER BELT QUICK DISCONNECT

Christopher D. Meyer, Sterling Heights, Mich., assignor to Allied-Signal, Inc., Morris Township, Morris County, N.J.

Filed Dec. 22, 1988, Ser. No. 289,631

Int. Cl.[4] B60R *22/18*

U.S. Cl. 280—801 5 Claims

1 A seat belt interlock mechanism comprising:

a tongue plate, adapted to be secured to a first seat belt at a first end thereof, including a second end formed as a tongue adapted to be securely received within a buckle assembly; the tongue plate, between the first and second ends, including intersecting or overlapping first and second openings of dissimilar diameters, the points of intersection of the openings having a diameter smaller than the diameter of either of the two openings, the diameter of the first opening being larger than the diameter of the second opening;

a connector plate assembly moveable relative to the tongue plate between unlocked and locked positions comprising a connector plate adapted to be connected to a second seat belt at one end thereof, comprising:

a two tier shoulder rivet including an enlarged head portion having a diameter capable of being received within the first opening, a circular boss formed on one side of the head portion having a diameter larger than the diameter of the second opening and the distance between the points of intersection, but smaller than the head portion,

a shaft portion, extending from the boss, having a diameter smaller than the diameter across the points of intersection of the first and second openings, and adapted to be attached proximate an opposite second end of the connector plate,

a spring retainer, loosely received upon the shaft portion, having a flat engagement surface the outer diameter of which is greater than that of the first opening to frontally engage a flat surface of the tongue plate upon initial insertion of the rivet into the first opening and to provide for a flat slideable engagement therebetween as the connector plate is moved into the locked position, with the boss engaging the second opening; and bias means, for urging the spring retainer toward engagement with the boss when in an unlocked position and for urging the spring retainer into the tongue plate when in the locked position.

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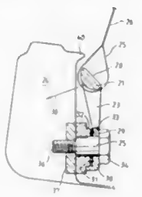
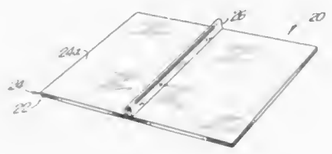
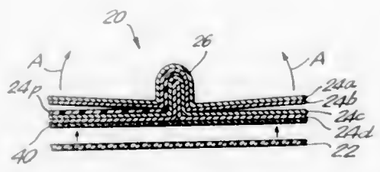
4,915,414
SEAT BELT ANCHORAGE
Per-Olof Weman, Heverlee, Belgium, assignor to General Engineering (Netherlands) B.V., Utrecht, Netherlands
Filed May 6, 1988, Ser. No. 191,032
Claims priority, application Sweden, May 8, 1987, 8701922
Int. Cl.[4] B60R *22/24*
U.S. Cl. 280—801 20 Claims



1. In an anchorage for a seat belt for use to protect a person sitting in a front seat of a two-door vehicle, said anchorage comprising a slider bar mounted in the interior of the vehicle adjacent and spaced from a door sill of the vehicle and extending in the longitudinal direction of the vehicle, with one end of the seat belt being slidably attached to the bar, so that the end of the belt can slide between a front position, adopted when the seat belt is in use, and a rear position, adopted when the seat belt is not in use; the improvement comprising means, including a portion of said slider bar, for causing the slider bar to be moved towards the sill in response to a vertical component of a downward force from above to which the slider bar is subjected, so that the distance between the slider bar and the sill is reduced.

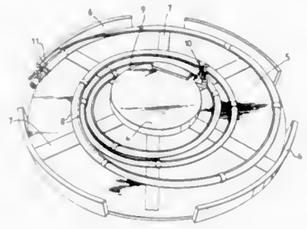
4,915,415
INTERNALLY DISPOSED WELDED BINDING
Mortimer S. Sendor, 80-32 221 St., Queens Village, N.Y. 11427, and Bernard T. Sendor, 608 Blair Dr., Westbury, N.Y. 11590
Filed Nov. 30, 1988, Ser. No. 277,798
Int. Cl.[4] B42D *1/00*
U.S. Cl. 281—15.1 13 Claims





1. A booklet formed from a plurality of generally registered pages secured to one another at an elongated, welded stub defining a spine of said booklet, at least one of said pages being folded in a first direction relative to said stub and the remainder of said pages being folded in a direction opposite said first direction relative to said stub such that said stub is disposed intermediate said at least one page and the remainder of said pages, said booklet further comprising a cover secured outwardly of outermost pages in said booklet and extending continuously between said outermost pages and across an outwardly facing portion of said welded stub.

4,915,416
UNDERWATER OIL PRODUCTION
Ian M. Barrett, Carshalton Beeches, and Steven P. Burchell, Farnham, both of England, assignors to The British Petroleum Company p.l.c., London, England
Filed Nov. 17, 1987, Ser. No. 121,858
Claims priority, application United Kingdom, Nov. 27, 1986, 8628340
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—18 13 Claims

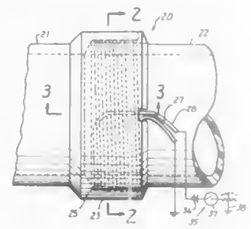


1. A swivel-less coupling for joining a non-rotatable pipe with a pipe capable of rotating about the longitudinal axis of said non-rotatable pipe comprising:
an inner drum for receiving an end of the non-rotatable pipe,
a surface surrounding the drum and means supporting said drum relative to said surface,
a helical coil of flexible pipe supported on said surface but capable of coiling and uncoiling across said surface,
one end of said helical coil of flexible pipe being fixed to the inner drum and in communication with the non-rotatable pipe, and
the other end of said helical coil of flexible pipe being in communication with the pipe capable of rotation at a point at the outer periphery of the surface, said point being capable of moving relative to the inner drum around the circumference of the surface.

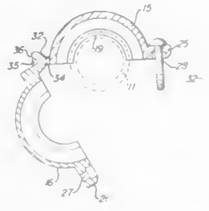
4,915,417
THERMALLY ASSEMBLED CONDUITRY
Russell J. Sarno, Tarzana, Calif., and Patrick Madormo, Highland Beach, Fla., assignors to Flo-Control, Inc., Burbank, Calif.
Filed Aug. 2, 1988, Ser. No. 227,289
Int. Cl.[4] F16L *47/02*
U.S. Cl. 285—21 7 Claims

1. A telescopic joinder for the ends of a pair of pipes made of rigid thermoplastic material which material is fusible by applied heat to enable surfaces of such material to fuse together when heated sufficiently to remain fused together after they have cooled, said joinder comprising:
a receptacle in one end of one of said pipes having an internal wall;
an outer wall adjacent to the end of the other of said pipes, said walls being telescopically fitted and aligned;
a heating coil disposed between said walls to heat them, said coil having a pair of leads extending from said joinder;
a clamp encircling said joinder in alignment with said walls and coil, and including spring means adapted to exert a prevailing compressive force on said joinder to press said

walls together while being heated and to maintain said force substantially undiminished while being heated and cooled, said clamp further including a pair of strap segments releasably joined to one another enabling them to be separated to embrace the joinder, and to be connected together to exert said prevailing force.

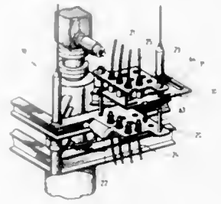


4,915,418
HINGED PIPE COUPLING
Josef Palatchy, Tiberias, Israel, assignor to Urdan Industries (USA), Inc., Southfield, Mich.
Filed May 19, 1989, Ser. No. 354,298
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—24 18 Claims



1. A pipe coupling for coupling together the adjacent ends of a pair of axially aligned pipes, comprising:
a substantially circular casing formed of arcuate segments which are aligned end to end along the arc of a circle and which are connected together, with the segments similarly U-shaped in cross-section so as to provide a continuous, inwardly opening, annular channel within the casing, and with the casing channel being generally defined by an annular base and a pair of spaced apart, annular, radially inwardly directed legs whose free, annular inner edges encircle and enclose the adjacent end portions of the aligned pipes;
an annular, resilient gasket positioned within the casing channel for encircling and sealing against the adjacent end portions of the aligned pipes for sealing the coupling joint of the pipes;
each segment having radially outwardly extending lugs formed on each of its opposite ends, with the lugs of each segment arranged to overlap the adjacent lug of its adjacent aligned segment;
hinge-like means for interconnecting at least one pair of the overlapped lugs of each pair of adjacent, aligned segments;
said hinge-like means comprising a hook formed on one of the lugs and an elongated, narrow, enclosed opening formed in the other of the pair of overlapped lugs for receiving the hook, with the opening being elongated in a direction parallel to the casing axis; and with the portion of the free end of the lug defining one elongated edge of the opening forming an elongated axle which is axially parallel to the axis of the coupling, said axle positioned a radial distance away from said casing such that said hook is positioned on said axle between said axle and casing free of contact with said casing;
said hook being of a cross-sectional size to closely fit within the opening and being elongated in width to closely fit within the axially directed width of the opening, so that the hook passes through the enclosed opening, fits over the axle and extends around the axle, and the hook may be pivoted around the axle;
with the segment upon whose lug the hook is formed being pivotally movable downwardly and, therefore, supported by the hook and axle connection while dangling downwardly under the influence of gravity, so that one segment may be manually placed in position around a pipe end portion while its adjacent segment may dangle downwardly therefrom for subsequent manual pivoting around the pipes;
and a manually releasable mechanical fastener interconnecting and locking together at least one pair of adjacent overlapped lugs when the segments are circularly aligned with each other for encircling the adjacent coupled pipe ends.

4,915,419
SLIDING LOCK PLATE FOR HYDRAULIC CONNECTORS
Robert E. Smith, III, Stafford, Tex., assignor to National Coupling Company, Inc., Houston, Tex.
Filed Oct. 28, 1988, Ser. No. 264,160
Int. Cl.[4] F16L *37/08*
U.S. Cl. 285—26 11 Claims



1. An apparatus for releaseably locking together a plurality of first and second coupling members comprising:
a sliding lock plate positionable between the first and the second coupling members;
a plurality of first coupling members, each member having a cylindrical body with a longitudinal axis and an outer groove in the body transverse to the longitudinal axis;
a plurality of second coupling members engageable with the first coupling members to establish fluid communication therebetween, the second coupling members, each having a cylindrical body with a longitudinal axis and an outer groove in the body transverse to the longitudinal axis; and
the sliding lock plate being slidable in a direction transverse to the longitudinal axis between a first position and a

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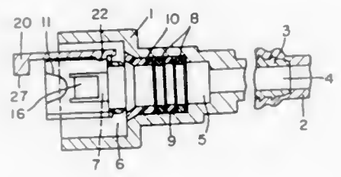
second position, the sliding lock plate having a plurality of channels extending therethrough configured to receive the second coupling members in the first position, the channels engageable with the grooves of the first and the second coupling members in the second position whereby axial movement of the first and second coupling members is restricted.

4,915,420

CONNECTOR FOR CONNECTING PIPE

Katsushi Washizu, Shizuoka, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Shizuoka, Japan

Filed Mar. 3, 1989, Ser. No. 318,891
Claims priority, application Japan, Mar. 5, 1988, 63-52383
Int. Cl.[4] F16L *39/00*
U.S. Cl. 285—39 9 Claims



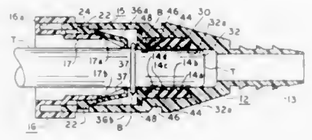
1. A connector for connecting a pipe having an annular swelling adjacent an end thereof to a hose, comprising:
a joint body having opposed first and second ends and an axial core interior extending therebetween, said axial core interior being formed with a stepped small diameter chamber communicating with a communication passageway of a hose connecting portion provided on the first end of said joint body, and with a stepped enlarged diameter installing chamber disposed behind said small diameter chamber at the second end of the joint body; sealing members attached to the inside of the small diameter chamber; a bush member, accommodated intermediate said sealing members and the second end of the joint body; and a holder having pawls engaging with the pipe annular swelling portion when said pipe has completely been connected and having means for engaging the holder in the axial core of the joint body, characterized by a connection confirmative member caught by said holder and including at least a single piece of pawl capable of impinging upon said pipe annular swelling portion, said connection confirmative member disengaging from said holder when said pipe has completely been connected.

4,915,421

QUICK CONNECTOR ASSEMBLY

Robert D. Dennany Jr., Lapeer, Mich., assignor to ITT Corporation, New York, N.Y.

Filed Mar. 30, 1988, Ser. No. 175,005
Int. Cl.[4] F16L *37/12*
U.S. Cl. 285—39 3 Claims



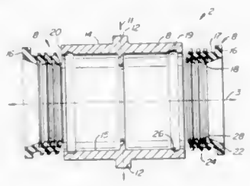
1. A connector for connecting the ends of tubing sections, said connector comprising in combination:
a connector housing having an opening therein and extending therethrough along a longitudinal axis of said housing, said housing having a first end for connection to a first tubing section;
a first chamber in said housing between said first end and the second end of said housing for receiving a generally annular seal therein which sealingly engages a second tubing section;
a generally tubular retaining clip in said housing between said seal and said second end of said housing, said clip having at least one flexible retaining portion thereon which is radially deflectable relative to said axis and wherein the deflected end of said retaining portion engages a radially outwardly directed flange portion of said second tubing section when said second tubing section is inserted into said housing and said retaining portion is deflected radially outwardly until said flange is inserted between said end of said retaining portion and said seal;
means for retaining said clip in said housing to limit the axially inward position of said end of said retaining portion to a predetermined distance from said seal along the direction of said axis; and,
a retaining cap for enclosing said second end and having an opening therein coaxial with said axis for receiving the inserted end of said second tubing section,
wherein the surface of said housing includes at least one notch therein for receiving a radially outwardly projection of said retaining clip for retaining said clip in said housing,
wherein said connector includes projections on said retaining cap which are slidably received in corresponding radially inwardly facing notches in said clip for releasably retaining said retaining cap in said housing, and
wherein said notches in said retaining clip are generally L-shaped thereby to deflect said retaining portion radially outwardly when said retaining cap is inserted into said housing along one leg of said L-shaped notch and to lock said projections when said projections are rotated into the other leg of said L-shaped notch.

4,915,422

PIPE COUPLING

Michael Chacon, Pleasanton; Clifford Cooper; Michael Herrell, both of Oakland; John Fehringer, San Mateo; Daniel Nunes, San Leandro; Joseph Panek, Concord; Theodore Ray, San Leandro; Anthony Sumida, Alameda, and Clifford Wixson, Castro Valley, all of Calif., assignors to The American Brass & Iron Foundry, San Leandro, Calif.

Filed Jan. 6, 1989, Ser. No. 294,151
Int. Cl.[4] F16L *21/02*
U.S. Cl. 285—39 5 Claims



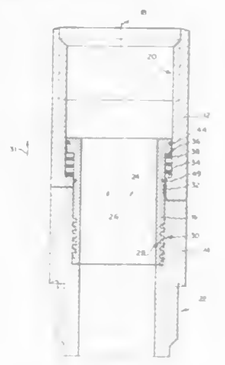
1. An article of manufacture for joining first and second axially aligned hubless pipe sections consisting of:
a one-piece outer sleeve having an outer surface, an interior surface, first and second axial ends and a lip formed on said interior surface for abutting engagement;
a pair of axially elongated, resilient gaskets, each disposed within respective of the first and second axial ends of said outer sleeve, each gasket having an outer surface and an inner surface, each gasket including outwardly extending ribs disposed on said outer surface engaging the interior sruface of said outer sleeve and inwardly extending ribs disposed on said inner surface for engaging respective of said pipe end sections for retaining said first pipe end section within said first axial end and said second pipe end section within said second axial end; and
a single pair of diametrically opposed cylindrically shaped lugs positioned on said outer surface of said sleeve equidistant from said first and second axial ends and having an axis perpendicular to the axis of said outer sleever, said lugs and lip being aligned with each other along the axis of said sleeve.

4,915,423

REMOTE RELEASE COUPLING

Tom B. Wallace, 3 Villa Del Lago, Kings Avenue, Windsor, Johannesburg, South Africa 2194

Filed Jun. 6, 1989, Ser. No. 362,318
Claims priority, application South Africa, Jun. 9, 1988, 88/4095; Jun. 23, 1988, 88/4502
Int. Cl.[4] F16L *55/00*
U.S. Cl. 285—91 10 Claims



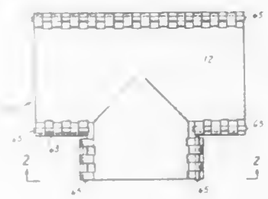
1. A releasable coupling which includes
a first hollow element which is rotatable about a rotational axis;
a second hollow element which is axially aligned with the first element, the first element and the second element being axially displaceable relative to each other, the first element and the second element defining complementary drive formations which, when the first element and the second element abut axially are engaged with each other, and when the first element and the second element are spaced axially from each other by a predetermined amount are disengaged from each other; and
a connecting member which fits within the first element and the second element for releasably coupling the first and the second element together, the connecting member and the first element having complementary restraining formations for inhibiting rotation of the connecting member, relative to the first element but permitting limited axial displacement of the first element relative to the connecting member and the connecting member being screw-threadedly connected to the second element by complementary screw-threads carried by the connecting member and the second element so that, when the drive formations of the first element and the second element are disengaged and the first element is rotated in a predetermined direction, the connecting member is disconnected from the second element.

4,915,424

BRANCH FOR OTHER CONTAINMENT SHROUD

Russel J. Sarno, Tarzana, Calif., and Patrick Madormo, Higland Beach, Fla., assignors to Flo-Control, Inc., Burbank, Calif.

Filed Aug. 2, 1988, Ser. No. 227,287
Int. Cl.[4] F16L *41/00*
U.S. Cl. 285—156 2 Claims



1. A shroud branch for containment conduitry, said branch having a first and a second axis, said axes intersecting each other at an angle, said shroud being adapted to fit to next assemblies, and to house a piping branch with parallel axes, said shroud branch comprising:
a first half and a second half, said halves each having a wall extending along both of said axes, and edges parallel to each of said axes;
seal grooves in each of said edges facing one another when the halves are brought against one another;
a seal groove in each of said walls extending from edge to edge;
a continuous seal fitted in said grooves, said seal projecting beyond its respective edge, and beyond the wall where it fits in the wall, whereby the seals meet along the edges when the halves are brought together, and the seal in the wall is adapted to fit against a contained member;
retention means on all of said edges, and
a cylindrical pin engageable with said retention means to hold the halves assembled together;
said retention means comprising a plurality of fingers spaced apart along each of said edges so disposed and arranged that when the halves are brought toward one another they interleave with adjacent fingers along corresponding edges, each finger having a bearing face facing in an opposite direction from the bearing faces on the opposite half, and dimensioned such that the seals are first brought into contact with an opposite seal or a surface to be sealed against, and the pin cannot then be placed between and against all of the bearing faces, compressive deformation of said seals by forcing the halves toward one another aligning said bearing faces with the pin and enabling the pin to be shoved between them so as to hold the halves together with the seals in compressive resilient deformation.

4,915,425

PIPE CONNECTING ELEMENT

Wilhelm Hegler, and Ralph-Peter Hegler, both of Goethestrasse 2, D-8730 Bad Kissingen, Fed. Rep. of Germany, assignors to Wilhelm Hegler, Bad Kissingen, Fed. Rep. of Germany

Filed Oct. 19, 1988, Ser. No. 259,861
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1987, 3744510
Int. Cl.[4] F16L *43/00*
U.S. Cl. 285—179 12 Claims

4. Pipe connecting element, particularly angle piece or bifurcating piece, for connecting pipes which consist essentially of a continuous inner pipe and projections connected with it which extend radially outwards and serve for the stiffening of the pipe, including double walled pipes or corrugated pipes, the pipe connecting element comprising:

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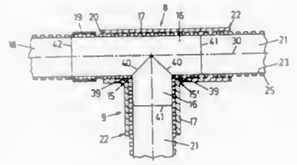
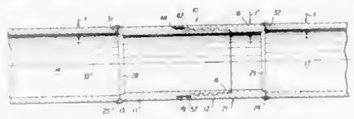
at least two sections, each formed by a core pipe with outwardly extending radial projections and a jacket pipe, wherein adjacent sections are connected on their butt joint surfaces in such a manner that in the core pipes and the jacket pipes each of these adjacent sections are connected to each other, and wherein the core pipe and the jacket pipe of each section are firmly connected with each other, and wherein the projections of the respective core pipe are subjected to elastic radial pre-tensioning against the associated jacket pipe.

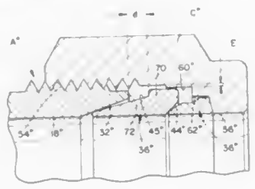


4,915,426
PIPE COUPLING FOR WELL CASING
Claud T. Skipper, P.O. Box 7929, Houston, Tex. 77270
Filed Jun. 1, 1989, Ser. No. 359,905
Int. Cl.[4] F16L *15/00*
U.S. Cl. 285—286 5 Claims



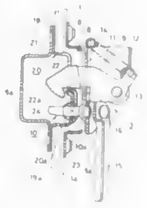
1. A stainless steel well casing including pipe couplings of stainless steel for joining adjacent pipe sections of a selected diameter to extend in an axial direction, the pipe couplings each comprising:
a tubular male member having first and second ends and a tubular female member having first and second ends wherein the first ends of the male and female members abut the pipe sections while the second end of the male member is received within the female member and the second end of the female member extends over the male member;
the male member having a first portion having an outside diameter equal to that of the pipe section; a second portion having a reduced outside diameter and joining the first portion at a first radial shoulder, the reduced diameter portion having a continuous first unthreaded cylindrical surface of a constant diameter extending from the first radial shoulder in the axial direction; a threaded section extending from the first unthreaded cylindrical section, the threaded section having threads of a square cross-section and a diameter no greater than the outside diameter of the first unthreaded cylindrical surface; a second unthreaded cylindrical surface extending from the threaded section to the second end of the male member, the second end of the male member presenting a radial surface perpendicular to the axis of the male member; and a constant internal diameter over substantially the entire length thereof, except for a frusto-conical section adjacent the first end thereof;
the female member having a constant outside diameter over the entire length thereof, the outside diameter of the female member being equal to the outside diameter of the first portion of the male member with the second end of the female member being a radial surface normal to the axis of the female member; a first portion with an internal diameter equal to that of the internal diameter of the male member, said first portion joining the first end of the female member with a frusto-conical surface; a second portion of a diameter less than the first portion and greater than the second portion of the male member, the second portion of the female member having a first unthreaded cylindrical surface adjacent a second radial shoulder; a threaded section extending from the first unthreaded cylindrical portion, the threaded section having square threads thereon which complement the square threads of the threaded section on the male member but wherein there is axial and radial spacing between the threads of the male and female members allowing initial play therebetween; a second unthreaded cylindrical surface between the threaded section and the second end of the female member, the second unthreaded cylindrical surface having an internal diameter greater than the internal diameter of the first unthreaded cylindrical surface and slightly greater than the first unthreaded cylindrical surface on the male member;
wherein the distance between the shoulders and second ends of the male and female members is identical;
a seal disposed only on the first unthreaded cylindrical surface of the male member and being engageable by the second unthreaded cylindrical surface of the female member as the male and female members are being threaded together, the second unthreaded cylindrical surface of the male member and first unthreaded cylindrical surface of the female member being in direct opposed relation with no seal disposed therebetween wherein the coupling becomes increasingly rigidified and sealed as the male and female members are threaded together, and wherein the coupling becomes completely rigid upon engagement of the second ends of the male and female members with the shoulders of the female and male members; and
internal welds for joining the first end members to adjacent sections of pipes, the first ends of the members abutting the pipes directly and the welds having beads which overly at least a portion of the interior wall of the pipe and the frustoconical surfaces of the male and female members.

4,915,427
COUPLING DEVICE FOR HEAVY-WALLED TUBULAR MEMBERS
Emery J. Zahuranec, Novelty, Ohio, assignor to Crawford Fitting Co., Solon, Ohio
Continuation-in-part of Ser. No. 131,220, Dec. 10, 1987, Pat. No. 4,826,218. This application Oct. 18, 1988, Ser. No. 259,348
The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.
Int. Cl.[4] F16L *19/08*
U.S. Cl. 285—342 3 Claims



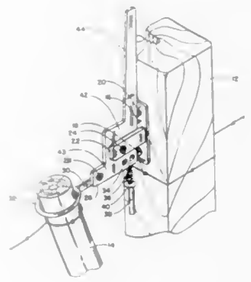
1. A coupling device adapted for use with an elongated heavy-walled tubular member having a generally cylindrical outer wall, said device comprising:
a coupling body having an axial opening adapted to receive an associated tubular member, said opening including a generally frusto-conical camming surface tapering radially inward over the axial extent thereof from adjacent the outer end of said opening, said coupling body further including a threaded section extending axially thereof;
a first generally annular ferrule having a tapered external surface portion cooperatively engageable with said coupling body camming surface, and a tapered internal surface portion;
a second generally annular ferrule having a tapered external surface at one end for cooperative engagement with the tapered internal surface portion of said first ferrule and a shoulder defined at the other end;
a coupling nut having a threaded region adapted for selective threaded engagement with the threaded section on said coupling body, said coupling nut having a bore extending axially therethrough adapted to closely receive an associated tubular member, and first and second counterbores for receiving said first and second ferrules, respectively, said first counterbore having a cross-sectional dimension substantially less than the minimum cross-sectional dimension of said threaded region for limiting radial expansion of said first ferrule and thereby readily facilitate selective disassembly and reassembly of the device; and
said first ferrule having a radially extending cylindrical flanged portion surrounding said tapered internal surface portion and lying at least partially within said first counterbore.

4,915,428
DOOR LOCK SYSTEM OF A VEHICLE
Hatsuo Hayakawa, Yokohama, Japan, assignor to Ohi Seisakusho Co., Ltd., Kanagawa, Japan
Filed Jun. 24, 1988, Ser. No. 211,549
Claims priority, application Japan, Jun. 26, 1987, 62-157505
Int. Cl.[4] E05C *3/10*
U.S. Cl. 292—29 8 Claims



1. A door lock system of a vehicle, comprising:
a door lock opening/closing device, operatively connected to operating means provided on a door of the vehicle;
a first member having a recessed portion, provided at either one of an end face of the vehicle body and an end face of the door which confront each other when the door is in its closed position; and
a second member having a projecting portion, provided at the other of the end faces, said second member being formed to be received in said recessed portion of said first member;
the projecting portion comprising a guide slot and an engaging slot with a locking portion provided at an end thereof, the recessed portion having a guide pin with a tapered end portion which is formed so as to be guided into the guide slot and also having a pivotally supported hook member formed with a hook at an engaging end that is engageable with the engaging slot and is operatively connected to the door lock opening/closing device so as to lock the hook member at the locking portion.

4,915,429
GATE LATCH
Randy R. Gregersen, P.O. Box 1624, 6602 County Rd. 24.2, Cortez, Colo. 81321
Filed Apr. 3, 1989, Ser. No. 332,765
Int. Cl.[4] F05C *17/12*
U.S. Cl. 292—113 1 Claim



1 A gate latch for use in releasably securing a moveable post of a gate to a stationary fence post, comprising:
a first ring member secured at a bottom end of the stationary fence post and dimensioned for insertion of a bottom end of the moveable gate post;
a mounting bracket secured on a vertically extending sidewall of the stationary post, adjacent an upper end thereof;
a pair of spaced parallel horizontally extending support members each having a first end connected with said mounting bracket;
a latch bar having a body portion received between said horizontally extending support members;
a pivot pin mounting said latch bar for pivotal movement between said horizontally extending support members;
an elongated lever extending from a first side of said latch bar body portion for manually pivoting said latch bar;
a transverse leg member connected to an opposite side of said latch bar body portion, said transverse leg member extending perpendicular to said lever;
a first end of said transverse leg member provided with a plurality of apertures;
an elongated strut pivotally secured at a second and opposite end of said transverse leg member;
a second ring member secured on said elongated strut and dimensioned to be received over a top end of the moveable gate post;
said latch bar moveable between an unlatched position in which said lever extends in a generally vertical direction and said transverse leg member extends in a generally horizontal direction and a latched position in which said lever extends in a generally horizontal direction and said transverse leg member extends in a generally vertical direction partially between said horizontally extending support members, with said first end of said transverse leg member disposed above said horizontally extending support members; and
a retaining pin secured by a chain to said mounting bracket and dimensioned for insertion through one of said plurality of apertures in said first end of said transverse leg member and for abutment with said horizontally extending support members to retain said latch bar in said latched position.

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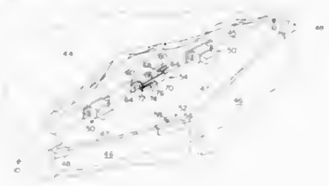
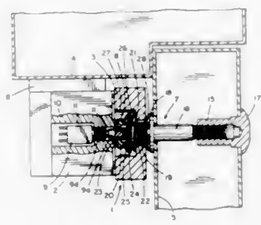
4,915,430
TAMPER RESISTANT LATCH
Lawrence Vitale, Philadelphia, Pa., assignor to Mobil Service Systems, Inc., Philadelphia, Pa.
Filed Oct. 28, 1988, Ser. No. 264,301
Int. Cl.[4] F05C *1/04*
U.S. Cl. 292—145 18 Claims



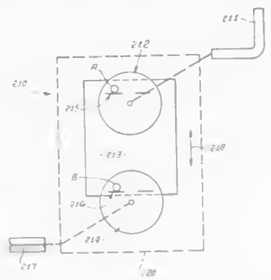
1. A tamper resistant latch comprising:
(a) a reciprocally movable member having a latch arm extending therefrom in a direction substantially perpendicular to the direction of movement of said member, the latch arm having a shank terminating in a generally spherical member of a diameter larger than the largest transverse dimension of the shank; and
(b) a keeper plate being disposed between the movable member and the generally spherical member at the end of the shank and having at least one slot therein with an open end for receiving the shank of the latch arm, the slot terminating at the non-open end in an at least partially recessed latch retainer;
(c) the generally spherical member at the end of the latch arm being positively seated in the latch retainer when the latch arm shank is fully received in the slot so as to prevent movement of the movable member and whereby relative movement of the movable member and the keeper plate toward one another is required to unseat the generally spherical member from the latch retainer so as to permit movement of the movable member.

4,915,431
ELECTROMAGNETIC LOCK HAVING A SELF-ADJUSTING SWITCH ASSEMBLY FOR DOOR-MOVEMENT ALERT
Kevin L. Bailey, Rolling Meadows, Ill., assignor to Rixson-Firemark Inc., Franklin Park, Ill.
Filed Feb. 27, 1989, Ser. No. 315,617
Int. Cl.[4] E05C *17/56*
U.S. Cl. 292—251.5 13 Claims



1. In an electromagnetic lock including an armature an electromagnet with the armature adapted for floating attachment to a door by attachment means fixed to the door, and an electromagnet adapted for fixed mounting to an adjacent door element, the improved door-movement alert switch means comprising a switch supported relative the electromagnet, extensible means supported on the door attachment means, and means force-biasing the extensible means into mating contact with the switch when the door is electromagnetically locked to establish a first switch-actuation state, and the force-biased extensible means maintaining the switch in its first state while the armature is magnetically restrained in response to limited door movement.

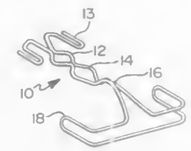
4,915,432
DOOR HANDLE MOTION TRANSFER MECHANISM
Charles A. Gressett, Jr., Eagle Rock, Calif., assignor to Adams Rite Manufacturing Company, City of Industry, Calif.
Filed Dec. 19, 1988, Ser. No. 286,178
Int. Cl.[4] E05C *21/02*
U.S. Cl. 292—336.3 15 Claims



1. In apparatus for transferring door opening or closing motion, in response to rotation of a door handle, the combination comprising:
(a) a mounting means,
(b) first, second and third elements carried by the mounting means, for movement relative thereto, the first and third elements coupled to the second element, the second element carried for bodily movement in response to rotation of the first element by the door handle, the third element being rotatable in response to bodily movement of the second element,
(c) a rotary output element connected to the third element, and
(d) at least two of the first, second and third elements having alternative coupling positions characterized in that in one position the output element is rotated clockwise when the handle is rotated clockwise, and in the other position the output element is rotated clockwise when the handle is rotated counterclockwise,
(e) the first element being operatively connected with the handle to be rotated thereby, and the third element being operatively connected with the rotary output element to rotate the rotary output element,
(f) the second element comprising a generally linearly movable slider interfitting two pins, A and B, pin A operatively carried by the first element, and pin B operatively carried by the third element.

4,915,433
COOKING LID LIFTING SUPPORT
Karoleen Schafer, 724 Ann Street, Birmingham, Mich. 48009
Filed Aug. 5, 1988, Ser. No. 229,010
Int. Cl.[4] A47J *45/00*
U.S. Cl. 294—12 3 Claims

1. A cooking lid lifting support for a cooking vessel lid, comprising:
a lid lifter portion made of a bent wire-like assembly designed of substantially circular openings for straddling and removably attaching and accommodating varying sizes and shapes of handles of a cooking vessel lid, said lid lifter portion being designed for securely supporting and lifting a lid having a handle on its top;
a deep, U-shaped clip designed for clipping onto the side of the cooking vessel, said clip acting as a holder for holding the lid lifting support and the lid in a desired relation on the side of the cooking vessel, thereby imparting, stability to the lid lifting support while holding the lid in position on the side of the cooking vessel; and

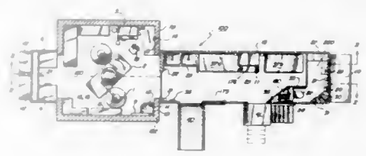


a handle located intermediate the lid lifter portion and the clip, said handle being integral with and permanently attached to both the lid lifter portion and the clip, and said handle further being shaped to be complementary to the shape of a human hand for lifting the lid and for placing the clip on the side of the cooking vessel, and lifting support being designed so that the lid after portion holds the cooking vessel lid in such a fashion that when clipped to the side of the cooking vessel, the drippings on the inside surface of the lid drip and return into the cooking vessel.

4,915,434
APPARATUS FOR SHORTENING AND FASTENING A STRAP TO WRAP AND HOIST A LOAD
Udo Dolezych, Im Grund 26, 5804 Herdecke, and Rupprecht Graf, Cologne, both of Fed. Rep. of Germany, assignors to Udo Dolezych, Herdecke, Fed. Rep. of Germany
Filed Apr. 25, 1988, Ser. No. 186,056
Claims priority, application Fed. Rep. of Germany, May 3, 1987, 3714756; Jul. 3, 1987, 3722970; Aug. 21, 1987, 3727918
Int. Cl.[4] B66C *1/10;* A44B *11/06;* F16G *11/14*
U.S. Cl. 294—74 13 Claims

1. Apparatus to shorten and/or fasten flat belts for wrapping and hoisting a load, comprising:
(a) a base plate being adapted for use in a vertical orientation and having a crane lug defined in an upper portion thereof, said base plate having an extended surface and an edge surface; and
(b) a plurality of elongated deflector elements having free ends for being at least in partial removable contact with the belts with said free ends for receiving the belts, and with said deflector elements being attached at ends opposite said free ends to said base plate in spaced apart relation to one another, said deflector elements projecting from said base plate and adapted to have inserted past said free ends thereof and pulled therebetween and deflected and looped thereabout in a meandering fashion the belts to fasten the belts to said deflector elements before hoisting the load; and
means for securing a portion of a belt disposed away from the meandering portion of the belt, the load for being disposed between;
the portion of the belt disposed away from the meandering portion of the belt secured by said securing means and the meandering portion of the belt meandering about said deflector elements;
said plurality of deflector elements including at least three deflector elements including at least three deflectors; and
said deflector elements projecting generally perpendicularly from the extended surface of said base plate.

4,915,435
MOBILE OPERATING ROOM WITH PRE AND POST-OPERATIONAL AREAS
Brian M. Levine, 28571 Springfield Dr., Laguna Niguel, Calif. 92677
Filed Apr. 5, 1989, Ser. No. 333,634
Int. Cl.[4] B60P *3/14*
U.S. Cl. 296—74.1 35 Claims



1 A mobile invasive surgery van capable of being transported on the roads and highways and equipped with essential equipment for invasive surgery to be performed within the van, said van comprising:
a main body section that is capable of being towed, mounted on wheels for mobility by a separate power section;
an expandable portion of said main body provided by telescoping side sections thereof which move outwardly from the main body portion in order to form an expanded invasive surgery room; and
an operating table centrally located in said expandable section, said table being stowable so that the expandable section may be nested or expanded without removal of said surgery room operating table from said van.

4,915,436
WHEEL SET FOR RAIL VEHICLES
Rudolf Jaus, Gruneggstr. 12, 6005 Luzern, Switzerland
Filed Apr. 13, 1988, Ser. No. 181,192
Claims priority, application Switzerland, Apr. 13, 1987, 1420/87
Int. Cl.[4] B60B *35/00*
U.S. Cl. 295—36.1 11 Claims

1. A wheel set for rail vehicles, the wheel set comprising:
an axle for supporting two wheels spaced apart, the axle having opposite ends and respective end regions inward from the opposite ends;
a respective support tube for a wheel disposed around each of the end regions of the axle; a respective wheel arranged on each support tube at the respective end region of the axle, the wheel extending around the support tube and the support tube extending through the wheel, whereby the wheel is supported to the support tube; the support tubes

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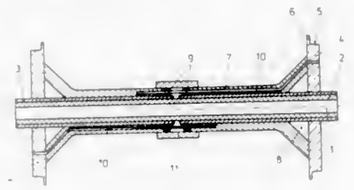
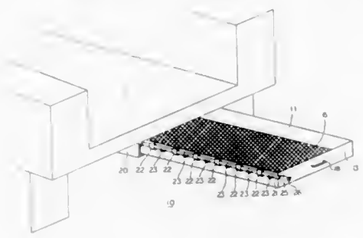
being so placed on the axle as to space the wheels apart a distance corresponding to a preset wheel gauge;

a respective sleeve disposed around the outside of each support tube, axially inward of each of the wheels, and engaging and extending axially inward from the inner side of the wheel toward the middle of the axle, in the region



of the sleeve axially approaching the inner side of the wheel, the sleeve flaring outwardly and defining a conical shape at and axially inward from the inner side of the wheel such that a space is formed between the conical shape, the wheel, and the support tube, the conical shape being selected for reducing air turbulence in the region of the wheel.

4,915,437
TOOL TRAY
Kim Cherry, P.O. Box 4364, Boise, Id. 83711
Filed Mar. 27, 1989, Ser. No. 328,879
Int. Cl.[4] B60R *11/06*
U.S. Cl. 296—37.6 4 Claims



1. A tool tray for storing tools on the underside of the bed of a utility truck, said truck including a pair of longitudinal frame members, said members forming receiving channels having an upper lip and a lower lip, and being abutted in a parallel spaced relation to the underside of the bed, which comprises:

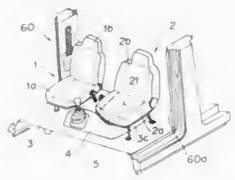
a rectangular frame having first and second length defining side members and front and back width defining end members, wherein said side and end members each have an upper edge and lower edge;

a rectangular bottom panel having a similar length and width to that of said rectangular frame and being attached to said frame along the lower edges of said side and end members;

roller means being attached to said rectangular frame and in constant slidable engagement with said upper and lower lips of said receiving channels and bearing against said lower lip, in the manner of a fulcrum and against said upper lip to allow cantilever support for said tray for slidably supporting said rectangular frame in said receiving channels; and

engagement means cooperatively attached between said rectangular frame and said receiving channels for holding said rectangular frame in any one of a plurality of preselected displacement positions with respect to said receiving channels, said plurality of displacement positions including an open position, a closed position, and positions therebetween.

4,915,438
VEHICULAR SEATING APPARATUS
Teruo Hashimoto, Higashihiroshima; Takashi Masuhara, Toyota; Tetsuro Murakami; Yoshinori Murakami, both of Hiroshima, and Tetsuya Kameshima, Higashihiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Feb. 2, 1989, Ser. No. 305,609
Claims priority, application Japan, Feb. 2, 1988, 63-21152; Feb. 25, 1988, 63-42992
Int. Cl.[4] B62D *25/10*
U.S. Cl. 296—65.1 20 Claims

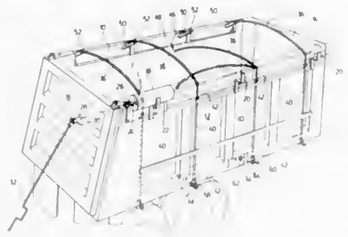


1. A vehicular seating apparatus including an assistant driver's seat mounted in the interior of a driver cabin of a vehicle and above a service hole on an engine deck raised at the central part of a floor sideward of a driver's seat, wherein said apparatus includes:

a transverse displacement mechanism for displacing said assistant driver's seat in the transverse direction of the vehicle, and

a transverse leap-up mechanism for upwardly turning the assistant driver's seat about a pivot which is at an end of a seat cushion of the assistant driver's seat situated on the side of the driver's seat.

4,915,439
TARPAULIN SUPPORT STRUCTURE
Nello Cramaro, 779 York Road, Dundas, Ontario, Canada L9J 1J9
Filed Mar. 14, 1988, Ser. No. 176,953
Claims priority, application Canada, Nov. 10, 1987, 544414
Int. Cl.[4] B60J *7/10*
U.S. Cl. 296—98 18 Claims



1. A tarpaulin support superstructure for use with an open-topped container body constituted by two transversely spaced side walls, two longitudinally spaced end walls and a floor, the superstructure comprising:

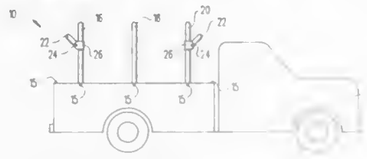
a plurality of longitudinally-spaced transverse support members each of a length to extend from one side of the container to the other with their two ends supported at the respective side walls, and each movable between an operative position in which the member extends between the side walls to support a tarpaulin thereon, and a stored position in which it lies along the respective side wall clear of the container body opening;

a vertical pivot member for each transverse support member having an upper and a lower end and having a respective adjacent end of the support member attached to the upper end thereof, and mounted on a respective container side wall for rotation about a vertical pivot axis, so that rotation of the pivot member about the pivot axis moves the support member between the said operative and stored positions;

an upwardly-extending ramp member for each transverse support member attached to the other side wall from the respective pivot member and engaged by the free end of the support member as it moves to the operative position to lift the free end and prevent jamming thereof against the other side wall; and

a handle connected to each vertical pivot member for rotation fo the pivot member about the pivot axis and consequent rotation of the respective support member.

4,915,440
TRUCK BED COVER
Avis U. Daniel, and Sallye R. Jones, both of 10666 Scotland Ave., Apt. #14042, Baton Rouge, La. 70807
Filed Mar. 8, 1989, Ser. No. 320,514
Int. Cl.[4] B62D *25/06*
U.S. Cl. 296—104 1 Claim



1. A truck bed cover for covering cargo loads, comprising:

a plurality of generally U-shaped rigid supports;

means for mounting said supports in spaced relation along the length of a truck bed;

each of said plurality of generally U-shaped rigid supports having collapsing leg portions;

said collapsing leg portions each formed by a plurality of telescoping sections;

forward most and rearward most ones of said supports each provided with a secondary pivotal arcuate rigid support bar;

bracket means mounting each of said secondary support bars to said telescoping sections for independent pivotal angular and vertical elevational adjustment with respect to each other and to said U-shaped supports;

a flexible cover supported over said plurality of supports and dimensioned for covering the truck bed;

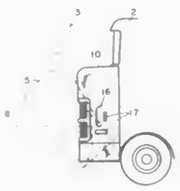
a plurality of spaced cooperating snap fasteners on said cover and the truck bed for securing said cover;

first retaining pin means for securing said secondary supports in selected discreet angular positions;

second retaining pin means for retaining said secondary supports in selected discreet vertical elevational positions; and

third retaining pin means for securing said telescoping sections in selected discreet positions, whereby said U-shaped rigid supports are mounted for vertical adjustment with respect to the truck bed, independently of said secondary supports, to allow adaptation of said cover for various different cargo load dimensions.

4,915,441
WIND FAIRING AND MOUNT
Clyde Nitzke, 730 Robert, Poy Sippi, Wis. 54967
Continuation of Ser. No. 219,378, Jul. 14, 1988, abandoned. This application Aug. 15, 1989, Ser. No. 393,799
Int. Cl.[4] B62D *35/00*
U.S. Cl. 295—180.2 13 Claims



4. A tiltable wind fairing and mount for the front of blunt fronted trucks comprising;

(a) a wind fairing having as a part of its construction, upper latch mounts,

(b) a latch assembly secured to the latch mounts, and the latch assembly has as a part thereof at least one latch hook,

(c) lower pivot mounts, forming a part of the fairing construction and positioned below the upper latch mounts,

(d) a latch engaging and pivot unit, secured to the pivot mounts, and having as a part thereof at least one latch hook engaging pin, and

(e) the latch engaging and pivot unit is operably secureable to the front of a blunt fronted truck.

4,915,442
DOOR REINFORCEMENT FOR MOTOR VEHICLES
Peter Garaweidner, Salzburg, Austria, assignor to Austria Metall Aktiengesellschaft, Braunau am Inn, Austria
Filed Aug. 1, 1988, Ser. No. 226,646
Claims priority, application Austria, Jul. 31, 1987, 1942/87
Int. Cl.[4] B60J *5/04*
U.S. Cl. 296—188 8 Claims

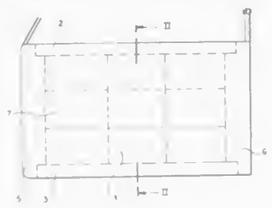
1. A door reinforcement for protecting a car against sideways collision comprising:

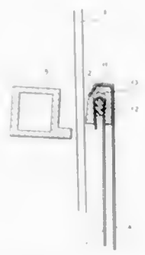
an upper and a lower rigid horizontal support parallel to one another, said upper rigid horizontal support having a recess therein and forming an outer sealing edge along an outward side of a window;

an inner horizontal support positioned along an inner side of said window forming an inner sealing edge thereof; and

at least one flexible pretensioned bracing band having first and second ends, said first and second ends attached to said upper and lower rigid horizontal supports, respec-

tively, said first end penetrating into said recess and having adjacent thereto a wedge, said wedge becoming





tighter when subjected to a tensile load on said bracing band.

4,915,443

TRANSFORMABLE PASSENGER MOTOR VEHICLE

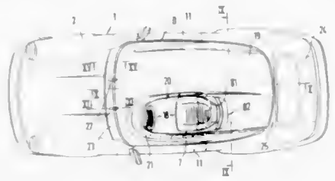
Rainer Uerlings, Rutesheim; Eugen Kolb, Stuttgart, and Winfried Altmann, Weissach, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Weissach, Fed. Rep. of Germany

Filed Aug. 11, 1988, Ser. No. 231,002

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1987, 3729557

Int. Cl.[4] B60J *7/00, 7/19*

U.S. Cl. 296—216 29 Claims



1. A transformable passenger motor vehicle arrangement for vehicles with lateral doors and a passenger space, comprising:

a one-piece form-rigid covering means adapted to extend approximately at a vehicle belt line height of an open vehicle body, said covering means serving to close off the entire passenger space except for a longitudinal cut out section for a vehicle driver,

pivot connection means for pivotally moving the covering means between a closed driving position and an open driver ingress and engress position for accommodating ingress and egress of the driver when the vehicle is not being driven,

wherein the pivot connection means includes one four-jointed hinge means arranged at each of the two longitudinal sides of the covering means, said hinge means including two guide members that are pivotally connected, on the one hand, with the vehicle body and, on the other, with the covering means, and

and cover latching means for latching the covering means in its closed driving position.

4,915,444

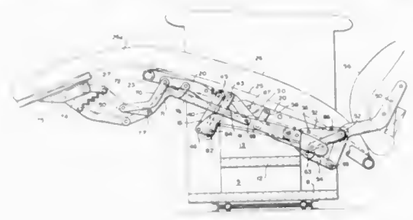
RECLINER CHAIR

Walter C. Rogers, Jr., P.O. Box 685, Denton, N.C. 27239

Filed Jun. 5, 1989, Ser. No. 361,309

Int. Cl.[4] A47C *1/02;* A61G *15/00*

U.S. Cl. 297—68 14 Claims



1. A recliner chair comprising in combination a base, a seat and backrest assembly, a linkage system mounting the seat and backrest assembly on the base, a footrest linkage mounted at the front of the chair for movement between retracted and extended positions, a footrest frame connected to the footrest linkage to move between a retracted position extending generally horizontally below the seat and inwardly of the front end of the seat and an extended position projecting forwardly from the front end of the seat, layer of upholstery overlying and fixed to the seat and extending continuously to the footrest frame while being fixed thereto, said upholstery layer extending continuously from the seat to the footrest frame when the footrest is in extended position to provide a continuous leg and foot support surface, and extending convexly about the front end of the seat and below the seat when the footrest frame in in retracted position and wherein the footrest linkage is located between the footrest frame and the seat when the footrest frame and the footrest linkage are in said retracted positions.

4,915,445

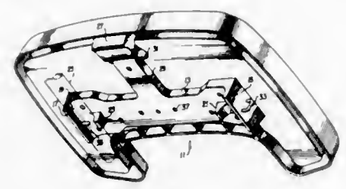
HIGH CHAIR LATCH MECHANISM

Harry J. Glambrone, Kettering, Ohio, assignor to Spalding & Evenflo Companies, Inc., Tampa, Fla.

Filed Sep. 11, 1989, Ser. No. 405,170

Int. Cl.[4] A47B *39/00*

U.S. Cl. 297—151 4 Claims



1. A high chair tray latch mechanism for removably securing a tray to the arms of a high chair, said latch mechanism comprising

a housing secured to the underside of a high chair tray;

a bell crank rotatably mounted substantially centrally within said housing;

first and second latches mounted at opposite ends of said housing, said latches adapted to mate with apertures in the arms of a high chair;

first and second rigid bars pivotally connected between opposite arms of said bell crank and said first and second latches;

spring means for biasing said bell crank in a direction to maintain said latches in a locked position within their respective arms of said high chair;

a cable operatively connected at one end to said bell crank between said arms whereby a force exerted on said cable rotates said bell crank so as to overcome the bias of said springs and move said latches to an unlocked position relative to said high chair arms; and

a lever secured to said housing and the other end of said cable whereby squeezing said lever against said tray foreshortens said cable and unlocks said latches.

4,915,446

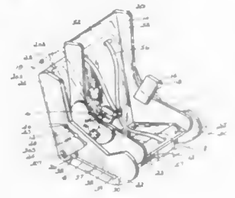
INFANT SEAT, REMOVABLE SEAT AND SEAT LATCH

Ronald J. Darling, Rte. 5; Thomas G. Darling, Oakridge Estates, Lot 36, and Steven M. Darling, 909 Parkview Dr., all of Decatur, Ind. 46733

Continuation-in-part of Ser. No. 53,811, May 26, 1987, abandoned. This application Nov. 18, 1988, Ser. No. 273,664

Int. Cl.[4] A47D *1/10*

U.S. Cl. 297—250 26 Claims



1. A seat for use by a child in an automobile equipped with a seat belt, said seat comprising a base member securable within an automobile by said seat belt, said base member having a frame and a holder, said holder being disposable within said frame in at least two positions, said holder being selectively slideable between said positions, an infant carrier joined to said holder, said carrier being disjoinable from said holder without removal of the child from said carrier, and means for restraining the child in said seat.

4,915,447

VEHICLE SEAT WITH ADJUSTABLE THIGH SUPPORT

J. Scott Shovar, Davenport, Iowa, assignor to Sears Manufacturing Company, Davenport, Iowa

Filed Mar. 13, 1989, Ser. No. 322,438

Int. Cl.[4] A47C *7/02*

U.S. Cl. 297—284 7 Claims

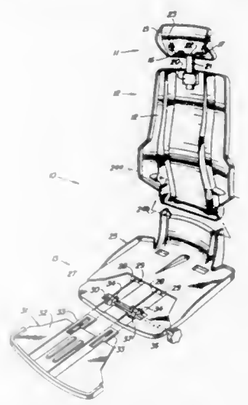
1. A vehicle seat comprising:

a backrest means;

seat means coupled to said backrest means and including a first seat part joined to the vehicle and a second seat part slidable with respect to said first seat part to vary the overall length of said seat means;

said first seat part having groove means therein and said second seat part having runner means which slidably engage said groove means;

said first seat part including a first seat pan, said groove means including a plurality of elongated depressions in said first seat pan and having at one end thereof slots formed through said first seat pan, said runner means being slidable in said depressions and through said slots to extend beneath said first seat pan; and



seat tilt means, said second seat part being slidable over said seat tilt means and pivotable with respect to said first seat part upon actuation of said seat tilt means.

4,915,448

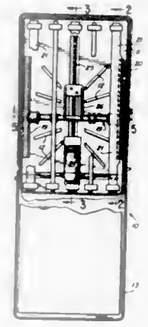
POWER ACTUATED LUMBOSACRAL BACKREST

Robin L. Morgenstern, 1443 N. Dearborn, Chicago, Ill. 60610

Filed Jul. 11, 1988, Ser. No. 217,368

Int. Cl.[4] A47C *3/00*

U.S. Cl. 297—284 10 Claims



1. A power driven lumbosacral backrest controlled by the user and comprising, in combination:

(a) a foundation frame of plastic or metal with internal and external reinforcing ribs;

(b) a pair of gear racks disposed one along each edge portion of the foundation frame;

(c) a motor and reduction gear located at the lower center of the foundation frame and connected to a vertically extending reversible drive shaft;

(d) a spindle disposed transversely of said foundation frame having a pair of axially spaced gears connected by a shift, each said gear engaging an adjacenet one of said pair of gear racks;

(e) a plurality of axially spaced rollers freely journaled on said shaft between said pair of gears;

(f) a series of flexible metallic bands or trained over said

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rollers which rotate reversely of the direction of spindle travel; and

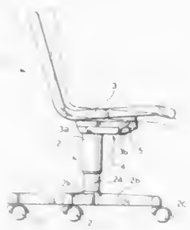
(g) a connecting bracket interposed between said reversible drive shaft and said spindle.

4,915,449

CHAIR WITH A PIVOTING SEAT

Giancarlo Piretti, Bologna, Italy, assignor to Pro-Cord S.r.l., Bologna, Italy

Filed May 8, 1989, Ser. No. 348,705
Claims priority, application Italy, May 18, 1988, 67463 A/88
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—326 **9 Claims**



1. A chair comprising:

a base structure,

a seat mounted on the base structure for pivoting about a transverse axis,

travel limiting means which define a position of maximum rearward pivoting of the seat and a position of maximum forward pivoting of the seat, and

resilient means which bias the seat towards its position of maximum rearward pivoting,

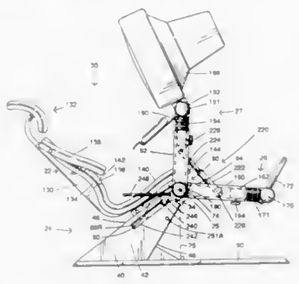
wherein the travel limiting means enable at least one of the end-of-travel positions to be adjusted.

4,915,450

WORK STATION SYSTEM

Lloyd G. B. Cooper, 3825 Redmont Rd., Birmingham, Ala. 35213

Continuation-in-part of Ser. No. 261,525, Oct. 24, 1988, which is a continuation-in-part of Ser. No. 934,970, Nov. 25, 1986, Pat. No. 4,779,922. This application Jun. 16, 1989, Ser. No. 367,469
Int. Cl.[4] A47B *39/00*; A47C *7/50*
U.S. Cl. 297—423 **38 Claims**



1. A work station comprising:

frame means for holding aloft a horizontal axis;

a chair for supporting a human operator;

a device carriage for supporting an operator-interactive device;

footrest means;

coupling means for coupling said chair, said device carriage, and said footrest means proximate said horizontal axis whereby said chair, said device carriage, and said footrest means are selectively pivotal together about said horizontal axis;

pivoting means for selectively pivoting said chair, axis device carriage, and said footrest means about said horizontal axis; and,

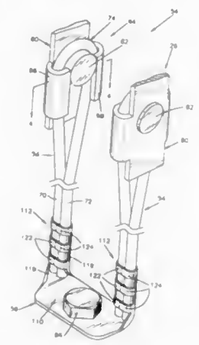
elevating means included in said frame means for selectively elevating said horizontal axis.

4,915,451

SAFETY BELT APPARATUS

Ken M. Forget, and Mark F. Gray, both of Ontario, Canada, assignors to TRW Vehicle Safety Systems Ltd., Midland, Canada

Filed Mar. 13, 1989, Ser. No. 322,692
Int. Cl.[4] B60R *21/00*
U.S. Cl. 297—468 **19 Claims**



1. Apparatus comprising:

a seat belt buckle having a base plate, said base plate having means defining facing channels;

a cable having a loop intermediate its ends and parallel extending end portions, opposite portions of said loop being located in said channels; and

a member for transmitting force acting on said buckle to said cable, said member being attached to said base plate and located in said loop and having surface portions engageable with said loop, said channels retaining said opposite portions of said loop against said member.

4,915,452

HYDRAULIC BOREHOLE MINING SYSTEM AND METHOD

Merton F. Dibble, 5908 Oakmont La., Lakeland, Fla. 33803

Filed Apr. 17, 1989, Ser. No. 339,136
Int. Cl.[4] E21C *45/00*
U.S. Cl. 299—17 **20 Claims**

1. A hydraulic borehole mining process for the extraction of minerals from a target zone of an underground formation, comprising the steps of:

drilling a borehole from the surface to said target zone;

lowering a cutting jet head by means of a string of multi-conduit pipe sections from the surface through said borehole to a downhole position adjacent said target zone;

delivering a high pressure flow of liquid from the surface through a first conduit of said pipe string to said head and directing the same through a nozzle on said head with sufficient force against said formation to separate particles of material from said target zone to create a slurry of said liquid and material;

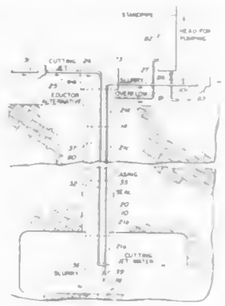
retrieving said slurry from said downhole position through a second conduit of said pipe string to the surface; and

vertically repositioning said nozzle within said borehole to a different position adjacent said target zone by selectively manipulating said head remotely from the surface through said pipe string, independently of vertical movement of said first conduit and the rest of said string.

16. A hydraulic borehole mining process for the extraction of minerals from a target zone of an underground formation, comprising the steps of:

drilling a borehole from the surface to said target zone;

lowering a cutting jet head by means of a string of multi-conduit pipe sections from the surface through said borehole to a downhole position adjacent said target zone;



delivering a high pressure flow of liquid from the surface through a first conduit of said pipe string to said head and directing the same through a nozzle on said head with sufficient force against said formation to separate particles of material from said target zone to create a slurry of said liquid and material;

sealing an annulus defined between walls of said borehole and said pipe string, and connecting said annulus at the surface to a vessel having a cavity extending above the elevation of a surface discharge line connected to a second conduit of said pipe string extending from said downhole position to the surface; and

retrieving said slurry through said second conduit by the assistance of a hydrostatic head pressure created when said slurry rises within said annulus and said cavity which acts to raise said slurry to the surface through said second conduit.

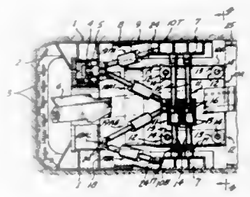
4,915,453

FLOATING SHOE TUNNEL BORING MACHINE AND BORING PROCESS

Tyman H. Fikse, P.O. Box, LaConner, Wash. 98257

Filed Apr. 18, 1988, Ser. No. 183,020
Int. Cl.[4] F21C *29/02*; F21D *9/08*
U.S. Cl. 299—31 **20 Claims**

1. A tunnel boring machine comprising a body having a front end, a rotary cutterhead of substantially the same frontal size as said body front end, rotatively mounted on said front end of said body and having cutters distributed circumferentially around said rotary cutterhead, a pair of anchor shoes floating relative to said body, the anchor shoes of said pair being disposed diametrically oppositely in generally circumferential registration, shoe-setting jack means floating relative to said body and engaged directly between the opposite anchor shoes of said anchor shoe pair for spreading the anchor shoes of said pair to set them against the tunnel wall in machine-anchoring position, said body including thrust-receiving means, and body-advancing jack means directly engaged between said thrust-receiving means and both shoes of said pair of floating anchor shoes for advancing said body relative to



said floating anchor shoes and to said floating shoe-setting jack means

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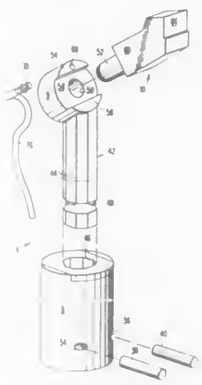
4,915,454

MINING BIT AND HOLDER

Philip W. Southern, 280 Ohio, Clarksburg, W. Va. 26301

Division of Ser. No. 926,554, Nov. 7, 1986, Pat. No. 4,842,337. This application Feb. 7, 1989, Ser. No. 307,304
Int. Cl.[4] E21C *35/18*
U.S. Cl. 299—80 **9 Claims**



5. A forward attack mining bit comprising a base, means for mounting said base to a holder for allowing said base to rotate about a longitudinal axis between first and second positions, and a cutting tip attached to said base, wherein said cutting tip is displaced from said axis and is located with respect to said base such that a first outermost cutting edge portion of said cutting tip when said base is in said first position is coincident with the location a second outermost cutting edge portion of said cutting tip would occupy when said base is in said second position.

4,915,455

MINER CUTTING BIT HOLDING APPARATUS

Michael L. O'Neill, Lucinda; Stephen P. Moore, Sandy Lake, and Eugene F. Pendolino, Franklin, all of Pa., assignors to Joy Technologies Inc., Pittsburgh, Pa.

Filed Nov. 9, 1988, Ser. No. 269,381
Int. Cl.[4] E21C *35/18*
U.S. Cl. 299—91 **22 Claims**

1. Apparatus for supporting a cutting bit on a moveable cutting head at a predetermined cutting angle, said cutting bit

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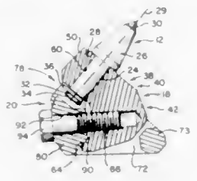
having an extended shank and a central axis passing through said shank, comprising:

a. a bit holder having an upper body portion and a lower shank portion where said body portion includes an aperture for receiving said shank of said cutting bit for supporting said cutting bit at said predetermined cutting angle, and at least one rear upper first abutment surface disposed substantially perpendicular to the axis of said cutting bit, and said shank portion includes a rear lower second abutment surface disposed substantially parallel to the axis of said cutting bit;

b. a mounting base which may be attached to sad cutting head, said mounting base having a cavity therein for receiving the shank portion of said bit holder, said mounting base having a rear member having at least one forward upper abutment surface disposed substantially perpendicular to the axis of said cutting bit and engaged by said at least one first abutment surface and a forward lower abutment surface which is substantially parallel to said axis of said cutting bit and which is engaged by said second abutment surface; and



c. means for urging said at least one first abutment surface into engagement with said at least one forward upper abutment surface of said mounting base and said second abutment surface into engagement with said forward lower abutment surface of said mounting base.

4,915,456

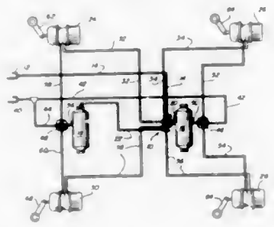
COMPACT, INTEGRATED, MULTI-FUNCTION BRAKE VALVE

Dario Gross, Corunna; Richard D. Hetfield, Owosso, and Jeffery S. Johnston, Haslett, all of Mich., assignors to Midland Brake, Inc., Owosso, Mich.

Filed May 2, 1989, Ser. No. 346,086

Int. Cl.[4] B60T *11/32*

U.S. Cl. 303—9 **8 Claims**



1. A compact, integrated, multi-function brake valve for controlling communication of a fluid under pressure between a source thereof, a plurality of reservoirs for storage thereof, and a plurality of fluid-pressure-released parking brakes, said valve comprising:

(a) first internal passageways and port for connection to said source of fluid under pressure;

(b) a plurality of second internal passageways and ports for connection respectively to each of said plurality of reservoirs for storage of fluid under pressure;

(c) a plurality of third internal passageways and ports for connection respectively to each of said plurality of fluid-pressure-released parking brakes;

(d) a fourth internal passageway and port exhausting to the atmosphere and in fluid communication with said third internal passageways and ports when the fluid pressure in said first internal passageway and port is below a first predetermined level;

(e) a first internal control means within said valve for interrupting fluid communication between said plurality of third internal passageways and ports and said fourth internal passageway and port, and for establishing fluid communication between said plurality of third internal passageways and ports and said plurality of second internal passageways and ports responsive to a fluid pressure at or above said first predetermined level in said first internal passageway and port;

(f) second internal control means within said valve for establishing fluid communication between said first internal passageways and port and said plurality of second internal passageways and ports responsive to a fluid pressure in said first internal passageway and port at or above a second predetermined level which is higher than said first predetermined level;

(g) first one-way means within the passageways of said plurality of second internal passageways and ports for individually isolating at least portions of each of said plurality of second passageways and ports and the corresponding reservoir from said first internal passageway and port responsive to a lower fluid pressure in said first internal passageways and port as compared with the fluid pressure in the respective portions of each of said plurality of second passageways and ports; and

(h) second one-way means within the passageways of said plurality of second internal passageways and ports for isolating each of said plurality of second internal passageways and ports from each other responsive to a pressure differential between the respective passageways and ports of said plurality of second internal passageways and ports; so that each of said plurality of reservoirs and communicating internal passageways and ports is protected against substantial loss of fluid pressure in the event of failure or leakage of fluid pressure from said source thereof and the communicating first internal passageways and ports, or from the others of said plurality of reservoirs and internal passageways and ports; whereby the protected reservoir is available to supply fluid under pressure to the plurality of fluid-pressure-released parking brakes.

4,915,457

LOAD-SENSITIVELY CONTROLLABLE BRAKING PRESSURE CONTROL UNIT

Bernd Schopper, Hattersheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

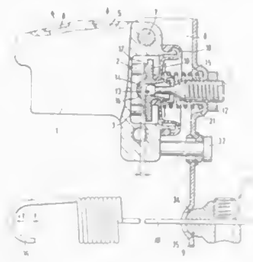
Filed Mar. 14, 1986, Ser. No. 839,788

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 3509605

Int. Cl.[4] B60T *8/22*

U.S. Cl. 303—22.8 **2 Claims**

1. A load-sensitively controllable braking pressure control unit including at least one control valve associated with a brake circuit and arranged in a housing, which is attachable to a vehicle part, at least one actuating tappet of said at least one control valve protruding from the housing, a transmission lever, which is acted upon by a first spring arrangement, adapted to be swiveled relative to the housing and is bearable against the at least one actuating tappet, said first spring arrangement having one end mounted for articulated movement to a vehicle part which moves relative to the housing, and a second end adapted to be connected to length-adjustable connecting means, said connecting means adapted to engage a free end of the transmission lever, a second spring arrangement clamped between the transmission lever and said at least one actuating tappet, and said stop means associated with the housing and the transmission lever for limiting movement of said



transmission lever, a predetermined clearance distance provided between the transmission lever and said at least one actuating tappet with the transmission lever against said stop means, said first and second spring arrangements generating identical torques with the transmission lever against said at least one actuating tappet.

4,915,458

RELAY VALVE APPARATUS

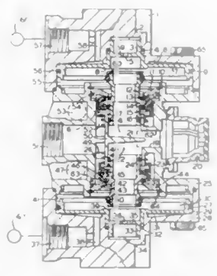
Karl-Heinz Deike, Pattensen, and Bernd Kiel, Wunstorf, both of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzuegbremsen GmbH

Filed Nov. 15, 1988, Ser. No. 271,548

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1987, 3741790

Int. Cl.[4] B60T *15/02, 8/38*

U.S. Cl. 303—40 **18 Claims**



1. A relay valve apparatus for use in an anti-lock regulation system for vehicle brake units comprising:

(a) a first double seat valve having a first inlet valve for establishing communication of a first working chamber with a fluid pressure input chamber, and having a first outlet valve for establishing communication of the first working chamber with a first outlet chamber which is in communication with the atmosphere;

(b) the first double seat valve having a first relay piston which is connected to a first source of control pressure;

(c) a second double seat valve having a second inlet valve for establishing communication of a working chamber with a fluid pressure input chamber, and having a second outlet valve for establishing communication of the second working chamber with a second outlet chamber which is in communication with the atmosphere;

(d) the second double seat valve having a second relay piston which is connected to a second source of control pressure;

(e) the first and second double seat valves and the relay pistons are located one behind the other in the direction of their longitudinal axes, so that the first and second double seat valves are located between the relay pistons;

(f) the first outlet chamber of the first double seat valve and the second outlet chamber of the second double seat valve empty into a common pressure outlet passage leading to the atmosphere; and

(g) a deflector located between the first and second outlet chambers for preventing interaction between the first and second relay pistons when fluid pressure is exhausted through the common outlet passage to atmosphere.

4,915,459

ANTILOCK MECHANISM

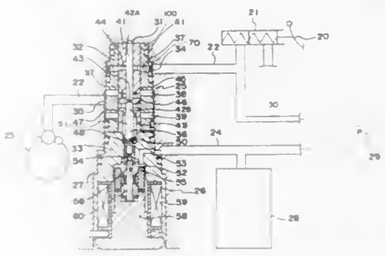
Koichi Hashida; Terahisa Kohno, and Koji Takata, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 17, 1989, Ser. No. 353,023

Claims priority, application Japan, May 31, 1988, 63-135040; May 31, 1988, 63-135041

Int. Cl.[4] B60T *8/36*

U.S. Cl. 303—119 **5 Claims**



1. An antilock mechanism which has a drain channel provided in such a manner as to branch from a main channel connecting a hydraulic pressure source with wheel brake, and a drain valve which opens to the drain channel upon electrical excitation and is provided with a flow control valve at said branch junction;

said flow control valve being provided with a housing having a bore formed therein with at least one end being opened, said flow control valve comprising an inlet port connected with said hydraulic pressure source, a first outlet port connected with said wheel brake, and a second outlet port connected with said drain valve;

inside said housing through said bore being inserted a spool comprising first axial conduit and a second axial conduit separated by a wall having a fixed orifice formed therein, said spool being biased by a return spring and sliding freely in the axial direction thereof;

depending upon the relative axial positions of said spool and housing, during a non-antilock control condition, a large fluid passage being formed between said inlet port and said first outlet port;

during antilock pressure release condition as obtained when the drain valve is open, said large fluid passage being blocked, and a pressure releasing passage being formed between said first outlet port and second outlet port;

during antilock pressure increase condition as obtained when the drain valve is closed, a variable orifice being formed between the spool and the housing, thus forming a small fluid passage from the inlet port to the first outlet port through said fixed orifice and said variable orifice in series;

and when a difference between the pressure at said inlet port

and that at said first outlet port is less than a predetermined amount, said return spring exerts returning force to said spool so as to return it to the non-antilock control position;

characterized in that:

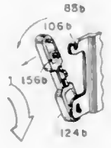
said open end of the bore of said housing forms said second outlet port such that a portion of said pressure releasing passage is formed straight between said open end of said flow control valve and a valve member of said drain valve which is located in such a manner as to block said open end.

4,915,460

SECURITY SYSTEM FOR DISPENSING RACKS

Thomas J. Nook, 15160 Deremo, Grand Haven, Mich. 49417, and Henry G. Oltof, 17863 Mohawk, Spring Lake, Mich. 49456

Filed Jun. 30, 1988, Ser. No. 214,429
Int. Cl.[4] A47F *3/00*
U.S. Cl. 312—138.1 **30 Claims**



1. A security system for a dispensing rack adapted to dispense articles having a predetermined height from the bottom of a stack of such articles, such rack having a front face, means defining an opening in said face, and a horizontal shelf positioned in said opening for supporting a stack of articles, said system comprising:

an upper shield having a lower horizontal edge vertically spaced from said shelf and a first pair of opposite lateral end portions, said upper shield being positioned across said opening with said lower horizontal edge being spaced from said horizontal shelf substantially said predetermined height of said articles to define an access space between said upper shield lower horizontal edge and said space to remove said articles individually from the bottom of a stack;

mounting means for pivotally mounting said upper shield to said front face such that said upper shield will pivot about a horizontal axis substantially at said upper shield lower horizontal edge between a first position facially adjacent said front face and a second position away from said front face, whereby said shelf may be stocked with articles with said upper shield in said second position;

a lower shield having upper and lower peripheral horizontal edges spaced apart substantially said predetermined height of said articles and a second pair of opposite lateral end portions;

first pivot means for pivotally mounting said lower shield at said upper edge to said upper shield at said lower edge thereof such that said lower shield will pivot about a first horizontal axis between a first position facially adjacent said upper shield to provide an access space to dispense individual ones of said articles in a stack and a second secured position extending between said upper shield and said shelf in which said lower shield closes said space to prevent dispensing of articles; and

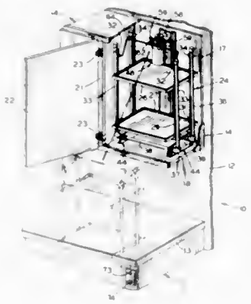
locking means for selectively securing said lower shield in said second position.

4,915,461

STORAGE CABINET RETRIEVAL SYSTEM

Michael R. Kingsborough, 1698 County Rd. 129, Fremont, Ohio 43420, and Dale D. Owens, 2295 County Rd. 292, Bellevue, Ohio 44811

Filed Jun. 7, 1989, Ser. No. 362,751
Int. Cl.[4] A47F *5/08*
U.S. Cl. 312—247 **8 Claims**



1. A storage and retrieval apparatus for use with elevated cabinets comprising, in combination, spaced pairs of front and rear arms, mean pivotally mounting said arms at their lower ends for swinging movement into and out of said cabinet, a first sling member pivotally carried at its upper ends between said spaced front arms, a second sling member pivotally carried at its upper ends between said spaced rear arms, a shelf means carried by said first and second sling members in a generally horizontal attitude, a flexible cord attached at the upper end of the swinging arm sling member assembly, a power unit including a rotatably driven reel adapted for winding and unwinding said flexible cord, and switch means operable to selectively activate said power unit in forward and reverse directions for winding and unwinding said flexible cord to thereby swing said arms carrying said shelf means between a storage position within said cabinet and a retrieval position outside said cabinet.

4,915,462

SHOCK-RESISTANT WIRE-MESH TROLLERY FOR TRANSPORTING VARIOUS PRODUCTS

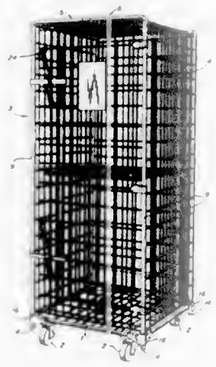
Alain Le Marchand, Reichstett, and Raymond Gillot, Bischheim, both of France, assignors to Ateliers Reunis Caddie, Schiltigheim, France

Filed Dec. 8, 1988, Ser. No. 281,454
Claims priority, application France, Dec. 9, 1987, 87 17132
Int. Cl.[4] A47B *47/03*
U.S. Cl. 312—250 **6 Claims**

1. Trolley for transporting miscellaneous products, which comprises a horizontal platform mounted on casters and a pair of vertical walls each comprising a grid of intercrossed metal wire, said walls having lower ends secured to two opposed sides of said horizontal platform,

said pair of vertical walls (**3**, **4**) each having a substantially inveted-L configuration, whereby said walls comrpise top horizontal wings (**5**, **6**) extending toward each other and having edges (**10**, **11**) joined to each other,

said pair of vertical walls further comprising side uprights (**9**, **9***a*, **9***b*, **9***c*) having lower ends (**13**, **13***a*, **13***b*, **13***c*) secured in



vertical sleeves (**14**) secured in turn at four corners of said horizontal platform (**1**).

4,915,463

MULTILAYER DIFFRACTION GRATING

Troy W. Barbee, Jr., Palo Alto, Calif., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Oct. 18, 1988, Ser. No. 259,564
Int. Cl.[4] G02B *5/18*
U.S. Cl. 350—1.1 **6 Claims**

1. An X-ray to VUV reflection multilayer diffraction grating, that comprises:

a reflection laminar diffraction grating of grating period D, that comprises a multiplicity of parallel and equally spaced flat-topped grating bars that are all attached to a common base, with all the flat tops of the grating bars being coplanar with one another and providing a surface;

a multiplicity of layered synthetic microstructures of microstructure period d, with each microstructure comprised of a common number of flat and parallel alternating layers of two different materials, with all the layers comprised of the first material being approximately equal in thickness and all the layers comprised of the second material being approximately equal in thickness, and with a single microstructure coveringly disposed over the flat top surface of each of the multiplicity of grating bars so that all the corresponding layers of each of the microstructures are coplanar with one another; and

said reflection laminar diffraction grating and said multiplicity of layered synthetic microstructures cooperatively interacting to provide that when radiation is incident on the reflection multilayer diffraction grating at an angle A with respect to the surface of the grating, the radiation is grating dispersed from the zero order reflective path at an angle B, such that the generalized grating equation for the multilayer diffraction grating is given with a high degree of accuracy by

$$\sin B \simeq \frac{2md}{nD}\left[1 - \frac{2f - f^2}{\sin^2 A}\right]^{1/2},$$

wherein,

m is the grating order of the dispersed radiation,

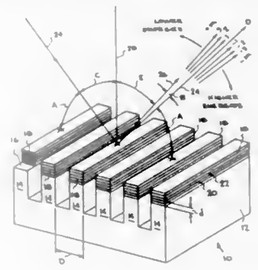
n is the order of Bragg reflection, and

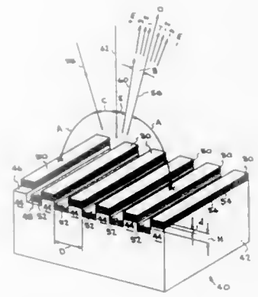
f is one minus the spatially averaged index of refraction of the layered synthetic microstructures;

wherein the multiplicity of parallel grating bars have a grating period D in the approximate range from 3,000 to 50,000 Angstroms;

wherein any two adjacent microstructure layers have a combined thickness in the approximate range from 10 to 400 Angstroms;

wherein the multiplicity of flat-topped grating bars of the reflection laminar diffraction grating are commonly fabricated by being anisotropically etched from a single crystal of silicon;





wherein all the corresponding layers of each of the microstructures are commonly synthesized in place by physical vapor deposition employing individual magnetron sputter sources for each of the two different materials; and

wherein the two different materials of the alternating layers of the microstructures are material pairs selected from the group consisting of rhodium and carbon, molybdenum and silicon, tungsten and carbon, tungsten and silicon, stainless steel and silicon, palladium and carbon, molybdenum disilicide and silicon, and tungsten carbide and carbon.

4,915,464

REFLECTION HOLOGRAMS AND THE REPLICATION THEREOF

Antony I. Hopwood, Bollington, England, assignor to Ciba-Geigy AG, Basle, Switzerland

Filed Aug. 18, 1988, Ser. No. 233,400
Claims priority, application United Kingdom, Aug. 27, 1987, 8720189; Aug. 27, 1987, 8720190; Aug. 27, 1987, 8720191
Int. Cl.[4] G03H *1/20*
U.S. Cl. 350—3.69 **17 Claims**

1. A reflection hologram which has been prepared from a transmission hologram, wherein the reflection hologram is divided into a plurality of sequential parallel notional strips extending from one side or end to the other, interference fringes present in said strips being substantially in the form of

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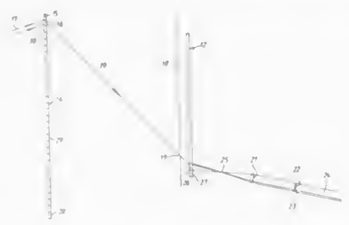
parts of concentric shells, and such strip of the reflection hologram containing information derived from the whole of the transmission hologram, the reflection hologram being viewable through a viewing window defined by the position of the transmission hologram relative to the reflection hologram during the production of the reflection hologram.



4,915,465

LASER BEAM PRINTER USING ONLY ONE SIDE SURFACE OF A ROTATIONAL MIRROR TO SCANNINGLY DEFLECT A SUBSTANTIALLY PERPENDICULAR LASER BEAM

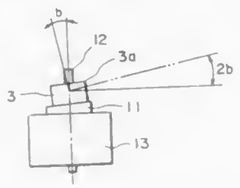
Hoshinori Sugiura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1988, Ser. No. 149,020

Claims priority, application Japan, Jan. 30, 1987, 62-019915; Apr. 28, 1987, 62-107002; Jun. 30, 1987, 62-101356; Oct. 8, 1987, 62-255992

Int. Cl.[4] G02B *26/10*

U.S. Cl. 350—6.5 **6 Claims**



1. A laser beam printer, comprising:

a photosensitive member;

a beam generating station for providing a laser beam modulated in accordance with image information;

a rotational mirror for reflecting the laser beam, said rotational mirror having one side surface effective to reflect the beam, said one side surface extending substantially parallel with a rotation axis of said rotational mirror, wherein only the one side surface is used for scanningly deflecting the beam to scan said photosensitive member, the laser beam being substantially perpendicularly incident on said one side surface; and

driving means for rotating said rotational mirror in one direction to scanningly deflect the beam.

4,915,466

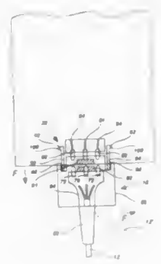
REVERSIBLE OPTICAL OR ELECTRO-OPTICAL CONNECTOR

Jay R. Sorensen, Aloha; Jack M. Millay, and Joseph D. LaPerna, both of Beaverton, all of Oreg., assignors to Space-Labs, Inc., Bothell, Wash.

Filed Sep. 15, 1988, Ser. No. 244,986

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.2 **10 Claims**



1. An optical or electro-optical connector, comprising:

a plug having a center optical coupling member and at least one pair of outer optical coupling members symmetrically positioned with respect to said center optical coupling member, each pair of outer optical coupling members being coupled to each other so that they output or receive the same optical signals; and

a socket having a center optical coupling member and at least one pair of outer optical coupling members symmetrically positioned with respect to said center optical coupling member, said outer optical coupling members of each pair being coupled to each other so that they output or receive the same optical signals, said center optical coupling member and each pair of said outer coupling members being positioned at locations that correspond to the positions of the respective center optical coupling member and each pair of outer optical coupling members of the plug so that, when said plug is inserted into said socket, the center optical coupling member of said plug is positioned adjacent the center optical coupling member of said socket and the pairs of outer optical coupling members of said plug are positioned adjacent corresponding pairs of outer optical coupling members of said socket, the center optical coupling member of said plug communicating with the center optical coupling member of said socket and the outer optical coupling members of said plug communicating with the adjacent outer optical coupling members of said socket, said plug and socket being physically adapted to interconnect with each outer optical coupling member of said plug opposite either outer optical coupling member of said socket so that said plug and socket may be reversibly interconnected without affecting the communication between said plug and socket.

4,915,467

METHOD OF MAKING FIBER COUPLER HAVING INTEGRAL PRECISION CONNECTION WELLS

George E. Berkey, Pine City, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Sep. 12, 1988, Ser. No. 242,919

Int. Cl.[4] G02B *6/26, 6/42*

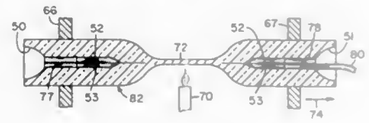
U.S. Cl. 350—96.15 **14 Claims**

1. A method of making a fiber optic coupler comprising the steps of

providing a glass coupler preform tube having first and second opposite end portions, a midregion, and a longitudinal aperture extending therethrough, the cross-sectional shape of said aperture being suitable for receiving a plurality of optical fibers in predetermined azimuthal locations, disposing within said longitudinal aperture at least two glass optical fibers, the ends of said fibers being disposed in those portions of said aperture between said midregion and the ends of said aperture,

heating the midregion of said tube to collapse said midregion around the central portions of said fibers, and

drawing the central portion of said midregion to reduce the diameter thereof.



4,915,468

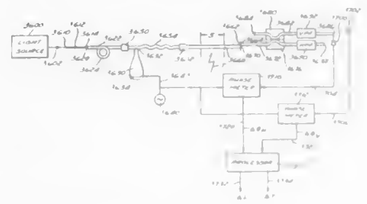
APPARATUS USING TWO-MODE OPTICAL WAVEGUIDE WITH NON-CIRCULAR CORE

Byoung Y. Kim, Menlo Park, Calif., and James N. Blake, Phoenix, Ariz., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 17,882, Feb. 20, 1987, abandoned. This application Sep. 16, 1988, Ser. No. 245,717

Int. Cl.[4] G02B *6/02, 6/26*

U.S. Cl. 350—96.15 **88 Claims**



1. An apparatus, comprising:

an optical waveguide having a core with a non circular cross section; and

a source of light for introducing light signals having at least one wavelength into the wavelength for propagation therein, such that a substantial portion of the light is at one or more wavelengths less than a first predetermined cutoff wavelength of said waveguide to cause the waveguide to guide light in both a fundamental spatial propagation mode and a higher order spatial propagation mode;

said waveguide being sized to provide a second predetermined cutoff wavelength for said signals, less than the first predetermined cutoff wavelength, the noncircular cross section of the core having cross-sectional dimensions selected such that light guided by the waveguide in the higher order mode at wavelengths greater than the second predetermined cutoff wavelength propagates in only a single, stable, spatial intensity pattern, substantially all of the light signals introduced into the waveguide by said source of light being at one or more wavelengths greater that the second predetermined cutoff wavelength to cause said light signals to propagate in only one spatial intensity pattern for the higher order mode.

4,915,469

ACTIVE OPTICAL FIBRE STAR COUPLERS

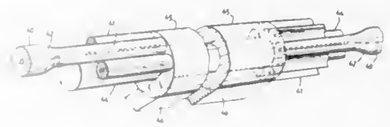
Kevin C. Byron; Philip W. Black, Bishop's Stortford; Terry Bricheno, Great Sampford, and John S. Leach, Bishop's Stortford, all of England, assignors to STC PLC, London, England

Filed Mar. 20, 1989, Ser. No. 325,788

Claims priority, application United Kingdom, Mar. 26, 1988, 8807274

Int. Cl.[4] G02B *6/28*

U.S. Cl. 350—96.16 **5 Claims**



1. An optical fibre star coupler having an optical mixer element and means for optically coupling the mixer element with a plurality of optical fibres, which mixer element is made of material capable of being pumped to render the mixer element optically amplifying, and is provided with pumping means for rendering it optically amplifying.

4,915,470

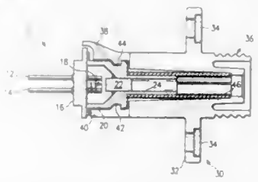
OPTICAL MODULE CONNECTOR APPARATUS

Andrew Moore, Plano; Peter Morgan, Allen, and Michael Wald, Rowlett, all of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 9, 1989, Ser. No. 351,010

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.20 **7 Claims**



1. Laser light beam apparatus comprising, in combination:

header including an opto-electric transducer and electrical connections;

a cap having an outer surface and sealed to said header for environmentally protecting said transducer;

unitary combination laser light beam convergent means for focusing and windowing comprising a sealed portion of the surface of said cap; and

alignment barrel, comprising a part of the cap in the area of the unitary combination laser light beam convergent means for focusing and windowing, for interaction with a laser light beam transmission medium mating connection incorporating a transmission medium therein to align and maintain a predetermined range of distances relative the transmission medium of the mating connection.

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4,915,471

OPTICAL SPLICE AND METHOD FOR MAKING THE SAME

Bernd D. Zimmermann, Hickory, N.C.; Richard O. Claus, Christiansburg, and Kent A. Murphy, Roanoke, both of Va., assignors to Center for Innovative Technology, Herndon, Va.

Filed Jun. 20, 1988, Ser. No. 210,889
Int. Cl.[4] G02B 6/38
U.S. Cl. 350—96.21 6 Claims

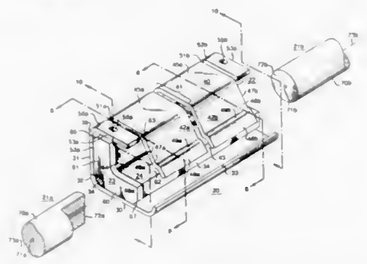
1. A method for manufacturing an optical splice with funnels comprising the steps of:
inserting drawn-down ends of capillaries into openings in a sleeve;
inserting an alignment rod into the sleeve and the capillaries;
filling the sleeve with curable elastomer;
curing the elastomer to a resilient state; and
removing the drawn-down ends of the capillaries and the alignment rod from the sleeve.

4,915,472

OPTICAL FIBER TERMINAL PLUG CONNECTORS

Wing S. Liu, Lawrenceville, Ga., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 28, 1988, Ser. No. 290,965
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.21 26 Claims



1. A connector for two optical fiber terminal plugs comprising: sleeve means, guide means disposed in said sleeve means alongside a passage therethrough for receiving said plugs end-to-end therein, spring contact means provided by part of said sleeve means and adapted by resilient deflection thereof to press said end-to-end plugs and guide means together to thereby align such plugs, holder means provided by part of said sleeve means and cooperable with said guide means to mechanically hold it fastened with said sleeve means, and means for decoupling said spring contact means and holder means so that such holding of said guide means is uninterrupted by such deflection of said spring contact means.

4,915,473

PRESSURE SENSOR UTILIZING A POLYURETHANE OPTICAL FIBER

Nathan N. Haese, Walnut Creek, and David R. Pedersen, Clayton, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 23, 1989, Ser. No. 314,685
Int. Cl.[4] G02B 6/00; H01J 5/16; G01D 5/34; B32B 27/00
U.S. Cl. 350—96.29 19 Claims

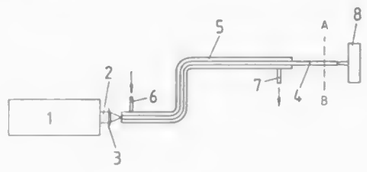
1. An optical fiber pressure sensing device comprising:
(A) a light source capable of transmitting light through the optical fiber(s);
(B) a means of transmitting light from the light source to the pressure sensing component;
(C) a pressure sensing component comprising:
(i) at least one unclad optical fiber in which the core is comprised of a flexible thermoplastic aliphatic segmented polyurethane through which light from the light souce is transmitted, and
(ii) a means of compressing the optical fiber(s) such that when the optical fiber(s) is compressed under pressure, the intensity of light passing through the optical fiber(s) varies inversely with the pressure applied without deleteriously affecting the physical integrity of the optical fiber(s);
(D) a means of transmitting light from the pressure sensing component to the light detector; and
(E) a light detector capable of measuring the intensity of light transmitted through the optical fiber(s).

4,915,474

TRANSMISSION LINE FOR OPTICAL RADIATION AND APPLICATIONS THEREOF

Karl F. Klein, Bruchköbel, and Walter Heitmann, Gross-Bieberau, both of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Filed Nov. 29, 1988, Ser. No. 277,249
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1988, 3803413
Int. Cl.[4] G02B 6/16
U.S. Cl. 350—96.30 8 Claims



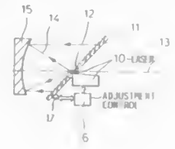
1. Transmission line for optical radiation in the range of about 160 to 300 nm, comprising:
means for transmitting optical radiation comprising at least one optical fiber having a core comprising vitreous synthetic silicon dioxide of high-purity as regards metal ion contaminants, and having cladding comprising vitreous synthetic silicon dioxide doped with at least one of boric oxide and fluorine, and means for cooling the optical fiber substantially over its entire length to a temperature below 220 K for enabling the optical fiber to transmit optical radiation with a wavelength in the range of about 160 to 300 nm.

4,915,475

OPTICAL RESONATOR ESPECIALLY FOR STABILIZING A LASER SOURCE

Peter Deimel, Langenpreising, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 20, 1988, Ser. No. 209,344
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1987, 3725573
Int. Cl.[4] H01S 3/08; G02B 5/18
U.S. Cl. 350—162.2 2 Claims



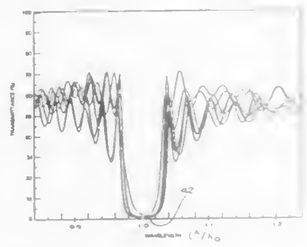
1. An optical resonator for stabilizing a laser source having an optical axis, comprising grating means having a central opening, said laser source being arranged in said central opening so that said optical axis of said laser source extends at an angle relative to a plane defined by said grating, and parabolic mirror means arranged in a beam path of said laser source, whereby said parabolic mirror means reflect a laser beam onto said grating for forming a folded laser resonator.

4,915,476

SINGLE-NOTCH RUGATE FILTERS AND A CONTROLLED METHOD OF MANUFACTURE THEREOF

James T. Hall, Torrance, and Ronald T. Smith, Redondo Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 31, 1988, Ser. No. 200,807
Int. Cl.[4] G02B 5/28
U.S. Cl. 350—163 10 Claims



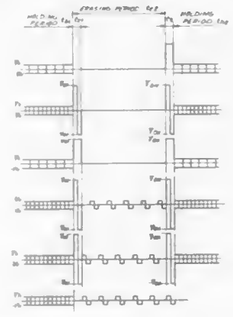
1. A method for forming a single notch rugate filter comprising a substrate having formed thereon a layer of an optical material having a refractive index that varies according to a predetermined sinusoidal pattern as a function of the thickness of said layer, comprising the steps of:
(a) providing said substrate;
(b) providing reactants which interact physically or chemically to form said optical material as a layer on said substrate;
(c) providing an ideal target profile of refractive index versus thickness of said layer, said profile having said sinusoidal pattern, and determining from said profile ideal values of optical thickness at successive points in time corresponding to points along said profile;
(d) providing target process conditions as a function of time for said reactants operative to form said layer having said ideal target profile;
(e) initiating said process conditions to form a layer having a depositing profile;
(f) performing continuous optical monitoring of said layer as deposited to provide an optical signal;
(g) determining from said optical signal the measured increments of optical thickness of said layer as deposited and continuously monitoring said increments of optical thickness;
(h) determining whether said optical thickness value is measured at the predetermined time relative to said target process conditions that produce said ideal target profile;
(i) based on the results of (h), determining the sinusoidal phase angle adjustment required to be made to the depositing profile of refractive index versus thickness of said layer in order to follow accurately said ideal target profile;
(j) altering said process conditions over time to provide said sinusoidal phase angle adjustment to said actual profile;
(k) repeating steps "f" through "j" the number of times required to form said single notch rugate filter.

4,915,477

METHOD FOR DRIVING AN ELECTRO-OPTICAL DEVICE WHEREIN ERASING DATA STORED IN EACH PIXEL BY PROVIDING EACH SCAN LINE AND DATA LINE WITH AN ERASING SIGNAL

Tadashi Ohta, and Jun Sugiyama, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Oct. 11, 1988, Ser. No. 255,296
Claims priority, application Japan, Oct. 12, 1987, 62-256911; Oct. 14, 1987, 62-258845; Oct. 22, 1987, 62-266883
Int. Cl.[4] G02F 1/13; G09G 3/36
U.S. Cl. 350—333 59 Claims



1. A method of driving an electro-optical device having a plurality of scan lines, data lines and pixels, comprising:
providing data on at least one of said data lines;
storing data in at least one of said pixels during a writing period by providing at least one scan line with a writing signal;
maintaining said data within said at least one pixel during a holding period by providing a bolding signal on said at least one scan line; and
erasing data stored in each pixel by providing each scan line and data line with an erasing signal during an erasing period, wherein the erasing period for each scan line occurs over substantially the same length of time after the

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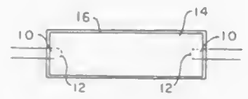
completion of one holding period and before the beginning of the next writing period.

4,915,478

LOW POWER LIQUID CRYSTAL DISPLAY BACKLIGHT

Daniel S. Lenko, Monrovia, and Wayne R. Grine, Crownsville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 5, 1988, Ser. No. 254,552
Int. Cl.[4] G02F *1/133*
U.S. Cl. 350—338 **1 Claim**



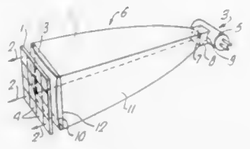
1. A liquid crystal display of the backlighting type comprising: a panel having a front view surface and a rear surface, a light passage member gradually reducing in thickness from spaced light input portions at opposite ends thereof and bounded by a light output surface and a light reflecting surface, a semiconductor light source comprising a battery source of voltage above a minimum level and two light emitting diodes disposed at the light input portions from which light enters into the light passage member, at an effective illumination level and light reflective means disposed at and attached to the light reflecting surface for diffusing and reflecting the light at said effective illumination level toward the light output surface with generally uniform distribution of illuminating intensity, said light reflecting surface being angled with respect to and facing the light output surface, said diffused and reflected light at the effective illumination level exiting the light output surface on the rear surface of the panel, the improvement residing in current regulator means electrically interconnecting the light emitting diodes in series with the battery source for generation of said light at the effective illumination level by constant current conducted through the light emitting diodes with minimum drain of the battery source while maintained thereby above the minimum voltage level.

4,915,479

LIQUID CRYSTAL DISPLAY ILLUMINATION SYSTEM

John A. Clarke, Carshalton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 8, 1987, Ser. No. 130,365
Claims priority, application United Kingdom, Dec. 17, 1986, 8630155
Int. Cl.[4] G02F *1/133*; F21V *7/04*
U.S. Cl. 350—345 **35 Claims**



27. An illumination system for a liquid crystal display panel comprising
a liquid crystalline display panel,
an extended area source of omnidirectional light,
light conducting means for conducting said extended area of omnidirectional light from said source to said display panel, said light conducting means including
an extended transparent input face adjacent said source of omnidirectional light,
an extended transparent output face directly adjacent to said display panel, said output face being larger in area than said input face, and
tapered reflective side walls extending from said input face to said output face, said side walls being at an angle to said input face and said output face,
wherein said output face passes collimated light directly into said liquid crystal display panel at smaller angles of divergence than light entering said input face from said source,
wherein said side walls are curved in planes transverse to said input face and said output face,
wherein a plurality of said light conducting means are disposed between said extended area source and said display panel, said output face of each of said plurality being adjacent to one another to cover the entire area of said display panel,
wherein said output face of each of said plurality are identical to one another, and wherein said output faces of said plurality are arranged in rows and columns to cover said entire area of said display panel,
wherein each of said plurality of output faces and each of the plurality of input faces of said light conducting means are rectangular, and
wherein a plurality of feeder light guides are disposed between said source and said light conducting means, each of said plurality of feeder light guides extending between different areas of said extended area source and said input face of each of said plurality of light conducting means.

4,915,480

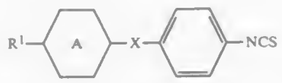
LIQUID CRYSTALLINE COMPOUNDS AND MIXTURES

Martin Petrzilka, 54 Schwartzackerstrasse, CH-4303 Kaiseraugst; Martin Schadt, 77 Liestalerstrasse, CH-4411 Seltisberg, and Alois Villiger, 5 Im Ettingerhof, CH-4055 Basel, all of Switzerland

Division of Ser. No. 36,132, Apr. 3, 1987, which is a continuation of Ser. No. 735,507, May 20, 1985, abandoned. This application Jul. 13, 1988, Ser. No. 218,752
Claims priority, application Switzerland, May 25, 1984, 2571/84; Mar. 12, 1985, 1113/85
Int. Cl.[4] G02F *1/13*; C07C *161/04*; C07D *239/26, 319/06*; C09K *19/34, 19/30*
U.S. Cl. 350—350 R **9 Claims**

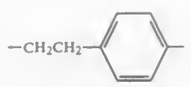
1. A compound of the formula:

I



wherein X is a single covalent bond, $—CH_2CH_2—$, 1,4-phenylene, a 2,5-disubstituted pyrimidine ring or a group of the formula:

IA



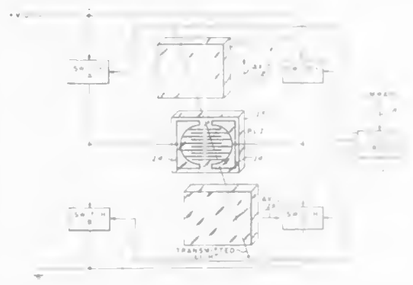
ring A is trans-1,4-cyclohexylene or, when X is a single covalent bond, ring A may also be 1,4-phenylene, a 2,5-disubstituted pyrimidine ring or a trans-2,5-disubstituted m-dioxane ring; and R^1 is a straight-chain trans-1-alkenyl having 2 to 12 carbon atoms or a straight-chain trans-3-alkenyl having 4 to 12 carbon atoms or, when X is $—CH_2CH_2—$, 1,4-phenylene, or a 2,5-disubstituted pyrimidine ring or when ring A is a 2,5-disubstituted pyrimidine ring, R^1 may also be straight-chain alkyl with 1 to 12 carbon atoms; and one of the benzene rings may have a lateral fluorine substituent.

4,915,481

APPARATUS FOR PREVENTING SPACE CHARGE BUILDUP EFFECTS IN ELECTRICALLY CONTROLLABLE OPTICAL TRANSMISSION CELLS

Lawrence H. Gilligan, and Thomas M. Woolfolk, both of Charlottesville, Va., assignors to Sperry Marine Inc., Charlottesville, Va.

Filed Aug. 25, 1988, Ser. No. 236,568
Int. Cl.[4] G02F *1/01, 1/03*
U.S. Cl. 350—355 **5 Claims**



1. Apparatus for operating an electrically controllable optical cell for neutralizing space charge effects thereof comprising
an electrically controllable optical transmission cell,
a source of said cell actuating potential,
first and second serially arranged switches coupled between said source of cell actuating potential and ground, said first and second switched having a first junction therebetween,
third and fourth switches coupled between said source of cell actuating potential and ground, said third and fourth switches having a second junction therebetween,
said cell coupled between said first and second junctions, and
logic means coupled to actuate said first, second, third, and fourth switches so that said polarity of said actuating potential across said cell sequentially reverses.

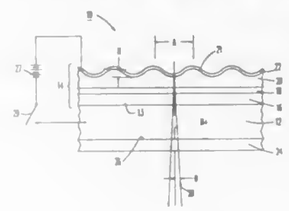
4,915,482

OPTICAL MODULATOR

Reuben T. Collins, Yorktown Heights; John R. Kirtley, Katonah, and Thomas N. Theis, Croton-on-Hudson, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 27, 1988, Ser. No. 263,743
Int. Cl.[4] G02F *1/015*
U.S. Cl. 350—355 **18 Claims**

16. An optical modulator comprising:
a semiconductor body having a positive dielectric constant and a periodically grated surface;
a layer of negative dielectric metal coating said periodically grated surface;
at least one quantum well including a first bandgap material sandwiched between a second bandgap material in said semiconductor body proximate and generally parallel to said periodically grated surface;
means for applying an electrical field across said semiconductor body, and
means for generating a beam of light incident to said semiconductor body such that said beam of light is phase matched to the surface plasmon using said periodically grated surface.

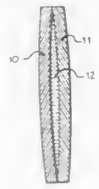


4,915,483

APOCHROMATIC LENS TRIPLETS WITH ASPHERICAL LENS ELEMENTS

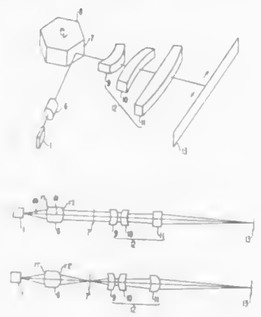
Paul N. Robb, Sunnyvale, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Jan. 4, 1989, Ser. No. 293,407
Int. Cl.[4] G02B *3/12, 13/18*
U.S. Cl. 350—418 **16 Claims**



1. A lens system color-corrected at more than two wavelengths, said lens system comprising a fluidal liquid lens element contained between two rigid lens elements, said two rigid lens elements and said fluidal liquid lens element being coaxially disposed with respect to each other along an optic axis, said two rigid lens elements being made of substantially the same optical material and being of substantially identical geometrical configuration, a surface on each of said two rigid lens elements being aspherical, said two rigid lens elements and said fluidal liquid lens element coacting with each other to bring paraxial marginal rays passing through said lens system to a common focus at the wavelengths for which said lens system is color-corrected.

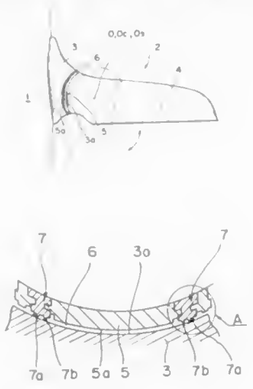
4,915,484
ANAMORPHIC SINGLE LENS
Yoshiharu Yamamoto, Toyonaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Apr. 6, 1988, Ser. No. 178,343
Claims priority, application Japan, Apr. 6, 1987, 62-84003; Oct. 23, 1987, 62-268627
Int. Cl.[4] G02B 13/08, 26/10
U.S. Cl. 350—420 14 Claims



1. An anamorphic single lens, comprising:
a single lens body having surface means comprising first and second surfaces at opposite sides of said lens body for refracting a divergent light beam emitted from a light source facing said first surface into a linear image;
said first surface having a refraction power rotation-symmetrical with respect to the optical axis of said lens body; and
said second surface having different refraction powers in respective first and second directions, wherein said first direction is perpendicular to said second direction, and both said first and second directions are perpendicular to said optical axis, thereby refracting a light beam differently in said first direction than in said second direction.

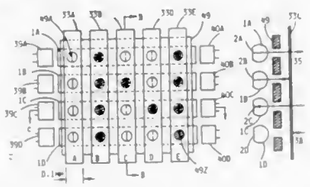
4,915,485
DOOR MIRROR ASSEMBLY
Morihiko Ogasawara, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Denki Seisakusho, Aichi, Japan
Filed Jun. 30, 1989, Ser. No. 373,441
Claims priority, application Japan, Jul. 4, 1988, 63-88923[U]
Int. Cl.[4] G02B 5/08
U.S. Cl. 350—604 5 Claims

1. In a door mirror assembly for use in motor vehicles having a mirror stay adapted to be secured to a door, and a mirror case pivotally mounted to the mirror stay between a forward normal position and a rearward unused position, the mirror stay and case having, respectively, curved end faces facing each other with a slight clearance maintained therebetween, wherein the improvement comprises:
sealing means which is mounted on one of the end faces to seal the clearance so that passage of air through the clearance is prevented,
said sealing means including at least two pairs of lip members, one of such pair of lip members being arranged at a forward side of the mirror assembly so as to extend substantially in the vertical direction in parallel and adjacent to each other, the other pair of lip members being arranged at a rear side of the mirror assembly so as to extend substantially in the vertical direction in parallel and adjacent to each other, one of the outer and inner lip members of each pair being slightly longer than the other of said pairs of lip members so as to contact the opposed end face



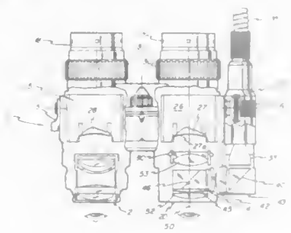
when centers of the curved end faces of the mirror stay and case are arranged to be concentric to each other.

4,915,486
DISPLAY PANEL FOR IMAGE PRESENTATION AND/OR RECORDING
Kjell Hansen, S tre, Norway, assignor to Powercraft AS, Nesbru, Norway
PCT No. PCT/NO87/00018, § 371 Date Nov. 23, 1987, § 102(e) Date Nov. 23, 1987, PCT Pub. No. WO87/06046, PCT Pub. Date Oct. 8, 1987
PCT Filed Mar. 10, 1987, Ser. No. 130,457
Claims priority, application Norway, Mar. 25, 1986, 861187
Int. Cl.[4] G02B 27/14; G02F 1/13
U.S. Cl. 350—171 12 Claims



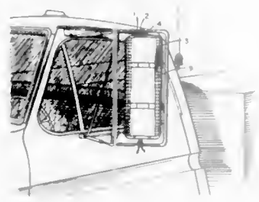
10. Display panel for image presentation and recording, comprising:
optical light guide means including a number of optical fibers for propagating first light there through along a longitudinal axis between two ends of said optical light guide means, with said first light to be presented as an image, and for propagating second light there through along said longitudinal axis between the two ends of said optical light guide means, with said second light representing an image received and to be recorded;
light emitter means provided at one end of said optical light guide means for providing said first light to that end of said optical light guide means representing the image to be presented;
light receiver means provided at the other end of said optical light guide means for receiving said second light representing the image received; and
light diverting means for diverting said first light transversely with respect to the longitudinal axis of said optical light guide means from said light emitter means and for diverting said second light received from a direction transverse to said longitudinal axis, along the longitudinal axis of said optical light guide means to said light receiver means.

4,915,487
HEADS UP DISPLAY FOR NIGHT VISION GOGGLE
James Riddell, III, Bellbrook, and David C. Lambertson, Dayton, both of Ohio, assignors to Systems Research Laboratories, Dayton, Ohio
Filed Feb. 1, 1989, Ser. No. 305,000
Int. Cl.[4] G02B 27/14, 23/10, 23/12
U.S. Cl. 350—174 4 Claims



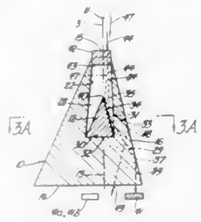
1. In a night vision goggle including an objective lens, an image intensifier receiving an image focused thereon by the objective lens, an eyepiece having an outer lens for focusing the image of said image intensifier on the eye,
the improvement comprising
means for introducing an additional image for viewing by the operator at the same focus as the intensified image, including means for displaying the additional image, and image combiner means placed between the image intensifier and the eyepiece outer lens for combining said additional image with the intensified image.

4,915,488
MIRROR SHADE SCREEN
Mack R. Lambert, 44 Powerline Rd., and Mack R. Lambert, Jr., 43 Powerline Rd., both of Pearl River, La. 70452
Filed Mar. 19, 1986, Ser. No. 841,252
Int. Cl.[4] G02B 17/00
U.S. Cl. 350—277 18 Claims



10. A mirror shade screen for shading a rear view mirror of a truck, comprising:
a shade material dimensioned so as to be able to cover and lap over edges of the mirror;
a fastening strip for fastening said shade material to the mirror, said fastening strip comprising first and second portions;
said first portion of said fastening strip attached to one edge of said shade material;
said second portion of said fastening strip attached to another edge of said material; and
a string attached to one end of said material for tying said one end of said material to the mirror.

4,915,489
PRISM WITH INTERNAL REFLECTOR
Robert Minko, 12945 Beresford, Sterling Heights, Mich. 48078
Filed Aug. 1, 1988, Ser. No. 227,047
Int. Cl.[4] G02B 5/04
U.S. Cl. 350—286 13 Claims



1. Mechanism for directing radiant energy, comprising a relatively large pyramidal prism having a plural number of energy reflective side surfaces diverging from an imaginary apex that is located on a central axis equidistant from the prism side surfaces; said prism side surfaces having a predetermined angle of divergence from the central axis; and a relatively small pyramidal reflector located within the prism; said pyramidal reflector having a second apex located on the aforementioned central axis; said pyramidal reflector having a plural number of reflective side surfaces diverging from said second apex; the reflector side surfaces having a different angle of divergence from the central axis than the prism side surfaces; said reflector being oriented to the prism so that radiant energy rays are passed between the prism side surfaces and the reflector side surfaces.

4,915,490
OPTICAL FIBRE CABLE WITH CRUSH-RESISTANT TUBE
Melvin M. Ramsay, London; Philip W. Black, Herts, and Idwal D. L. Jones, Glamorganshire, all of Great Britain, assignors to STC PLC, London, England
Filed Jun. 8, 1989, Ser. No. 363,487
Claims priority, application United Kingdom, Jan. 13, 1987, 8700681
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—320 5 Claims

1. A method of manufacturing an optical fibre cable or cable element consisting of or including an optical fibre encased in a crush-resistant tube constituted by a set of at least five helically stranded non-circular cross-section wires, in which method the non-circular cross-section wires are created from circular

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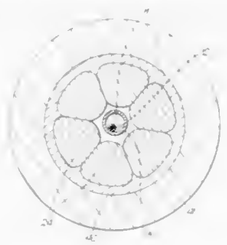
cross-section wires as the wires are stranded to form the tube, wherein the set of non-circular cross-section wires are worked



from the set of circular cross-section wires solely by contact between the members of the set and a co-operating die.

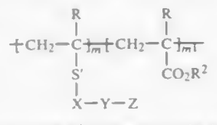
4,915,491

SIDE CHAIN LIQUID CRYSTALLINE ACRYLIC COPOLYMERS EXHIBITING NONLINEAR OPTICAL RESPONSE

Ronald N. DeMartino, Wayne; Hyun-Nam Yoon, New Providence, and James B. Stamatoff, Westfield, all of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 822,090, Jan. 24, 1986, abandoned. This application Oct. 3, 1986, Ser. No. 915,179
The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.
Int. Cl.[4] G02F *1/13;* C09K *19/52;* C08F *20/50*
U.S. Cl. 350—330 3 Claims

1. An optical light switch or light modulator device with a polymeric nonlinear optical component comprising a transparent solid medium of a copolymer which is characterized by recurring monomeric units corresponding to the formula:



where m and m[1] are integers which total at least 10; R is hydrogen or a C_1-C_4 alkyl, C_6-C_{10} aryl or halo substituent; S' is a flexible spacer group having a linear chain length of between about 1-25 atoms; X is $—NR^1—$, —O— or —S—; R^1 is hydrogen or a C_1-C_4 alkyl group; R^2 is a C_1-C_4 alkyl group; Y is

and Z is a nitro group; and wherein the copolymer has a stable orientation of an external field-induced alignment of mesogens.

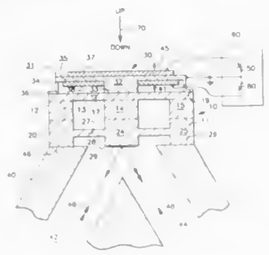
4,915,492

MIRROR TRANSDUCER ASSEMBLY WITH SELECTED THERMAL COMPENSATION

Theodor A. Toth, 1533 Trapp Ct., Fridley, Minn. 55432

Filed Feb. 6, 1989, Ser. No. 306,973
Int. Cl.[4] G02B *5/08;* H01S *3/083;* H01L *41/08*
U.S. Cl. 350—632 4 Claims

4. A mirror transducer assembly comprising:
a mirror assembly having
a central member having first and second opposite ends,
said central member having a first central axis passing centrally through said first and second opposite ends of said central member, and
said first end including means for reflecting electromagnetic waves; and
a driver assembly having,
a central member having first and second opposite ends,
an outer rim member,
a flexible annular diaphragm area between and integral with said central member and said outer rim member of said driver assembly, and
a second central axis passing centrally through said first and second opposite ends of said central member of said driver assembly;



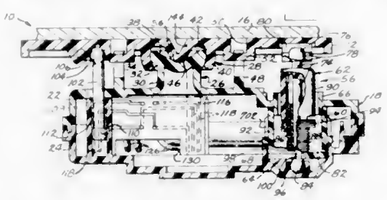
means for rigidly coupling together said outer rim members of said mirror assembly and said driver assembly;
means for coupling said central member of said driver assembly to said central member of said mirror assembly; and
first and second piezolelectric disks rigidly fixed and second piezolelectric disks rigidly portion of said flexible annular diaphragm area of said driver assembly, and wherein said first and second disks are of different sizes and have a selected difference in geometrical configuration to provide a selected temperature sensitivity of the movement of said central member of said driver assembly along said second central axis.

4,915,493

AUTOMOTIVE REAR VIEW MIRROR ASSEMBLY

Robert J. Fisher, and Donald S. Rawlings, both of Livonia, Mich., assignors to Magna International Inc., Markham, Canada

Filed Jan. 4, 1989, Ser. No. 293,459
Int. Cl.[4] G02B *7/18;* G05G *7/02*
U.S. Cl. 350—634 32 Claims



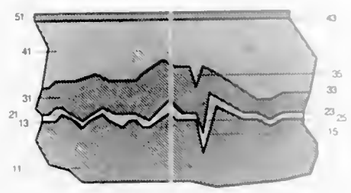
19. A mirror assembly comprising
a mirror holding member,
a mirror carried by said mirror holding member,
a support member,
means for connecting said mirror holding member on said support member for pivotal movements along two intersecting perpendicular axes and for substantially preventing pivotal movements about a third intersecting perpendicular axis,
a casing member fixed to said support member and forming therewith a casing assembly,
said casing assembly having power operated means mounted therein for effecting pivotal movements of said mirror holding member about said two intersecting perpendicular axis,
said power operated means including a pair of power driven actuator assemblies,
each actuator assembly including a member connected to said mirror holding member and a member connected to said casing member,
at least one connection between one member of each actuator assembly and the member to which it is connected comprising cooperating first and second connecting structures formed integrally on the members of said one connection,
said first integral connecting structure comprising a projecting base portion having an enlarged portion on a projecting end of said base portion, said enlarged portion having first convex connecting surface means disposed within a first spherical plane having a first pair of parallel truncations one of which is defined by an intersection with said base portion,
said enlarged portion having first concave connecting surface means facing away from said base portion disposed within a first spherical segmental plane having (1) a center coincident with the center of said first truncated spherical plane and (2) a radius smaller than the radius of aforesaid first truncated spherical plane,
said second integral connecting structure comprising a projecting annular wall having second concave connecting surface means disposed within a second spherical plane having (1) a radius generally equal to the radius of said first truncated spherical plane and (2) a second pair of parallel truncations,
said second integral connecting structure including a projecting central portion within said annular wall having second convex connecting surface means facing in the direction of projection of said annular wall disposed within a second spherical segmental plane having (1) a center coincident with the center of said second truncated spherical plane and (2) a radius equal to the radius of said first spherical segmental plane,
the nature of the plastic material and the construction of said annular wall being such that said annular wall is operable in response to the movement of said enlarged portion therein to resiliently yield and resiliently return to bring the first convex connecting surface means of said enlarged portion into engagement with the second concave connecting surface means of said annular wall and said first concave connecting surface means of said enlarged portion into engagement with the second convex connecting surface means of said projecting central portion, the engagement of said connecting surface means permitting relative sliding movement therebetween so as to retain the members of said one connection in cooperating relation in a multiplicity of different positions of pivotal movement.

4,915,494

CARBON-CARBON MIRROR FOR SPACE APPLICATIONS

John W. Shipley; Robert F. Monks, and Gary L. Corey, all of Palm Bay, Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jul. 6, 1988, Ser. No. 215,512
Int. Cl.[4] G02B *5/08, 7/18*
U.S. Cl. 350—641 15 Claims



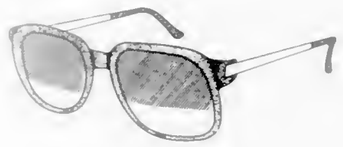
1. A mirror for high thermal energy applications comprising:
a carbon-carbon substrate;
a high reflectivity optical coating; and
material of high thermal conductivity adhering said high reflectivity optical coating to said carbon-carbon substrate, said high thermal conductivity adhering material comprising an adhesion layer on the order of 50-500 angstroms in thickness formed on said carbon-carbon substrate, and a plating base layer having a thickness on the order of 2000-2500 angstroms formed on said adhesion layer, said high reflectivity optical coating being plated on said plating base layer; and wherein
the total thickness of said high reflectivity optical coating and said adhering material is on the order of 1-3 mils.

4,915,495

SPECIAL LENS FOR EYEGLASSES

Kunio Takeuchi, 1-1, Nishi 23-chome, Hokkaido 064, Japan

Continuation of Ser. No. 33,913, Apr. 1, 1987, which is a continuation of Ser. No. 776,142, Sep. 4, 1985. This application Jul. 5, 1988, Ser. No. 215,259
Claims priority, application Japan, Jan. 4, 1984, 59-000148; Feb. 6, 1984, 59-20530
The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.
Int. Cl.[4] G02C *7/12*
U.S. Cl. 351—49 5 Claims



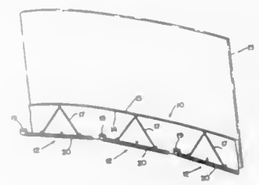
1 A method of preparing a special lens for eyeglasses for an eyeglass wearer, comprising determining an astigmatic distorted vision angle of the eyeglass wearer, and bonding a polarizing film between two eyeglass lenses at an angle determined by the distorted vision angle of the eyeglass wearer, the determined angle being equal to the distorted vision angle plus 90° if the distorted vision angle is from 0° to 90° and the determined angle being equal to the distorted vision angle less 90° if the distorted vision angle is from 90° to 180°.

4,915,496

MOTORIZED BOTTOM MASKING DEVICE FOR WIDE AND/OR CURVED MOTION PICTURE SCREENS

James G. Stine, Allentown, Pa., assignor to Automatic Devices Company, Allentown, Pa.

Filed Apr. 29, 1988, Ser. No. 187,954
Int. Cl.[4] G03B *37/00*
U.S. Cl. 352—69 12 Claims



1 A motorized bottom masking assembly for variably masking a lower portion of a large curved picture projection screen, comprising a bottom mask movable to various heights along the lower portion of the screen, the mask having a substantially

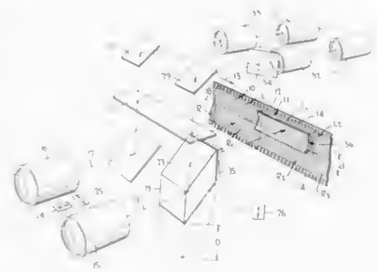
horizontal elongated rigid bar member defining the uppermost edge thereof, at least three bar positioning lift means located entirely below the bar member coupled to the bar member at first and second locations adjacent opposite ends of the bar member and at a third intermediate location therebetween; each of the three lift means including an elongated base track, a pair of lift arms arranged in upwardly converging inclined relation having lower end roller assemblies guided by the associated base track movable toward and away from each other and having upper ends coupled together to the bar member, a lead screw coupled to said roller assemblies and a drive motor therefor for converging and diverging the associated pair of lift arms relative to each other to raise and lower the bar member relative to the base track and thereby selectively vary the vertical distance spanned by the bottom mask.

4,915,497

STEREOSCOPIC MOTION PICTURE APPARATUS WITH HORIZONTAL FILM MOVEMENT

Stanislaw Loth, Nanuet, N.Y., and Anthony Petitto, Los Angeles, Calif., assignors to Parallex Company, Inc., Los Angeles, Calif.

Filed Jul. 18, 1989, Ser. No. 381,300
Int. Cl.[4] G03B *35/00*
U.S. Cl. 352—57 **5 Claims**



1. An apparatus for photographing a pair of diagonally related left and right images of a stereoscopic image couple on to film frames of a horizontally moving 65 mm film having fifteen film feed perforations per frame, comprising, left and right objective lenses laterally spaced a predetermined interocular distance apart and lying in a horizontal plane for respectively forming on adjacent film frames left and right images of a stereoscopic image couple, the image beams passing directly through said right objective lens for forming the right image on a full lower half of one film frame such that the formed right image has an aspect ratio of 3:1 and occupies one-half the width of the one frame and has a length equal to the fifteen film feed perforations, prism means in the optical path of said left objective lens for deviating image beams for forming the left image on a full upper half of an adjacent film frame diagonal to said right image such that the formed left image has an aspect ratio of 3:1 and occupies one-half the width of the adjacent frame and has a length equal to the fifteen film feed perforations.

4,915,498

RANGE IMAGING SENSOR

Joseph H. Malek, 4027 Alabama Ave., NE., St. Petersburg, Fla. 33703

Filed Apr. 19, 1988, Ser. No. 183,619
Int. Cl.[4] G01C *3/08*; H04N *7/00*
U.S. Cl. 356—5 **10 Claims**

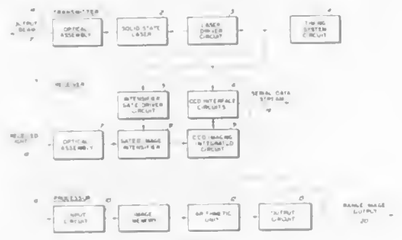
1. A range imaging sensor for creating images substantially a function of range to an object within a range depth, comprising in combination:

gated energy transmitter means for transmitting energy towards the object;

gated integrating imaging receiver means for receiving said transmitted energy reflected by the object and integrating said received energy for the images;

timing means for gating said transmitter means and said receiver means, said timing means comprising

means for initializing an integration level of said integration means,



means for gating said transmitter means and said receiver means such that said integration means produces a composite image which is substantially a function of range and unwanted information, and

means for gating said transmitter means and said receiver means such that said integration means produces a reference image which is substantially a function of said unwanted information; and

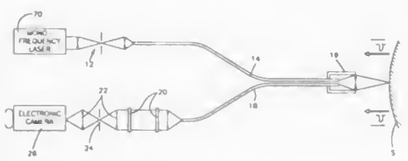
processor means for combining said composite image and said reference image to produce a range image which is substantially a function of the range.

4,915,499

OPTICAL DEVICE USING A MATCHED INTERFEROMETRIC ANALYZER AND FILTER

Serge Gidon, Voiron, and Gilles Behar, Sceaux, both of France, assignors to Comissariat a l'Energie Atomique, Paris, France

Filed Jan. 12, 1988, Ser. No. 143,357
Claims priority, application France, Jan. 21, 1987, 87 00659
Int. Cl.[4] G01P *3/36*; G01C *3/08*
U.S. Cl. 356—28.5 **7 Claims**



1. An optical device for measuring the position, displacement and/or speed of a surface, comprising:

a light source emitting a directional light beam with a wide spectrum,

first interferometric means having a multifrequency filtering spectrum and positioned so that said light beam emitted by said light source must pass through said first frequency filtering interferometric means, a light beam having a multifrequency spectrum within said wide spectrum being so emitted from said first frequency filtering interferometric means,

means for directing said light beam having a multifrequency spectrum onto a surface to be measured,

means for collecting the multifrequency light coming from said surface to be measured,

second interferometric means having said multifrequency filtering spectrum and positioned so that said collected light must pass therethrough, diffraction rings being so formed to the rear of said interferometric means, and

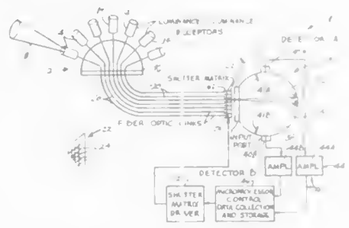
means for measuring the diameter of said diffraction rings and for computing said position, displacement and/or speed from said diameter.

4,915,500

MULTICHANNEL OPTICAL SENSING DEVICE

Stephen E. Selkowitz, Piedmont, Calif., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Aug. 16, 1985, Ser. No. 766,168
Int. Cl.[4] G01J *1/42*
U.S. Cl. 356—221 **9 Claims**



1. A compact multichannel optical sensing system for measuring the outdoor sky luminance or illuminance or the luminance or illuminance in a room by sampling in multiple directions, comprising a plurality of light receptors for receiving light separately and independently from various directions for transmission therethrough, each of said receptors being mounted so as to be directed to receive light along different diverging angles with respect to each other,

an optical shutter matrix including a plurality of optical shutter elements operable by electrical control signals between light transmitting and light stopping conditions,

a plurality of fiber optic elements connected between said light receptors and said optical shutter elements,

shutter control means for selectively supplying one or more electrical control signals to said optical shutter elements,

said shutter control means comprising a programmable control unit for controlling the sequence or combination with which the electrical control signals are supplied to said optical shutter elements,

a photodetector device for receiving all of the light transmitted from said receptors and fiber optic elements by said optical shutter matrix,

said photodetector device including an optical integrating sphere having a generally spherical integrating chamber with an input port for admitting the light selected under control of said control means to pass from said matrix into said spherical chamber,

said spherical chamber having detector means therein for producing electrical output signals corresponding to the light received by said spherical chamber,

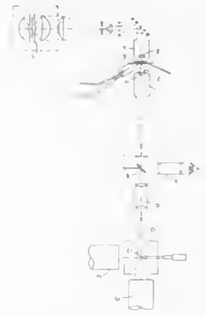
and output means for utilizing said output signals for analysis of the luminance or illum nance.

4,915,501

DEVICE FOR MEASURING THE LIGHT SCATTERING OF BIOLOGICAL CELLS IN FLOW CYTOPHOTOMETERS

Harald Steen, Wolffs gate 3, N-0358, Oslo 3, Norway

PCT No. PCT/NO86/00051, § 371 Date Mar. 6, 1987, § 102(e) Date Mar. 6, 1987, PCT Pub. No. WO87/00628, PCT Pub. Date Jan. 29, 1987
PCT Filed Jul. 11, 1986, Ser. No. 43,552
Claims priority, application Norway, Jul. 16, 1985, 852836
Int. Cl.[4] G01N *21/00*
U.S. Cl. 356—343 **4 Claims**



1. A flow cytometer device for simultaneous measurement of two angle components of light scattering from biological cells or particles comprising:

a microscope condenser having a high numerical aperture containing a central field stop means for producing a conical dark field in an illumination field of said condenser;

a microscope objective having an aperture disposed within said dark field and having an object plane in common with an object plane of the condenser, the dark field having an axis of symmetry in common with the optical axis of the objective and the condenser, and the dark field extending at an angle of at least 15° around said axis of symmetry, the entrance aperture of said objective as seen from the object plane of this objective extending over an angle which is 1°–2° smaller than the angle extended by the dark field and is thus situated entirely within said dark field;

telescope means for reproducing the dark field behind an image plane of the microscope objective;

mirror means for reflecting a central portion of said reproduced dark field;

a first light detector for receiving light reflected by said mirror means; and

a second light detector for receiving light in the peripheral portion of said dark field,

whereby, scattered light at small scattering angles produced by defraction from the cell or particle surface are separated from light scattered at larger angles from structures other than the cell surface.

4,915,502

INTERFEROMETER SPECTROMETER HAVING TILTABLE REFLECTOR ASSEMBLY AND REFLECTOR ASSEMBLY THEREFOR

Philip R. Brierley, Madison, Wis., assignor to Nicolet Instrument Corporation, Madison, Wis.

Filed Jan. 11, 1988, Ser. No. 142,142
Int. Cl.[4] G01B *9/02*; G01J *3/45*
U.S. Cl. 356—346 **9 Claims**

1. A reflectively scanned twin-arm interferometer for modulating an inlet beam of electromagnetic radiation, comprising:

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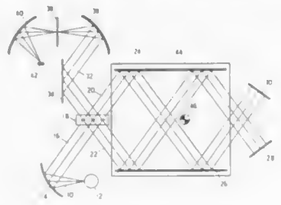
(a) a beamsplitter capable of being disposed within the path of the inlet beam, whereby the beamsplitter divides the inlet beam into a first arm beam and a second arm beam;
(b) a rotatably supported housing having first and second reflecting elements substantially rigidly attached thereto, wherein the first and second reflecting elements are mutually facing and are each substantially parallel to the rotation axis of the housing, the first reflecting element being disposed within the path of the first arm beam and the



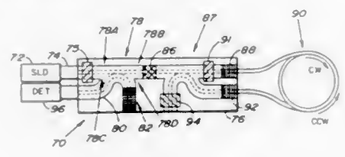
second reflecting element being disposed within the path of the second arm beam;
(c) recombination means, disposed within the paths of the first and second arm beams, for recombining the two arm beams to form an exit beam after the arm beams have interacted with the first and second reflecting elements; and
(d) drive means for imparting oscillatory motion to the housing about its rotation axis.

4,915,503

FIBER OPTIC GYROSCOPE WITH IMPROVED BIAS STABILITY AND REPEATABILITY AND METHOD

George A. Pavlath, Thousand Oaks, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Sep. 1, 1987, Ser. No. 91,972
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—350 19 Claims



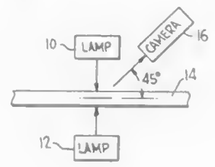
1. A fiber optic rotation sensor, comprising:
a substrate;
a first optical fiber having a central core and a surrounding cladding, a length of the first optical fiber having a portion of the cladding removed therefrom to form a first planar cladding surface thereon, the length of the first optical fiber being mounted to the substrate;
a second optical fiber having a central core and a surrounding cladding, a length of the second optical fiber having a portion of the cladding removed therefrom to form a second planar cladding surface thereon, the length of the second optical fiber being mounted to the substrate;
a first optical coupler formed between the first and second optical fibers;
means for introducing an optical signal into the first optical fiber;
a reciprocity polarizer formed on the planar cladding surface of the first optical fiber, the polarizer having a transmission axis aligned with an axis of birefringence of the first optical fiber to interact with the first optical fiber to remove an undesired linear polarization component from optical signals guided by the first optical fiber while permitting a desired linear polarization component to propagate unattenuated in the first optical fiber; and
a sensing coil of optical fiber arranged to guide light between the first and second optical fibers, the first and second optical fibers and the optical coupler cooperating to introduce counterpropagating light waves in the sensing coil.

4,915,504

OPTICAL RAIL GAGE/WEAR SYSTEM

David F. Thurston, Springfield, Va., assignor to Norfolk Southern Corporation, Norfolk, Va.

Filed Jul. 1, 1988, Ser. No. 214,398
Int. Cl.[4] G01B *11/24*
U.S. Cl. 356—376 28 Claims



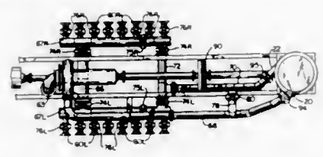
1. Apparatus for the non-contact measurement of rail parameters, comprising:
means for illuminating at least one of the left and right rails of a track;
means for detecting a selected portion of light reflected from at least one of the left and right rails and generating video signals representative thereof;
said means for illuminating and said means for detecting being mounted for movement along said rails; and
means for processing said video signals to determine at least one of the gage and wear of said rails using a repetitive frame scanning pattern formed by a grid of lines perpendicular to the profile of said rails with each line including a number of pixels, and including means for determining a line and the location of a pixel therein representative of at least a gage point on the gage face of at least one of said left and right rails for selected frames of said repetitive frame scanning pattern.

4,915,505

BLENDER APPARATUS

Jorge O. Arribau, Englewood, and Russell J. Dorn, Aurora, both of Colo., assignors to GEO Condor, Inc., Henderson, Colo.

Continuation of Ser. No. 840,343, Mar. 17, 1986, abandoned, which is a continuation of Ser. No. 340,527, Nov. 27, 1981, abandoned. This application Nov. 6, 1987, Ser. No. 118,407
Claims priority, application PCT Int'l Appl., Apr. 28, 1980, PCT/US80/00468
Int. Cl.[4] B01F *15/02*
U.S. Cl. 366—136 23 Claims



1. Apparatus for mixing materials in a liquid stream compris-

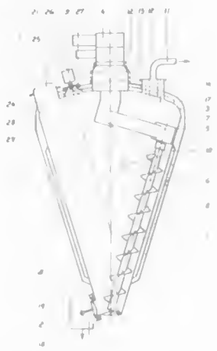
ing a housing having upper and lower ends and defining an interior chamber, said housing having an upper central opening therein, impeller means in said housing communicating with said central opening for receiving materials from said opening and imparting a centrifugal force thereto; said impeller means being dimensioned relative to said chamber to define therewith an annular mixing zone in the chamber; means for tangentially introducing liquid under pressure into said interior chamber near the upper end thereof and means for discharging material tangentially from near the lower end of said chamber whereby said liquid flows in a generally helical path in said chamber and through said mixing zone whereby materials discharged from said impeller means are mixed with said liquid in the mixing zone.

4,915,506

APPARATUS FOR DRYING MATERIAL WHICH IS MIXED WITH A SOLVENT

Isao Sato, and Antonius M. Van Aken, both of Doetinchem, Netherlands, assignors to Hosokawa Micron Europe B.V., Doetinchem, Netherlands

Filed Aug. 18, 1988, Ser. No. 233,803
Claims priority, application European Pat. Off., Sep. 10, 1987, 87201734
Int. Cl.[4] B01F *7/08*; **F26B** *3/347, 17/18*
U.S. Cl. 366—146 16 Claims



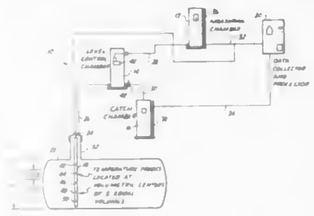
1. Apparatus for mixing and drying powdery, pasty, or granular material containing a solvent, comprising a container for holding a quantity of said material, a rotatable mixing screw extending through said container into said material and a cover for closing said container, said cover having at least one magnetron mounted thereon for emitting through a passage in said cover high frequency energy into said container, a passage for removal of vapors created during the mixing and drying of said material and means passing through said cover for driving and moving said mixing screw, including means for sealing the passages through which said magnetron, drive means and vapors pass through said cover, against leakage into the atmosphere of high energy beams emitted by said magnetron, said means for driving said mixing screw being surrounded by a metallic wire mesh basket sealed at its ends to said drive means and said cover by rings having a network of fine metallic wires embedded therein.

4,915,507

LIQUID AVERAGE TEMPERATURE MEASURING APPARATUS AND METHOD

Louis J. Janotta, 7940 Teton Rd., Orland Park, Ill. 60462

Division of Ser. No. 74,632, Jul. 7, 1987, Pat. No. 4,807,464. This application Nov. 17, 1988, Ser. No. 272,548
Int. Cl.[4] G01K *3/02, 13/00*; **G01F** *23/24*
U.S. Cl. 374—115 10 Claims



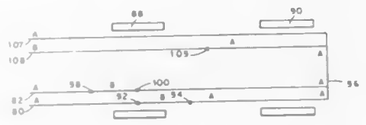
1 An apparatus for determining a volume weighted average temperature of liquid in a tank comprising:
a plurality of temperature sensors spaced apart such that each temperature sensor senses a temperature in a different predetermined volume fraction of the liquid in said tank; and
means associated with said plurality of temperature sensors and acting to process the temperature sensed by each of said plurality of temperature sensors to determine a volume weighted average temperature of the liquid in said tank, said volume weighted average temperature equal to the sum of each of said sensed temperatures multiplied by the predetermined volume fraction to which each of said sensed temperatures pertains.

4,915,508

PROBE WITH INTEGRATED HEATER AND THERMOCOUPLE PACK

Reg W. McCulloch, Oak Ridge; Ralph E. Dial, Concord, and Wilber K. R. Finnell, Kingston, all of Tenn., assignors to Delta M Corporation, Oak Ridge, Tenn.

Continuation of Ser. No. 788,780, Oct. 18, 1985, Pat. No. 4,725,399. This application May 22, 1987, Ser. No. 53,409
The portion of the term of this patent subsequent to Feb. 16, 2005, has been disclaimed.
Int. Cl.[4] G21C *17/00*
U.S. Cl. 374—166 1 Claim



1 In a probe having an elongate main body, said body being configured to produce hot regions and cold regions therein, relative one to the other, in the presence of radiation, the improvement comprising:
a longitudinal bore formed in, and being generally parallel to the length of, said main body;
a first type wire constructed of a first conductive material disposed within said bore and extending through said regions of said main body, said first type wire having inner and outer ends;
a plurality of second type wires for monitoring the temperature of said regions and corresponding in number to twice the number of regions to be monitored, said second type wires being disposed in said bore to extent through said

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regions of said main body and being connected to the outer end of said first type wire;

each of said second type wires comprising:

an outer segment constructed of the first conductive material, having outer and inner ends and being connected at its outer end to the outer end of the first type wire;

a middle segment constructed of a second conductive material that is different from the first conductive material, having outer and inner ends and being connected at its outer end to the inner end of said outer segment to form a first thermocouple junction in said second type wire;

an inner segment constructed of the first conductive material, having outer and inner ends, and being connected at its outer end to the inner end of said middle segment to form a second thermocouple junction having an opposite polarity from said first thermocouple junction, said first and second thermocouple junctions forming a thermocouple pair;

said second type wires being constructed with different length outer segments and different length inner segments dimensioned so that each of said hot regions has at least two thermocouple pairs located proximately thereto, each of said two thermocouple pairs having one thermocouple junction disposed within the hot region and having the other thermocouple junction disposed outside the hot region, the two other thermocouple junctions being disposed on opposite sides of the hot region, whereby the voltage potential produced by said two thermocouple pairs measured between the inner segments of the wires associated with said two thermocouple pairs corresponds to twice the temperature difference in said main body between inside the hot region and outside thereof; and

electrical insulation disposed within said bore for insulating said first and second type wires, one from the other, and from said bore.

4,915,509

MIXER FOR MIXING AT LEAST TWO FREE-FLOWING SUBSTANCES, ESPECIALLY THOSE WHICH REACT DURING MIXING

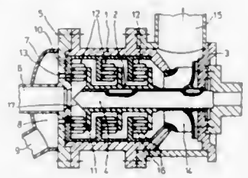
Heinz Sauer; Hermann Dallmeyer, both of Odenthal; Uwe J. Zarnack, Brunsbuettel; Berthold Keggenhoff, and Bernd Weber, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed May 5, 1988, Ser. No. 190,580

Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717058

Int. Cl.[4] B01F *5/06*

U.S. Cl. 366—171 8 Claims



1. A mixer for mixing at least two free-flowing, reactive or unreactive substances comprising

(a) a casing having at least two inlets and at least one outlet,

(b) a rotatable shaft extending through said casing,

(c) at least one rotor disc attached to said shaft such that said rotor disc is perpendicular to said shaft,

(d) at least one stator disc attached to said casing such that said stator disc is parallel to said rotor disc and has an opening such that said shaft can pass through said stator disc,

(e) at least one running wheel attached to said shaft and containing openings such that when the shaft is rotating, said running wheel provides a pumping effect to the mixture passing through said mixer,

(f) at least one first inlet through said casing for introducing a first substance axially to said shaft and against said rotor disc and

(g) at least on second inlet for introducing a second substance against a rotor disc at a point which is radially outward from the introduction of said first substance.

4,915,510

HYDROSTATIC THRUST BEARING SYSTEM

Thomas Arvidsson, Linköping, Sweden, assignor to Cellwood Machinery AB, Nässjö , Sweden

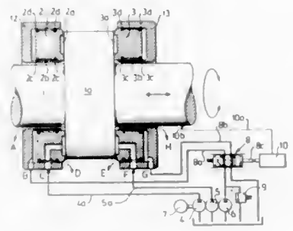
PCT No. PCT/SE87/00524, § 371 Date May 1, 1989, § 102(e) Date May 1, 1989, PCT Pub. No. WO88/03611, PCT Pub. Date May 19, 1988

PCT Filed Nov. 9, 1987, Ser. No. 354,434

Claims priority, application Sweden, Nov. 12, 1986, 8604848

Int. Cl.[4] F16C *32/06*

U.S. Cl. 384—99 10 Claims



1. A hydrostatic thrust bearing system for a radially journalled axle or shaft (1) provided with a pressure plate or collar (1*a*), the thrust bearing system having an external configuration which enables the system to be mounted around the rotatable axle (1) and including a hydrostatic thrust bearing (2, 3; 2'*a*, 3'*a*) on each side of the pressure plate (1*a*), and in which system each of the thrust bearings incorporates at least one oil pocket (2*a*, 3*a*; 2'*a*, 3'*a*), to which hydraulic fluid is fed from a hydraulic fluid source, characterized in that the hydrostatic bearings (2, 3; 2', 3') are axially movable and are held urged against the pressure plate (1*a*) in mutually opposite directions by means of hydraulic pressure created in a chamber associated with a respective bearing; and in that means, is provided for coaction with an axial-position sensing means (10*b*) for controlling the amount of hydraulic fluid fed to a respective chamber and also to control the hydraulic pressure acting on a respective bearing such as to take-up axial loads which vary in magnitude and direction.

4,915,511

ROLLER CHAIN

Katsumi Kotegawa; Makoto Kanehira; Kiyofumi Suzuki; Shinichi Hayashi, and Hidekazu Adachi, all c/o Tsubakimoto Chain Co., 17-88, Tsurumi 4-chome, Tsurumi-ku, Osaka-Shi, Osaka-fu, Japan

Filed Jun. 26, 1986, Ser. No. 878,688

Claims priority, application Japan, Jun. 26, 1985, 60-140890

Int. Cl.[4] F16C *21/00*

U.S. Cl. 384—127 9 Claims

1. A roller chain comprising:

inner link plates oppositely disposed in parallel;

a bushing interconnecting said inner link plates;

plural bearing rollers located around the outer periphery of said bushing in parallel with the center line of said bushing;

a generally annular shaped roller provided with a cylindrical body portion having an inner periphery surrounding said bearing rollers and in contact therewith;

radially inwardly extending flanges formed at both ends of said body portion, each flange having an inside surface extending radially inwardly along end surfaces of said bearing rollers and each flange having an inner peripbery spaced from the adjacent outer periphery of said bushing;

thrust rings made of bearing material in the shape of a disk

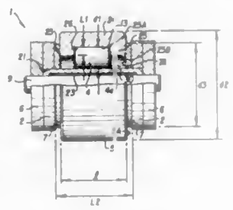


plate mounted on said bushing in a relatively closely fitting manner and located between the axial end surfaces of the radially inwardly extending flanges of said roller and one of inner surfaces of said link plates and having a flat axial inside surface; and

a closed annular lubricant reservoir defined by the inner periphery of said flange, the end surfaces of said plural bearings, the outer periphery of said bushing and the axial inside surface of said thrust ring.

4,915,513

CROSSED TAPERED ROLLER BEARING AND APPLICATION THEREOF IN A HUB FOR AN AUTOMOBILE

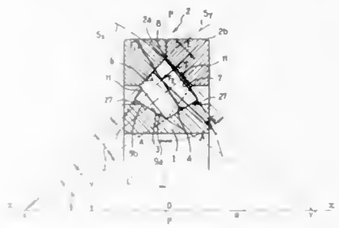
Michel A. Orain, Conflans Ste Honorine, France, assignor to Glaenzer Spicer, Poissy, France

Filed May 20, 1988, Ser. No. 196,256

Claims priority, application France, May 22, 1987, 87 07213

Int. Cl.[4] F16C *19/50, 19/40*

U.S. Cl. 384—447 17 Claims



1. A crossed tapered roller bearing, comprising:

an inner ring;

an outer ring disposed around said inner ring, wherein each said ring is centered on a bearing axis and each said ring defines two frustoconical raceways which are in confronting relation to each other and which together have a concave profile; and

two series of rollers, each said roller having a generally frustoconical shape, said rollers of a first said series having a frustoconical lateral wall interposed between one of said raceways of said outer ring and an axially opposed raceway of said inner ring, and said rollers of the second said series, alternating with said rollers of said first series, having a frustoconical lateral wall interposed between the other two said raceways;

wherein each said roller further has a relatively large base portion comprising a crown portion is slidably bearing relation with a confronting said raceway of said outer ring, said frustoconical lateral walls of said rollers of each respective said series and the respective said raceways between which said series is interposed converge substantially toward respective apexes located substantially on said bearing axis, and said crown portions of said rollers of each said series are spherical portions having centers at said respective apexes; and

wherein the angle between said raceways of said outer ring is less than 90° such that said crown portion of each said roller contacts said respective confronting raceway of said outer ring substantially along a segment of a circle centered on said bearing axis, and said angle between said raceways of said outer ring is chosen in relation to the conicity of said frustoconical lateral walls of each said roller such that the distance between the apex of said angle between said raceways of said outer ring and the contact between said crown portion of each said roller and said respective confronting raceway is substantially between 10% and 20% of the diameter of said roller at said relatively large base portion.

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1. A thrust bearing comprising: a first thrust race having a radially extending annular portion; a second thrust race having a radially extending annular portion axially separated from the radially extending annular portion of the first thrust race; the radially extending annular portions having opposed radially extending annular raceways; rolling members adapted to roll on the raceways; the first thrust race radially extending annular portion having a magnetic field source radially outwardly separated from the rolling members; the second thrust race having at least one lip extending axially from the outside diameter of its radially extending annular portion and away from the first thrust race; a sensor mount supported by and piloted by the at least one lip; and a sensor mounted on the sensor mount and facing the magnetic field source on the first thrust race.

4,915,514

ROTARY MACHINE EQUIPPED WITH A THRUST BALANCING ARRANGEMENT

Frits Söderlund, Saltsjöbaden, Sweden, assignor to Svenska Rotor Maskiner AB, Stockholm, Sweden

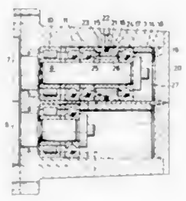
PCT No. PCT/SE88/00068, § 371 Date Jul. 20, 1989, § 102(e) Date Jul. 20, 1989, PCT Pub. No. WO88/06247, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 17, 1988, Ser. No. 391,525

Claims priority, application Sweden, Feb. 18, 1987, 8700671-4

Int. Cl.[4] F16C *39/04*; F04C *29/00*; F01C *21/02*

U.S. Cl. 384—616 **5 Claims**



1. A rotary machine, comprising:

a housing (1) having a low-pressure side (2), a high-pressure side (3), a working-fluid inlet channel (4) for receiving a working fluid, a working-fluid outlet channel (5), thrust bearing (11) mounted in the housing, a rotor (7) which is rotatably journalled in the housing by means of a rotor journal shaft (8) and which during rotation is subjected to an axial load by the working fluid in a direction towards the low-pressure side (2) and towards the thrust bearings (11), and a thrust balancing arrangement (15, 16) in the housing, and said rotor also being subjected to an axial load in a direction towards the high-pressure side (3) by the thrust balancing arrangement (15, 16);

the thrust balancing arrangement comprising an auxiliary thrust bearing (17), an axially acting spring means (19) for urging the rotor (7) towards the low-pressure side (2) of the housing, and a piston-cylinder device which, under the influence of pressure fluid contingent on the operating conditions of the machine, partially relieves a load on the thrust bearings (11) by means of the auxiliary thrust bearing (17) which is arranged for limited movement against the action of the axially acting spring means (19), the spring means (19) generating an urging force sufficient to hold the rotor (17) urged towards the low-pressure side (2) when the thrust balancing arrangement (15, 16) is substantially inactive when starting and stopping the machine;

a locking device (27) detachably mounted on an outermost part of the rotor journal shaft (8) at the high-pressure side (3) of the housing;

the auxiliary thrust bearing (17) being mounted on an outermost part of the rotor journal shaft (8) at the high-pressure side (3) of the housing, between the locking device (27) which locks the auxiliary thrust bearing (17) and the thrust balancing arrangement (15, 16); and

the thrust balancing arrangement being located axially inwards of the auxiliary thrust bearing (17) and the piston-cylinder device of the thrust balancing arrangement comprising two annular parts (15, 16) which are axially expandable in a cylindrical recess (14) in the housing (1).

4,915,515

ROTATIONAL BEARING ARRANGEMENT FOR HIGH ROTATIONAL SPEEDS

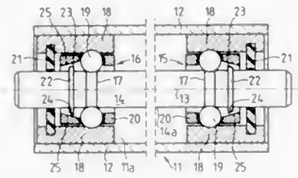
Reinhard Rohrer; Henri Bürki, both of Biel; Jürg Bischofberger, Elsau, and Raymond Frey, Zurich, all of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed May 9, 1988, Ser. No. 192,073

Claims priority, application Switzerland, May 8, 1987, 01767/87

Int. Cl.[4] F16C *33/46*

U.S. Cl. 384—465 **10 Claims**



1. A rotational bearing arrangement for high speeds of rotation and disposed substantially horizontally when in assembled state, comprising:

a casing having oppositely situated ends;

a shaft having a rotational axis;

two radial rolling bearings for mounting said shaft in said casing for rotation around said rotational axis;

each of said two radial rolling bearings comprising rolling members, a rotatable cage and a groove provided in said shaft;

said rolling members of each radial rolling bearing being guided in an associated rotatable cage and groove of the shaft;

a respective cover plate provided at each end of the oppositely situated ends of said casing;

a respective lubricant slinger ring coacting with an associated one of said radial rolling bearings and mounted on said shaft;

each said lubricant slinger ring having an operative edge disposed between said rolling members and said cover plate of the associated radial rolling bearing;

a respective impingement surface cooperating with the lubricant slinger ring of each radial rolling bearing for returning to said rolling members of the associated radial rolling bearing lubricant propelled from the operative edge of said associated lubricant slinger ring to the respective impingement surface;

said impingement surface extending concentrically around said cooperative edge of the associated lubricant slinger ring; and

each said rotatable cage being structured such that during operation of the rotational bearing arrangement each said rotatable cage conveys lubricant to the associated rolling members during rotation of the rotatable cage.

4,915,516

THERMAL TRANSFER RECORDING APPARATUS WITH INK PAPER CASSETTE

Hiroshi Shimizu; Naohiro Ozawa, both of Yokohama; Toshihiko Gotoh, Tokyo, and Kentaro Hamma, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 21, 1988, Ser. No. 222,428

Claims priority, application Japan, Jul. 24, 1987, 62-183283

Int. Cl.[4] B41J *3/02*

U.S. Cl. 400—120 **13 Claims**

1. A thermal transfer recording apparatus comprising a printer mechanism, and an ink paper cassette having ink paper made of a strip film on which ink is applied, a supply shaft on which said ink paper is wound and a take-up shaft juxtaposed with said supply shaft for winding said ink paper,

said printer mechanism including:

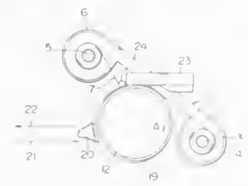
(1) a front face for preventing said printer mechanism from being accessible from the outside, said front face having a loading aperture through which said ink paper cassette is loadable into said printer mechanism in a direction parallel to axes of said take-up and supply shafts;

(2) torque transmission means for transmitting torque to said take-up and said supply shafts;

(3) a drum on which a transfer paper is to be wound, said drum forwarding said transfer paper successively in accordance with image print; and

(4) a thermal head receiving a signal corresponding to a pictorial image to be printed, bringing the ink paper in said ink paper cassette into contact with said transfer paper wound on said drum, and generating heat in accordance with said signal to thermally transfer the ink on said ink paper to said transfer paper, thereby printing a desired pictorial image onto said transfer paper, and said ink paper cassette including:

(1) a rear connecting portion having a first end portion rotatably supporting one end of said take-up shaft, a



second end portion rotatably supporting one end of said supply shaft, and an interconnecting portion connecting said first and second end portions with a predetermined space therebetween, said interconnecting portion disposed asymmetrically with respect to a line extending through said axes of said take-up and supply shafts, a depth of said rear connecting portion being smaller than a dimension of said loading aperture of said printer mechanism, permitting said cassette to be loaded from said rear connecting portion thereof into said printer mechanism; and

(2) a front connecting portion juxtaposed with said rear connecting portion, and having a first end portion rotatably supporting the other end of said take-up shaft, a second end portion rotatably supporting the other end of said supply shaft, and an interconnecting portion connecting said first and second end portions with the predetermined space therebetween, said front connecting portion having a depth greater than the dimension of said loading aperture of said printer mechanism, preventing the ink paper cassette from being loaded from said front connecting portion thereof into said printer mechanism.

4,915,517

PRINT HEAD

Robert G. Husome, 3243 Betsy Ross Way, Boise, Id. 83706

Filed Jun. 9, 1989, Ser. No. 363,701

Int. Cl.[4] B41J *3/10*

U.S. Cl. 400—124 **8 Claims**

1. Print head apparatus comprising:

a hollow, substantially gas tight, housing, said housing including a gas intake port;

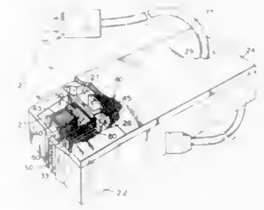
an end guide mounted on said housing, said end guide provided with a plurality of tubular linear bearings;

a plurality of coils mounted within said housing;

a plurality of armatures mounted within said housing, each of said armatures in electromagnetic engagement with a respective coil;

a plurality of print wires contained within said housing, each of said print wires connected to a respective armature and each of said print wires reciprocally movable in a respective linear bearing of said end guide for impacting an ink ribbon upon selective actuation of said coils; and

means providing a gas bearing in each of said tubular linear bearings including



a pressurized gas source for forcing gas through said gas port into said housing to provide gas flow through each of said linear bearings to provide a gas bearing and to prevent ink flow from said ribbon into said bearings.

4,915,518

PRINTER AND RELATED MULTIFUNCTIONAL STAND

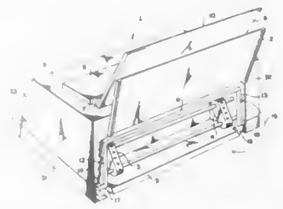
Paolo Urso, Villapia di Parabiago, Italy, assignor to Bull HN Information Systems Italia S.p.A., Caluso, Italy

Filed Sep. 28, 1988, Ser. No. 250,456

Claims priority, application Italy, Oct. 19, 1987, 22319 A/87

Int. Cl.[4] B41J *29/06*

U.S. Cl. 400—681 **3 Claims**



1. In combination, a printer for printing on fanfolded continuous forms having a feeding tractor internal of said printer, and a related multifunctional stand for selectively holding the rear portion of said printer spaced from a supporting surface of a working desk, said printer having a body with a base and a rear wall, said base and said rear wall meeting at a rear-lower edge, a recess in said rear wall, a first opening in said rear wall above said rear-lower edge for entering continuous forms in said printer from a feeding stack, a second opening for the output of said forms from said printer, said forms being pulled through said first opening from said feeding stack by said feeding tractor and once printed being discharged through said second opening to a collecting stack, said multifunctional stand being formed by a rectilinear rod and by two end arms perpendicular to said rod, one end of each of said arms being fixed with respect to a corresponding end of said rod, the other end of each of said arms being hinged in said body near said rear-lower edge so that said stand may pivot between a plurality of positions including a first non-operative position in which said stand is wholly contained in said recess, and a second operative position in which said stand supports the rear portion of said printer lifted from said desk to enable said feeding stack to be partially laid on said desk above said rod and at least partially below said rear portion of said body, and means in said body to maintain said stand in said second operative position in which

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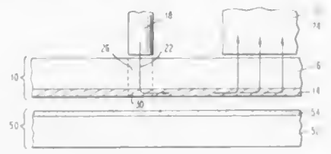
said rod of said stand is spaced apart from said body and performs a supporting function for said body, so that a rear portion of said body is kept lifted from said desk by said rod resting on said desk.

4,915,519

DIRECT NEGATIVE FROM RESISTIVE RIBBON

Ali Afzali-Ardakani, White Plains; Mukesh Desai, Fishkill, and Keith S. Pennington, Somers, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 30, 1987, Ser. No. 115,227
Int. Cl.[4] B41J *3/20*
U.S. Cl. 400—120 18 Claims



1. A method for producing a direct negative, which method comprises:

locating a multi-stylus recording head capable of providing electrical current pulses in selected ones of said recording styli in contact with a resistive layer of an ink receiving medium comprising said resistive layer and thereon a thin ink receiving metal layer;

applying electrical current pulses through selected ones of said recording styli to produce high density localized currents in the regions of said resistive layer in contact with said selected energized styli, said electrical currents providing sufficient resistive heating to heat regions of said ink receiving metal layer about coextensive with said resistive layer regions;

contacting said heated ink receiving metal layer with a negative precursor comprising a transparent support carrying thereon a thin layer of an opaque heat softenable ink, with said layer of ink being in contact with said ink receiving metal layer, while maintaining through said resistive heating said regions of said metal layer at a temperature sufficient to soften said ink regions in contact therewith sufficiently to transfer essentially the entire cross sections of said ink regions to said ink/receiving metal layer, thereby forming a direct negative in said transparent support having light opaque regions where said opaque ink has not been removed and light transparent regions were said opaque ink has been removed.

14. An apparatus system for forming a direct negative comprising:

an ink receiving medium comprised of a resistive layer and a thin ink receiving metal layer thereon;

a multi-stylus recording head for providing patterns of electrical current through selected regions of said resistive layer, where said electrical currents are localized in the regions of said resistive layer contacted by the styli which are energized by said electrical currents, said localized electrical currents being sufficiently dense to provide sufficient resistive heating to heat regions of said metal layer about coextensive with said selected regions of said resistive layer to a temperature sufficient to soften a thermoplastic ink brought in contact therewith, and

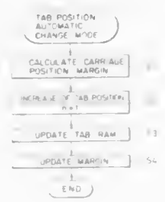
a negative precursor comprising a transparent substrate carrying thereon a layer of an opaque thermoplastic ink.

4,915,520

OUTPUT APPARATUS HAVING A TAB INTERVAL INCREASING/DECREASING FUNCTION

Masaru Makita, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 709,608, Mar. 8, 1985, abandoned. This application Dec. 30, 1986, Ser. No. 4,211
Claims priority, application Japan, Mar. 12, 1984, 59-45383
Int. Cl.[4] B41J *21/00*
U.S. Cl. 400—279 32 Claims



1. An output apparatus for outputting information in accordance with format information, said apparatus comprising:

setting means for setting output format information including a margin;

storage means for storing format information set by said setting means; and

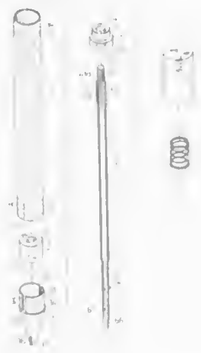
deriving means for, when the margin is changed, deriving new format information including a tab position such that a balanced output layout is obtained and for causing said storage means to store the new format information.

4,915,521

MECHANICAL PENCIL WITH ROTARY DISCHARGE MEMBER

Lee-Fen Hwang, Shin-Ying, Taiwan, assignor to Saint Island International Patent and Law Offices, Taipei, Taiwan

Filed Jun. 19, 1989, Ser. No. 367,936
Claims priority, application Taiwan, Sep. 25, 1987, 76209381
Int. Cl.[4] B43K *21/14*
U.S. Cl. 401—56 10 Claims



1. A mechanical pencil comprising:

a tube-like housing having an upper end and a tapered bottom end portion, an elongated central cavity and a plurality of elongated lead cavities annularly provided around said central cavity, said lead cavities being adaptable for receiving aligned leads with their sharpened ends directed downward, said housing further having a lead discharge member receiving cavity below said central cavity and said lead cavities, said tapered end portion having a lead guiding passage means below said lead discharge member receiving cavity and a lead outlet;

an operating rod movably received in said central cavity, having an upper end and a lower end, said lower end extending into said lead guiding passage means;

means for urging said rod to move upward;

a lead discharge member provided in said lead discharge member receiving cavity, having a bore to permit said rod to pass therethrough and a single lead discharging passage to selectively register with said lead cavities, said lead discharge member being cooperatively associated with said rod so as to discharge a piece of lead into said lead guiding passage means when said rod is depressed, said lead discharging passage permitting leads to fall into said lead guiding passage means when said rod is moved downward and then upward.

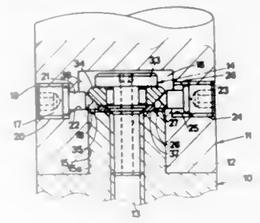
lying in said common radial plane, said clamping member being displaceable generally radially inwardly and outwardly,

said connecting means comprising a fastener including:

a shaft detachably secured in said recess,

a collar disposed forwardly of said shaft and having a larger cross-sectional dimension than that of said shaft, rearward movement of said collar being opposed by a front end of said spigot,

a neck arranged forwardly of said collar,



a head connected to a front end of said neck and having a cross-sectional dimension larger than that of said neck, and

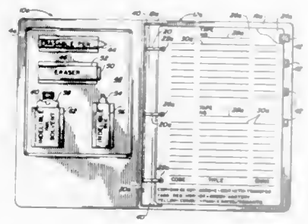
a radially floatable washer mounted with radial play on said neck, said floatable washer including an outer peripheral surface sized to permit said floatable washer to be inserted longitudinally into and from said cavity, whereupon said outer peripheral surface contacts said inner ends of said retaining pins and is displaced radially thereby to permit passage of said floatable washer longitudinally past said retaining pins.

4,915,522

VIDEO TAPE LOG DEVICE

David P. Greathouse, 13961 Tucker Ave., Sylmar, Calif. 91342

Filed Sep. 12, 1988, Ser. No. 242,587
Int. Cl.[4] B42F *13/00*
U.S. Cl. 402—79 18 Claims



1. An improved video tape log device, said log device comprising, in combination:

(a) a looseleaf binder having a pair of covers connected to a page holder; and,

(b) a plurality of pages detachable from said page holder, both opposite sides of each said page being encased in transparent plastic upon which removable indicia can be disposed, each said page bearing printed indicia for identifying the particular tape and a plurality of tape segments on such tape.

4,915,523

DEVICE FOR COUPLING A FEMALE MEMBER TO A MALE MEMBER

Kjell Andersson, Fagersta, Sweden, assignor to Seco Tools AB, Sandviken, Sweden

Filed Apr. 24, 1989, Ser. No. 341,814
Claims priority, application Sweden, May 6, 1988, 8801717
Int. Cl.[4] B25G *3/00*
U.S. Cl. 403—11 14 Claims

1. A male member and female member coupled together by connecting means:

said male member including a longitudinally forwardly projecting spigot in which there is formed a forwardly open, rearwardly extending recess,

said female member including a rearwardly open, forwardly extending cavity, a portion of said cavity receiving said spigot with a sliding fit,

at least two retaining pins mounted in said female member and lying in a common radial plane, said pins including inner ends projecting generally radially into said cavity, and

a clamping member mounted in said female member and

4,915,524

PRINT WIRE GUIDING DEVICE FOR WIRE TYPE DOT PRINTER

Akio Mitsuishi; Yasuhiko Nakazawa, and Takumi Sato, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Division of Ser. No. 823,167, Jan. 27, 1986, Pat. No. 4,767,227. This application Aug. 24, 1988, Ser. No. 235,864
Claims priority, application Japan, Jan. 25, 1985, 60-11854; Jan. 25, 1985, 60-11855; Jan. 25, 1985, 60-11856; Jan. 25, 1985, 60-11857; Jan. 25, 1985, 60-11858; Jan. 25, 1985, 60-8970; Jan. 25, 1985, 60-8971; Feb. 20, 1985, 60-31928; Feb. 20, 1985, 60-23356; Feb. 20, 1985, 60-233557
Int. Cl.[4] B41J *3/12*
U.S. Cl. 400—124 12 Claims

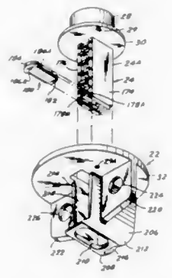
1. An assembly for supporting a member in a wire type dot printer having a plurality of printing wires comprising:

a first member having a guide means for guiding said wires;

a second member having grooves for receiving said first member;

a plurality of projections extending from said first member so as to be disposed in at least one of said grooves between said first member and said second member, said projections being deformable so as to provide a wedge action between said first member and said second member when said first member is inserted into said grooves, whereby

motion of said first member with respect to said second member in a direction opposite to that of insertion is



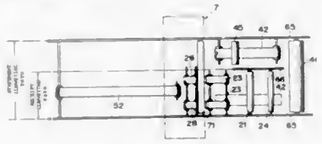
substantially prevented, said projections being of conical shape.

4,915,525

SLIP ISSUING APPARATUS

Noritaka Hosoi, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 800,778, Nov. 17, 1985, abandoned. This application Apr. 24, 1987, Ser. No. 52,127
Claims priority, application Japan, Nov. 27, 1984, 59-250992
Int. Cl.[4] B41J *11/42*
U.S. Cl. 400—583 3 Claims



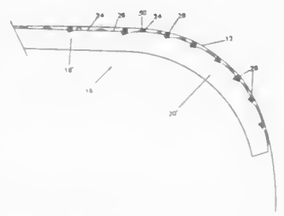
1. A slip issuing apparatus, comprising:
(a) a first rolled paper holder for supporting a rolled paper slip;
(b) second support means for supporting a second kind of slip having a slip width different from that of the rolled paper slip;
(c) printing means having a printing head movable within a predetermined printing range corresponding to a wider slip width of the rolled paper slip and said second kind of slip;
(d) first conveying means for conveying the roller paper slip supported by said rolled paper holder to said printing means, said first conveying means having a width corresponding to a width of said rolled paper slip;
(e) second conveying means for conveying the second kind of slip supported by said second supporting means to said printing means, said second conveying means having a width corresponding to a width of said second kind of slip, said first and second conveying means being positioned in spaced vertical relationship with each other;
(f) cutter means disposed adjacent said first conveying means, for cutting said rolled paper slip into predetermined lengths prior to said rolled paper slip reaching said printing means;
(g) control means for controlling said first and second conveying means so as to convey a specified kind of slip to said printing means in response to a designation of the kind of slip to be issued and for shifting the printing head within said predetermined printing range according to the specified kind of slip to print predetermined data on the slip;
(h) a slip discharge outlet means;
(i) third conveying means for conveying the slip printed by said printing means to said slip discharge outlet means; and
(j) collecting means for driving said third conveying means in reverse to collect a discharged slip conveyed to said slip discharge outlet means when the discharged slip is not extracted from the outlet after a predetermined time has elapsed.

4,915,526

STATIC-PROOF PLATEN FOR GRAPHICS PLOTTER

Pernie E. Westly, Huntington Beach; Alexander C. Grattan, Jr., La Habra, and Susan Mathewes, Mission Viejo, all of Calif., assignors to Calcomp Inc., Anaheim, Calif.

Filed Mar. 31, 1988, Ser. No. 175,946
Int. Cl.[4] B41J *13/10*
U.S. Cl. 400—642 3 Claims



1. In a graphics plotter having a driving roller mechanism for moving a writing medium in a first direction over a platen disposed transverse to the first direction adjacent the roller mechanism and having a generally horizontal table portion and a curved outer portion where the writing medium is smoothly curved from a generally horizontal supported state to an unsupported vertically hanging state the method of improving the platen to eliminate static charge buildup problems comprising the steps of:
(a) transversely grooving the upper surface of at least the curved outer portion of the platen in a second direction transverse to the first direction by creating a plurality of grooves of substantially V-shaped cross-section so as to create, in effect, a series of plates on the surface of the platen overlapped in the first direction
(b) covering the surface of the platen with a uniform layer of a static charge conducting material; and,
(c) splattering the surface of the platen with additional static charge conducting material of a sufficiently viscous consistency so as to create a series of slightly raised conductive bumps on the surface of the platen on which a writing medium can be supported and over which it can ride.

4,915,527

CASE FOR STICK-TYPE COSMETIC

Shinichi Asano, and Tomio Tahara, both of Tokyo, Japan, assignors to Kamaya Kagaku Kogyo Co., Ltd., Tokyo, Japan

Filed Jul. 22, 1988, Ser. No. 223,280
Claims priority, application Japan, Apr. 22, 1988, 63-54145[U]
Int. Cl.[4] A45D *40/00, 40/02, 40/12, 40/22*
U.S. Cl. 401—60 11 Claims

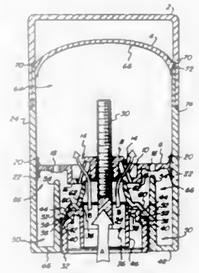
2. In a case for containing a stick-type cosmetic, the case including:
a substantially tubular case body having an open end and a closed end, the body having parallel planar opposite side faces constituting a part of the outer peripheral face of the body the planar side faces extending between the open and closed ends of the body, each of the planar side faces having a through slot extending along the longitudinal axis of the body, the through slot communicating with the internal space of the body,
a receptacle member for fixedly receiving one of the opposite ends of the stick-type cosmetic, the receptacle member being slidably received in the tubular case body for axial movement between first and second positions, the first position being such that the cosmetic fully projects outward from the open end of the body when the receptacle member is in the first position, the second position being such that the cosmetic is fully retracted into the body when the receptacle member is in the second position;
a pair of coaxial pivots connected to the receptacle member is such a manner that the axes of the pivots are perpendicular to the planar side faces of the body, the pivots being received respectively in the through slots of the body for sliding movement along the slots; and
generally U-shaped lid member having a head portion and a pair of spaced parallel leg portions, each of the leg portions having proximal and distal ends and outer and inner opposite faces, the proximal ends of the leg portions being integrally connected to the head portion, the distal ends of the leg portions being pivotally connected to the receptacle member through the pivots so that the lid member is pivotally movable about the axes of the pivots, the inner faces of the leg portions being substantially planar, the lid member being movable to a closed position, the closed position being such that when the lid member is in the closed position, the head portion of the lid member closes the open end of the body with the receptacle member being in the second position and the entire inner faces of the leg portions are mated respectively with the entire planar side faces of the body,
the improvement wherein the case body has a pair of inner peripheral walls, each defining the through slot, each of the inner peripheral walls comprising first and second opposite end portions and a pair of opposed and elongated side portions, the first end portion being disposed adjacent to the open end of the body, the second end portion being disposed adjacent to the closed end of the body, wherein each of the planar side faces of the body has an annular guide groove surrounding the second end portion of the corresponding inner peripheral wall, the annular guide groove intersecting the corresponding through slot so that the guide groove overlaps and communicates with the corresponding through slot, and wherein the inner face of each of the leg portions has an arcuate projection disposed adjacent to the distal end of the corresponding leg portion, the arcuate projection being slidably received in the corresponding annular guide groove for sliding movement along the annular guide groove when the receptacle is in its second position and being slidably received in the corresponding through slot for sliding movement along the through slot when the arcuate projection is brought into the through slot.

4,915,528

SOLID STICK DISPENSER SUITABLE FOR TOP OR BOTTOM FILLING

Richard H. Seager, Mystic, Conn., assignor to Risdon Corporation, Naugatuck, Conn.

Filed May 4, 1989, Ser. No. 347,529
Int. Cl.[4] A45D *40/06*
U.S. Cl. 401—68 40 Claims



1. A dispenser suitable for top- or bottom-filling comprising:
a container defining a chamber for storing material to be dispensed and extending between a base end and an outlet end;
a piston positioned within said container and having fluid passage means to enable fluid to pass through said piston;
actuation means positioned to move said piston within the chamber between a retracted position adjacent the base end and a fully advanced position adjacent the outlet end;
passage closure means attached to said container and positioned proximate to the base end to close the fluid passage means when said piston is in the retracted position but not when said piston is moved toward the advanced position; and
feed passage means adapted for directing fluids from the base end, past said passage closure means, through the fluid passage means, and into the chamber when said piston is advanced from the retracted position.

4,915,529

SEALING CAP FOR WRITING, DRAWING OR PAINTING INSTRUMENT

Holger List, Pyrbaum, Fed. Rep. of Germany, assignor to J. S. Staedtler GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 237,899
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1987, 3728896
Int. Cl.[4] B43K *5/00*
U.S. Cl. 401—202 7 Claims

1. Sealing cap for a writing, drawing or painting instrument comprising an axially elongated tubular member for placement over a tip of the instrument, said tubular member having a first end and a second end spaced apart in the axial direction, said first end being open to receive the tip of the instrument and said second end being closed, said tubular member having an axially extending interior space therein for receiving the tip of the instrument inserted through the first end with the interior space being closed by said second end, at least one axially extending air channel extending in the axial direction of and at least along an axially extending portion of said tubular mem-

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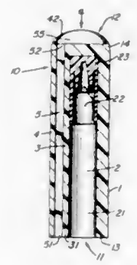
ber, wherein the improvement comprises that said air channel is located within said tubular member, said air channel having a first open end and a second open end spaced apart in the axial direction thereof, said air channel has an axially extending radially outer wall closed between the first and second open ends and an axially extending radially inner wall separating said air channel from said interior space and being closed along

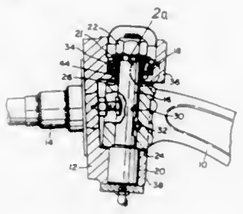


the axial extent thereof, first means adjacent the first end of said tubular member for interconnecting the first open end of said air channel and said interior space, and second means adjacent the second end of said tubular member extending axially outward from said second end forming an at least partially laterally closed space being in communication with the second open end of said air channel.

4,915,530
KINGPIN ASSEMBLY

Malcolm Tomlinson, Luton, Great Britain, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 5, 1988, Ser. No. 214,952
Claims priority, application United Kingdom, Aug. 21, 1987, 8719859
Int. Cl.[4] F16C *11/06*
U.S. Cl. 403—158 6 Claims

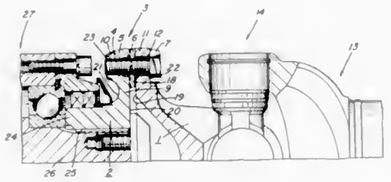


1. A kingpin assembly for an axle of a motor vehicle comprising an axle beam and a steering knuckle pivotally mounted thereon, the steering knuckle having upper and lower yokes, the kingpin assembly comprising a kingpin fixedly secured in an aperture in the axle beam and passing through apertures in the steering knuckle upper and lower yokes, the kingpin having an upper threaded end with an engaged nut having a washer underneath the nut surrounding the kingpin; a thrust washer/seal surrounding the kingpin between the axle beam and the upper yoke; a tapered roller thrust bearing having inner and outer races, the inner race being pressed downward by the washer when the nut is tightened, the outer race being positioned around the kingpin within the aperture in the steering knuckle upper yoke to allow relative rotation between the steering knuckle and the kingpin; and a predetermined number of annular spacers positioned around the kingpin and between the thrust washer/seal and the inner race of the bearing for providing a predetermined spacer height and for providing a required pre-load for the assembled kingpin assembly, the annular spacers having a predetermined thickness of at least 1.0 mm and a diameter less than that of the thrust washer/seal and being selected from a range of annular spacers comprising annular spacers having one of a selected number of small variations in thickness, and which when assembled can provide a variation in excess of the possible range of spacer height the uppermost of the annular spacers contacting the inner race of the thrust bearing and the lowermost of the annular spacers contacting the washer/seal.

4,915,531
DISC CLUTCH

Jacques G. Mangiavacchi, Chatou, France, assignor to GKN Cardantec International Gesellschaft für Antriebstechnik mbH, Essen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 263,593, Oct. 27, 1988, abandoned. This application Nov. 14, 1988, Ser. No. 270,953
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1987, 3738210
Int. Cl.[4] F16D *1/00*
U.S. Cl. 403—337 9 Claims



1. A disc clutch, comprising:
a first clutch part having a first radially extending flange, said first radially extending flange having a clutch face with a toothed portion and a through hole;
a second clutch part having a second radially extending flange, said second radially extending flange having a clutch face with toothed portions, and a radial face provided so as to face away from said toothed portions, said first and said second radially extending flanges being removable connected to each other;
connecting bolts arranged in the region of said toothed portions so as to pass through said through hole in said first clutch part;
axially projecting cam means provided on the radial face of the flange opposite the clutch face so as to project axially from the radial face, the cam means including a bored step provided so as to start from said toothed clutch face of said second clutch part and having a bored diameter greater than the outer diameter of said connecting bolts, said projecting cam means further including threaded bores provided with threads for said connecting bolts and so as to follow said bored step; and
reinforcement ribs provided so as to follow both sides of said cam means and extend along said toothed portions.

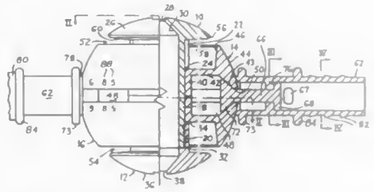
4,915,532
CONNECTOR FOR 3-DIMENSIONAL FRAME STRUCTURES

Simon P. Radclyffe, 57 Bentham Way, Ealing, London, England W5 1BE

Filed Nov. 12, 1987, Ser. No. 119,851
Claims priority, application United Kingdom, Nov. 13, 1986, 8627117
Int. Cl.[4] F16B *7/00*
U.S. Cl. 403—171 7 Claims

1. A spherical connector for connecting structure members

by respective ends thereof to form a 3-dimensional structure, comprising:
a core with a substantially cylindrical central portion having, at each axial end, a part-spherical end portion wider than the cylindrical central portion, said core being formed of a pair of coil portions, each of which has one of said part-spherical end portions;
first and second apertures in the form of elongate slots, each formed in a part-spherical outer surface of a respective one of said end portions, a hollow region extending within the cylindrical central portion of the core and being adjacent to each said slot to enable a tongue on one said structural member having a widened free end, elongate in end view and tapering inwardly from its free end in plan view, to be inserted and retained by rotating it through 90° about a common axis of said connector passing through both said slots;
a pair of bearing surfaces formed within said hollow region and diverging from one another from respective opposed longitudinal edges of each said slot in a direction away from said part-spherical outer surface; and
a pair of annular members mounted on and surrounding the cylindrical central portion of the core and having respective annular outer portions, with part spherical outer



surfaces connected by annular webs to respective cylindrical portions surrounding the cylindrical central portion of said core, and defining therebetween an annular channel extending circumferentially and entirely around said connector to form a third aperture to receive a plurality of said tongues, said annular channel including a median plane of said connector perpendicular to said core and having a radially outer constriction towards which extend a pair of annular bearing surfaces within said channel, one formed on each of said annular members with its wider circumference adjacent a respective edge of said constriction;
wherein a secondary channel is defined between each said end portion of said core and a respective one of said annular members, said secondary channels constituting respective fourth and fifth apertures to receive further said tongues and each having therein a pair of annular bearing surfaces which converge towards one another in a radially outward direction, one of said annular bearing surfaces extending from the cylindrical central portion of said core to a circumferential edge of the respective end portion and the other being an inner surface of the respective annular member extending from its part-spherical outer surface to the respective annular web

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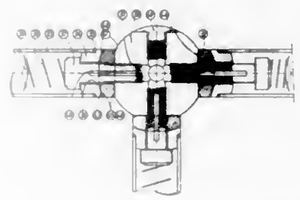
4,915,533
COUPLING PIECE FOR JOINING TWO OR MORE RODS

Cornelis F. de la Haye, Gevers Deynootweg 590, 2586 BS Den Haag, Netherlands

Filed Sep. 28, 1987, Ser. No. 101,612
Claims priority, application Netherlands, Oct. 2, 1986, 8602487
Int. Cl.[4] F16D *1/00*
U.S. Cl. 403—171 18 Claims

1. In a coupling piece for coupling two or more rods including a connector rotatably connectable at one end to said coupling piece for connecting the coupling piece to a rod, the other end of said connection having means for coaction with an end of a rod the improvement wherein said connector has a polygonal outer circumferential portion, and further comprising a ring between the rod and coupling piece having a corre-

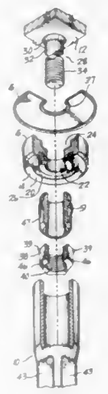


sponding internal polygonal portion configured to slide axially along the connector and rotate therewith and having external engagement surfaces, wherein the ring has two radial faces and at least one radial face thereof has an annular recess with sealing ring therein.

4,915,534
SCREW JOINT CONNECTION BETWEEN METAL MEMBERS

Peter S. Richards, Issaquah, Wash., assignor to Progressive Fastening, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 47,730, May 6, 1987, Pat. No. 4,826,343. This application May 1, 1989, Ser. No. 346,417
Int. Cl.[4] F16B *7/08*
U.S. Cl. 403—189 18 Claims



1 A joint construction, comprising:
a hard metal support member;
a soft metal base member including a first side defected towards said support member, a second side, an opening extending between said first and second sides, and a trepan groove in said second side concentrically surrounding said opening;
hard metal bolt extending from said support member and having a shank extending through said opening, said shank including a threaded portion which projects beyond the second side of said base member;
a soft metal post member having a tubular end sized to fit within said trepan groove;
a hard metal insert located within and secured to said post member, said insert having a central opening with threads

constructed to make threaded engagement with the threads on said bolt; and

wherein in use the post member is moved towards the base member and its tubular end is placed within said trepan groove and the threads of the bolt are mated with the threads in the insert, and then the post member is rotated for the purpose of making a threaded connection between the bolt and the insert and tightening such connection until the tubular end of the post member is tight within said trepan groove.

4,915,535

CONNECTOR

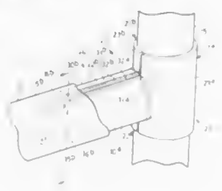
Charles A. Willetts, 147A Vicarage Road, Wollaston, West Midlands, United Kingdom (DY8 4QU)

Filed Dec. 2, 1988, Ser. No. 278,956

Claims priority, application United Kingdom, Dec. 2, 1987, 8728208; Dec. 12, 1987, 8729084

Int. Cl.[4] F16B *7/08*

U.S. Cl. 403—191 12 Claims



1. An assembly comprising a member, having a recess, connected by a connector to a component having an outwardly presented surface part, the connector comprising at least one pair of discrete elements pivotally joined together by a pivotal joint means, each element having a female part and a male part which co-operate, respectively, to provide the connector with a female portion in which said surface part of the component is received and a male portion which is engaged in the recess of the member, said pivotal joint means comprising releasably interengaging formations provided on the female parts of the elements of said at least one pair.

4,915,536

MODULAR YOKE END

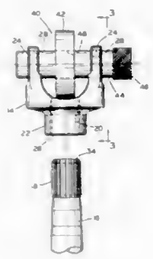
Dee E. Bear, Roanoke; Fred Osborne, Fort Wayne, and Dick E. Cleveland, Garrett, all of Ind., assignors to Dana Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 102,224, Sep. 29, 1987, abandoned. This application Oct. 10, 1989, Ser. No. 419,054

Int. Cl.[4] F16B *11/00*

U.S. Cl. 403—267 9 Claims

1. In a power drive assembly including a metallic driving shaft having an externally splined connection end, a metallic yoke having a hub adapted for securement to said connection end of said shaft, said hub including a mating internally splined portion for torsional securement to said externally splined connection end; an improvement comprising: the combination of (1) an interference fit between said mating splined shaft and yoke portions, and (2) a bonding adhesive applied at the interface of said mating portions, whereby said yoke and shaft members are fixedly secured against axial and rotational movement with respect to one another, said interference occurring only at select portions of said interface, wherein the remaining portions of said interface provide a clearance for admission of



said bonding adhesive, and wherein said mating splines comprise a pressure angle of 30 degrees.

4,915,537

COMPOUND JOINT AND METHOD FOR ITS PRODUCTION

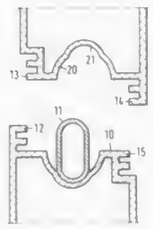
Hans Berghelm, and Winfried Griep, both of Bonn, Fed. Rep. of Germany, assignors to Vereinigte Aluminum-Werke A.G., Bonn, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 882,099, Jul. 3, 1986, Pat. No. 4,722,633. This application Aug. 27, 1987, Ser. No. 90,078

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1985, 3523921

Int. Cl.[4] B25G *3/28*

U.S. Cl. 403—277 16 Claims



16. A compound joint comprising:

a lower section;

an upper section having a common contact plane with said lower section;

interlocking means on each said upper and lower sections for positively interlocking said sections;

a depression on each of said sections, said depression oriented along said common contact place such that when said sections are interlocked, said depression forms an enclosed tube;

a spreader tube for positioning within said enclosed tube, whereby the expansion of said spreader tube within said enclosed tube to a volume larger than the volume of said enclosed tube causes said interlocked upper and lower sections to be permanently joined, and

said spreader tube comprising an aluminum alloy that undergoes cold work hardening during said expansion, the cross section of said depression being semi-oval and the cross section of said enclosed tube being oval.

4,915,538

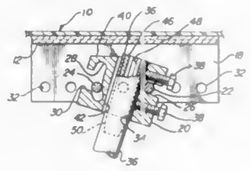
SUPPORT FOR A BICYCLE TYPE SEAT

Robert C. Golden, 24110 Denise, Apt. 12-A, Mt. Clemens, Mich. 48043-3869, and Martin J. Neumeyer, 5165 Hamshire Dr., Utica, Mich. 48087

Filed Dec. 19, 1988, Ser. No. 286,189

Int. Cl.[4] F16B *2/00*

U.S. Cl. 403—362 11 Claims



1. In a support having self adjusting means for mounting bicycle type seats on conventional seat supporting posts within a broad range of diameters, the combination of a pair of depending brackets, a rigid block spacing said brackets, means for clamping said brackets securely against the sides of said block, said block having a post receiving hole therein, the sidewall of said hole having channel means therein extending parallel to the longitudinal axis of said hole, said channel means intersecting the sidewall of said hole at a pair of impact ridges parallel to said axis, and means for forcing a seat supporting post out of axial alignment with respect to said hole and against said ridges to embed the latter into said post comprising bolt means in screw threaded engagement with said block and extending from the exterior thereof into said hole in opposition to said channel means.

4,915,539

WEAR RESISTANT PAVEMENT STRUCTURE

Toru Yoshikane; Hiromitsu Nakanishi; Shinichi Takei, and Tatsushi Kajino, all of Nagoya, Japan, assignors to Taiyu Kensetsu Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 16, 1988, Ser. No. 285,613

Claims priority, application Japan, Dec. 28, 1987, 62-335241

Int. Cl.[4] E01C *5/06*

U.S. Cl. 404—31 20 Claims

1. A pavement structure comprising a skeleton concrete formed by evenly spreading a mixture containing not less than 30% by volume of coarse aggregate, 2% to 20% by volume of cement and 3% to 20% by volume of water, said skeleton concrete including about 10%-40% by volume voids which are filled with a material containing a thermosetting resin, said voids being filled in situ with a hardenable fluid material comprising said thermosetting resin

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4,915,540

CONTRACTIBLE MINE STOPPING AND CONTRACTIBLE BLOCK MEMBER FOR USE THEREIN

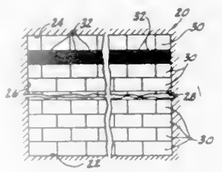
William R. Kennedy, and John M. Kennedy, both of Taylorville, Ill., assignors to Jack Kennedy Metal Products and Buildings, Inc., Taylorville, Ill.

Filed Jun. 5, 1989, Ser. No. 361,211

Int. Cl.[4] E21F *1/14*

U.S. Cl. 405—132 21 Claims

1. A contractible mine stopping adapted to be installed to extend as a vertical wall from the floor to the roof of passageway in a mine, said wall comprising a series of rows of substantially solid substantially non-compressible blocks of substantially fire-resistant material stacked one on top of another, and at least one row of contractible substantially fire-resistant block-like members adapted to contract without loss of structural integrity when the wall is subjected to a compressive load, as during a convergence of the floor and roof of the passageway, each block-like member being a hollow metal member which, when subjected to a compressive load, is adapted to contract heightwise of the member a distance corresponding to at least a major portion of the height of the member without loss of structural integrity of the member.



4,915,541

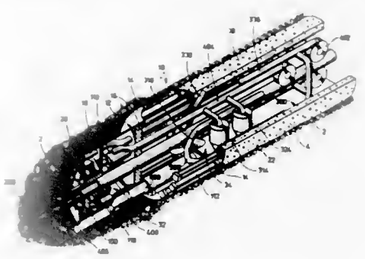
METHOD AND APPARATUS FOR CONTINUOUSLY BORING AND LINING TUNNELS AND OTHER LIKE STRUCTURES

Louis J. Thompson, 1216 Haines, College Station, Tex. 77840; Peter M. McIntyre, 713 E. 30th St., Bryan, Tex. 77801, and James K. Carta, 3610 Bluebonnet Cir., Weatherford, Tex. 76086

Continuation-in-part of Ser. No. 121,534, Nov. 12, 1987, Pat. No. 4,793,736, which is a continuation of Ser. No. 766,919, Aug. 19, 1985, abandoned. This application Jun. 9, 1988, Ser. No. 204,691

Int. Cl.[4] E21D *11/10, 9/06*

U.S. Cl. 405—146 5 Claims



4. A method for continuously and simultaneously boring and lining a tunnel comprising the steps of:

(a) excavating a bore through a solid medium;

(b) lining the excavated bore where the lining comprises at least two continuous passageways formed in the lining;

(c) removing excavation debris through at least one of the continuous passageways formed in the lining;

(d) transporting hardenable liner material through at least one of the continuous passageways formed in the liner;

(e) lining the continuous passageways formed in the lining with a sheet material;

(f) controlling the excavation, lining, removal of excavation debris, and transportation of hardenable liner materials.

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4,915,542

PROCESS FOR WATERPROOFING SURFACES

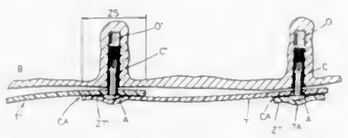
Gordun B. Fernando, Trinxan 63, Barcelona, Spain

Continuation-in-part of Ser. No. 946,556, Dec. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 797,160, Nov. 12, 1985, abandoned. This application Jan. 29, 1988, Ser. No. 150,787

Claims priority, application Spain, Nov. 16, 1984, 537709

Int. Cl.[4] E21D *11/00*

U.S. Cl. 405—150 **8 Claims**



1. A method of waterproofing surfaces, in particular inner surfaces of tunnels, channels and mine galleries, said surfaces having irregular walls which may be subjected to strong run-offs, low temperatures, strong and turbulent air flows, in which sheets of material are unrolled from rolls in situ and applied to said walls, said material having the properties of being impermeable to water, flexible and heat weldable, having high resistance to tension, shearing and tearing, being fire resistant self-extinguishable and not giving off toxic fumes, and being resistant and inert to chemical and biological agents and to aging, the method comprising the steps of:

(a) cutting the sheets in situ to the proper lengths in order to perfectly fit the surfaces (B) to be waterproofed;

(b) applying the sheets to said surfaces to produce said fit and to produce overlaps between sheets;

(c) producing in a single operation by a percussion and rotation hole-cutting tool, holes (O) in the rock through the corresponding sheet T and the surface (B);

(d) applying anchors (C) of stainless material and having a head (A), the places of attachment of the anchors (C) being distributed to secure and fix the fit of the respective sheet (T) to the surface (B), heads (A) of the anchors (C') at said overlaps remaining on top of one of the sheets (T') and being covered by the other sheet (T);

(e) welding the overlapping regions (ZS) by thermal fusion (CA), zones of thermal fusion (ZT) remaining around the heads;

(f) applying a circular protective part (TA) of the same material as said sheets, on the anchors of the sheet (T, T') which are not located at said overlaps, the diameter of said part being more than 6 cm greater than the diameter of the heads of said anchors (A);

(g) applying a greater density of anchors in the waterproofing starting and ending zones (AT and ET), and applying a sealing bead between the sheet (T) and the surface (B); and

(h) applying in the regions in which elements (ES) protrude from the surface (B) and the sheets (T), protective parts in the form of a washer made of the same material as the sheets and welding said protective parts to the sheet (T) by thermal fusion, leaving a zone (ZT) around the element (ES), and applying a thermally hardenable or vulcanizable sealing material (SE) in rubberoid state to the part (ZT) and around the element (ES).

4,915,543

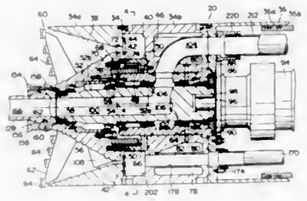
EXISTING PIPELINE RENEWING METHOD AND APPARATUS THEREFOR

Toshio Akesaka, Yokohama, Japan, assignor to Kabushiki Kaisha Iseki Kaihatsu Koki, Tokyo, Japan

Division of Ser. No. 193,110, May 11, 1988. This application Feb. 6, 1989, Ser. No. 307,282

Int. Cl.[4] E03F *3/06*

U.S. Cl. 405—156 **20 Claims**



17. A shield tunnelling machine as claimed in claim 16, further comprising:

a rotor disposed in said front region of said shield body and supported rotatably by said eccentric portion of said crankshaft;

a gear mechanism provided with an internal gear fixed to one of said shield body or said partition wall and an external gear fixed to the other; and

said cutter assembly being mounted on a tip portion of said rotor, whereby said cutter assembly is revolved around the rotary axis of said crankshaft and rotated around said eccentric portion along with the rotation of said crankshaft.

4,915,544

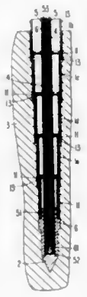
METHOD OF MAKING CAST-IN-PLACE PRESTRESSING CONCRETE PILE BY MEANS OF MOVABLE CASING SET

Juei-Jse Lin, Room C, 11F., No. 122, Sec. 4, Chung Hsiao E. Rd., Taipei, Taiwan

Filed Aug. 19, 1985, Ser. No. 766,786

Int. Cl.[4] E02D *5/38*

U.S. Cl. 405—243 **2 Claims**



1. A method of making a cast-in-place pile by means of a series of casings rotatble relative to each other between locked and unlocked positions, said locked position permitting a given vertical displacement between any two adjacent casings, displacement of the casings toward one another being limited by an abuttment affixed to one casing which is pushed by the adjacent casing when the casings are pushed together, said method comprising the steps of:

a. driving a casing into the earth;

b. engaging another casing with said casing of step a and rotating said casings relative to each other into the locked position;

c. repeating steps a and b until the casing extends into the earth to the depth desired for the pile, thereby pushing said casings against the respective abuttments so as to drive the casings into the earth in a compressed state;

d. pouring mortar into the lowermost casing to form a section of the pile and allowing it to hardern;

e. pulling on the casings so that the casings are displaced from each other one by one;

f. pulling a casing out of the earth to raise the lowermost casing into position wherein said lowermost casing slightly overllaps the hardened mortar, for forming another section of the pile; and

g. repeating step d through f until all sections of the pile are formed and hardened, whereupon the lowermost casing is pulled out of the earth.

4,915,545

LARGE SIZED UNDERGROUND STORAGE TANK WITH STRUCTURAL STABILITY

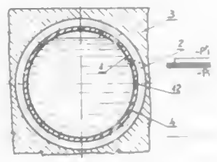
Franco Ferrari, La Spezia, Italy, assignor to Nino Ferrari USA Inc., Montclair, N.J.

Filed Jun. 29, 1988, Ser. No. 212,911

Claims priority, application Italy, Jan. 29, 1988, 12413 A/88

Int. Cl.[4] E04B *1/92*

U.S. Cl. 405—53 **9 Claims**



1. Underground installed storage tank consisting of an internal metal sheel (1) a static external facing in simple or reinforced concrete (2) and a filler (4) to be poured into the hollow space between the two walls, the metal shell (1) being formed by large rings (5) placed side by side and having edges fitted with channels for drainage, location and recovery of any leaks or drippings, characterized by the fact that the filler (4) is a hot injected or poured material which, after cooling, has sufficient plasticity to transmit any stresses from the metal to the static facing structure and vice-versa, so that all tank components are contributing to the stability of the assembly and so that the tank may be designed for a lower stress resistance (S'e, — P'i) than adopted in conventional design (Se, — Pi) resulting in savings in the metal shell structure and static facing wall.

4,915,546

DATA INPUT AND PROCESSING APPARATUS HAVING SPELLING-CHECK FUNCTION AND MEANS FOR DEALING WITH MISSPELLED WORD

Norio Kobayashi; Naohisa Kaneko, and Akemi Nagatsuma, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 28, 1987, Ser. No. 90,364

Claims priority, application Japan, Aug. 29, 1986, 61-203969; May 19, 1987, 62-122225

Int. Cl.[4] H41J *50/30*

U.S. Cl. 400—697 **25 Claims**

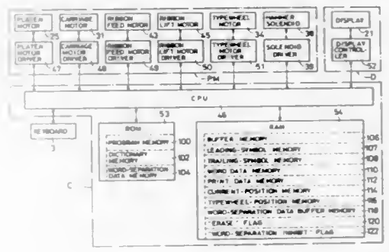
1. A data input and processing apparatus, comprising:

a keyboard having a plurality of keys operable for entering character data indicative of characters, and word-separation data indicative of termination of entry of a word;

memory means for storing at least one set of entered word data indicative of a word represented by the character data entered through said keyboard;

a dictionary memory storing word data indicative of a multiplicity of words;

spelling-check means responsive to said word-separation data entered through said keyboard, for determining whether or not said dictionary memory stores the word data which is identical with the entered word data in said



memory means which was entered last prior to the entry of said word-separation data, and for thereby determining whether or not a spelling of an entered word is correct; and

inhibiting means responsive to said spelling-check means, for inhibiting an operation defined by said word-separation data if said spelling-check means determines that the spelling of said entered word is not correct.

4,915,547

ARTICLE TRANSPORT SYSTEM

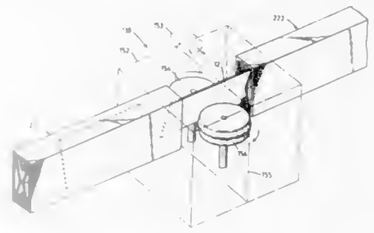
Michael J. Cahill, and Kenvin R. Fincham, both of Coventry, England, assignors to Molins PLC, Milton Keynes, United Kingdom

Filed Feb. 24, 1988, Ser. No. 160,020

Claims priority, application United Kingdom, Feb. 27, 1987, 8704719; Mar. 17, 1987, 8706320

Int. Cl.[4] B65G *47/24, 51/00, 51/02, 51/03*

U.S. Cl. 406—87 **25 Claims**



20. An article transport system comprising a pneumatic conveying duct in which articles may be conveyed in at least two different orientations which are angularly spaced relative to the longitudinal axis of the duct, means for introducing articles into the duct in different orientations, and means for introducing conveying air into the duct at an intermediate station through which articles are conveyed while retaining their respective orientations, said intermediate station having conveying means for receiving articles in either of said at least two orientations and for conveying articles through said intermediate station while maintaining their respective orientations.

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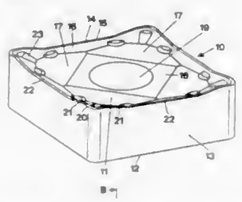
4,915,548

CUTTING INSERT WITH RAISED CUTTING EDGE

Richard Fouquer, and Jocelyn Gilbert, both of Tours, France, assignors to Safety S.A., Cedex, France

Filed Dec. 9, 1988, Ser. No. 282,067
Claims priority, application France, Dec. 11, 1987, 87 17300
Int. Cl.[4] B23B *27/22*
U.S. Cl. 407—114 11 Claims



1. A cutting insert for chipforming machining of metal workpieces comprising a polygonal body of wear resistant material, said body including top and bottom surfaces, and a plurality of peripheral walls extending therebetween, the intersection of said peripheral walls and at least said top surface forming cutting edge means, said top surface including:
- a land area joining said cutting edge means and extending inwardly therefrom toward a center of said body, said land area including:
  - corner portions disposed at respective corners of said body,
  - a recessed portion disposed between adjacent corner portion at a lower elevation than said corner portions, said recessed portion lying parallel to said corner portions, and
  - sloping portions inclined downwardly from said corner portions to said recessed portion,
- descending surface means joining an inner margin of said land area and descending therefrom toward said center of said body,
- primary projections disposed in said descending surface means at respective corners of said body, said primary projections being convex and sloping downwardly and inwardly and each including a planar upper surface located at an elevation between an adjacent section of said cutting edge means, and
- secondary projections disposed in said descending surface means, said secondary projections being convex and sloping downwardly and inwardly, and each including a planar upper surface located at an elevation below an adjacent section of said cutting edge means, said secondary projections being spaced from respective ones of said primary projections in a direction toward adjacent corners of said body to define chip curling zones between said primary and secondary projections.

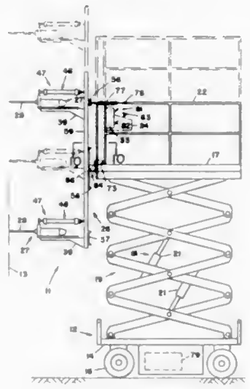
4,915,549

MULTIPLE BORE DRILLING APPARATUS

Charles C. Riddell, Castro Valley, Calif., assignor to Michael A. Wilkman, Danville, Calif., a part interest

Filed Feb. 6, 1989, Ser. No. 306,704
Int. Cl.[4] B23B *39/14, 39/16*
U.S. Cl. 408—43 8 Claims

1. Apparatus for drilling a plurality of horizontal bores into a substantially vertical building wall or the like comprising:
- a mobile vehicle having ground engaging means and being adapted for travel towards said wall or the like and away from the said wall or the like and for movement to successive locations along said wall or the like,
- a vertically extending frame carried at the forward end of said vehicle and which faces in the direction of forward travel of said vehicle,
- means for enabling selective raising and lowering of said frame relative to said vehicle,
- a plurality of drill supports secured to said frame and extending forwardly therefrom, said drill supports being individually extendible and contractible,
- a plurality of spaced apart drills each being secured to a separate one of said drill supports, said drills having parallel horizontally extending drill bits which extend forward from said drill supports at a region which is above and in front of said vehicle, said drills further having a first plurality of motors each of which drives an individual one of said drills, and
- a second plurality of motors each being connected to extend and contract a separate one of said drill supports.

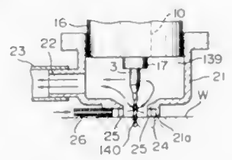


4,915,550

PRESSURE FOOT OF PRINTED CIRCUIT BOARD DRILLING APPARATUS

Kunio Arai, Atsugi, and Yasuhiko Kanaya, Machida, both of Japan, assignors to Hitachi Seiko Ltd., Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,153
Int. Cl.[4] B23B *47/34;* **B23Q** *11/02, 11/10*
U.S. Cl. 408—56 11 Claims



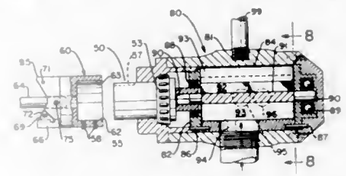
1. A pressure foot used in a printed circuit board drilling apparatus, said pressure foot being supported by a bearing holding a spindle in such a manner as to be slidable in the axial direction of the bearing, being connected with a dust collector through a vacuum port, and being adapted to press a printed circuit board in a drilling process and to exhaust the chips coming out in the drilling process through the vacuum port towards the dust collector, comprising:
- an annular end surface adapted to contact with the printed circuit board in such a manner that an interior volume of the pressure foot is isolated from the exterior of the pressure foot when the pressure foot and the printed circuit board are brought into contact with each other during the drilling process,
- a plurality of injection ports inwardly opened to the inner surface of the pressure foot, and
- compressed air feed passage means having one end thereof connected with said plurality of injection ports and at another end with a compressed air supply source, wherein said plurality of injection ports are arranged to provide rotational air flow therefrom, in a region surrounded by an inner surface of the pressure foot, to the vacuum port in such a manner that the direction of the rotational air flow is opposite to the rotational direction of the drill.

4,915,552

PORTABLE POWER TOOL FOR MILLING TUBE ENDS

Tollief O. Hillestad, 108 9th Ave. W., Summerland Key, Fla. 33042, and Mark W. Hillestad, 220 Hatch Rd., Wadsworth, Ohio 44281

Continuation-in-part of Ser. No. 254,958, Nov. 7, 1988, Pat. No. 4,889,454. This application Apr. 6, 1989, Ser. No. 334,314
Int. Cl.[4] B23B *5/16*
U.S. Cl. 408—125 16 Claims



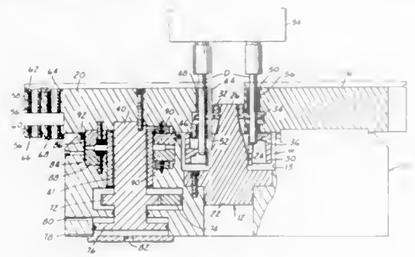
1. A portable, gas-operated rotary tool for milling a surface on an end of a tubular workpiece, comprising:
- a gas-operated radial-vane-type rotary motor having a rotor hub with a plurality of radial vanes slidably mounted therein and a tubular stator defining an eccentric stator chamber with a lobe shaped transverse cross-section, said rotor hub, radial vanes and stator chamber defining a plurality of expansible cavities, the ratio of the axial length of said stator chamber to the maximum radial extension of said vanes being between about 1.2 and about 1.8;
- first means in said stator defining a gas inlet adapted to admit gas under pressure to said expansible cavities when in their minimal volume condition;
- second means in said stator defining a gas outlet for exhausting gas from said expansible cavities;
- a rotary milling head operatively connected to said rotary motor;
- a pilot tube means connected to and extending forwardly from said milling head for insertion in said tubular workpiece; and
- non-locking means for aligning said tool whereby an operator may position said milling head with said guide means inserted in an end of said tubular workpiece so that rotation of said milling head mills a surface on the respective end of said tubular workpiece.

4,915,551

GUIDE MECHANISM FOR PRECISION DRILLING AND REAMING

John A. Watson, East Lansing, and Thomas D. Campbell, Grand Ledge, both of Mich., assignors to The Olofsson Corporation, Lansing, Mich.

Filed May 26, 1988, Ser. No. 199,150
Int. Cl.[4] B23B *49/00*
U.S. Cl. 408—72 R 6 Claims



1. Apparatus for precision guiding roughing tools and finishing tools so that preformed holes in a workpiece may be initially subjected to a roughing operation by precision guided roughing tools and thereafter to a finishing operation by precision guided finishing tools, said apparatus comprising a workpiece holder for mounting the workpiece in a fixed position, bushing support and positioning means comprising a plurality of elongated bushing carrier arms, each said carrier arm having a first end and a second end, means for mounting said carrier arms at an intermediate point in the length of each for swinging movement on pivot axes spaced apart arcuately around said workpiece holder and spaced laterally outwardly from said workpiece holder, a roughing guide bushing mounted on each carrier arm adjacent said first end thereof and a finishing guide bushing mounted on each carrier arm adjacent said second end thereof, said carrier arms being capable of swinging to a first operative position in which said roughing guide bushings are aligned with said preformed holes in the mounted workpiece, to a second operative position in which said finishing guide bushings are aligned with said preformed holes in the mounted workpiece, and to a retracted position in which said carrier arms are withdrawn clear of the workpiece holder permitting loading and unloading of the workpiece, releasable locking means for locking each carrier arm selectively in said first and second operative positions, and means for swinging said carrier arms in unison.

4,915,553

TOOL RETENTION AND EJECTION MECHANISM

Milisav Lazarevic, Racine, Wis., assignor to Tree Machine Tool, Co., Racine, Wis.

Filed Feb. 1, 1989, Ser. No. 304,448
Int. Cl.[4] B23Q *3/12*
U.S. Cl. 409—233 7 Claims

1. A tool retention and ejection mechanism for a spindle having an axial socket for receiving a tool that is provided with a rearwardly extending retention knob comprising:
- a collet actuatable to engage the retention knob and draw the tool into the socket of the spindle and retain it therein;
- a drawbar coupled to said collet and being movable relative to the spindle between a locking position and a release position for actuating the collet;
- biasing means connected to move said drawbar into its locking position for actuating said collet to draw the tool into the socket of the spindle and retain it therein;
- a first annular piston and cylinder mechanism encircling the spindle and connected to actuate said biasing means;
- a second piston and cylinder mechanism encircling the spindle and connected to actuate said drawbar;
- a source of fluid pressure;
- a first port in said first cylinder;
- a second port in said second cylinder;
- means connecting said first port to said source of fluid pres-

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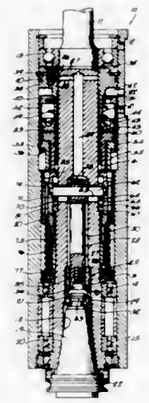
sure and then subsequently connecting said second port to said source of fluid pressure whereby said piston and cylinder mechanisms operate sequentially so that said first piston and cylinder mechanism is actuated to relieve the



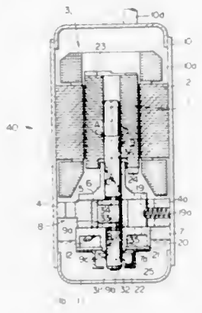
pressure of said biasing means for releasing said drawbar and said second piston and cylinder mechanism is then actuated to shift said drawbar out of its locking positions for moving said collet to release the retention knob of the tool so that the latter can be removed from the spindle.

4,915,554

HERMETIC ROTARY COMPRESSOR WITH BALANCING WEIGHTS

Yukio Serizawa; Kazuo Ikeda; Hiroaki Hata, all of Tochigi; Shin Ishihara, Kasukabe, and Motohiro Shiga, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 17, 1988, Ser. No. 258,462
Claims priority, application Japan, Oct. 19, 1987, 62-261588
Int. Cl.[4] F04C *18/356, 29/02*
U.S. Cl. 418—94 **10 Claims**



1. A hermetic rotary compressor having a motor unit composed of a stator and a rotor which are arranged in an upper portion of a hermetic housing, an oil-lubricated compressor unit arranged in a lower portion of said hermetic housing, a crank shaft connecting said motor unit and said compressor unit together, a discharging silencer formed by a lower bearing of said compressor unit positioned around a lower end portion of the crank shaft and a cover of said lower bearing, wherein said hermetic rotary compressor further comprises:

a lower balancing weight mounted on a lower shaft end portion of said crank shaft which extends to a position below said discharging silencer; and

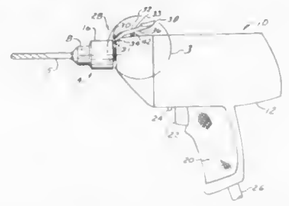
two rotor balancing weights provided on both end portions of said rotor.

4,915,555

POWER DRILL HAVING DRILL CHUCK TIGHTENER

Clarence W. Smothers, 1202 Kinsley Ave., Pomona, Calif. 91767

Filed Jun. 7, 1989, Ser. No. 362,883
Int. Cl.[4] B23B *31/06*
U.S. Cl. 408—240 **20 Claims**



1. A drill chuck tightener apparatus for a reversible power drill having a body and a chuck reversibly rotatable with respect to the body, the chuck having a nose for receiving a drill bit and a sleeve rotatable about the nose, a drill bit for the drill being tightened in the nose by inserting the bit into the nose and rotating the nose in relation to the sleeve in a first direction of rotation, the drill bit being loosened by rotating the nose in relation to the sleeve in a second direction of rotation, the tightener comprising:

(a) braking means attached to the sleeve for braking the sleeve from rotating with respect to the nose;

(b) contact mans movably attached to the body for contacting the braking means in a first position of the contact means, thereby braking the sleeve to tighten the drill bit as the chuck rotates in the first direction of rotation and to loosen the bit as the chuck rotates in the second direction of rotation, the contact means being restrained from movement in the first and second directions of rotation, the contact means being disengaged from the braking means in a second position; and

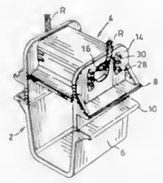
(c) means for adjusting a desired level of braking of the braking means.

4,915,556

HOLD-DOWN BRACKET FOR PICKUP TRUCKS

Eric Unger, EIP Equipment & Safety Products Ltd., P.O. Box 165, Clarkson Postal Station, Mississauga, Ontario, Canada L5J 3Y1

Filed Feb. 10, 1989, Ser. No. 308,643
Int. Cl.[4] B65D *63/00;* **F16G** *11/00;* **A44C** *5/18*
U.S. Cl. 410—110 **4 Claims**



1. In a tie-down bracket for installation in a post pocket of a pickup truck, comprising a generally U-section body having a lower portion dimensioned to enter the post pocket, upper and lower flanges on an outer surface of each limb of the body and

spaced to engage therebetween opposite lips defining an entrance to the pocket, the body being sufficiently resiliently deformable inwardly under hand pressure applied to upper portions of the limbs that the lower flanges can be inserted past the opposite lips; the improvement wherein:

the upper portion of each limb has an aperture for passage of a hold-down rope; and

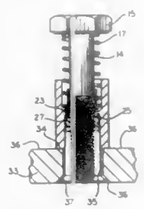
a bracing member is provided insertable between the limbs and releasable from at least one of them, to hold the limbs apart with the upper and lower flanges in engagement with the lips, the bracing member being tubular, and coaxial when inserted with the apertures in the limbs for passage of the hold-down rope.

4,915,557

CAPTIVE SCREW ASSEMBLY

Jay M. Stafford, Torrance, Calif., assignor to Rexnord Holdings Inc., Torrance, Calif.

Filed Sep. 13, 1988, Ser. No. 243,882
Int. Cl.[4] F16B *39/00*
U.S. Cl. 411—107 **13 Claims**



1. A captive screw assembly, comprising:

a screw having a head at one end and an adjacent shaft having an upper unthreaded shank and a lower threaded section, with the diameter of the upper unthreaded shank section being substantially the same as the maximum thread diameter of the lower threaded section;

a housing having a hole with two ends and sized to receive the screw shaft, the housing including an annular flange projecting inwardly in the hole at a location spaced from the hole's two ends; and

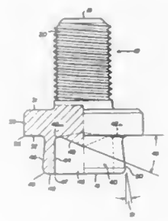
a one-piece stopnut threaded to a selected position on the lower threaded section of the screw shaft, the stopnut having a forward end disposed nearest the screw head, a rearward end disposed furthest from the screw head, and an annular flange located between the forward end and the rearward end and facing the screw head, wherein the forward end has an outer diameter less than the inner diameter of the inwardly-projecting flange, and wherein the rearward end has an outer diameter less than the inner diameter of the hole in the housing but greater than the inner diameter of the inwardly-projecting flange, to allow a limited retraction of the screw from the housing, to a selected position where the annular shoulder engages the inwardly-projecting flange.

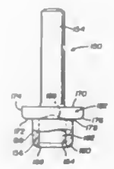
4,915,558

SELF-ATTACHING FASTENER

Rudolph R. M. Muller, Frankfurt, Fed. Rep. of Germany, assignor to Multifastener Corporation, Detroit, Mich.

Division of Ser. No. 892,017, Aug. 1, 1986, Pat. No. 4,765,057, which is a division of Ser. No. 773,387, Sep. 6, 1985, Pat. No. 4,633,560, which is a division of Ser. No. 563,833, Dec. 21, 1983, Pat. No. 4,555,838, which is a continuation-in-part of Ser. No. 485,099, Mar. 28, 1983, Pat. No. 4,459,073, and Ser. No. 504,074, Jan. 12, 1983, Pat. No. 4,543,701, which is a continuation of Ser. No. 229,274, Jan. 28, 1981, abandoned, said Ser. No. 485,099, is a division of Ser. No. 229,274,. This application May 19, 1988, Ser. No. 196,209
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1980, 3003908
The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.
Int. Cl.[4] F16B *37/04*
U.S. Cl. 411—179 **18 Claims**





1. A metal self-piercing and riveting member for attachment to a panel, said member having a body portion and a self-piercing and riveting annular wall having a diameter less than said body portion extending from said body portion, said annular wall having an outer surface and a generally smooth inner surface terminating in an outwardly angled annular conical piercing face adjacent the free end of said annular wall for piercing a slug from the panel having a diameter greater than the internal diameter of said annular wall inner surface, said annular wall inner surface terminating in a bottom wall defining a socket opening through said annular wall free end for receipt of the panel slug, and said annular wall free end joining said outer surface in a radius for deforming said panel into a die opening.

6. A self-attaching metal stud member for attachment to a panel, said self-attaching stud member having a self-riveting barrel portion comprising an annular plastically deformable wall of substantially constant diameter concentrically surrounding a longitudinal axis of said stud member adapted to be received in a panel opening, said annular wall having an open free end adapted to be deformed radially outwardly in a die member riveting said barrel portion to said panel and an opposite end, said annular wall free end having a rounded outer surface for driving against said panel and a chamfered inner surface for engagement with a die member when said free end is deformed radially outwardly, a radial flange portion integral with said barrel portion opposite end extending generally

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perpendicular to said longitudinal axis of said stud member, said flange portion bridging said annular wall and a recess in said barrel portion closed by said flange portion, said flange portion extending radially outwardly from said stud member longitudinal axis beyond said annular wall for engaging said panel, and a solid stud portion integral with said flange portion and extending generally perpendicular to said flange portion in said stud member longitudinal axis generally coaxially aligned with said barrel portion annular wall, said stud portion adapted to retain a structural element to said panel.

4,915,559

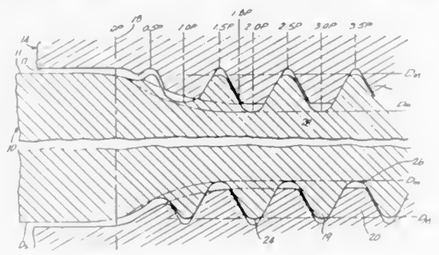
LIGHTWEIGHT FASTENER

Roland A. Wheeler, and Jack Rath, both of Los Angeles, Calif., assignors to VSI Corporation, Culver City, Calif.

Filed May 29, 1987, Ser. No. 56,456

Int. Cl.[4] **F16B** *35/00, 37/16;* **B21D** *53/20;* **B21K** *1/44*

U.S. Cl. 411—366 **51 Claims**



1. A threaded fastener comprising:

a head;

a cylindrical shank;

a tip having a roll formed thread with a uniform pitch P, a major diameter which is less than the shank diameter, and a minor diameter;

a maximum grip plane defined between the shank and tip a specified length from the head; and

a run-out zone between the maximum grip plane and the tip having a length in the range of from 1.58P to 2.3P, the run-out zone having a roll formed thread, the thread root in the run-out zone being tangent to the minor diameter at one end and enlarging toward the maximum grip plane along a continuous outwardly concave curve to at least a portion near the maximum grip plane.

4,915,560

ANTI-CROSS THREADING FASTENER

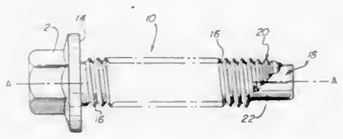
Francis C. Peterson, Woodbury, and Jeffrey C. Bergren, Berlin, both of Conn., assignors to Buell Industrial, Inc., Waterbury, Conn.

Continuation-in-part of Ser. No. 34,010, Apr. 2, 1987, Pat. No. 4,789,288. This application Aug. 22, 1988, Ser. No. 234,891

The portion of the term of this patent subsequent to Dec. 6, 2005, has been disclaimed.

Int. Cl.[4] **F16B** *35/00*

U.S. Cl. 411—386 **22 Claims**



1. An anti-cross threading screw comprising:

a head;

a threaded shank projecting from said head, said shank having a central axis;

a tip section formed on and joining said shank at the axial end of said shank opposite said head, said tip section having an end and a partial thread side and an unthreaded side, said tip section being generally circular in cross-section,

said partial thread side having at least one partial thread thereon and being substantially contiguous with and an extension of the radial surface of said threaded shank, and

said unthreaded side being located opposite said partial thread side beyond said shank axis and having a maximum ray length from said central axis of said shank which is less than said radius of said shank, said unthreaded side tapering to join said partial thread side;

said anti-cross threading screw being threadable into a bore of a female part without cross-threading or substantial deformation of the bore of the female part.

4,915,561

FASTENING ELEMENT ASSEMBLY WITH A DEFORMABLE SLEEVE

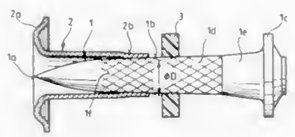
Reinhard Buhri, Frastanz, Austria; Elmer C. Hoepker, Planken, Liechtenstein; Elmar Thurner, Feldkirch, Austria, and Alfred Tobler, Erlen, Switzerland, assignors to Hilti Aktiengesellschaft

Filed Dec. 19, 1988, Ser. No. 286,329

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3743049

Int. Cl.[4] **F16B** *15/00*

U.S. Cl. 411—439 **11 Claims**



1. Fastening element assembly such as used with an explosive powder charge operated driving device, comprising an axially extending nail-like fastening element having a leading end to be driven first into a receiving material and a trailing end, said fastening element having a pointed tip at the leading end and an outwardly projecting head at the trailing end with a shank extending between said tip and said head, wherein the improvement comprises that said shank widens conically from said tip toward said head, and an axially extending and axially deformable sleeve having a leading end and a trailing end with an annular flange extending radially outwardly transversely of the fastening element axis at the leading end thereof adjacent said tip and a tubular section extending axially from a radially inner edge of said flange toward and spaced from said head, an axially extending part of said tubular section of said sleeve is displaceably secured on said shank at an axially extending location on said shank spaced between said tip and said head.

4,915,562

RUPTURABLE CAN MEMBER AS WELL AS METHOD AND APPARATUS FOR ITS PRODUCTION

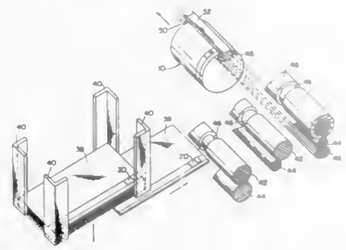
Paul Opprecht, Bergdietikon, and Werner Urech, Kaiserstuhl, both of Switzerland, assignors to Elpatronic AG, Zug, Switzerland

Continuation of Ser. No. 110,533, Oct. 16, 1987, Pat. No. 4,795,295, which is a continuation of Ser. No. 896,610, Aug. 14, 1986, abandoned, which is a division of Ser. No. 779,885, Sep. 25, 1985, Pat. No. 4,662,534. This application Jul. 26, 1988, Ser. No. 224,325

Claims priority, application Switzerland, Sep. 25, 1984, 4582/84

Int. Cl.[4] **B21D** *51/28*

U.S. Cl. 413—69 **3 Claims**



1. An apparatus for producing rupturable cylindrical can members from sheet-metal blanks having a tear strip formed therein, one set of opposed and parallel edges and another set of opposed and parallel edges extending substantially perpendicular to the one set, said apparatus comprising:

a holding means for receiving and stacking said sheet-metal blanks therein, after each of said sheet-metal blanks have a tear strip formed therein and a tongue welded thereon;

a forming roller means sequentially receiving and rolling up the sheet-metal blanks to form cylindrical can members, said forming roller means including plural pairs of opposed rollers with one roller of said roller pairs having an annular groove with a depth and width being respectfully greater than the width and thickness of the welded-on tongue to accommodate the tongue during forming; and

a mash seam welding means for receiving said can members and including a rail means positioned with a last pair of rollers having guide edges adapted to receive the respective edges of the one set, said rail means for configuring a received can member such that said edges of the one set approach can another and finally overlap to form a seam, for mash seam welding said edges to one another with said edges having a limited overlap to form a can member.

4,915,563

AUTOMATIC LOCK FOR MECHANISMS CONTROLLING VARIOUS MOVEMENTS OF THE GRIPPING PLIERS OF A REMOTE HANDLING DEVICE WHEN DISMOUNTING THE BALL AND SOCKET JOINT BEARING THESE PLIERS

Eric Teillaschet; Angelo Bandiera, both of Vendome, and Laurent Girault, Blois, all of France, assignors to Societe Nouvelle d'Exploitation La Calhene, Villacoublay, France

PCT No. PCT/FR88/00253, § 371 Date Jan. 9, 1989, § 102(e) Date Jan. 9, 1989, PCT Pub. No. WO88/09247, PCT Pub. Date Dec. 1, 1988

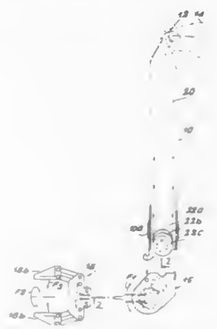
PCT Filed May 19, 1988, Ser. No. 310,722

Claims priority, application France, May 20, 1987, 87 07067

Int. Cl.[4] **B25J** *15/04*

U.S. Cl. 414—1 **8 Claims**

1. A device for the automatic locking of mechanisms controlling the various movements (F1, F2, F3) of a pair of gripping pliers (18) borne by a ball and socket joint (16) secured in a dismountable way to the extremity of a slave arm (10, 14) of a remote handling device during dismounting of the ball and socket joint, these mechanisms comprising a first series of pinions (26a, 26b, 26c) housed in the extremity of the slave arm and a second series of pinions (30a, 30b, 30c) mounted inside the ball and socket joint so as to be geared onto the pinions of the first series when the ball and socket joint (16) is secured to



the extremity of the slave arm, wherein said device comprises mobile blocking devices (60a, 60b, 60c) housed inside the extremity of the slave arm, elastic means (72) tending to apply these blocking devices against the pinions (26a, 26b, 26c) of the first series, and at least one stop (73, 74) integral with the blocking devices so as to free the latter from the pinions of the first series under the effect of the stop coming to rest against an opposite surface (76) formed on the ball and socket joint when the latter is secured to the extremity of the slave arm.

4,915,564

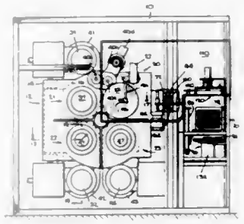
METHOD AND APPARATUS FOR HANDLING AND PROCESSING WAFER-LIKE MATERIALS

Miroslav Eror, Old Tappan, N.J., and Richard E. Biehl, Pearl River, N.Y., assignors to Materials Research Corporation, Orangeburg, N.Y.

Continuation of Ser. No. 112,777, Oct. 22, 1987, abandoned, which is a continuation of Ser. No. 848,297, Apr. 4, 1986, abandoned. This application Jul. 20, 1988, Ser. No. 222,328

Int. Cl.[4] **B65G** *65/00*

U.S. Cl. 414—217 **38 Claims**



1. Apparatus for exchanging wafer-like articles between a position in a first plane and a processing location in a second plane perpendicular to said first plane with a minimum of motion of the apparatus and where at least part of the movement of each of the articles occurs simultaneously, said apparatus comprising:

a bi-directional longitudinally extending arm having a longitudinal axis lying in a third plane, spaced a fixed distance

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from and parallel to said first plane at said processing location, a fixed transverse axis perpendicular to said longitudinal axis, and an end rotatable about said longitudinal axis, said arm being pivotal about said transverse axis such that said end is movable essentially only in an arcuate path in said third plane about said transverse axis,

at least two engaging means including first and second engaging means each disposed on said arm adjacent said end and spaced essentially said fixed distance from said longitudinal axis so as to simultaneously carry said engaging means along an arcuate path about said longitudinal axis when said arm is rotated thereabout;

said arm being constrained to carry one of said articles engaged by one of said engaging means from said position to said processing location by a combination of movements consisting essentially of a first rotational motion of said arm about said longitudinal axis and a first pivotal motion of said arm about said transverse axis; and

said arm being further constrained to carry another of said articles engaged by the other one of said engaging means from said processing location to said position by a combination of movements consisting essentially of a second rotational motion of said arm which includes at least part of the same rotational motion as said first rotational motion, and by a second pivotal motion of said arm;

whereby said articles are exchanged at said processing location without said arm returning to said position.

4,915,565

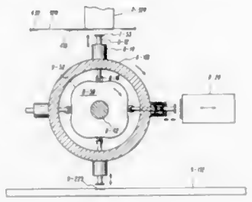
MANIPULATION AND HANDLING OF INTEGRATED CIRCUIT DICE

Robert H. Bond, Carrollton; Steven Swendrowski, The Colony; Michael A. Olla, Flower Mound, and Barry L. Morrison, Bedford, all of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Continuation of Ser. No. 917,003, Oct. 9, 1986, abandoned, which is a division of Ser. No. 592,151, Mar. 22, 1984, Pat. No. 4,626,167. This application Mar. 16, 1989, Ser. No. 325,014

Int. Cl.[4] **B65G** *65/00*

U.S. Cl. 414—255 **5 Claims**



1. An apparatus for manipulating integrated circuit dice comprising:

means for holding an array of dice contact side down at a predetermined source position, said dice being adhesively attached to the bottom side of a support member;

means for knocking a selected die from said array of dice down from said support member at a predetermined source position directly onto rotatable intermediate receptacle means, wherein said means for knocking a selected die includes striking means, positioned above said support member, for striking downward on and penetrating said support member to dislodge dice therebelow wherein said striking member includes a needle member having four needles positioned in a rectangular array and a fifth spring loaded needle positioned within said rectangular array and extending a predetermined distance below the others of said needles for perforating said support member and striking a die adhesively attached therebelow and means for driving said needle member downward;

a rotating cylinder;

a tube slidably mounted in a housing supported by said rotating cylinder;

a cam cylinder within and coaxial with said rotating cylinder;

a cam follower attached to said slidable tube, wherein relative rotation of said cam and said cylinder causes the sliding translation of said tube within said housing in a direction substantially perpendicular to the outer surface of said rotating cylinder;

means for rotating said cylinder 180 degrees about a horizontal axis; and

means for holding said selected die during rotation and for releasing said selected die after rotation.

4,915,566

INSTALLATION FOR COLLECTING CRATES

Elbertus J. van Elten, St. Ann, Mo., assignor to Elten Nederland B.V., Barneveld, Netherlands

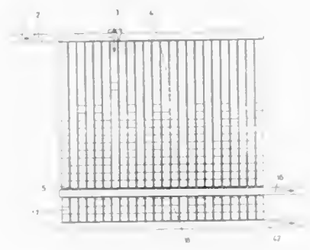
PCT No. PCT/NL86/00034, § 371 Date Jul. 31, 1987, § 102(e) Date Jul. 31, 1987, PCT Pub. No. WO87/02016, PCT Pub. Date Apr. 9, 1987

PCT Filed Oct. 6, 1986, Ser. No. 67,462

Claims priority, application Netherlands, Oct. 4, 1985, 8502715

Int. Cl.[4] **B65G** *1/16*

U.S. Cl. 414—276 **6 Claims**



1. A system for the order collection of containers, comprising:

a first set of roller tracks arranged in inclined adjacent rows and having an upper input portion and a lower output portion with a stopping means to halt the movement of said containers;

a supply conveyor, adjacent to said upper input portion, to transfer said containers from a storage area to a position adjacent to said upper input portion;

at least one movable loader, adjacent to said supply conveyor, having an urging means to contact said containers on said supply conveyor and transfer said conveyors onto said first set of roller tracks;

a second set of roller tracks arranged in adjacent rows and longitudinally aligned with said first set of roller tracks so that said containers can be transferred from said first set of roller tracks onto said second set of roller tracks, said second set of roller tracks having a first portion and a second portion; and

a transfer means, movable in a longitudinal recliner direction on a conveyor assembly transversely positioned between said lower output portion and said first portion so as to discharge boxes from said system, having a switchable delivery means engageable with said containers on said lower output portion so as to lift said containers from said lower portion onto said transfer means so that said containers can be transferred to either said conveyor assembly or to said first portion by roller track assemblies on said switchable delivery means.

4,915,567

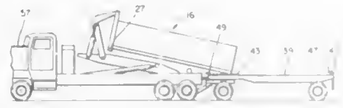
FLATRACK LOADING SYSTEM AND METHOD FOR PALLETIZED LOADING SYSTEM

Svein Ellingsen, Kirkland, Wash., assignor to Paccar Inc., Bellevue, Wash.

Continuation of Ser. No. 923,315, Oct. 31, 1986, abandoned. This application Nov. 23, 1988, Ser. No. 275,700

Int. Cl.[4] **B60P** *1/64*

U.S. Cl. 414—345 **23 Claims**



1. An improved flatrack loading system comprising:

(a) a self-contained flatrack with a front end and a rear end, having fastener holes at the front end, and having elongated support members positioned parallel to each other, said support members having a front end, a rear end and side edges extending from said front end to said rear end, said side edges having an upwardly angled side edge portion extending longitudinally along said respective support members which align the flatrack as it moves along a trailer, each support member having a curved, non-rotatable rear skid plate having said upwardly angled side edge portion secured to the rear end and a front end plate at the front end;

(b) the trailer with a front end and a rear end having fastener holes at the front end, and having elongated trough-shaped said tracks having upwardly angled flanges, said skid tracks being positioned parallel to each other for receiving the flatrack support members and aligning the flatrack as it moves along the trailer, each skid track having a front positioning block with a downwardly sloped rear face at the front end and a rear stop block at the rear end;

(c) means for moving the flatrack onto the trailer such that the rear skid plates of the flatrack support members contact and move along the skid tracks as the flatrack is moved onto the trailer, said upwardly angled flanges forming an aligning contact with said upwardly angled side edges for maintaining said flatrack and said trailer in alignment as said flatrack moves along said tracks, and such that the skid plates contact the rear stop blocks and the front end plate is aligned with the front positioning blocks when the flatrack is fully loaded onto the trailer;

(d) coupling mechanisms having a horizontal projecting member and a horizontal receiving member, one member being located on the rear end of the flatrack and other member being located at the rear end of the trailer, the projecting member engaging the receiving member to secure the rear end of the flatrack to the rear end of the trailer when the flatrack is fully loaded; and

(e) hand-held fasteners for manually securing the front end of the flatrack to the front end of the trailer by horizontal insertion through the fastener holes in the flatrack and the trailer which are aligned when the flatrack is fully loaded.

4,915,568

VEHICLE RESTRAINING APPARATUS

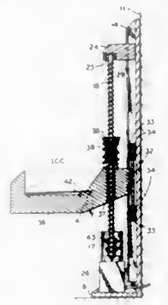
David E. West, 1544 Basswood Ct., Lilburn, Ga. 30247

Continuation-in-part of Ser. No. 159,825, Feb. 24, 1988, abandoned. This application Apr. 4, 1989, Ser. No. 333,106

Int. Cl.[4] **B65G** *67/02*

U.S. Cl. 414—401 **14 Claims**

12. Apparatus for restraining a truck parked in a position closely adjacent a loading dock and with the apparatus comprising, in combination, a screw adapted to be mounted upright beside the dock, motor means for rotating said mounted to said screw follower telescopically about said screw, and a hook



carried by said spring for movement into and out of restraining engagement with a truck.

4,915,569

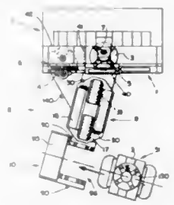
COMBINATION MACHINE TOOL APPARATUS AND PALLET CHANGING SYSTEM

Carl F. Cherko, Euclid, Ohio, assignor to Oerlikon Motch Corporation, Cleveland, Ohio

Division of Ser. No. 11,146, Feb. 5, 1987, Pat. No. 4,797,989. This application May 25, 1988, Ser. No. 198,517

Int. Cl.[4] **B65G** *67/02*

U.S. Cl. 414—401 **18 Claims**



1. A lift table assembly for raising and lowering a load comprising a base member, a main frame, support means on said main frame for supporting such load thereon, jack means for raising and lowering said main frame relative to said base member, said support means including a floating subframe mounted for limited lateral movement in any direction relative to said main frame, said floating subframe having four sides, and centering springs acting on each of said sides for urging said floating subframe to a centered position with respect to said main frame.

4,915,570

BODY FOR A TRASH RECYCLING TRUCK

Albert Rath, Kitchener; Eugen J. Bextea, Ancaster, and Gerald Liesemer, Maryhill, all of Canada, assignors to Compro Limited, Toronto, Canada

Filed Jan. 27, 1989, Ser. No. 315,823

Int. Cl.[4] **B65F** *3/04*

U.S. Cl. 414—409 **16 Claims**

1. A truck body comprising:

a floor, first and second opposing sidewalls, front and rear walls, and a roof;

a plurality of interior partitions each extending substantially from roof to floor and first to second sidewall transversely of the body, thereby defining a plurality of truck body

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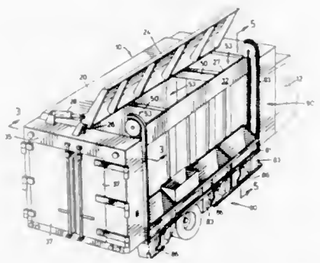
compartments, each partition being hinged at its top edge to allow the partition to pivot toward the rear of the body;
means for positioning the interior partitions at a plurality of different locations longitudinally along the body;
means for locking each interior partition in place;
a door in the rear wall providing access through a major portion of the rear wall to the interior of the body;
a movable panel in the roof, the panel being hinged centrally longitudinally substantially along the entire length of the roof, and means for moving the panel to provide access to the interior of the body;
a trough extending along one side of the body, the trough defining a plurality of buckets in corresponding relation to the interior compartments of the body; and



guide and lift means for moving the trough vertically along the side from a position near the bottom of the side to an inverted position above the top of the side, said guide and lift means enabling contents of the trough to be dumped into the partitioned interior of the body when the movable roof panel is opened, the guide and lift means comprising a track attached to and extending upright along a sidewall at each end of the trough; a roller attached to each end of the trough for engaging each track, the track and roller at each end of the trough coacting to guide the trough upwardly and downwardly along the sidewall of the body; a chain attached at each end of the trough, each chain extending uprightly along the sidewall adjacent each rail; and sprocket wheels and motor means for driving each chain to lift and lower the trough.

4,915,571

DEVICE FOR LOADING CANS, BOTTLES, OR THE LIKE INTO A DISPENSING MECHANISM

Ozaki Toshihiko, and Kuribara Toshihiko, both of Isesaki, Japan, assignors to Sanden Corporation, Gunma, Japan

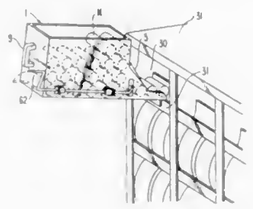
Filed Dec. 7, 1987, Ser. No. 129,296

Claims priority, application Japan, May 12, 1986, 61-187791[U]

Int. Cl.[4] B65G *59/06*; A47F *5/01*

U.S. Cl. 414—414 **10 Claims**

1. A device for loading merchandise into a dispensing mechanism of an automatic vending machine comprising:
a receiving box for temporarily holding said merchandise, said receiving box having a receiving opening and a discharge opening;
a cover element pivotally supported on the receiving box to controllably open and close said discharge opening;
a guide including a portion disposed on said receiving box beneath said cover element and extending from said discharge opening for guiding merchandise into the dispensing mechanism; and
a control mechanism to control the pivotal movement of said cover element to open and close said discharge opening, said control mechanism comprising a crank arm movably supported on said receiving box with one end of said crank arm being received through a slot formed in a flange



portion of said guide when said crank arm is in a first position.

4,915,572

CONVEYOR SYSTEM FOR ROD-LIKE ARTICLES

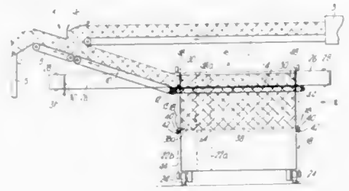
Dennis Hinchcliffe, Orpington, and Desmond W. Molins, High Wycombe, both of England, assignors to Molins PLC, Milton Keynes, England

Filed May 15, 1987, Ser. No. 49,939

Claims priority, application United Kingdom, May 15, 1986, 8611873

Int. Cl.[4] B65G *1/00*

U.S. Cl. 414—416 **23 Claims**



1. A conveyor system for rod-like articles comprising a rod-like article delivery device, a rod-like article receiving device, conveyor means linking said article delivery and article receiving devices for conveying articles in multi-layer formation, a reversible resevoir for holding rod-like articles in stack formation and being connectable to said conveyor means, and means for transferring rod-like articles in stack formation between said reservoir and said conveyor means, said transferring means including suction means for effecting separation between batches of rod-like articles to allow relative movement of a separated batch and the stack of rod-like articles in a direction transverse to a line of separation between the batch and the stack, said suction means including means for applying suction to the end faces only of rod-like articles and means for moving said suction applying means in a direction transverse to the lengths of the rod-like articles to move said rod-like articles as a batch in said transverse direction.

4,915,573

STAIR LIFT

Frank J. Wapner, and Shirley E. Wapner, both of 2473 Wilbraham Rd., **Springfield, Mass. 01129**

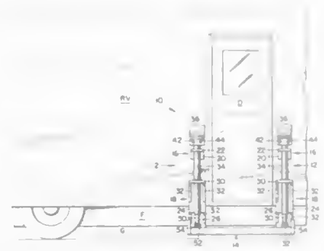
Filed Sep. 6, 1988, Ser. No. 240,677

Int. Cl.[4] B60P *1/00*

U.S. Cl. 414—540 **1 Claim**

1. In combination with a battery-powered vehicle having a doorway and a vehicle support frame member which extends the length of the vehicle and is disposed inwardly of a vehicle side wall below the doorway and disposed a substantial distance above the ground, a stair lift comprising:

a pair of screw-type power jack assemblies vertically disposed one on each side of the doorway and rigidly secured to the vehicle,
each power jack assembly including an outer cylindrical sleeve, an inner cylindrical sleeve, a motor and a power switch and being supported by upper and lower L-shaped brackets fixed to the vehicle on each side of the doorway,
each upper bracket including a vertically-disposed brace fixed to the vehicle side wall and a horizontally-disposed brace fixed to and extending outwardly from its upper end,
each lower bracket including a pair of spaced, parallel vertically-disposed upper and lower braces, a lower horizontal brace which connects between the lower end of the upper brace and the upper end of the lower brace, and an upper horizontal brace which extends outwardly from the upper end of the upper vertical brace,
the lower vertical brace of each lower bracket being fixed to the vehicle support frame member,
gussets extending between each of the braces of each lower bracket to strengthen the structure,



the outer cylindrical sleeve of each jack assembly passing vertically through and being rigidly held by the horizontal braces of the upper and lower brackets,
a stair extending horizontally between the jack assemblies and being suspended therefrom for supporting a person thereon, the stair comprising a horizontally-disposed rear portion fixed to the inner cylindrical sleeves of the power jack assemblies and a front portion pivoted to the rear portion and manually movable between a vertical position wherein it is angularly-disposed relative to the rear portion and a horizontal position wherein it is in horizontal alignment with the rear portion,
locking means for locking the stair front portion in selected vertical or horizontal positions relative to the stair rear portion,
means electrically connecting the motors and power switches to each other and to the vehicle battery for effecting tandem operation of the jack assemblies upon actuation of either power switch, and
a ram in each inner cylindrical sleeve of each power jack assembly rotatable upon activation of the motors by either power switch for raising and lowering the stair and the person supported thereon relative to the ground.

4,915,574

OBSTACLE DETECTOR

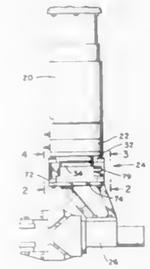
Joon Park, Glendale, and Hin Leung, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 29, 1988, Ser. No. 250,878

Int. Cl.[4] B25J *19/00*

U.S. Cl. 414—680 **8 Claims**

1. An obstacle detector comprising:
a first member and a second member, one of said members being for attachment to a moving machine and the other of said members being for carrying a handling device thereon, an axis through said first and second members;
means interengaging said first and second members for resiliently retaining said first and second members in a neutral position, wherein said resilient interengaging means between said members comprises first, second and third projections mounted in one of said members and first, second and third substantially conical projection-receiving sockets in the other of said members, in which said projection is seated in a set screw engaged in a said second member so that adjustment of said screw adjusts the positions of said projection with respect to said second member, said projections lying substantially in a plane which is normal to said axis so that lateral motion forces said projections out of their sockets, and there is a plurality of tension springs interengaged between said first and said second members for resiliently urging said projections into said sockets so that the number of springs engaged between said first and said second members can be related to the weight of the handling device attached to said second member; and;



means connected between said first and second members for detecting when one of said members moves with respect to the other of said members for indicating impact with an obstruction and for connection for stopping motion of said positioning machine wherein said detecting means comprises a switch interengaged between said first and said second members so that forcing said projections out of said sockets causes switch actuation.

4,915,575

MATERIAL HANDLING ATTACHMENT FOR A TRACTOR HAVING A MULTIPLE-POINT HITCH ASSEMBLY

Joseph W. Langenfeld, and Neal W. Westendorf, both of Onawa, Iowa, assignors to Westendorf Mfg. Co., Inc., Onawa, Iowa

Filed Dec. 27, 1985, Ser. No. 814,043

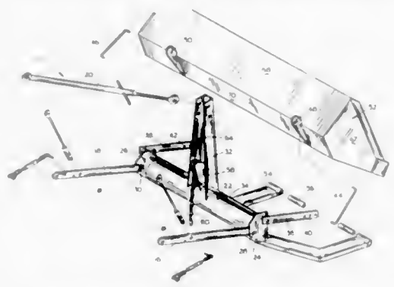
The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.

Int. Cl.[4] B66F *9/00*

U.S. Cl. 414—703 **3 Claims**

1. In combination,
a tractor having a vertically movable three-point hitch assembly provided thereon, said hitch assembly being movable between a lower position and an upper position,
a materials handling bucket pivotally secured to said three-point hitch assembly for vertical movement therewith, said bucket being movable between working and dumping positions,
and mechanical linkage means interconnecting said bucket, said hitch assembly and said tractor which positions said bucket in its working position when said hitch assembly is in its said lower position and which causes said bucket to dump as said hitch assembly moves to its upper position from a position slightly lower than its said upper position,

said hitch assembly comprising first and second lower link arms and an upper link arm, said link arms having rearward and forward ends, said mechanical linkage means comprising, an elongated horizontally disposed support positioned transversely with respect to the longitudinal axis of the tractor and having opposite ends, an upstanding post means secured at its lower end to said support at the center of said support, the rearward ends of said first and second lower link arms being pivotally secured to the opposite ends of said support, the rearward end of said upper link arm being pivotally secured to said upstanding post means adjacent the upper end thereof, a horizontally disposed shaft operatively rotatably mounted on said support and being parallel thereto, an actuator means mounted on said shaft to cause the rotation of said shaft, connection means extending between said actuator means and a fixed point on said tractor whereby upward move-



ment of said hitch assembly will cause said shaft to be rotated, by said actuator means in a first direction, first and second arms rigidly secured to the opposite ends of said shaft and extending rearwardly therefrom, first and second spaced-apart support arms rigidly secured to said support and extending rearwardly therefrom, the rearward ends of said first and second support arms being pivotally secured to said bucket, first and second elongated links pivotally secured at one end to the rearward ends of said first and second arms respectively, the other ends of said links being pivotally secured to said bucket, the relationship of said bucket, links, arms and support arms being such that said bucket cannot be pivotally moved to its dumping position when said hitch assembly is in its said working position and will remain so until said hitch assembly is raised to a predetermined height relative to the tractor.

4,915,576

SIDE SHIFT GRAPPLER

John J. Lanigan, Jr., Lynwood; Myron Glickman, Morton Grove, and Bernard A. Ermel, Clarendon Hills, all of Ill., assignors to Mi-Jack Products, Inc., Hazel Crest, Ill.

Division of Ser. No. 920,792, Oct. 20, 1986. This application Jul. 11, 1988, Ser. No. 217,555

Int. Cl.[4] B66C *3/16*

U.S. Cl. 414—786 5 Claims

1. A method of controlling horizontal movement of containers, raised and lowered by a crane and lift apparatus, comprising the steps of

providing an upper frame assembly supported at an uppermost level of the apparatus and operable to be moved horizontally and transversely therealong,

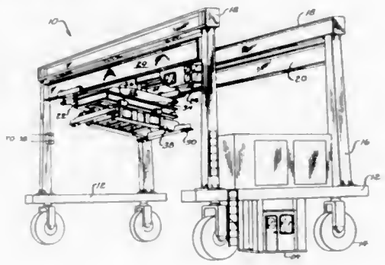
providing a lower frame assembly having means for attachment to said containers depending from said upper frame assembly and operable to be raised or lowered vertically in relationship thereto,

providing side shift means mounted within said upper frame assembly operable for preselected rectilinear movement therein,

moving said upper frame assembly transversely to a position substantially overhead at least one of said containers,

lowering said upper frame assembly in a vertical direction to an elevation just above the top of a container,

securing said attachment means to said container,



moving the container from a first location to be positioned on a railroad car;

aligning the container with connecting means mounted on the railroad car, and

moving said side shift means to provide finite incremental horizontal adjustment within said upper frame assembly so as to secure the container with said connecting means mounted on the railroad car.

4,915,577

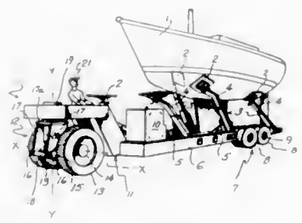
SELF-PROPELLED MOBILE CRADLE FOR BOATS

Richard Fraser, 19 Donovan Dr., West Newbury, Mass. 01985

Filed Mar. 23, 1988, Ser. No. 172,061

Int. Cl.[4] B60P *3/10*

U.S. Cl. 414—476 16 Claims



1. A self-propelled mobile cradle for boats, said cradle comprising:

a frame having transversely spaced, longitudinally extending side members interconnected at their forward ends to form an opening extending inwardly from the rear end of the frame;

forward wheel means for supporting the forward end of said frame;

rear wheel means disposed at the rear of the frame for supporting the rear of the frame, said rear wheel means comprising at least two wheels, each independently operable from the other to raise or lower a respective side of said frame, at least one of said wheels being disposed on each side of said frame;

rear motive means for raising or lowering said frame relative to said independently operable rear wheel means, said rear motive means comprising an independently operable suspension for each of said rear wheel means, whereby one side of said frame can be raised or lowered relative to the other side of said frame;

forward motive means for raising or lowering the forward end of said frame relative to said forward wheel means, said forward motive means including a generally U-shaped yoke supporting said forward wheel means and a trunion pivotably attached to each end of the U of said yoke, said forward wheel means being rotatably disposed on said trunions;

steering means for turning said forward wheel means about an axis generally normal to said longitudinally extending side members, whereby said cradle can be turned by turning said forward wheel means;

means for driving said mobile cradle and power means for each of said forward and said rear motive means;

engaging means attached to and disposed on each side of said longitudinally extending side members to engage the bottom of a boat and hold it stationary relative to said cradle.

4,915,578

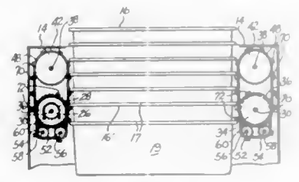
BIN UNSTACKING MACHINE

Henry A. Becker, North Manchester, Ind., assignor to Total Tote, Inc., North Manchester, Ind.

Filed Jul. 25, 1988, Ser. No. 223,345

Int. Cl.[4] B65G *59/06, 59/10*

U.S. Cl. 414—797.6 12 Claims



6. An apparatus for unstacking stacked bins, comprising endless chain means for supporting the stacked bins and moving them downwardly at a first speed, endless chain means for stripping the bottommost bin from the stack of stacked bins to unstack the bottommost bin including plural stripping members for engaging the bottommost bin and means for moving the stripping members downwardly at a second speed which is greater than the first speed so that one stripping member pushes the bottommost bin from the stack of bins.

4,915,579

PUMP SEALING APPARATUS

John D. Whittier, Lakewood; G. Michael Wilfley, Castlerock, and Irvin F. Zagar, Denver, all of Colo., assignors to A. R. Wilfley & Sons, Inc., Denver, Colo.

Filed Aug. 15, 1988, Ser. No. 232,626

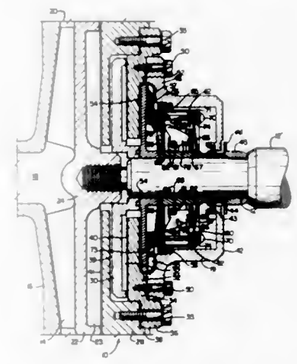
Int. Cl.[4] F16J *15/16, 15/18*

U.S. Cl. 415—171.1 19 Claims

1. In pumping apparatus wherein a centrifugal pump includes a drive shaft, a pump casing and a seal housing in outer spaced surrounding relation to said drive shaft, an impeller at one end of said drive shaft within said casing to discharge fluid introduced via a fluid inlet in said casing through an outlet, and a fluid channel is provided to establish fluid communication between said pump casing and said seal housing when said pump is in operation, the improvement comprising:

a valve assembly in said seal housing including a valve seat, a valve member and resilient enclosure means normally urging said valve member into sealed engagement with said valve seat whereby to completely isolate fluid retained in said seal housing from said pump casing when said pump is not in operation; and

centrifugal force-responsive means mounted in said enclosure means so as to be isolated from fluid in said pump-casing and seal housing at all times, said force-responsive means movable under centrifugal force to engage said enclosure means to move said valve member away from



sealed engagement with said valve seat whereby to establish fluid communication between said seal housing and said pump casing when said pump is in operation.

4,915,580

WIND TURBINE RUNNER IMPULSE TYPE

Louis Obidniak, Quebec, Canada, assignor to Sambrabec Inc., Montreal, Canada

Continuation-in-part of Ser. No. 878,242, Jun. 25, 1986, abandoned, which is a continuation-in-part of Ser. No. 699,137, Feb. 7, 1985, abandoned. This application Aug. 6, 1987, Ser. No. 82,352

Claims priority, application Canada, Feb. 7, 1984, 446935

Int. Cl.[4] F03D *1/04*

U.S. Cl. 415—2.1 18 Claims

1. A turbine blade, for use in a wind turbine, for receiving a flow of air from a windstream at an inlet of said blade and deflecting the air to an outlet of said blade, the blade comprising a pair of opposed planar sides joined by a arcuate portion to form a hollow conoidal shaped body having a longitudinal axis and tapering from said inlet to said outlet, and a cross-section decreasing longitudinally along said axis, from said inlet to said outlet, means for connecting the blade with said axis of the hollow conoidal shaped body at an angle to said flow of air to the blade.

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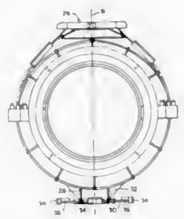
4,915,581

STEAM TURBINE WITH IMPROVED INNER CYLINDER

John C. Groenendaal, Jr., Winter Springs, and Mary W. Schleider, Orlando, both of Fla., assignors to Westinghouse Corp., Pittsburgh, Pa.

Filed Jan. 3, 1989, Ser. No. 293,161
Int. Cl.[4] F01D *25/26*
U.S. Cl. 415—213.1 17 Claims



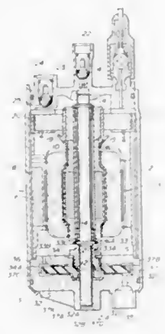
1. In a steam turbine which includes a casing structure having an outer cylinder and an inner cylinder, means attached to the inner cylinder for supporting a plurality of stationary blades arranged in a predetermined number of annularly-shaped rows along the length of the turbine, a rotor mounted in the turbine along a longitudinal axis with a plurality of rotating blades arranged in a predetermined number of annularly-shaped rows along the length thereof and attached thereto, and extraction steam piping attached to and exiting from the inner cylinder, integrated casing alignment and steam extraction apparatus, comprising:
a load plate arranged perpendicularly to the extraction steam piping;
one or more flex plates attached between said load plate and the inner cylinder;
a plurality of alignment lugs attached in predetermined positions about said load plate; and
a plurality of stiffening gussets attached both to said alignment lugs and to said load plate.

4,915,582

ROTARY TURBINE FLUID PUMP

Yukihiro Nishikawa, Gunma, Japan, assignor to Japan Electronic Control Systems Company, Limited, Isezaki, Japan

Filed Aug. 11, 1988, Ser. No. 230,996
Claims priority, application Japan, Aug. 12, 1987, 62-201494
Int. Cl.[4] F01D *3/00*
U.S. Cl. 415—55.1 30 Claims



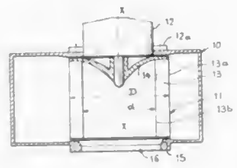
1. A rotary turbine fluid pump comprising:
a rotary turbine having a plurality of turbine vanes which are arranged on the outer circumference thereof and which are rotatingly driven by means of a driving means, said rotary turbine having a pair of surfaces at its both axis ends;
a pump housing defining therein a pumping chamber connected to an inlet for introducing fluid therethrough and to an outlet for discharging pressurized fluid therefrom, said pump housing having wall sections mating portions mating with said surfaces of said turbine;
means for defining sealing chambers between said surfaces and said wall sections for establishing a floating seal therebetween; and
means for introducing pressurized fluid into said sealing chambers, which defines pressurized fluid path connected to said sealing chambers and gradually reducing path area toward said sealing chamber.

4,915,583

RADIAL-FLOW FAN IN PARTICULAR FOR THE AIR-CONDITIONING OF A MOTOR VEHICLE

Jean C. Vera, Valentigney, and Maurice Bertot, Luxeuil Les Bains, both of France, assignors to Aciers Et Outillage Peugeot, Audincourt, France

Filed Mar. 17, 1987, Ser. No. 26,803
Claims priority, application France, Mar. 17, 1986, 86 03742
Int. Cl.[4] F04D *29/54*
U.S. Cl. 415—206 14 Claims



1. A radial-flow fan for the air conditioning of a motor vehicle, comprising:
a volute housing (**10**);
a ventilation wheel (**11**) disposed in said housing and rotatable about an axis (X—X);
driving means (**12**) connected to said ventilation wheel;
an air intake (**16**) with an intake edge (**15**) centered on said axis, said ventilation wheel including a plurality of axially extending vanes (**13**; **20**) each having an outer edge (**13***a*) and an inner edge (**13***b*; **20***a*) and each extending in a direction substantially parallel to said axis; and
a bowl (**14**; **19**) connecting said vanes with said driving means and defining with said intake edge a space for a fluid flow, the outer edges (**13***a*) of said vanes defining a first circle of diameter D, and the inner edges (**13***b*; **20***a*) of said vanes defining a second circle of diameter d, both said first and second circles being centered on said axis so that each of said vanes has a constant radial width, each of said bowl (**14**; **19**) and intake edge (**15**) having respective surfaces which are in confronting position and which are generated, at least to the vane inner edges (**13***b*; **20***a*), only by rotation of sections of curves about said axis, and wherein the traces of said surfaces, in a meridian plane which passes by said axis, always are parallel curves.

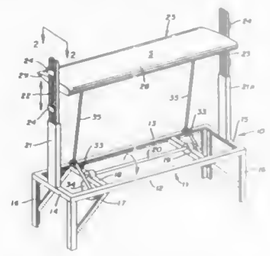
4,915,584

WIND DEVICE WITH AN OSCILLATING BLADE

Daniel Kashubara, 8803 N. Palmyra Rd., Canfield, Ohio 44406

Filed Aug. 11, 1988, Ser. No. 230,912
Int. Cl.[4] F03D *5/00*
U.S. Cl. 416—64 2 Claims

1. A wind device comprised of a support frame, a pair of guide tracks extending vertically from said support frame, an airfoil positioned for vertical movement between said guide tracks, said airfoil comprising a longitudinal spar having spaced contoured ribs positioned thereon, surface material extending over said ribs defining a wing shape, an airfoil support assembly affixed to said longitudinal spar of said airfoil and movably secured to said support frame, said airfoil support



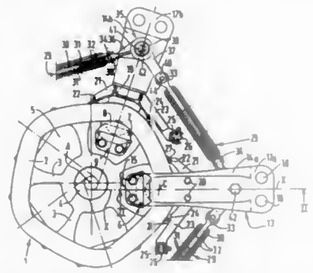
assembly comprises an axle rotatably secured to said support frame, at least one crank arm secured to said axle, a connecting rod pivotally secured to said crank arm at one end and affixed to said longitudinal spar at its other end, a counter weight secured to said crank arm in spaced relation to said axle, means for pivoting and airfoil in said guide tracks.

4,915,585

ROTARY-WING AIRCRAFT ROTOR HEAD HAVING RESILIENT-RETURN INTERBLADE TIES WITH BUILT-IN DAMPING

Bruno Guimbal, Chateauneuf-les-Martigues, France, assignor to Aerospatiale Societe National Industrielle, Paris, France

Filed Apr. 26, 1989, Ser. No. 343,305
Claims priority, application France, Apr. 29, 1988, 88 05816
Int. Cl.[4] B64C *27/38*
U.S. Cl. 416—140 26 Claims



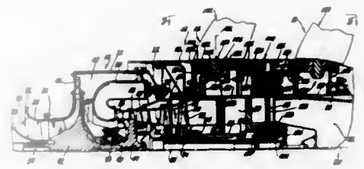
1. A rotary-wing aircraft rotor head, of the type comprising a hub to which each blade of the rotor is held by a connection member fixed to the blade and connected to the hub with the aid of articulation means permitting angular oscillations of the blade about a single point on which the flapping axis, the lag axis and the longitudinal pitch change axis of the blade are convergent, the rotor head also comprising an interblade connection device consisting of elongated resilient-return ties with built-in damping, the number of which ties is equal to that of the blades and which are mounted substantially in a ring around the hub, so that each of them connects together two neighboring blades of the rotor, each tie comprising at least two rigid elongated members, each of which is provided with means for the articulated connection of a respective end of the tie to a respective one of the two blades connected by said tie, and which are connected to one another by at least one resilient return member of the two rigid members, for return to a relative initial position, and by at least one member damping all relative movement of the two rigid members, at least in the longitudinal direction of the tie, wherein said means for the articulated connection of each tie to a blade comprise a main ball whose center is situated on or in immediate proximity to the longitudinal pitch axis of the blade and which is retained, on the means connecting the blade to the hub, radially on the outside, relative to the center of the hub, of the point of intersection of the lag, flapping and pitch change axes, which point constitutes the single center of articulation of the connection means on the hub.

4,915,586

PROPFAN BLADE ATTACHMENT

James R. Williams, Martinsville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 20, 1988, Ser. No. 246,832
Int. Cl.[4] B64C *11/28*
U.S. Cl. 416—89 4 Claims



1. In A PROPFAN PROPULSION SYSTEM including
a SUPPORT BODY having a cylindrical outside wall aligned on a longitudinal axis of said SUPPORT BODY,
an annular propfan hub disposed on said SUPPORT BODY for rotation about said longitudinal axis, and
a propfan blade having a folded position generally flat against said outside wall of said SUPPORT BODY for storage and an unfolded position generally perpendicular to said outside wall of said SUPPORT BODY for propelling said SUPPORT BODY when said propfan hub rotates,
a propfan blade attachment comprising:
a hinge on said propfan hub rotatable therewith about said longitudinal axis and relative thereto between an extended position corresponding to said folded position of said propfan blade and a retracted position corresponding to said unfolded position of said propfan blade,
means connecting said propfan blade to said hinge for rotation relative thereto about a principal axis of said propfan blade and for rotation as a unit with said hinge between said extended and said retracted positions of said hinge,
a pitch control arm having one end rigidly attached to said propfan blade for rotation as a unit therewith, and
a pitch control link having a first end universally articulated to said pitch control arm at the other end thereof and a second end universally articulated to said propfan hub at a link attaching point on said propfan hub,
said pitch control link and said pitch control arm cooperating to locate said propfan blade in each of said folded and said unfolded positions thereof when said hinge is in respective ones of said extended and said retracted positions.

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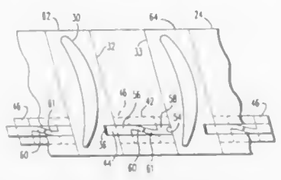
4,915,587

APPARATUS FOR LOCKING SIDE ENTRY BLADES INTO A ROTOR

Frank A. Pisz, Titusville; Leroy D. McLaurin, Winter Springs; George A. Gergely, Stuart, and John P. Donlan, Oviedo, all of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 24, 1988, Ser. No. 261,668
Int. Cl.[4] F01D 5/32
U.S. Cl. 416—220 R 15 Claims



1. A gas turbine, said gas turbine having a rotor, comprising:
(a) a plurality of approximately axially extending grooves, spaced about the periphery of said rotor in a row;
(b) a blade for each of said grooves, each of said blades having an airfoil portion and a blade root portion, said airfoils emanating directly from said blade roots without intervening platforms, each of said blade roots having first and second approximately axially extending sides formed therein, said blade roots adapted to be sequentially installed in said rotor by slidably entering said grooves in such a manner as to restrain relative movement of said blades in all but the direction in which said grooves extend;
(c) a circumferential slot disposed around the periphery of said rotor, a portion of said circumferential slot being disposed between each adjacent pair of said grooves;
(d) a locking device for each of said blade roots, each of said locking devices disposed in said circumferential slot between each adjacent pair of said blade roots;
(e) a first spacer disposed in said circumferential slot adjacent to the one of said locking devices locking the last of said blades installed in said row; and
(f) said first spacer and said last blade locking device each having a deformable lug, said lugs opposing one another, said lugs having means for preventing motion of said last blade locking device in the circumferential direction when said lugs are in a deformed state.

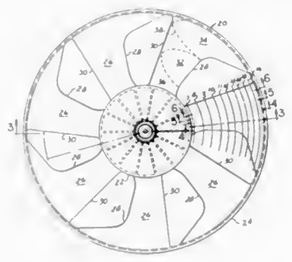
4,915,588

AXIAL FLOW RING FAN WITH FALL OFF

Stephen E. Brackett, Blenheim, Canada, assignor to Siemens-Bendix Automotive Electronics Limited, Chatham, Canada

Filed Jun. 8, 1989, Ser. No. 364,359
Int. Cl.[4] F04D 29/38
U.S. Cl. 416—189 3 Claims

1. In an axial flow ring fan that has a plurality of forwardly skewed blades extending between a central hub and an outer ring, the improvement which comprises each blade having a characteristic wherein the pitch ratio to average pitch ratio as a function of the blade's non-dimensional radius is substantially constant for non-dimensional radii between 0.4 plus or minus 0.03 and 0.495 plus or minus 0.03, is decreasing for non-dimensional radii between 0.495 plus or minus 0.03 and 0.55 plus or minus 0.03, is substantially constant for non-dimensional radii between 0.55 plus or minus 0.03 and 0.675 plus or minus 0.03, is increasing for non-dimensional radii between 0.675 plus or minus 0.03 and 0.850 plus or minus 0.03 and is decreasing for non-dimensional radii greater than 0.850 plus or minus 0.03, wherein the pitch ratio at any particular non-dimensional radius is 6.28 times the non-dimensional radius times tangent Q where Q is the acute angle between a first line extending between the leading and trailing edge points of a planar projection of the cross section of the blade along the particular non-dimensional radius and a second line that extends through the trailing edge point and is perpendicular to the direction of



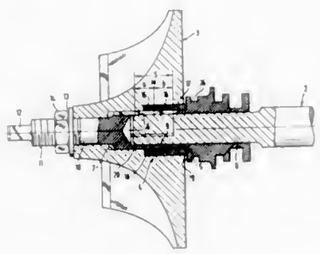
projection, and wherein the average pitch ratio of the blade is an average of the pitch ratios at a number of non-dimensional radii of the blade sufficient to at least approximate the actual average, the improvement also comprising each blade having a fall off ratio greater than zero.

4,915,589

RUNNER WITH MECHANICAL COUPLING

Herbert Gessler, Dietratried, and Helmut Kölker, Munich, both of Fed. Rep. of Germany, assignors to Elektroschmelzwerk Kempten GmbH, Munich, Fed. Rep. of Germany

Filed May 5, 1989, Ser. No. 348,281
Claims priority, application Fed. Rep. of Germany, May 17, 1988, 3816796
Int. Cl.[4] F01D 5/28
U.S. Cl. 416—241 B 4 Claims



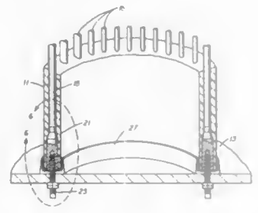
1. A runner consisting of a radial turbine ceramic rotor (1) with an integrated ceramic shaft (2) and a non-ceramic compressor impeller (3) which is rotationally firmly connected to the ceramic shaft (2) by a releasable, mechanical coupling (4) in such a way that the releasable mechanical coupling (4) is located within the compressor impeller (3) and wherein coupling (4) consists of a cylindrical slotted sleeve (5) which, on the one hand, is fitted into a cylindrical fitting bore (7) in the compressor impeller (3) and, on the other, accepts the end (8) of the ceramic shaft (2) in a fitting bore (9), of a tie rod (10) with a screw thread (11) and conical clamping means between the cylindrical sleeve (5) and the compressor impeller (3).

4,915,590

WIND TURBINE BLADE ATTACHMENT METHODS

John E. Eckland, and James V. Frerotte, both of Tracy, Calif., assignors to Fayette Manufacturing Corporation, Tracy, Calif.

Filed Aug. 24, 1987, Ser. No. 88,670
Int. Cl.[4] F01D 5/30
U.S. Cl. 416—225 10 Claims



1. A rotor blade for a wind turbine having a formed blade portion and a blade root, said root being formed for attachment to the hub of the rotational shaft of the turbine, said blade root including at least one sucker rod secured internally thereof and disposed for securement to said hub, said sucker rod being unbonded to said blade root for a substantial portion of the length thereof forming a free end of said sucker rod of the root end and a secured end at the formed blade portion end, said sucker rod being formed shorter in length at the root end than said rotor blade root whereby the free end of the sucker rod is recessed in the surrounding structure of the root of said rotor blade so that it can be placed in tension when it is secured to said hub.

8. A method for making a wind turbine rotor blade having a blade root which is secured to the hub of the rotational shaft of the turbine comprising
embedding a multiplicity of sucker rods internally around the periphery of said blade root generally parallel the axis of said blade,
coating a substantial length of the sucker rod from the root end with a releasing agent, and
bonding the remaining length of the sucker rod internally to said blade root whereby the root ends of said sucker rods are approximately equal length free ends floating in the root of said blade.

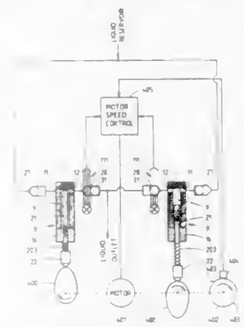
4,915,591

RECIPROCATING PUMP AND CONTROL USING OUTLET VALVE FOSITION SENSORS

Herbert Funke, Krailling, Fed. Rep. of Germany, assignor to Saphirwerk Industrieprodukte AG, Switzerland

Division of Ser. No. 840, Jan. 6, 1987, Pat. No. 4,808,092. This application May 9, 1988, Ser. No. 191,687
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1986, 3600343; Jan. 8, 1986, 3600342; Jan. 8, 1986, 3600342; Dec. 5, 1986, 3641652
Int. Cl.[4] F04B 49/00; B01D 15/08
U.S. Cl. 417—18 4 Claims

1. A precision reciprocating metering pump and control therefore comprising, a pump head casing with at least two displacement chambers having inlet and outlet ports, a piston for each displacement chamber, with at least one performing its displacement stroke at any given time whereby a pre-compression stroke is carried out prior to each such displacement stroke in order to compensate for the influence of the specific compressibility of the liquid being pumped on the pumping efficiency of the delivery system, a pair of check valve units associated with the inlet and outlet ports, at least one outlet check valve unit (28) comprising in part components made of transparent material, with a check valve ball (31) however, being colored or opaque, a piston position indicator and a sensor device monitoring the actual onset of the liquid displacement and connected to a piston speed control circuitry, whereby the underlying feed-back principle is characterized by said sensor device (111) monitoring the actual onset of the liquid displacement as triggered by the lifting of a check valve



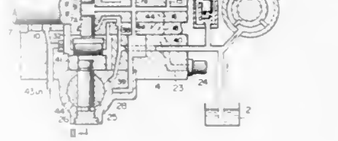
ball (31) from its seat (30) in at least one outlet check valve unit (28), and the sensor device (111) for monitoring the actual onset of liquid delivery, is an optical system, as for example, a light-gate, which is triggered by the lifting of the check valve ball (31) from its seat (30).

4,915,592

INNER-CAM TYPE DISTRIBUTION FUEL INJECTION PUMP

Osamu Hishinuma, Kariya; Fumiaki Tanaka, Obu; Akira Shibata, Anjo; Nobuo Kato, Toyohashi; Yutaka Inoue, and Yukinori Miyata, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 9, 1988, Ser. No. 230,253
Claims priority, application Japan, Aug. 10, 1987, 62-200306; Oct. 9, 1987, 62-255637; Nov. 18, 1987, 62-291499
Int. Cl.[4] F04M 1/10
U.S. Cl. 417—206 18 Claims



1. An inner-cam type distribution fuel injection pump comprising:
an inner cam having an inner peripheral cam profile;
a rotor disposed in said inner cam and driven by a drive shaft so as to rotate relative to said inner cam;
at least one plunger slidably received in a radial bore formed in said rotor, said plunger being capable of moving reciprocatingly in said radial bore as the radially outer end of said plunger slides on said cam profile on said inner cam thereby sucking, pressurizing and delivering a fuel oil; and
a lubricating system for lubricating the interior of a cam chamber defined by said inner cam and said rotor with a lubricating oil having a viscosity higher than the viscosity of said fuel oil.

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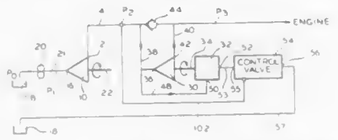
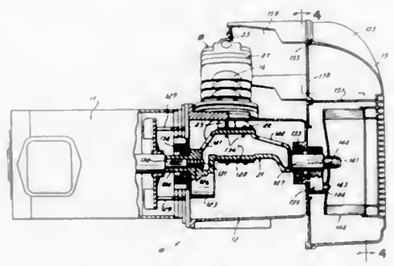
4,915,593
FLUID SUPPLY SYSTEM WITH TURBINE DRIVEN START PUMP
John E. Cygnor, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.
Division of Ser. No. 137,608, Dec. 24, 1987. This application Jan. 6, 1989, Ser. No. 293,979
Int. Cl.[4] F04D *13/12*
U.S. Cl. 417—245 2 Claims



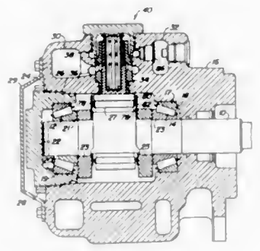
1. A system for boosting the pressure of fluid supplied by a main centrifugal pump having an outlet connected to a delivery line, comprising a check valve in the delivery line preventing reverse flow to the main centrifugal pump, a second pump having an outlet connected to the delivery line downstream of the check valve, and a turbine drivingly-connected to the second pump, each of said second pump and turbine having an inlet in flow communication with the outlet of the main centrifugal fuel pump.

4,915,594
IMPROVED COMPRESSOR CRANKSHAFT
James B. Lammers, Cleves, Ohio, assignor to Campbell Hausfeld/Scott Fetzer Company, Harrison, Ohio
Division of Ser. No. 856,645, Apr. 25, 1986, Pat. No. 4,801,250. This application Oct. 3, 1988, Ser. No. 252,695
Int. Cl.[4] F04B *39/02*
U.S. Cl. 417—265 11 Claims



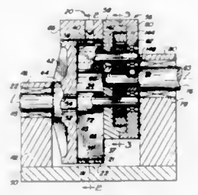
1. A fluid pump having fluid pumping pistons and a crankshaft for driving said pistons, said crankshaft including:
a driven end;
a piston rod bearing surface;
a driving end;
said driven end having an internally threaded bore therein for receiving a motor drive shaft; and
said crankshaft having a hollowed-out core area, said threaded bore operatively communicating with, and open to, said hollowed-out core area for transmittal of lubricant to internal threaded surfaces of said bore.

4,915,595
VALVE/PISTON CARTRIDGE AND ROTOR BEARING PRE-LOAD FOR A RADIAL PISTON PUMP
Roger J. Nelson, Cedar Falls; Donald J. Macdonald, Waterloo; Arlen W. Koelling, Waverly, and William L. Snyder, Cedar Falls, all of Iowa, assignors to Deere & Company, Moline, Ill.
Filed Jun. 15, 1988, Ser. No. 207,347
Int. Cl.[4] F04B *1/04*
U.S. Cl. 417—273 13 Claims



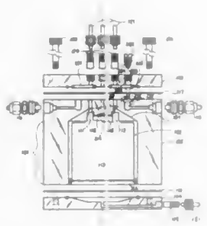
1. A valve/piston cartridge for a radial piston pump having at least one cartridge receiving bore formed therein, with inlet and outlet passages opening into said at least one cartridge bore, the cartridge comprising:
a hollow substantially cylindrical liner positionable within the at least one cartridge bore;
an end cap for holding said liner in the cartridge bore;
a piston slidably disposed within said liner; and
valve means positioned within said liner, with said liner, end cap, piston and valve means defining a piston chamber therebetween which is hydraulically connectible to said pump inlet passage and said pump outlet passage, and said valve means regulating flow between said piston chamber and at least one of said pump inlet passage and said pump outlet passage, said valve means further comprising a check valve allowing flow from said inlet passage to said piston chamber, and preventing flow from said piston chamber to said inlet passage.

4,915,596
PURE ROTARY POSITIVE DISPLACEMENT DEVICE
William B. McCall, 5 Clarita Ct., Novato, Calif. 94947
Filed Oct. 24, 1988, Ser. No. 261,422
Int. Cl.[4] F04B *1/20*
U.S. Cl. 417—273 21 Claims



1. A rotary positive displacement device for pumping or compressing a fluid, said rotary positive displacement device comprising in combination:
a. a circular cylinder housing having a central rotational axis and an arcuate peripheral surface, said cylinder housing having a plurality of cylinders formed therein, the number of said cylinders being an even number, each of said cylinders extending radially from a proximal end within a central portion of said cylinder housing toward a distal end proximate said arcuate peripheral surface, said cylinders being equiangularly spaced from each other, said cylinder housing including a substantially planar front face perpendicular to the central rotational axis thereof, each of said cylinders having an opening communicating with the front face of said cylinder housing, each of said cylinders including a fluid discharge passage extending from the distal end of each cylinder to an exhaust opening formed in said arcuate peripheral surface;
b. cylinder housing carrier means for supporting said cylinder housing for rotation about the central rotational axis thereof;
c. a piston carrier having a central rotational axis and having a substantially planar sealing face perpendicular to the central rotational axis thereof;
d. piston carrier support means for supporting said piston carrier for rotation about the central rotational axis thereof, said piston carrier support means supporting the planar sealing face of said piston carrier parallel to and adjacent to the front face of said cylinder housing, the central rotational axis of said piston carrier being offset by a predetermined distance from the central rotational axis of said cylinder housing;
e. at least one piston secured to said piston carrier and extending from the planar sealing face thereof into said cylinder housing for movement into and out of said cylinders as said piston carrier and cylinder housing rotate, the number of said pistons being one-half the number of said cylinders, each piston being spaced from the central rotational axis of said piston carrier by said predetermined distance;
f. inlet means for admitting a fluid to be compressed or pumped into said cylinder housing for supplying fluid to the proximal ends of said cylinders; and
g. exhaust means in sealing engagement with said cylinder housing proximate the arcuate peripheral surface thereof and in fluid communication with the exhaust openings formed therein for releasing fluid pumped or compressed by each piston as each piston advances toward the distal end of one of said cylinders.

4,915,597
FILTER PUMP HEAD ASSEMBLY IMPROVEMENTS
Scott E. Moore, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.
Filed Dec. 19, 1988, Ser. No. 286,854
Int. Cl.[4] F04B *43/02*
U.S. Cl. 417—313 4 Claims



1. Improvements in a pneumatic filter pump head assembly, which includes pneumatically controlled diaphragm valves, a body, a filter cavity within said body, a filter, a top cap, a bottom cap, a plurality of fluid ports, a plurality of pneumatic control ports, and valves located where said body interfaces with said top cap, said fluid ports in communication with said valves, said control ports in communication with said diaphragm valves, so that when pneumatic pressure to said control ports is varied, fluid can be pumped from one fluid port to another fluid port through said filter, said improvement comprising:
(a) said body and diaphragms being made of chemically inert material;
(b) said filter cavity's highest elevation being formed into a filter interface and a bubble channel;
(c) said filter cavity being tapered from a second elevation to the bubble channel, said second elevation being lower than said bubble channel, said taper being continuously joined to said bubble channel, so that a bubble in the filter cavity will be urged by the taper to enter the bubble channel;
(d) said bubble channel containing an inlet orifice and a vent orifice, and being tapered such that a bubble located at any point within the bubble channel will be urged to exit through the vent orifice, said vent orifice being at the highest elevation of the bubble channel;
(e) fittings attaching outside fluid connections to pump fluid ports, each fitting providing a seal between said fluid connection and a fluid port;
(f) said body, top cap, and bottom cap being substantially solid and self supporting when assembly is operating, so that outer sheathing is unnecessary, said top cap joined to the top of the body, and said bottom cap being joined to the bottom of the body;
(g) said filter interface having an outlet orifice and a depression surrounding the outlet orifice for smoother fluid flow;
(l) said valves being substantially oval shaped, to minimize volume of fluid or gas containable in said valves;
(i) a shutoff device integrated into one or more of the valves;
(j) an output valve having an outlet hole, an inlet hole, and a fluid relief channel surrounding the inlet hole, said channel of greater area than the outlet hole of said valve, to assist the outlet hole to close first while the valve is shutting off, to provide clean valve shutoff action;
(k) said outlet hole having a surrounding o-ring with an upper surface slightly higher than the bottom surface of the valve to further assist said outlet hole closing; and
(l) each fitting providing a threadless seal and strain relief between said fluid connection and a fluid port, each fitting interfacing into a busing which interfaces into a respective port.

4,915,598
AUXILIARY DRIVE OF AN INTERNAL COMBUSTION ENGINE FOR AN AIR COMPRESSOR
Heribert Kubis, Nuremberg, Fed. Rep. of Germany, assignor to MAN Nutzfahrzeuge GmbH, Munich, Fed. Rep. of Germany
Filed Feb. 3, 1989, Ser. No. 306,429
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1988, 3804575
Int. Cl.[4] F04B *35/00*
U.S. Cl. 417—380 4 Claims

1. In an auxiliary drive of an internal combustion engine for an air compressor, which is constructed as a piston compressor having a piston that is guided in a cylinder and that is driven via a connecting rod by a crankshaft, which is connected to a drive gear wheel that is driven by the drive shaft of the internal combustion engine by means of gear wheels, with said air compressor drive gear wheel meshing with a gear wheel of a camshaft, comprising the improvement therewith wherein:
said air compressor drive gear wheel is arranged in alignment with said air compressor crankshaft;
the transmission ratio between said air compressor drive gear wheel and said camshaft gear wheel is an integral multiple of a load cycle of the camshaft drive torque; and at the same time,
the angular position of said compressor crankshaft relative to said camshaft is fixed such that negative torque components of said air compressor crankshaft are eliminated by

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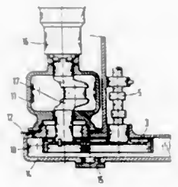
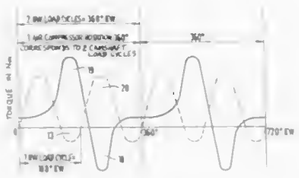
the overlapping of positive torque components of said camshaft with which reverse acceleration of said camshaft





gear wheel is prevented with any knocking pulse and noise in mesh of said camshaft gear wheel is minimized.

4,915,599

COATING MATERIAL SUPPLY DEVICE

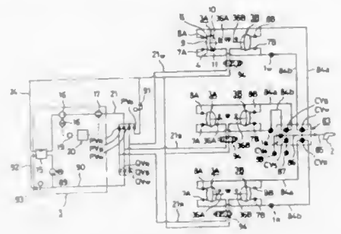
Kazuo Katsuyama, Toyota; Yutaka Ohhashi, Aichi, and Kenji Fukuta, Toyota, all of Japan, assignors to Trinity Industrial Corporation, Tokyo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Division of Ser. No. 109,264, Oct. 14, 1987. This application Oct. 7, 1988, Ser. No. 254,979

Claims priority, application Japan, Oct. 31, 1986, 61-258443

Int. Cl.[4] F04B *43/06;* B05B *15/02*

U.S. Cl. 417—393 4 Claims



1. A coating material supply device in which coating material is pumped out at a predetermined flow rate and supplied at a constant flow rate to a coating machine, wherein said device comprises:

a plurality of double-acting reciprocal pumping means, each having an inlet for the coating material supplied from a coating material supply source and an exit for discharging said coating material by the pressure of hydraulic fluid supplied at a constant flow rate from a hydraulic fluid supply source, connected to coating material selection valves connected in parallel with each other to the coating machine, and connected to switching valves that selectively switch flow channel for the hydraulic fluid supplied from the hydraulic fluid supply source in response to switching operation of said coating material selection valves,

a flow rate control mechanism for maintaining the flow rate of the hydraulic fluid constant being disposed to the flow channel for said hydraulic fluid between the hydraulic fluid supply source and said switching valves,

there being a connection between a hydraulic pressure source and the pumping means,

the pumping means having a member responsive to hydraulic pressure, said member being connected to the pumping means,

said coating material selection valves being provided in controlling relationship to said material supply source and exits, and

said switching valves being provided in individual connections between the hydraulic fluid supply source and the pumping means.

4,915,600

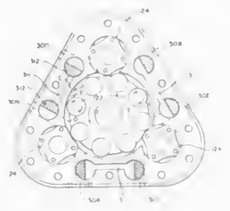
ROTARY APPARATUS WITH ROTATING MOBILE AND STATIONARY BLOCKING MEMBERS

William W. Hutchinson, Everett City, Wash., assignor to Hutchinson Research and Development Corp., Lynnwood, Wash.

Filed Oct. 12, 1988, Ser. No. 256,887

Int. Cl.[4] F04B *49/02;* F01C *1/30, 21/12*

U.S. Cl. 417—440 9 Claims



1. A rotating machine comprising:

a housing having an elongated cylindrically shaped cavity defined by an interior cavity wall;

a cylindrical rotor journaled to the housing for rotation within the cavity and having an exterior dimension less than the cavity dimensions to define an annular passageway therebetween; and

a plurality of free floating cylindrical, mobile blocking members, spaced at a plurality of locations on the rotor and in the annular passageway to define discrete fluid chambers therein, and received for rotation within the cylindrical rotor and having peripheral positions extending sufficiently near the cavity wall and spaced away therefrom so that rotation of the rotor causes the mobile blocking members to rotate within the rotor and cause substantial fluid turbulence between the mobile blocking members and the cavity wall to form a velocity seal to block the passage of fluid between adjacent fluid chambers within the annular passageway;

a stationary blocking member rotatably coupled to and timed with the rotor to permit passage of the mobile blocking members thereby; and

a fluid inlet and a fluid outlet in communication with the annular passageway and the discrete fluid chamber.

4,915,601

DOSAGING PUMP WITH PUMP BELLOWS ON BOTTLES OR THE LIKE

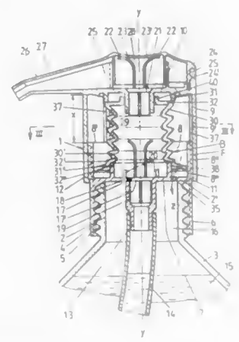
Alfred von Schuckmann, Kervendonk, Fed. Rep. of Germany, assignor to Mega Product- und Verpackungsentwicklung Marketing GmbH & Co. Kommanditgesellschaft, Wuppertal, Fed. Rep. of Germany

Division of Ser. No. 836,937, Mar. 6, 1986, Pat. No. 4,732,549. This application Dec. 3, 1987, Ser. No. 128,466

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509178; Jun. 15, 1985, 3521611; Jan. 9, 1986, 3600356

Int. Cl.[4] F04B *43/00, 21/04;* B67D *5/42, 88/54*

U.S. Cl. 417—472 36 Claims



1. An improvement in a dosage pump having a pump bellows and two valves, and being adapted to be placed on a container, one of the valves being associated with a nozzle and the other with an inlet from the container, the improvement in the dosaging pump comprising

a lower member,

un upper member movable relative to the lower member during pumping,

said one valve comprises a nozzle-side valve-closure member which is seated in the upper member,

the other valve comprises an inlet-side valve-closure member, the latter being seated within the lower member,

said upper and lower members include collars,

end portions of the pump bellows are seated on said collars of said upper and lower members, respectively,

said valve-closure members communicate with the interior of said bellows, and

said lower member and upper member are turnable with respect to each other in an expanded position of the pump bellows into one turn-stop position and another turn-stop position,

said upper member is formed with ribs and said lower member is formed with projections,

said turn-stop positions are defined by said projections abutting side flanks of said ribs.

4,915,602

PUMP FOR PUMPING A FLUID COMPRISING A LIQUIFIED GAS

Claudio Tschopp, Muttenz, Switzerland, assignor to Cryopump AG, Switzerland

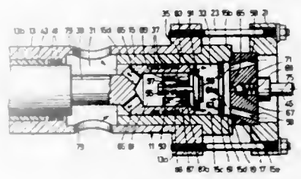
Filed May 9, 1988, Ser. No. 192,160

Claims priority, application Switzerland, May 19, 1987, 1923/87

Int. Cl.[4] F04B *41/00*

U.S. Cl. 417—503 16 Claims

1. Pump for pumping a fluid comprising liquified gas, the pump comprising an inlet and an outlet for the fluid, a housing with an end member limiting an inner space in which a piston is displaceably guided towards and away from said end member wherein said inner space comprises a pump chamber between said end member and said piston, the pump also comprising fluid feeding means connecting said inlet through said end member with said pump chamber and comprising a first back-pressure valve, the pump further comprising fluid abducting means connecting said pump chamber with said outlet and comprising a second backpressure valve, wherein the piston comprises a third backpressure valve adapted to connect



said inlet with said pump chamber wherein said first and third back-pressure valves are adapted to let fluid flow from said inlet to said pump chamber and said second back-pressure valve is closed while said piston is moved away from said end member and wherein the second back-pressure valve is open to permit fluid to flow from said pump chamber to said outlet and said first and third back-pressure valves are closed while said piston is moved toward said end member.

4,915,603

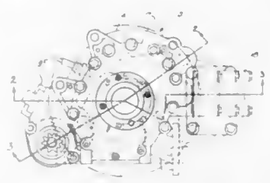
ROTARY ENGINE COOLING SYSTEM

William D. Corbett, and Benjamin L. Sheaffer, both of Fond du Lac, Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Aug. 1, 1988, Ser. No. 226,686

Int. Cl.[4] F01C *21/06*

U.S. Cl. 418—83 3 Claims



1. In a rotary engine for an outboard motor having a composite engine block including a lower housing, an intermediate rotor housing and an upper housing, said housings defining a generally central opening including a rotor chamber, and an exhaust manifold attached to the outside of the engine block adjacent an exhaust gas outlet in the rotor chamber, an improved engine cooling system comprising:

a cooling water jacket disposed around the outer surface of the exhaust manifold;

a first inlet in one end of the cooling water jacket for supplying cooling water thereto;

a first outlet in the other end of the cooling water jacket for discharging cooling water therefrom;

a second inlet in the rotor housing adjacent the exhaust gas outlet and in operative communication with the first outlet for receiving cooling water from the cooling water jacket;

cooling water passage means circumferentially disposed along a peripheral portion of each of the housings and extending generally adjacent the combustion and exhaust regions of the rotor chamber;

transfer passage means serially interconnecting one end of each cooling water passage means with the end of an adjacent cooling water passage means;

a third inlet in the upstream end of said serially intercon-

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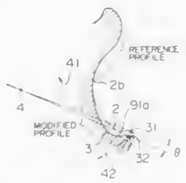
nected cooling water passage means for receiving cooling water from the rotor housing;
a discharge outlet in the downstream end of said serially interconnected cooling water passage means for discharging cooling water from the system;
an annular chamber connected to the second inlet and surrounding the exhaust gas outlet;
a second outlet at the lower end of the annular chamber in open communication with the third inlet; and,
vent means in the upper portion of the annular chamber in communication with the cooling water passage means in the upper housing.

4,915,604

ROTORS FOR A SCREW FLUID MACHINE

Toshiaki Nagai, Shimizu, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 5, 1988, Ser. No. 228,422
Claims priority, application Japan, Aug. 11, 1987, 62-199119
Int. Cl.[4] F01C *1/16*
U.S. Cl. 418—201 4 Claims



1. A screw fluid machine comprising a female rotor including a main portion positioned inside a pitch circle thereof and a plurality of recesses and a plurality of projections formed between said recesses, each of said recesses having a forward flank and a backward flank, and a male rotor including a main portion positioned outside a pitch circle thereof, a plurality of projections and a plurality of recesses formed between said projections of the male rotor, and a contour having a backward flank and a forward flank each engageable by said female rotor, said female and male rotors being rotatably supported in a casing of said screw fluid machine, and said male rotor being driven by a driving means, wherein
when tooth shapes of said female and male rotors formed in such a manner that said female and male rotors are meshed with each other without clearance therebetween are defined as reference profiles, a profile of at least one of said forward and backward flanks of said female and male rotors is formed as a modified profile obtained by appropriately angularly shifting said reference profile of the associated flank around a center of the associated rotor so as to provide proper backlash between a tooth including said profile and a tooth of the other rotor meshed therewith.

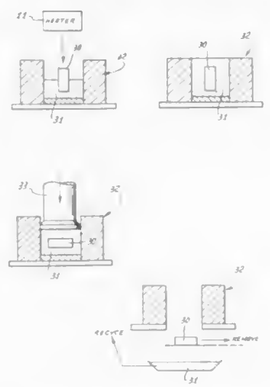
4,915,605

METHOD OF CONSOLIDATION OF POWDER ALUMINUM AND ALUMINUM ALLOYS

Hing Chan, Dixon; Brian L. Oslin, Carmichael, and Raymond L. Anderson, Redding, all of Calif., assignors to Ceracon, Inc., Sacramento, Calif.

Filed May 11, 1989, Ser. No. 350,457
Int. Cl.[4] B22F *3/00*
U.S. Cl. 419—6 12 Claims

1. The method of consolidating metal powders selected from the group consisting essentially of aluminum, aluminum alloys, and aluminum metal matrix composites that includes:
(a) pressing said powder into a preform, and preheating the preform to elevated temperature,
(b) providing a bed of flowable pressure transmitting particles,
(c) positioning the preform in such relation to the bed that the particles encompass the preform,
(d) and pressurizing said bed to compress said particles and cause pressure transmission via the particles to the preform, thereby to consolidate the preform into a desired shape,
(e) said metal powder having surface oxide, and said pressurizing being carried out to break up, partially or fully, said surface oxide, and to cause resultant formation of metal-metal as well as metal-oxide-metal bonds.

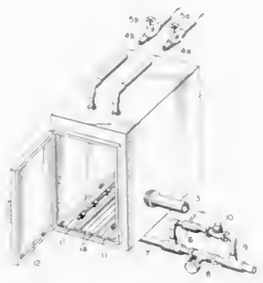


4,915,606

STEAM STERILIZING APPARATUS FOR MUSHROOM CULTURE MEDIUM

Tsuyoshi Shimokawa, Koushoku, Japan, assignor to Kabushiki Kaisha Tiyoda Seisakusho, Koushoku, Japan

Filed Aug. 22, 1988, Ser. No. 234,957
Claims priority, application Japan, Aug. 26, 1987, 62-128559[U]; Aug. 26, 1987, 62-128560[U]
Int. Cl.[4] A61L *2/00*
U.S. Cl. 422—295 3 Claims



1. An apparatus for sterilizing a culture medium for cultivating mushrooms comprising:
a sterilizing container in which a culture medium for cultivating mushrooms is placed;
means connected to said container for supplying heated steam into said sterilizing container;
means connected to said container for exhausting steam and air in said sterilizing container into the atmosphere; and

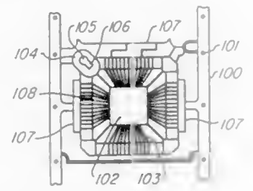
means connected to a bottom of said container for draining condensate from said bottom of said sterilizing container, said draining means comprising a drain pipe having one end opened in the bottom of said sterilizing container, said drain pipe having a drain valve therein for regulating flow rate of the condensate and a bypass pipe connected to said drain pipe so as to bypass said drain valve, said bypass pipe being arranged above said drain pipe at a level substantially equal to or slightly higher than the bottom surface of the sterilizing container, and having a trap therein, said drain pipe having a diameter greater than that of said bypass pipe.

4,915,607

LEAD FRAME ASSEMBLY FOR AN INTEGRATED CIRCUIT MOLDING SYSTEM

Jerry B. Medders, Van Alstyne; Susan S. Fitzgerald; Donald R. Kelley, both of Sherman, all of Tex., and Jeffrey L. Popken, Cincinatti, Ohio, assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 103,555, Sep. 30, 1987, Pat. No. 4,812,114.
This application Oct. 6, 1988, Ser. No. 254,333
Int. Cl.[4] B29C *45/14*
U.S. Cl. 425—116 2 Claims



1. A lead frame assembly for use with a multiple charge transfer molding system, the molded system having a mold cavity with upper and lower mold cavity portions, and a gate allowing injection of molding compound into the mold cavity, said lead frame assembly including two side rails, lead pins, a permanent support base, and temporary support structure, the side rails connected to the lead pins and support base in part by the temporary support structure, part of the temporary support structure having an opening therein through which the molding compound is injectable into the upper mold cavity portion, said opening in the temporary support structure being positioned in the mold cavity above the gate of the mold cavity, said temporary support structure being removable after molding.

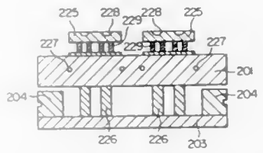
4,915,608

DEVICE FOR RESIN SEALING SEMICONDUCTOR DEVICES

Yasutsugu Tsutsumi; Sueyoshi Tanaka; Tatsuro Takahashi; Yutaka Morita; Hideaki Suezaki, and Hiromichi Yamada, all of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 15, 1988, Ser. No. 219,483
Claims priority, application Japan, Jul. 20, 1987, 62-180297; Jul. 27, 1987, 62-187317; Jul. 27, 1987, 62-187318; Jul. 27, 1987, 62-187319; Jan. 28, 1988, 63-17876
Int. Cl.[4] B29C *45/16*
U.S. Cl. 425—121 9 Claims

5. A device for resin sealing semiconductor devices comprising:
a press machine having a pair of opposed press surfaces;
a base disposed on each of said press surfaces and opposed to each other;
a pair of retention boards each respectively spaced apart from one of said bases;
a chase block fixed to each of said retention boards, each chase block having cavities for accommodating semiconductor devices;
spacer blocks disposed between said respective bases and retention boards;
a plurality of support members situated intermediate of said spacer blocks and between said respective retention boards and bases for supporting the respective retention boards and for undergoing elastic compressive deformation during pressing together of said chase blocks by said press machine, wherein said support members are of a sufficient length to maintain clearance between said retention boards and said spacer blocks when said support members are elastically deformed during the pressing together of said chase blocks by said press machine; and
plastic injection means for injecting plastic into the cavities of said chase blocks.

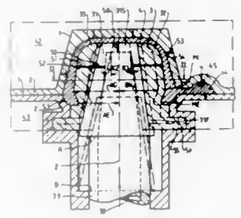


4,915,609

SINTERING DEVICE FOR BLANKS OF FOAMABLE PLASTICS WITH UNDERCUTS

Ortwin Hahn, and Gottfried Wimmer, both of Paderborn, Fed. Rep. of Germany, assignors to Klevotec, Gesellschaft Fur Rechnergestutzte Systemanwendungen GmbH Co. K.G., Fed. Rep. of Germany

Filed Apr. 28, 1988, Ser. No. 187,179
Claims priority, application European Pat. Off., Oct. 16, 1987, 87115136.1
Int. Cl.[4] B29C *33/04*
U.S. Cl. 425—384 6 Claims



1. A sintering device comprising:
(i) separable mould walls which together define a mould cavity;
(ii) a mould core positioned within the cavity and defining an undercut mould surface therein;
(iii) the core including a hollow frusto-pyramidal central support formed with guideways and a plurality of core segments mounted for slidable movement within the guideways whereby the core is radially expandable and contractable;
(iv) the segments comprising a plurality of arc-surface segments alternating with trapezoidal segments;
(v) the mould walls and the core including passages through the support and the sliding segments for introducing steam and air into the cavity;
(vi) the passages of the core placing the hollow interior of

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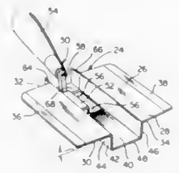
the central support in communication with the mould cavity.

4,915,610
JOINT FINISHING TOOL
Emory H. Curry, 619 Morwood Rd., Morwood, Pa. 18969
Filed Sep. 6, 1988, Ser. No. 240,498
Int. Cl.[4] E04F *21/165*
U.S. Cl. 425—458 5 Claims



1. A joint finishing tool for applying a hardenable fluent material coating over and within layers of reinforcing mesh applied over grooved insulation building panels in a manner maintaining a substantially constant cross-sectional shape to the coated grooved zones of said panels, said tool including a single, substantially stiff panel of generally rectangular configuration having upper and lower faces and incorporating first and second opposite end edges and first and second opposite side longitudinal margins, said panel including an elongated, longitudinal extending channel defining zone thereof centrally intermediate said margins, said tool panel being substantially planar between each said side longitudinal margin and said channel defining zone, said channel defining zone defining a channel of substantially constant cross-sectional shape and size opening outwardly of said upper face and a rib of substantially the same cross-sectional shape, but slightly greater cross-sectional size as said channel, projecting outward of the lower face of said panel, said rib including opposite sides formed as angulated portions of said panel projecting below said lower face extending lengthwise of said panel and a connecting bight portion interconnecting and extending between lower portions of said sides remote from said lower face, an elongated handle including base and handgrip ends, said handle being arranged longitudinally of said panel with said base end anchored in said channel and said handgrip end projecting outwardly over one end edge of said panel and being upwardly offset relative to said base end to an elevation spaced above said upper face, said sides including outwardly convergent extensions projecting outwardly of one of said end edges of said panel and said bight portion including an outwardly and upwardly inclined extension extending between and interconnecting said side extensions, said opposite side longitudinal margins being slightly upwardly and outwardly inclined.

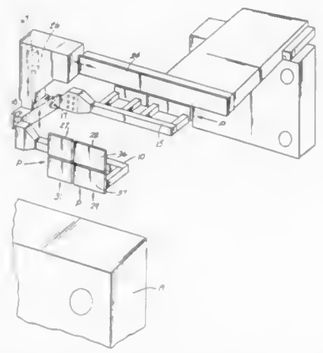
4,915,611
APPARATUS FOR AUTOMATICALLY PACKAGING ARTICLES IN ORDERLY FASHION RECEIVED FROM A MULTI-CAVITY HIGH VOLUME INJECTION MOLDING MACHINE
Paul P. Brown, Orangeville, Canada, assignor to Husky Injection Molding Systems, Ltd., Bolton, Canada
Division of Ser. No. 47,442, May 8, 1987, Pat. No. 4,814,134. This application Jan. 4, 1989, Ser. No. 293,364
Int. Cl.[4] B29C *45/42*
U.S. Cl. 425—556 12 Claims

1. In an injection molding machine a device for receiving and packaging molded articles in a nested or neatly stacked manner comprising:

a multi-cavity mold for molding large volumes of articles in continuous and cyclic fashion, said mold cavities being arranged to mold articles individually in an orderly array,

a movable receiving means operable to move into register with said orderly array of molded articles,

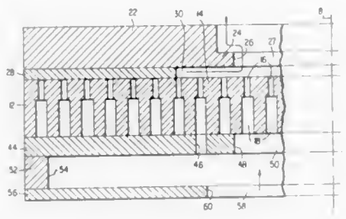
ejector means for transferring said articles from respective mold cavities to said receiving means without disrupting said orderly array,



retention means incorporated in said receiving means to hold said articles releasably, and

means incorporated in said receiving means operable to change the arrangement of said orderly array of said articles while retained by said retention means.

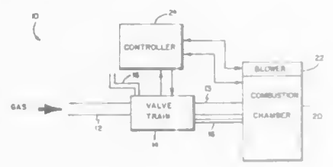
4,915,612
EXTRUSION DIE ASSEMBLY FOR FORMING HONEYCOMB STRUCTURES HAVING THICKENED OUTER SKIN
John R. Gangeme, Painted Post, and Richard D. Putt, Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.
Filed Jan. 26, 1989, Ser. No. 302,013
Int. Cl.[4] B29C *47/12*
U.S. Cl. 425—464 11 Claims



1. An extrusion die assembly for extruding a structure having a thickened outer skin, the assembly including an extrusion die having a plurality of axially extending and generally parallel feedholes, the die having an inlet face and an outlet face, the outlet face having a plurality of discharge slots, said discharge slots being arranged in criss crossing rows and columns, a plurality of axially extending pins integral with the die and located between the rows and columns of said discharge slots, a die mask at the periphery of the outlet face of the die, the mask having a radially inwardly extending lip axially spaced downstream from said pins and overlying an annularly continuous peripheral region of the die outlet face, the die mask axially spaced from the die outlet face by a shim to thereby define a shim reservoir between the die outlet face and the

mask, said mask lip having an edge, said mask lip exerting a radially inwardly directed force on material being extruded through a central portion of the die to thereby form a thickened skin, a forming plate positioned over the die inlet face and in surface contact therewith, said forming plate having a central opening congruent with the cross sectional shape of the structure being extruded, the forming plate having a plurality of axially extending, flow controlling openings spaced radially outwardly from the edge of said forming plate central opening, each of said flow controlling openings being aligned with and adapted to feed the input end of at least one die feedhole, a portion of said forming plate between the edge of its central opening and its flow controlling openings blocking the inlet end of some of said feedholes at said die inlet face, said flow controlling openings being axially aligned with a portion of said shim reservoir, whereby batch material fed to the die assembly reaching the shim reservoir is separated from a main mass of batch material passing through the central opening in the forming plate.

4,915,613
METHOD AND APPARATUS FOR MONITORING PRESSURE SENSORS
William R. Landis, Bloomington, Minn.; Paul A. Schimbke, Shorewood, and Michael J. Seidel, Wauwatosa, both of Wis., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Jan. 25, 1989, Ser. No. 301,498
Int. Cl.[4] F23N *5/24*
U.S. Cl. 431—6 6 Claims



1. A method for monitoring fuel pressure in a heating system where a controller controls actuation of fuel valves, the method comprising the steps of:

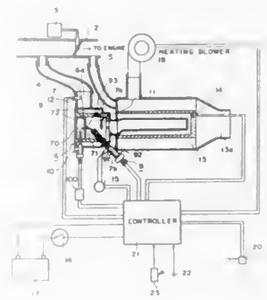
providing a fuel pressure threshold signal to the controller for determining whether the fuel pressure reaches predetermined thresholds; and

ignoring the fuel pressure threshold signal for a predetermined time interval after the controller has actuated a fuel valve, to compensate for momentary, transient pressure changes caused by actuation of the fuel valve.

4,915,614
PRIMARY GAS FURNACE CONTROL
Frederick J. Geary, Holland, Mich., assignor to Robertshaw Controls Company, Richmond, Va.
Division of Ser. No. 185,068, Apr. 22, 1988, Pat. No. 4,836,770, which is a division of Ser. No. 879,067, Jul. 12, 1984, Pat. No. 4,680,005, which is a division of Ser. No. 627,038, Jul. 12, 1984, Pat. No. 4,626,192. This application Mar. 30, 1989, Ser. No. 331,617
Int. Cl.[4] F23Q *23/00*
U.S. Cl. 431—25 1 Claim

1. In a primary control for gas furnaces, the combination including a low voltage circuit adapted to be connected to a source of low voltage AC current, said low voltage circuit including a thermostatic switch, an electrically operable pilot gas valve, an electrically operable main gas valve, pulse generating means, and first relay means controlling the energization of said main gas valve and said pulse generating means, a high voltage spark generating circuit including spaced electrodes disposed in the path of gas emanating from said pilot valve, means interfacing said low voltage circuit and said spark generating circuit and providing a substantially higher voltage in said spark generating circuit than in said low voltage circuit, and flame sensing means including a probe disposed in the path of gas emanating from said pilot gas valve and being subjected to the heat of the gas flame when gas ignition is obtained by said spark generating circuit whereby flame rectification is effected, said flame sensing means controlling said main gas valve and said pulse generating means through said first relay means, said means interfacing said low voltage circuit and said spark generating circuit including voltage doubler means and step up transformer, means.

4,915,615
DEVICE FOR CONTROLLING FUEL COMBUSTION IN A BURNER
Hideo Kawamura, Samukawa, and Kelichi Yamashita, Yokohama, both of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan
Filed Nov. 16, 1987, Ser. No. 121,274
Claims priority, application Japan, Nov. 15, 1986, 61-272682
Int. Cl.[4] F23N *1/00*
U.S. Cl. 431—41 5 Claims



1. An apparatus for controlling fuel combustion in a burner comprising:

a combustion tube including an ignition chamber for igniting fuel and a combustion chamber for combusting fuel ignited by the ignition chamber;

a fuel atomizer disposed in said combustion chamber and including an atomizing glow plug for heating and atomizing fuel, and a nozzle for ejecting atomized fuel into said ignition chamber;

an igniting glow plug disposed in said ignition chamber for igniting the fuel atomized by the fuel atomizer;

burner temperature detecting means for detecting the temperature in the burner;

an ambient temperature sensor for detecting the temperature of air introduced into the burner; and

control means for controlling electric power supplied to the atomizing glow plug based on a signal from said burner temperature detecting means and a signal from said ambient temperature sensor.

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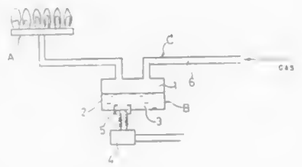
4,915,616

SYSTEM UTILIZING GAS FLAME FOR APPRECIATION OR ORNAMENTATION

Toshihisa Kanamaru, and Shinichi Ito, both of Fukuoka, Japan, assignors to Saibu Gas Co., Fukuoka, Japan

PCT No. PCT/JP87/00313, § 371 Date Jan. 13, 1988, § 102(e) Date Jan. 13, 1988
PCT Filed May 18, 1987, Ser. No. 165,997
Int. Cl.[4] F23Q *2/32*
U.S. Cl. 431—126 17 Claims



1. A system utilizing a gas flame for appreciation or ornamentation said system comprising

at least one gas burner having a nozzle adapted to display a desired design or pattern by the flame emitted from the nozzle;

at least one airtight container for storing an aqueous solution of a metallic compound so that a space exists above the surface of the water solution;

at least one ultrasonic wave generator having a resonator located at the bottom of said airtight container to vibrate said solution, thereby atomizing at least part of said solution to generate a mist within said space; and

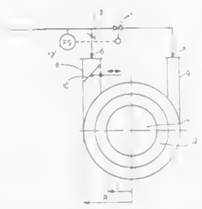
a first pipe line connecting said space in said at least one container with said at least one burner so that mist generated within said space is supplied to said burner.

4,915,617

DEVICE FOR FEEDING WASTE AIR AND/OR COMBUSTION AIR TO A BURNER OR COMBUSTION CHAMBER

Werner Hüning; Claus Gockel, both of Odenthal; Herbert Wiebe, Krefeld; Kurt Noll, Willich, and Otto Carlowitz, Wolfenbuettel, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen and Kleinewefers Energie-Und Umwelttechnik GmbH, Krefeld, both of, Fed. Rep. of Germany

Filed Mar. 22, 1989, Ser. No. 327,217
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1988, 3813222
Int. Cl.[4] F23C *5/32*
U.S. Cl. 431—173 5 Claims



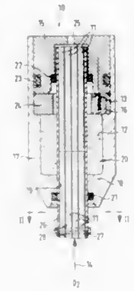
1. A burner having an inlet header, a cylindrical combustion chamber having an axis and a given radius and an upstream cylindrical swirl inlet system receptive of air for generating a swirling flow comprising a main feeder nozzle at a radial distance from the axis and on the inlet header to form a main swirling flow, which radial distance is greater than the given radius of the combustion chamber, means forming inlet slots in the header, a secondary nozzle with a control element leading into the inlet header downstream of the main nozzle through the inlet slots for forming a flow tangentially and opposite to the main swirling flow to slow down a tangential flow component of the flow from the main feeder nozzle.

4,915,618

IGNITER FOR THERMAL LANCE

Roland Brandin, Nora, Sweden, assignor to Norabel AB, Sweden

Filed Mar. 20, 1989, Ser. No. 325,541
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1988, 3809636
Int. Cl.[4] F23Q *1/00*
U.S. Cl. 431—267 12 Claims



1. An igniter for a coupling to the free end of a thermal lance having a passageway receiving pressurized oxygen, comprising a priming composition (12), a primer adjacent said priming composition a frictional element coupled to said primer, a mounting unit coupling said primer and said priming composition to the free end of said lance, said mounting unit having a closure element (15) coupled to said oxygen passageway and actuated by the pressure of the oxygen introduced by said lance to activate said frictional element to ignite said primer for ignition of said priming composition.

4,915,619

BURNER FOR COAL, OIL OR GAS FIRING

Albert D. LaRue, Uniontown, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Continuation-in-part of Ser. No. 190,734, May 5, 1988, Pat. No. 4,836,772. This application Oct. 20, 1988, Ser. No. 260,435
Int. Cl.[4] F23Q *9/00*; F23D *1/02*
U.S. Cl. 431—284 12 Claims

1. A burner for the combustion of coal, oil or gas, comprising:

a tubular burner nozzle having an inlet end and an outlet end and which defines a central passageway for conveying primary air containing pulverized coal particles therethrough to an outlet end of the burner;

a gas zone sleeve having an inlet end and an outlet end, concentrically arranged around the tubular burner nozzle and partially defining an annular enclosure therebetween;

an inner zone sleeve having an inlet end and an outlet end, concentrically arranged around the gas zone sleeve and defining an inner annular passageway therebetween, for conveying a first portion of secondary air needed for combustion to the outlet end of the burner;

a burner barrel having an inlet end and an outlet end, concentrically arranged around the inner zone sleeve and defining an outer annular passageway therebetween, for conveying a second portion of secondary air needed for combustion to the outlet end of the burner;

an air separation vane, connected to and extending outwardly and circumferentially around the outlet end of the inner zone sleeve, for influencing the path of the first portion of secondary air as it exits from the burner;

a retractable oil atomizer having an inlet end and an outlet end, centrally disposed and supported within the central passageway, for conveying a mixture of oil and atomizing media to an atomizer sprayer plate located at the outlet end of the atomizer at the outlet end of the burner;

a plurality of retractable and rotatable gas elements each having a longitudinal axis and an outlet end, each of said gas elements having:

(a) several stabilizing holes E equally spaced around the periphery of the outlet end located with their longitudinal axes at an angle gamma with respect to the longitudinal axis of each gas element;

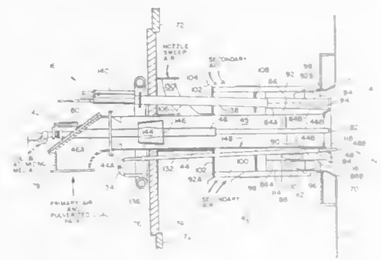
(b) two subholes F located adjacent each other on one side of the outlet end of said gas element, at an angle perpendicular to the longitudinal axis of each gas element, both subholes F having their longitudinal axes perpendicular to the longitudinal axis of each gas element and lying in a first common plane defined by these three axes;

(c) a main hole G located at the end of each gas element with the longitudinal axis thereof at an angle alpha with respect to the longitudinal axis of each gas element, angle alpha lying in a range of approximately 35° to approximately 50°; and

(d) a reburning hole H located adjacent said main hole G and at an angle beta with respect to the longitudinal axis of each gas element, angle beta being less than angle alpha and lying in a range from 0° to approximately 15°, the longitudinal axes of said main hole G and said reburning hole H intersecting at a point P near the longitudinal axis of each gas element and lying in a second common plane which contains the longitudinal axis of each gas element, said second common plane being perpendicular to said first common plane,

said gas elements for conveying gas to the outlet end of the burner, said outlet ends located in close proximity to the outlet end of the tubular burner nozzle, and being shielded from the secondary air when fully inserted into the burner by;

a flame stabilizing ring, attached to the outlet end of the tubular burner nozzle and which together with the tubular burner nozzle and the gas zone sleeve defines the annular enclosure therebetween, having a first portion circumferentially extending into the central passageway to define an opening therein, a second L-shaped portion attached to the first portion of the flame stabilizing ring extending circumferentially around and outwardly from the outlet end of the tubular burner nozzle, and having a plurality of openings adapted to closely receive therethrough each of the plurality of retractable and rotatable gas elements.

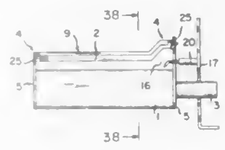


4,915,620

BURNER, IN PARTICULAR ATMOSPHERIC PRE-MIX GAS BURNER, AND COOLING RODS THEREFOR

Bernd Bittmann, Wermelskirchen; Donald Hellmann, Iserlohn; Kurt Pelzer, Kürten-Weiden; Thomas Pieper, Wermelskirchen; Jürgen Tenhumberg, Radevormwald, and Horst J. Schilling, Wermelskirchen, all of Fed. Rep. of Germany, assignors to Joh. Vaillant GmbH & Co., Remscheid, Fed. Rep. of Germany

Filed Aug. 20, 1987, Ser. No. 138,491
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1985, 3535937; Austria, Dec. 23, 1985, 3719/85; Fed. Rep. of Germany, Feb. 25, 1986, 8605042; Austria, Jun. 27, 1986, 1752/86; Fed. Rep. of Germany, Aug. 18, 1986, 8622113; Aug. 26, 1986, 8622799; Aug. 28, 1986, 8623133
Int. Cl.[4] F23D *14/12*
U.S. Cl. 431—347 24 Claims



1. Burner, in particular an atmospheric pre-mix gas burner, with at least one longitudinally extended burner pipe disposed inside a burner chamber, where the pipe wall of the burner pipe is provided with group-wise disposed bundles of fuel exit openings for a fuel to be fed into the interior of the burner pipe, and in particular for a fuel-air mixture at the upper side disposed toward the interior of the burner chamber, characterized in that at least one cooling rod, consisting of a thermally stable and thermally conducting material, extends inside the burner chamber at a distance (x) above the upper side of the pipe wall at least over free regions remaining between the bundles of fuel exit openings of the burner pipe, wherein the cooling rod has an offset end position spaced further from the burner pipe, where the cooling rod (2) serves to cool the core region of the flames formed at the fuel exit openings and comprising a pilot element disposed between the offset end position of the cooling rod and the burner pipe, said pilot being directed with its flame toward fuel exit openings of the burner pipe.

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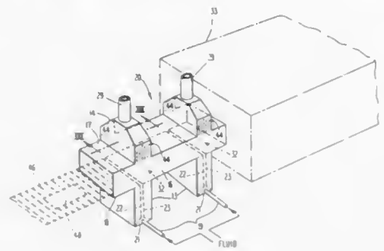
4,915,621
GAS BURNER WITH COOLING PIPES
Jürgen Schilling, and Thomas Pieper, both of Wermelskirchen, Fed. Rep. of Germany, assignors to Joh. Vaillant GmbH und Co., Remscheid, Fed. Rep. of Germany
PCT No. PCT/DE86/00468, § 371 Date Aug. 20, 1987, § 102(e) Date Aug. 20, 1987, PCT Pub. No. WO87/03068, PCT Pub. Date May 21, 1987
PCT Filed Nov. 17, 1986, Ser. No. 102,566
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1985, 3541088
Int. Cl.[4] F23D 13/12
U.S. Cl. 431—350 11 Claims

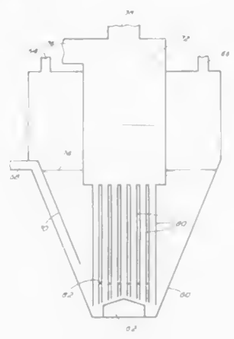
1. A gas-heated heat exchanger with a cylindrical pipe, conducting combustible gas;
wherein longitudinally spaced areas of the cylindrical pipe include a first longitudinally running group of first gas exit nozzles (2) and a second longitudinally running group of second gas exit nozzles (3); wherein the second gas exit nozzles (3) are relatively small compared to the first gas exit nozzles (2);
wherein the first gas exit nozzles (2) and the second gas exit nozzles (3) are interspaced in a transverse direction with respect to the primary longitudinal axis of the conducting pipe (1);
wherein such first longitudinally running group of gas exit nozzles (2 or, respectively, 3) are disposed on two sides relative to a radius of said cylindrical pipe extending from the pipe to a pipe line, wherein said pipe line (5) is disposed parallel to the combustible gas-conducting pipe (1), wherein said pipe line (5) is disposed generally above the second group of nozzles of the combustible gas-conducting pipe, and wherein the pipe line (5) serves to conduct a heat-storing medium.

4,915,622
FLUID BARRIER CURTAIN SYSTEM
Warner H. Witmer, Penn Centre Plaza, Quakertown, Pa. 18951
Division of Ser. No. 901,380, Aug. 28, 1986, Pat. No. 4,696,226.
This application May 13, 1987, Ser. No. 49,277
Int. Cl.[4] F24F 9/00; F27D 7/00
U.S. Cl. 432—64 4 Claims



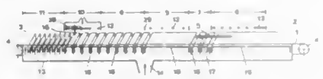
1. An apparatus for maintaining separation between the gases within a furnace and the atmosphere outside while allowing objects to be passed in to said furnace and out of said furnace, said apparatus comprising:
a plurality of spaced-apart fluid barrier curtain units located adjacent the entrance of said furnace and a plurality of such units corresponding to those fluid barrier curtain units adjacent the entrance of the furnace, located adjacent the exit of the furnace for defining entrance and exit zones through which objects pass into and out of said furnace; and
duct means between the said barrier curtain units of each plurality thereof for providing a passage into and a passage out of the furnace, each said barrier curtain unit
having fluid flow shaping means at one boundary of each zone for directing a supplied fluid flow in a concentrated laminar sheet completely across each entry and exit zone and toward an opposite boundary thereof;
receiving means located opposite said fluid flow shaping means for receiving the resulting flow and receiving fluids entrained therewith, and inducing the fluids arriving in its vicinity to be collected together and caused to emerge from said zone as a coherent fluid effluent; and
means for supplying the aforesaid fluid flow to each said fluid flow shaping means.

4,915,623
CALCINATION APPARATUS
David J. Ball; Edward Varney; Philip Curtis, all of Nottingham, Great Britain, and Martin Dzidrums, Ontario, Canada, assignors to United States Gypsum Company, Chicago, Ill.
Continuation of Ser. No. 115,468, Oct. 30, 1987, abandoned.
This application Feb. 28, 1989, Ser. No. 317,179
Claims priority, application United Kingdom, Oct. 30, 1986, 8625964
Int. Cl.[4] F26B 9/18; B01J 6/00
U.S. Cl. 432—139 11 Claims



1. Apparatus for calcining gypsum to produce a plaster having a minimal anhydrite content, comprising:
a kettle for containing the gypsum material;
a combustion chamber associated with the kettle and providing a source of non-reacting hot post combustion gases: and
a plurality of uninsulated, gas conducting tubes each connected at its upper end to and in gas receiving communication with the source of combustion gases and extending generally downwardly therefrom into the contents of the kettle and having an opening at its lower end for discharging the combustion gases into the kettle contents, said tubes having heat conductive walls effective to conduct heat from the flowing hot gases to the kettle contents through said walls before discharging said gases, the number and size of the tubes being such that the total heat conductive surface area of the plurality of tubes is at least twice the heat conductive surface area of a single tube large enough to handle the same volume of gases.

4,915,624
CONTINUOUS OVEN FOR SOLDERING ELECTRONIC COMPONENTS
Norbert Mittelstädt, Hanau, Fed. Rep. of Germany, assignor to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany
Filed Oct. 26, 1988, Ser. No. 263,024
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1987, 3738136
Int. Cl.[4] F27B 9/28
U.S. Cl. 432—59 19 Claims

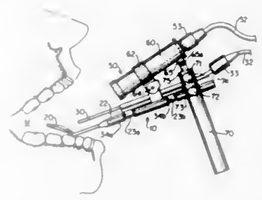


1. A continuous oven for soldering large and small electronic components on circuit boards, comprising:
a conveyor belt having supports for the circuit boards;
along the conveyor belt, at least one of above and below the belt's plane of movement, infrared radiators disposed in a spaced-apart relationship, which are associated with t least one preheating means and, seen in the direction of belt movement, behind this means, with a soldering means;
cooling means disposed between the preheating means and the soldering means and disposed among the soldering means, and nozzle means disposed in the cooing means substantially perpendicularly to the plane of the conveyor belt for performing a forced cooling with a gaseous coolant, whereby small components are subjected to less thermal stress and total heating time is reduced.

4,915,625
CERAMIC ORTHODONTIC BRACKET
Koji Tsukuma, Atsugi; Seiji Ota, and Hirotoshi Haga, both of Kawasaki, all of Japan, assignors to Tosoh Corporation, Shinnanyo, Japan
Filed Jun. 30, 1988, Ser. No. 214,038
Claims priority, application Japan, Jul. 2, 1987, 62-163907; Jun. 2, 1988, 63-134483
Int. Cl.[4] A61C 3/00, 7/00
U.S. Cl. 433—8 4 Claims

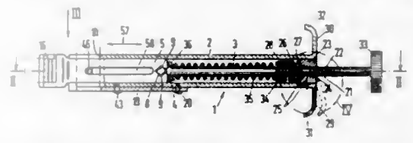
1. A ceramic orthodontic bracket having first and second faces, said first face having a shape appropriate for attachment to a tooth and said second face having wire support means, wherein said bracket is composed of a sintered body consisting essentially of 2 to 15% by mole of yttrium oxide (Y_2O_3), 5 to 20% by mole of titanium dioxide (TiO_2) and a balance of zirconia (ZrO_2).

4,915,626
DENTAL INSPECTION AND DISPLAY APPARATUS
Edgar S. Lemmey, 70 Westwood Dr., New York, N.Y. 11590
Filed Jan. 18, 1989, Ser. No. 298,466
Int. Cl.[4] A61C 3/00
U.S. Cl. 433—31 10 Claims



1. An apparatus for viewing the interior of the oral cavity of a patient and contemporaneously providing a signal for displaying a video image of the oral cavity on a video monitor comprising:
(a) a light reflecting mirror for insertion into the mouth, said mirror having a light reflecting surface for directing light into the mouth from a source of light located outside of the mouth and for reflecting from within the mouth an image of the mouth;
(b) a handle adapted to be held outside of the mouth for holding and manipulating said mirror into a selected position;
(c) a mirror mounting means to mount the mirror on the handle;
(d) a camera for receiving the reflected image from the reflecting surface and for converting said image to an output signal representative of the reflected image adapted to being coupled to a video monitor; and
(e) a camera mounting means for securing the camera to the handle such that the camera is positioned physically remote from said reflecting surface and does not extend into the mouth of the patient.

4,915,627
MATRIX CLAMP FOR DENTISTRY
Ruediger Hirdes, Kleinberbeder Str. 9a, D-5810 Witten, Fed. Rep. of Germany
Filed Apr. 10, 1989, Ser. No. 335,944
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1988, 3811753
Int. Cl.[4] A61C 5/04
U.S. Cl. 433—155 38 Claims



1 A matrix clamp for dentistry, comprising a frame; a threaded rod screwingly displaceable in said frame and having a front end and a rear end; a coulisse block arranged to releasably hold ends of a loop of a matrix band having an adjustable width, said coulisse block being slidingly displaceable by said front end of said threaded rod; a screw element having an inner thread, said rear end of said threaded rod being provided with an outer thread engaging with said inner thread of said screw element and also being provided with a handle, said screw element being formed as an axially immovable quick tensioning nut which is tiltable relative to a longitudinal axis of said

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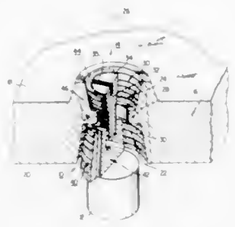
threaded rod; and a tightening spring held on said threaded rod and acting upon said quick tightening nut.

4,915,628
SUBMERGIBLE DENTAL IMPLANT AND METHOD OF UTILIZATION
Leonard I. Linkow, New York, N.Y., and Anthony W. Rinaldi, Philadelphia, Pa., assignors to Vent-Plant Corporation, Inc., Philadelphia, Pa.
Filed Dec. 14, 1988, Ser. No. 284,235
Int. Cl.[4] A61C 8/00
U.S. Cl. 433—173 19 Claims

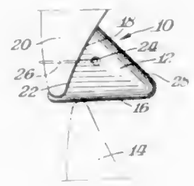
1. An implant portion of an oral implant arrangement for supporting an artificial tooth structure, comprising
an elongated body having a first and a second ends, said first end being adapted to receive at least a portion of said artificial tooth structure, said second end being adapted for insertion into a crypt in a bone located to support the artificial tooth in the vicinity of the occlusal plane of a patient,
at least one longitudinal column projecting outwardly from said outside surface of the elongated body and extending at least part way toward the second end of the body,
cutting means defined at the end of said longitudinal column toward the second end of said body,
whereby during insertion of said elongated body into the crypt in the bone said longitudinal column closely engages slots formed within the walls of the bone crypt by the cutting means so as to create at least one antirotational pillar which resist accidental spinning of the implant portion in the crypt.

4,915,629
DIRECT ASSEMBLY FRAMEWORK FOR AN OSSEOINTEGRATED IMPLANT
Grady C. Sellers, Rte. 3, Box 79, Sulphur Springs, Tex. 75482
Filed Apr. 15, 1988, Ser. No. 181,919
Int. Cl.[4] A61C 8/00
U.S. Cl. 433—173 19 Claims



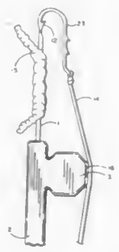
1. A framework for a fixed/detachable prosthesis that is assembled intraorally onto at least one abutment supported by an osseointegrated implant, the framework comprising:
a cast member having an upper surface and a lower surface each including a recess therein, the upper surface for supporting an aesthetic veneer;
a sleeve supported on the abutment between the abutment and the recess in the lower surface;
a sleeve supported in the recess in the upper surface;
fastening means supported in the sleeve in the upper surface for securing the cast member to the abutment; and
cement means located in the recesses in the upper and lower surfaces to provide accurate adaptation of the cast member to the abutment upon installation of the cast member.

4,915,630
DENTAL SPLINT
Gordon C. Honig, 737 Taunton Rd., Wilmington, Del. 19803
Filed May 15, 1989, Ser. No. 351,939
Int. Cl.[4] A61C 5/00
U.S. Cl. 433—215 10 Claims



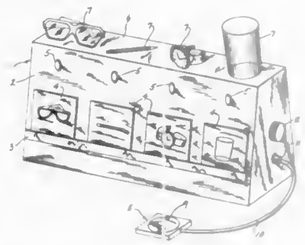
1. A dental splint for attachment to a tooth to establish a bite plane comprising a body member, said body member having a generally planar lower contact surface, an anchoring front surface extending upwardly and inwardly from said contact surface, and said anchoring surface being of a size and shape to fit snugly lingually against a single tooth and to be bonded to the tooth by application of an adhesive thereto.

4,915,631
FISHING WORM THREADER
Oscar T. Robinson, and Ann Robinson, both of 348 22nd St., Costa Mesa, Calif. 92627
Continuation of Ser. No. 204,885, Jun. 10, 1988. This application Jun. 6, 1989, Ser. No. 362,204
Int. Cl.[4] A01K 97/00
U.S. Cl. 43—4 4 Claims



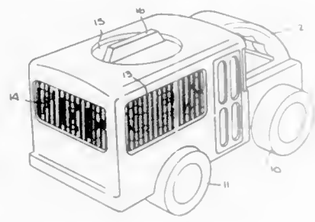
1. A fishing worm threader by which to place a worm or similar bait on a fishing hook that is attached to a fishing line, said threader comprising an elongated handle means, an elongated threading tube being in parallel alignment with said handle means wherein said threading tube is to be pushed through the body of a worm, one end of said threading tube being received by one end of said handle means and the second end of said threading tube being hollow to form a socket in which to receive and retain the barb of the fishing hook so that the worm can be slid off said threading tube and onto the hook, and a fishing line support projecting outwardly perpendicularly from said handle means, the outermost surface of said fishing line support having a slit extending therethrough within which to receive the fishing line so that the user can grip the handle and place his thumb across said slit in the outermost surface of said fishing line support to maintain said fishing line in a taut condition during the time that the worm is slid from said threading tube to said hook.

4,915,632
COMMUNICATION AID WITH SEQUENTIAL LIGHTING
Ruth B. Leff, and Aaron N. Leff, both of 6589 N. Crestwood Dr., Milwaukee, Wis. 53209
Filed Apr. 24, 1989, Ser. No. 342,490
Int. Cl.[4] G09B 5/00, 19/00
U.S. Cl. 434—112 9 Claims



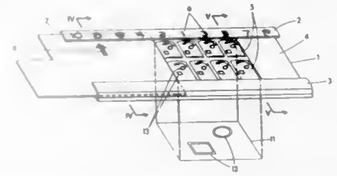
1. A communication aid, comprising a supporting structure comprising a housing having a supporting surface, a plurality of physical objects mounted in spaced relation on the supporting surface, a plurality of lights, each light associated with one of said objects, power supply means for illuminating said lights in sequential progression, and manually operable switch means for terminating the sequential progression of lights and maintaining illumination of a single light of said plurality

4,915,633
TOY ALPHABET SCHOOL BUS
Robert T. Auer, East Stroudsburg, Pa.; David W. Reina, Maplewood, N.J., and Richard L. Keats, Sands Point, N.Y., assignors to Buddy L Corporation, New York, N.Y.
Filed Mar. 20, 1989, Ser. No. 325,943
Int. Cl.[4] G09B 1/24
U.S. Cl. 434—159 11 Claims



1. An educational toy vehicle comprising:
A a vehicle having a set of wheels and a body having at least one window;
B an endless scroll guided for movement within the body in a path running behind the window, said scroll having printed thereon the letters of an alphabet in sequence and having superposed on the letters an endless grating of equi-spaced parallel bars, said window having formed thereon an array of equi-spaced parallel opaque bars; and
C means operatively coupling the scroll to said set of wheels whereby the scroll is caused to advance continuously across said window as the vehicle is propelled on a playing surface in the course of which the scroll bars alternately first lie in registration with the window bars to expose the letters and then lie in registration with the interstices of the window bars to effectively render the window opaque, whereby the exposed letters on the continuously advancing scroll appear to be advancing in incremental steps.

4,915,634
VISUAL AND MANIPULATIVE TEACHING AID FOR MATHEMATICS
Brenda Hedden, P.O. Box 225 A, Staffordville, Conn. 06077
Filed Mar. 6, 1989, Ser. No. 318,960
Int. Cl.[4] G09B 19/02
U.S. Cl. 434—209 7 Claims



1 A visual and manipulative aid for teaching multiplication and division comprising an array of wide angle lenses arranged in side-by-side relationship, each of the lenses having a field of vision when stationary which corresponds to the field of vision of the lens array whereby objects disposed thereunder are all simultaneously visible through each of the lenses, and a cover panel slidably disposed above said lenses to selectively cover from one to all of said lenses.

4,915,635
COMPACT INTERACTIVE TRAINING MANIKIN SYSTEM
Michael Ingenito; Eve J. Ingenito, and Michael P. Ingenito, White Plains, N.Y., assignors to Michael Ingenito, White Plains, N.Y.
Division of Ser. No. 28,593, Mar. 20, 1987, Pat. No. 4,828,501. This application Jan. 13, 1989, Ser. No. 298,212
Int. Cl.[4] G09B 250/00
U.S. Cl. 434—396 4 Claims

1 Control means for monitoring a cardiopulmonary resuscitation (CPR) function including a read-out for lung expansion and chest compression used in a training system including a manikin, said control means including detecting means for detecting the lung expansion and chest compression and generating a data-representing input signal, said read-out comprising a plurality of visible display indicators arranged to form a line simulating a bar graph, and divided into a plurality of groups positioned at respective successive positions along the length of said bar graph, the color of the indicators being uniform within each group, and readily distinguishable from the color of the indicators in each of the other groups for representing a range of lung expansion and chest compression values, and means responsive to the data-representing input signal to activate each individual indicator along the length of the bar graph in succession as the magnitude of the data-representing input

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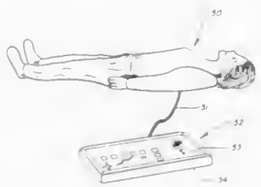
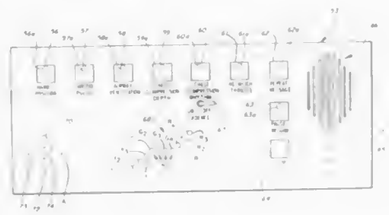
signal varies, whereby the read-out indicates both a progression from one to another of the individual values represented





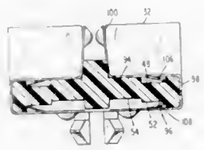
by respective indicators and a progression from one color-coded range of values to another.

4,915,636

CARD GUIDE WITH ELECTRICAL CONTACTS

Donald L. Knight, Alexandria, Va., assignor to Dynatech Labs, Inc., Chantilly, Va.

Filed Jul. 25, 1988, Ser. No. 224,173
Int. Cl.[4] H05K *1/00*
U.S. Cl. 439—65 6 Claims



1. A connector for interconnecting a base circuit board and a companion circuit board in substantially perpendicular relation to each other, comprising:

(a) an elongated connector body having an insertion slot opening at the top thereof extending along the longitudinal axis of said elongated body for receiving the companion circuit board therein, and having multiple cross slots at the top thereof extending thereacross substantially perpendicular to said insertion slot;

(b) multiple spaced snap-type fasteners attached to the underside of said elongated body and extending away from said insertion slot for fastening said connector to the base circuit board;

(c) said elongated body having formed in its underside multiple shallow cross slots aligned with said cross slots at the top of said body;

(d) a plurality of electrical contacts having a U-shaped base portion and an upstanding contact arm extending from the end of one leg of said U-shaped base portion;

(e) said electrical contacts being mounted on said elongated body with the upstanding contact arms disposed in said cross slots in pairs adjacent said insertion slot for making contact with conductors on a companion board when a companion board is inserted in said insertion slot;

(f) the legs of the U-shaped portion of the contacts engaging opposed surfaces of said elongated body within said slots to attach said contacts to said elongated body;

(g) said elongated body having shallow slots at opposed sides thereof communicating with said cross slots and said shallow cross slots, the bights of said contacts being received in said shallow side slots, said contacts being mounted on outer surfaces of said connector body whereby the outer surfaces of the U-shaped portions thereof are exposed and the outer surfaces of said upstanding contact arms are exposed;

(h) said legs of said U-shaped portions of said contacts having locking finger means struck therefrom and extending inwardly from the legs towards the bight and said U-shaped portions; said finger means engaging recesses formed in said opposed surfaces to lock said contacts to said elongated body;

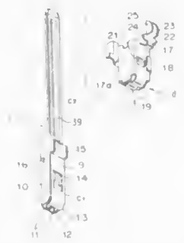
(i) said snap-type fasteners having axial openings therein and fastener pins received within said openings to lock said snap-type fasteners against further inward movement to lock said connector to a base board.

4,915,637

FUNCTION-PRESET WIRING DEVICE FOR AUTOMOBILES

Kikuo Ogawa, and Kikuo Kimura, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Division of Ser. No. 43,353, Apr. 28, 1987, Pat. No. 4,799,893.
This application Jul. 15, 1988, Ser. No. 220,762
Claims priority, application Japan, May 2, 1986, 61-100900
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—76 2 Claims



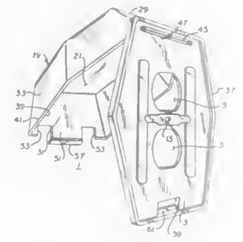
1. A through terminal integrally formed of a metallic base plate having a generally elongated planar structure with first and second end portions, said first end portion including an elastic contact piece extending from a longitudinal end of the base plate and folded backwardly in parallel to said planar structure and a pair of elastic arms erected from lateral sides of said base plate and folded inwardly and back toward said folded elastic contact piece, said folded elastic contact piece and folded pair of elastic arms cooperating to form a female terminal section for receiving a tab terminal from a bus bar circuit such that said first end portion forms a junction block connection section, said second end portion including a pair of integral flap portions integrally extending longitudinally along lateral sides of said base plate folded to lap thereover to form a generally planar tab-shaped male terminal, said base plate having an exposed surface formed with a bead extending longitudinally at said second end portion.

4,915,638

PROTECTIVE ENCLOSURE FOR ELECTRICAL OUTLETS

Anthony Domian, D3 Sandpiper Condominium, 9th Ave., N. Myrtle Beach, S.C. 29582

Filed Apr. 29, 1988, Ser. No. 187,861
Int. Cl.[4] H01R *13/44*
U.S. Cl. 439—142 4 Claims



1. A protective enclosure for electrical outlets comprising a base plate having openings therein for receiving an electrical outlet, a cover defining a cavity having a depth sufficient to accommodate electrical devices plugged into said electrical outlet and having a generally planar opening rimmed by an edge, a pivot connection pivotally connecting said cover to said base plate at a first location on said edge for pivoting said cover between an open position providing access to said electrical outlet and a closed position in which said generally planar opening of said cover buts against said base plate to enclose said electrical outlet, a pair of spaced slots extending into said cover from said edge to a second location spaced from the first location to define between said slots a cantilevered locking tab, said slots being dimensioned to permit the passage therethrough of electrical cords connected to electrical plugs inserted in the electrical outlet, and a hook member secured to the edge of the cover along said locking tab and projecting outward substantially in a direction parallel to said planar opening, said base plate having a catch member defining a ledge under which the hook member engages, said pair of slots being spaced from one another such that the cantilever locking tab substantially lies in a common plate with said slots and is sufficiently flexible that it can be displaced generally in a direction transverse to the common plane with said slots to engage and disengage said hook member from the ledge of the catch.

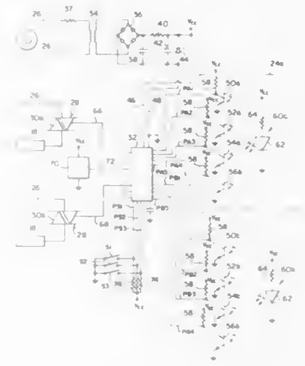
4,915,639

"SMART" AC RECEPTACLE AND COMPLEMENTARY PLUG

Steven C. Cohn, Jericho, and Michael A. Kelly, Amityville, both of N.Y., assignors to B.A.S.E.C. Industries, Ltd., Mineola, N.Y.

Filed Nov. 8, 1988, Ser. No. 268,896
Int. Cl.[4] H01R *13/703*
U.S. Cl. 439—188 11 Claims

1. An intelligent outlet adapted to matingly receive a plug said pug carrying optically coded information in addition to the presence of said plug in said outlet, information at least indicative of the power to be drawn by said plug and the load attached thereto, said outlet comprising at least one socket adapted to receive the plug and having optical sensor means carried in the outlet adapted to read the code of the plug when the same is inserted into said socket, microprocessor means carried in the outlet and in electrical communication with said sensor, and switch means carried in the outlet and operated by said microprocessor, said switch means being interposed between a power line and a contact of said socket, said microprocessor adapted to scan said sensor whereby when the plug is inserted into said socket and said sensor detects a code valid



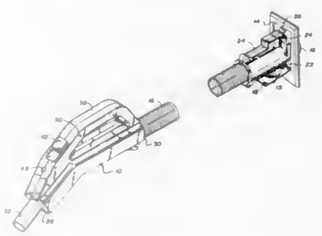
for said outlet, said microprocessor activates said switch means thus to apply power to the plug.

4,915,640

CENTRAL VACUUM SYSTEM APPARATUS

Theodore R. Hayden, 10291 Springhill Crescent, Richmond, British Columbia V7W 1W7, Canada

Filed Aug. 25, 1988, Ser. No. 237,213
Int. Cl.[4] H01R *4/60*
U.S. Cl. 439—191 4 Claims



1. A handle for a vacuum hose of a central vacuum system having a power cable built into said vacuum hose comprising:

a body having a first end and a second end, said body being formed in two halves with means locating the halves of the body together;

a nozzle projecting outwardly at the first end that is clamped between said two halves of said body;

a recess at the second end to receive the vacuum hose;

a pathway through the body communicating the recess and the nozzle;

a handgrip formed integrally with the body of the handle;

first connection means on the body, generally adjacent the first end adapted to engage and receive electrical power from the power cable of the vacuum hose;

a switch adjacent the handgrip;

conductors joining the first connection means to the switch;

second connection means on the body, adjacent the second end for providing power to auxiliary equipment; and

conductors joining the switch to the second connection means.

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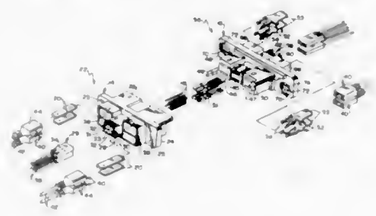
4,915,641

MODULAR DRAWER CONNECTOR

Michael J. Miskin, Naperville, and Wayne A. Zahlit, Downers Grove, both of Ill., assignors to Molex Incorporated

Filed Aug. 31, 1988, Ser. No. 238,632
Int. Cl.[4] H01R *13/514*
U.S. Cl. 439—247 20 Claims



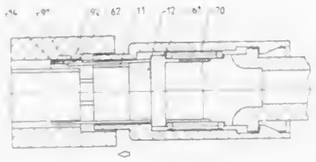
14. A drawer connector comprising a drawer connector housing having a mounting flange, a forward mating end and a rearward conductor-receiving end, a plurality of drawer connector terminals mounted in the drawer connector housing, said mounting flange having a plurality of mounting apertures extending therethrough for receiving mounting means to mount said housing to a panel. said mounting apertures each comprising a mounting collar having an external cross-sectional dimension less than the internal cross-sectional dimension of the corresponding mounting aperture, said mounting collar being initially supported in alignment with said mounting aperture by at least one frangible support, said frangible support being breakable from said mounting flange upon engagement of said mounting means with the drawer connector, the dimensions of said mounting collar relative to said mounting aperture permitting a controlled amount of float of said drawer connector relative to said panel.

4,915,642

TROUBLE-FREE CONNECTOR WITH LOCK MECHANISM

Chen-Chih Lin, and Tien-Chih Hsing, both of Taipei, Taiwan, assignors to Pan-International Industrial Corporation, Hsin-tien Taipei, Taiwan

Filed Jan. 19, 1989, Ser. No. 299,056
Int. Cl.[4] H01R *13/627*
U.S. Cl. 439—352 7 Claims



1. An electrical connector having a lock mechanism, the connector comprised of:

a tubular body having a top portion, a rear end and a pair of opposite sides, the top portion having a rectangular-shaped slot formed therein;

a pair of matched eccentric convex protrusions, each protrusion located on a respective side of the tubular body;

a support core slidably disposed in the tubular body, the support core including a surface having a concave-shaped groove formed therein, such that when the support core is slidably disposed in the tubular body, the concave-shaped groove is substantially aligned with the slot formed in the top portion of the tubular body;

the support core further including a plurality of crimping terminals;

a cable secured to the crimping terminals, whereby the cable is connected to the support core;

a rear cup having an outer rim, the rear cup being fitted to the rear end of the tubular body, the rear cup having a hole formed therethrough in which the cable is received and secured;

an insulation shell secured on the outer rim of the rear cup, the insulation shell including a protrusion stopper;

a locking device having a pair of ring-shaped side wings that are received around and ride on the tubular body, so that the respective side wings abut the respective protrusions formed on the tubular body, thereby defining a force receiving point, the locking device further including an arm integral with the side wings and extending forwardly therefrom, the arm being sized and shaped so as to mate with the slot formed in the body of the tubular member;

a coil spring disposed on the rear end of the tubular body between the side wings of the locking device and the rear cup;

a slider for slidingly accommodating the tubular body, the support core, the locking device, the coil spring, the rear cup and at least part of the insulation shell, the slider including an internal drive block located forwardly of the side wings of the locking device when the locking device is disposed in the slider, whereby normal disengagement is permitted through actuation of the coil spring via the side wings of the locking device;

a socket including a front side, the front side having an insertion slot formed therein; and

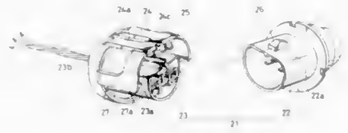
wherein after engagement, the plug may be matched with the insertion slot formed in the front side of the socket, thereby producing the locking action.

4,915,643

CONNECTOR

Masakuni Samejima; Kiyohito Fukuda, and Mitsuru Matsumoto, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed Oct. 28, 1988, Ser. No. 263,876
Claims priority, application Japan, Oct. 28, 1987, 62-164735[U]; Oct. 28, 1987, 62-164736[U]
Int. Cl.[4] H01R *13/627*
U.S. Cl. 439—357 3 Claims



1. A connector, comprising:

a female housing having an upper surface;

a male housing to be inserted and fitted into said female housing for establishing electrical connection therebetween, the male housing having an upper surface;

a flexible locking arm having a locking aperture, said locking arm provided on the upper surface of said male housing so as to be flexibly supported thereon, said flexible locking arm having a tip portion and two sides;

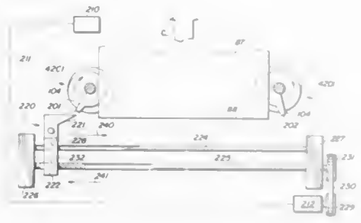
a locking projection provided on the upper surface of said male housing, said locking projection generating a restoring force in said locking arm by cambering said locking arm when said male housing is inserted into said female housing, and said locking projection being engaged with said locking aperture by the restoring force when said male and female housings are properly fitted together; and means for producing a fitting-confirmation sound by said restoring force when said locking projection is engaged with said locking aperture, said fitting confirmation sound producing means comprising a pair of vertical plates provided on both sides of the tip portion of said locking arm, respectively, along the longitudinal direction of the locking arm in order to reinforce the tip portion of the locking arm, and the vertical plates being adapted to strike the upper surface of said female housing to produce the sound by the restoring force when said male and female housings are properly fitted, whereby the restoring force is generated only in the non-reinforced portion of said locking arm to increase the restoring force.

4,915,644

CONTINUOUS FORM STATIONERY FOLDING AND CUTTING MACHINE

Earnest B. Bunch, Jr., Phoenix, and Earnest B. Bunch, III, Glendale, both of Ariz., assignors to B. Bunch Company, Phoenix, Ariz.

Filed Dec. 2, 1988, Ser. No. 279,426
Int. Cl.[4] B65H *29/66, 35/06, 45/105*
U.S. Cl. 493—357 7 Claims



1. In combination with apparatus for producing continuous form stationery by folding a strip of paper along transverse lines of weakening formed therein, said apparatus including

a frame,

oscillating guide means mounted on said frame for alternately distributing said successive lines of weakening in said paper in substantially opposite directions,

means for feeding paper into said guide means at a predetermined speed,

folding means carried on said frame and operatively associated with said oscillating guide means for urging said paper distributed by said guide means into a folded condition, said folding means including first and second spaced apart pairs of spirals having helical flight means shaped and dimensioned and rotatably driven to receive paper from said oscillating guide means to fold the paper along transverse lines of weakening, each spiral in said first pair being positioned on a side of said paper strip opposite the side of said paper strip on which the other spiral in said first pair is positioned,

said guide means, feeding means and folding means moving in synchronous relationship during the operation of said apparatus,

the improvement comprising means for severing the folded paper along at least a selected one of the folded transverse lines of weakening extending from one side to the other side of said paper strip and extending between the spirals in said first spiral pair, said severing means including

(a) cutting means mounted for transverse movement between at least two operative positions,

(i) a first operative position located on said one side of said paper strip and adjacent one end of said selected one of said transverse lines of weakening, and

(ii) a second operative position located on said other side of said paper strip adjacent the other end of said selected one of said transverse lines of weakening; and,

(b) means for moving said cutting means from said first operative position to said second operative position at a selected time to cut said one of said folded transverse lines of weakening, said one of said folded transverse lines of weakening interconnecting paper having a portion extending from said one of said lines of weakening

(i) through and contacting said helical flight means of at least one of the spirals in said first pair, and

(ii) to a folded line of weakening selected from the group consisting of

the folded line of weakening immediately preceding said one of said folded transverse lines of weakening, and,

the folded line of weakening immediately succeeding said one of said folded transverse lines of weakening,

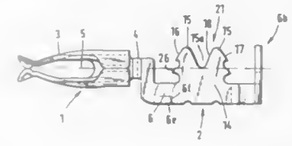
said immediately preceding and immediately succeeding lines of weakening being folded by said second spiral pair.

4,915,645

MINIATURIZED CONTACT SPRING PLUG

Alfred Könnemann, Wuppertal, and Bernd Zinn, Ennepetal, both of Fed. Rep. of Germany, assignors to Grote & Hartmann GmbH & Co. KG, Fed. Rep. of Germany

Filed Jul. 20, 1988, Ser. No. 221,706
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1987, 3734654
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—417 16 Claims



1. Miniaturized contact spring plug with one or more contact elements having a spring contact area and a cable terminal area with a base web and a lug-shaped two-peak penetration terminal as well as a casing with a cover which can be assembled and locked together after insertion of the contact element(s) and can be brought to the final locking position after insertion of the flat wire conductor(s), and the penetration terminals penetrate through the cable insulation and form contact with the flat wire conductor, locking securely in the cover, while the insulation displacement terminal holds the insulation in a tension relief manner, characterized in that

(a) the base web (6) and the lacing web (4) are aligned vertically in one piece in the contact element,

(b) the bottom (32) of the chambers (35) is lengthened toward the rear in the casing and forms a bottom area (32*a*) with supporting webs (39) projecting vertically upward at a distance from the vertical chamber walls (36) with which they are aligned on the bottom (32*a*), thus forming boxes (38) in the rear area of the casing (28), and longitudinal grooves (40) are provided in the bottom wall (32*a*) approximately in the transverse middle of each box (38) so the base web (6) of the contact elements are inserted in a form fitting manner into these grooves, but preferably also with a force fit, so the base web (6) or the insulation displacement terminals (21) extend vertically upward parallel to the supporting webs (39), and the cover (29) which is designed as a cube-shaped body (48) sits on the casing (28) in the area of the boxes (38) and the cable boles (49), preferably round, running in the longitudinal direction of the plug are provided in the area of the longitudinal extent of the box, and the body (48) projects

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over the boxes (38) toward the rear with a rear wall (50) which also extends downward from the cube-shaped body (48) and prevents the contact elements from falling out of the boxes in the prelocked position of the cover (29), and the cable holes (49) end at the front at a front wall web (51) which is provided at the top with a plug bordering web (52) that extends forward like a collar, and between the cable holes (49) there are holes (53) in the cube-shaped body (48) running continuously from bottom to top for the supporting webs (39) of the casing (28) to be inserted into them in a form fitting manner, preferably also with a force fit, where the supporting webs (39) and/or the holes (53) preferably have clamping devices and/or snap-lock devices, and a slit (54) runs from each cable hole (49) perpendicularly downward approximately in the middle of the hole so the insulation displacement terminal (21) can slip through it in a positive locking manner, optionally also in a nonpositive manner, and the lugs (23) of the insulation displacement terminal (21) are anchored like barbs in the front wall and rear wall of the slit (54) in the final locking position of the cover (29) and additional passages (54) and (56) are provided in front of and behind the slip (54) in the area of the cable holes (49) for the lacing web (4) and the cable displacement terminal device (6*b*).

4,915,646

ELECTRICAL TRUNKLINE SYSTEM

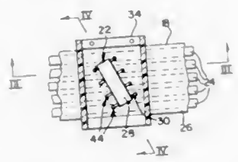
Immo E. Bock, Randburg; Philip L. Nathan, Senderwood, and Peter O. Malpage, Norwood, all of South Africa, assignors to Johannesburg Construction Corporation (Proprietary) Limited, Johannesburg, South Africa

Filed Aug. 17, 1988, Ser. No. 233,214

Claims priority, application South Africa, Aug. 18, 1987, 87/6093

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—425 9 Claims



1. An electrical trunkline, which includes

a flat, ribbon-like cable having a plurality of conducting cores arranged next to and spaced from one another in a substantially planar manner with an electrically insulating material covering the cores and filling the spaces between them, and having a number of groups of holes at spaced positions along the length of the cable, each group comprising a plurality of holes each of which passes through a core and insulating material on one side thereof;

a plurality of electronic modules each of which has a plurality of pins, there being at least as many holes in each group as there are pins, with modules engaged with the cable at at least some of the positions, the pins of each module passing through the holes in the cores at that position to make electrical contact with the cores; and

a retaining means for retaining each of the modules on the cable with its pins in electrical contact with the cores.

4,915,647

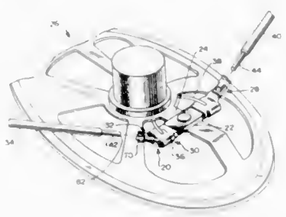
WIRE TRAP SPEAKER TERMINAL

Richard R. Edgley, Elmhurst; Lawrence D. Kroeger, Burr Ridge, and Daniel M. Palmieri, Bloomingdale, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Jan. 9, 1989, Ser. No. 294,623

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—441 15 Claims



1. An electrical terminal for use in coupling a speaker wire for a speaker to an audio system lead wire having a conductor, said electrical terminal comprising:

a mounting means for mounting the terminal to the speaker, said speaker wire being coupled to said mounting means and said mounting means having a base portion from which extends arm means adapted to be bent so as to be mounted on an insulator affixed to said speaker; and

a wire trap means extending from the mounting means, said wire trap means adapted to receive said conductor of said lead wire to couple said lead wire to said electrical terminal;

wherein said arm means includes a first pair of arms extending from one edge of said base portion and a second pair of arms extending from an opposite edge of said base portion, said first pair of arms being adapted to be wrapped bout an edge of an insulator secured to said speaker and said second pair of arms being adapted to be wrapped about an opposite edge of said insulator.

4,915,648

CONNECTOR WITH A LOCK MECHANISM

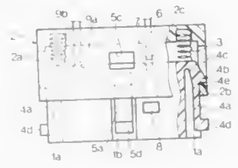
Akira Takase, Oota, and Kunihiko Muraoka, Isezaki, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1989, Ser. No. 316,792

Claims priority, application Japan, Mar. 4, 1988, 63-028813[U]

Int. Cl.[4] H01R *13/64*

U.S. Cl. 439—490 7 Claims



1. A connector comprising:

a plug;

a socket having a structure for receiving the plug;

a first lock mechanism for locking the plug at a short interserting position;

a second lock mechanism for locking the plug at a long inserting position; and

indicator means for indicating a locked state by the second lock mechanism; and wherein

the indicator means is a mark provided on the plug, which is exposed at the short inserting position.

4,915,649

CONNECTOR

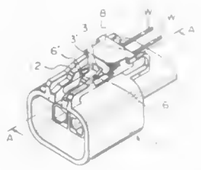
Hiroyuki Shimazu, and Kazuo Mitsui, both of Kanagawa, Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie, Japan

Filed Jul. 20, 1988, Ser. No. 221,913

Claims priority, application Japan, Jul. 21, 1987, 62-112447[U]

Int. Cl.[4] H01R *3/00, 13/71*

U.S. Cl. 439—490 4 Claims



1. A connector for connection to a complementary connector, comprising:

a connector housing haing a contact recess, a contact terminal cavity, and a contact piece gap;

a contact piece having a base portion and bifurcated free ends, said base portion of said contact piece disposed in said contact piece gap, and said bifurcated free ends of said contact piece extending into said contact recess; and

wire contact terminals projecting from said contact terminal cavity into said contact recess of said connector housing;

one of said bifurcated free ends of said contact piece arranged so as to contact one of said wire contact terminals in said recess, and another of said bifurcated free ends arranged so as to contact another of said wire contact terminals when an arm of a complementary connector housing is connected to said contact recess to complete an electrical circuit between said wire contact terminals.

4,915,650

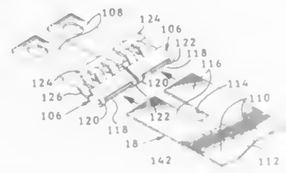
ELECTRICAL TERMINALS AND METHOD FOR TERMINATING FLAT POWER CABLE

John K. Daly, Scottsdale, Ariz.; William B. Fritz, Hummelstown, Pa., and Earl R. Kreinberg, Phoenix, Ariz., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 193,852, May 13, 1988, Pat. No. 4,859,204, Ser. No. 194,063, May 13, 1988, Pat. No. 4,859,205, and Ser. No. 298,259, Jan. 13, 1989, Pat. No. 4,867,700, which is a continuation of Ser. No. 193,458, May 13, 1988, abandoned, which is a continuation-in-part of Ser. No. 50,793, May 14, 1987, abandoned. This application Apr. 14, 1989, Ser. No. 338,079

Int. Cl.[4] H01R *9/07*

U.S. Cl. 439—498 20 Claims



1. A pair of terminals for terminating an end portion of flat power cable having at least one insulated conductor, comprising:

two like terminals each including a forward contact section and opposing upper and lower plate sections extending forwardly from a laterally spaced pair of bight straps and opposing each other spaced to receive a cable portion therebetween, said pair of bight sections defining a cable-receiving slot transversely across a rearward terminal end through which a said cable portion is insertable, said upper and lower plate sections including transverse termination regions thereacross containing respective arrays of shearing means adapted to penetrate the cable portion inserted therebetween upon said plate sections being pressed together to shear the insulation and the cable conductor therebetween, said plate sections being rotated together about said bight straps.

4,915,651

COAXIAL CONNECTOR

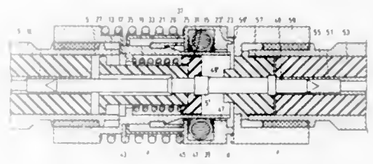
Willem J. F. Bout, Huizen, Netherlands, assignor to AT&T Philips Telecommunications B. V., Hilversum, Netherlands

Filed Oct. 17, 1988, Ser. No. 258,356

Claims priority, application Netherlands, Oct. 26, 1987, 8702537

Int. Cl.[4] H01R *17/04*

U.S. Cl. 439—578 3 Claims



1. A coaxial connector, comprising a first and a second connector portion, each of which comprises an electrically conductive inner contact member which is coaxially surrounded by an electrically conductive outer contact member whereto it is mechanically connected via an electrically insulating body, and a spring, the free end of each of the contact members having a contact face which extends perpendicularly to the axis of the contact member, corresponding contact faces of the two connector portions being capable of cooperating, at least one of each pair of cooperating contact faces having a predetermined contact area such that, after the coupling of the two contact portions, a suitable electrical connection exists between the cooperating contact members if the axis of the first connector portion has been shifted with respect to the axis of the second connector portion over no more than a predetermined distance, the contact members of at least the first connector portion being independently movable in the axial direction, against the force of the spring with respect to the insulating body, at least the first connector portion comprising an electrically conductive, tubular extension which is rigidly connected to the insulating body and the inner surface of which serves as a bearing for an axially movable inner contact carrier which carries the inner contact member, its outer sur-

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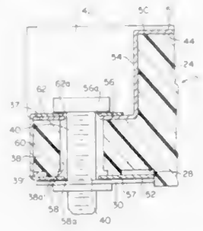
face acting as a bearing for an axially movable outer contact carrier which carries the outer contact member, an inner coiled spring being provided between a radially outwards projecting shoulder of the inner contact carrier and a radially inwards projecting shoulder of the extension, an outer coiled spring being provided between radially outwards projecting shoulders of the outer contact carrier and the extension.

4,915,652

SHIELDED ELECTRICAL CONNECTOR

Scott D. Madara, Raritan, N.J., assignor to Thomas & Betts Corporation, Bridgewater, N.J.

Filed Jun. 12, 1989, Ser. No. 364,283
Int. Cl.[4] H01R *13/648*
U.S. Cl. 439—607 10 Claims



1. An electrical connector for attachment to a printed circuit board comprising:
an elongate insulative housing having a connection surface an attachment surface, and printed circuit board-mounting ears extending from each longitudinal end;
plural electrical contacts supported in said housing, each said contact having a connection end adjacent said connection surface of said housing and a contact tail extending through said attachment surface for electromechanical engagement with said printed circuit board; and
means for shielding said housing from electromagnetic and radio frequency interferences, said shielding means including a first planar conductive shield overlying a first longitudinal surface of said housing, said first shield having first shield extending portions overlying said printed circuit board mounting ears of said housing, and a second shield overlying a second longitudinal surface of said housing, opposed to said first longitudinal housing surface, said second shield having second shield extending portions which wrap at least partially around said printed circuit board mounting ears and overlie said first shield extending portions.

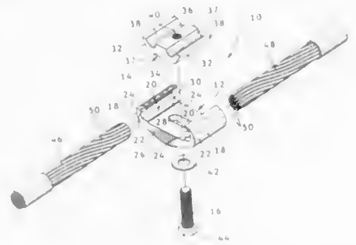
4,915,653

ELECTRICAL CONNECTOR

Ross L. Mair, Barrie, Canada, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 16, 1988, Ser. No. 285,279
Int. Cl.[4] H01R *4/44, 11/01*
U.S. Cl. 439—781 5 Claims

1. An electrical connector for electrically connecting and mechanically securing two cables, said connector comprising:
a C-shaped member having parallel, inwardly facing channels spaced apart and joined by a web extending therebetween, said channels having a compound curving radius;
a wedge block having lateral sides extending obliquely outwardly from a lower surface to an upper surface, said wedge block adapted to be drawn into said C-shaped member between said channels so that said sides engage



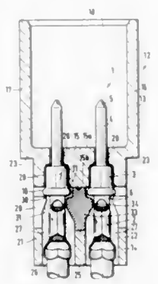
cables which may be in said channels and to thereby compress and secure the cables therein; and
means to draw said wedge block into said C-shaped member.

4,915,654

ELECTRIC PLUG CONNECTOR

Bernd Zinn, Ennepetal, Fed. Rep. of Germany, assignor to Grote & Hartmann GmbH & Co. KG, Fed. Rep. of Germany

Filed Feb. 6, 1989, Ser. No. 306,679
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1988, 3810209
Int. Cl.[4] H01R *13/436, 13/422*
U.S. Cl. 439—595 7 Claims



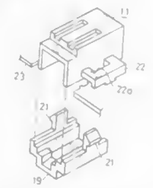
1. Electric plug connector having a contact plug housing and a contact sleeve housing, each said housing having the following: two side walls, two end walls and, paralleling the side walls, a longitudinal partition with transverse compartment partitions; a plurality of compartments each holding a contact; a passageway extending from one said end wall and through the longitudinal partition and the transverse partitions to the other said end wall; and a bar-like locking slide adapted to be inserted and withdrawn through said passageway; each said housing being further characterized by the fact that in the side wall of each compartment a prelocking stay, which can swing elastically outwardly and whose free end is directed toward the inner space of the compartment, is provided with a rounded engagement shoulder protruding into said inner space of the compartment, the locking slide and the prelocking stays engagement the contacts to prevent removal thereof from the compartments.

4,915,655

TELEPHONE CONNECTOR

Masanori Tanaka, Osaka, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Apr. 17, 1989, Ser. No. 338,815
Claims priority, application Japan, Apr. 25, 1988, 63-56276[U]
Int. Cl.[4] H01R *23/02*
U.S. Cl. 439—676 8 Claims



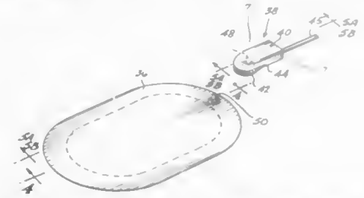
1. A telephone connector comprising:
a substantially rectangular parallelpipedic body having at least two side panels and a top panel but having an open front and an open bottom:
mounting means formed integrally with said body on the outside surfaces of said side panels and defining the plane in which said body is mounted on a printed circuit board;
a contact holder disposed in said body;
a plurality of contacts held by said contact holder at predetermined intervals in said body, rear end portions of said contacts projecting out from a lower end face of said contact holder and extending downwardly of said plane;
a cover for closing the open bottom of said body; and
locking means for locking said cover to said body on the outside surface of its said side panels.

4,915,656

DISCRIMINATING MEDICAL ELECTRODE CONNECTOR

Clifton A. Alferness, Woodinville, Wash., assignor to Physio-Control Corporation, Redmond, Wash.

Filed Oct. 21, 1988, Ser. No. 260,798
Int. Cl.[4] H01R *4/48;* A61B *5/04*
U.S. Cl. 439—729 11 Claims



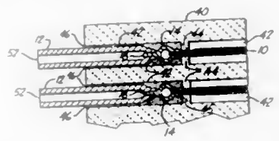
1. A discriminating connector for connecting a defibrillation electrode but not an ECG monitoring electrode to a cable, the defibrillation electrode having a conducting post located a first distance from an outer edge of the defibrillation electrode and the ECG monitoring electrode having a conducting post substantially identical to the conducting post of the defibrillation electrode located a second distance from an outer edge of the ECG monitoring electrode, the second distance being substantially greater than the first distance, wherein the discriminating connector comprises:
(a) housing means having an opening that is configured to permit a medical electrode having a conducting post to be inserted edge first therein, wherein said housing means includes an upper member having sides and first and second ends, a lower member having sides and first and second ends, wherein said lower member is substantially parallel to and spaced apart from said upper member, and a connecting member located between said first and second ends of said upper and lower members and connecting said upper and lower members, and wherein said opening is defined by an upper wall formed by said upper member between said first end of said upper member and said connecting member, a lower wall formed by said lower member between said first end of said lower member and said connecting member, and a backwall formed by said connecting member; and,
(b) conductive receiving means disposed within said opening of said housing means for receiving said conducting post of said medical electrode, wherein said housing means is constructed to permit the insertion of said medical electrode into said opening to a depth which is at least equal to that required for said conductive receiving means to receive the conducting post of the defibrillation electrode but which is less than that required to receive the conducting post of the ECG monitoring electrode.

4,915,657

METHOD AND APPARATUS FOR MICROMINIATURIZED HEADER ASSEMBLY

Robert W. Derry, Stacy, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 17, 1989, Ser. No. 325,452
Int. Cl.[4] H01R *11/05*
U.S. Cl. 439—879 10 Claims



5. An electrical header assembly comprising:
a standard housing normally used in connectors having an aperture therethrough;
a standard male connector member normally used in connectors mounted in the aperture;
a standard "Y" shaped member normally used in connectors mounted in the aperture and having a cup shaped portion and a tail portion, the cup shaped portion being crimped to make good electrical contact with one end of the male connector member; and
a standard female connector member normally used in connectors mounted in the aperture and having an initial bore sized to fit a standard male connector, one end of the female connector member crimped to the tail portion of the "Y" shaped member to make good electrical contact.

4,915,658

REFERENCE AND SUPPORT SYSTEM FOR FLAT CRT TENSION MASK

Donald J. Lopata, Horseheads, and Robert L. Mathew, Elmira, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Division of Ser. No. 177,338, Apr. 4, 1988. This application Aug. 25, 1989, Ser. No. 398,411
Int. Cl.[4] H01J *9/227*
U.S. Cl. 445—30 13 Claims

7 A method of securing a tension shadow mask to a flat panel faceplate of a CRT which comprises:
forming a glass faceplate with substantially parallel inner and outer surfaces;
forming a flat central target surface area portion on the inner surface of said faceplate;
forming a peripheral surface about said central target area surface portion which peripheral surface lies substantially

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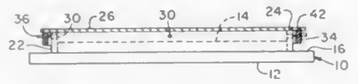
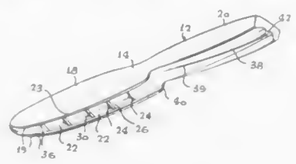
perpendicular to said flat central target area surface portion;
securing a support frame on said faceplate so as to engage said peripheral surface;
finishing an upper surface of said support frame so as to provide a desired Q-spacing between said flat central target area surface portion and the upper surface of said support frame;
providing wall portions of said support frame with reference means equally spaced from said upper surface thereof for defining a reference plane relative to said upper surface;
providing a temporary fixture having a peripheral frame larger than the outer periphery of said support frame;
providing locating means in wall portions of said temporary fixture equally distant from an upper reference surface thereof for defining a reference plane relative thereto;



initially securing a tensioned shadow mask to the upper reference surface of said temporary fixture;
positioning and repositioning said temporary fixture over said supporting frame such that said locating means engage said reference means to position said shadow mask in the plane of the upper surface of said support frame and with the desired orientation and Q-spacing between the mask and the target area so as to facilitate the lighthousing of various phosphors sequentially applied to such target area; and
finally positioning said temporary fixture over said supporting frame with the desired orientation and Q-spacing between the mask and the target area and securing said tensioned shadow mask to the upper surface of said support frame, and severing the shadow mask exteriorly of said support frame and removing said temporary fixture therefrom.

4,915,659
WATER SKI ALSO ADAPTED FOR USE ON LAND
Rock A. Sanders, 1563 Bridgegate St., Westlake Village, Calif. 91361
Filed Jun. 17, 1988, Ser. No. 208,108
Int. Cl.[4] A63C *15/03*
U.S. Cl. 441—76 **10 Claims**



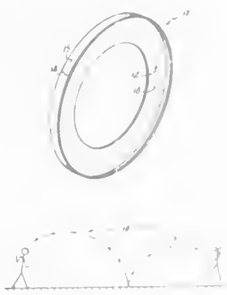
8. A water ski also adapted for walking on land, which comprises:
a pontoon of generally streamlined shape and having a body portion formed of a lightweight rigid plastic foam, and having a front portion and a rear portion,
a plurality of spaced flexible cups disposed longitudinally and centrally along the lower surface of said pontoon, each of said cups being open at the rear end thereof to form a pocket to receive water on expansion and provide water resistance against the backward movement of said pontoon, said cups having a notch along the rear edge thereof to insure opening, said cups substantially closing against the lower surface of said pontoon by the action of the water during forward motion of the pontoon to reduce drag,
a plurality of rigid fins disposed longitudinally along the lower front portion of said pontoon and extending below said cups in the substantially closed position thereof, said fins positioned along opposite sides of said pontoon with said cups disposed between said fins,
an additional fin disposed longitudinally and centrally along the lower rear portion of said pontoon and extending below said cups in the substantially closed position thereof,
each of said fins having a streamlined configuration and being formed integral with the body portion of said pontoon and formed of the same material as the body of said pontoon, said fins providing for stability and guidance of the pontoon in the water and providing support to permit walking with the pontoon on land without damaging the cups in the closed position thereof,
a cavity provided in the upper portion of said pontoon for the insertion of the user's foot, and
means in said cavity for attaching the foot.

4,915,660
ANIMAL CALLING DEVICE HAVING A RESTRICTED BORE OPENING
Henry W. Overholt, Sr., Rte. One, Box 165, Marshallville, Ga. 31057
Continuation-in-part of Ser. No. 786,594, Oct. 11, 1985, abandoned. This application Sep. 21, 1987, Ser. No. 99,122
Int. Cl.[4] A63H *5/00*
U.S. Cl. 446—207 **10 Claims**

8. An animal calling device comprising a generally cylindrical barrel portion having a fully open end and an opposite end with a restricted opening, a mouthpiece portion having a groove formed therein, one end of said mouthpiece portion being disposed in said fully open end of said barrel for establishing communication between said groove and said barrel, said one end of said mouthpiece portion being laterally widened to define a bridge portion, said bridge portion spanning said groove at the point of insertion of said mouthpiece portion into said barrel, a vibratable reed member having one end seated on said bridge portion and freely extending from said seated end to overlie said groove, and a wedge block disposed over said reed member and forcefully interfitted into said fully open end of said barrel for holding said reed member in place.

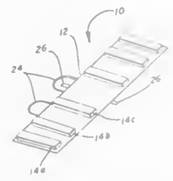
4,915,661
DISC TOY
William F. Getgey, Cincinnati, Ohio, assignor to Tedco, Inc., Hagerstown, Ind.
Filed Feb. 5, 1988, Ser. No. 152,440
Int. Cl.[4] A63H *27/00*; **A63B** *65/00*
U.S. Cl. 446—48 **2 Claims**

1. A flying disc toy which is to be thrown through the air while rotating about the axis of the disc toy and while oriented either horizontally or vertically, and which when thrown while rotating about a vertical axis will maintain its horizontal orientation, and which when thrown while rotating about a horizontal axis will maintain its vertical orientation even when bounced off of a wall or off of a flat horizontal surface, said flying disc toy comprising
a generally planar annular disc having a flange extending from outer periphery, said flange extending an equal distance from each side of said disc, said flange being symmetrical on opposite sides of said disc,
said flange having an outer surface configured to enable said disc toy when oriented vertically to bounce off of a flat surface while maintaining its vertical orientation,



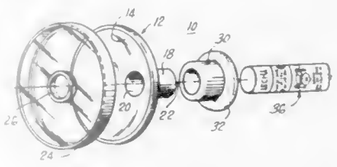
the dimensions of said annular disc toy and the material from which the annular disc is made being such that when the toy is dropped vertically and bounced off its peripheral edge, said toy bounces a minimum of approximately two-thirds of the height from which it was dropped,
said disc being approximately 9 inches in outside diameter and approximately 6 inches in inside diameter,
said annular disc being approximately ¼ inch in thickness and said flange extending approximately ¼ inch from each side of said disc.

4,915,662
MARINE FENDER AND CUSHION DEVICE
David Kent, 1431 Jameston, Springfield, Mo. 65809
Filed Feb. 2, 1989, Ser. No. 305,014
Int. Cl.[4] B63C *9/30*
U.S. Cl. 441—127 **9 Claims**



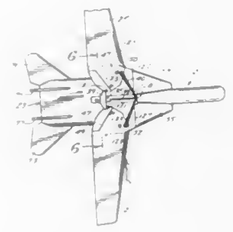
1. An improved foldable marine fender device and cushion combination, comprising in combination,
a base formed by an enlarged rectangular pliable sheet having opposed side edges and a top and bottom edge,
a plurality of paired symmetrical cushioning pads mounted on said base in a patterned spaced apart orientation consisting of at least, a first pair of cushioning pads mounted along the opposed side edges of said base,
a second pair of cushioning pads mounted on said base inwardly from said first pair of cushioning pads a distance equivalent to the overall width of one of said cushioning pads,
at least a third pair of cushioning pads mounted on said base inwardly from said second pair of cushioning pads a distance equivalent to the overall width of two of said cushioning pads,
said cushioning pads being foldable in an internesting relationship one to the other such that said base and cushioning pads are foldable into a compact seat cushion configuration for use as a seat cushion and for storage purposes.

4,915,663
IMAGE EXPANDING APPARATUS
Ronald G. Magers, 5 Allen Ave., Manchester, Mass. 01944
Filed Jul. 20, 1987, Ser. No. 75,770
Int. Cl.[4] A63H *33/32*
U.S. Cl. 446—219 **9 Claims**



1. An optical image generating toy for generating an undistorted image from a distorted image, comprising:
a reflector means;
a central opening disposed in said reflector means;
an image bearing means receivable in said central opening to permit a distorted image carried by said image bearing means to be reflected as a proper image in said reflector means toward a viewer;
said reflector means comprising a reflector having a concave reflecting surface;
said image bearing means comprising a longitudinally movable shaft, movement of which through said opening displays an image upon said reflector.

4,915,664
TOY GLIDER WITH WING CONVERGING MECHANISM
Erik Bakker, 60 Roycroft #39, Long Beach, Calif. 90701
Filed Dec. 22, 1988, Ser. No. 288,773
Int. Cl.[4] A63H *27/00, 33/00*
U.S. Cl. 446—62 **11 Claims**



1. A variable swept wing toy glider comprising:
a wide body horizontally disposed, elongated fuselage formed in its midsection with a longitudinally elongated slot and further formed with oppositely disposed, horizontal, outboard wing support surfaces:
track means in said slot;
a pair of symmetrical elongated wings formed with inboard

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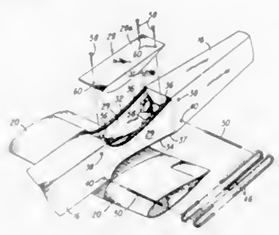
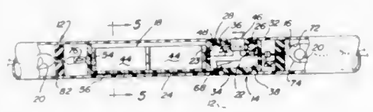
bearing surfaces disposed in opposed relationship to said support surfaces;
pivot pins pivotally connecting said wings to said fuselage;
biasing means to bias the outboard ends of said wings forwardly to respective extended positions;
a pair of drive pins mounted on said wings at a location inboard and rearward of the respective pivot pins;
slider means received in said track means and including laterally projecting drive plate means engaging behind said drive pins and including a downwardly projecting launch hook projecting beneath said fuselage whereby a slingshot type launcher may be connected with said launch hook and actuated to draw said launch hook and slider forwardly in said track means to move said drive plate means forwardly to drive said drive pins forwardly to rotate said wings about the respective pivot pins to overcome the bias of said bias means and retract said wings to their retracted position such that release of said launcher to propel said glider forwardly to an aloft position will free said launch hook and slider such that, as the velocity of said glider slows as it reaches the apex of its flight, the forces holding the wings back in their swept back configuration will be reduced sufficiently to allow the force of said bias means to overcome such forces and allow said bias means to rotate said wings about the respective pivot pins to rotate them forwardly to an extended position.

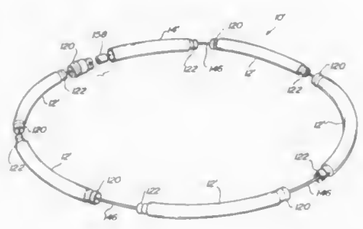
4,915,665
MODEL AIRPLANE INTERCHANGEABLE BETWEEN HIGH WING AND LOW WING
Wong S. Ming, 1001 E. 2nd St., Dayton, Ohio 45402
Filed Feb. 27, 1989, Ser. No. 315,540
Int. Cl.[4] A63H *27/00*
U.S. Cl. 446—66 **14 Claims**



8. A model airplane comprising a fuselage having an upper portion and a lower portion, means forming a recess in the upper portion of the fuselage, means forming a recess in the lower portion of the fuselage, an insert member positionable within the recess in the upper portion of the fuselage and positionable within the recess in the lower portion of the fuselage, each recess having given dimensions, the insert member having dimensions which are substantially the same as the given dimensions of each recess, whereby the insert member substantially fills the recess within which the insert member is positioned, a wing member positionable within the recess in the upper portion of the fuselage and positionable within the recess at the lower portion of the fuselage, means for attaching the insert member to the fuselage when the insert member is positioned within one of the recesses, and means for attaching the wing member to the fuselage when the wing member is positioned within one of the recesses.

4,915,666
LIGHTED HOOP
John R. K. Maleyko, 609 Belle River Rd., Bell River, Ontario, Canada N0R 1A0
Continuation-in-part of Ser. No. 79,478, Jul. 29, 1987, abandoned. This application Sep. 2, 1988, Ser. No. 239,776
Int. Cl.[4] A63H *33/02*
U.S. Cl. 446—242 **10 Claims**



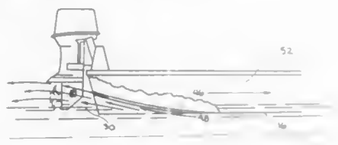


I. A kit for making an entertainment device comprising:
a plurality of tubular members each having a longitudinal axis of arcuate configuration and constructed of translucent plastic material,
a coupling member having a longitudinal axis of arcuate configuration and including a battery compartment with battery contacts at each end thereof,
a switch mounted on said coupling member and being accessible for manual operation externally of said coupling member,
a conductor connected between one of said battery contacts and one terminal of said switch,
an electrical circuit made of flexible wire and having a plurality of LEDs connected therewith and extending through all of said tubular members in succession and having its opposite ends connected to said coupling member whereby the tubular members are strung on said circuit and held captive thereby, said circuit wire being electrically connected with the other terminal of said switch and the other of said battery contacts and having enough slack so that said members can be laid side-by-side,
and each of said members being provided with ends adapted to telescopically mate with the adjacent end of the adjacent member, whereby the members can be assembled to form a hoop.

4,915,667
ELASTIC SOCKET FOR LIGHT BULBS AND FUSES
Jesus E. Tobias-Pader, Montevideo #727, Col. Latinoamericana 252700, Saltillo, Coahuila, Mexico
Filed Jul. 13, 1988, Ser. No. 218,943
Int. Cl.[4] H01R *4/38*
U.S. Cl. 439—257 **1 Claim**

1. A socket for light bulbs and fuses comprising in combination, an open ended metallic cylinder receptacle socket with a longitudinal opening presenting opposed edges about the open end of the cylinder defining an opening and a contact member at an opposite end of the cylinder for receiving said light bulbs and fuses said socket further having a coil spring with two opposed free ends attached across said longitudinal opening of the socket to the opposed edges to restrict the opening size, thereby to frictionally engage and retain light bulbs and fuses in place in the socket by means of said coil spring.

4,915,668
BOAT TUNNEL APPARATUS AND METHOD
Charles R. Hardy, Rte. 2, High Rd., No. 79, San Marcos, Tex. 78666
Filed Aug. 24, 1988, Ser. No. 235,491
Int. Cl.[4] B63H *5/16*
U.S. Cl. 440—69 **8 Claims**



1. A boat tunnel system comprising:
A. a boat with a hull, bow, and stern;
B. a convex tunnel formed in said hull exiting said stern above a water line of said boat so that as said boat travels through water, said water adheres to said convex tunnel as said tunnel exists said stern above said water line and flows upwardly above said water line as said water exits the tunnel at said stern; and
C. a movable motor means, with a propeller, attached to said stern so that as said water exits said convex tunnel and flows upwardly therefrom, said propeller is raised within said upwardly flowing exiting water until said propeller is above said water line.

4,915,669
BALL WITH SWINGABLE INTERNAL WEIGHT
Gordon K. Russell, Islington, Canada, assignor to Pressers International Products Inc., Mississauga, Canada
Continuation of Ser. No. 175,979, Apr. 1, 1988, Pat. No. 4,842,563. This application Mar. 17, 1989, Ser. No. 325,163
Claims priority, application Canada, Mar. 30, 1988, 562984
The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.
Int. Cl.[4] A63H *3/06, 17/00;* **A63B** *37/00*
U.S. Cl. 446—221 **8 Claims**

1. A ball comprising an outer chamber having an outer skin and a first center of volume, an inner chamber, the inner chamber being substantially smaller than the outer chamber and being contained therein, the inner chamber having a second center of volume displaced from said first center of volume, the inner chamber having a body portion and a neck portion, the neck portion extending between the body portion and the outer skin, the neck portion being the only connection between said inner and outer chambers and being flexible for permitting said inner chamber to swing back and forth within said outer chamber about said connection between said inner and outer chambers when said ball is in use, said outer chamber containing air and said inner chamber containing a selected amount of a medium much denser than air, whereby said ball has eccentric and unpredictable flight characteristics.

4,915,670
RADIO EQUIPPED UMBRELLA
Mark S. Nesbit, 1248 - 17th, West Des Moines, Iowa 50265
Filed May 23, 1988, Ser. No. 197,380
Int. Cl.[4] H04B *1/08*
U.S. Cl. 455—344 **47 Claims**

18. An umbrella comprising:
an elongated shaft having a top portion, and a bottom portion;
a canopy having an outside, an inside, and a number of flexible support ribs extending from said shaft at the center of said canopy outwardly to the edges of said canopy, said canopy being attached to the top portion of said shaft and being movable between an open position and a closed position;
an audio signal source attached to the bottom portion of said shaft to form a handle grip wherein said audio signal source includes a tuning control disposed around the circumference of said handle grip;
a speaker assembly attached to the umbrella; and
means for electronically coupling said speaker assembly to said audio signal source.

4,915,671
VIBRATORY SEED CROP HARVESTING METHOD AND APPARATUS
Howard B. Johnson, Woodland, Calif., assignor to Johnson Farm Machinery Co., Inc., Woodland, Calif.
Filed Feb. 1, 1988, Ser. No. 150,698
Int. Cl.[4] A01F *7/04*
U.S. Cl. 460—59 **61 Claims**

1. A method for harvesting a seed crop having kernels carried by plant growth, the method comprising the steps of moving the crop along a surface in a predetermined direction; during the moving step subjecting the crop to cyclical acceler-

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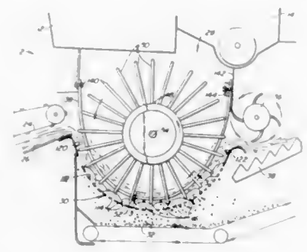
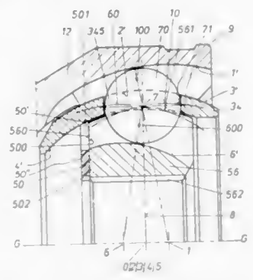
ations and decelerations substantially parallel to said direction and of a sufficient frequency and amplitude to separate the



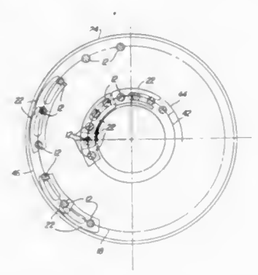
kernels from the plant growth; and segregating the kernels from the plant growth.

4,915,672
CONSTANT VELOCITY FIXED JOINT
Sobhy L. Girguis, Magdalenenstrasse 19, D-5210 Troisdorf-Oberlar, Fed. Rep. of Germany
Filed Jul. 1, 1988, Ser. No. 214,335
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1987, 3721775
Int. Cl.[4] F16D *3/23*
U.S. Cl. 464—145 30 Claims



1. A constant velocity fixed joint with three main parts comprising two transmitting parts and a cage, said transmitting parts comprising a hollow outer part having races on its internal surface and an inner part having corresponding races on its external surface, with balls disposed in said races for torque transmission, said cage being located in the space between said transmitting parts and having windows therein holding the centers of said balls in a ball plane, the points of contact of said balls with said races lying on one side of said ball plane at least for one direction of torque and in the straight position of the joint, said main parts being adapted for relative angular travel about a joint center by means of an external centering surface angularly displaceable with said inner part coacting with an internal centering surface angularly displaceable with said cage and an external centering surface angularly displaceable with said cage coacting with an internal centering surface angularly displaceable with said outer part, wherein one said centering surface (**50'**, **20'**, **30'**, **40'**) is associated with a supporting disk (**50**, **20**, **30**, **40**) angularly displaceable with one of said main parts (**56**, **12**, **34**) on which said one main part (**56**, **12**, **34**) is axially supported but radially displaceable.

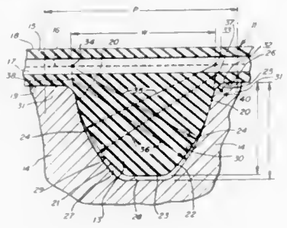
4,915,673
VARIABLE DIAMETER PULLEY HAVING EXTENDIBLE ELEMENTS
Werner Krude, Oxford, Mich., assignor to GKN Automotive, Inc., Auburn Hills, Mich.
Filed Jun. 13, 1989, Ser. No. 365,555
Int. Cl.[4] F16H *7/06*, *55/52*
U.S. Cl. 474—49 20 Claims



1. A variable diameter pulley having a pair of spatially separated side members, a plurality of belt support members supported between said spatially separated side members in a circular pattern, and means for radially displacing said belt support members between a maximum and a minimum radial position, an improvement comprising:

a plurality of extendible elements, at least two of said extendible elements of said plurality of extendible elements being pivotably connected to each of said belt support members and slidably connected to at least one adjacent belt support member, each said extendible element of said plurality of extendible elements having a convex external surface providing a generally cylindrical surface for engagement by a drive belt.

4,915,674
TOOTHED DRIVE BELT
Hiroyuki Tanaka, Hyogo; Hideo Hirai, Kakogawa; Kazumi Kawai, Hyogo, and Tsuneo Shaura, Hyogo, all of Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan
Filed Jul. 21, 1988, Ser. No. 222,629
Claims priority, application Japan, Sep. 14, 1987, 62-231688
Int. Cl.[4] F16G *1/28*, *7/02*
U.S. Cl. 474—153 32 Claims



1. In a belt drive having a toothed pulley and a cooperating toothed belt,

said pulley defining a circumferential array of pulley teeth separated by intermediate grooves each defining a bottom,

each said pulley tooth defining a tooth tip and opposite side flanks extending inwardly from said tip into said pulley grooves,

each said pulley flank having a height,

said belt defining a plurality of longitudinally spaced belt teeth separated by intermediate belt grooves,

said belt teeth being adapted to be received selectively in said pulley grooves,

each belt tooth defining a tooth tip and opposite side flanks extending outwardly from said belt tooth tip into said belt grooves,

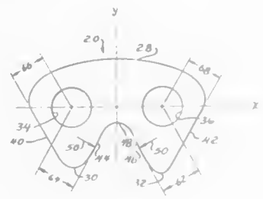
said belt tooth flanks each having a height and an arcuate configuration traced by an arc centered on a first axis transverse to the belt substantially the entire belt tooth flank height,

said pulley tooth flanks being arcuate and traced by an arc centered on a second axis transverse to the belt over substantially the entire height of the pulley tooth flank,

said second axis being spaced from the location of said first axis when the belt tooth is fully received in said pulley groove,

said location of said second axis and the configuration of said belt teeth and pulley grooves being preselected to cause the flanks of the belt teeth to be juxtaposed to said pulley tooth flanks at the other end of the belt tooth flanks and become gradually increasingly spaced from the pulley tooth flanks inwardly from adjacent said outer end of the belt tooth flanks to adjacent the bottom of the pulley groove.

4,915,675
PITCH EQUALIZED CHAIN WITH FREQUENCY MODULATED ENGAGEMENT
Stellios A. Avramidis, 2028 Foxcliff North, Martinsville, Morgan County, Ind. 46151
Filed Feb. 28, 1989, Ser. No. 316,776
Int. Cl.[4] F16G *13/04*
U.S. Cl. 474—213 27 Claims



1. A power transmission chain including a plurality of plain links arranged in side by side relationship to form a plurality of ranks of links, each of said plain links having apertures disposed about horizontal and vertical axes of the links,

a plurality of guide links having apertures disposed about horizontal and vertical axes thereof, said guide links being mounted on distal ends of pins connecting first alternate ranks of said plain links so as to form a guide link row, the other alternate ranks of said plain links being effective to form an articulated link row,

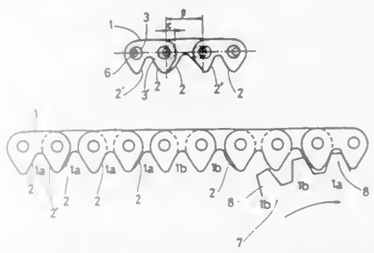
a plurality of guide link rows and a plurality of articulated rows being interweaved and interconnected by said pins to form said chain, comprising

said plurality of said plan links in each said guide link row being disposed between said guide links,

said plurality of guide links in each said guide link row each being equal in thickness and having a kidney shaped configuration that avoids any peripheral discontinuity and are formed having a mass disposed below a horizontal axis substantially greater than a mass disposed above said horizontal axis,

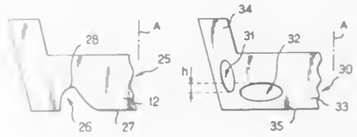
whereby when said chain is subjected to a load, said configuration and said thickness of said guide links cause the guide links to elongate substantially similarly to said plain links in each of said guide link rows thereby preventing deformation of said connecting pins and maintaining said pins substantially parallel to each other.

4,915,676
POWER TRANSMISSION CHAIN
Akiyoshi Komeya, Kaga, Japan, assignor to Daido Kogyo Co., Ltd., Kaga, Japan
Filed Feb. 22, 1989, Ser. No. 314,092
Claims priority, application Japan, Jun. 15, 1988, 63-78355[U]
Int. Cl.[4] F16G *13/06*
U.S. Cl. 474—213 5 Claims



1. A power transmission chain of the type which is formed of a series of articular units engaging sprocket teeth, each unit consisting of a number of interleaved links having a couple of pin-receiving holes at predetermined intervals and pivotally connected to links of adjacent units by pins loosely fitted in the pin-receiving holes, the links being engageable with said sprocket teeth for power transmission, wherein said links are formed of an asymmetrical shape in the direction of the pitch line and relative to a center line through a median point between said pin-receiving holes first and second inner flanks defining a crotch portion of said link, said first flank being bulged toward said second opposite inner flank and being connected in a reversed direction to adjacent links so as to provide a link mechanism which differs from other adjacent links in meshing engagement with said sprocket teeth.

4,915,677
FORCE RESOLVING V BELT
Jean-Michel Simon, Clamart, France, assignor to Hutchinson, Paris, France
Filed Aug. 12, 1988, Ser. No. 231,478
Claims priority, application France, Aug. 13, 1987, 87 11529
Int. Cl.[4] F16H *1/22*
U.S. Cl. 474—242 14 Claims



1. An endless belt for use with a pulley having inclined interior walls comprising a longitudinal reinforcement formed by at least one tension resistant member having a high tensile strength, a plurality of spaced apart transverse elements having a generally trapezoidal form, each such transverse element including a base having an inner edge and two lateral fins inclined with respect to the base, each fin having a side for engaging the pulley, an elastomer provided between at least a portion of said transverse elements and longitudinal reinforcement to join together such elements and said at least one tension resistant member, said transverse elements are including

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means for rendering the transverse element deformable under lateral compression force, said deformable means being positioned symmetrically on said transverse element with respect to a longitudinal plane thereof and adjacent said fins and said inner edge so that, during operation, the resultant of bearing reaction forces of the interior wall of the pulley acting on said transverse elements is very close to a mean force transmission line of the longitudinal reinforcement which forms substantially a neutral axis of the belt.

4,915,678

BOX FORMING EQUIPMENT

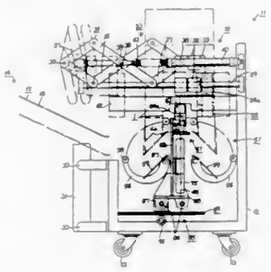
Shigeru Morita, Iruma, Japan, assignor to Nippon Flute Co., Ltd., Irumagun, Japan

Filed Jul. 27, 1988, Ser. No. 224,843

Claims priority, application Japan, Jul. 27, 1987, 62-114873[U]

Int. Cl.[4] B31B *1/76, 1/60*

U.S. Cl. 493—116 **7 Claims**



1. A compact box forming apparatus for erecting from a folded, generally flat, storage condition to a generally rectangular erect condition a box having opposing end walls and opposing side walls and at least opposing bottom end edges and opposing bottom side edges connected to the opposing end walls and opposing side walls respectively and the bottom edges being operable to be folded into a bottom surface of the box with a bottom seam, said box forming apparatus comprising:

a frame;

means connected to said frame for raising a box material from a folded, generally flat storage condition into a generally rectangular shape with at least open, and mutually opposing, bottom end edges and open, and mutually opposing, bottom side edges at a box forming station;

means connected to said frame for folding the open, mutually opposing, bottom end edges toward each other at said box forming station;

means connected to said frame for folding open, mutually opposing, bottom side edges toward each other at said box forming station following folding of the open, mutually opposing, bottom end edges toward each other; and

means connected to said frame for applying box adhering tape onto the box along the bottom seam, said means including

reciprocating tape means for being driven beneath the box with its folded bottom end and side edges positioned at said box forming station and for applying a strip of adhering tape, at said box forming station, said reciprocating tape means beginning movement at an initial position at least partially upon an end wall of the box, said reciprocating tape means continuing movement along a bottom seam extending between the opposing bottom side edges and upon each of the opposing bottom side edges, and completing its movement at least partially upon an opposing end wall of the box to secure the bottom of the box in an erect condition and said reciprocating tape means returning to said initial position.

4,915,679

MANUFACTURING METHOD OF PLEATED MULTILAYER BAG

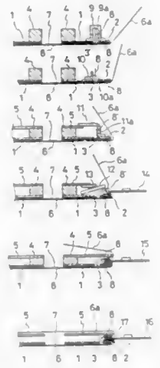
Toyokichi Gotou, Souka, Japan, assignor to Newlong Machine Works, Ltd., Tokyo, Japan

Filed Nov. 10, 1988, Ser. No. 269,764

Claims priority, application Japan, Jun. 4, 1988, 63-136645

Int. Cl.[4] B31B *39/02, 39/26*

U.S. Cl. 493—217 **8 Claims**



1. A method of manufacturing a pleated multilayer bag, comprising the steps of:

preparing a tubular synthetic resinous film collapsed flatly, each of opposite side edges of the collapsed film being folded inwardly to form a pair of pleats extending along the side edge;

superimposing said film upon an outer-layer bag material;

transporting said film and said outer-layer bag material, superimposed one upon the other, while setting only one of the pair of pleats at each side edge of said film substantially normal to the rest of the film to form an upstanding section;

subsequently, folding back opposite side portions of said outer-layer bag material respectively toward the upstanding sections at the respective side edges of said film;

folding down the upstanding pleat at each side edge of said film toward the other pleat at the corresponding side edge;

forcing a part of each of the opposite side portions of said outer-layer bag material, into a space between the pair of pleats at a corresponding one of the opposite side edges of said outer-layer bag material; and

folding the opposite side portions of said outer-layer bag material over said film in such a manner that the folded side portions of said outer-layer bag material extend along an outer surface of said film said succession of steps being performed with said film and said pairs of pleats thereof being maintained in their collapsed state,

wherein the upstanding pleats at the respective side edges of said film are transported in such a manner that the upstanding pleats are inserted respectively into a pair of engaging grooves defined respectively between a pair of lower guide plates and a pair of side guide plates, and the upstanding pleats at the respective side edges of said film are caused to pass respectively through a pair of recesses which open downwardly, each of said pair of recesses being defined by a support frame which is mounted to an upper surface of a corresponding one of said pair of lower guide plates and an upper surface of a corresponding one of said pair of side guide plates.

4,915,680

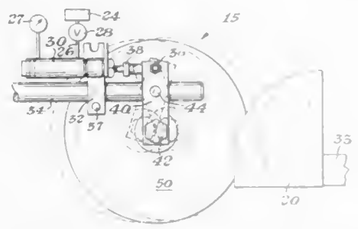
FLOATING ADUSTABLE GUSSETING WHEEL

Robert J. Nestle, Essexville, and David A. Barker, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 21, 1988, Ser. No. 260,644

Int. Cl.[4] B65H *45/22*

U.S. Cl. 493—417 **11 Claims**



1. Apparatus for introducing a gusset into a sequentially advancing, continuous, folded-over web of plastic film of varying width, comprising aligned and spaced-apart receiving plates over which the film web passes, a protruding plate located generally equidistantly between the receiving plates and generally parallel thereto and around which the film web is intended to pass, a pneumatic biasing means for applying a substantially constant pressure to the film web to form said gusset when the web width changes during advancement of the web, and a means for connecting the protruding plate to the biasing means.

4,915,681

CENTRIFUGAL SEPARATOR WITH CONTINUOUS DISCHARGE

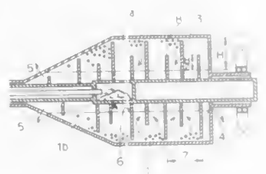
Tomio Suzuki, Tokyo, Japan, assignor to Nishihara Environmental Sanitation Research Corporation, Tokyo, Japan

Filed Feb. 28, 1989, Ser. No. 316,793

Claims priority, application Japan, Feb. 29, 1988, 63-44424

Int. Cl.[4] B04B *1/20*

U.S. Cl. 494—54 **15 Claims**



1. A centrifugal separator for separating a liquid from a slurry, with continuous discharge, comprising:

a rotating bowl having a peripheral outer wall defining a space for accumulation of the slurry therein, said bowl rotating about an axis, said bowl having a first shaft hole at one end thereof and a second shaft hole at a second opposite end thereof;

a screw shaft extending along said axis in said bowl and received in said first and second holes and having a slurry inlet orifice which is in communication with said space,

said outer wall having a sludge discharge port in the vicinity of said first shaft hole and a liquid discharge port in the vicinity of said second shaft hole;

a screw positioned inside said rotating bowl concentrically therewith and including said screw shaft and a screw vane having a pitch, said screw vane rotating about said axis substantially in the same direction as said bowl but at a different speed from said rotating bowl; and

at least one baffle plate radially extending within the pitch of the screw vane in said space,

said at least one baffle plate having a tip end positioned radially outward of said liquid discharge port.

4,915,682

CENTRIFUGAL SEPARATOR

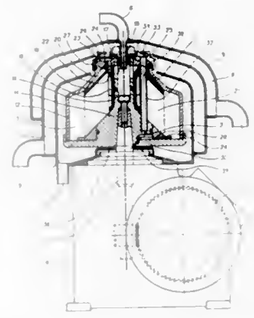
Klaus Stroucken, Rönninge, Sweden, assignor to Alfa-Laval Separation AB, Tumba, Sweden

Filed Sep. 27, 1988, Ser. No. 249,498

Claims priority, application Sweden, Oct. 13, 1987, 8703966

Int. Cl.[4] B04B *1/08*

U.S. Cl. 494—70 **10 Claims**



1. A centrifugal separator for the separation of two components from a liquid mixture comprising a rotor body having a central inlet chamber and a separation chamber, said separation chamber having two ends, an inlet for the liquid mixture to be separated, and at least one outlet for a separated component of said mixture, a plurality of conical separation discs positioned in said separation chamber coaxially with said rotor, each of said discs having an apex portion and a base portion, the base portions of said discs facing one end of the separation chamber and the apex portions facing the other end, a partition member arranged between the separation discs and the rotor body, said partition member forming, with a part of the rotor body, inlet passages connecting said central inlet chamber with said separation chamber at the end of the separation chamber towards which the apex portions of the separation discs face, a plurality of holes in said partition member and corresponding holes in the body of said rotor, and a plurality of tubular members sealingly connected to the partition member and the rotor body around said holes, said tubular members forming closed outlet channels from the separation chamber, said channel extending in a direction transverse to the inlet passages extending between the inlet chamber and the separation chamber.

4,915,683

ANTIVIRAL METHOD, AGENTS AND APPARATUS

Fritz Sieber, Brookfield, Wis., assignor to The Medical College of Wisconsin, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 933,697, Nov. 21, 1986, Pat. No. 4,775,625. This application Mar. 10, 1987, Ser. No. 24,150

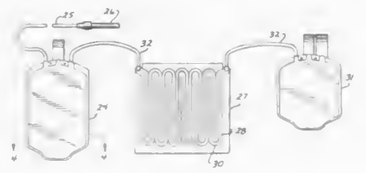
The portion of the term of this patent subsequent to Oct. 4, 2005, has been disclaimed.

Int. Cl.[4] A61M *37/00;* **C12N** *7/06*

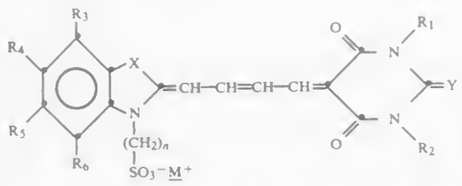
U.S. Cl. 604—4 **3 Claims**

1. The method of treating a body fluid to inactivate viruses therein which comprises first bringing said body fluid into contact with an effective amount of a photosensitizing agent which selectively binds to enveloped viruses and enveloped

virus infected cells and then exposing the combination of body fluid and agent to visible light to photosensitize and inactivate



the enveloped viruses in said body fluid said photosensitizing agent having the following formula:



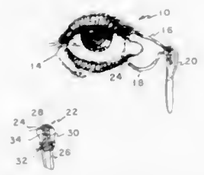
in which n is 1-5, x is oxygen (0), sulfur (S), $-CR_1R_2-$ or selenium (Se); y is O or S, M is alkali metal or other basic group; R_1 and R_2 are the same or different alkyl groups of 1 to 8 carbon; and, R_3, R_4, R_5 and R_6 are selected from hydrogen, lower alkyl group of 1 to 5 carbons, lower alkoxy groups of 1 to 5 carbon atoms, phenyl lower alkyls; or R_3 and R_4, or R_4 and R_5, or R_5 and R_6 are part of an aromatic ring.

4,915,684

METHOD AND APPARATUS FOR MODULATING THE FLOW OF LACRIMAL FLUID THROUGH A PUNCTUM AND ASSOCIATED CANALICULUS

Donald L. MacKeen, P.O. Box 40813, Washington, D.C. 20016, and Hans-Walter Roth, 73 Im Grund, D-79-VLM-10, Fed. Rep. of Germany

Filed Jun. 21, 1988, Ser. No. 209,601
Int. Cl.[4] A61M *27/00*
U.S. Cl. 604—8 **12 Claims**



1. A lacrimal fluid modulating device for controlling the flow of the lacrimal fluid through the punctum and associated canaliculus of a human eye comprising:

a generally cylindrical body member having an axial bore extending from a first, inlet, end of said generally cylindrical body to a second, outlet, end thereof;

an arcuate head member fashioned at said first end of said generally cylindrical body, said arcuate head member having,

a bore coaxial with the bore of said generally cylindrical body, and

the exterior diameter of said arcuate head member being greater than the exterior diameter of said generally cylindrical body member;

means peripherally fashioned about the exterior surface of said generally cylindrical body member at said second end of said body member, for facilitating placement of said generally cylindrical body member through a punctum of a patient and for retaining said cylindrical body member within an associated canaliculus; and

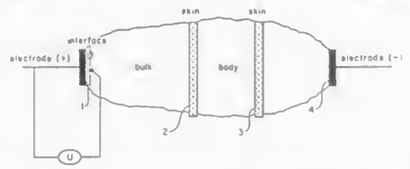
said axial bore extending completely through said generally cylindrical body member to operably modulate the flow of lacrimal fluid through the punctum and associated canaliculus and thus enhancing the retention of lacrimal fluid within the eye of a patient.

4,915,685

METHODS AND APPARATUS FOR IONTOPHORESIS APPLICATION OF MEDICAMENTS AT A CONTROLLED PH THROUGH ION EXCHANGE

Tomasz J. Petelenz, 623 University Village, Salt Lake City, Utah 84108; Stephen C. Jacobsen, 274 S. 1200 East, Salt Lake City, Utah 84102; Robert L. Stephen, 2501 Kensington Ave., and Jiri Janata, 2231 Logan Ave., both of Salt Lake City, Utah 84108

Continuation-in-part of Ser. No. 841,329, Mar. 19, 1986. This application Jun. 19, 1987, Ser. No. 64,769
Int. Cl.[4] A61N *1/30*
U.S. Cl. 604—20 **14 Claims**



1. A method for iontophoretically administering a medicament through the skin of a patient while simultaneously removing competing ions from the medicament medium, the method comprising the steps of:

(a) obtaining an ion exchange matrix and a drug comprising medicament ions which are insoluble in an iontophoresis medium and complementary ions;

(b) obtaining a first electrode and a second electrode;

(c) obtaining an iontophoresis medium;

(d) placing the ion exchange matrix and the drug in communication with iontophoresis medium such that the medicament ions are precipitated onto the ion exchange matrix;

(e) placing the first electrode in communication with the iontophoresis medium;

(f) placing the iontophoresis medium in communication with the patient such that the medium is disposed between the first electrode and the skin of the patient;

(g) placing the second electrode in communication with the skin of the patient at a point distal from the first electrode; and

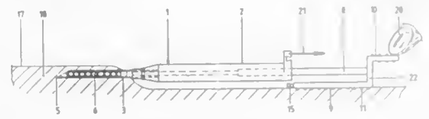
(h) creating an electrical voltage difference between the first and second electrodes, said voltage difference causing the electrolysis reaction of water, the products of the electrolysis of water acting to solubilize the medicament such that the medicament ions are transported through the skin of the patient, while an approximately constant pH is maintained within the iontophoresis medium.

4,915,686

IMPLANT INJECTION DEVICE

Mervyn J. Frederick, Eh Oss, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Jul. 28, 1988, Ser. No. 225,451
Claims priority, application Netherlands, Aug. 18, 1987, 8701934
Int. Cl.[4] A61M *37/04*
U.S. Cl. 604—60 **36 Claims**



1. An injection device for injecting a controlled drug release implant beneath a subject's skin, comprising:

a housing, said housing having an injection needle mounted on one end thereof and collinearly therewith to form a single unit, both said housing and needle having hollow, communicating centers:

an implant being disposed within the hollow center of the housing and needle unit, and

a plunger disposed within the hollow center of said housing and displaceable in an axial direction toward said needle to interact with said implant and provided with an actuating element, said actuating element including means extending axially on opposite sides of said element for alternately supporting and pressing said element against or on skin to be treated so as to maintain said plunger in a steady position with respect to said implant despite collinear relative movement of said housing and needle unit.

4,915,687

NEEDLELESS INJECTION PORT ARRANGEMENT

George A. Sivert, 7211 Columbia Ave., Louisville, Ky. 40222

Filed Feb. 17, 1989, Ser. No. 311,800
Int. Cl.[4] A61M *5/00, 37/00*
U.S. Cl. 604—83 **8 Claims**

1. A needleless injection port arrangement adapted for use in an intravenous fluid system including an upstream intravenous fluid supply tube, a downstream intravenous fluid supply tube, and a syringe containing fluid medicants wherein said arrangement comprises:

a valve housing unit disposed intermediate both the upstream and downstream intravenous supply tubes wherein the valve housing unit comprises a dual port upper valve housing member operatively connected to a single port lower valve housing member; and,

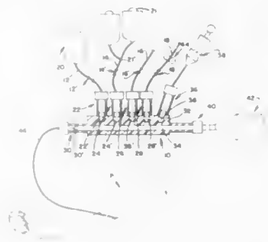
a valving unit operatively disposed intermediate the upper and the lower valve housing members wherein the valving unit comprises: a valve support member captively engaged between the upper and the lower valve housing members and having a central recess formed therein; a resilient biasing member having one end dimensioned to be received and supported in said central recess; and, a valve head member having a central recess formed in the lower end; wherein, the central recess in the valve head member is dimensioned to receive the other end of said resilient biasing member.

4,915,688

APPARATUS FOR ADMINISTERING SOLUTION TO A PATIENT

Reinhard Bischof, deceased, late of Baldham, and by Ursula Bischof, heiress, Gelsenkirchen, both of Fed. Rep. of Germany, assignors to Baxter International Inc., Deerfield, Ill.

Filed Dec. 3, 1987, Ser. No. 128,655
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—83 **14 Claims**



1. Apparatus for administering medicinal or nutritional solutions, comprising:

a multiway valve having a one-piece valve body, said valve body having a plurality of inlets, a collecting reservoir, and an outlet; each of said inlets allowing flow only from the inlet to said collecting reservoir; said outlet being connectable to a patient, said outlet having a non-return valve allowing flow only from said collecting reservoir to outside said valve;

4,915,689

PARENTERAL DELIVERY SYSTEM COMPRISING A VIAL CONTAINING A BENEFICIAL AGENT

Felix Theeuwes, Los Altos, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 620,371, Jun. 13, 1984, abandoned. This application Feb. 24, 1986, Ser. No. 832,194
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—83 **16 Claims**

1. A method for the administration of a beneficial agent to a warm-blooded animal which method comprises:

(a) admitting into the animal an agent delivery member in fluid communication with the parenteral delivery system, the delivery system comprising:

(1) a reservoir of a pharmaceutically acceptable medical fluid;

(2) a vial containing a pharmaceutically acceptable beneficial solid agent selected from the group consisting of dry, spray-dried and lyophilized beneficial agents that dissolve in the presence of an incoming medical fluid;

(3) a rigid manifold that provides fluid communication between the reservoir and the vial and which is capable of supporting at least one of the reservoir and the vial and comprises an internal conduit for conveying fluid therethrough;

(b) permitting fluid to flow from the reservoir through the manifold into the vial to form in the vial a medical solution containing beneficial agent; and,

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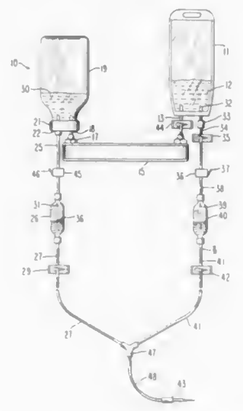
(c) administering the agent to the animal by letting the medical solution comprising the beneficial agent flow from the



vial to the delivery member, thereby administering the agent to the animal.

4,915,690

MICRO-INJECTION PORT

Lori L. Cone; Arthur L. Rosenthal, both of Cranston, R.I., and Michael A. Nadeau, Attleboro, Mass., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Feb. 2, 1988, Ser. No. 151,406
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—93 23 Claims

1. An implantable subcutaneous injection port comprising,
a rigid housing, said housing having a substantially flat top wall, a substantially flat bottom wall and a side wall connecting the periphery of said top and bottom walls,
means defining an injection chamber in said rigid housing,
an opening in said side wall,
a septum captured by said housing and sealing said opening in said side wall, said septum having a puncture area occupying a substantial portion of the projected side wall area of the housing when viewed along the centerline of the septum, and
an exit port communicating with said chamber and passing through said side wall.

4,915,691

ASPIRATOR

Charles A. Jones, and George E. Sinko, both of San Antonio, Tex., assignors to Gesco International, Inc., San Antonio, Tex.

Continuation of Ser. No. 47,727, May 7, 1987, abandoned. This application Aug. 22, 1988, Ser. No. 235,720
Int. Cl.[4] A61M *1/66*
U.S. Cl. 604—73 15 Claims

1. A handheld medical aspirating apparatus comprising:
a body member having a pistol grip-like shape for holding in one hand and a cavity therethrough;
means forming one opening of the cavity in said body member for receiving a standard catheter connector therein for suctioning liquid from the body of a patient;
means forming a second opening of the cavity in said body member for connecting the body member to a vacuum source;
a vacuum control means positioned at the upper portion of the body member for engagement by the thumb when said body member is held in the hand of the user;

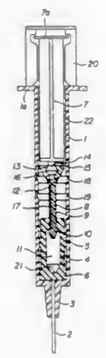
removable vial means sealingly connected to the bottom of said body member for receiving and collecting liquid from the body of a patient; and
means for deflecting liquid pulled into the cavity in said body member by the vacuum source downwardly into the vial and for preventing liquid from being drawn into said vacuum source connecting means when said body member is held in a generally upright position.

4,915,692

NON-REUSABLE SYRINGE

Jacques Verlier, 16, rue Michel-Servet, 1206 Geneve, Switzerland

Filed Dec. 29, 1988, Ser. No. 291,572
Claims priority, application Switzerland, Dec. 30, 1987, 5103/87; PCT Int'l Appl., Dec. 12, 1988, PCT/EP88/01141
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—110 19 Claims



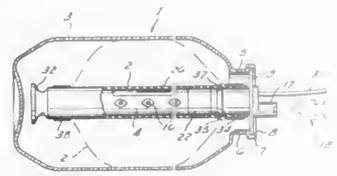
1. A non-reusable syringe having a hollow syringe barrel with a first open end adapted for receiving a hypodermic needle and a second open end opposite said first end, a plunger assembly reciprocal in said syringe barrel, said assembly comprising a plunger rod and a piston member, said plunger rod comprising resilient blocking means having at least one peripheral portion tending to be applied to the inside wall of said syringe barrel, said inside wall having at least a first recess with a substantially sharp edge, said recess extending from said edge towards said first open end of the syringe barrel, said peripheral portion of said resilient means being arranged so as to be capable of becoming engaged with said edge to prevent a retraction of the plunger rod in the direction of said second open end of the syringe barrel beyond a position in which said peripheral portion is engaged with said edge, said side plunger rod having a first end portion extending through said second open end of the syringe barrel, and a second end portion which is slidably connected with said piston member so as to allow a limited relative movement of said second end portion of said plunger rod with respect to said piston member.

4,915,693

PRESSURIZED FLUID DISPENSER

Stephen R. Hessel, Poway, Calif., assignor to Baxter International, Inc., Deerfield, Ill.

Continuation of Ser. No. 935,021, Nov. 26, 1986, Pat. No. 4,769,008. This application Sep. 2, 1988, Ser. No. 240,757
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—132 5 Claims



1. An infusion pump for delivering a quantity of fluid material at a substantially constant flow rate, comprising:
an elongate elastomeric bladder having a central lumen and at least one open end;
an elongate stress member means of substantially constant diameter extending continuously throughout and along the length of and within the lumen of the bladder, and having a fluid-tight seal to the bladder;
a filling port in the stress member means in communication with the lumen of the bladder through a first lumen extending through the stress member means; and
an exit port in the stress member means in communication with the lumen of the bladder through a second lumen extending through the stress member,
the stress member means acting to minimize pressure surging at the terminal end of the deflation cycle, by having a diameter that is from 1.1 to 2.0 times the unstressed internal diameter of the bladder, an axial length of the bladder at the fluid-tight seal which is substantially unchanged upon filling the fluid material.

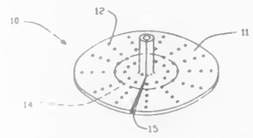
4,915,694

ANTIMICROBIAL WOUND DRESSING AND SKIN FIXATOR FOR PERCUTANEOUS CONDUITS

Ronald Yamamoto; Stanley R. Conston, both of Redwood City, and Sophia Pesotchinsky, Palo Alto, all of Calif., assignors to Vitaphore Corporation, Menlo Park, Calif.

Filed Oct. 2, 1987, Ser. No. 104,460
Int. Cl.[4] A61F *13/02*
U.S. Cl. 604—180 4 Claims

1. An antimicrobial catheter shield comprising a central elastomeric collar having a longitudinal orifice and having one end of said collar orthogonally disposed to a planar, elastomeric, porous, peripheral flange, said flange extending around said end of said collar, an absorbent patch comprising collagen and containing an antimicrobial agent peripherally and centrally attached to the surface of said flange opposite to said collar, said collagen serving as an antimicrobial drug reservoir and said antimicrobial agent selected from the group consisting of chlorhexidene and silver salts, the maximum dimensions of said patch being less than the maximum dimensions of said flange;
wherein a radial slit extends through said collar, flange and patch from said longitudinal orifice of said collar to the outer edge of said flange to provide a lateral insertion route of a catheter into said collar;



said collar adapted with means for securing said collar around a catheter to prevent longitudinal motion of said catheter through said collar;
a pressure-sensitive adhesive coating on the lower surface of said flange; and
one or more tabs removably adherent to said pressure-sensitive coating and at least coextensive with said flange and cofacial to said patch.

4,915,695

MULTIPLE BARREL SYRINGE

David C. Koobs, 982 West Brevard St., Apt. G6, Tallahassee, Fla. 32304

Filed Sep. 12, 1988, Ser. No. 242,816
Int. Cl.[4] A61M *5/18*
U.S. Cl. 604—191 10 Claims

1. A multiple barrel syringe for selective dispensing of fluids comprising:
a body having a plurality of pie shaped bores therein, said body pie shaped bores being open at one end and narrowing at the other end into separate smaller bore opening at the other end thereof and said smaller bores converging together into one bore;
a plurality of plungers, each plunger being adapted to fit into one said pie shaped bore of said body and each plunger having a plurality of ratchet teeth thereon, each of said plurality of plungers having a pie shaped cross-section matching said pie shaped bore in said body and a pie shaped resilient seal on the end thereof;
a plurality of pawls formed on said body, one pawl positioned adjacent each body pie shaped bore one end for selectively engaging said ratchet teeth on the adjacent

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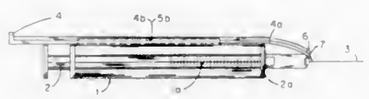
plunger whereby a plurality of fluids each of different amounts can be injected from the same syringe.

4,915,696
SAFETY SYSTEM FOR HYPODERMIC SYRINGE AND NEEDLE

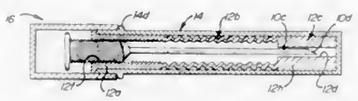
Michael P. Feimer, 13627 Hascall, Omaha, Nebr. 68114
Filed Jun. 20, 1988, Ser. No. 208,682
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—192 **4 Claims**



1. A retrofit system for securing a hypodermic syringe and needle after use, to prevent accidental pricking of patients or medical professionals, etc., and to prevent unintended leakage of fluid from the syringe portion of the hypodermic through the attached needle comprising a guide, which attaches longitudinally to the barrel of the syringe; which guide provides an internal space into which a needle securing plunger can slide; which needle securing plunger, at the syringe end, thereof, has a head portion suitable for application of pressure by a user's thumb or finger, etc., followed by, as the length of the needle securing plunger is transversed, a tapering width dimension, which width dimension, becomes a smaller constant width as one follows the needle securing plunger toward the distal needle end thereof, which constant width is slightly smaller than the width of the space in the guide so that the needle securing plunger can slide into said guide; which guide and needle securing plunger further comprise teeth on the outer side of the needle securing plunger and on the inner side of the guide so that when the needle securing plunger is slid into the guide the teeth thereon move past the teeth in the guide, so that the needle securing plunger will not thereafter easily slide back out of the guide; which needle securing plunger further comprises, at the distal end thereof, a needle pocket on the bottom side thereof and a "v" shaped needle guide structure as viewed from the top or bottom of the needle guide structure; and which needle securing plunger is constructed so as to have a natural spring or tendency to curve toward the needle as the needle securing plunger is caused to move through the guide when pressure is applied to the head of the needle securing plunger, so that the needle pocket will naturally move to encompass the needle point as the needle securing plunger is caused to move as just described.

4,915,697
HYPODERMIC NEEDLE ASSEMBLY

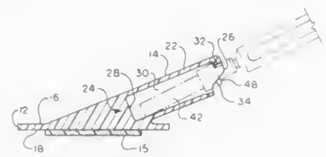
Frank DuPont, 4495 Clarke Dr., St. Clair, Mich. 48079
Continuation of Ser. No. 170,680, Mar. 16, 1988, abandoned, which is a continuation of Ser. No. 33,657, Apr. 3, 1987, abandoned. This application Apr. 18, 1989, Ser. No. 339,960
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—192 **21 Claims**



1. A needle assembly comprising:
(a) an injection needle including a relatively large diameter hollow base portion and a relatively small diameter hollow shaft portion extending downwardly from said base portion and including a lower end portion terminating in a pointed tip; and
(b) an elongated unitary sleeve sized to fit telescopically over said needle and including an axially and radially rigid upper mounting portion sized to mount over said needle base portion and including means for coaction with said base portion to detachably secure said sleeve to said base portion, an axially collapsible intermediate portion formed integrally with said upper mounting portion and having a normal extended condition and a collapsed condition to respectively provide a relatively long and a relatively short overall length for said sleeve, and an axially and radially rigid lower portion formed integrally with said intermediate portion and defining an axially extending central bore, of constant length and diameter irrespective of the extended or collapsed condition of said intermediate portion, opening to the atmosphere centrally in the lower end of said sleeve and sized to telescopically but loosely slidably receive said needle lower end portion and positioned, with said upper sleeve portion mounted over said needle base portion and said intermediate portion in its axially extended condition, in surrounding relation to said needle end portion with said pointed tip spaced upwardly from the open lower end of said bore.

4,915,698
DEVICE FOR REMOVING AND REPLACING NEEDLE COVER ON SYRINGE

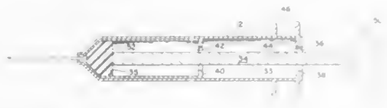
Myron F. Levenson, Timberidge Trail, Gates Mills, Ohio 44040
Filed Jul. 8, 1988, Ser. No. 216,777
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—192 **9 Claims**



1. A needle cover removing and replacing device for removing and replacing a cover on a needle of a syringe, said cover having an elongated, generally cylindrical tubular body and including a closed end, an opened end for receiving said needle and a lip adjacent the open end, said device comprising:
a securable surface for being secured to a separate surface,
a generally hollow member having an open end dimensioned to receive axially a needle cover, and an inner surface defining an elongated cavity having an inner transverse dimenson slightly larger than the maximum diameter of said needle cover to be received therein;
barrier means within said cavity a predetermined distance from said open end to limit receipt of said cover within said cavity; and
tab means extending inwardly from said inner surface of said hollow member, said tab means being dimensioned to allow insertion of said cover into said cavity when said cover is urged away therefrom and said tab means being operable to engage said lip on said cover when said cover is within said cavity and to restrict removal of said cover therefrom when said cover is urged thereagainst, said cover being retained in said cavity after removal from said syringe when said syringe is drawn away from said device.

4,915,699
SYRINGE

Elliot Kornberg, 650 N. Atlantic Ave., Penthouse #5, Cocoa Beach, Fla. 32931
Filed Oct. 19, 1988, Ser. No. 259,709
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—195 **11 Claims**

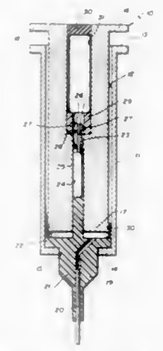


1. A syringe assembly comprising:
(a) an elongated outer casing having a longitudinal axis, a forward end, a rearward end, an exterior surface and an interior surface with said interior surface defining an interior space;
An elongated inner chamber slideably received within the interior space in said outer casing along said longitudinal axis, said inner chamber having a forward end, a rearward end, an exterior surface and an interior surface with said interior surface defining a hollow interior, and said inner chamber including abutment means positioned at the rearward end of said inner chamber;
(c) a plunger with a sealing plug attached to one end, said sealing plug adapted to slide within the hollow interior of said inner chamber between the forward end and said abutment means at the rearward end of said inner chamber such that said inner chamber can be drawn rearwardly within said outer casing;
(d) attachment means for releasably attaching said inner chamber to said outer casing in an operating position and a storage position the forward end of said inner chamber is releasably locked in a position essentially coincident with the forward end of said outer casing when in the operating position and the rearward end of said inner chamber is essentially coincident with the rearward end of said outer casing when in the storage position, said attachment means being released and engaged by a movement of said inner chamber with respect to said outer casing which involves, in its entirety, an essentially non-rotative movement of said inner chamber along said longitudinal axis, and said inner chamber being retained within the interior space of said outer casing when in said operating position and when in said storage position, and the interior surface of said outer casing and the exterior surface of said inner chamber are in frictional contact at the location of said attachment means, and a portion of said sealing plug and the interior surface of said inner chamber are in frictional contact, and the force, F_1, required to initiate movement of said inner chamber with respect to said outer casing from the location of said attachment means is greater than the force, F_2, required to initiate movement of said sealing plug along the hollow interior of said inner chamber.

4,915,700
SYRINGE

Thomas J. Noonan, Jr., 779 Southbridge St., Auburn, Mass. 01501
Filed Jul. 19, 1988, Ser. No. 221,294
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—195 **6 Claims**

1. Syringe comprising:
(a) an elongated cylinder having a first bore extending into one end and terminating in a closure at the other end, a second bore extending through the closure coaxially of the first bore,
(b) a plunger extends through the first bore and has a section fitting tightly in the bore, while having a section extending from the said first end for use in sliding the plunger to and from in the bore,
(c) a needle assembly having a main body that fits snugly and slidably in the second bore and has a flange that fits snugly and slidably in the first bore, the plunger having a passage extending therethrough and the needle assembly having a rod fitting slidably in the passage, and



(d) detent means is associated with the needle assembly to lock the needle assembly to the plunger when the plunger has been initially completely depressed, so that the needle assembly is caused to retract into the cylinder when the plunger is subsequently retracted.

4,915,701
PROTECTIVE DEVICE AND SYRINGE

Douglas R. Halkyard, 4300 Sandridge Rd., Morris, Ill. 60450
Filed Feb. 21, 1989, Ser. No. 312,794
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—198 **18 Claims**

1 A protective device for a syringe of the type having an elongated barrel to receive a cartridge therein containing a substance to be injected into a patient by operation of said syringe, having a plunger assembly connected to said barrel at one end to operate said syringe and having needle connecting means to connect a hypodermic needle to said syringe at the other end thereof, wherein said protective device comprises a sheath having a peripheral wall bounding a through channel opening at one end to an open rearward end wall and at the opposite end to an open forward end wall, said through channel having a cross-sectional dimension and configuration cor-

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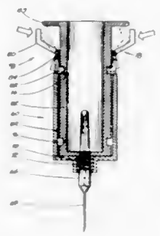
responding to that of said elongated of said syringe to receive it therein and to enable sliding said sheath forwardly on said barrel in the direction toward said needle connecting means and rearwardly thereon in the direction toward said plunger assembly, said peripheral wall of said sheath having an elongated needle protective portion, said sheath being reciprocally movable on said barrel of said syringe between a retracted position wherein said needle protective portion of said peripheral wall of said sheath is positioned to enable access to said needle connecting means of said syringe and an extended needle protecting position wherein said needle protective portion of said peripheral wall of said sheath extends forwardly of said barrel of said syringe, said elongated needle protective portion of said peripheral wall of said sheath which extends forwardly of said barrel of said syringe having a longitudinal dimension at least as great as that of a said hypodermic needle when connected to said needle connecting means of said syringe, said protective device including needle disconnect means to enable disconnecting said hypodermic needle from said syringe while said sheath is in its said extended needle protecting position.

4,915,702

SHIELDED SAFETY SYRINGE

Terry Haber, Lake Forest, Calif., assignor to Hahley Medical Technology of California, Laguna Hills, Calif.

Division of Ser. No. 43,042, Apr. 27, 1987, Pat. No. 4,758,231. This application Jul. 11, 1988, Ser. No. 216,957
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—198 15 Claims



1. A shielded syringe comprising an inner syringe cylinder having proximal and distal ends, a hypodermic needle supported at and extending outwardly from said distal end, and an outer protective sleeve having proximal and distal ends, said outer sleeve coaxially aligned with and axially advanceable relative to said inner cylinder from a retracted position, where said needle projects outwardly through an opening in the distal end of said sleeve, to an extended position, where said needle is located within and completely surrounded by said sleeve;
a first groove formed in said inner cylinder; and
locking means pivotally interconnected with said outer sleeve and rotatable between unlocked and locked conditions, said locking means rotated to the locked condition for receipt within the groove formed in said inner cylinder when said outer sleeve is advanced axially from the retracted to the extended position relative to said inner cylinder to thereby lock said outer sleeve in the extended position with said needle shielded by said sleeve.

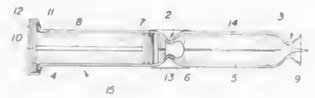
4,915,703

AMPOULE-SYRINGE

Guglielmo Mattoni, Rome, Italy, assignor to Sigma-Tau Industrie Farmaceutiche Riunite S.P.A., Rome, Italy

Filed Oct. 4, 1988, Ser. No. 253,244
Claims priority, application Italy, Oct. 9, 1987, 22200 A/87
Int. Cl.[4] A61M *5/28*
U.S. Cl. 604—200 5 Claims

1. An ampoule-syringe comprising:
a cylindrical element (**1**) having one open end and an opposite closed end, said cylindrical element having an interior surface defining an interior space, said cylindrical element including a narrow neck portion (**2**) for dividing said interior space into a syringe space communicating with said open end and an ampoule space closed by said closed end;
a needle support (**6**) in said narrow neck portion for separating said ampoule space from said syringe space;
a needle (**5**) in said needle support, extending into said ampoule space;
a syringe piston (**7**) mounted for sliding contact against the interior surface of said cylindrical element, in said syringe space;



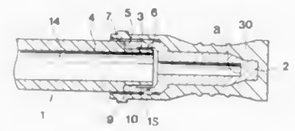
a piston rod having one end connected to said piston and an opposite end, said piston rod movable in said syringe space with movement of said piston,
a finger-rest disc (**10**) fixed to the opposite end of said rod and engageable against said one open end of said cylindrical element for closing said one open end when said piston is adjacent said narrow neck portion, said piston rod and piston having an overall length which is less than the length of said cylindrical element from said narrow neck portion to said open end of said cylindrical element; and
sealing means connected between said disc and said cylindrical element for sealing said disc to said one open end of said cylindrical element to seal said syringe space closed.

4,915,704

TUBE ASSEMBLY WITH A BREAKAWAY PLUG

Eiichi Miyasaka; Tetsuro Nishimura, and Kazuhiko Sudo, all of Shizuoka, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1988, Ser. No. 212,216
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—256 6 Claims



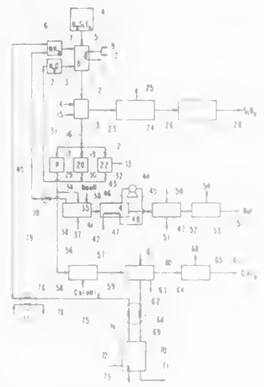
1. A tube assembly comprising
a tubular body having at least two open ends,
a plug of a relatively flexible material mounted on one open end of said tubular body, said plug including
(a) a hollow mount segment having an open end, a portion of the mount segment extending from its open end being fixedly secured to the one open end of said tubular body,
(b) a closing segment axially connected to the mount segment, and
(c) a frangible portion located axially outside the secured portion whereby said plug is breakable at the frangible portion and removable from the one open end of the tubular body, and
means comprised of a relatively rigid material fitted over the closing segment of the plug and extending over the frangible portion of the plug for protecting the frangible portion of the plug and for gripping the plug in order to break in the plug along the frangible portion tube assembly ready for use.

4,915,705

PRODUCTION OF SILICA AND FLUORINE-CONTAINING COPRODUCTS FROM FLUOSILICIC ACID

Phillip D. Mollere; Tadeusz K. Wiewiorowski; Vivian C. Astley, all of New Orleans; Willis L. Thornaberry, Jr., Gretna, and Michael A. Murray, Harvey, all of La., assignors to Freeport Research and Engineering Co., New Orleans, La.

Continuation of Ser. No. 891,889, Aug. 1, 1986, abandoned. This application Jul. 22, 1988, Ser. No. 224,223
Int. Cl.[4] C01D *3/24*
U.S. Cl. 23—362 R 26 Claims



1. A process for producing a silica product and a liquid phase containing an ammonium fluoride product, comprising:
(a) adding a material consisting of water, to a reactor;
(b) simultaneously adding fluosilicic acid and a composition selected from the group consisting of ammonia and an aqueous solution of ammonia, to said water in an amount sufficient to provide between 0.1 and 2.0 pounds of fluosilicic acid solution per pound of water originally contained in the reactor, and to maintain the pH of the liquid phase of the resultant slurry of silica and ammonium fluoride solution at between 6 and 8;
(c) thereafter, discontinuing the addition of fluosilicic acid but continuing the ammonia addition until said pH in said liquid phase increases to at least about 8.0;
(d) aging the thus treated slurry of silica and ammonium fluoride solution at a temperature exceeding about 100° F.,
(e) separating said aged slurry into a solid phase containing said silica and a liquid phase containing said ammonium fluoride product; and
(f) washing said separated silica-containing solid phase to recover therefrom said silica product, said silica being precipitated particles substantially free of impurities and having a size of about 10 to 100 microns and a surface area of about 120 to 180 m^2/gm.

4,915,706

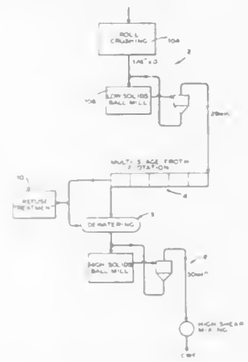
COAL-WATER FUEL PRODUCTION

Ralph D. Daley, 1267 Baier Ave., Louisville, Ohio 44641, and Kevin E. Redinger, 1841 Carriage La., #301, Alliance, Ohio 44601

Continuation of Ser. No. 732,550, May 10, 1985, abandoned. This application Mar. 3, 1987, Ser. No. 22,560
Int. Cl.[4] C10L *1/32*
U.S. Cl. 44—51 22 Claims

1. A method of producing coal-water fuel from raw coal, comprising:
crushing the raw coal for initial size reduction of the coal;
grinding the crushed coal in a primary grinding mill;
then adding water and chemicals to the ground coal in a froth flotation process for removing ash and coarse pyritic sulphur from the ground coal to form a reduced-ash and reduced-sulphur coal;
next adding water and chemicals to the reduced-ash reduced-sulphur coal in a reverse flotation process for removing fine pyritic sulphur from the coal;
dewatering the coal from the froth flotation and reverse flotation processes; and
preparing a slurry from the dewatered coal which has a selected size distribution, the slurry being usable as coal-water fuel.

13. An apparatus for producing coal-water fuel from raw coal comprising:
a crusher for receiving the raw coal and crushing it;
a primary grinder connected to said crusher for receiving and grinding the crushed raw coal;



froth flotation means connected to said primary grinder for receiving crushed and ground raw coal from the primary grinder to form a reduced-ash and reduced-pyritic sulphur coal;
reverse flotation means connected to said froth flotation means for receiving the reduced-ash reduced-pyritic sulphur coal for further reduction of pyritic sulphur in the coal;
dewatering means connected to said flotation means for dewatering the reduced-ash and reduced-pyritic sulphur coal, and slurry forming means connected to said dewatering means for receiving dewatered coal from the dewatering means and forming a slurry thereof which can be used as coal-water fuel.

4,915,707

PROCESS FOR PURIFYING LIMONENE FOR FUEL AND THE LIKE

Robert D. Whitworth, Houston, Tex., assignor to Lemco Energy, Inc., Greenville, S.C.

Division of Ser. No. 111,914, Oct. 21, 1987, Pat. No. 4,818,250. This application Apr. 3, 1989, Ser. No. 332,583
Int. Cl.[4] C10L *1/22*
U.S. Cl. 44—62 9 Claims

1. A process for producing purified limonene comprising the steps of:

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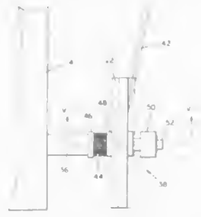
(a) providing a supply of limonene;
(b) distilling the limonene and removing the distillate fraction in a temperature range of from about 346° F. to about 382° F.;
(c) removing water from the distilled limonene.

4,915,708
FLUIDIFIER ADDITIVES FOR DISPERSIONS OF COAL IN WATER
Aldo Prevedello; Carlo Carniani; Armando Marcotullio, all of Milan, and Elio Donati, Pesaro, all of Italy, assignors to Enlricerche S.p.A. and Snamprogetti, S.p.A., both of Milan, Italy
Filed Oct. 31, 1988, Ser. No. 265,041
Claims priority, application Italy, Nov. 13, 1987, 22626 A/87
Int. Cl.[4] C10L *1/32*
U.S. Cl. 44—90 11 Claims

3. Process for preparing a dispersion of coal solids in water, comprising the following treatments:
(a) pre-grinding of coal under dry conditions in order to produce a pre-ground coal with a maximum particle size of about 6 mm;
(b) wet grinding of a portion of the pre-ground coal, carried out in the presence of an additive, wherein said additive is the product from the poly-ethoxylation of a styrene-allyl alcohol copolymer, wherein said copolymer has a weight average molecular weight comprised within the range of from 500 to 5,000, and contains at least two hydroxy groups per molecule, and said poly-ethoxylation product contains an average of at least 20 condensed units of ethylene oxide per hydroxy group with the residual percentage being water, in order to produce an aqueous dispersion of micronized coal solids, with an average size of the particles of the order of from 6 to 12 μm;
(c) addition of the residual portion of pre-ground coal to said dispersion, and homogenizing of the resulting dispersion, and improvement of the resulting dispersion by homogenization of a suitable mixer.

4,915,709
KNIFE SHARPENER
Michael A. Andrew, Milford; Thomas G. Siegel, Southbury; Omer Shifflet, Shelton, all of Conn.; James Green, Spencerport, and Duane Seaburg, Oakfield, both of N.Y., assignors to Black & Decker, Inc., Newark, Del.
Filed Aug. 8, 1988, Ser. No. 229,911
Int. Cl.[4] B24B *3/36*
U.S. Cl. 51—109 BS 10 Claims

1. An electric sharpener comprising: an electric motor having a shaft;
a sharpening wheel operatively connected to said motor shaft whereby said sharpening wheel rotates with said shaft;
means for guiding a blade selectively to first and second surfaces of said sharpening wheel;
said first surface of said sharpening wheel positioned with respect to said guiding means so that the insertion of said blade in said guiding means in contact with said first surface of said sharpening wheel will apply axial force to said sharpening wheel in a first axial direction;
said second surface of said sharpening wheel positioned with respect to said guiding means so that the insertion of said blade in said guiding means in contact with said second surface of said sharpening wheel will apply axial force to said sharpening wheel in a second axial direction;
means for permitting said sharpening wheel to translate substantial distances in said first and second axial directions;
first resilient means for urging said sharpening wheel in said first axial direction;
second resilient means for urging said sharpening wheel in said second axial direction;



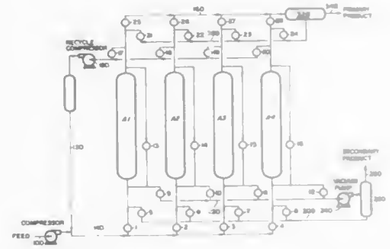
means for limiting the displacement of said first resilient means in said first direction to position said sharpening wheel at a nominal position with respect to said guiding means;
said second resilient means being effective for resisting motion of said sharpening wheel when said sharpening wheel is displaced from said nominal position in said first direction; and
said first resilient means being effective for resisting motion and said second resilient means being effective for encouraging motion of said sharpening wheel when said sharpening wheel is displaced from said nominal position in said second direction.

4,915,710
ABRASIVE COMPOSITION AND PROCESS FOR POLISHING
Kunihiro Miyazaki; Ken Ishitobi, both of Shiojiri, and Yoshinobu Yamaguchi, Nagoya, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo and Yamaguchi Seiken Kogyo Kabushiki Kaisha, Aichi, both of, Japan
Filed Mar. 16, 1989, Ser. No. 324,057
Claims priority, application Japan, Sep. 20, 1988, 63-235545
Int. Cl.[4] B24D *3/02*
U.S. Cl. 51—309 17 Claims

1. An acid abrasive composition comprising an an aqueous slurry of alpha alumina, a polishing accelerator of gluconic and/or lactic acids, a surface modifier of colloidal alumina, and water.

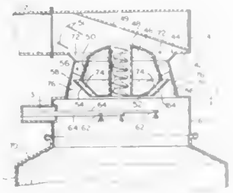
4,915,711
ADSORPTIVE PROCESS FOR PRODUCING TWO GAS STREAMS FROM A GAS MIXTURE
Ravi Kumar, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.
Filed May 18, 1989, Ser. No. 354,182
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—26 15 Claims

1. A pressure swing adsorption process for recovery of two gas products at high recovery and high purity from a feed gas stream containing said products wherein a first gas product is a less strongly adsorbed component and a second gas product is a more strongly adsorbed component, comprising:
(a) introducing a feed gas stream at elevated pressure containing said less strongly adsorbed component and said more strongly adsorbed component into one of a plurality of parallel adsorptive beds filled with an adsorbent selective for said more strongly adsorbed component, so as to retain said more strongly adsorbed component on said adsorbent and allow the less strongly adsorbed component to pass through said bed for recovery as said first gas product at high recovery and high purity;
(b) terminating the introduction of said feed gas stream into said bed before said more strongly adsorbed component breaks through the downstream end of said bed and depressurizing said bed to approximately ambient pressure



to remove less strongly adsorbed component from said bed and recycling the resulting depressurization effluent to said feed gas stream;
(c) passing a low pressure purge gas stream of more strongly adsorbed component through said bed to remove any residual less strongly adsorbed component from said bed and recycling the resulting effluent from said purged bed to the feed gas stream;
(d) evacuating said bed to a subambient pressure to recover more strongly adsorbed component as said second gas product at high recovery and high purity, and
(e) repressurizing said bed with less strongly adsorbed component to approximately the pressure of the feed gas stream, wherein the steps (a) through (e) are performed on said plurality of beds to result in a continuous process.

4,915,712
EVAPORATIVE GAS COOLING SYSTEM AND METHOD
Robert J. C. Feldsted, Seattle, Wash., assignor to Aerequipment Engineers, Inc., Woodinville, Wash.
Division of Ser. No. 46,935, May 5, 1987, abandoned. This application Aug. 5, 1988, Ser. No. 228,980
Int. Cl.[4] B01F *3/04*
U.S. Cl. 55—84 18 Claims



1. A method of evaporatively cooling a gas stream, comprising:
dividing said gas stream into an inner gas stream flowing along the center axis of a cooling tower in a swirling manner toward one end of said cooling tower, and an outer gas stream surrounding said inner gas stream and flowing axially through said cooling tower, said outer gas stream forming a substantially continuous barrier between said inner gas stream and the wall of said cooling tower; and
spraying droplets of a cooling fluid into said inner gas stream downstream from where said gas stream is divided into inner and outer gas streams so that the substantially continuous barrier formed by said outer gas stream restricts said droplets from contacting the wall of said cooling tower, wherein further including the step of directing said inner gas stream in a radially inward direction to promote mixing between said inner gas stream and said droplets and to restrict said droplets from contacting the wall of said cooling tower.

4,915,713
LIQUID DEGASSING SYSTEM AND METHOD
Edmund Bazza, and Samuel Ricchio, both of Fullerton, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.
Filed Mar. 13, 1989, Ser. No. 322,810
Int. Cl.[4] B01D *19/00*
U.S. Cl. 55—55 17 Claims

13. A method of degassing a liquid system comprising feeding liquid from a reservoir at a first volume rate, directing the liquid at the first volume rate to a chamber, removing gas from the liquid through a first chamber outlet, feeding the removed gas to the reservoir at a second volume rate, the second volume rate being less than the first volume rate, pumping the gas reduced liquid from a second chamber outlet, and directing the substantially gas reduced liquid to the reservoir and including directing the gas reduced liquid flow to a sensing element before entering the reservoir.

4,915,714
FIBER BED ELEMENT AND PROCESS FOR REMOVING SMALL PARTICLES OF LIQUIDS AND SOLIDS FROM A GAS STREAM
Richard K. Teague, 512 Factory Row, Winston-Salem, N.C. 27101; Dean M. Pruette, 5416 Edenfield Dr., and Jeffrey L. Parks, 1020 Winesap Dr., both of Kernersville, N.C. 27284
Filed Jun. 23, 1988, Ser. No. 210,548
Int. Cl.[4] B01D *46/02*
U.S. Cl. 55—486 26 Claims

1. A fiber bed element for removing and collecting small particles of liquids or soluble solids from a gas stream comprising: a layer of pin-punched fiber from ¼" to 1' thick; means supporting said fiber layer; a second or more layers of pin-punched fiber positioned against said first layer and maintained by said supporting means, the pin-punched holes and said

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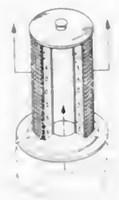
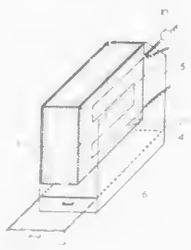
layers functioning to create drainage paths through which the liquids may drain, the multiple layered element having a den-



sity of from about 80 kilograms of fiber per cubic meter of bed to about 480 kilograms of fiber per cubic meter of bed.

4,915,715
HUMIDITY CONDITIONER
Masayuki Oshima, Tamano; Akira Matsuoka, Okayama; Kazuhiko Asano, Okayama; Kiyoshi Mimura, Okayama; Masanori Shimada, Yahata; Hajime Baba, Nara, and Hiroshi Okamoto, Okayama, all of Japan, assignors to Daiken Kogyo Kabushiki Kaisha, Toyama, Japan
Filed Mar. 27, 1989, Ser. No. 328,922
Claims priority, application Japan, Mar. 29, 1988, 63-75781; Jul. 20, 1988, 63-180735; Jan. 25, 1989, 1-15884
Int. Cl.[4] B01D *19/00*
U.S. Cl. 55—208 13 Claims



6. A dehumidifying apparatus comprising a moisture absorber including a porous material formed of laminated fiber having continuous fine interstices, a hygroscopic filler that fills said interstices, said moisture absorber having at least one laminar section which forms a moisture absorbing face at a right angle to a moisture desorbing face, a heating element integrated with said moisture desorbing face of said moisture absorber which allows release of moisture from the moisture absorber, and a cover which overlies at least one portion of said moisture absorber.

4,915,716
FABRICATION OF LIGHTGUIDE SOOT PREFORMS
Douglas W. Monroe, Newtown Township, Bucks County, Pa., and Chenkou Wei, East Windsor Township, Mercer County, N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.
Continuation of Ser. No. 914,417, Oct. 2, 1986, abandoned. This application Jun. 3, 1988, Ser. No. 202,749
Int. Cl.[4] C03B *37/018*
U.S. Cl. 65—2 6 Claims

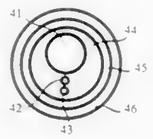
1. A method of forming a lightguide preform by vapor-phase axial deposition comprising the steps of:

feeding glass-forming reactants as a gas through a double-flame torch;

directing gases through the torch toward a support structure to form an outer flame front between an outermost gas and an intermediate gas, said outer flame front having a first temperature;

directing an additional gas through the torch toward the support structure to form an inner flame front between an intermediate gas and said additional gas, said inner flame front having a second temperature and being substantially surrounded by said outer flame front;

forming a stream of glassy soot by directing said reactants through the torch and substantially surrounded by the outer flame front toward the support structure, said reactants being of appropriate composition and having appro-

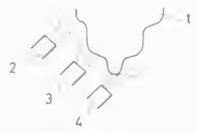


priate properties to react at the temperatures at which they are subjected so as to form a glassy soot stream of glassy soot particles, part of which is deposited on the support structure to form a sootform;

consolidating the soot-form to form a lightguide preform, wherein:

said second temperature of the inner flame front is sufficiently higher than said first temperature of the outer flame front so as to establish a significant temperature gradient at the location on the support structure at which glassy soot is deposited, which gradient decreases in temperature in a direction from the center of the double flame toward the outside of the double flame, and is sufficiently pronounced that excess non-deposited glassy soot particles of the glassy soot stream are directed away from the support structure by thermophoretic forces.

4,915,717
METHOD OF FABRICATING OPTICAL FIBER PREFORMS
Minoru Watanabe; Naoki Yoshioka; Hiroo Kanamori, all of Kanagawa, and Nobuo Inagaki, Ibaraki, all of Japan, assignors to Tokyo Nippon Telegraph Public Corporation and Sumitomo Electric Industries, Ltd., both of Osaka, Japan
Filed Feb. 6, 1984, Ser. No. 577,405
Int. Cl.[4] C03B *37/018*
U.S. Cl. 65—3.12 8 Claims



1. A method for fabricating an optical fiber preform consisting of a core having a given refractive index distribution in the radial direction and a cladding having a constant refractive index, comprising the steps of:

feeding a core material gas and a fuel gas through a core burner;

burning the hydrogen to form glass particles by flame hydrolysis;

sending said glass particles onto a rotating member to deposit said particles thereon, thereby growing said particles in the axial direction on said member to form a core soot, and

simultaneously with said feeding, burning and sending steps, feeding a cladding material gas and fuel gas through a cladding burner, separate from said core burner, burning the hydrogen gas to form glass particles by flame hydrolysis with said cladding material gas, sending said cladding particles onto the core soot, and depositing said cladding particles to a predetermined thickness to form a cladding soot;

wherein said cladding burner is designed so that at least one of the outlets for said (1) cladding feed material gas, (2) said fuel gas, (3) an auxiliary fuel gas, and (4) an inert gas is an outlet composed of a plurality of openings adjacent to each other.

5. An apparatus for fabricating an optical fiber prefrom consisting of a core having a given refractive index distribution in the radial direction and a cladding having a constant refractive index, comprising:

first feeding means for feeding a core material gas and a fuel gas through a core burner;

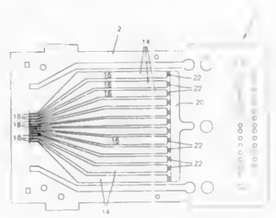
means for burning the hydrogen to form glass particles by flame hydrolysis;

means for sending said glass particles onto a rotating member to deposit said particles thereon, thereby growing said particles in the axial direction on said member to form a core soot; and

second feeding means, operating simultaneously with the operation of said first feeding means, burning means and sending means, for feeding a cladding material gas and a fuel gas through a cladding burner, separate from said core burner, and for burning the hydrogen gas to form glass particles by flame hydrolysis with said cladding material gas, for sending said cladding particles onto the core soot, and for depositing said cladding particles to a predetermined thickness to form a cladding soot; and

wherein said cladding burner is designed so that at least one of the outlets for said cladding feed (1) cladding feed material gas (2) said fuel gas, (3) an auxiliary fuel gas, and (4) an inert gas is an outlet composed of a plurality of openings adjacent to each other.

4,915,718
FABRICATION OF INK JET NOZZLES AND RESULTING PRODUCT
Prakash D. Desai, San Jose, Calif., assignor to On Target Technology, Inc., Santa Clara, Calif.
Filed Sep. 28, 1988, Ser. No. 250,354
Int. Cl.[4] C03C *25/06*
U.S. Cl. 65—31 4 Claims



1. A method for fabricating an ink jet nozzle structure with at least one ink jet nozzle for delivery of an ink jet toward a surface, an ink chamber for each ink jet nozzle, positioned upstream of the jet nozzle, and at least one inlet for the flow of ink into the chamber, the method comprising,

exposing one side of a transparent photoform glass base plate generally in a pattern to form the nozzle, the ink chamber and the inlet, such exposure making the exposed areas of the photoform glass much more susceptible to acid etching than unexposed areas,

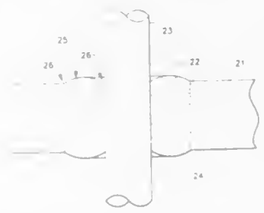
at selected transition points between the ink chamber and the nozzle, leaving a thin transverse line unexposed, across the transition point,

acid etching said one side of the glass in a two-step etching wherein, in one step the nozzle area is masked substantially to said transition point and generally along said thin transverse line, and in a second step the masking is removed and the nozzle area is etched along with the ink chamber,

thereby leaving a raised barrier along said thin transverse lines of unexposed glass, comprising essentially unetched glass extending transversely across the transition between the ink chamber and the nozzle area and deep into the base plate, and

removing the barrier between the deeper ink chamber and the shallower nozzle area.

4,915,719
METHOD OF PRODUCING A HERMETIC GLASS TO METAL SEAL WITHOUT METAL OXIDATION
Akbar Saffari, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Sep. 30, 1988, Ser. No. 252,208
Int. Cl.[4] C03B *11/04;* C03C *27/02*
U.S. Cl. 65—32.2 16 Claims



1 A method for producing an article having an electrically insulating hermetic seal surrounding an electric feedthrough conductor extending through a metal header, the method leaving the feedthrough conductor and header substantially free of oxide, comprising the steps of:

providing a metal header having an aperture therethrough for accommodating an electrical feedthrough conductor;

providing an electrical feedthrough conductor which extend through the aperture in the metal header;

providing a glass bead of a material selected to have a lower coefficient of thermal expansion than the material of the metal header in the aperture in the metal header surrounding the feedthrough conductor;

heading the header, glass bead and feedthrough conductor to above the melting temperature of the glass bead in a dehydrated pure hydrogen environment which is sufficiently dry to substantially preclude oxidation of the surfaces of the metal header and feedthrough conductor; and

cooling the assembled header, glass bead and feedthrough conductor in the dehydrated pure hydrogen environment which is sufficiently dry to substantially preclude oxidation of the surfaces of the metal header and feedthrough conductor to solidify the glass head, whereby the header contracts around the solidified glass bead to form a hermetic compression seal.

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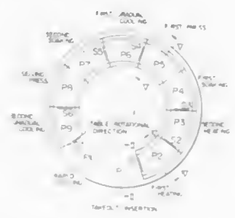
METHOD OF AND APPARATUS FOR MOLDING GLASS ARTICLES

Shinichiro Hirota, Hachioji; Kishio Sugawara, Hamura, and Tadayuki Fujimoto, Hachioji, all of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Sep. 26, 1988, Ser. No. 249,179
Claims priority, application Japan, Sep. 30, 1987, 62-246216
Int. Cl.[4] C03B *23/00*
U.S. Cl. 65—64 13 Claims



1. A method of molding glass articles, comprising the steps of:

preparing a mold having accommodated therein glass preform;

carrying out a first pressing of the glass preform within said mold where a pressing stroke is restricted at a first pressing, when the glass preform has its viscosity within a range of from 10^8 to $10^{9.5}$ poises; and

transferring said mold having accommodated therein the pressed glass from said first pressing position to a second pressing position where a second pressing is carried out with respect to the pressed glass within said mold when the pressed glass has its viscosity within a range of from $10^{10.5}$ to 10^{12} poises.

4,915,721

PROCESS FOR PREPARATION OF FLUOROPHOSPHATE OPTICAL GLASS

Heinz Broemer, Wetzlar; Werner Huber, and Norbert Meinert, both of Solms-Albshausen, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Division of Ser. No. 268,634, Nov. 8, 1988, Pat. No. 4,857,487, which is a continuation of Ser. No. 63,436, Jun. 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 413, Oct. 17, 1986. This application Jul. 5, 1989, Ser. No. 375,495
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1985, 3537293; Oct. 11, 1986, 3634676
Int. Cl.[4] C03B *19/02, 5/00;* C03C *3/247*
U.S. Cl. 65—66 8 Claims

1. A process for producing an optical fluorophosphate glass having a refractive index n_e between 1.47 and 1.50, an Abbe-value ν_e between 85 and 80 and a positive anomalous partial dispersion value $+\Delta\nu_e$ between 17 and 22, comprising providing said glass as a melt from a mixture which has the following composition in weight %:

$Ba(PO_3)_2$	18–20
$Al(PO_3)_3$	4–7
MgF_2	1.5–4
CaF_2	18–20
SrF_2	25–29
BaF_2	0.5–2
AlF_3	22–26,

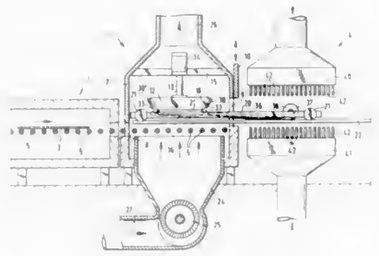
and cooling the melt to provide said optical fluorophosphate glass having said refractive index, abe value and partial dispersion value.

4,915,722

PROCESS AND APPARATUS FOR MANUFACTURING A CURVED SHEET OF GLASS

Hubert Havenith, Wurselen, Fed. Rep. of Germany; Herbert Radermacher, Raeren, Belgium; Hans-Werner Nowoczyn, Aachen, Fed. Rep. of Germany; Benoit D'Iribarne, Aachen, Fed. Rep. of Germany; Hans-Werner Kuster, Aachen, Fed. Rep. of Germany, and Luc Vanaschen, Eupen, Belgium, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Feb. 3, 1989, Ser. No. 305,705
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1988, 3803575
Int. Cl.[4] C03B *23/023*
U.S. Cl. 65—106 10 Claims



1. A process for manufacturing a curved glass sheet, comprising the steps of:

determining at least one characteristic of a heated glass sheet;

bending the heated glass sheet having at least one characteristic in a bending press having a male type mold and a female type mold cooperating therewith to produce a bent glass sheet, the female type mold having at least one mold part which can swivel to bend a glass sheet in the bending press; and

controlling the swivelling of said at least one mold part during said bending step as a function of said characteristic of the heated glass sheet being bent;

wherein said at least one characteristic is at least one of a temperature of the heated glass sheet before said bending step and a change in the temperature of the heated glass sheet during said bending step, wherein said at least one mold part is hinged and wherein said controlling step comprises controlling an angular velocity of the swivelling of said at least one mold part as a function of said characteristic by reducing said angular velocity between the beginning of said bending step and the end of said bending step.

7. An apparatus for the manufacture of curved glass sheets, comprising:

means for detecting at least one characteristic of a heated glass sheet;

a bending station having a male type mold and a cooperating female type mold, said female type mold having at least one swivelable mold part which can swivel against the male type mold during a bending operation for bending a heated glass sheet in said bending station;

means for conveying a heated glass sheet into said bending station and between said male and female type molds;

electric motor means for swivelling said swivelable mold part; and

means for controlling said electric motor means as a function of the at least one characteristic of a heated glass sheet being bent by reducing the angular velocity of the swivelling of said mold part between a beginning and an end of the bending operation,

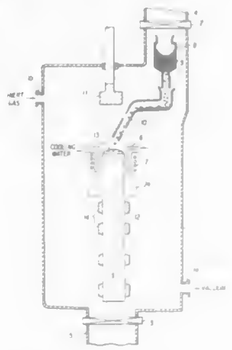
wherein said means for detecting comprise means for detecting at least one of a starting temperature of a heated glass sheet and a change in temperature of the heated glass sheet during said bending step.

4,915,723

APPARATUS FOR CASTING SILICON WITH GRADUAL COOLING

Kyojiro Kaneko, and Jun-Ya Masuda, both of Hyogo, Japan, assignors to Osaka Titanium Co., Ltd., Hyogo, Japan

Filed Jun. 30, 1989, Ser. No. 374,250
Claims priority, application Japan, Jul. 5, 1988, 63-167194
Int. Cl.[4] C03B *37/02*
U.S. Cl. 65—144 20 Claims



1. An apparatus for casting silicon, comprising:

an electrically conductive bottomless crucible, at least an axial part of said crucible being divided into a plurality of circumferentially spaced parts;

an electrical induction coil surrounding said crucible, whereby silicon continuously moving through said crucible may be melted and subsequently solidified; and

means for heating said solidified silicon, said means for heating being disposed downstream of a boundary surface level between said molten and solidified silicon, in a direction of movement of said silicon, whereby a temperature gradient in said solidified silicon in the direction of movement is reduced.

4,915,724

FUNGAL HERBICIDE FOR CONTROL OF LAMB'S QUARTERS AND OTHER CHENOPODIUM WEEDS

Alan Watson, Pincourt; William Allan, and Lee Wymore, both of Ste-Anne de Bellevue, all of Canada, assignors to The Royal Institution for the Advancement of Learning, Montreal, Canada

Filed Jun. 2, 1988, Ser. No. 201,211
Claims priority, application Canada, Jun. 16, 1987, 539789
Int. Cl.[4] D01N *0/00;* C12R *1/645*
U.S. Cl. 71—65 12 Claims

1. A method for controlling growth of plants of Chenopodium weed species in agricultural crops which method comprises applying to the plants or to the locus of the plants an effective amount of the fungus *Ascochyta hyalaspora* to effect and produce typical lesions in said plants so as to inhibit the growth of or kill said plants.

9. A biologically pure culture of the fungal microorganism having the identifying characteristics of *Ascochyta hyalospora* IM1 302770.

4,915,725

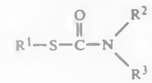
HERBICIDE COMPOSITIONS OF EXTENDED SOIL LIFE

Daniel L. Hyzak, Austin, Tex., and Reed A. Gray, Saratoga, Calif., assignors to ICI Americas, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 507,616, Jun. 24, 1983, abandoned, which is a continuation-in-part of Ser. No. 304,216, Sep. 21, 1981, abandoned, which is a continuation-in-part of Ser. No. 198,034, Oct. 17, 1980, abandoned, which is a continuation of Ser. No. 60,603, Jul. 27, 1979, abandoned, which is a continuation-in-part of Ser. No. 944,094, Sep. 20, 1978, abandoned. This application Apr. 30, 1984, Ser. No. 605,441
Int. Cl.[4] A01N *57/02*
U.S. Cl. 71—87 14 Claims

1. An herbicidal composition comprising

(a) an herbicidally effective amount of a thiolcarbamate having the formula



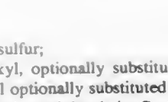
in which

R^1 is C_1–C_6 alkyl,

R^2 is C_1–C_6 alkyl,

R^3 is C_1–C_6 alkyl or cyclohexyl; and

(b) an alkyl thiolcarbamate herbicide soil-life-extending non-phytotoxic amount of an organophosphorus compound having the formula



in which

Y is oxygen or sulfur;

R^4 is C_1–C_6 alkyl, optionally substituted with halo, or is C_3–C_6 alkenyl optionally substituted with cyano;

R^5 is C_1–C_4 alkyl, straight-chain C_1–C_6 alkoxy or C_1–C_4 alkylthio other than tertiary butylthio;

R^6 is C_1–C_4 alkyl substituted with one C_1–C_3 alkylthio group; C_5–C_7 cycloalkyl; C_1–C_4 alkylimino optionally substituted with one, two or three halogen atoms; phenyl optionally substituted with nitro, ortho-nitro and halo, C_1–C_3 alkylsulfinyl, α-pentynyl, or trifluoromethyl; benzyl optionally substituted with halo; or is $-(R^7)-\phi$ in which R^7 is C_1–C_4 alkylene substituted with either cyano or with one, two or three halogen atoms; and ϕ is phenyl substituted with halo when R_7 is substituted with cyano but is phenylthio subsituted with halo with R_7 is substituted with one, two or three halogen atoms;

X is oxygen or sulfur; with the provisos that:

when R^4 is C_1–C_6 alkyl, R^4 is other than tertiary butyl;

when R^6 is C_5–C_7 cycloalkyl, substituted or unsubstituted phenyl, or substituted or unsubstituted benzyl, then X must be oxygen;

when R^4 is allyl, Y is oxygen, and R^6 is para-nitrophenyl, then R^5 is other than methyl; and

when R^4 is methyl and R^6 is phenyl, then R^5 is other than C_1–C_4 alkylthio or ethoxy.

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4,915,726

BIOLOGICAL CONTROL OF DODDER

Thomas A. Bewick; Jana S. Stewart; Larry K. Binning, and Walter R. Stevenson, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Feb. 3, 1987, Ser. No. 10,208
Int. Cl.[4] A01N *63/00*
U.S. Cl. 71—79 9 Claims

1. A method of controlling the growth of dodder on field crops comprising the step of introducing onto the dodder an effective amount of spores of the mycoherbicide *Fusarium tricinctum* and mutations thereof.

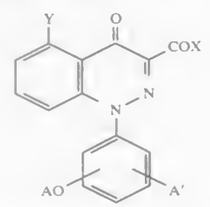
4,915,727

PLANT MALE STERILANT

Masato Mizutani, Toyonaka; Masao Shiroshita, Nishinomiya; Nobuaki Mito, Takarazuka; Hiroki Okuda, and Masaharu Sakaki, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 24, 1987, Ser. No. 137,703
Claims priority, application Japan, Dec. 26, 1986, 61-314254; Dec. 26, 1986, 61-314255
The portion of the term of this patent subsequent to Oct. 24, 2006, has been disclaimed.
Int. Cl.[4] A01N *43/58*
U.S. Cl. 71—92 7 Claims

1. A composition for inducing male sterility in a plant, which comprises, as an active ingredient, an effective amount of a compound having the formula:



in which X is —OH, $—O^- M^+$, —OR^1 or

wherein M^+ is an alkali metal cation, an alkaline earth metal cation or

in which

R^4, R^5 and R^6 are the same or different and each is hydrogen, C_1–C_6 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_3–C_8 cycloalkyl, benzyl or phenyl;

R^1 is C_1–C_9 alkyl, C_3–C_6 alkenyl, C_3–C_4 alkynyl, C_1–C_3 alkoxy (C_1–C_4) alkyl, C_3–C_8 cycloalkyl, benzyl or phenyl; and

R^2 and R^3 are the same or different and each is hydrogen, C_1–C_6 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_3–C_8 cycloalkyl, benzyl in which at most two hydrogen atoms at the α-position thereof may be substituted by methyl, C_2–C_3 hydroxyalkyl or phenyl in which at most three hydrogen atoms thereof may be substituted by the same different C_1–C_2 alkyl;

Y is fluorine, chlorine, trifluoromethyl or C_1–C_6 alkoxy;

A is CF_3, CHF_2, CF_2Cl, CF_2BR, CF_2CHF_2, CH_2CF_3, CF_2CHCl_2, $CFClCHFCl$, CF_2CHFCl or CF_2CHFCF_3; and

A' is hydrogen or halogen;

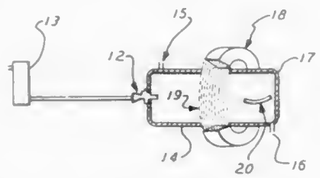
and an agriculturally acceptable carrier or diluent.

4,915,728

IRON/COBALT ALLOY FILAMENTS

Thomas E. Schell, Wyckoff, N.J., assignor to GAF Chemicals Corporation, Wayne, N.J.

Filed Oct. 3, 1988, Ser. No. 252,100
Int. Cl.[4] C22B *5/20*
U.S. Cl. 75—347 11 Claims



11. A method of generating iron/cobalt alloy filaments in a low cost, effective manner, which comprises:

(a) introducing a heated carbon dioxide carrier gas into a reaction chamber;

(b) heating said reaction chamber;

(c) mixing a solution of crystal dicobalt octacarbonyl in liquid iron pentacarbonyl;

(d) atomizing said liquid solution into the reaction chamber;

(e) applying a solenoidal magnetic field to the reaction chamber;

(f) decomposing said liquid solution in a simultaneous manner, thereby forming iron/cobalt alloy filaments;

(g) venting said carbon dioxide carrier gas from said reaction chamber; and

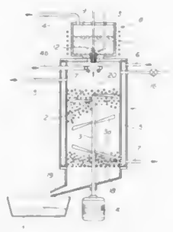
(h) retrieving said iron/cobalt alloy filaments from said reaction chamber.

4,915,729

METHOD OF MANUFACTURING METAL POWDERS

Peter Boswell, Acacias/Geneva; Dag F. Richter, Carouge, and Georges Haour, Geneva, all of Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

Continuation of Ser. No. 2,632, Dec. 9, 1986, abandoned. This application Apr. 4, 1988, Ser. No. 177,891
Claims priority, application Switzerland, Apr. 16, 1985, 1613/85
Int. Cl.[4] B22F *9/06*
U.S. Cl. 75—331 9 Claims



1. A method of manufacturing metal powders by breaking up a liquid metal into droplets and then placing them in contact

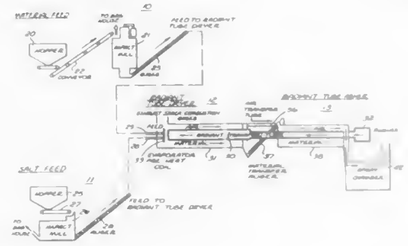
with a cooling component capable of bring about a quenching effect so as to give them a specific structure typical of rapid cooling, wherein the cooling and solidifying component comprises a bed of beads of solid impact-resistant material subjected to rapid colliding and rebounding motion by agitation.

4,915,730

PROCESS AND APPARATUS FOR RECOVERY OF FLUE DUST

Allan Elias, HCR 34 Box 3, Pocatello, Id. 83202, and Hans W. Rasmussen, 660 S. 400 East, St. George, Utah 84770

Continuation of Ser. No. 133,243, Dec. 10, 1987, abandoned, which is a continuation of Ser. No. 777,207, Sep. 19, 1985, abandoned. This application Jul. 13, 1989, Ser. No. 379,691
Int. Cl.[4] C22B *1/02, 3/04, 7/02*
U.S. Cl. 75—7 12 Claims



1. A process for recovery of metals from phosphate flue dust which contains carbon, wherein the metals are selected from the group consisting of silver, gallium, arsenic and cadmium, including the steps of:

blending a solid chloride source and the flue dust to produce a blended material;

roasting the blended material in an oxygen bearing atmosphere to oxidize carbon in the blended material producing a gas, and to react the chloride with the metal in the blended material producing water soluble metallic salt solids,

said roasting step including cascading said blended material over a heat source in the presence of air, and moving said blended material and air along said heat source;

dissolving the metallic salt solids in water to produce a first solution, said water including cyanide in solution;

filtering the first solution to remove any remaining solids to form a filtered pregnant solution; and

precipitating metals from the filtered solution.

4,915,731

METALLURGICAL METHOD AND APPARATUS

Belton Y. Cooper, The Herman Williams Company, Inc., 3517 Tenth Ave., N., Birmingham, Ala. 35234

Filed Dec. 6, 1988, Ser. No. 280,445
Int. Cl.[4] C21B *13/12*
U.S. Cl. 75—26 12 Claims

1. The method for recovering a metal from an ore, comprising the steps of

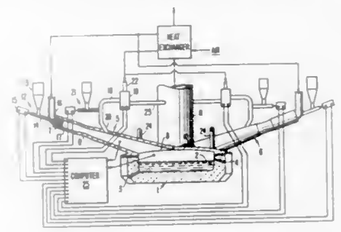
providing a hearth constructed and arranged to confine a body of molten metal having a surface;

establishing a confined high velocity turbulent flow of fuel and a hot combustion-supporting gas at a combustion temperature within at least one supply conduit having a venturi section and combusting the fuel within the supply conduit;

supplying the ore and a flux in particulate form to the confined turbulent flow within the supply conduit downstream of the venturi section to entrain the particles of ore and flux in the confined turbulent flow;

reducing and melting the ore to a molten metal within the supply conduit prior to entering the hearth;

directing the confined turbulent flow, with the reduced and melted ore entrained therein, into the hearth along a line



which slants downwardly to forcibly eject the confined turbulent flow from the supply conduit onto the surface of the body of molten metal being recovered; and

removing molten metal from the hearth.

4,915,732

DESULFURIZING IRON

Ian A. Cameron, Hamilton, and Lorne E. Murphy, Burlington, both of Canada, assignors to Stelco Inc., Hamilton, Canada

Filed May 9, 1989, Ser. No. 349,481
Claims priority, application Canada, Jun. 6, 1988, 568752
Int. Cl.[4] C21C *7/02*
U.S. Cl. 75—536 20 Claims

1. A method of desulfurizing molten iron, which comprises:

injecting a desulfurizing agent other than a metal selected from magnesium, aluminum and calcium into the molten iron until the sulfur content of said molten metal is about 0.015 wt.%,

thereupon injecting a sulfide-oxidation inhibiting amount of a metal selected from magnesium, aluminum and calcium into said molten iron simultaneously with said desulfurizing agent, and thereafter

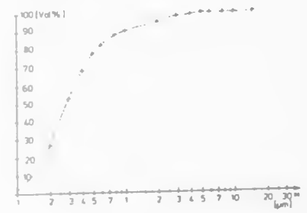
continuing injection of said desulfurizing agent to a predetermined residual sulfur concentration ins aid molten iron.

4,915,733

AGGLOMERATED METAL COMPOSITE POWDERS

Heinz-Eckert Schütz, Goslar; Bernhard Szesny, Langelsheim, and Bruno E. Krismer, Goslar, all of Fed. Rep. of Germany, assignors to Hermann C. Starck Berlin GmbH & Co. KG, Werk Goslar, Fed. Rep. of Germany

Filed Jan. 19, 1989, Ser. No. 298,995
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1988, 3802811
Int. Cl.[4] C22C *28/00*
U.S. Cl. 75—228 3 Claims



1. Metal powder agglomerates of individual particles com-

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prising (i) more than 70% by weight of one or more metals selected from the group consisting of the elements molybdenum, rhenium and tungsten and (ii) one or more binder metals selected from the group consisting of iron, cobalt, nickel, copper, silver, gold, palladium, platinum, rhodium, chromium and rhenium, wherein the individual particles have grain sizes of less than 2 μm and all the metal particles lie side by side in uniform random distribution, wherein both (i) and (ii) are not both rhenium.

4,915,734

CEMENTED CARBONITRIDE ALLOY WITH IMPROVED TOUGHNESS BEHAVIOUR

Nils G. L. Brandt, Solna, and Zeljka D. Senesan, Stockholm, both of Sweden, assignors to Sandvik AB, Sandviken, Sweden

Filed Apr. 26, 1988, Ser. No. 186,310
Claims priority, application Sweden, Apr. 29, 1987, 8701791
Int. Cl.[4] B22F *1/00*
U.S. Cl. 75—229 5 Claims

1. Sintered carbonitride-based cutting tool comprising 5–50% by volume of whiskers of at least one hard compound selected from the nitrides, carbides and carbonitrides of titanium, zirconium and hafnium and mutual solid solutions thereof, said whiskers having a surface which minimizes reactions between the whiskers and the carbonitride matrix of said cutting tool, 25–82% by volume of hard phases comprising carbides and/or nitrides of metals an solid solutions thereof from groups IVb, Vb and/or VIb in the periodic table of the elements and 3–25% by volume of a binder metal being at least one element selected from the group consisting of iron, cobalt and nickel, forming a structure comprising essentially a three phase mixture as identified by X-ray diffraction analysis of: a hard phase comprising carbides and/or nitrides and solid solutions thereof, binder metal and whisker single crystal phase.

4,915,735

WEAR-RESISTANT SINTERED ALLOY AND METHOD FOR ITS PRODUCTION

Naoki Motooka, Itami, Japan, assignor to Sumotomo Electric Industries, Ltd., Osaka, Japan

PCT No. PCT/JP87/00505, § 371 Date May 10, 1988, § 102(e) Date May 10, 1988, PCT Pub. No. WO88/00621, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 14, 1987, Ser. No. 180,819
Claims priority, application Japan, Jul. 14, 1986, 61-165230; Mar. 6, 1987, 62-52650
Int. Cl.[4] C22C *29/00*
U.S. Cl. 75—231 12 Claims

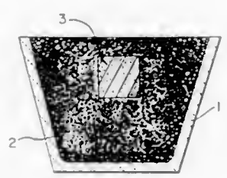
1. A wear-resistant sintered alloy consisting essentially of an iron base alloy matrix, 0.5 to 3% by weight of particles of CaF_2, and 5 to 20% by weight of particles of a hard alloy, said CaF2 and said hard alloy being dispersed in said iron base alloy matrix in the form of particles, said iron base alloy matrix consisting essentially, by weight, of 10 to 20% of Cr, 1.5 to 3.5% of C, and the balance being essentially iron, said hard alloy consisting essentially, by weight, of 50 to 70 of Cr, 5 to 10% of C, not more than 1% of Si, and the balance being essentially Fe, the particle of said hard alloy having particle size of 44 to 150 μm and the mean value of Vickers hardness of 800 to 2000.

4,915,736

METHOD OF MODIFYING CERAMIC COMPOSITE BODIES BY CARBURIZATION PROCESS AND ARTICLES PRODUCED THEREBY

Terry D. Claar, Newark, and Gerhard H. Schiroky, Hockessin, both of Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Filed Dec. 23, 1987, Ser. No. 137,382
Int. Cl.[4] B22F *1/00*; C22C *29/04*
U.S. Cl. 75—238 8 Claims



1. A method of producing a self-supporting body comprising producing a first composite body by:
selecting a parent metal;
heating said parent metal in a substantially inert atmosphere to a temperature above its melting point to form a body of molten metal and contacting said body of molten parent metal with a mass comprising boron carbide;
maintaining said temperature for a time sufficient to permit infiltration of molten parent metal into said mass and to permit reaction of molten parent metal with said boron carbide to form at least one boron-containing compound;
continuing said infiltration reaction for a time sufficient to produce said self-supporting body comprising at least one parent metal boron-containing compound; and
subjecting said self-supporting body to a carburizing environment, thereby converting residual parent metal in the self-supporting body into a parent metal-carbide component.

4,915,737

ALLOY TARGET FOR MANUFACTURING A MAGNETO-OPTICAL RECORDING MEDIUM

Toshio Morimoto; Keizo Kazama; Yasuhiro Okajima; Yasuhiro Tsugita, and Shinobu Endo, all of Ichikawa, Japan, assignors to Sumitomo Metal Mining Company Limited, Japan

Filed Apr. 29, 1988, Ser. No. 188,203
Claims priority, application Japan, Apr. 30, 1987, 62-104770
Int. Cl.[4] C22C *29/00*
U.S. Cl. 75—246 5 Claims

1. An alloy target for making a magneto-optical recording medium by sputtering comprising an alloy containing 10 to 50 atom % of at least one rare earth element selected from the group consisting of Sm, Nd, Gd, Tb, Dy, Ho, Tm and Er, the balance being substantially at least one transition metal selected from the group consisting of Co, Fe and Ni, said alloy having a mixed structure composed of at least three phases of an intermetallic compound formed by said rare earth element and said transition metal, and containing no phases composed exclusively of a rare earth element or a transition metal.

4,915,738

ALLOY TARGET FOR MANUFACTURING A MAGNETO-OPTICAL RECORDING MEDIUM

Toshio Morimoto, and Tatsuo Nate, both of Ichikawa, Japan, assignors to Sumitomo Metal Mining Company Limited, Japan

Filed Apr. 29, 1988, Ser. No. 188,206
Claims priority, application Japan, Apr. 30, 1987, 62-104771
Int. Cl.[4] C22C *29/00*
U.S. Cl. 75—246 5 Claims

1. An alloy target for making a magneto-optical recording medium by sputtering comprising an alloy containing 10 to 50 atom % of at least one rare earth element selected from the group consisting of Sm, Nd, Gd, Tb, Dy, Ho, Tm and Er, the balance being substantially at least one transition metal selected from the group consisting of Co, Fe and Ni, said alloy having a mixed structure composed of at least one phase of an intermetallic compound formed by said rare earth element and said transition metal and a phase of said rare earth element alone, and containing no phase exclusively composed of a transition metal.

4,915,739

MODIFIED CARBON FIBER REINFORCED CEMENT

Takeo Sawanobori, Kawasaki; Yuji Noguchi, Yokohama; Hiromichi Sakai, Kitakyushu, and Kazuhiro Sone, Yokkaichi, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Division of Ser. No. 38,899, Apr. 16, 1987, abandoned. This application Nov. 9, 1988, Ser. No. 269,070
Claims priority, application Japan, Apr. 23, 1986, 61-93670; May 6, 1986, 61-103479
Int. Cl.[4] C04B *14/38, 20/10*
U.S. Cl. 106—99 13 Claims

1. A reinforced cement produced by a process comprising mixing into a water-curable cement a reinforcing quantity of a fiber prepared by impregnating a carbon fiber with from 50 to 200 wt.% of a thermosetting resin, coating said impregnated fiber with from 10 to 200 wt.% of a rubber solution or rubber latex, and then curing said coated fiber

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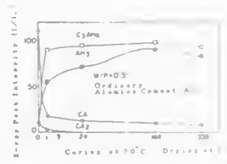
4,915,740

HYDRAULIC MATERIAL COMPOSITION HAVING HIGH STRENGTH

Etsuo Sakai, Ichikawa; Tutomu Kida, Machida; Yasuhito Fushii, and Yukio Sasagawa, both of Omuta, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Sep. 24, 1987, Ser. No. 100,466
Claims priority, application Japan, Sep. 25, 1986, 61-224902; Sep. 23, 1987, 62-37890
Int. Cl.[4] C04B *7/32*
U.S. Cl. 106—104 28 Claims



1. A hydraulic material composition having high strength comprising a hydraulic material containing as main ingredients an alkaline earth metal oxide and aluminum oxide (Al_2O_3), ultra-fine particles selected from the group consisting of silica, said hydraulic materials, blast furnace slags, fly ash, alumina and a mixture thereof and having a mean particle size smaller by one order or more than that of said hydraulic material, said hydraulic material composition containing 95 to 50% by weight of the hydraulic material and 5 to 50% by weight of the ultrafine particles, a metal aggregate having a particle size from about 0.1 to 0.3 mm, said metal aggregate present in an amount not more than 5 times by weight the total amount by weight of said hydraulic material and said ultra-fine particles, and a plasticizer, said plasticizer present in an amount of between about to 15 parts by weight to 100 parts by weight of the sum of said hydraulic material and said ultra-fine particles.

4,915,741

CEMENTITIOUS MIXES

Stefano Biagini, and Mario Collepardi, both of Treviso, Italy, assignors to Sandoz Ltd., Basle, Switzerland

Filed Nov. 5, 1986, Ser. No. 927,553
Claims priority, application Italy, Nov. 8, 1985, 48760 A/85
Int. Cl.[4] C04B *24/20*
U.S. Cl. 106—314 6 Claims

1. A process for the production of cementitious mix comprising the step of mixing together a hydraulic binder, aggregate and water in the presence of a least one additive selected from plasticizers and superplasticizers, characterized in that the hydraulic binder is treated with water before the mixing step and separately from the addition of plasticizer or superplasticizer, so that it retains from 0.1 to 10% by weight of water.

4,915,742

IRON BLUE PIGMENT, PROCESS FOR ITS PIGMENTATION AND USE

Everhard Gratzfeld, Wesseling; Eva Clausen, Cologne, and Heinrich Winkeler, Wesseling, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 9, 1988, Ser. No. 281,988
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1987, 3742628
Int. Cl.[4] B32B *19/00*
U.S. Cl. 106—418 5 Claims

1. An iron blue pigment characterized by an ammonium content of ≧5.5 weight %, a potassium content of <0.1 weight %, a sodium content of <0.weight %, a color strength in a toluene intaglio printing ink up to 15% greater than the standard Vossen blue 705/80 (calculated in accordance with DIN 53 234) and the color spacings (determined in accordance with DIN 6174, relative to Vossen blue 705/80 as standard) of

Δa^* : 6.5±0.5

Δb^* 1.3±0.3

Δc^* 5±0.5

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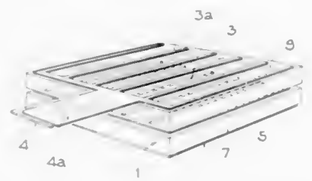
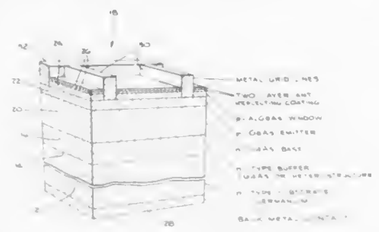
SPACE SOLAR CELL
Roland Schilling, Gemmingen, Fed. Rep. of Germany, assignor to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany
Filed Sep. 28, 1988, Ser. No. 250,447
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1987, 3733645
Int. Cl.[4] H01L *31/06, 25/02*
U.S. Cl. 136—256 **20 Claims**



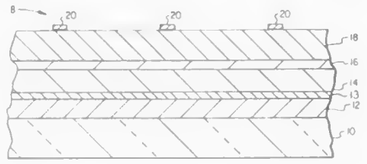
1. In a solar cell including a doped semiconductor basic element having a first surface for light incidence and metallic contacts on the first surface and on the opposite rear surface of the semiconductor basic element, and a cover glass disposed on said first surface and having metallic contacts on the outer surface of the cover glass; the improvement wherein the contacts on the semiconductor element and the cover glass have connector contacts integrated homogeneously with the contacts and at least partially projecting beyond the respective carrier elements such that via these connector contacts the cover glass is electrically connectable to a contact of the semiconductor element, and the contacts of the semiconductor element are connectable to further solar cells.

4,915,744
HIGH EFFICIENCY SOLAR CELL
Frank F. Ho, Yorba Linda, and Milton Y. Yeh, Santa Monica, both of Calif., assignors to Applied Solar Energy Corporation, City of Industry, Calif.
Filed Feb. 3, 1989, Ser. No. 306,480
Int. Cl.[4] H01L *31/06, 31/18*
U.S. Cl. 136—262 **20 Claims**



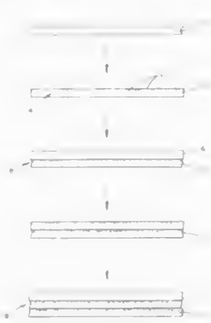
1. A high efficiency solar cell comprising:
a germanium substrate having a front surface and a back surface;
a back-metal contact on the back surface of said substrate;
a buffer layer having a photovoltaic inhibited junction with the front surface of said substrate;
said cell including a gallium-arsenide base of one conductivity type on said buffer layer;
a gallium-arsenide emitter of the other conductivity type on said base;
metal grid lines extending over and being coupled to said emitter; and
said germanium substrate having the front face thereof oriented approximately three degrees to twenty degrees away from perpendicularity relative to the 001 crystal axis, toward an angle in the order of half-way between the 111 and the 011 crystal axes.

4,915,745
THIN FILM SOLAR CELL AND METHOD OF MAKING
Gary A. Pollock, Canoga Park; Kim W. Mitchell, Granada Hills, and James H. Ermer, Burbank, all of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.
Filed Sep. 22, 1988, Ser. No. 247,802
Int. Cl.[4] H01L *31/06, 31/18*
U.S. Cl. 136—265 **24 Claims**



1 In a photovoltaic device of the type having a metal back contact, a Group I-III-VI semiconductor film of a first conductivity type on said back contact and a semiconductor film of conductivity type opposite said first type on said Group I-III-VI film, the improvement comprising:
an interfacial film containing gallium between said metal back contact and said Group I-III-VI film.

4,915,746
METHOD OF FORMING HIGH TEMPERATURE BARRIERS IN STRUCTURAL METALS TO MAKE SUCH METALS CREEP RESISTANT AT HIGH HOMOLOGOUS TEMPERATURES
Gerhard E. Welsch, 2514 Edgehill Rd., Cleveland Hts., Ohio 44106
Filed Aug. 15, 1988, Ser. No. 232,284
Int. Cl.[4] C21D *10/00*; **C22F** *3/00*
U.S. Cl. 148—4 **47 Claims**



1. A method of forming internal high temperature barriers in structural metals to prevent movement of boundaries and dislocations for making said structural metals creep resistant at high homologous temperature, the method comprising the steps of:
providing a first layer of undoped structural metal that creeps at high homologous temperatures and has zero or very low solubility for the group of elements consisting of xenon, helium, neon, argon, krypton, potassium, rubidium, cesium, and francium;
implanting ions in said first layer of metal to form a first implantation region, said ions being members of the group consisting of the elements xenon, helium, neon, argon, krypton, potassium, rubidium, cesium, francium and mixtures thereof; and,
layering a second layer of undoped structural metal on said first ion implanted layer to form a composite, the implantation region buried inside the composite.

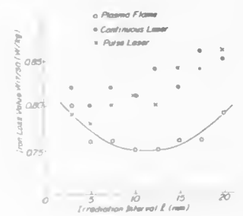
4,915,747
ALUMINUM-LITHIUM ALLOYS AND PROCESS THEREFOR
Chul W. Cho, Monroeville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Continuation of Ser. No. 927,054, Nov. 4, 1986, abandoned, which is a continuation-in-part of Ser. No. 793,260, Oct. 31, 1985, Pat. No. 4,844,750. This application Jul. 1, 1988, Ser. No. 214,857
Int. Cl.[4] C22F *1/04*
U.S. Cl. 148—12.7 A **15 Claims**

1. A method of producing an unrecrystallized wrought aluminum-lithium product having improved levels of strength and fracture toughness, the method comprising the steps of
(a) providing a body of a lithium containing aluminum base alloy;
(b) heating the body to a hot working temperature;
(c) hot working the body to a first product;
(d) cold working said first product to a second wrought product;
(e) reheating said second wrought product while avoiding substantially recrystallization thereof, the reheating adapted to relieve stored energy capable of causing recrystallization during a subsequent heat treating step; and
(f) solution heat treating, quenching and aging said reheated product to provide a substantially unrecrystallized product having improved levels of strength and fracture toughness.

4,915,748
ALUMINUM ALLOYS
William S. Miller, Gerrards Cross, United Kingdom, assignor to Alcan International, Buckinghamshire, United Kingdom
Continuation of Ser. No. 874,838, Jun. 13, 1986, abandoned, which is a continuation of Ser. No. 528,706, Sep. 1, 1983, abandoned. This application May 20, 1988, Ser. No. 198,595
Claims priority, application United Kingdom, Sep. 3, 1982, 8225297
Int. Cl.[4] C22F *1/04*
U.S. Cl. 148—12.7 A **7 Claims**

3. A method of producing a semi-fabricated product selected from the group consisting of an aluminum base alloy consisting essentially of:
(A)
Cr 1.5% to 7.0% by weight
Zr 0.5% to 2.5% by weight
Mn 0.25% to 4.0% by weight
Al remainder including normal impurities, or
(B) 7000 series Al alloys containing as added constituents.
Cr 0.5% to 3.0% by weight
Zr 0.5% to 2.5% by weight
Mn 0.1% to 2.0% by weight,
comprising the steps of
rapidly solidifying the molten alloy at a cooling rate of at least 10^3° C. sec^{-1} and sufficiently rapidly to produce a ductile particulate (50–150 kg/mm^2) which is non-brittle and in which the bulk of the alloying additions are retained in solid solution,
consolidating the particulate and age hardening by heating the consolidated particulate to a temperature of 300° C.–500° C. to increase said alloy in hardness from its as-quenched ductile state.

4,915,749
METHOD OF REDUCING IRON LOSS OF GRAIN ORIENTED SILICON STEEL SHEET
Bunjiro Fukuda; Keiji Sato, and Eiji Hina, all of Chiba, Japan, assignors to Kawasaki Steel Corp., Japan
Filed Apr. 11, 1988, Ser. No. 180,250
Claims priority, application Japan, Apr. 17, 1987, 62-93361
The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.
Int. Cl.[4] H01F *1/04*
U.S. Cl. 148—112 **2 Claims**



1 A method of reducing iron loss of a grain oriented silicon steel sheet by irradiating a plasma flame at an irradiation interval to the surface of the grain oriented silicon steel sheet after final annealing, characterized in that said plasma flame is irradiated in a direction across the rolling direction of the steel sheet, said irradiation interval satisfying the following equation (1):

$$22 - 2.5D \leq l \leq 36 - 2.5D \quad (1)$$

wherein D is the average secondary recrystallized grain size (mm) of the steel sheet and l is the irradiation interval (mm).

4,915,750
METHOD FOR PROVIDING HEAT RESISTANT DOMAIN REFINEMENT OF ELECTRICAL STEELS TO REDUCE CORE LOSS
James A. Salsgiver, Sarver, and Randal K. Knipe, Natrona Heights, both of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.
Filed Mar. 3, 1988, Ser. No. 163,670
Int. Cl.[4] H01F *1/04*
U.S. Cl. 148—112 **19 Claims**

1. A method for improving the core loss properties of electrical sheet products, the method comprising:
annealing an electrical metal sheet to obtain its magnetic properties;
thereafter, subjecting at least one surface of the sheet to an electron beam treatment to produce narrow substantially parallel bands of treated regions separated by untreated regions substantially transverse to the direction of sheet manufacture;
said treated regions resulting from melting and resolidifying of metal strip in those regions;

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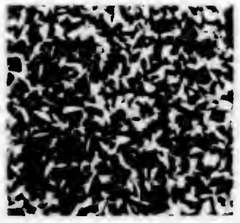
the electron beam treatment including generating an electron beam with a voltage of 20 to 200 kilovolts, and providing an energy density sufficient to produce a permanent defect in each treated region to effect heat resistant refinement of magnetic domain wall spacing of the sheet up to 1800° F. suitable to provide reduced core loss.

4,915,751
ACCELERATED WHISKER GROWTH ON IRON-CHROMIUM-ALUMINUM ALLOY FOIL
Gerald L. Vaneman, Grand Ledge, and David R. Sigler, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Sep. 6, 1988, Ser. No. 240,285
Int. Cl.[4] C23C *11/08*
U.S. Cl. 148—280 10 Claims



1. An accelerated method for growing oxide whiskers on an aluminum-containing ferritic stainless steel foil formed by a metal peeling process and containing chromium and between about 3 and 6 percent by weight aluminum; said method comprising heating the surface absent any precursor oxide film in readily oxidizing atmosphere at an initial temperature between about 900° C. and 960° C. for a time less than about two hours to initiate whisker growth and thereafter at a relatively higher temperature between about 960° C. and 1000° to continue whisker growth for a time sufficient to grow mature whiskers of a desired size.

4,915,752
CORROSION RESISTANT ALLOY
John H. Culling, St. Louis, Mo., assignor to Carondelet Foundry Company, St. Louis, Mo.
Continuation-in-part of Ser. No. 243,790, Sep. 13, 1988, abandoned. This application Apr. 10, 1989, Ser. No. 335,799
Int. Cl.[4] C22C *38/44, 38/42*
U.S. Cl. 148—327 8 Claims

1. A two-phase alloy which is weldable, is resistant to sea water and has good resistance to strong oxidizing substances, comprising a ferritic phase and an austenitic phase in which the ferritic phase is from about 25% to about 60% of the alloy, said alloy consisting essentially of:

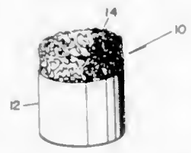
Nickel	7.8 to 11.5% by weight
Chromium	23.8 to 28.5%
Molybdenum	3.4 to 5.6%
Copper	0.8 to 1.5%
Nitrogen	0.12 to 0.23%
Iron	Essentially the balance

provided that the percentage of chromium and of molybdenum falls within the area ABCA of FIG. 1.

4,915,753
COATING OF BORON PARTICLES
John C. Trowbridge, Saratoga, Calif., and Jack D. Breazeal, Koloa, Hi., assignors to United Technologies Corporation, Hartford, Conn.
Division of Ser. No. 93,938, Sep. 8, 1987, abandoned. This application Nov. 21, 1988, Ser. No. 252,840
Int. Cl.[4] C06B *45/30*
U.S. Cl. 149—5 1 Claim

1. A solid propellant comprising about 0.8 micron to about 1.2 micron mean size boron particles having a boron carbide layer about 1 Å to about 100 Å thereon.

4,915,754
HIGH SOLIDS RATIO SOLID ROCKET MOTOR PROPELANT GRAINS AND METHOD OF CONSTRUCTION THEREOF
James O. Hightower, Jr.; Tomio Sato; James W. Hamner, all of Huntsville, and Carl M. Rector, Brownsboro, all of Ala., assignors to Morton Thiokol, Inc., Chicago, Ill.
Division of Ser. No. 908,761, Sep. 18, 1986, Pat. No. 4,764,319. This application Mar. 8, 1988, Ser. No. 165,641
Int. Cl.[4] C06B *45/10*
U.S. Cl. 149—19.4 10 Claims



1. A propellant grain comprises a propellant material and a reticulated structure embedded therein, said propellant material includes a highly plasticized binder such that the grain has a solids ratio equal to at least about 95 percent.

4,915,755
FILLER REINFORCEMENT OF POLYURETHANE BINDER USING A NEUTRAL POLYMERIC BONDING AGENT
Chung S. Kim, 1955 Santa Maria Way, Sacramento, Calif. 95825
Filed Oct. 2, 1987, Ser. No. 104,789
Int. Cl.[4] C06B *45/10*
U.S. Cl. 149—19.4 14 Claims

1. A filler-reinforced propellant composite comprising,
(A) a binder matrix of polyurethane derived from a OH-terminated prepolymer and a polyfunctional isocyanate curing agent,
(B) a polar plasticizer,
(C) polar filler particles essentially insoluble in said binder matrix, said particles being in a size range large enough to benefit from interfacial bonding,
(D) non-nitrocellulosic neutral polymeric bonding agent, NPBA, free of amine and acid groups, having a pH in the range from 5.5 to 8.5, a molecular weight in the range from about 3000 to about 500,000 and having at least three OH groups per molecule for reaction with said curing agent, yet having sufficient reactive OH groups remaining to undergo primary chemical bonding with the binder matrix through reaction with the curing agent, said NPBA being present in an amount sufficient to be adsorbed on at least a portion of the surfaces of enough particles to provide a predetermined composite strength, said curing agent being present in an amount sufficient to provide enough reactive groups to react with substantially all OH groups in said prepolymer and all OH groups in said NPBA, whereby tensile strength of said composite with 50% filler loading, at 50% elongation of said composite, is at least double the tensile strength at 50% elongation of the same composite with the same loading but without a bonding agent.

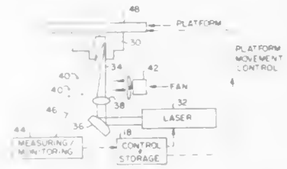
4,915,756
PYROTECHNICAL DELAY CHARGE
Staffan Calsson; Tore Boberg, and Conny Sjöqvist, all of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Karlskoga, Sweden
Filed Sep. 26, 1988, Ser. No. 248,802
Claims priority, application Sweden, Sep. 29, 1987, 8703743-8
Int. Cl.[4] C06B *45/10*
U.S. Cl. 149—19.9 8 Claims

1. A pyrotechnical delay charge with a rate of burning of 3–20 mm/sec., comprising
4–17% by weight of boron (B)
0–17% by weight of zirconium (Zr), titanium (Ti) and/or zirconium-nickel alloys
10–35% by weight of titanium dioxide (TiO_2)
40–65% by weight of tin dioxide (SnO_2)
0.5–10% by weight of chlorinated rubber and possibly up to 3% by weight of an aqueous dispersible acrylate binder.

4,915,757
CREATION OF THREE DIMENSIONAL OBJECTS
Joseph F. Rando, Los Altos Hills, Calif., assignor to Spectra-Physics, Inc., San Jose, Calif.
Filed May 5, 1988, Ser. No. 190,604
Int. Cl.[4] G06F *15/46*
U.S. Cl. 156—64 17 Claims

1. A method of constructing a three dimensional solid model, said method comprising,
(a) scanning a first area having a plurality of predetermined, known work location sites with a work element which can be selectively activated either to perform work or not to perform work at each one of the work location sites,
(b) supplying model information to the work element during said scanning of said first area,
(c) activating the work element to perform work at each of the work location sites only when the model information signals that work is to be done at that site,
(d) examining the actual condition of material at each site as affected by the action of the work element on the site,
(e) feeding back information on said actual condition of material at each site,
(f) comparing the feedback information on the actual condition of material at each site with the desired condition of material at that site as called for by the model information supplied pursuant to paragraph (b),
(g) making an appropriate correction for increasing or decreasing the amount of work done by the work element when the difference between the actual condition and the desired condition of the material at the work sites is greater than a selected difference,
(h) moving the work element to a second area having a plurality of predetermined and known work location sites,
(i) repeating steps (a) through (g) for the second area, and
(j) repeating step (i) for additional areas until the solid model has been physically constructed by the action of the work element.

17. Apparatus for automated production of a three-dimensional model, comprising,



a block or mass of ablatable material which has dimensions larger than those of the three-dimensional shape to be created,
an end effector tool having means effective to direct a stream of energy at specific work sites on the block of material at which the end effector tool is aimed, and means for moving the end effector tool around the surface of the mass or block of material as required by the shape to be produced,
means for monitoring the dimensions of material at work sites to determine the condition of the work site, i.e. the amount of material which remains at the work site,
feedback means for feeding back information from the monitoring of dimensions at the work sites, and
controller means for controlling the end effector tool, for receiving fed back information from the feedback means, and for making decisions as to whether further energy is to be directed at particular work sites based on the information fed back to the controller, and for effecting such decisions by either directing further energy to a work site using the end effector tool or not directing further energy to the work site.

4,915,758
RACEWAY FRAME AND METHOD FOR CURVED MODULAR WALL PANEL
George E. Baggett, Jr., Oswego, and Robert W. DeRoss, Naperville, both of Ill., assignors to Molex Incorporated, Lisle, Ill.
Division of Ser. No. 214,075, Jul. 1, 1988, Pat. No. 4,835,921. This application Dec. 1, 1988, Ser. No. 278,389
Int. Cl.[4] B29C *65/08*
U.S. Cl. 156—73.1 3 Claims

1. A method of making a raceway frame for a curved modular wall panel comprising the steps of:
molding from a thermoplastic material a first elongated member of generally T-shaped cross section having a curved segment and a lap joint shape at the free end of the base of its T-shaped cross-section;

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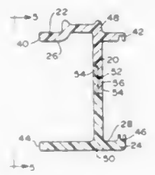
molding from a thermoplastic material a second elongated member of generally T-shaped cross section having a curved segment and a lap joint shape at the free end of the base of its T-shaped cross section cooperating with said lap join shape of said first elongated member;



aligning the first and second members with the bases of their T-shaped cross sections with said cooperating lap joint shapes in direct contact with one another; and

assembling an I-shaped body from said members by securing the bases of said members together where the plane of the joint is parallel to the radius of curvature of said segments.

4,915,759

METHOD FOR PRODUCING A MULTILAYER SYSTEM

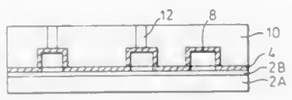
Peter L. Moran, 21 Windermere Drive, Alderley Edge, England

Filed Jan. 29, 1987, Ser. No. 8,498

Claims priority, application United Kingdom, Jan. 30, 1986, 8602331

Int. Cl.⁴ B32B *31/24*

U.S. Cl. 156—89 **10 Claims**



1. A method of producing a multilayer system characterised by:

a. coating an electrically insulating substrate with a seed layer of an electrically conductive oxidisable material which on oxidation is non-conductive and glass-forming,

b. depositing a pattern of solid conductor on the seed layer,

c. oxidising the parts of the seed layer not in contact with the pattern to their full depth, and

d. coating the whole with a firable dielectric which is fusable at 500° to 600° C., and then

e. firing the system to 500° to 600° C. to fuse the dielectric.

4,915,760

METHOD OF PRODUCING A COATED FIBER-CONTAINING COMPOSITE

Raj N. Singh, Schenectady, and Achuta R. Gaddipati, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 26, 1988, Ser. No. 262,651

Int. Cl.⁴ C04B *37/04*

U.S. Cl. 156—89 **32 Claims**

1. A process for producing a composite comprised of boron nitride coated fibrous material in a ceramic matrix which comprises the following steps:

(a) providing matrix-forming ceramic particulate material and organic binding material;

(b) forming a slurry of said matrix-forming material and organic binding material in a liquid medium;

(c) depositing a coating of boron nitride on fibrous material leaving no significant portion thereof exposed;

(d) providing said boron nitride coated fibrous material substantially as a layer;

(e) casting said slurry onto said coated fibrous material in an amount sufficient to form a tape therewith;

(f) evaporating said liquid medium forming a tape;

(g) assembling a plurality of said tapes to produce a layered structure;

(h) laminating the layered structure to form a laminated structure;

(i) heating said laminated structure to remove said organic binding material leaving no significant deleterious residue; and

(j) hot pressing the resulting porous structure at a sufficient temperature under a sufficient pressure for a sufficient period of time to consolidate said structure to produce said composite having a porosity of less than about 10% by volume, said composite containing no significant amount of reaction product of said coated fibrous material and said matrix, said ceramic matrix having a thermal expansion coefficient which ranges from lower than that of said coated fibrous material to less than about 15% higher than that of said coated fibrous material, at least about 10% by volume of said composite being comprised of said coated fibrous material.

4,915,761

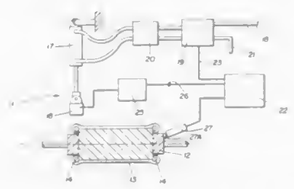
MAGNETIC BEAD SPOTTER

David P. Krause, Hartville, Ohio, assignor to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Feb. 18, 1983, Ser. No. 464,720

Int. Cl.⁴ B29D *30/00*; G01B *7/00*

U.S. Cl. 156—111 **6 Claims**



1. An apparatus for determining the rotational orientation of a green tire carcass having a ferrous member therein, comprising:

(a) first means for demagnetizing said ferrous member;

(b) second means adapted to magnetize a small portion of said ferrous member; and

(c) third means adapted to detect the magnetization of said ferrous member, wherein said third means comprises:

(a) magnetic probe means;

(b) amplifying means adapted to receive the output of said magnetic probe means;

(c) level detection means adapted to receive the output of said amplifying means; and

(d) logic means adapted to receive the output of said level detection means.

6. In an apparatus for detecting a magnetized area in a ferrous member contained in a green tire carcass employing a magnetic probe, the improvement comprising means for detecting the zero crossing of the output of said magnetic probe.

4,915,762

PROCESS FOR MAKING A HIGH-PRESSURE HOSE

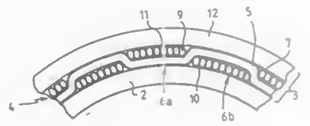
Yves Berlincourt, Blois, and Alain Mouchot, Cheverny, both of France, assignors to Tecalemit Flexibles, S.A., Blois, France

Division of Ser. No. 38,884, Apr. 14, 1987, Pat. No. 4,802,510. This application Sep. 10, 1987, Ser. No. 95,091

Claims priority, application France, Apr. 18, 1986, 86-05629

Int. Cl.⁴ B31C *1/00*

U.S. Cl. 156—143 **16 Claims**



1. A process for the production of a hose comprising an inner plastic tube covered by at least one braiding of plastic filaments which are helically crossed around the inner tube in two different directions, wherein said plastic filaments are braided by the filaments being helically crossed around the inner tube in two different directions so that the gap between any two adjacent layers which extend in the same direction as one another is at least 100% filled by braiding said filaments with sufficient tension to stretch said filaments so that on application of said filaments to said inner tube, said filaments are flattened in a direction substantially tangentially against said tube, and deformed out of their circular right cross-section.

4,915,763

NON-WOVEN FABRIC, OPAQUE AND NON-OPAQUE, WITH AND WITHOUT WEAVE-LIKE FINISH AND PROCESS FOR PRODUCING THESE

Paul G. Swiszcz, Boulder, Colo., assignor to Hunter Douglas Inc., Upper Saddle, N.J.

Filed Aug. 24, 1988, Ser. No. 236,071

Int. Cl.⁴ B32B *31/00*

U.S. Cl. 156—209 **16 Claims**

1. A method for producing a non-woven fabric having a weave-like finish from a spunbonded substrate having lowmelt and highmelt fibers wherein the lowmelt fibers have a melting point lower than the melting point of the highmelt fibers, comprising the steps of:

(a) embossing the substrate with a weave-like pattern;

(b) subsequently saturating a binder material through the substrate; and

(c) heating the fabric to dry and cure the binder material.

4,915,764

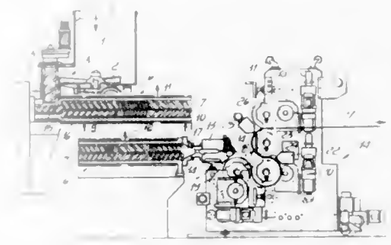
METHOD OF MAKING PANELS

Mario Miani, Via E. Fermi 9, 20017 Rho (Provincia Di Milano), Italy, assignor to Mario Miani, Milan, Italy

Filed Jun. 1, 1987, Ser. No. 55,958

Int. Cl.⁴ B32B *27/20*; B29C *47/10, 47/40*

U.S. Cl. 156—244.19 **19 Claims**



1. Method of making panels from an organic filler and a thermoplastic resin selected from a group consisting of polyethylene, polypropylene and polyvinylchloride, alone or in mixture, said method comprising the steps of;

providing an organic filler tank,

bulk feeding said organic filler to said organic filler tank,

moving at least some of said organic filler from said organic filler tank,

substantially metering a quantity of said organic filler moved from said organic filler tank to provide a substantially metered quantity of organic fiber,

providing a double volute,

moving said substantially metered quantity of organic filler to said double volute,

counter rotating said double volute thereby mixing said organic filler and conveying said organic filler along said double volute,

heating said organic filler thereby substantially desiccating said organic filler,

feeding at least one first charge of thermoplastic resin into said organic filler, thereby substantially lubricating said organic filler,

degassing said organic filler and said first charge of thermoplastic resin,

adding at least one second charge of thermoplastic resin to said organic filler and said first charge of thermoplastic resin to form a mixture containing from over 60% to 80% by weight of organic filler and from under 40% to 20% by weight of thermoplastic resin,

degassing said mixture,

plasticizing said mixture to form a plasticated mixture,

extruding said plasticated mixture to form an extruded plasticated mixture, and

shaping said plasticized mixture to form panels.

4,915,765

METHOD OF MANUFACTURING A FLUID BARRIER FOR MEDICAL DRESSING

John R. Metters, Hingham, Mass., assignor to Aegis Medical Corporation, Weymouth, Mass.

Continuation-in-part of Ser. No. 93,502, Sep. 19, 1987, Pat. No. 4,829,995. This application Jan. 20, 1988, Ser. No. 147,371

Int. Cl.⁴ B32B *31/18*

U.S. Cl. 156—267 **2 Claims**

1. A method of manufacturing a barrier for a medical dressing, comprising the steps of

providing a sheet stock of base substrate material having an adhesive layer on one side and disposed on a release paper substrate;

superimposing on the other side of said base substrate a

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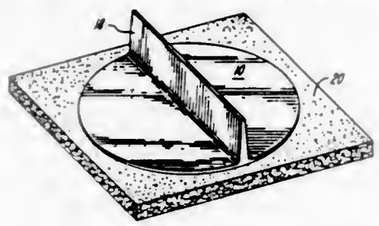
tab-forming substrate to form a medical dressing barrier stock material, said tab forming substrate having non-adhesive backed areas comprising a tab-forming element and adhesive backed areas;

cutting the medical dressing barrier stock material to the desired size and shape and simultaneously trimming a portion of the tab-forming element to provide medical barrier dressings having an adhesive layer on one surface



thereof and non-adhered tab members protruding from the other surface;

trimming the waste substrate material surrounding the produced medical dressing barriers from the release paper to yield a multitude of discrete medical dressing barriers adhered to the release paper; and

collecting the medical dressing barriers and release paper on a wind-up roll.

4,915,766

PREPARATION OF WOOD LAMINATES USING HIGH MOISTURE CONTENT VENEERS

Gene F. Baxter, Decature, Ga., assignor to Georgia-Pacific Resins, Inc., Atlanta, Ga.

Continuation of Ser. No. 917,545, Oct. 10, 1986, abandoned. This application Jan. 23, 1989, Ser. No. 300,238

Int. Cl.[4] C09J *5/00*

U.S. Cl. 156—335 **30 Claims**

17. A method for making wood laminates from a plurality of wood veneers comprising (a) applying an adhesive to a mating surface of least one of a plurality of veneers, said adhesive comprising a mixture of an alkaline catalyst and a blend of a thermosetting phenol-aldehyde resin and an acetone-formaldehyde resin, said blend having between about 0.11 to one part by weight acetone-formaldehyde resin per part by weight of phenol-aldehyde resin, said acetone-formaldehyde resin having been prepared by reacting acetone and formaldehyde in an aqueous reaction mixture under controlled reaction conditions at an acetone to formaldehyde mol ratio in the range of about 1:2.7 to 1:4 and at a ph of above about 8.0, wherein said pH is maintained by adding between about 2.9 and 4.4 percent by mol alkaline catalyst based on the mols of said acetone to said aqueous reaction mixture during preparation of said acetone-formaldehyde resin, (b) assembling said plurality of wood veneers into a panel by mating with the surface to which the adhesive has been applied, and (c) consolidating the panel at a temperature, pressure and for a time sufficient to cure the adhesive.

29. An adhesive useful for bonding wood veneers comprising a mixture of an alkaline catalyst and a blend of a thermosetting phenol-aldehyde resin and an acetone-formaldehyde resin, said blend having between about 0.11 to one part by weight acetone-formaldehyde resin per part by weight of phenol-aldehyde resin, said acetone-formaldehyde resin having been prepared by reacting acetone and formaldehyde in an aqueous reaction mixture under controlled reaction conditions at an acetone to formaldehyde mol ratio in the range of about 1:2.7 to 1:4 and at a pH of above about 8, wherein said alkaline catalyst is sodium hydroxide and said pH is maintained by adding between about 2.0 and 3.0 percent by weight sodium hydroxide based on the weight of said acetone to said aqueous reaction mixture during preparation of said acetone-formaldehyde resin.

4,915,767

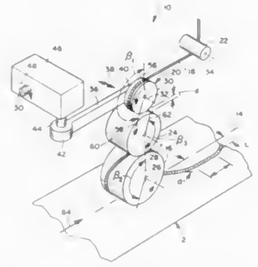
APPARATUS FOR APPLYING AN ELASTIC IN A CURVED PATTERN TO A MOVING WEB

Gregory J. Rajala, Neenah, Wis.; William J. Moore, Brea, Calif., and Kurt J. Kloehn, Little Chute, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 17, 1988, Ser. No. 272,670

Int. Cl.[4] A61F *13/16*; B32B *31/08*; A41B *13/02*

U.S. Cl. 156—440 **8 Claims**



1. An apparatus for applying an elastic member in a curved path relative to its dwell line onto a continuously moving web, comprising:

a rotatable nip roll adapted to be in rolling engagement with the web and to press an elastic member against the web such that the elastic member is spaced a predetermined maximum distance from the dwell line,

a rotatable buffer roll being disposed above and in rolling engagement with said rotatable nip roll to cushion said rotatable nip roll against transient perturbations and being adapted to press the elastic member against said rotatable nip roll to maintain the elastic member in a curved form, and

an oscillating roll being disposed above and spaced apart a predetermined length from said rotatable buffer roll, said oscillating roll oscillating in a path generally transverse to a direction of web travel and applying the elastic member in a curved line on said rotatable buffer roll,

the predetermined maximum distance of the elastic member from the dwell line being directly proportional to the predetermined length between said oscillating roll and said rotatable buffer roll.

4,915,768

DEVICE FOR APPLYING COVERING MATERIAL

Hans Söderberg, Fösabacken, Sweden, assignor to Sprayway Maskin AB, Sweden

Filed Feb. 17, 1989, Ser. No. 311,856

Claims priority, application Sweden, Mar. 4, 1988, 8800790

Int. Cl.[4] B26F *3/02*; B32B *35/00*

U.S. Cl. 156—527 **20 Claims**

1. A device for applying covering material provided in the form of a roll, comprising:

a frame,

two holders arranged on the frame, each holder for carrying a roll of covering material, the axes of the two holders lying substantially parallel to each other,

a handle connected to the frame and extending between said axes and in a plane substantially perpendicular thereto,

the device being arranged to simultaneously receive a roll of covering material on each holder and to permit a web of covering material to be fed from the two rolls, respectively, in opposite directions, the handle being so arranged

that the device can be moved in one application direction in order to simultaneously feed out a web of covering material and in an opposite application direction in order to simultaneously feed out a web of covering material from the other of the rolls of covering material, and

a webshearing means arranged on the frame in each of the application directions of the covering material being fed out.

4,915,769

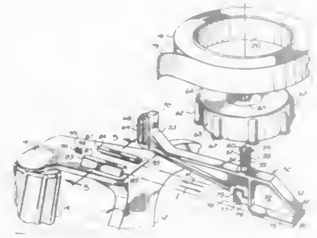
MASKING MACHINE

Robert H. Hell, New Richmond, Wis.; Frederic A. Longworth, Shoreview, and Allen J. Rivard, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company

Filed Mar. 20, 1989, Ser. No. 326,015

Int. Cl.[4] B32B *35/00*; B26F *3/02*

U.S. Cl. 156—527 **7 Claims**



1. In a masking machine including

a frame, and

a roll holder rotatably carried by said frame for supporting a primary roll of tape,

improvements therein for selective convenient access to a source of tape independent of said primary roll of tape, said improvements comprising:

(a) dispensing means for supporting an auxiliary roll of tape, said dispensing means including a subframe; and

(b) attachment means for detachably securing said dispensing means to the frame of said masking machine, said attachment means including

(i) an element of an engagement pair carried by said frame,

(ii) a complemental element of said engagement pair carried by said subframe,

said element and said complemental element being relatively movable between an engagement position and a separation position, and

(iii) detent means for releasably retaining said engagement pair in the engagement position, said detent means including

(1) a first element of a locking pair carried by said frame, and

(2) a second element of said locking pair carried by said complemental element for snappingly engaging said first element.

4,915,770

ELECTRONIC CHIP SUPPLYING APPARATUS AND METHOD

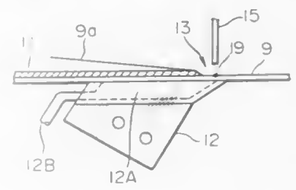
Yoshio Haeda, Yaizu; Masato Itagaki, and Keisuke Fujishiro, both of Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 5, 1988, Ser. No. 190,660

Claims priority, application Japan, May 9, 1987, 62-112846

Int. Cl.[4] B65B *69/00*; B65H *5/28*

U.S. Cl. 156—344 **6 Claims**



1. An electronic chip supplying apparatus comprising:

guide means for guiding a retainer tape to an opening position where electronic chips are to be picked up by a chip pickup means, said electronic chips being encased in recesses arranged along a longitudinal direction of said retainer tape, and said recesses being sealed by attaching a detachable coating tape onto a top surface of said retainer tape;

intermittent driving means for intermittently pulling under traction said retainer tape at a position downstream of said opening position;

peeling means for peeling said coating tape away from said retainer tape at said opening position;

tape support means for supporting said retainer tape at said opening position including vacant chamber means maintained undera vacuum pressure, an aperture means communicating with said vacant chamber means and opening toward said retainer tape; and

suppressing means for suppressing vertical fluctuation of said retainer tape at said opening position, said suppressing means includes said tape support means.

6. An electronic chip supplying method comprising the following steps of:

intermittently moving a retainer tape, which encases therein electronic chips, to a chip pickup position;

sucking said retainer tape at said chip pickup position toward a tape support means, said sucking step being performed simultaneously with said intermittently moving step;

peeling a coating tape from said retainer tape at said chip pickup position; and

after said peeling step, picking up said chips away from said retainer step.

4,915,771

SEGMENTED TAPE SHOE

Kevin D. O'Brien, Des Moines, and Elmer R. Hulstrom, Sumner, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 8, 1987, Ser. No. 106,724

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—574 **2 Claims**

1. A segmented tape shoe for pressing a tape into place along a predetermined trajectory on a contoured lay-down surface, comprising:

a shoe body for holding each of a plurality of tape shoe

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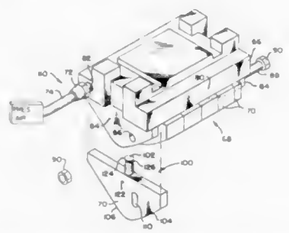
segments against the lay-down surface in a close widthwise array that is transverse to the trajectory;

a plurality of tape shoe segments, each having a substantially constant width, the portions of the cross sections of the tape shoe segments that are held against the lay-down surface being substantially identical, wherein the close



widthwise array of the plurality of tape shoe segments has two end segments, the two end segments being thinner than at least one tape shoe segment contained internally within the widthwise array of tape shoe segments; and

bias means for separately urging each of the tape shoe segments downwardly from the shoe body.

4,915,772

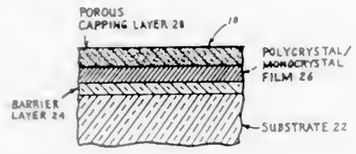
CAPPING LAYER FOR RECRYSTALLIZATION PROCESS

Francis P. Fehlner, Corning; Roger A. Miller, Painted Post, and Arthur J. Whitman, Horseheads, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Oct. 1, 1986, Ser. No. 913,998

Int. Cl.[4] C30B *13/00*

U.S. Cl. 156—620.7 3 Claims



2. A method of enhancing the surface smoothness of a film of semiconductive material which has been deposited on a surface of refractory material and thereafter crystallized, said method comprising the steps of

depositing a capping layer over said film prior to crystallizing said film to prevent agglomeration of said film while it is in a molten state while said film is being crystallized, and

applying heat to said film while it is sandwiched between said capping layer and said refractory material surface to crystallize said film,

wherein the step of depositing a capping layer comprises evaporating silicon from a source in the presence of oxygen and positioning said substrate such that said vapor deposits on said film and forms a SiO_2 capping layer having a thickness of at least 0.4 μm, said capping layer being deposited under such conditions that it is sufficiently porous that gases generated while said film is being crystallized are vented therethrough.

4,915,773

PROCESS FOR GROWING SHAPED SINGLE CRYSTALS

Dmitry Y. Kravetsky, ulitsa Bibliotechnaya, 13, kv. 91; Lev M. Zatulovsky, Orlikov pereulok, 8, kv. 55; Leonid P. Egorov, ulitsa Profsojuznaya, 75, korpus 1, kv. 92; Boris B. Pelts, ulitsa Lesnaya, 63/43, kv. 157; Leonid S. Okun, ulitsa Udaltsova, 4, kv. 306; Viktor V. Averyanov, ulitsa Energeticheskaya, 10, korpus 2, kv. 95; Efim A. Freiman, ulitsa 2-aya Vladimirskaya, 15, korpus 1, kv. 53, and Alexandr L. Alishoev, Kronshtadtsky bulvar, 13, korpus 2, kv. 168, all of Moscow, U.S.S.R.

PCT No. PCT/SU87/00117, § 371 Date Jul. 26, 1988, § 102(e) Date Jul. 26, 1988, PCT Pub. No. WO88/03967, PCT Pub. Date Jun. 2, 1988

PCT Filed Oct. 23, 1987, Ser. No. 241,988

Claims priority, application U.S.S.R., Nov. 26, 1986, 4149059

Int. Cl.[4] C30B *15/14*

U.S. Cl. 156—617.1 5 Claims

1. A process for growing shaped single crystals of refractory optically transparent metal compounds, comprising the steps of:

(1) melting a starting stock of said refractory metal compound in an inert gas atmosphere under the effect of heat evolved by a heater;

(2) fusing a seed in a zone of crystallization;

(3) building-up a single crystal and pulling thereof from the zone of crystallization to a required length while continuously feeding a melt into the zone of crystallization through a capillary system of a shaping unit; and

(4) varying the power of the heater after which the single crystal is cut-off from the melt and cooled, wherein prior to melting of the starting stock, a control particle of said starting stock is placed in the zone of crystallization, the power P of the heater is noted at the moment of fusing of said control particle, and melting of the starting stock is then effected at a heater power of (1.04–1.1)P, fusing of the seed is carried out at a power of the heater of (1.03–1.08)P, building-up of the single crystal at a power of (1.02–1.08)P, pulling of the single crystal from the crystallization zone at a power of (1.02–1.22)P and cooling of the single crystal is conducted at a rate of 20°–30° C./min. by lowering power of the heater, and upon reaching the single crystal temperature of 1,600°–1,550° C., the heater is switched-off.

4,915,774

METHOD OF MANUFACTURING ORIENTATED SUBSTRATE PLATES FROM SOLID SEMICONDUCTOR BLOCKS FROM THE III–V GROUP

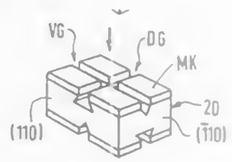
Claude Schiller, Savigny-sur-Orge, and Jean-Pierre Farges, Soignolles, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 11, 1988, Ser. No. 217,537

Claims priority, application France, Jul. 9, 1987, 87 09736

Int. Cl.[4] C30B *15/00, 15/20, 15/26*

U.S. Cl. 156—617.1 9 Claims



1. A method of manufacturing oriented substrate plates of a III–V-material, which comprises:

(a) forming a monocrystalline pulling nucleus of the III V material having crystallographic axes OU, OV and OZ which axes form an orthonormal system;

(b) pulling according to the Czochralski method a monocrystalline ingot of the III–V-material using the nucleus with its axis OZ parallel to the pulling direction;

(c) shaping the ingot into the form of a more perfect cylinder with its axis parallel to the axis OZ;

(d) determining by X-ray diffraction the direction of the crystallographic axes OU and OV of the ingot which form with the axis OZ an orthonormal system;

(e) shaping on the ingot a major flat perpendicular to the axis OU and a minor flat perpendicular to the axis OV and

(f) cutting substrate plates from the ingot perpendicular to the axis OZ, characterized in that,

(g) during step (a) the seed crystal further is shaped into the form of a rectangular prism with flat perpendicular to its crystallographic axis OU and OV, which flats then are slightly etched in an etching bath which preferentially attacks the III–V-material and

(h) during steps (c) and (d) the seed crystal remains attached to the ingot.

4,915,775

APPARATUS FOR ADJUSTING INITIAL POSITION OF MELT SURFACE

Nobuo Katsuoka, Takasaki; Yoshihiro Hirano, Annaka; Munenori Tomita, Annaka, and Atsushi Ozaki, Annaka, all of Japan, assignors to Shin-Etsu Handotai Company, Ltd., Tokyo, Japan

Filed Jul. 21, 1988, Ser. No. 222,438

Claims priority, application Japan, Jul. 21, 1987, 62-181722

The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.

Int. Cl.[4] C30B *15/70, 15/30, 15/00, 15/26*

U.S. Cl. 422—249 7 Claims

1. An apparatus for adjusting the initial position of the surface of the melt, which is suitable for use in a monocrystal growing system employing the Czochralski method, comprising:

a melt-surface initial position measuring device for measuring the vertical position (H) of the surface (16A) of a melt (16) within a crucible (14); and

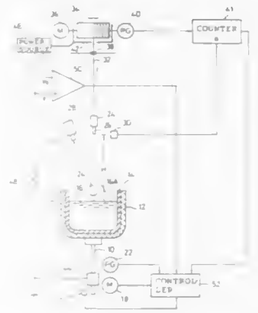
means (18, 22, 52) for vertically moving said crucible (14) to a desired initial position selected on the basis of measurement of said melt-surface initial position by said melt-surface initial position measuring device;

wherein said melt-surface initial position measuring device comprises:

electrical contact detecting means (46, 48, 50) for detecting the electrical contact between a seed crystal (26) and said melt (16);

reference position detecting means (30, 30A) disposed above said melt (16) for detecting that the lower end of said seed crystal (26) is at a reference position;

pulse generating means (40) for outputting a number of pulses proportional to the distance through which said seed crystal (26) descends; and



pulse counting means (41) for counting the number of pulses generated while said seed crystal (26) descends from said reference position to the position at which said seed crystal (26) is brought into electrical contact with said melt (16), and for outputting a vertical position of the surface (16A) of said melt (16).

4,915,776

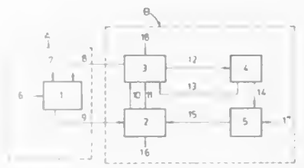
PROCESS FOR ETCHING COPPER WITH AMMONIACAL ETCHANT SOLUTION AND RECONDITIONING THE USED ETCHANT SOLUTION

Ming H. Lee, No. 16, Lane 25, Lin-Hsi Street, Taipei, Taiwan

Filed Apr. 21, 1989, Ser. No. 341,469

Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06;* **C23F** *1/00*

U.S. Cl. 156—642 4 Claims



1. A process for etching copper with an etchant solution and reconditioning said etchant solution characterized in that it comprises: providing an etching zone, a first reaction zone, a second reaction zone, a decomposition zone, and a hydration zone; said etching zone containing a charge of said etchant solution and a copper material to be etched, said etchant solution being an aqueous solution of ammonium hydroxide and ammonium chloride;

supplying to said etching zone a gaseous feed stream comprising oxygen in excess amount;

allowing said etchant solution to undergo etching reaction with said copper in said etching zone to form an aqueous used etchant solution which contains tetrammine copper chloride;

introducing to said first reaction zone said aqueous used etchant solution and a feed of calcium hydroxide drawn from said hydration zone;

allowing said first aqueous used etchant solution and said

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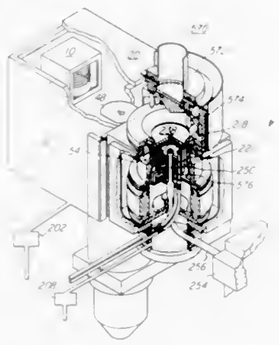
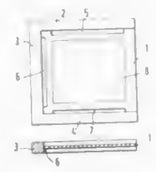
calcium hydroxide to react in said first reaction zone to form a first reaction mixture containing ammonia gas, an aqueous calcium chloride solution and copper hydroxide precipitate;
separating said copper hydroxide precipitate from said first reaction mixture;
introducing said ammonia gas and said aqueous calcium chloride solution to said second reaction zone;
supplying to said second reaction zone a first feed water and a feed of carbon dioxide feed drawn from said decomposition zone;
allowing said first feed water, said carbon dioxide, said ammonia and said aqueous calcium chloride solution to undergo reaction at a pH value lower than 7 to form a second reaction mixture of an aqueous solution of ammonium hydroxide and ammonium chloride and calcium carbonate precipitate;
separating said calcium carbonate precipitate from said second reaction mixture and introducing said separated calcium precipitate into said decomposition zone;
sintering said calcium carbonate at a sintering temperature above 600° C. to form gaseous carbon dioxide and calcium oxide;
introducing said gaseous carbon dioxide as said feed of carbon dioxide feed to said second reaction zone;
introducing said calcium oxide to said hydration zone;
supplying a second feed water to said hydration zone;
allowing said calcium oxide to react with said second feed water to form said feed of calcium hydroxide which is introduced to said first reaction zone.

4,915,777
METHOD FOR ETCHING TUNGSTEN
Rhett B. Jucha, Celeste; Monte A. Douglas, Coppell, and Cecil J. Davis, Greenville, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 74,450, Jul. 16, 1987, Pat. No. 4,838,990, and a continuation of Ser. No. 71,512, Jul. 9, 1987, abandoned, and a continuation of Ser. No. 250,185, Sep. 28, 1988. This application Mar. 2, 1989, Ser. No. 318,035
Int. Cl.[4] C23F *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—643 **15 Claims**



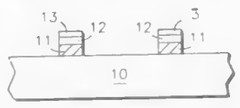
1. A method for etching a layer of Tungsten in a process chamber comprising:
(a) providing a mask layer to protect portions of the layer of tungsten which are not to be etched;
(b) subjecting the masked layer to a fluid comprising:
i. an etchant; and
ii. a carbon containing gas taken from the group consisting of CO and CH_4.

4,915,778
METHOD OF FABRICATING AN APPARATUS FOR MEASURING VELOCITY OF FLOW
Wolfgang Porth, Frankfurt am Main, and Wolfgang Weibler, Hofheim, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt, Fed. Rep. of Germany
Division of Ser. No. 21,300, Mar. 3, 1987, Pat. No. 4,841,769. This application Feb. 21, 1989, Ser. No. 314,630
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1986, 3606851
Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—643 **5 Claims**



1. In a method for fabricating an apparatus for measuring the velocity of flow of fluids, and particularly of the intake air of internal-combustion engines, the apparatus having an electrically heatable resistance layer which is applied in insulated manner on a support, which layer comprises silicon and is in thermal contact with the flowing fluid, and wherein,
the support is rectangular and includes a flat central part which carries a resistance layer, the support further comprising reinforcement strips integral one-piece therewith on at least three sides of the support for securing the resistance layer;
the method comprising the steps of
fabricating a sheet having the thickness of the reinforcement strips and the rectangular shape of the support, applying covering masks to the sheet wherein the covering masks have the shape of the reinforcement strips, and subjecting the sheet to an etching process to reduce the thickness of the sheet in areas not covered by the covering masks.

4,915,779
RESIDUE-FREE PLASMA ETCH OF HIGH TEMPERATURE ALCU
G. Scot Srodes, Mesa; Willis R. Goodner, Chandler; John L. Freeman, Jr., Mesa, and Andrew G. Nagy, Phoenix, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.
Filed Aug. 23, 1988, Ser. No. 235,134
Int. Cl.[4] H01L *21/306;* **C23F** *1/00*
U.S. Cl. 156—643 **10 Claims**



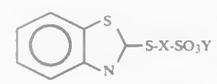
9. A method for etching a high temperature metallization layer on a semiconductor structure in a manner to provide a residue-free surface, comprising: providing the semiconductor structure; providing the high temperature metallization layer on the semiconductor structure; providing a protective layer over the metallization layer; providing a layer of photoresist over the protective layer and patterning the photoresist to expose portions of the protective layer; placing the semiconductor structure in a plasma etcher and creating a vacuum around the semiconductor structure; etching away the exposed portions of the protective layer to expose portions of the metallization layer while maintaining the vacuum; and etching away the exposed portions of the metallization layer without breaking the vacuum around the semiconductor structure to provide a residue-free surface where the exposed portions of the metallization layer had previously existed.

4,915,780
PROCESS FOR MAKING AN ELEMENT FOR MICROWAVE HEATING
Donald E. Beckett, Mississauga, Canada, assignor to Beckett Industries Inc., Mississauga, Ontario, Canada
Continuation of Ser. No. 10,182, Feb. 2, 1987, abandoned. This application Apr. 12, 1989, Ser. No. 353,206
Int. Cl.[4] B44C *1/22;* **C23F** *1/02;* **C03C** *15/00, 25/06*
U.S. Cl. 156—661.1 **3 Claims**

1. A method for the selected demetallization of a web of metallized flexible polymeric material having an etchant-removable metal layer on one surface thereof, which comprises:
screen applying to at least one first region of said metal layer an etchant resistant-material to provide in said at least one first region a plurality of dots of said etchant-resistant material only partially covering and protecting said metal layer to a degree determined by the number of screen lines of said screen and leaving exposed metal between said dots in said at least one first region;
applying to at least one second region of said metal layer separate from said at least one first region an etchant-resistant material to provide in said at least one second region said etchant-resistant material completely covering and protecting said metal layer in said at least one second region
said screen application and said application of said etchant-resistant material leaving a third region of said metal layer between said at least one first region and said at least one second region from which said etchant-resistant material is absent;
applying to said metal layer an etchant material for said metal;
(i) to remove metal from said at least one first region in those exposed areas thereof not covered and protected by said plurality of dots of said etchant-resistant material,
(ii) to remove no metal from said at least one second region by virtue of protection of said metal from said etchant by said covering of etchant-resistant material in said at least one second region, and
(iii) to remove metal completely from said third region between said at least one first region and said at least one second region; and
washing spent etchant from said metal layer, thereby providing a partially-etched web having:
(i) in said at least one first region, a metal layer of decreased density with respect to the metal layer on the web determined by the number of screen lines of said screen,
(ii) in said at least one second region, a metal layer having a density the same as the metal layer on the web, and
(iii) in said third region between said at least one first region and said at least one second region, a complete absence of metal layer.

4,915,781
STABILIZED HYDROGEN PEROXIDE COMPOSITIONS
Bruce A. Bohnen, Roseville; Kurt E. Heikkila, Circle Pines, and Rodney K. Williams, Stacy, all of Minn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Jul. 27, 1988, Ser. No. 224,803
Int. Cl.[4] C09G *13/06;* **C23G** *1/18*
U.S. Cl. 156—664 **14 Claims**

1. A stabilized hydrogen peroxide composition comprising hydrogen peroxide and a compound of the following formula:



wherein X is a linking group and Y is a metal cation or H which compound is soluble in hydrogen peroxide.

4,915,782
ALUMINUM LITHIUM ETCHANT
Dolphus L. Coggins, St. Louis, Mo.; Walter E. Lindner, Plano, Tex., and Elias Malakelis, St. Louis, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.
Filed Dec. 21, 1988, Ser. No. 287,917
Int. Cl.[4] C23F *1/00;* **B44C** *1/22*
U.S. Cl. 156—665 **20 Claims**

12. A method of caustically etching alloy 2090 lithium containing aluminum alloy effective to uniformly and smoothly etch the alloy comprising etching the alloy in an etchant bath containing between about 1250 to 300 grams per liter of an inorganic hydroxide, between abut 35 to 145 grams per liter of an inorganic sulfide, and an etch rate controller, including an aluminum complexing agent, the etchant bath containing inorganic hydroxide and inorganic sulfide in amounts effective to etch the alloy and, in combination with the etch rate controller, being effective to produce a smooth, uniform chemically milled surface free of stress concentrating surface features.

4,915,783
PAPER RECYCLING A1D
Edward J. Griffith, Manchester, and William C. McDaniel, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.
Filed Dec. 27, 1988, Ser. No. 290,558
Int. Cl.[4] D21C *5/02*
U.S. Cl. 162—8 **20 Claims**

1. In a process for recycling waste paper the improvement comprising adding an alkali metal Kurrol's salt, and a source of diverse ions in an amount sufficient to render said Kurrols'salt soluble, to the process water.

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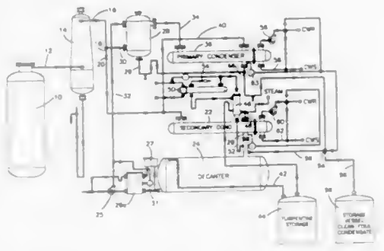
4,915,784

PROCESS AND APPARATUS FOR REMOVING CONTAMINANTS FROM PULP DIGESTER VENT GAS

Ellis W. Reynolds, 2506 Acadie Dr., Jacksonville, Fla. 32217

Filed May 3, 1989, Ser. No. 346,634
Int. Cl.[4] D21C *11/06*; C07C *7/00*
U.S. Cl. 162—15 5 Claims



1. In an apparatus for increasing the yield of turpentine recoverable from the hot vapor containing turpentine, foul water and noncondensible gas issuing from a pulp digester, said apparatus including at least one digester yielding said hot vapor, means for conducting said hot vapor to a separator for removal of carry over black liquor from said hot vapor, means for conducting black liquor depleted hot vapor from said separator to a first condenser, a first condenser for condensing the turpentine and foul water phases in said hot vapor and separating them from non-condensible gases, means for conducting the condensate including turpentine and foul water to a decanter, and a decanter for separating turpentine and foul water condensate phases; the improvement which comprises: (a) means for conducting said hot vapor to a gas/liquid contact vessel, (b) means for recycling liquid foul water from said decanter to said gas/liquid contact vessel, (c) a gas/liquid contact vessel for contacting from hot vapor with recycle liquid foul water condensate from said decanter to yield a gaseous effluent containing foul water condensate vapor, turpentine, and noncondensible gases, (d) means for conducting said gaseous effluent to a selective condenser and (e), a selective condenser for cooling the gaseous effluent from said gas/-liquid contact vessel to condense the foul water condensate vapor and to yield a gaseous fraction containing turpentine and noncondensible gases for return to said first condenser to condense turpentine from said gaseous fraction, whereby useful foul water condensate and an enhanced yield of turpentine are obtained.

4,915,785

SINGLE STAGE PROCESS FOR BLEACHING OF PULP WITH AN AQUEOUS HYDROGEN PEROXIDE BLEACHING COMPOSITION CONTAINING MAGNESIUM SULPHATE AND SODIUM SILICATE

Gregory J. Siminoski, Ancaster, and Tadas S. Macas, West Vancouver, both of Canada, assignors to C-I-L Inc., North York, Canada

Filed Dec. 23, 1988, Ser. No. 289,309
Int. Cl.[4] D21C *9/16*
U.S. Cl. 162—78 12 Claims

1. A rapid, single stage process for the bleaching of mechanical pulp, said process comprising treating said pulp at a pH selected from the range of about 9 to about 11 in an aqueous bleaching composition comprising greater than about 10 percent by weight on pulp of hydrogen peroxide, magnesium sulphate in an amount greater than or equal to about 0.2 percent by weight on pulp, sodium silicate in an amount equal to or greater than 6 percent by weight on pulp and a base, wherein the hydrogen peroxide, magnesium sulphate, sodium silicate and base are in ratios and in sufficient amounts to reduce the wasteful non-bleaching reactions of the hydrogen peroxide; and for a sufficient period of time to effect enhanced brightness of said pulp; and to produce a pulp of said enhanced brightness and a residual liquor.

4,915,786

NONIONIC EMULSIFIER AND SUBSTITUTED SUCCINIC ANHYDRIDE COMPOSITONS THEREWITH

W. Alan Sweeney, Lakespur, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 638,169, Aug. 6, 1984, abandoned, which is a division of Ser. No. 449,324, Dec. 13, 1982, abandoned. This application Sep. 22, 1986, Ser. No. 909,979
Int. Cl.[4] D21H *3/08*
U.S. Cl. 162—158 21 Claims

1. A method of imparting water repellency to surfaces containing groups reactive to anhydrides which comprises impregnating said surfaces with an aqueous emulsion of a stable hydrocarbyl-substituted succinic anhydride/nonionic emulsifier composition comprising:

(a) 70 to 99.5% of a normally liquid hydrocarbyl-substituted succinic anhydride having from 10 to 30 carbon atoms in the substituent; and

(b) 0.5 to 30% of a water-soluble emulsifier comprising the reaction product of a hydrocarbyl-substituted succinic anhydride having from 10 to 30 carbon atoms in the substituent and a nonionic water-soluble compound having 1 to 3 groups reactive to anhydrides, wherein said water-soluble compound has sufficient hydrophilic strength to give a balanced oil-in-water emulsifier;

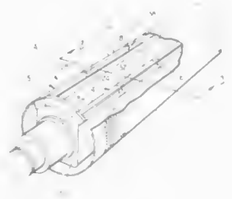
and wherein the emulsifier so produced contains a free carboxyl group and a substituted carboxyl group per each reacted anhydride molecule.

4,915,787

PAPER MACHINE SUCTION ROLL SEAL STRIPS

William R. Branyon, Landrum; David M. Cline, and William B. Richmond, both of Greenville, all of S.C., assignors to The Cline Company, Inc., Greenville, S.C.

Filed Aug. 30, 1988, Ser. No. 238,283
Int. Cl.[4] D21F *3/10*
U.S. Cl. 162—199 14 Claims



12. In a papermaking machine having a stationary suction box and a perforated cylindrical shell which rotates around an interface with said suction box which is disposed cylindrically within said cylindrical shell, a method of sealing the interface between said suction box and cylindrical shell as said cylindrical shell rotates about said stationary suction box comprising:

forming a composite seal strip in edge slots constructed on edges of said suction box having a generally open-top U-shaped channel extending generally across the entire width of said suction box;

forming said composite strip by joining a plurality of elongated generally rectangular seal strips in said slots together end-to-end throughout the width of each slot;

retaining a lower edge of said seal strips in said slots across the width of said suction box, and engaging an upper edge of said seal strips having a wear surface against an interior surface of said cylindrical shell as it rotates about said suction box; and

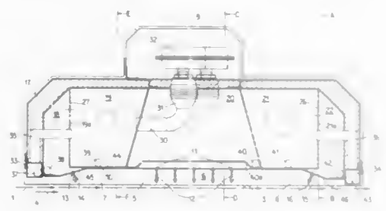
joining said seal strips together by correspondingly shaped convex surfaces and concave surfaces formed on first and second end sections near free ends of adjoining strips having a prescribed radius of curvature which fit together, said convex and concave surfaces forming an interfitted radius joining said free ends together in opposition to the motion of rotation of said cylindrical shell.

4,915,788

METHOD OF CONTACTING RUNNING WEBS WITH STEAM

Stefan H. Winbeim, Frankfurt am Main, Fed. Rep. of Germany, assignor to V.I.B. Apparatebau GmbH, Maintal, Fed. Rep. of Germany

Continuation of Ser. No. 82,786, Aug. 6, 1987, abandoned. This application Jan. 24, 1989, Ser. No. 302,075
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1987, 3701406
Int. Cl.[4] D21F *5/00*
U.S. Cl. 162—207 18 Claims



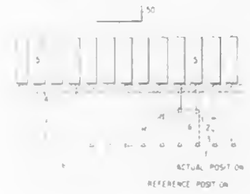
1. A method of treating a running moist fibrous web with steam, comprising the steps of transporting the web along a predetermined path; directing at least one first stream of steam against one side of the running web in a predetermined portion of said path; directing at least one additional stream of steam against the one side of the running web in a second portion of said path adjacent said predetermined portion, said step of directing said first stream including conveying said first stream through at least one aperture having a length which at least equals the width thereof; orienting the additional stream with reference to the web in said path in such a way that the additional stream draws atmospheric air toward the predetermined portion of the path; and regulating at least one of the first and additional streams so that the drawn atmospheric air substantially prevents the flow of steam along the one side of the running web and out of the second portion of said path in a direction counter to the direction of flow of atmospheric air drawn by the additional stream; and wherein the step of directing the first stream includes directing a plurality of first jets of steam in a first direction substantially at right angles to the one side of the running web, said step of directing the additional stream including directing a plurality of second jets of steam against the one side of the running web in the second portion of said path, said orientating step including confining said jets of said additional stream to a flow at an acute angle to said first direction.

4,915,789

APPARATUS FOR ADJUSTING A DIAPHRAGM BLADE

Rudolf Münch, Ravensburg, and Peter Ficklscherer, Baindt-Sulpach, both of Fed. Rep. of Germany, assignors to Sulzer-Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Mar. 13, 1989, Ser. No. 322,296
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1988, 3808050
Int. Cl.[4] D21F *1/06*
U.S. Cl. 162—259 2 Claims



1 In a headbox of a papermaking machine, an apparatus for adjusting a diaphragm blade at a slice opening gap of the headbox of the papermaking machine, comprising:

a diaphragm blade having connecting locations;

driveable adjustable elements arranged at a predetermined spaced relationship substantially parallel to the diaphragm blade and coupled with the diaphragm blade in order to apply at said connecting locations a force upon the diaphragm blade;

a rigid stationary support;

said driveable adjusting elements being supported at said rigid stationary support;

said driveable adjusting elements comprising adjusting spindles;

adjustment motors provided for driving said adjusting spindles;

means for individually setting each of said adjustment motors to a predetermined desired thrust speed and a predetermined desired thrust distance for each respective adjusting spindle prior to starting said adjustment motors; and

means for simultaneously setting said adjustment motors into operation and for simultaneously turning them off subsequent to reaching a predetermined reference position of the diaphragm blade so that each adjusting spindle covers its respective thrust distance within the same time interval.

4,915,790

PRESS SECTION OF A PAPERMAKING MACHINE WITH ADJUSTABLE FELT GUIDE ROLL

Hans Dahl, Karl Erb-Ring 89, 7980 Ravensburg, Fed. Rep. of Germany

Filed Dec. 12, 1988, Ser. No. 282,693
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1987, 3742848
Int. Cl.[4] D21F *3/04*
U.S. Cl. 162—305 10 Claims

1.

A pressing section of a papermaking machine for dewatering a paper web, comprising:

means defining a pair of pressing surfaces for each of two spaced and successively arranged pressing locations;

each pair of pressing surfaces comprising an upper pressing surface and a lower pressing surface;

said upper pressing surface and said lower pressing surface of each pair defining therebetween an extended nip;

a pair of felt belts for guiding therebetween a paper web having a predetermined direction of travel;

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said pair of felt belts comprising an upper felt belt and a lower felt belt;

one pressing location of said two spaced pressing locations being arranged upstream of the other pressing location as viewed with respect to said predetermined direction of travel of the paper web;

said one pressing location defining a first pressing location;

said other pressing location defining a second pressing location;

one felt belt of said pair of felt belts travelling through both said spaced first and second pressing locations;

the other felt belt of said pair of felt belts extending together with said one felt belt solely through said first pressing location and being spaced from said paper web after passing through said first pressing location;

said paper web only being carried by said one felt belt when said paper web passes through said second pressing location;

said paper web being deflected away from said one felt belt downstream of said second pressing location in order to be conveyed into a drying section of said papermaking machine;

a guide roll arranged downstream of said first pressing location and provided for said other felt belt extending solely through said first pressing location;

said guide roll defining an adjustable guide roll which is positionally adjustable in a direction towards said paper web in order to ensure take-over and retention of said paper web by and at said one felt belt;

transfer suction means provided downstream of said first pressing location for the retention and take-over of said paper web at and by said one felt belt travelling through both said spaced first and second pressing locations;

such transfer suction means comprising a transfer suction device;

said adjustable guide roll together with said other felt belt selectively having a position of contact with said paper web and an operating position in which said adjustable guide roll is positioned away from said paper web;

said transfer suction device being structured and arranged for providing a vacuum as a function of which the position of said adjustable guide roll is controlled and said vacuum being maintained by the resistance of said one felt belt and said paper web;

means for constantly measuring said vacuum; and

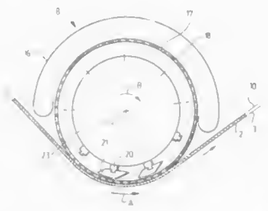
said adjustable guide roll together with said other felt belt being structured and arranged to be held at said paper web in said position of contact as long as said vacuum is below a predetermined value and held in said operating position away from said paper web as long as said vacuum exceeds said predetermined value.

4,915,791

ROLL WITH BLADES ROTATABLY MOUNTED WITHIN IT IN THE FORMING SECTION OF A PAPER MACHINE

Jukka Rannikko, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland

Filed Apr. 27, 1989, Ser. No. 344,315
Claims priority, application Finland, May 18, 1988, 882336
Int. Cl.[4] D21F *1/00, 1/54*
U.S. Cl. 162—351 **6 Claims**



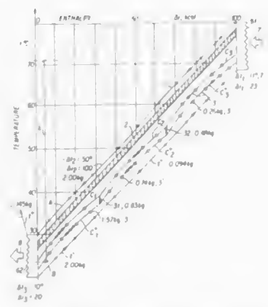
1. In a paper machine forming section, a roll (**8**) comprising a perforated shell (**17**) for removing water from a fibre suspension through holes (**18**) in the shell (**17**) into the roll (**8**), means for mounting said roll rotatably in the machine, a wire (**3**; **10**) within the forming section arranged to be in contact with the shell (**17**) over a part of its periphery and to move in synchronization therewith, said roll (**8**) including, substantially over the entire peripheral length of said shell, bladelike means (**21**; **33**) extending in the longitudinal direction of the roll (**8**), means for mounting the bladelike means rotatably with respect to the shells the bladelike means being positioned within the shell (**17**) close to the inner surface thereof and mounted in such a manner that the shell (**17**) moves relative to the bladelike means when the roll (**8**) rotates.

4,915,792

PROCESS FOR SEPARATING A VOLATILE COMPONENT FROM A MIXTURE

Sten Zellon, Heimdalsgaten 21, S-26162 Glumslöv, Sweden

PCT No. PCT/SE88/00041, § 371 Date Oct. 11, 1988, § 102(e) Date Oct. 11, 1988, PCT Pub. No. WO88/06054, PCT Pub. Date Aug. 25, 1988
PCT Filed Feb. 8, 1988, Ser. No. 259,266
Claims priority, application Sweden, Feb. 11, 1987, 8700553-4
Int. Cl.[4] B01D *3/00*
U.S. Cl. 203—22 **9 Claims**



1. A method of separating a volatile component (**1**) from a mixture (**2**) by using a combination of a carrier gas and a separate flow of liquid each in heat transfer contact with the mixture said method comprising: introducing the mixture into an evaporator (**4**), circulating a flow (**3'**) of a carrier gas through

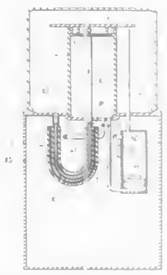
the evaporator (**4**) to a condenser (**5**) and back to said evaporator (**4**), said carrier gas being supplied to the evaporator (**4**) to contact said mixture (**2**) within the evaporator and to receive the volatile component from the mixture and to carry the volatile component from the evaporator, the carrier gas subsequently being transferred to the condenser (**5**) together with the volatile component (**1**) of the mixture (**2**), precipitating a part (**1''**) of said volatile component (**1**) by condensation in said condenser, and sequentially circulating a separate flow (**1'**) of a liquid in heat transfer contact with said mixture (**2**) in the evaporator, then passing the liquid in heat transfer contact with an external heat sink (**8**) in a cooler (**62**) to provide a cooled liquid, then passing the cooled liquid from the cooler in heat transfer contact with said carrier gas (**3**) in said condenser (**5**), then passing the cooled liquid from the condenser (**5**) in heat transfer contact with an external heat source (**7**) in a heater (**61**) to provide a heated liquid, and then passing the heated liquid from the heater back to said evaporator for heat transfer contact with said mixture (**2**), wherein the cooled liquid is supplied to said condenser (**5**) by being applied to contact means (**55**) in said condenser (**5**) to provide direct contact with said carrier gas (**3**), such that the separation of the volatile component (**1**) from the mixture (**2**) is achieved at pressure and temperature below the boiling point of the volatile component (**1**) at an improved energy efficiency.

4,915,793

WATER TREATMENT APPARATUS

Tien-Fu Chou, 37-5, Kuo Pei Lane, Feng Shan City, Kaohsiung, Hsien, Taiwan

Filed Oct. 7, 1988, Ser. No. 255,012
Int. Cl.[4] B01D *3/04*
U.S. Cl. 202—202 **6 Claims**



1. A water treatment apparatus comprising:

a first reservoir for storing raw water;

a second reservoir for storing water at a first temperature, said second reservoir being disposed in said first reservoir and surrounded by raw water in said first reservoir so as to effect a heat exchange between raw water in said first reservoir and water in said second reservoir;

a condenser, disposed in said first reservoir above said second reservoir, having a lower end which is in fluid communication with said second reservoir;

a heat resistant pipe connected with a lower end of said first reservoir so that raw water in said first reservoir naturally flows into said pipe;

a first heating device connected to said pipe for vaporizing raw water in said pipe;

a vapor duct connecting said pipe and said condenser so that vapor in said pipe rises in said vapor duct, thereby flowing into said condenser;

a third reservoir for storing water at a second temperature, the water at the second temperature being cooler than the water at the first temperature, said third reservoir being disposed outside said first reservoir adjacent said second reservoir;

a water duct connecting a lower end of said second reservoir and said third reservoir so that water in said second reservoir naturally flows into said third reservoir through said waterduct in which water from said second reservoir is cooled to form the cooler water in said third reservoir;

a first water tap unit connected with said second reservoir for regulating and guiding water stored in said second reservoir to outside of said second reservoir; and

a second tap unit connected with said third reservoir for regulating and guiding water stored in said third reservoir to outside of said third reservoir.

4,915,794

PROCESS FOR CONVERTING INTERNAL OLEFINS TO ALPHA OLEFINS

Lynn H. Slaugh, Cypress, and Howard L. Fong, Sugarland, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 27, 1988, Ser. No. 263,225
Int. Cl.[4] B01D *3/34*; C07C *5/23, 7/152*
U.S. Cl. 203—29 **12 Claims**

1. A process for producing an olefin product having an enhanced alpha olefin content from an olefin feedstock comprising internal olefins or a mixture of internal and alpha olefins which process comprises:

(a) contacting said feedstock with an anthracene and a double-bond isomerization catalyst at a temperature ranging from about 150° to about 275° C. to form an olefin adduct with the anthracene,

(b) separating said adduct from the feedstock

(c) heating said separated adduct at a temperature ranging from about 250° to about 400° C. to produce the anthracene and an olefin product enhanced in alpha olefin content over the alpha olefin content of the feedstock, and

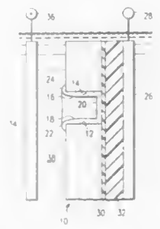
(d) separating the anthracene from the product of step (c) to produce said product enchanced in alpha olefin.

4,915,795

PLATED-THROUGH HOLE PLUGS FOR ELIMINATING SOLDER SEEPAGE

Frank McKiel, Jr., Dallas, and David Garms, Richardson, both of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 23, 1989, Ser. No. 313,842
Int. Cl.[4] C25D *5/02*
U.S. Cl. 204—15 **6 Claims**



1. A method of electrically inter-connecting conductive material on opposite sides of an insulative circuit board comprising the steps of:

forming a composite cathode comprising:

a non-adherent membrane;

a rigid cathodic plate, and

electrically conductive compliant material intermediate said membrane and said plate;

forceably securing the non-adherent membrane side of said

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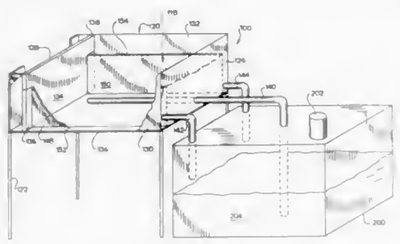
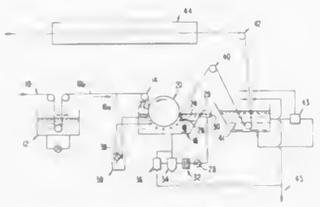
composite cathode to one side of a circuit board containing vias; and
placing said composite cathode and circuit board in an activated copper plating bath until concave cylindrical plugs are formed in the vias.

4,915,796
ELECTROPLATING PROCESS
Charles Denofrio, 117 Oregon Ave., West Dundee, Ill. 60118
Division of Ser. No. 258,211, Oct. 14, 1988. This application Jun. 7, 1989, Ser. No. 362,817
Int. Cl.[4] C25D *5/02*
U.S. Cl. 204—15 13 Claims



1. A process for coating of a printed circuit board by electroplating, wherein said process comprises:
(a) suspending said printed circuit board in a horizontal position in a coating chamber;
(b) flooding said coating chamber with a coating solution while applying an electric charge to said printed circuit board;
(c) applying said electric charge to said printed circuit board with at least one upper anode mounted above said printed circuit board and at least one lower anode mounted below said printed circuit board; and
(d) recovering and recirculating said coating solution.

4,915,797
CONTINUOUS PROCESS FOR COATING PRINTED CIRCUIT GRADE COPPER FOIL WITH A PROTECTIVE RESIN
Lawrence E. Vigezzi, West Trenton, and Adam M. Wolski, Edgewater Park, both of N.J., assignors to Yates Industries, Inc., Bordentown, N.J.
Filed May 24, 1989, Ser. No. 356,213
Int. Cl.[4] C25D *7/06, 13/16*
U.S. Cl. 204—28 11 Claims



1. A continuous process for electrodepositing a resinous coating on a surface of a treated copper foil which process comprises:
(a) passing a strip of copper foil, at least one side of which has a matte surface which has been treated to increase its surface area, through a bath of a cationic electrodeposition paint in an electrolytic cell, the paint comprising an aqueous dispersion of particles of a resin to be electrodeposited;
(b) rendering the foil cathodic with respect to an insoluble anode spaced apart from the foil in the cell;
(c) maintaining an electric potential between the treated surface of the foil and said anode means under electrodeposition conditions to electrodeposit a uniform coating of the resin on the treated surface of the foil; and
(d) curing the deposited resin to form a solid, protective coating of the resin on the treated surface of the foil.

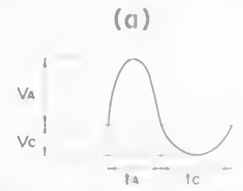
4,915,798
CORROSION RESISTANT ALUMINUM PRODUCT WITH UNIFORMLY GREY, LIGHT-FAST SURFACE AND PROCESS FOR ITS MANUFACTURE
Alexander Maitland, Schaffhausen, Switzerland, assignor to Intevep, S.A., Caracas, Venezuela
Filed Oct. 13, 1987, Ser. No. 107,772
Int. Cl.[4] C25D *11/04*
U.S. Cl. 204—29 8 Claims

1. A method of producing an improved aluminum article having uniformly grey, light-fast surface and a light reflectivity of at most 50% in the anodized state comprising the steps of:
(a) providing an aluminum alloy consisting essentially of 1.20 to 1.60 wt. % iron; 0.25 to 0.55 wt. % manganese; 0.10 to 0.20 wt. % vanadium; up to 0.20 wt. % silicon; up to 0.30 wt. % copper; up to 5.0 wt. % magnesium; up to 0.10 wt. % chromium; up to 2.0 wt. % zinc; up to 0.25 wt. % zirconium; up to 0.10 wt. % titanium; up to 0.50 wt. % total impurities; and the balance aluminum;
(b) casting said alloy;
(c) processing said cast alloy from the casting stage to the article stage at processing temperatures of no more than 560° C. wherein the duration of processing at temperatures between 540° to 560° C. is not greater than 4 hours; and
(d) anodizing said processed aluminum article.

4,915,799
ELECTROLYTIC COLORING METHOD FOR CHROMIUM ALLOY
Hideki Iai; Katsuaki Shimouchi, and Yoshikazu Aoki, all of Yao, Japan, assignors to Kinki Yakuhin Industrial Co., Ltd., Yao, Japan
Filed Feb. 19, 1987, Ser. No. 16,430
Claims priority, application Japan, Feb. 21, 1986, 61-37989; Feb. 21, 1986, 61-37990; Feb. 21, 1986, 61-37991; May 15, 1986, 61-111860; May 19, 1986, 61-114293
Int. Cl.[4] C25D *5/44*
U.S. Cl. 204—35.1 26 Claims

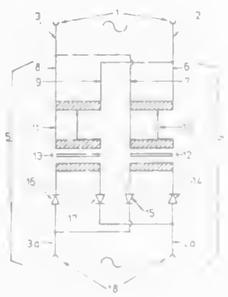
1. An electrolytic coloring method for chromium alloy which colors chromium alloy by applying an electrolytic treatment to said chromium alloy, comprising the following steps:
inserting chromium alloy into an aqueous solution containing a chromium compound as a main material and sulfuric acid,
forming an oxide film on the surface of said chromium alloy by alternately applying an anode electrolytic treatment and a cathode electrolytic treatment respectively for one or more seconds with a current having an average current density of 0.05–2 A/dm^2 respectively one or more times and,
hardening the oxide film on the surface of said chromium alloy by an electrolytic treatment to said chromium alloy, having a current which has an average current density larger than the average current density of said cathode electrolytic treatment in said step for forming said oxide film and which is 0.5–5 A/dm^2, wherein the step of forming said oxide film on the surface of said chromium alloy adjusts the color tone of said oxide film by varying respective average current densities, respective treating times and the number of repetition cycles of said anode electrolytic treatment and of said electrolytic cathode treatment.

4,915,800
PROCESS FOR ELECTROLYTICALLY SURFACE-ROUGHENING ALUMINUM SUPPORT
Haruo Nakanishi, and Hirokazu Sakaki, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minamiashigara, Japan
Filed Dec. 15, 1988, Ser. No. 284,661
Claims priority, application Japan, Dec. 18, 1987, 62-320893
Int. Cl.[4] C25D *13/18, 13/20;* **C25F** *3/00*
U.S. Cl. 204—35.1 9 Claims



1. A process for electrolytically surface-roughening an aluminum plate in an acidic electrolytic solution, comprising forming an organic coating comprised of a compound having a relatively high electrical insulation or inorganic coating on said aluminum plate prior to the electrolytic surface-roughening.

4,915,801
PROCESS FOR THE ELECTROLYTIC COLORING OF ANODIZED ALUMINUM SURFACES
Dieter Brodalla, Duesseldorf; Werner Huppertz, Krefeld; Georg Wagner, Chleming, all of Fed. Rep. of Germany; James W. Costello, Sellerville, Pa., and Karl-Heinz Munk, Hamm, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Postfach, Fed. Rep. of Germany
Continuation of Ser. No. 76,647, Jul. 23, 1987, abandoned. This application Jun. 5, 1989, Ser. No. 363,316
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1986, 3624868; Jun. 4, 1987, 3718741
Int. Cl.[4] C25D *11/22, 21/12*
U.S. Cl. 204—376 9 Claims



1. A process for the electrolytic coloring of an anodized article of aluminum or aluminum alloy in a coloring bath which contains at least one metal salt for coloring said article, consisting of applying to said coloring bath a controllable, asymmetrical and substantially sinusoidal a.c. voltage of substantially constant frequency wherein said sinusoidal a.c. voltage is obtained from a voltage source supplying a symmetrical sinusoidal a.c. voltage having two current paths, dividing said current paths into two parallel main lines each consisting of a pair of individual current paths, and successively feeding each pair of individual current paths to a variable ratio transformer then to a second transformer, and then to a diode or thyristor whereby the amplitude level of the positive half wave and the amplitude level of the negative half wave and the ratio of the amplitude level of the positive half wave to the amplitude level of the negative half wave of the a.c. voltage applied to said coloring bath are made variable and adjustable independently of one another, adjusting said positive half wave and said negative half wave to the desired values, and recombining said main lines to form the a.c. voltage applied to said coloring bath by combining the pairs of individual current paths and introducing the combined current paths to said coloring bath, wherein an a.c. voltage of from about 10 to about 30 volts and a current density of from about 0.2 to about 1.2 A./dm^2 is applied to said coloring bath during the coloring of said article, the amplitude level of said negative half being greater than that of said positive half wave, and the value for the negative peak voltage being more negative than −9 volt.

4,915,802
METHOD FOR MAKING LOW ALPHA COUNT LEAD
John A. Dunlop, Veradale, Wash.; Edward F. G. Milner, Trail, Canada; Robert W. Smyth, Trail, Canada, and Gerald W. Toop, Trail, Canada, assignors to Comino Ltd., Vancouver, Canada
Division of Ser. No. 237,747, Aug. 29, 1988, Pat. No. 4,887,492. This application Jun. 7, 1989, Ser. No. 362,495
Int. Cl.[4] C25C *3/00, 3/34*
U.S. Cl. 204—66 5 Claims

1. A method for production of lead with a low emission of alpha particles which comprises the steps of selecting an orebody containing lead mineral comprising galena in a coarsely-disseminated form substantially free of impurities, in a carbonate-type host rock together with associated minerals and relatively low in alpha emitters; mining said ore body to produce a mined ore; milling said mined ore to form ground ore having particle sizes such that separation of lead mineral from said host rock and associated minerals can be effected; forming a fluid suspension of said ground ore; subjecting said suspension to a gravity separation to remove said host rock and associated minerals from said lead mineral; recovering said lead mineral as a lead concentrate; subjecting said concentrate to a reduction; carrying out said reduction electrolytically by feeding an amount of said concentrate into an agitated bath of molten lead chloride contained in an electrolytic cell having an anode immersed in said bath, said lead chloride, said cell and said anode having no or a low emission of alpha particles; flowing a direct electrical current between said cell and said anode to provide a current density in the range of about 6000 to 9000 A./m^2; maintaining a temperature in the range of about 500° to 600° C.; maintaining a concentration of lead sulfide in said bath in the range of about 2.5 to 25%; and recovering lead having an alpha count of 0.02 particle per cm^2 per hour or less from said reduction.

4,915,803
COMBINATION SEAL AND FRAME COVER MEMBER FOR A FILTER PRESS TYPE ELECTROLYTIC CELL
Gregory J. E. Morris, Milan, Italy, assignor to The Dow Chemical Company, Midland, Mich.
Filed Sep. 26, 1988, Ser. No. 249,640
Int. Cl.[4] C25B *1/24, 9/00, 13/00*
U.S. Cl. 204—128 7 Claims

7. A method of operating an electrolytic cell comprising:
(a) providing a combination seal and cover member comprising a pair of gasket load-bearing sections integral with a peripheral frame cover section for covering both the peripheral outer surface of a frame member and the load-bearing flange surfaces of the frame member, the gasket load-bearing sections including a first side for contacting a

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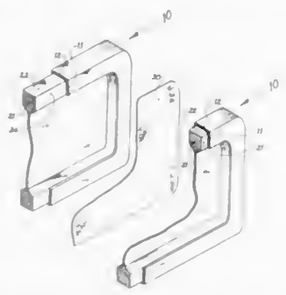
membrane member and a second side contacting a frame member, the cover section with a first side for contacting the outer peripheral surface of a frame member and a second side for contacting the atmosphere;

(b) disposing said seal/cover members on at least two adjacent electrolytic cell frame members;

(c) interposing a sheet-like separator between at least the two adjacent electrolytic cell frame members with seal/-



cover members; the separator spacing apart an anode and a cathode compartments defined by the adjacent frame members and the separators;

(d) compressing the seal/cover member, separator and the adjacent frame members together;

(e) feeding an aqueous alkali metal halide solution to the electrolytic cell; and

(f) passing an electrical current from the anode to the cathode such that a halide is evolved at the anode.

4,915,804

TITANATE BOUND PHOTOSENSITIZER FOR PRODUCING SINGLET OXYGEN

Stephen F. Yates, Arlington Heights, Ill.; Mary L. Good, Convent Station, N.J., and Romulus Gaita, Morton Grove, Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 20, 1988, Ser. No. 287,317

Int. Cl.[4] B01J *19/08, 31/00;* **B05D** *7/00, 3/02*

U.S. Cl. 204—157.5 **22 Claims**

1. A supported photosensitizer coating comprising a polytitanate bound photosensitizer supported on a solid support, the polytitanate bound photosensitizer characterized as the displacement reaction product of an organo titanium compound and a photosensitizer containing a hydroxyl group which is capable of displacing a ligand on the titanium compound and forming a titanium-oxygen-carbon bond.

4,915,805

HOLLOW CATHODE TYPE MAGNETRON APPARATUS CONSTRUCTION

Ray D. Rust, Berkeley Heights, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 21, 1988, Ser. No. 273,766

Int. Cl.[4] C23C *14/34*

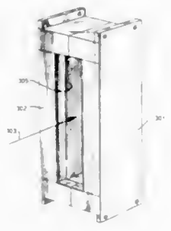
U.S. Cl. 204—192.12 **15 Claims**

9. A method of generating a contained region of sputtering activity by confining the controlling electromagnetic field within the contained region comprising the steps of:

positioning a plurality of planar targets to form four planar sides of a rectangular parallelpiped bounding the contained region on four sides with two added opposing sides of the rectangular parallelpiped open to permit entry of articles to be processed;

positioning a plurality of permanent magnetic sources all having an identical N-S orientation perpendicular to a plane of the opposing sides and positioned behind and adjacent to the plurality of planar targets;

electrically energizing the targets to a cathodic potential; and



shielding peripheral exposed ends of the planar targets with shields having anodic potential.

4,915,806

PROCESS AND APPARATUS FOR COATING MICROCAVITIES

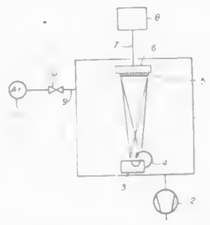
Marcel Lardon, Maienfeld; Rainer Buhl, and Hans-Peter Bader, both of Sargans, all of Switzerland, assignors to Balzers Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Jul. 22, 1986, Ser. No. 888,881

Claims priority, application Switzerland, Jul. 26, 1985, 03256/85

Int. Cl.[4] C23C *14/34*

U.S. Cl. 204—192.31 **12 Claims**



1. A process for coating a microcavity within a surface of a substrate, comprising the steps of coating said microcavity by placing said microcavity at a distance from a particle beam emitting surface of a source for said beam, selecting said emitting surface so that at least predominant parts of said emitting surface appear under an angle of no more than 10° seen from said microcavity with respect to a normal direction on said surface of said substrate, selecting said distance with respect to said normal direction on said substrate, to be at most three times the mean free path of particles emitted from said surface to form said beam.

4,915,807

METHOD AND APPARATUS FOR PROCESSING A SEMICONDUCTOR WAFER

Jeffrey A. McKee, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 29, 1988, Ser. No. 251,623

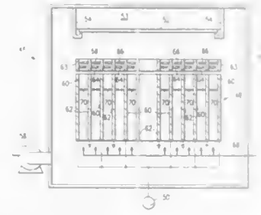
Int. Cl.[4] C23F *4/00*

U.S. Cl. 204—192.32 **26 Claims**

20. A method for processing a semiconductor wafer, comprising the steps of:

maintaining a plurality of spaced-apart first plates at ground potential;

applying a second potential to a plurality of second plates spaced apart from and alternated with said first plates;



injecting a gas between said first and second plates to excite said gas to create wafer processing radicals wherein said plates inhibit the passage of electrons to the wafer; and

supporting the wafer proximate to one end of the first and second plates, the wafer being supported transversely to the flow of gas between said first and second plates.

4,915,809

CARBON ELECTRODES INCLUDING TRASITION METAL DISPERSED THEREIN

Oliver R. Brown, Tyne and Wear, and Martyn J. Wilmott, Stockton, both of United Kingdom, assignors to British Nuclear Fuels Plc, United Kingdom

Continuation of Ser. No. 66,145, Jun. 25, 1987, abandoned. This application Nov. 2, 1988, Ser. No. 267,616

Claims priority, application United Kingdom, Aug. 1, 1986, 8618909

Int. Cl.[4] C25C *3/00*

U.S. Cl. 204—243 R **10 Claims**

1. In an electrolytic cell for the production of fluorine, said cell comprising a molten fluorine-containing salt electrolyte and means, including a carbon anode, for providing electrolysis of said electrolyte to generate fluorine, the improvement wherein the carbon anode comprises a consolidated mass consisting essentially of carbon particles, and less 1.0 atoms % of a transition metal, at least a substantial part of the transition metal being dispersed within the consolidated mass as a very fine dispersion of metal sites having diameters no greater than 1×10^{-9} meters, to thereby inhibit anode over-voltage during operation of the cell.

4,915,810

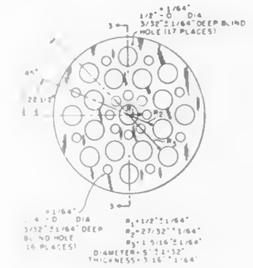
TARGET SOURCE FOR ION BEAM SPUTTER DEPOSITION

Michael Kestigian, Charlton Depot, Mass., and John F. Gillin, Commack, N.Y., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Apr. 25, 1988, Ser. No. 185,669

Int. Cl.[4] C23C *14/34*

U.S. Cl. 204—298.04 **9 Claims**



1 A sputtering apparatus comprising:

a source of plasma disposed within a chamber and having a predetermined pattern of ion beam intensity,

an intermediate target angularly disposed in relationship with said source of plasma and in angular relationship with a substrate, said target comprising a matrix of material to be deposited upon said substrate and including a plurality of bore,, said bores disposed in a predetermined radial pattern comprising an axial bore of a first predetermined diameter, a first plurality of radially disposed bores of a second predetermined diameter surrounding said axial bore, a second plurality of radially disposed bores of said first predetermined diameter surrounding said first plurality, and a third plurality of radially disposed bores surrounding said second plurality and of diameters alternating between said first predetermined diameter and said second predetermined diameter, each of said bores having an aspect ratio of between 0.1875 and 0.375 and a predetermined depth of one-half the thickness of said target, and

a plurality of plugs of predetermined composition, adapted for a press fit and disposed within said bores,

wherein ions are made to collide against said target so as to

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4,915,808

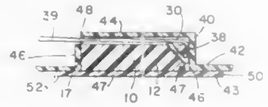
ANODE AND CAPSULE ASSEMBLY FOR AUTOMOTIVE CATHODIC PROTECTION

David F. McCready, P.O. Box 651, Altoona, Pa. 16603, and Kenneth M. Imler, Altoona, Pa., assignors to David F. McCready, Altoona, Pa.

Filed Jun. 8, 1988, Ser. No. 203,920

Int. Cl.[4] C23F *13/00*

U.S. Cl. 204—196 **14 Claims**



1. An encapsulated anode for an automotive cathodic protection system comprising a generally rectangular block anode made of a compressed absorbent carbon and silica material, the anode having a first face for juxtaposing to a painted sheet metal surface and having a second generally parallel face spaced therefrom, and having sidewalls extending between the faces, a hole extending diagonally through a sidewall and through the second face near that sidewall, and a multistrand insulated wire lead having a distal end stripped of insulation and extending through the diagonal hole in the side wall and outward through the hole in the second face, strands of the wire lead being bent along the second face and securing the strands extending outward through the hole in the second face thereby preventing removal of the wire lead from the hole in the second face, and a capsule surrounding the block anode and covering the second face and sidewalls and the diagonal hole, the capsule having an opening for passing the wire lead, and the wire lead extending outward through the opening in the capsule.

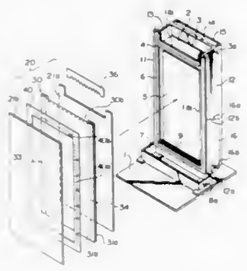
liberate particles of materials of which said target and said plugs are made, thereby depositing a thin homogeneous film of said particles in a further predetermined composition on said substrate.

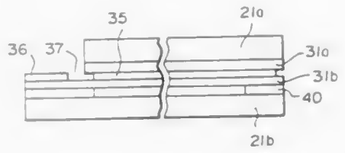
4,915,811

ELECTROPHORESIS APPARATUS

Masayoshi Yamamoto; Akira Fujita, and Shoichi Yamamoto, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 17, 1988, Ser. No. 208,399
Claims priority, application Japan, Jun. 19, 1987, 62-153024
Int. Cl.[4] G01N *27/28, 27/26*
U.S. Cl. 204—299 R **12 Claims**





1. In an electrophoresis apparatus comprising two sheet members formed of a non-conductive organic polymer film and disposed to stand facing each other, spacers having predetermined thicknesses disposed at right and left edge portions between the two sheet members, and an eletrophoresis gel membrane of uniform thickness grasped between the two sheet members thereby forming an electrophoresis sheet, a pair of flat plate-like supporting members for supporting the electrophoresis sheet by sandwiching it between the supporting members, a frame-like spacer disposed between the electrophoresis sheet and one of the supporting members, and a flat plate-like comb member having teeth-like protrusions inserted in the top edge of the gel membrane to form sample liquid pouring apertures disposed along the membrane and defined by the top edge of the membrane, the upper edges of the spaced-apart sheet members, and the adjacent faces of the teeth-like protrusions, wherein the improvement comprises:

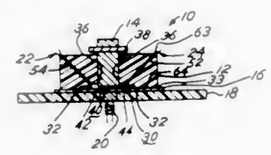
said frame-like spacer having an upper outer edge and an upper inner edge spaced downwardly from said upper outer edge to define the upper width of said frame, said frame being positioned with its upper inner edge substantially aligned with the upper edge of said gel membrane when said frame is in place.

4,915,812

ZERO VOLUME CELL

John W. Parce, Winston-Salem, N.C., and Robert F. Zuk, Burlingame, Calif., assignors to Molecular Devices Corporation, Menlo Park, Calif.

Filed Jun. 20, 1986, Ser. No. 876,925
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—403 **29 Claims**



1. An apparatus for measuring a material capable of affecting the potential of a semiconductive working electrode, said apparatus comprising:

an assay chamber;

a semiconductive working electrode and controlling electrode serving as walls of said chamber;

means for moving said electrodes from a distal position to a proximal confronting position;

at least one channel in communication with said chamber; and

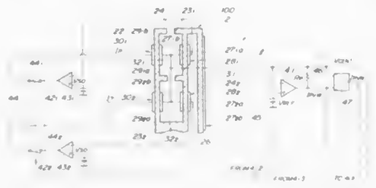
means for connecting said electrodes to an external circuit for measuring changes in the electrical characteristics of said working electrode.

4,915,813

OXYGEN CONCENTRATION DETECTING DEVICE

Toyohei Nakajima; Toshiyuki Mieno; Yasuhiro Toyoda; Akira Kato; Haruo Horiuchi, and Toru Yano, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1988, Ser. No. 281,713
Claims priority, application Japan, Dec. 9, 1987, 62-312670; Dec. 28, 1987, 62-332843; May 30, 1988, 63-71489; Jun. 30, 1988, 63-162855
Int. Cl.[4] G01N *27/58*
U.S. Cl. 204—406 **12 Claims**



1. In an oxygen concentration detecting device including at least one oxygen concentration detecting element formed by an oxygen-pumping element and a cell element, each of said oxygen-pumping element and said cell element being composed of a wall of a solid electrolytic material having oxygen ion-conductivity, and a pair of electrodes having said wall interposed therebetween, said oxygen-pumping element and said cell element defining a gas diffusion-limiting zone, a current detecting resistance connected in series to said oxygen-pumping element and cooperating therewith to form a series circuit, said current detecting resistance having a first end and a second end, voltage applying means for applying an output voltage corresponding to the difference between a voltage developed between said electrodes of said cell element and a first predetermined reference voltage to said series circuit

formed by said oxygen-pumping element and said current detecting resistance, and output detecting means for outputting in the form of a voltage signal value of pumping current flowing through said current detecting resistance,

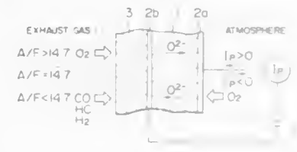
the improvement comprising an operational amplifier circuit having a non-inverting input terminal supplied with a second predetermined reference voltage, an inverting input terminal connected to said first end of said current detecting resistance, and an output terminal connected to said second end of said current detecting resistance, and wherein said output detecting means detects a first voltage at said first end of said current detecting resistance and a second voltage at said second end of said current detecting resistance and outputs said voltage signal corresponding to the difference between the detected first and second voltages.

4,915,814

SENSOR FOR MEASUREMENT OF AIR/FUEL RATIO AND METHOD OF MANUFACTURING

Takeshi Harada; Masatoshi Kanamaru, both of Ibaraki; Yoshiro Ibaraki, Tsukuba; Katsuyoshi Terakado, Ibaraki; Sadayasu Ueno, Katsuta, and Norio Ichikawa, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 28, 1988, Ser. No. 250,238
Claims priority, application Japan, Sep. 30, 1987, 62-243684; Feb. 10, 1988, 63-27518; Feb. 29, 1988, 63-44405
Int. Cl.[4] G01N *27/56, 27/58;* **B05D** *5/12*
U.S. Cl. 204—425 **24 Claims**



1. A sensor for measurement of air/fuel ratio (A/F) comprising:

a solid electrolyte made of an oxygen ion conductive metal oxide, having an atmospheric side surface and an exhaust gas side surface;

first and second electrodes in the form of porous thin films which are respectively provided on the atmosphere side surface and the exhaust gas side surface of said solid electrolyte, said first and second electrodes being operable by a predetermined voltage applied thereacross to ionize oxygen near said solid electrolyte and diffuse oxygen ions into said solid electrolyte; and

a gas diffusion layer in the form of a porous sintered layer covering said second electrode and made of electrically insulative metal oxide fine particles having a mean particulate size of 1 μm or less, said gas diffusion layer having first and second porous sintered layers respectively made of two kinds of electrically insulative metal oxide fine particles having different mean particulate sizes, said first porous sintered layer being contiguous to said second electrode and having a larger mean particulate size than that of said second porous sintered layer, contiguous to the exhaust gas,

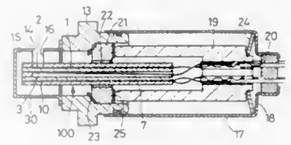
the second electrically insulative metal oxide layer, contiguous to the exhaust gas, having a mean particle size which measures 0.1 μm or less, said gas diffusion layer further comprising an intermediate layer between said first and second layer, part of said second layer being impregnated into part of pores of said first layer to form said intermediate layer, so that oxygen or molecules of other gas components in the exhaust gas can move through pores of said gas diffusion layer, but that the gas diffusion layer limits diffusion speed of incompletely burnt gas components in the exhaust gas therethrough, whereby the measuring sensor can be used for a rich A/F range.

4,915,815

SENSOR INCORPORATING A HEATER

Kazuyoshi Shibata, and Yoshihiko Mizutani, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Continuation of Ser. No. 919,433, Oct. 16, 1986, abandoned. This application Apr. 20, 1988, Ser. No. 185,315
Claims priority, application Japan, Oct. 18, 1985, 60-234047
Int. Cl.[4] G01N *27/58*
U.S. Cl. 204—429 **48 Claims**



1. A heater-built-in sensor for detecting a component in a measurement gas, comprising:

at least one electrochemical cell having a solid electrolyte body, and at least one pair of electrodes formed on said solid electrolyte body, said at least one pair of electrodes including a measuring electrode, said at least one electrochemical cell having a detecting portion which includes said measuring electrode, said at least one electrochemical cell being exposed to said measurement gas at said detecting portion;

heating means for heating at least said detecting portion of said at least one electrochemical cell to a predetermined operating temperature; and

a protective covering device surrounding said detecting portion of said at least one electrochemical cell and said heating means, said protective covering device comprising gas inlet means for introducing the measurement gas to said measuring electrodes, and thermally insulating means for preventing dissipation of heat generated from said heating means, wherein said thermally insulating means and said gas inlet means are separate structures, said thermally insulating means surrounding and contacting said detecting portion at all parts of said detecting portion, except a part at which said measuring electrode is located.

4,915,816

POLYMER HYGROMETER FOR HARSH ENVIRONMENTS

Parthasarathy Shakkottai, 2622 Gardi St., Duarte, Calif. 91010; Daniel D. Lawson, 5542 Halifax Rd., Arcadia, Calif. 91006, and Shakkottai P. Venkateshan, Gandhi Nagar, Adyar, Madras 600020, India

Filed Sep. 6, 1988, Ser. No. 240,736
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—430 **4 Claims**

1. A sensor for deriving data incidative of relative humidity and temperature of air in drier ducts, ovens and so forth comprising a lithium-doped Nafion strip mounted across two glass capillaries embedded in a Teflon base, with the ends of said Nafion strip embedded in a filling of conducting silver-filled epoxy; said filling also providing electrical connections to a pair of gold coated brass pins through platinum wires also embedded in said filling; a temperature sensor mounted across another pair of pins located on said base on a line at right angles to a line joining said first pair of pins; multi conductor cables which connect said sensors to two measuring circuits; one of said circuits comprising means for power, square wave generation, buffered amplification, inversion, perfect rectifica-

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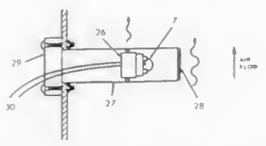
tion and means for amplified output, which produces an output voltage or current proportional to the conductance of said Nafion sensor; the other said measuring circuit producing an output proportional to temperature of said temperature sensor; a tubular shield with porous ends in which said sensor is



boused to prevent excessively high speeds air from blowing directly on said sensor; output means for displaying outputs from said measuring circuits, calculating relative humidity and temperature and generating useful control signals to utilize said calculated relative humidity and said calculated temperature of air in said duct or oven.

4,915,817

PROCESS FOR THE FLEXIBLE PRODUCTION OF HIGH-QUALITY GAS OIL

Gilberto Callera, Rome; Antonio Cerase, Rome; Luciano Vinti, Rome, and Andrea D'Alberton, Venice, all of Italy, assignors to AGIP Petroli S.p.A., Rome, Italy

Filed Nov. 15, 1988, Ser. No. 271,443
Claims priority, application Italy, Nov. 18, 1987, 22683 A/87
Int. Cl.[4] C10G *67/00*
U.S. Cl. 208—97 7 Claims

1. A process for producing high-quality gas oil which comprises:

subjecting a heavy crude gas oil to a catalytic dewaxing step in the presence of hydrogen,

subjecting the resulting dewaxed heavy crude gas oil to a desulfurization step without undergoing any separation treatment,

subjecting by heat exchange a light crude gas oil to a preheating step by heat exchanging it against the effluent of the crude gas oil from the desulfurization step,

combining the resulting light crude gas oil from the preheating step with the effluent from the catalytic dewaxing step,

simultaneously subjecting the heavy crude gas oil resulting from the dewaxing step and the preheating step to said desulfurization step,

and recovering a high-quality gas oil.

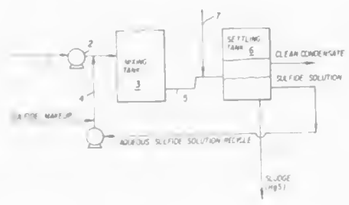
4,915,818

USE OF DILUTE AQUEOUS SOLUTIONS OF ALKALI POLYSULFIDES TO REMOVE TRACE AMOUNTS OF MERCURY FROM LIQUID HYDROCARBONS

Tsoung Y. Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 25, 1988, Ser. No. 160,440
The portion of the term of this patent subsequent to Nov. 14, 2005, has been disclaimed.
Int. Cl.[4] C10G *17/00*
U.S. Cl. 208—251 R 19 Claims

1. A method for removing mercury from a mercury-contaminated liquid hydrocarbon comprising contacting it with an aqueous dilute solution of alkali metal sulfide salts and separating a liquid hydrocarbon phase substantially free of mercury



from said mixture of mercury-contaminated liquid hydrocarbon and aqueous dilute alkali metal sulfide solution.

4,915,819

TREATMENT OF VISCOUS CRUDE OILS

Maria L. Chirinos, Caracas; Jorge L. Grosso; Ignacio Layrisse, both of Miranda, all of Venezuela, and Alan Stockwell, Surrey, England, assignors to The British Petroleum Company plc, London, England and Intevep SA, Caracas, Venezuela

Continuation of Ser. No. 888,109, Jul. 21, 1986, Pat. No. 4,871,819, which is a continuation of Ser. No. 628,523, Jul. 6, 1984, abandoned. This application Sep. 9, 1988, Ser. No. 242,689
Claims priority, application United Kingdom, Jul. 6, 1983, 8318313
Int. Cl.[4] C10C *3/00*
U.S. Cl. 208—309 13 Claims

1. A method for the treatment of viscous crude oil produced in the form of an emulsion of fine droplets of formation water in oil, comprising the stages of dehydration and solvent deasphalting, said dehydration and solvent deasphalting capable of being carried out in a single zone or separate zones, said method comprising:

(a) adding a deasphalting/dewatering solvent to the emulsion of water in oil upstream of the dehydration and deasphalting stages,

(b) withdrawing water from the dehydration stage, and

(c) causing deasphalting to occur in a deasphalting stage by contacting the oil with the solvent at a temperature in the range of 40° C. to 60° C. at which said solvent is asphaltene insoluble and precipitating asphaltenes from the deasphalting stage.

4,915,820

REMOVAL OF COKE AND METALS FROM CARBO-METALLIC OILS

William P. Hettinger, Jr., Russell, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Feb. 8, 1985, Ser. No. 699,757
Int. Cl.[4] C10G *17/00, 29/04*
U.S. Cl. 208—253 1 Claim

1. A process for the decarbonization and demetallization of a heavy hydrocarbon stream containing substantial amounts of carbon formers and metals, said hydrocarbon stream being a member of the group consisting of residual oils, reduced crudes, topped crudes, and other high-boiling feeds containing substantial amounts of carbon formers, and mixtures thereof, which process comprises:

A. contacting said stream in a riser reaction zone with a relatively inert solid particulate sorbent in the presence of steam and under reaction conditions comprising a temperature within the range of about 482° C. (900° F.) to about 649° C. (1,200° F.), a pressure within the range of about 1 atm. (0 psig) to about 3.38 atm. (35 psig), a contact time within the range of about 1 sec. to about 2 sec., a steam-to-hydrocarbon weight ratio within the range of about 4 gm. of water per 100 gm. of hydrocarbons to about 20 gm. of water per 100 gm. of hydrocarbons, and a sorbent-to-hydrocarbon weight ratio within the range of about 3 gm. of sorbent per gm. of hydrocarbons to about 8 gm. of sorbent per gm. of hydrocarbons to form a coked particulate sorbent and gaseous hydrocarbons comprising hydrocarbons, hydrogen, and CO, said particulate sorbent being a calcined member of the group consisting of spent catalysts have low activities, bentonite, kaolin, attapulgus clay, montmorilonite, smectites, other two-layered lamellar silicates, mullite, pumice, silica, laterite, low-surface area silica gel, low-surface area bauxite, and combinations thereof,

B. separating said gaseous hydrocarbons from said coked particulate sorbent, passing said coked particulate sorbent through a stripping zone to remove from said coked particulate sorbent loosely-held hydrocarbons and to provide a stripped, coked particulate sorbent,

C. separating said gaseous hydrocarbons into a light gaseous hydrocarbon product stream comprising C_2-minus hydrocarbons, hydrogen, and CO, a C_3-plus hydrocarbon product stream, and a water-containing condensation product, recovering a hydrocarbon-containing gas stream separately from said light gaseous hydrocarbon product stream, and purifying said hydrogen-containing gas stream, and obtaining useful hydrocarbon products from said C_3-plus hydrocarbon product stream,

D. contacting stripped, coked particulate sorbent in a regeneration zone with a mixture of steam and oxygen under suitable regeneration conditions comprising a temperature within the range of about 732° C. (1,350° F.) to about 927° C. (1,700° F.), a pressure within the range of about 1 atm. (0 psig) to about 3.38 atm. (35 psig), an oxygen-to-coke weight ratio within the range of about 1.1 gm. of oxygen per gm. of coke to about 2.8 gm. of oxygen per gm. of coke, and a steam-to-oxygen weight ratio within the range of about 0.2 gm. of water per gm. of oxygen to about 8 gm. of water per gm. of oxygen, to provide a regenerated particulate sorbent having reduced amounts of carbon and metals and a regeneration flue gas comprising CO and a small amount of hydrogen,

E. passing said regenerated particulate sorbent to said riser reaction zone,

F. combining said regeneration flue gas with said hydrogen-containing gas stream to produce a combined synthesis gas,

G. treating at least a portion of said water-containing condensation product for removal of sulfur and nitrogen compounds to provide a treated water-containing condensation product and recycling said treated water-containing condensation product to said riser reaction zone, said regeneration zone, or said riser reaction zone and said regeneration zone, and

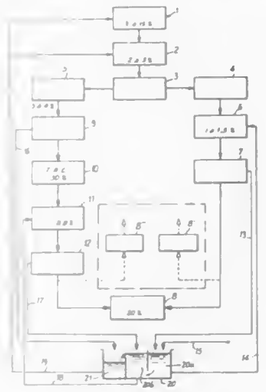
H. regulating the balancing with each other the conditions that are employed in said riser reaction zone and the conditions that are employed in said regeneration zone to provide temperatures that fall within the temperatures ranges presented hereinabove, a carbon level on spent particulate sorbent within the range of about 0.8 wt. % to about 8 wt. %, based upon the weight of said spent particulate sorbent, and a carbon level on regenerated particulate sorbent within the range of about 0.5 wt. % to about 0.50 wt. %, based upon the weight of said regenerated particulate sorbent.

4,915,821

APPARATUS FOR TREATMENT OF OLD PRINTED PAPERS WITH SHORT AND LONG FIBER SEPARATION

Jean P. Lamort, Virty Le Francois, France, assignor to E & M Lamort, Vitry Le Francois, France

Filed Sep. 15, 1987, Ser. No. 97,566
Claims priority, application France, Sep. 15, 1986, 86 12856
Int. Cl.[4] D21C *5/02*
U.S. Cl. 209—17 3 Claims



1. Apparatus for the treatment of old papers including means for pulping, means for pre-purification, means for fractionation of a resulting paste into short fibers and long fibers, means for de-inking by flotation the short fibers, means for fine purification of the long fibers, the apparatus further comprising:

means for thickening/washing the fraction of long fibers, said means utilizing at least one reservoir to receive thickening waters and ink from the long fibers; and

first return conduit means for recycling the thickening waters and ink from the long fibers upstream of the means for fractionation, to the means for pulping and to the means for pre-purification,

the at least one reservoir including a first reservoir for the recovery of the thickening waters from the fraction of short fibers, and from the thickening/washing waters of the fraction of long fibers, the first reservoir containing pure water for the starting of the apparatus, and

a second reservoir in fluid communication with the first reservoir such that the overflow of the first reservoir empties into the second reservoir.

4,915,822

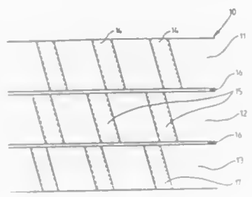
METHOD AND APPARATUS FOR TREATING FIBER SUSPENSION

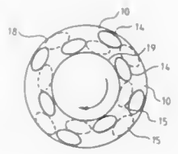
Risto A. Ljokkoi, Karhula, Finland, assignor to A. Ahlstrom Corporation, Noormarkku, Finland

Filed Oct. 2, 1988, Ser. No. 256,694
Claims priority, application Finland, Oct. 13, 1987, 874498
Int. Cl.[4] B07B *1/20*
U.S. Cl. 209—273 7 Claims

1. A method of treating a fiber suspension, comprising: providing a treatment apparatus having treatment zones in which the suspension is divided into an acceptable fraction and a rejected fraction, the zones including a reject treatment zone to which all of the rejected fraction is delivered; feeding the fiber suspension into the treatment apparatus; dividing the suspension into the acceptable fraction and the rejected fraction; guiding the rejected fraction from one of the treatment zones past at least one adjacent treatment zone without mixing with the suspension in said at least one adjacent treatment zone

to the reject treatment zone; and discharging the fractions from the apparatus as separate flows, including discharging the





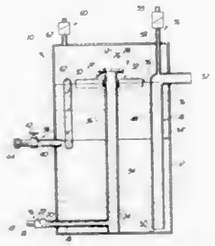
acceptable fraction still in the suspension in the reject treatment zone separately from the rejected fraction.

4,915,823

ASSEMBLY FOR THE SEPARATION OF OIL FROM WATER

Thomas W. Hall, 4120 NE. 22nd Ter., Lighthouse Point, Fla. 33064

Filed Nov. 14, 1988, Ser. No. 271,590
Int. Cl.[4] B01D *17/032*
U.S. Cl. 210—95 15 Claims



1. An oil and water separation assembly primarily used on marine craft for separating pollutants from water discharged from the bilge of the craft, said assembly comprising:

a. a container structured to hold liquid and having an elongated configuration oriented in a substantially upright position,

b. inlet means for allowing an inflow of oil/water mixture into said container and including a fill conduit having an open discharge end located at an upper interior end of the container,

c. dispersion means mounted in liquid receiving and contacting relation to said discharge end of said fill conduit and structured and configured to dispense liquid flow issuing from said discharge end in a transverse, substantially radial path of flow relative thereto,

d. said dispersion means comprising a dispersion plate movably disposed relative to said fill conduit and having a dispersion surface extending outwardly from said fill conduit and disposed in liquid receiving relation to the oil/water mixture issuing from said discharge end of said conduit,

e. a discharge means at least partially located at a bottom end of said container in receiving relation to separated water for the exiting thereof from the container interior,

f. oil outlet means located above said discharge means and in fluid receiving relation to separated oil floating on the surface of the collected and separated water, and

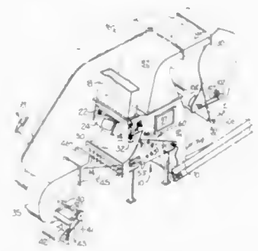
g. vent means on said container for venting interior portions of the container to atmosphere.

4,915,824

PNEUMATIC CLASSIFIER FOR TOBACCO AND METHOD

Guy F. Surtees, P.O. Box 466, Wilson, N.C. 27894

Continuation nf Ser. No. 764,486, Aug. 12, 1985, abandoned. This application Dec. 4, 1987, Ser. No. 128,710
Int. Cl.[4] B07B *4/02, 11/02*
U.S. Cl. 209—139.1 34 Claims



1. A vertical lift pneumatic classifier for separating light tobacco leaf particles from heavier tobacco stem particles, and being characterized by a single pass of tobacco particles across a separation chamber, and being adjustable for use with a full range of fed tobacco particle sizes and shapes in a threshing system, said classifier comprising:

a vertically extending separator chamber;

tobacco particle feed means located at a first end of said separator chamber for projecting a dispersing stream of intermixed light leaf and heavier stem particles across said separator chamber from one end thereof toward another in an unrestricted path;

leaf removal means disposed proximate an upper portion of said separator chamber;

stem removal means located at a second opposite end of said separator chamber, opposite said tobacco particle feed means, and at an elevation below that of the tobacco particle feed means;

a forced air distribution surface having a length extending across the lower portion of said separator chamber substantially from the chamber first end to the chamber second end, said surface including openings permitting the introduction of upwardly directed forced air from underneath the surface and into the separator chamber for the purpose of lifting and separating the tobacco leaf particles;

forced air supply means for directing forced air upwardly through said air distribution surface and into the separator chamber;

means associated with said forced air supply means and said air distribution surface for establishing along the length of said air distribution surface and from said first end of said chamber to said chamber second end, a plurality of upwardly directed air streams with varied velocities with the higher velocity air streams being proximate the separator chamber first end and the lower velocity air streams being proximate the chamber second end, so that the velocity of the respective upwardly directed forced air streams is correlated with the decreasing velocity of the stream of

leaf and stem particles propelled across the separator chamber; and

means for selectively adjusting the tobacco particle feed velocity and the angular orientation of the fed particle stream with respect to the horizontal;

the velocities of the forced air streams being adjustable independently of the velocity and angular orientation of the particle stream in response to the characteristics of the tobacco particles to provide, for all tobacco particle characteristics, peeling off of a substantial portion of the light leaf particles in an upward direction proximate said first end and projection of the heavier stem particles substantially along a descending path across said chamber to said stem removal means.

4,915,825

PROCESS FOR COAL FLOTATION USING 4-METHYL CYCLOHEXANE METHANOL FROTHERS

Richard D. Christie, Minooka; Anthony E. Gross, St. Charles, and Randall J. Fortin, Osewego, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed May 19, 1989, Ser. No. 353,935
Int. Cl.[4] B02D *1/02*
U.S. Cl. 209—166 21 Claims

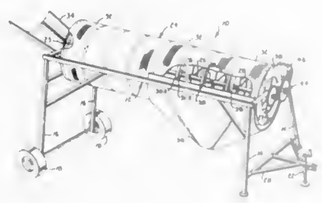
1. In a froth flotation process wherein solid coal particles are selectively separted under coal froth flotation conditions as a froth phase from remaining solid feed particles as an aqueous phase in the presence of a frother, the improvement comprising a frother comprising a mixture of 4-methyl cyclohexane methanol, water, and a monoether of 4-methyl cyclohexane methanol.

4,915,826

GRAIN CLEANER

Larry Nordhus, Nemaha County, Rural Route, Centralia, Kans. 66415

Continuation of Ser. No. 593,821, Mar. 27, 1984, abandoned, which is a continuation-in-part of Ser. No. 415,280, Sep. 7, 1982, abandoned. This application Mar. 4, 1986, Ser. No. 835,965
Int. Cl.[4] B07B *1/22*
U.S. Cl. 209—288 5 Claims



1. A grain cleaner for receiving grain and foreign material and separating the grain from the foreign material, said grain cleaner comprising:

a framework;

a rotatable drum having opposite ends defining an inlet at one end for receiving grain to be cleaned and an outlet at the opposite end for discharging relatively large particles of foreign material separated from the grain, said drum presenting a substantially continuous screen surface of increasing mesh size from the inlet toward the outlet with a first portion of said screen surface adjacent said inlet having a mesh size to prevent passage of the grain therethrough but allow passage of relatively small particles of foreign material therethrough, and a second portion of said screen surface adjacent said outlet having a mesh size to permit passage of grain therethrough but prevent passage of relatively large particles of foreign material therethrough, said screen surface being subtantially cylindrical and uniform in diameter between said inlet and outlet;

means for mounting said drum for rotation on said framework about an axis which inclines downardly from said inlet to said outlet of the drum;

means for rotating said drum about said axis to transport material through the drum with the relatively small particles of foreign materials being discharged from the drum through said first portion of the screen surface and the grain passing through said second portion of the screen surface;

a hopper supported on said framework at a location to underlie the entirety of said second portion of the screen surface but not said first portion thereof, wherby said hopper receives the grain passing through the second portion but not small particles of the foreign material passing through said first portion and out of the drum;

a plurality of relatively small baffles in said drum spaced apart from one another along said first portion of the screen surface and an upstream end of said second portion, said baffles projecting inwardly from said screen surface and and retarding the flow of material through the drum; and

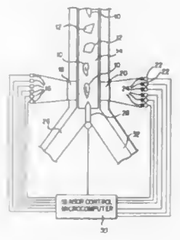
an end baffle in said drum adjacent said outlet and acting to retard the flow of said large particles out through said outlet and to effect a buildup of said large particles on a downstream end of said second portion to thereby impede grain mixed with said large particles from being carried therewith out through said outlet, said end baffle acting to restrict flow therepast to a greater extent than said relatively small baffles.

4,915,827

METHOD AND APPARATUS FOR OPTICAL SORTING OF MATERIALS USING NEAR INFRARED ABSORBTION CRITERIA

Robert D. Rosenthal, Gaithersburg, Md., assignor to Trebor Industries, Inc., Gaithersburg, Md.

Filed May 19, 1988, Ser. No. 195,796
Int. Cl.[4] B07C *5/342*
U.S. Cl. 209—577 7 Claims



1. A method for sorting desired pieces of agricultural materials from pieces of undesired material present in mixtures of desired agricultural material and undesired materials, comprising:

(a) irradiating a piece of material from a mixture of pieces of desired agricultural material and pieces of undesired material with a plurality of wavelengths of near-infrared radiation;

(b) measuring values for said plurality of wavelengths of near infrared radiation exiting said piece which are indicative of near-infrared radiation absorbed by said piece;

(c) sequentially comparing the measured values to a successive series of predetermined different absorption criteria in a predetermined order, which criteria distinguish the desired pieces of agricultural material from undesired pieces of material;

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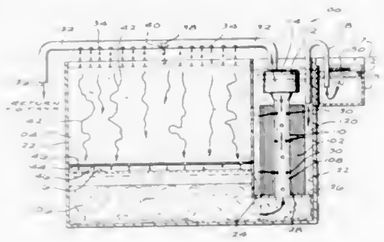
(d) rejecting the piece if it fails any one criterion in the sequence; and
(e) accepting the piece if it passes all criteria in the sequence.

4,915,828
AQUARIUM FILTER
Raymond Meyers, 11 Loma Vista, Monterey, Calif. 93940, and David R. Morris, 725 E. Romie La. A-4, Salinas, Calif. 93901
Filed Apr. 12, 1989, Ser. No. 336,833
Int. Cl.[4] A01K *63/04*; C02F *3/00*
U.S. Cl. 210—110 20 Claims



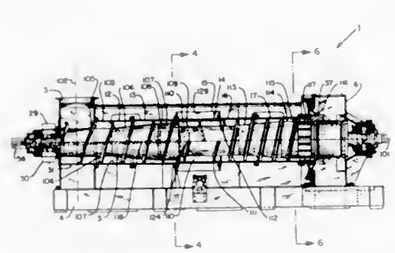
1. An aquarium tank filtering apparatus comprising, in combination:
means for drawing a volume of water from said aquarium tank into said filtering apparatus;
means for prefiltering said volume of water for removing debris, said prefiltering means being segregated within said filtering apparatus;
means for pumping said prefiltered water to a water return line, said water return line including means for recycling a portion of said prefiltered water through said filtering apparatus;
means for biologically filtering said prefiltered water, said biological filtering means receiving said recycled portion of said prefiltered water for decomposing biological waste within said volume of water, said biological filtering means being arranged for parallel operation with said prefiltering means;
means for chemically filtering said volume of water, said chemical filtering means receiving said recycled portion of said prefiltered water from said biological filtering means for removing chemical waste from said volume of water, said chemical filtering means being arranged for series operation with said biological filtering means and for parallel operation with said prefiltering means; and
means for maintaining a pair of water levels within said filtering apparatus, said maintaining means comprising a concentric tube arrangement for drawing said volume of water and said recycled portion of said filtered water into said pumping means, said pair of water levels being provided for simultaneously retaining said pumping means in a submerged condition and said biological filtering means in a non-submerged condition.

4,915,829
ACTIVATED-SLUDGE AERATION SYSTEM
Sam Long, 3046 40th St., Kansas City, Kans. 66104
Filed Sep. 6, 1988, Ser. No. 240,546
Int. Cl.[4] C02F *3/02*
U.S. Cl. 210—151 8 Claims

1. In an activated-sludge sewage treatment plant, an aeration chamber comprising a series of tanks having common side walls, said chamber comprising:
inlet means for introducing raw sewage and recycle biological sludge into said chamber;
a primary aeration means for receiving said sewage influent and treating the same by aeration, to provide an effluent, said means comprising a means for providing complete-mix aeration,
a settling basin comprising a sludge scalper means for receiving said effluent and having means for removing from 10% to 70% of the settleable biological sludge therefrom to provide a partially clarified effluent;
a secondary hydraulic plug-flow means for receiving said partially clarified effluent and having means for aerating the same by introduction of air thereto as said effluent

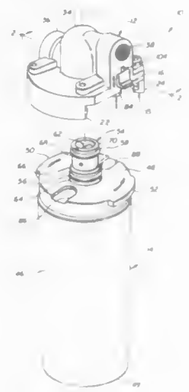
flows through said secondary section to progressively reduce the biological oxygen demand and thereby provide a further treated effluent having a B.O.D. of less than 20 ppm;
a final clarifier means for receiving said further treated effluent and having means for producing a final, clarified effluent; and
outlet means for discharging said final, clarified effluent from said final clarifier means.

4,915,830
PULP WASH PRESS
William D. Mackay, Montoursville, and William L. Bohn, Williamsport, both of Pa., assignors to Sprout-Bauer, Inc., Muncy, Pa.
Filed Aug. 19, 1988, Ser. No. 234,430
Int. Cl.[4] D21C *9/00*
U.S. Cl. 210—209 15 Claims



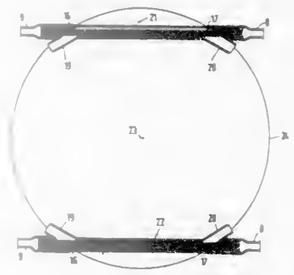
1. A displacement press for washing a pulp slurry to remove process liquors comprising:
an elongated housing having a slurry inlet port at one end and a pulp discharge port at the other end;
a pressing section within the housing in fluid communication with the inlet port, and including first means, for extracting liquor from the slurry by passing the slurry through a first compression restriction to produce a pressed pulp;
a washing section within the housing immediately downstream of and in fluid communication with the first compression restriction, said washing section having coaxial inner and outer walls defining an elongated washing chamber for decompressing and washing the pressed pulp, said washing section including,
means for injecting washing liquid into the washing chamber through said inner wall,
means projecting from at least one of said walls into the washing chamber, for mechanically agitating the decompressed pulp and wash liquid to produce a mixture,
a wash jacket including a perforated cylindrical portion concentrically disposed within an imperforate cylindrical portion which defines an annular space therebetween, said perforated cylindrical portion forming said washing section outer wall,
means for supplying washing liquid into the wash jacket for injection throughout the washing chamber through said outer wall formed by said perforated cylinder,
means for conveying the mixture of decompressed pulp and washing liquid from the washing chamber longitudinally through the washing section; and
a repressing section within the housing in fluid communication with the washing section for receiving said conveyed mixture, said repressing section including,
second means, for extracting the washing liquid from the mixture by passing the mixture through a second compression restriction to produce a repressed pulp, and
means for conveying the repressed pulp to said discharge port.

4,915,831
FILTER ASSEMBLY FEATURING DISPLACEABLE FILTER HEAD PLUNGER FOR LOCKING INTO FILTER CARTRIDGE DETENT
Bruce Taylor, Kensington, Conn., assignor to Cuno, Incorporated, Meriden, Conn.
Filed Jan. 23, 1989, Ser. No. 300,575
Int. Cl.[4] B01D *27/08*
U.S. Cl. 210—232 33 Claims



1. A filter cartridge and head unit comprising:
a head having an inlet passage and an outlet passage;
a cartridge having a cavity for filter material;
securing means for twisting the cartridge onto the head; and
locking means for preventing untwisting of the cartridge;
said locking means comprising:
a plunger being supported by the head and having an axis and being axially displaceable from an unlocked position to a locked position, and having a spring means engaging the head and urging the plunger to the locked position; and
a detent being disposed in a top wall surface of the cartridge and being coaxial with the plunger in the locked position when aligned therewith, the detent for receiving the plunger in a locked position and for receiving a shear force from the plunger occurring when the cartridge is subject to an untwisting torque.

4,915,832
FILTER FOR OBTAINING PLASMA OR PLASMA WATER
Mathieu Bernd, Spiesen-Elversberg; Schulz Wolfgang, St. Wendel, and Weber Wolfram, Spiesen-Elversberg, all of Fed. Rep. of Germany, assignors to Fresenius, AG, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 1,815, Jan. 8, 1987, Pat. No. 4,789,473. This application Nov. 15, 1988, Ser. No. 271,742
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1986, 3600527
Int. Cl.[4] B01D *13/01*
U.S. Cl. 210—321.8 3 Claims



1. A hollow fiber filter for obtaining plasma or plasma water, comprising:
(a) a hollow, tubular housing having an interior chamber, a longitudinal axis and open ends;
(b) a plurality of elongated hollow fibers, disposed within said housing and being substantially parallel to said longitudinal axis of said housing and extending the length of said housing;
(c) two casting compound members disposed within said open ends of said housing, effectively sealing both ends of said housing, while permitting the passage of said hollow fibers therethrough, thereby defining a free flow space within said housing, said free flow space having a cross-sectional area equal to the cross-sectional area of said interior chamber less the combined cross-sectional area of said hollow fibers, and said casting compound members each having a curved face adjacent to said free flow space forming a segment of a cylinder, said curved face being disposed non-perpendicular to said longitudinal axis of said housing;
(d) at least two hollow fluid flow connectors, each having a longitudinal axis, said fluid flow connectors sealingly affixed to, and forming an intersection with said housing in close proximity to said casting compound members and in flow communication with said free flow space, said connectors being disposed in a manner in which said longitudinal axis of each fluid flow connector forms an acute angle with respect to said longitudinal axis of said housing, the cross-sectional area of said intersection between said flow connectors and said housing being approximately equal to the cross-sectional area of said free flow space, forming means to improve fluid flow through said connectors and housing, and reducing turbulent or stagnant flow characteristics; and
(e) at least one plasma outlet, said outlet being connected to, and in communication with said hollow fibers external to said casting compound members and said free flow space.

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4,915,833

COLUMN FILTER USING BUNDLES OF LONG FIBERS

Takeshi Iwatsuka, Tokyo, and Toshio Kasai, Saitam, both of Japan, assignors to Japan Organo Co., Ltd., Tokyo, Japan

Division of Ser. No. 357,321, May 25, 1989, Pat. No. 4,886,601. This application Jul. 14, 1989, Ser. No. 380,801

Claims priority, application Japan, May 31, 1988, 63-131715; Nov. 30, 1988, 63-300980

Int. Cl.[4] B01D *13/00, 13/01*

U.S. Cl. 210—321.67 15 Claims

1. In a column filter comprising an upright cylindrical shell and bundles of long fibers arranged substantially upright inside the shell with the lower end portions thereof being fixed and the upper end portions thereof being free-standing, whereby, when a raw liquid with suspended solids therein is fed to a top part of the shell and is then allowed to pass from the upper end portions of the bundles of long fibers toward their lower end portions, the suspended solids are at least partly trapped in interstices among the fibers, the improvement which comprises: a plurality of holders for the respective bundles of fibers, each of said holders being formed of an upper cap member and a lower hollow member communicating with each other, said upper cap member defining openings therethrough and said lower hollow member defining at least an axially-elongated opening through a side wall thereof and opening at both upper and lower ends thereof, a perforated plate arranged transversely in a lower interior part of the shell, said holders being mounted on said perforated plate with the upper cap member being located above the perforated plate and the lower hollow member being positioned below the perforated plate; the holders covering substantially all the perforations of the perforated plate; and means for fixing the lower end portion of each of the bundles of long fibers to a lower periphery of a side wall of the associated upper cap member for flowing a backwashing fluid through said lower hollow cap member and thence through said openings in said upper cap member to dislodge solids that are trapped in the interstices among the fibers sufficient to cause the column filter to be backwashed completely in a short time.

4,915,834

MULTI-LAYER MEMBRANE AND THE USE THEREOF FOR THE SEPARATION OF LIQUID MIXTURES ACCORDING TO THE PERVAPORATION PROCESS

Hartmut Brüschke, Nussloch, Fed. Rep. of Germany, assignor to GFT Ingenieurbüro Für Industrieanlagenbau, Fed. Rep. of Germany

Division of Ser. No. 778,741, Sep. 23, 1985, Pat. No. 4,755,299, which is a continuation of Ser. No. 499,847, Jun. 1, 1983, abandoned. This application Apr. 27, 1988, Ser. No. 197,055

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1982, 3220570

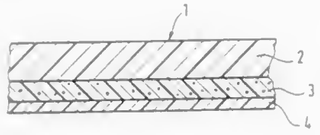
Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—321.84 18 Claims

1. Apparatus for separating a liquid mixture into separable components comprising said mixture, comprising:

(a) a composite membrane consisting essentially of (1) a non-porous separating layer having a thickness between 0.05 and 10 μm, said separating layer being useful for separating an aqueous liquid mixture comprising at least one organic liquid, said separating layer being comprised of cross-linked polyvinyl alcohol, and (2) at least one porous backing layer comprised of a second polymer, said composite membrane being in the form of a flat sheet membrane and being capable of separation of mixtures in a pervaporation process;

(b) means for delivering said liquid mixture to a first free surface of said composite membrane;



(c) means for applying a vacuum to, or an inert gas stream over, a second free surface of said composite membrane, such that said components of said liquid mixture are separated across said composite membrane by pervaporation; and

(d) means for removing pervaporated material.

4,915,835

FLUSHABLE FIBER-FILTER ELEMENT FOR FILTERING A FLUID

Ytzhak Barzuza, Petach Tikva, and Boaz Lerner, Herzliya, both of Israel, assignors to Filtration Water Filters for Agri. and Indt. Ltd., Tel Aviv, Israel

Division of Ser. No. 788,699, Oct. 21, 1985, Pat. No. 4,617,120, which is a continuation of Ser. No. 478,310, Mar. 24, 1983, abandoned. This application Oct. 9, 1986, Ser. No. 917,206

The portion of the term of this patent subsequent to Oct. 14, 2003, has been disclaimed.

Int. Cl.[4] B01D *29/38*

U.S. Cl. 210—350 3 Claims

1. A flushable fiber-filter element for filtering a fluid comprising:

(a) at least one body member having openings providing access and egress for said fluid, and a plurality of fibers, each having an active length;

(b) said fibers being oriented uniformly in a given direction over at least a portion of their active lengths, along which portion at least, each of said fibers is disposed in close proximity to its adjacent fibers forming a layer;

(c) said body member having a central bore at least a portion of which is substantially tapering, at least said tapering portion being lined with a sleeve-like layer of said fibers; and

(d) a hollow-perforated mandril of a shape substantially complementary to said sleevelike layer at said tapering portion and movable in the direction of its longitudinal axis, which mandril in a first position, presses said sleeve-like layer against the wall surface of said bore, and, in a second, axially shifted position removes the pressure from said layer, wherein, in said second position, fluid jets are applied against said layer via said perforations.

4,915,836

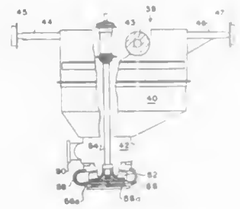
SOLIDS DISPERSION TRANSFER PUMP WITH INTERMEDIATE CHAMBER

James J. Komadina, Elko, Nev., assignor to Newmont Gold Company, Carlin, Nev.

Filed Oct. 31, 1988, Ser. No. 265,200

Int. Cl.[4] B01D *33/38*

U.S. Cl. 210—416.1 20 Claims



15. A combination for separating solids from a first dispersion and for forming and transferring a second dispersion of said solids comprising:

a screen apparatus for separating solids from a first liquid; and

a pump comprising:

an upper chamber open to the atmosphere operatively associated with said screening apparatus for intermittently receiving said solids therefrom and including means for introducing a second liquid thereinto to form a second dispersion of said solids in said second liquid;

an intermediate chamber in fluid communication with said upper chamber and including means for discharging said second dispersion in a horizontal direction; and

a lower chamber in fluid communication with said intermediate chamber and including an impeller rotating horizontally therein for inducing a vortex in said intermediate chamber whereby said second dispersion is discharged from said discharging means without deleteriously affecting the solids of said second dispersion thereby transferring said second dispersion independently of direct contact with said impeller.

4,915,837

HOLLOW FIBER SHEET FILTER OF ALPHA CELLULOSE

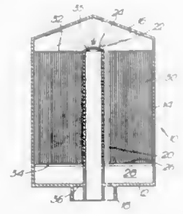
Denis B. Verity, Cliff Cottage, Coppell Hill, Goodrich, Ross-on-Wye, Herefordshire, England

Filed Oct. 17, 1988, Ser. No. 258,679

Claims priority, application United Kingdom, Jan. 14, 1988, 8800798

Int. Cl.[4] B01D *39/18*

U.S. Cl. 210—456 9 Claims



1. Filter apparatus for filtering a liquid, said apparatus comprising a rigid chamber, a liquid inlet and a filtrate outlet, a mass of hollow fibers formed as a cross-linked matrix of alpha cellulose, in the form of cotton staple fibers, formed into a sheet which is rolled into a cylinder to form said mass, whereby said mass is loosely packed into said chamber, when dry, and a distributor connected to said liquid inlet effective to feed said liquid to be filtered over a substantial surface area of one axial end of said cylindrical mass, whereby when the liquid is passed therethrough the matrix will expand to be tightly packed into the chamber.

4,915,838

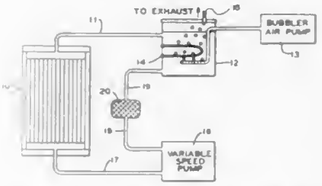
MEMBRANE DEHUMIDIFICATION

Ulrich Bonne, Hennepin, Minn.; David W. Deetz, Allegheny, Pa.; Joey H. Lai, Dakota, Minn.; David J. Odde, Hennepin, Minn., and J. David Zook, Dakota, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 174,920, Mar. 29, 1988, abandoned. This application Dec. 21, 1988, Ser. No. 289,466

Int. Cl.[4] E01D *13/01*

U.S. Cl. 210—640 17 Claims



1 A system for removing water vapor from the ambient atmosphere of a conditioned space comprising:

a microporous vapor exchange medium having a first microporous surface disposed to be exposed to the ambient atmosphere from which an amount of water vapor is to be removed and a second microporous surface opposite said first surface said surfaces being in communication through the micropores;

a quantity of moving hygroscopic collecting fluid medium contacting said second surface of said membrane in relative motion thereto such that water molecules migrate from the ambient atmosphere to sorption by the collecting fluid via the microporous membrane structure, and wherein the microporous medium is not wet by said collection fluid;

means for regenerating said collecting medium by removing sorbed water from the collecting medium without returning the sorbed water to the conditioned space; and

means for circulating said collecting fluid between said microporous exchange medium and said regenerating means.

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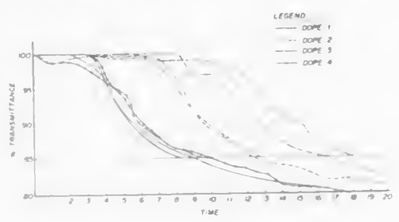
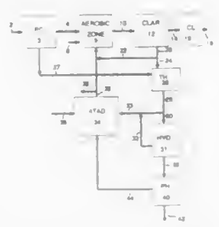
4,915,839
PROCESS FOR SURFACE MODIFYING A MICROPOROUS MEMBRANE
Paul J. Marinaccio, Monroe; Rodney A. Knight, New Milford, and Joseph V. Fiore, Fairfield, all of Conn., assignors to Cuno, Incorporated, Meriden, Conn.
Continuation of Ser. No. 589,895, Mar. 15, 1984. This application Dec. 30, 1988, Ser. No. 292,324
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—500.23 19 Claims



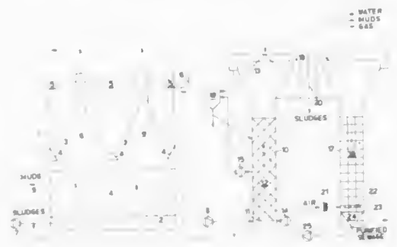
1. A filter media comprising a felted structure of nylon microporous membrane fibers having a microstructure throughout each fiber and cellulose fibers.

4,915,840
PROCESS FOR SLUDGE REDUCTION IN AN AEROBIC SLUDGE GENERATING WASTE TREATMENT SYSTEM
Alan F. Rozich, Wilmington, Del., assignor to Bioprocess Engineering, Inc., Wilmington, Del.
Filed Jun. 7, 1988, Ser. No. 203,242
Int. Cl.[4] C02F *11/02*
U.S. Cl. 210—605 14 Claims



1. In an activated sludge process wherein waste containing organic matter is contacted in an aerobic zone with an oxygen-containing gas in the presence of suspended biologically active organisms under conditions for effecting biological digestion of said organic matter and generating an effluent containing suspended organic matter, said effluent being separated into a disposable aqueous fraction and a heavy sludge fraction containing organic solids, with a portion of the sludge being recycled to said aerobic zone, the improvement for enhancing sludge reduction in said activated sludge process which comprises the steps:
(a) hydrolyzing at least a portion of said heavy sludge fraction under conditions for solubilizing at least a portion of said organic solids therein and thereby forming a hydrolyzed sludge containing solubilized organics;
(b) charging said hydrolyzed sludge to an autothermal thermophilic aerobic digester zone wherein the hydrolyzed sludge is contacted with an oxygen-containing gas at a temperature ranging from 35°–75° C. for digesting and effecting decay of said solubilized organics and generating an effluent stream;
(c) removing said effluent stream from said autothermal thermophilic aerobic digester zone.

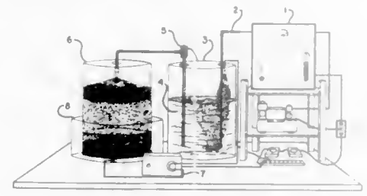
4,915,841
PROCESS FOR THE BIOLOGICAL PURIFICATION OF WASTE WATERS
Vincenzo Lagana', Milan; Angiolo Farneti, and Angelo Bassetti, both of Fano, all of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy
Filed Jul. 18, 1988, Ser. No. 220,077
Claims priority, application Italy, Aug. 7, 1987, 21618 A/87
Int. Cl.[4] C02F *3/30*
U.S. Cl. 210—605 13 Claims



1. A process for purifying by biological treatment a wastewater flow having feed streams and recycle streams and conducted at approximately ambient temperature, comprising:
(a) treating the wastewater flow in an upflow anaerobic sludge blanket by means of an expanded mud bed anerobic/anoxic biological process comprising a thick bed of expanded mud and an overlying zone separating the wastewater flow into water and mud wherein the combination of feed streams and recycle streams maintain an upward speed comprising the range of from about 0.1 to 0.5 m/hr, the flow to said expanded mud bed comprises volumetric values of about 1 kg of COD per cubic meter per day, and the wastewater flow has a residence time of from about 5 to about 20 hours;
(b) treating the flow from said upflow anaerobic sludge blanket by means of an anaerobic biological process having fine inert support media, wherein said anaerobic biological process comprises a fluidized bed; and
(c) nitrifying and oxidizing the flow from said anaerobic biological process having fine inert support media in an aerobic biological process by means of a treatment air flow through a fixed bed.

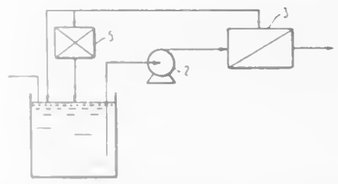
4,915,842
SIMPLE SYSTEM TO DECOMPOSE PESTICIDE WASTE WATER
Philip C. Kearney, Laurel; Mark T. Muidoon, Bowie, and Cathleen J. Somich, Laurel, all of Md., assignors to the United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Filed Jul. 8, 1988, Ser. No. 220,181
Int. Cl.[4] C02F *9/00*
U.S. Cl. 210—617 4 Claims

1. A process for disposing of atrazine, comprising:
producing 2-chloro-4, 6-diamino-s-triazine from atrazine in an aqueous carrier solution by ozonating the atrazine; and,



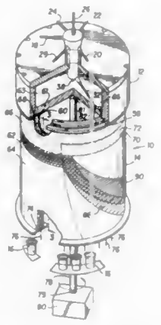
degrading the 2-chloro-4, 6-diamino-s-triazine in an organic-rich soil containing microorganisms capable of metabolizing the 2-chloro-4,6-diamino-s-triazine.

4,915,844
LIQUID-SOLID PARTICLE SEPARATION PROCESS
Yuko Imamura, and Hiroshi Matsuno, both of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan
Filed Feb. 27, 1989, Ser. No. 316,000
Claims priority, application Japan, Feb. 25, 1988, 63-43349
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—651 4 Claims



1 A liquid-solid particle separation process, comprising the steps of:
repeatedly feeding waste solution containing fine solid particles to a membrane-type separator; and
feeding at least part of said solution concentrated with particles therefrom back to said membrane-type separator on one hand while providing said concentrated solution to a centrifugal separator on the other.

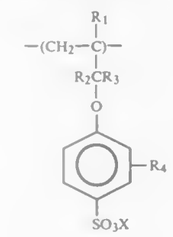
4,915,843
CONTINUOUS DISPLACEMENT CHROMATOGRAPHIC METHOD
Vernon T. Taniguchi, Anaheim, Calif.; Charles H. Byers, Oak Ridge, Tenn., and Allen W. Doty, Pomona, Calif., assignors to Union Oil Company of California, Brea, Calif.
Filed Nov. 28, 1988, Ser. No. 276,627
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—635 45 Claims



45. A method for separating at least two chromatographic species from each other, the method comprising the steps of:
(a) loading a particulate bed comprising a resin with a chromatographic specie A so that substantially all of the resin is loaded with A;
(b) displacing at least a portion of A from the resin with a mixture of at least two chromatographic species that are to be substantially separated from each other, each of the chromatographic species to be separated having a greater affinity than A for the resin;
(c) simultaneously introducing a stream of chromatographic specie A, a stream of the mixture of chromatographic species to be separated, and a stream of a chromatographic specie D proximate a top portion of the resin bed, wherein D has a greater affinity for the resin than all of the chromatographic species to be separated;
(d) moving the stream of A, the stream of the mixture of the chromatographic species to be separated, and the stream of D with respect to the particulate bed so that substantially all the resin is sequentially contacted with (i) the species to be separated, (ii) D, and (iii) A; and
(e) substantially separately collecting each chromatographic specie in the mixture.

4,915,845
INHIBITION METHOD
John C. Leighton, Flanders, and Michael J. Sanders, Flemington, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.
Division of Ser. No. 147,125, Jan. 21, 1988, Pat. No. 4,892,898, which is a continuation-in-part of Ser. No. 944,478, Dec. 19, 1986, abandoned. This application Mar. 16, 1989, Ser. No. 324,509
Int. Cl.[4] C02F *1/00*
U.S. Cl. 210—701 13 Claims

1 A method for dispersing inorganic particulate matter in an aqueous system comprising adding an effective particulate dispersant amount of a water soluble polymer consisting essentially of 1 to 20 mole percent of a recurring monomer unit (A) represented by the chemical structure:



wherein
R_1, R_2, R_3, and R_4 are independently hydrogen or C_1–C_6 alkyl; and
X is hydrogen, an alkali or alkaline earth metal or ammonium and 80 to 99 mole percent of a monomer unit (B) represented by the structure

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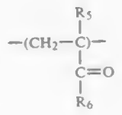


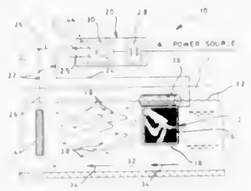
wherein
R_5 is hydrogen or C_1–C_6 alkyl;
R_6 is OX' or NR_7R_8;
R_7 and R_8 are independently hydrogen, C_1–C_6 alkyl, or hydroxyalkyl; and
X' is hydrogen, C_1–C_6 alkyl, hydroxyalkyl, an alkali or alkaline earth metal or ammonium.

4,915,846

WATER CLARIFICATION

William W. Thomas, Jr., Dryden, Va., and J. David Lewis, Knoxville, Tenn., assignors to Clean Water Technologies, Inc., Cumberland Gap, Tenn.

Continuatioo-in-part of Ser. No. 197,230, May 23, 1988, abandoned. This application Mar. 23, 1989, Ser. No. 328,057
Int. Cl.[4] C02F *1/46*
U.S. Cl. 210—702 **7 Claims**



1. A water clarification for removing dye from waste water within a reservoir, said method comprising the steps of:
placing at least one firse electrode comprising a wire mesh screen mounted in a frame within said reservoir whereby said first electrode is immersed in said waste water;
placing at least one second electrode comprising an elongated rod of conductive metal within said reservoir a preselected distance from said first electrode, whereby said second electrode is immersed in said water, said second electrode defining a smaller surface area than said first electrode;
connecting said first and second electrodes to a DC power supply means whereby said first electrode defines a cathode and said second electrode defines a cathode; and
utilizing said power supply means, applying a preselected voltage to said first electrode such that electrical current passes through said waste water from said anode to said cathode, said electrical current defining a preselected average current density of between 0.00016 and 0.00128 amps per cubic foot between said anode and said cathode, whereby said electrical current passes through said water causing said dye to coagulate into a precipitatable solid.

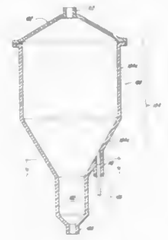
4,915,847

CRYOGLOBULIN SEPARATION

David M. Dillon, Dover, and Stephen H. Franks, Hopkinton, both of Mass., assignors to Baxter International Inc., Deerfield, Ill.

Filed Aug. 4, 1987, Ser. No. 81,484
Int. Cl.[4] B01D *21/26*
U.S. Cl. 210—737 **8 Claims**

7. An improved method of isolating cryoprecipitate by freezing and thawing plasma and subsequently centrifuging the thawed plasma to separate precipitated material therefrom, wherein said isolating is performed on plasma in a separation vessel, and the improvement comprises the steps of
providing in said separation vessel an interior filter chamber communicating through a filter with the interior of said separation vessel,
placing cellular material in said interior filter chamber, and



freezing, thawing and centrifuging said separation vessel with said cellular material in said interior filter chamber whereby certain components of said cellular material separate out with said cryoprecipitate while cell membrane material is retained in said filter.

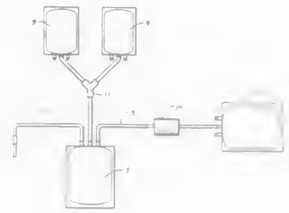
4,915,848

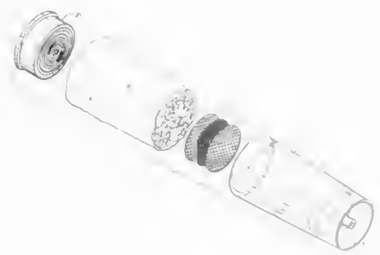
RED BLOOD CELL FILTERING SYSTEM

Raleigh A. Carmen, Concord; Chiyong Chong, San Francisco, and Barry S. Leng, Pleasant Hill, all of Calif., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation of Ser. No. 53,884, May 26, 1987, Pat. No. 4,810,378, which is a continuation-in-part of Ser. No. 854,287, Apr. 21, 1986, Pat. No. 4,855,063. This application Jan. 31, 1989, Ser. No. 304,133
The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.
Int. Cl.[4] B01D *21/26, 29/08, 36/00*
U.S. Cl. 210—749 **8 Claims**

1. A method of processing whole blood for the storage of red blood cells comprising the steps of:
(a) collecting whole blood from a donor into a donor bag of a closed multiple blood bag system comprising a donor bag in communication with at least one other bag via connecting tubing, the tubing including an integral white blood cell filter consisting essentially of a single continuous filtering fiber of about 2.2 denier and the at least one other bag including a red blood cell additive solution;
(b) centrifuging the whole blood in the donor bag under conditions sufficient to separate the whole blood into an upper plasma component and a lower red blood cell component which includes some white blood cells;
(c) removing the plasma component from the donor bag;
(d) introducing the additive solution into the donor bag by passing the solution through the filter to prime the filter removing air from the filter and then mixing the solution with the red and white blood cells; and
(e) passing the mixture of step (d) through the filter and into the at least one other bag under conditions sufficient to remove substantially all white blood cells from the mixture, thereby providing a red blood cell preparation substantially free of white blood cells and suitable for long





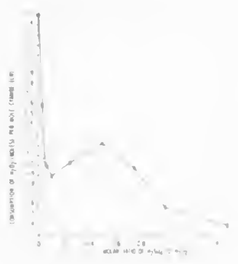
term storage without substantial amounts of white blood cell contaminants.

4,915,849

PROCESS FOR THE TREATMENT OF EFFLUENTS CONTAINING CYANIDE AND OTHER OXIDIZABLE SUBSTANCES

Andrew Griffiths, Ridgewood; M. Quamrul Ahsan, Waldwick, both of N.J.; Roy Norcross, Norwalk, Conn.; Helmut Knorre, Seligenstadt, and Friedrich W. Merz, Nierstein, both of Fed. Rep. of Germany, assignors to Degussa Aktiegesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 17, 1988, Ser. No. 233,165
Int. Cl.[4] C02F *1/58*
U.S. Cl. 210—759 **10 Claims**



1. A process for treating effluent containing cyanide and other xoidizable substances comprising:
contacting said effluent with a mixture formed from hydrogen peroxide and sulfuric acid thereby oxidizing the cyanide, wherein the ratio of H_2SO_4 : H_2O_2 is between 0.01 and 0.5 moles to 1 mole.

4,915,850

METHOD AND APPARATUS FOR SEPARATING GRANULATE FROM A VISCOUS SUSPENSION

Pieter R. Ouwes, Amsterdam, Netherlands, assignor to Mud-cleaning Services Amsterdam B.V., Netherlands

Continuation-in-part of Ser. No. 62,649, Jun. 16, 1987, abandoned. This application Sep. 30, 1988, Ser. No. 251,661
Claims priority, application Netherlands, Jun. 19, 1986, 8601595; Oct. 28, 1986, 8602703
Int. Cl.[4] B01G *19/00*; B01D *33/04*
U.S. Cl. 210—771 **18 Claims**

1. A method of separating and recovering granulate from a viscous suspension containing the granulate, comprising the steps of:
moving an endless sieve belt with a generally borizontal upper run moving in a direction of movement;
placing a layer of the suspension containing granulate on the endless sieve belt so as to form one free edge of the suspension extending across the upper run so that the layer only partially covers the upper run along the length thereof.
separating the granulate as sieve residue on the upper run of the sieve belt and dumping the granulate from the sieve belt after the free edge at one end of the upper run;
passing the suspension through the sieve belt upper run and collecting the suspension between the upper run and a lower run of the sieve belt; and
passing a stream of air downwardly through the sieve belt upper run by ventilator means.

4,915,851

CLARIFYING FILTER-CENTRIFUGE AND METHOD OF FILTERING SUSPENSIONS

Wilfried Flory, Brühl, Fed. Rep. of Germany, assignor to DRM. Dr. Müller AG, Männedorf, Switzerland

Division of Ser. No. 906,920, Sep. 11, 1986, Pat. No. 4,808,308. This application Aug. 29, 1988, Ser. No. 237,996
Claims priority, application Switzerland, Sep. 16, 1985, 4005/85-4
Int. Cl.[4] B04B *7/16, 3/00, 11/00*; B01D *33/02*
U.S. Cl. 210—781 **2 Claims**

1. A method of filtering a suspension by a clarifying filter-centrifuge having feed means for feeding said suspension to be filtered into said filter-centrifuge; discharge means for discharging a filtrate from said filter-centrifuge; a drum with a cover closing one end thereof driven by a rotatable driving shaft including an outer sleeve having an interior and an inner sleeve also having an interior and being coaxial with said outer sleeve; filter means mounted on said cover and extending normal to an axis of rotation of said shaft; said driving shaft including a hollow shaft and an inner shaft; means for an axial displacement of said inner shaft in said hollow shaft, said drum being connected to said hollow shaft, said feed means feeding said suspension axially into said interior of said inner sleeve; said inner sleeve including means defining a distributing channel communicating with said interior of said inner sleeve; a thrust body mounted in said drum adjacent said inner sleeve being provided with distributing means connecting said distrib-

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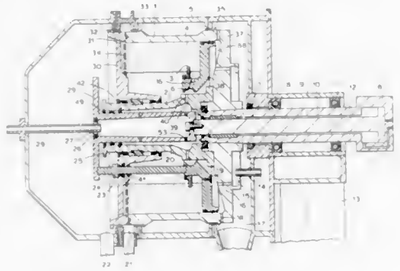
uting channel of said inner sleeve with said interior of said outer sleeve, said distributing means in said thrust body including a means defining a distributing opening and a conduit arrangement in the vicinity of said distributing opening, said distributing opening being positioned between said conduit arrangement and a side of said thrust body facing said cover, the method comprising the steps of:

a. feeding said suspension axially to said interior of said inner sleeve by said feed means;

b. separating and accelerating said suspension in said inner sleeve to precentrifuge and precondense said suspension;



c. flowing said suspension from said inner sleeve through said distributing channel toward said thrust body;

d. flowing said suspension from said distributing channel to said distributing means in said thrust body and through said distributing opening;

e. deflecting said suspension axially in the direction of said filter means via said conduit arrangement to form a suspension liquid; and

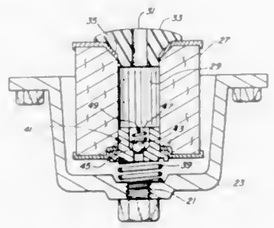
f. flowing said suspension liquid through said filter means to form said filtrate and discharging said filtrate by said discharge means.

4,915,852

OIL FILTER ASSEMBLY FOR A VOLKSWAGEN FLAT FOUR OPPOSED CYLINDER AIR COOLED ENGINE

Robert A. Tomlinson, 28813 Farmersville, Farmersville, Calif. 93223

Filed Apr. 12, 1989, Ser. No. 336,825
Int. Cl.[4] B01D *37/00*
U.S. Cl. 210—805 4 Claims



1. The method of providing an oil filter assembly for a Volkswagen flat four opposed cylinder air cooled engine comprising

providing an additional oil sump secured to an engine oil pan drain hole cover plate opening,

installing an open-sided inflow canister-type oil filter in said additional sump, said oil filter having an oil seal at the upper end thereof for engaging an engine oil pump pickup tube in sealed relation, and a bypass valve at the lower end thereof, and

compressing spring means against said bypass valve for urging said bypass valve and said oil filter upward in said sump toward said engine oil pump pickup tube.

4,915,853

METHOD FOR FIRE EXTINGUISHMENT OF HARDLY EXTINGUISHABLE DANGEROUS MATERIAL

Hisayoshi Yamaguchi, Tokyo, Japan, assignor to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1988, Ser. No. 291,046
Claims priority, application Japan, Dec. 28, 1987, 62-335445; Mar. 14, 1988, 63-59585; Mar. 29, 1988, 63-75401
Int. Cl.[4] c09K *21/00*
U.S. Cl. 252—2 14 Claims

9. A method for extinguishment of fire of a difficult to extinguish material which comprises sprinkling, over the burning site of the material, a powdery fire extinguishing agent comprising a boron oxide powder having a purity relative to the content of B_2O_3 of at least 90% by weight and containing water in an amount not exceeding 2% by weight, the particles of the powder having a diameter in the range from 5 μm to 1000 μm as the principle constituent, with admixture of at least one additive powder selected from the group consisting of:

(a) a first additive powder capable of exhibiting a suffocating and cooling effect on the fire by eutectically melting with boron oxide to decrease the melting point thereof selected from the group consisting of sodium chloride, potassium chloride, sodium carbonate, magnesium carbonate and anhydrous sodium tetraborate;

(b) a second additive powder capable of forming a suffocating and shielding layer having a high strength; and

(c) a third additive powder capable of absorbing a liquid burning material to exhibit a removing and suffocating effect.

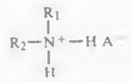
4,915,854

ION-PAIR COMPLEX CONDITIONING AGENT AND COMPOSITIONS CONTAINING SAME

Mark H. Mao; Robert Mermelstein; Debra S. Caswell, and Ellen S. Baker, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 930,840, Nov. 14, 1986, abandoned. This application Oct. 15, 1987, Ser. No. 108,838
Int. Cl.[4] C11D *9/30, 9/48*
U.S. Cl. 252—8.8 69 Claims

1. A detergent composition comprising: from about 0.1% to about 20% of a conditioning agent comprising water-insoluble particles having an average diameter of from about 10 microns to about 300 microns, said particles comprising an alkyl amine-anionic compound ion-pair complex having the formula:



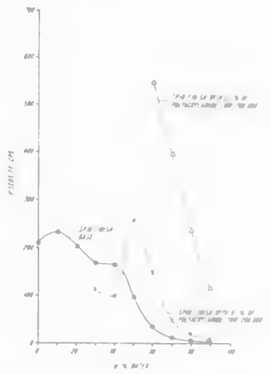
wherein each R_1 and R_2 independently is a C_{12}–C_{20} alkyl or alkenyl, each R_3 is H or CH_3, and A^- is an anionic compound selected from the group consisting of alkyl sulfonates, aryl sulfonates, alkylaryl sulfonates, alkyl sulfates, dialkyl sulfosuccinates, alkyl oxybenzene sulfonates, acyl isethionates, acylalkyl taurates, alkyl ethoxylated sulfates, and olefin sulfonates, and mixtures of said ion-pair complexes; from about 1% to about 98% of a water-soluble detergent surfactant selected from the group consisting of cationic surfactants, nonionic surfactants, zwitterionic surfactants, amphoteric surfactants, and anionic surfactants, wherein the quantity of said detergent surfactant is exclusive of the quantity of anionic compound present in said ion-pair complex; and from about 5% to about 80% of a detergency builder other than C_{10}–C_{18} alkyl monocarboxylic acids or salts thereof.

4,915,855

VISCOSITY REGULATORS FOR WATER-BASED SPIN FINISHES

Gunilla E. Gillberg-LaForce, Summit, and Helen A. Kravas, Chatham, both of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Division of Ser. No. 244,650, Sep. 13, 1988, Pat. No. 4,859,350, which is a continuation of Ser. No. 859,972, May 5, 1986, abandoned. This application Apr. 13, 1989, Ser. No. 337,746
Int. Cl.[4] D06M *13/18*; C10M *173/00*
U.S. Cl. 252—8.9 19 Claims



1. A spin finish composition for yarns comprising:

(A) from about 70 to about 99.5% by weight of water; and

(B) 30 to 0.5% by weight of an oil-based component comprising:

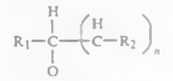
(i) a lubricating oil in an amount sufficient to achieve lubrication of a material contacted with the composition;

(ii) an emulsifier in an amount sufficient to emulsify the lubricating oil and the water; and

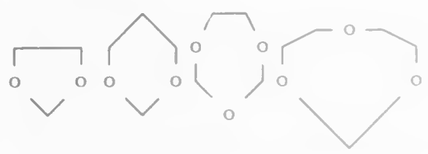
(iii) an associative thickener comprising:

(I) copolymers of 1,3-dioxolane and aliphatic 1,2 epoxides;

(II) a polymerized cyclic ether of the formula:



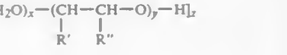
wherein R_1 and R_2 are each alkyl, cycloalkyl, aryl, alkoxy or aryloxy and n has the value of 1 to 4, or a polymerized cyclic acetal having one of the following formulae:



or a mixture of any of the cyclic ethers and/or acetals among themselves or with a cyclic acetal having the formula:

(III) a liquid straight-chain polyoxyalkylene heteric or block copolymer intermediate capped with an alpha-olefin oxide;

(IV) a compound of the formula:



wherein

z is 1 or 2,

R is, for z = 1, alkyl, aralkyl or alkylaryl of 8 carbon atoms in the alkyl chain or hydroxyalkyl of 2–22 carbon atoms, and, for z = 2, (aryl)alkylene of 4–18 carbon atoms in the alkyl chain,

R′ and R″ each independently is hydrogen or C_1–C_{20}-alkyl wherein R′ and R″ are not simultaneously hydrogen and R, and R″ together have a total of 8–20 carbon atoms,

x is 10–40 and

y is 1.2–5;

(V) copolymers of ethylene oxide and epoxy-n-alkane of 12 to 25 carbon atoms; or

(VI) cellulose ethers modified with long-chain hydrocarbon epoxides,

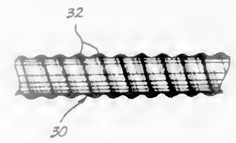
the associative thickener being present in an amount which does not substantially affect the initial viscosity of said spin finish composition, yet causes a substantial increase in the viscosity of the composition as the water contained therein decreases from its initial level and effects no substantial change in viscosity as the water content further decreases to below about 40%.

4,915,856

SOLID LUBRICANT COMPOSITION

Warren E. Jamison, Edmonds, Wash., assignor to Durafilm Corporation, Everett, Wash.

Continuation-in-part of Ser. No. 72,097, Jul. 10, 1987, abandoned. This application Oct. 6, 1988, Ser. No. 256,142
Int. Cl.[4] C10M *125/02, 125/04*
U.S. Cl. 252—26 78 Claims



1. A solid lubricant composition comprising:

(a) from about 16% to about 70% by weight of a polymeric carrier;

(b) from about 20% to about 70% by weight of a lubricating oil, said lubricating oil being soluble in said polymeric carrier;

(c) from about 10% to about 65% by weight of a solid lubricating powder selected from one or more of the group consisting of copper, lead, antimony, zinc, bismuth, tin,

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aluminum, magnesium, selenium, arsenic, cadmium, tellurium, graphite, and alloys thereof, in powered form; and

(d) from about 0.25% to about 18% by weight of a surface acitve agent comprising a metallic dithiophosphate and an organic molybdenum compound.

4,915,857

AMINE COMPATIBILITY AIDS IN LUBRICATING OIL COMPOSITIONS

Jacob Emert, Brookyln, N.Y., and Malcolm Waddoups, Westfield, N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed May 11, 1987, Ser. No. 48,722
Int. Cl.[4] C10M *137/10*
U.S. Cl. 252—32.7 E 45 Claims

1. A composition comprising:

(a) an ashless nitrogen containing dispersant compound selected from the group consisting of oil soluble salts, amides, imides, or mixtures thereof, of long chain hydrocarbon substituted mono- and dicarboxylic acids or their anhydrides;

wherein said long chain hydrocarbon group is a polymer of a C_2 to C_5 monoolefin, said polymer having a number average molecular weight of about 700 to about 5000;

(b) a high total base number detergent material;

(c) an oil soluble copper containing antioxidant material;

(d) a friction modifier; and

(e) an amine compatibilizing material of the formula:

wherein R^1 and R^2 are independently H or hydrocarbyl groups, having from 4 to 20 carbon atoms, selected from substituted or unsubstituted alkyl, alkenyl, aralkyl or cycloalkyl groups; and wherein R^1 and R^2 are not both H and together contain at least 8 carbon atoms.

4,915,858

NITROGEN CONTAINING ANTI-OXIDANT COMPOSITIONS

Mary F. Salomon, Cleveland Heights, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 59,884, Jun. 9, 1987, Pat. No. 4,798,684. This application Jun. 23, 1988, Ser. No. 210,603
The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.
Int. Cl.[4] C10M *135/22*
U.S. Cl. 252—47.5 28 Claims

1. A composition of matter which is the amine terminated reaction product obtained from two equivalents of a secondary aromatic monoamine with two equivalents of a beta-thiodialkanol.

4,915,859

MICRO-EMULSION DRAWING FLUIDS FOR STEEL AND ALUMINUM

E. Michael Kerr, Naperville, and Bernard R. Szyszko, Warrenville, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Sep. 16, 1988, Ser. No. 245,106
Int. Cl.[4] C10M *173/00*
U.S. Cl. 252—49.5 11 Claims

1. A micro-emulsion drawing and stamping extreme pressure lubricant composition for steel and aluminum which consists essentially of water and about 2 to 30 percent of 500–3,000 s.u.s. viscosity hydrocarbon oil, and as an emulsifier and stabilizer base is tall oil fatty acid, triethanolamine soap, petroleum sulfonate and nonionic emulsifier.

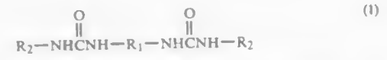
4,915,860

UREA-URETHANE GREASE COMPOSITION

Hirotugu Kinoshita; Makoto Sekiya, and Masaru Mishima, all of Kawasaki, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

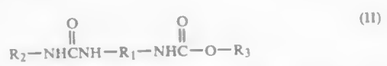
Continuation of Ser. No. 141,401, Jan. 4, 1988, abandoned. This application Mar. 23, 1989, Ser. No. 328,786
Claims priority, application Japan, Jan. 9, 1987, 62-001763
Int. Cl.[4] C10M *115/08*
U.S. Cl. 252—51.5 R 10 Claims

1. A urea-urethane grease composition comprising, as essential ingredients, a thickener and a lubricant base oil, said thickener containing a urea-urethane mixture having a composition including 20 to 95 mol. % of a diurea compound represented by the general formula (I) of:



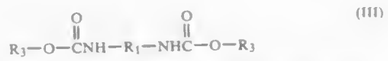
(I)

4 to 30 mol. % of a urea-urethane compound represented by the general formula (II) of:



(II)

and 1 to 50 mol. % of a diurethane compound represented by the general formula (III) of:



(III)

wherein R_1 represents a difunctional aromatic hydrocarbon residue having 6 to 15 carbon atoms, R_2 a cyclohexyl group or a group derived from cyclohexyl and having 7 to 12 carbon atoms and R_3 an alkyl group or an alkenyl group having 8 to 20 carbon atoms, the ratio of the numbers of amino groups R_2—NH— to those of alkoxy groups R_3—O— in said mixture being 95/5 to 40/60, said thickener being contained in an amount of 2 to 25 wt. % based on the total weight of the grease composition.

4,915,861

LIQUID ELECTROLYTE FOR USE IN ELECTROLYTIC CAPACITOR

Yutaka Yokoyama; Makoto Shimizu, and Tatsunori Tsuji, all of Tokyo, Japan, assignors to Nippon Chemi-Con Corporation, Tokyo, Japan

Continuation of Ser. No. 169,245, Mar. 16, 1988, abandoned. This application Dec. 12, 1988, Ser. No. 282,650
Claims priority, application Japan, Mar. 16, 1987, 62-60740
Int. Cl.[4] H01G *9/02*
U.S. Cl. 252—62.2 4 Claims

1. A liquid electrolyte capacitor which contains as an electrolyte a dicarboxylic acid salt of tetramethylammmonium in an aprotic polar solvent, with the molar ratio of cations to anions in the electrolyte being adjusted to be within the range of from 1:1.05 to 1:1.40.

4,915,862

GRANULAR DETERGENT COMPOSITIONS CONTAINING CRUTCHED AND ADMIXED PHOSPHATE BUILDER SYSTEM

Lisa A. Beerse, Maineville, and Keith H. Baker, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 11, 1988, Ser. No. 231,108
Int. Cl.[4] C11D *3/06, 17/04*
U.S. Cl. 252—90 6 Claims

1. A granular detergent composition having a phosphate builder system comprising:

(A) a crutched builder comprising sodium tripolyphosphate (STPP) and tetrasodium pyrophosphate (TSPP) having a crutched STPP/TSPP ratio of from 3:1 to 1:3; wherein said crutched builder is in a spray dried detergent granule; and

(B) an admixed builder selected from STPP and TSPP and a mixture thereof; and

wherein the builders of said (A) and said (B) have a crutched-/admixed ratio of from about 1:5 to about 5:1;

wherein said phosphate builder system contains from 0% to about 50% of said admixed TSPP by weight of the builder system; and

wherein said granular detergent composition comprises from about 5% to about 40% surfactant and from about 10% to about 75% of said builder system by weight of said composition.

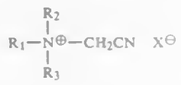
4,915,863

BLEACHING COMPOSITION

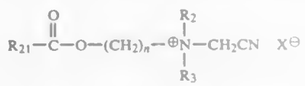
Muneo Aoyagi; Kazuhiro Takanashi; Masaaki Yamamura, all of Utsunomiya; Moriyasu Murata, Chiba; Hiroyuki Yamada; Hiroyuki Araki, both of Ichikaimachi, and Takanori Fukumoto, Ichikaimachi, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Aug. 8, 1988, Ser. No. 229,913
Claims priority, application Japan, Aug. 14, 1987, 62-202966; Sep. 9, 1987, 62-225870; Sep. 9, 1987, 62-225871; Mar. 24, 1988, 63-70380; Jul. 5, 1988, 63-167157
Int. Cl.[4] C11D *3/39, 3/395, 7/54;* D06L *3/02*
U.S. Cl. 252—102 9 Claims

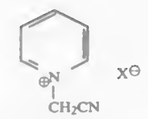
1. A bleaching composition comprising (a) hydrogen peroxide or a peroxide capable of releasing hydrogen peroxide in an aqueous solution, and (b) an organic peracid precursor, the mole ratio of (a)/(b) being in the range of from 99.9/0.1 to 20/80, said organic peracid precursor being at least one member selected from the group consisting of



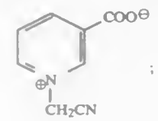
wherein X is an anion, R_1 is alkyl having 1 to 24 carbon atoms, and R_2 and R_3 are each alkyl having 1 to 3 carbon atoms;



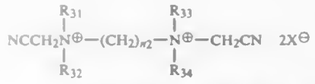
wherein X, R_2 and R_3 have the same meanings as defined above, R_{21} is alkyl having 1 to 20 carbon atoms or phenyl, and n is a number of 1 to 3;



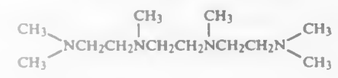
wherein X has the same meaning as defined above;



;



wherein X has the same meaning as defined above, R_{31}, R_{32}, R_{33} and R_{34} are each alkyl having 1 to 3 carbon atoms, and n_2 is a number of from 1 to 9; and, the reaction product of



with chloroacetonitrile.

4,915,864

AQUEOUS SOLUTION COMPOSITION OF STRONG ALKALI AND NONIONIC SURFACE ACTIVE AGENT

Kazuo Kita; Etsuko Morimi, and Toshimasa Hamai, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jun. 13, 1988, Ser. No. 205,992
Claims priority, application Japan, Jun. 25, 1987, 62-158682; Nov. 9, 1987, 62-28342
Int. Cl.[4] C11D *1/10, 1/66*
U.S. Cl. 252—117 7 Claims

1. An aqueous solution composition of a strong alkali and a nonionic surface active agent comprising: (a) a strong alkali, (b) a nonionic surface active agent having an HLB value of 3–18, and, as a solubilizing agent, (c) a carboxylic acid represented by the following formula (I):

$$R_1COOM_1 \quad (I)$$

in which R_1 represents a C_{4-18} linear aliphatic hydrocarbon group, C_{4-18} branched aliphatic hydrocarbon group, or C_{6-18} aromatic hydrocarbon group, and M_1 represents a hydrogen atom, an alkali metal, an aliphatic amine having a C_{1-4} carbon atom content, ammonia, or an alkanolamine, and a carboxylic acid of the following formula (II), in combination:

$$R_2—X—(CH_2)_{m1}COOM_2 \quad (II)$$

in which R_2 represents a C_{4-18} linear aliphatic hydrocarbon group, C_{4-18} branched aliphatic hydrocarbon group, or C_{6-18} aromatic hydrocarbon group, X represents a group >NH, $>N(CH_2)_{n1}COOM_2$, or $>CHCOOM_2$, M_2 represents a hydrogen atom, an alkali metal, an aliphatic amine having a C_{1-4} carbon atom content, ammonia, or alkanolamine, and m1 and n1 independently indicate integers of 1–3, wherein the strong alkali (a) is present in an amount of 3–50 wt. %, the nonionic surface active agent (b) is present in an amount of 0.01–30 wt.

%, and the solubilizing agent (c) is present in an amount of 0.01–30 wt. %.

4,915,865

DIMENSIONALLY STABLE ALKALINE CLEANSING AGENTS OF LOW DENSITY, AND A PROCESS FOR THEIR PREPARATION

Lothar Westermann, Cologne; Hannsjörg Ulrich, and Werner Klose, both of Erftstadt, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 16, 1988, Ser. No. 207,454

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1987, 3721461

Int. Cl.[4] C11D *7/06, 7/12*

U.S. Cl. 252—157 **13 Claims**

1. A process for the preparation of a dimensionally stable alkaline cleansing agent of low density, said agent comprising

2 to 50% by weight of alkali metal phosphate,

2 to 50% by weight of a silicate and

1 to 60% by weight of alkali metal hydroxide,

alkali metal carbonate or bicarbonate or mixtures thereof,

which process comprises foaming 0.25 to 10% by weight, on the same weight basis as the listed ingredients a phosphoric acid partial ester, selected from the group consisting of phosphoric acid monoester, phosphoric acid diester or mixtures thereof having been obtained by reaction of a phosphorylating agent with an organic hydroxy compound, with water in a weight ratio of (1:2) to (1:80), using intensive stirring, incorporating into the foam further components selected from alkali metal phosphate, a silicate, alkali metal hydroxide, alkali metal carbonate and alkali metal bicarbonate, using stirring and kneading, respectively, converting the resulting mixture to moldings and allowing the moldings to set for 0.5 to 15 hours.

4,915,866

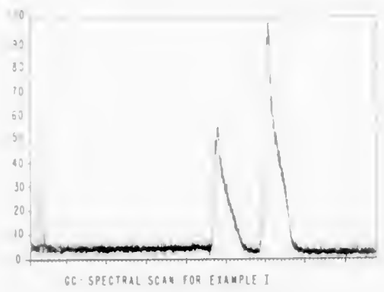
SCHIFF BASE REACTION PRODUCTS OF MIXTURES OF ALDEHYDES INCLUDING HELIONAL AND ALKYL ANTHRANILATES; DERIVATIVES THEREOF; AND ORGANOLEPTIC USES THEREOF

Braja D. Mookherjee, Holmdel; Robert W. Trenkle, Point Pleasant, both of N.J.; Nicholas Calderone, Laurel Hollow, N.Y.; Lisa Schreck, Tinton Falls, and Keith P. Sands, Marlboro, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 164,503, Mar. 4, 1988, Pat. No. 4,839,083, which is a continuation-in-part of Ser. No. 114,247, Oct. 29, 1987, Pat. No. 4,775,720. This applicatioo Jan. 10, 1989, Ser. No. 295,465

Int. Cl.[4] C11D *3/50*

U.S. Cl. 252—174.11 **2 Claims**



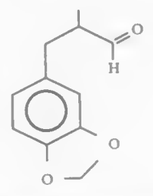
1. A process for overcoming the malodor of a detergent powder product suitable for use in the washing of fabrics which detergent powder product comprises:

(i) from 5 to 40% by weight of a non-soap detergent active compound comprising an anionic detergent active compound;

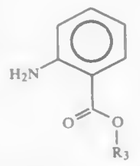
(ii) from 1 to 90% by weight of a non-soap detergency builder; and

(iii) from 1 to 30% by weight of a peroxy bleach compound together with an activator therefor;

which process comprises the step of intimately admixing with said detergent powder from 0.1 up to 5% of a bleach stable perfume which comprises 50 to 100% of a schiff base reaction product of helional having the structure:



and an alkyl anthranilate having the structure:



wherein R_3 is selected from the group consisting of methyl and ethyl having a lipoxidase inhibiting capacity of at least 50% or a Raoult variance ratio of at least 1.1 wherein the schiff base reaction product is judged to be stable in the presence of sodium perborate tetrahydrate and N,N,N',N'-tetraacetyl ethylenediame (TEAD) according to the bleach stability test, said schiff base reaction product having a malodor reduction value of from 0.25 to 3 as measured by the malodor reduction value test.

4,915,867

LIQUID CRYSTAL HIGH MOLECULAR MATERIAL

Kazuharu Morita, and Satoshi Hachiya, both of Chiba, Japan, assignors to Idemtsu Kosan Company Limited, Tokyo, Japan

PCT No. PCT/JP87/00521, § 371 Date Mar. 17, 1988, § 102(e) Date Mar. 17, 1988, PCT Pub. No. WO88/00606, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 16, 1987, Ser. No. 199,409

Claims priority, application Japan, Jul. 18, 1986, 61-169288

Int. Cl.[4] C09K *19/54*

U.S. Cl. 252—299.5 **8 Claims**

1. A liquid crystal high molecular weight material comprising the hydrogen bonded product of

a non-liquid crystalline polymer having proton transfer functionality selected from a group consisting of polyacrylic acid, polymethacrylic acid, polyacrylate, polymethacrylate, polyacrylamide, polyvinyl alcohol and its partial hydrolysis, and polyvinyl acetate, the polymerization degree of the polymer being 10–10,000; and

a low molecular weight compound having the formula A—X—Y—Z, which has proton transfer functionality opposite to and reactive with the proton transfer functionality of said polymer, to produce hydrogen bending, said low molecular weight compound being at least one compound having a terminal group A having a proton donor and/or a proton acceptor selected from:

$HOOC-CH_2CH_2-COO-(CH_2)_{12}-O-$,

$HOOC-CH_2CH_2-COO-(CH_2)_{11}-C(=O)-$,

$H_3C-C(CH_2OH)_2-COO-(CH_2)_{12}-O-$,

$H_3C-C(CH_2OH)_2-COO-(CH_2)_{11}-C(=O)-O-$,

$HO-C(CH_2OH)_2-COO-(CH_2)_{12}-O-$,

$HO-C(CH_2OH)_2-COO-(CH_2)_{11}-C(=O)-O-$,

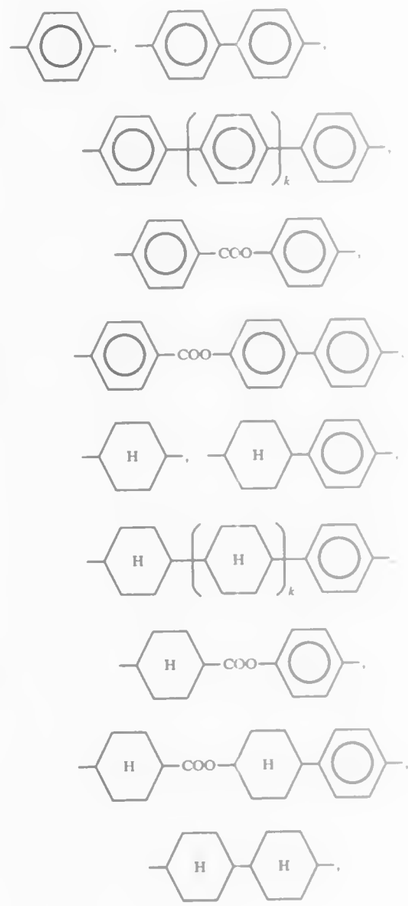
$HO-CH_2CH_2-COO-(CH_2)_{12}-O-$,

$HO-CH_2CH_2-COO-(CH_2)_{11}-C(=O)-$,

$HOOC(CH_2)_3COO(CH_2)_6-O-$,

$HO-(CH_2)_{12}-O-$, and $HOOC(CH_2)_8C(=O)-O-$

a cyclic group X selected from



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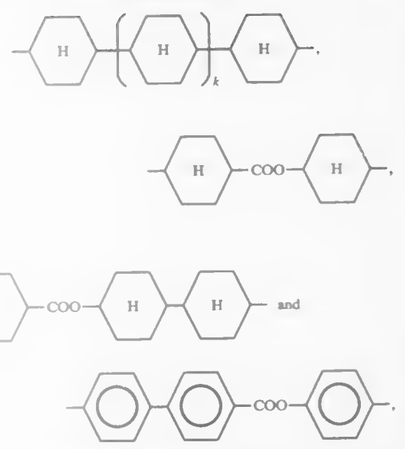
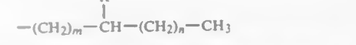


wherein k represents and integer of about 1 or 2, a bridging group Y selected from —O—, —COO—, —OCO—, —CO—S—, —CH=C(CN)—, —CH=CH— and —CO—CH_2—, and a chiral terminal group Z represented by the following formula:



wherein R represents a lower alkyl group, a halogen atom or a nitrile group, m represents an integer of 0–5 and n represents 0 or 1,

the number of proton transfer functional groups of the low molecular weight compounds being about the same as the number of proton transfer functional groups of the non-liquid crystalline polymer.

4,915,868

OPTICALLY ACTIVE ESTERS OF 1-ACYLPROLINE AS DOPES IN LIQUID-CRYSTAL MIXTURES, AND NOVEL OPTICALLY ACTIVE ESTERS OF 1-ACYLPROLINE

Dieter Günther, Kelkheim; Dieter Ohlendorf, Liederbach, and Rainer Wingen, Hattersheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

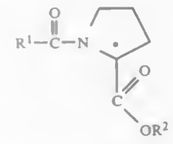
Filed Dec. 22, 1987, Ser. No. 136,595

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644522

Int. Cl.[4] C09K *19/52, 19/34;* **G02F** *1/13*

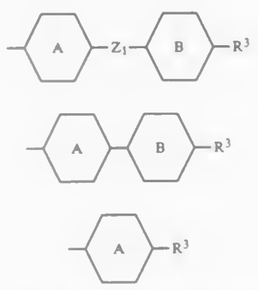
U.S. Cl. 252—299.61 **4 Claims**

1. A liquid-crystal mixture containing at least two components, wherein at least one component is an optically active ester of 1-acylproline of the formula (I)

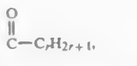


(I)

in which one of R^1 or R^2 is a mesogenic radical of the formulas (II), (III) or (IV)



(II)

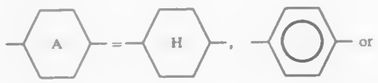


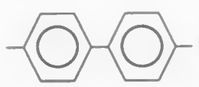
(III)

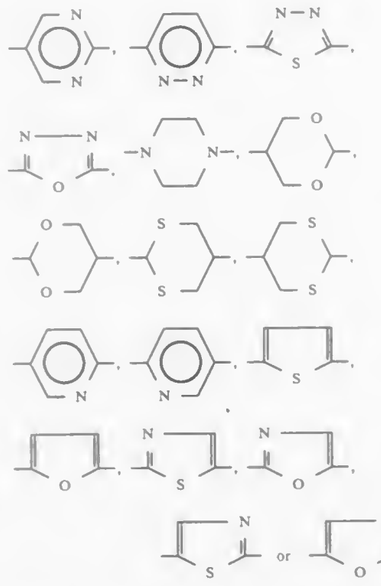
(IV)

where the indices and components have the following meanings:

Z_1=COO, OOC, $(CH_2)_2$, OCH_2, CH_2O, or CH_2,

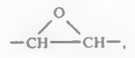




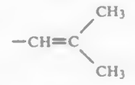


R^3=C_rH_{2r+1}, OC_rH_{2r+1}, SC_rH_{2r+1},

$OOC—C_rH_{2r+1}$, $COOC_rH_{2r+1}$ or NHC_4H_{2r+1}, where r is an integer from 1 to 12, and in which the other radical R^1 or R^2 is: a straight-chain or branched alkyl group which has 1–12 carbon atoms, which is unsubstituted or substituted by F, Cl, Br or CN, in which one or two non-neighboring $—CH_2$- groups may be replaced by —O—, —S—, —CO—, —OCO—, —COO—, —OCS—, —COS—, $—CH=CH_{13}$, and or



and which can contain a terminal group $—CH=CH_2$ or



or which is cyclohexyl or phenyl, or 4-alkylcyclohexyl or 4-alkylphenyl or 4-alkoxyphenyl having 1–6 carbon atoms in the alkyl.

4,915,869

MIXED LANTHANUM-MAGNESIUM ALUMINATES

Jean-Jacques Aubert, Saint Egreve; Maurice Couchaud, Seyssinet-Pariset; Anne-Marie Lejus, Montrouge, and Daniel Vivien, Garches, all of France, assignors to Commissariat a l'Energie Atomique and Centre National de la Recherche Scientifique, both of Paris, France

Continuation of Ser. No. 919,131, Oct. 15, 1986, abandoned. This application Dec. 30, 1988, Ser. No. 292,636
Claims priority, application France, Oct. 21, 1985, 85 15579
Int. Cl.[4] C09K *11/80*
U.S. Cl. 252—301.4 R **7 Claims**

1. A monocrystalline mixed aluminate of lanthanum and magnesium of the general formula:

$$La_{1-x}Nd_xMg_yAl_{11}O_{18+y}$$

in which x is a number such that $0<x\leqq0.2$ and y is a number such that $0.5\leqq y<0.7$ and wherein said mixed aluminate has a magnetoplumbite crystalline structure.

4,915,870

PROCESS FOR THE MANUFACTURE OF POTASSIUM STABILIZED SILICA SOLS

Robert D. Jones, Naperville, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Oct. 7, 1988, Ser. No. 254,769
Int. Cl.[4] C09K *13/02*
U.S. Cl. 252—313.2 **5 Claims**

1. A method for producing a low sodium silica sol comprising the following steps:
A. providing a 0.1%–5% aqueous solution of potassium hydroxide,
B. heating the aqueous solution of the potassium hydroxide to at least 80° C.,
C. preparing a modified acid sol by mixing aqueous silicic acid and another acid in a weight ratio of silicic acid to the other acid within the range of from 10:1 to 150:1;
D. Adding to the heated aqueous solution of the KOH a 2 to 10% by weight modified acid sol in a volume ratio of from 2:1 to 15:1, the mole ratio of Sio_2: KOH being in the range of 1:1 to 150:1, at a rate which maintains a substantially constant, concentration of SiO_2 in the resultant mixture thereby producing the silica sol and then,
E. concentrating the silica sol by either distillation or ultrafiltration so as to recover an aqueous colloidal silica sols which contains 5–55% by weight SiO_2 having a pH of 8–10.5 and containing less than 150ppm sodium metal.

4,915,871

WATER RESISTANCE OF FINE-VERMICULITE ARTICLES

Alan W. Atkinson, Rugby, and Jody K. Burnett, Northamptonshire, both of United Kingdom, assignors to T&N Technology, Limited, Manchester, England

Filed Apr. 13, 1989, Ser. No. 337,413
Claims priority, application United Kingdom, Apr. 26, 1988, 8809820
Int. Cl.[4] C04B *20/06, 31/22, 31/26*
U.S. Cl. 252—378 R **8 Claims**

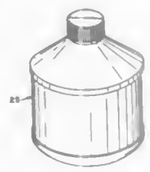
4. A process for improving the water-resistance of an article which comprises gas-exfoliated vermiculite bound together by very fine particles, having a diameter of about 100 μm, of vermiculite from which the interstitial magnesium ions have been at least partially removed and which has been swollen in water, in which process the article is brought into contact with a solution of a salt selected from aluminates and zirconyl salts.

4,915,872

CAST SOLID BLOCK CORROSION INHIBITOR COMPOSITION

Stanlay J. Ciuba, Burnsville, and Guillermo C. Etienne, St. Louis Park, both of Minn., assignors to Drew Chemical Corporation, Boonton, N.J.

Continuation of Ser. No. 89,192, Oct. 1, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 333,872
Int. Cl.[4] C23F *11/08*
U.S. Cl. 252—389.3 **4 Claims**



1. A composition comprising:
(a) about 5 to 20 wt-% silicate, calculated as sodium metasilicate pentahydrate;
(b) about 70 to 90 wt-% borate, calculated as sodium tetraborate pentahydrate;
(c) about 0.5 to 5 wt-% polymeric dispersant; and
(d) about 10 to 30 wt-% water; the composition being substantially free of any nitrite or nitrate salts, and cast into a solid block.

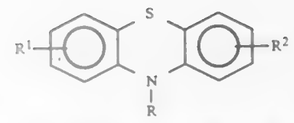
4,915,873

POLYMERIZATION INHIBITOR COMPOSITION FOR VINYL AROMATIC COMPOUNDS

Gerald J. Abruscato, New Britain, and Paul E. Stott, Sandy Hook, both of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Continuation-in-part of Ser. No. 146,913, Jan. 22, 1988, abandoned. This application Mar. 22, 1988, Ser. No. 172,048
Int. Cl.[4] C09K *15/26;* **C07C** *7/20*
U.S. Cl. 252—402 **7 Claims**

1. A polymerization inhibitor composition comprising:
(a) a phenothiazine compound having the structure:



wherein R is hydrogen or C_1–C_{12} alkyl; and R^1 and R^2 are each independently selected from the group consisting of hydrogen, C_6–C_{10} aryl, C_7–C_{11} aralkyl, C_7–C_{16} alkaryl and C_1–C_{12} alkyl; and
(b) a phenylenediamine compound having the structure:

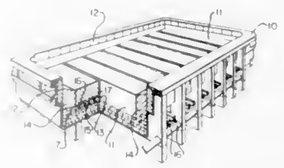
wherein
R^3 is C_6–C_{10} aryl or C_7–C_{16} alkaryl; and
R^4, R^5 and R^6 are each independently selected from the group consisting of hydrogen, C_1–C_{12} alkyl, C_3–C_{12} cycloalkyl, C_7–C_{11} aralkyl, and C_7–C_{16} alkaryl.

4,915,874

CEMENT FOR COLLECTOR BAR-CARBON BLOCK JOINTS OF ELECTROLYTIC CELLS

Sadashiv K. Nadkarni, Jonquiere, and Lise Castonguay, Chicoutimi-Nord, both of Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Aug. 14, 1987, Ser. No. 85,856
Claims priority, application Canada, Aug. 20, 1986, 516432
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—511 **18 Claims**



1. A conductive cement for collector bar-carbon block joints of electrolytic cells, which comprises:
an aggregate selected from the group consisting of calcined anthracite and mixtures of calcined anthracite and graphite, said aggregate having a particle size distribution comprising less than 30% by weight of a +10 Tyler mesh fraction and between 15 and 30% by weight of a −200 Tyler mesh fraction;
a settable liquid polymeric binder comprising a material selected from the group consisting of liquid phenol-formaldehyde resin, furfuryl alcohol phenolic resin, furfuryl phenolic resin, and precursors thereof; and
a curing agent for causing said binder to set;
the ratio of said binder to said aggregate and the particle size of he aggregate being such that said cement has a linear shrinkage falling within the range of about 0.3 to 1.5% when exposed to normal operating temperatures of an electrolytic cell and said cement is sufficiently fluid at ambient temperatures for introduction into said joints.

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4,915,875

OXIDATION PRODUCTS OF PARAMETHYL-SUBSTITUTED HINDERED PHENOLS

Timothy R. Diephouse, and Robert M. Strom, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 762,668, Aug. 5, 1985, abandoned, which is a continuation-in-part of Ser. No. 606,482, May 3, 1984, abandoned. This application Nov. 4, 1986, Ser. No. 926,693

Int. Cl.[4] C07C *41/06, 45/38, 46/02, 50/30, 67/04, 69/16*

U.S. Cl. 552—304 24 Claims

1. A process for oxidizing p-methylsubstituted hindered phenols to selectively prepare oxygenated organic products comprising contacting a p-methyl-substituted hindered phenol with an oxidizing agent and at least a stoichiometric amount of a nucleophile at an elevated temperature in the presence of a catalytic amount of a heterogeneous oxidation catalyst under conditions such that a nucleophile substitution product wherein the nucleophile is substituted on the methyl carbon is selectively prepared.

18. A process for oxidizing p-methyl-substituted hindered phenols to selectively produce a substituted stilbenequinone which process comprises contacting a p-methyl-substituted hindered phenol with an oxidizing agent at an elevated temperature in the presence of a catalytic amount of a heterogeneous oxidation catalyst and in the absence of a nucelophile under conditions such that a substituted stilbenedquinone is selectively prepared.

4,915,876

PROCESS FOR THE DEODORIZATION AND STABILIZATION OF POLYUNSATURATED OILS

Robert C. Lindsay, Madison, Wis., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Jul. 20, 1987, Ser. No. 75,505

Int. Cl.[4] C11B *5/00*

U.S. Cl. 260—398.5 29 Claims

1. A method for deodorizing a polyunsaturated oil to yield an oil of enhanced stability, comprising the steps of:

A. emulsifying a deaerated polyunsaturated oil with sufficient amounts of a first aqueous solution of a volatile mild edible base having a pH of about 7-11 to form an emulsion in a volume ratio of oil to solution ranging from about $2 \geqq 8:1$;

B. first basic stream co-distilling the basic emulsion at a temperature ranging from about 100° to 150° C. at a pressure of about 5 to 50 Torr with steam and a vaporous aqueous solution of an edible base whereby odoriferous constituents and substantially all of the base is removed to form an alkalinzed oil;

C. final acidic steam co-distilling the alkalinzed oil at a temperature ranging from about 100 to 150° C. at a pressure of about 5 to 50 Torr with steam and a vaporous aqueous solution of an edible volatile acid to form an acidified deodorized oil;

D. adding antioxidants to the acidified deodorized oil to form an acidified, deodorized, antioxidant-loaded oil;

E. removing residual acid and moisture from the deodorized, antioxidant loaded oil to form a dry, neutralized oil; and

F. reacidulating the dry neutral oil with a solid edible acid to form a reacidulated deodorized, dry, antioxidant loaded oil of enhanced stability.

29. The oil prepared according to the process of claim 1.

4,915,877

FILL ASSEMBLY FOR COOLING TOWER

Charles E. Shepberd, 4202 Markham, Houston, Tex. 77027

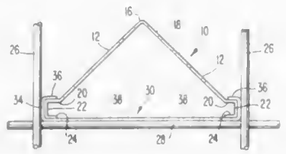
Filed May 18, 1989, Ser. No. 353,605

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—111 4 Claims

1. A fill assembly adapted to facilitate the formation of liquid droplets for enhanced contact with air or gas passing through the fill assembly, comprising:

(a) a fill member having a generally inverted V-shape cross-section open at the bottom, said fill member comprising upwardly converging side walls terminating in a top ridge, said side walls being formed with openings, the surrounding defining edges of which are adapted to engage descending streams or drops of liquid and break the same up into smaller droplets thereby increasing the total liquid surface subject to contact with the air, the downwardly and outwardly diverging bottoms of said side walls being laterally spaced from a longitudinal axis through said top ridge, and



(b) a generally flat bottom member extending between and interconnected to the bottoms of said side walls to close off the open bottom of said fill member, said interconnection being such as to substantially inhibit downward deformation of said ridge and lateral spreading of said side walls responsive to heavy loading on said fill assembly, said bottom member being apertured to provide an additional surface for droplet formation.

4,915,878

PACKING STRUCTURE ESPECIALLY FOR USE IN A COLUMN MAINLY FOR CONTACTING LIQUID AND GAS PHASES

Fábry György, Csalán u. 1, H-1025 Budapest, and Manczinger Pál, Rügy u. 5, H-1026 Budapest, both of Hungary

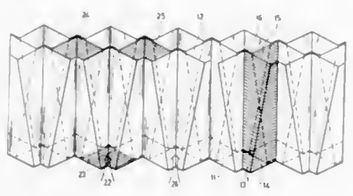
PCT No. PCT/HU87/00017, § 371 Date Sep. 23, 1988, § 102(e) Date Sep. 23, 1988, PCT Pub. No. WO87/05827, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 24, 1987, Ser. No. 272,983

Claims priority, application Hungary, Mar. 24, 1986, 1219/86

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—112.2 9 Claims



1. Packing structure especially for use in a column mainly for contacting liquid and gas phases, said packing comprises sheets being periodically folded and attached to each other, said sheets define regular and periodical passage channels opening to respective parallel planes defined by sides of said sheets, characterized in that each of said sheets being composed of periodically repetitive elements, each line of intersection of said elements with said planes having a shape similar to the letter "M" or "W" which is symmetrical and having uneven arms formed by straight or slightly curved line sections, and the intersection line of an element with one of said planes defined by a first side (2) of said sheet being geometrically congruent with the intersection line of said element with the other one of said planes defined by a second side (1) of said sheet and said two intersection lines being laterally offset by a half period relative to each other, and adjacent ones of said sheets being attached to each other in such a way that an apex (C) defined by a pair of said shorter arms (3,4) of a sheet abutting an apex defined by said longer arms of said adjacent sheet and said adjacent sheets abutting each other alternatively and periodically at one or the other one of said sides.

4,915,879

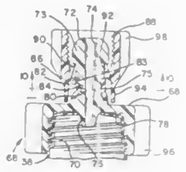
SIGNAL COUPLING FOR HUMIDIFIER CONTAINER

Gerhard H. Weiler, South Barrington, and Henry Komendowski, Des Plaines, both of Ill., assignors to Automatic Liquid Packaging, Inc., Woodstock, Ill.

Continuation-in-part of Ser. No. 300,023, Jan. 19, 1989, which is a continuation-in-part of Ser. No. 909,191, Sep. 19, 1986, abandoned. This application Jun. 28, 1989, Ser. No. 373,155

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—122 3 Claims



1. A signal coupling for a humidifier container having a gas inlet duct terminating in an externally threaded male inlet coupling which comprises

an internally threaded elongated member adapted to threadingly engage said male inlet coupling and provided with an upstanding protuberance having a head portion and a stem portion, said stem portion defining a main gas passageway therethrough, an outwardly flared signal gas passageway communicating with the main gas passageway and a substantially planar land region on the peripheral surface of the stem portion adjacent to the signal gas passageway; and

a flexible, elastic sleeve situated in tension about the peripheral surface of the stem portion and occluding said signal gas passageway as well as said planar land region.

4,915,880

CONTAINER FOR A BUBBLER

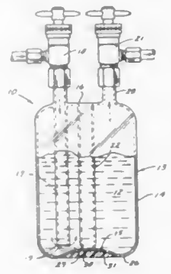
Glen D. Jenkins, Rockford, Ill., assignor to Advanced Delivery & Chemical Systems Incorporated, Austin, Tex.

Filed May 22, 1989, Ser. No. 354,789

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—124 8 Claims

1. A bubbler assembly comprising an upright container made of a highly refractory material, said container including a bottom having a lower side formed with an indented concave pocket for providing strength to the container, and a filler potted within said pocket and bonded to the material of said container, said filler being heat conductive and enhancing the heat transfer charactertistics of the bottom of said container.



4,915,881

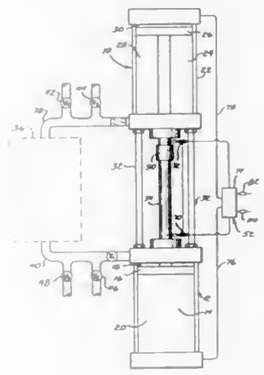
APPARATUS FOR MAKING A POST FOAMING GEL

Alan Straw, Cheshire, and Roger D. Ellis, Lancashire, both of Great Britain, assignors to Colgate-Palmolive Company, Piscataway, N.J.

Filed Dec. 10, 1987, Ser. No. 131,222

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—152 7 Claims



1. An apparatus for making a post-foaming gel, comprising:

a first cylinder having a chamber and a slideable piston separating the chamber into a first compartment to receive a gel base and a second compartment;

a second cylinder having a chamber and a slideable piston separating the chamber into a first compartment to receive the gel base and a second compartment, with the first compartment of the first and second cylinders facing each other;

a shaft connecting the pistons of the first and second cylinders;

conduit means connecting the first compartments of the first and second cylinders;

means for reciprocating the pistons in the first and second cylinders to cycle the gel base through the conduit means between the first compartments of the first and second cylinders; and

means for introducing a foaming agent to the gel base while it is being cycled between the cylinders, wherein the shaft

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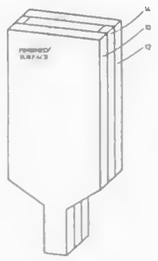
includes a coupling for adjustment to allow for volume of added foaming agent.

4,915,882

METHOD AND APPARATUS FOR MANUFACTURING MONOCRYSTAL REFLECTORS

Jurgen Wisotzki, Weserstrabe 7a, 6074 Rödermark-Urberach, Fed. Rep. of Germany

Filed Jan. 11, 1985, Ser. No. 830,025
Int. Cl.[4] B29D *11/00*; C22B *15/00*
U.S. Cl. 156—616.4 3 Claims



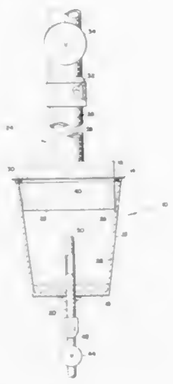
1. In a method for manufacturing monocrystal reflectors of copper, silver or gold for laser applications the the improvement comprising producing copper, silver, or gold monocrystals for use as such reflectors, said crystals having a uniformly smooth finished reflecting surface with unworked monocrystal structure, using a crucible polished to optical quality on the surface thereof in contact with the reflecting surface of the monocrystal.

4,915,883

METHOD OF AND APPARATUS FOR PURGING AN ANNULAR BAYONET

Richard E. Morgan, Huntsville, Ala., assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Aug. 3, 1987, Ser. No. 81,201
Int. Cl.[4] C06B *21/00*
U.S. Cl. 264—3.4 16 Claims



1. A method of purging an annular bayonet for use in the pressure casting of a solid propellant rocket motor with uncured propellant, said annular bayonet having an entry end for propellant and an exit end for propellant, comprising the steps of:

(a) connecting the entry end of the annular bayonet to a source of uncured propellant;

(b) placing the exit end of the annular bayonet in sealed engagement with the mouth of a conical cup, said cup being made of a material a portion at least of which allows the passage of light therethrough;

(c) applying vacuum pressure to the interior of said conical cup to exhaust air therefrom and from said annular bayonet;

(d) upon the emergence of propellant from the exit end of said annular bayonet, as externally visible through the material of said annular bayonet vacuum cup, cutting off the vacuum pressure to said conical cup;

(e) disengaging said annular bayonet from said conical cup; and

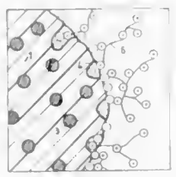
(f) discarding said conical cup, thereby eliminating the necessity for clean-up of waste propellant.

4,915,884

PROCESS FOR PRODUCTION OF GRANULAR MATERIAL FOR WATER TREATMENT

Bernard Capdeville, Toulouse; Yves Aurelle, Aucamville; Michel Roustan, Ramonville Saint Agne, and Henri Roques, Portet sur Garonne, all of France, assignors to Institut National des Sciences Appliquees de Toulouse, Toulouse, France

Filed Mar. 14, 1988, Ser. No. 167,587
Claims priority, application France, Mar. 13, 1987, 87 03611
Int. Cl.[4] B29B *9/06*
U.S. Cl. 264—15 20 Claims



1. A process for the production of a granular water treatment material, permitting obtaining granules of a specific gravity 'd' and a size 't' adjustable independently within the respective ranges $1 < d \leqq 3$ and $0.5\ mm \leqq t \leqq 10\ mm$, in order to permit adapting said granules to the type of treatment for which said material is intended, said process comprising forming, a mixture of an oxidizable thermoplastic resin, of a specific gravity 'dr' less than 'd', with an adjuvant in the form of a powder with a granulometry less than about 200 microns and a specific gravity 'da' such that $da > 1.7d - 0.7dr$, said mixture having a weight percentage of adjuvant 'pa' such that

$$pa = \frac{da(d - dr)}{d(da - dr)}$$

heating said mixture to a plastic state, extruding said plastic mixture through an extrusion plate in such a manner as to produce cylindrical plastic strands of a diameter slightly greater than 't', immediately cutting said plastic strands at the outlet of said extrusion plate so as to obtain plastic pieces of a length essentially equal to their diameter, soaking said plastic pieces in such a manner as to cause by the effects of cooling and shrinking a beading of said pieces thereby forming spherical granules, subjecting said spherical granules to an oxidation so as to create hydrophilic sites on the surface thereof for imparting to said granules a wettability preferential to water with respect to air.

4,915,885

PROCESS OF MAKING A BLEND OF PET AND PBT

Nadka V. Avramova; Isak A. Avramov; Stoyko C. Fakirov, all of Sofia, Bulgaria, and Jerold M. Schultz, Newark, Del., assignors to University of Delaware, Newark, Del.

Filed Jun. 23, 1988, Ser. No. 210,261
Claims priority, application Bulgaria, Jul. 23, 1987, 80693
Int. Cl.[4] B29C *35/16, 55/04, 71/02*
U.S. Cl. 264—28 5 Claims

1. The process of preparing a homogeneous amorphous polymeric blend of polyethyleneterephthalate (PET) and polybutyleneterephthalate (PBT) which comprises:

(a) intimately mixing the PET and PBT at a weight ratio of about 10:90–90:10;

(b) melting the mixture at a temperature of about 290°–330° C.; and

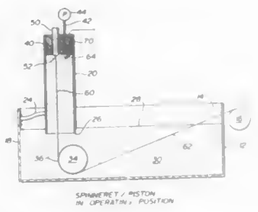
(c) cooling the mixture at a temperature between about 0° C. and −194° C.

4,915,886

METHOD OF MANUFACTURING NYLON MICROPOROUS HOLLOW FIBER MEMBRANE

Ronald V. Repetti, Guilford; Scott P. Yaeger, Cheshire, both of Conn., and Chaokang Chu, Lexington, Mass., assignors to Cuno, Incorporated, Meriden, Conn.

Continuation of Ser. No. 43,003, Apr. 27, 1987, Pat. No. 4,820,460. This application Dec. 20, 1988, Ser. No. 287,006
The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.
Int. Cl.[4] D01D *5/247*
U.S. Cl. 264—41 4 Claims



1. A method of manufacturing a skinless, nylon microporous hollow fiber membrane comprising the steps of:

(a) providing a nylon polymer dope solution;

(b) providing a quench liquid capable of solidifying and forming micropores in an extruded nylon polymer dope solution to produce a skinless microporous nylon membrane;

(c) placing the quench liquid into a vessel;

(d) providing a tube having a top and bottom outlet;

(e) partially submerging the bottom outlet of the tube in the quench liquid, the tube vertically extending therefrom;

(f) providing a spinneret having an outlet adjacent the top of the tube;

(g) raising the chemical quench liquid in the tube until it is in substantial contact with the spinneret outlet;

(h) extruding the nylon polymer dope solution in the form of a hollow fiber through the spinneret outlet directly into the quench liquid;

(i) passing the extruded hollow fiber down through the tube and into the vessel, whereby the quench liquid solidifies and forms micropores in the extruded nylon polymer dope solution to thereby form a skinless nylon microporous hollow fiber; and

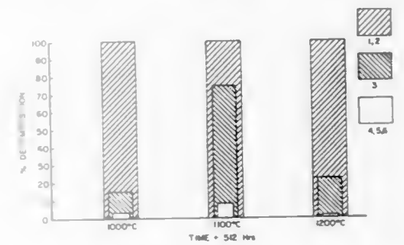
(j) redirecting the fiber int he vessel in a generally horizontal direction through the vessel.

4,915,887

METHOD OF PREPARING HIGH TEMPERATURE LOW THERMAL EXPANSION CERAMIC

John P. Day, Big Flats, and Robert J. Locker, Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Division of Ser. No. 177,050, Apr. 4, 1988, Pat. No. 4,855,625.
This application May 30, 1989, Ser. No. 358,830
Int. Cl.[4] C04B *35/64*
U.S. Cl. 264—56 13 Claims



1. A method for making a sintered ceramic body consisting essentially of the composition expressed in terms of weight percent on the oxide basis, of 1.5–20% SiO_2, >5–25% Fe_2O_3, 35–75% Al_2O_3, 10–40% TiO_2, and 0.1–5% RE_2O_3 the steps comprising:

(a) calcining a mixture of Fe_2O_3, TiO_2 and Al_2O_3 to a single phase solid solution,

(b) grinding said solid solution to a powder,

(c) mixing mullite with said powder to form a homogeneous body,

(d) combining rare earth metal oxides either to said mixture prior to said calcining step or to said powder in said mixing step,

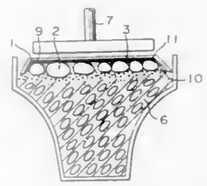
(e) firing said body.

4,915,888

METHOD OF MANUFACTURING A CONCRETE BLOCK HAVING DECORATIVE STONES EMBEDDED IN A SURFACE THEREOF

Toshiaki Sato, Yamanashi, Japan, assignor to Fuji Tokushu Concrete Industry Co., Ltd., Fujiyoshida, Japan

Filed Jun. 22, 1988, Ser. No. 210,036
Claims priority, application Japan, Oct. 19, 1987, 62-263530; Jan. 14, 1988, 63-6264
Int. Cl.[4] B28B *1/16, 1/28, 3/00*; B29C *39/12*
U.S. Cl. 264—71 13 Claims



1. A method of manufacturing a concrete block having decorative surface stones embedded in a surface thereof; comprising the steps of: placing on a face plate a layer of filler stones, inserting decorative surface stone partially into said layer of filler stones, said surface stones being spaced from each other and having sizes substantially larger than the sizes of said filler stones, applying a layer of a cement mortar over said surface stones and said filler stones, introducing concrete having a slump value of substantially 0 cm into a separate

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mold, inverting said face plate having said stones and mortar thereof and placing same on the top of said concrete in said mold, applying pressure and vibration to said concrete and stones to consolidate said concrete and to assemble said concrete and said surface stones, removing said mold and said face plate from said assembled concrete and surface stones after said step of applying pressure and vibration, and thereafter curing the resulting concrete block having said decorative surface stones embedded in a surface thereof without said mold.

4,915,889

METHOD OF PRODUCING AN ELECTRICALLY SEMI-CONDUCTING, STRIPPABLE PLASTICS MIXTURE

Inger-Margrete Procida, Hellerup, and Keld V. Poulsen, Lynge, both of Denmark, assignors to NKT A/S, Broodby, Denmark

PCT No. PCT/DK88/00031, § 371 Date Dec. 9, 1988, § 102(e) Date Dec. 9, 1988, PCT Pub. No. WO88/06341, PCT Pub. Date Aug. 25, 1988
PCT Filed Feb. 19, 1988, Ser. No. 263,774
Claims priority, application Denmark, Feb. 20, 1987, 890/87
Int. Cl.[4] B29C *47/06, 67/00;* **B32B** *27/18;* **H01B** *1/06*
U.S. Cl. 264—83 **14 Claims**

1. A method of producing an electrically semi-conducting, strippable plastic composition for use as a coating material for electrical wires or cables, wherein an olefin polymer, a hydrolyzable unsaturated organic silane, an organic free-radical-forming compound and optionally plastic additives are mixed in a hot state until the unsaturated organic silane has reacted with the polymer to form a premix, whereafter comminuted carbon particles are added while the premix is still hot, the mixture is subsequently granulated and cooled.

4,915,890

CASTING PROCESS

Brian D. Koblinski, Missouri City; Alfredo C. Tamez, Angleton, and Alan P. Croft, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 97,883, Sep. 17, 1987, abandoned. This application Jun. 1, 1988, Ser. No. 200,815
Int. Cl.[4] B28B *1/26*
U.S. Cl. 264—87 **27 Claims**

1. A casting process comprising preparing a slip from a slip medium and a particulate material which is suspended in a slip medium and cast into a whiteware article selected from the group consisting of sanitary ware, china, artware, and giftware, by placing the slip into a mold, removing a portion of the slip medium through the mold, and recovering the whiteware cast part, wherein the slip comprises a polyalkylene polyamine having an average molecular weight of less than about 1000 in an amount sufficient to increase the casting rate.

4,915,891

METHOD FOR PRODUCING A NONCIRCULAR PERMANENT MAGNET

Vijay K. Chanhok, and Bao-Min Ma, both of Pittsburgh, Pa., assignors to Crucible Materials Corporation, Pittsburgh, Pa.

Filed Nov. 27, 1987, Ser. No. 126,201
Int. Cl.[4] H01F *7/06;* **B22F** *7/00*
U.S. Cl. 264—112 **6 Claims**

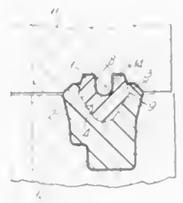
1. A method for producing a noncircular magnet having asymmetric magnetic properties along axes thereof, said method comprising placing a particle charge of a composition from which said magnet is to be produced in a container, heating said container and particle charge, and extruding said container and particle charge to compact said particle charge to substantially full density by mechanical deformation produced during said extruding with said mechanical deformation being nonuniform.

4,915,892

MAKING SEALING RING ASSEMBLY

Nicholas A. Peppiatt, Lightwater, Surrey, England, assignor to Hallite Holdings Limited, England

Filed Dec. 4, 1986, Ser. No. 937,915
Claims priority, application United Kingdom, Dec. 16, 1985, 8530895; Jan. 24, 1986, 8601723
Int. Cl.[4] B29C *45/14*
U.S. Cl. 264—138 **6 Claims**



1. A method of making a sealing ring assembly comprising a sealing lip-defining outer ring having an annular channel and an insert ring for energizing sealing by the outer ring, said method comprising the steps of:
(a) preforming a said insert ring comprising a thermosetting elastomeric material more resilient than the material of the outer ring;
(b) positioning the preformed insert ring in a ring mould in a position such that a projecting outer surface portion of the insert ring partly defines a moulding cavity of said mould and so that portions of the ring moulding cavity define limbs which extend around the projecting outer surface of the insert ring on opposite sides thereof, said positioning comprising disposing a channel in the insert ring over a location projection extending around said ring mould to thereby hold the insert ring in position;
(c) injecting a curable material for forming a said outer ring into the ring moulding cavity, onto the projecting outer surface portion of the insert ring and filling said portions defining said limbs; and
(d) curing the injected material to thereby form a said tough elastomeric outer ring including a sealing lip and having, in cross-section, two limbs, formed by said portions of the moulding cavity, defining between them a said annular channel in the outer member, said annular channel extending sufficiently far around the insert ring to retain the insert ring mechanically in the channel.

4,915,893

METHOD OF PREPARING POLYESTER FILAMENT MATERIAL

Sylwester Gogolewski, Renens, Switzerland, and Albert J. Pennings, Norg, Netherlands, assignors to Medtronic, Inc., Minneapolis, Minn.

PCT No. PCT/NL83/00028, § 371 Date Mar. 13, 1984, § 102(e) Date Mar. 13, 1984, PCT Pub. No. WO84/00303, PCT Pub. Date Feb. 2, 1984
PCT Filed Jul. 15, 1983, Ser. No. 597,159
Claims priority, application Netherlands, Jul. 16, 1982, 8202894
Int. Cl.[4] D01F *1/02*
U.S. Cl. 264—205 **11 Claims**

1. A process for the manufacture for filament involving dry-spinning a spinning mixture comprising a polyester material and an additive, wherein the filament is prepared by dry-spinning, at room temperature, a solution in which the polyester material is poly(L-lactide), PLLA, poly (DL-lactide), PDLLA, or combinations thereof, in a concentration in the range of 5–70% by weight in the presence of the additive, the

additive being a polyurethane which is a biodegradable polyester urethane material.

4,915,894

AROMATIC POLYIMIDE FILM AND PROCESS FOR THE PREPARATION OF THE SAME

Kazuhiko Mitsui; Kenji Kuniyasu, and Toshiyuki Nishino, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Aug. 22, 1988, Ser. No. 234,797
Claims priority, application Japan, Aug. 21, 1987, 62-209075
Int. Cl.[4] B29D *7/00*
U.S. Cl. 264—212 **10 Claims**

1. A process for the preparation of an aromatic polyimide film which comprises the steps of:
heating an aromatic polyimide continuous film formed from a polymer soluiton wherein the polymer is produced by a polymerization reaction of a biphenyltetracarboxylic acid component and a phenylenediamine component, at a temperature of 400° to 500° C. and extending said film by applying thereto a tension of 100 to 400 g/mm^2 in the longitudinal direction, and then
heating said aromatic polyimide continuous film at a temperature of 270° to 370° C. under a tension of 60 to 90 g/mm^2 applied in the longitudinal direction without essentially extending said film.

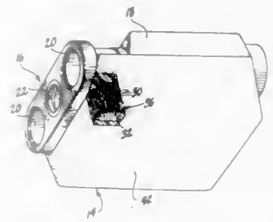
4,915,895

METHOD FOR MAKING A COMPOSITE TREAD FOR TRACK-LAYING VEHICLES

Russell C. Savage; Gary P. Zeller, and Martin D. Skirha, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 126,896, Nov. 30, 1987, Pat. No. 4,844,561. This application Oct. 14, 1988, Ser. No. 257,589
Int. Cl.[4] B29C *45/14*
U.S. Cl. 264—258 **2 Claims**

1. A method for making a composite tread member having a metal support member embedded in a monofilament reinforced polymeric material by a reaction injection molding process in a matched upper and lower mold members having interior mold surfaces defining a mold cavity therein comprising the steps of:
a plurality of monofilaments in the lower mold member in an orientation such that said monofilaments being in an about perpendicular relationship to said interior mold surface of said lower mold member,
said monofilament being selected from the group consisting a silicone carbide particle filled Nylon monofilament and a polyamide extrusion coated polyaramide fiber monofilament,
placing a metal support member on top of said monofilaments,



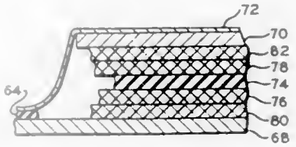
closing said upper mold member onto said lower mold member forming a mold cavity therein,
injecting a quantity of a reaction injection moldable polymeric material into said mold cavity and thus embedding said monofilaments and said metal support member, and
demolding said composite tread member after said polymeric material is cured in said mold cavity.

4,915,896

VACUUM BAGGING PROCESS FOR FIBER REINFORCED THERMOPLASTICS

Duane M. Rachal, Pearland, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 1, 1987, Ser. No. 91,815
Int. Cl.[4] B29C *43/20, 43/56*
U.S. Cl. 264—511 **17 Claims**



1. A process for simultaneously forming a plurality of flattened consolidated composite sheets, each of said sheets comprising a fiber reinforced thermoplastic resin, said process comprising the steps of:
(A) supporting on a substantially flat, rigid substrate surface a stack comprising a plurality of interfacially adjacently arranged composite layers,
at least two adjacent said layers being separated from one another by an interposed metallic sheet,
said stack further including a metallic sheet positioned adjacent the outside surface of each of the topmost said layer and the bottommost said layer,
each said layer comprising a thermoplastic resin and reinforcing fibers,
said substrate surface being thermally stable at a temperature above the melting point of said thermoplastic resin,
(B) overlaying said stack with an air-impermeable sheet and sealing said air-impermeable sheet peripherally around said stack to said substrate surface,
said air-impermeable sheet being thermally stable to a temperature above the melting point of said thermoplastic resin,

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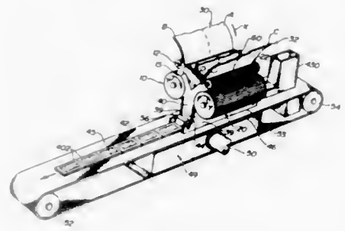
thereby to produce a layup comprised of said substrate surface, said stack, and said air-impermeable sheet,
(C) heating said layup in a heating zone to a temperature sufficient to melt said thermoplastic resin, said heating being carried out by impinging heated gas against said layup,
(D) applying suction between said air-impermeable sheet and said substrate surface, thereby to urge said sheet towards said substrate surface and achieve wet-out of said reinforcing fibers by said molten thermoplastic resin, and
(E) cooling said layup in a cooling zone to a temperature below the melting point of said thermoplastic resin, said cooling being carried out by impinging gas cooled to below about 100° F. against the resulting said layup, thereby to form said plurality of consolidated composite sheets.

4,915,897

TRANSVERSE POCKET FORMING MACHINE AND METHOD FOR USE THEREOF

Allan P. Farrington, Englishtown; Gerald M. Marshall, Somerville, and Nicholas Wereson, Spotswood, all of N.J., assignors to Chicopee, New Brunswick, N.J.

Continuation of Ser. No. 99,874, Sep. 22, 1987, abandoned. This application Jan. 20, 1989, Ser. No. 298,860
Int. Cl.[4] D04H *1/72*
U.S. Cl. 264—517 10 Claims



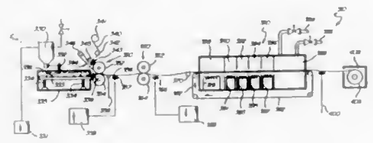
1. A pad product forming apparatus comprising:
first feed means for feeding a fibrous material to a first fiberizing station at a first location;
second feed means for feeding a fibrous material to a second fiberizing station at a second location;
means defining a mixing zone between said fiberizing stations;
first and second lickerins mounted for rotation toward each other about respective parallel axes, a portion of the outer periphery of said first and second lickerins being adjacent to said first and second feeding means, respectively, at the first and second fiberizing stations, respectively; said first and second lickerins being engageable with the fibrous materials feed to the respective fiberizing stations so as to open the materials and produce individualized fibers moving in first and second streams, respectively, in trajectories toward each other and said mixing zone;
conveyor means that is at least partially permeable to air and moves parallel to the lickerin axes, said conveyor means being located beyond said mixing zone;
condensing zone between the conveyor means and the mixing zone, said conveyor means entering said condensing zone at an entrance end and leaving at an exit end of said condensing zone;
at least one mold, separate from said conveyor means and having a predetermined pocket shape corresponding to the desired individual shape of the pad, said mold being adapted to receive therein fibers in the air stream from the mixing zone and being introduced to the condensing zone by said conveyor means;
a foraminous surface in contact with a lower surface of said mold and being in at least partial communication with an air permeable portion of the conveyor; and
a vacuum means in selective communication with said condensing zone through the air permeable portions of said conveyor and the foraminous surface while said mold is passing through said condensing zone, said vacuum means tending to draw air-entrained fibers into said molds for condensation therein on the foraminous surface.
6. A method of forming a pad of fibers comprising the steps of:
feeding a first source of fibrous material into engagement with a first lickerin;
feeding a second source of fibrous material into engagement with a second lickerin arranged with its axis parallel to the axis of said first lickerin;
rotating said first and second lickerins toward each other about their axes such that the fibrous material is opened so as to form individual fibers;
doffing the fibers from the first and second lickerins in the form of two fiber streams directed toward each other and into a mixing zone;
conveying said fibers streams from the mixing zone to a condensing zone;
conveying said fibers into an individually shaped pad having a greater proportion of one of said fibers in a first portion of said pad than in a second portion of said pad within at least one mold, while conveying said mold through said condensing zone in a direction parallel to the axes of said lickerins; and
providing said mold with a foraminous surface, separate from said mold, in contact with the mold's surface remote from the fiber streams so as to allow accumulation of fibers in the mold.

4,915,898

METHOD FOR THE CONTINUOUS FABRICATION OF COMMINUTED HYDROGEN STORAGE ALLOY MATERIAL NEGATIVE ELECTRODES

Merle Wolff, Rochester; Mark A. Nuss, Rochester Hills; Michael A. Fetchenko, Royal Oak; Andrea L. Lijoi, Utica; Steven P. Sumner; Joseph LaRocca, both of Warren, and Thomas Kaatz, Drayton Plains, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 185,598, Apr. 25, 1988, Pat. No. 4,820,481, and a continuation-in-part of Ser. No. 247,570, Sep. 22, 1988. This application Feb. 9, 1989, Ser. No. 308,289
Int. Cl.[4] B22F *5/00*
U.S. Cl. 419—3 17 Claims



1. A method of substantially continuously fabricating a large area, metal hydride electrochemical hydrogen storage alloy negative electrode for use in a rechargeable nickel-metal hydride battery, said method comprising the steps of:
(a) providing particulate metal hydride electrochemical hydrogen storage alloy material in a substantially non-reactive gas atmosphere;
(b) providing a high speed impact mill adapted to tangentially and radially accelerate particles placed therein against an impact block;
(c) introducing said particulate metal hydride, hydrogen storage alloy material into said impact mill for comminution along natural fracture lines of the material, while maintaining said non-reactive atmosphere;

(d) transporting said comminuted metal hydride, electrochemical hydrogen storage material to a classifying means in a stream of said substantially non-reactive gas;
(e) separating oversized particles from said comminuted material in said classifying means;
(f) recirculating said non-reactive gas;
(g) transporting said comminuted metal hydride electrochemical hydrogen storage alloy to a compaction means;
(h) providing a continuous, wire mesh screen substrate to said compaction means;
(i) providing a measured amount of the comminuted metal hydride electrochemical hydrogen storage alloy material to said compaction means;
(j) continuously disposing a layer of the comminuted electrochemical hydrogen storage alloy material into contact with the wire mesh screen substrate, in a substantially inert atmosphere;
(k) compacting the hydrogen storage alloy material into the wire mesh screen so as to form a green deposit thereof,
(l) preheating the green deposit of hydrogen storage alloy-wire mesh screen;
(m) sintering the green deposit of hydrogen storage alloy wire mesh screen in an anhydrous, substantially oxygen free inert atmosphere so as to liberate moisture therefrom; and
(n) cooling said sintered hydrogen storage alloy wire mesh screen in a controlled hydrogen atmosphere so as to impart a partial charge thereto.

4,915,899

PROCESS FOR CO-SINTERING CONDUCTORS OF COPPER OR COPPER-BASE ALLOYS AND THEIR CERAMIC SUBSTRATE OF CORDIERITE

Véronique Oliver; Jean-Louis Guille, both of Strasbourg; Jean-Claude Bernier, Lingolsheim, and Claude Drapier, Vaucresson, all of France, assignors to Pechiney Recherche Groupement d'Interet Economique, Paris, France

Filed Jan. 23, 1989, Ser. No. 299,335
Claims priority, application France, Jan. 22, 1988, 88 01136
Int. Cl.[4] B22F *7/02*
U.S. Cl. 419—8 22 Claims

1. A process for co-sintering conductors of copper or copper alloy and a ceramic substrate, comprising the steps of:
(a) shaping a ceramic substrate from a powder consisting essentially of cordierite type ceramic having a sintering temperature lower than 950° C., a specific surface area greater than $50m^2/g$, and a chemical composition between 2 $Al_2O_3$2 MgO 5 SiO_2, pure cordierite, and 3 $Al_2O_3$2 SiO_2, mullite;
(b) depositing on an external surface of said substrate a copper-based ink comprising a copper-based powdered pigment and said powder of cordierite type;
(c) heat-treating said substrate with external deposit in a first phase in an oxidizing atmosphere at a temperature not greater than 500° C. to decompose substantially all organic compounds present in the substrate and/or ink;
(d) heat-treating said substrate with external deposit in a second phase in a reducing atmosphere at 120° to 350° C. to regenerate copper; and
(e) heat-treating said substrate with external deposit in a third phase at a temperature plateau at between 1065° and 1080° C. for 15 minutes to 2 hours, at least partially in a flow of moist inert gas for co-sintering, resulting in densification of the cordierite type ceramic of at least 95% with the formation of at least one crystalline phase, and in the formation of a liquid Cu-Cu_2O eutectic from said external deposit which bonds the deposit to the Al_2O_3 of the cordierite-type ceramic.

4,915,900

FREE-CUTTING STEEL HAVING HIGH FATIGUE STRENGTH

Itie Nomura; Takao Ooki, and Yoshihiro Wakikado, all of Aichi, Japan, assignors to Aichi Steel Works, Ltd., Tokai and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Oct. 14, 1988, Ser. No. 257,922
Claims priority, application Japan, Oct. 15, 1987, 62-260330
Int. Cl.[4] C22C *38/60, 38/12*
U.S. Cl. 420—84 3 Claims

1. A free-cutting steel having a high fatigue strength consisting essentially of 0.30–0.50% C., 0.10–0.50% Si, 0.50–1.00% Mn, 0.04–0.12% S, 0.05–0.20% V, 0.005–0.018% Al, 0.05–0.30% Pb, and 0.001–0.006% Ca by weight, the remainder being Fe and inevitable impurities.

4,915,901

REINFORCING STEEL HAVING RESISTANCE TO SALT AND CAPABLE OF PREVENTING DETERIORATION OF CONCRETE

Haruo Shimada; Yoshiaki Sakakibara, both of Kawasaki, and Takashi Waseda, Tokyo, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 2, 1985, Ser. No. 803,284
Claims priority, application Japan, Dec. 18, 1984, 59-265277; Jun. 3, 1985, 60-120316; Jun. 10, 1985, 60-124198
Int. Cl.[4] C22C *38/44*
U.S. Cl. 420—119 11 Claims

1 A high-purity reinforcir g steel resistance to salt and capable of remarkably retarding deterioration of concrete even under such a severe corrosive condition that the salt content of said concrete exceeds 0.5 wt% in terms of NaCl amount in sand of concrete, said reinforcing steel consisting of 0.001 to 1.0 wt% of C, not greater than 0.05 wt% of Si, 0.01 to 2.0 wt% of Mn, less than 0.015 wt% of P, less than 0.005 wt% of S, 1.0 to 5.5 wt% of Ni, 0.001 to 0.5 wt% of W, 0.001 to 0.1 wt% of Al and the balance Fe and incidental impurities.

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4,915,902

COMPLEX CERAMIC WHISKER FORMATION IN METAL-CERAMIC COMPOSITES

John M. Brupbacher, Catonsville; Leontios Christodoulou, Baltimore, and Dennis C. Nagle, Ellicott City, all of Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Continuation-in-part of Ser. No. 943,061, Dec. 18, 1986, which is a division of Ser. No. 662,928, Oct. 19, 1984, abandoned. This application Feb. 17, 1988, Ser. No. 156,682

The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.

Int. Cl.[4] C22C *1/09*

U.S. Cl. 420—129 68 Claims

67. A method for the formation of complex boride whiskers within a final metal matrix, wherein the complex boride comprises boron and at least two of the elements selected from the group consisting of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo and W, the method comprising:

(a) preparing a mixture comprising powders of reactive complex boride-forming constituents and a solvent metal in which at least one of the complex boride-forming constituents is more soluble than the complex boride phase;

(b) adding the mixture to a molten matrix metal, metal alloy or intermetallic at a temperature at which sufficient diffusion of at least one of the complex boride-forming constituents into the solvent metal occur to initiate an exothermic reaction;

(c) permitting the exothermic reaction to further heat the mixture and to form a distribution of complex boride whiskers within the final metal matrix; and

(d) recovering a product.

4,915,903

PROCESS FOR FORMING COMPOSITES HAVING AN INTERMETALLIC CONTAINING MATRIX

John M. Brupbacher; Leontios Christodoulou, both of Baltimore, and Dennis C. Nagle, Ellicott City, all of Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Continuation-in-part of Ser. No. 873,890, Jun. 13, 1986, Pat. No. 4,774,052, which is a continuation-in-part of Ser. No. 662,428, Oct. 19, 1984, abandoned. This application May 5, 1988, Ser. No. 190,561

The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.

Int. Cl.[4] C22C *1/00, 32/00*

U.S. Cl. 420—129 51 Claims

1. A method for forming intermetallic-second phase composite materials, the method comprising contacting reactive second phase-forming constituents and a solvent metal at a temperature sufficient to initiate an exothermic reaction of the second phase-forming constituents to thereby form a first composite comprising a dispersion of second phase particles within a solvent metal matrix, introducing the first composite into a host metal to form a second composite comprising a dispersion of the second phase particles within an intermediate metal matrix, introducing the second composite into an intermetallic precursor metal which is reactive with the intermediate metal matrix to form an intermetallic containing matrix, and recovering a final composite comprising an intermetallic containing matrix having second phase particles dispersed therein.

4,915,904

PROCESS FOR STABILIZATION OF TITANIUM SILICIDE PARTICULATES WITHIN TITANIUM ALUMINIDE CONTAINING METAL MATRIX COMPOSITES

Leontios Christodoulou, Baltimore, Md.; James C. Williams, Cincinnati, Ohio, and Michael A. Riley, Belcamp, Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Continuation-in-part of Ser. No. 873,890, Jun. 13, 1986, Pat. No. 4,774,052, which is a continuation-in-part of Ser. No. 662,928, Oct. 19, 1984, abandoned. This application Sep. 26, 1988, Ser. No. 249,021

The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.

Int. Cl.[4] C22C *1/00, 32/00*

U.S. Cl. 420—418 3 Claims

1. A method for forming a final composite material comprising titanium silicide particles within a titanium aluminide containing matrix, the method comprising contacting titanium, silicon and aluminum at a temperature sufficient to initiate a reaction between the titanium and silicon to thereby form a first composite comprising titanium silicide particles dispersed within an aluminum matrix; admixing the first composite with titanium and zirconium to form a mixture; heating the mixture to a temperature sufficient to convert at least a portion of the aluminum matrix to titanium aluminide; and recovering a final composite material comprising titanium silicide particles dispersed within a titanium aluminide containing matrix.

4,915,905

PROCESS FOR RAPID SOLIDIFICATION OF INTERMETALLIC-SECOND PHASE COMPOSITES

Stephen L. Kampe, Laurel; John M. Brupbacher; Leontios Christodoulou, both of Baltimore, and Dennis C. Nagle, Ellicott City, all of Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Continuation-in-part of Ser. No. 873,889, Jun. 13, 1986, Pat. No. 4,836,982, and a continuation-in-part of Ser. No. 873,890, Jun. 13, 1986, Pat. No. 4,774,052, each is a continuation-in-part of Ser. No. 662,928, Oct. 19, 1984, abandoned. This application Sep. 26, 1988, Ser. No. 249,626

The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.

Int. Cl.[4] C22C *1/00, 32/00*

U.S. Cl. 420—418 30 Claims

1. A method for the preparation of intermetallic-second phase composite materials, said method comprising: contacting reactive precursors of a second phase material and a solvent matrix material comprising an intermetallic or precursors thereof at a temperature sufficient to initiate the exothermic reaction of said second phase precursors to thereby form the second phase within said solvent matrix material; recovering a composite comprising an intermetallic containing matrix having particles of said second phase dispersed therein; and subjecting said composite to rapid solidification.

4,915,906

NOVEL ZINC-BASED ALLOYS, PREPARATION AND USE THEREOF FOR PRODUCING THERMAL-SPRAYED COATINGS HAVING IMPROVED CORROSION RESISTANCE AND ADHERENCE

Blaise Champagne; Bernard Arsenault, both of Boucherville; Claude Gelinas, Ste.Etienne Lauzon, and Serge Dallaire, Longueuil, all of Canada, assignors to Canadian Patents and Development Limited/Societie Canadienne des Brevets et d'Exploitation Limitee, Ottawa, Canada

Filed Jun. 17, 1988, Ser. No. 207,942

Int. Cl.[4] C22C *18/00, 19/03*

U.S. Cl. 420—441 18 Claims

1. A coating material exhibiting high corrosion resistance and adherence for forming corrosion-resistant thermal-sprayed coatings on metallic substrates, comprising a zinc-based alloy containing about 80 to 90 weight percent zinc and about 10 to 20 weight percent cobalt, said alloy being present in the form of particles having a size ranging from about 0.03 to about 0.15 mm.

4,915,907

SINGLE CRYSTAL ARTICLES HAVING REDUCED ANISOTROPY

Dilip M. Shah, Glastonbury, and David N. Duhl, Newington, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 847,972, Apr. 3, 1986, abandoned. This application Jan. 19, 1988, Ser. No. 144,767

Int. Cl.[4] C22C *19/05*

U.S. Cl. 420—448 5 Claims

1. A method for modifying the nickel base superalloy composition Ni-5Co-10Cr-4W-5Al-1.5Ti-12Ta such that single crystal castings made therefrom have reduced anisotropy, comprising adding an effective amount of hafnium to the alloy composition.

4,915,908

METAL-SECOND PHASE COMPOSITES BY DIRECT ADDITION

Dennis C. Nagle, Ellicott City; John M. Brupbacher, and Leontios Christodoulou, both of Baltimore, all of Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Continuation-in-part of Ser. No. 662,928, Oct. 19, 1984, abandoned. This application Nov. 5, 1986, Ser. No. 927,031

The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.

Int. Cl.[4] C22C *1/00*

U.S. Cl. 420—590 23 Claims

1. A method for the production of a composite comprising a distribution of second phase particles in a metal, metal alloy, or intermetallic final matrix, the method comprising steps of:

(a) preparing a mixture of elemental powders of reactive second phase-forming constituents and a substantially nonreactive solvent metal;

(b) adding the mixture to a molten matrix metal, metal alloy or intermetallic at a temperature at which sufficient diffusion of said second phase-forming constituents into the solvent metal occurs to initiate an exothermic reaction of the reactive second phase-forming constituents;

(c) permitting the exothermic reaction to further heat the mixture, consuming the second phase-forming constituents, and to form said composite.

4,915,909

METHOD OF CONTROLLING ALGAE GROWTH

Peter Song, Midlothian, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Oct. 5, 1988, Ser. No. 254,247

Int. Cl.[4] A01N *25/02*

U.S. Cl. 422—28 12 Claims

1. A method of controlling growth of algae and algae-like microorganisms on a surface f wood that is normally in contact with water of an aqueous system by imparting to said surface of wood resistance to growth of algae and algae-like microorganisms which persists while said surface of wood is in substantially continuous contact with said water of said aqueous system, comprising:

substantially isolating said surface of wood from said water of said aqueous system and while said surface of wood is so isolated applying to said surface of wood a solution of 3-iodo-2-propynylbutylcarbamate, said solution containing at least about 0.1 weight percent of said 3-iodo-2-propynylbutylcarbamate in a solvent system that contains water and a water-miscible organic solvent for said 3-iodo-2-propynylbutylcarbamate in sufficient amount to render said 3-iodo-2-propynylbutylcarbamate soluble in said solvent system; and

then flooding said surface of wood with sufficient water to exceed the solubility limit of the 3-iodo-2-propynylbutylcarbamate in said solvent system and bringing said surface of wood into substantially continuous contact with said water of said aqueous system for at least a substantial time period.

4,915,910

CORROSION MONITORING APPARATUS

Michael I. Manning, Dorking; Allan G. Crouch, Horsham, and Bernard Lloyd, Fetcham, all of United Kingdom, assignors to Central Electricity Generating Board, London, United Kingdom

Filed Mar. 25, 1987, Ser. No. 30,722

Claims priority, application United Kingdom, Mar. 26, 1986, 8607492; Jun. 13, 1986, 8614400

Int. Cl.[4] G01N *7/00, 33/00*

U.S. Cl. 422—53 18 Claims

18. Corrosion monitoring apparatus comprising:

means for contiguously arranging in a stack along an axis a plurality of members, at least two of which are corrosible;

support means passing freely through an aperture in each member to retain the members in the stack; and

means for measuring along said axis dimensional increases of the composite of the members.

4,915,911

DEVICE FOR RINSING OUT A SUBSTANCE PRESENT IN A ZONE

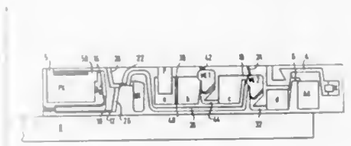
Sigmar Klose, Berg; Manfred Paach, Tutzing; Helmut Schlumberger, Polling; Wolfgang Kleeman, Tutzing, and Friedhelm Vieth, Hausshofen, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 751,786, Jul. 3, 1985, abandoned. This application Sep. 21, 1987, Ser. No. 98,780

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1984, 3425009

Int. Cl.[4] G01N *21/07*

U.S. Cl. 422—72 22 Claims



1. Apparatus for transfer of a liquid comprising a rotor

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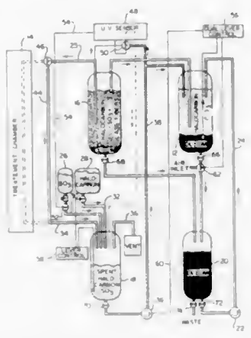
which rotates about an axis of rotation, a first chamber disposed on said rotor and having a defined volume and an upper portion and a lower portion, a second chamber disposed on said rotor radially outward relative to said first chamber on said axis of rotation, a third chamber having an upper portion and a lower portion and a defined volume which is less than the volume of said first chamber, said third chamber positioned radially between said first and second chamber, wherein the upper portion of said first chamber is connected to the upper portion of said third chamber by a first pipe means characterized as a capillary breaking throttle means joining said first chamber to said third chamber from a point on the upper portion of said first chamber, said first pipe means being positioned at least partially radially outward on said axis of rotation, and said lower portion of said third chamber is connected to said second chamber by a second pipe means, said second pipe means having a first capillary section which leads from the lower portion of said third chamber, said second pipe means being positioned at least partially radially inward on said rotor and a second capillary section leading from the furthest radially inward point of said first capillary section, and said second capillary section having a component portion positioned radially outward with respect to said second chamber.

4,915,912

APPARATUS FOR THE GENERATION OF SULFUR TRIOXIDE REAGENT AND SULFONATION OF THE SURFACE OF POLYMERIC RESINS

Wilhelm E. Walles, Freeland, and Donald L. Tomkinson, Auburn, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 4, 1988, Ser. No. 190,313
The portion of the term of this patent subsequent to Feb. 20, 2007, has been disclaimed.
Int. Cl.[4] C01B *17/48*
U.S. Cl. 422—160 **8 Claims**



1. An apparatus for regenerating a reagent of sulfur trioxide in a carrier comprising:

(a) a reagent generator having associated therewith means for introducing sulfur trioxide from a source of sulfur trioxide, oleum from a source of oleum, and a carrier selected from the group consisting of non-reactive liquid halocarbons and non-reactive gases into said reagent generator, and means to contact sulfur trioxide, a carrier, and oleum to form a reagent phase containing a reagent and an oleum phase containing impurities, said reagent being sulfur trioxide in a carrier,

(b) means for removing said reagent phase from said reagent generator,

(c) means for feeding said reagent from said reagent phase to a treatment chamber and for treating a surface with said reagent and form spent reagent,

(d) means for recycling said spent reagent to said reagent generator along with said sulfur trioxide from said source of sulfur trioxide,

(e) means for removing said oleum phase from said reagent generator,

(f) means for regenerating said oleum in said oleum phase to remove said impurities, and

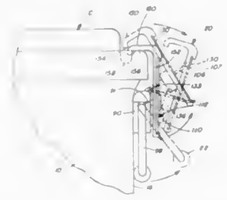
(g) means for recycling said regenerated oleum to said reagent generator along with said oleum from said source of oleum.

4,915,913

MEDICAL STERILIZER DEVICE WITH IMPROVED LATCH MECHANISM

Edward S. Williams, Burke, Va., and John R. Herzog, Sacramento, Calif., assignors to Genesis Medical Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 612,928, May 22, 1984, abandoned. This application Aug. 6, 1986, Ser. No. 893,647
Int. Cl.[4] A61L *2/26*
U.S. Cl. 422—119 **7 Claims**



1. In a sterilization container of the type for use in the sterilization and storage of medical instruments or the like in which the container includes a container body member defined by a bottom and a sidewall and being open at the top, a cover member detachably and lockably attached to the body member for closing the open top of the container body member, the improvement comprising:

a pair of opposed latch mechanisms adapted to releasably secure said cover member in sealed relation with said container body member;

a pair of support bar members fixed to opposite sidewalls of said container body member for mounting said latch mechanisms to said container;

each of said latch mechanisms including a hinge plate member and a latch plate member;

said hinge plate member pivotally fixed to and cantilevered from said support bar member so that said hinge plate member is spaced from the container sidewall, said hinge plate member having a retention member having an axial passageway extending therethrough;

said latch plate member pivotally mounted to said hinge plate member by a pair of spaced pivot pins;

spring bias means connected between said pivot pins so that when said hinge plate member is pivoted in one direction, said hinge plate member moves against the bias of said spring bias means and pivots said latch plate member in a direction opposite from one said direction;

said hinge plate member and said latch plate member being configured to lockingly engage each with the other when said hinge plate member is pivoted in one direction to thereby lock said cover member in sealed relation with said container body and configured to disengage when said hinge plate member is pivoted in a direction opposite said one direction to thereby unlock said cover member and permit its removal;

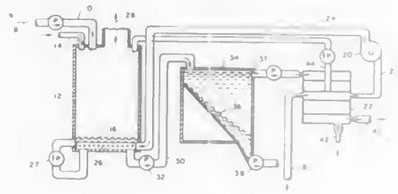
a severable indicia element adapted to be disposed in said retention member of said hinge plate member, said indicia element being automatically severed upon actuation of said latch mechanism so as to evidence opening of said container.

4,915,914

SYSTEM FOR SIMULTANEOUSLY SCRUBBING CEMENT KILN EXHAUST GAS AND PRODUCING USEFUL BY-PRODUCTS THEREFROM

Garrett L. Morrison, Unity, Me., assignor to Passamaquaddy Tribe, Perry and Princeton, Me.

Division of Ser. No. 904,719, Sep. 5, 1986, Pat. No. 4,716,027, which is a continuation-in-part of Ser. No. 890,991, Jul. 25, 1986, Pat. No. 4,708,855. This application Jan. 19, 1987, Ser. No. 64,867
Int. Cl.[4] F23J *15/00*; B01J *10/00*
U.S. Cl. 422—168 **4 Claims**



1. A system for reacting cement kiln exhaust gas containing as pollutants at least one of the acidic oxides of sulfur, nitrogen, carbon and halogen compounds with waste cement kiln dust containing alkali and alkaline earth metal salts utilizing heat from the exhaust gas to recover the reaction products while eliminating waste materials, which comprises

a heat exchanger-crystallization unit, a gas-liquid contacting treatment tank, a settling tank, and means interconnecting said unit and tanks, said interconnecting means comprising

conduit means for conducting the exhaust gas through said unit into said gas-liquid treatment tank and venting after treatment,

compressor means for moving the gas,

means for introducing a mixture of water and cement dust to said treatment tank for reaction with the gas,

means for removing the reacted liquid and solid contents of said treatment tank to said settling tank wherein the contents are separated into (a) solids suitable for use as feed stock for the kiln and (b) a liquid containing dissolved salts comprising potassium sulfate and sodium sulfate, and

conduit means for conveying the last named liquid to said heat exchanger-crystallization unit which serves to cool the exhaust gas while heating the liquid to the point of evaporation thereby crystallizing the salts contained therein for subsequent recovery.

4,915,915

WATER-POWDERED PIEZOELECTRIC UNIT FOR PRODUCING NITROGEN FERTILIZER

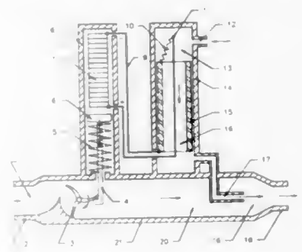
Richard W. Treharne, 13512 Lakevining Dr. Apt. 15102, Orlando, Fla. 32821

Filed Oct. 11, 1988, Ser. No. 256,867
Int. Cl.[4] B01J *19/08, 19/12*; C01B *21/03, 21/24*
U.S. Cl. 422—186.24 **1 Claim**

1. A water-powered piezoelectric unit for producing a nitrogen fertilizer solution from air and water:

said unit comprising an electric arc generating means constituted by piezoelectric crystals (8) which are actuated by hammer element (6) driven by spring element (5) powered by turbine blade (3) located in conduit (21);

wherein in operation water flowing through said conduit turns said turbine blade, actuating said spring mechanism which causes said hammer element to strike said piezoelectric crystals causing an electric arc spark discharge



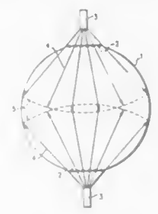
which causes nitrogen and oxygen to combine to form said nitrogen fertilizer solution.

4,915,916

METHOD OF AND APPARATUS FOR TREATING WASTE GAS BY IRRADIATION WITH ELECTRON BEAM

Kunichi Ito, and Akihiko Maezawa, both of Yokohama, Japan, assignors to Ebara Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 265,453, Sep. 26, 1988. This application Oct. 31, 1988, Ser. No. 264,848
Claims priority, application Japan, Apr. 24, 1986, 61-95666
Int. Cl.[4] B01J *19/08, 19/12*; A21K *27/02*
U.S. Cl. 422—186 **5 Claims**



2. An apparatus for treating waste gas flowing in a main duct by irradiation with electron beams, comprising:

an electron beam irradiation chamber including at least one electron beam accelerator for irradiation of the interior of said chamber with electron beams;

separating means for separating a part of the waste gas to be treated from said main duct and feeding the separated part of the waste gas into said electron beam irradiation chamber where said separated part of the waste gas is irradiated with electron beams thereby to form active species, and for feeding the separated and irradiated waste gas having said active species formed therein back to said waste gas main duct through which said waste gas to be treated is flowing, wherein the amount of the waste gas separated from the main duct as a percentage of the waste gas flowing in the main duct is defined by the following equation:

$$\frac{\pi/4\ D^2 \times V \times 3600}{Q} \times 100$$

wherein D is the diameter of an electron beam irradiation chamber, that is, about 2.0 m or less corresponding to an accelerating voltage of about 500 KV or less, V is the flow rate of waste gas in the electron beam irradiation chamber of about 30

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m/s or less, and Q (m^3/h) is the amount of waste gas to be treated flowing in the main duct;

dispersing means for uniformly dispersing in the main duct separated and irradiating waste gas having said active species formed therein fed from said separating means, thereby changing noxious gaseous ingredients in said waste gas flowing in said main duct into the form of mist or dust by the action of said active species; and

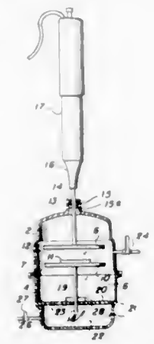
dust collector means for capturing the mist or dust into which noxious gaseous ingredients in the waste gas within the main duct have been changed by the action of said active species.

4,915,917

GLOW DISCHARGE UNIT

Thomas D. Pollard, Baltimore, Md., and Ueli Aebi, Bottmingen, Switzerland, assignors to The Johns Hopkins University, Baltimore, Md.

Filed Feb. 19, 1987, Ser. No. 16,570
Int. Cl.[4] B01J *19/08*
U.S. Cl. 422—186.05 6 Claims



1. A glow discharge unit comprising a desiccator unit including upper and lower sections capable of being sealed to provide a vacuum chamber; means for reducing the pressure in said chamber; horizontally disposed upper and lower plate members within said chamber, said plate members being spaced apart and parallel to each other to provide a glow discharge zone therebetween, the upper plate member being held in fixed position while the lower plate member is adjustably mounted so as to permit adjustment in the spacing and consequent glow discharge zone between the plate members, said lower plate member including means for holding material to be made hydrophilic; high frequency vacuum tester means comprising a Tesla coil electrically connected to said upper plate member to provide said glow discharge between the plate members sufficient to render material in said holding means hydrophilic; means grounding said lower plate member; and means in said upper section for supplying a controlled amount of gas into said chamber.

4,915,918

MEDICAL INSTRUMENT STERILIZATION CONTAINER

Robert L. Nichols, 808 Fort Worth, Jacksonville, Tex. 75766

Continuation of Ser. No. 821,136, Jan. 22, 1986, Pat. No. 4,752,453, which is a division of Ser. No. 668,090, Nov. 5, 1984, Pat. No. 4,617,178. This application Jun. 17, 1988, Ser. No. 208,730
Int. Cl.[4] A61L *2/26*
U.S. Cl. 422—292 6 Claims

1. A medical instrument sterilization container comprising:

a housing having a bottom and sidewalls for receiving medical instruments for sterilization;

a removable lid sealingly fitted over said housing, said lid having a centrally located aperture therethrough;

a filter disposed in said aperture to allow the passage of condensible sterilizing gases therethrough while inhibiting the passage of contaminants;

said housing bottom having two openings therethrough to drain condensate from said housing, said openings being spaced apart from one another and being laterally spaced from said aperture in said lid when said lid is fitted over said housing such that the axis of said aperture is located between said openings; and

a filter disposed in each said opening in said housing bottom, said filters passing air therethrough but preventing passage of contaminants into said housing.

4,915,919

RECOVERY OF GERMANIUM FROM AQUEOUS SOLUTIONS BY SOLVENT EXTRACTION

Daniel A. D. Boateng, Montrose; David A. Neudorf, Val Thereses, and Victor N. Saleh, Trail, all of Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Aug. 29, 1988, Ser. No. 237,742
Claims priority, application Canada, Sep. 29, 1987, 548084; Aug. 26, 1988, 575886
Int. Cl.[4] C01G *17/00*
U.S. Cl. 423—89 8 Claims

1. In a process for the separation of germanium from an aqueous sulphuric acid containing feed solution containing, together with from about 50 to about 150 g/liter of acid, germanium and other dissolved metal elements including at least one metal chosen from the group consisting of zinc, arsenic, cadmium, antimony, indium, copper, and ferrous iron, which process utilizes multistage countercurrent liquid-liquid extraction, the improvement comprising using as the organic phase a solution in a hydrocarbon diluent of 5,8-diethyl-7-hydroxy-6-dodecanone oxime together with a phosphoric acid chosen from either di-2-ethyl-hexylphosphoric acid or a mixture of mono- and di-2-ethylhexylphosphoric acids.

4,915,920

DRY METHOD OF PURIFYING FLUE GAS

Yoshio Kobayashi, 543-10 Shichiyama, Kumatori-cho, Sennan-gun, Osaka, Japan

Filed Dec. 8, 1988, Ser. No. 281,771
Claims priority, application Japan, Dec. 9, 1987, 62-311406
Int. Cl.[4] B01J *8/00*; **C01B** *21/00, 17/00*
U.S. Cl. 423—239 7 Claims

1. A dry method of purifying a flue gas containing SO_x, NO_x, steam and oxygen, including desulfurization thereof, said method comprising the steps of:

treating a mixture containing lime, gypsum and fly ash with water and steam to form porous compound sorbent particles having a mean particle diameter in the range 3–22 μm;

injecting said sorbent particles into said flue gas that is at a temperature of 85° to 160° C. to disperse the same therein; and

separating said dispersed compoundsorbent particles from said flue gas by dust collection means after reaction between said sorbent particles and said SO_x and NO_x for simultaneous removal thereof from the flue gas.

4,915,921

METHOD FOR THE REMOVAL OF SULFUR OXIDE AND NITROGEN OXIDE FROM EXHAUST GASES

Ekkehard Richter; Karl Knoblauch, and Hans-Jürgen Schmidt, all of Essen, Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 307,315, Sep. 30, 1981, abandoned. This application Dec. 12, 1983, Ser. No. 560,420
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1980, 3039477; Jan. 15, 1981, 3101053
Int. Cl.[4] B01J *8/00*; **C01B** *21/00, 17/00*
U.S. Cl. 423—239 14 Claims

1. Method for the removal of sulfur oxides and nitrogen oxides from exhaust gas with the addition of gaseous ammonia at temperatures between about 110° and 180° C, in which the exhaust gas is led across through a layer of granulated, carbon-containing adsorption agent travelling from above to below in the interior of a reactor, a portion of the sulfur oxide is initially adsorptively removed in a first travelling bed, and the nitrogen as well as further sulfur oxide being separated in a second travelling bed, thereby characterized in that one combined travelling bed consisting of two successive parts is provided and that unloaded adsorption agent is delivered to the upper part of the travelling bed, partially loaded adsorption agent is removed from said upper part of the travelling bed and delivered to the lower part of said travelling bed, loaded adsorption agent is removed from said lower part of said travelling bed and led to a regeneration stage, and regenerated adsorption agent is delivered to said upper part of said travelling bed, said removal from the upper part and delivery to the lower part following without mingling of the granulated adsorption agent, at least with regard to the direction of flow of said exhaust gas, and said exhaust gas initially flowing through the upper part of the travelling bed with unloaded adsorption agent in the first direction and then through the lower part of the travelling bed with partially loaded adsorption agent in a second direction opposite to the first direction.

4,915,922

PROCESS FOR PREPARATION OF OXIDAZABLE OXIDES OF NITROGEN FROM WASTE GAS STREAMS

Peter Filss, Jülich, Fed. Rep. of Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit baschrankter Haftung, Jülich, Fed. Rep. of Germany

Filed Apr. 26, 1988, Ser. No. 186,182
Claims priority, application Fed. Rep. of Germany, May 15, 1987, 3716334
Int. Cl.[4] B01J *8/00*; **C01B** *17/00*
U.S. Cl. 423—239 9 Claims

1. Process of separating, in a flow-through reactor vessel the nitrogen oxide content from an effluent gas having a nitrogen oxide content composed at least in part of NO, comprising the steps of:

coating surfaces of impermeable bodies of, or located in, said reactor vessel with a layer of solid material which includes a permanganate reagent for oxidizing NO, said layer also being capable of binding, by chemical combination, said NO gas content after the oxidation thereof by said oxidizing reagent, said coated surfaces all being within said reactor vessel, and

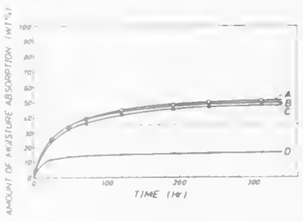
heating said coated surfaces within said reactor vessel to a temperature exceeding 150° C. and exposing said effluent gas to said solid material layer coating of said surfaces within said reactor by passing said effluent gas through said reactor, and also maintaining said coated surfaces at a temperature exceeding 150° C. during continuing exposure of said effluent gas to said solid material layer, thereby substantially separating out at least the NO component of said nitrogen oxide content from said effluent gas.

4,915,923

FILLER FOR INK JET RECORDING PAPER

Masahide Ogawa; Teiji Sato, both of Shibata; Mase Takahashi, Shimuji; Toshio Kitsu, Shibata; Seikichi Takahashi, Nakajo, and Kinichi Ono, Kurokawa, all of Japan, assignors to Mizusawa Industrial Chemicals, Ltd., Tokyo, Japan

Filed Jan. 9, 1988, Ser. No. 205,445
Int. Cl.[4] C01B *33/12*
U.S. Cl. 423—335 5 Claims



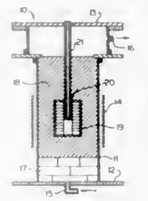
1. A filler for ink jet recording paper, said filler being composed of amorphous silica having (i) a median diameter, measured by the Coulter counter method, of 2 to 15 μm, (ii) an oil absorption of at least 180 ml/100 g, (iii) a refractive index, measured by the solvent method, of at least 1.450, (iv) a specific surface area of 280 to 500 m^2/g, (v) a pore volume, measured by the nitrogen adsorption method, of more than 1.30 cc/g, and (vi) a moisture absorption, measured when it is caused to absorb moisture for 200 hours at a relative humidity of 90% and a temperature of 25° C., of at least 35%.

4,915,924

METHOD OF PREPARING WHISKERS OF SILICON CARBIDE AND OTHER MATERIALS

Sadashiv K. Nadkarni, and Mukesh K. Jain, both of Jonquiere, Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Aug. 10, 1988, Ser. No. 230,747
Claims priority, application Canada, Aug. 12, 1987, 544348
Int. Cl.[4] C01B *31/36*
U.S. Cl. 423—345 34 Claims



1. A method of producing whiskers of silicon carbide, which comprises:

forming a first reaction zone containing particles of silicon dioxide having an average size less than about 5 microns uniformly mixed with carbon or a carbon precursor, the ratio of the silicon dioxide to the carbon present as a starting material or derivable from the precursor being greater than about 5 to 1 by weight;

forming a closely adjacent second reaction zone containing a porous mass of an infusible carbon precursor or active carbon, said porous mass having a density of less than about 0.2 g/cc and said second reaction zone being a layer

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directly overlying said first reaction zone, less than about 10 cm thick;

heating both reaction zones under a non-oxidizing atmosphere to reaction temperatures at which silicon monoxide is formed in the first reaction zone, diffuses to the second reaction zone and reacts with said active carbon or carbon derived from said carbon precursor in the second reaction zone to form silicon carbide; and

making a fresh supply of a whisker-forming catalyst continuously available in said second reaction zone where said silicon monoxide and carbon react with each other by providing said catalyst in the first reaction zone together with a volatilization aid for said catalyst such that the catalyst diffuses from the first reaction zone to the second reaction zone at said reaction temperatures.

4,915,925

EXFOLIATED GRAPHITE FIBERS AND ASSOCIATED METHOD

Deborah D. L. Chung, 3812 Henley Dr., Pittsburgh, Pa. 15235

Continuation-in-part of Ser. No. 700,035, Feb. 11, 1985, abandoned. This application Jul. 7, 1986, Ser. No. 882,748

Int. Cl.⁴ C01B *31/04*

U.S. Cl. 423—447.1 13 Claims

1. A method of producing an exfoliated graphite fiber comprising

intercalating a graphite fiber with an intercalating agent to form an intercalated fiber, and

heating said intercalated fiber to exfoliate said intercalated fiber.

4,915,926

BALANCED ULTRA-HIGH MODULUS AND HIGH TENSILE STRENGTH CARBON FIBERS

Jacob Lahijani, Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Feb. 22, 1988, Ser. No. 158,677

Int. Cl.⁴ D01F *9/12*

U.S. Cl. 423—447.1 4 Claims

1. A substantially round or circular cross-sectional, pitch-derived carbon fiber with balanced tensile strength and modulus characteristics having a crystal orientation angle of less than 6 degrees, a small angle x-ray scattering (SAXS) slope between about −1.8 and −2.1, an ultra-high modulus greater than 100 Mpsi, and a fiber tensile strength of at least about 500 kpsi.

4,915,927

PRODUCTION OF CHLORIC ACID

Marek Lipsztajn, Rexdale; Zbigniew Twardowski, and Gerald Cowley, both of Mississauga, all of Canada, assignors to Tenneco Canada Inc., Islington, Canada

Filed Oct. 21, 1988, Ser. No. 260,500

Int. Cl.⁴ C01B *11/02*

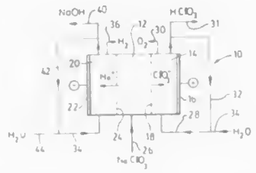
U.S. Cl. 423—472 9 Claims

1. A method for the production of chloric acid, which comprises:

feeding an aqueous chlorate solution to an electrolytic-electrodialytic cell,

electrolytically forming hydrogen ions in one compartment in said cell and transferring chlorate ions from said feed of aqueous chlorate solution across an anion-exchange membrane into said one compartment to form chloric acid therein,

removing chloric acid from said one compartment,



electrolytically forming hydroxyl ions in another compartment in said cell and transferring the cation of said chlorate from said feed of aqueous chlorate solution across a cation-exchange membrane into said another compartment to form a hydroxide of said cation, and

removing an aqueous hydroxide solution from said another compartment.

4,915,928

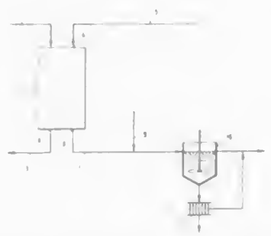
PROCESS FOR REMOVING SELENIUM FROM WASTEWATER EFFLUENT

Paul J. Marcantonio, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 31, 1989, Ser. No. 331,360

Int. Cl.⁴ B01D *15/04, 15/06*

U.S. Cl. 423—510 33 Claims



1. A process for removing selenium from wastewater effluent comprising the steps of;

(i) contacting a selenide containing wastewater and a strong-base anion exchange resin to adsorb selenide on the resin;

(ii) eluting the ion exchange resin with an eluant which is effective for stripping selenide therefrom; and

(iii) recovering elemental selenium from the selenide containing eluate resulting from step (ii).

4,915,929

ISOTOPIC SEPARATION OF D_2O FROM H_2O USING RUTHENIUM ADSORBENT

Patricia A. Thiel, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

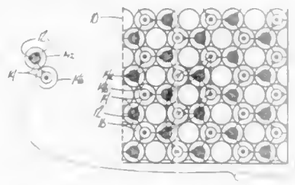
Filed Jan. 25, 1988, Ser. No. 148,369

Int. Cl.⁴ C01B *5/00*

U.S. Cl. 423—580 8 Claims

1. A one-phase method for enriching the concentration of D_2O in solutions of D_2O and H_2O comprising contacting in the absence of hydrogen gas steam phase D_2O and steam phase H_2O, with the hexagonal surface of crystalline ruthenium having a particle size greater than 10 nanometers so that sufficient (0001) face is exposed to produce enriched D_2O.

6. A one-phase method of enriching the concentration of



D_2O and solutions of D_2O and H_2O comprising contacting said D_2O and H_2O in the steam phase with the hexagonal surface of crystalline ruthenium wherein said ruthenium is divided into particles of about 1 micron to produce enriched D_2O.

4,915,930

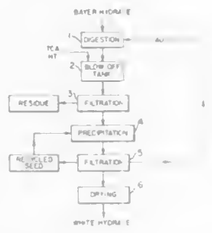
PROCESS FOR PRODUCING ALUMINUM HYDROXIDE OF IMPROVED WHITENESS

Richard H. Gobeen; William A. Nigro, both of Benton, Ark., and Paul J. The, Murrysville, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 891,751, Jul. 31, 1986, abandoned. This application Nov. 23, 1988, Ser. No. 275,683

Int. Cl.⁴ C01F *7/02*

U.S. Cl. 423—629 29 Claims



1. A process for producing aluminum hydroxide comprising the steps of:

(a) dissolving colorant-containing aluminum hydroxide in a sodium-hydroxide-containing, aqueous medium to form a solution;

(b) treating the solution with solid phase material comprising tricalcium aluminate and hydrotalcite to collect colorant into said solid phase material;

(c) separating said solid phase material with colorant collected therewith from the solution; and

(d) precipitating aluminum hydroxide of improved whiteness from the solution as compared to the starting aluminum hydroxide

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4,915,931

TC-99M MONONUCLIDE COMPLEX COMPOUND

Akira Yokoyama, Otsu, and Yasushi Arano, Uji, both of Japan, assignors to Nihon Medi-Physics Co., Ltd., Hyogo, Japan

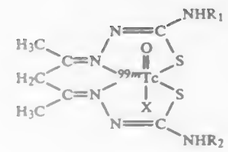
Filed Jan. 17, 1989, Ser. No. 297,385

Claims priority, application Japan, Jan. 18, 1988, 63-8056

Int. Cl.⁴ A61K *43/00, 49/02;* **C07F** *13/00;* **C07C** *159/00*

U.S. Cl. 424—1.1 4 Claims

1. A Tc-99m mononuclide complex compound of the formula:



wherein R_1 and R_2 are each a hydrogen atom or a C_1–C_3 alkyl group and X is an anion.

4,915,932

MACROAGGREGATES FOR RADIATION SYNOVECTOMY

Ashley B. McLaren, Bangor; Eric L. Hetherington, and Desmond J. Maddalena, both of Kirrawee, all of Australia, assignors to Australian Nuclear Science & Technology Organisation, Australia

Filed Oct. 13, 1988, Ser. No. 257,384

Claims priority, application Australia, Oct. 14, 1987, P14880

Int. Cl.⁴ A61K *43/00;* **A61B** *6/00;* **C09K** *11/04;* **C01G** *57/00*

U.S. Cl. 424—1.1 12 Claims

1. A formulation for treatment of synovial inflammation consisting of an active ingredient selected from the group consisting of dysprosium-165 hydroxide macroaggregates and yttrium-90 hydroxide macroaggregates, as the only ingredient suspended in a pharmaceutically acceptable carrier.

7. A method of treatment of synovial inflammation in human subjects, which method comprises administering to said subject an intra-articular injection of an effective amount formulation consisting of an active ingredient selected from the group consisting of dysprosium-165 hydroxide macroaggregates and yttrium-90 hydroxide macroaggregates, as the only ingredient suspended in a pharmaceutically acceptable carrier.

4,915,933

MIXED COMPLEXES AS SHIFT AND CONTRAST REAGENTS IN NMR IMAGING AND SPECTROSCOPY

Nicholas A. Matwiyoff, Sante Fe, N. Mex., assignor to The University of New Mexico, Albuquerque, N. Mex.

Filed Jun. 26, 1986, Ser. No. 878,651

Int. Cl.⁴ A61K *49/00;* **A61B** *6/00*

U.S. Cl. 424—9 28 Claims

1. In a nuclear magnetic resonance diagnostic method of the type wherein a paramagnetic species is employed in an amount sufficient to observably alter the magnetic properties of a reference ion in vivo or in vitro, the improvement comprising employing as the paramagnetic species an anionic mixed complex of a paramagnetic ion of the formula:

$$[M(W)_m(Y)_n(Z)_p]^{r-}$$

wherein

M is a paramagnetic ion;

W, Y, and Z are each a different bidentate or polydentate ligand which is a chelating agent for the ion M;

$m+n+p \geq 2$ but less than 5, and no more than one of m, n, or p is zero; and

the complex has an overall negative charge r−.

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4,915,934

FOAMABLE BIOCIDE COMPOSITION

Roderick P. J. Tomlinson, 32 Highwood Dr., Glen Waverly, Victoria, Australia (3150)

Continuation-in-part of Ser. No. 17,817, Feb. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 758,558, Jun. 18, 1985, abandoned. This application Nov. 29, 1988, Ser. No. 277,262

Claims priority, application Australia, Oct. 24, 1983, PG2011/83; Oct. 22, 1984, PCT/AU84/00215

Int. Cl.[4] A61K *9/12*

U.S. Cl. 424—45 9 Claims

1. A corrosive biocidal foam aerosol composition stored in a corrodible metal pressurized aerosol container comprising:

(a) from 0.1 to 105 w/w of chlorhexidine;

(b) 70 to 96% w/w of a quick breaking alcoholic foaming agent comprising:

(i) an aliphatic alcohol selected from the group consisting of methanol, ethanol, isopropanol and butanol;

(ii) a fatty alcohol selected from the group consisting of cetyl alcohol, stearyl alcohol, lauryl alcohol, myristyl alcohol and palmityl alcohol;

(iii) water;

(iv) an ethoxylated surface active agent;

(c) from 3 to 20% w/w of an aerosol propellant selected from the group consisting of propane, butane, dichloro difluoro methane, dichloro tetra fluoro ethane and octafluorocyclo butane;

said composition containing 0.1 to 6% w/w of a corrosion inhibitor selected from the group consisting of sorbic acid, benzoic acid, potassium sorbate and sodium benzoate;

said composition being free of flammable ethanol.

4,915,935

PROCESS FOR APPLYING REFLECTIVE PARTICLES TO HAIR

John F. Corbett, Norwalk, and Girish V. Patel, Bridgeport, both of Conn., assignors to Clairol Incorporated, New York, N.Y.

Continuation of Ser. No. 869,850, May 27, 1986, abandoned, which is a continuation of Ser. No. 685,203, Dec. 24, 1984, abandoned, and Ser. No. 639,169, Aug. 9, 1984, abandoned. This application Jun. 21, 1988, Ser. No. 211,076

Int. Cl.[4] A61K *7/06, 7/07, 7/11, 9/12*

U.S. Cl. 424—47 11 Claims

1. A composition for depositing reflective particles on hair which composition consists essentially of from about 0.5 to about 20% pigment and from about 1 to about 10% by weight, based on total weight of foamable liquid, dispersed in a foamable liquid, wherein the liquid contains:

(a) a sufficient quantity of an aqueous solution of a water soluble resin to serve as a styling aid and fixative for the particles; and

(b) from 1 to 2% a foaming agent consisting essentially of cetyl alcohol ethanol and water, said foaming agent being present in an amount sufficient to inhibit caking and to provide a moderately fast-breaking foam when the product is dispersed from an aerosol can.

4,915,936

DENTAL HYGIENE COMPOSITION FOR REDUCING PERIODONTAL DISEASE

Lloyd D. Patterson, Ormond Beach, and Jay W. Palmer, Tampa, both of Fla., assignors to United States Gypsum Company, Chicago, Ill.

Filed Oct. 31, 1988, Ser. No. 264,526

Int. Cl.[4] A61K *7/16, 33/06*

U.S. Cl. 424—49 8 Claims

1. A dental hygiene composition comprising water and which contains about 16% by weight of calcium sulfate hemihydrate, about 21% by weight ethanol and about 8% by weight glycerin.

4,915,937

DENTAL ANTIHYDROLYSIS AGENT

Zahid Amjad, Avon Lake, Ohio, assignor to The BF Goodrich Company, Akron, Ohio

Filed Aug. 1, 1988, Ser. No. 226,587

The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.

Int. Cl.[4] A61K *7/16, 7/18*

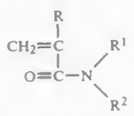
U.S. Cl. 424—52 19 Claims

1. An oral composition comprising

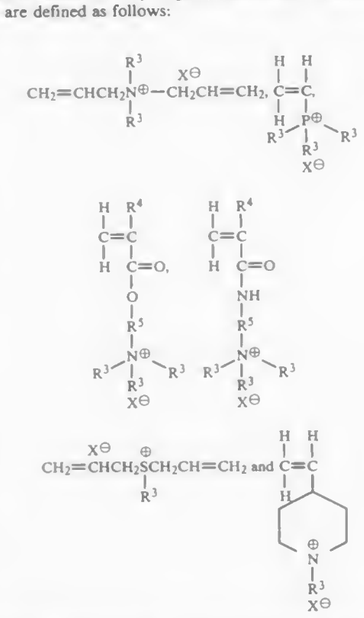
(a) 0.005 to 3.0% of a fluoride source, based on the weight of said composition;

(b) an effective amount of a dental abrasive containing 0.1 to 10% by weight of said composition of a polyphosphate effective to inhibit hydroxyapatite formation, said polyphosphate is selected from the group consisting essentially of alkali metal hexametaphosphates, alkali metal tripolyphosphates, dialkali metal diacids, trialkali metal monoacids, tetraalkali metal pyrophosphates, and mixtures thereof; and

(c) 0.01% to 10% by weight of said composition of at least one antihydrolysis agent selected from homopolymers of substituted acrylamides, homopolymers of unsaturated sulfonic acids and salts thereof, and homopolymers and copolymers of cationic monomers; said substituted acrylamides are defined as follows:



where R is hydrogen or methyl and R^1 and R^2 are individually selected from hydrogen, alkyl and substituted alkyl groups each containing a total of 1 to 12 carbon atoms, provided that R^1 and R^2 are not both hydrogens; wherein said cationic monomers are defined as follows:



wherein R^3 is selected from hydrogen, phenyl group, and alkyl groups of from 1 to 3 carbon atoms, R^4 is selected from hydrogen and alkyl groups of from 1 to 3 carbon atoms; R^5 is selected from straight and branched chain groups of from 1 to 12 carbon atoms; and X is selected from anions.

4,915,938

HAIR TREATING COMPOSITION

Mary E. Zawadzki, Nine Chauncy St., Apt. 54, Cambridge, Mass. 02138

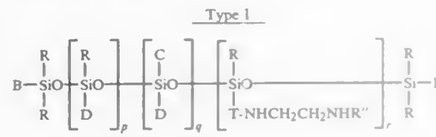
Filed Nov. 13, 1987, Ser. No. 120,336

Int. Cl.[4] A61K *7/06*

U.S. Cl. 424—70 5 Claims

1. A composition comprising a liquid aqueous vehicle having dispersed therein from 0.25 to 30% by weight of a mixture comprising two types of polysiloxanes having the following average compositions:

Type I



in which

R is a monovalent hydrocarbon group having 1 to 20 carbon atoms.

R'' is hydrogen or R

B is —R or —OH or —OR or —$TNHCH_2CH_2NHR''$

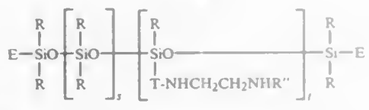
C is —OH or —OR

D is —R, —OH, or —OR

T is a divalent hydrocarbon group having 1 to 8 carbon atoms

p, q and r are positive integers, the sum of p, q or r being from 10 to 300,

Type II



in which

R is a monovalent hydrocarbon group having 1 to 20 carbon atoms,

R'' is hydrogen or R,

T is a divalent hydrocarbon group having 1 to 8 carbon atoms, preferably an alkylene group having 1 to 4 carbon atoms,

E is —OR or —T—$NHCH_2CH_2NHR''$,

s and t are positive integers, the sum of

s and t being from 10 to 300, and t is at least 2, and

the molar ratio of Type I to Type II being from 4:1 to

and a cross-linking agent comprising a water-soluble compound containing at least two carboxyl groups, the amount of said agent being from 0.6 to 90% by weight of total polysiloxane.

4,915,939

REACTION TYPED DEODORANT COMPOSITION HAVING A CORROSION-INHIBITING ACTIVITY

Takashi Iwahashi, Sagamihara, Japan, assignor to Aikoh Co., Ltd., Tokyo, Japan

Filed Jul. 15, 1988, Ser. No. 219,386

Int. Cl.[4] A61L *9/01*

U.S. Cl. 424—76.21 2 Claims

1. A corrosion-inhibiting deodorant composition for use in the spraying or dusting on sources of acidic bad odors during treatment of sewage, dust and industrial wastes which consists essentially of at least one alcoholic amine compound selected from the group consisting of diethanol amine, triethanolamine and 2-diethylaminoethanol, at least one organic zinc compound selected from the group consisting of zinc lower alkyl monocarboxylate and zinc lower alkyl tricarboxylate said lower alkyl group having 1–7 carbon atoms and water, the proportion of each ingredient being 1% to 60% by weight of alcoholic amine compound per 100% by weight of the composition, 0.1% to 40% by weight of organic zinc compound and the remainder water.

4,915,940

FILM-FORMATION-TYPE ANTIFUNGAL PREPARATION

Izumi Saitoh, Hyogo; Kaori Ikeda; Yoshio Doi, both of Osaka, and Shohei Egawa, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Nov. 15, 1988, Ser. No. 271,304

Claims priority, application Japan, Dec. 8, 1987, 62-310480

Int. Cl.[4] A61K *31/78, 31/74;* A01N *43/56, 43/38*

U.S. Cl. 424—81 5 Claims

1. A film-formation-antifungal preparation consisting essentially of about 0.1% to about 1.5% of tolnapbtate. about 10% to about 20% of a dimethylaminoethyl methacrylate-methacrylic acid ester copolymer, and 0.5% to about 10% of a medium chain fatty acid ester in an alcoholic solvent but containing practically no water.

4,915,941

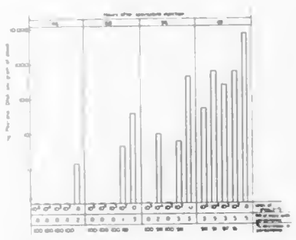
METHOD FOR PREVENTING THE DEVELOPMENT OR DECREASING THE EXTENT OF MALARIAL PARASITEMIA

Arturo Ferreira Vigouroux, Santiago, Chile, and Victor Nussenzweig, New York, N.Y., assignors to New York University, New York, N.Y.

Filed Dec. 11, 1986, Ser. No. 940,510

Int. Cl.[4] A61K *45/02*

U.S. Cl. 424—85.5 19 Claims



1. A method for inhibiting the development or limiting the extent of malarial parasitemia in mammals comprising administering to a mammal in need of such treatment before the onset of parasitemia in said mammal an amount of gamma-interferon sufficient to inhibit parasitemia, said parasitemia being incident to invasion of said mammal by sporozoites of a member of the genus Plasmodium, said administration taking place no later than the end of the prepatency period of said mammal.

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4,915,942

CROSS-REACTIVE AND PROTECTIVE EPITOPES OF CS

Ulises Vergara, Brooklyn; Andres Ruiz, Queens; Arturo Ferreira, New York; Ruth S. Nussenzweig, New York, and Victor N. Nussenzweig, New York, all of N.Y., assignors to New York University, New York, N.Y.

Continuation of Ser. No. 649,903, Sep. 12, 1984. This application Oct. 26, 1987, Ser. No. 115,634

Int. Cl.[4] C07K *7/00;* **A61K** *35/74, 37/02*

U.S. Cl. 424—88 **24 Claims**

1. A peptide antigen comprising an amino acid sequence consisting essentially of a non-repetitive epitope of the circumsporozoite protein of a parasite of the genus plasmodium, said peptide having the property of eliciting formation of antibodies that bind to said non-repetitive epitope on the parasite surface, said peptide being synthetic, essentially purified, and substantially shorter in length than said protein.

4,915,943

COMPOSITIONS CONTAINING BIOSYNTHETIC PESTICIDE PRODUCTS, PROCESSES FOR THEIR PRODUCTION AND THEIR USE

Ignace Gago, Braine-l'Alleud; Lucien Charmoille, Brussels, and Rene Detrox, Ohain, all of Belgium, assignors to Solvay & CIE (Société Anonyme), Brussels, Belgium

Filed Sep. 14, 1988, Ser. No. 244,384

Claims priority, application France, Sep. 14, 1987, 87 12738

Int. Cl.[4] A61K *35/74, 31/025*

U.S. Cl. 424—93 **12 Claims**

1. A composition containing a biosynthetic pesticide product non-toxic to warm-blooded and cold-blooded animals derived from a microorganism of the family Bacillaceae microorganism not to include vegetative cells of said microorganism itself as said pesticide in the form of solid particles in suspension in a liquid, comprising at least one substance of general formula (I):

(I)

in which R represents a hydrogen atom, a halogen atom, or a salt deriving from this substance.

4,915,944

NOVEL ISOLATE OF TRICHODERMA, FUNGICIDAL COMPOSITIONS CONTAINING SAID ISOLATE AND USE THEREOF

Ilan Chet; Alex Sivan, both of Ness Ziona, and Yigal Elad, Sireni, all of Israel, assignors to Yissum Research Development Corp. of the Hebrew University of Jerusalem, Jerusalem, Israel

Division of Ser. No. 588,950, Mar. 13, 1984, Pat. No. 4,713,342. This application Sep. 28, 1987, Ser. No. 101,636

Claims priority, application Israel, Mar. 15, 1983, 68129

Int. Cl.[4] A61K *35/70;* **A01N** *63/04;* **C12N** *1/14*

U.S. Cl. 424—93 **7 Claims**

1. A method of protecting seedlings from diseases caused by soil-borne pathogenic fungi which comprises incorporating in or applying to the soil in which the seedlings are grown an effective amount of a biologically pure, stable culture of a strain of a mycoparasite of the species *Trichoderma harzianum* designated *Trichoderma harzianum* Rifai T-315 (ATCC No. 20671) or a mutant derived therefrom useful as a biological control agent.

4,915,945

PROCESS FOR THE PREPARATION OF THE C1 INACTIVATOR

Hermann Pelzer; Helmut Heber; Norbert Heimburger; Hans M. Preis, and Horst Naumann, all of Marburg, Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Continuation of Ser. No. 518,101, Jul. 28, 1983, abandoned. This application Apr. 18, 1985, Ser. No. 724,050

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1982, 3228502

Int. Cl.[4] A61K *37/02;* **C07K** *3/20*

U.S. Cl. 421—101 **18 Claims**

1. A process for purifying an inactivator of C1 esterase of the complement system (C1 inactivator) comprising subjecting an aqueous solution containing C1 inactivator and concomitant proteins to precipitation and adsorption, wherein an amount of a carrier containing a hydrophobic group effective for adsorbing said concomitant proteins is utilized as an adsorbent, to provide purified C1 inactivator in said aqueous solution.

4,915,946

PROCESS FOR MANUFACTURING A FUSED SALT FROM GINKGO, PERSIMMON, PINE, AND BAMBOO, AND THE COMPOSITION PRODUCED THEREBY

Kwon J. Kang, 101-5 Nonhyun-Dong, Kangnam-Ku, Seoul, Rep. of Korea

Filed Jan. 13, 1988, Ser. No. 143,397

Claims priority, application Rep. of Korea, Jul. 21, 1987, 87-7884[U]

Int. Cl.[4] A61K *35/78;* **A23L** *1/30*

U.S. Cl. 424—195.1 **9 Claims**

1. A process for preparing a fused salt composition which comprises the steps of:

(a) heating a predetermined quantity of bay salt at an elevated temperature to form a salt powder;

(b) combining said salt powder with leaves from the genus Ginkgo, Persimmon, Pine and Bamboo to form an initial mixture, said salt powder and said leaves being present in amount of about 95% and 5% by weight, respectively;

(c) combusting said initial mixture in a furnace using firewood at a temperature of about 1,000° to 1,300° C. to produce a first fusing solution which is solidified into a first fused solid;

(d) pulverizing said fused solid to form a pulverized solid;

(e) combusting a mixture formed from combining said pulverized solid with leaves from the genus Ginkgo, Persimmon, Pine and Bamboo in said furnace with firewood at a temperature of about 1,000° to 1,300° C. to produce a second fusing solution which is solidified into a second fused solid;

(f) repeating steps (d) and (e) at least 5 times;

(g) combusting a plurality of Bamboo tubes which contain said fused solid produced by step (f) in said furnace to produce solid salt rods;

(h) heating said solid salt rods in said furnace at a temperature of about 1,000° to 1,300° C. to produce a third fusing solution which is solidified into a third fused solid; and

(i) heating said third fused solid in an electronic furnace to a temperature of about 1,300° C. to form a final fused salt composition.

4,915,947

MICROENCAPSULATED FUNGICIDE

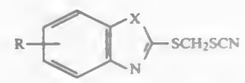
Jean Thenard, Paris, France, and Shyam B. Advani, North Wales, Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 7, 1986, Ser. No. 928,085

Int. Cl.[4] A01N *25/34;* **B01J** *13/02*

U.S. Cl. 424—408 **17 Claims**

1. A fungicide product comprising microcapsules containing a phytotoxic compound of the formula:



where X is —O— or —S— and R is alkyl, alkoxy, alkylamino, halo, nitro or hydrogen wherein the alkyl group or radical has from 1 to 6 carbon atoms, said microcapsules having walls of a resinous polycondensate selected from the group consisting of crosslinked polyurea, crosslinked polyamide and crosslinked polyamide-polyurea wherein the degree of crosslinking ranges from about 25 to 100%, said walls being about 10 to about 30% of the total weight of said microcapsules, and said microcapsules having an average size ranging from about 7 to about 25 microns in diameter.

4,915,948

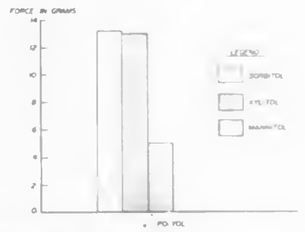
TABLETS HAVING IMPROVED BIOADHESION TO MUCOUS MEMBRANES

Andrew R. Gallopo, Garfield, and Steven S. Dills, Wharton, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Aug. 31, 1987, Ser. No. 91,575

Int. Cl.[4] A61F *13/00*

U.S. Cl. 424—435 **24 Claims**



1. A tablet having improved bioadhesion to mucous membranes comprising:

(a) a water-soluble natural biopolymer in an amount of from about 40 to about 80 weight percent of the tablet, selected from the group consisting of a xanthan gum, a pectin and mixtures thereof; and

(b) a solid polyol in an amount of from about 20 to about 60 weight percent of the tablet and having a solubility at room temperature in water greater than about 20 grams of polyol per 100 g of solution

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4,915,949

DISPENSER WITH MOVABLE MATRIX COMPRISING A PLURALITY OF TINY PILLS

Patrick S.-L. Wong, Hayward; Felix Theeuwes, Los Altos; Richard Cortese, Los Gatos, and James B. Eckenhoff, Los Altos, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 72,506, Jul. 13, 1987, Pat. No. 4,824,675. This application Feb. 21, 1989, Ser. No. 312,270

The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.

Int. Cl.[4] A61K *9/22, 9/26*

U.S. Cl. 424—438 **1 Claim**

1. A method for administering a beneficial agent to an animal, wherein the method comprises:

(a) admitting into the animal a dispenser comprising:

(1) a lumen;

(2) a wall that surrounds and defines the lumen;

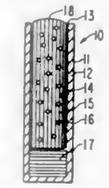
(3) pharmaceutically acceptable carrier in the lumen, which carrier substantially keeps its physical and chemical integrity while the carrier is in the lumen;

(4) a plurality of tiny pills in the carrier, which tiny pills comprise:

(i) a drug; and,

(ii) a wall surrounding the drug;

(5) means in the lumen for displacing the pharmaceutically acceptable carrier from the lumen;



(6) a mouth in the dispenser that connects the lumen with the exterior of the dispenser;

(b) letting fluid enter the dispenser to cause the means to displace the carrier through the mouth from the lumen; thereby,

(c) administering the beneficial agent in the tiny pills to the animal to produce a beneficial effect over time.

4,915,950

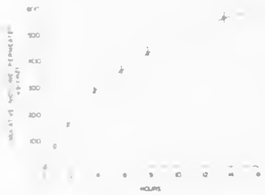
PRINTED TRANSDERMAL DRUG DELIVERY DEVICE

Jesus Miranda, Menlo Park, and Gary W. Cleary, San Mateo, both of Calif., assignors to Cygnus Research Corporation, Redwood City, Calif.

Continuation-in-part of Ser. No. 155,327, Feb. 12, 1988, abandoned. This application Jul. 5, 1988, Ser. No. 215,074

Int. Cl.[4] A61F *13/02*

U.S. Cl. 424—448 **12 Claims**



1. A method for making a transdermal delivery device, comprising:

(a) laminating an adsorbent source layer to a pressure-sensitive, pharmaceutically acceptable contact adhesive layer, the contact adhesive layer comprised of a material that is permeable to the drug and which defines a basal surface for adhesion to skin;

(b) printing a drug in liquid form onto the adsorbent fabric layer;

(c) laminating an anchor adhesive layer to the source layer; and

(d) applying a backing layer to the anchor adhesive layer which defines the upper surface of the device and is substantially impermeable to the drug.

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4,915,951

CRYOPROTECTIVE REAGENT

John D. Baldeschwieler, and Raymond P. Goodrich, Jr., both of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Dec. 3, 1987, Ser. No. 128,152
Int. Cl.[4] A61K *37/22*; B01J *13/02*
U.S. Cl. 424—450 3 Claims

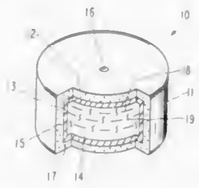
1. A composition for application to and protection of phosphoglyceride-containing biological and synthetic membranes from the disruptive effects of freezing, thawing, and freeze-drying, comprising a dispersion of molecules, each molecule consisting of a cholesterol moiety modified at the 3-position by the attachment of a carbohydrate moiety located at a predetermined, variable distance from said cholesterol moiety by means of a hydrophilic polyoxyethylene unit of predetermined variable length.

4,915,952

COMPOSITION COMPRISING DRUG, HPC, HPMC AND PEO

Atul D. Ayer, Mt. View, and Lawrence G. Hamel, Sunnyvale, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 19,989, Feb. 27, 1987, Pat. No. 4,810,502.
This application Feb. 15, 1989, Ser. No. 310,167
Int. Cl.[4] A61M *31/00*
U.S. Cl. 424—467 1 Claim



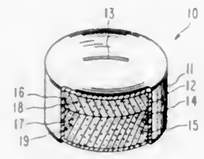
1. A composition useful for manufacturing a lamina of a drug dosage form, the composition comprising at least one drug, hydroxypropylcellulose, hydroxypropylmethylcellulose and polyethylene oxide.

4,915,953

DOSAGE FORM FOR DELIVERING ACETAMINOPHEN OR PHENYLPROPANOLAMINE

Maureen L. Jordan, Mt. View; Atul D. Ayer; Paul R. Magruder, both of Palo Alto, and David E. Edgren, El Granada, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 92,857, Sep. 3, 1987, Pat. No. 4,814,181. This application Feb. 21, 1989, Ser. No. 312,556
The portion of the term of this patent subsequent to Mar. 20, 2006, has been disclaimed.
Int. Cl.[4] A61K *9/24*
U.S. Cl. 424—473 2 Claims



1. A dosage form for delivering a drug to an animal, wherein the dosage form comprises:
(a) a wall comprising at least in part a composition permeable to fluid;
(b) a compartment defined by the wall;
(c) a first composition in the compartment comprising (1) a therapeutically effective amount of acetaminophen, and (2) a hydroxypropylcellulose comprising about 17% to 16% hydroxypropyl group;
(d) a second composition in the compartment comprising (3) a therapeutically effective amount of acetaminophen, and (4)a member selected from the group consisting of a hydroxypropylmethylcellulose and a hydrogel; and,
(e) exit means frod elivering the first composition in a short period of time.

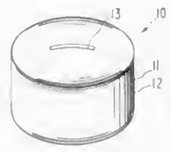
2. A dosage form for delivering a drug orally to an animal, wherein the dosage form comprises:
(a) a wall comprising at lease in part a compostion permeable to fluid;
(b) a compartment formed by the wall;
(c) a first composition in the compartment comprising (1) a therapeutically effective amount of phenylpropanolamine and (2) a hydroxypropylcellulose comprising about 7% to 16% hydroxypropyl group;
(d) a second composition in the compartment comprising (3) a therapeutically effective amount of phenylpropanolamine and (4) a member selected from the group consisting of a hydroxy propylmethylcellulose and a hydrogel; and,
(e) exit means for delivering the first composition in a short period of time.

4,915,954

DOSAGE FORM FOR DELIVERING A DRUG AT TWO DIFFERENT RATES

Atul D. Ayer, Palo Alto; Maureen L. Jordan; Paul R. Magruder, both of Mt. View, and David E. Edgren, El Granada, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 92,857, Sep. 3, 1987, Pat. No. 4,814,181. This application Feb. 21, 1989, Ser. No. 313,006
The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.
Int. Cl.[4] A61K *9/24*
U.S. Cl. 424—473 3 Claims



1. A dosage form for delivering a drug to an animal, wherein the dosage form comprises:
(a) a wall comprising at least in part a composition permeable to fluid;
(b) a compartment defined by the wall;
(c) a first composition in the compartment comprising (1) a drug selected from the group consisting of cimetidine, ranitidine, nizatidine, roxatidine and famotidine, and (2) a hydroxypropylcellulose comprising about 7% to 16% hydroxypropyl group;
(d) a second composition in the compartment comprising (3) a drug selected from the group consisting of cimetidine, ranitidine, nizatidine, roxatidine and famotidine, and (4) a member selected from the group consisting of a hydroxypropylmethylcellulose and a hydrogel; and,
(e) exit means for delivering the first composition in a short period of time.

2. A dosage form for delivering a drug orally to an animal, wherein the dosage form comprises:
(a) a wall comprising at least in part a composition permeable to fluid;
(b) a compartment formed by the wall;

(c) a first composition in the compartment comprising (1) a drug selected from the group consisting of captopril, ramipril, enalapril, enalaprilat and lisinopril, and (2) a hydroxypropylcellulose comprising about 7% to 16% hydroxypropyl group;
(d) a second composition in the compartment comprising (3) a drug selected from the group consisting of captopril, ramipril, enalapril, enalaprilat and lisinopril, and (4) a member selected from the group consisting of hydroxypropylmethylcellulose and hydrogel; and,
(e) exit means for delivering the first composition in a short period of time to the animal.

3. A dosage form for delivering a drug orally to an animal, wherein the dosage form comprises:
(a) a wall comprising at least in part a composition permeable to fluid;
(b) a compartment formed by the wall;
(c) a first composition in the compartment comprising (1) a drug selected from the group consisting of colestipol, pravastatin, lovastatin, simvastatin and fluindostatin and (2) a hydroxypropylcellulose comprising about 7% to 16% hydroxypropyl group;
(d) a second composition in the compartment comprising (3) a drug selected from the group consisting of colestipol, pravastatin, lovastatin, simvastatin, and fluindostatin, and (4) a member selected from the group consisting of hydroxyproylmetylcellulose and a hydrogel; and,
(e) exit means for delivering the first composition in a short period of time to the animal.

4,915,955

PROCESS FOR PREPARING A DISINFECTANT

Janos Gömöri, Stäfa, Switzerland, assignor to Sanosil AG., Feldmeilen, Switzerland

Filed Sep. 5, 1986, Ser. No. 904,055
Claims priority, application Switzerland, Apr. 22, 1986, 1629/86
Int. Cl.[4] A01N *39/00, 59/16*
U.S. Cl. 424—616 12 Claims

1. A process for preparing a storage stable, clear concentrate of unlimited durability which, upon admixture with hydrogen peroxide, forms a disinfectant, comprising:
(a) admixing an inorganic acid with water, said water being selected from the group consisting of distilled water and fully desalted water, to yield aqueous inorganic acid having a pH less than or equal to 1.6;
(b) admixing said aqueous acid at a temperature between 50 and 60° C. with a silver composition, selected from the group consisting of silver salts and silver salt complexes, in an amount which yields 95–105 g Ag per liter of the final concentrate;
(c) cooling the resultant admixture to between 25 and 30° C., and adding such an amount of the same acid as was used for adjusting the pH of the water whereby the total amount of said acid is at least equimolar with the amount of silver present;
(d) adding to said admixture an organic acid stabilizer, and optional gelatin, at 20 to 25° C.; and
(e) homogenizing the obtained mixture.

4,915,956

LIQUID CISPLATIN FORMULATIONS

Abu S. Alam, Libertyville; Shaila Battu, Villa Park; Jairaj U. Mehta, Forest Park; Fakrul A. A. Sayeed, Mundelein, and John N. Kapoor, Lake Forest, all of Ill., assignors to Lyphomed, Inc., Rosemont, Ill.

Filed Dec. 16, 1987, Ser. No. 133,516
Int. Cl.[4] A61K *33/24*
U.S. Cl. 424—649 10 Claims

4. An injectable, stable, sterile aqueous solution of cisplatin in a unit dosage form in a sealed container, the solution being suitable for administration by the injection thereof into man upon the removal thereof from the container, the solution consisting of water, cisplatin, and sodium chloride, said solution having a concentration of cisplatin between about 1 and about 1.3 mg./mL, and a pH in the range of about 3.5 to about 5.0, the solution being substantially free of dissolved oxygen.

4,915,957

ANTACID MATERIAL

Michael Schneider, and Adolf Knecht, both of Freiburg, Fed. Rep. of Germany, assignors to Gödecke Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 513,136, Jul. 12, 1983, Pat. No. 4,482,542, which is a continuation of Ser. No. 260,859, May 6, 1981, abandoned. This application Aug. 8, 1984, Ser. No. 638,829
Int. Cl.[4] A61K *33/08*
U.S. Cl. 424—690 14 Claims

1. An antacid material of the formula

$$Mg_5Al_{10}(OH)_{26}O_5](SO_4)_2 \cdot nH_2O$$

wherein n is 35–95.

4,915,958

HIGH-BASE GUM COMPOSITION WITH EXTENDED FLAVOR RELEASE

Steven M. Faust, Stanhope, and Subraman R. Cherukuri, Towaco, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 939,918, Dec. 10, 1986, Pat. No. 4,872,884. This application Dec. 30, 1988, Ser. No. 292,283
Int. Cl.[4] A23G *3/30*
U.S. Cl. 426—3 18 Claims

1. A chewing gum composition capable of releasing increased amounts of flavor evenly over a longer release time using conventional flavor levels comprising:
(a) a gum base present in an amount of from about 50% to about 90% by weight;
(b) a carbohydrate component present in an amount of from about 7% to about 45% by weight; and
(c) a flavor component present in an amount of up to about 4% by weight; wherein the gum base comprises in percentages by weight of the gum base;
(1) about 0.5% to about 20% elastomer;
(2) about 10% to about 25% of a polyvinyl acetate having a medium molecular weight of about 35,000 to about 55,000;
(3) about 4.5% to about 10% acetylated monoglyceride;
(4) about 6% to about 10% of a wax having a melting point below about 60° C.; and
(5) remaining amounts of a material selected from the group consisting of elastomer solvent, emulsifiers, plasticizers, fillers and mixtures thereof.

4,915,959

METHOD FOR THE CONTINUOUS MATURATION OF FERMENTED BEER

Eako Pajunen, Helsinki; Veijo Makinen, Espoo; Heikki O. Lommi, Kantvik, and Markku S. Loisa, Hanko, all of Finland, assignors to Suomen Kokeri Oy, Helsinki, Finland

Filed May 9, 1988, Ser. No. 191,320
Int. Cl.[4] C12C *11/04*
U.S. Cl. 426—13 12 Claims

1. A method for the continuous maturation of beer fermented with yeast which comprises:
removing substantially all of said yeast from the fermented beer after primary fermentation;
heat treatment of said beer within the range of about 60° C. to less than about 90° C. at a pressure in excess of atmospheric pressure to effect the conversion of all or substantially all of the alpha acetolactate and other diacetyl precursors present to diacetyl;
cooling said heat treated beer to a temperature of between about 0° C. and about 25° C.; feeding said beer under

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pressure through a reaction column packet with immobilized yeast cells on a suitable carrier material at a flow rate which effects the conversion of said diacetyl to acetoin in order to lower the concentration of said diacetyl; and

cooling said fermented, heat treated, matured beer to a temperature sufficient to stabilize said beer.

4,915,960

DIETARY FIBER PRODUCT

Lennart Holmgren, Ängelholm, Sweden, assignor to Tricum AB, Hoganas, Sweden

Division of Ser. No. 927,468, Nov. 6, 1986, Pat. No. 4,765,994, which is a continuation-in-part of Ser. No. 797,189, Nov. 12, 1985, abandoned, which is a continuation of Ser. No. 578,197, Feb. 8, 1974, abandoned. This application Mar. 15, 1988, Ser. No. 168,283

Claims priority, application Sweden, Feb. 23, 1983, 8300981

The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.

Int. Cl.[4] A23L *1/42*

U.S. Cl. 426—31 1 Claim

1. A water absorbing dietary fibre product comprising at least 80% by weight of dietary fibre, less than 0.5% by weight of phytic acid, no more than 8% by weight protein, no more than 4% by weight fat and no more than 2% by weight minerals, said product being obtained by a process comprising mixing wheat bran with aqueous acid of pH about 5 and maintaining the mixture at a temperature of about 50°–60° C. for a time sufficient to permit the naturally occurring phytase in the raw material bran to reduce the naturally occurring phytic acid content to below about 0.5%; increasing the pH to about 6; adding a proteinase to the pH adjusted mixture at about 50°–60° C. and maintaining the resultant mixture at this temperature until the protein content has been reduced to about 8% or less; increasing the temperature to about 70°–75° C. and adding a starch degrading enzyme to the mixture and maintaining the resultant mixture at a temperature and for a time sufficient to permit the starch degrading enzyme to degrade substantially all of the starch in the mixture; increasing the temperature of the mixture containing the starch degrading enzyme sufficient to halt the enzymatic reactions and removing the water from the mixture and drying the resultant product.

4,915,961

VACUUM-PACKED FOOD CONTAINING DUNALIELLA ALGAE AND PROCESS FOR THE PRODUCTION THEREOF

Yoshio Tanaka, 22 Banchi, Yamaguchi-cho, Gifu-shi, Gifu-ken, Japan

Filed Jul. 28, 1988, Ser. No. 225,424

Claims priority, application Japan, Feb. 25, 1988, 63-40753

The portion of the term of this patent subsequent to Apr. 3, 2007, has been disclaimed.

Int. Cl.[4] B65B *31/02;* A23L *1/03*

U.S. Cl. 426—72 4 Claims

1. A food product comprising Dunaliella algae, cyclodextrin, an antioxidant selected from the group consisting of vitamin C and vitamin E, and a binder selected from the group consisting of sugars, wherein the ratio of cyclodextrin to said dried powder is from 15 to 50:100, the ratio of antioxidant to said binder to said mixture of said powder and cyclodextrin is 0.10–0.25:35.50–40.60:100, and the ratio of said powder to said food is 10–240:300.

4,915,962

CULINARY SEASONING COMPOSITION

Alan N. Howard, Cambridge, England, assignor to The Howard Foundation, Leeds, England

Continuation-in-part of Ser. No. 844,574, Mar. 27, 1986, abandoned. This application Jul. 25, 1988, Ser. No. 224,546

Claims priority, application United Kingdom, Mar. 27, 1985, 8507977

Int. Cl.[4] A23L *1/237, 1/304*

U.S. Cl. 426—74 19 Claims

1. A culinary seasoning composition, which composition comprises:

(a) a saline component, said saline component comprising sodium chloride or from about 10 to about 90% by weight of sodium chloride, the balance of said saline component comprising potassium chloride; and

(b) a trace element component of the group of zinc, copper, manganese, chromium, selenium, molybdenum or a mixture thereof,

the composition being formulated such that a portion of from about 5 to about 15 grams of the composition contains in said portion at least:

about 15 mg of zinc,

from about 2.0 to about 3.0 mg of copper,

from about 2.5 to about 5.0 mg of manganese,

at least about 50 mcg of chromium,

at least about 50 mcg of selenium, and

at least about 150 mcg of molybdenum.

4,915,963

METHOD FOR PREPARING A COOKED MEAT PRODUCT PACKAGE

Stanley Lustig, Park Forest, and Jeffrey M. Schuetz, Woodridge, both of Ill., assignors to Viskase Corporation, Chicago, Ill.

Continuation of Ser. No. 126,336, Nov. 30, 1987, Pat. No. 4,784,863. This application Oct. 3, 1988, Ser. No. 252,409

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.[4] A22C *11/00*

U.S. Cl. 426—113 3 Claims

1. A method for preparing a cooked meat product comprising the steps of:

(a) providing a tube formed of multilayer film comprising at least three layers including a barrier layer as the core, an inner layer formed of ethylene vinyl acetate and an outer layer on the opposite side of said barrier layer, and wherein said ethylene vinyl acetate has between about 3% and about 18% by weight vinyl acetate, and at least about 4 grams/1000 ft.^{2} of starch particles having major dimensions less than about 100 microns and being substantially uniformly dispersed across the inner surface of said inner layer and integral therewith, with at least the dispersed starch particle—containing ethylene vinyl acetate inner layer being irradiated at dosage of at least about 2 MR;

(b) sealing one end of said tube and stuffing said tube with uncooked meat so that the meat outer surface is in direct contact with said inner surface of said inner layer;

(c) sealing the opened end of the uncooked meat-containing tube; and

(d) cooking said meat in the sealed tube by contacting the stuffed tube outer surface with a heated aqueous medium and simultaneously adhering the cooking meat outer surface to the tube inner surface.

4,915,964

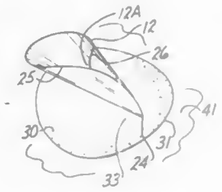
METHOD OF MAKING A CONICALLY SHAPED TORTILLA SHELL

Leo P. Smietana, 16696 Forrest St., Victorville, Calif. 92392

Filed Jan. 5, 1989, Ser. No. 293,889

Int. Cl.[4] A23L *1/164;* A23P *1/10*

U.S. Cl. 426—282 11 Claims



1. A method of making a crisp conically shaped tortilla shell, which comprises:

using a pliable corn or wheat flour tortilla patty having a rounded tip end portion;

placing said pliable tortilla patty on a substantially flat surface;

using at least two conically shaped molds each having an apex portion;

positioning one of said molds on its side on the surface of said tortilla;

aligning the rounded tip end portion of said tortilla patty adjacent to the apex portion of said one of said molds;

moving relative to one another the mold and said aligned rounded tip end portion of said tortilla patty to wrap the tip end portion about the apex;

moving a peripheral surface near the tip end portion of said patty only into engagement flat against the apex portion of the mold;

holding the peripheral surface firmly against the apex portion;

rolling the patty and the mold along the substantially flat surface until the patty peripheral surface commences to be moved under the mold and against the top surface of the patty adjacent to its rounded tip end;

continuing to roll said mold and said patty to cause the patty tip end portion to tuck inwardly to form a closed apex tucked in portion thereby forming a conically shaped tortilla shell having a closed apex portion;

inserting said tortilla wrapped mold into the open interior of the other one of said molds until said molds are secured nestled securing the tortilla patty between the interior surface of one mold and the exterior surface of the other mold;

placing the nestled molds in a vessel of cooking oil;

cooking the tortilla patty until it become a crisp cone-shaped shell having a closed apex portion;

removing said molds and said cooked tortilla patty from said vessel; and then

separating said cooked tortilla patty from said molds.

4,915,965

PROCESS FOR PRODUCTION OF ENCAPSULATED FOODSTUFF CONTAINING DUNALIELLA ALGAE

Yoshio Tanaka, 22 Banchi, Yamaguchi-cho, Gifu-shi, Gifu-ken, Japan

Filed Jul. 28, 1988, Ser. No. 225,417

Claims priority, application Japan, Feb. 25, 1988, 63-40754; Feb. 25, 1988, 63-40755

The portion of the term of this patent subsequent to Apr. 3, 2007, has been disclaimed.

Int. Cl.[4] A23L *1/42*

U.S. Cl. 426—282 3 Claims

1. A process for the production of foodstuffs containing Dunaliella algae encapsulated in a hard capsule comprising the following steps:

adding cyclodextrin to dried powder of Dunaliella algae in an amount so that the ratio of said cyclodextrin to said powder is from 15–50 parts by weight to 100 parts by weight;

stirring and blending said cyclodextrin and said powder in a mixer;

adding, to 100 parts by weight of the mixture of cyclodextrin and said powder, from 0.10 to 0.25 parts by weight of an antioxidant and selected from the group consisting of vitamin C and vitamin E, from 3.50 to 4.50 parts by weight of a lubricant selected from the group consisting of talc and esters of sucrose with a fatty acid; and from 35.50 to 40.60 parts by weight of a binder selected from the group consisting of sugars;

blending said materials to make a mixture;

granulating said mixture in the form of granules; and

encapsulating said granules in a light-impermeable hard capsule.

4,915,966

METHOD OF MAKING DRIED PASTA PRODUCTS

Roberto Guarneri, Parma, Italy, assignor to Barilla G. E R. F.LLI - Societa' Per Azioni, Parma, Italy

Filed Dec. 19, 1988, Ser. No. 286,025

Claims priority, application Italy, Dec. 18, 1987, 23095 A/87

Int. Cl.[4] A23L *1/16*

U.S. Cl. 426—451 4 Claims

1. A method of making dried pasta products, which comprises drying freshly prepared pasta stepwise by isothermal application of heat at gradually higher temperatures within the range of from 40° to 110° C., said stepwise pasta drying taking place with the pasta Aw controlled to drop no lower than 0.86.

4,915,967

METHOD FOR PROCESSING FOOD

Tooru Nozaka, Nakano, Japan, assignor to Shonan Koryo Corporation, Tokyo, Japan

Filed Jul. 8, 1988, Ser. No. 216,605

Claims priority, application Japan, Jul. 28, 1987, 62-188596

Int. Cl.[4] A23L *2/26, 1/325*

U.S. Cl. 426—489 24 Claims

1. A method for processing food, comprising:

subjecting a food material, selected from the group consisting of fruits, vegetables, and fishery products, to one or more processing steps selected from a group consisting of extracting, filtering, and concentrating, under a nitrogen gas atmosphere at a gauge pressure of at least 150 KPa, thereby preventing oxidation of said food material and the growth of microorganisms therein.

4,915,968

EXTRUSION OF MULTIPLE EXTRUDATES HAVING COMPLIMENTARY SHAPES

Bernard T. Matthews, Norwich; David J. Joll, Holt; Habeeb M. Ziauddin, and David N. Wilson, both of Norwich, all of England, assignors to Bernard Matthews PLC, England

Filed Dec. 14, 1988, Ser. No. 284,437

Claims priority, application United Kingdom, Dec. 24, 1987, 8730125

Int. Cl.[4] A23P *1/10, 1/12*

U.S. Cl. 426—513 5 Claims

1. A method of manufacturing shaped products, such method comprising extruding from adjacent locations at least two extrudates into fitting flexible inner casings and into an

overall outer flexible casing, the nature of the extrudates and the conditions of extrusion being such that the two extrudates

co-operate with one another to provide complementary predetermined shapes constrained within the outer casing.

4,915,969

SWEETENER FOR BEVERAGES

Pamela K. Beyts, Reading, Great Britain, assignor to Tate & Lyle PLC, Great Britain

Continuation-in-part of Ser. No. 699,791, Feb. 8, 1985, abandoned. This application Jul. 17, 1989, Ser. No. 380,304

Claims priority, application United Kingdom, Feb. 10, 1984, 8403612

Int. Cl.[4] A23L *1/09*

U.S. Cl. 426—548 20 Claims

1. A method of sweetening a beverage for incorporating therein a combination of two components: component 1, a chlorosucrose sweetener; and component 2, cyclamate, either alone or in combination with one or two other low calorie sweeteners, the sweetness contribution ratio of the two components in the mixture being from 90%:10% to 10%:90% respectively, the percentage sweetness contribution provided by the cyclamate in component 2 being from 30 to 100%.

4,915,970

METHOD OF THICKENING FOOD PRODUCTS BY MIXTURES OF STARCH AND METHYLCELLULOSE ETHERS AS HIGH TEMPERATURE THICKENERS

Donald G. Coffey, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 24,450, Mar. 11, 1987, abandoned. This application Oct. 11, 1988, Ser. No. 255,563

Int. Cl.[4] A23L *1/195, 1/04*

U.S. Cl. 426—573 16 Claims

1. In a method of thickening water based food compositions, wherein the food product is thickened by the addition of starch to the food product, the improvement which comprises:

(a) incorporating methylcellulose into the starch and food product to make a modified food product, wherein the methylcellulose has a molecular weight sufficient to yield a viscosity ranging from about 10 cps to about 1,000 cps in a 2 percent aqueous solution at 20° C., and wherein the starch and methylcellulose are used in a combined total amount of up to about 5 percent by weight of the modified food product, and wherein the methylcellulose is present in an amount effective to render the viscosity of the modified food product after step (b) substantially equal to or greater than the viscosity of the modified food product at an ambient temperature, prior to its being heated to an elevated temperature in step (b); and

(b) heating said modified food product to an elevated temperature effective to achieve the desired thickening of the modified food product and for a time period and conditions to effectively form a homogeneous mixture having a viscosity of from about 2,000 to about 25,000 centipoise at the elevated temperature.

4,915,971

METHOD FOR MAKING AN EDIBLE FILM AND FOR RETARDING WATER TRANSFER AMONG MULTI-COMPONENT FOOD PRODUCTS

Owen R. Fennema, Madison, Wis.; Susan L. Kamper, Minneapolis, Minn., and Jeffrey J. Kester, Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation of Ser. No. 809,531, Dec. 16, 1985, abandoned, which is a continuation-in-part of Ser. No. 628,723, Jul. 9, 1984, abandoned. This application Aug. 4, 1987, Ser. No. 81,828

Int. Cl.[4] A23L *1/04*

U.S. Cl. 426—578 6 Claims

1. A method for making an edible film and for retarding water transfer among components of a multi-component food product, the method comprising the steps of:

(a) preparing a film-forming liquid by mixing an edible hydrophilic polymer that displays gelation and an edible lipid which is added in an amount sufficient to allow substantially complete coverage of the surface of the hydrophilic polymer when said film-forming liquid is dried by heat, said mixing of said polymer and said lipid occurring in an aqueous solvent system containing an alcohol;

(b) plating the film-forming liquid on a non-food supporting surface to a depth such that upon drying of said film-forming liquid, a film of desired thickness is obtained, and drying the film-forming liquid on said surface to form a cohesive film such that the depth of the film-forming liquid selected is sufficient to contain enough polymer and lipid to result in a dried barrier film of said desired film thickness and such that the film comprises a hydrophilic polymer layer adjacent to the supporting surface and a hydrophobic lipid layer presented away from the supporting surface, the lipid layer having a concentration of at least approximately 0.8 milligrams lipid per square centimeter of hydrophilic polymer layer;

(c) removing the film from the supporting surface; and

(d) placing the film between food components that have different vapor pressures relative to each other such that said hydrophobic lipid layer is oriented toward the food components having the higher vapor pressure such that moisture transfer from the food components having a higher vapor pressure to food components having a lower vapor pressure is effectively retarded during an extended period of storage and upon heating will be consumable with the separated food components.

4,915,972

FOOD PROCESSING IN OXYGEN-FREE ENVIRONMENT

Rajendra P. Gupta, and Rashmi R. Gupta, both of Ottawa, Canada, assignors to Prosoya Corporation, Maryland Hts., Md.

Continuation of Ser. No. 141,114, Jan. 5, 1988, abandoned, which is a continuation-in-part of Ser. No. 856,374, Apr. 28, 1986, abandoned. This application Mar. 29, 1989, Ser. No. 330,219

Int. Cl.[4] A23L *1/20*

U.S. Cl. 426—598 12 Claims

1. A method for producing protein foods and edible oils from protein and oil containing seeds comprising steps of:

placing the seeds in an environment created to reduce its freeoxygen concentration below the threshold for the developing of volatiles causing off-flavors and bitter taste by the catalystic activity of lipoxygenase enzymes;

maintaining the temperature of said environment below 60 ° C. to prevent denaturing of the seed proteins;

disintegrating the seeds in said environment such that air is prevented from entering in and mixing with said environment; and

separating protein foods and edible oils from the resultant of the previous steps;

wherein said environment comprises a medium selected from a group consisting of an aqueous solvent, organic solvent, inert gas, and vacuum.

4,915,973

METHOD FOR TREATING SKIN DISEASES

António Costa, Rua Bernardo Santareno, Bloco C, 19-r/chao B, Miratejo, Corroios, Seixa, Almada, Portugal

Filed Apr. 20, 1988, Ser. No. 184,049

Claims priority, application Portugal, Apr. 24, 1987, 84755

Int. Cl.[4] A61K *33/36*

U.S. Cl. 424—667 2 Claims

1. A process of treating psoriasis, eczema and dermatitis by applying to the diseased skin a dermatological lotion which comprises a mixture of 800–1200 ml. ethyl alcohol, 160–240 g. salicylic acid, 160–240 g. alum powder, and 45–55 ml. tincture of iodine.

4,915,974

POLYVINYL OLEATE AS A FAT REPLACEMENT

Ronald P. D'Amelia, Hicksville, N.Y., and Peter T. Jacklin, Lafayette, N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Filed Feb. 17, 1989, Ser. No. 312,618

Int. Cl.[4] A23L *1/307*

U.S. Cl. 426—611 23 Claims

1. A food composition comprising as an edible fat compound, molecular weight 1000 to 5000 polyvinyl alcohol esterified with fatty acids.

4,915,975

METHOD OF FLUID FLOW VISUALIZATION

Hugh M. L. Watson, Derby, England, assignor to Rolls-Royce plc, London, England

Filed Aug. 30, 1988, Ser. No. 238,245

Claims priority, application United Kingdom, Oct. 7, 1987, 8723544

Int. Cl.[4] F05D *3/00*

U.S. Cl. 427—8 5 Claims

1. A method of fluid flow visualization comprising the steps of,

coating a surface of a component with a pigmented oil based paint of non-geling characteristics,

applying to the surface coated with the oil based paint dry dye particles which are soluble in the oil based paint,

passing a fluid flow over the component whereby the fluid flow causes the dry dye particles to translate across the surface coated with the oil based paint,

the dye particles dissolving in the oil based paint as they translate across the coated surface to leave trails in the oil based paint,

said trails in the oil based paint enabling visualization of the passage of the fluid flow over the surface of the component.

4,915,976

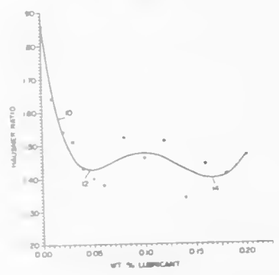
PROCEDURE FOR CONTROLLING POWDER FLUIDITY

Doris L. Brown; Charles F. Chenot, both of Towanda; Deborah V. Lutz, Troy, and Robin W. Munn, Sayre, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 5, 1988, Ser. No. 279,611

Int. Cl.[4] B05D *1/22*

U.S. Cl. 427—8 9 Claims



1 A process for applying a lubricant to a powdered material which is to be processed in a fluid bed to control the fluidity of the powdered material said process comprising:

(a) obtaining at least x number of samples of said powdered material without lubricant,

(b) applying increasing amounts of lubricant to x—1 number of said samples,

(c) measuring the bulk and tap densities of the samples,

(d) determining the Hausner Ratio from the densities,

(e) plotting the Hausner Ratio versus the concentration of the lubricant in the powder samples,

(f) determining the concentration of the lubricant in the powder samples at the first and second local minima of the plot obtained in step e and

(g) providing a concentration of a lubricant in the remainder of the powdered material within about 0.01% by weight of the concentration of the lubricant at the first local minimum if the ratio of the cross sectional area in square millimeters to the circumference in millimeters of the fluid bed to be used is about 20:1 or greater or within about 0.02% less weight of the concentration of lubricant at the second local minimum if the ratio of the cross-sectional area in square millimeters to the circumference in millimeters is less than about 20:1.

4,915,977

METHOD OF FORMING A DIAMOND FILM

Koji Okamoto; Masayasu Tanjo, and Eiji Kamijo, all of Kyoto, Japan, assignors to Nissin Electric Co., Ltd., Kyoto, Japan

Filed Feb. 25, 1988, Ser. No. 160,261

Claims priority, application Japan, Feb. 26, 1987, 62-43861

Int. Cl.[4] B05D *3/06*

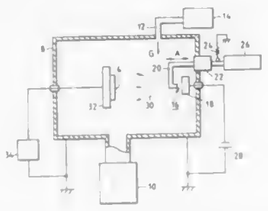
U.S. Cl. 427—37 10 Claims

1. A method of forming a diamond film on a substrate comprising the steps of:

introducing a gas selected from the group consisting of inert gases, hydrocarbon series gases, organic compound series gases and mixtures thereof into a vacuum vessel to contact a substrate housed in said vessel; and

evaporating carbon onto said substrate by arc discharge at a

carbon cathode housed in said vacuum vessel, while applying a negative bias voltage to said substrate or to a



holder for holding said substrate to deposit carbon on said substrate thereby forming said diamond film.

4,915,978

METHOD AND DEVICE FOR FORMING A LAYER BY PLASMA-CHEMICAL PROCESS

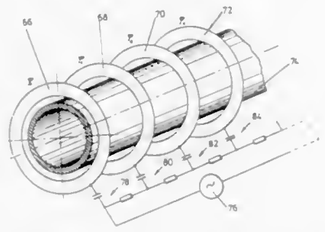
Hilmar von Campe, Bad Homburg; Dietmar Liedtke, Nidderau; Berthold Schum, Biebergemünd, and Jörg Wöner, Grobkrotzenburg, all of Fed. Rep. of Germany, assignors to Nukem GmbH, Main, Fed. Rep. of Germany

Continuation of Ser. No. 84,559, Aug. 12, 1987, abandoned. This application Dec. 8, 1988, Ser. No. 281,874

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1986, 3629000

Int. Cl.[4] B05D *3/06*; C23C *14/00, 16/00*

U.S. Cl. 427—38 6 Claims



1. A device for forming at least one layer on a surface of a substrate by a plasma-chemical process, comprising an evacuatable reaction chamber, at least three electrodes mounted in said chamber a voltage source operatively connected to said electrodes so as to increase or decrease the potential over all of said at least three electrodes and to establish a potential difference ΔU between adjacent electrodes which is identical in each case and at least one supply device for introducing the gas required for the process whereby the electrodes form an envelope corresponding to the pattern of the electrical field between the electrodes, and means for mounting a substrate in said chamber so that the pattern of the electrical field runs parallel or nearly parallel to the surface of said substrate, said supply device so that gas is emmittable to said surface with even distribution and means for drawing off the used gas directly from said surface.

6. A plasma-chemical process for forming at least one large-area layer on a surface of a substrate, using at least three electrodes formed as rod or ring electrodes mounted in an evacuable reaction chamber, said process comprising operatively connecting said at least three electrodes to a power supply so that a potential exists over all of said at least three electrodes which increases or decreases progressively from electrode-to-electrode by an increment ΔU between adjacent electrodes, the potential difference between successive electrodes being, in each case, of the same magnitude, thereby producing an electric field between the electrodes which is parallel to an area or envelope defined by the electrodes and the spaces between them,

positioning the surface of the substrate substantially parallel to the area or envelope defined by the electrodes and the spaces between them so as to prevent ion and electron bombardment of said surface,

flowing gas into said chamber directly between or through said electrodes onto said surface which is to be developed by the plasma-chemical process

and drawing off used gas directly from the surface of said substrate.

4,915,979

SEMICONDUCTOR WAFER TREATING DEVICE UTILIZING ECR PLASMA

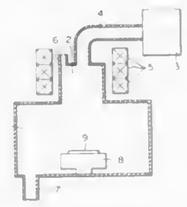
Tomoaki Ishida; Nobuo Fujiwara; Kyusaku Nishioka; Moriaki Akazawa; Teruo Shibano, and Kenji Kawai, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 2, 1988, Ser. No. 279,016

Claims priority, application Japan, Jul. 5, 1988, 63-165812

Int. Cl.[4] C23C *16/50*

U.S. Cl. 427—39 6 Claims



1. A device for treating semiconductor wafers utilizing a plasma generated electron cyclotron resonance comprising:

a first chamber accommodating support means for supporting a semiconductor wafer;

a second chamber disposed adjacent to and in communication with said first chamber;

gas supplying means for supplying a gas into said second chamber;

means coupled to said second chamber for supplying microwave energy having a frequency greater than 100 MHz and less than 2 GHz to said second chamber; and

electromagnetic means surrounding said second chamber for forming a magnetic field in said second chamber for producing an electron cyclotron resonance plasma in said second chamber and for forming a magnetic field in said first chamber diverging in a direction from said second chamber to said support means for transporting a plasma generated in said second chamber to the semiconductor wafer supported by said support means.

4. A method of treating a semiconductor wafer with a plasma comprising:

disposing a semiconductor wafer in a first chamber, the first chamber being in communication with a second chamber;

supplying a gas to the second chamber;

maintaining a subatmospheric pressure in the first and second chambers;

establishing a magnetic field in the first chamber diverging from the second chamber toward the wafer in the first chamber;

supplying microwave energy to the second chamber having a frequency greater than 100 MHz and less than 2 GHz to establish a plasma in the second chamber; and

establishing a magnetic field in the second chamber having a flux density producing electron cyclotron resonance in the plasma whereby the wafer is relatively uniformly treated over its exposed surface.

4,915,980

METHOD FOR PRODUCING AMORPHOUS METAL LAYER

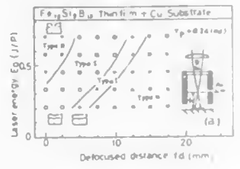
Akira Matsunawa, Nishinomiya; Seiji Katayama, Saita, and Takanori Kuroki, Munakata, all of Japan, assignors to Kuroki Kogyosho Co., Ltd., Fukuoka, Japan

Continuation of Ser. No. 102,191, Sep. 29, 1987, abandoned. This application Jul. 12, 1989, Ser. No. 379,670

Claims priority, application Japan, Sep. 30, 1986, 61-233763; Dec. 17, 1986, 61-302659

Int. Cl.[4] B05D *3/06*; C22C *00/00*

U.S. Cl. 427—53.1 6 Claims



1. A method for producing an amorphous metal layer on a substrate, comprising

(a) metallurgically bonding a material to a substrate to form a thin film of said material on said substrate, said substrate comprising a metal having a greater thermal conductivity than a thermal conductivity of said material, at least a portion of said material film being non-amorphous but easily-convertible to an amorphous state;

(b) irradiating a plurality of separate areas of said non-amorphous portion of said film with a pulse-laser to fuse said film and substrate while rapidly solidifying said film to convert said irradiated areas to a plurality of amorphous areas separated by a plurality of non-irradiated, non-amorphous areas; and

(c) eluting and dissipating said plurality of non-irradiated, non-amorphous areas.

4,915,981

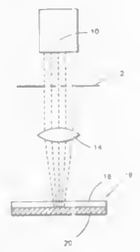
METHOD OF LASER DRILLING FLUOROPOLYMER MATERIALS

Richard T. Traskos, Brooklyn; Cathy A. Fleischer, Canterbury; Carlos L. Barton, Brooklyn, and David B. Noddin, Ledyard, all of Conn., assignors to Rogers Corporation, Rogers, Conn.

Filed Aug. 12, 1988, Ser. No. 231,693

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—53.1 16 Claims



1. A method of forming a hole through a substrate comprised of a composite, the composite including fluoropolymeric matrix material which is substantially transparent to ultraviolet radiation and at least one filler material disposed within said fluoropolymeric matrix material, the filler material interacting with said fluoropolymeric matrix material so as to render said composite absorptive to ultraviolet radiation wherein said composite defines a filled fluoropolymeric composite, the substrate further having opposed first and second surfaces, comprising the step of:

delivering ultraviolet radiation onto said first surface of said filled fluoropolymer composite substrate for sufficient time to ablate said composite and form a hole wherein said substrate is progressively ablated from said first surface to said opposed second surface.

4,915,982

METHOD OF MAKING THIN FILM PHOTOLUMINESCENT ARTICLES

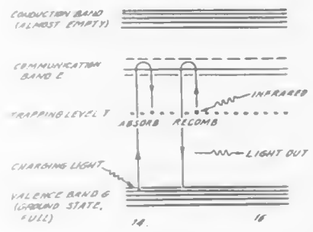
Joseph Lindmayer, Potomac, Md., assignor to Quantex Corporation, Rockville, Md.

Continuation-in-part of Ser. No. 870,809, Jun. 5, 1986, Pat. No. 4,830,875, and a continuation-in-part of Ser. No. 870,877, Jun. 5, 1986, Pat. No. 4,864,536, Continuation-in-part of Ser. No. 786,095, Oct. 10, 1985, Pat. No. 4,705,952. This application Apr. 21, 1988, Ser. No. 184,263

The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.

Int. Cl.[4] B05D *5/06, 5/12*

U.S. Cl. 427—69 11 Claims



1. A process for preparing a photoluminescent article, comprising the steps of:

mixing,

a base material selected from the group of alkaline earth metal sulfides and mixtures thereof,

a first dopant for establishing a election trapping level, and

a second dopant for establishing an communication ban for luminescence;

depositing the mixture in a thickness on the order of microns such a non-interactive substrate using a vapor deposition technique; and

heating the mixture and substrate to a temperature at which crystallization of said mixture occurs without degrading the integrity of the substrate, to form a continuous thin film electron trapping storage type photoluminescent article.

4,915,983

MULTILAYER CIRCUIT BOARD FABRICATION PROCESS

Harold Lake, Sharon, and Paul E. Grandmont, Franklin, both of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Jun. 10, 1985, Ser. No. 742,747

Int. Cl.[4] B05D *5/12*; H05K *3/06, 3/42, 3/46*

U.S. Cl. 427—98 23 Claims

1. A method of fabricating an electrical interconnection board, comprising

defining a conductive metal pattern on one side of a permanent insulating film layer,

applying said insulating layer to a metal conductor bearing

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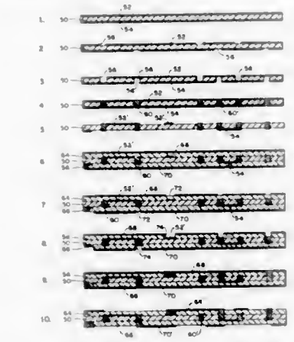
substrate with the conductive pattern side down adjacent to said substrate surface,

aperturing said insulating layer in a predetermined pattern so as to expose underlying metal sites, and



plating up with metal from said exposed metal sites to fill the apertures in said insulating layer to form solid conductors and interlayer vias.

4,915,984

PROCESS FOR PRODUCING GRAPHITE FILMS AND FIBERS

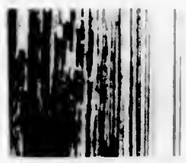
Mutsuaki Murakami, Tokyo, Japan, assignor to Reserach Development Corp., Tokyo and Matsushita Electric Industrial, Osaka, both of, Japan, a part interest to each

Continuation of Ser. No. 886,292, May 23, 1986, abandoned. This application Jun. 7, 1988, Ser. No. 205,580

Claims priority, applicatioo Japan, May 30, 1985, 60-115417; Jun. 28, 1985, 60-140207

Int. Cl.[4] D01F *9/14;* B29C *71/02*

U.S. Cl. 427—113 5 Claims



1μm

1. A process for producing graphite film and fiber at a lower graphitization temperature, which comprises preliminarily heat treating a film or fiber of at least one polymer selected from the group consisting of a polyoxadiazole, polybenzothiazoles, a polybenzobisthiazole, a polybenzoxazole, a polybenzobisoxazole and a polythiazole, under tension, at a temperature of 400° to 700° C., in vacuo or in an inert gas, without the presence of oxygen, to convert the film or fiber to a hetero-atom-containing condensed-polycyclic structure having the orientation of the polymer, and then heat treating the film or fiber at a temperature of at least 1800° C., for at least 30 minutes, in vacuo or in an inert gas, thereby graphitizing the film or fiber to produce a film or fiber having an improved graphite content of at least 17%.

4,915,985

PROCESS FOR FORMING ARTICLES OF FILLED INTRINSICALLY CONDUCTIVE POLYMERS

MacRae Maxfield, Plainfield; Lawrence W. Shacklette, and Sharon Gould, both of Maplewood, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation of Ser. No. 762,357, Aug. 5, 1985, abandoned. This application Aug. 15, 1986, Ser. No. 895,596

Int. Cl.[4] B05D *5/12*

U.S. Cl. 427—126.6 22 Claims

1. A process for fabricating a composite comprising a substrate having a conjugated backbone polymer or polymer adhering to the surface thereof, said process comprising contacting a gas, suspension or solution of a monomer, monomers or other precursor of said polymer with a substrate having a catalyst for the polymerization of said monomer, monomers or other precursors bonded to the surface thereof or as a part of said surface thereby forming a layer of said polymer on the surface of said substrate bonded to said catalyst bonded to or a part of the surface of said substrate wherein said substrate has a catalyst bonded to the surface thereof formed by derivatizing the surface of said substrate with an active polymerization catalyst prior to contacting said substrate with said monomer, monomers or precursors.

4,915,986

OPTICAL LENS TINTING MACHINE

Tariq J. Elias, and Hani E. Chika, both of 4521 Park Blvd., San Diego, Calif. 92116

Filed Mar. 7, 1988, Ser. No. 165,235

Int. Cl.[4] B05D *5/06;* B05C *11/00*

U.S. Cl. 427—164 9 Claims

1. An eye glass lens dipping machine for dipping lenses held in a lens holder at least partially into a vat of dye to tint the lenses, said machine comprising:

a. a base;

b. support means extending from said base for suspending said lens holder;

c. controlled motor means for causing said support means to move such that lenses in a lens holder suspended therefrom are at least partially dipped in dye in said vat of dye during an immersion stroke, and lifted out of the dye on an upstroke;

d. a microprocessor based controlled which controls said controlled motor means and causes same to continuously reciprocate said support means and lenses in a lens holder suspended thereby after said immersion stroke during a dye absorbing cycle to stir the dye in said vat to prevent streaking and blotching from occurring on said lenses due to localized temperature and dye density gradients in said dye;

e. said dye absorbing cycle being a gradient tint cycle and

said support means being caused by said controlled motor means controlled by said microprocessor based controller to reciprocate said lens holder alternately up and down with the up distance greater than the down distance greater than the down distance so that up-side down lenses held in said lens holder have their upper regions immersed in the dye longer than the lower regions to create a gradient tint;

f. said gradient tint cycle comprising a plurality of identical repeated periods with each period comprising a series of laps with each lap in each period being substantially similar to the prior lap except that the lenses being the respective lap higher in the dye than they did in the prior lap; and

g. said microprocessor based controller being programmed to drive said controlled motor means such that when said gradient tint cycle is graphed with its instantaneous vertical positioned plotted against time, each period results in a sawtooth superimposed on a sawtooth.

4,915,987

METHOD OF IMPROVING QUALITY OF SURFACE OF SOLID PARTICLES AND APPARATUS THEREOF

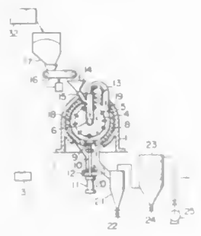
Yorioki Nara, Tokyo, and Masumi Koishi, Sagamihara, both of Japan, assignors to Nara Machinery Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 903,145, Sep. 3, 1986, abandoned. This application Apr. 11, 1988, Ser. No. 183,297

Claims priority, application Japan, Oct. 7, 1985, 60-223158; Dec. 13, 1985, 60-280272; Mar. 22, 1986, 61-64317; Apr. 23, 1986, 61-94172; May 7, 1986, 61-104527; Jun. 17, 1986, 61-140993

Int. Cl.[4] B45D *1/12*

U.S. Cl. 427—180 28 Claims



12. A method for improving the surface quality of solid particles by impacting the surface of said solid particles with fine particles smaller in size than said solid particles, utilizing a collision chamber and a rotating plate having a plurality of impact pins extending from the surface thereof, said rotating plate being rotatably disposed within said collision chamber, which comprises

introducing said solid particles and fine smaller particles into said collision chamber,

rotating the rotating plate at a peripheral speed of 5 to 160 m/sec to create a high speed gas flow within said collision chamber, said gas flow serving to conduct and circulate said solid particles and fine smaller particles within said collision chamber to form a circulating cycle of enormous speed and circulation frequency whereby the smaller fine particles are caused to impact upon and be fixed to the surface of the solid particles thereby improving the surface quality of the solid particles.

4,915,988

CHEMICAL VAPOR DEPOSITION OF GROUP IIA METALS AND PRECURSORS THEREFOR

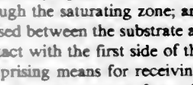
Ahmet Erbil, Atlanta, Ga., assignor to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Jun. 22, 1988, Ser. No. 209,999

Int. Cl.[4] G23C *16/00*

U.S. Cl. 427—252 16 Claims

1. A process chemical vapor deposition for depositing a metallic coating on a heated substrate by thermal decomposition of an organometallic compound, said process comprising contacting an organmetallic compound of the formula



where M is magnesium, calcium, strontium or barium or a mixture thereof and R is an alkyl or alkenyl radical containing from 2 to about 6 carbon atoms, with said heated substrate, said substrate being at a temperature above the decomposition temperature of said organometallic compound.

4,915,989

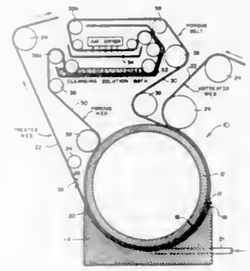
PRESSURE SATURATOR AND METHOD

Howard K. Measer, Plymouth, Ind., and Eliot R. Long, Arlington Heights, Ill., assignors to Miply Equipment, Inc., Plymouth, Ind.

Continuation-in-part of Ser. No. 230,742, Aug. 9, 1988, abandoned. This application Sep. 12, 1988, Ser. No. 243,583

Int. Cl.[4] B05D *1/18*

U.S. Cl. 427—434.2 38 Claims



1. A pressure saturator comprising:

first and second elements configured to define a saturating zone therebetween;

means for passing a substrate through the saturating zone with a first side of the substrate adjacent the first element;

means for introducing a liquid saturant into the saturating zone such that the saturant contacts a second side of the substrate and impregnates the substrate as the substrate passes through the saturating zone; and

a belt interposed between the substrate and the first element and in contact with the first side of the substrate;

said belt comprising means for receiving gases and at least some of any excess saturant from the first side of the substrate as the saturant enters the substrate in the saturating zone, thereby protecting the first element from contact with the saturant.

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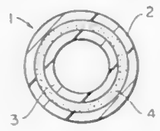
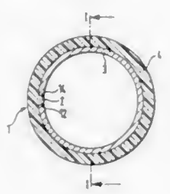
4,915,990
METHOD OF, AND ELASTOMERIC COMPOSITION FOR, PROTECTING A SUBSTRATE
Rong J. Chang, Fremont, Calif., assignor to Raychem Corporation, Menlo Park, Calif.
Continuation of Ser. No. 20,633, Mar. 2, 1987, abandoned. This application Feb. 25, 1988, Ser. No. 160,228
Int. Cl.[4] F16L *11/00*; B32B *31/00*
U.S. Cl. 428—34.9 32 Claims



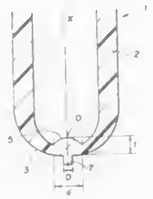
1. An article for environmentally protecting a substrate, which comprises an elastomeric tubular article and a hold-out member by means of which said elastomeric article is maintained in a stretched configuration, said elastomeric article:
(a) having when relaxed an elongation at break of at least 5%,
(b) having a tear strength of at least 3 Kg per linear cm,
(c) having a modulus of M_{100} of 1.4–17.6 Kg per sq. cm, and
(d) comprising a curable elastomeric composition which has been partially cured and which comprises an elastomeric composition and a curable component dispersed therein,
the article being capable of being positioned around the substrate while maintained in a stretched configuration, such that while maintained in a stretched configuration, such that when released from the hold-out member the elastomeric article engages the substrate, the elastomeric article after further curing of the composition:
(a) having a tear strength of at least 5 Kg per linear cm, and
(b) having a modulus, M_{100} of at least 3.5 Kg per sq. cm.

4,915,991
NOVEL STRUCTURAL ELEMENT
Jürgen Rabe, Aurachtal, Fed. Rep. of Germany, assignor to INA Walzlager Schaeffler KG, Fed. Rep. of Germany
Division of Ser. No. 105,548, Oct. 5, 1987, Pat. No. 4,800,057. This application Sep. 12, 1988, Ser. No. 243,442
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1986, 3635247
Int. Cl.[4] B32B *15/08*
U.S. Cl. 428—35.8 5 Claims



1. A structural element comprises a metallic sleeve retained in a resiliently expanded condition and provided with a continuous axial slot at a circumferential area and an outer surface completely surrounded by a polymeric jacket produced by the process comprising producing a metallic sleeve (3,18) with an inner diameter corresponding to a maximum of the inner diameter of the finished structural element (1,16) surrounding said sleeve with the jacket (4,17) in an injection molding apparatus (5) provided with a core (8) for receiving the metallic sleeve (3,18) and elastically widening the metallic sleeve (3,18) when placed on the core (8), closing the molding apparatus and injecting polymeric material into the molding apparatus whereby the slot (2,19) of the metallic sleeve (3,18) is at least partially filled with the material of the jacket (4,17) during formation of the jacket (4,17) so that the boundary surfaces of the slot (2,19) of the metallic sleeve (3,18) are at least partially covered.

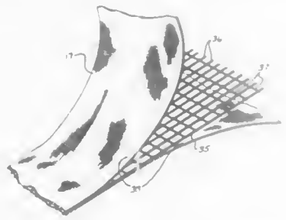
4,915,992
PARISON FOR STRETCH MOLDING
Nobuyuki Takakusaki, Yokohama, and Kohei Shimojima, Tokyo, both of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan
Filed Sep. 8, 1988, Ser. No. 241,613
Claims priority, application Japan, Sep. 11, 1987, 62-227665
Int. Cl.[4] B65D *1/00*
U.S. Cl. 428—36.92 2 Claims



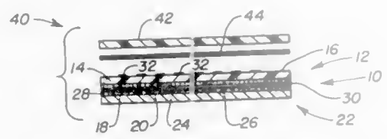
1. A parison for stretch molding said parison being produced by injection molding and having a central axis, said parison comprising a sidewall which forms a barrel portion of a hollow vessel during blow molding, said side wall being radially spaced from and surrounding said central axis, a bottom wall which continues from said side wall and forms a bottom wall of said vessel during said blow molding, said bottom wall having an internal periphery and an external periphery, and a padding portion which is gradually made thin outward in the radial direction substantially from a central portion of said bottom wall and which is provided in the internal periphery of said bottom wall;
wherein said padding portion has a circular cross-section in a plane perpendicular to said central axis with said circular cross-section having a maximum diameter d adjacent said internal periphery of said bottom wall;
said parison being further provided with a burr portion produced during said injection molding, said burr being located at said central portion of said bottom wall on the external periphery of said bottom wall, said burr having a circular cross-section in a plane perpendicular to said central axis, with said circular cross-section having a maximum diameter D;
wherein said maximum diameter d of said padding circular cross-section is greater than the maximum diameter D of said burr circular cross-section.

4,915,993
ZIGZAG FOLDED TOWEL PACKET FOR USE WITH TOWEL DISPENSING APPARATUS
Anne W. Ten Wolde, Bentveld, Netherlands, assignor to Vendor Holding B.V., Netherlands
Continuation-in-part of Ser. No. 020,707, Mar. 2, 1987, abandoned, which is a division of Ser. No. 741,704, Jun. 5, 1985, abandoned, which is a continuation of Ser. No. 534,600, Sep. 22, 1983, abandoned. This application Apr. 19, 1989, Ser. No. 341,291
Int. Cl.[4] B32B *5/08*
U.S. Cl. 428—40 4 Claims

1. A packet of toweling adapted to be dispensed for hand drying from an apparatus having a supply chamber from which the toweling is manually withdrawn for use and a storage roller operable in response to the withdrawal of toweling to roll up and store the used wet toweling, said packet comprising a zigzag folded, continuous web of paper material extending between first and second web ends, said paper material having a reinforcement for providing said web with a tensile strength sufficient to prevent tearing during withdrawal, use and rolling up, said reinforcement comprising a fabric of synthetic threads disposed in a grid-pattern with the threads extending in directions longitudinally and transversely of the paper web, said longitudinally extending threads being more closely spaced than said transversely extending threads, said web having an adhesive area on the exposed surface adjacent one of said ends by which an additional, similar packet may be joined to said packet, said adhesive area having a removable cover.

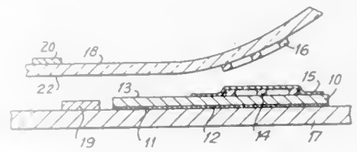


4,915,994
DIMENSIONALLY STABLE PRESSURE SENSITIVE LABEL
Larry J. Begelfer, York; Scott L. Hoofnagle, Spring Grove, and Paul H. Yeagle, York, all of Pa., assignors to York Tape and Label Company, York, Pa.
Filed Oct. 24, 1988, Ser. No. 261,676
Int. Cl.[4] B32B *7/06*
U.S. Cl. 428—40 5 Claims



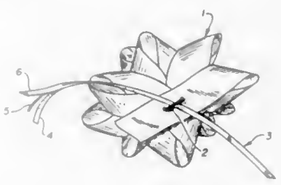
1. A dimensionally stable pressure sensitive label for distortion free utilization upon support surfaces in high temperature application environments of up to 800-degrees Fahrenheit, comprising in combination a face stock material having applied to the lower inward facing surface thereof an adhesive bonding primer and imprinted upon the upper outward facing surface thereof a printing of machine and human readable matter, a carrier lining backing paper having applied thereto a silicone release medium, an adhesive film laminately bonding the lower inward facing surface of said face stock material to said silicone release medium to form a pressure sensitive laminate label structure, and a heat resistant dimensionally stable insulating cover film component comprised of a high polymer having an imide group in the polymer chain being laminately bonded to the upper outward facing surface of said face stock material upon said printing by means of a bonding adhesive component to thereby form said dimensionally stable pressure sensitive label.

4,915,995
INDEX MARKING ARTICLE FOR SUPERPOSED SHEETS
Benjamin Smolen, 10 Reed Ct., Great Neck, N.Y. 11024
Filed Apr. 17, 1989, Ser. No. 338,621
Int. Cl.[4] B32B *7/06*; C09J *7/02*
U.S. Cl. 428—40 2 Claims



1. An article for applying index marks in precise superposed relation on a juxtaposed pair of receiver sheets comprising a carrier sheet having a first and a second surface, adhesive means on said first surface for fixedly mounting said carrier sheet to a receiver sheet, said second surface of said carrier sheet including a first index mark fixedly bonded thereto, a release coat superposed over said first index mark, a second index mark releasibly supported on said release coat in precise registry with said first index mark, said second index mark comprising an opaque dry transfer mass including pressure activated adhesive components integrated therein and exposed at the surface of said second index mark remote from said release coat.

4,915,996
TWIST-TIE
Thomas J. Curry, Wantagh, N.Y., assignor to Bleyer Industries, Inc., Lynbrook, N.Y.
Filed Aug. 4, 1988, Ser. No. 228,292
Int. Cl.[4] B32B *7/12*; D04D *7/10*; B65D *77/10*
U.S. Cl. 428—40 10 Claims



1. A twist-tie comprising:
a base layer;
flexible wire stiffening means affixed to said base layer for securing said twist-tie to a surface;
an adhesive formed on said base layer for enabling said twist-tie to be affixed to a surface; and
peelable means covering said adhesive and peelably secured to said base layer by said adhesive to expose said adhesive to said surface;
said wire-stiffening means disposed between said base layer and said peelable means, and said peelable means at least as large as said adhesive.

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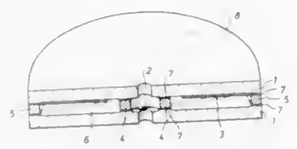
4,915,997

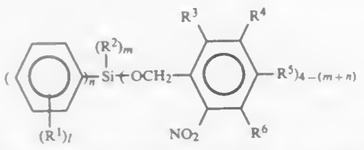
OPTICAL INFORMATION RECORDING MEDIUM

Tetsu Yamamuro, Yamato; Yotaka Ueda, Yokohama, and Eiji Noda, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 3, 1988, Ser. No. 252,559
Claims priority, application Japan, Oct. 6, 1987, 62-251874; Jul. 18, 1988, 63-179983
Int. Cl.[4] B32B *3/02*
U.S. Cl. 428—64 5 Claims



3. An optical information recording medium comprising a pair of substrates at least one of which has a recording layer on a part of one side thereof, which are placed opposingly to each other so that said recording layer is positioned on the inside and which are bonded to each other by photopolymerizable adhesive layer(s) with or without spacer(s) therebetween to form a sealed structure, said adhesive layer being composed of a cured adhesive formed from a composition comprising (a) an epoxy resin, (b) a photolyzable organosilicon composition of 0.55 to 37.5% by weight based on the epoxy resin, which the photolyzable organosilicon composition comprises a mixture of (b-1) a photolyzable organosilicon compound represented by the following formula (I):



(I)

(wherein R^1 represents a fluorine atom: R^2 represents a lower alkyl group, a lower unsaturated alkyl group and aromatic group, and is the same or different from each other when m is 2; R^3, R^4, R^5 and R^6 are the same or different from each other, and represent a hydrogen atom, a halogen atom, an alkyl group, an aryl group, a nitro group, a cyano group and an alkoxy group; l is an integer of 1 to 5; m is 0, 1 and 2; and n is an integer of 1 to 3, but $m+n \leqq 3$), and (b-2) a silicon compound having at least one phenyl group having no substituents and at least one o-nitrobenzyloxy group having a substituent or no substituents, the amount of the silicon compound being in the range of from 0.1 to 1.5 times by weight as large as the photolyzable organosilicon compound, and (c) an aluminum complex compound of 0.01 to 10% by weight based on the epoxy resin.

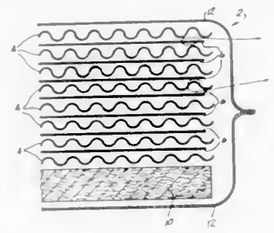
4,915,998

THERMAL INSULATION BLANKET

Edmund K. Parenti, Jr., Manchester, and George T. Suljak, Vernon, both of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Filed Aug. 24, 1988, Ser. No. 236,095
Int. Cl.[4] B32B *3/02, 7/02, 15/14*
U.S. Cl. 428—76 7 Claims

1. A thermal insulation blanket suitable for use in vacuum and ambient air environments, said blanket comprising: a plurality of metalized film layers interleaved with intervening ceramic fiber glass layers; a layer of a pliant thermal insulating material disposed on one side of said interleaved film and fiber glass layers, said pliant material layer imparting a pliancy to said blanket which enables said blanket to closely conform to the contours of any object about which it is wrapped; said interleaved film and fiber glass layers, as well as said pliant



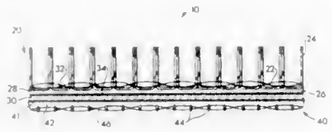
material layer being contained in a fiber glass cloth outer envelope and; said pliant material layer being significantly thicker than the sum total of said interleaved film and fiber glass layers, in the order of at least four times.

4,915,999

CARPET PRODUCT WITH INTEGRAL BALANCING LAYER

John G. Tillotson, 1311 Dana Dr., Dalton, Ga. 30720

Filed Feb. 6, 1989, Ser. No. 306,940
Int. Cl.[4] B32B *3/02, 33/00*
U.S. Cl. 428—95 16 Claims



1. A carpet product comprising:
a pile fabric layer having an upper face side and a lower back side;
a stabilizing layer having upper and lower sides, said upper side of said stabilizing layer being superposed on the back side of said pile fabric layer and adhered thereto to provide dimensional stability against stresses applied against the face of said pile fabric layer; and
a balancing layer having an upper side, said balancing layer being superposed on said lower said of said stabilizing layer and adhered thereto, and said balancing layer having thermal response and water absorption characteristics similar to the thermal response and water absorption characteristics of said pile fabric layer,
whereby bending forces exerted by said pile fabric layer experiencing dimensional changes resulting from thermal changes or water absorption are counteracted by substantially equal bending forces exerted by said balancing layer experiencing similar dimensional changes resulting from said thermal changes or water absorption,
whereby said carpet product resists bending in response to temperature extremes and variations in ambient humidity.

4,916,000

BALLISTIC-RESISTANT COMPOSITE ARTICLE

Hsin L. Li; Dusan C. Prevorsek; Gary A. Harpell, and Young D. Kwon, all of Morris, N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jul. 13, 1987, Ser. No. 62,998
Int. Cl.[4] H32B *5/12*
U.S. Cl. 428—105 58 Claims

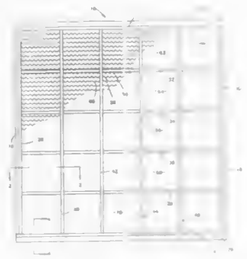
1. An impact resistance composite comprised of one or more layers; at least one of said layers comprising a network of filaments having a tensile modulus of at least about 150 g/denier, and an energy-to-break of at least about 8 j/g and a tenacity equal to or greater than about 7 g/denier in a matrix wherein, the ratio of the thickness of said layer to the equivalent diameter of said filaments is equal to or less than about 12.8.

4,916,001

UNITIZED CATALYST PANEL

William A. Whittenberger, Garrettsville, Ohio, and Steven S. Edson, Elkridge, Md., assignors to W.R. Grace & Co.-Conn., New York, N.Y.

Filed May 24, 1988, Ser. No. 197,993
Int. Cl.[4] K32B *3/12*
U.S. Cl. 428—116 17 Claims



1. A rectangular unitized monolithic honeycomb catalyst panel comprising
parallel top and bottom frame plates, and parallel side frame plates orthogonally related thereto,
a plurality of parallel stiffener bars at spaced intervals extending between said top and bottom frame plates from both the front and rear marginal edges of said top and bottom frame plates,
parallel stop bars lying against the inside surface of each of said side plates and extending between said top and bottom frame plates;
a plurality of parallel notched separator plates extending between said side plates with the front and rear stop bars and stiffener bars occupying said notches whereby a grid of uniformly sized rectangles is defined, and
a plurality of nonnesting corrugated catalyst supporting metal foil laminations adapted for contacting exhaust gases flowing from the front to the rear of the panel, said metal foil laminations filling
the spaces between said separator plates, and
the space between the uppermost separator plate and the adjacent top frame plate and
the space between the lowermost separator plate and the bottom frame plate.

4,916,002

MICROCASTING OF MICROMINIATURE TIPS

Thomas E. Carver, Mountain View, Calif., assignor to The Board of Trustees of the Leland Jr. University, Stanford, Calif.

Filed Jan. 13, 1989, Ser. No. 297,059
Int. Cl.[4] B32B *3/10*; H01L *21/306*; B44C *1/22*; C03C *15/00*
U.S. Cl. 428—139 26 Claims

13. A microminiature tip assembly, comprising:
a support arm member having an aperture formed therein;
a microminiature tip member having a base portion engaged by said support arm member within said aperture, said microminiature tip also having a body portion extending from said base portion and tapering inward to a predetermined extent, said body portion having a polygon cross section at any point along its length.

4,916,003

HEAT-FORMED COMPOSITE PANELS

Alain Le Sech, Tassin La Demi Lune; Pierre-Francois Boilly, Champillon; Rene Gest, and Pierre Egly, both of Rantigny, all of France, assignors to Isover Saint-Gobain and Societe Kerlane, both of Courbevoie, France

Filed Sep. 12, 1988, Ser. No. 243,458
Claims priority, application France, Sep. 10, 1987, 87 12548
Int. Cl.[4] B29C *1/00*; B29L *9/00*; B32B *15/14, 17/04, 19/04*
U.S. Cl. 428—174 10 Claims

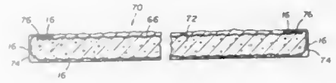
1. A composite molded panel composed of at least one layer of fibers impregnated with a mineral binder, an intermediate layer impervious to water and water vapor and a layer of fibers impregnated with an organic binder on the side of said intermediate layer opposite said mineral binder.

4,916,004

CEMENT BOARD HAVING REINFORCED EDGES

Robert P. Ensminger, Carman; Robert E. McCleary, Geneva, and Ladwig Wenzlow-Lukasch, Deerfield, all of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Continuation-in-part of Ser. No. 831,706, Feb. 20, 1986, abandoned. This application Dec. 27, 1988, Ser. No. 290,841
Int. Cl.[4] B32B *23/02*
U.S. Cl. 428—192 8 Claims



1. A cement board consisting essentially of a core, a bottom surface, a top surface, uniform longitudinal edge surfaces, and a mesh of reinforcing glass fibers embedded in the core just beneath said surfaces.

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4,916,005

DIAPER ARTICLE WITH ELASTICIZED WAIST PANEL

Mary E. Lippert, Outagamie County; Kenneth M. Enloe, Winnebago County; Debra J. Koch, Winnebago County; Thomas H. Roessler, Winnebago County, and Patrick A. Pazdernik, Winnebago County, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 108,515, Oct. 13, 1987, Pat. No. 4,861,652. This application May 15, 1989, Ser. No. 351,906
The portion of the term of this patent subsequent to Aug. 29, 2006, has been disclaimed.
Int. Cl.[4] A61F *13/18;* B05D *5/00*
U.S. Cl. 428—192 44 Claims

1. An absorbent article, comprising:
(a) a substantially liquid impermeable backsheet layer which delimits at least one waistband portion of said article;
(b) a substantially liquid permeable topsheet layer which is located in facing relation with an inner surface of said backsheet layer;
(c) an absorbent body located between said topsheet layer and said backsheet layer; and
(d) an elastic member connected to a selected surface of said waistband portion, said elastic member comprising an elastomeric nonwoven fibrous web material which is arranged to gather and shirr said waistband portion and is composed of at least one layer of nonwoven fabric secured to a meltblown fibrous elastic layer, said elastic member having an untensioned bulk thickness of at least about 0.025 in, and said backsheet layer, topsheet layer and elastic member providing a composite waistband which has an untensioned total bulk thickness of at least about 0.050 in.

4,916,006

HEAT-SENSITIVE TRANSFER RIBBON

Kyoichi Yamamoto, Sagamihara; Akira Mizobuchi, Tokyo; Yasuo Sato, Funabashi; Takayasu Hirano, Chiba; Nobuhiko Ikebayashi, Hino, and Hirokatsu Imamura, Tokyo, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

PCT No. PCT/JP87/00168, § 371 Date Nov. 13, 1987, § 102(e) Date Nov. 13, 1987, PCT Pub. No. WO87/05564, PCT Pub. Date Sep. 24, 1987
PCT Filed Mar. 18, 1987, Ser. No. 130,871
Claims priority, application Japan, Mar. 18, 1986, 61-60185
Int. Cl.[4] B41M *5/26*
U.S. Cl. 428—195 13 Claims

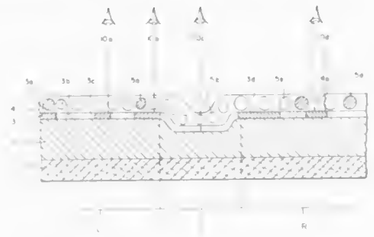
1. A heat-sensitive transfer ribbon having a heat-fusible ink layer produced on one surface of a polyester base film and a heat-resistant protective layer provided on the other surface, said heat-resistant protective layer comprising (a) a chlorinated 4-methyl-1-pentene polymer or a carbonyl or carboxyl derivative thereof, and (b) an amorphous linear saturated polyester.

4,916,007

UNDERPRINTED INLAID SHEET MATERIALS HAVING UNIQUE DECORATIVE DESIGN EFFECTS

Andrew J. Manning, Randolph, N.J.; Edward F. Lussi, Bethlehem, and William R. Marley, Saylorsburg, both of Pa., assignors to Tarkett Inc., Parsippany, N.J.

Filed Oct. 18, 1985, Ser. No. 789,026
Int. Cl.[4] B32B *3/10*
U.S. Cl. 428—203 17 Claims



1. An underprinted inlaid sheet product having unique design effects comprising:
(a) a substrate,
(b) a first layer of a resinous polymer composition,
(c) a pattern or design, printed on the surface of said first layer and having two or more distinguishably different, colored, printed portions, and
(d) a second layer of a resinous polymer composition overlying and in contact with the printed surface of said first layer and containing colored particles having one or more colors substantially uniformly dispersed throughout said second layer, wherein the color differences between the colors of said colored particles and the colors of said printed pattern or design are between about 0 and about 20 CIE units, so that when the finished product is viewed, the colors of said printed pattern or design show through said second layer, and combine with the colors of said colored particles

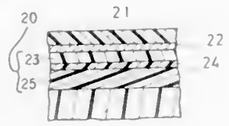
whereby said sheet product exhibits an inlaid appearance with visual depth.

4,916,008

PLASTIC MOLDING

Kenji Katayama, and Masayoshi Kozuka, both of Anjyo, Japan, assignors to Inoue MTP Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 10, 1988, Ser. No. 269,828
Claims priority, application Japan, May 26, 1988, 63-69724[U]
Int. Cl.[4] B32B *3/10, 15/08*
U.S. Cl. 428—205 6 Claims



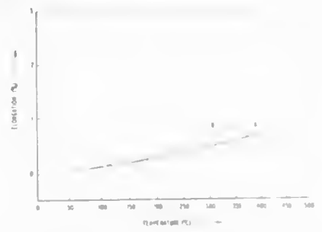
1. A plastic molding, comprising: a plastic substrate and a decorative film or sheet having an outermost protecting layer of fluoroplastics being metallized on one surface, an intermediate layer of an ethylene-acrylic acid copolymer laminated on the metal layer, and an innermost backing layer adhered to the intermediate layer by an adhesive layer, said backing layer of said decorative film or sheet being molten to be adhered onto the plastic substrate, so that the backing layer comes into contact with the plastic substrate.

4,916,009

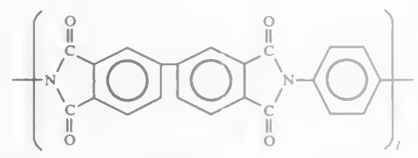
FLEXIBLE PRINTING BASE

Atsushi Hino, and Yuzuru Noda, both of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

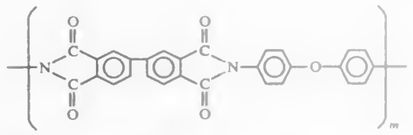
Filed Jul. 27, 1988, Ser. No. 224,612
Int. Cl.[4] B32B *15/08*
U.S. Cl. 428—220 6 Claims



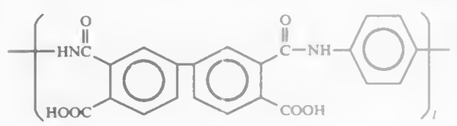
1. A flexible printing base comprising a metal foil having formed thereon a polyimide layer, wherein said copper foil has a centerline average roughness of not more than 0.7 μm, and said polyimide mainly comprises a repeating unit represented by formula (I):


(I)

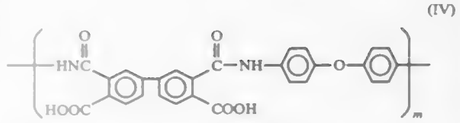
and a repeating unit represented by formula (II):


(II)

wherein l : m=x : y, wherein x represents a number not less than 45 and less than 70; y represents a number more than 30 and not more than 55; and x + y = 100, said polyimide layer is formed by applying a solution of a polyamic acid mainly comprising a repeating unit represented by formula (III):


(III)

and a repeating unit represented by formula (IV):


(IV)

wherein l and m are as defined above, in N,N'-dimethylformamide and/or N,N'-dimethylacetamide on a metal foil, followed by imidation.

6. A flexible printing base as claimed in claim 1, wherein said polyimide film has a thickness of from 5 to 200 μm.

4,916,010

STAMPING-MOLDABLE MATERIAL

Yoshihiro Yamana, and Yasuhira Takeuchi, both of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Jun. 21, 1988, Ser. No. 210,415
Claims priority, application Japan, Jun. 25, 1987, 62-159171
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—283 10 Claims

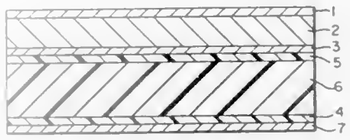
1 A stampable material comprising:
(i) a thermoplastic resin and
(ii) a reinforcing material in an amount of from 20 to 60% by weight of said stampable material, said reinforcing material comprising (a) a mat of chopped glass strands having fiber lengths of not less than 20 mm, each of said strands being bonded with a binder to others and (b) a flake-type filler, having a weight average flake diameter of not more than 100μ, in an amount of from 10 to 50% by weight of said reinforcing material.

4,916,011

ELEMENT HAVING IMPROVED ANTISTATIC LAYER

Conrad E. Miller, Hendersonville, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 275,956, Nov. 25, 1988, Pat. No. 4,859,570. This application Jul. 20, 1989, Ser. No. 383,328
Int. Cl.[4] G03C *1/76*
U.S. Cl. 428—341 14 Claims



1. An element comprising a polymeric-shaped article having carboxyl groups attached to the surface thereof and which is coated with at least one permanent antistatic layer consisting essentially of the reaction product of
(1) a water-soluble, electrically conductive polymer having functionally attached carboxyl groups integral to the polymer, and
(2) a polyfunctional substituted aziridine wherein at least one hydrogen atom on a carbon atom of the aziridine ring is substituted with an alkyl substituent wherein alkyl is of 1

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to 6 carbon atoms, wherein the aziridine interlinks the water-soluble, electrically conductive polymer having functionally attached carboxyl groups integral to the polymer and the carboxyl groups on the surface of the shaped article to form an antistatic layer having a coating weight based on the weight of conductive polymer (1) of less than 4.5 mg/dm^2.

4,916,012

CEMENT REINFORCING FIBER

Takeo Sawanobori, Kawasaki; Yuji Noguchi, Yokohama; Hiromichi Sakai, Kitakyushu, and Kazuhiro Sone, Yokkaichi, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Continuation of Ser. No. 38,899, Apr. 16, 1987, abandoned. This application Feb. 9, 1989, Ser. No. 309,959
Claims priority, application Japan, Apr. 23, 1986, 61-93670; May 6, 1986, 61-103479
Int. Cl.[4] B32B *9/00, 15/00;* C04B *7/02*
U.S. Cl. 428—367 5 Claims

1. A cement reinforcing fiber prepared by a process comprising:

impregnating a carbon fiber with from 50 to 200% by weight, relative to said fiber, of a thermosetting epoxy resin;

coating the impregnated carbon fiber with from 10 to 200% by weight, relative to said fiber, of a styrene-butadiene rubber latex; and then curing said coated fiber.

4,916,013

ARTIFICIAL HAIR AND PRODUCTION THEREOF

Katsura Maeda; Masao Kawamoto, and Sadao Sanada, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Dec. 18, 1987, Ser. No. 135,079
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—374 3 Claims

1. Polyester-based artificial hair which comprise a plurality of filaments of different denier as defined by the formula:

$$D = X \pm a$$

where

D is the denier,

X is the average denier, which is 30 to 70 denier,

a is less than 20 denier

and the individual filaments have a roughened, pitted surface, having average interval between adjacent pits of 0.1 and 1.5 μm and from 5 to 100 pits in a planar distance of 10 μm.

4,916,014

I.R. REFLECTING PAINT

Paul Weber, 358B Saybrook La., Wallingford, Pa. 19086, and Michael R. Weber, 22 Seneca Rd., Ft. Lauderdale, Fla. 33308

Filed Oct. 30, 1987, Ser. No. 115,154
Int. Cl.[4] B32B *15/00, 17/00, 19/00*
U.S. Cl. 428—403 8 Claims

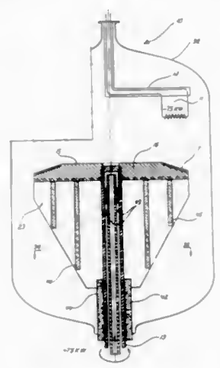
1. In a paint composition having a film forming binder the improvement which comprises incorporating into said paint composition particles of a substrate with a layer of an infrared reflecting metal, said metal being coated with a dielectric material, said particles being present in an amount effective for reflecting infrared radiation when applied to a structure.

4,916,015

HEAT DISSIPATION MEANS FOR X-RAY GENERATING TUBES

Donald R. Schaffner, Mission Viejo, and Donald H. Leeds, Rolling Hills, both of Calif., assignors to The B.F.Goodrich Company, Akron, Ohio

Division of Ser. No. 653,629, Sep. 24, 1984, Pat. No. 4,688,239. This application May 4, 1987, Ser. No. 45,495
The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.
Int. Cl.[4] B32B *9/00;* H01J *35/10;* C23C *14/00*
U.S. Cl. 428—408 1 Claim



1. A fin configured for heat radiation in an X-ray tube formed from at least one of bulk and pyrolytic graphite and having surface portions having enhanced surface emissivity imparted by ion bombardment of the surface by a stream of ions at an intensity and of a duration sufficient to impart a closed surface emittance to the bombarded surface portions of at least 0.90.

4,916,016

METAL OR PLASTIC-CLAD POLYVINYL RESIN LAMINATES

William W. Bristowe, and Hong C. Kim, both of Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.

Continuation of Ser. No. 821,769, Jan. 23, 1986, abandoned. This application Feb. 18, 1987, Ser. No. 15,894
Int. Cl.[4] B32B *15/08, 27/08;* B29C *45/00*
U.S. Cl. 428—411.1 12 Claims

1. A metal foil or plastic film-clad laminate having at least one sheet or foil or film directly bonded to a shaped resin when made by the steps comprising:

(a) forming an ethylenically unsaturated monomer solution of resins selected from the group consisting of ethylenically unsaturated polyesters, vinylesters, polyesterurethanes, methylmethacrylates, methacrylates, vinylisocyanurates, polyurethanes, polyepoxies, and polymer initiator catalysts to start polymerization, free of internal mold release agents which promote nonadhesion to mold surfaces.

(b) immediately injecting said polymerizing solution under pressure into a closed heated mold cavity wherein said mold cavity has at least one surface covered by a metal foil or plastic film, free of agents which promote nonadhesion,

(c) permitting said polymerizing solution to cure in said mold against said metal foil or plastic film under pressure, and removing a cured metal foil or plastic film-clad article from said mold.

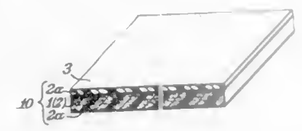
3. A product of claim 1 wherein said plastic film is selected from the group consisting of polyethersulphone, polyetherketone, nylon, polyester, polyimide, polycarbonate, and polyvinylidine fluorides.

4,916,017

SHEET MATERIAL

Haruo Nomi, 15-9, 1-chome, Sakuragaokanishi, Sanyo-cho, and Minoru Hatakeyama, 1-22, 7-chome, Sakuragaokanishi, Sanyo-cho, both of Akaiwa-gun, Japan

Filed Aug. 31, 1988, Ser. No. 238,748
Claims priority, application Japan, Sep. 10, 1987, 62-225367
Int. Cl.[4] B32B *27/04, 27/08, 27/28*
U.S. Cl. 428—413 11 Claims



1. A composite sheet material comprising a porous, expanded polytetrafluoroethylene base sheet impregnated with a first resin that has a lower heat-shrinkability than said base sheet, said impregnated base sheet having a covering layer which has a thickness of at least three (3) micrometers and which comprises a second resin whose hardening rate is lower than that of said impregnating resin.

4,916,018

OXIRANE PRIMERS FOR SMC ADHESIVES AND BONDING METHOD EMPLOYING SAME

Anil B. Goel, Worthington, and Joseph G. Holehouse, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Jul. 21, 1986, Ser. No. 887,499
Int. Cl.[4] B32B *25/38;* C09J *5/04*
U.S. Cl. 428—414 18 Claims

1. In the process for adhering the surfaces of two or more fiber reinforced plastic substrate materials to one another to form a composite structure by means of an adhesive, the improvement comprising the steps of (1) priming the surfaces with an epoxy resin, (2) applying to the primed surfaces of polyurethane adhesive, and (3) contacting the resulting surfaces to effect lamination.

4,916,019

CATIONIC ELECTRODEPOSITION COATING COMPOSITION FOR MULTILAYER FILM FORMATION

Eisaku Nakatani; Akira Tomiyaga; Haruo Nagaoka; Yoichi Masubuchi; Masafumi Kume, and Tadayoshi Hiraki, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Continuation-in-part of Ser. No. 7,898, Jan. 28, 1987, abandoned. This application Jul. 27, 1988, Ser. No. 225,292
Claims priority, application Japan, Jan. 28, 1986, 61-14730
Int. Cl.[4] C25D *13/06;* B32B *15/08, 24/38;* C08L *63/02*
U.S. Cl. 428—418 15 Claims

1. A cationic electrodeposition coating composition for forming a multilayer film, said composition comprising

(A) an epoxy-type cationic electrodepositable resin which is an addition-reaction product formed between an epoxy resin and a basic amino compound, having a surface tension of 40 to 60 dynes/cm and being capable of forming a cathodically depositable aqueous bath by neutralization with an acid,

(B) a non-ionic, non-selfcurable, film-forming resin having a surface tension of 25 to 45 dynes/cm, and

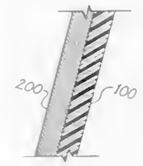
(C) a blocked polyisocyanate compound as a curing agent, the weight ratio of resin (A) to resin (B) being from 60:40 to 98:2, and the surface tension of resin (A) being at least 5 dynes/cm higher than that of resin (B), the resin (A) and the resin (B) being incompatible or difficultly compatible with each other and resin (A), resin (B) and the polyisocyanate compound (C) having substantially no ethylenically double bond.

4,916,020

REACTIVE BONDING METHOD

Wanda W. Golding, Angleton, and Bobby R. Ezzell, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 26, 1988, Ser. No. 160,796
Int. Cl.[4] B32B *15/08, 27/06*
U.S. Cl. 428—421 22 Claims

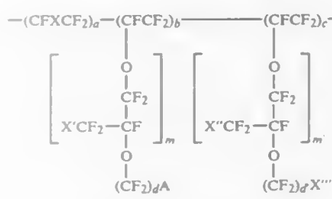


1. A composite comprising:

a functional fluoropolymer having pendant groups which terminate with a second reacting group; and

a first substrate having a first reacting group,

wherein at least a portion of the first reacting group and at least a portion of the second reacting group have reacted with each other to form covalent or ionic bonds wherein the functional fluoropolymer is represented by the formula:



where:

a and b are independently an integer greater than zero;

c is zero or an integer greater than zero;

X, X', X" and X''' are independently halogen, —CF_3 or a fluorinated alkyl having from 2 to 10 carbon atoms

m and m' are independently an integer from zero to four;

d and d' are independently an integer from one to six;

A is a sulfonic group, a carboxylic group, or a derivative thereof.

4,916,021

RADIATION CURED BINDERS INTERNETWORKED WITH SOFT MATERIALS

Dennis W. Karle, San Jose, and Zie A. Payne, Cupertino, both of Calif., assignors to Memorex Telex N.V., Amsterdam, Netherlands

Continuation of Ser. No. 454,903, Dec. 30, 1982, abandoned, which is a division of Ser. No. 240,189, Mar. 3, 1981, abandoned. This application May 6, 1987, Ser. No. 48,522
The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.
Int. Cl.[4] G11B *5/702*
U.S. Cl. 428—425.9 13 Claims

1. A magnetic recording medium including magnetic particulates in a cured resin matrix on a backing film, wherein prior to curing the resin matrix comprises a binder material includ-

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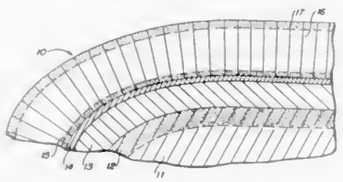
ing a radiation-curable material and a material which is not cured by radiation such that cure thereof produces an interaction yielding a soft/hard segment binder system forming a semi-interpenetrating network whose recording-related characteristics are determined by the ratio of curable to non-curable materials; this binder material comprising polyurethane and a resin amenable to radiation curing.

4,916,022

TITANIA DOPED CERAMIC THERMAL BARRIER COATINGS

Patricia A. Solfest, Chandler, and Thomas E. Strangman, Phoenix, both of Ariz., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Nov. 3, 1988, Ser. No. 267,209
Int. Cl.[4] B32B *15/04*
U.S. Cl. 428—623 **7 Claims**



1. An article of manufacture suitable for use at high temperatures in a gas turbine engine comprising:
a nickel base superalloy substrate;
a metallic, aluminum oxide forming bond coating on the substrate; said bond coating selected from the group consisting of MCrAlY, diffusion aluminides, and combinations thereof;
an insulative, vapor deposited columnar grained ceramic coating on the metallic bond coating; and
an interlayer between the bond coating and the ceramic coating which contains an oxide of titanium in a concentration of from about 0.1 to about 10 percent by weight.

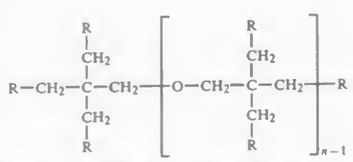
4,916,023

GEL COATING RESIN COMPOSITION AND SHAPED ARTICLE USING THE SAME

Yoshichika Kawabata; Shigeru Motomiya, and Mitsunori Ikezoe, all of Osaka, Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 201,701
Claims priority, application Japan, Jun. 5, 1987, 62-139930; Jun. 5, 1987, 62-139931; Jun. 8, 1987, 62-87536[U]; Jun. 8, 1987, 62-87537[U]
Int. Cl.[4] C08L *67/06*
U.S. Cl. 428—482 **9 Claims**

1. A gel coating resin composition comprising (A) 10 to 45 parts by weight of an unsaturated polyester with an equivalent weight per unsaturated group ranging from 140 to 330, (B) 15 to 60 parts by weight of a styrene monomer, and (C) 5 to 75 parts by weight of a polyfunctional (meth)acrylic monomer represented by the following general formula (I) and which has an equivalent weight per unsaturated group ranging from 89 to 130:



(I)

where at least four of the R groups present are (meth)acryloxy groups, with the remainder being an organic group except (meth)acryloxy groups; and n is an integer of 1 to 5.

4,916,024

MAGNETIC RECORDING MEDIUM

Akira Kasuga, and Masaaki Fujiyama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 25,693, Mar. 13, 1987, abandoned. This application Aug. 1, 1989, Ser. No. 390,503
Claims priority, application Japan, Mar. 13, 1986, 61-53567
Int. Cl.[4] G11B *5/708*
U.S. Cl. 428—323 **8 Claims**

1. A magnetic recording medium comprising:
a non-magnetic support having provided thereon an intermediate layer comprising carbon black, a binder and ferromagnetic particles present in a weight ratio of from 5% to 25% based on the carbon black, and wherein said carbon black is employed in an amount of from 70 to 200 wt% based on said binder; and
a magnetic layer provided on said intermediate layer, wherein said magnetic layer comprises ferromagnetic particles and a binder.

4,916,025

HDPE FILMS WITH IMBALANCED BIAXIAL ORIENTATION

Pang-Chia Lu, Pittsford, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 101,894, Sep. 28, 1987, Pat. No. 4,870,122. This application Aug. 3, 1989, Ser. No. 389,200
Int. Cl.[4] B32B *27/28, 27/32*
U.S. Cl. 428—516 **9 Claims**

1. A biaxially oriented high density polyethylene film comprising at least 50 weight percent of a high density polyethylene (HDPE) having a density of 0.96 or higher which is oriented in the solid state to a degree of from about 1.25:1 to about 2:1 in the machine direction, and to a degree of from about 6:1 to about 12:1 in the transverse direction, said film having a heat sealable layer on at least one side thereof.

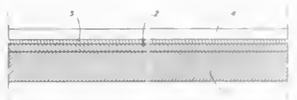
4,916,026

LAMINATE

Erich Bergmann, Mels, Switzerland; Harald Pfestorf, Untereisesheim, and Jürgen Braus, Walldorf, both of Fed. Rep. of Germany, assignors to Balzers Aktiengesellschaft, Furstentum, Liechtenstein

Filed Jul. 10, 1987, Ser. No. 72,099
Claims priority, application Switzerland, Jul. 15, 1986, 02806/86
The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.
Int. Cl.[4] B22F *7/04*
U.S. Cl. 428—555 **19 Claims**

1. A laminated bearing stock, comprising, a substrate structure, at least one cathode sputtered under 150° C. sliding layer applied over said substrate structure, said sliding layer comprising a mixture of particles distributed in a particle size distribution, said mixture of particles containing: at least one metallic material forming a solidly coherent matrix, and at least one additional metallic material being substantially insoluble in said matrix material in the solid state, said material insoluble in said matrix having a lower melting point than said matrix material, and said material insoluble in said matrix being constituted of



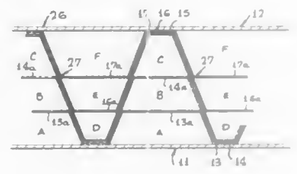
particles, said particles of said material insoluble in said matrix having diameters distributed in a normal statistical distribution with a mean value of $X = \leqq 0.3\ \mu m$.

4,916,027

PRIMARY STRUCTURE MULTI-LAYER INSULATION

Alfred R. DelMundo, Cerritos, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 21, 1988, Ser. No. 146,661
Int. Cl.[4] B32B *15/18, 15/20, 15/01*
U.S. Cl. 428—586 **15 Claims**



1. A primary structure multi-layer load carrying and insulation member which comprises a diffusion bonded and superplastically formed metal truss core structure containing opposing spaced apart outer and inner face sheets, a plurality of internal core sheets, said core sheets being spaced apart from each other and from said face sheets, and truss means extending internally across the structure, said truss means comprising a plurality of integrally connected like truss members extending internally entirely across and along said truss core structure between said spaced apart face sheets, said truss members being integrally connected on opposite sides thereof to said opposing face sheets and integrally connected to and supporting said core sheets.

4,916,028

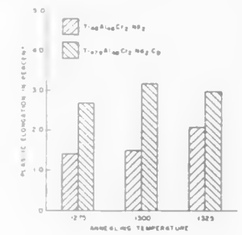
GAMMA TITANIUM ALUMINUM ALLOYS MODIFIED BY CARBON, CHROMIUM AND NIOBIUM

Shyh-Chin Huang, Latham, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 28, 1989, Ser. No. 386,326
Int. Cl.[4] C22C *14/00*
U.S. Cl. 428—614 **12 Claims**

1. A chromium, carbon and niobium modified gamma titanium aluminum base alloy consisting essentially of titanium, aluminum, chromium, niobium and carbon in the following approximate atomic ratio:

$$Ti_{52\text{-}42}Al_{46\text{-}50}Cr_{1\text{-}3}Nb_{1\text{-}5}C_{0.05\text{-}0.2}.$$



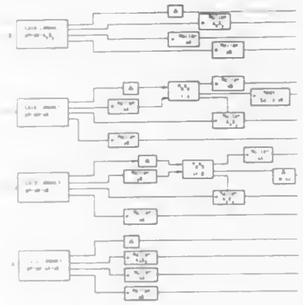
11. The component of claim 9, wherein the component is reinforced by filamentary reinforcement.

4,916,029

COMPOSITES HAVING AN INTERMETALLIC CONTAINING MATRIX

Dennis C. Nagle, Elliott City; John M. Brupbacher, and Leontios Christodoulou, both of Baltimore, all of Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Division of Ser. No. 873,890, Jun. 13, 1986, Pat. No. 4,774,052, which is a continuation-in-part of Ser. No. 662,928, Oct. 19, 1984, abandoned. This application Sep. 29, 1987, Ser. No. 102,503
Int. Cl.[4] C22C *32/00*
U.S. Cl. 428—614 **15 Claims**



1. A composite material comprising a dispersion of in-situ precipitated second phase particles selected from the group consisting of borides, carbides, nitrides, and sulfides, in an intermetallic containing matrix selected from the group consisting of the aluminides, silicides, and beryllides of nickel, copper, titanium, cobalt, iron, platinum, gold, silver, niobium, tantalum, zinc, molybdenum, hafnium, tin, tungsten, lithium, magnesium, thorium, chromium, vanadium, zirconium, and manganese.

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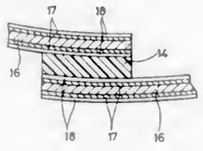
4,916,030
METAL-SECOND PHASE COMPOSITES
Leontios Christodoulou, Baltimore; Dennis C. Nagle, Ellicott City, and John M. Brupbacher, Baltimore, all of Md., assignors to Martin Marietta Corporation, Bethesda, Md.
Division of Ser. No. 927,032, Nov. 5, 1986, Pat. No. 4,751,048, which is a continuation-in-part of Ser. No. 662,928, Oct. 19, 1984, abandoned. This application Sep. 29, 1987, Ser. No. 102,501
The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.
Int. Cl.[4] C22C *32/00*
U.S. Cl. 428—614 11 Claims

1. A metal matrix composite comprising a final metal, metal alloy, or intermetallic matrix consisting of intermediate metal and host metal, having uniformly dispersed therein at least about 5 volume percent of substantially unagglomerated in-situ precipitated second-phase particles.

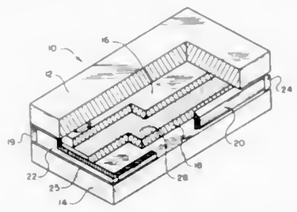
4,916,031
SURFACE-TREATED STEEL PLATE AND BONDED STRUCTURE OF METAL MATERIAL
Yoichi Kitamura; Hisashi Hotta, both of Yokohama, and Toshimasa Kodaira, Tokyo, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan
Continuation of Ser. No. 48,679, May 12, 1987, abandoned, which is a division of Ser. No. 800,135, Nov. 20, 1985, Pat. No. 4,701,354. This application Nov. 8, 1988, Ser. No. 270,440
Int. Cl.[4] B65D *25/14;* B32B *15/08*
U.S. Cl. 428—626 11 Claims



10. A bonded structure comprising (A) at least two portions of a surface-treated steel plate which comprises (i) a steel plate substrate, (ii) a chromium-containing coating layer formed on the surface of the steel plate substrate, which is composed of metallic chromium, chromium oxide or a mixture thereof and has a coated amount of 6 to 360 mg/m^2 as chromium, and (iii) an ultra-thin layer bonded to the surface of the chromium-containing coating layer, which is composed of a hydroxymethyl substituted phenol or a polycondensate thereof and has a thickness of 1 to 100 Å, and (B) a polyamide adhesive interposed between the two ultra-thin layers of said portions.

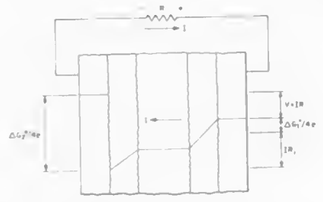
4,916,032
CLAD METAL
Kenneth J. Humberstone, Pepper Pike, Ohio, assignor to The American Tank & Fabricating Company, Cleveland, Ohio
Filed Dec. 12, 1988, Ser. No. 283,286
Int. Cl.[4] B32B *15/18*
U.S. Cl. 428—683 16 Claims

1. A clad metal comprising at least one layer of rephosphorized carbon steel and at least one layer of stainless steel metallurgically bonded to said rephosphorized carbon steel layer,



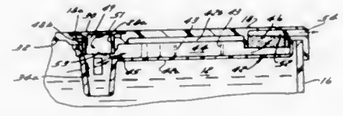
said carbon steel layer comprising at least about 0.050 weight percent phosphorus.

4,916,033
METHOD AND APPARATUS FOR CONVERTING CHEMICAL AND THERMAL ENERGY INTO ELECTRICITY
Meredith Gourdine, 2227 Country Rd. #391, Pearland, Tex. 77581
Filed Feb. 13, 1987, Ser. No. 14,442
Int. Cl.[4] H01M *10/36, 10/39*
U.S. Cl. 429—49 7 Claims



1. The Thermovoltaic cell, comprising:
a first metal;
a second metal;
a non-metal adjacent to and between said first metal and said second metal; said first and second metals having a different oxidation-reduction reaction occurring at the interface with said non-metal;
wherein the molecules are easily ionized molecules; and wherein the molecules are nitrous oxide.

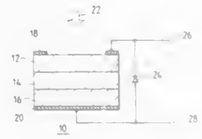
4,916,034
BATTERY VENT STRIP
Randy K. Huisebus, Colgate; Edward N. Mrotek, Grafton, both of Wis.; Paul J. Buckethal, Villa Hills; Lanny D. Lower, Fort Mitchell, and Gerald A. Cummins, Dry Ridge, all of Ky., assignors to Globe-Union Inc., Milwaukee, Wis.
Filed Sep. 8, 1988, Ser. No. 241,717
Int. Cl.[4] H01M *2/12, 2/08*
U.S. Cl. 429—86 9 Claims



1. A battery having an housing including:

(a) top member for enclosing a plurality of separated cells, said top member having a plurality of ports, each of which are in gaseous communication with respective cells;
(b) a flame arrester element disposed within said housing and being in gaseous communication with at least one of said cells; and
(c) means for removably covering said ports when in association with said top and placing said other cells in gaseous communication with said flame arrester element.

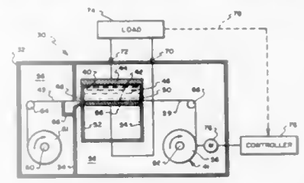
4,916,035
PHOTOELECTROCHEMICAL CELLS HAVING FUNCTIONS AS A SOLAR CELL AND A SECONDARY CELL
Akio Yamashita, Kanagawa; Satoshi Sekido; Takeshi Takeda, both of Kawasaki, and Sohji Tsuchiya, Kanagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 8, 1988, Ser. No. 232,637
Claims priority, application Japan, Aug. 6, 1987, 62-196720; Nov. 10, 1987, 62-283546; Nov. 10, 1987, 62-283547; Nov. 10, 1987, 62-283551; Jun. 16, 1988, 63-148551; Jun. 16, 1988, 63-148552
Int. Cl.[4] H01M *6/30;* H01L *31/04*
U.S. Cl. 429—111 58 Claims



1. A photoelectrochemical cell comprising:
a positive electrode made of a conductive semiconductor which is able to generate electron-hole pairs when irradiated with light and a Chevrel compound having a three-dimensional structure which allows metal atoms thereof to be deintercalated in the form of metal ions by reaction with said holes;
a current collector for said positive electrode provided in contact with said positive electrode;
a metal ion conductive solid electrolyte layer provided in contact with one side of said positive electrode to receive said metal ions when said Chevrel compound is deintercalated;
a negative electrode provided in contact with said solid electrolyte layer without direct contact with said positive electrode; and
a current collector for said negative electrode provided in contact with said negative electrode, whereby when light is irradiated on said positive electrode so that said conductive semiconductor adsorbs light at an energy level higher than a band gap thereof, said cell is photoelectrochemically charged and is discharged when said positive and negative electrodes are electrically connected.

4,916,036
CONTINUOUS CONSUMABLE ANODE
Michael C. Cheiky, Santa Barbara, Calif., assignor to Dreisbach Electromotive, Inc., Santa Barbara, Calif.
Filed Oct. 20, 1983, Ser. No. 260,477
Int. Cl.[4] H01M *6/00*
U.S. Cl. 429—127 16 Claims

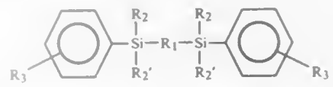
1. A continuous electrode for an electrochemical cell comprising:
a length of flexible tape wound into a cylindrical coil and mounted on a rotatable hub, said tape having a leading edge containing a releasable connector member adapted to engage a second connector member on a second tape, said flexible tape being formed of a first layer of metal



consumable by an electrochemical cell and the first layer being bonded to an inert, conductive substrate.

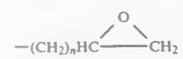
4,916,038
SUBSTITUTED AROMATIC SILANE COMPOUNDS AND METHOD FOR PREPARATION OF SAME
Kreisler S. Y. Lau, Alhambra; Susan L. Oldham, Torrance; William E. Elias, Redondo Beach, and Stephen J. Bigus, Long Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Division of Ser. No. 46,013, May 7, 1987, Pat. No. 4,861,901. This application Aug. 29, 1988, Ser. No. 237,816
Int. Cl.[4] B32B *9/04*
U.S. Cl. 428—447 10 Claims

1. A polymer material formed by polymerization of a compound having the formula

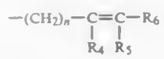


where R_1 is selected from the group consisting of
(a) an aliphatic hydrocarbon group containing 2 to 10 carbon atoms, and
(b) a group having the formula

where
n = 1 to 3
m = 0 to 5;
R_2 and R_2' are each selected from the group consisting of an alkyl group containing 1 to 4 carbon atoms, an unsubstituted aryl group, and a substituted aryl group; and R_3 is selected from the group consisting of:



and



where R_4, R_5, and R_6 are each selected from the group consisting of H, an alkyl group containing 1 to 4 carbon atoms, and an aryl group; and n = 0 to 10.

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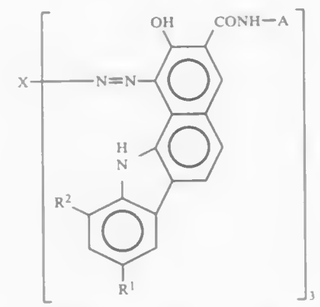
4,916,039

ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR

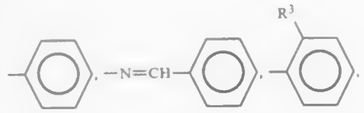
Mitsuru Hashimoto, Numazu, and Masaomi Sasaki, Susono, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

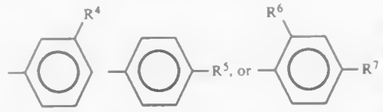
Filed Jul. 8, 1988, Ser. No. 216,340
Claims priority, application Japan, Jul. 8, 1987, 62-171625; Jul. 17, 1987, 62-178777
Int. Cl.[4] G03G 5/14
U.S. Cl. 430—57 5 Claims

1. An electrophotographic photoconductor comprising an electroconductive support and a photoconductive layer formed thereon, said photoconductive layer comprising as a charge generating material an azo pigment having general formula (I):

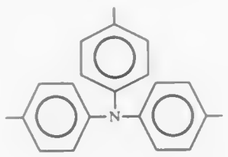


wherein R^1 represents H, Cl, CH_3, or OCH_3; R^2 represents H, Cl, or CH_3, provided that R^1 and R^2 may not be hydrogen at the same time; A represents





wherein R^3 represents a lower alkyl group or a nitro group; R^4 represents a lower alkyl group, a lower alkoxyl group or Cl; R^5 represents a lower alkyl group, a lower alkoxyl group, Cl or a nitro group; and R^6 and R^7 each represent a lower alkyl group or Cl; and X represents



4,916,040

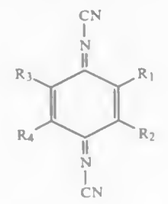
PHOTOSENSITIVE MEMBER WITH PHOTOCONDUCTIVE LAYER COMPRISING N-CYANOIMINE COMPOUND

Hideaki Ueda, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

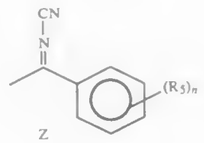
Filed Aug. 2, 1989, Ser. No. 388,512
Claims priority, application Japan, Aug. 2, 1988, 63-193218
Int. Cl.[4] G03G 5/06, 5/14
U.S. Cl. 430—72 24 Claims

1. A photosensitive member wherein a photoconductive layer comprising a N-cyanoimine compound represented by the following formula [I], [II] or [III] is formed on or over an electroconductive substrate;

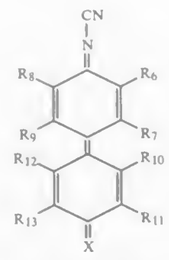
[I]



[II]



[III]



wherein R_1–R_{13} are respectively a hydrogen atom, an alkyl group, an alkoxy group, a halogen atom, a nitro group, a cyano group, a substituted sulfonyl group or a carboxylate group; n is an integer of 0–4; Z is a residual group which forms a ring with the benzene ring; Z may have a substituent; X ix an oxygen atom or N—CN.

4,916,041

PRESENSITIZED LITHOGRAPHIC PLATE COMPRISING SILVER HALIDE, REDUCING AGENT AND POLYMERIZABLE COMPOUND ALL IN MICROCAPSULES

Akira Hasegawa, Shizuoka, and Soichiro Yamamoto, Minami-ashigara, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 4, 1987, Ser. No. 116,352
Claims priority, application Japan, Nov. 5, 1986, 61-264265
The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.
Int. Cl.[4] G03F 7/02; G03C 1/72
U.S. Cl. 430—138 9 Claims

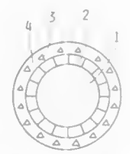
1. A presensitized lithographic plate comprising a light-sensitive layer containing silver halide, a reducing agent, an ethylenically unsaturated polymerizable compound and a hydrophilic binder on a hydrophilic support wherein the silver halide, the reducing agent and the polymerizable compound are contained in lipophilic microcapsules including a shell of a lipophilic material which are dispersed in the light-sensitive layer, at least a portion of the silver halide being contained in said shell of said microcapsule

4,916,042

MULTICOLOR IMAGING MATERIAL

Hiromichi Sakojiri, and Hiroshi Takahashi, both of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Filed Oct. 2, 1987, Ser. No. 104,348
Claims priority, application Japan, Jun. 22, 1987, 62-155224
Int. Cl.[4] G03C 1/54, 1/72, 7/00
U.S. Cl. 430—138 14 Claims



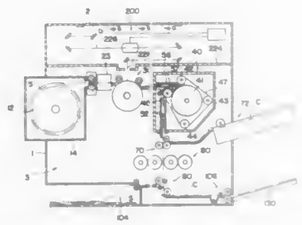
1. A multicolor imaging material comprising:
a substrate; and
a photosensitive layer on the substrate containing a diazo compound, a coupling component, a coloring assistant and an infrared absorbent, said coupling component being encapsulated with a heat-raeltable microcapsule such that the coupling component is released from the microcapsule to react with the diazo compound to thereby produce the color, said heat-meltable microcapsule having a porous membrane which encloses the coupling component and a capsule wall which includes the infrared absorbent effective to absorb infrared rays of a specified wavelength to generate heat to thereby melt the capsule wall of the microcapsule to release the coupling component through the porous membrane.

4,916,043

IMAGE-FORMING METHOD EMPLOYING LIGHT-SENSITIVE MATERIAL COMPRISING THE REMOVAL OF WATER FROM THE BASE PAPER SUPPORT

Akihiko Nagumo, and Koichi Nakamura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 134,112, Dec. 17, 1987, abandoned. This application Sep. 6, 1988, Ser. No. 241,791
Claims priority, application Japan, Dec. 17, 1986, 61-298632; Apr. 20, 1987, 62-96801
Int. Cl.[4] G03C 5/54, 3/00
U.S. Cl. 430—203 16 Claims



1. An image-forming method comprising the steps of:
(A) imagewise exposing a light-sensitive material comprising a light-sensitive layer containing silver halide, a reducing agent and a polymerizable compound provided on a paper support; and
(B) simultaneously or thereafter, heat-developing the light-sensitive material to imagewise polymerize the polymerizable compound,
wherein the paper support comprises a coating layer containing a hydrophobic polymer provided on a base paper sheet, the light-sensitive layer is provided on the coating layer, and the light-sensitive material is heat-developed after removal of water from the base paper sheet, and wherein a surface of said coating layer has a water absorptiveness of not more than 10 g/m^2, said water absorptiveness being a value measured according to the Cobb test method.

4,916,044

COLOR DIFFUSION TRANSFER ELEMENT WITH AUXILLARY NEUTRALIZING LAYER COMPRISING CELLULOSE ACETATE

Hideki Tomiyama, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 29, 1987, Ser. No. 139,235
Claims priority, application Japan, Dec. 29, 1986, 61-315539
Int. Cl.[4] G03C 5/54, 7/00
U.S. Cl. 430—216 14 Claims

1. A photographic element comprised of a light-sensitive dye release sheet comprising silver halide and dye release compounds capable of releasing dye in the presence of an alkaline processing solution and stop development at a first pH determined by a neutralization system defined below, a receiving sheet and a cover sheet, wherein development, dye release and dye transfer occur in the presence of an alkaline processing solution, and wherein said cover sheet is provided with a neutralizing system which causes neutralization by an alkaline processing solution to proceed by at least a first and a second stage, wherein the first stage is characterized in that neutralization (lowering) of the pH of an alkaline processing solution occurs to the extent to interrupt development and dye release reactions but at which the transfer of a dye for forming a transfer image can continue, and a second stage at which the pH of the processing solution is gradually lowered to a final value at which the transfer of a dye for forming a transfer image is inhibited and which is stably maintained over prolonged storage, said photographic element characterized in that the neutralizing system comprises at least a neutralizing layer, a second neutralization timing layer, an auxiliary neutralizing layer and a first neutralization timing layer as viewed from the support side, and that said auxiliary neutralizing layer contains from 5 to 60% by weight of a cellulose acetate having an acetylation degree of 40 to 60.

4,916,045

PHOTOSENSITIVE RECORDING ELEMENT CONTAINING AN IONIC POLYMER

Horst Koch, Groesskarlbach; Wolfgang F. Mueller; Reiner Hofmann, both of Neustadt, and Peter Richter, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 133,333, Dec. 15, 1987, abandoned, which is a continuation-in-part of Ser. No. 940,647, Dec. 11, 1986, abandoned. This application Mar. 30, 1989, Ser. No. 330,964
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1985, 3543646
Int. Cl.[4] G03C 1/76
U.S. Cl. 430—270 4 Claims

1. A photosensitive recording element for the preparation of photopolymerized printing plates, relief plates or photoresists comprising
(i) a dimensionally stable, solid, non-tacky, elastomeric photopolymerizable or photocrosslinkable layer (RL) of a thick-

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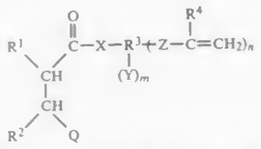
ness from 0.1 to 6000 μm developable in the aqueous basic media and consisting essentially of

(il) an ionic polymer which contains

(A) from about 45 to about 90% by weight, based on the ionic polymer, of a polymer main chain formed from an alkadiene polymer A′ having a number average molecular weight M_n of from 500 to 20,000,

(B) from about 6 to about 45% by weight, based on the ionic polymer, of one or more olefinically unsaturated side radicals which are introduced into the alkadiene polymer A′ by, first, maleation of the alkadiene polymer A′ yielding succinic acid anhydride side groups therein, and, second, partial esterification or partial amidation of the said succinic acid anhydride side groups with suitable compounds, said side radicals B having the structure (I),



where R^1 and R^2 differ from one another and are each hydrogen or a carbon atom of the alkadiene chain A′, R^3 is selected from the group consisting of polyvalent, straight-chain aliphatic hydrocarbon radicals of 1 to 20 carbon atoms, polyvalent, branched aliphatic hydrocarbon radicals of 1 to 20 carbon atoms, polyvalent, straight-chain aliphatic hydrocarbons radicals of 1 to 20 carbon atoms whose chains are interrupted by oxygen, nitrogen or sulfur, and polyvalent, branched aliphatic hydrocarbon radicals of 1 to 20 carbon atoms whose chains or branches are interrupted by oxygen, nitrogen or sulfur; X is oxygen, sulfur or amino, Y is a polar group, m is 0 or an integer from 1 to 5, n is an integer from 1 to 3, Z is a methylene, ether, amide or ester group, R^4 is hydrogen or methyl, and Q is carboxyl or carboxylate, and

(C) from about 0.5 to about 10% by weight, based on the ionic polymer, of cations selected from the group consisting of cations of elements of the main groups I to V, of the subgroups 1 to VIII and of the Lanthanide series of the periodic table of elements, of ammonia, of polyfunctional organic amines, and of hydrozine,

(i2) from 0.001 to 10 parts by weight per 100 parts by weight of the ionic polymer of one or more photoinitiators, and

(i3) from 0 to 30 parts by weight per 100 parts by weight of the ionic polymer of photopolymerizable, nongaseous monomers which are compatible with the ionic polymer, and

(ii) a dimensionally stable support layer

4,916,046

POSITIVE RADIATION-SENSITIVE MIXTURE, USING A MONOMERIC SILYLENOL ETHER AND A RECORDING MATERIAL PRODUCED THEREFROM

Karl-Friedrich Doessel, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 13, 1988, Ser. No. 243,819

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1987, 3730783

Int. Cl.[4] G03C *1/495*

U.S. Cl. 430—281 **18 Claims**

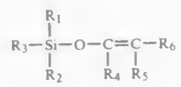
1. A positive radiation-sensitive mixture, comprising:

a compound which forms an acid under the action of actinic radiation,

a monomeric acid-cleavable compound, and

a binder that is insoluble in water and soluble in aqueous alkaline-solution,

wherein the acid-cleavable compound comprises a silylenol ether group of the formula I



(I)

in which

R_1 and R_2 are identical of different and denote alkyl, cycloalkyl or aryl,

R_3 denotes alkyl, cycolalkyl, aryl or —O—R_7,

R_4, R_5 and R_6 are identical or different and denote hydrogen, alkyl, cycloalkyl, alkenyl, cycloalkenyl or aryl, and

R_7 denotes hydrogen, alkyl, cycloalkyl, alkenyl, loalkenyl, aryl or silyl.

4,916,047

SILVER HALIDE LIGHT-SENSITIVE MATERIAL

Keizo Koya; Junichi Yamanouchi; Masaharu Toriuchi, and Yoshisada Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

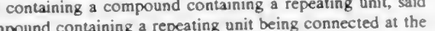
Filed Apr. 29, 1988, Ser. No. 188,782

Claims priority, application Japan, Apr. 30, 1987, 62-106881; Dec. 23, 1987, 62-325956

Int. Cl.[4] G03C *1/06, 1/34, 7/26, 5/54*

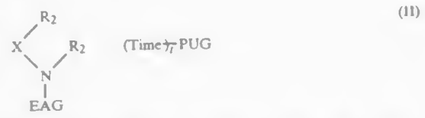
U.S. Cl. 430—353 **19 Claims**

1. A silver halide light-sensitive material comprising a support having thereon at least one silver halide emulsion layer, and containing a compound containing a repeating unit, said compound containing a repeating unit being connected at the repeating unit to a compound represented by formula (I) at the position of the PWR or Time moiety:



(I)

wherein PWR represents a moiety capable of releasing (Time)$_t$PUG upon reduction, and PUG represents a group which can fulfill a photographically useful function after the release; Time represents a moiety capable of releasing PUG through a reaction subsequent to the release from PWR in the form of —Time)$_t$PUG; and t represents 0 or 1, said compound represented by formula (I) being a compound represented by formula (II):



(II)

wherein EAG represents an electron accepting group; and N represents a nitrogen atom, and X represents an oxygen atom (—O—), a sulfur atom (—S—), or a nitrogen-containing group (—N(R_3)—); R_1, R_2, and R_3 each represents a mere bonding hand, or a group other than a hydrogen atom; R_1, R_2, R_3 and EAG may combine with one another to form a ring; and Time represents a group to release PUG through a reaction which succeeds taking advantage of the N—X bond cleavage as a trigger, t represents 0 or 1, and when t is 0, Time represents a mere bonding hand; and wherein each of the full lines indicates a bond, and the dashed lines indicate that at least one of them is a bond; and PUG has the same meaning as in formula (I).

4,916,048

OPTICAL RECORDING MEDIUM AND METHOD OF OPTICAL RECORDING AND ERASING USING MEDIUM

Noboru Yamada, 4-2, 1-chome, Kuzuhaoka, Hirakata-shi, Osaka-fu 573; Kenichi Nishiuchi, 4-49, Satanaka-machi, Moriguchi-shi, Osaka-fu 570, and Mutsuo Takenaga, 12-305 Ikuno, Katano-shi, Osaka-fu 576, all of Japan

Continuation of Ser. No. 594,561, Mar. 29, 1984, abandoned. This application Nov. 7, 1986, Ser. No. 930,017

Claims priority, application Japan, Apr. 1, 1983, 58-58158

Int. Cl.[4] G03C *1/72, 1/94*

U.S. Cl. 430—523 **16 Claims**

1. An optical recording medium comprising a photosensitive layer whose optical density can be reversibly varied between states of high and low optical density when irradiated with light energy, said photosensitive layer including Te, Ge, O and at least one additional element selected from the group consisting of Sb, Bi, In, Tl, Cu, Ag, Au, Pd, and Pt, where the ratio x of the total number of atoms of O to that said Te is in the relation of $0<x<2$ and the mole percentage Z_1 of Ge and the mole percentage Z_2 of said at least one additional element satisfy the relation of $0<Z_1\leqq 10$ mol % and $0<Z_2\leqq 50$ mol % respectively, and where at least part of said Ge and said at least one additional element exist in the layer in non-oxide states.

4,916,049

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Ichizo Toya, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 12, 1988, Ser. No. 282,781

Claims priority, application Japan, Dec. 11, 1987, 62-313637

Int. Cl.[4] G03C *1/76*

U.S. Cl. 430—531 **11 Claims**

1. A silver halide photographic material comprising a support having on one side of the support a subbing layer, and at least two hydrophilic colloid layers, at least one of said hydrophilic colloid layers containing dextran having an average molecular weight of at least 100,000, wherein at least one hydrophilic colloid layer containing substantially no dextran and having a dry thickness of at 1.0 μm exits between (1) the hydrophilic colloid layer containing the dextran disposed nearest to the support and (2) the subbing layer.

4,916,050

SILVER HALIDE LIGHT-SENSITIVE PHOTOGRAPHIC MATERIAL

Toyoki Nishijima, Odawara, and Kaoru Onodera, Sagamihara, both of Japan, assignors to Konica Corporation, Tokyo, Japan

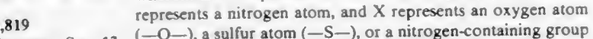
Filed May 25, 1988, Ser. No. 198,319

Claims priority, application Japan, May 26, 1987, 65-130686; Jun. 3, 1987, 65-140416

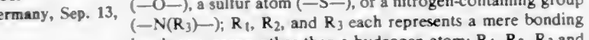
Int. Cl.[4] G03C *1/38, 7/26, 7/34, 7/38*

U.S. Cl. 430—546 **22 Claims**

1. A silver halide light-sensitive photographic material which comprises a support and, provided thereon, photographic component layers including at least one silver halide emulsion layer, wherein at least one of said photographic component layers contains a compound of Formula [I] and/or Formula [II]:



[I],



[II]

wherein R_1 and R_4 are independently selected from the group consisting of an alkyl group, and alkenyl group, a cycloalkyl group, an aryl group and a heterocyclic group; R_2, R_3, R_6 and R_7 are divalent groups independently selected from the group consisting of an alkylene group, an alkenylene group, a cycloalkylene group and a group of any combination of these groups; R_5 and R_8 each is either an acyl group or a phosphonyl group; and n is an integer of from 1 to 20.

4,916,051

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Kimie Tachibana, Tokyo, and Yutaka Kaneko, Sagamihara, both of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Apr. 5, 1988, Ser. No. 177,987

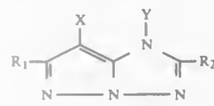
Claims priority, application Japan, Apr. 7, 1987, 62-85510; Apr. 7, 1987, 62-85511; May 13, 1987, 62-114838

The portion of the term of this patent subsequent to Oct. 10, 2006, has been disclaimed.

Int. Cl.[4] G03C *7/38*

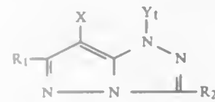
U.S. Cl. 430—558 **20 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having at least one red light-sensitive silver halide emulsion layer, wherein said red light-sensitive silver halide emulsion layer contains at least one cyan dye-forming coupler selected from the group consisting of those represented by Formulas I, II, III, IV, V and VI;

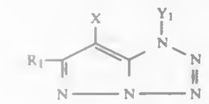


I

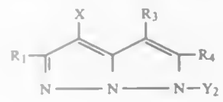
wherein X represents a hydrogen atom or a substituent capable of being split off upon reaction with the oxidized product of a color developing agent, Y represents a hydrogen atom or a substituent, and R_1 and R_2 independently represent a hydrogen atom, a substituent or a group having an —NH group provided that at least one of R_1 and R_2 is a group having an —NH— group;



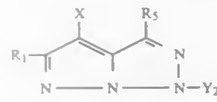
II



III

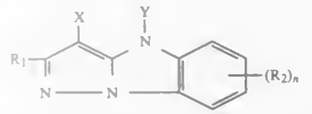


IV



V

wherein in Formulas II through V R_1 represents a group having an —NH group, R_2, R_3, R_4, R_5, Y_1 and Y_2 independently represent a hydrogen atom or a substituent, and X represents a hydrogen atom or a group capable of being split off upon reaction with the oxidized product of a color developing agent.



VI

wherein R_1 represents a group having an —NH group, R_2

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represents a substituent, n is an integer of from 0 to 4, provided that, when n is 2 or more, respective R_2's may be the same with or different from each other, X represents a hydrogen atom or a substituent capable of being split off upon reaction with the oxidized product of a color developing agent, and Y represents a hydrogen atom or a substituent.

4,916,052

HOLLOW SILVER HALIDE GRAINS AND PROCESS FOR THE PREPARATION THEREOF

Mark E. Irving, and Robert J. Newmiller, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 22, 1989, Ser. No. 369,795
Int. Cl.[4] G03C *1/02*
U.S. Cl. 430—567 **26 Claims**

1. A process for the preparation of hollow, radiation sensitive silver halide grains which process comprises the steps of:

(a) forming in a colloid dispersing medium silver halide grains containing at least 90 mol % iodide and having predominantly crystals of the configuration of four truncated hexagonal bipyramids, the four bases of which are joined to form a common tetrahedron by homogeneous nucleation of silver iodide grains at a pAg of from about 11.0 to about 5.0 at a temperature between about 30° and about 90° C.;

(b) maintaining the conditions in step (a) until the silver iodide grains are from about 0.005 to about 0.5 μm in diameter;

(c) altering the growth environment of the silver iodide grains to a pAg of from about 13.5 to about 9.8 at a temperature from about 30° to about 90° C.; and

(d) nucleating iodohalide epitaxy on the end faces of each of the four hexagonal bipyramids of the silver iodide grains at a pAg of from about 3.0 to about 11.0 and a temperature between about 30° and 90° C.

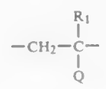
4,916,053

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Naoto Ohshima; Toshiaki Hayakawa, and Shunji Takada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

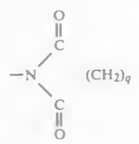
Continuation of Ser. No. 878,538, Jun. 25, 1986, abandoned. This application Sep. 16, 1988, Ser. No. 245,922
Claims priority, application Japan, Jun. 25, 1985, 60-138775
Int. Cl.[4] G03C *1/10*
U.S. Cl. 430—599 **15 Claims**

1. A negative-type silver halide photographic material having at least one surface latent image silver halide emulsion layer on a support, wherein chemically-sensitized silver halide grains contained in the emulsion of said emulsion layer comprise normal crystalline grains, and said emulsion layer containing said normal crystalline silver halide grains comprises a protective colloid or a binder and a polymer having a repeating unit represented by formula (I) which increases the sensitivity of the silver halide emulsion:



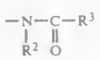
(I)

wherein R_1 represents a hydrogen atom or an alkyl group; Q represents one group selected from formulae (i), (ii), (iii), and (iv);



(i)

wherein q is an integer of from 2 to 4;

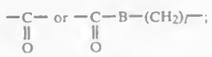


(ii)

wherein R^2 and R^3 each represents a hydrogen atom or an alkyl group;

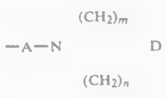
(iii)

wherein Z^1 represents an atomic group forming a lactam ring, an oxazolidone ring, or a pyridone ring;
A represents a single bond,



B represents —O— or

wherein R^4 represents a hydrogen atom or an alkyl group; and
l is an integer of from 1 to 6; and



(iv)

wherein
A has the same meaning as defined for formula (iii);
D represents a single bond, —O— or

wherein
R^5 represents a hydrogen atom, an alkyl group, or

wherein R^6 represents an alkyl group; and
m and n each represents an integer of from 1 to 6, provided that the sum of m and n is an integer of from 4 to 7, wherein the amount of the polymer having the repeating unit represented by formula (I) is smaller than the amount of the polymer which is used as a protective colloid or binder, the amount of the polymer having a repeating unit represented by formula (I) being from 0.02 to 5 g per mole of silver used.

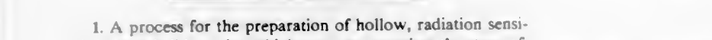
4,916,054

SILVER HALIDE PHOTOGRAPHIC ELEMENT CONTAINING A COATING AID

Masakazu Yoneyama, and Jun Arakawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 21, 1988, Ser. No. 171,362
Claims priority, application Japan, Mar. 20, 1987, 62-67507
Int. Cl.[4] G03C *1/02*
U.S. Cl. 430—636 **5 Claims**

1. A silver halide photographic element having at least one light-sensitive silver halide emulsion layer and at least one hydrophilic colloid layer on a support, and containing in the silver halide emulsion layer or in said hydrophilic colloid layer a compound of formula (I):



(I)

wherein
X represents $—(CH_2CH_2O)_a—(C_3H_6O)_b—$;
a represents 0 or from 1 to 50 on the average;
b represents from 1 to 5 on the average;
A represents an alkyl or alkenyl group having from 8 to 25 carbon atoms, or an aryl group;
B represents a divalent linking group;
n represents 0 or 1; and
M represents a cation;
wherein when n is 1, B in formula (I) represents a straight or branched chain alkylene or carbonylalkylene group, and wherein the amount of compound of formula (I) added to the layer is from 0.01 to 50 g per kg of the coating composition.

4,916,055

DETECTION OF HUMAN CANCER WITH A MONOCLONAL ANTIBODY SPECIFIC FOR ANTIGEN GP650

Lynn C. Yeoman, Houston, Tex., and Joseph P. Moosic, Arlington Heights, Ill., assignors to Baylor College of Medicine, Houston, Tex.

Filed Dec. 13, 1985, Ser. No. 808,910
Int. Cl.[4] G01N *33/53, 33/577*; C07K *1/14*; C12N *1/00*
U.S. Cl. 435—7 **13 Claims**

1. A human gp650 antigen being in substantially purified form, having:

a molecular weight of about 650,000 daltons as determined by gel filtration on a calibrated S-300 Sephacryl column;

a molecular weight of about 300,000 daltons after denaturation in the presence of 8M guanidine-hydrochloride;

being soluble in 0.05 M Tris-HCl/0.005 M $MgCl_2$ 0.025 M KCl, pH 7.4; and;

being primarily localized in the cytosolic fraction of human colon tumor cells.

4,916,056

SOLID-PHASE ANALYTICAL DEVICE AND METHOD FOR USING SAME

William E. Brown, III, Grayslake; Sarah E. Safford, Libertyville, and John M. Clemens, Gurnee, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 831,013, Feb. 18, 1986, which is a continuation-in-part of Ser. No. 784,416, Oct. 4, 1988, abandoned. This application Mar. 28, 1988, Ser. No. 173,979
Int. Cl.[4] G01N *33/53, 33/543, 33/545*; C12M *1/12*
U.S. Cl. 435—7 **4 Claims**

1. A solid phase assay device for use in a binding assay to determine the presence or amount of an analyte in a fluid sample through the use of a label capable of producing a detectable response, said device comprising a reaction site on a porous matrix having,

a negative control area,

a positive control area within said negative control area containing immobilized binding reagent for said label, and

an analyte binding area within said negative control area containing immobilized binding reagent for analyte in the sample,

said positive control area being shaped such that, in the presence or absence of analyte in the sample and in the presence of said label, a minus symbol is formed representing a negative result, and

said analyte binding area being shaped such that, taken together with said minus symbol in the presence of said label and analyte, a plus symbol is formed representing a positive result.

4,916,057

CHLAMYDIA ASSAY EMPLOYING BASE TREATMENT

Jeffrey A. Thompson, Richfield; Patrick A. Mach, Shorewood, and Howard R. Soule, Minnetonka, all of Minn., assignors to Kallestad Diagnostics, Inc., New York, N.Y.

Filed Feb. 29, 1988, Ser. No. 161,576
Int. Cl.[4] G01N *33/569, 33/571*
U.S. Cl. 435—7 **4 Claims**

1. A method for substantially eliminating the occurrence of false negative and false positive results in an enzyme imunoassay for a chlamydia antigen in a patient specimen taken from the eye, nares at the back of the nose, cervix, urethra, throat or rectum comprising treating said specimen with an aqueous solution having a final concentration of not less than 0.1M NaOH or 0.1M KOH and then neutralizing the specimen-containing solution before conducting the immunoassay.

4,916,058

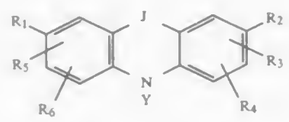
METHOD AND TEST COMPOSITION FOR DETERMINATION OF HYDROGEN PEROXIDE

Norihito Aoyama; Akira Miike; Yoshiaki Shimizu, all of Shizuoka, and Toshio Tatano, Numazu, all of Japan, assignors to Kyowa Medex Co., Ltd., Tokyo, Japan

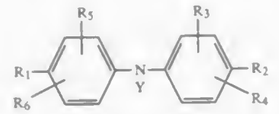
Continuation of Ser. No. 594,865, Mar. 29, 1984, abandoned. This application Jun. 23, 1987, Ser. No. 65,126
Claims priority, application Japan, Mar. 31, 1983, 58-56652
Int. Cl.[4] C12Q *1/62, 1/60, 1/54, 1/26, 1/28*
U.S. Cl. 435—10 **11 Claims**

1. A method for the determination of hydrogen peroxide in

a sample which comprises reacting the hydrogen peroxide with a chromogen represented by the formula



or

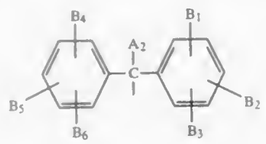


wherein Y represents hydrogen or

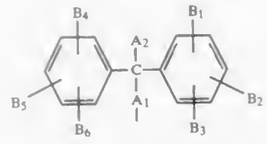
Z represents an oxygen atom or a sulfur atom, X represent hydrogen, alkyl, alkenyl, aryl, aralkyl, amino or substituted amino, R_1 represents hydroxyl, amino or substituted amino, R_2 represents hydrogen, hydroxyl, alkyl, alkoxy, aryl, aralkyl, alkenyl, amino or substituted amino, R_3 represents groups represented by the general formula (III), (IV), (V) or (VI) described hereinafter, R_4, R_5 or R_6 may be the same or different and represents hydrogen, alkyl, alkenyl, acyl, aryl, aralkyl, halogen atom, nitro, sulfo, carboxyl, hydroxyl, alkoxy or groups represented by the general formula (III), (IV), (V), (VI) or (VII) described hereinafter, J represents —S—, —O—, the general formula

or the general formula

R_7 and R_8 are the same or different and represent hydrogen atom, alkyl or alkenyl, and R_5 and R_6 may form alkenylene:

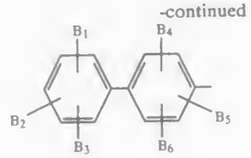


general formula (III)

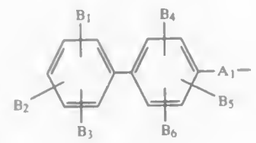


general formula (IV)

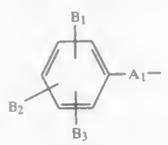
-continued



general formula (V)



general formula (VI)



general formula (VII)

wherein A_1 represents alkylene, A_2 has the same meaning as that of R_2, B_1, B_2, B_3, B_4, B_5 or B_6 may be the same or different and represents hydrogen atom, alkyl, alkenyl, acyl, aryl, aralkyl, halogen atom, nitro, sulfo, carboxyl, hydroxyl, alkoxy or hydroxyalkyl; in the presence of peroxidase and measuring the absorbancy of the reaction solution in the visible or near infrared ray region.

4,916,059

REAGENT SHEET AND INTEGRAL MULTILAYER ANALYTICAL ELEMENT FOR MEASUREMENT OF GGT ACTIVITY

Shigeki Kageyama, and Harumi Katsuyama, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 20, 1986, Ser. No. 876,975

Claims priority, application Japan, Jun. 20, 1985, 60-135529; Jun. 20, 1985, 60-135530

Int. Cl.[4] C12Q *1/48*

U.S. Cl. 435—15 **15 Claims**

1. A reagent sheet for the measurement of the activity of γ-glutamyl transferase, comprising a porous sheet containing a substrate selected from the group consisting of γ-glutamyl-p-nitroanilide and γ-glutamyl-3-carboxy-4-nitroanilide, and a cationic surfactant in an amount ranging from 0.2 to 5 g/m^2.

7. An integral multilayer analytical element for the measurement of the activity of γ-glutamyl transferase, comprising a porous spreading layer containing a substrate selected from the group consisting of γ-glutamyl-p-nitroanilide and γ-glutamyl-3carboxy-4-nitroanilide and a cationic surfactant in an amount ranging from 0.2 to 5 g/m^2, a water-absorbing layer and a support layer in a laminated form.

4,916,060

PROCESS FOR CHEMICAL MEASUREMENT IN SMALL VOLUME SAMPLES BY FLUORESCENT INDICATORS

James C. Weaver, Sudbury, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 776,936, Sep. 17, 1985, abandoned. This application Jun. 27, 1989, Ser. No. 372,127

Int. Cl.[4] C12Q *1/02*

U.S. Cl. 435—29 **21 Claims**

1. A process for detecting a change in the concentration of a microbiologically or biochemically active material comprising:

(a) providing microdroplets containing:
  (i) a source of the microbiologically for biochemically active material; and
  (ii) at least two fluorescent compounds wherein at least one first fluorescent compound is capable of contributing to a change in color by increasing in fluorescent emission intensity in response to a change in concentration of the microbiologically or biochemically active material, and at least one second fluorescent compound which is a reference standard, the proportion of which fluorescent compounds changes as the concentration of the microbiologically or biochemically active material changes, thereby producing a color change in fluorescent emissions from the fluorescent compounds;
(b) determining the color of the fluorescent emission from the fluorescent compounds.
(c) maintaining the microdroplets under conditions which allow the concentration of the microbiologically or biochemically active material to change; and
(d) detecting the change in the concentration of the microbiologically or biochemically active material by determining the change in color of the fluorescent emission from the fluorescent compounds

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4,916,061

GRAM STAINING METHOD AND KIT

Ludmilla P. Di Ianni, Hawthorne, N.J., assignor to Fisher Scientific Company, Pittsburgh, Pa.

Filed Dec. 14, 1987, Ser. No. 132,604

Int. Cl.[4] C12Q *1/04*

U.S. Cl. 435—34 **15 Claims**

1. A method for the staining of a biological specimen to identify Gram Positive bacteria. which comprises:
(a) staining the biological specimen with Gentian Violet, and
(b) contacting the Gentian Violet stained specimen with a solution comprising iodine, an iodide salt and an alcohol solvent for a time sufficent to intensify the staining of Gram Positive bacteria and to decolorize Gram Negative bacteria.

4,916,062

ENZYME, ITS METHOD OF PRODUCTION AND ITS APPLICATION TO THE PREPARATION OF METHYL N-(L-ASPARTYL-1) L-PHENYLALANINATE

Francois Paul; Francis Duchiron, and Pierre Monsan, all of Haute-Garonne, France, assignors to Societe Francaise Hoechst, Puteaux, France

Filed Oct. 21, 1986, Ser. No. 921,632

Claims priority, application France, Nov. 5, 1985, 85 16365

Int. Cl.[4] C12P *21/02;* **C12M** *9/00;* **C12R** *1/265*

U.S. Cl. 435—68.1 **2 Claims**

1. A partially purified enzyme isolated from the multienzyme SP component of *Micrococcus caseolyticus* Strain I 194, deposited at the Institut Pasteur, having a molecular weight of at least 200,000 and not exhibiting any proteolytic activity on casein.

2. A method for producing aspartame comprising condensing L-aspartic acid with methyl DL-phenylalaninate in the presence of a catalytically effective amount of the enzyme of claim 1.

4,916,063

BU-2867T PEPTIDE ANTIBIOTICS

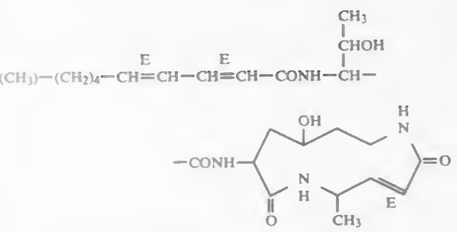
Masahisa Oka, Yokohama, and Masataka Konishi, Kawasaki, both of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 908,850, Sep. 18, 1986, Pat. No. 4,777,160. This application Sep. 14, 1987, Ser. No. 95,722

Int. Cl.[4] C12P *21/04, 17/10;* **C12N** *1/00*

U.S. Cl. 435—71.3 **2 Claims**

1. The process for the preparation of BU-2867T F having the formula



which comprises cultivating *Polyangium brachysporum* (ATCC 53080) or a BU-2867T F-producing mutant thereof in an aqueous nutrient medium containing assimilable sources of carbon and nitrogen under submerged aerobic conditions until a recoverable amount of BU-2867T F is produced by said organism in said culture medium and then recovering the BU-2867T F antibiotic from the culture medium substantially free of co-produced substances.

4,916,064

CARBOHYDRATE REFINING PROCESS AND NOVEL ENZYME COMPOSITIONS SUITABLE FOR USE THEREIN

Frank G. H. Derez, Halle; Jos W. G. C. de Sadeleer, Kessel Lo, and Alan L. Reeve, Leefdaal, all of Belgium, assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Oct. 6, 1986, Ser. No. 915,438

Claims priority, application United Kingdom, Oct. 10, 1985, 8525012

Int. Cl.[4] C12P *19/14*

U.S. Cl. 435—99 **11 Claims**

1. A process for the treatment of an aqueous solution of a wheat starch hydrolysate which is difficult of filter and/or which produces a cloudy filtrate and which contains as an impurity a phospholipid which comprises incubating said wheat starch hydrolysate with an enzyme composition comprising a phospholipase, a xylanase and a beta-glucanase enzyme at a temperature of 20° C. to 110° C. and a pH maintained up to 8 for a sufficient time to achieve a desired filtration rate and/or filtrate clarity, the ratio of phospholipase enzyme to total xylanase and beta-glucanase enzymes in the enzyme composition being at least 0.05:1.

4,916,065

BU-3420T ANTITUMOR ANTIBIOTIC

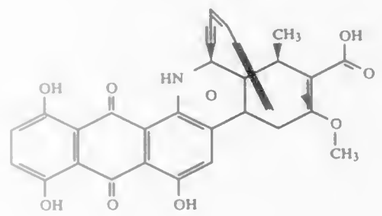
Hiroaki Ohkuma, Tokyo; Masataka Konishi, Kanagawa; Kiyoshi Matsumoto, Kawaguchi; Toshikazu Oki, Yokohama, and Yutaka Hoshino, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Jun. 10, 1988, Ser. No. 208,330

Int. Cl.[4] C12P *17/18;* **C12R** *1/29;* **C07D** *498/08;* **A61K** *31/395*

U.S. Cl. 435—119 **8 Claims**

3. A process for the preparation of BU-3420T having the formula



VOL 1113 ISS 2 AP 10 1990 UMI

which comprises cultivating *Micromonospora chersina* ATCC 53710 or a BU-3420T-producing mutant thereof in an aqueous nutrient medium containing assimilable sources of carbon and nitrogen under submerged aerobic conditions until a substantial amount of BU-3420T is produced by said organism in said culture medium and then recovering said BU-3420T from the culture medium.

4,916,066

PROCESS FOR PRODUCTION OF BISHOMO-GAMMA-LINOLENIC ACID

Kengo Akimoto, Osaka; Yoshifumi Shinmen, Kyoto; Hideaki Yamada, Kyoto, and Sakayu Shimizu, Kyoto, all of Japan, assignors to Suntory Limited, Osaka, Japan

Filed Dec. 20, 1988, Ser. No. 286,856

Claims priority, application Japan, Dec. 21, 1987, 62-321551; Mar. 9, 1988, 63-53642

Int. Cl.[4] C12P *7/64*; C12R *1/645, 1/66, 1/785*

U.S. Cl. 435—134 **10 Claims**

1. A process for a production of bishomo-γ-linolenic acid, comprising the steps of:

culturing a microorganism capable of producing arachidonic acid in a culture medium containing an additive selected from the group consisting of sesame oil, peanut oil and a mixture thereof to produce bishomo-γ-linolenic acid or a lipid containing bishomo-γ-linolenic acid; or adding the additive to a culture medium in which the microorganism has been grown, and then further culturing the microorganism to produce bishomo-γ-linolenic acid or a lipid containing bishomo-γ-linolenic acid; and

recovering the bishomo-γ-linolenic acid.

4,916,067

METHOD FOR THE PREPARATION OF SORBIC ACID BY OXIDIZING 2,4-HEXADIENAL WITH A MICROORGANISM

Motoshi Suzuki; Nobuo Murakami, and Akira Inoue, all of Sodegaura, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 254,938, Jul. 11, 1988. This application Mar. 9, 1989, Ser. No. 321,968

Claims priority, application Japan, Dec. 17, 1986, 61-300425; Apr. 15, 1988, 63-91736

Int. Cl.[4] C12P *7/40*; C12R *1/01, 1/40*

U.S. Cl. 435—136 **8 Claims**

1. A method for the preparation of sorbic acid which comprises oxidizing 2,4-hexadienal by bringing at least one kind of microorganisms having an activity to oxidize 2,4-hexadienai and belonging to either one of the genuses of Arthrobacter, Bacillus, Bacteridium, Brevibacterium, Citrobacter, Corynebacterium, Enterobacter, Escherichia, Flavobacterium, Klebsiella, Micrococcus, Microbacterium, Nocardia, Rhodococcus, Paracoccus, Proteus, Pseudomonas, Serratia, Rhodotorula and Saccharomycopsis into contact with the 2,4-hexadienal.

4,916,068

BIOCONVERSION PRODUCTION OF ASCORBIC ACID WITH L-GALACTONO-1,4-OXIDASE

John F. Roland, Glenview, Ill.; Theodore Cayle, Fox Point, Wis.; Robert C. Dinwoodie, Glenview, and David W. Mehnert, Lake Villa, both of Ill., assignors to Kraft, Inc., Glenview, Ill.

Continuation-in-part of Ser. No. 543,975, Oct. 20, 1983, Pat. No. 4,595,659. This application Jun. 18, 1985, Ser. No. 749,538

Claims priority, application PCT Int'l Appl., Oct. 19, 1984, PCT/US84/01695

Int. Cl.[4] C12P *9/60*; C12N *11/00, 9/04*; C12R *1/72*

U.S. Cl. 435—138 **9 Claims**

1. A bioconversion method for producing L-Ascorbic acid, comprising the steps of providing a L-galactono-1,4-oxidase enzyme from a yeast of the strain Candida *norvegensis* MF-56 ATCC 20686, MF-78 ATCC 20732 or an L-ascorbic acid overproductive mutant strain related thereto having an activity of at least about 6.6×10^3 micromoles/min/mg protein, immobilizing said enzyme to form an immobilized enzyme, contacting said immobilized enzyme with said aqueous bioconversion medium containing at least about 2.0 millimolar L-galactono-1,4-lactone, maintaining an oxygen level of at least about 3.0 ppm in said bioconversion medium in contact with said immobilized enzyme to convert said L-galactono1,4-lactone to L-Ascorbic acid under oxygenated conditions, and recovering said L-Ascorbic acid.

4,916,069

ENZYME AND PROCESS FOR PRODUCING THE SAME

Akiko Fujiwara; Tatsuo Hoshino, both of Kamakura, and Teruhide Sugisawa, Yokohama, all of Japan, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 29, 1987, Ser. No. 55,271

Claims priority, application United Kingdom, Jun. 3, 1986, 8613430; Apr. 14, 1987, 8708907

Int. Cl.[4] C12N *9/04*; C12R *1/01*

U.S. Cl. 435—147 **8 Claims**

1. The enzyme L-sorbose dehydrogenase as a pure single protein.

4. A process of producing L-sorbosone comprising oxidizing L-sorbose in an inert solvent medium to form L-sorbosone, said oxidation being carried out in said solvent medium containing as a catalyst the enzyme L-sorbose dehydrogenase in the form of a single pure protein.

4,916,070

FIBRIN-SPECIFIC ANTIBODIES AND METHOD OF SCREENING FOR THE ANTIBODIES

Gary R. Matsueda, Winchester, and Edgar Haber, Weston, both of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Filed Apr. 14, 1986, Ser. No. 851,514

Int. Cl.[4] C12N *5/00*; A61K *39/395*; G01N *33/577*

U.S. Cl. 435—172.2 **7 Claims**

1. A method of screening for hybridomas that secrete human cross-linked fibrin clot-specific monoclonal antibodies consisting essentially of:

(a) immobilizing a cross-linked human fibrin clot on a solid support or surface;

(b) contacting said immobilized clot of step (a) with supernatant from a hybridoma cell line capable of secreting monoclonal antibodies against cross-linked fibrin, without fibrinogen cross-reactivity, to form a clot/cross-linked fibrin-specific monoclonal antibody complex; and

(c) screening for the clot/cross-linked fibrin-specific monoclonal antibody complex by a detectable labeling step to select hybridomas that secrete human cross-linked fibrin clot-specific monoclonal antibodies.

4,916,071

POLY-KRINGLE PLASMINOGEN ACTIVATOR

Paul P. Hung, Bryo Mawr; Narender K. Kalyan, King of Prussia, and Shaw-guang L. Lee, Villanova, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 766,163, Aug. 14, 1985, abandoned. This application Jul. 11, 1986, Ser. No. 884,835

Int. Cl.[4] C12N *9/48, 9/72, 9/64*

U.S. Cl. 435—212 **5 Claims**

1. A human tissue plasminogen activator hybrid comprising at least both kringle regions of human tissue plasminogen activator and one or two heterologous kringles selected from the group consisting of the human urokinase kringle and either of the human prothrombin kringles, wherein said hybrid possesses the fibrinolytic and amidolytic activities of native human tissue plasminogen activator.

4,916,072

PROCESS FOR THE FORMATION OF HUMAN-HUMAN HYBRIDOMA

Kimiyoshi Tsuji, Yokohama, and Nobunao Ikewaki, Hatano, both of Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1987, Ser. No. 31,671

Claims priority, application Japan, Mar. 28, 1986, 61-70199

Int. Cl.[4] C12N *5/00*; A61K *39/395*

U.S. Cl. 435—240.27 **2 Claims**

1. The antibody-producing human-human hybridoma deposited with IFO under IFO-50127.

4,916,073

CDNA AND GENE FOR HUMAN ANGIOGENIN (ANGIOGENESIS FACTOR) AND METHODS OF EXPRESSION

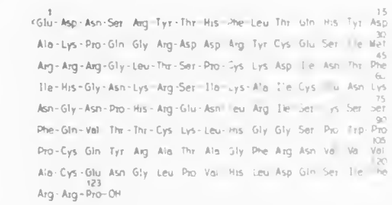
Bert L. Vallee, Brookline, Mass., and Kotoku Kurachi, Seattle, Wash., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Continuation of Ser. No. 105,106, Oct. 5, 1987, abandoned, which is a continuation of Ser. No. 778,547, Sep. 20, 1985, Pat. No. 4,721,672, which is a continuation-in-part of Ser. No. 770,657, Aug. 28, 1985, abandoned. This application Dec. 1, 1988, Ser. No. 278,574

The portion of the term of this patent subsequent to Jan. 26, 2005, has been disclaimed.

Int. Cl.[4] C12N *1/20, 15/00, 7/00*

U.S. Cl. 435—252.3 **2 Claims**



1. A vector for expressing in transformed bacteria the protein defined in FIG. 1 or a protein having substantially the same amino acid sequence and substantially the same angiogenic activity as the protein of FIG. 1, said vector includes a DNA construct comprising the DNA sequence coding for said protein and a promoter upstream of and operably linked to said sequence.

4,916,074

PROCESS FOR PRODUCING OPTICALLY ACTIVE COMPOUNDS

Naoyuki Yoshida, and Hiroshi Morita, both of Yokohama, Japan, assignors to Chisso Corporation, Osaka, Japan

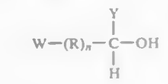
Filed Oct. 28, 1987, Ser. No. 113,764

Claims priority, application Japan, Oct. 30, 1986, 61-256952; Nov. 7, 1986, 61-263837

Int. Cl.[4] C12P *41/00*

U.S. Cl. 435—280 **6 Claims**

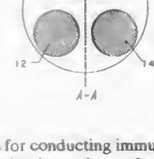
1. A process for the production of an optically active ester of an alcohol which comprises reacting a triglyceride with an (R,S)-alcohol of the formula



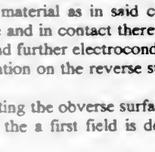
wherein

Y is alkyl of 1-3 carbon atoms,

W is a member selected from the group consisting of (1)



wherein X^1, X^2, X^3, X^4 and X^5 are hydrogen, halogen, alkyl of 1-20 carbon atoms, alkoxy of 1-20 carbon atoms, or a group of the formula



wherein Z^1, Z^2, Z^3, Z^4 and Z^5 are hydrogen, halogen, alkyl of 1-20 carbon atoms or alkoxy of 1-20 carbon atoms, and

(2) alkyloxycarbonyl in which the alkyl moiety is of 1-20 carbon atoms,

R is methylene, and

n is 1,

under substantially anhydrous conditions and in the presence of an enzyme obtained from a Pseudomonas species and having the ability to preferentially conduct a transesterification reaction between the triglyceride and the (R,S)-alcohol to effect the transesterification reaction and obtaining the corresponding R- or S-ester of the alcohol.

4,916,075

DIFFERENTIAL HOMOGENEOUS IMMUNOSENSOR DEVICE

Mark K. Malmros, Newton, and Julian Gulbinski, III, Jamison, both of Pa., assignors to Ohmicron Corporation, Del.

Filed Aug. 19, 1987, Ser. No. 87,087

Int. Cl.[4] C12M *1/00, 1/40*

U.S. Cl. 435—291 **8 Claims**

1 A sensor means for conducting immunoassays comprising:

a film of semiconductive polymer having an obverse and reverse surface,

a common electroconductive area on the reverse surface in contact therewith,

at least one further electroconductive area of the same electroconductive material as in said common area on said reverse surface and in contact therewith,

at least one second further electroconductive area placed at a different location on the reverse surface and in contact therewith,

means for separating the obverse surface of the film in such a manner that the a first field is defined over said first

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electroconductive area and a second field is defined over said second electroconductive area while a portion of each of said fields lies over the said common electroconductive area.

7. An immunoassay sensor cell comprising a sensor means of claim 1,

electrical connection means to said electroconductive areas,

a sample reservoir having an open upper and lower end, the portion of said reservoir surrounding said open lower end being adapted to contact and form a liquid leakproof seal with the obverse surface of the film, of sufficient size to encompass at least the obverse surface over the electroconductive areas on the reverse side,

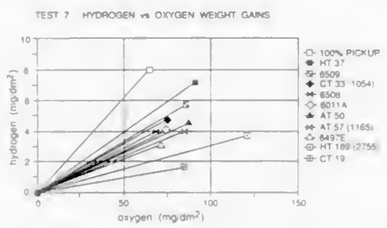
a dual chamber insert, adapted to fit removably inside said reservoir, having open upper and lower ends, the portion of said insert surrounding said open lower end being adapted to contact and form a liquid leakproof seal with the obverse surface of the film and being of sufficient size to encompass at least a part of the obverse surface over the electroconductive areas on the reverse side within said open lower end and having a center partition similarly adapted to contact and form a liquid leakproof seal with the obverse surface of the film.

4,916,076

METHOD TO PREDICT RELATIVE HYDRIDING WITHIN A GROUP OF ZIRCONIUM ALLOYS UNDER NUCLEAR IRRADIATION

A. Burtron Johnson, Jr., Richland; Ira S. Levy, Kennewick; Dennis J. Trimble, Kennewick; Donald D. Lanning, Kennewick, and Franna S. Gerber, Richland, all of Wash., assignors to Battelle Memorial Institute, Richland, Wash., a part interest

Filed Jun. 17, 1988, Ser. No. 208,332
Int. Cl.[4] G01N *31/00*; G21C *17/00*
U.S. Cl. 436—6 **7 Claims**



7. A process for determining which of at least two zirconium alloy materials having different composition and/or fabrication will hydride least rapidly in the presence of water and a source of nuclear radiation, the process comprising:

contacting, under the same conditions, samples of said zirconium alloy materials with an 0.3 to 1.0M aqueous LiOH solution at a temperature of 280° to 316° C. to cause the zirconium alloy to gain weight at a rate of 1.5 to 15 mg/dm^2/day for a period of at least seven days;

determining the ratio of hydrogen weight gain to oxygen weight gain for each sample; an

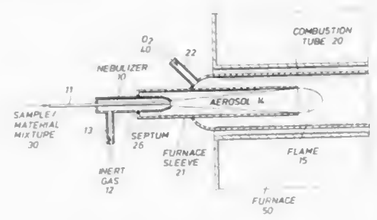
then comparing the ratios, the material having the lowest ratio being the material which will experience the least amount of hydriding in the presence of water and nuclear radiation.

4,916,077

METHOD AND APPARATUS FOR OXIDATIVE DECOMPOSITION AND ANALYSIS OF A SAMPLE

Alan R. Forster, and Gregory J. Kamla, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 20,295, Feb. 27, 1987, abandoned. This application Sep. 28, 1988, Ser. No. 253,549
The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.
Int. Cl.[4] G01N *31/12*
U.S. Cl. 436—160 **8 Claims**



1. A method for analyzing a sample, comprising:

nebulizing in a cool zone at least a portion of said sample using an inert gas,

transporting said nebulized sample to a decomposition zone located in a hot zone,

decomposing said sample in an oxygen-rich atmosphere at a temperature sufficient to ensure complete combustion of said sample,

transporting said decomposed sample to a detection zone, and

analyzing said decomposed sample for a preselected analyte.

3. Apparatus for analyzing a sample, comprising:

means located in a cool zone for nebulizing at least a portion of such a sample to form an aerosol containing said portion of such a sample,

means for decomposing said aerosol in an oxygen-rich atmosphere of oxygen and an inert gas at a temperature sufficient to ensure complete combustion of said portion of such a sample in said aerosol in said decomposition zone,

means for transporting said portion of such a sample from said means for decomposing to a detection zone, and

means for analyzing said portion of such a sample for a preselected analyte in said detection zone.

4,916,078

PROCESS FOR CARRYING OUT ANALYTICAL DETERMINATIONS AND MEANS FOR CARRYING OUT THIS PROCESS

Sigmar Klose, Berg, and Fritz Stähler, Tutzing, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 822,561, Jan. 24, 1986, abandoned, which is a division of Ser. No. 413,012, Aug. 30, 1982, abandoned. This application Sep. 3, 1987, Ser. No. 93,136
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1981, 3134611
Int. Cl.[4] G01N *21/03*
U.S. Cl. 436—165 **5 Claims**

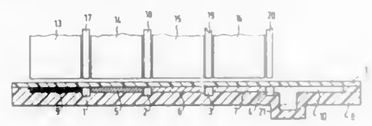
1. Process for analyzing a fluid sample, comprising:

(a) applying a fluid sample to an application point on a transport path,

(b) transporting said fluid sample on said path to a reagent containing zone which contains at least one dry reagent which is dissolvable in said fluid sample,

(c) mixing and incubating said fluid sample and said dry reagent to form a reaction mixture, and

(d) transporting said reaction mixture to a sample measurement point on said transport path to measure a parameter of said reaction mixture, wherein transport of said fluid sample and said reaction mixture on said transport path is accomplished by two transport forces, the first of said forces being a surface force characteristic of said transport path, said first force being a driving force for said fluid



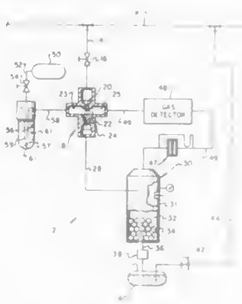
sample and said reaction mixture, and the second of said forces being exerted in a direction perpendicular to the transport direction and a controllably variable pressure force which, when superimposed homogeneously on said first force modifies it throughout and, accelerates, impedes, or stops transport flow of said fluid sample or said reaction mixture on said transport path.

4,916,079

METHOD AND SYSTEM FOR DETERMINING THE CONCENTRATION OF A GAS IN A LIQUID

Lloyd A. Baillie, and Frank H. Hsu, both of Plano, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 13, 1988, Ser. No. 193,965
Int. Cl.[4] G01N *33/00*
U.S. Cl. 436—174 **16 Claims**



1. A method for determining the concentration of a gas substance in a liquid comprising the steps of:

placing a flowstream of the liquid in equilibrium with a flowstream of vapor containing the gas to be measured and determining the concentration of the gas to be measured in said vapor flowstream;

adding a quantity of the gas to be measured at a known rate to the liquid flowstream which is in equilibrium with said vapor flowstream and measuring the change in concentration in the vapor flowstream of the gas to be measured to determine the incremental change of concentration of the gas to be measured in the liquid flowstream for a known rate of gas added to said liquid flowstream; and

dividing the measurement of the concentration of gas in the vapor flowstream which is in equilibrium with said liquid by the incremental unit increase in concentration of the gas in the vapor flowstream to determine the concentration of gas to be measured in the liquid flowstream initially.

4,916,080

IMMUNOASSAY WITH ANTIGEN OR ANTIBODY LABELLED MICROCAPSULES CONTAINING FLUORESCENT SUBSTANCE

Kyoko Imai, Katsuta, and Yasushi Nomura, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 7, 1986, Ser. No. 927,932
Claims priority, application Japan, Nov. 8, 1985, 60-248841
Int. Cl.[4] G01N *33/543, 33/544, 33/546, 33/542*
U.S. Cl. 436—518 **42 Claims**

1. An immunoassay method for determining the concentration of an antigen in a test sample, comprising the steps of:

(a) mixing microcapsules labelled with an antibody for the antigen being tested for with a sample to produce a mixture; wherein said microcapsules (i) contain a fluid having a viscosity different from that of the mixture outside the microcapsules; (ii) contain a fluorescent substance; and, (iii) are susceptible to lysis upon complement activated immunoreaction;

(b) irradiating said mixture with excited light and detecting the vertical-polarization component $I_{\parallel B}$ and the parallel-polarization component $I_{\perp B}$ of fluorescence from the mixture;

(c) adding complement to the mixture to initiate lysis of the microcapsules wherein the number of microcapsules lysed is dependent upon the antigen concentration of the sample;

(d) irradiating the reaction mixture with excited light and detecting the vertical-polarization component $I_{\parallel B}$ and the parallel-polarization component $I_{\perp B}$ of fluorescence from the reaction mixture;

(e) comparing the detection results of the vertical-polarization component of $I_{\parallel B}$ and the parallel-polarization component $I_{\perp B}$ of fluorescence from the mixture with the vertical-polarization component $I_{\parallel B}$ and the parallel-polarization component $I_{\perp B}$ of fluorescence from the reaction mixture to determine the change in the degree of polarization fluorescence due to the lysis of the microcapsules; and,

(f) comparing the change in the degree of polarization fluorescence with a calibration curve which was previously prepared by subjecting standard samples containing known concentrations of the antigen to change in polarization fluorescence measurements, thereby determining the concentration of the antigen in the test sample.

4,916,081

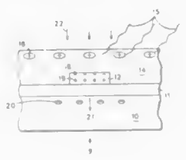
ASSAY METHOD AND APPARATUS OF IMMUNE REACTION

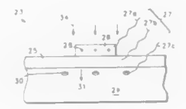
Satoru Kamada, Yamato, and Shuji Iwasaki, Machida, both of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Jul. 6, 1987, Ser. No. 69,968
Claims priority, application Japan, Jul. 4, 1986, 61-157605
Int. Cl.[4] G01N *33/553*
U.S. Cl. 436—526 **15 Claims**

1. In an immuno assay method for optically detecting the complex of an immuno reaction conducted on the surface of a bead, the improvement comprising vibrating said bead so as to average an existence probability of said bead in a cell during the optical detection of the complex.

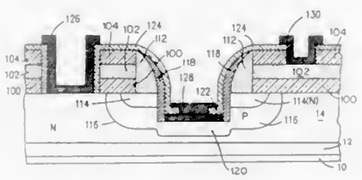
4,916,082
METHOD OF PREVENTING DIELECTRIC DEGRADATION OR RUPTURE
Israel A. Lesk; Clarence A. Lund, both of Phoenix, and Thomas C. Smith, Scottsdale, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.
Filed Mar. 14, 1989, Ser. No. 322,945
Int. Cl.[4] H01L *21/268*
U.S. Cl. 437—20 12 Claims





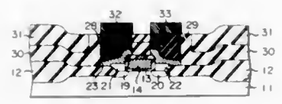
1. A method of preventing damage to a dielectric layer, comprising the steps of:
providing a wafer comprising a semiconductor substrate, the dielectric layer disposed on the substrate, and a floating semiconductor layer disposed on the dielectric layer;
subjecting the wafer to a process step that injects charge into the wafer; and
illuminating the wafer with light concurrently with the process step that injects charge into the wafer, wherein the light provides for production of electrons in the substrate which facilitates tunneling of the electrons, and thus prevents damage to the dielectric layer.

4,916,083
HIGH PERFORMANCE SIDEWALL EMITTER TRANSISTOR
Michael D. Monkowski, Beacon, and Joseph F. Shepard, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 48,346, May 11, 1987, Pat. No. 4,847,670.
This application Mar. 6, 1989, Ser. No. 318,984
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—31 32 Claims



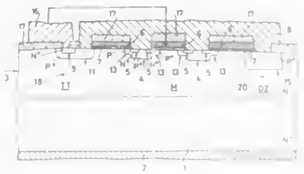
1. A process for forming a vertical bipolar transistor comprising:
providing a semiconductor substrate having a first conductivity type epitaxial layer thereon;
forming an insulator-conductor dual layer having at least one substantially vertical surface on said epitaxial layer;
forming a second conductivity type intrinsic base region in a surface portion of said epitaxial layer adjacent said wall;
forming a first conductivity type doped material on said epitaxial layer as a sidewall abutting said vertical surface;
anisotropically etching to recess epitaxial layer not masked by said sidewall and said dual layer below the surface of the remainder of said epitaxial layer;
forming a first conductivity type emitter by diffusing dopant from said sidewall into a surface portion of the intrinsic base in correspondence with said sidewall;
establishing a second insulator on said sidewall; and forming a second conductivity type extrinsic base in a surface portion of said recessed epitaxial layer.

4,916,084
METHOD FOR MANUFACTURING MOS SEMICONDUCTOR DEVICES
Hideki Shibata, and Mitsuchika Saitoh, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 12, 1988, Ser. No. 217,787
Claims priority, application Japan, Jul. 13, 1987, 62-174119
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—41 6 Claims



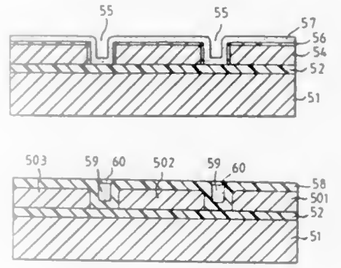
1. A method for manufacturing MOS semiconductor devices which comprises the steps of:
forming an oxidation resistant film on the upper and side surfaces of a gate electrode which is formed on a semiconductor substrate via an oxide film and whose upper and side surfaces are coated with an insulation oxide film;
effecting thermal oxidation with said oxidation resistant film as a mask;
removing said oxidation resistant film and part of said oxide film lying directly under said oxidation resistant film to selectively expose the surface of said semiconductor substrate;
doping impurity into the exposed surface area of said semiconductor substrate to form impurity regions serving as source and drain regions;
forming a semiconductor layer on the exposed surface of said semiconductor substrate by a growth process;
forming a first refractory metal layer on the entire surface of the semiconductor structure;
forming an insulation film on said first refractory metal layer;
selectively removing said insulation film to form at least one contact hole;
forming a second refractory metal layer in said contact hole by a deposition process;
removing said insulation film and said first refractory metal layer except that part thereof which lies directly under said second refractory metal layer; and
depositing an interlayer insulation film on the entire surface of the semiconductor structure, and planarizing the surface of said interlayer insulation film to expose the surface of said second refractory metal layer.

4,916,085
MOS POWER STRUCTURE WITH PROTECTIVE DEVICE AGAINST OVERVOLTAGES AND MANUFACTURING PROCESS THEREFOR
Ferruccio Frisina, Catania, Italy, assignor to SGS Microelettronica S.p.A., Catania, Italy
Division of Ser. No. 130,952, Dec. 9, 1987, abandoned. This application Jun. 15, 1989, Ser. No. 366,212
Claims priority, application Italy, Dec. 17, 1986, 22719 A/86
Int. Cl.[4] H01L *21/283*
U.S. Cl. 437—44 2 Claims



2. A method of fabricating a MOS power structure comprising the steps of:
(a) forming a N^--doped epitaxial layer on a N^+-doped semiconductor substrate;
(b) forming an oxide layer on the epitaxial layer;
(c) patterning the oxide layer to form a window corresponding to the anode region of a zener diode;
(d) implanting acceptor impurities through the patterned oxide layer to form the p^+-anode region of the zener diode at a specified depth;
(e) forming and patterning a second oxide layer to establish windows corresponding to the well regions of MOS cells and the base region of a bipolar transistor protection structure;
(f) implanting acceptor impurities through the patterned oxide layer to simultaneously form the p^+-well regions and the p^+-base region in the epitaxial layer;
(g) depositing a gate oxide layer on the entire surface of the epitaxial layer;
(h) depositing a polysilicon gate electrode layer on the oxide layer;
(i) patterning the polysilicon layer to form gate electrode regions for the MOS cells;
(j) implanting acceptor impurities into the epitaxial layer using the gate electrode regions as a mask to form the p^--channel regions which control the threshold of the MOS cells;
(k) forming a third oxide pattern corresponding to the source regions of the MOS cells and the emitter region of the bipolar transistor protection structure;
(l) implanting donor impurities into the p^+-well regions and the p^+-base region of the bipolar protection device to simultaneously form the N^+-source regions of the MOS cells and the N^+-emitter region of the bipolar transistor protection structure;
(m) forming a fourth oxide pattern corresponding to ohmic contacts; and
(n) depositing a metallization layer connecting between the source electrode and the well region of each MOS cell and the base region of the protection transistor as well as the anode region of the zener diode and a metallization layer connecting the gate of the MOS cell to the emitter region of the bipolar transistor protection structure.

4,916,086
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING ROUNDED TRENCH CORNERS
Kouichi Takahashi, Kawasaki; Hiroshi Kinoshita, Yokohama; Naoto Miyashita, Kawasaki, and Hiromori Sonobe, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 9, 1988, Ser. No. 204,550
Claims priority, application Japan, Jun. 18, 1987, 62-150281
Int. Cl.[4] H01L *21/76*
U.S. Cl. 437—62 5 Claims



1. A method of manufacturing a semiconductor device, comprising the steps of:
preparing a semiconductor substrate having a first surface;
forming a trench region in the first surface of the substrate, having corners at the intersections of the trench region with the first surface;
forming a first polycrystalline layer on the first surface covering the corners of, and only partially filling the trench region;
oxidizing the first polycrystalline layer;
oxidizing the corners of the trench region during the oxidation of the first polycrystalline layer to form an oxidized layer at the corners;
removing the oxidized layer formed at the corners of the trench region thereby rounding the corners of the trench region and exposing the rounded corners;
subjecting the semiconductor substrate having the rounded corners to an oxidation treatment to form a first insulating layer to fill the trench region partially; and
forming a second polycrystalline layer over the first insulating layer to fill the trench region completely.

4,916,087
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE BY FILLING AND PLANARIZING NARROW AND WIDE TRENCHES
Hidehisa Tateoka, Tenri; Shigeo Onishi, Nara, and Masato Kawai, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Aug. 29, 1989, Ser. No. 400,013
Claims priority, application Japan, Aug. 31, 1988, 63-219505
Int. Cl.[4] H01L *21/82*
U.S. Cl. 437—67 7 Claims

1. A method of manufacturing a semiconductor device, comprising the steps of
(a) depositing a first insulating film by anisotropic deposition method over the entire surface of a semiconductor substrate which is provided with a narrow trench having an opening width in submicrons and a broad trench having an opening width larger than 1 μm so that said narrow and broad trenches are substantially filled with said first insulating film;

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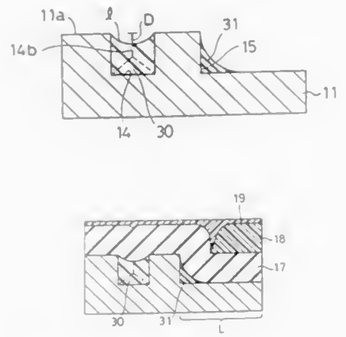
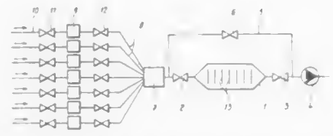
(b) removing said first insulating film by an isotropic dry etching method;
(c) depositing a second insulating film over the entire surface of said semiconductor substrate by an isotropic deposition method so that said narrow and broad trenches are substantially filled with said second insulating film;
(d) forming a first resist layer on said broad trench filled with said second insulating film;



(e) forming a second resist layer over the entire surface of said second insulating film and said first resist layer thereon; and
(f) removing said first and second resist layers and said second insulating film by an anisotropic dry etching method until the surface of the semiconductor substrate is flattened.

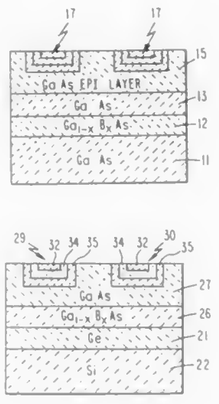
4,916,089
PROCESS FOR THE EPITAXIAL PRODUCTION OF SEMICONDUCTOR STOCK MATERIAL
Jaap Van Suchtelen, Hoogeloon; Lodevicus J. Giling, and Josephus E. M. Hogenkamp, both of Nijmegen, all of Netherlands, assignors to Stichting Katholieke Universiteit, Nijmegen, Netherlands
Filed Sep. 2, 1988, Ser. No. 240,784
Claims priority, application Netherlands, Sep. 4, 1987, 8702096
Int. Cl.[4] H01L *21/20*
U.S. Cl. 437—81 4 Claims



I. Process for the epitaxial production of semiconductor products or of articles provided with a layer, wherein a number of metered gases are passed into a pulsed reactor, in which reactor a decomposition of molecules, and depositions of atoms take place, characterized in that each of the said gases is fed to a separate gas pipette and thereafter the content of the gas pipette is passed cyclically, by pressure differential, into the pulsed reactor, with the composition of the mixture being changed per one or more cycles.

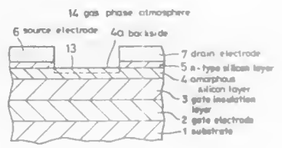
4,916,088
METHOD OF MAKING A LOW DISLOCATION DENSITY SEMICONDUCTOR DEVICE
John B. Mooney, San Jose, and Arden Sher, San Carlos, both of Calif., assignors to SRI International, Menlo Park, Calif.
Filed Apr. 29, 1988, Ser. No. 187,939
Int. Cl.[4] H01L *21/20*
U.S. Cl. 437—81 71 Claims

I. In method of forming a low dislocation density layer of a III-V or II-VI semiconductor compound on a bulk semiconductor substrate, introducing into the compound alloying atoms enabling the layer to have a lower dislocation density than it would have if the alloying atoms were not so introduced, the quantity of alloying atoms being such that they are in a supersaturated state in the compound, and adding sufficient energy to the compound and alloying atoms to cause the alloying atoms to be predetermined positions in the lattice structure of the compound that provides the lower dislocation



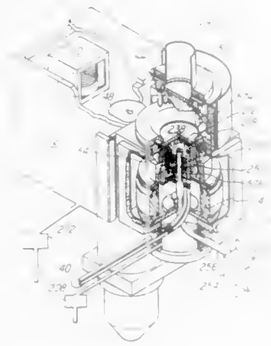
density, the amount of the added energy being such that the alloying atoms are not precipitated from the compound.

4,916,090
AMORPHOUS SILICON THIN FILM TRANSISTOR AND METHOD OF MANUFACTURING THE SAME
Noboru Motai; Yoshihisa Ojiwara, both of Tochigi, and Yasunari Kanda, Tokyo, all of Japan, assignors to Nippon Precision Circuits Ltd. and Seikosha Co., Ltd., both of Tokyo, Japan
Filed Mar. 13, 1989, Ser. No. 322,842
Claims priority, application Japan, Mar. 23, 1988, 63-68697
Int. Cl.[4] H01L *21/22, 21/223, 21/326*
U.S. Cl. 437—141 11 Claims



1. A method of manufacturing an amorphous silicon thin film transistor, comprising the steps of:
exposing an amorphous silicon layer sandwiched between a gate electrode and source and drain electrodes, at a side thereof facing away from the gate electrode and which is exposed between said source electrode and said drain electrode, to a gas phase atmosphere at least having a gas containing an impurity forming an acceptor, the amorphous silicon layer being of a first conduction type and the acceptor being of a second different conduction type, and
then activating said impurity with an electric field energy or light energy, thereby doping said activated impurity from said side of said amorphous silicon layer into said amorphous silicon layer.

4,916,091
PLASMA AND PLASMA UV DEPOSITION OF SiO_2
Dean W. Freeman, San Diego, Calif.; James B. Burris, Dallas, Tex.; Cecil J. Davis, Greenville, Tex., and Lee Loewenstein, Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 117,708, Nov. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 74,391, Jul. 16, 1987, abandoned. This application Dec. 13, 1988, Ser. No. 284,835
Int. Cl.[4] H01L *21/00, 21/02, 21/306;* C03C *15/00*
U.S. Cl. 437—238 8 Claims



I. A method for depositing silicon dioxide on a wafer comprising:
(a) transferring a wafer into a process chamber of a process module;
(b) purging said chamber with an appropriate gas;
(c) lowering the pressure within said chamber to less than ambient;
(d) heating the chamber;
(e) generating a remote plasma from an oxygen containing gas in a plasma generator remote from the process chamber using microwave energy;
(f) presenting said remote plasma to a face of said wafer in said chamber;
(g) providing a gas therewith comprising 1,3,5,7 tetramethylcyclotetrasiolxane, and
(h) illuminating said face of said wafer with ultraviolet energy generated by plasma inside said module.

4,916,092
CERAMIC COMPOSITES REINFORCED WITH MODIFIED SILICON CARBIDE WHISKERS
Terry N. Tiegs, Lenoir City, and Terrence B. Lindemer, Oak Ridge, both of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.
Filed Feb. 4, 1988, Ser. No. 152,276
Int. Cl.[4] C04B *35/80*
U.S. Cl. 501—89 4 Claims

4. A ceramic composite comprising a ceramic matrix having elongated monocrystalline silicon carbide whiskers homogeneously dispersed therein, said whiskers having a diameter in the range of about 0.1 to 10 μm and a length to diameter ratio greater than about 10, said whiskers having a surface characterized by a silicon dioxide-to-silicon carbide ratio of less than 0.1, a concentration of calcium oxide less than about 1.5 wt. %, and a coating of free carbon on said surface of about 1–100 angstroms.

4,916,093
METHOD OF PRODUCING CONTINUOUS INORGANIC FIBER CONSISTING OF SI, N AND O
Kiyohito Okamura, Mito; Mitsuhiko Sato, and Yoshio Hasegawa, both of Ibaraki, all of Japan, assignors to Nippon Carbon Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 207,934, Jun. 17, 1988, abandoned, which is a continuation of Ser. No. 936,394, Dec. 1, 1986, abandoned, which is a division of Ser. No. 727,816, Apr. 26, 1985, Pat. No. 4,650,733. This application Feb. 21, 1989, Ser. No. 312,392
Claims priority, application Japan, Jun. 25, 1984, 59-129145
Int. Cl.[4] C04B *35/80*
U.S. Cl. 501—95 8 Claims

1. A method for producing a continuous inorganic fiber consisting essentially of Si, N and O in a composition ratio wherein the atomic ratio of N/Si is 1.3/0.5 and that of O/Si is 1.0/0.05; which comprises:
(a) spinning a fiber from a polycarbosilane having a molecular weight of 800–50,000;
(b) heating the spun fiber in an oxidizing atmosphere at 50°–400° C. or irradiating the spun fiber in an oxidizing atmosphere with 10^6–10^{10} R of the γ-ray radiation or 10^7–10^{10} Rad electron bean radiation to form an infusible fiber; and
(c) heating the infusible fiber at a temperature of 800°–1,650° C. in a stream of ammonia gas.

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4,916,094

METHOD FOR PRODUCING HIGH SOLIDS KAOLIN SLURRY

Jorge Salinas, Homestead, Fla., assignor to E.C.C. America Inc., Atlanta, Ga.

Filed Jul. 21, 1988, Ser. No. 222,279
Int. Cl.[4] C04B *33/04*
U.S. Cl. 501—146 5 Claims

1. A process for treating a crude kaolin clay mineral which comprises:

a. blunging the clay in sufficient water to form an aqueous suspension having a solids content of at least 60% by weight for a period of time in the range of about two minutes to less than an hour, adding sufficient ammonia to adjust the pH to within the range of about 3.0 to about 4.5 and adding polyacrylic acid as a dispersant, employing a quantity of dispersant sufficient to achieve substantially minimum low shear viscosity;

b. degritting to remove particles larger than those that would pass through a 200 mesh screen;

c. bleaching the suspension with a reducing bleaching agent; and

d. recovering a clay suspension of increased brightness and improved color having a solids content of at least 60% by weight.

4,916,095

MODIFIED CLAY SORBENTS

H. Scott Fogler, Ann Arbor, and Keeran R. Srinivasan, Livonia, both of Mich., assignors to The University of Michigan, Ann Arbor, Mich.

Filed Jul. 14, 1988, Ser. No. 219,091
Int. Cl.[4] B01J *21/16*
U.S. Cl. 502—62 19 Claims

1. A clay-based sorbent comprising:

(a) a clay having an external surface and lamellar layers; and

(b) cationic surfactant ions having a hydrocarbon portion and a cationic head portion, the cationic surfactant ions being irreversibly bound to the external surface by the hydrocarbon portion.

13. Cetylpyridinium-aluminum hydroxy-montmorillonite.

16. The clay-based sorbent of claim 1 wherein the clay is a non-expandable clay.

18. The clay-based sorbent of claim 16 wherein the cationic surfactant ions are selected from the group consisting of ionized cetylpyridinium chloride and cetylalkonium chloride.

4,916,096

HYDROCARBON CONVERSION CATALYSTS

Arend Hoek; Tom Huizinga, and Ian E. Maxwell, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 55,652, May 29, 1987, Pat. No. 4,857,170.
This application Apr. 28, 1989, Ser. No. 344,588
Claims priority, application United Kingdom, May 30, 1986, 8613132
Int. Cl.[4] B01J *29/06*
U.S. Cl. 502—66 35 Claims

1. A composition of matter suitable as a catalyst (base) in hydroprocessing comprising a crystalline aluminosilicate zeolite and a binder wherein the crystalline aluminosilicate comprises a modified Y zeolite having a unit cell size below 24.35 Å, a degree of crystallinity which is at least retained at increasing SiO_2/Al_2O_3 molar ratios, a water adsorption capacity (at 25° C. and a p/p_o value of 0.2) of between 10% and 15% by weight of modified zeolite and a pore volume of at least 0.25 ml/g wherein between 10% and 60% of the total pore volume is made up of pores having a diameter of at least 8 nm.

4,916,097

METHOD FOR ACTIVATING ZEOLITES CONTAINING ORGANIC CATIONS

Yung F. Chu, Plainsboro, and John P. McWilliams, Woodbury, both of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Filed May 16, 1988, Ser. No. 194,683
Int. Cl.[4] B01J *29/06*
U.S. Cl. 502—85 15 Claims

1. A method for activating an organic cation-containing crystalline catalyst by removal of the organic cation which comprises contacting the catalyst with steam for a sufficient time and under conditions resulting in substantial decomposition of the organic cation and activation of the catalyst.

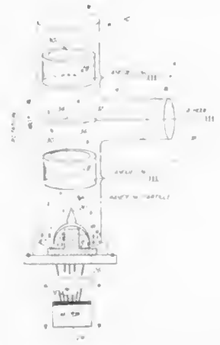
4. The method of claim 1 wherein the organic cation-containing zeolite is contacted with steam at a temperature from about 500° F. to about 1100° F.

4,916,098

PROCESS AND APPARATUS FOR MANUFACTURING AN ELECTROCATALYTIC ELECTRODE

Hugues Ménard, Sherbrooke; Louis Brossard, Ste-Julie, and Yves Choquette, Anjou, all of Canada, assignors to Sherbrooke University, Quebec, Canada

Filed Nov. 21, 1988, Ser. No. 273,812
Int. Cl.[4] H01M *4/88*; C25D *15/00*
U.S. Cl. 502—101 16 Claims



1. A process for manufacturing an electrocatalytic electrode, comprising the steps of:

placing an electrically conductive substrate in a solution contained in an electrolytic cell, said solution itself containing ions of a metal and dispersed particles of an electrocatalytic material selected from the group consisting of:

(1) Fe;
(2) Ni;
(3) Co;
(4) Cu; and
(5) an alloy of at least two metals, namely a first metal and a second metal, said first metal being selected from the group consisting of:
(a) Fe;
(b) Ni;
(c) Co; and
(d) Cu,

said second metal being selected from the group consisting of:

(a) Al;
(b) Zn;
(c) Cd;
(d) Sn; and
(e) Mo,

establishing an electric current in said solution between an anode and a cathode, said substrate constituting said cathode, to thereby induce a deposition of metal on said substrate by reduction of metal ions, said deposited metal forming a binder for retaining particles of said electrocatalytic material on said substrate; and

periodically turning said cell between at least two predetermined positions to cause a recurrent migration of the particles of electrocatalytic material, under the effect of gravity, toward said substrate whereby particles of the electrocatalytic material are captured in said binder.

13. An apparatus for producing an electrocatalytic electrode from an electrically conductive substrate immersed in a solution containing ions of a metal and dispersed particles of an electrocatalytic material selected from the group consisting of:

(1) Fe;
(2) Ni;
(3) Co;
(4) Cu; and
(5) an alloy of at least two metals, namely a first metal and a second metal, said first metal being selected from the group consisting of:
(a) Fe;
(b) Ni;
(c) Co; and
(d) Cu,

said second metal being selected from the group consisting of:

(a) Al;
(b) Zn;
(c) Cd;
(d) Sn; and
(e) Mo,

said electrode producing apparatus comprising:

a cell itself comprising container means to receive said solution, an anode means in electrical contact with said solution, and means for holding said substrate immersed into said solution, said substrate constituting a cathode;

an electric power source connected to said anode means and to said substrate to establish an electric current in said solution between said anode means and said substrate to thereby induce a deposition of metal on said substrate by reduction of metal ions, said deposited metal forming a binder for retaining particles of said electrocatalytic material on said substrate; and means for periodically turning said cell between at least two predetermined positions to cause a recurrent migration of the particles of electrocatalytic material, under the effect of gravity, toward said substrate whereby particles of the electrocatalytic material are captured in said binder, said anode means comprising a pair of spaced apart anodes, said substrate being mounted between said anodes and comprising two generally opposite surfaces to be coated with electrocatalytic material, each surface being faced by a respective one of said two anodes and wherein each anode is formed with a passage allowing particles of the electrocatalytic material to migrate through said passage.

4,916,099

SOLID CATALYST COMPONENT FOR OLEFIN COPOLYMERIZATION AND PROCESS FOR OLEFIN COPOLYMERIZATION USING SAID SOLID CATALYST COMPONENT

Toshio Sasaki; Yoshihiro Miyoshi; Takeshi Ebara, all of Ichihara, and Kiyoshi Kawai, Chiba, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 29, 1988, Ser. No. 237,324
Claims priority, application Japan, Sep. 9, 1987, 62-227032
The portion of the term of this patent subsequent to Sep. 13, 2006, has been disclaimed.
Int. Cl.[4] C08F *4/64*
U.S. Cl. 502—126 18 Claims

1. A solid catalyst component for olefin copolymerization containing a trivalent titanium compound, which is obtained by reducing a titanium compound respectively by the general formula $Ti(OR^1)_nX_{4-n}$ (wherein R^1 is a hydrocarbon group of 1 to 20 carbon atoms, X is a halogen atom, and n is a number satisfying $0<n\leqq 4$) with an organomagnesium compound in the presence of a porous carrier having a pore volume of, at pore radius of 50 to 5,000 Å, at least 0.2 ml/g to obtain a solid product, treating the solid product with a mixture of a dialhyl ether and titanium tetrachloride.

4,916,100

PROCESS FOR PREPARING A CATALYST SYSTEM FOR SELECTIVE ALKYLATION OF TOLUENE WITH PROPYLENE

Pekka Knuuttila, Porvoo, and Aila Ali-Hokka, Kulloo, both of Finland, assignors to Neste Oy, Finland

PCT No. PCT/FI87/00175, § 371 Date Aug. 11, 1988, § 102(e) Date Aug. 11, 1988, PCT Pub. No. WO88/04956, PCT Pub. Date Jul. 14, 1988
PCT Filed Dec. 29, 1987, Ser. No. 235,885
Claims priority, application Finland, Dec. 31, 1986, 865363
Int. Cl.[4] B01J *23/04, 27/232*
U.S. Cl. 502—174 2 Claims

1. Procedure for preparing a catalyst system for selective alkylation of toluene with propylene, containing metallic sodium which has been thermally decomposed from a compound containing sodium, onto the surface of solid K_2CO_3,

wherein the compound containing sodium is thermally decomposed onto the surface of the solid K_2CO_3, and

the compound containing sodium is sodium azide (NaN_3).

4,916,101

METHOD OF PREPARING HETEROPOLYACID CATALYSTS

James E. Lyons, Wallingford; Paul E. Ellis, Jr., Downingtown; Wayne A. Langdale, Milmont Park, and Harry K. Myers, Jr., Cochranville, all of Pa., assignors to Sun Refining and Marketing Company, Philadelphia, Pa.

Filed Dec. 5, 1988, Ser. No. 279,903
Int. Cl.[4] B01J *27/18, 27/182, 27/185, 27/188*
U.S. Cl. 502—209 3 Claims

1. Method of preparing a heteropolyacid from its ammonium or alkali metal salt, said heteropolyacid having the formula

$$H_c(X_kM_nO_y)^{-e}$$

where X is a group IIIA-VIA element, M is a transition metal, k is 1–5, n is 5–20, and y is 18–62 which comprises reacting said salt with a C_1–C_7 tetraalkylammonium halide to form the tetraalkylammonium salt of said heteropolyacid, and pyrolyzing said latter salt to form said heteropolyacid.

4,916,102

CATALYST SYSTEM FOR OLEFIN DISPROPORTIONATION

Frank J. Janssen; Coenraad H. Wilms; Donald Reinalda, and Hendrik W. Bruijn, all of AM Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 17, 1988, Ser. No. 272,590
Claims priority, application United Kingdom, Nov. 18, 1987, 8726925
Int. Cl.[4] B01J *21/04, 23/28, 27/02, 27/19*
U.S. Cl. 502—211 22 Claims

1. A catalyst system for olefin disproportionation containing molybdenum oxide supported on alumina prepared by a process which comprises:

(a) comulling a gamma alumina providing agent with a sulfur-containing compound and/or a phosphorus-containing compound to produce a homogeneous mass,

(b) extruding the mass and dividing it into small particles,

(c) drying and calcining said particles at a temperature in the range of from about 400° C. to about 800° C.

(d) subjecting said particles at least once to an additional step

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comprising: (1) impregnating said particles with a solution of molybdenum oxide(s), (2) drying and (3) calcining said impregnated particles at a temperature in the range of from about 400° C. to about 800° C.

4,916,103

PREPARATION OF A CATALYTICALLY ACTIVE COMPOSITION FOR THE GAS PHASE OXIDATION OF PROPYLENE TO ACROLEIN AND ACRYLIC ACID

Hans Martan, Frankenthal; Matthias Schwarzmann, Limburgerhof; Karl-Heinz Boehning, Darmstadt, and Heinz Dreyer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 25, 1988, Ser. No. 275,974

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1987, 3740271

Int. Cl.[4] B01J *23/78, 23/84, 23/88, 27/18*

U.S. Cl. 502—212 1 Claim

1. A process for preparing, for the gas phase oxidation of propylene to acrolein and acrylic acid, a catalytically active composition of the general formula

$$Mo_{12}Bi_{0.1\text{-}10}Fe_{0.8\text{-}12}M_{0.1\text{-}10}P_{0\text{-}2}A_{0\text{-}10}B_{0\text{-}001\text{-}1}O_x$$

wherein

A is arsenic, antimony, tin, thallium, tungsten, an alkaline earth metal, zinc and/or chromium,

B is at least one of the metals sodium, potassium, rubidium, cesium and/or indium,

M is Ni, Co or a combination thereof, and

x is the number determined by the atomic valences of the individual elements,

by mixing salts of the constituents in an aqueous medium, evaporating the water and calcining at from 400° to 650° C., wherein a dried pulverulent iron molybdate gel ($Fe(MoO_4)_3$) is added to an aqueous solution or suspension of water-soluble salts of the other constituents customary for this purpose, including any excess of iron or molybdenum salt beyond the amount introduced with the iron molybdate, the mixture is rigidified into a gel by stirring and possibly heating, and the gel is constituted and dried at an elevated temperature and then calcined.

4,916,104

CATALYST COMPOSITION FOR DECOMPOSITION OF METHANOL

Nobuo Isogai; Makoto Takagawa; Kumiko Watabe; Mikio Yoneoka, and Ken Yamagishi, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jan. 10, 1989, Ser. No. 295,525

Claims priority, application Japan, Jan. 13, 1988, 63-3866; Oct. 28, 1988, 63-270638

Int. Cl.[4] B01J *27/18, 27/185;* C01B *3/22, 31/18*

U.S. Cl. 502—213 11 Claims

1. A catalyst composition for decomposition of methanol comprising a substantially aluminum-free precipitate composed of a copper compound and a nickel compound, a phosphate salt of aluminum and an alkali metal compound, the content of the alkali metal being 1 to 100 atoms per 100 atoms in total of copper and nickel in the precipitate.

4,916,105

CATALYST AND METAL FERRITES FOR REDUCTION OF HYDROGEN SULFIDE EMISSIONS FROM AUTOMOBILE EXHAUST

Jeffrey S. Rieck, Jessup; Wilson Suarez, Columbia, and Joseph E. Kubsh, Silver Spring, all of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Feb. 7, 1989, Ser. No. 307,649

Int. Cl.[4] B01J *21/04, 23/10, 23/40*

U.S. Cl. 502—303 21 Claims

1. Automotive exhaust catalyst comprising a support carrying a catalytically effective amount of at least one platinum group metal and an H_2S gettering amount of a metal ferrite having the formula MFe_2O_4, where M is Co, Ni, Cu, Zn, Mn, or Fe.

4,916,106

SUPPORTED CATALYST AND PROCESS FOR ITS PRODUCTION FOR THE REDUCTION OF NITROGEN OXIDES

Hans-Joachim Koschlig, Bochum-Dahlhausen; Frank Hutter, Würzburg, and Helmut Schmidt, Zellingen, all of Fed. Rep. of Germany, assignors to Dr. C. Otto Feuerfest GmbH, Bochum-Dahlhausen, Fed. Rep. of Germany

Filed Dec. 18, 1987, Ser. No. 135,080

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1986, 3643605

Int. Cl.[4] B01J *21/04, 21/06, 23/22, 23/30*

U.S. Cl. 502—309 8 Claims

1. A supported catalyst for nitrogen oxide reduction, comprising a solid porous supporting body on which an essentially amorphous active catalyst coating containing metal oxides is deposited, wherein the active catalyst coating is obtained by a sol-gel process which comprises reacting:

(a) a solution of soluble and hydrolyzable compounds:

(A) of one element selected from the group consisting of Al, Si and Ti;

(B) of at least one element selected from the group consisting of V, Mn, Fe, Co and Ni;

(C) of at least one element selected from the group consisting of Cr, Mo, W and Sn; and

(D) of optionally at least one element selected from the group consisting of Mg, Cu, Zn, La, Ce and Gd;

wherein the proportion of said elements, expressed as an atomic percentage of the elements, is 50–98% of (A), 1–50% of (B), 0.5–20% of (C), and 0–5% of (D), and the total of the atomic percentages is 100%,

in an organic solvent with a lesser quantity of water than the quantity stoichiometrically necessary for the complete hydrolysis of the compounds, optionally in the presence of an acidic or basic catalyst;

(b) optionally further condensing the precondensate produced with a quantity of water necessary for the hydrolysis of the residual hydrolyzable components, optionally in the presence of an acidic or basic catalyst;

(c) coating the solid, porous catalyst supporting body with the solution of the precondensate from step (a) or the further condensed product from step (b), further condensation o the precondensates in said first mentioned case being performed on the coated supporting body; and

(d) drying and heating the coated carrier body.

4,916,107

CATALYST FOR THE SELECTIVE REDUCTION OF NITROGEN OXIDES WITH AMMONIA

Reinhold Brand; H. Bernd Engler, both of Hanau; Wolfgang Honnen, Bruchkoebel; Peter Kleine-Moellhoff, and Edgar Koberstein, both of Alzenau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Nov. 17, 1988, Ser. No. 272,311

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1987, 3740289

Int. Cl.[4] B01J *21/06, 23/20, 23/22, 23/28*

U.S. Cl. 502—309 14 Claims

1. A catalyst for the selective reduction with ammonia of nitrogen oxides in oxygen containing exhaust gas comprising an intimate mixture of at least three metals each in the form of their oxides, namely,

(A) titanium as constituent A,

(B_1) tungsten as the first constituent B, and

(B_2) at least one of the metals selected from the group consisting of vanadium, iron, niobium, and

molybdenum as the second constituent B with an atomic ratio of constituent (A) to (B) of 1 : 0.001 to 1, wherein the constituent (A) is present in the form of a finely divided oxide obtained by flame hydrolysis of $TiCl_4$ and wherein said finely divided oxide has the following properties:

BET surface area	m^2/g	50 +/− 15
average size of primary particles	nm	30
tamp density[1]	g/L	ca. 150
loss on drying[2] (2 h at 105° C.)	wt. %	1.5
loss on ignition[2][4] (2 h at 1000° C.)	wt. %	2
pH[3] (in 4% aqueous dispersion)		3–4
x-ray structure		mainly anatase
isoelectric point at pH		6.6
density	g/cm^3	3.8
Al_2O_3[5]	wt. %	0.3
TiO_2[5]	wt. %	99.5
SiO_2[5]	wt. %	0.2
Fe_2O_3[5]	wt. %	0.01
HCL[5][6]	wt. %	0.3

[1]according to DIN 53194 or ISO 787/XI

[2]according to DIN 55921 or ISO 787/11, or ASTM D 280-30 (loss on drying) and ASTM D1208-65 (loss on ignition)

[3]according to DIN 53200 or ISO 787/IX, or ASTM D 1208-65

[4]based on the substance dried 2 hours at 105° C

[5]based on the substance calcined 2 hours at 1000° C

[6]HCl content is a part of the loss on ignition

and the catalyst is obtained by impregnation of the said titanium dioxide with solutions of salts of the metals of group (B), drying and calcination at 100–650° C.

4,916,108

CATALYST PREPARATION USING SUPERCRITICAL SOLVENT

David F. McLaughlin, Oakmont, and Michael C. Skriba, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 25, 1988, Ser. No. 236,482

Int. Cl.[4] B01J *23/40, 23/50, 23/72, 23/74*

U.S. Cl. 502—337 18 Claims

1. A process for preparing a metal catalyst supported on a high surface area porous support including the steps of:

(a) selecting a high surface area porous support;

(b) selecting a salt of a catalytic metal;

(c) selecting a supercritical fluid solvent in which said catalytic metal salt is highly soluble;

(d) dissolving said catalytic metal salt in said supercritical fluid solvent at a temperature and pressure above the critical temperature and above the critical pressure of said fluid t form a catalytic metal salt-supercritical fluid solution;

(e) contacting said porous support with said solution;

(f) maintaining the catalytic metal salt-supercritical fluid solution at said temperature above the critical temperature for said fluid and at said pressure above the critical pressure for said fluid for the time required for the catalytic metal salt-supercritical fluid solution to substantially completely penetrate substantially all of the surface area of said support; and

(g) changing either one of the temperature or the pressure of said solution to a temperature above the critical temperature or to a pressure below the critical pressure for said fluid to deposit a film of said catalytic metal salt on the surfaces of said porous support and to change said supercritical fluid to a recoverable gas.

4,916,109

CATALYST FOR THE OXIDATION OF CARBON COMPOUNDS

Alfons Baiker, Opfikon, and Daniel Gasser, Schaffhausen, both of Switzerland, assignors to Lonza Ltd., Gampel Valais, Switzerland

Filed Jul. 13, 1988, Ser. No. 220,796

Claims priority, application Switzerland, Jul. 14, 1987, 2685/87

Int. Cl.[4] B01J *21/06, 23/44*

U.S. Cl. 502—339 7 Claims

1. Activated catalyst of the general formula $Pd_x(ZrO_2)_y$, wherein x is a number between 1 and 99, y is the difference between x and 100 and z is a value between 0.5 and 2.

4,916,110

MICROPOROUS CATALYTIC MATERIAL AND SUPPORT STRUCTURE

Jame L. Mannino, Newark, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Nov. 1, 1988, Ser. No. 265,632

Int. Cl.[4] B01J *23/00, 23/42*

U.S. Cl. 502—439 12 Claims

1. A microporous catalytic material and support structure for catalytic material comprising a three-dimensional tubular network of metal having micropores throughout, which network comprises the hollow tubular residue of continuous metal plated nodes and fibrils of the interstices of a microporous polymeric material which has been pyrolyzed to remove all materials except said metal material.

4,916,111

THERMOSENSITIVE RECORDING MATERIAL

Hiroshi Yaguchi; Hisashi Sakai; Kenji Uematu, and Kanijiro Kawasaki, all Numazu, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 1, 1988, Ser. No. 238,852

Claims priority, application Japan, Sep. 1, 1987, 62-219348

Int. Cl.[4] B41M *5/18*

U.S. Cl. 503—226 6 Claims

1. In a thermosensitive recording material comprising:

a support, an intermediate layer including a foamed portion with minute voids on said support, and a thermosensitive coloring layer formed on said intermediate layer wherein said thermosensitive coloring layer comprises a leuco dye and a color developer capable of inducing color formation in said leuco dye upon application of heat thereto, the improvement wherein the voidage of the upper portion of said intermediate layer close to said thermosensitive coloring layer is smaller than the voidage of the lower portion of said intermediate layer close to said support.

4,916,112

SLIPPING LAYER CONTAINING PARTICULATE ESTER WAX FOR DYE-DONOR ELEMENT USED IN THERMAL DYE TRANSFER

Richard P. Henzel, Webster, and Noel R. Vanier, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 30, 1989, Ser. No. 373,748

Int. Cl.[4] B41M *5/35, 5/26*

U.S. Cl. 503—227 19 Claims

1. In a dye-donor element for thermal dye transfer comprising a support having on one side thereof a dye layer and on the other side a slipping layer comprising an organic lubricating material in a binder, the improvement wherein said lubricating material comprises a nonhomogenous layer of a particulate ester wax comprising an ester of a fatty acid having at least 10 carbon atoms and a monohydric alcohol having at least 6 carbon atoms, said ester wax having a particle size of from about 0.5 μm to about 20 μm.

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4,916,113

METHODS OF MAKING COMPOSITE CERAMIC ARTICLES

Marc S. Newkirk; Andrew W. Urquhart, both of Newark, Del.; Harry R. Zwicker, Elkton, Md., and H. Daniel Lesher, Wilmington, Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 819,397, Jan. 17, 1986, Pat. No. 4,851,375, which is a continuation-in-part of Ser. No. 697,876, Feb. 4, 1985, abandoned. This application Nov. 1, 1988, Ser. No. 265,835

The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.

Int. Cl.[4] **C04B** *35/00*

U.S. Cl. 501—89 **10 Claims**

9. A method for producing a self-supporting ceramic composite structure comprising (1) a ceramic matrix obtained by oxidation of a parent metal to form a polycrystalline material comprising an oxidation reaction product of said parent metal with a vapor-phase oxidant; and (2) at least one filler embedded by said matrix, the method comprising the steps of:

(a) positioning a parent metal comprising aluminum adjacent to a permeable mass of filler material which comprises at least one material selected from the group consisting of aluminum oxide, silicon carbide, silicon aluminum oxynitride, zirconium oxide, zirconium boride, titanium nitride, barium titanate, boron nitride, silicon nitride, iron-chromiumaluminum alloy and aluminum, said filler being in the form of at least one material selected from the group consisting of hollow bodies, particulates, fibers, whiskers, spheres, plates, aggregate, rods, bars, and platelets, said aluminum parent metal being oriented relative to said filler so that formation of said oxidation reaction product will occur in a direction towards and into said mass of filler, wherein said aluminum parent metal is combined with at least one dopant comprising a material selected from the group consisting of at least one of magnesium, zinc, silicon, germanium, tin, lead, boron, sodium, lithium, calcium, phosphorus, yttrium, and rare earth metals;

(b) heating said aluminum parent metal to a temperature above its melting point but below the melting point of its oxidation reaction product to form a body of molten parent metal and reacting the molten parent metal with said oxidant at said temperature to form said oxidation reaction product, and at said temperature maintaining at least a portion of said oxidation reaction product in contact with and extending between said body of molten metal and said oxidant, to draw molten metal through the oxidation reaction product towards the oxidant and towards and into the adjacent mass of filler so that fresh oxidation reaction product continues to form within the mass of filler at an interface between the oxidant and previously formed oxidation reaction product;

(c) continuing said reacting for a time sufficient to embed at least a portion of the filler within said polycrystalline material.

4,916,114

METHOD FOR PRODUCING A LAYER-LIKE COMPOSITION OF OXIDE-CERAMIC SUPERCONDUCTING MATERIAL

Eckhardt Hoenig, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

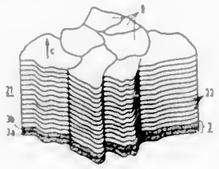
Filed Aug. 2, 1988, Ser. No. 227,365

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1987, 3726016

Int. Cl.[4] **B05D** *5/12;* **C23C** *16/00*

U.S. Cl. 505—1 **22 Claims**

1. A method for manufacturing a layer-like composition of an oxide-ceramic superconductive material with a high transition temperature and large current-carrying capacity on the basis of a material system containing metallic components and oxygen, in which method the metallic components of the system are applied in a physical deposition process and while oxygen is supplied on a predetermined substrate as a preliminary product with a structure which still is disordered with respect to the superconducting metal oxide phase to be formed, which structure is converted, using a heat treatment and while oxygen continues to be supplied, into the desired superconducting oxide phase, the method comprising the steps of applying a multilayer layer of the superconducting material on a fine-crystalline substrate the steps of applying comprising first, forming successive layers of individual films with a respective film thickness under 10 nm, the step of forming each of these films comprising the steps of:



applying the metallic components of the system to the respectively provided underlayer by means of the physical deposition process and while supplying oxygen at a temperature below 400° C. and

converting the so obtained preliminary product by means of short thermal pulses into an intermediate product with a columnar structure which exhibits columns densely packed and c-axes standing at least approximately perpendicularly to the respective underlayer, an then forming the desired superconducting metal oxide phase in the intermediate products of all films by means of further oxygen supply and at a temperature below 400° C.

4,916,115

SELECTIVE LASER PYROLYSIS OF METALLO-ORGANICS AS A METHOD OF FORMING PATTERNED THIN FILM SUPERCONDUCTORS

Joseph V. Mantese, Washington; Antonio B. Catalan, Sterling Heights; Jeffrey A. Sell, W. Bloomfield; Martin S. Meyer, Southfield, and Andrew M. Mance, Royal Oak, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 20, 1988, Ser. No. 209,496

Int. Cl.[4] **B05D** *3/06, 5/12*

U.S. Cl. 505—1 **2 Claims**

1. A method for forming patterned films of superconductive materials consisting essentially of the steps of:

(a) forming a solution from the neodecanoates of yttrium, barium and copper, said neodecanoates forming an oxide mixture exhibiting superconductive properties upon subsequent thermal decompositions wherein said oxide mixture is characterized by a ratio of yttrium:barium:copper of approximately 1:2:4, said solution comprising an organic solvent such as xylene;

(b) adding to said solution an appropriate dye, said dye comprising 4-[(4-Ethoxyphenyl)axo]-1- naphthol and capable of absorbing a selective wavelength of light;

(c) depositing a film of said solution having said dye onto a strontium titanate substrate;

(d) exposing selective regions of said film with an Argon laser emitting said wavelength of light, such that said exposed regions of said film become insoluble in said xylene;

(e) immersing said film into said xylene so that the soluble, unexposed regions of said film are removed from said substrate;

(f) heating said film at a first temperature of about 500° C. and duration that is sufficient to thermally decompose said neodecanoates of yttrium, barium and copper into a film containing yttrium, barium and copper oxides in the ratio of approximately 1:2:4 respectively, but insufficient to significantly recrystallize said oxides; and

(g) heating said oxide film at a second temperature ranging between approximately 850° C. and 1000° C. for a duration of up to about two minutes, sufficient to promote recrystallization and grain growth of said metal oxides within said film and induce a change therein by which said film exhibits superconducting properties.

4,916,116

METHOD OF ADDING A HALOGEN ELEMENT INTO OXIDE SUPERCONDUCTING MATERIALS BY ION INJECTION

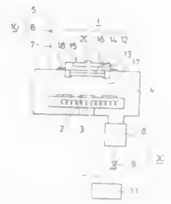
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Filed May 5, 1988, Ser. No. 190,352

Claims priority, application Japan, May 6, 1987, 62-111614; Jun. 1, 1987, 62-138580

Int. Cl.[4] **B05D** *3/06*

U.S. Cl. 505—1 **6 Claims**



1. A method of producing oxide superconducting materials comprising the steps of:

providing a superconducting oxide;

forming a passivation film on said superconducting oxide;

adding halogen ions into said superconducting oxide after said forming of the passivation film, wherein said addition of halogen ions is effected by ion injection;

heat treating said superconducting oxide in oxygen after said injection of the halogen ions.

4,916,117

TREATMENT OF INFLAMMATION USING ALPHA 1-ANTICHYMOTRYPSIN

John Lezdey, 976 Kingston Dr., Cherry Hill, N.J. 08034, and Allan Wachter, 7370 S. Bonarden La., Tempe, Ariz. 85283

Continuation-in-part of Ser. No. 946,445, Dec. 24, 1986, abandoned. This application Apr. 14, 1988, Ser. No. 181,706

Int. Cl.[4] **A61K** *37/64;* **C07K** *15/14*

U.S. Cl. 514—8 **10 Claims**

1. A method for treating the symptoms of pulmonary and/or bowel inflammations in a mammal or the prophylaxis treatment therefor which comprises administering an effective amount of alpha 1-antichymotrypsin, the derivatives or salts thereof.

4,916,118

PHARMACEUTICAL ADMINISTRATION SYSTEMS CONTAINING CHEMOTACTIC PEPTIDES

Isaiah J. Fidler, Kingwood; Kiyoshi Morikawa, and Rajiv Nayar, both of Houston, all of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

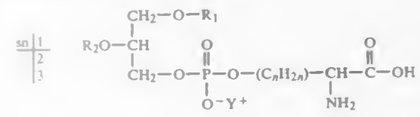
Continuation-in-part of Ser. No. 897,250, Aug. 18, 1986. This application Aug. 12, 1987, Ser. No. 84,636

Int. Cl.[4] **A61K** *37/02;* **C07K** *7/09*

U.S. Cl. 514—16 **9 Claims**

1. A composition operable to produce a pharmaceutical administration system in liposome form, said composition comprising:

(a) a first phospholipid of the formula:



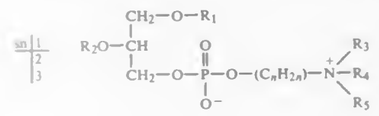
wherein

n is 1, 2, or 3;

each of R_1 and R_2, independently of the other, is alkyl, alkenyl, or acyl of from 10 to 20 carbon atoms; and

Y^+ is the cation of a pharmaceutically acceptable base;

(b) a second phospholipid of the formula:



wherein

n is 2, 3, or 4;

each of R_1 and R_2, independently of the other, is as herein defined; and

each of R_3, R_4, and R_5, independently of the other, is hydrogen or alkyl of 1 to 4 carbon atoms, said second phospholipid being present with respect to said first phospholipid in a mole percent ratio of from about 9:1 to about 1:1; and

(c) at least one chemotactic peptide having pharmacological activity, the ratio of the molar amount of said chemotactic peptide to the total molar amount of said first and second phospholipids of being from about 0.0001:1 to about 0.1:1.

4,916,119

PEPTIDES, THEIR PREPARATION AND COMPOSITIONS CONTAINING THEM

Jean Bouchaudon, Morsang-sur-Orge; Daniel Farge, Thiais, and Claude James, Paris, all of France, assignors to Rhone-Poulenc Industries, Paris, France

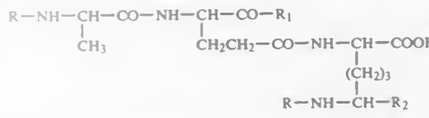
Filed Jun. 27, 1980, Ser. No. 163,878

Claims priority, application France, Jun. 29, 1979, 79 16844

Int. Cl.[4] **C07K** *5/08, 5/10, 37/02*

U.S. Cl. 514—18 **10 Claims**

1. A tripeptide of the general formula:



wherein the symbols R, which are the same or different, represent a hydrogen atom or a fatty acid residue, at least one of the symbols R representing a fatty acid residue, R_1 represents a hydroxy or amino radical, and R_2 represents a hydrogen atom or a carbamoyl radical, the alanine moiety is in the L form, the glutamic acid moiety is in the D form, the lysine moiety, when R_2 represents a hydrogen atom, is in the L form, and the 2,6-diaminopimelamic acid moiety, when the symbol R_2 represents a carbamoyl radical, is in the D,D, L,L, D,D,/L,L (racemic) or D,L (meso) form, or a non-toxic salt thereof.

4,916,120

PARASITICIDAL AVERMECTIN DERIVATIVES

Wolfgang Röben, Bergisch Gladbach; Stendel Wilhelm, and Peter Andrews, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

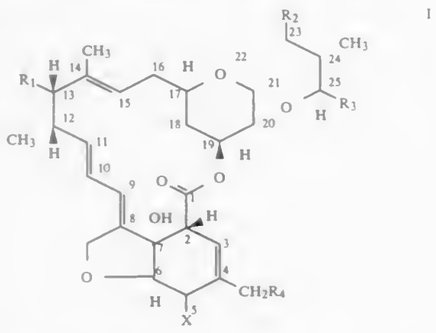
Filed Aug. 1, 1988, Ser. No. 230,221

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1987, 3727648

Int. Cl.[4] A61K *31/70*; **C07H** *17/04*

U.S. Cl. 514—30 7 Claims

1. An avermectin derivative of the formula



I

in which

R^1 stands for hydrogen, OH, C_{1-5}-alkanoyloxy, α-L-oleandrosyloxy, α-L-oleandrosyl-α-L-oleandrosyloxy, 4'-C_{1-5}-alkanoyl-α-L-oleandrosyloxy or 4''-C_{1-5}-alkanoyl-α-L-oleandrosyl-α-L-oleandrosyloxy,

R^2 stands for hydrogen, OH, C_{1-5}-alkanoyloxy, or R^2 stands for hydrogen when there is a double bond between C22 and C23,

R^3 stands for straight-chain or branched C_{1-4}-alkyl or C_{2-8}-alkenyl,

R^4 stands for hydrogen, OH, C_{1-5}-alkanoyloxy, or the bond between the C atoms C22 and C23 is a single or a double bond and the double bond of the cyclohexene ring can be between the C atoms C3 and 4 or between the C atoms C4 and C5, and

X stands for hydrogen or halogen.

4,916,121

ANTITUMOR COMPOSITION COMPRISING PYRIMIDINE TYPE NUCLEIC ACID DERIVATIVE AND 1-[(2-HYDROXYETHOXY)METHYL]URACIL DERIVATIVE

Mineo Saneyoshi, Sapporo; Takeo Kawaguchi, Tokyo; Masahiko Saito, Tokorozawa; Yoshiki Suzuki, and Nobuaki Hanajima, both of Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

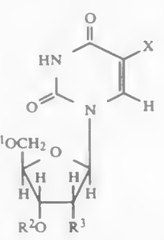
Filed May 7, 1986, Ser. No. 860,390

Claims priority, application Japan, May 7, 1985, 60-95358; Aug. 8, 1985, 60-173106

Int. Cl.[4] A61K *31/70*

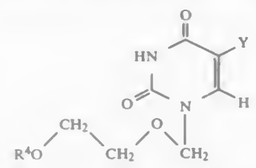
U.S. Cl. 514—50 13 Claims

1. An antitumor composition containing, as effective ingredients in pharmaceutically effective amounts, (i) at least one pyrimidine type nucleic acid derivative having the formula (I):



(I)

wherein X represents a fluorine atom or a trifluoromethyl group, R^1 and R^2 may be the same or different and represent a hydrogen atom, an aliphatic acyl group having 4 to 24 carbon atoms or an aromatic acyl group having 7 to 12 carbon atoms, R^3 represents a hydrogen atom or a hydroxyl group, and (ii) at least one 1-[(2-hydroxyethoxy)-methyl]uracil derivative having the formula (II):



(II)

wherein Y represents a hydrogen atom, a halogen atom, a methyl group, a benzyl group, a benzyloxybenzyl group, a vinyl group, a nitro group, or an amino group and R^4 represents a hydrogen atom, an aliphatic acyl group having 2 to 24 carbon atoms or an aromatic acyl group having 7 to 12 carbon atoms.

13. A method for treating tumors, which comprises administering pharamaceutically effective amounts of the component (i) of claim 1 and the component (ii) of claim 1 to a warm-blooded animal.

4,916,122

3'-AZIDO-2',3'-DIDEOXYURIDINE ANTI-RETROVIRAL COMPOSITION

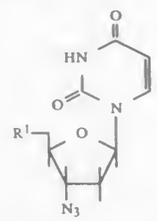
Chung K. Chu, Athens, and Raymond F. Schinazi, Tucker, both of Ga., assignors to University of Georgia Research Foundation, Inc., Athens and Emory University, Atlanta, both of, Ga.

Continuation-in-part of Ser. No. 7,473, Jan. 28, 1987. This application Oct. 2, 1987, Ser. No. 104,438

Int. Cl.[4] A61K *31/70*

U.S. Cl. 514—50 6 Claims

1. A method for treating HIV in a human, which method comprises administering a compound having the formula:



wherein R^1 is OH monophosphate, diphosphate, triphosphate; or a pharmacologically acceptable salt thereof, in association with a pharmaceutically acceptable carrier; to a human being infected by HIV, in an amount effective for the treatment of an HIV infection.

4,916,123

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF 2-(DECYLTHIO) ETHANAMINE HYDROCHLORIDE AND N-TRIBUTYLTETRADECYL PHOSPHONIUM CHLORIDE

Deborah K. Donofrio, The Woodlands, and Wilson K. Whitekettle, Conroe, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed May 25, 1989, Ser. No. 357,495

Int. Cl.[4] A01N *33/08, 37/00*

U.S. Cl. 514—75 7 Claims

1. A bacterial inhibiting composition comprising a synergistic mixture of 2-(decylthio)ethanamine hydrochloride ("DTEA") and N-tributyl tetradecyl phosphonium chloride ("TPC"), wherein the weight ratio of said DTEA to said TPC is from about 3.5:1 to 1;18.3.

4,916,124

INDOLOQUINOXALINES WITH SUBSTITUENTS IN 6-POSITION CONTAINING CYCLIC GROUPS AS ANTIVIRAL AGENTS

Jan O. E. Bergman, Spånga, and Stig G. Akerfeldt, Saltsjö-Duvnäs, both of Sweden, assignors to Lief Landblad, Huddinge, Sweden

PCT No. PCT/SE87/00020, § 371 Date Nov. 18, 1987, § 102(e) Date Nov. 18, 1987, PCT Pub. No. WO87/04437, PCT Pub. Date Jul. 30, 1987

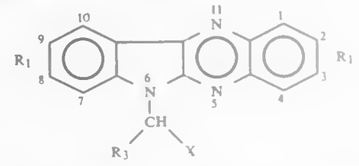
PCT Filed Jan. 19, 1987, Ser. No. 102,146

Claims priority, application Sweden, Jan. 21, 1986, 8600261

Int. Cl.[4] A61K *31/495*; **C07D** *413/00, 417/00, 403/00*

U.S. Cl. 514—211 10 Claims

1. Indoloquinoxalines having substituents in 6-position containing cyclic groups of the formula I

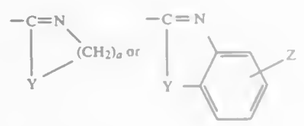


I

wherein

R_1 represents hydrogen or one of several, preferably 1 to 4, similar or different substituents in the positions 1–4 and/or 7–10, selected from halogen, lower alkyl-/alkoxy group having not more than 4 carbon atoms, trifluoromethyl group, trichloromethyl group;

X is a group



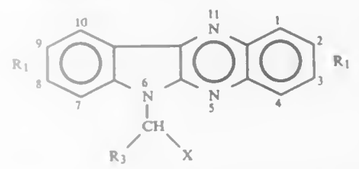
wherein

Y is CH_2, NH, O or S and a is 2, 3 or 4 and wherein also the bond —C=N— can be saturated; Z is alkyl having 1–6 carbon atoms, Cl, Br or CF_3 and

R_3 represents hydrogen, lower alkyl-cycloalkyl group having not more than 4 carbon atoms,

or a physiologically acceptable addition product of the compounds with a physiologically acceptable acid or a halogen adduct thereof.

7. An antiviral agent active against DNA viruses characterized in that it contains as an active component an indoloquinoxaline of the formula

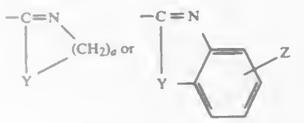


I

wherein

R_1 represents hydrogen or one or several preferably 1 to 4, similar or different substituents in the positions 1–4and/or 7–10, selected from halogen, lower alkyl-/alkoxy group having not more than 4 carbon atoms, trifluoromethyl group, trichloromethyl group;

X is a group



wherein

Y is CH_2, NH, O or S and a is 2, 3 or 4 and wherein also the bond —C=N— can be saturated; Z is alkyl having 1–6 carbon atoms, Cl, Br or CF_3 and

R_3 represents hydrogen, lower alkyl-/cycloalkyl group having not more than 4 carbon atoms,

or physiologically acceptable addition products of the compounds with a physiologically acceptable acid or a halogen adduct thereof in a pharmaceutically acceptable carrier.

4,916,125

METHOD OF TREATING MIGRAINE

Paul L. Herrling, Bern, and Julian A. Gray, Binningen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Jul. 11, 1989, Ser. No. 377,989

Int. Cl.[4] A61K *31/66, 31/675*

U.S. Cl. 514—89 3 Claims

1. A method of treating migraine in a subject in need of such treatment, which comprises administering to said subject a therapeutically effective amount of E-2-amino-4-methyl-5-phosphono-3-pentenoic acid or a pharmaceutically acceptable salt thereof.

4,916,126

DIACYL DERIVATIVES OF 4-(TRIALKYLBENZYL)-PIPERAZINYL COMPOUNDS

Peter Traxler, Schönenbuch; Klaus Müller, Ettingen, and Wilhelm Kump, Biel-Benken, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

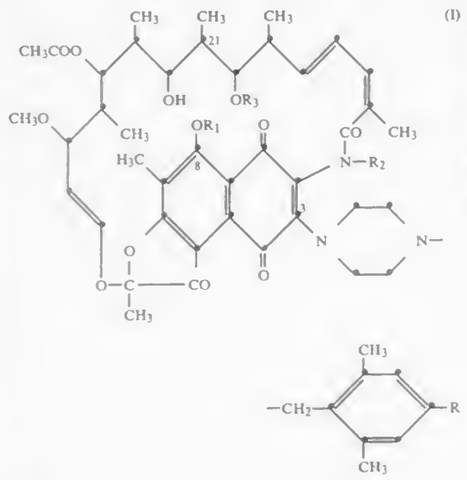
PCT No. PCT/CH87/00123, § 371 Date Nov. 14, 1988, § 102(e) Date Nov. 14, 1988, PCT Pub. No. WO89/02894, PCT Pub. Date Apr. 6, 1989

PCT Filed Sep. 25, 1987, Ser. No. 270,701

Int. Cl.[4] C07D *498/08*; **A61K** *31/399*

U.S. Cl. 514—183 14 Claims

1. A compound of the formula



(I)

in which R represents lower alkyl, R_1 represents tri-lower alkylmethylcarbonyl, and one of the radicals R_2 and R_3 represents tri-lower alkylmethylcarbonyl and the other represents hydrogen, or a pharmaceutically acceptable salt thereof.

14. A method of reducing lipids in an animal in need thereof comprising administering to said animal a hypolipidaemically effective amount of a compound of claim 1 or a pharmaceutically acceptable salt thereof.

4,916,127

MIXED CHALCOGENIDE PYRYLIUM SALTS OF A LEWIS BASE

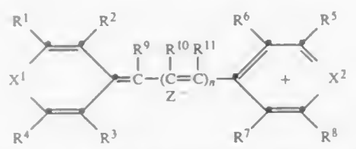
Michael R. Detty, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 24, 1988, Ser. No. 261,289

Int. Cl.[4] C07D *421/06*; A61K *31/33*

U.S. Cl. 514—183 **3 Claims**

1. A pharmaceutically pure form of a seleno- or telluropyrylium dye having the following structural formula:



wherein R^1, R^4, R^5, and R^8 are selected from hydrogen, aryl, heteroaryl, or alkyl from one to twelve carbon atoms; R^2, R^3, R^6, and R^7 are selected from hydrogen, alkyl, aryl, alkylthio, arylthio, alkylseleno, arylseleno, alkyltelluro or aryltelluro of from one to twelve carbon atoms; halogen; hydroxy; alkoxy; and amino; R^9, R^{10}, and R^{11} are selected from hydrogen, alkyl and alkoxy of from one to twelve carbon atoms, halogen and cyano; n is 0, 1 or 2; X^1 and X^2 are chalcogenides different from each other except that one is either Se or Te, and Z^- is a Lewis base selected from the group consisting of chloride, bromide and $CH_3SO_3^-$, said pure form having impurities not exceeding 2% of the dye by weight.

4,916,128

THIADIAZINONES

Rochus Jonas, Darmstadt, Fed. Rep. of Germany; Jaime Piulats, Barcelona, Spain; Michael Klockow, Rossdorf, Fed. Rep. of Germany; Ingeborg Lues, Darmstadt, Fed. Rep. of Germany, and Hans-Jochen Schliep, Tralsa, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

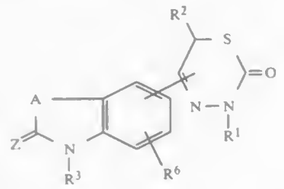
Filed Jun. 6, 1988, Ser. No. 202,294

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1987, 3719031; Dec. 24, 1987, 3744149

Int. Cl.[4] C07D *401/04, 417/04*; A61K *31/54*

U.S. Cl. 514—213 **18 Claims**

1. A thiadiazinone of the formula



wherein

A is $—CHR^4—CHR^5—$, $—CH_2—CR^4R^5—$, $—CR^1R^5—CH^2—$, $—CHR^4—CHR^5—CH_2—$, $—CH^4—CH_2—CHR^5—$, $—CH_2—CHR^4—CHR^5—$, $—CR^4R^5—CH_2CH_2—$, $—CH_2—CR^4R^5—CH_2—$ or $—CH_2CH_2—CR^4R^5—$,

R^1, R^2, R^3, R^4 and R^5 are each independently H, C_{1-5}-alkyl, C_{2-5}-alkenyl or C_{2-5}-alkinyl, or

R^3 is alkanoyl, alkenoyl or alkinoyl with up to 10 C atoms each; hydroxyacetyl; methoxyacetyl; chloroacetyl; aminoacetyl; N-methylaminoacetyl; N,N-diethylaminoacetyl; aroyl with 7–15 C atoms, optionally substituted by 1–3 of C_{1-3}-alkyl, C_{1-3}-alkoxy, C_{1-3}alkylthio, C_{1-3}alkylsulfinyl, C_{1-3}-alkylsulfonyl, methylenedioxy, OH, F, Cl, Br, I, NO_2, NH_2, C_{1-3}-alkylamino, or di(C_{1-3}-alkyl)-amino; 2- or 3-methoxy-4-(2-hydroxyethoxy)-benzoyl; 2- or 3-methoxy-4-(2methoxyethoxy)-benzoyl; C_{6-10}-aryl-C_{1-4}-alkanoyl; o—, m— or p-methoxyphenylacetyl; C_{3-8}-cycloalkylcarbonyl; C_{1-8}-alkylsulfonyl; C_{6-15}-arylsulfonyl; o—, m— or p-methoxybenzenesulfonyl; C_{1-8}-alkoxycarbonyl; fluorinated C_{1-8}-alkoxycarbonyl; C_{3-8}cycloalkoxycarbonyl; C_{6-10}-aryloxycarbonyl; o—, m— or p-methoxyphenoxycarbonyl; aminocarbonyl; N-C_{1-8}-alkylaminocarbonyl; N,N-di-(C_{1-8}-alkyl)aminocarbonyl; dialkylaminoalkanoyl with 4–14 carbon atoms; dialkylaminocarbonyl with 3–9 carbon atoms; N-C_{3-8}-cycloalkylaminocarbonyl; N,N-Di-(C_{3-8}-cycloalkyl)-aminocarbonyl; N-C_{6-10}-arylaminocarbonyl; C_{1-8}-alkanoylaminocarbonyl, methoxymethylthiobenzoyl; 2- or 3-thenoyl; is H, C_{1-5}-alkyl, C_{2-5}-alkoxy, OH, F, Cl, Br or I and is 2 hydrogen atoms, H and C_{1-5}-alkyl, or 2 independent C_{1-5}-alkyl groups, or a salt thereof.

17. A method of treating cardiac insufficiency in a patient in need of such treatment comprising administering an effective amount of a compound of claim 1.

4,916,129

COMBINATION β-BLOCKING/ANGIOTENSIN II BLOCKING ANTIHYPERTENSIVES

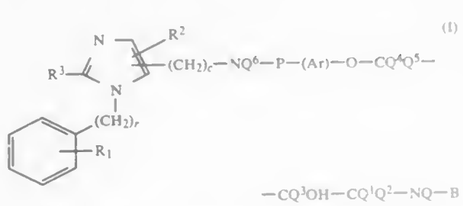
David J. Carini, Wilmington, and John J. V. Duncia, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 19, 1989, Ser. No. 299,709

Int. Cl.[4] C07D *413/14*; C07F *9/65*; A61K *31/535*

U.S. Cl. 514—235.2 **5 Claims**

1. An antihypertensive compound of the formula:



(I)

$—CQ^3OH—CQ^1Q^2—NQ—B$

wherein

Q and Q^1–Q^6 are independently selected from hydrogen and alkyl of 1–4 carbon atoms;

P is a carbonyl group or

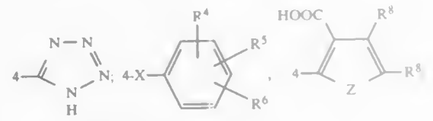
with N and O, respectively, bonded to Ar;

B is an alkyl group of 1 to 6 carbon atoms;

Any of the $—(CH_2)_c—$ groups independently are optionally substituted by one or two alkyl groups of 1 to 4 carbon atoms;

Ar is a benzene ring or a naphthyl or indolyl ring system any of which is optionally substituted in any position by one or more substituents independently selected from alkyl groups of 1 to 4 carbon atoms being optionally substituted by one or more halogen atoms, alkosy of 1 to 9 carbon atoms, halogen, nitro, amino, carboxy, alkoxycarbonyl of 1 to 4 carbon atoms, and hydroxy;

R^1 is —4—COOH; —4—CO_2R^7;



$NHSO_2CF_3$; $CONHOR^9$.

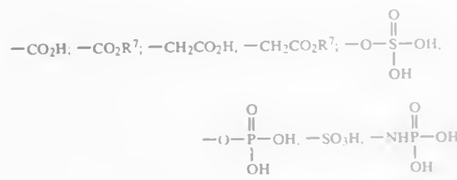
R^2 is H, F, Cl, Br, I, NO_2, alkyl of one to six carbon atoms, perfluoroalkyl of one to six carbon atoms, phenyl, pentafluorophenyl, CN, COR^{16};

R^3 is alkyl of 2 to 10 carbon atoms, alkenyl or alkynyl of 3 to 10 carbon atoms, alkylthio of 2–10 carbon atoms;

R^4 is H; Cl; Br; F; NO_2; alkyl of 1 to 4 carbon atoms; acyloxy of 1 to 4 carbon atoms; alkoxy of 1 to 4 carbon atoms; CO_2H; CO_2R^7; $NHSO_2CH_3$; $NHSO_2CF_3$; $CONHOR^9$; SO_2NH_2; phenyl or furyl;

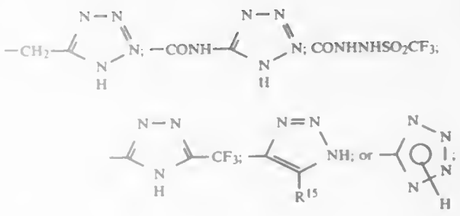
R^5 is H; Cl, Br, I or F; alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms;

R^6 is

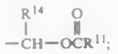


$—CO_2H$; $—CO_2R^7$; $—CH_2CO_2H$, $—CH_2CO_2R^7$; $—O—SO_3H$;

$—PO_3H$; $—C(CF_3)_2OH$; $—NHSO_2CH_3$; $—NHSO_2CF_3$; $—NHCOCF_3$; $—CONHOR^9$; $—SO_2NH_2$;



R^7 is



R^8 is H, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl or benzyl;

R^9 is H, methyl or benzyl;

R^{11} is alkyl of 1 to 6 carbon atoms; $—NR^{12}R^{13}$; or

R^{12} and R^{13} are independently H, alkyl of 1 to 6 carbon atoms, benzyl, or are taken together as $(CH_2)_u$ where u is 3 to 6;

R^{14} is H, CH_3 or $—C_6H_5$;

R^{15} is *CN*, NO_2 or CO_2R^8;

R^{16} is H; alkyl of 1 to 6 carbon atoms; phenyl; phenylalkyl where alkyl is 1 to 6 carbon atoms; OH; alkoxy of 1 to 6 carbon atoms; phenoxy; benzyloxy; NH_2; alkylamino or dialkylamino where alkyl is 1 to 6 carbon atoms; or morpholino;

X is a carbon-carbon single bond, —CO—, —O—, —S—, —NH—, —NHCO—, —CONH—, $—OCH_2$, $—CH_2O—$, —CH=CH—, $—SCH_2—$, $—NHCH_2—$, $—CH_2—$, $—CH_2S—$, $—CH_2NH—$;

Z = O, S;

c = 1 to 10;

r = 0 to 2; or a pharmaceutically acceptable salt of these compounds.

4. A method of treating hypertension in a warm-blooded animal comprising administering to the animal a compound of claim 1 in an amount effective to lower the animal's blood pressure.

5. A method of treating congestive heart failure in a warm-blooded animal comprising administering to the animal a compound of claim 1 in an amount effective to correct the hemodynamic burden on the heart to relieve the congestion.

4,916,130

PLATELET AGGLUTINATION-INHIBITING AGENT

Masakazu Iwai; Chikara Fukaya, and Kazumasa Yokoyama, all of Osaka, Japan, assignors to Green Cross Corporation, Osaka, Japan

Filed Sep. 8, 1988, Ser. No. 241,447

Claims priority, application Japan, Sep. 8, 1987, 62-224442

Int. Cl.[4] A61K *31/535, 31/16, 31/415*

U.S. Cl. 514—237.8 **4 Claims**

1. A method of treating a patient in need of an agent inhibiting the agglutination of platelets which comprises administering thereto in an amount effective to inhibit agglutination of platelets,

an amide derivative comprising a sulfur-containing amine, selected from the group consisting of cystine, cysteine, cystamine, cysteamine, taurine, methionine, ethyonine and

VOL 1113 ISS 2 AP 10 1990 UMI

lantionine, or those having an SH group substituted by an alkyl group, bound, through an amide bond, to an unsaturated fatty acid having 4 to 13 carbon atoms represented by the general formula:

$$CH_3(CH_2)_mCH{=}CH(CH_2)_nCOOH$$

wherein m+n is an integer of from 0 to 9.

4,916,131

NAPHTHYRIDINE DERIVATIVES AND METHOD FOR TREATING ALLERGIC REACTIONS

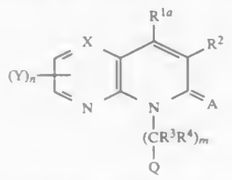
David J. Blythin, North Caldwell; Marvin I. Siegel, Woodbridge, and Sidney R. Smith, Ridgewood, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 943,859, Dec. 18, 1986, Pat. No. 4,775,686, which is a continuation-in-part of Ser. No. 919,345, Oct. 15, 1986, abandoned. This application Jul. 20, 1988, Ser. No. 221,704

Int. Cl.[4] **C07D** *251/00, 471/02*

U.S. Cl. 514—245 **22 Claims**

1. A compound having the structural formula II



II

or a pharmaceutically acceptable salt or solvate thereof, wherein:

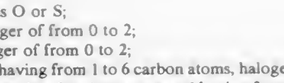
X represents =N—;

A represents O or S;

m is an integer of from 0 to 2;

n is an integer of from 0 to 2;

R^{1a} is alkyl having from 1 to 6 carbon atoms, halogenated alkyl having from 1 to 6 carbon atoms and having from 1 to 5 halo groups replacing some or all of the hydrogens thereon, cycloalkyl having from 3 to 7 carbon atoms in a saturated carbocyclic ring, alkenyl having from 3 to 6 carbon atoms and having at least one carbon to carbon double bond, alkynyl having from 3 to 6 carbon atoms and having at least one carbon to carbon triple bond, cycloalkenyl having from 5 to 8 carbon atoms in a ring and having one carbon to carbon double bond in the ring, halo or —D—Z—R^5 {wherein D represents alkanediyl having from 1 to 6 carbon atoms and having two available bonds from the same or different carbon atoms thereof, Z is



—S(O)$_p$— (wherein p is 0, 1 or 2 with the proviso that p is 0 when R^5 is H) or

(wherein R^6 is H or alkyl having from 1 to 6 carbon atoms), and R^5 is H, alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 3 to 7 carbon atoms in a saturated carbocyclic ring, phenyl or phenyl substituted by 1 to 3 Y groups as defined below};

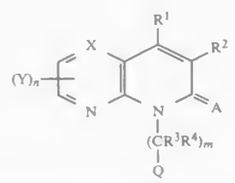
R^2 is alkyl having from 1 to 6 carbon atoms or halogenated alkyl having from 1 to 6 carbon atoms and having from 1 to 5 halo groups replacing some or all of the hydrogens thereon;

R^3 and R^4 are the same or different and each is independently H or alkyl having from 1 to 6 carbon atoms;

Q represents an aryl group having from 6 to 15 carbon atoms and having at least one benzene ring or an aromatic heterocyclic group selected from pyridyl, furyl, thienyl, thiazolyl, imidazolyl, pyrimidinyl, pyrazinyl, pyridazinyl, triazinyl, thiadiazolyl, benzofuranyl, indolyl, pyrazolyl, and oxazolyl, which aryl or aromatic heterocyclic group can optionally be substituted with from 1 to 3 substituents Y as defined below; and

each Y substituent is independently selected from alkyl having from 1 to 6 carbon atoms, halo, —NO_2, —CF_3, —CN, cycloalkyl having from 3 to 7 carbon atoms in a saturated carbocyclic ring, alkenyloxy having from 3 to 6 carbon atoms and having at least one carbon to carbon double bond, alkynyloxy having from 3 to 6 carbon atoms and having at least one carbon to carbon triple bond, —S(O)$_p$—R^7 {wherein R^7 is alkyl having from 1 to 6 carbon atoms and p is as defined above}, —CO—R^8 {wherein R^8 represents R^5, $N(R^9)_2$ or OR^6 in which R^5 and R^6 are as defined above and each R^9 is independently H or alkyl having from 1 to 6 carbon atom} or —O—D—COR^8 {wherein D and R^8 are as defined above}.

9. A method for treating allergic reactions in a mammal which comprises administering to said mammal an anti-allergy effective amount of a compound having the structural formula I



I

or a pharmaceutically acceptable salt or solvate thereof, wherein:

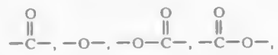
X represents =N—;

A represents O or S;

m is an integer of from 0 to 2;

n is an integer of from 0 to 2;

R^1 is H, alkyl having from 1 to 6 carbon atoms, halogenated alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 3 to 7 carbon atoms in a saturated carbocyclic ring, alkenyl having from 3 to 6 carbon atoms and having at least one carbon to carbon double bond, alkynyl having from 3 to 6 carbon atoms and having at least one carbon to carbon triple bond cycloalkenyl having from 5 to 8 carbon atoms in a ring and having one carbon to carbon double bond in the ring, halo, or —D—Z—R^5 {wherein D represents alkanediyl having from 1 to 6 carbon atoms and having two available bonds from the same or different carbon atoms, Z is



—S(O)$_p$— (wherein p is 0, 1 or 2 with the proviso that p is 0 when R^5 is H) or

(wherein R^6 is H or alkyl having from 1 to 6 carbon atoms), and R^5 is H, alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 3 to 7 carbon atoms in a saturated carbocy-

clic ring, phenyl or phenyl substituted by 1 to 3 Y groups as defined below};

R^2 is alkyl having from 1 to 6 carbon atoms or halogenated alkyl having from 1 to 6 carbon atoms and having from 1 to 5 halo groups replacing some or all of the hydrogens thereon;

R^3 and R^4 are the same or different and each is independently H or alkyl having from 1 to 6 carbon atoms;

Q represents an aryl group having from 6 to 15 carbon atoms and having at least one benzene ring or an aromatic heterocyclic group selected from pyridyl, furyl, thienyl, thiazolyl, imidazolyl, pyrimidinyl, pyrazinyl, pyridazinyl, triazinyl, thiadiazolyl, benzofuranyl, indolyl, pyrazolyl, and oxazolyl, which aryl or aromatic heterocyclic group can optionally be substituted with from 1 to 3 substituents Y as defined below; and

each Y substituent is independently selected form —OR^6 {wherein R^6 is as defined above}, alkyl having from 1 to 6 carbon atoms, halo, —NO_2, —CF_3, —CN, cycloalkyl having from 3 to 7 carbon atoms in a saturated carbocyclic ring, alkenyloxy having from 3 to 6 carbon atoms and having at least one carbon to carbon double bond, alkynyloxy having from 3 to 6 carbon atoms and having at least one carbon to carbon triple bond, —S(O)$_p$—R^7 {wherein R^7 is alkyl having from 1 to 6 carbon atoms and p is as defined above}, —CO—R^8 {wherein R^8 represents R^5, $N(R^9)_2$ or OR^6 in which R^5 and R^6 are as defined above and each R^9 is independently H or alkyl having from 1 to 6 carbon atoms}, —O—D—COR^8 {wherein D and R^8 are as defined above}, —$N(R^9)_2$ {wherein R^9 is defined above} or —NH(CO)H.

4,916,132

USE OF DIHYDROERGOTAMINE AND ITS SALTS FOR THE LOCAL TREATMENT OF TROPHIC DISTURBANCES

Hubert Seibel, Aachen, Fed. Rep. of Germany, assignor to Dr. Rentschler Arzneimittel GmbH & Co., Laupheim, Fed. Rep. of Germany

Filed Mar. 22, 1988, Ser. No. 171,545

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1987, 3710216

Int. Cl.[4] **A61K** *31/50, 31/495*

U.S. Cl. 514—250 **18 Claims**

1. A method for the local treatment of trophic disturbances of the skin involving venous insufficienty comprising the step of topically administering to a subject in need thereof a composition consisting essentially of an amount of dihydroergotamine or a pharmaceutically-acceptable salt thereof which is effective for alleviation, amelioration, or cure of the said condition.

4,916,133

1-PIPERAZINYLPYRIMIDINE COMPOSITIONS AND APPLICATION THEREOF IN THERAPEUTICS AND COSMETICS

Philippe Manoury, Verrières le Buisson, and Jean F. Grollier, Paris, both of France, assignors to L'Oreal, Paris, France

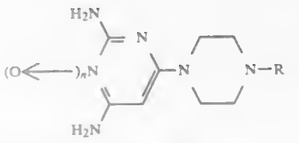
Division of Ser. No. 126,799, Dec. 1, 1987, Pat. No. 4,885,296. This application Sep. 8, 1989, Ser. No. 404,551

Claims priority, application Luxembourg, Dec. 1, 1986, 86695

Int. Cl.[4] **A61K** *31/495*

U.S. Cl. 514—252 **2 Claims**

1. Composition to be used for the treatment of the scalp and hair for inducing and stimulating hair growth and for decreasing hair loss containing an effective amount of a compound of the formula:



(I)

in which R represents an alkoxycarbonyl group having from 1 to 3 carbon atoms in the alkoxy chain or represents a furoyl group, n is 0 or 1, and their acid addition salts, in the form of an aqueous/alcholic gel containing a gelling agent selected from the group consisting of heterobiopolysaccharides and celulose derivatives.

4,916,134

4-[4-[4-[4-[[2-(2,4-DIFLUOROPHENYL)-2-(1H-AZOLYLMETHYL)-1,3-DIOXOLAN-4-YL]METHOXY]PHENYL]-1-PIPERAZINYL]PHENYL]TRIAZOLONES

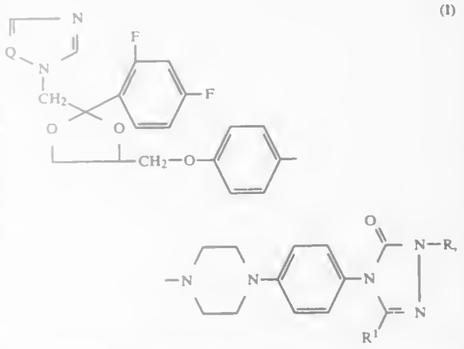
Jan Heeres, Vosselaar; Leo J. J. Backx, Arendonk, and Louis J. E. Van der Veken, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation of Ser. No. 164,024, Mar. 4, 1988, abandoned, which is a continuation-in-part of Ser. No. 30,207, Mar. 25, 1987, abandoned. This application Apr. 7, 1989, Ser. No. 336,549

Int. Cl.[4] **A61K** *31/495;* **C07D** *403/14*

U.S. Cl. 514—252 **10 Claims**

1. A compound of the formula:



(I)

a pharmaceutically acceptable acid-addition salt or a stereochemically isomeric form thereof, wherein:

the substituents on the dioxolane moiety have a cis configuration;

Q is N or CH; and

R is C_{1-6}alkyl and R^1 is hydrogen.

8. A method of inhibiting and/or eliminating the development of fungi and bacteria in warm-blooded animals suffering from diseases caused by these fungi and/or bacteria by the systemic or topical administration to said warm-blooded animals of an antimicrobially effective amount of a compound as claimed in claim 1.

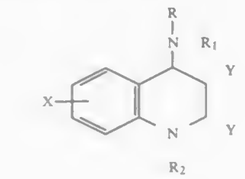
4,916,135

N-HETEROARYL-4-QUINOLINAMINES

Richard C. Effland; Joseph T. Klein, both of Bridgewater; Larry Davis, Sergeantsville, and Gordon E. Olsen, Somerset, all of N.J., assignors to Hoechst Roussel Pharmaceuticals Inc., Somerville, N.J.

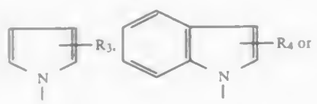
Filed May 8, 1989, Ser. No. 348,937
Int. Cl.[4] A61K *31/495;* C07D *401/12*
U.S. Cl. 514—254 56 Claims

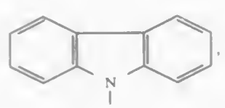
1. A compound of the formula



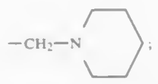
(I)

where
—R is

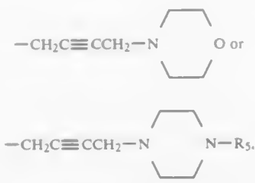




—R_3 and R_4 being independently —H, loweralkyl, —CHO, —CH=CH_2, —CH=CH—loweralkyl, —CH=CH-$CO_2C_2H_5$, —$CH_2N(C_2H_5)_2$ or



—R_1 when existent is —H, loweralkyl, —$CH_2C{\equiv}CH$,



R_5 being methyl or phenyl optionally mono-substituted with loweralkyl or loweralkoxy;
—R_2 when existent is loweralkyl or —$CH_2CH{=}CH_2$;
—X is —H, loweralkyl, loweralkoxy, halogen or trifluoromethyl; and the two —Y groups when existent are both —H, or combine to constitute —$(CH_2)_4$—;
or a pharmaceutically acceptable acid addition salt thereof.

56. A method of treating a patient in need of relief from a memory dysfunction characterized by decreased cholinergic function which comprises administering to such a patient an effective amount of a compound as defined in claim 1.

4,916,136

EICOSATETRAYNOIC ACID AMIDES AND THEIR APPLICATION IN PHARMACY

Braham Shroot, Antibes; Christopher Hensby, Biot; Jean Maignan, Tremblay-les-Gones; Gérard Lang, Saint-Gratien; Serge Restle, Aulnay-sous-Bois, and Michel Colin, Livry-Gargan, all of France, assignors to Centre International de Recherches Dermatologioues C.I.R.D., Valbonne, France

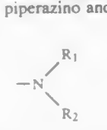
Filed Dec. 28, 1987, Ser. No. 138,791
Claims priority, applicatioo France, Dec. 31, 1986, 86 18419
Int. Cl.[4] A61K *31/495, 31/535;* C07D *295/18;* C09F *5/06*
U.S. Cl. 514—255 17 Claims

1. A compound having the formula:

$$C_5H_{11}(C{\equiv}C{-}CH_2)_4{-}CH_2CH_2COR \quad (I)$$

wherein

wherein
R_1 and R_2, each independently, represent hydrogen, linear or branched lower alkyl having 1–8 carbon atoms substituted with at least one hydroxy group, optionally interrupted by one heteroatom selected from oxygen, nitrogen or sulfur, with the proviso that R_1 and R_2 are not hydrogen simultaneously, or
R_1 and R_2 together with the nitrogen atom to which they are attached form a heterocycle selected from morpholino, piperazino and 4-(2-hydroxyethyl) piperazino, or said



represents N-methylglucamine, and
an inorganic or organic salt of said compound.

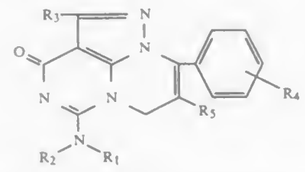
4,916,137

5-(SUBSTITUTED-AMINO)-8-(PHENYL OR SUBSTITUTED-PHENYL)-3H,6H-1,4,5A,8A-TETRAAZAACENAPHTHYLEN-3-ONES AND TREATMENT OF NEURAL BEHAVIOR DISORDERS

Joseph W. Epstein, Monroe; Jeremy I. Levin, Spring Valley, both of N.Y., and Shin S. Tseng, Bridgewater, N.J., assignors to American Cyanamid Company, Wayne, N.J.

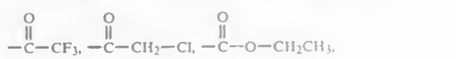
Continuation-in-part of Ser. No. 158,448, Feb. 22, 1988, abandoned. This application Nov. 30, 1988, Ser. No. 278,296
Int. Cl.[4] H61K *31/505;* C07D *239/00, 413/00*
U.S. Cl. 514—267 18 Claims

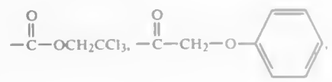
1. A compound of the formula:

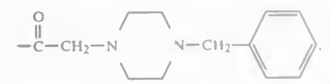


wherein R_1 and R_2 are each individually selected from the

group consisting of hydrogen, alkyl(C_1–C_4), benzoyl, mono or disubstituted benzoyl wherein the substituents are alkyl(C_1–C_6), alkoxy(C_1–C_6), acyloxy(C_2–C_7), halogen, nitro or trifluoromethyl, and moieties of the formulae:







or —$(CH_2)_n$—R

wherein n is an integer from 1 to 3 and R is hydroxy, 4-morpholinyl, 1H-imidazol-1-yl, —CH[alkoxy(C_1–C_3)]$_2$, α-hydroxybenzyl, phenyl or mono or disubstituted phenyl wherein the substituents are halogen or alkyl(C_1–C_6); R_1 and R_2 taken together with their associated (Nitrogen) is 4-morpholinyl or a moiety of the formula: —N $(CH_2)_m$ wherein m is an integer from 2 to 6; R_3 is hydrogen or alkyl(C_1–C_6); R_4 is hydrogen, halogen, alkoxy(C_1–C_3), alkyl(C_1–C_3) or trifluoromethyl; and R_5 is hydrogen or alkyl(C_1–C_6).

17. A method for the treatment of cognitive and related neural behavioral disorders in warm-blooded animals affected with such a disorder which comprises administering to said warm-blooded animal a therapeutically effective amount of a compound of claim 1.

4,916,138

SOLID DISPERSION COMPOSITION OF FR-900506 SUBSTANCE

Yoshio Ueda, Kobe; Fumio Shimojo, Kawanishi; Yasuo Shimazaki, Takarazuka; Kazutake Kado, Ikeda, and Toshiyasu Honbo, Kobe, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 32,572, Apr. 1, 1987, abandoned. This application Jul. 25, 1988, Ser. No. 224,235
Claims priority, application United Kingdom, Apr. 2, 1986, 8608080
Int. Cl.[4] A61K *31/44*
U.S. Cl. 514—294 3 Claims

1. A solid dispersion composition comprising FR-900506 substance and water-soluble hydroxypropyl methylcellulose which is capable of dispersing the FR-900506 substance, the FR-900506 substance and hydroxypropyl methylcellulose being in the ratio of 1:0.1 to 1:20 by weight.

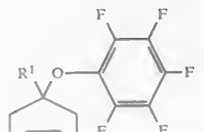
4,916,139

3-(2,3,4,5,6-PENTAFLUOROPHENOXY)-8-AZABICYCLO(3.2.1)OCTANES

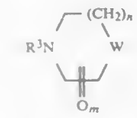
Grover C. Helsley, Pluckemin; Larry Davis, Sergeantsville, and Gordon E. Olsen, Somerset, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 167,942, Mar. 14, 1988, Pat. No. 4,861,889. This application Jun. 7, 1989, Ser. No. 362,639
Int. Cl.[4] A61K *31/495, 31/435;* C07D *401/06*
U.S. Cl. 514—299 8 Claims

1. A convulsion treating composition comprising an inert convulsion-treating adjunct and, as the active ingredient, an effective anticonvulsant amount of a compound of the formula



wherein R^1 is hydrogen or aryl and R^2 is a monovalent radical selected from the group consisting of hydrogen, cyano, loweralkyl, cycloalkylloweralkyl, arylloweralkyl, heteroarylloweralkyl, formyl, loweralkylcarbonyl, loweralkoxycarbonyl, (arylloweralkyl)carbonyl, thioformyl, loweralkylthiocarbonyl, loweralkoxythiocarbonyl, (arylloweralkyl)thiocarbonyl, aminocarbonyl, (loweralkylamino)carbonyl, (diloweralkylamino)carbonyl, (arylamino)carbonyl, aminocarbonyl, (loweralkylamino)thiocarbonyl, (diloweralkylamino)thiocarbonyl, (arylamino)thiocarbonyl, aminoloweralkyl, (loweralkylamino)loweralkyl, (diloweraminoalkyl)loweralkyl, (diloweralkylphosphinyl)loweralkyl, a group of the formula



wherein n is an integer having a value of zero or 1, m is an integer having a value of zero or 1, W is CH_2, or NR^{3a} wherein R^{3a} is hydrogen, loweralkyl or aryl, and R^3 is loweralkylene, or loweralkynylene, and a group of the formula

where R^4 is $CH(Cl)CH_3$, the term aryl in each occurrence signifying a phenyl group optionally substituted by one or more substituents selected from the group consisting of halogen, loweralkyl, loweralkoxy and trifluoromethyl; the term cycloalkyl in each occurrence signifying saturated carbocyclic group having from 3 to 7 carbon atoms; and the term heteroaryl in each occurrence signifying an aromatic heterocyclic mono- or dicyclic radical selected from the group consisting of benziscxazolyl, indolyl, benzimidazoyl, and pyrrolidinyl optionally substituted by one or more substituents selected from the group consisting of halogen, loweralkyl and loweralkoxy.

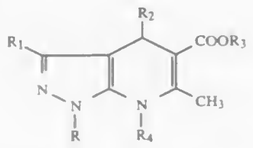
4,916,140

ANTIEPILEPTIC PYRAZOLOPYRIDINES

Michael G. Palfreyman, Cincinnati; Francis P. Miller, Loveland, both of Ohio, and Anis Mir, Bartenheim, France, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Sep. 28, 1988, Ser. No. 250,478
Int. Cl.[4] A61K *31/44*
U.S. Cl. 514—299 5 Claims

1. A method for treating epilepsy in a patient in need thereof which comprises administering to the patient an anticonvulsantly effective amount of a compound of the formula

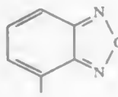


wherein

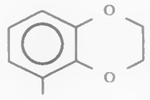
R represents hydrogen, (C_1–C_6)alkyl, (C_1–C_6)alkenyl, (C_3–C_7) cycloalkyl, unsubstituted phenyl or a phenyl substituted by 1, 2 or 3 substituents selected from (C_1–C_4)alkyl, (C_1–C_4)alkoxy, chloro, fluoro, bromo, nitro, and (C_1–6) alkoxycarbonyl, unsubstituted phenyl (C_1–C_4)alkyl, or phenyl (C_1–C_4)alkyl substituted as above;

R_1 represents hydrogen, (C_1–C_6) alkyl, (C_2–C_6)alkyl, (C_2–C_6)alkenyl, (C_3–C_7) cycloalkyl, (C_1–C_6)alkoxycarbonyl, unsubstituted phenyl or phenyl substituted as above, or unsubstituted phenyl(C_1–C_4)alkyl, or phenyl (C_1–C_4) alkyl substituted as above;

R_2 represents unsubstituted phenyl groups or phenyl groups substituted with 1, 2 or 3 substituents selected from (C_1–C_4)alkyl, (C_1–C_4)alkoxy, halo(C_1–C_4)alkyl, chloro, bromo, fluoro, nitro, cyano, (C_1–C_6)alkoxycarbonyl, and a group of formula S(O)n-(C_1–C_6)alkyl, wherein n represents zero or the integer 1 or 2, or R_2 represents a pentafluorophenyl group, an α- or β-naphthyl group, an aromatic 5–6 membered heterocycle ring selected from the group consisting of furanyl or thienyl, a group of formula



or a group of formula



wherein

R_3 represents (C_1–C_6)alkyl, (C_2–C_6)alkenyl, unsubstituted phenyl or phenyl substituted as above, and unsubstituted phenyl(C_1–C_4)alkyl or phenyl (C_1–C_4)alkyl substituted as above, (C_1–C_4)alkoxy-(C_1–C_6)alkyl, amino(C_1–C_6)alkyl, mono- or di-(C_1–C_4)alkylamino(C_1–C_6)alkyl,

R_4 represents hydrogen, (C_1–C_4)alkyl or benzyl; or a physiologically acceptable salt thereof.

4,916,141

(S)-7-(3-AMINO-1-PYRROLIDINYL)-1-CYCLOPROPYL-6-FLUORO-1,4-DIHYDRO-4-OXO-1,8-NAPHTHYRIDINE-3-CARBOXYLIC ACID

Joseph P. Sanchez, Novi, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 28, 1989, Ser. No. 329,461

Int. Cl.[4] C07D *471/04;* A61K *31/44*

U.S. Cl. 514—300 **4 Claims**

1. Substantially pure (S)-7-(3-amino-1-pyrrolidinyl)-1-cyclopropyl-6- fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid, a lower alkyl ester or a pharmaceutically acceptable acid addition or base salt thereof.

4,916,142

N-HETEROCYCLIC-N-(4-PIPERIDINYL)AMIDES AND PHARMACEUTICAL COMPOSITIONS AND THEIR USE AS ANALGESICS

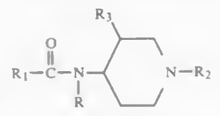
Jerome R. Bagley, North Plainfield, and H. Kenneth Spencer, Chatham, both of N.J., assignors to BOC, Inc., Murray Hill, N.J.

Division of Ser. No. 282,092, Dec. 9, 1988, which is a continuation of Ser. No. 9,587, Feb. 2, 1987, Pat. No. 4,791,112. This application Jun. 6, 1989, Ser. No. 362,119

Int. Cl.[4] A61K *31/44;* C07D *213/02, 239/02*

U.S. Cl. 514—318 **21 Claims**

1. A compound having the formula:



and the optically active isomeric forms, and the pharmaceutically acceptable acid addition salts thereof, in which formula:

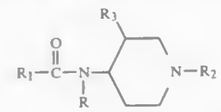
R is pyridinyl which may be unsubstituted or substituted with substituents independently selected from the group consisting of halogen, lower-alkyl, lower-alkoxy, halogenated lower-alkyl, lower-alkylthio, oxygen, and combinations thereof;

R_1 is selected from the group consisting of furanyl lower-alkyl, thienyl lower-alkyl, pyrrolyl, pyrrolyl lower-alkyl, and lower-alkyl and lower-cycloalkyl of 2 to 6 carbons, wherein the R_1 groups may be either unsubstituted or substituted with the substituents independently selected from the group consisting of halogen, lower-alkyl, lower-alkoxy, halogenated lower-alkyl, lower-alkylthio, oxygen, and combinations thereof;

R_2 is selected from the group consisting of thienyl lower-alkyl, thienyl hydroxy lower-alkyl, pyrazoyl lower-alkyl, and (4,5-dihydro-5-oxo-1H-tetrazol-1-yl) lower-alkyl, which may be substituted in the 4-position with a group selected from lower-alkyl, wherein the R_2 group may be either unsubstituted or substituted with the substituents independently selected from the group consisting of halogen, lower-alkyl, lower-alkoxy, halogenated lower-alkyl, lower-alkylthio, oxygen, and combinations thereof; and

R_3 is hydrogen.

8. A narcotic antagonistic or analgesic composition comprising a non-toxic pharmaceutically acceptable carrier and an analgesically or antagonistically effective amount of a compound having the formula:



and the optically active isomeric forms, and the pharmaceutically acceptable acid addition salts thereof, in which formula:

R is pyridinyl which may be unsubstituted or substituted with substituents independently selected from the group consisting of halogen, lower-alkyl, lower-alkoxy, halogenated lower-alkyl, lower-alkylthio, oxygen, and combinations thereof;

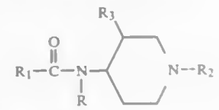
R_1 is selected from the group consisting of furanyl lower-alkyl, thienyl lower-alkyl, pyrrolyl, pyrrolyl lower-alkyl, and lower-alkyl and lower-cycloalkyl of 2 to 6 carbons, wherein the R_1 groups may be either unsubstituted or substituted with substituents independently selected from the group consisting of halogen, lower-alkyl, lower-alkoxy, halogenated lower-alkyl, lower-alkylthio, oxygen, and combinations thereof;

R_2 is selected from the group consisting of thienyl lower-

alkyl, thienyl hydroxy lower-alkyl, pyrazoyl lower-alkyl, and (4,5-dihydro-5-oxo-1H-tetrazol-1-yl) lower-alkyl, which may be substituted in the 4-position with a group selected from lower-alkyl, wherein the R_2 group may be either unsubstituted or substituted with substituents independently selected from the group consisting of halogen, lower-alkyl, lower-alkoxy, halogenated lower-alkyl, lower-alkylthio, oxygen, and combinations thereof; and

R_3 is hydrogen.

15. A method for producing analgesia or selectively reversing the actions of opiate analgesics in a mammal, including respiratory depression, comprising administering to the mammal an analgesically or antagonistically effective amount of a compound having the formula:



and the optically active isomeric forms, and the pharmaceutically acceptable acid addition salts thereof, in which formula:

R is pyridinyl which may be unsubstituted or substituted with substituents independently selected from the group consisting of halogen, lower-alkyl, lower-alkoxy, halogenated lower-alkyl, lower-alkylthio, oxygen, and combinations thereof;

R_1 is selected from the group consisting of furanyl lower-alkyl, thienyl lower-alkyl, pyrrolyl, pyrrolyl lower-alkyl, and lower-alkyl and lower-cycloalkyl of 2 to 6 carbons, wherein the R_1 groups may be either unsubstituted or substituted with substituents independently selected from the group consisting of halogen, lower-alkyl, lower-alkoxy, halogenated lower-alkyl, lower-alkylthio, oxygen, and combinations thereof;

R_2 is selected from the group consisting of thienyl lower-alkyl, thienyl hydroxy lower-alkyl, pyrazoyl lower-alkyl, and (4,5-dihydro-5-oxo-1H-tetrazol-1-yl) lower-alkyl, which may be substituted in the 4-position with a group selected from lower-alkyl, wherein the R_2 group may be either unsubstituted or substituted with substituents independently selected from the group consisting of halogen, lower-alkyl, lower-alkoxy, halogenated lower-alkyl, lower-alkylthio, oxygen, and combinations thereof; and

R_3 is hydrogen.

4,916,143

HYDROXYINDOLE ESTERS

Henning Böttcher, Darmstadt; Christoph Seyfried, Seeheim-Jugenheim, and Klaus-Otto Minck, Ober-Ramstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

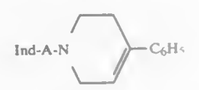
Continuation of Ser. No. 15,198, Feb. 17, 1987, abandoned. This application Aug. 4, 1988, Ser. No. 228,150

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1986, 3604949

Int. Cl.[4] C07D *401/06, 401/12;* A61K *31/40, 31/445*

U.S. Cl. 514—323 **8 Claims**

1. A hydroxyindole ester of the formula



wherein

Ind is 3-indolyl substituted in the 5-position by acyloxy, wherein acyl is C_{1-4}-alkanoyl or benzoyl,

A is—$(CH_2)_4$—, and

—C_6H_5 is phenyl, or a physiologically acceptable salt thereof.

3. A pharmaceutical composition comprising an amount of a compound of claim 1 effective to exert a dopamine stimulating effect and a pharmaceutically acceptable carrier.

4,916,144

N-SUBSTITUTED IMIDAZOLES AS AROMATASE INHIBITORS

Peter Strehlke; Rolf Bohlmann; David Henderson, and Yukishige Nishino, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Fed. Rep. of Germany

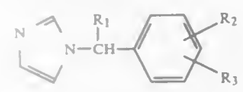
Filed Mar. 31, 1989, Ser. No. 331,283

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3811574

Int. Cl.[4] A61K *31/445, 31/415;* C07D *233/60, 233/61*

U.S. Cl. 514—326 **13 Claims**

1. An imidazole of the formula



in which

R_1 is hydrogen, a hydrocarbyl radical with 1 to 10 carbon atoms, or a cyclic hydrocarbon radical with 3 to 9 carbon atoms, or a cycloalkylalkyl radical with 4 to 12 carbon atoms or an arylalkyl radical with 7 to 12 carbon atoms,

R_2 is a benzyloxy group or benzyloxy substituted with halogen, C_{1-4}-alkyl, hydroxyl, methoxy, amino, cyano or combinations thereof,

R_3 is a cyano group; an alkanoyl group having 2 to 10 carbon atoms; an alkanoyl group having 2 to 10 carbon atoms which is substituted with halogen, methoxy, amino, hydroxyl, cyano and combinations thereof;

a benzoyl group; a benzoyl group substituted with halogen, C_{1-4}-alkyl, methoxy, amino, hydroxyl, cyano or combinations thereof;

a carboxylic group; a carboxylic acid C_{1-6}-alkyl ester; a carboxylic acid amide or the corresponding anilide thereof; a mono- or di-C_{1-6}-alkylamide; or a saturated heterocyclic amide wherein the nitrogen atom thereof forms a ring of the formula

or a pharmaceutically acceptable salt thereof.

6. A method of treating estrogen-stimulated tumors in a patient in need of such treatment comprising administering an effective amount of a compound of claim 1.

4,916,145

SUBSTITUTED N-[(PYRIDYL)ALKYL]ARYL-CARBOXAMIDE

Jefferson W. Tilley, North Caldwell; Robert W. Guthrie, Saddle Brook; John W. Clader, Cranford, and Ronald A. LeMahieu, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 10, 1987, Ser. No. 72,386

Int. Cl.[4] C07D *213/56, 213/65, 213/70;* A61K *31/44*

U.S. Cl. 514—357 **19 Claims**

1. A compound of the formula

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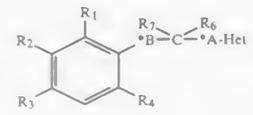
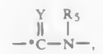
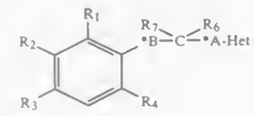


wherein *B is

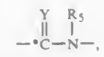


Y is O or S, *A is —*$(CH_2)_n$—$(X)_m$—$(CH_2)_r$—, n or r, independently, are integers from 0 to 3, m is an integer from 0 to 1, provided that when m is 1, then n must be at least 1, X is O or S, R_1 and R_4, independently, are hydrogen, halogen, lower alkyl, hydroxy or lower alkoxy,
R_2 and R_3 are independently hydrogen, lower alkyl, cycloalkyl, halogen, nitro, lower alkoxy, lower alkenyl, lower alkynyl, phenyl, naphthalenyl, or phenyl or napthalenyl mono-, di- or trisubstituted by halogen, trifluoromethyl, lower alkyl, lower alkoxy or nitro, R_5 and R_6, independently are hydrogen or lower alkyl, R_7 is hydrogen, lower alkyl, cycloalkyl, phenyl, naphthalenyl, or phenyl or naphthalenyl mono-, di- or trisubstituted by halogen, trifluoromethyl, lower alkyl, lower alkoxy or nitro, Het is pyridyl unsubstituted or substituted by lower alkyl, halogen, phenyl, naphthalenyl, or phenyl or naphthalenyl mono-, di- or trisubstituted hy halogen, trifluoromethyl, lower alkyl, lower alkoxy or nitro, and the asterisk denotes the point of attachment, and, provided that at least one of R_2 and R_3 is phenyl, naphthalenyl, or phenyl or naphthalenyl mono-, di- or trisubstituted by halogen, trifluoromethyl, lower alkyl, lower alkoxy or nitro, or when R_6 and R_7 are different, an enantiomer or racemic mixture thereof, or a pharmaceutically acceptable acid addition salt thereof.

16. A method of treating a disease state due to an excess of platelet activating factor which comprises administering to a host in need of such treatment an effective amount of a compound of the formula



where *B is



Y is O or S, *A is —*$(CH_2)_n$—$(X)_m$—$(CH_2)_r$—, n or r, independently, are integers from 0 to 3, m is an integer from 0 to 1, provided that when m is 1, then n must be at least 1, X is O or S, R_1 and R_4, independently, are hydrogen, halogen, lower alkyl, hydroxy or lower alkoxy, R_2 and R_3 are independently hydrogen, lower alkyl, cycloalkyl, hydrogen, nitro, lower alkoxy, lower alkenyl, lower alkynyl, phenyl, naphthalenyl, or phenyl or naphthalenyl mono-, di- or trisubstituted by halogen, trifluoromethyl, lower alkyl, lower alkoxy or nitro, R_5 and R_6, independently are hydrogen or lower alkyl, R_7 is hydrogen, lower alkyl, cycloalkyl, phenyl, naphthalenyl, or phenyl or naphthalenyl mono-, di- or trisubstituted by halogen, trifluoromethyl, lower alkyl, lower alkoxy or nitro, Het is pyridyl unsubstituted or substituted by lower alkyl, halogen, phenyl, naphthalenyl, or phenyl or naphthalenyl mono-, di- or trisubstituted by halogen, trifluoromethyl, lower alkyl, lower alkoxy or nitro, and the asterisk denotes the point of attachment, and, provided that at least one of R_2 and R_3 is phenyl, naphthalenyl, or phenyl or naphthalenyl mono-, di-or trisubstituted by halogen, trifluoromethyl, lower alkyl, lower alkoxy or nitro, or, when R_6 and R_7 are different, an enantiomer or racemic mixture thereof, or a pharmaceutically acceptable acid addition salt thereof.

4,916,146

AMINO ACID IMIDE DERIVATIVES, USAGE THEREOF, AND MEDICINAL COMPOSITION CONTAINING THE SAME

Yoshiaki Tanaka; Tomoji Antsuka; Naomi Kobayashi; Naoki Nakata; Kuniyoshi Ogura; Motoki Torizuka; Naoyoshi Miura, and Heihachiro Arai, all of Konan, Japan, assignors to Zeria Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,556

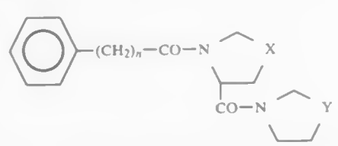
Claims priority, application Japan, Dec. 23, 1987, 62-326549; Oct. 14, 1988, 63-256940

Int. Cl.[4] **C07D** *417/02;* **A61K** *31/425*

U.S. Cl. 574—365 **5 Claims**

I. N-substituted amino acid imide derivatives represented by formula (I):

(I)



wherein n represents an integer of 0 to 5, and X and Y, which may be the same or different, represent a methylene group or a sulfur atom, provided that not both X and Y are methylene groups at the same time.

4,916,147

3-[(4-AROYL) PHENOXY (OR PHENYLTHIO)]-CYCLOPENTANECARBOXYLIC ACID ANALOGUES AND TREATMENT OF CEREBRAL EDEMA THEREWITH

Katsuhiro Imaki, Tsuzuki; Tadao Okegawa, Yawata, and Yoshinobu Arai, Osaka, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jun. 21, 1986, Ser. No. 887,772

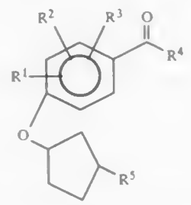
Claims priority, application Japan, Jul. 19, 1985, 60-157990

Int. Cl.[4] **C07D** *257/04;* **A61K** *31/41, 31/12;* **C07C** *49/23*

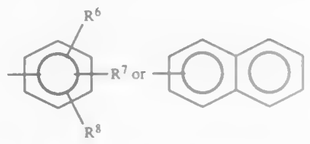
U.S. Cl. 514—381 **6 Claims**

1. A 3-(4-aroyl)phenoxy cyclopentanecarboxylic acid derivative represented by the general formula:

(1)



where R^1, R^2 and R^3 represent a hydrogen atom or a halogen atom, with the proviso that when two or three of R^1, R^2 and R^3 represent halogen atoms, they represent the same atoms, R^4 represents the general formula:



wherein R^6, R^7 and R^8 represents a hydrogen atom or a halogen atom, with the proviso that when two or three of R^6, R^7 and R^8 represent halogen atoms, they represent the same atoms, R^5 represents a 5-tetrazolyl group or a carboxy group, or a non-toxic salt thereof.

6. A method for the prevention and/or treatment of cerebal edema, which comprises administering to the patient an effective amount of the compound of general formula (I) of claim 1 or a non-toxic salt thereof.

4,916,148

NAPHTHO(2,1-B) FURAN DERIVATIVES

Philip N. Edwards, Bramhall, and Michael S. Large, Gillow Heath, both of England, assignors to Imperial Chemical Industries PLC, London, England

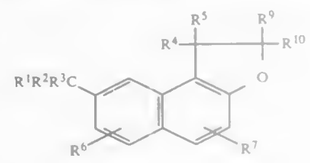
Filed Nov. 4, 1988, Ser. No. 267,319

Claims priority, application United Kingdom, Nov. 12, 1987, 8726505

Int. Cl.[4] **C07D** *405/10;* **A67K** *31/41*

U.S. Cl. 514—383 **7 Claims**

1. A naphtho[2,1-b]furan derivative of the formula:



wherein

R^1 is a 1H-1,2,4-triazol-1-yl or 4H-1,2,4-triazol-4-yl, radical optionally substituted in the 5-position by a 1–6C alkyl or halogenoalkyl radical;

R^2 and R^3, which may be the same or different, are each a hydrogen or deuterium atom, a cyano radical, a 1–6C alkyl or halogenoalkyl radical, a phenyl radical optionally substituted by halogen, or one of R^2 and R^3 is a radical of the formula R^1 as defined above, and the other is hydrogen;

R^4 and R^5, which may be the same or different, are each a 1–2C alkyl, deuterioalkyl or halogenoalkyl radical;

R^6 and R^7, which may be the same or different, are each a hydrogen or halogen atom, an amino, carboxy, carbamoyl, cyano, 1-cyano-1-methylethyl or nitro radical, a 1–6C alkyl or halogenoalkyl radical, a mono- or di-(1–6C)alkylcarbamoyl radical, a mono- or di-(1–6C)halogenoalkylcarbamoyl radical, a group of the formula —COR^8, —SO_nR^8 or —OR^8, in which n is 0, 1 or 2 and R^8 is a 1–6C alkyl or halogenoalkyl radical, or a benzoyl radical optionally substituted by halogen;

one of R^9 and R^{10} is hydrogen and the other is a hydroxy or 1–6C

alkoxy radical, or R^9 and R^{10} together form an oxo radical; and the pharmaceutically acceptable acid addition salts thereof.

4,916,149

DIURETIC AND SALURETIC 4-CHLORO-3-SULFAMOYLBENZOIC ACID HYDRAZIDES

Endre Pálosi; Dezso Korbonits, both of Budapest; Molnár née Bakó Erzsébet, Szodliget; Ida Szoboda née Kanzel, Dunakeszi; László Hársing, Budapest; György Simon, Budapest; Sándor Virág, Budapest; Vera Gergely, Budapest, and Katalin Marmarosi née Kellner, Biatorbágy, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Dec. 29, 1988, Ser. No. 295,925

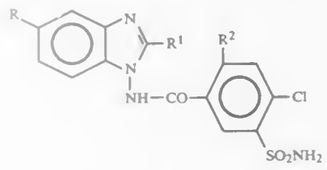
Claims priority, application Hungary, Dec. 30, 1987, 6131/87

Int. Cl.[4] **A61K** *31/415;* **C07D** *235/22, 235/28*

U.S. Cl. 514—387 **4 Claims**

1. A compound of the formula

(I)



wherein

R is hydrogen atom or a trifluoromethyl, carboxy, C_{2-5}alkoxycarbonyl, cyano, benzoyl, sulfamoyl or C_{1-4}alkylsulfonyl group;

R^1 is hydrogen atom or a linear or branched chain C_{1-4}alkyl, C_{1-4}alkylthio, C_{1-4}alkylsulfonyl, benzylthio, benzylsulfonyl, phenyl, hydroxy or mercapto group; and

R^2 is hydrogen or chlorine or a monohydrate or a pharmaceutically acceptable salt thereof.

4. A diuretic and saluretic method of treatment which comprises the step of administering a mammalian subject in need of said treatment, a therapeutically effective amount of the compound of the Formula (I) as defined in claim 1 or a monohydrate or a pharmaceutically acceptable salt thereof.

4,916,150

1H-PYRAZOLE-1-ALKANAMINES ANTIARRHYTHMIC COMPOSITIONS AND USE

Denis M. Bailey, East Greenbush, and Ronald G. Powles, Rotterdam, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

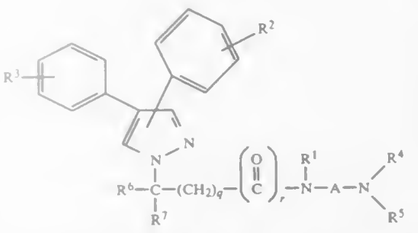
Filed Mar. 22, 1989, Ser. No. 327,228

Int. Cl.[4] **A61K** *31/415;* **C07D** *231/12*

U.S. Cl. 514—406 **11 Claims**

1. A compound of formula

I



or acid addition salt or solvate thereof wherein R^1 is hydrogen or lower-alkyl; R^2 and R^3 are independently hydrogen, hydroxy, lower-alkyl, lower-alkoxy, or halo; R^4 and R^5 are independently hydrogen or lower-alkyl, or R^4 and R^5 together form a straight or branched alkylene chain of four to six carbon atoms; R^6 and R^7 are independently hydrogen or straight-chain

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lower-alkyl; r is zero; q is one; and A is $CH_2CH(OH)CH_2$ or $(CH_2)_n$ wherein n is an integer from two to eight.

6. A composition for treating cardiac arrhythmias comprising an amount of a compound according to claim 1 effective to treat cardiac arrhythmias together with one or more pharmaceutically acceptable excipients or diluents.

4,916,151

METHOD OF TREATING PARKINSON'S SYNDROME

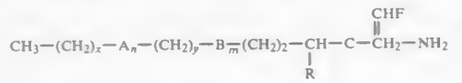
Philippe Bey; Michael G. Palfreyman, both of Cincinnati, and Ian A. McDonald, Loveland, all of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 143,549, Jan. 13, 1988, abandoned, which is a continuation-in-part of Ser. No. 806,162, Dec. 5, 1985, abandoned. This application Mar. 10, 1989, Ser. No. 323,071

Int. Cl.[4] A61K *31/40, 31/135, 31/195*

U.S. Cl. 514—419 **9 Claims**

1. A method of treating Parkinson's syndrome in a patient in need thereof which comprises conjunctive administration to said patient of a fluoroallylamine of the formula

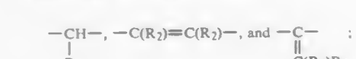


wherein

R is hydrogen or a $(C_1–C_4)$ alkyl;

n and m are each either zero or 1;

A and B are each selected from



x+y+z is zero or an integer of from 1 to 16;

R_1, R_2, R_3, R_4, and R_5 are each a hydrogen or a $(C_1–C_4)$alkyl,

or a pharmaceutically acceptable acid addition salt thereof, exogenous L-dopa, and a peripherally acting aromatic amino acid decarboxylase inhibitor, each in amounts which when conjunctively administered are effective to treat Parkinson's syndrome.

4,916,152

PYRROLIDINE DERIVATIVES AS ANTIASTHMATICS

Hiroyuki Setoi; Hideo Hirai; Hiroshi Marusawa; Akio Kuroda; Hirokazu Tanaka, and Masashi Hashimoto, all of Tsukuba, Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

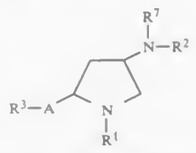
Filed Apr. 28, 1988, Ser. No. 187,240

Claims priority, application United Kingdom, May 1, 1987, 8710352; Jul. 13, 1987, 8716438; Dec. 23, 1987, 8730027

Int. Cl.[4] A61K *31/40;* **C07D** *207/10;* **C07F** *9/02*

U.S. Cl. 514—426 **9 Claims**

1. A compound of the formula:



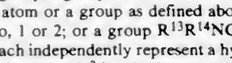
wherein R^1 is hydrogen, lower alkoxycarbonyl, phenylsulfonyl, phenylsulfonyl substituted with 1 to 3 substituent(s) selected from the group consisting of halogen, nitro, lower alkoxy, mono (or di or tri)halo(lower)alkyl and lower alkyl, phenylcarbamoyl, lower alkylsulfonyl, benzoyl or thienylsulfonyl;

R^2 is phenylsulfonyl or phenylsulfonyl substituted with 1 to 3 substituent(s) selected from the group consisting of halogen, lower alkyl, lower alkoxy and mono(or di or tri)halo(lower)alkyl,

R^3 is carboxy(lower)alkyl, lower alkyl substituted with carboxy and 1 to 3 halogen atom(s), esterified carboxy(lower)alkyl, carbamoyl(lower)alkyl, lower alkylsulfonylcarbamoyl(lower)alkyl, phenylsulfonylcarbamoyl(lower)alkyl, carboxyphenyl, esterified carboxyphenyl, carboxy, esterified carboxy, hydroxy(lower)alkyl, sulfino(lower)alkyl, phosphono(lower)alkyl, di(lower)alkoxyphosphoryl(lower)alkyl or halo(lower)alkyl,

R^7 is hydrogen or lower alkyl, and

A is



in which R^8 is hydrogen or lower alkyl, or a pharmaceutically acceptable salt thereof.

9. A method for the treatment of thrombosis, asthma or nephritis which comprises administering an effective amount of a compound of claim 1 to a human or animals.

4,916,153

MACROLID COMPOUNDS

Brian M. Bain, Tylers Green; Paul F. Lambeth, London; Alison C. Rosemeyer, Kingswood; John B. Ward, Bushey; Neil Porter, Pinner; Hazel M. Noble, Burnham; Richard A. Fletton, Ruislip; David Noble, Burnham; Derek R. Sutherland, Chalfont St Giles; Michael V. J. Ramsay, South Harrow, and Edward P. Tiley, Village Way, all of England, assignors to American Cyanamid Company, Stamford, Conn.

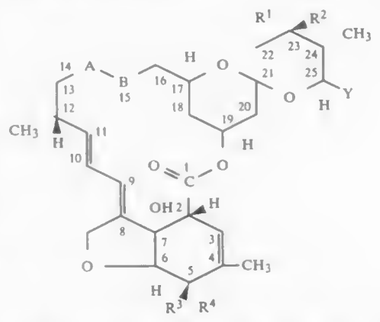
Filed Mar. 11, 1987, Ser. No. 24,469

Claims priority, application United Kingdom, Mar. 12, 1986, 8606107; Mar. 12, 1986, 8606124; Jul. 17, 1986, 8617484; Jul. 17, 1986, 8617483

Int. Cl.[4] A61K *31/335;* **C07D** *313/06*

U.S. Cl. 514—450 **12 Claims**

1. Compounds of formula (I):



and salts thereof; wherein R^1 is a group OR^5, where the group R^5 may represent an acyl group of the formula R^9CO— or R^9OCO— or R^9OCS—, where R^9 is an alkyl, alkenyl, alkynyl, cycloalkyl, aralkyl or aryl group; a formyl group, a group R^{10} which is as defined above for R^9, a group $R^{11}SO_2$—, where R^{11} is a $C_{1–4}$ alkyl or $C_{6–10}$ aryl group, a silyl group, a cyclic or acyclic acetal group, a group $—CO(CH_2)_nCO_2R^{12}$, where R^{12} is a hydrogen atom or a group as defined above for R^9 and n represents zero, 1 or 2; or a group $R^{13}R^{14}NCO$— where R^{13} and R^{14} may each independently represent a hydrogen atom or a $C_{1–4}$ alkyl group, and R^2 is a hydrogen atom or R^1 and R^2 together with the carbon atom to which they are attached represent $<C=CH_2$ or $<C=NOR_6$ where R_6 is a hydrogen atom, $C_{1–8}$ alkyl group or a $C_{3–8}$ alkenyl group and the group $CNOR_6$ is in the E configuration;

R^3 is a group OR^5 as defined above and R^4 is a hydrogen atom; or R^3 and R^4 together with the carbon atom to which they are attached represent $<C=O$; —A—B— is (i) a group

where X is a chlorine or bromine atom; and Y is a group

where X is as defined above, R^7 is a methyl, ethyl or isopropyl group; with the proviso that when —A—B— is

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4,916,154

23-IMINO DERIVATIVES OF LL-F28249 COMPOUNDS

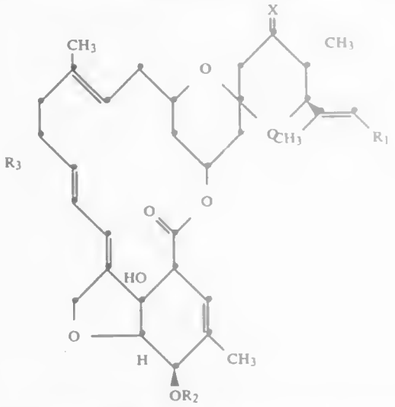
Goro Asato, Titusville, and Donald J. France, Pennington, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 907,283, Sep. 12, 1986, abandoned. This application Aug. 27, 1987, Ser. No. 88,953

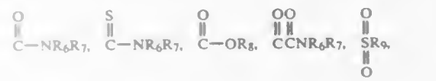
Int. Cl.[4] A61K *31/335;* **C07D** *313/06*

U.S. Cl. 514—450 **15 Claims**

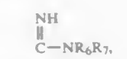
1. A compound represented by structural formula (I):



wherein R_1 is methyl, ethyl or isopropyl; R_2 is hydrogen, methyl, $C_1–C_4$ alkanoyl, methoxyacetyl, chloroacetyl, dichloroacetyl, trichloroacetyl, trifluoroacetyl, phenoxyacetyl, optionally substituted on the phenyl ring with one or two halogens, $C_1–C_4$ alkyl groups, $C_1–C_4$ alkoxy groups or nitro groups, or benzoyl optionally substituted with one or two halogens, $C_1–C_4$ alkyl groups, $C_1–C_4$ alkoxy groups, or nitro groups; R_3 is hydrogen or methyl; X is NOR_4, or N—NHR_5; R_4 is hydrogen, $C_1–C_6$ alkyl, $C_1–C_4$ alkoxymethyl, benzyl, allyl, propargyl, phenyl, CH_2COO-alkyl $(C_1–C_4)$, N-$(C_1–C_6$ alkyl)carbamoyl, N-(allyl)carbamoyl, N-(propargyl)carbamoyl, N-(phenyl)carbamoyl, N-(chlorophenyl)carbamoyl, N-(dichlorophenyl)carbamoyl, N-(benzyl)carbamoyl, $C_1–C_6$ alkanoyl, chloroacetyl, methoxyacetyl, phenylacetyl optionally substituted on the phenyl ring with one or two halogens, $C_1–C_4$ alkyl groups, $C_1–C_4$ alkoxy groups or nitro groups, phenoxyacetyl optionally substituted on the phenyl ring by one or two halogens, $C_1–C_4$ alkyl groups, $C_1–C_4$ alkoxy groups or nitro groups, or benzoyl optionally substituted with one or two halogens, $C_1–C_4$ alkyl groups, $C_1–C_4$ alkoxy groups or nitro groups; R_5 is



$C_1–C_6$ alkanoyl, $C_1–C_6$ alkyl,



or benzoyl optionally substituted with one or two halogens, $C_1–C_4$ alkyl groups, $C_1–C_4$ alkoxy groups or nitro groups; R_6 and R_7 are hydrogen or $C_1–C_6$ alkyl, or phenyl optionally substituted with one or two halogens, $C_1–C_4$ alkyl, $C_1–C_4$ alkoxy, or phenyl optionally substituted with one or two halogens, $C_1–C_4$ alkyl groups, $C_1–C_4$ alkoxy groups or nitro groups, R_8 is $C_1–C_6$ alkyl or phenyl optionally substituted with one or two halogens, $C_1–C_4$ alkyl groups, $C_1–C_4$ alkoxy groups or nitro groups; R_9 is $C_1–C_6$ alkyl or phenyl optionally substituted with one or two halogens, $C_1–C_4$ alkyl groups, $C_1–C_4$ alkoxy groups or nitro groups; or a pharmaceutically and pharmacologically acceptable salt thereof.

4,916,155

CRYSTALLINE CALCIUM PSEUDOMONATE

Geoffrey H. Baker, Banstead, and Merle Beal, Horley, both of England, assignors to Beecham Group p.l.c., Epsom, England

Continuation of Ser. No. 72,683, Jul. 13, 1987, abandoned, which is a continuation of Ser. No. 745,213, Jun. 17, 1985, abandoned. This application Apr. 13, 1989, Ser. No. 338,446

Claims priority, application United Kingdom, Jun. 19, 1984, 8415579

Int. Cl.[4] A61K *31/35;* **C07D** *309/10*

U.S. Cl. 514—460 **3 Claims**

1. Anhydrous crystalline calcium pseudomonate.

4,916,156

AROMATIC DERIVATIVES, THEIR PREPARATION AND THEIR USE AS ANTIMICROBIAL AGENTS

Madeleine Mossé, Montpellier, and Vincenzo Proietto, Saint-Georges D'Orques, both of France, assignors to Sanofi, Paris, France

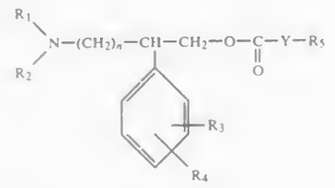
Filed Apr. 6, 1988, Ser. No. 178,327

Claims priority, application France, Apr. 10, 1987, 87 05165

Int. Cl.[4] A01N *47/06, 37/10;* **C07C** *154/00, 87/32*

U.S. Cl. 514—510 **12 Claims**

1. A compound of the formula:



(I)

in which:
n is an integer between 2 and 10;
R_1 and R_2 are identical or different and represent a cycloalkyl containing 3 to 6 carbon atoms or an alkyl containing from 1 to 6 carbon atoms which is unsubstituted or substituted by a phenyl or benzyl group;
R_3 represents a hydrogen, a halogen, a methyl or a phenyl;
R_4 represents a hydrogen, a halogen or a methyl; or R_3 and R_4, taken together with the benzene ring to which they are bonded, form a naphth-1-yl or naphth-2-yl group;
Y represents a direct bond, a methyleneoxy group, a methylenethio group or a vinylene group; and
R_5 represents an alkyl containing from 5 to 18 carbon atoms, a cycloalkyl containing from 3 to 8 carbon atoms, an adamantyl, naphth-1-yl or naphth-2-yl group, an unsubstituted phenyl group or a phenyl group substituted by one or 2 substituents selected from halogen atoms, the trifluoromethyl group, the nitro group and the phenyl group;
and its salts with mineral or organic acids.

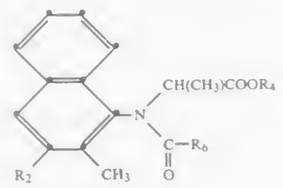
4,916,157

ACYLATED NAPHTHYLAMINES AS PLANT FUNGICIDES

Hans Moser, Magden, Switzerland; Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany; Walter Kunz, Oberwil, and Adolf Hubele, Magden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 820,271, Jan. 16, 1986, abandoned, which is a continuation of Ser. No. 430,060, Sep. 30, 1982, abandoned, Ser. No. 430,078, Sep. 30, 1982, abandoned, and Ser. No. 431,522, Sep. 30, 1982, abandoned, said Ser. No. 430,060, Ser. No. 430,078, and Ser. No. 431,522, each is a division of Ser. No. 195,221, Oct. 8, 1980, abandoned, which is a continuation-in-part of Ser. No. 138,066, Apr. 7, 1980, abandoned. This application Apr. 3, 1989, Ser. No. 333,887
Claims priority, application Switzerland, Apr. 10, 1979, 3404/79
Int. Cl.[4] C07C *103/48*; A01N *37/22*
U.S. Cl. 514—510 **13 Claims**

1. An acylated naphthylamine of the formula



wherein
R_2 is hydrogen or methyl;
R_4 is C_1–C_4-alkyl, unsubstituted or substituted by halogen or by C_1–C_2-alkoxy; and
R_6 is the group CH_2Z, wherein Z is -X-R_7 wherein
X is oxygen or sulfur, and
R_7 is a C_1–C_6-alkyl group optionally substituted by C_1–C_2-alkoxy, or it is a C_3–C_4-alkenyl or C_3–C_4-alkynyl group, including the salts and metal complexes thereof.

4,916,158

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF 2-(DECYLTHIO)ETHANAMINE HYDROCHLORIDE AND METHYLENE BIS(THIOCYANATE)

Wilson K. Whitekettle, Conroe, and Deborah K. Donofrio, The Woodlands, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed May 25, 1989, Ser. No. 357,224
Int. Cl.[4] A01N *33/08, 47/48*
U.S. Cl. 514—515 **7 Claims**

1. A bacterial inhibiting composition comprising a synergistic mixture of (a) 2-(decIthio)ethanamine hydrochloride ("DTEA") and (b) methylene bis(thiocyanate) ("MBT"), wherein the weight ratio of said DTEA to said MBT is from about 56:1 to 1:9.1.

4,916,159

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF 2-(DECYLTHIO)ETHANAMINE HYDROCHLORIDE AND 2,2-DIBROMO-3-NITRILO PROPIONAMIDE

Wilson K. Whitekettle, Conroe, and Deborah K. Donofrio, The Woodlands, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed May 25, 1989, Ser. No. 357,387
Int. Cl.[4] A01N *33/08, 37/34*
U.S. Cl. 514—528 **7 Claims**

1. A bacterial inhibiting composition comprising a synergistic mixture of (a) 2-(decylthio)ethanamine hydrochloride ("DTEA") and (b) 2,2-dibromo-3-nitrilo propionamide ("DBNPA"), wherein the weight ratio of said DTEA to said DBNPA is from about 23:1 to 1:11.

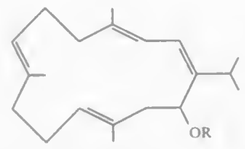
4,916,160

ANTI-TUMOR PROMOTER AGENTS

Yoshiharu Morita, Yokohama, and Koichiro Hirayama, Sagamihara, botb of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Jul. 10, 1987, Ser. No. 72,141
Claims priority, application Japan, Jul. 10, 1986, 61-162783
Int. Cl.[4] A61K *31/22, 31/045*
U.S. Cl. 514—546 **3 Claims**

1. A pharmaceutical composition for treating solid tumors which are sensitive to treatment with one or more compounds of the formula I:



(I)

wherein R is selected from the group consisting of hydrogen, acetyl, propionyl and butyryl, which comprises:
(a) an effective amount of one or more compounds of the formula I; and
(b) a pharmaceutically acceptable excipient, and wherein said composition is in the form of a capsule, tablet, granule or powder, which comprises at least about 5% of said compound or compounds of the formula 1.

4,916,161

TASTE-MASKING PHARMACEUTICAL AGENTS

Mahesh K. Patell, Edison, N.J., assignor to Bristol-Myers Squibb, New York, N.Y.

Filed Oct. 25, 1988, Ser. No. 262,911
Int. Cl.[4] A61K *9/62*; B01J *13/02*; B05D *7/00*; B22B *9/02*
U.S. Cl. 514—570 **13 Claims**

1. A process for preparing tablets containing a foul tasting pharmaceutical agent in which the bad taste of the agent is effectively masked comprising the steps of:
(a) wet-granulating a dry particulate pre-granulation blend comprising the agent and hydroxypropyl methylcellulose phthalate with an aqueous granulating composition in which said hydroxypropyl methylcellulose phthalate is at least partially soluble to form a granulation containing the agent;
(b) grinding and drying the product of step (a);
(c) blending the product of step (b) with tablet adjuvants, and
(d) compressing the product of step (c) to produce tablets.

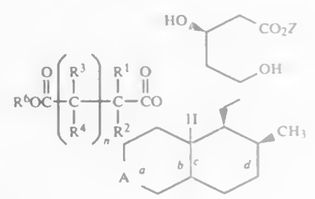
4,916,162

ANTIHYPERCHOLESTEROLEMIC COMPOUNDS

William F. Hoffman, Lansdale; Clarence S. Rooney, Worcester, and Ta Jyb Lee, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

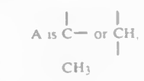
Continuation of Ser. No. 859,535, May 5, 1986, Pat. No. 4,771,071. This application Jul. 18, 1988, Ser. No. 220,848
Int. Cl.[4] A61K *31/19*
U.S. Cl. 514—574 **13 Claims**

1. A compound represented by the following general structural formula (II')



(II')

wherein:
n is 0 to 1;
R^1 is C_{1-3}alkyl;
R^2 is hydrogen or C_{1-3}alkyl;
R^3 is hydrogen or C_{1-3}alkyl;
R^4 is hydrogen or C_{1-3}alkyl;
R^6 is hydrogen or C_{1-3}alkyl;



A is C— or CH.

and
a, b, c and d represent single bonds, one of a, b, c or d represent a double bond, or both a and c or both b and d represent double bonds;
Z is hydrogen, C_{1-5}alkyl, or C_{1-5}alkyl substituted with a member of the group consisting of phenyl, dimethylamino or acetylamino; or a pharmaceutically acceptable salt of a compound of the formula (II^{40}) in which Z is hydrogen.

4,916,163

SPRAY-DRIED LACTOSE FORMULATION OF MICRONIZED GLYBURIDE

Philip F. Ni, Texas Township, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jun. 4, 1985, Ser. No. 741,241
Int. Cl.[4] A61K *31/17*
U.S. Cl. 514—593 **4 Claims**

1. In an micronized glyburide anti-diabetic pharmaceutical composition as a unit dose, containing one or more pharmaceutically acceptable excipients, the improvement which comprises:
spray-dried lactose as the preponderant excipient in said composition, being present therein at about not less that seventy percent (70%) by weight of the final composition.

4,916,164

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF 2-(DECYLTHIO)ETHANAMINE HYDROCHLORIDE AND B-BROMO-B-NITROSTYRENE

Wilson K. Whitekettle, Conroe, and Deborah K. Donofrio, The Woodlands, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed May 25, 1989, Ser. No. 357,390
Int. Cl.[4] A01N *33/08, 33/18*
U.S. Cl. 514—665 **7 Claims**

1. A bacterial inhibiting composition comprising a synergistic mixture of (a) 2-(decylthio)ethanamine hydrochloride ("DTEA") and (b) B-bromo-B-nitrostyrene ("BNS"), wherein the weight ratio of said DTEA to said BNS is from about 14:1 to 1:18.3.

4,916,165

HEAT-FOAMABLE CROSSLINKED PROPYLENE RESIN COMPOSITION IN THE FORM OF A MELT-SHAPED SHEET STRUCTURE

Takashi Hashimoto, Waki, and Zenichi Sasaki, Ohtake, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 824,548, Jan. 23, 1986, Pat. No. 4,870,114. This application May 1, 1989, Ser. No. 345,462
Claims priority, application Japan, Jan. 25, 1985, 60-10781; Feb. 1, 1985, 60-16636; Feb. 7, 1985, 60-20941; Feb. 13, 1985, 60-24382
Int. Cl.[4] C08J *9/00*
U.S. Cl. 521—96 **17 Claims**

1. A foamable, melt-shaped sheet structure obtained by melting and shaping a heat-foamable crosslinked propylene resin composition comprising
(1) 100 parts by weight of a partially crosslinked polypropylene resin composition obtained by mixing at least four components composed of (A) a propylene resin, (B) an olefin resin other than the resin (A), 0.05 to 0.5 parts by weight, per 100 parts by weight of the resins (A) and (B) combined, of a radical initiator (C) and 0.1 to 1 part by weight, per 100 parts by weight of the resins (A) and (B) combined, of (D) a crosslinking agent at a temperature at which the radical initiator decomposes to form the partially crosslinked propylene resin (), and
(2) 0.05 to 5 parts by weight of a blowing agent capable of generating a gas when heated at the temperature at which the heat-foaming crosslinked propylene resin composition in the form of a melt-shaped sheet structure is foamed; wherein
(a) the propylene resin (A) is in the amount of 60 to 95 parts by weight per 100 parts by weight of the resins (A) and (B) combined, contains 0 to 30 mole% of an alpha-olefin other than propylene and has a melt flow rate (MFR), determined by ASTM D1238L, of 0.1 to 50 g/10 min., and
(b) the alpha-olefin resin (B) is in an amount of 5 to 40 parts by weight per 100 parts by weight of the resins (A) and (B)

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combined, and is selected from the group consisting of a propylene random copolymer resin (B1) composed of 55 to 85 mole% of propylene and 15 to 45 mole% of an alpha-olefin with 4 to 20 carbon atoms and having an amount of heat of crystal fusion, determined by thermal analysis on a differential scanning calorimeter, of 25 to 70 joules/g and a melt flow rate (MFR), determined by ASTM D1238L, of 0.05 to 20 g/10 min. and a 1-butene polymer or a 1-butene random copolymer resin (B2) composed of 70 to 100 mole% of 1-butene and 0 to 30 mole% of an alpha-olefin having 2, 3 or 5 to 20 carbon atoms and having an amount of heat of crystal fusion, determined by thermal analysis on a differential scanning calorimeter of 20 to 70 joules/g and a melt flow rate (MFR), determined by ASTM D1238L, of 0.05 to 50 g/10 min.

4,916,166

INSULATING ALKENYL AROMATIC POLYMER FOAM

Kyung W. Suh, and Jerry L. Severson, both of Granville, Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 258,750, Oct. 17, 1988, abandoned.
This application Aug. 22, 1989, Ser. No. 397,340
Int. Cl.[4] C08J *9/14*
U.S. Cl. 521—98 7 Claims

1. An alkenyl aromatic thermoplastic synthetic resinous elongate foam body comprising the body having a machine direction and a transverse direction and defining a plurality of closed noninterconnecting gas-containing cells therein, the cells having an average cell size of from about 0.05 to about 2.0 millimeters when measured across a minimum cross-sectional dimension of the body, the body being of a generally uniform celluloar structure without substantial discontinuities, the body having a cross-sectional area of at least 8 square inches (51.6 square centimeters) with a minimum cross-sectional dimension of at least about 0.25 inch (6.35 millimeters), a water vapor permeability not greater than about 1.8 per inch (3.02 metric perm centimeters) a density of from about 1.0 to about 2.4 pounds per cubic foot (16 to 38 kilograms/cubic meter) with the further limitations that the cells contain, as gas, 1,1-difluoro-1-chloroethane and that any change in dimension in any direction be about four percent or less when measured by the test designated ASTM D2126/C578.

4,916,167

PRODUCTION OF HYBRID FOAM FOR SOUND ABSORPTION

Jul-Hsiang Chen; Shih-Jung Tsai; Shen-Nan Tong, all of Hsinchu, and Peter T. K. Wu, Taipei, all of Taiwan, assignors to Industrial Technology Research Institute, Taiwan

Filed Sep. 29, 1988, Ser. No. 250,896
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—159 22 Claims

1. A lightweight, flame retardant, sound absorption composition, comprising a phenol-aldehyde/polyurethane hybrid polymer foam of open cell structure and interconnected continuous porous architecture, formed from 100 parts by weight phenolic resin, about 50–300 parts by weight polyisocyanate, about 5–30 parts by weight aliphatic group containing polyol having a molecular weight of from 500 to 1500, and about 0–100 parts by weight filler.

4,916,168

MANUFACTURE OF POLYURETHANE FOAM

Tu Pham, Grez-Doiceau, and Louis Muller, Ottenburg, both of Belgium, assignors to Imperial Chemical Industries PLC, London, England

Filed Sep. 21, 1988, Ser. No. 247,453
Claims priority, application United Kingdom, Sep. 21, 1987, 8722149; Sep. 21, 1987, 8722150; Aug. 22, 1988, 8819880
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—167 10 Claims

1. Process for manufacturing flexible polyurethane foams based on methylene diphenyl isocyanates and isocyanate-reactive compounds, which comprises reacting methylene diphenyl isocyanates with one or more isocyanate-reactive compounds selected from polyols and polyamines with a functionality of 2–4 and an average equivalent weight ranging from 750–5000 and from 0 to 5 parts by weight of water per 100 parts of polyols and/or polyamine, optionally together with additives conventional in the art, and optionally together with blowing agents other than water, whereas the isocyanate index ranges from 10 to 60.

4,916,169

VISIBLE RADIATION ACTIVATED HYDROSILATION REACTION

Larry D. Boardman, and Joel D. Oxman, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 9, 1988, Ser. No. 242,478
Int. Cl.[4] C08F *2/46*
U.S. Cl. 522—27 27 Claims

1. A hydrosilation process which comprises reacting a composition comprising a compound having aliphatic unsaturation and a compound containing at least one silicon-bonded hydrogen atom and not having more than three hydrogen atoms attached to any one silicon atom, in the presence of both a (η^5-cyclopentadienyl)tri(σ-aliphatic)platinum complex and a sensitizer that is capable of absorbing visible light and that is capable of transferring energy to said platinum complex such that the hydrosilation reaction is initiated upon exposure to visible light.

4,916,170

PROCESS FOR MAKING SKIN MARKER

Masao Nambu, Yokohama, and Nobuichi Makino, Nagoya, both of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 945,357, Dec. 22, 1986, abandoned.
This application Jul. 27, 1988, Ser. No. 224,938
Claims priority, application Japan, Dec. 27, 1985, 60-292861
Int. Cl.[4] G21K *1/10*
U.S. Cl. 523—137 11 Claims

1. A process for making a skin marker for diagnosis by X-ray tomography and nuclear magnetic resonance imaging, comprising a casting step of casting into a vessel an aqueous solution containing more than 8 wt % and not more than 20 wt % of a polyvinyl alcohol having a degree of hydrolysis of not less than 98 mol % and an average polymerization degree of not less than 1,000, a non-magnetic and X-ray radioopaque material being dispersed in a wall of said vessel, a freezing step of cooling the cast aqueous solution of to a temperature of not higher than −(minus) 10° C. to obtain a frozen mass and a thawing step of thawing said frozen mass to obtain a hydrogel of high water content filled in said vessel.

4,916,171

POLYMERS COMPRISING ALKALI-INSOLUBLE CORE/ALKALI-SOLUBLE SHELL AND COPOSITIONS THEREOF

Albert B. Brown; Paul H. Gehlhaus, both of Warrington; William H. Harrop, Elverson; Dennis P. Lorah, Lansdale; Thomas G. Madle, Flourtown; Travis E. Stevens, Ambler; Ted Tysak, and Constance A. Lane, both of Philadelphia, all of Pa., assignors to Rohm and Haas Company, Independence Mall West, Del.

Continuation-in-part of Ser. No. 872,714, Jun. 10, 1986, abandoned, which is a continuation-in-part of Ser. No. 634,333, Jul. 25, 1984, abandoned. This application Sep. 1, 1987, Ser. No. 93,069
Int. Cl.[4] C08L *51/00*
U.S. Cl. 523—161 22 Claims

1. A composition comprising a core-shell polymer having an alkali-insoluble, emulsion polymer core and an alkali-soluble, emulsion polymer shell attached or associated with said core so that upon dissolving said shell with alkali, a portion of said shell remains attached or associated with said core, wherein the weight ratio of core polymer to shell polymer is about 99:1 to about 1:99 and said core and shell are each independently polymerized from monomer systems comprised of monomers selected from the group consisting of methyl acrylate, ethyl acrylate, butyl acrylate, 2-ethylhexyl acrylate, decyl acrylate, methyl methacrylate, ethyl methacrylate, butyl methacrylate, acrylonitrile, acrylic acid, methacrylic acid, itaconic acid, maleic acid, fumaric acid, styrene, substituted styrene, vinyl acetate, and other C_1 to C_{12} alkyl acrylates.

21. An ink or paint composition containing the core-shell polymer of claim 1, a pigment and a dispersing agent.

4,916,172

REACTION CURABLE COMPOSITION AND ARTIFICIAL MARBLE

Takao Hayashi, Zushi, and Kazuhiko Kameda, Yokohama, both of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Sep. 23, 1988, Ser. No. 248,086
Claims priority, application Japan, Sep. 25, 1987, 62-238981; May 13, 1988, 63-114862
Int. Cl.[4] C08K *3/36, 3/34, 3/26, 3/22*
U.S. Cl. 523—171 10 Claims

1. A reaction curable composition comprising a curable component, a polymerization initiator for curing the curable component and an amount of from 30 to 90% by weight, based on the total composition, to effect the appearance of marble upon curing, of an inorganic filler selected from the group consisting of aluminum hydroxide, magnesium hydroxide, silica, calcium carbonate, calcium silicate, kaolin, clay or talc, wherein the curable component is a combination of a polyfunctional allylcarbonate or its precondensate, an unsaturated polyester and a reactive diluent, or a combination of a partially cured product of at least two of such three components and the uncured remainder thereof if there be any.

4,916,173

POLYURETHANE SYNTACTIC FOAM MODELING STOCK

Elizabeth L. Otloski, Haslett, and George H. Sollner, Lansing, both of Mich., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 6, 1988, Ser. No. 190,796
Int. Cl.[4] C08J *9/32*
U.S. Cl. 523—219 17 Claims

1. A curable polyurethane composition consisting essentially of a blend of (a) from 30–55% of a polyisocyanate, (b) from 9–35% of an amine-based polyol, (c) from 5–40% of a polyether triol, (d) from 3–10% of a molecular sieve and (e) from 10–40% of a hollow microsphere filler, all percentages being by weight of the total composition.

4,916,174

RUBBER-MODIFIED PHENOLIC RESIN COMPOSITION AND METHOD OF MANUFACTURING THE SAME

Akira Yoshizumi, Yokohama; Shinetsu Fujieda, Kawasaki; Ken Uchida, Tokyo; Naoko Kihara, Matsudo; Kazuhiro Sawai, Kawaguchi; Tsutomu Nagata, Iwatsuki; Shinji Murakami, and Shigeyuki Kouchiyama, both of Kawaguchi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Toshiba Chemical Corporation, Tokyo, both of, Japan

Filed Sep. 13, 1988, Ser. No. 243,719
Claims priority, application Japan, Jan. 6, 1988, 63-1031
Int. Cl.[4] C08L *63/00*
U.S. Cl. 523—436 8 Claims

1. An electronic device encapsulant comprising:
(A) a rubber-modified phenolic resin composition comprising a novolak-type phenolic resin and at least one modifying agent selected from the group consisting of an acrylonitrile-butadiene-styrene copolymer resin and a methyl methacrylate-butadiene-styrene copolymer resin dispersed in said novolak-type phenolic resin;
(B) an epoxy resin; and
(C) an inorganic filler, wherein said novolak-type phenolic resin is selected from the group consisting of a phenolic novolak, a cresol novolak, a tert-butyl phenolic novolak, a nonyl phenolic novolak, a phenolic aralkyl resin, and a dicyclopentadiene phenolic novolak; wherein said acrylonitrile-butadiene-styrene copolymer resin is a graft copolymer and wherein said methyl methacrylate-butadiene-styrene copolymer resin is a graft copolymer.

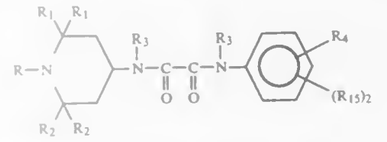
4,916,175

N-(2,2,6,6,-TETRAALKYLPIPERIDINYL-4)-N'-PHENYL OXALIC ACID DIAMIDES

Lajos Avar, Biel-Benken, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Nov. 5, 1987, Ser. No. 117,778
Claims priority, application United Kingdom, Nov. 7, 1986, 8626609
The portion of the term of this patent subsequent to Mar. 8, 2005, has been disclaimed.
Int. Cl.[4] C08K *5/34;* C07D *401/12*
U.S. Cl. 524—99 25 Claims

1. A compound of formula I

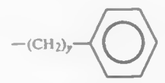


(I)

in which
R is hydrogen, oxygen, C_{1-8}alkyl or —COR$_5$;
each R_1 independently, is —CH_3 or —CH_2(C_{1-4}alkyl) or both groups R_1 form a group —$(CH_2)_5$—;
each R_2, independently, is —CH_3 or —CH_2(C_{1-4}alkyl) or both groups R_2 form a group —$(CH_2)_5$—;
each R_3, independently, is hydrogen or C_{1-4}alkyl;
R_4 is —OH; —O—$(CH_2)_x$—CO—R_{10} or —CO—X—R_{20};
R_5 is —C(R_3)=CH_2, C_{1-6}alkyl, phenyl, —CO—O—C_{1-4}alkyl, —NR_7R_8,

—C—OH;

R_7 is hydrogen, C_{1-12}alkyl, C_{5-6}cycloalkyl, phenyl, phenyl C_{1-4}alkyl or C_{1-12}alkylphenyl;
R_8 is C_{1-12}alkyl or hydrogen;
R_{10} is —OR_{11} or —NR_3—R_{12};
R_{11} is C_{1-12}alkyl unsubstituted or monosubstituted by —OH,



or phenyl or R_{11} is a group of formula (a)

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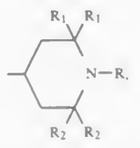


(a)

R_{12} is C_{1-12}alkyl or a group of formula (a) defined above;
R_{15} is hydrogen, C_{1-12}alkyl, C_{1-12}alkoxy or halogen;
R_{20} is hydrogen or C_{1-22}alkyl, unsubstituted or substituted by 1 to 3 substituents selected from —OH, halogen and C_{1-4}alkoxy;
X is —O—or —NH—;
x is a number from 1 to 6 inclusive; and
y is an integer from 1 to 3 inclusive.

4,916,176

COATING COMPOSITIONS

Zafirios Vachlas, Bourne End, and Stephen J. Thorne, Reading, both of England, assignors to Imperical Chemical Industries PLC, Millbank, United Kingdom

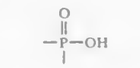
Continuation of Ser. No. 20,959, Mar. 2, 1987, abandoned. This application May 6, 1988, Ser. No. 191,810

Claims priority, application United Kingdom, Mar. 20, 1986, 8606915

Int. Cl.[4] C08K *5/52*

U.S. Cl. 524—140 **7 Claims**

1. A coating composition comprising a film-forming material, a metallic pigment, a phosphate inhibitor being either an orthophosphoric acid or an organic ester of phosphoric acid containing a group of formula (I):



(1)

a water containing diluent and a salt which is soluble in said water containing diluent, and which is a salt of a metal selected from the group consisting of sodium, potassium, magnesium, calcium, strontium, barium, vanadium, cobalt, nickel, copper, zinc and silver, there being sufficient water in the diluent to dissolve said salt.

4,916,177

INK COMPOSITIONS AND PREPARATION

Charles H. Coney; John R. Gossett, Jr., and Theron E. Parsons, III, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 50,434, May 15, 1987, abandoned, which is a continuation-in-part of Ser. No. 872,293, Jun. 2, 1986, abandoned. This application Dec. 2, 1988, Ser. No. 278,918

Int. Cl.[4] C08L *67/02;* **C09C** *11/10*

U.S. Cl. 524—389 **2 Claims**

1. A composition which is a printing ink or concentrate thereof comprising:
(A) from about 5 to 60 weight % of at least one linear, water dispersible polyester material having carbonyloxy linking groups in the linear molecular structure wherein up to 80% of the linking groups may be carbonylamido linking groups, the polyester having an inherent viscosity from about 0.28 to about 0.38 measured in a 60/40 parts by weight solution of phenol/tetrachloroethane at 25° C. at a concentration of 0.25 gram of polyester in 100 ml of the solvent, the polyester containing substantially equimolar proportions of carboxylic acid equivalents (100 mole percent), to hydroxy equivalents (100 mole percent), the polymer comprising the reaction products of (a), (b), (c), and (d) from the following reactants;
(a) about 80 to 83 mole percent, based on a total of all acid, and hydroxyl equivalents in the polymer being equal to 200 mole percent, of isophathalic acid:
(b) about 17 to 20 mole percent of 5-sodiosulfoisophthalic acid;
(c) about 52 to 56 mole percent of diethylene glycol; and
(d) about 44 to 48 mole percent of 1,4-cyclohexanedimethanol;
(B) from about 0.1 to about 60 weight % of pigment material dispersed in said polyester material; and
(C) from about 10 to 90 weight % of water admixed with an alcohol selected from methanol, ethanol, n-propanol, isopropanol or mixtures thereof, in a weight ratio of water to alcohol of about 99/1 to 1.1.

4,916,178

STABLE SOLUTIONS OF POLY-α-HYDROXYACRYLIC ACID SALTS

Werner Amatl, Hersberg, and José Canela, Therwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 68,461, Jun. 30, 1987. This application Oct. 27, 1988, Ser. No. 263,666

Int. Cl.[4] C08F *8/26, 120/04;* **D06L** *3/02;* **D21C** *9/16*

U.S. Cl. 524—401 **26 Claims**

1. A stock solution comprising
(a) a water-soluble salt of a poly-α-hydroxyacrylic acid, the sodium salt thereof having an average molecular weight Mw from 2000 to 10,000;
(b) from 70 to 300 g/l of an alkali metal hydroxide, and
(c) water.

4,916,179

INHIBITION OF POLY(ARYLENE SULFIDE) RESIN INDUCED METAL CORROSION

Van C. Vives, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 2, 1988, Ser. No. 201,141

Int. Cl.[4] C08K *3/30*

U.S. Cl. 524—421 **12 Claims**

9. An admixture comprising poly(arylene sulfide) resin and a corrosion inhibiting amount of lithium sulfite.

4,916,180

BUTYL RUBBER/POLYPROPYLENE ELASTOPLASTIC

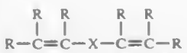
Keith J. Robinson, Sarnia, Canada, and Michel Longuet, Strasbourg, France, assignors to Polysar Limited, Sarnia, Canada

Filed Dec. 29, 1988, Ser. No. 291,677

Int. Cl.[4] C08L *23/12, 23/26, 9/00*

U.S. Cl. 524—456 **8 Claims**

1. An elastoplastic composition comprising a blend of from 20 to 45 parts by weight of thermoplastic polypropylene and, correspondingly to 100 parts by weight, from 80 to 55 parts by weight butyl terpolymer rubber comprising a major portion of isobutylene, a minor portion of isoprene and a minor portion of a divinyl aromatic monomer of the formula:



wherein X is an aromatic nucleus and each R, which may be the same or different, is selected from hydrogen and a C_{1-5} alkyl, wherein said composition is characterized by being vulcanized solely with a peroxide curing agent selected from organic peroxides and organic hydroperoxides.

4,916,181

WATER-BORNE ACRYLIC/POLYESTER RESIN

Rudolf Maska, Pittsburgh, and William A. Essary, Freeport, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 29, 1987, Ser. No. 102,209

Int. Cl.[4] C08L *67/06*

U.S. Cl. 524—457 **8 Claims**

1. An aqueous composition of a water-borne resin which water-borne resin comprises:
(I) from 10 to 50 percent by weight of a polyester polymer, and
(II) from 90 t 50 percent by weight of a solution polymerized acrylic copolymer derived from a mixture of monomers comprising an ethylenically unsaturated carboxylic acid monomer.
wherein said water-borne resin is at least partially neutralized by a base and prior to neutralization has an acid value based on resin solids of from 10 to 200, said aqueous composition has an organic solvent content of less than or equal to 15 percent by weight and a viscosity at 25 degrees Celsius of less than or equal to 5,000 centipose when the total solids content of said aqueous composition is greater than or equal to 40 percent by weight, and wherein said aqueous composition is prepared by:
(A) addition polymerizing in solution in the presence of a free-radical polymerization initiator, a first monomer composition essentially free of ethylenically unsaturated monomers having functional groups substantially reactive with epoxy groups, said first monomer composition containing from 1 to 15 percent by weight of an epoxy-functional vinyl monomer and from 99 to 85 percent by weight of at least one other copolymerizable vinyl monomer in the presence of said polyester polymer having an acid value on solids of from 10 to 85 and a weight average molecular weight of from 500 to 2,000 until the epoxy functionality of said epoxy-functional vinyl monomer has been essentially completely reacted, to form a first product (1) wherein the vinyl portion of said product (1) is hydrophobic, and thereafter
(B) addition polymerizing in solution in said first product (1) in the presence of a free-radical polymerization initiator, a second monomer composition containing from 3 to 50 percent by weight, based on the total weight of vinyl monomers from components (A) and (B), of an ethylenically unsaturated carboxylic acid and at least one other copolymerizable vinyl monomer different from said epoxy-functional vinyl monomer, to form a second product (2),
wherein the addition polymerizations of steps (A) and (B) above are conducted in the presence of at most a limited amount of an organic solvent, and thereafter
(C) dispersing said product (2) in water utilizing a neutralizing agent selected from the group consisting of ammonia, an organic base or a mixture thereof.

4,916,182

ADHESIVE EMULSION COMPOSITION AND ACCOMPANYING COATED SUBSTRATES, SUCH AS PREPASTED WALL COVERINGS

Wegdan R. Azzam, Scarborough, Canada, assignor to Borden, Inc., Columbus, Ohio

Filed Dec. 15, 1988, Ser. No. 284,667

Int. Cl.[4] C08J *3/02*

U.S. Cl. 524—501 **20 Claims**

1. A water in oil emulsion composition which comprises a blended mixture consisting essentially of at least two emulsions of substantially linear, non cross-linked, water soluble, high molecular weight polymers, with
one of said two emulsions consisting essentially of a water in oil emulsion whose water phase contains dissolved therein the substantially linear, non crosslinked, water soluble polymer which is an anionic polymer which is a homopolymer of an anionic monomer or a copolymer of two monomers, the one selected from anionic monomers and the other selected from non-ionic monomers, and
an other of said two emulsions consisting essentially of a water in oil emulsion whose water phase contains dissolved therein the substantially linear, non cross-linked, water soluble polymer which is a cationic which is a homopolymer of a monomers selected cationic monomer or a copolymer of two monomers, the one selected from cationic monomers and the other selected from non-ionic monomers, and
with said emulsion composition characterized after application to a substrate and drying to a discontinuous film upon water wetting by said discontinuous film swelling with water absorption and within about 30 seconds becoming substantially saturated and substantially ceasing to absorb water.

4,916,183

COPOLYMERS AS THICKENERS AND MODIFIERS FOR LATEX SYSTEMS

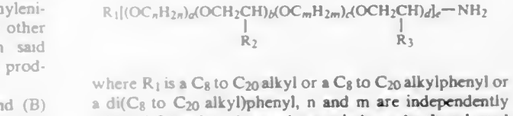
Milagros C. Barron, Red Bank, Tenn.; Ronald L. Swope, Fort Oglethorpe, Ga.; John M. Wilkerson, III, Hixson, and Charles G. Ruffner, Chattanoga, both of Tenn., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 46,458, May 6, 1987. This application Mar. 2, 1989, Ser. No. 318,140

Int. Cl.[4] C08F *220/34*

U.S. Cl. 524—555 **16 Claims**

1. An aqueous copolymer solution useful for thickening and improving the rheology and dry tensile strength of latex systems comprising a copolymer having as monomeric units:
(A) about 79–99 percent of a (meth)acrylic acid salt of sodium, potassium or ammonium;
(B) about 0–20 percent of (meth)acrylic acid;
(C) about 0–20 percent of a lower alkyl ester of (meth)acrylic acid;
(D) about 1–21 percent of surfactant monomer which is the urea reaction product of a monoethylenically unsaturated monoisocyanate with a nonionic surfactant having the formula



where R_1 is a C_8 to C_{20} alkyl or a C_8 to C_{20} alkylphenyl or a di(C_8 to C_{20} alkyl)phenyl, n and m are independently selected from 2 to 4, a and c are independently selected from the range of 0 to 100, provided that a+c is within the range of 2 to 100; R_2 and R_3 are independently selected from CH_3 or CH_2CH_3, b and d are independently selected from the range of 0 to 50, provided that b+d is within the range of 0 to 50; and e is from 1 to 50; wherein the sum of a+c is always greater than the sum of b+d;
(E) about 0–1 percent of a copolymerizable polyethylenically unsaturated monomer, said percentages being by weight based on the total weight of monomeric units in said copolymer.

4,916,184

ADHESIVE COMPOSITIONS COMPRISING MALEIC ACID PEROXY COMPOUNDS AS ADHESIVE PROMOTERS

Paul J. Clark, West Simsbury, Conn., assignor to Loctite Corporation, Newington, Conn.

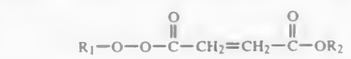
Continuation of Ser. No. 144,894, Jan. 13, 1988, abandoned. This application May 24, 1989, Ser. No. 356,167

Int. Cl.[4] C08G *63/76;* **C08F** *4/32*

U.S. Cl. 525—27 **19 Claims**

1 A curable adhesive composition comprising (i) a cross-linkable component containing ethylenic unsaturation and (ii)

from about 0.1 to about 10 percent by weight, based on the combined weight of (i) and (ii) of an initiator of the formula:



wherein R_1 is H or lower alkyl and R_2 is H or $-OR_3$, where R_3 is H or lower alkyl.

4,916,185

OLEFINIC IMPACT MODIFIERS FOR COMPATIBLE BLENDS OF POLYPHENYLENE ETHERS AND LINEAR POLYESTER RESINS

John B. Yates, III, 38 Chrisken Dr., Glenmont, N.Y. 12158; Charles F. Pratt, Henri de Winterlei 3, 2130 Brasschaat, Belgium, and Angelika H. McHale, 325 Roosevelt, Mt. Vernon, Ind. 47620

Filed Sep. 9, 1987, Ser. No. 94,552
Int. Cl.[4] C08L *51/04, 69/00, 71/04*
U.S. Cl. 525—67 12 Claims

1. An impact modified thermoplastic composition comprising the following various components and any reaction products thereof:

(a) a compatible resin composition comprising (i) at least one polyphenylene ether resin, alone, or in combination with a polystyrene resin selected from the group consisting of a styrene homopolymer, a random copolymer of styrene and a rubber modified polystyrene; (ii) at least one poly(alkylene dicarboxylate) ratio of component (i) to component (ii) being at most 1.5:1; and (iii) at least one polymer containing a substantial proportion of aromatic polycarbonate units; and

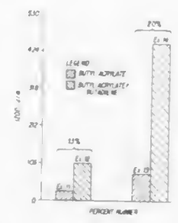
(b) an effective amount of an impact modifier comprising an EPDM terpolymer grafted with a compound selected from the group consisting of glycidyl methacrylate, glycidyl acrylate and a mixture thereof, alone, or grafted in further combination with a compound selected from the group consisting of a C_1-C_{18} alkyl methacrylate, a C_1-C_{18} alkyl acrylate and a mixture thereof.

4,916,186

IMPACT- AND WEATHER-RESISTANT THERMOPLASTIC POLYBLENDS

Raymond D. Burk, Wilbraham; Fred M. Peng, and A. Hameed Bhombal, both of Longmeadow, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 790,914, Oct. 24, 1985, abandoned. This application Apr. 13, 1987, Ser. No. 38,461
Int. Cl.[4] C08L *51/04*
U.S. Cl. 525—71 7 Claims



1. A polyblend comprising:

(I) a first graft copolymer comprising a first substrate and a first superstrate wherein said first substrate comprises a polybutadiene rubber having a weight average particle size diameter, D_w, between about 0.6 and about 10 microns and wherein said first superstrate comprises styrene and acrylonitrile in a ratio between about 80:20 and about 60:40; and

(2) a second graft coplymer comprising a second substrate and a second superstrate wherein said second substrate comprises a saturated ethylene propylene non-conjugated diene rubber having a monomonal particle size distribution and a weight average particle size diameter between about 0.05 and about 0.5 micron, and wherein said second superstrate comprises styrene and acrylonitrile in a ratio between about 80:20 and about 60:40;

and wherein the total rubber content of said polyblend is between about 5 and about 40 wt. %; and wherein the weight ratio of polybutadiene rubber to saturated rubber is between about 5:95 and about 30:70.

4,916,187

EPOXY RESIN WITH POLYAMINE-POLYPHENOL SOLID SALT IN LIQUID POLY(ALKYLENE OXIDE) POLYAMINE-POLYPHENOL

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 18,363, Feb. 24, 1987, Pat. No. 775,728. This application Sep. 2, 1988, Ser. No. 239,876
Int. Cl.[4] C08G *59/14;* C08L *63/02*
U.S. Cl. 525—109 8 Claims

1. A two component epoxy resin adhesive composition consisting essentially of a first polyepoxide component and a second curing component comprising a finely dispersed solid salt of a polyamine and a polyphenol, said polyamine being at least one member selected from the group consisting of 1,3-propanediamine, ethylene diamine, 1,6-hexamethylene diamine, N,N-diethyl-1,3-propane diamine, diethylene triamine, triethylamine tetramine and imino bis(propylamine), in a liquid adduct of a poly (alkylene oxide) polyamine and a polyphenol wherein the polyepoxide component is modified by reacting partially with a carboxylic acid terminated rubber and contains up to 20% by weight of the rubber.

4,916,188

FLUOROCARBON POWDER PAINTS

John C. Reising, Avon, Ohio, assignor to The Glidden Company, Cleveland, Ohio

Filed Nov. 28, 1988, Ser. No. 277,013
Int. Cl.[4] C08L *67/02, 75/06*
U.S. Cl. 525—124 11 Claims

1. A powder plant coating composition substantially free of organic solvent and water, the paint coating composition containing a thermosetting polymeric binder, comprising:

a hydroxyl functional fluorocarbon copolymer of copolymerized monomers comprising hydroxy alkyl vinyl ether and fluorolefin, where the fluorocarbon copolymer contains between 1% and 30% mole percent hydroxy alkyl vinyl ether, said fluorocarbon polymer produced by copolymerizing said monomers in the absence of water;

blocked diisocyanate where the blocked diisocyanate is adapted to coreact and crosslink with said functional fluorocarbon copolymer upon heat curing the paint coating;

functionally reactive hydroxyl acrylic copolymer or hydroxyl polyester polymer adapted to coreact with the blocked isocyanate, and said binder comprises on a weight basis between 20% and 86% functional fluorocarbon polymer, between 0% and 60% functionally reactive hydroxyl acrylic polymer or hydroxyl functional polyester polymer, and between 10% and 40% said blocked diisocyanate crosslinker.

4,916,189

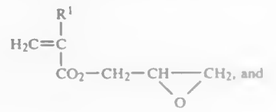
METHOD FOR THE PREPARATION OF CROSS-LINKED POLYCARBONATES, AND COMPOSITIONS MADE THEREFROM

Luca P. Fontana, Clifton Park, and Sterling B. Brown, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 5, 1988, Ser. No. 214,965
Int. Cl.[4] C08L *69/00*
U.S. Cl. 525—186 4 Claims

1. A prepreg composition comprising a filler and a resinous component which itself comprises a mixture of cyclic carbonate oligomers and at least one polyglycidyl acrylate copolymer which is the reaction product of A and B, wherein

A is at least one monomer of the formula



B is at least one monoethylenically unsaturated monomer free of an epoxy group having a reactivity such that B forms a copolymer with A;

and R^1 is selected from the group consisting of hydrogen, alkyl groups containing about 1–10 carbon atoms, and aromatic groups containing about 6–20 carbon atoms.

4,916,190

FILM AND SHEET CAPABLE OF FORMING RETORTABLE AND EASY-OPEN PACKAGINGS

Charles C. Hwo, Sugarland, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 15, 1987, Ser. No. 49,903
Int. Cl.[4] C08L *23/06, 23/08, 23/12, 23/14*
U.S. Cl. 525—227 14 Claims

1. A packaging film or sheet which is capable of forming peel seals, comprising a mixture containing:

from about 50 percent by weight to about 75 percent by weight of a butene-1 homopolymer or copolymer; and

from about 5 percent by weight to about 25 percent by weight of an ethylenic homopolymer or copolymer selected from the group consisting of linear low density polyethylene (LLDPE), low density polyethylene (LDPE), medium density polyethylene (MDPE), ethylene vinyl acetate copolymer (EVA), ethylene-methyl acrylate copolymer (EMA), ethylene-ethyl acrylate copolymer (EEA), ethylene-butyl acrylate copolymer (EBA), and high density polyethylene (HDPE);

from about 25 percent by weight to about 45 percent by weight of propylene homopolymer or copolymer.

4,916,191

GRAFT COPOLYMER HAVING DISPERSION STABILIZING EFFECT, A PROCESS FOR PRODUCING THE SAME, AND A PROCESS OF EMULSION POLYMERIZATION USING THE SAME

Fumikatsu Takeuchi; Tsutomu Takeuchi; Noriyuki Osaka; Yoichi Takizawa, and Susumu Kawase, all of Sayama, Japan, assignors to Soken Kagaku Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1987, Ser. No. 66,813
Claims priority, application Japan, Jul. 1, 1986, 61-154845
Int. Cl.[4] C08L *51/00;* C08F *2/22*
U.S. Cl. 525—276 4 Claims

1. In a process for aqueous emulsion polymerization of vinyl monomers where no surfactant is used but the polymer is obtained in emulsion as a result of a water-soluble or water dispersible polymeric dispersion stabilizer added, the improvement which comprises using as the polymeric dispersion stabilizer a graft copolymer of a mean molecular weight of at least 5,000 which is a product of polymerization of 5 to 30% by weight of a macromonomer which has a molecular weight of 1,000 to 100,000 and has a radical polymerizable unsaturated group at its one end, 1 to 40% by weight of a hydrophilic monomer which has a hydrophilic moiety in it selected from the group consisting of hydroxyl groups, carboxyl groups or salt forms thereof and has a radical polymerizable unsaturated group, and 5 and to 40% by weight of a fluorinated monomer which has a fluorinated moiety in it and has a radical polymerizable unsaturated group, the % by weight being based on a total of the three monomers, and 0 to 50% of the total of the three monomers of a monomer copolymerizable therewith thereby to produce an emulsion of a polymer of a mean particle diameter of at least 0.5 microns.

4,916,192

HYDROGENATED LIQUID ALIPHATIC HYDROCARBON RESINS

Steven G. Hentges, Baton Rouge, La., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 96,087, Sep. 14, 1987, abandoned, which is a continuation-in-part of Ser. No. 936,409, Dec. 1, 1986. This application Aug. 18, 1989, Ser. No. 396,776
Int. Cl.[4] C08F *36/04, 8/04*
U.S. Cl. 525—327.9 10 Claims

1. A hydrogenated petroleum hydrocarbon resin suitable for use as a tackifier in an adhesive composition, said hydrogenated resin having a softening point of about 0°–40° C., a number average molecular weight Mn of about 100 to 900, a Gardner color of 6 or less, and a piperylene-derived content of about 5–50 weight percent, said resin being prepared by the aluminum chloride catalyzed Friedel-Crafts polymerization of a hydrocarbon feed comprising:

(a) less than about 5 weight percent vinyl aromatic hydrocarbons;

(b) less than 1 weight percent butadiene;

(c) about 10–90 weight percent piperylene stream; and

(d) about 90–10 weight percent monoolefin chain transfer agent stream.

4,916,193

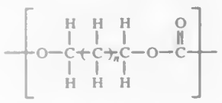
MEDICAL DEVICES FABRICATED TOTALLY OR IN PART FROM COPOLYMERS OF RECURRING UNITS DERIVED FROM CYCLIC CARBONATES AND LACTIDES

Reginald T. Tang, Warren; Frank Mares, Whippany; William J. Boyle, Jr., Parsippany; Tin-Ho Chiu, Millburn, and Kundanbhai M. Patel, Landing, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 134,321, Dec. 17, 1987, and a continuation-in-part of Ser. No. 134,339, Dec. 17, 1987. This application Aug. 1, 1988, Ser. No. 226,706
Int. Cl.[4] C08L *69/00*
U.S. Cl. 525—413 29 Claims

1 A medical device formed totally or in part of one or more block copolymers having at least one type of recurring monomeric unit of the General Structure I:

Structure I



and having at least one type of recurring monomeric units of the Structure II:

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Structure II

wherein:

n is from 1 to about 8; and

R_1 and R_2 are the same or different and are hydrogen, alkyl or phenyl with the proviso that at least one of R_1 and R_2 is other than hydrogen.

4,916,194

FLAME RETARDANT AROMATIC POLYCARBONATE BLENDS

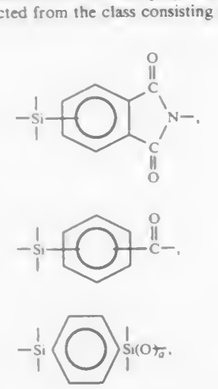
Peter P. Policastro, Niskayuna, N.Y.; Pamela K. Hernandez, North Olmsted, Ohio; Gary C. Davis, Albany, and Jonathan D. Rich, Rexford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 6, 1989, Ser. No. 319,026

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—433 10 Claims

1. An aromatic polycarbonate composition exhibiting enhanced flame retardant properties comprising aromatic polycarbonate and poly(arylene silicon) material, where the poly(arylene silicon) material is present at up to about 50% by weight of the aromatic polycarbonate composition and there is present in the polycarbonate composition from about 0.5 to about 40 mole percent, based on the total moles of arylcarbonate units of the aromatic polycarbonate of arylene silicon units selected from the class consisting of



and mixtures thereof, where the unsatisfied valence bonds of the silicon atoms of the arylene silicon units are satisfied by a member selected from the class consisting of oxygen, a $C_{(1-13)}$ monovalent hydrocarbon radical, a $C_{(1-13)}$ monovalent hydrocarbon radical substituted with radicals inert during equilibration or condensation and mixtures thereof and a is a whole number equal to 0 or 1.

4,916,195

POLY(N-ACYLETHYLENEIMINE) GRAFTED POLYSILOXANE AND ITS PREPARATION

Akihiro Kanakura, 25-22-405, Shakusonji-cho, Hirakata-shi, Osaka-fu; Yoshio Eguchi, 1-10-2, Sumiyoshi, Ikeda-shi, Osaka-fu; Ryuzo Mizuguchi, 42-6-301, Hashimoto-Kurigatani, Yawata-shi, Kyoto-fu; Mitsuhiro Takarada, 787-2, Yanase, Annaka-shi, Gunma-ken; Yoshio Okamura, 3-19-1, Isobe, Annaka-shi, Gunma-ken, and Hideyuki Itoh, 1610, Nishikamiisobe, Annaka-shi, Gunma-ken, all of Japan

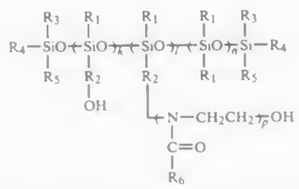
Filed May 9, 1988, Ser. No. 199,265

Claims priority, application Japan, May 8, 1987, 62-112938

Int. Cl.[4] C08F *283/00*

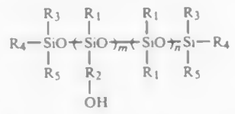
U.S. Cl. 525—474 3 Claims

1. A process for preparing a poly(N-acylethyleneimine) grafted polysiloxane represented by the formula:

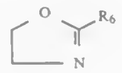


wherein each R_1 is the same or different member selected from the group consisting of alkyl having 1 to 18 carbon atoms and aryl; R_2 is an alkylene chain having 1 to 100 carbon atoms, an alkylene chain having 2 to 100 carbon atoms which is interrupted by one or more ether bonds, or an alkylene chain having 2 to 100 carbon atoms which is interrupted by one or more ester bonds; R_3, R_4 and R_5 each represents the same or different member selected from the group consisting of hydroxyl, allyloxy, alkyl having 1 to 20 carbon atoms, alkoxy having 1 to 20 carbon atoms, ω-hydroxy alkyl having 1 to 100 carbon atoms, ω-hydroxy alkyl having 2 to 100 carbon atoms which is interrupted by one or more ether bonds, and ω-hydroxy alkyl having 2 to 100 carbon atoms which is interrupted by one or more ester bonds; R_6 represents alkyl having 1 to 40 carbon atoms, aralkyl, aryl or said group substituted by hydroxy; k, l and n each is a real number representing a number of siloxane repeating units and fulfilling the requirements $k \geqq 0$, $l \geqq 1$, $n \geqq 0$ and $2 \leqq k+l+n \leqq 2{,}000$; and p is a real number representing a polymerization degree of N-acylethyleneimine and determined in a range of $1 \leqq p \leqq 200$,

which process comprises sulfo-esterifying all or part of alcoholic hyroxy groups of a hydroxy-containing polysiloxane of the formula:



wherein R_1, R_2, R_3, R_4 and R_5 are as defined above; m and n each is a real number representing a number of siloxane repeating units and fulfilling the requirements $m \geqq 1$, $n \geqq 0$ and $2 \leqq m+n \leqq 2000$, by reacting said hydroxy-containing polysiloxane with a sulfonic halide in the presence of a base to obtain a sulfo-ester polysiloxane, and conducting a ring-opening polymerization of a 2-oxazoline compound of the formula:



wherein R_6 is as defined above, in the resultant sulfo-esterification reaction mixture, thereby reacting said sulfo-ester polysiloxane and polymerized oxazoline compound to give said poly(N-acylethyleneimine) grafted polysiloxane.

4,916,196

PROCESS FOR PRODUCING A HEAT RESISTANT RESIN COMPOSITION

Yuji Aoki, Yokkaichi, and Hiroaki Miyazaki, Suzuka, both of Japan, assignors to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

PCT No. PCT/JP87/00733, § 371 Date May 27, 1988, § 102(e) Date May 27, 1988, PCT Pub. No. WO88/02380, PCT Pub. Date Apr. 7, 1988

PCT Filed Oct. 2, 1987, Ser. No. 236,525

Claims priority, application Japan, Oct. 3, 1986, 61-235830

Int. Cl.[4] C08F *2/18*

U.S. Cl. 526—79 5 Claims

1. A process for producing a heat resistant resin composition, which comprises polymerizing by suspension polymerization a monomer mixture comprising from 30 to 80% by weight of an aromatic vinyl monomer, from 10 to 50% by weight of an N-substituted maleimide monomer, from 10 to 40% by weight of a vinyl cyanide monomer and from 0 to 30% by weight of other vinyl monomer copolymerizable therewith, characterized in that the polymerization reaction is initiated in the presence of a part of the monomer mixture and a part of a suspending agent in the suspension polymerization system prior to the initiation of the polymerization reaction, and then during the polymerization, the rest of the monomer mixture and the rest of the suspending agent are added to the polymerization system continuously or intermittently to complete the polymerization reaction.

4,916,197

HYDROPHILIC COPOLYMER AND THE METHOD FOR PRODUCING THEREOF

Jiří Vacík, and Jana Kůdelková, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

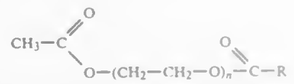
Filed Jul. 7, 1989, Ser. No. 376,697

Claims priority, application Czechoslovakia, Jul. 8, 1988, 4954-88

Int. Cl.[4] C08F *26/08*

U.S. Cl. 526—264 11 Claims

1. Hydrophilic copolymer prepared by copolymerization of 5 to 95 wt.-% of 1-vinyl-2-pyrrolidone with 95 to 5 wt.-% of alkylene glycol acetate methacrylate or acrylate of formula I,



(I)

where R is the group $CH_2{=}CH{-}$ or $CH_2{=}C(CH_3){-}$ and n is an integer of 1 to 3, in the presence of 0.01 to 50 wt.-% cross-linking agent total monomer basis.

4,916,198

HIGH MELT STRENGTH, PROPYLENE POLYMER, PROCESS FOR MAKING IT, AND USE THEREOF

B. Joseph Scheve; John W. Mayfield, and Anthony J. DeNicola, Jr., all of New Castle County, Del., assignors to HIMONT Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 819,395, Jan. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 696,799, Jan. 31, 1985, abandoned. This application Feb. 5, 1988, Ser. No. 152,619

Int. Cl.[4] C08F *110/06*

U.S. Cl. 526—351 9 Claims

1 Normally solid, high molecular weight, gel-free, propylene polymer material, the branching index of which is less than 1, that has strain hardening elongational viscosity.

4,916,199

POLYURETHANES MADE FROM BLENDS OF POLYPROPYLENEOXIDE POLYOL AND ORGANIC-SILICONE BLOCK COPOLYMER BASED POLYOL INTERMEDIATES

Baldev K. Bandlish, Charlotte, N.C., and Larry R. Barron, Mentor, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 14, 1988, Ser. No. 218,780

Int. Cl.[4] C08G *77/04*

U.S. Cl. 528—28 20 Claims

1. A prepolymer composition, comprising:

an isocyanate-terminated urethane prepolymer having substantially all of said isocyanate groups blocked with an isocyanate reactive blocking agent, said urethane prepolymer being a blend of a polypropyleneoxide polyol intermediate and an organic-silicone block copolymer based polyol intermediate reacted with a polyisocyanate, the amount of said polypropyleneoxide polyol intermediate being from about 60 percent to about 92 percent by weight based upon the total weight of said polypropyleneoxide polyol intermediate and said organicsilicone block copolymer based polyol intermediate, the amount of said organic-silicone block copolymer based polyol intermediate being from about 8 percent to about 40 percent by weight based upon the total weight of said polypropyleneoxide polyol intermediate and said organic-silicone block copolymer based polyol intermediate, said polypropyleneoxide polyol having a molecular weight of from about 1,000 to about 10,000, and said organicsilicone block copolymer based polyol intermediate having a molecular weight of from about 1,000 to about 10,000.

4,916,200

SILANE MODIFIED POLYSILACYCLOBUTASILAZANES

Gary T. Burns, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 58,966, Jun. 8, 1987, abandoned. This application Jun. 30, 1988, Ser. No. 213,380

Int. Cl.[4] C08G *77/04, 77/00*

U.S. Cl. 528—34 26 Claims

1. A process for preparing modified polysilacyclobutasilazanes comprising:

(A) contacting and reacting in an inert, essentially anhydrous atmosphere, a polysilacyclobutasilazane polymer with a compound or mixture of compounds selected from the group consisting of

(i) chlorosilanes having the general formula

$(Rv)_mSiCl_{4-m}$ and

(ii) chlorodisilanes having the general formula

$\{Si(Rv)_rCl_{3-r}\}_2$

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where, in the general formulae for chlorosilanes and chlorodisilanes, each Rv is independently selected from the group consisting of hydrogen, alkyl radicals having 1 to 4 carbon atoms, aryl radicals, and the vinyl radical; m is 0, 1, or 2; and t is 0 to 2;

at a temperature in the range of −50° to +25° C. for a time sufficient to form a partially modified polysilacyclobutasilazane polymer,

(B) contacting and reacting the partially modified polysilacyclobutasilazane polymer with dry ammonia, and

(C) recovering modified polysilacyclobutasilazane polymer.

4,916,201

AMINO-FUNCTIONAL POLYETHERS CONTAINING UREA, BIURET, THIOUREA, DITHIOBIURET, THIOAMIDE, AND/OR AMIDE MOIETIES IN THEIR BACKBONE AND URETHANE/UREA PREPOLYMERS AND POLYMERS MADE THEREFROM

Robert F. Harris, Midland, Mich., and Craig D. DePorter, Blacksburg, Va., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 99,027, Sep. 21, 1987, abandoned. This application Sep. 21, 1988, Ser. No. 247,460

Int. Cl.[4] C08G *18/32*

U.S. Cl. 528—60 35 Claims

1. An isocyanate-functional prepolymer comprising the reaction product of

(a) an excess over stoichiometry of an organic polyisocyanate and

(b) at least one polyahl, at least one of which comprises a polyamine having at least two primary amine moieties, at least two polyalkyleneoxy moieties and at least one aminocarbonyl or aminothiocarbonyl moiety selected from the group consisting of biuret, thiobiuret, urea, thiourea, amide and thioamide provided that each aminocarbonyl or aminothiocarbonyl moiety is separated from each amine moiety by at least one polyalkyleneoxy moiety, said reaction product having terminal isocyanate moieties.

4,916,202

EPOXY RESIN

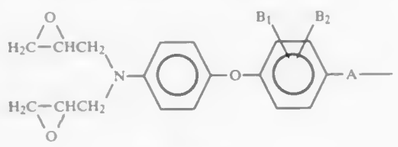
John M. Butler, Centerville; Richard P. Chartoff, Cincinnati, and James A. Harvey, Kettering, all of Ohio, assignors to University of Dayton, Dayton, Ohio

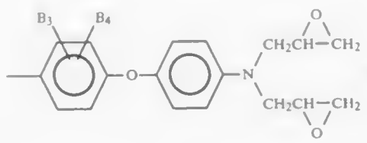
Filed Sep. 17, 1987, Ser. No. 98,091

Int. Cl.[4] C08G *59/24, 59/28, 59/30*

U.S. Cl. 528—98 4 Claims

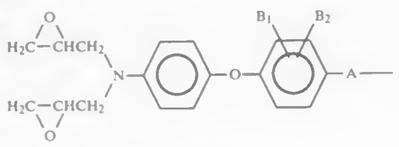
1. An epoxy resin of the formula

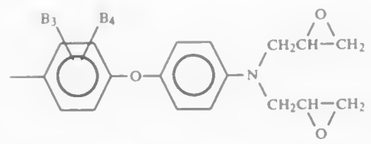




wherein A is $-C(CH_3)_2-$ and B_1, B_2, B_3, and B_4 are —H.

2. An epoxy resin of the formula





wherein A is $-C(CF_3)_2-$ and B_1, B_2, B_3 and B_4 are —H.

4,916,203

CURABLE RESIN COMPOSITION FROM EPOXY COMPOUND AND PROPARGYL AROMATIC ETHER

Anthony M. Pigneri, Houston, and James Vick, III, deceased, late of Katy, Tex. (by Janet I. Vick, executrix), assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 14, 1988, Ser. No. 271,132

Int. Cl.[4] C08G *59/40*

U.S. Cl. 528—101 26 Claims

1. A curable resin composition consisting of:

(a) a polyepoxy compound which is the reaction product of a polyhydric phenol or a chlorine- or bromine-substituted derivative thereof with an epihalohydrin; and

(b) a polypropargyl aromatic ether of the formula

$$R—OCH_2—C{\equiv}CH)_n$$

wherein R is an aromatic group and n is an integer of 2 or greater, which is the reaction product of a polyhydric phenol and propargyl chloride or bromide.

4,916,204

PURE POLYANHYDRIDE FROM DICARBOXYLIC ACID AND COUPLING AGENT

Abraham J. Domb, Brookline; Robert S. Langer, Somerville; Eyal Ron, Waltham; Steven Giannos; Rohit Kothari, both of Somerville, and Edith Mathiowitz, Somerville, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 31, 1987, Ser. No. 80,332

Int. Cl.[4] C08G *67/04*

U.S. Cl. 528—271 6 Claims

1. A highly pure polyanhydride produced by reacting a dicarboxylic acid with phosgene or diphosgene in the presence of an acid acceptor and in a solvent to produce a polyanhydride soluble in said solvent and byproduct acid acceptor insoluble in said solvent, and removing insoluble byproduct acid acceptor and any unreacted phosgene or diphosgene, said polyanhydride consisting essentially of polyanhydride.

4,916,205

COPOLYESTERS FROM 4,4'-BIPHENYLDICARBOXYLIC ACID, 1,6-HEXANEDIOL AND 1,4-BUTANEDIOL

John C. Morris, and Winston J. Jackson, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 23, 1988, Ser. No. 288,902

Int. Cl.[4] C08G *63/02*

U.S. Cl. 528—272 19 Claims

1. A copolyester comprising

(A) an acid component comprising repeating units of at least 80 mol % 4,4'-biphenyldicarboxylic acid, and

(B) a glycol component comprising repeating units of from about 95–10 mol % 1,6-hexanediol, and about 5–90 mol % 1,4-butanediol,

wherein the total mol % of acid component and glycol component are each 100 mol %.

4,916,206

NITRAMINE-CONTAINING HOMOPOLYMERS AND CO-POLYMERS AND A PROCESS FOR THE PREPARATION THEREOF

Roger W. Day, Meriden, and Rahim Hani, Cheshire, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Nov. 14, 1988, Ser. No. 270,977

Int. Cl.[4] C08G *63/02*

U.S. Cl. 528—272 18 Claims

1. A nitramine-containing polymer characterized by an advantageous combination of a low viscosity and a low glass transition temperature and represented by the following empirical structural formula:

$$[(OOCCH_2CH_2—R—CH_2CH_2CO)_x(OOCCH_2C\text{-}H_2—R'—CH_2CH_2CO)_y(OR'')]_n$$

wherein R and R' are the same or different moieties selected from the group consisting of $—N(NO_2)—$, $—N(NO_2)CH_2CH_2N(NO_2)—$, and $—N(NO_2)ZN(NO_2)—$, wherein Z is a linear or branched-chain hydrocarbon having between 3 and 10 carbon atoms, with the proviso that at least one R or R' moiety on average per molecule of said polymer must be other than $—N(NO_2)CH_2CH_2N(NO_2)—$, and wherein x represents a mole fraction having a value between 0 and 1, y represents a mole fraction equal to 1 minus x and having a value between 0 and 1, R'' is a linear or branched chain alkylene or alkylene ether radical having between 2 and 12 carbon atoms and having primary or secondary carbon atoms at said radical's points of attachment in said polymer, and n has a value between 2 and 50, said polymer being prepared by reacting a nitramine-containing dicarboxylic acid with a diol, said nitramine-containing dicarboxylic acid being selected from the group consisting of 4,7-dinitraza-1,10-decanedioic acid (DNDA); 5-methyl-4,7-dinitraza-1,10-decanedioic acid (MDNDA); 4-nitraza-1,7-heptanedioic acid (NHDA); 4,8-dinitraza-1,11-undecanedioic acid, and combinations thereof; and said diol being selected from the group consisting of ethylene glycol, propylene glycol, 1,4-butane diol, 1,6-hexane diol, diethylene glycol and combinations thereof.

4,916,207

POLYCARBONATE HOMOPOLYMER-BASED FIBER COMPOSITIONS AND METHOD OF MELT-SPINNING SAME AND DEVICE

William J. Boyle, Jr., Denville; Frank Mares, Whippany; Kundan M. Patel, Landing, and Reginald T. Tang, Warren, all of N.J., assignors to Allied-Signal, Inc., Morris Township, Morris County, N.J.

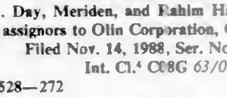
Division of Ser. No. 134,290, Dec. 17, 1987, abandoned. This application Aug. 15, 1988, Ser. No. 232,408

Int. Cl.[4] C08G *63/62*

U.S. Cl. 528— 370 44 Claims

1. An implantable medical device fabricated totally or in part from a homopolymer having recurring monomer units of the following General Structure I or II:

Structure I



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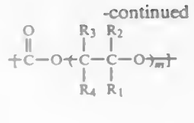
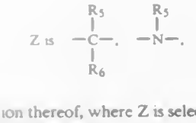
Structure II



wherein

Z is  or a

combination thereof, where Z is selected such that there are no adjacent heteroatoms;

n and m are the same or different and are integers from about 1 to 8;

R_1, R_2, R_3 and R_4 are the same or different at each occurrence and are hydrogen, aryloxylalkyl, alkoxyaryl, aryloxyaryl, arylalkyl, alkylarylalkyl, arylalkylaryl, alkylaryl, arylcarbonylalkyl, alkyl, aryl, alkylcarbonylalkyl, cycloalkyl, arylcarbonylaryl, alkylcarbonylaryl, alkoxyalkyl, or aryl or alkyl substituted with one or more alkyl, aryl, alkoxy, aryloxy, dialkylamino, diarylamino or alkylarylamino substituents; and

R_5 and R_6 are the same or different and are R_1, R_2, R_3, R_4, dialkylamino, diarylamino, alkylarylamino, alkoxy, aryloxy, alkanoyl, or arylcarbonyl, or any two of R_1 to R_6 together may form an alkylene chain completing a 3, 4, 5, 6, 7, 8 or 9 membered alicyclic fused, spiro, bicyclic, tricylic ring system or a combination thereof, which system may optionally include one or more non-adjacent carbonyl, oxa, alkylaza or arylaza groups;

With the proviso that at least one of R_1 to R_6 is other than hydrogen.

4,916,208

NOVEL POLYMERS

George B. Klingensmith, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 134,677, Dec. 18, 1987, Pat. No. 4,822,871. This application Mar. 15, 1989, Ser. No. 323,724

Int. Cl.[4] C08G *67/02*

U.S. Cl. 528—392 11 Claims

1. A linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon having a monomeric unit purity of over 99.5% by mol.

4,916,209

BIOABSORBABLE POLYDEPSIPEPTIDE, PREPARATION AND USE THEREOF

Fung-Fu-Ning, Salem, and Raymond C. Glowaky, Niantic, both of Conn., assignors to Pfizer Inc., New York, N.Y.

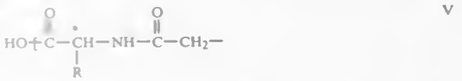
Filed Dec. 23, 1987, Ser. No. 137,262

Int. Cl.[4] C08G *69/00*

U.S. Cl. 528—403 8 Claims

1. An optically-active, hydrolyzable, semi-crystalline polydepsipeptide having a number average molecular weight of from about 5,000 to 200,000 and the structural formula V:

V



wherein

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R is C_1–C_{12} alkyl, C_{1-C6} alkoxy (C_1–C_6 alkyl), aryl, aryl(C_1–C_{12} alkyl), C_1–C_{12} alkylaryl, C_1–C_6 alkylaryl(C_1–C_6 alkyl), C_1–C_6 alkylthio(C_1–C_6 alkyl), C_1–C_6 alkylsulfinyl(C_1–C_6 alkyl), C_1–C_6 alkylsulfonyl(C_1–C_6 alkyl), cyano(C_1–C_{12} alkyl) or aminocarbonyl(C_1–C_{12} alkyl), with each aryl group having up to 10 carbons in the nuclear ring, p1 x,y are relative amounts of (D) and (L) optical isomers, respectively, wherein the asterisk indicates the stated optical activity, and

the ratio x/(x+y) is either less than about 0.45 or greater than about 0.55.

4,916,210

RESIN FROM ALPHA, ALPHA', ALPHA''-TRIS(4-CYANATOPHENYL)-1,3,5-TRIISOPROPYLBENZENE

Roy J. Jackson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 20, 1988, Ser. No. 260,346

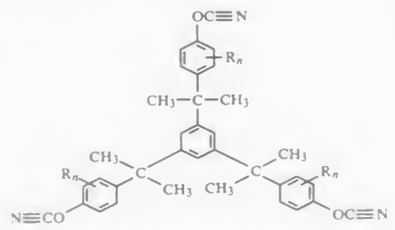
Int. Cl.[4] C08G *83/00*

U.S. Cl. 528—422 **15 Claims**

1. A curable resin composition comprises:

(a) at least one cyanate aromatic ester of the formula I

(I)



wherein in each R is independently an alkyl group containing from 1 to 4 carbon atoms, and each n is independently 0, 1 or 2, a prepolymer of the cyanate ester (I), a prepolymer of the cyanate ester (I) with an amine, (a) alone or with one or more of

(b) a copolymer of the ester of formula I with at least one or more of

(1) a second mono- or polycyanate aromatic ester, a prepolymer of said second cyanate aromatic ester, or a prepolymer of said second cyanate aromatic ester with an amine;

(2) an amine; and

(c) a maleimide component, a prepolymer of a maleimide or a coprepolymer of a maleimide and an amine.

4,916,211

THERMOCHROMIC CROSS POLYMERIZED POLYAMIDE-DIACETYLENE COMPOUND

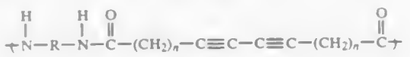
Michael F. Rubner, Chelmsford, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Division of Ser. No. 837,524, Mar. 7, 1986, Pat. No. 4,849,500. This application Nov. 3, 1988, Ser. No. 266,905

Int. Cl.[4] C08G *69/46, 69/48*

U.S. Cl. 528—480 **4 Claims**

1. A thermochromic polyamide produced by cross-polymerizing diacetylene units of a polyamide-diacetylene having repeat units of the following formula:



wherein n is an integer between 3 and 10 and R is an organic radical.

4,916,212

DNA-SEQUENCE ENCODING BIOSYNTHETIC INSULIN PRECURSORS AND PROCESS FOR PREPARING THE INSULIN PRECURSORS AND HUMAN INSULIN

Jan Markussen, Herlev; Niels Fiil, Copenhagen; Mogens T. Hansen, Olstykke; Kjeld Norris, Birkerod, all of Denmark; Gustav Ammerer, East Seattle, Wash.; Lars Thim, Gentofte, and Hans O. Voigt, Lyndby, both of Denmark, assignors to Novo Industri A/S, Bagsvaerd, Denmark

Filed May 29, 1985, Ser. No. 739,123

Claims priority, application Denmark, May 30, 1984, 2665/84; Feb. 8, 1985, 582/85

Int. Cl.[4] C12N *15/00, 12/00, 1/20;* **C12P** *21/00*

U.S. Cl. 530—303 **32 Claims**

1. A DNA-sequence comprising a sequence encoding an insulin precursor of the formula:

B(1-29)-$(X_n$-Y$)_m$-A(1-21),

wherein X_n is a peptide chain with n amino acid residues, Y is Lys or Arg, n=0 to 33, m=0 or 1, B(1-29) is a shortened B-chain of human insulin from Phe^{B1} to Lys^{B29}, A(1-21) is the A-chain of human insulin, and the peptide chain —X_n-Y- does not contain two adjacent basic amino acid residues.

18. A process for producing an insulin precursor of the formula:

B(1-29)-$(X_n$-Y$)_m$-A(1-21),

wherein X_n is a peptide chain with n expressible amino acid residues, Y is Lys or Arg, n=0 to 33, m=0 or 1, B(1-29) is a shortened B-chain of human insulin from Phe^{B1} to Lys^{B29}, A(1-21) is the A-chain of human insulin, and the peptide chain —X_n-Y- does not contain two adjacent basic amino acid residues; said process comprising the steps of:

culturing a transformant yeast strain in a suitable nutrient medium, said transformant yeast strain including a replicable expression vehicle capable of expressng a DNA-sequence encoding said insulin precursor, and recovering said insulin precursor.

4,916,213

RIBOSOMAL INHIBITING PROTEIN-IMMUNOGLOBULIN CONJUGATES WITH SPECIFICITY FOR TUMOR CELL SURFACE ANTIGENS, AND MIXTURES THEREOF

Patrick J. Scannon, Davis, Calif.; Robert W. Baldwin, Long Eaton, England, and Vera S. Byers, San Francisco, Calif., assignors to Xoma Corporation, Berkeley, Calif.

Continuation of Ser. No. 896,999, Aug. 15, 1986, which is a continuation-in-part of Ser. No. 875,256, Jun. 17, 1986, Pat. No. 4,708,862, which is a continuation of Ser. No. 468,193, Feb. 22, 1983. This application Jun. 8, 1988, Ser. No. 206,968

Int. Cl.[4] A61K *39/395;* **C12N** *15/00;* **C07K** *15/14*

U.S. Cl. 530—391 **28 Claims**

1. A pharmaceutical composition comprising an immunotoxin consisting essentially of a ribosomal inhibiting toxin conjugated to a monoclonal antibody that binds to an epitope on a non-shedding membrane-bound human osteogenic sarcoma tumor associated antigen of about 72 kD m.w., and which has the binding specificity of antibodies produced by hybridoma XMMCO-791 having A.T.C.C. Accession No. HB 9173.

4,916,214

CATIONIC COMPLEXES OF TECHNETIUM-99M

Kwok W. Chiu; James D. Kelly, both of Buckinghamshire; Ian A. Latham, Nottingham; David V. Griffiths, Staffordshire, all of England, and Peter G. Edwards, Cardiff, Scotland, assignors to Amersham International plc., Little Chalfont, England

Filed Oct. 6, 1988, Ser. No. 254,082

Claims priority, application United Kingdom, Oct. 6, 1987, 8723438

Int. Cl.[4] A61K *43/00, 49/00;* **C07B** *59/00;* **C07F** *13/00*

U.S. Cl. 534—14 **5 Claims**

1. A cationic complex of technetium 99 m having a formula selected from

$[Tc(NO)_nX_mL_2]^+A^-$

and

$[TcL_3]^+A^-$

where

X is a monodentate anionic ligand for Tc

A is an anion

n is 1 or 2 and m is correspondingly 1 or 0, and

L is a bidentate ligand having the formula: Y_2QZQY_2

where

each Q is phosphorus or arsenic,

the groups Y may be the same or different and each is H or C1–C8 saturated hydrocarbon or saturated fluorohydrocarbon which may contain up to 3 ether oxygen atoms,

Z is a —CC— or —CCC— or —COC— chain or o-phenylene which may be substituted by at least one C1–C8 saturated hydrocarbon or saturated fluorohydrocarbon group which may contain up to 3 ether oxygen atoms,

provided that the ligand contains at least one —COC— ether linkage.

4,916,215

WATER-SOLUBLE DISAZO COMPOUNDS CONTAINING SUBSTITUTED TRIAZINYL RADICAL, PYRAZOLE-TYPE GROUPS, AND A PLURALITY OF FIBER-REACTIVE SULFONE-CONTAINING GROUPS, SUITABLE AS DYESTUFFS

Ernst Hoyer, Frankfurt am Main, and Rudolf Fass, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

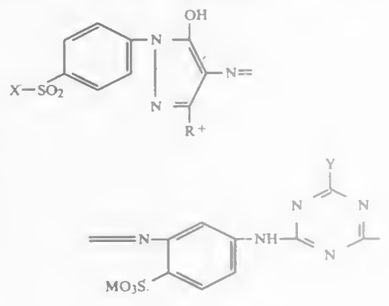
Continuation of Ser. No. 647,025, Sep. 4, 1984, abandoned, which is a continuation of Ser. No. 490,151, Apr. 29, 1983, abandoned. This application Mar. 29, 1988, Ser. No. 177,893

Claims priority, application Fed. Rep. of Germany, May 8, 1982, 3217312

Int. Cl.[4] D06P *1/02, 1/38;* **C09B** *62/08, 62/82*

U.S. Cl. 534—636 **11 Claims**

1. A water-soluble compound of the formula



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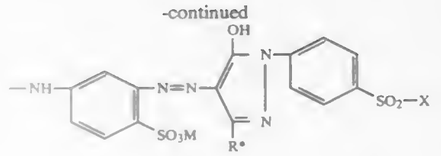


in which:

R^+ is methyl, carboxy, or carbalkoxy of 2 to 5 carbon atoms,

R° is methyl, carboxy or carbalkoxy of 2 to 5 carbon atoms,

X is vinyl, β-sulfatoethyl, β-thiosulfatoethyl, or β-chloroethyl,

M is hydrogen or alkali metal or one equivalent of an alkaline earth metal, and

Y is chlorine, fluorine, or bromine.

4,916,216

PROCESS FOR GRANULATING AZOBISAMIDINE SALTS USING AN AQUEOUS BINDER

Motoaki Tanaka, Urawa; Takanori Toyama, Kawagoe, and Hiroki Sugioka, Sakado, all of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed May 11, 1987, Ser. No. 48,335

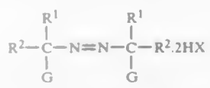
Claims priority, application Japan, May 13, 1986, 61-109127

Int. Cl.[4] C07C *103/30, 107/02, 123/00, 13/00*

U.S. Cl. 534—738 **4 Claims**

1. A process for producing granules of an azobisamidine salt of the formula:

(I)



wherein R^1 and R^2 are independently selected from the group consisting of C_{1-6} alkyl, C_{3-6} cycloalkyl and an aliphatic ring wherein R^1 and R^2, together with the carbon to which they are attached, are bonded together to form a ring containing 4 to 8 carbon atoms; G is a guanyl group of the formula

wherein R^3 and R^4 are independently selected from the group consisting of hydrogen, C_{1-10} alkyl, C_{1-10} alkyl substituted with a substituent selected from the group consisting of hydroxy, chloro, bromo, and phenyl, C_{3-6} cycloalkyl, allyl, phenyl, phenyl substituted with a substituent selected from the group consisting of methyl, ethyl, methoxy, ethoxy, hydroxy, nitro, amino, acetyl and acetylamino; R^5 is a lower alkylene or lower alkylene having one or more substituents selected from the group consisting of C_{1-4} alkyl and hydroxy; R^6 is hydrogen or a hydroxyalkyl; and X is selected from the group consisting of Cl, Br and CH_3COO—, which comprises granulating a powder of azobisamidine salt using a mixture of water and a water-soluble organic solvent as a binder, wherein the mixture of water and a water-soluble organic solvent is adjusted to make the amount of water 5 to 18% by weight, based on the weight of the azobisamidine salt.

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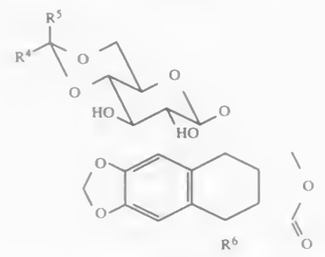
4,916,217

PHOSPHORUS CONTAINING DERIVATIVES OF EPIPODOPHYLLOTOXIN

Mark G. Saulnier, Middletown, Conn., assignor to Bristol-Myers Company, New York, N.Y.

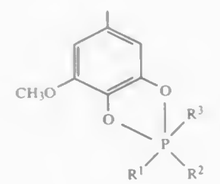
Filed Jan. 8, 1987, Ser. No. 1,281
Int. Cl.[4] C07H *15/00, 17/00*
U.S. Cl. 536—17.1 10 Claims

1. A compound having Formula V

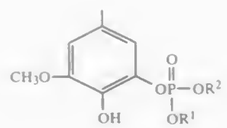


V

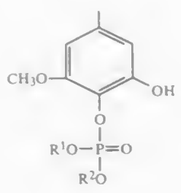
wherein R^6 is a structure selected from Formulas Va, Vb, Vc, and Vd



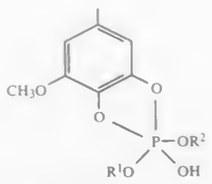
Va



Vb



Vc



Vd

wherein R^1, R^2, and R^3 are substituted or unsubstituted groups having a maximum of 20 carbon atoms and independently selected from the group consisting of alkyl or A-substituted alkyl having 1–12 carbon atoms, alkenyl or A-substituted alkenyl having 2–12 carbon atoms, cycloalkyl or A-substituted cycloalkyl having 3–7 ring carbon atoms, aryl or B-substituted aryl having 6–10 ring carbon atoms, and aralkyl or B-substituted aralkyl having 6–10 ring carbon atoms and 1–4 carbon atoms in the alkyl portion, wherein said A substituents are one or more groups selected from hydroxy, cyano, and halo, and said B substituents are selected from alkyl or a group listed in the A substituent definition, and R^4 and R^5 are each alkyl groups having 1–10 carbon atoms, or they are joined to form with the carbon atom to which they are attached a cycloalkyl group of 5 or 6 ring members, or one of them is hydrogen and the other is C_{1-10}alkyl, C_{2-10}alkenyl, C_{4-7}cycloalkyl, furyl, thienyl, C_{6-10}aryl, or C_{7-14}aralkyl.

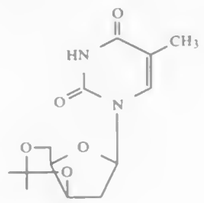
4,916,218

1-(β-D-XYLOFURANOSYL)THYMINE DERIVATIVES

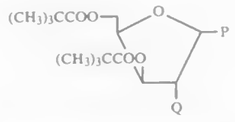
Merrick R. Almond, 1214 Chimney Hill Dr., Apex, N.C. 27502; Jeffrey D. Wilson, 27 Gorham Pl., Durham, N.C. 27705, and Janet L. Rideout, 3101 Morningside Dr., Raleigh, N.C. 27607

Filed Jun. 9, 1988, Ser. No. 204,692
Int. Cl.[4] C07H *15/00, 17/00*
U.S. Cl. 536—18.2 2 Claims

1. A compound of formula



2. A compound of formula



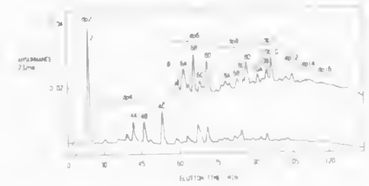
wherein P and Q are both hydroxy groups or together form a cyclic sulphite group.

4,916,219

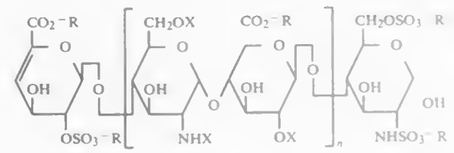
OLIGOSACCHARIDE HEPARIN FRAGMENTS AS INHIBITORS OF COMPLEMENT CASCADE

Robert J. Linhardt, and John M. Weiler, both of Iowa City, Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

Continuation-in-part of Ser. No. 717,213, Mar. 28, 1985, abandoned. This application Aug. 2, 1988, Ser. No. 227,357
Int. Cl.[4] A01N *43/04;* **C08B** *37/10;* **C07G** *37/00;* **C07H** *1/00*
U.S. Cl. 536—21 22 Claims



1. An oligosaccharide of the formula:



wherein R is a metallic or nonmetallic cation, X is SO_3R, and n is an integer from 5 to 11,
wherein said oligosaccharide has heparin-like anticomplement activity,
wherein said oligosaccharide has reduced anticoagulant activity as compared with heparin, and
wherein the sodium salt of the oligosaccharide contains at least 14% sulfur.

4,916,220

PALMITOYL-FRUCTOSE-1,6-DIPHOSPHATE, ITS THERAPEUTIC USE AND RELEVANT PREPARATION METHODS

Lauro Galzigna, Padova, and Franco Gritti, Rome, both of Italy, assignors to Biomedica Foscama Industria Chimico-Farmaceutica, Rome, Italy

Filed Apr. 18, 1989, Ser. No. 340,054
Claims priority, application Italy, Apr. 19, 1988, 20245 A/88
Int. Cl.[4] C07H *11/04;* **C07G** *17/00;* **A61K** *31/70*
U.S. Cl. 536—117 4 Claims

1. Pharmaceutical preparations containing a carrier with palmitoyl-fructose-1,6-diphosphate as active drug, for use in the therapy of hypophosphatemias, of cardiopathies, and of alcoholism.

4,916,221

FLUORINE-CONTAINING PROTOPORPHYRIN DERIVATIVES AND THEIR SALTS

Itsumaro Kumadaki, Hirakata; Akira Ando, Yawata, and Haruo Sato, Chiba, all of Japan, assignors to Sato Pharmaceutical Research Institute Ltd., Tokyo, Japan

Filed Nov. 4, 1988, Ser. No. 267,327
Claims priority, application Japan, Nov. 9, 1987, 62-282344
Int. Cl.[4] C07D *487/22*
U.S. Cl. 540—145 4 Claims

4. The fluorine-containing protoporphyrin derivative and salts thereof according to claim 1, wherein both R_1 and R_2 are $-CH=CF_2$.

4,916,222

ORGANO-METALLIC COMPLEX OF MOLYBDENUM CARBOXYLATE AND ETHYLENE DIAMINE

Michael C. Kerby, Annandale, and Bryan W. Eichhorn, Madison, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 22, 1988, Ser. No. 288,513
Int. Cl.[4] C07F *13/00*
U.S. Cl. 556—63 2 Claims

1. An organo metallic complex of the formula:

$$[Mo_2(O_2CR)_2(H_2NCH_2CH_2NH_2)_4]\cdot[(O_2CR)_2]\,H_2NCH_2CH_2NH_2$$

wherein R is C_1–C_5 alkyl.

4,916,223

SUBSTITUTED HEXAHYDROARYLQUINOLIZINES

John J. Baldwin, Gwynedd Valley; Joel R. Huff, Lederach; Susan J. DeSolms, Norristown; Joseph P. Vacca, Telford, all of Pa.; Jonathan M. Wiggins, Lafayette, Ind., and Steven D. Young, Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 76,495, Jul. 27, 1987, Pat. No. 4,831,035, which is a continuation-in-part of Ser. No. 901,485, Aug. 28, 1986, abandoned. This application Feb. 6, 1989, Ser. No. 306,138
Int. Cl.[4] A61K *31/505;* **C07D** *495/20*
U.S. Cl. 544—231 2 Claims

1. A hexahydroarylquinolizine compound of the formula

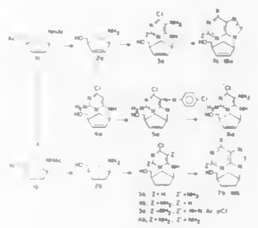
or a pharmaceutically acceptable salt thereof.

4,916,224

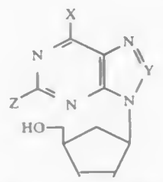
DIDEOXYCARBOCYCLIC NUCLEOSIDES

Robert Vince, St. Paul, and Mei Hua, Minneapolis, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Jan. 20, 1988, Ser. No. 146,252
Int. Cl.[4] C07D *473/02, 473/26, 473/40;* **A61K** *31/52*
U.S. Cl. 544—254 14 Claims



1. A compound of the formula:



wherein X is OH NH_2 or Cl, Z is NH_2 and Y is CH or N, and the pharmaceutically acceptable salts thereof.

4,916,225

9-SUBSTITUTED GUANINES

Regina A. Zhuk; Marger J. Lidak, both of Riga; Marina A. Madre, Ogre; Veniamin I. Votyakov, Minsk; Olga T. Andreeva, Minsk; Evgeny I. Boreko, Minsk; Ljudmila V. Korobchenko, Minsk; Vyacheslav A. Rusyaev, Minsk, and Olga I. Starkova, Minsk, all of U.S.S.R., assignors to Institut Organicheskogo Sinteza Akademii nauk Latviiskoi SSR and Belorussky Nauchno-Issledovatelsky Institute Epidemiologii i Mikrobiologii

PCT No. PCT/SU87/00135, § 371 Date Jul. 14, 1988, § 102(e) Date Jul. 14, 1988, PCT Pub. No. WO88/03923, PCT Pub. Date Jun. 2, 1988

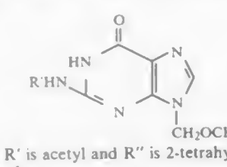
PCT Filed Nov. 23, 1987, Ser. No. 242,191

Claims priority, application U.S.S.R., Nov. 25, 1986, 4152348

Int. Cl.[4] C07D *473/18*

U.S. Cl. 544—276 1 Claim

1. 9-substituted guanines of the formula



wherein R' is acetyl and R" is 2-tetrahydrofuryl or 2-tetrahydropyranyl.

4,916,226

OPTICAL RESOLUTION METHOD FOR 3S-(3-PYRIDYLMETHYL)-6-(2-QUINOLYL)-METHOXY-4S-CHROMANOL

Bernard S. Moore, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

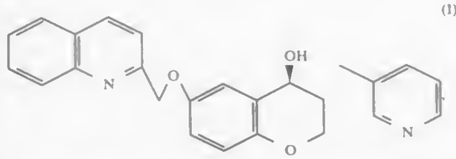
Filed Aug. 4, 1989, Ser. No. 389,714

Int. Cl.[4] C07D *405/14*

U.S. Cl. 546—176 3 Claims

1. A method for the preparation of 3S-(3-pyridylmethyl)-6-(2-quinolyl)methoxy-4S-chromanol of the formula

(I)



or a pharmaceutically acceptable salt thereof, which comprises the steps of:

(a) combining racemic cis-3-(3-pyridylmethyl)-6-(2-quinolyl)methoxy-4-chromanol with at least a half-molar quantity of L-tartaric acid in ethyl acetate at a temperature in the range of about 20° C. to about 65° C., at a concentration such that the L-tartrate salt of the compound of the formula (I) crystallizes substantially uncontaminated by the L-tartrate salt of the enantiomer of the compound of the formula (I);

(b) conventionally recovering said L-tartrate salt of the compound of the formula (I); and

(c) conventionally treating said L-tartrate salt with base in a reaction-inert solvent to produce said compound of the formula (I).

4,916,227

PREPARATION OF BIARYL COMPOUNDS

Thomas A. Puckette, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 3, 1989, Ser. No. 389,022

Int. Cl.[4] C07D *213/26;* C07C *103/20, 43/02, 1/20*

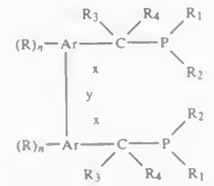
U.S. Cl. 546—259 32 Claims

1. A method for coupling aryl and heteroaryl monohalides having 4 to 20 carbon atoms to produce biaryl or hetero-biaryl compounds, said method comprising contacting said monohalide with a catalytic combination comprising:

(I) an anhydrous nickel compound, wherein the ratio of gram atoms of nickel to moles of monohalide is in the range of about 0.0001 up to 0.5;

(II) at least one bidentate phosphorus-containing ligand selected from the group consisting of

(i)



wherein each Ar is independently selected from aromatic ring compounds having 4 up to 20 carbon atoms;

the x bonds and the y bonds are attached to adjacent carbon atoms on the ring structures;

each R, when present as a substituent, is independently selected from alkyl, aryl, —F, —NR'_2, —CN, —CHO, —OR', —OCO—R', —COO—R',

—SO_2—R', —SO_3R', or —NR'COR':

wherein R' is a hydrocarbyl or heteroaryl radical having up to 20 carbon atoms;

n is an integer in the range of 0–4 where Ar is phenyl; 0–6 where Ar is naphthyl; and 0–8 where Ar is phenanthryl or anthracenyl;

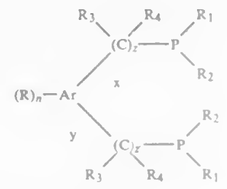
each R_1 and R_2 is independently selected from alkyl, aryl, aralkyl, alkaryl or cycloaliphatic radicals, or substituted derivatives thereof wherein substituted derivatives include ethers, amines, amides, sulfonic acids, esters, hydroxyl groups and alkoxy groups;

each R_3 and R_4 is independently selected from hydrogen and the R_1 substituents;

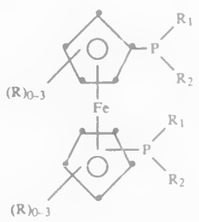
each of the above alkyl groups or moieties is straight or branched chain of 1–20 carbon atoms;

each aryl group contains 4–20 ring carbon atoms; and

each cycloaliphatic group contains from 4–8 ring carbons;

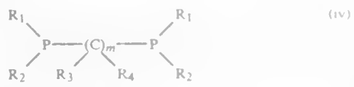


wherein Ar, x, y, R, n, R_1, R_2, R_3 and R_4 are each as defined above, and each of z and z' can independently vary between 0 and 4, with the proviso that z+z' is at least 2;



wherein R, R_1 and R_2 are as defined above; and

(iv)



wherein R_1, R_2, R_3 and R_4 are as defined above; and m is a whole number which can vary from 4 up to 8;

as well as mixtures of any two or more thereof, wherein the amount of ligand is in the range of about 0.5 up to 20 moles per gram atom of nickel; and

(III) at least one reducing metal selected from the group consisting of zinc, magnesium and manganese; wherein the molar ratio of reducing metal to reactant monohalide falls in the range of about 0.01 up to 20:1;

wherein said contacting is carried out in the presence of a polar, aprotic solvent at a temperature in the range of 0° up to 250° C. for a time sufficient to form said biaryl or heterobiaryl compounds.

4,916,228

PROCESS FOR THE PREPARATION OF 1-HYDROXY-2-PYRIDONES

Dieter Reuschling, Butzbach, and Bengt-Thomas Gröbel, Bad Soden am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 31, 1987, Ser. No. 80,085

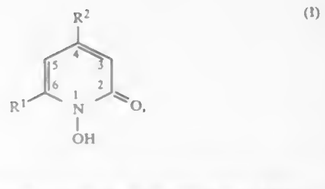
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1986, 3626210

Int. Cl.[4] C07D *213/89, 213/63*

U.S. Cl. 546—290 13 Claims

1. A process for the preparation of 1-hydroxy-2-pyridones of the formula I

(I)



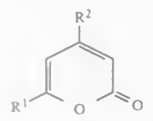
in which

R^1 denotes an at most olefinically monounsaturated aliphatic hydrocarbon radical having 1 to 17 carbon atoms, a cycloalkyl radical having 3 to 8 carbon atoms in the ring and which can carry in addition 1 to 2 alkyl groups in each case having 1 to 3 carbon atoms and which is bonded to the pyridone ring either directly or via a methylene or ethylene group, or a phenyl or phenylalkyl radical which is unsubstituted or substituted in the aromatic ring by 1 to 3 alkyl, benzyl, alkoxy, phenoxy or halogen atoms, where the benzyl or phenoxy groups included as substituent may be substituted in the same fashion,

R^2 denotes hydrogen, and at most olefinically monounsaturated aliphatic hydrocarbon radical having 1 to 6 carbon atoms or a benzyl radical which is unsubstituted or may be substituted in the same fashion as in the case of R^1,

by reacting a pyrone of the formula II

(II)



with a hydroxylammonium salt in the presence of basic compounds at a temperature not exceeding 120° C., wherein the basic compounds used are alkali metal carbonates or hydrogen carbonates in an amount which is at least equivalent to that of the hydroxylammonium salt.

4,916,229

PYRIDINE CARBOXYLIC ACID DERIVATES

John S. Kiely, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 78,618, Jul. 28, 1987, abandoned. This application Aug. 26, 1988, Ser. No. 237,247

Int. Cl.[4] C07D *211/72;* C07C *69/74*

U.S. Cl. 546—297 7 Claims

1 A compound of the name 3-(cyclopropylamino)-3-imino propanoic acid ethyl ester, monohydrochloride.

7 A compound of the name 2-(ethylamino)-5-fluoro-6-hydroxy-β-oxo-3-pyridinepropanoic acid ethyl ester.

4,916,230

PROCESS FOR PREPARING NOVEL N-(ACYLOXY-ALKOXY)CARBONYL DERIVATIVES USEFUL AS BIOREVERSIBLE PRODRUG MOIETIES FOR PRIMARY AND SECONDARY AMINE FUNCTIONS IN DRUGS

Jose Alexander, Lawrence, Kans., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 2, 1984, Ser. No. 627,156

Int. Cl.[4] C07D *211/78, 211/90*

U.S. Cl. 546—318 10 Claims

1 A compound of the formula:

ps wherein X is phenyl substituted with one or more of the

substituents selected from the group consisting of nitro, halo, cyano, C_{1-6} alkylsulfonyl, C_{1-6} alkylsulfenyl, trihalogemthylthio, trihalogemthylsulfonyl, trihalomethylsulfenyl or a radical selected from the group consisting of C_{1-5} polyhaloalkyl and C_{2-12} alkylsulfonylalkyl; R_1 is selected from the group consisting of C_{1-6} alkyl, C_{1-5} alkoxycarbonylalkyl, aryl and aralkyl; R_2 is selected from the group consisting of hydrogen C_{1-6} alkyl, C_{1-5} alkloxycarbonyl alkyl, aryl and aralkyl; and R_3 is selected from the group consisting of C_{1-20} alkyl, C_{2-20} alkenyl, C_{1-20} alkynyl, aryl, C_{7-10} aralkyl, C_{3-8} cycloalkyl, C_{3-10} cycloalkenyl, C_{2-20} carboxyalkyl, carboxy C_{5-20} cycloalkyl, C_{2-20} haloalkyl, C_{1-5} alkoxycarbonyl C_{2-10} alkyl, C_{2-20} alkylsulfoxide, C_{2-20} carbamyl substituted alkyl, C_{2-20} carbamyl substituted aralkyl, and heterocyclics selected from the group consisting of pyridyl, pyrolyl, pyrrolidinyl, and piperidinyl.

4,916,231

ALKENYLTETRAZOLE DERIVATIVES

Masayuki Narisada, Osaka; Mitsuaki Ohtani; Fumihiko Watanabe, both of Nara; Takaharu Matsuura, Hyogo; Sanji Hagishita, Nara, and Kaoru Seno, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

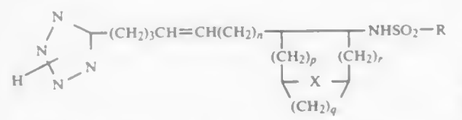
Filed Jul. 10, 1989, Ser. No. 377,409

Claims priority, application Japan, Jul. 19, 1988, 63-181274; Mar. 7, 1989, 64-54569

Int. Cl.[4] C07D *409/08*

U.S. Cl. 548—252 **5 Claims**

1. A compound represented by the formula:



wherein R is naphthyl or phenyl optionally substituted by phenyl, lower alkyl, halogen, lower alkoxy, hydroxy or acetoxy; X is methylene, dimethylmethylene or oxygen; n is an integer of 0 or 1; and p and r each is an integer of 0 or 1 and q is an integer of 1 or 2 provided that p+q+r=2; or a tautomer in tetrazole ring and a pharmaceutically acceptable salt thereof.

4,916,232

BIS-(1,2,3-TRIAZOL-1-YL)-DERIVATIVES

Paolo Zanlato; Francesco Pilati, both of Bologna, and Antonio Chiolle, Ferrara, all of Italy, assignors to Ausimont S.p.A., Milan, Italy

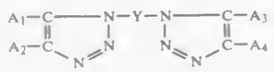
Filed Mar. 25, 1988, Ser. No. 173,629

Claims priority, applicatioo Italy, Mar. 30, 1987, 19897 A/87

Int. Cl.[4] C07D *249/06*

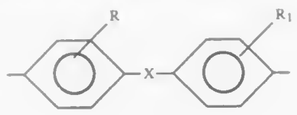
U.S. Cl. 548—255 **10 Claims**

1. Bis-triazolyl derivatives of the formula:

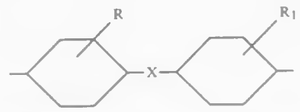


wherein:

Y is a bivalent radical selected from:



and



X is a bivalent radical selected from: —O—; —S—; CR_2R_3; —NR_7— and an aliphatic α-α'-alkylenesubstituted cycloketone, wherein R_2, R_3 and R_7, equal to or different from each other, represent hydrogen or an alkyl group having from 1 to 18 carbon atoms wherein the alkylene is a lower alkylene and the cycloketone is a cyclic hydrocarbon ketone having 4 to 10 carbon atoms;

R and R_1, equal to or different from each other, represent hydrogen or an alkyl group having from 1 to 4 carbon atoms; and

A_1, A_2, A_3 and A_4, equal to or different from each other, are selected from:

(a) hydrogen;

(b) a —$COOR_4$ ester group, wherein R_4 may be hydrogen or an alkyl group having from 1 to 18 carbon atoms;

(c) a hydroxyalkyl —$(CH_2)_n$—OH group, wherein n is zero or an integer from 1 to 18;

(d) an amino-alkyl—$(CH_2)_m$—NR_5R_6 group, wherein m is zero or an integer from 1 to 18, while R_5 and R_6, equal to or different from each other, represent hydrogen or an alkyl group having from 1 to 4 carbon atoms;

(e) a nitrile —CN group;

(f) an alkyl group having up to 18 carbon atoms, and

(g) an aryl, arylalkyl or alkylaryl group having from 6 to 18 carbon atoms;

provided, however, that at least one of the A_1 or A_2 groups and at least one of the A_3 and A_4 groups are different from hydrogen and selected from alkyl-, aryl-, arylalkyl- or alkylaryl-groups.

4,916,233

METHOD FOR PRODUCTION OF 4-METHYL-5-(2-AMINOETHYL)-THIOMETHYL)-IMIDAZOLE

Tsunemasa Ueno, Kawasaki; Koichi Yamamoto, Tokyo; Masao Kitano, Kamakura, and Yutaka Morimoto, Yokohama, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Apr. 25, 1989, Ser. No. 342,798

Claims priority, application Japan, Apr. 26, 1988, 63-101243; May 27, 1988, 63-128193; May 27, 1988, 63-128194; May 31, 1988, 63-131497; Jun. 1, 1988, 63-132832; Juo. 1, 1988, 63-132833; Jun. 14, 1988, 63-144688; Sep. 22, 1988, 63-236327; Sep. 28, 1988, 63-240799; Sep. 30, 1988, 63-243800

Int. Cl.[4] C07D *233/64*

U.S. Cl. 548—342 **11 Claims**

1. A method for the production of 4-methyl-5-[(2-aminoethyl)-thiomethyl]-imidazole comprising causing 4-methylimidazole or a salt thereof to react with at least one member selected from the group consisting of (a) a formaldehyde adduct of cysteamine, (b) 2-aminoethanethiol sulfuric acid and formaldehyde or a formaladehyde oligomer, and (c) thiazolidine or a salt thereof, in the presence of a mineral acid, removing a portion of reaction liquid out of the reaction system while maintaining molar concentration of 4-methyl-5-[(2-aminoethyl)-thiomethyl]-imidazole in the reaction system not exceeding 70 mol % based on total mol numbers of 4-methylimidazole and 4-methyl-5-[(2-aminoethyl)-thiomethyl]-imidazole, then separating a liquid containing 4-methyl-5-[(2-aminoethyl)-thiomethyl]-imidazole from the removed portion of reaction liquid, and recycling the remainder into the reaction system.

4,916,234

CHROMOGENIC DICYANOMETHYLENEPYRAZOLINONES

Hans Junek, and Manfred Klade, both of Graz, Austria, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

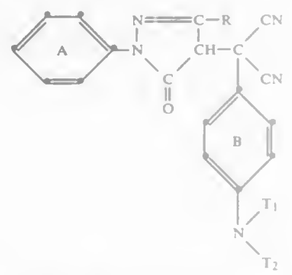
Filed Jun. 8, 1989, Ser. No. 363,650

Claims priority, application Switzerland, Jun. 17, 1988, 2355/88

Int. Cl.[4] C07D *231/22, 231/52*

U.S. Cl. 548—360 **7 Claims**

1. A chromogenic dicyanomethylenepyrazolinone of the formula



(I)

in which R is hydrogen, hydroxyl, amino, alkyl, cycloalkyl, aryl or aralkyl, T_1 and T_2, independently of one another, are each hydrogen, unsubstituted or halogen-, hydroxyl-, cyano- or lower alkoxy-substituted alkyl having a maximum of 12 carbon atoms, cycloalkyl having 5 to 10 carbon atoms or unsubstituted or halogen-, cyano-, lower alkyl- or lower alkoxy-(ring)substituted phenalkyl or phenyl, or T_1 and T_2 together with the nitrogen linking them are a five- or six-membered heterocyclic radical, and rings A and B, independently of one another, are unsubstituted or substituted by halogen, cyano, nitro, lower alkyl, lower alkoxy, (lower alkyl)carbonyl or (lower alkoxy)carbonyl.

4,916,235

RESIN SYSTEMS DERIVED FROM BENZOCYCLOBUTENE-MALEIMIDE COMPOUNDS

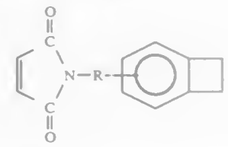
Loon-Seng Tan, and Fred E. Arnold, both of Centerville, Ohio, assignors to University of Dayton, Dayton, Ohio

Filed Nov. 26, 1986, Ser. No. 935,447

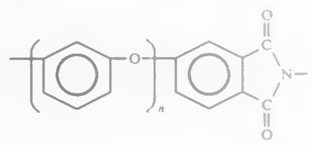
Int. Cl.[4] C07D *209/48*

U.S. Cl. 548—461 **7 Claims**

1. A compound of the formula

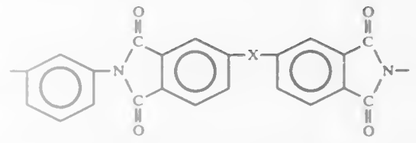


wherein R is a member selected from the group consisting of (a) (b) and (c), wherein (a) is

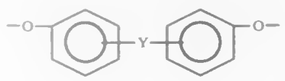


wherein n is 0 or 1;

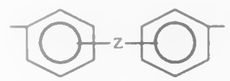
(b) is



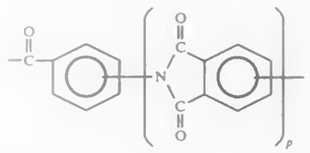
wherein X is a direct bond, —$C(CF_3)_2$—, —$C(CH_3)_2$—, —CH_2—, —O—, —S—, —CO—, —SO_2—, or



or



wherein Y is —$C(CF_3)_2$—, —$C(CH_3)_2$—, —O—, —S—, —CO—, or a direct bond, and Z is —$C(CF_3)_2$—, —$C(CH_3)_2$—, —CH_2—, —O—, —S—, —CO—, —SO_2—, or a direct bond; and wherein (c) is



wherein p is 0 or 1.

4,916,236

PREPARATION OF INDOLES BY CYCLIZATION

Akihide Kudoh, Yokohama; Tadatoshi Honda, Hiratsuka; Makoto Kotani; Kazuhiro Terada, both of Yokohama; Takeshi Tsuda, Kouza, and Shinji Kiyono, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 930,188, Nov. 13, 1986, abandoned, which is a continuation of Ser. No. 752,543, Jul. 8, 1985, abandoned, which is a continuation of Ser. No. 508,011, Jun. 27, 1983, abandoned. This application Nov. 14, 1988, Ser. No. 270,067

Claims priority, application Japan, Jul. 8, 1982, 57-117824

Int. Cl.[4] C07D *209/08;* **C07B** *37/10*

U.S. Cl. 548—508 **7 Claims**

1. A process for preparing indole comprising contacting a vaporous mixture of N-(β-hydroxy) ethylaniline, aniline, water and hydrogen with a catalyst selected from the group consisting of a cadmium sulfide catalyst, a copper-chromium catalyst, a catalyst of platinum carried on silica, a catalyst of silver carried on SiO_2-ZnO, a catalyst of silver carried on SiO_2-In_2O_3 an AgO-SiO_2-ZnO catalyst, a catalyst of copper carried on SiO_2-ZnO-CaO, a catalyst of copper carried on SiO_2-ZnO-CaO, a catalyst of copper carried on SiO_2-GeO_2, a CuO-SiO catalyst, a CuO-SiO-MgO catalyst, a CuO-SiO-ZnO-MnO catalyst, a CuO-MgO-MnO-SiO catalyst and a CuO-SiO-ZnO-MgO catalyst, at a temperature of 200° to 600° and at a liquid hourly space velocity of the N-(β-hydroxy) ethylaniline of 0.01 to 10 hr^{-1}, and cooling the resulting vaporous reaction mix-

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ture containing indole to condense the indole, wherein the improvement comprises conducting the reaction at a presence ranging from 2.0×10^5 Pa to 3.0×10^6 Pa such that said vaporous mixture does not form a condensate and the catalyst is not substantially deactivated after a duration of about 100 hours of said contacting step.

4,916,237

SUBSTITUTED 1,2,3-THIADIAZOLE-4-THIOLATES

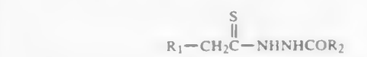
Ving J. Lee, Monsey, and William V. Curran, Pearl River, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 883,189, Jul. 8, 1986, Pat. No. 4,803,280. This application Aug. 26, 1988, Ser. No. 237,301

Int. Cl.[4] C07C *153/05*

U.S. Cl. 549—76 21 Claims

1. A compound having the formula:



$$R_1-CH_2\overset{\overset{S}{\|}}{C}-NHNHCOR_2$$

wherein R_1 is selected from the group consisting of hydrogen; alkyl(C_1–C_6); polyfluorinated alkyls(C_1–C_6); phenyl; (multisubstituted)phenyl wherein the substituents are selected from alkyl(C_1–C_6), alkoxy(C_1C_3), chloro, fluoro and trifluoromethyl; naphthyl; thienyl; phenylthio; tetrahydropyranyl; benzyl; and $-COOC_2H_5$; and R_2 is selected from the group consisting of amino and alkoxy(C_1–C_3).

4,916,238

PROCESS FOR PREPARING ALLENIC PROSTANOIC ACID DERIVATIVES

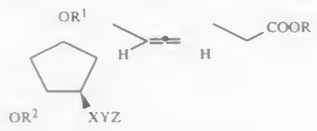
Gary F. Cooper, Portola Valley; Colin C. Beard, Palo Alto; David Y. Jackson, Oakland, and Douglas L. Wren, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Dec. 13, 1988, Ser. No. 283,644

Int. Cl.[4] C07F *7/18*

U.S. Cl. 549—214 18 Claims

1. A process for the preparation of an allenic prostanoic acid derivative in the form of a single stereoisomer, or a mixture of stereoisomers, represented by the following formula (I):



(I)

wherein

R is lower alkyl of 1–6 carbon atoms;

R^1 is a protecting group which can be selectively removed in the presence of R^2, wherein

R^2 is an acid-labile, base stable protecting group;

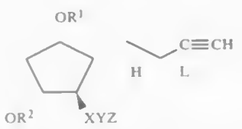
X is $-(CH_2)_2-$, trans $-CH=CH-$ or $-C\equiv C-$;

Y is $-C(R^3)(OR^2)CH_2-$ in which $-OR^2$ is in the α or β configuration and R^3 is hydrogen or methyl;

Z is alkyl of one to ten carbon atoms, or phenyl, benzyl or phenoxy, each optionally substituted on the phenyl ring of the phenyl, benzyl or phenoxy group by one or two substituents chosen from lower alkyl of one to three carbon atoms, lower alkoxy of one to three carbon atoms, fluoro, chloro or trifluoromethyl;

and the wavy lines represent the α or β configuration with the proviso that when one wavy line is α the other is β,

which comprises contacting a compound represented by the following formula (3):



(3)

wherein R, R^1, R^2, X, Y, Z and the wavy lines are as defined above and L is a leaving group, with a 2-carbo(lower-alkoxy)ethylzinc iodide in the presence of a copper(I) salt and a cation-ligand complexant.

4,916,239

PROCESS FOR THE LACTONIZATION OF MEVINIC ACIDS AND ANALOGS THEREOF

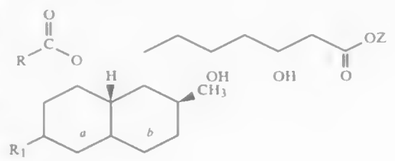
Laszlo R. Treiber, Gillette, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 19, 1988, Ser. No. 221,475

Int. Cl.[4] C07D *309/30*

U.S. Cl. 549—292 11 Claims

1. A process for the lactonization of a compound of structure (I):



(I)

wherein:

R is $C_{1\text{-}10}$ alkyl;

R_1 is CH_3, CH_2OH,

CH_2OCR_2,

CO_2R_3,

OH, CH_2OR_2, or $CH_2NR_4R_5$;

Z is H or NH_4+ or a metal cation;

R_2 is $C_{1\text{-}5}$ alkyl;

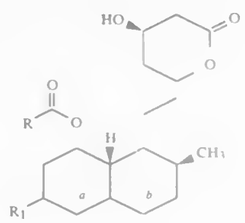
R_3 is H or $C_{1\text{-}5}$ alkyl;

R_4 and R_5 are independently selected from H or $C_{1\text{-}5}$ alkyl;

a and b are both double bonds or one of a and b is a single bond or both a and b are single bonds; which comprises:

(A) treating (I) with a mixture of a water miscible organic solvent, water and an acid catalyst under an inert gas atmosphere for about 2–3 hours at 20°–25° C.;

(B) treatment of the reaction mixture with additional water to precipitate the product lactone (II) as a crystalline mass.



(II)

group consisting of phenyl, OR, OAr or halogen wherein R is lower alkyl containing 1 to 6 carbon atoms or A^1A^2 represents $-OCH_2O-$.

4,916,240

HETERO-POLYCYCLIC AROMATIC COMPOUNDS

Ronald W. Kenyon, Manchester, England, assignor to Imperial Chemical Industries PLC, London, England

Filed May 26, 1988, Ser. No. 199,056

Claims priority, application United Kingdom, Jun. 1, 1987, 8712784

Int. Cl.[4] C07D *491/04*

U.S. Cl. 549—299 4 Claims

1. A compound of the formula:

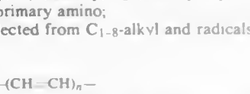
wherein

X^1 and X^2 are selected from hydrogen, halogen, cyano, $C_{1\text{-}4}$-alkyl, $C_{1\text{-}4}$-alkoxy, phenyl, $-CONL^1L_2$, $-SO_2NL^1L^2$, $-COOL^3$ and substituted $C_{1\text{-}4}$-alkyl, $C_{1\text{-}4}$-alkoxy and phenyl in which the substitutents are selected from hydroxy, halogen, nitro, $C_{1\text{-}4}$-alkyl and $C_{1\text{-}4}$-alkoxy,

L^1, L^2 and L^3 are selected from hydrogen, $C_{1\text{-}4}$-alkyl and phenyl;

R^1 is selected from naphthyl, phenyl and substituted phenyl in which the substituents are selected from halogen, hydroxy, $C_{1\text{-}4}$-alkoxy, $C_{2\text{-}4}$-alkenyloxy, $C_{1\text{-}4}$alkylthio, thiol, and primary amino;

A is selected from $C_{1\text{-}8}$-alkyl and radicals of the formula



$$R^2-(CH=CH)_n-$$

wherein R^2 is selected from naphthyl, anthryl, phenathryl, pyrenyl, fluorenyl, fluryl, pyrrolyl, thienyl, indolyl, pyridyl, quinolyl, phenyl and substituted phenyl in which the substituents are selected from $C_{1\text{-}4}$-alkyl, $C_{1\text{-}4}$-alkoxy, $C_{2\text{-}4}$-alkenyloxy, halogen, primary amino, cyano, hydroxy, carbamoyl, nitro, styryl, trifluoromethyl, carboxymethoxy and methoxycarbonylmethoxy, and n has a value of 1 or 2.

4,916,241

INHIBITION OF BONE LOSS BY 4-SUBSTITUTED-5-HYDROXY-2(5H)-FURANONES

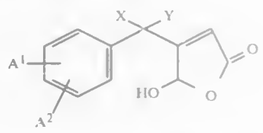
Marshall A. Hayward, Lawrenceville; Joseph P. Sabatucci; Ivo L. Jirkovsky, both of Plainsboro, and Yvon Lefebvre, Plainsboro, all of N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed Jun. 6, 1988, Ser. No. 205,147

Int. Cl.[4] C07D *307/32*

U.S. Cl. 549—313 9 Claims

1. The compounds of formula (I)



(I)

wherein X is hydroxy; Y is lower alkyl containing 1 to 6 carbon atoms; A^1 and A^2 are independently selected from the

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4,916,242

COMBINED PROCESS FOR THERMALLY AND CHEMICALLY TREATING LIGNOCELLULOSE-CONTAINING BIOMASS AND FOR PRODUCING FURFURAL

Gerard Avignon, Agen, France; Wolfgang Jaeggle, Bodnegg, Fed. Rep. of Germany; Horst Steinmüller, Leonding, and Karl Lackner, Linz, both of Austria, assignors to Voest-Alpine Industrieanlagenbau Gesellschaft m.b.H., Linz, Austria

Filed May 12, 1988, Ser. No. 193,828

Claims priority, application Austria, May 12, 1987, 1189/87

Int. Cl.[4] C07D *307/50*

U.S. Cl. 549—489 7 Claims

1. In a combined process for thermally and chemically treating lignocellulose-containing biomass and for producing furfural, by supplying lignocellulose-containing biomass and cooking liquor in the cooker in batches, heating said biomass and said cooking liquor in the cooker in a heating phase and cooking said biomass in a cooking phase subsequent to said heating phase enabling the formation of one of cellulose and pretreated biomass, and withdrawing said one of cellulose and pre-treated biomass from the cooker in batches, the improvement comprising:

heating said biomass and said cooking liquor in said heating phase in order to hydrolyze pentosans to pentoses;

withdrawing cooking liquor from said cooker during said heating phase as soon as pentosans have been hydrolyzed to said pentose and have been dissolved in the cooking liquor, and supplying said cooking liquor with the pentoses dissolved therein to a furfural production plant;

dehydrating the pentoses contained in said cooking liquor to furfural in the furfural production plant so as to obtain a liquid substrate containing furfural;

subjecting said liquid substrate to steam distillation so as to obtain remaining cooking liquor and condensed exhaust vapors;

returning said remaining cooking liquor into said cooker;

subjecting said condensed exhaust vapors to an at least single-stage distillation to separate said furfural;

withdrawing said one of cellulose and pretreated biomass from said cooking phase; and

ceasing to supply said cooking liquor to said furfural production plant when the pentose concentration of said cooking liquor falls to below 5g/l.

4,916,243

NEW CATALYST COMPOSITION AND PROCESS FOR OXIDATION OF ETHYLENE TO ETHYLENE OXIDE

Madan M. Bhasin, Charleston; Paul C. Eligen, Saint Albans, and Charles D. Hendrix, South Charleston, all of W. Va., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Continuation of Ser. No. 763,273, Aug. 7, 1985, abandoned, which is a continuation of Ser. No. 497,231, May 23, 1983, abandoned, which is a continuation of Ser. No. 116,292, Feb. 13, 1980, abandoned, which is a continuation-in-part of Ser. No. 21,727, Mar. 20, 1979, abandoned. This application Apr. 1, 1987, Ser. No. 32,911

Int. Cl.[4] C07D *301/10*

U.S. Cl. 549—534 11 Claims

1. In the continuous process for the production of ethylene oxide by the vapor phase oxidation of ethylene with molecular oxygen provided as an oxygen-containing gas at a temperature of from about 200° C. to 300° C. in the presence of at least about one mole percent of carbon dioxide and an organic chloride in the gaseous feed stream and in the presence of a supported, silver-containing catalyst in a fixed bed, tubular reactor used in commercial operations to form ethylene oxide,

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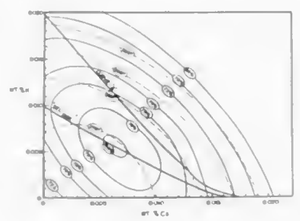
wherein said supported, silver-containing catalyst contains 2 to 20 weight percent silver deposited on a support which is in a form and size for use in the reactor, wherein (i) the specific reaction conditions of the ethylene oxide process; (ii) the specific catalyst support characteristics and (iii) the specific silver deposition method comprise an ethylene oxide production system, the improvement in which the catalyst comprises silver deposited on an alpha-alumina macroporous support in a first amount having a surface area less than 10 m^2/g and contains a combination of (a) cesium in a second amount and (b) at least one other alkali metal selected from the group consisting



of lithium, sodium, potassium and rubidium in a third amount, which combination comprises (a) and (b) in amounts in relation to the amount of silver in the catalyst sufficient to provide an efficiency of ethylene oxide manufacture that is greater than the efficiencies obtainable in the same ethylene oxide production system, including the same conversions, than (i) a second catalyst containing silver in the first amount and cesium in the second amount, and (ii) a third catalyst containing silver in the first amount and the alkali metal in the third amount, wherein the combination of silver, cesium and alkali metal in said catalyst is characterizable by an efficiency equation:

$$\text{efficiency } \% = b_0 + b_1(BG) + b_2(BCs) + \sum_1^4 b_{3j}\,BA_j + b_4(BG)^2 + b_5(BCs)^2 + \sum_1^4 b_{6j}\,BA_j^2 + b_7(BG \cdot BCs) + (BG)\sum_1^4 b_{8j}\,BA_j + (BCs)\sum_1^4 b_{9j}\,BA_j,$$

where

$BA_1 = BRb$,

$BA_2 = BK$,

$BA_3 = BNa$,

$BA_4 = BL_i$, and where the coefficient b_0 through b_{9j} and BG, BRb, BK, BNa, BLi and BCs are determined from a composite design set of experiments using the same ethylene oxide production system for the independent variables silver, cesium and alkali metal, and wherein BG is the difference of the average value of the silver content from the silver content used in the design set, BCs is the difference of the average value of the cesium content from the cesium content used in the design set, BRb is the difference of the average value of the rubidium content from the rubidium content used in the design set, BK is the difference of the average value of the potassium content from the potassium content used in the design set, BNa is the difference of the average value of the sodium content from the sodium content used in the design set and BLi is the difference of the average value of the lithium content from the lithium content used in the design set.

4,916,244

PREPARATION OF 1-AMINO-4-HYDROXY-2-(6'-HYDROXYHEXOXY)-ANTHRAQUINONE

Helmut Hoch, Weisenheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 10, 1988, Ser. No. 230,451

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1987, 3726983

Int. Cl.[4] C07C *97/26*

U.S. Cl. 552—246 **7 Claims**

1. The process for preparing 1-amino-2-(6'-hydroxyhexoxy)-4-hydroxyanthraquinone, which comprises:

(a) reacting 1-amino-2-phenoxy-4-hydroxyanthraquinone or a mixture of 1-amino-2-chloro(bromo)-4-hydroxyanthraquinone and a phenol with 1,6-hexanediol, in excess, in the presence of an alkaline agent at elevated temperatures, using from about 2 to 6 moles of 1,6-hexanediol per mole of 1-amino-2-phenoxy-4-hydroxyanthraquinone or 1-amino-2-chloro(bromo)-4-hydroxyanthraquinone, and heating said mixture in the presence of from about 50 to 150% by weight, based on either of said hydroxyanthraquinone compounds, of a polyethylene glycol, of an ethylene oxide adduct on a phenol, a C_1-C_{20}-alkylphenol, or a C_1-C_{20}-alkanol or a mixture thereof, at from about 125° to 135° C., to produce a mixture of said 1-amino-2-(6'-hydroxyhexoxy)-4-hydroxyanthraquinone and 1',6'-bis(1-amino-4-hydroxyanthraquinonyloxy)hexane; and

(b) heating the reaction mixture at from about 140° to 150° C., until the proportion of said 1',6'-bis(1-amino-4-hydroxyanthraquinonyloxy)hexane is less than or equal to 2% by weight, based on the weight of said 1-amino-2-(6'-hydroxyhexoxy)-4-hydroxyanthraquinone.

4,916,245

PREPARATION OF ALKYL SILANES

Gunner E. Nelson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed May 25, 1988, Ser. No. 198,514

The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.

Int. Cl.[4] C07F *7/08*

U.S. Cl. 556—478 **8 Claims**

1. Process for the preparation of a mixture of tetraalkylsilanes having the formula $RSiR'_3$ wherein R and R' are alkyl radicals, the radicals depicted by R' are alike or different, R has from 1 to about 4 carbon atoms, and R' has from about 8 to about 14 carbon atoms; said process comprising contacting reactants (a), (b) and (c) at a reaction temperature, wherein:

reactant (a) is an alkyl metal aluminum tetraalkyl having the formula $MAlR'_4$ wherein M is an alkali metal selected from the class consisting of lithium, sodium, and potassium, and R, has the same significance as above,

reactant (b) is a trihaloalkylsilane having the formula $RSiX_3$ wherein each X is a halogen radical selected from fluoride, chloride, and bromide, and R has the same significance as above, and

reactant (c) is an olefin corresponding to R', wherein R' has the same significance as above,

such that the mole ratio of reactant (a) to reactant (b) is from about 0.75:1.0, to about 1:1, and the ratio of reactant (c) to reactant (a) is selected to confer in said product mixture of tetraalkylsilanes, the desired concentration of radicals R' derived from said olefin.

4,916,246

PARAMAGNETIC CHELATES USEFUL FOR NMR IMAGING

Ernst Felder, Riva S. Vitale, Switzerland; Fulvio Uggeri, Codogno, Italy; Luciano Fumagalli, and Giorgio Vittadini, both of Milan, Italy, assignors to Bracco Chimica S.p.A., Milan, Italy

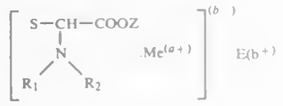
Filed Jan. 12, 1987, Ser. No. 2,115

Claims priority, application Italy, Jan. 30, 1986, 19236 A/86

Int. Cl.[4] C07F *13/00, 15/02*

U.S. Cl. 556—1 **30 Claims**

1. A compound having the formula



wherein:

a is 2 or 3;

b is an integer from 0 to 4;

$Me^{(a+)}$ is $Fe^{(2+)}$, $Fe^{(3+)}$, $Gd^{(3+)}$, or $Mn^{(2+)}$;

$E^{(b+)}$ is one or more physiologically biocompatible cation of an inorganic or an organic base or amino acid, said cation representing a total positive charge of b units;

S is the group —A-O-R wherein;

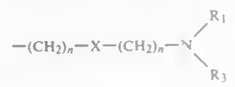
A is $-(CH_2)_m-$; $-CH_2-C(CH_3)_2-$;

m is an integer from 1 to 5

R is H; linear or branched alkyl of 1 to 8 carbon atoms, said carbon atoms being unsubstituted or substituted by one or more hydroxy group; aralkyl of 1 to 4 aliphatic carbon atoms; phenyl or phenyl substituted by halogen, amino or hydroxy; (poly)-oxa-alkyl of 1 to 10 oxygen atoms and from 3 to 30 carbon atoms;

R_1 is $-CH_2COOZ$: $-CH(CH_3)COOZ$; $-(CH_2)_n-N(CH_2COOZ)_2$; hydroxy-arylalkyl radical, in which the aryl radical is unsubstituted or substituted by hydroxy;

R_2 is $-CH_2COOZ$: $-CH(CH_3)COOZ$;



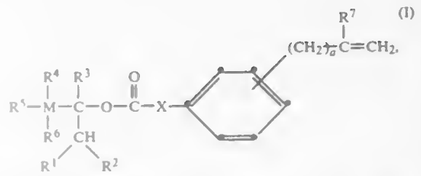
wherein

R_3 is $-CH_2COOZ$; $-CH(CH_3)COOZ$, a monovalent radical having the structure S—CH—COOZ;

X is a direct chemical bond; —O—; —S—; —NH— —N—CH_2COOZ; —N—$CH(CH_3)COOZ$;

n is the integer 2 or 3, with the proviso that when X is a direct chemical bond, n is 1, 2 or 3;

Z is H or a negative charge.



in which R^1 to R^6 independently of one another are C_1-C_4alkyl C_1-C_4-alkoxy, phenyl, benzyl, phenoxy, a group $-M(R^8)_3$ or

or R^3 and R^4 together are

and R^1 to R^3 can, in addition, also be hydrogen atoms, R^7 is hydrogen or C_1-C_4alkyl and R^8 is C_1-C_4alkyl, C_1-C_4alkoxy, phenyl, benzyl or phenoxy, M is Si, Ge, Sn, CH_2Si or OSi and X is O,S or NH and a is zero or 1, b is an integer from 1 to 6 and c is an integer from 3 to 6.

4,916,247

ORGANOMETAL-CONTAINING COMPOUNDS

Alfred Steinmann, Praroman, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 29, 1988, Ser. No. 237,473

Claims priority, application Switzerland, Sep. 7, 1987, 03425/87

Int. Cl.[4] C07F *7/08, 7/04, 7/22, 7/30*

U.S. Cl. 556—82 **7 Claims**

1. An organometal-containing styrene derivative of the formula I

4,916,248

SILYL DERIVATIVES OF 2, 6-DIMETHYL-4-ALLYL PHENOL

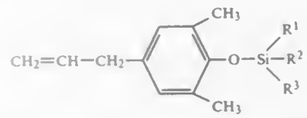
George L. Brownell, Pittsburgh; Mary K. Hays, Turtle Creek, and Andrew J. Sivak, Edgewood Boro, all of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Filed Jul. 5, 1989, Ser. No. 375,644

Int. Cl.[4] C07F *7/08*

U.S. Cl. 556—486 **4 Claims**

1. A compound of the formula



in which R^1, R^2 and R^3 are independently selected from linear, branched and cyclic hydrocarbon groups having from one to about eight carbon atoms.

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4,916,249
GLYCERO-3(2)-PHOSPHO-L-SERINE DERIVATIVES AND SALTS THEREOF

Hans Brachwitz; Peter Langen; Christine Lehmann; Eckart Matthes; Jurgen Schildt; Iduna Fichtner, all of c/o Academy of Sciences, Otto-Nuschke-Strasse 22/23, D-x 1086 Berlin, German Democratic Rep.; Albin Hermetter, and Friedrich Paltauf, both of c/o Technical University of Graz, Schlogelgasse 9, A-8010 Graz, Austria

Continuation of Ser. No. 19,277, Apr. 22, 1987, abandoned. This application Jul. 7, 1989, Ser. No. 376,161

Claims priority, application German Democratic Rep., Jul. 3, 1985, 2782300; Jul. 3, 1985, 27823170; Jul. 15, 1985, 2785600; Jul. 15, 1985, 2785625

Int. Cl.[4] C07F *9/10*

U.S. Cl. 558—169 1 Claim

1. A glycero-3(2)-phospho-L-serine compound selected from the group consisting of: 1-O-hexadecyl-2-chloro-2-deoxy-glycero-3-phospho-L-serine, 1-O-hexadecyl-2-fluoro-2-deoxy-glycero-3-phospho-L-serine, 1-chloro-1-deoxy-3-O-hexadecyl-glycero-2-phospho-L-serine, and 1-O-(2,2,2-trifluoroethyl)-2-O-hexadecylglycero-3-phospho-L-serine.

4,916,250
PHOSPHONATE REAGENT COMPOSITIONS

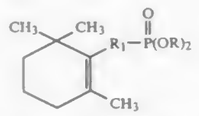
James H. Babler, Chicago, Ill., assignor to Loyola University of Chicago, Chicago, Ill.

Filed Oct. 31, 1988, Ser. No. 264,543

Int. Cl.[4] C07F *9/40*

U.S. Cl. 558—217 8 Claims

1. Phosphonates of the formula:



in which R is an alkyl group having up to four carbon atoms, and R_1 is a 3-methyl pentadienyl group.

4,916,251
CYANOISOALKYLATION OF HYDROXY SUBSTITUTED ARYL COMPOUNDS USING KETONES

Ted A. Morgan, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 2, 1987, Ser. No. 223

Int. Cl.[4] C07C *121/75*

U.S. Cl. 558—332 20 Claims

1. A process to produce a cyanoisoalkylated, hydroxy aryl compound comprising bringing together a hydroxy substituted aryl compound which is unsubstituted in at least one of the positions ortho or para to the hydroxy moiety, a ketone, cyanide ion and sufficient hydroxide ion under reaction conditions sufficient to produce an aryl compound substituted with a hydroxy moiety and a cyanoisoalkyl group which is ortho or para to the hydroxy moiety.

4,916,252
PROCESS FOR PREPARING OPTICALLY ACTIVE ALCOHOL

Noboru Sayo; Takao Saito; Hidenori Kumobayashi; Susumu Akutagawa, all of Kanagawa; Ryoji Noyori, and Hidemasa Takaya, both of Aichi, all of Japan, assignors to Takasago International Corporation, Tokyo, Japan

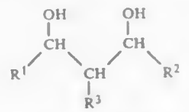
Filed Jun. 16, 1988, Ser. No. 207,428

Claims priority, application Japan, Jun. 18, 1987, 62-150187

Int. Cl.[4] C07C *101/30*

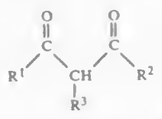
U.S. Cl. 560—39 3 Claims

1. A process for preparing an optically active alcohol represented by formula (I):



(I)

wherein R^1 and R^2 each represents an alkyl group having from 1 to 8 carbon atoms, a haloalkyl group, a hydroxyalkyl group, a trifluoromethyl group, a phenyl-substituted lower alkyl group, an alkoxycarbonyl-substituted lower alkyl group, a lower aminoalkyl group, a lower alkyl-substituted lower aminoalkyl group, a phenyl group, or a benzyloxy group; R^3 represents a hydrogen atom, a halogen atom, a lower alkyl group, or a lower alkoxycarbonyl group; or R^1 and R^2, or R^2 and R^3 are taken together with the carbon atoms therebetween to form a 5- to 7-membered ring which may contain a lower alkoxycarbonyl group or a double bond, which comprises asymmetrically hydrogenating a β-diketone represented by formula (II):

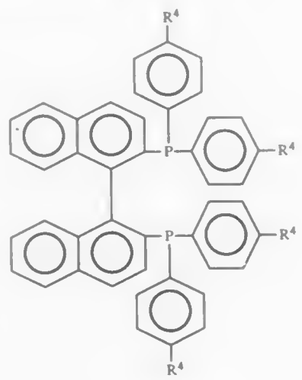


(II)

wherein R^1, R^2, and R^3 are as defined above, in the presence of a ruthenium-optically active phosphine complex as a catalyst, wherein said ruthenium-optically active phosphine complex is a compound represented by formula (III):

$$Ru_xH_yCl_z(R^4\text{-BINAP})_2(Q)_p \quad \text{(III)}$$

wherein R^4-BINAP represents a tertiary phosphine represented by formula (IV):



(IV)

wherein R^4 represents a hydrogen atom, a methyl group, or a t-butyl group; Q represents a tertiary amine; when y represents 0, then x represents 2, z represents 4, and p represents 1; and when y represents 1, then x represents 1, z represents 1, and p represents 0, or a compound represented by formula (v):

$$(RuH(R_4\text{-BINAP})_v)Y_w \quad \text{(V)}$$

wherein R^4-BINAP is as defined above; Y represents ClO_4, BF_4, or PF_6; when e represents 0, then v represents 1, and w represents 2; and when e represents 1, then v represents 2, and w represents 1.

4,916,253
FLUOROBENZOATES AND PROCESS FOR THEIR PRODUCTION

Yasuo Yoshida, Ihara, Japan, assignor to Ihara Chemical Industry Company, Ltd., Tokyo, Japan

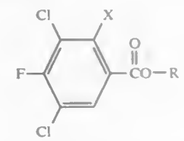
Filed Jun. 16, 1988, Ser. No. 207,230

Claims priority, application Japan, Jun. 22, 1987, 62-155039

Int. Cl.[4] C07C *69/76*

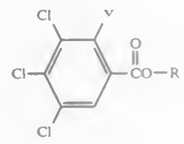
U.S. Cl. 560—103 3 Claims

1. A process for producing a fluorobenzoate having the formula



(I)

wherein X is a fluorine atom or a hydrogen atom, and R is an alkyl group, which comprises reacting a chlorobenzoate having the formula:



(II)

wherein Y is a hydrogen atom or a chlorine atom, and R is as defined above, with a metal fluoride.

4,916,254
PROCESS FOR PRODUCING EPSILON-CAPROLACTONE-MODIFIED HYDROXYALKYL ACRYLATE OR METHACRYLATE AND COATING COPOLYMER FROM THE SAME

Shoji Watanabe, and Kiyoshi Okitsu, both of Ohtake, Japan, assignors to Daicel Chemical Industries, Inc., Sakai, Japan

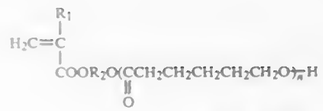
Continuation of Ser. No. 373,306, Apr. 29, 1982, abandoned. This application Sep. 9, 1988, Ser. No. 244,525

Claims priority, application Japan, May 11, 1981, 56-70336; May 29, 1981, 56-82182

Int. Cl.[4] C07C *69/66*

U.S. Cl. 560—185 8 Claims

1. A process for preparation of a poly(ε-caprolactone)-modified hydroxyalkyl acrylate or hydroxyalkyl methacrylate of the formula:



wherein R_1 is hydrogen or methyl, R_2 is alkylene, and n has a value of from 0.3 to 20 on the average, which consists essentially of effecting ring opening polymerization of ε-caprolactone with hydroxyalkyl acrylate or hydroxyalkyl methacrylate, the amount of ε-caprolactone being in the range of 1 to 20 mols per mol of hydroxyalkyl acrylate or hydroxyalkyl methacrylate, in the presence of 1 to 1000 ppm, based on the total contents of the reaction system, of a catalyst selected from the group consisting of stannous chloride, stannous bromide, and stannous iodide, as the sole catalyst in the reaction mixture, at a polymerization temperature in the range of 80° C. to 150° C. and in the presence of air.

4,916,255
METHOD FOR PRODUCTION OF METHACRYLATE ESTER

Akihiro Kobayashi; Toshiyuki Fujita; Takayuki Saito, all of Hitachi, and Toshio Akima, Ichihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 16, 1988, Ser. No. 194,347

Claims priority, application Japan, May 19, 1987, 62-121548; Oct. 23, 1987, 62-268948

Int. Cl.[4] C07C *67/02*

U.S. Cl. 560—217 32 Claims

1. A method for producing a methacrylate ester of an alcohol having at least one ether linkage and/or at least one alicyclic ring, which comprises treating said alcohol with alkaline substance which is lithium hydroxide or lithium alkoxide, and then reacting the same with methyl methacrylate in the presence of said alkaline substance.

4,916,256
PROCESS FOR THE PRODUCTION OF ALKYL TRIFLUOROACETATES

Saverio Grego, Venezia-Mestre; Adriano Checchin, Venice, and Giorgio Guglielmo, Mirano-Venezia, all of Italy, assignors to Ausimont, S.p.A., Milan, Italy

Continuation of Ser. No. 886,928, Jul. 18, 1986, abandoned. This application Aug. 18, 1988, Ser. No. 233,854

Claims priority, application Italy, Jul. 19, 1985, 21652 A/85

Int. Cl.[4] C07C *67/14*

U.S. Cl. 560—227 8 Claims

1. Process for the production of alkyl trifluoroacetate by esterification of trifluoroacetyl chloride with an alkyl alcohol of the formula R-OH, with R being an alkyl group having from 1 to 4 carbon atoms, with a trifluoroacetyl chloride/alkyl alcohol molecular ratio between 1.1 and 2.

4,916,257
PROCESS FOR THE PURIFICATION OF 2-HYDROXYNAPHTHALENE-6-CARBOXYLIC ACID

Helmold von Plessen, Königstein; Siegbert Rittner, Mörfelden-Walldorf; Heinrich Volk, Bad Vilbel; Werner Wykypiel, Rodgau, and Rudolf Neeb, Offenbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 12, 1989, Ser. No. 296,441

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1988, 3800989

Int. Cl.[4] C07C *63/34*

U.S. Cl. 562—467 9 Claims

1. A process for the purification of 2-hydroxynaphthalene-6-carboxylic acid by recrystallization, which comprises recrystallizing the crude acid from water-miscible linear or cyclic aliphatic ethers, aliphatic polyethers or aliphatic hydroxy ethers or from at least 10% strength by weight aqueous solutions of these ethers.

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4,916,258

THREE SERVICE RECESSED AFTERSET

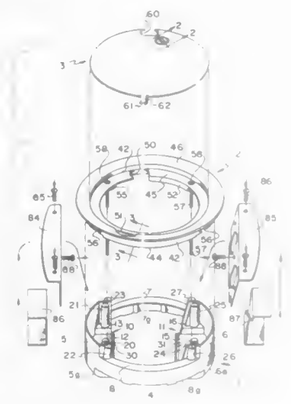
Gregory L. Mohr, Marietta, Ohio, assignor to Butler Manufacturing Company, Kansas City, Mo.

Continuation of Ser. No. 99,720, Sep. 22, 1987, Pat. No. 4,783,577, which is a continuation of Ser. No. 944,013, Dec. 22, 1986, abandoned. This application Apr. 29, 1988, Ser. No. 188,427

The portion of the term of this patent subsequent to Nov. 8, 2005, has been disclaimed.

Int. Cl.[4] H02G *3/12*

U.S. Cl. 174—48 7 Claims



1. For a triple service afterset, the combination of:

base means to be disposed over power and communication cells of a cellular raceway;

power cell aperture means formed by said base means, the power cell aperture means being for use in passing power cable;

communication cell aperture means formed by said base means, the communication cell aperture means being for use in passing communication cable;

means connected to said base means and forming receptacle bracket support means and ring support means;

a pair of receptacle brackets for mounting on said receptacle bracket support means respectively in positions adjacent said power cell aperture means;

ring means for mounting on said ring support means; and

cover means for mounting on said ring means alternatively in position to cover the central part of the ring means or in position to uncover the central part of the ring means to provide access to the interior of the afterset and the cover means having means for passing cable.

4,916,259

COMPOSITE DIELECTRIC STRUCTURE FOR OPTIMIZING ELECTRICAL PERFORMANCE IN HIGH PERFORMANCE CHIP SUPPORT PACKAGES

Ronald S. Charsky, Binghamton, N.Y.; Leonard T. Olson, Centreville, Va., and David P. Pagnani, Apalachin, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 226,579, Aug. 1, 1988, abandoned. This application Jul. 3, 1989, Ser. No. 375,247

Int. Cl.[4] H05K *1/00*

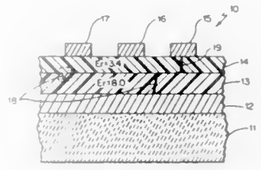
U.S. Cl. 174—256 6 Claims

1. A composite structure for an electronic package when electrical impedance or capacitance of a thin film dielectric component part between two metallic levels is predetermined, comprising:

a substrate of electrically non-conductive material providing a first surface with electrically conductive elements deposited thereon for functioning as a reference plane;

a dielectric component part providing a second surface with electrically conductive elements deposited thereon for functioning as circuit conductors, said second surface being arranged substantially parallel to said first surface; and

said dielectric component part being located intermediate said reference plane and said circuit conductors, said



dielectric component part having a relative dielectric constant greater than 1.0 and comprising:

a first layer of a ceramic material having a thickness composed of a predetermined number of discrete layers; and

a second layer of a polyimide material having a thickness composed of a predetermined number of spray coated layers of polyimide, each layer having a thickness less than 0.0004 inch;

whereby the electrical impedance or capacitance of said dielectric component part is predeterminable.

4,916,260

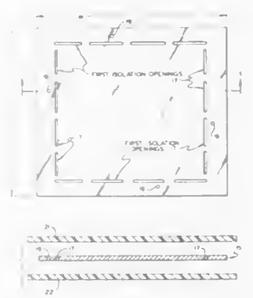
CIRCUIT MEMBER FOR USE IN MULTILAYERED PRINTED CIRCUIT BOARD ASSEMBLY AND METHOD OF MAKING SAME

Cynthia J. Broaddus, Binghamton; John R. Jephson, Endicott; Eugene M. Scales, Endicott; Carl C. Sinsenstein, Endicott, and John P. Wiley, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 11, 1988, Ser. No. 255,310

Int. Cl.[4] H05K *1/00, 3/00*

U.S. Cl. 174—268 26 Claims



1. A method of making an electrically conductive circuit member for use within a multilayered circuit board assembly, said method comprising:

providing a sheet of electrically conductive material;

forming a plurality of first openings within said electrically conductive sheet at predetermined locations therein;

encapsulating said electrically conductive sheet having said first openings therein between first and second layers of electrically insulative material;

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providing a plurality of apertures within said encapsulated electrically conductive sheet; and

providing a plurality of second openings within said encapsulated electrically conductive sheet relative to said plurality of first openings to define said circuit member having at least two electrically isolated regions within said electrically conductive sheet, said circuit member adapted for being combined with additional circuit members to form a multilayered circuit board assembly.

20. An electrically conductive circuit member for use within a multilayered circuit board assembly, said member comprising:

a sheet of electrically conductive material and first and second layers of electrically insulative material bonded to said sheet of conductive material to substantially encapsulate said sheet of conductive material therein, said sheet of conductive material including therein a plurality of apertures and a plurality of elongated openings defining at least two electrically isolated regions within said conductive material, said sheet of conductive material and said first and second layers of insulative material bonded thereto forming an integral, singular member of substantially planar configuration.

4,916,261

CIRCUIT SUBSTRATE AND PRODUCING METHOD OF THE SAME

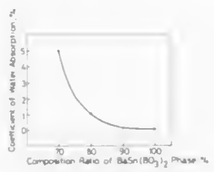
Truong D. Thanh, Kawasaki, and Nobuo Iwase, Kamakura, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 7, 1984, Ser. No. 648,304

Claims priority, application Japan, Sep. 9, 1983, 58-165154; Feb. 27, 1984, 59-34160; May 18, 1984, 59-98792

Int. Cl.[4] C04B *35/46, 35/00*

U.S. Cl. 174—255 12 Claims



1. A circuit substrate comprising a sintered oxide body used as an insulating body, said sintered oxide body consisting essentially of barium, tin, and boron equivalent to: BaO 10 to 68 mol %, SnO_2 9 to 50 mol %, and B_2O_3 13 to 72 mol %.

4,916,262

LOW-PROFILE, RUBBER KEYPAD

Polly S. Jungels-Butler, Streamwood, and Scott D. Beutler, Hoffman Estates, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 3, 1988, Ser. No. 266,749

Int. Cl.[4] H01H *13/70*

U.S. Cl. 200—5 A 7 Claims

1. A keypad comprising in combination:

a rubber overlay having a top surface with a plurality of protruding portions producing keys, and having a substantially flat bottom surface;

a first adhesive layer having an outer edge portion bonded to the bottom surface of the rubber overlay at the periphery thereof;

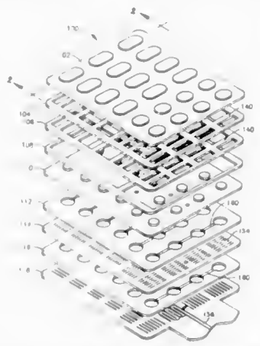
an actuation layer having a top surface bonded by the first adhesive layer to the rubber overlay, having a bottom surface, and having a plurality of pairs of cavities each separated by an actuating strip thereof, each actuating strip being substantially aligned with a corresponding key;

a second adhesive layer having an outer edge portion bonded to the bottom surface of the actuation layer at the periphery thereof;

a tactile layer having a top surface bonded by the second adhesive layer to the actuation layer, having a bottom surface, and having a plurality of collapsible resilient domes, each dome being substantially aligned with a corresponding actuation layer and key;

a third adhesive layer having a plurality of cavities each substantially aligned with a corresponding key and being bonded to the bottom surface of the tactile layer;

a shorting layer having a top surface bonded by the third adhesive layer to the tactile layer, having a bottom surface, and having a plurality of conductive areas thereon,



each conductive area being substantially aligned with a corresponding key; and

a fourth adhesive layer having a plurality of cavities each substantially aligned with a corresponding key and being bonded to the bottom surface of the shorting layer;

a circuitry layer having a top surface bonded by the fourth adhesive layer to the shorting layer, having a bottom surface, and having a plurality of conductor pairs, each conductor pair being substantially aligned with a corresponding conductive area of said shorting layer, whereby depression of a key and corresponding actuating strip collapses a corresponding dome to produce contact between a corresponding conductive area and a conductor pair.

4,916,263

SWITCH FOR DETECTING SHIFT POSITIONS OF AUTOMATIC TRANSMISSION

Koichi Ichigo, Aichi, Japan, assignor to Aisin-Aw Kabushiki Kaisha, Japan

Filed Nov. 9, 1988, Ser. No. 268,756

Claims priority, application Japan, Dec. 25, 1987, 62-326786

Int. Cl.[4] H01H *19/54*

U.S. Cl. 200—11 DA 5 Claims

1. A switch for detecting shift positions of an automatic transmission in which a movable contact piece is moved in a linked relationship with the shifting over of shift positions of the transmission so as to effect switching with each of stationary contact pieces corresponding to said shift positions, said switch comprising:

stationary monitoring contact pieces disposed in combination with said stationary contact pieces corresponding to

POSITIONS / CONTACT POINTS	P	R	N	D	3	2	1
A	ON	ON	OFF	OFF	ON	ON	OFF
B	OFF	ON	ON	ON	ON	OFF	OFF
C	OFF	OFF	OFF	ON	ON	ON	ON
PA	ON	OFF	ON	OFF	ON	OFF	ON

said shift positions in order to output a predetermined combination signal.

4,916,264

ROTARY SWITCH

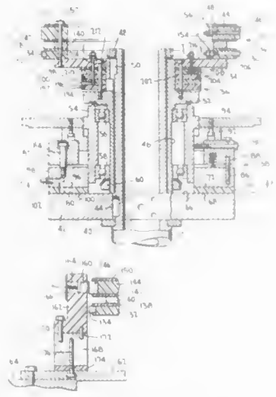
John Walter, Evergreen Park, Ill., assignor to Continental Can Company, Inc., Norwalk, Conn.

Division of Ser. No. 207,500, Jun. 16, 1988, Pat. No. 4,830,048.

This application Jan. 31, 1989, Ser. No. 304,221

Int. Cl.[4] H01H *19/00*

U.S. Cl. 200—24 10 Claims



1. A rotary switch assembly for use in a multiple work station machine to deliver electrical power to said work stations one at a time in sequence, said machine including a rotating shaft carrying a plurality of circumferentially spaced separate work stations each requiring a separate electrical power supply, said rotary switch assembly including a rotary switch mounted on said shaft for rotation with said shaft and comprising first and second insulated rings, one of said insulated rings carrying a continuous slip ring having a continuous contact surface, and the other of said insulated rings carrying a plurality of contacts disposed in circumferentially spaced insulated relation and having curved outer contact surfaces lying in a common cylindrical pattern, and first and second brushes carried by a fixed support and contacting a respective one of said slip ring contact surfaces and said plurality of contact surfaces, each of said plurality of contacts carrying a connecting member for separate electrical connection to a respective work station, and said slip ring carrying at least one connecting member for electrical connections to said plurality of work stations.

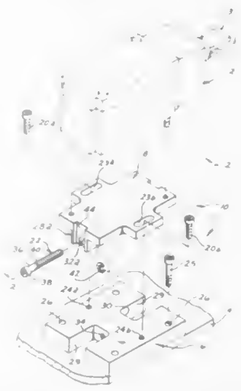
4,916,265

ADJUSTABLE MOUNTING ASSEMBLY FOR A LIMIT SWITCH

Richard L. Luallen, New Albany, Ind., assignor to Gary D. Thomas, DePauw, Ind., a part interest

Filed Nov. 21, 1988, Ser. No. 273,845

Int. Cl.[4] H01H *3/16*

U.S. Cl. 200—47 17 Claims

1. An adjustable mounting assembly for a limit switch comprising

an H-shaped stationary base plate defining two outwardly opening slots therein separated by a cross member,

means for securing said base plate to a supporting surface,

a movable plate slidably disposed on said base plate for supporting a limit switch thereon, said movable plate containing at least one outwardly projecting tab adapted to fit in one of said slots in relatively close fitting slidable relationship,

adjusting means interconnected between said base plate and said movable plate for slidably moving said movable plate on said base plate to adjust the position of said switch relative to said base plate and supporting surface, said adjusting means being connected between said tab and said cross member, and

locking means separate and distinct from said adjusting means for securing said movable plate to said base plate for maintaining a selected position of said switch.

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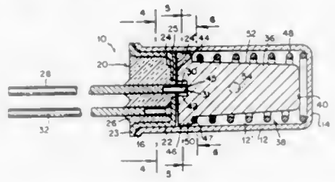
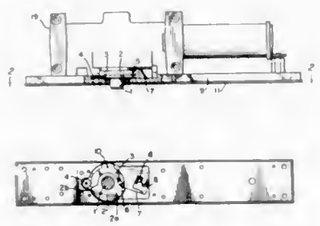
4,916,266
MINIATURE OMNIDIRECTIONAL INSTANTLY RESPONSIVE IMPACT SWITCH
Leonard P. Tetrault, Northport, N.Y., assignor to Aerodyne Controls Corporation, Ronkonkoma, N.Y.
Filed Jun. 8, 1989, Ser. No. 363,280
Int. Cl.[4] H01H *35/14*
U.S. Cl. 200—61.45 R 10 Claims



1. A miniature omnidirectional instantly responsive impact switch, comprising:
a hollow cylindrical housing closed at one end and open at the other end to define a cylindrical chamber therein;
a cylindrical header secured in and closing said open end of said housing, said header having an electrically conductive header wall with a central aperture facing inwardly of said chamber, and an insulator adjacent said header wall and facing outwardly of said housing;
a first electrical conductor extending axially through said insulator and having a free end extending through said aperture in said header wall;
a second electrical conductor extending axially through said insulator and spaced from said first conductor and connected to said header wall;
an electrically conductive mass having a generally cylindrical body movably disposed in said chamber, said body having an end with a blind bore therein, said bore having an internal end wall, said bore receiving said free end of said first conductor in contact with said internal end wall to tilt said mass axially in said housing; and a compressed coil spring in said chamber biasing said tilted mass so that a portion of said end thereof contacts said header wall, whereby said first and second conductors are connected electrically in a closed circuit via said mass and said header wall;
whereby said mass separates instantly from said first conductor against the bias of said spring when an impact of sufficient magnitude is applied to said housing to open said closed circuit momentarily.

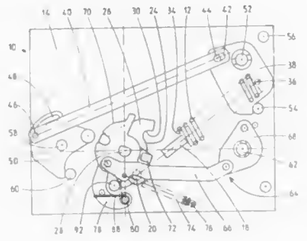
4,916,267
DOOR CLOSER POSITION MONITOR
Thomas R. Lasier, Princeton, and William L. Downey, Peru, both of Ill., assignors to Schlage Lock Company, San Francisco, Calif.
Filed Dec. 23, 1988, Ser. No. 289,317
Int. Cl.[4] G08B *13/08*; **H01H** *3/16*
U.S. Cl. 200—61.62 17 Claims

1. A Door Position Control and Monitoring Apparatus comprising: a force producing means for accomplishing door positioning coupled to a door by linkage means; a position sensing means coacting with said linkage means to monitor door position; said position sensing means further comprising means for reporting a particular door position; said means for reporting a particular door position having means for field adjustment on installation, said means being tamper resistant in the insecure or open position of the door and inaccessible in the secure or closed position of the door; said force producing means for accomplishing door positioning is a door closer; said linkage means further comprising a rotating output shaft exiting said door closer and having a linkage arm attached thereto for rotation with said output shaft, said linkage arm engaging a



track means mounted substantially within and concealed in one edge of said door.

4,916,268
OPERATING MECHANISM OF A THREE-POSITION SWITCH
Robert Micoud, Le Fontanil, and Jacques Vernay, Grenoble, both of France, assignors to Merlin Gerin, France
Filed Mar. 16, 1988, Ser. No. 168,949
Claims priority, application France, Mar. 27, 1987, 87 04658
Int. Cl.[4] H01H *5/06*
U.S. Cl. 200—400 6 Claims



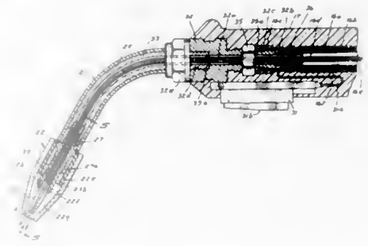
1. An operating mechanism of a multipole switch having a movable assembly capable of occupying three distinct stable positions, notably a first closed position (F), a second intermediate open position (O), and a third grounded position (T), said mechanism (**10**) comprising:
an energy storage spring (**12**) associated with a toggle (**16**) having a high-speed dead-point overshoot, the toggle (**16**) beign fitted with an actuating lever (**18**) articulated on a spindle (**20**) of a first operating crank (**22**) for changing a line of action of said energy storage spring (**12**),
a main operating crank (**26**) fixed on a rotating shaft (28) which actuates the movable assembly of the switch,
a grounding crank (**38**) mounted with limited rotation on a first operating spindle (**52**) between an inactive position when the main crank (**26**) is moved by the toggle (**16**) between the closed (F) and open (O) positions, and an active grounded position causing the line of action of the energy storage spring (**12**) to be modified resulting in further rotation of the main crank (**26**) beyond the open position (O) to the grounded position (T),
a second operating spindle (**62**) for controlling opening and closing of the switch, said spindle (**62**) being offset from the rotating shaft (**28**) and cooperating with a transmission system (**64**) capable of driving the first operating crank (**22**) of the toggle (**16**) in rotation, and
locking means for locking the main crank 26 in each of three positions (F, O, T) of the switch, said locking means including a latching lever (**78**) cooperating with the main crank (**26**), said lever being automatically actuated to an unlocked position when the toggle (**16**) is near the dead-point.

4,916,269
PUSH-BUTTON ROCKER ELECTRIC SWITCH
Hubert Spazierer, and Adam Weber, both of Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany
Filed Jul. 25, 1988, Ser. No. 223,966
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724736
Int. Cl.[4] H01H *5/14, 5/08*
U.S. Cl. 200—408 6 Claims

1. An electric switch having a housing including a base plate, said switch comprising a push-button which is movable in a linear direction with respect to the housing, a switching tappet movable by means of the push-button and swivellable with respect to said push-button and a switching rocker which is rotatably mounted on the base plate, the switching rocker being movable between two end positions via the push-button and the switching tappet and which thereby controls a movable bridging contact, and said switching tappet being mounted on the base plate, wherein the switching tappet is mounted to said base plate by means of at least one pivot pin, and at least one elongated hole, wherein the switching tappet is affixed to the base plate, and wherein said at least one elongated hole has an inserting slot provided with an inserting inclination, the width of which inserting slot is smaller than the diameter of said at least one pivot pin.

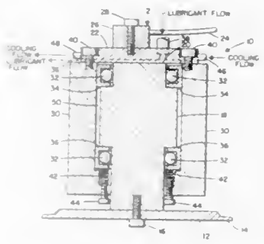
4,916,270
MIG WELDER CUTTING HEAD ATTACHMENT
John C. West, Eagan, and Terry A. Prentice, Bloomington, both of Minn., assignors to Century Mfg. Co., Minneapolis, Minn.
Filed Feb. 6, 1989, Ser. No. 306,669
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—70 1 Claim

1. A nozzle structure for cutting metal in connection with a welder cable of an insert gas welder, said nozzle structure comprising
a housing having a tapered outlet passage,
an electrode passing through said passage,
means providing a metal cutting voltage energizing said electrode,
means passing air under pressure through said cable and into said nozzle,
a chamber in said nozzle receiving said air,
a restrictive orifice between said chamber and said outlet passage causing a build-up of back pressure of air in said chamber and causing air acceleration of said air therefrom



through said outer passage with sufficient velocity to flush away cut metal.

4,916,271
RESISTANCE WELDING HEAD
Jack W. Lee, Brookfield; Roman T. Kowalski, Gilford, and John L. Fritz, Trumbull, all of Conn., assignors to Avco Corporation, Providence, R.I.
Filed Nov. 10, 1988, Ser. No. 269,966
Int. Cl.[4] B23K *11/06, 11/30*
U.S. Cl. 219—84 10 Claims



1. A welding head for coupling a welding electrode to a source of electrical current, comprising:
a housing; an electrically conductive shaft means rotatably mounted within said housing, said shaft means having a first end surface for mounting a welding electrode thereto and a second, opposing, substantially planar end contact surface; and
electrically conductive contact plate means rigidly coupled to said housing and having a substantially planar contact surface compressively coupled to said contact surface of said shaft means such that, during a rotation of said shaft means, said contact plate means remains stationary while said contact surface of said shaft means rotates upon said contact surface of said contact plate means, and wherein at least one of said contact surfaces is provided with a channel or channels for flowing a lubricant therethrough.

4,916,272
PERFORATING APPARATUS FOR WEB
Yutaka Okumoto, and Takao Furukawa, both of Tokyo, Japan, assignors to Japan Tobacco Inc., Tokyo, Japan
Filed Jul. 24, 1989, Ser. No. 383,444
Claims priority, application Japan, Jul. 28, 1988, 63-186950
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.7 9 Claims

1. A perforating apparatus for forming a plurality of rows of very small holes in a web, comprising:

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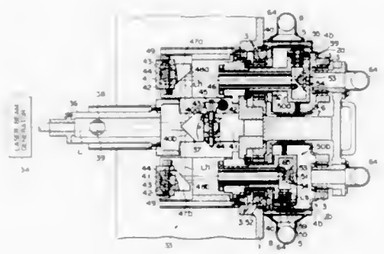
a pair of hollow guide drums having their respective axes parallel to each other and arranged so as to be freely rotatable around the axes, each said guide drum having a circumferential opening defined in the outer peripheral wall thereof, a ring-shaped mask member whose outer peripheral surface is situated within the same cylindrical plane as the outer peripheral surface of the guide drum, and a plurality of slits formed in the mask member so as to extend in the axial direction of the guide drum and be arranged circumferentially at regular intervals, the circumferential openings of said individual guide drums being situated in different axial positions with respect to the axial direction of the guide drums;

web transportation means adapted to guide the web so that the web is wound so as to cover part of the mask member on the outer peripheral surface of one of the guide drums, and then to guide the web so that the web is wound so as to cover part of the mask member on the outer peripheral surface of the other guide drum, while causing the guide drums to rotate; and

laser beam converging means for converging laser beams through the slits of the mask members on the web wound on the respective outer peripheral surfaces of the guide drums, thereby forming very small holes in the web,

said laser beam converging means including



a laser beam source for emitting a continuous laser beam parallel to the respective axes of the guide drums toward the region halfway between the guide drums,

a two-segment mirror disposed between the laser beam source and the guide drums and adapted to reflect the laser beam, emitted from the laser beam source, toward the respective axes of the guide drums so that the laser beam is divided in two,

split beam guide means for guiding split laser beams, obtained by means of the two-segment mirror, into the guide drums so as to be coaxial therewith,

multisegment reflection mirrors each fixedly located on the axis of each corresponding guide drum, inside the guide drum, and adapted to reflect the split laser beams toward the web wound on the guide drums so that the split laser beams are radially subdivided into a predetermined number of laser beams,

condensing lenses arranged at predetermined intervals within the circumference of one and the same circle between the mask member and the multisegment reflection mirror corresponding thereto, and adapted to converge the subdivided laser beams, reflected by the multisegment reflection mirrors, on the web on the guide drums through the slits, and adjusting means for deviating the positions of the condensing lenses in the guide drums from one another in the axial direction of the guide drums.

4,916,273

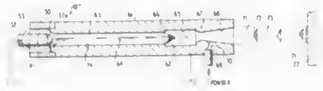
HIGH-VELOCITY CONTROLLED-TEMPERATURE PLASMA SPRAY METHOD

James A. Browning, P.O. Box 6, Hanover, N.H. 03755

Continuation of Ser. No. 193,702, May 13, 1988, Pat. No. 4,841,114, which is a continuation-in-part of Ser. No. 24,485, Mar. 11, 1987, Pat. No. 4,788,402. This application Mar. 30, 1989, Ser. No. 330,512

Int. Cl.[4] B23K *9/00*

U.S. Cl. 217—121.47 1 Claim



1. In a method of operating a plasma-arc torch having a cylindrical casing and having a first, electrically conductive end wall including an extended length nozzle bore defining an anode nozzle passage extending axially therethrough and forming an anode electrode and a second, opposite end wall, a cathode electrode mounted coaxially within the opposite end wall of the cylindrical casing and being electrically insulated from the first end wall and terminating short thereof, said anode nozzle passage at its end facing said cathode electrode flaring outwardly and being conically enlarged, said method comprising the steps of:

introducing a plasma producing gas under pressure into said chamber and creating an electrical potential difference between the cathode electrode and said anode nozzle to create a plasma-arc flame normally exiting from said anode nozzle passage, the improvement comprising;

causing an arc of sufficient size at a point along the extended length nozzle bore sufficiently upstream of said nozzle exit orifice and to pass to the anode nozzle passage wall and to thereby establish an arc column which, with a downstream ionized region, is maintained wholly within the extended length nozzle bore, thereby extending the life of the circumferential anode region in the vicinity of the exit of the anode nozzle, while yielding full control over the arc-length characteristics, and

introducing particles to be sprayed at a point within said plasma-arc flame downstream of said arc column with its downstream ionized region at an area of said plasma-arc flame in the form of a high velocity hot gas stream exhibiting no ionization with said particles accelerated to extreme velocity for impact against a workpiece surface to be coated, thereby eliminating excessive heating of the particles prior to impact.

4,916,274

SNAP ACTION SUMP PUMP SWITCH

Richard H. Hawley, Torrington, and Joseph L. G. Bouthet, Newington, both of Conn., assignors to Cooper Industries, Inc., Houston, Tex.

Continuation of Ser. No. 97,234, Sep. 16, 1987. This application Nov. 17, 1988, Ser. No. 284,572

Int. Cl.[4] H01H *5/06*

U.S. Cl. 200—457 2 Claims

1. A snap action switch having an operating lever, said snap action switch comprising:

a housing having an interior wall with a depression therein;

a cover for said housing;

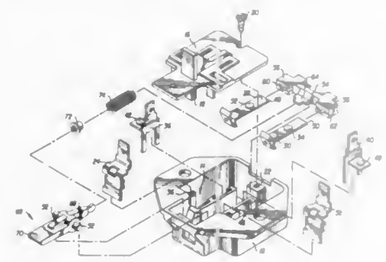
at least two movable terminals mounted in said housing, each of said movable terminals having a free end;

at least two fixed terminals mounted in said housing, each associated with one of said movable terminals;

operating means for moving the free ends of said movable terminals between a stable position in contact with said associated fixed terminals and a stable position out of contact with said fixed terminals, said operating means comprising:

lever pivot means including a pivot shaft mounted in the depression in the wall of said housing;

a one piece actuating lever having a portion pivotally received in a notch formed to some extent by a portion of said housing which is spaced apart from said depression mounting said pivot shaft, said actuating lever having spaced side legs connected to the free ends of said mov-



able terminals, said actuating lever further having a spring end receiving portion;

an operating lever mounted on said pivot shaft for pivotable movement thereon, said operating lever having a first lever portion on one side of said pivot shaft extending in the direction of said actuating lever; and

a compression spring interposed between said first lever portion of said operating lever and the spring receiving portion of said actuating lever.

4,916,275

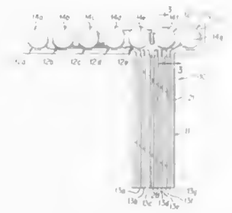
TACTILE MEMBRANE SWITCH ASSEMBLY

Richard H. Almond, Longmont, Colo., assignor to Square D Company, Palatine, Ill.

Filed Apr. 13, 1988, Ser. No. 180,870

Int. Cl.[4] H01H *13/70*

U.S. Cl. 200—516 12 Claims



1. A flexible and thin tactile switch assembly including at least one switch site with an inner contact and an outer contact, said assembly comprising,

a substrate of polyester,

a plurality of stacked layers of ink deposited on said substrate and defining said contacts and conductive runs including,

a first layer of dielectric ink outlining the switch site with inner and outer contact areas,

a second layer of conductive ink defining the inner contact and at least a pair of conductive runs, one run connecting to the inner contact and the other run to be connected to the outer contact and connecting to said other run, and

a third layer of dielectric ink covering the conductive run for the inner contact,

a fourth layer of conductive ink defining the outer contact and connecting to said other run, and

a fifth layer of wear conductive ink on the outer contact, and

a snap dome switch secured in place on the switch site to peripherally engage said outer contact and which upon being depressed to snap will engage the inner contact and electrically connect the contacts.

4,916,276

PUSH LOCK MECHANISM

Shinji Sasaki, Miyagi, Japan, assignor to Alps Electric Co., Tokyo, Japan

Filed Jun. 9, 1988, Ser. No. 204,440

Claims priority, application Japan, Aug. 6, 1987, 62-119753[U]

Int. Cl.[4] H01H *3/42*

U.S. Cl. 200—524 2 Claims

1 In a push lock mechanism including a heart-shaped cam groove, a driving pin adapted to trace in said heart-shaped cam groove, and an axially reciprocable operation shaft, wherein said operation shaft moves axially between a non-depressed and a depressed position thereof, and said operation shaft is adapted to lock in said depressed position thereof by cooperation of said heart-shaped cam groove and said driving pin; the improvement comprising a slider having said heart-shaped cam groove on its peripheral surface and arranged around said operation shaft, a first return spring for biasing said slider toward said non-depressed position of said operation shaft, a driving member provided so as to project from said operation shaft for transmitting power between said operation shaft and said slider, and a second return spring for biasing said driving member in such a direction as to urge said driving member against said slider, said second return spring having a spring force set to be smaller than a spring force of said first return spring, wherein when said operation shaft is locked in said depressed position thereof and said slider is moved toward said non-depressed position of said operation shaft, said driving member is moved away from said slider.

4,916,277

ALTERNATE ACTION MECHANISM

Daniel E. Tretter, Shannon, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 29, 1988, Ser. No. 252,241

Int. Cl.[4] H01H *13/56, 3/42*

U.S. Cl. 200—524 10 Claims

1. An alternate action mechanism comprising:

a housing having an interior chamber enclosed in part by mutually transverse first and second walls, the first wall having a hole therethrough extending along an axis, the second wall having an exterior surface thereon;

a switching element located in said chamber, at least a portion of said element being movable along the axis between first and second positions respectively nearer to and further from the first wall, said element being biased toward the first position;

an actuator having a plunger slidably disposed in said hole

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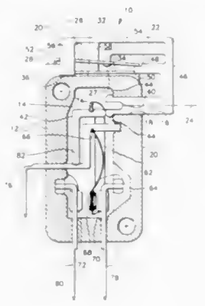
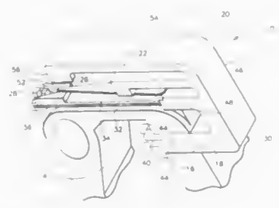
along the axis thereof, said plunger engaging said switching element, said actuator further having a first member extending along the external surface of the second wall;

means for engaging the first member of said actuator with said housing second wall so as to maintain linear sliding movement of said actuator along a direction parallel with





the axis of said hole between extended and depressed positions; and

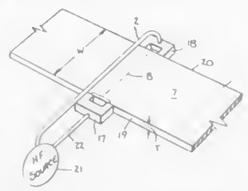
means including cooperating elements on said actuator and on the exterior surface of the second wall for alternately retaining the actuator in the depressed position and releasing the actuator from the depressed position on successive depressions of said actuator.

4,916,278

SEVERING METAL STRIP WITH HIGH FREQUENCY ELECTRICAL CURRENT

Wallace C. Rudd, New Canaan, and Humfrey N. Udall, Darien, both of Conn., assignors to Thermatool Corporation, Stamford, Conn.

Filed Sep. 1, 1989, Ser. No. 402,090
Int. Cl.[4] H05B *6/02*; B26D *7/10*
U.S. Cl. 219—10.41 **12 Claims**



1. A method for severing a metal piece into parts on opposite sides of a line between the parts, said metal piece having a predetermined width transversely to its length and a predetermined thickness at said line, said method comprising:

engaging said metal piece at one end of said line with a first contact and at the other end of said line with a second contact;

supplying electrical current of a frequency which provides a reference depth in the metal of said metal piece which is at least equal to 90% of the thickness of said metal piece along said line to said first contact through a conductor adjacent said line but spaced from said metal piece and to said second contact, to cause heating of said metal piece along said line;

maintaining the supply of said electrical current to said first contact and said second contact and the heating of the metal of said metal piece until the metal along said line reaches a temperature at least equal to a temperature at which there is a significant reduction in the tensile strength of said metal along said line as compared to the tensile strength of the metal adjacent thereto; and

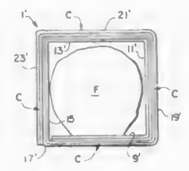
separating said parts along said line.

4,916,279

APPARATUS FOR SURFACE HEATING AN OBJECT BY MICROWAVE ENERGY

Richard K. Brown, Hortonville, and Thomas D. Pawlowski, Neenah, both of Wis., assignors to James River Corporation, Richmood, Va.

Filed Apr. 28, 1989, Ser. No. 344,396
Int. Cl.[4] H05B *6/80*; B65D *81/34*
U.S. Cl. 219—10.55 E **26 Claims**



1. An apparatus for surface heating an object in an oven by microwave energy, comprising:

(a) microwave interactive heating means for surface heating the object by converting microwave energy to heat; and

(b) support means for supporting said microwave interactive heating means and for engaging the object to be surface heated by the microwave interactive heating means, said support means having at least one contact wall with a contact surface against which the object is disposed;

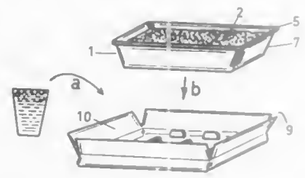
wherein said at least one contact wall is comprised of at primary panel which defines said contact surface and a secondary panel which is coextensive in area with at least an object heating portion of said primary panel and which is disposed adjacent to said primary panel at an opposite side thereof from said contact surface; and wherein said microwave interactive heating means comprises a first layer of microwave interactive heater material that is applied to said primary panel covering at least the object heating portion thereof, and a second layer of microwave interactive heater material applied to said secondary panel covering at least a part of a facing surface thereof that is directed toward said primary panel, said part of said facing surface being substantially coextensive with at least said object heating portion of the primary panel; and wherein said primary panel and said second panel are both formed by unitary sections of a single paperboard blank, said paperboard blank carrying only a single layer of microwave interactive heater material.

4,916,280

FOOD PACKAGE ADAPTED PARTICULARLY FOR MICROWAVE HEATING

Bernard Havette, Bresles, France, assignor to Nestec S.A., Vevey, Switzerland

Filed Jun. 22, 1988, Ser. No. 209,885
Claims priority, application European Pat. Off., Jul. 11, 1987, 87110045
Int. Cl.[4] H05B *6/80*; B65D *81/34*
U.S. Cl. 219—10.55 E **20 Claims**



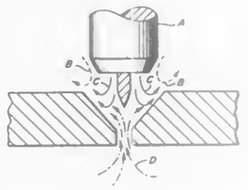
1. A food package comprising a container for food and a cover covering a first surface of the container, the cover being made of a material transparent to microwaves, being removably connected to the container and having a receptacle adjacent the first surface of the container for containing and for surrounding a second surface of the container opposite the first surface with a fluid which absorbs microwaves.

4,916,281

GAS BACK-PURGING DURING WELDING OF PIPE

Lee M. Flasche, Kokomo; Gregory L. Hoback, Greentown, and James L. Meyers, Kokomo, all of Ind., assignors to Haynes International, Inc., Kokomo, Ind.

Filed Feb. 23, 1989, Ser. No. 313,824
Int. Cl.[4] B23K *9/16*
U.S. Cl. 219—61 **3 Claims**



1. The process of welding pipe wherein a back-purging gas system is used, including the following steps:

preparing the pipe ends to be welded;

installing purge dams;

fitting the pipe sections to establish proper root gap tolerance;

purging the weld zone at a rate about 40 CFH down to about 5000 ppm oxygen content;

tack welding and closure welding of the pipe, using torch shielding and back-purging gas flow rates;

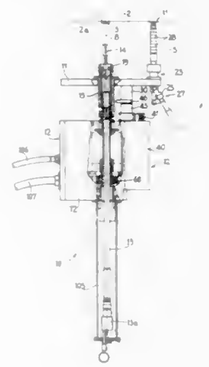
characterized by: a back-purging gas flow rate to welding torch shielding gas flow rate within the ratios of 2 to 1 and 6 to 1.

4,916,282

DEVICE FOR CUTTING THE WALL OF THE TUBULAR PIECE BY ELECTRICAL DISCHARGE MACHINING

Pierre Chamming's, Caluire, and Jean P. Cartry, Lyons, both of France, assignors to Framatome, Courbevcie, France

Filed Nov. 21, 1988, Ser. No. 274,221
Claims priority, application France, Nov. 20, 1987, 87 16123
Int. Cl.[4] B23H *1/00, 7/26*
U.S. Cl. 219—69.2 **13 Claims**



1. Device for cutting by electrical discharge machining the wall of a tubular piece crimped inside a cylindrical receptacle in a fixed installation, in order to make, from the inside of the tubular piece, at least two cuts directed axially relative to the cylindrical receptacle and to the tubular piece, comprising at least one electrode, means for supplying said electrode with electrical current, and means for circulating water in the tubular piece, and further comprising:

(a) a support provided with means for fastening to the fixed installation adjacent the cylindrical receptacle and with guide means in a direction corresponding to an axial direction of the cylindrical receptacle upon fastening of the support;

(b) an assembly mounted movably relative to the support in said axial direction as a result of the guide means and comprising drive means for movement in said axial direction;

(c) a tubular pole mounted on the assembly, having a longitudinal part a diameter of which is less than an inside diameter of the tubular piece;

(d) an electrode-holder fastened to the free end of the longitudinal part of the pole and taking the form of a tubular piece part of whose bore is of frusto-conical shape, separated into at least two segments, each carrying an electrode, by means of axial cuts;

(e) an actuating rod mounted so as to be axially movable in the tubular pole and associated with means for axial movement and of which the end penetrating into the frusto-conical bore has a diameter greater than the diameter of the bore and allows radial movement of the electrodes; and

(f) a device for causing axial vibration, said device having a part movable in the axial direction and fixed to the tubular pole and a fixed part mounted on the movable assembly.

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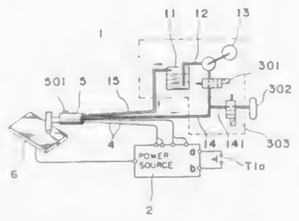
4,916,283

WATER COOLING PLASMA ARC WORKING APPARATUS

Moritoshi Nagasaka, Ibaragi; Kikuo Terayama, Ikeda; Toshihiko Okada, Takatsuki; Masanobu Uchida, Suita, and Hirokazu Kubo, Takatsuki, all of Japan, assignors to Daihen Corporation, Osaka, Japan

Filed Apr. 24, 1989, Ser. No. 342,475
Claims priority, application Japan, Apr. 26, 1988, 63-56114[U]; May 20, 1988, 63-67110[U]
Int. Cl.[4] B23K 9/00
U.S. Cl. 219—121.51 5 Claims



1. A plasma arc working apparatus of water cooling type wherein a plasma arc torch is connected to a working power source device and a circulation system for cooling water is provided for feeding the cooling water in a reservoir tank through the inner space of the torch by a water feeding pump and returning the same to the reservoir tank through a circulating passage having at least two separate inputs, comprising:

a conduit comprising a first input of said circulating passage for feeding said cooling water;

a conduit comprising a second input of said circulating passage for introducing pressurized gas into a feeding side of said circulation passage;

a control circuit for controlling said water feeding pump which starts said water feeding pump when the working electric power is applied to said plasma arc torch and stops the same when the working power is cut off; and

a pressurized gas introducing means for automatically introducing said pressurized gas, via said conduit, into said circulation passage for a pre determined time interval just after the power supply to said power device was cut off, whereby the cooling water remaining in said circulation passage including said torch is forcibly discharged therefrom.

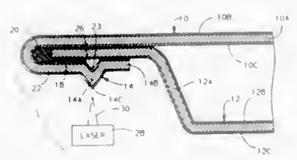
4,916,284

METHOD OF MAKING HEMMED JOINTS UTILIZING LASER WELDING

Frederick D. Petrick, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 8, 1989, Ser. No. 348,749
Int. Cl.[4] B23K 26/00
U.S. Cl. 219—121.64 9 Claims

1. A method of making a hem joint between two sheets of steel that have a corrosion protective metallic zinc coating, the steps comprising, forming a first sheet of steel into a configuration that has a hem flange portion which carries a plurality of spaced tab portions that extend from said flange portion, forming each tab portion to define a groove, folding said hem flange portion and said tabs around a marginal portion of a second sheet of steel to form a hem joint, said hem joint being defined by said hem flange portion and a portion of said first sheet with said marginal portion of said second sheet disposed therebetween, the wall of said tab that defines said groove and a portion of said second steel sheet said that faces said wall defining a gas vent channel which is open to the atmosphere at opposite ends of a tab portion, and then directing a laser beam sequentially to each tab portion at a point aligned with a said channel to create a weld zone of molten metal that connects a tab portion to a portion of said second sheet, said channel



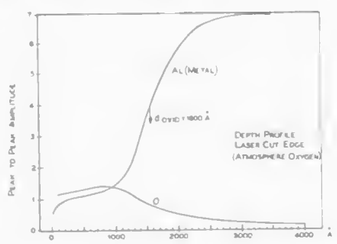
providing a path for the escape of gas developed by the vaporizing of said zinc coating.

4,916,285

CAPACITOR FOIL OF ALUMINUM OR AN ALUMINUM ALLOY

Rudolf Baur, and Markus Kern, both of Kreuzlingen, Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation-in-part of Ser. No. 128,332, Dec. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 856,407, Apr. 28, 1986, abandoned. This application Mar. 6, 1989, Ser. No. 319,975
Int. Cl.[4] B23K 26/12
U.S. Cl. 219—121.72 8 Claims



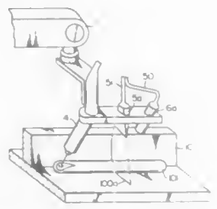
1. Process for forming a capacitor foil of aluminum alloy which comprises creating at least one rounded edge exhibiting substantially no burrs and cracks on said aluminum or aluminum alloy foil with a LASER beam enclosed in a reactive gas wherein said reactive gas is a gas mixture containing from about 45% to about 60% oxygen so that air in the immediate vicinity of the LASER beam is displaced by said reactive gas and the LASER beam is enveloped in the reactive gas and forming a relatively thick oxide layer for adsorbing and binding free ions at and in the vicinity of said at least one edge as a result of the reactive gas being in effective contact with the foil during creation of the at least one edge and providing an increase in the nominal field strength of capacitors made with said foil as a result of reducing the imbalance of field strength at the edge region of the foil by creating said at least one rounded edge having substantially no burrs and cracks.

4,916,286

METHOD AND AN APPARATUS FOR CONTROLLING WORK PERFORMED BY AN AUTOMATIC WORK PROCESSING MACHINE

Shinichi Sarugaku, Funabashi, and Yasunori Shimura, Chiba, both of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Keiyo Engineering Co., Ltd., Narashino, both of, Japan

Filed Jan. 12, 1988, Ser. No. 143,067
Claims priority, application Japan, Jan. 13, 1987, 62-4117
Int. Cl.[4] B23K 9/12
U.S. Cl. 219—124.34 18 Claims



4. A method for welding two workpieces together with a welding torch, comprising the steps of:

controlling the movement of a welding torch along a line connecting the two workpieces together in accordance with control parameters;

setting a plurality of the control parameters to effect the result of the welding on the two workpieces;

imaging an area of said connecting line to obtain an image having a shape of a contour of said area where the welding has been performed and has left a molten pool that has subsequently solidified, and converting said image into electrical signals including data concerning conditions in said area;

extracting a plurality of data characteristic of said shape of said image from said electrical signal, said characteristic data being representative of results of the welding on said welding line;

comparing said extracted characteristic data with corresponding reference values representative of predetermined desired conditions of welding in said area, and detecting deviations between the characteristic data and the reference values; and

changing said control parameters according to the detected deviations in a direction such that said characteristic data approaches said reference values.

4,916,237

INSTANT HEATING SYSTEM FOR MOTOR VEHICLES AND THE LIKE

George Soden, 3731 Oceanic Ave., Sea Gate, Brooklyn, N.Y. 11224, and Howard J. Lettine, Rd. 4-Box 583, Middletown, N.Y. 10940

Filed Dec. 2, 1988, Ser. No. 278,767
Int. Cl.[4] H05B 1/02; F24H 3/04
U.S. Cl. 219—202 10 Claims

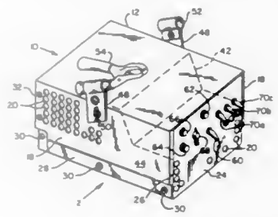
1. A heater for the interior of motor vehicles and the like operable from a source of DC electrical power comprising:

(a) a casing having an electric fan positioned in an airflow passage therein, said passage including a first multi-apertured wall in the rear of said casing upstream from said fan through which ambient air is drawn, and including a second multi-apertured wall in the front of said casing downstream from said fan through which air is discharged;

(b) airflow guide means located within the airflow passage in said casing downstream from said fan for guiding said air from said fan to said second wall;

(c) fan switch means connecting said electric fan to said DC electrical power source whereby said fan may be actuated by operating said fan switch means;

(d) a plurality of electrically powered heating coils located within said airflow passage downstream from said fan, each of said heating coils including a manually operable heater switch connected herewith for providing an electrical current path through each selected heating coil independently of the other coils upon operation of its associated heater switch;



(e) a power switch for said heating coils operable to connect said DC electrical power source to the selected ones of said heating coils only when said electric fan is actuated; and

(f) manually adjustable time delay means including a time adjustment control operable in response to operation of said power switch for automatically disconnecting said source of DC power from said heating coils upon expiration of the time selected by said time adjustment control.

4,916,288

ELECTRICALLY HEATED HORSESHOEING TOOL

Ralph F. Redden, Box 507, Versailles, Ky. 40383

Filed Jun. 26, 1989, Ser. No. 371,321
Int. Cl.[4] H05B 1/00
U.S. Cl. 219—228 2 Claims

2. An electrically heated tool for treating the ground contact surface of a horse's hoof, said tool comprising:

a generally horseshoe shaped part having a flat working surface,

at least one electrical heating element encased in said part and having first and second element ends extending from said part, said at least one heating element further comprising a conductor having first and second conductor ends and extending through said heating element with said first and second conductor ends extending from said first and second element ends,

an adaptor,

a hollow handle,

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a power cord having first and second wires and a ground wire,

first means for attaching said ground wire to said adaptor,

second means for attaching said first and second conductor ends to said first and second wires respectively,

said adaptor having first and second holes for receiving first and second heating element ends and first means for retaining said heating element ends in said first and second holes,

said handle being adapted to fit over said adaptor and having second means for retaining said handle on said adaptor,

whereby with (1) said first and second heating element ends inserted through said first and second holes in said adaptor and retained in said adaptor by said first means for retaining, (2) said first and second conductor ends attached to said first and second wires respectively by said second means for attaching, (3) said ground wire attached to said adaptor by said first means for attaching, (4) said power cord passed through said hollow handle and (5) said handle fitted over said adaptor and retained on said adaptor by said second means for retaining, said tool is assembled and ready for use in which said heating element heats said part and said working surface of said part is applied to said ground contact surface of said hoof for 3 to 10 seconds, the heating capacity of said at least one heating element being such that in a steady state heating situation the temperature of said part is in the range of 500° F. to 900° F.

4,916,289

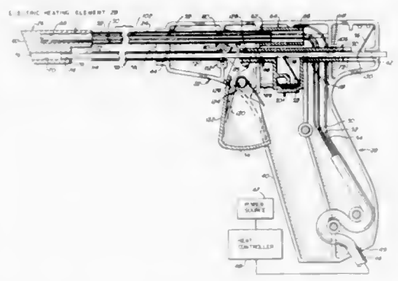
PLASTIC WELDER

Kenneth J. Suhanek, 9025 N. Karlov Ave., Skokie, Ill. 60076

Continuation-in-part of Ser. No. 29,454, Mar. 13, 1987, abandoned. This application Mar. 23, 1988, Ser. No. 172,077

Int. Cl.[4] H05B *1/00*

U.S. Cl. 219—230 16 Claims



1. A plastic welder for use in securing a first object formed of a given thermoplastic material to a second object formed of a similar thermoplastic material by producing a weld along a joint between said two objects through melting the portions of said first and second objects that are immediately adjacent said joint and applying to said joint a quantity of a similar thermoplastic material in melted form from a supply rod of such material, said given thermoplastic material and said similar thermoplastic material having predetermined melting ranges that overlap for at least a portion of their respective melting ranges, and have maximum safe temperatures above which said materials should not be heated, which plastic welder comprises:

(a) a casing having a feed aperture and a discharge aperture;

(b) a handle supporting said casing, said handle being grippable by a user of the plastic welder;

(c) a heating tip positioned outside of, and supported by, the casing, said heating tip defining (i) a heating element chamber to house a heating element, and (ii) an elongated supply rod heating chamber to receive a supply rod of thermoplastic material, said supply rod heating chamber having a feed aperture and a discharge aperture,

said heating tip having (i) a top wall, a bottom wall, and an elongated end wall in which said supply rod heating chamber discharge aperture is located, said elongated end wall facing away from the casing, (ii) two opposed side walls, (iii) a first medium plane located midway between said two side walls, and (iv) a second medium plane perpendicular to said first median plane and located midway between the top and bottom walls of the heating tip,

said end wall having an exterior end surface that is elongated in a direction that is generally vertical when the plastic welder is positioned so that said first median plane is vertically oriented and said second median plane is horizontally oriented, said elongated end surface being comprised of a plurality of parallel, substantially straight geometric elements that are disposed generally vertically when the plastic welder is positioned as just described, all said generally vertically disposed, substantially straight geometric elements in said end surface extending substantially from top to bottom of said exterior end surface at substantially the same acute angle to said second median plane, the one of said geometric elements located at the lateral center of said elongated end surface being located at least as far away from the casing as the remainder of said end surface, the width of said elongated end surface being substantially the same throughout the major portion of the length of the elongated end surface, the height of said elongated end surface of the end wall being substantially the same throughout the major portion of the width of the elongated end surface;

(d) means to support a supply rod within said casing, after the rod is inserted in the casing feed aperture, with one end of the rod exposed and protruding from the casing discharge aperture and into the supply rod heating chamber within the heating tip, where a portion of the rod will melt upon application of sufficient heat, said supply rod being formed of a thermoplastic material similar to the given thermoplastic material;

(e) means for advancing the supply rod out of said casing, and into the feed aperture of said supply rod heating chamber within the heating tip, to thereby (i) push a previously melted portion of the rod out of the supply rod heating chamber discharge aperture, and (ii) at the same time, position another portion of the supply rod within the supply rod heating chamber to be melted therein;

(f) manually actuatable operating means on the casing for the user of the plastic welder to selectively operate the supply rod advancing means, said operating means being actuatable by the same hand with which the user of the plastic welder grips the casing handle;

(g) an electrical heating element housed within the heating element chamber in the heating tip to provide a quantity of heat to the heating tip;

(h) a heat controller in circuit with the heating element to maintain the temperature of the heating tip, with the heating element housed therein, at a level at least high enough to fall within said overlapping portions of the predetermined melting ranges of given thermoplastic material and similar thermoplastic material, but not above the maximum safe temperature for either of said materials, when the exposed end of the supply rod is inserted within the supply rod heating chamber in the heating tip and the heating tip is in contact with the immediately adjacent portions of the two objects to be welded together, said heat controller providing an infinite number of possible temperature levels for the heating tip, in a continuous series from a predetermined minimum temperature level to a predetermined maximum temperature level; and

(i) manually operable selector means for the user of the plastic welder to set the temperature level provided by the heat controller at the appropriate level for the given thermoplastic material and said similar thermoplastic material,

whereby (1) when the exposed end of the supply rod is inserted in the supply rod heating chamber within the heating tip, and the heating tip with the heating element housed therein is brought into contact with the portions of the first and second objects to be welded immediately adjacent the joint between the two objects, the supply rod exposed end portion and said immediately adjacent portions of said first and second objects are melted, and (2) when the supply rod advancing means is operated to push the melted portion of the supply rod out of the discharge aperture of the supply rod heating chamber, the melted thermoplastic material from the supply rod and the immediately adjacent melted portions of the two objects are fused together, to form a weld after they are allowed to cool upon removal of the heating tip from the aforementioned contact with the adjacent portions of the two objects.

4,916,290

PORTABLE OVEN AND AN IMPROVED METHOD FOR HEATING FOOD

Junior F. Hawkins, 3120 W. 16th, Wichita, Kans. 67203-1742

Continuation-in-part of Ser. No. 78,203, Jul. 27, 1987. This application Oct. 27, 1988, Ser. No. 263,399

Int. Cl.[4] H05B *3/36*

U.S. Cl. 219—385 15 Claims

1. A pliable and flexible oven for heating food and the like comprising a pliable and flexible waterproof, reflective inside wall wherethrough heat can be conducted; a pliable and flexible outside wall secured to said inside wall, said inside and outside walls being secured to each other such as to form a front outer cover, a rear outer cover, and an intermediate cover strip secured to said front outer cover, to said rear outer cover in order to form a pair of ends and a bottom and an opening communicating with the inside wall, said rear outer cover extending beyond said opening to define a cover flap that is adaptable to generally close said opening; a fastening means secured to said cover flap and to said front outer cover for sealing the opening to totally enclose any food that has been disposed through the opening and resting on the waterproof, reflective inside wall; and a pliable and flexible heating element means for heating food resting on the inside wall, said heating element means disposed between the inside and outside wall and extending through the outside wall to communicate with a power source, said waterproof, reflective inside wall comprising polyethylene terephthalate.

4,916,291

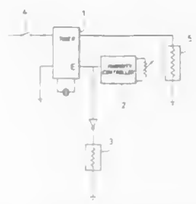
ELECTRIC DRYING APPARATUS AUTOMATIC CONTROLLER

Yih-Ching Jan, 2Fl., No. 1, Alley 2, Lane 258, Fu Hsing Rd., Luchou Hsiang, Taipei Hsien, Taiwan

Filed Feb. 9, 1989, Ser. No. 308,079

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—492 3 Claims



1. An electric drying apparatus automatic controller for controlling an electric drying apparatus comprising:

a humidity controller means for providing a high signal when relative humidity within a revolving cylinder of said drying apparatus is above a fixed value and a low signal when said relative humidity is below said fixed value;

a timer means connected to a heater of said drying apparatus and to said humidity controller means for receiving said high and low signals and providing on and off signals for respectively turning said heater on and off, said, timer means being preset for a period of heating time; and said timer means starting and continuing counting of said period of heating time and providing said on signal to said heater when a power switch of said drying apparatus is turned on as long as said low signal is received, and providing said on signal to said heater and discontinuing said counting when said high signal is received; after said counting has been discontinued, said timer means resetting and restarting said counting when said low signal is received, and said timer means providing said off signal to said heater after counted time equals said period of heating time; and

an exhaust control valve means connected to said humidity controller means and receving said high and low signals therefrom for exhausting air from within said revolving cylinder when said high signal is received, and containing said air within said revolving cylinder when said low signal is received.

4,916,292

COILED RESISTANCE HEATING ELEMENT OF CARBONACEOUS MATERIAL

Takamasa Kawakubo, Gunma; Mitsuru Yoshida, Fujioka, and Yoshihisa Suda, Maebashi, all of Japan, assignors to Mitsubishi Pencil Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1988, Ser. No. 181,368

Int. Cl.[4] H05B *3/10*

U.S. Cl. 219—553 10 Claims

1. A coiled resistance heating element of carbonaceous material substantially composed of carbon and having properties peculiar to carbon, produced by carbonization of a coiled strand of a composite a organic material wherein said organic material is selected from the group consisting of asphalt pitches, dry-distilled pitches, and organic polymers selected from the group consisting of polyvinyl chloride, polyvinyl alcohol, vinyl chloride/vinyl acetate copolymers, polyamides, polyimides, phenolic resins, furan resins, epoxy resins, unsaturated polyester resins, lignin, cellulose, tragacanth gum, arabic gum, polysaccharides, formalin condensates of napthalenesulfonic acid, and indanthrene-type vat dyes, and mixtures thereof.

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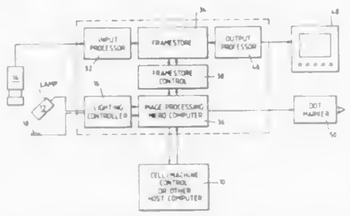
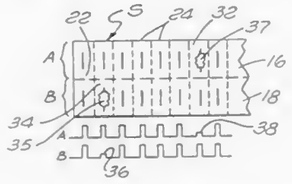
4,916,293
IDENTIFICATION IN MANUFACTURE
Andrew G. Cartlidge, Alvaston, and Eric Warren, Etwall, both of England, assignors to Rolls-Royce plc, London, United Kingdom
Filed Dec. 8, 1987, Ser. No. 130,325
Claims priority, application United Kingdom, Feb. 25, 1987, 8704474
Int. Cl.[4] G06F 15/20
U.S. Cl. 235—375 12 Claims



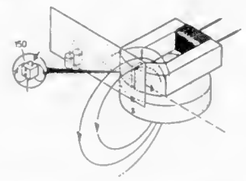
1. A method of identifying a workpiece in the course of its manufacture, in which the workpiece carrying an existing identification marking is supplied to an apparatus in which it is to be subject to a process that removes or obscures the marking, the marking is machine-read after the workpiece has been placed in the apparatus but before the process begins, data from the reading is put in store, and at the end of the process the identification is re-marked on the workpiece in accordance with the stored data while the workpiece is retained in a predetermined position in the apparatus.

4,916,294
SYSTEM FOR RELIABLE DIGITAL RECORDING ON UNRELIABLE MAGNETIC MEDIA
Robert N. Goldman, Honolulu, Hi., assignor to Light Signatures, Inc., Los Angeles, Calif.
Filed Jul. 25, 1988, Ser. No. 223,311
Int. Cl.[4] G06K 5/00, 7/08
U.S. Cl. 235—449 14 Claims



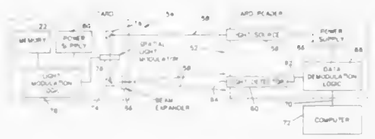
1. A process for recording digital data on marginal magnetic medium comprising the steps of:
defining a pair of record tracks on said magnetic medium with bit locations;
recording a digit in each bit location of each record track of said magnetic medium;
testing pairs of bit locations from said pair of record tracks to signal record quality for both locations in a pair with respect to said recorded digits, said pair of bit locations including a bit location from each track; and
altering the record of said magnetic medium to record digital data selectively in pairs of bit locations signaled to be of record quality by said testing step.

4,916,295
DOCUMENT DETECTING ARRANGEMENT
Pawel Chominski, Huddinge, Sweden, assignor to Inter Innovation AB, Stockholm, Sweden
Filed May 25, 1988, Ser. No. 198,354
Claims priority, application Sweden, Jun. 12, 1987, 87-02455
Int. Cl.[4] G06K 7/08
U.S. Cl. 235—449 2 Claims



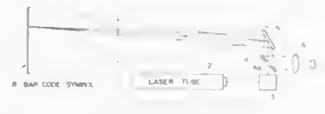
1. An arrangement for detecting documents, such as bank notes, cheques, coupons and the like, exhibiting magnetic properties, the arrangement including transport means (11) for transporting documents along a transport path (0—0) past a magnetic detector (12–14), the magnetic detector (12–14) including means (12) for generating a permanent magnetic field having a north-south-direction in magnetic circuit (13) and being so positioned in relation to the transport means (11) that transported documents are caused to pass by said magnetic circuit (13) and therewith cause changes to occur in the magnetic field in response to the magnetic properties of the documents, characterized in that said magnetic circuit (13) comprises a pair of substantially parallel arms (132, 133) jointed at one end thereof by a yoke and configured at the other end thereof to define a narrow air gap, said gap being located closely adjacent said transport path (0—0) and lying within a plane intercepting the transport path (0—0) essentially perpendicularly to said path, and a detector means (14) which is operative to detect any change in the magnetic field that might occur; said generating means (12) being structured so that the north-south-direction of said magnetic field at a location closely adjacent the air gap extends in the same direction as an intersecting line between said plane and the transport path of a passing document, and said magnetic field at a location closely adjacent the air gap (131) being oriented to lie in said plane; and the output side of the detector means (14) being connected to a signal processing means (30–34) for generating a profile signal in dependence on the magnetic properties of the document.

4,916,296
LIGHT MODULATING SMART CARD
Donald A. Streck, Ojai, Calif., assignor to Jerry R. Iggulden, Santa Clarita, Calif., a part interest
Continuation of Ser. No. 113,899, Oct. 29, 1987, abandoned.
This application Mar. 23, 1989, Ser. No. 328,785
Int. Cl.[4] G06K 7/10
U.S. Cl. 235—454 10 Claims



1. In a smart card system comprising a smart card having a digital memory therein containing data and a reader for reading the data from the smart card, the improvement comprising:
(a) spatial light modulator light modulating means incorporated into the smart card for modulating a continuous light beam passing therethrough from a front side to a back side of said spatial light modulator with the data in the memory;
(b) light sensing means associated with the reader for detecting said light beam and for demodulating the data therefrom;
(c) the reader including light producing means for producing said beam of light and for directing it on the smart card; and,
(d) the smart card including light directing means separate from said light modulating means for receiving said beam of light from the reader, for directing said beam of light through said light modulating means from said front side to said back side, and for directing said beam of light back to said light sensing means of the reader.

4,916,297
CODE READER
Toshirou Tukada, and Koichi Kameyama, both of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 121,644, Nov. 16, 1987, abandoned.
This application Jul. 12, 1989, Ser. No. 378,485
Claims priority, application Japan, Nov. 17, 1986, 61-273187
Int. Cl.[4] G06F 7/10
U.S. Cl. 235—462 9 Claims



1. A bar code reader for reading a bar code disposed on a surface of an object, comprising:
scanner means, including a galvano mirror, for scanning the bar code in a first direction and in a second direction opposite to said first direction, said scanner means including an illuminating light source for illuminating a bar code pattern via said galvano mirror, said bar code pattern having at least first and second partial code patterns divided by a center bar for optically distinguishing said first and second partial code patterns from each other;
light receiving means for receiving light reflected by said at least first and second bar code patterns, and for generating respective output signals in accordance with said reflected light;
binary processing means for binating said output signals generated by said light receiving means;
decoding means operably connected to said scanner means for decoding the binary signals corresponding to each of said at least first and second partial code patterns according to an output power of said binary processing means;
said decoding means including means for judging whether the partial code pattern data corresponding to respective ones of said at least first and second partial code patterns is correctly read;
memory means, responsive to said judging means, for storing the partial code pattern data correctly read; and
code data composing means for composing said at least first and second partial code pattern data stored in said memory means, said bar code pattern being illuminated with said illuminating light source by moving one of said scanner means and said bar code pattern thereacross.

4,916,298
METHOD FOR THE OPTICAL READING OF BAR CODES
Moreno Raphaël, Marseilles, France, assignor to SGS-Thomson Microelectronics SA, Gentilly, France
Filed Oct. 31, 1988, Ser. No. 265,230
Claims priority, application France, Nov. 6, 1987, 87 15403
Int. Cl.[4] G06K 7/10
U.S. Cl. 235—463 8 Claims

1. A method for the optical reading of bar codes, comprising the following sequence of processing operations:
(a) providing, by means of an optical detector, a representation of a zone containing the bar code, in the form of a matrix of pixels in which each pixel represents a binary logic state characteristic of a dot of the zone;
(b) computing the total Tj of the number of pixels in a first logic state for each column of the matrix, j being the column index of the matrix;
(c) establishing a value SDA such that the columns for which Tj is below SDA are not considered as probably containing a bar of the bar code;
(d) determining, by making j increase, a sequence of abscissae of columns XA1, XA2, . . ., XAr etc., for which Tj crosses the value SDA in a first direction and a sequence of abscissae of columns XB1, XB2. . . . XBR, etc. for which Tj crosses the value SDA in the other direction;
(e) demarcating, in the matrix of pixels, for each index r, a rectangle having, as its sides, the columns of abscissae XAr, XBr or immediately adjacent columns;
(f) comparing, for each rectangle, a parameter of the total image represented by the pixels of a defined logic state, contained in this rectangle, with a theoretical, nominal parameter of a bar code bar which would be pointed essentially in the direction of the columns of the rectangle;
(g) giving a binary electrical signal of a first logic state or a second logic state as a function of the result of the comparison, said signal representing the presence or absence of a bar.

4,916,299
CARD RECEPTICLE HOUSING
Aaron M. Fish, Cote St. Luc; Leon Mayzels, Montreal; Alexander Branover, Cote St. Luc; Masoud Miresmaili, Lasalle, and Jean-Paul Dansereau, Laval, all of Canada, assignors to ILCO Unican Inc., Moutreal, Canada
Division of Ser. No. 779,455, Sep. 24, 1985, Pat. No. 4,762,212.
This application Mar. 4, 1988, Ser. No. 164,201
Int. Cl.[4] G06K 13/00
U.S. Cl. 235—482 1 Claim

1. A card receiving arrangement mounted on, and integral with, a housing for a actuator assembly, said housing having a front wall, a rear end spaced from said front wall, a top edge and a bottom edge;
said arrangement comprising:
a recess formed in said front wall, said recess comprising a back wall, first and second opposing and spaced side walls and a bottom wall;
said back wall extending from said top edge to said bottom wall and sloping inwardly from said top edge to said bottom wall;
a barrier wall portion of said front wall extending from said first side wall to said second side wall across said recess to cover a portion of said recess;

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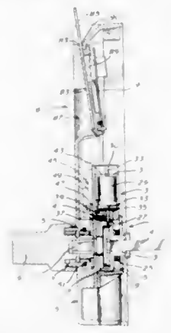
wherein a slot is formed between the interior surface of said barrier wall and said back wall; and

wherein, an opening is defined below said barrier wall by the



bottom edge of said barrier wall and the edges of said first, second and bottom walls;

whereby a card is inserted into said arrangement from said top edge, through said slot and behind said opening.

4,916,300

OPTICALLY READABLE/WRITABLE CARD

Takeshi Ishida, Takatsuki, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 37,535, Apr. 13, 1987, abandoned. This application Jun. 28, 1989, Ser. No. 372,114

Claims priority, application Japan, Apr. 15, 1986, 61-57165[U]

Int. Cl.⁴ G06K *19/00*

U.S. Cl. 235—487 **2 Claims**

1. An optically readable/writable card comprising a card substrate, a recording medium layer on said card substrate, a transparent protection layer laminated to cover said recording medium layer, said transparent protection layer being formed with a recess portion at a position corresponding to said recording medium layer, and the bottom surface of said recess portion being located lower than the surface of the card, said recess portion being formed by a depression in an upper surface of said transparent protection layer at the position corresponding to said recording medium layer.

4,916,301

GRAPHICS FUNCTION CONTROLLER FOR A HIGH PERFORMANCE VIDEO DISPLAY SYSTEM

Robert L. Mansfield; Alexander K. Spencer, both of Austin, and Joe C. St. Clair, Round Rock, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 13,849, Feb. 12, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,792

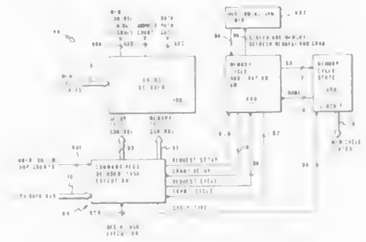
Int. Cl.⁴ G09G *1/00*

U.S. Cl. 340—747 **20 Claims**

1. A processing system comprising:

external device means for executing an external device command, each external device command being executed within a fixed time cycle; and

a processor means connected to said external device means for decoding processor means instructions, each instruction decoded to provide an external device means command and an internal processor command wherein said internal processor command is derived from the decoded instruction, a current state of the processor means, and a



signal from said external device means indicating a current state of the external device means, said processor means including means for providing said external device command to said external device means and simultaneously executing said internal processor command within the same fixed time cycle.

4,916,302

APPARATUS FOR AND METHOD OF MEASURING DISTANCES TO OBJECTS PRESENT IN A PLURALITY OF DIRECTIONS

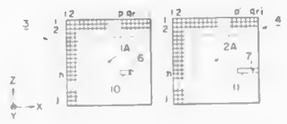
Kanehiro Sorimachi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 827,016, Feb. 7, 1986, Pat. No. 4,749,848. This application Mar. 28, 1988, Ser. No. 174,441

Claims priority, application Japan, Feb. 9, 1985, 60-22798

Int. Cl.⁴ G01V *1/20*

U.S. Cl. 356—1 **12 Claims**



1. A method for measuring the distances to objects present in a plurality of directions, comprising the steps of:

setting a plurality of measuring regions for each of first and second photodetectors and predetermining a plurality of pairs of regions, each pair having a measuring region from said first photodetector and a measuring region from said second photodetector, each pair being associated with a different direction from one another;

receiving light from the objects by means of said first photodetector through a first optical system;

receiving light from the objects by means of said second light receiving surface through a second optical system, said first and second optical systems being disposed in a predetermined relationship to each other;

taking a correlation between the illumination distributions in said paired regions of said first and second photodetectors; and

calculating each of the distances to the objects present in different directions corresponding to said plurality of pairs of regions, on the basis of the result of said correlation-taking step for each said pair of regions to measure the distances to the objects.

4,916,303

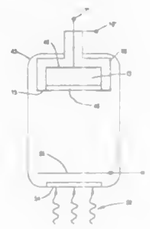
ELECTRON BEAM CONTROLLED BULK SEMICONDUCTOR SWITCH WITH CATHODOLUMINESCENT ELECTRON ACTIVATION

Karl H. Schoenbach, Norfolk; Vishnukumar K. Lakdawala, Virginia Beach; Ralf P. Brinkmann, and Glenn A. Gerdin, both of Norfolk, all of Va., assignors to Center for Innovative Technology, Herndon, Va.

Continuation-in-part of Ser. No. 184,680, May 16, 1989, Pat. No. 4,831,248, which is a continuation-in-part of Ser. No. 82,546, Apr. 25, 1989, Pat. No. 4,825,061. This application May 15, 1989, Ser. No. 351,218

Int. Cl.⁴ H01J *40/14*

U.S. Cl. 250—211 R **11 Claims**



1. A vacuum tube switching device, comprising:

first and second terminals;

a block of direct semiconductor material with a first contact on a first surface connected to the first terminal, a second contact on a second surface, opposite the first surface, connected to the second terminal and a doped region exposed by the first surface;

electron beam means for directing an electron beam onto the first surface and into the doped region of said block to produce an electron-hole plasma between the first and second contacts by direct impact, recombination radiation and Bremsstrahlung, thereby permitting current to flow between the first and second terminals during irradiation of said block by the electron beam; and

an enclosure, surrounding said block and said electron beam means, for maintaining pressure within said enclosure below atmospheric pressure, said first and second terminals extending beyond said enclosure.

4,916,304

IMAGE RECORDING DEVICE HAVING A CONDUCTIVE LAYER FORMED BELOW A LIGHT RECEIVING WINDOW

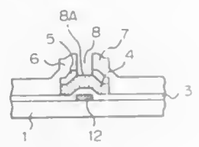
Satoshi Itabashi, Atsugi; Toshihiro Saika, and Ikuchiro Gofuku, both of Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 104,986, Oct. 6, 1987, abandoned. This application Dec. 23, 1988, Ser. No. 290,805

Claims priority, application Japan, Oct. 7, 1986, 61-237066; May 31, 1987, 62-135420

Int. Cl.⁴ H01J *40/14*

U.S. Cl. 250—211 R **5 Claims**



1. A photosensor, comprising:

an electrically insulating, translucent substrate;

an opaque conductive layer formed on said substrate;

an insulating layer formed on said conductive layer;

a semiconductive layer formed on said insulating layer for receiving light and providing a current corresponding thereto;

a pair of electrodes formed in contact with said semiconductive layer and defining a light receiving window therebetween, said electrode being formed so as to not substantially overlap said conductive layer; and

means for supplying said conductive layer with a bias voltage corresponding to a polarity and an amount of carriers defining the current of the semiconductor layer and a voltage Va of a small absolute value during a non-reading period of said photosensor.

4,916,305

OPTICAL DETECTORS WITH SELECTIVE BIAS VOLTAGE APPLICATION

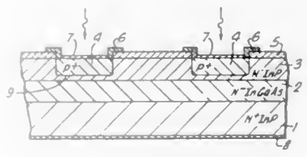
George R. Antell, Saffron Weldron, Great Britain, assignor to STC PLC, London, England

Filed Nov. 2, 1988, Ser. No. 266,389

Claims priority, application United Kingdom, Nov. 3, 1987, 8725687

Int. Cl.⁴ H01J *40/14*; **H01L** *27/14*

U.S. Cl. 250—211 J **7 Claims**



1. An optical detector array, comprising an N^+-type single crystal indium phosphide substrate on one major surface of which is provided a common electrical contact for the array and on the opposite major surface of which is provided a first, N^--type indium gallium arsenide layer grown on the substrate, a second N^--type indium phosphide layer grown on the first layer, an array of P^+-type regions disposed in the second layer and providing the optically responsive elements of the detector array, each said P^+-type region extending into the first layer but not into the second layer whereby to form a PN junction adjacent the boundary between the first and second layers so as to form a PIN diode structure, and means for selectively applying a bias voltage to each said PIN diode structure, wherein each said PN junction is so disposed relative to the boundary between the first and second layers that, when a said bias voltage is applied to said corresponding PIN diode structure, a depletion layer associated with that junction extends into the first layer thereby reducing a hole potential barrier associated with the PN junction and rendering that PIN diode selectively responsive to incident light.

4,916,306

DEVICE FOR DETECTING SPATIAL VARIATION IN THE INTENSITY OF ELECTROMAGNETIC RADIATION

Denis L. Heidtmann, Portland, and Morley M. Blouke, Beaverton, both of Oreg., assignors to Tektronix, Beaverton, Oreg.

Filed Jul. 14, 1988, Ser. No. 219,024

Int. Cl.⁴ H01L *27/14, 31/06*

U.S. Cl. 250—211 J **23 Claims**

18. A device for detecting spatial variation in the intensity of electromagnetic radiation in a given spectral region, comprising:

a body of semiconductor material that responds to electromagnetic radiation in said given spectral region by gener-

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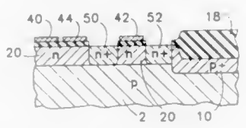
ating charge carriers, the body of semiconductor material having first and second charge collection regions separated by a barrier region that forms a potential barrier to the charge carriers in the charge collection regions,



means for establishing a predetermined potential in the charge collection regions, whereby charge carriers can be accumulated in the charge collection regions, and

first and second floating diffusion amplifiers connected to said first and second charge collection regions respectively for extracting charge therefrom.

4,916,307

LIGHT INTENSITY DETECTING CIRCUIT WITH DARK CURRENT COMPENSATION

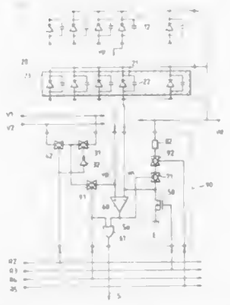
Takashi Nishibe, and Shotaro Yokoyama, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Dec. 12, 1988, Ser. No. 282,813

Claims priority, application Japan, Dec. 15, 1987, 62-315306; Jun. 2, 1988, 63-136596

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—214 C 6 Claims



1. A received light intensity detecting circuit with an optical sensor having first and second terminals and a parallel capacitor and being connected at the first terminal with a predetermined potential, first potential applying means connected between the second terminal of the optical sensor and a source of a first potential and rendered conductive at an initial setting, and a comparator having a first input terminal connected to the second terminal of the optical sensor and a second input terminal receiving a comparative reference potential of a level between the predetermined potential and the first potential such that the intensity of received light is detected as the time period between the initial setting and the instant when an output signal is generated from the comparator, comprising:

an optically shielded mimic sensor having a first terminal connected to the predetermined potential and a second terminal connected to the second input terminal of the comparator and having the same structure as that of the optical sensor including a corresponding parallel capacitor;

a source of a second potential having a level between the predetermined potential and the first potential; and

second potential applying means connected between said second potential source and the second terminal of said mimic sensor and being rendered conductive only at said initial setting.

4,916,308

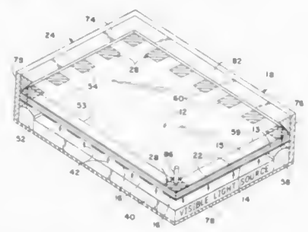
INTEGRATED LIQUID CRYSTAL DISPLAY AND OPTICAL TOUCH PANEL

Robert D. Meadows, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 17, 1988, Ser. No. 258,420

Int. Cl.[4] G06F *3/03;* **G01V** *9/04*

U.S. Cl. 250—221 5 Claims



1. An integrated display and optical touch panel apparatus, comprising:

(a) a display panel having a plurality of elements arranged in a matrix of multiple columns and multiple rows;

(b) emitter means associated with a first column of elements for projecting light toward those elements, the first column of elements being controllable for assuming a transparent state and an opaque state, the light propagating through any one of the first column of elements that is in the transparent state;

(c) reflection means for directing across the surface of the display panel light propagating through any element in the first column of elements; and

(d) detection means for detecting the light reflected by the reflection means and for providing a signal indicative thereof.

4,916,309

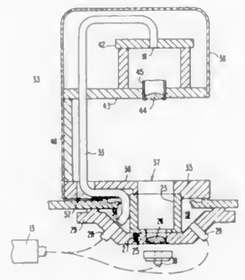
APPLIANCE FOR CONVERTING REFLECTANCE MEASURING INSTRUMENT INTO A TRANSMITTANCE MEASURING INSTRUMENT

Thomas J. Keane, Gaithersburg, Md., assignor to BYK-Gardner, Inc., Silver Spring, Md.

Filed Jan. 9, 1989, Ser. No. 294,678

Int. Cl.[4] H01J *5/16*

U.S. Cl. 250—227.29 4 Claims



1. An appliance for converting a reflectance measuring instrument into a transmittance measuring instrument wherein said reflectance measuring instrument comprises reflectance sample receiving means to receive a reflectance sample, light sournce means to direct light toward a reflectance sample received by said reflectance sample receiving means to be reflected by such reflectance sample, and light receiving means to receive and perform measurements on light reflected by such reflectance sample, wherein said appliance comprises fitting means to make a fit with said instrument, means to receive a transmittance sample, fiber optic means having a receiving end positioned to receive light from said light source means when said fitting means makes a fit with said instrument, said fiber optic means having a transmitting end positioned to transmit light through a transmittance sample received by said transmittance sample receiving means to said light receiving means when said fitting means makes a fit with said instrument.

4,916,310

IMAGE READ-OUT APPARATUS WITH IMAGE SIGNAL ADDING

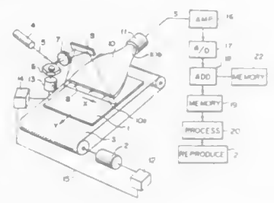
Ryousuke Furue, and Toshitaka Agano, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 20, 1988, Ser. No. 260,110

Claims priority, application Japan, Oct. 20, 1987, 62-265001

Int. Cl.[4] H01J *3/14*

U.S. Cl. 250—236 2 Claims



1. An image read-out method for obtaining image signals by scanning a material to be scanned, which carries an image recorded thereon and which is conveyed in a sub-scanning direction, by a light beam deflected by a rotating polygon mirror having a plurality of mirror surfaces, in a main scanning direction approximately normal to the sub-scanning direction, and photoelectrically detecting light, which carries the image and which is obtained from a portion scanned by the light beam, by a light detection means to produce image signals, an image signal corresponding to the detected light produced over a single scan of a scanning line in the main scanning direction,

wherein the improvement comprises the steps of:

obtaining image signals, each obtained in each of main scanning steps, in a number obtained by a single turn of said rotating polygon mirror or n turns thereof, where n is an integral multiple of one,

(ii) adding said number of image signals to obtain a summed image signal over a single main scanning line and

(iii) identifying as the image signal representative of image information in a scanning line the summed image signal for that scanning line.

4,916,311

ION BEAMING IRRADIATING APPARATUS INCLUDING ION NEUTRALIZER

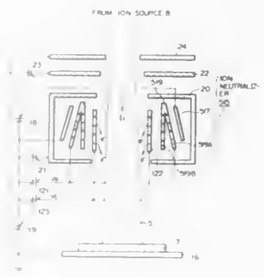
Naomitsu Fuzishita; Shigeo Sasaki; Yasushi Matsumura; Akira Shuhara, and Kazuhiro Shono, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1988, Ser. No. 166,074

Claims priority, application Japan, Mar. 12, 1987, 62-55303; Mar. 18, 1987, 62-64861; Mar. 18, 1987, 62-64863; Jul. 20, 1987, 62-180298

Int. Cl.[4] H05H *3/00*

U.S. Cl. 250—251 5 Claims



1. An ion beam irradiating apparatus for irradiating a specified neutralized ion beam to a sample, comprising:

generating means for generating ion beams;

accelerating means for accelerating the ion beams produced from the generating means;

selecting means for selecting a specified ion beam from the accelerated ion beams; and

ion neutralizer means for neutralizing ions in said specified ion beams, positioned between the selecting means and the sample and including

an electron beam emitting source inclined with respect to an irradiation direction of the specified ion beam, for emitting an electron beam,

electron drawing means positioned parallel to the electron beam emitting source, for electronically drawing the emitted electron beam from the electron beam emitting source to an orbit of the specified ion beam, said drawn electron beam having a velocity component directed toward the sample,

first electron scatter preventing means for preventing the electron beam emitted from the electron beam emitting source from being scattered outside the ion neutralizer means;

second electron scatter preventing means for preventing the electron beam induced into the orbit of the specified ion beam from being scattered in a direction opposite to the ion irradiating direction; and

electron energy controlling means for electronically controlling the energy of the electron beam drawn by the electron drawing means into the orbit of the specified ion beam,

wherein said electron drawing means

an electron incoming plane, positioned parallel to the electron beam emitting source; and

an electron outgoing plane, positioned parallel to the electron energy controlling means, which is inclined with respect to said electron incoming plane at a predetermined angle.

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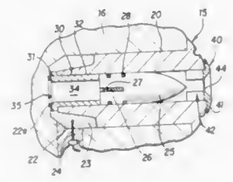
4,916,312
DEVICE FOR PLACING A RADIOACTIVE SOURCE IN A FORMATION THROUGH WHICH A BOREHOLE PASSES

Ian C. Ellis, Stavanger, Norway; Fernand Fourcade, Estagel, and Patrick Vandenabeele, Clamart, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Mar. 4, 1988, Ser. No. 164,254
Claims priority, application France, Mar. 5, 1987, 87 02974
Int. Cl.[4] G01V *5/00*
U.S. Cl. 250—260 18 Claims

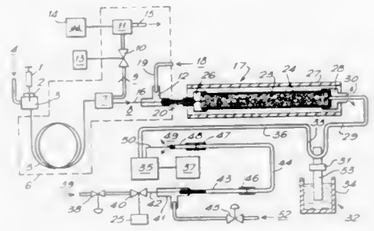


1. A device for firing a radioactive source into a formation through which a borehole passes, said device comprising:
a gun barrel;
a bullet having a radioactive source and engaged in said barrel;
explosive means located behind said bullet to propel said bullet towards the formation upon detonation of said explosive means; and
retarding means located between said explosive means and said bullet, said retarding means including a chamber having sufficient volume so as to enable gases produced by said explosive means upon detonation to expand, thereby reducing the impact of said gases on said bullet and retarding the speed at which said bullet penetrates into the formation upon detonation of said explosive means

4,916,313
METHOD AND APPARATUS FOR THE DETERMINATION OF ISOTOPIC COMPOSITION

Keith Hall, Altrincham; Philip A. Freedman, Hartford; Elizabeth J. Jumeau, Leftwich, all of England; Roger Guilluy, St Bon et de Mure, France; Christiane Pachiaudi, Meyrieu, France, and Jean P. Riou, Lyon, France, assignors to VG Instruments Group Limited, Crawley, England

Filed Aug. 31, 1988, Ser. No. 238,910
Claims priority, application United Kingdom, Sep. 2, 1987, 8720586
Int. Cl.[4] B01D *59/44*
U.S. Cl. 250—282 24 Claims



1. A method of determining the isotopic composition of an element comprised in a sample, said method comprising the steps of:
a) passing a carrier gas through a gas chromatographic column and introducing said sample in to the column;
b) converting at least some of said sample present in the effluent from the column into an analysis gas comprising said element in elemental form or in the form of a simple compound;
c) introducing at least one calibration sample of a reference gas containing said element into a mass spectrometer during at least one first time interval;
d) allowing carrier gas which has passed through the column to flow into the mass spectrometer only during at least one second time interval, at least some of said analysis gas being allowed into the mass spectrometer during a said second time interval, said first and second time intervals being non-overlapping; and
e) determining the isotopic composition of said element in said analysis gas from outputs of the mass spectrometer indicative of said element in said analysis gas and said reference gas.

4,916,314
METHOD AND APPARATUS FOR ANALYZING COMPONENTS OF SELECTED FLUID INCLUSIONS

Michael P. Smith, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

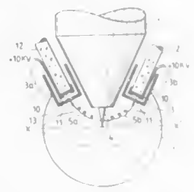
Filed Sep. 23, 1988, Ser. No. 248,526
Int. Cl.[4] H01J *37/26*
U.S. Cl. 250—307 17 Claims

1. Method for obtaining information useful in exploring for oil and gas by analyzing composition of nonvolatile components of specific individually targeted fluid inclusions in sedimentary mineral matrix comprising:
in a sample chamber of an electron microprobe, directing a matrix-abrading ion beam at matrix adjacent overlaying a specific individually targeted fluid inclusion in a specimen of sedimentary mineral matrix comprising a plurality of fluid inclusions less than 100 microns in diameter;
uncovering and exposing specifically the individually targeted fluid inclusion;
then, using the electron microprobe, directing an X-ray emission stimulating beam of electrons at the specific individually targeted uncovered and exposed inclusion stimulating emission of characteristic X-rays and determining atomic elements present in the uncovered and exposed inclusion from the emitted characteristic X-rays.

4,916,315
SCANNING ELECTRON MICROSCOPE FOR OBSERVING AND MEASURING MINUTE PATTERN OF SAMPLE

Tadashi Otaka, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 30, 1989, Ser. No. 330,766
Claims priority, application Japan, Apr. 1, 1988, 63-78149
Int. Cl.[4] H01J *37/28*
U.S. Cl. 250—310 5 Claims

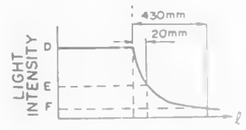


1. A scanning electron microscope for observing and measuring a minute pattern of a sample comprising,
an electron lens for focusing an electron beam from an electron source onto the sample, wherein the electron beam scans on the sample,
an inclining means for inclining the sample at an arbitrary angle α, and
two secondary electron detectors are disposed at the positions which are respectively turned at the same angle θ around a central axis of the electron beam from a plane which contains an axis of inclination of the sample and the central axis of the electron beam.

4,916,316
RADIATION IMAGE RECORDING AND REPRODUCING METHOD

Chiyuki Umemoto; Masanori Teraoka, and Nobuyoshi Nakajima, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 20, 1987, Ser. No. 39,845
Claims priority, application Japan, Apr. 20, 1986, 61-90787
Int. Cl.[4] G03C *5/16*
U.S. Cl. 250—327.2 5 Claims

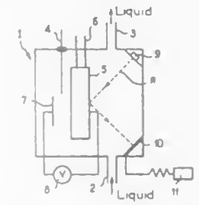


1. A radiation image recording and reproducing method for storing a radiation image on a stimulable phosphor sheet, scanning the stimulable phosphor sheet with stimulating rays which cause it to emit light in proportion to the stored radiation energy, photoelectrically detecting the emitted light to obtain an image signal, and reproducing a visible radiation image by use of the image signal,
wherein the improvement comprises the step of detecting said image signal including a stimulated light emission signal obtained by photoelectrically detecting said light emitted by a portion of said stimulable phosphor sheet exposed to said stimulating rays, and a stimulated light emission after-glow signal obtained by photoelectrically detecting a stimulated light emission after-glow emanated by the portion of said stimulable phosphor sheet which is no longer exposed to said stimulating rays after being exposed to said stimulating rays, said detection of said image signal being carried out with the criteria such that the level of said stimulated light emission after-glow signal detected at a position on said stimulable phosphor sheet 20 mm beyond the position where exposure to said stimulating rays is completed is not higher than $10^{-2.5}$ times the level of said stimulated light emission signal, and the level of said stimulated light emission after-glow signal detected at a position 430 mm beyond the position where exposure to said stimulating rays is completed is not higher than $10^{-3.3}$ times the level of said stimulated light emission signal.

4,916,317
METHOD AND A DEVICE FOR DETECTING CHANGES IN A SURFACE STATE AND FOR MONITORING THE SURFACE STATE

Jean-Marie Gabriel, Le Pecq; Louis Cognet, Le Vesinet; Robert Semet, Lyon; Gilles Courtois, and Nadine M. R. Courtois, both of Ecully, all of France, assignors to Societe Lyonnaise Des Eaux, Paris, France

Filed Oct. 6, 1988, Ser. No. 254,360
Claims priority, application France, Oct. 9, 1987, 87 13969
Int. Cl.[4] G01N *21/55*
U.S. Cl. 250—341 15 Claims



1 A method of detecting changes in and monitoring the surface state of a reference body of metal whose surface is at a given temperature and is in contact with a flowing liquid at a given temperature, which may optionally be different from the given temperature of the surface, comprising the steps of placing the reference body in the liquid, the reference body having a surface at a temperature which is adjustable independently of the temperature of the liquid, and the reference body acting as an electrode which is optionally raised to an adjustable potential, and detecting the surface state of the reference body by measuring the intensity of light radiation reflected from at least one mirror-forming portion of the surface of the reference body.

4,916,318
SCAN TYPE OPTICAL READER WITH CHANGING BEAM WAIST POSITION

Mitsunori Iima, Tokyo, Japan, assignor to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Dec. 16, 1987, Ser. No. 133,895
Claims priority, application Japan, Dec. 16, 1986, 61-299675; Dec. 16, 1986, 61-299676; Dec. 19, 1986, 61-303206; Dec. 22, 1986, 61-305947; Feb. 26, 1987, 62-27861; Apr. 22, 1987, 62-97593; Sep. 17, 1987, 62-141787[U]
Int. Cl.[4] G06K *7/10*; H01J *5/16*
U.S. Cl. 250—568 22 Claims

22. A scan type optical reader comprising:
a laser source;
an optical deflecting member for defecting a laser beam emitted from said laser source and for projecting the laser beam to a subject to be scanned;
a projecting lens disposed between said laser source and said optical deflecting member;
a light receiving device for receiving the laser beam re-

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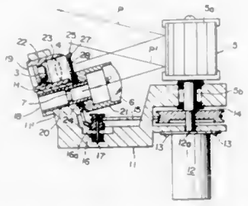
flected by the subject to be scanned in order to read information on said subject;

means for changing a beam waist position of the laser beam



with respect to said projecting lens, disposed between said laser source and said optical deflecting member; and

means for moving said means for changing a beam waist position into and out of the optical path of the laser beam.

4,916,319

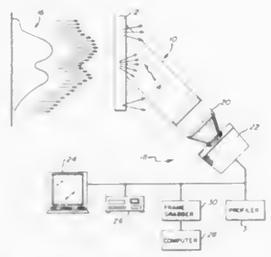
BEAM INTENSITY PROFILOMETER

William B. Telfair, Newtown; Clifford A. Martin, Bridgeport; Paul R. Yoder, Wilton, all of Conn., and Eugene I. Gordon, Pacific Palisades, Calif., assignors to Tauton Technologies, Inc., Monroe, Conn.

Filed Apr. 22, 1988, Ser. No. 185,152

Int. Cl.[4] G01J *5/48*

U.S. Cl. 250—461.1 **17 Claims**



1. A beam intensity profilometer, comprising:

means to produce a fluorescent emission distribution having a spatial distribution linearly proportional to the local intensity of an incident UV beam aimed on the emission distribution means, said means to produce the emission distribution comprising a plate constructed of fluorescent material optically transparent to fluorescent wavelengths; and

means being operatively connected to the fluorescent emission distribution means for displaying and analyzing the spatial distribution of the UV beam as a function of the spatial distribution of the fluorescent emission.

4,916,320

SAMPLE COUNTING SUPPORT WITH SOLID SCINTILLATOR FOR USE IN SCINTILLATION COUNTING

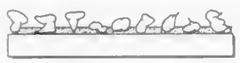
Stephen W. Wunderly, Irvine, and Joseph F. Quint, Orange, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Aug. 24, 1987, Ser. No. 88,939

Int. Cl.[4] G01T *1/20*

U.S. Cl. 250—483.1 **20 Claims**

9. A sample counting support for use in scintillation counting of a radioactively labeled sample, in a liquid scintillation counter, comprising a support material having a surface for receiving a solid scintillator inorganic compound, said solid scintillator compound adhering to said support material and forming a layer of dry solid scintillator compound thereon, said layer being means for receiving and intimately contacting



a sample having a material labeled with a radioactive isotope, said solid scintillator compound producing light events in response to particle emissions from the radioactive isotope for measurement by the liquid scintillation counter to analyze the sample.

4,916,321

RADIATION-MEASURING INSTRUMENT

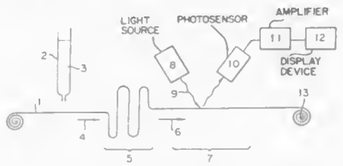
Hisashi Shiraishi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 614,675, May 29, 1984. This application Oct. 10, 1986, Ser. No. 918,598

Claims priority, application Japan, May 27, 1983, 58-93599

Int. Cl.[4] G01T *1/20*

U.S. Cl. 250—484.1 **5 Claims**



1. A radiation-measuring element in the form of a continuous plastic material selected from the group consisting of a tape, a string or a continuous fibrous material in which a stimulable phosphor is encased, said element being provided with a liquid-adsorbing structure.

4,916,322

ARRANGEMENT FOR STABILIZING AN IRRADIATED MASK

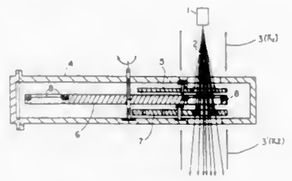
Hilton F. Glavish, Salem, Mass.; Hans Loschner, Vienna, Austria; Gerhard Stengel, Karnten, Austria, and Alfred Chalupka, Vienna, Austria, assignors to Osterreichische Investitionskredit Aktiengesellschaft and IMS Ionen Mikrofabrikations Systeme Gesellschaft, both of, Austria

Filed Sep. 13, 1988, Ser. No. 243,815

Claims priority, application Austria, Jan. 22, 1988, 118/88

Int. Cl.[4] H01J *37/317*

U.S. Cl. 250—492.2 **26 Claims**



1. A lithographic system including a source of radiation and a mask-exposure station, the source of radiation arranged to expose a mask at said station to a beam of radiation of substantial energy and a cooling surface disposed adjacent to the mask exposure station and surrounding the optical path of said beam, said cooling surface being at a temperature below the temperature of said mask and disposed in the field of view of the mask exposure station, whereby energy deposition on said mask by said beam can be compensated by thermal radiation from said mask to said cooling surface.

4,916,323

OPTICAL CONTROL CIRCUIT AND A SEMICONDUCTOR DEVICE FOR REALIZING SAME

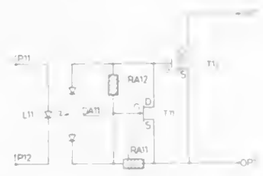
Yutaka Hayashi, Ibaragi; Shigeaki Tomonari, Kadoma; Keizi Kakite, Kadoma, and Jun Sakai, Kadoma, all of Japan, assignors to Agency of Industrial Science and Technology, Ibaragi and Matsushita Electric Works, Ltd., Osaka, both of, Japan

Filed Sep. 21, 1988, Ser. No. 247,081

Claims priority, application Japan, Sep. 24, 1987, 62-239169

Int. Cl.[4] G02B *27/00*

U.S. Cl. 250—551 **45 Claims**



1. An optical control circuit comprising a first transistor having a control electrode and first and second output electrodes, said first output electrode forming one of an emitter and source and said second output electrode forming one of a collector and drain,

a first resistive element connected between said control electrode and said first output electrode of said first transistor,

a second resistive element connected between said control electrode and said second output electrode of said first transistor,

an array of a plurality of photovoltaic elements connected in parallel with said second resistive element, and

a second transistor having a control electrode connected to said second output electrode of said first transistor for being turned off when the first transistor is in conductive state.

4,916,324

METHOD AND APPARATUS FOR ELECTRO-OPTICAL DISTANCE MEASUREMENT

Dietrich Meier, Niedererlinsbach, Switzerland, assignor to Kern & Co. AG, Aarau, Switzerland

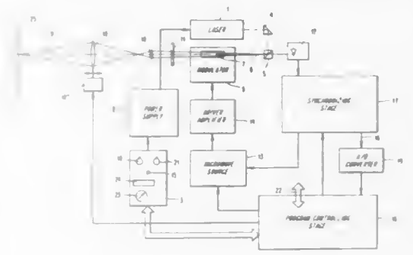
Filed Sep. 29, 1988, Ser. No. 250,854

Claims priority, application Switzerland, Oct. 23, 1987, 4163/87

Int. Cl.[4] G01N *21/86*

U.S. Cl. 250—561 **14 Claims**

1. A method for electro-optical distance measurement employing a distance measuring apparatus, comprising the steps of: generating a bundle of electromagnetic radiation; modulating said bundle a first time by means of an electro-optic modulator; focussing the bundle onto a target; modulating a second



time components of said bundle reflected at said target means; and measuring the signal strength of said components.

4,916,325

METHOD AND APPARATUS FOR THE MEASUREMENT OF AIRBORNE FIBRES BY THE ILLUMINATION OF FIBROUS PARTICLES PRECIPITATED ON A SURFACE

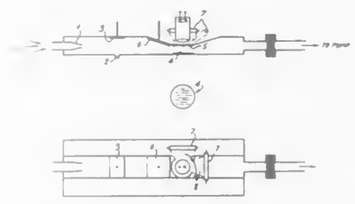
Anthony P. Rood, and Edward J. Walker, both of London, England, assignors to National Research Development Corporation, London, England

Filed Sep. 27, 1988, Ser. No. 250,256

Claims priority, application United Kingdom, Sep. 30, 1987, 8722982

Int. Cl.[4] G01N *15/06*

U.S. Cl. 250—573 **9 Claims**



1 Apparatus for measuring a quantity of fibres present in a gaseous fluid comprising:

means for creating a flow of said gaseous fluid through a chamber,

aligning means for aligning an orientation of fibrous particles flowing into said chamber,

electrical charging means for charging said particles within said chamber,

carrier means for providing a surface for said fibrous particles to precipitate thereon,

electrical precipitating means for precipitating said fibrous particles onto said carrier means,

illuminating means for illuminating said carrier means with radiation, and

measuring means for measuring radiation transmitted from said carrier means, thereby to derive an indication of the number of said particles precipitated thereon.

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LONG ARRAY PHOTOELECTRIC CONVERTING APPARATUS WITH REDUCED CROSSTALK

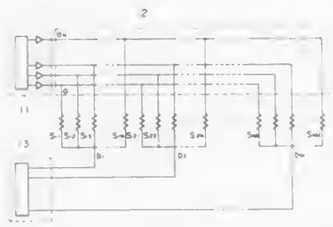
Katsunori Hatanaka, Yokohama; Yoshinori Isobe, Yokohama; Toshihiro Saika, Hiratsuka, and Katsumi Nakagawa, Tsuchihashi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 221,661, Jul. 20, 1988, abandoned, which is a division of Ser. No. 5,767, Jan. 21, 1987, abandoned. This application Aug. 22, 1989, Ser. No. 396,760

Claims priority, application Japan, Jan. 24, 1986, 61-11987; Jan. 24, 1986, 61-11988

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—578.1 **20 Claims**



1. A photoelectric converting apparatus comprising:

a plurality of photoelectric converting elements arranged in a line;

a plurality of accumulation means each electrically connected to a respective one of said photoelectric converting elements for accumulating an electric signal read by a respective one of said photoelectric converting elements;

a plurality of switch means each comprising input wirings and output wirings, each of said plurality of accumulation means being electrically connected to said input wiring of a respective one of said switch means; and

a plurality of drive signal lines each for selectively driving a respective one of said switch means for transferring the electric signal accumulated in a respective one of said accumulation means, wherein cross wiring points are formed by said plurality of drive signal lines and said input wirings and no cross wiring points are formed with said output wirings.

4,916,327

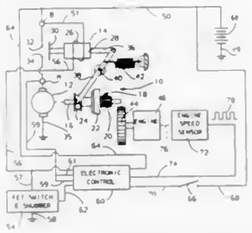
ELECTRONIC STARTING MOTOR CONTROL HAVING PINION BLOCK PROTECTION

Donald L. Cummins, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1988, Ser. No. 282,800

Int. Cl.[4] F02N *11/08*

U.S. Cl. 290—38 R **7 Claims**



1. A control system for an electric engine starter comprising, an electric starter comprising a cranking motor, a pinion rotatably driven by said cranking motor and a solenoid having a plunger connected to said pinion for moving said pinion into mesh with the ring gear of an engine to be cranked, said solenoid having a coil and solenoid contact means operated by said plunger that are closed when said pinion meshes with said ring gear, said solenoid contact means being open when end tooth abutment occurs between said pinion and ring gear that prevents the pinion from meshing with the ring gear, said solenoid contact means connected to said cranking motor whereby said cranking motor is energized when said contact means is closed and is deenergized when said contact means is open, a start switch, means for energizing said solenoid coil when said start switch is closed, control means connected to said solenoid contact means and to said start switch for developing a lock-out signal if said solenoid contact means does not close after said start switch is closed, and means responsive to the development of said lock-out signal for causing said solenoid coil to be deenergized and for maintaining said solenoid coil deenergized until said start switch is opened.

4,916,328

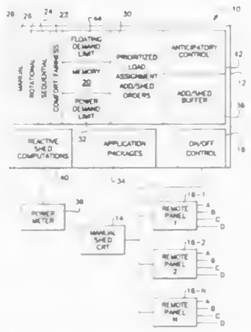
ADD/SHED LOAD CONTROL USING ANTICIPATORY PROCESSES

Charles H. Culp, III, Mandelein, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 8, 1988, Ser. No. 282,097

Int. Cl.[4] H02J *1/00*

U.S. Cl. 307—39 **32 Claims**



1. An add/shed system for adding/shedding loads to maintain the power consumption of a building below a predetermined level, said system comprising:

a plurality of loads;

measuring means for measuring the present total power consumption of said building;

first means for shedding selected ones of said loads responsive to said measured present total power consumption of said building to maintain the present power consumption of said building below said predetermined level; and

second means for determining the anticipated future increase or decrease in power consumption of said building and for adding/shedding selected ones of said loads responsive to said measured present total power consumption of said building and said anticipated future increase or decrease in power consumption of said building for continuously maintaining the power consumption of said building below said predetermined level, wherein said second means is arranged to determine the anticipated future increase or decrease in power consumption by determining which of said loads will be required on or off during a preselected time interval and by determining which of said loads will be requested on or off during a preselected time interval.

4,916,329

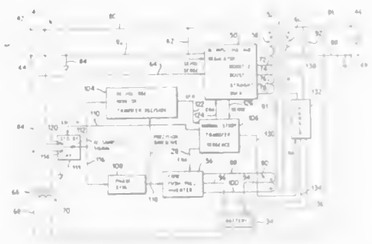
UNINTERRUPTIBLE POWER SUPPLY

Gurcharn S. Dang, Escondido, and Casey Kuzara, San Diego, both of Calif., assignors to Square D Company, Palatine, Ill.

Filed Oct. 5, 1987, Ser. No. 104,725

Int. Cl.[4] H02J *9/00*

U.S. Cl. 307—66 **68 Claims**



1. In an uninterruptible power supply for transmitting voltage varying and interruptible AC electrical power received from a AC input source to a load through a transformer during availability of said power from said AC input source and supplying said load with AC electrical power through said transformer from an auxiliary source during interruption of power from said AC input source, a circuit for transferring between sensing the voltage of said electrical power transmitted to said load and sensing the voltage of said received electrical power while supplying said load with AC electrical power, said circuit comprising;

A. AC input terminals to be connected to receive said AC input source of AC electrical power;

B. load terminals to be connected to said load;

C. switch means connected to said AC input terminals and load terminals for selecting an AC sample signal from one of said AC electrical power received at said AC input terminals and said AC electrical power transmitted to said load terminals, said selection respectively occurring in response to receipt of a switch signal of a standby state or a normal state;

D. monitor means receiving said AC sample signal and producing a transfer signal of a normal state while the voltage of said AC sample signal continues between certain voltage limits indicating availability of said AC input source AC electrical power and producing a transfer signal of a standby state when the voltage of said A sample signal exceeds said certain voltage limits indicating interruption of said AC input source of AC electrical power; and

E. sequence control means for producing said switch signal of said normal state to select passing said AC sample signal from said load terminals while said transfer signal continues in said normal state and for producing said switch signal of said standby state to select passing said AC sample signal from said AC input terminals while said transfer signal continues in said standby state.

4,916,330

SIGNAL LEVEL TRANSFORMING CIRCUIT

Akira Hatakeyama, Okazaki, and Takeshi Nakane, Ichinomiya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi pref., Japan

Filed Sep. 26, 1988, Ser. No. 249,157

Claims priority, application Japan, Sep. 25, 1987, 62-241330

Int. Cl.[4] H03K *5/153, 3/29;* **H03L** *5/00*

U.S. Cl. 307—264 **4 Claims**

1. A signal level transforming circuit operative to transform an input signal into a binary signal comprising:

an input terminal;

an input resistor;

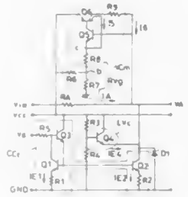
an output terminal connected to said input terminal via said input resistor;

a common voltage level terminal;

a constant current circuit, having a power supply terminal, for supplying a constant current corresponding to the voltage of said terminal, power supply said circuit being connected between said output terminal and said common voltage level terminal;

a zener diode, connected to said output terminal and across said constant current circuit to protect said constant current circuit against overload;

a low level clamping circuit for clamping the minimum value of the output voltage at said output terminal to a first voltage at a low level;



a voltage generating circuit having an input terminal and a voltage output terminal and being operable for generating a constant voltage; and

a comparing circuit having a hysteresis characteristic and comprising a setting resistor, a multi-collector type transistor having an emitter connected to said input terminal of said voltage generating circuit, one collector connected with the voltage output terminal in said voltage generating circuit via said setting resistor for setting a comparing voltage, and having another collector connected to said output terminal, said comparing circuit further including a first transistor inserted between a base of said multi-collector type transistor and said setting resistor, said first transistor having its base connected to said output terminal and being operative to turn ON when the voltage at said input terminal exceeds the voltage across said setting resistor.

4,916,331

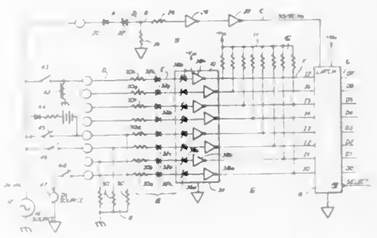
SYNCHRONIZED INPUT LATCH CIRCUIT WITH CONDITIONING CIRCUITS FOR AC INPUTS

Robert W. Peitz, Jr., Fayetteville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 27, 1988, Ser. No. 224,829

Int. Cl.[4] H03K *5/153, 17/56, 5/08, 17/00*

U.S. Cl. 307—269 **7 Claims**



1. AC synchronized input conditioning circuit for detecting an electrical load condition for an electrical device, in which

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an AC power source applies to said device an AC power wave that has alternate positive and negative half cycles, the synchronizing circuit comprising:

latching means having at least one latch with an input and an output, and a latch enable terminal, each of said at least one latch holding on its output the electrical state of the associated input during periods between successive enable signals applied to said latch enable terminal;

latch synchronizing means having an input coupled to said AC source and an output coupled to said latch enable terminal for applying said latch enable signal to said terminal only when said AC power exceeds a predetermined latching threshold during alternate half cycles thereof; and

at least one conditioning channel, each said channel having an input coupled to said device, sensing means for generating a sense signal which is of one binary sense when the voltage at the input of said channel exceeds a predetermined sampling threshold and is of a complementary binary sense otherwise, and an output supplying said sense signal to the associated latch input of said latching means.

4,916,332

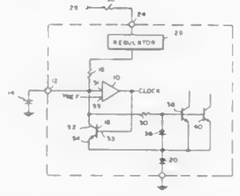
TIMING AND SUPPLY BIAS CIRCUIT USING ONE CAPACITOR

Walter S. Gontowski, Thompsoo, Conn., assignor to Cherry Semiconductor Corporation, East Greenwich, R.I.

Continuation-in-part of Ser. No. 152,679, Feb. 5, 1988, abandoned. This application Mar. 21, 1989, Ser. No. 326,895

Int. Cl.[4] H03K *3/01, 5/13*

U.S. Cl. 307—296.4 **15 Claims**



7. A supply bias circuit for logic circuitry comprising:

supply means for receiving a source voltage;

terminal means for connecting to a capacitor;

a switching transistor having an input terminal, and a control terminal;

comparator means, having an input coupled to said terminal means and the input terminal of said switching transistor and having an output coupled to the control terminal of said switching transistor, for turning said switching transistor off and on to charge and discharge said capacitor;

first resistor means coupled between said supply means and said terminal means, for receiving supply current from said supply means and for forming with said capacitor a low pass filter to prevent transient signals from shutting off the current to said logic circuitry; and

second resistor means, coupled to said first resistor means, for providing current received from said first resistor means to said logic circuitry.

4,916,333

BINARY LOGIC LEVEL ELECTRICAL DETECTOR NAMELY TO PREVENT THE DETECTION OF SECRET CODES CONTAINED IN A MEMORY CARD

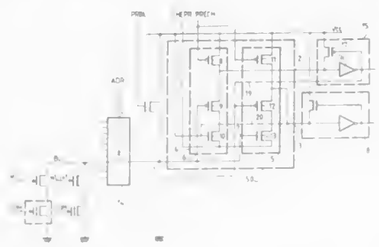
Jacek Kowalski, Trets, France, assignor to SGS Thomson Microelectronics SA, Gentilly, France

Filed Jun. 29, 1988, Ser. No. 212,888

Claims priority, application France, Jul. 10, 1987, 87 09790

Int. Cl.[4] G06F *7/04;* **G06K** *5/00, 7/01;* **H03K** *17/30*

U.S. Cl. 307—296.5 **10 Claims**



1. A binary logic level electrical detector of the biased type, comprising means to receive a signal with a given logic level and to deliver a signal with a logic level corresponding to the received logic level, said detector comprising means to make its electrical consumption independent of the logic levels delivered.

4,916,334

HIGH VOLTAGE BOOSTER CIRCUIT FOR USE IN EEPROMS

Hidenobu Minagawa, Kawasaki; Yuuichi Tatsumi, Tokyo; Hiroshi Iwabashi, Yokohama; Masamichi Asano, Tokyo, and Mizuho Imai, Annaka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 29, 1988, Ser. No. 226,312

Claims priority, application Japan, Jul. 29, 1987, 62-189435; Jul. 29, 1987, 62-189436

Int. Cl.[4] H03K *17/10, 3/027, 17/687;* **G11C** *11/40*

U.S. Cl. 307—296.5 **14 Claims**

1. A semiconductor integrated circuit device comprising:

a CMOS circuit operated on a voltage of a first voltage level;

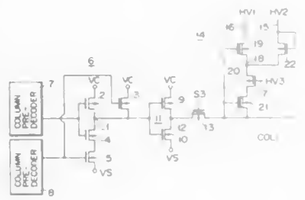
an output circuit for controlling supply of a voltage of a second voltage level which is higher than the first voltage level to a signal output node, said output circuit including a first node to which a voltage of a third voltage level lower than the second voltage level is applied, a second node to which a voltage of the second voltage level is applied, a first MOS transistor of a depletion type having a current path connected between the second node and a third node and a gate connected to said signal output node, a second MOS transistor of an enhancement type having a current path connected between the first and third nodes and a gate connected to the first node, and a third MOS transistor of the enhancement type having a current path connected between the third node and said signal output node and a gate connected to a fourth node to which a voltage of a fourth voltage level higher than the third voltage level is applied;

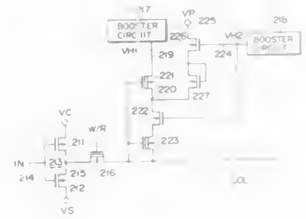
an isolation MOS transistor having a current path connected between an output node of said CMOS circuit and said signal output node;

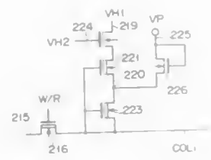
discharging means provided in said CMOS circuit to discharge the output node of said CMOS circuit, said discharging means discharging the output node of said CMOS circuit with the conduction resistance of said isolation MOS transistor kept high after the lapse of a

period in which the voltage of the second voltage level is kept supplied from said output circuit to said signal output node; and

control means for supplying a control signal to control the







conduction state of said isolation MOS transistor, said control means supplying the control signal to reduce the conduction resistance of said isolation MOS transistor after the discharging operation of the output node of said CMOS circuit by said discharging means is completed.

4,916,335

SUPERCONDUCTING CIRCUIT

Eiichi Goto, Fujisawa, and Yutaka Harada, 2196-416 Hiral, Hinodemachi, Nishitama-gun, Tokyo, both of Japan, assignors to L. Research Development Corporation of Japan and Yutaka Harada, both of Tokyo, Japan, a part interest

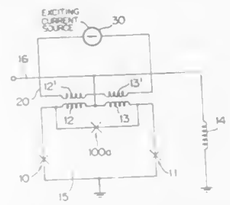
Filed Sep. 9, 1988, Ser. No. 242,210

Claims priority, application Japan, Sep. 9, 1987, 62-226202

Int. Cl.[4] H03K *17/92, 19/195*

U.S. Cl. 307—306 **6 Claims**

1. A quantum flux parametron-type superconducting circuit comprising a superconducting loop including two Josephson devices and two exciting inductors, a load inductor connected to the superconducting loop and other inductors magnetically coupled with said exciting inductors,



said circuit including a path with a Josephson device which is connected in parallel with said exciting inductors or said other inductors.

4,916,336

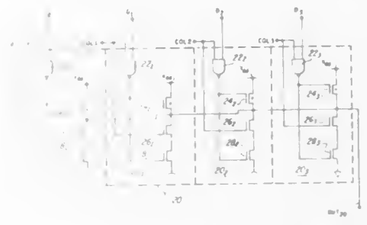
COLUMN SELECT CIRCUIT

Theodore W. Houston, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 9, 1987, Ser. No. 130,769

Int. Cl.[4] H03K *19/094, 19/082*

U.S. Cl. 307—449 **9 Claims**



1. A column selector for a memory device, comprising:

a plurality of gates, each having an input for receiving a data signal and an input for receiving a decoded address signal, and each having an output for presenting a signal corresponding to the data signal responsive to its decoded address signal indicating selection of the data signal; and

a plurality of drivers, each associated with one of said plurality of gates, each having an input connected to the output of its associated gate, for driving its output to a logic state corresponding to the output of its associated gate, and each having isolation means, connected to its corresponding decoded address signal, for placing its output in a high impedance state responsive to said decoded address signal indicating non-selection of its data signal;

wherein the outputs of said plurality of drivers are connected together, for presenting a logic state corresponding to the logic state of the selected data signal.

4,916,337

TTL TO CMOS LOGIC LEVEL TRANSLATOR

Wingyu Leung, Cupertino, and Winston K. M. Lee, San Francisco, both of Calif., assignors to Integrated Device Technology, Inc., Santa Clara, Calif.

Filed Mar. 7, 1989, Ser. No. 320,312

Int. Cl.[4] H03K *19/092, 19/094, 19/20, 17/04*

U.S. Cl. 307—475 **5 Claims**

1. A TTL to CMOS logic level translator comprising in combination:

an input line;

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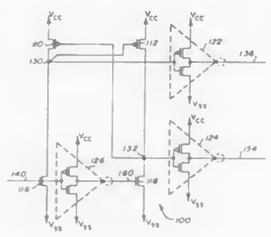
a pair of nodes including a first node and a second node;
an output line coupled to a predetermined one of said pair of nodes;
inverter means having an input connected to said input line and an output;
a first transistor having source means connected to receive a first power suppiy potential, drain means connected to said first node, and a gate connected to said second node;
a second transistor having a gate connected to said input line, drain means connected to said first node, and source



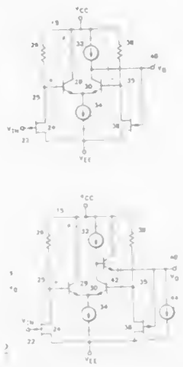
means connected to receive a second power supply potential;
a third transistor having source means connected to receive said first power supply potential, drain means connected to said second node, and a gate connected to said first node;
a fourth transistor having a gate connected to said inverter output, drain means connected to said second node, and source means connected to receive said second power supply potential.

4,916,338

FET BUFFER AMPLIFIER

Arthur J. Metz, Gervais, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 12, 1988, Ser. No. 282,526
Int. Cl.[4] H03K *3/023, 17/16, 3/013;* G06G *7/12*
U.S. Cl. 307—495 6 Claims



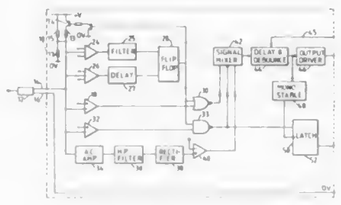
1. An FET buffer amplifier circuit having a voltage input and a voltage output comprising:
(a) a first source follower FET amplifier having an input and an output, the input forming the voltage input;
(b) a second source follower FET amplifier having an input and an output; and
(c) an operational amplifier having a positive input, a negative input, and an output, the positive input being coupled to the output of said first source follower FET amplifier, the negative input being coupled to the output of said second source follower FET amplifier, and the output coupled to the input of said second source follower FET amplifier to form the voltage output.

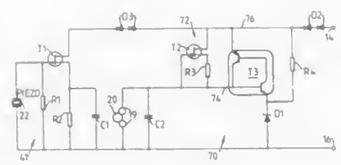
4,916,339

SIGNAL PROCESSING FOR CONTACT-SENSING PROBE

Peter G. Lloyd, Bristol, United Kingdom, assignor to Renishaw plc, United Kingdom

PCT No. PCT/GB87/00610, § 371 Date Apr. 26, 1988, § 102(e) Date Apr. 26, 1988, PCT Pub. No. WO88/01726, PCT Pub. Date Mar. 10, 1988
PCT Filed Sep. 2, 1987, Ser. No. 191,165
Claims priority, application United Kingdom, Sep. 3, 1986, 8621243; Dec. 24, 1986, 8630836
Int. Cl.[4] H03K *5/26, 5/22, 3/00, 3/033*
U.S. Cl. 307—518 12 Claims





1. A circuit for processing a trigger signal from a workpiece position-sensing probe having first and second sensing means for producing said trigger signal, the circuit comprising:
first detecting means for detecting a signal produced by the first sensing means, giving a first detection signal;
second detecting means for detecting a signal produced by the second sensing means, giving a second detection signal;
means for combining the first and second detection signals and producing an output trigger signal on an output line in response to whichever of said detection signals is the first to occur; and
means for discriminating which of said first and second detection signals produced the output trigger signal, and providing a further output accordingly.

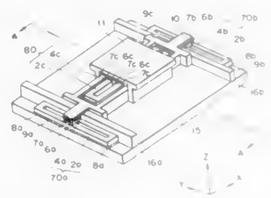
4,916,340

MOVEMENT GUIDING MECHANISM

Mahito Negishi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1989, Ser. No. 299,342
Claims priority, application Japan, Jan. 22, 1988, 63-12138; Jan. 29, 1988, 63-17335
Int. Cl.[4] H02K *41/00*
U.S. Cl. 310—12 13 Claims

1. A movement guiding device, comprising:
a surface plate;
a stationary guide fixedly provided on said surface plate;
a movable member supported by said surface plate and said stationary guide through a hydrostatic bearing member and being movably guided in a predetermined direction, said movable member being supported by said surface plate in a direction perpendicular to said surface plate while being supported by said stationary guide in a horizontal direction;



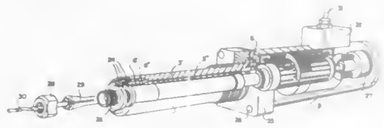
a linear motor for moving said movable member relative to said surface plate in said predetermined direction, said linear motor having a stator fixed to said surface plate with a predetermined interspacing thereto defined by a spacer, said linear motor also having a moving element fixed to said movable member with a predetermined interspacing thereto defined by another spacer; and
a heat insulating material which occupies each of said interspacings.

4,916,341

ELECTRIC ARBOR INTEGRATED WITH AN INDUCTION MOTOR

Elis Mantovani, Cadempino, Switzerland, assignor to Tecnodelta S.A., Manno, Switzerland

Division of Ser. No. 79,029, Jul. 29, 1987, Pat. No. 4,796,353.
This application Jul. 25, 1988, Ser. No. 233,968
Claims priority, application Switzerland, Nov. 24, 1986, 4690/86
Int. Cl.[4] B23B *19/02;* H02K *5/16*
U.S. Cl. 310—50 2 Claims



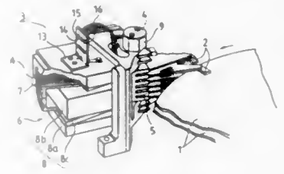
1. An electric arbor integrated with an induction motor, for durable high frequency operation, comprising an induction motor and an arbor assembly detachably securable thereto; said arbor assembly comprising an outer sleeve and a coaxial inner sleeve, said outer sleeve having opposite ends each defining a bearing seat, each said bearing seat having an annular radially extending shoulder, said bearing seats and said coaxial inner sleeve being precisely machined such that said coaxial inner sleeve has a length substantially identical to the distance between said bearing seats; said arbor assembly further comprising an arbor shaft fitted in said coaxial inner sleeve and pre-stressed bearings surrounding said arbor shaft and received in said bearing seats.

4,916,342

ROTARY ACTUATOR

Yoshiyuki Hirano, Yono, and Yoshihiro Moribe, Chigasaki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 2, 1989, Ser. No. 317,723
Int. Cl.[4] H02K *5/24, 3/00;* G11B *5/55;* F16F *15/22*
U.S. Cl. 310—51 5 Claims



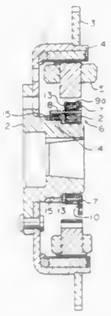
1. A rotary actuator comprising:
a rotatably supported rotary shaft;
a carriage having two ends, a first end being on a first side of said rotary shaft and a second end being on a second side of said rotary shaft opposite to said first end, said carriage being fixed to said rotary shaft and having a load at said first end; and
a voice coil motor having a coil comprising a plurality of kinds of coil portions made of materials having different specific gravities, said coil being fitted to said carriage at said second end opposite to said first end;
wherein said coil portions of said voice coil motor disposed on the second end of said carriage balance the rotation on the side of the rotary shaft on which the coil is disposed and the rotation on the side of the rotary shaft on which said load is disposed.

4,916,343

MULTI-PICKUP SENSOR BRACKET FOR MAGNETO

Hideki Umemoto; Tsutomu Momoyama, and Masayuki Ozawa, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1989, Ser. No. 329,141
Claims priority, application Japan, Apr. 18, 1988, 63-96270
Int. Cl.[4] H02K *1/22;* F02P *1/02*
U.S. Cl. 310—153 7 Claims



1. An engine-igniting signal generation apparatus which comprises:
a flywheel rotatable about the crank shaft of an internal combustion engine;
a field magnet attached to said flywheel;
a plurality of pickup devices provided facing said field magnet to produce ignition signals in synchronism with the

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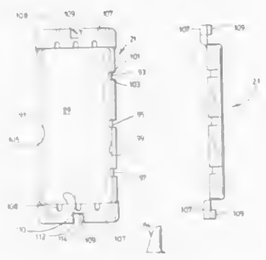
rotation of said flywheel, cores of said pickup devices being formed from a one-piece substrate body;
a coil wound around each of said cores;
one or more terminals which are connected to each of said coils for receiving the ignition signals; and
an insulating material covering at least part of said terminals and said coils.

4,916,344

MOTOR MAGNET SHIELD RETENTION ASSEMBLY

Joe K. Hammer, Bowling Green; Alan H. Fitzsimmons, and Hans Greutmann, both of Toledo, all of Ohio, assignors to Prestolite Electric Incorporated, Toledo, Ohio

Filed Dec. 15, 1988, Ser. No. 285,091
Int. Cl.[4] H02K *15/14, 21/26;* **H01F** *7/02*
U.S. Cl. 310—154 **25 Claims**



1. A motor comprising
a drive end head having an armature bearing;
a commutator end head having an armature bearing;
an armature rotatably mounted in said bearings and between said end heads, said armature having a coil area;
a frame disposed between said end heads and having a cylindrical portion surrounding the coil area of said armature;
a plurality of magnets disposed between said cylindrical portion of said frame and said coil area of said armature, said magnets being equally spaced around the perimeter of said armature;
a plurality of first locating legs secured in fixed relationship with respect to said drive end head;
a plurality of second locating legs secured in a fixed relationship with respect to said commutator end head;
a plurality of magnet shields, each one of said shields for receiving one of said magnets and for retaining said one magnet in a relatively fixed relationship with respect to said coil area of said armature, each of said magnet shields having a pair of locating tabs, one of said tabs cooperating with one of said first locating legs and the other of said tabs cooperating with one of said second locating legs for positioning said magnet shield relative to said armature.

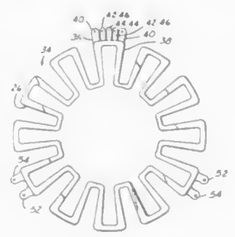
4,916,345

FLAT STATOR WINDING FOR ALTERNATOR STARTER

Andrew K. Tong, Rochester, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Sep. 2, 1988, Ser. No. 240,871
Int. Cl.[4] H02K *3/04*
U.S. Cl. 310—208 **9 Claims**

1. A stator winding assembly for use in an electrical machine adapted for use as an integral dual purpose motor and generator having a rotatable power shaft, said assembly comprising:
a generally flat ring shaped stator body lying about said shaft in a plane perpendicular to said shaft, said ring shaped stator body having an inside perimeter and an outside perimeter encircling said shaft and at least one generally flat conductive metal winding a set of winding within said stator body having a beginning end and a terminal end, said winding undulating radially between said outer perimeter and said inner perimeter as said winding encircles said shaft in said plane making a single pass around said



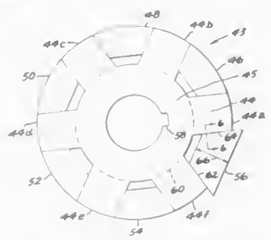
ring shaped stator body, said winding having an alignment means such as a plurality of spaced apart outwardly directed tabs for aligning said winding within said body.

4,916,346

COMPOSITE ROTOR LAMINATION FOR USE IN RELUCTANCE HOMPOLAR, AND PERMANENT MAGNET MACHINES

Gerald B. Kliman, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,404
Int. Cl.[4] H02K *1/06*
U.S. Cl. 310—216 **10 Claims**



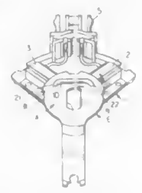
1. A composite disk lamination for a rotor of a magnetic machine selected from the group consisting of homopolar and switched reluctance machines, comprising:
a magnetic portion of uniform thickness and including an interior core portion with a plurality of pole pieces extended outwardly therefrom in a generally radial direction, each of said pole pieces having a pair of edges extending outward in a generally straight line and forming an interpole space between each adjacent pair of said pole pieces;
a plurality of non-magnetic segments having a uniform thickness, a separate one of said segments being situated, respectively, within each of said interpole spaces, respectively, and abutting one edge of each pole piece of said adjacent pair, each of the abutting edges of the non-magnetic segments, respectively, being parallel to a corresponding one of the edges of the pole pieces, respectively, and being rigidly attached thereto so as to provide said disk lamination with high structural strength without increasing windage losses in said rotor; and
each of said non-magnetic segments further being formed in a generally trapezoidal shape having two non-parallel edges abutting opposite edges of the adjacent pole pieces, respectively, and having an inner edge facing an outer circumferential edge of said interior core portion and having an outer edge forming a contiguous circumferential edge with outer edges of said pole pieces.

4,916,347

BRUSH-HOLDER PLATE IN PARTICULAR FOR AN ELECTRIC MOTOR

Alain Pillerel, Audincourt, France, assignor to ECIA - Equipements Et Composants Pour L'Industrie Automobile, Audincourt, France

Filed May 16, 1983, Ser. No. 194,373
Claims priority, application France, May 21, 1987, 87 07132
Int. Cl.[4] H02K *13/00*
U.S. Cl. 310—239 **14 Claims**



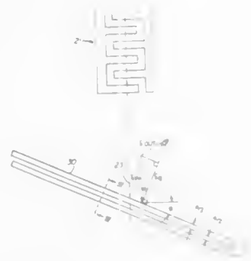
1. A brush-holder plate for an electric motor of the type having brush-holders containing radially inwardly biased brushes and a commutator having an axis of rotation, said plate comprising a first brush-holder support portion (1) for mounting the brush holders on the commutator, and retractable locking means (4) for locking the brushes in a radially outwardly retracted position in the brush holders during the mounting of the brush-holders on the commutator, said locking means (4) comprising a second portion (6) of the brush-holder plate axially offset relative to said first portion and defining orifices (21, 22), a locking member (10) comprising branches (8, 9) extending axially into said orifices and at least partly in confronting relation to the brush-holders for locking the brushes in the radially retracted position, and also extending partly in an axial insertion path of said commutator for releasing the brushes when the plate and commutator are in an assembled state.

4,916,348

SURFACE ACOUSTIC WAVE SCATTERING GRATING

Bruce C. Beggs, Kanata, and Grantley O. Este, Stittsville, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 24, 1989, Ser. No. 342,542
Claims priority, application Canada, Apr. 13, 1989, 596,653
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—313 D **7 Claims**



1. A piezoelectric solid having a surface acoustic wave transmission means comprising a transmitter means and a receiver means positioned on a first one of its surfaces, the direction of wave propagation between the transmitter means and the receiver means being along a first axis, the first axis intersecting a first edge of the solid on one side of the transmission means and also intersecting a second edge of the solid on the other side of the transmission means, the solid having a first grating positioned between the transmission means and the first edge, the first grating being comprised of a series of first grating members extending parallel to each other and crossing the first axis, each of the first grating members being positioned on the solid so as to be approximately longitudinally bisected by the first axis, the longitudinal axis of each first grating member being oriented at an angle relative to the first axis such that a substantial amount of the energy in waves propagating along the first axis toward the first grating is prevented from being reflected back toward, the transmission means, the relationship between the velocity 'V_{in}' of the acoustic waves along the first axis 'd' the frequency 'f' of those waves, the spatial periodicity 'd' of the first grafting, the solid's anisotropy parameter 'γ' and the angle 'θ' between the first axis and a normal to the longitudinal axis of each first grating member is approximated by the following equation:

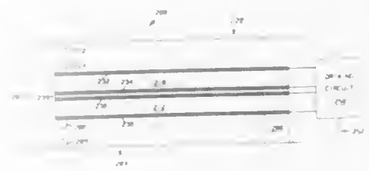
$$\frac{V_{in}}{f\,d} \sim (\cos\theta) + \left(\frac{1}{1-\gamma\theta^2}\right)\cdot\sqrt{1-((\sin^2\theta)\cdot(1-\gamma\theta^2)^2)}$$

4,916,349

LATCHING PIEZOELECTRIC RELAY

William P. Korarumpf, Albany, N.Y., assignor to Pacific Bell, San Francisco, Calif.

Filed May 10, 1988, Ser. No. 192,200
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—332 **4 Claims**



1. A relay comprising:
a cantilever mounted piezoelectric bimorph element having one end fixed and the other end thereof free, said bimorph element including first and second planar piezoelectric strips;
first contact means coupled to the free end of said bimorph element, positioned so as to engage a second contact means when the free end of said bimorph element is displaced in a predetermined direction;
a first set of electrodes comprising two planar electrodes sandwiching said first planar piezoelectric strip;
a second set of electrodes comprising two planar electrodes sandwiching said second planar piezoelectric strip; and
field means for altering the residual polarization of one of said first and second planar piezoelectric strips in response to predetermined control signals, said field means including means for applying first and second electrical signals to said first and second sets of planar electrodes, said first electrical signal being a DC signal causing one of said first and second piezoelectric strips to be substantially polarized and said second electrical signal being an AC signal causing the other of said first and second piezoelectric strips to be substantially depolarized.

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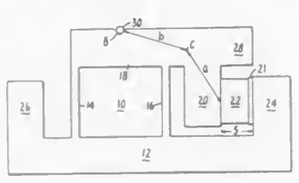
4,916,350

SENSOR FOR DETECTING VIBRATIONS IN A PLANE, PARTICULARLY IN A STRINGED MUSICAL INSTRUMENT

Allan C. Madden, 1103 Canada Rd., Woodside, Calif. 94062; Robert G. Bennett, 444 Wattle Street, Ultimo, NSW 2007, Australia; Robert Cellucci, 563 Everett St., Danville, Calif. 94526, and Duncan R. Mackay, 967-4 Belmont Ter., Sunnyvale, Calif. 94086

Filed May 12, 1988, Ser. No. 193,412
Int. Cl.[4] H01L *41/08*; G10H *3/00*
U.S. Cl. 310—338 10 Claims



1. A sensor for detecting vibrations in two dimensions in a plane, comprising:

a rigid foundation beam having a length;

two flexible leg members, each having two ends, positioned substantially parallel to one another and attached substantially at right angles to the foundation beam by a first end of each of said flexible leg members each leg member flexible in a direction substantially parallel to said length;

a flexible moving beam supported by and attached to said two flexible leg members at the second end of each of said flexible leg members, forming substantially a parallelogram said moving beam movable in a direction substantially parallel to said length and is flexible in a direction substantially perpendicular to said length;

a protrusion extending substantially from one end of said flexible moving beam, with said protrusion moving in response to the moving or the flexing of said flexible moving beam;

a force-sensitive transducer element for generating an electrical signal in response to a force applied thereto, positioned immediately adjacent to and contiguous with said protrusion; and

a fixed rest element attached to said rigid foundation beam, and positioned immediately adjacent to and contiguous with said transducer element;

wherein said transducer element generates said electrical signal in response to vibrations in two dimensions (substantially parallel to and perpendicular to said length) detected by said flexible moving beam causing said protrusion to move said transducer element against said rest element.

4,916,351

ARC TUBE HAVING CRYSTALLINE PRESS SEAL PENETRATION SUPPRESSION MEANS AND LAMP EMPLOYING SAME

William M. Keeffe, Rockport, Mass., and Robert Karlotski, Weare, N.H., assignors to GTE Products Corporation, Danvers, Mass.

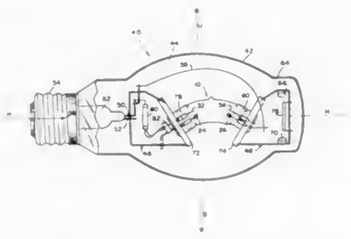
Filed Aug. 8, 1988, Ser. No. 229,931
Int. Cl.[4] H01J *61/34*, *61/10*
U.S. Cl. 313—25 40 Claims

1. An arched arc tube for an arc discharge lamp, said arc tube having an arched central axis and being designed to operate with said central axis arched upward, said arc tube comprising:

(a) an arched light-transmissive body hermetically enclosing an interior, said body having first and second opposed ends, said first end having a first press seal formed therein, said second end having a second press seal formed therein;

(b) a fill gas within said interior, said fill gas being capable of sustaining a light-producing electrical arc therethrough;

(c) first and second electrodes protruding into said interior, said first electrode being imbedded in said first press seal, said second electrode being imbedded in said second press seal; and



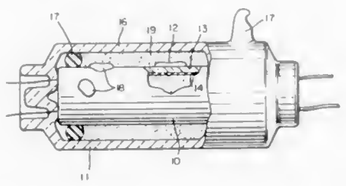
(d) first and second crystalline press seal penetration suppressing means protruding into said interior, said first suppression means being positioned above said first electrode and said second suppression means being positioned above said second electrode when said arc tube is operationally positioned.

4,916,352

JACKETED FLUORESCENT LAMPS

Elias S. Haim, Windham, N.H., and Frank W. McGlasson, Tewksbury, Mass., assignors to General Electric Company, Burlington, Mass.

Filed Nov. 7, 1988, Ser. No. 268,124
Int. Cl.[4] H01J *17/16*, *61/34*
U.S. Cl. 313—25 2 Claims



1. A light source comprising:

(a) a fluorescent lamp;

(b) a light transmissive jacket surrounding and fused to said fluorescent lamp and defining a sealed chamber surrounding said lamp;

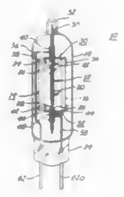
(c) fluid means comprising a mixture of fluids retained in said chamber, said fluid means being selected to be in a liquid phase below a selected temperature to form at least a partial vacuum to reduce heat loss from the lamp, and in a vapor phase above said selected temperature to extract heat from the lamp wall.

4,916,353

INCANDESCENT LAMP UTILIZING CYLINDRICAL TRANSPARENT HEAT MIRROR

George K. Danko, Moreland Hills, and Frederick A. Mosby, Shaker Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 28, 1989, Ser. No. 317,242
Int. Cl.[4] H01K *1/18*, *1/34*
U.S. Cl. 313—113 17 Claims



1. An incandescent lamp filament construction for use in a tungsten-halogen lamp comprising in combination:

(a) an axially extending tungsten filament coil physically suspended between a pair of lead-in conductors,

(b) an open-ended light transmissive cylinder surrounding the tungsten filament coil and extending substantially its entire length, the cylinder having one of its faces coated with an infrared reflecting film, and

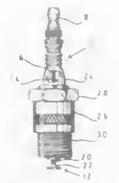
(c) refractory metal wire centering means disposed end of the cylinder, each centering means employing at least three wire lengths extending radially outward from the tungsten, filament coil and being secured at the outer ends to a wall of the cylinder.

4,916,354

SPARK PLUG FOR INTERNAL COMBUSTION ENGINES

Maston Forkum, Jr., Jackson County, Tenn., assignor to C. Earl Johnson, Winter Haven, Fla.

Filed Jul. 20, 1988, Ser. No. 221,733
Int. Cl.[4] H01T *13/32*
U.S. Cl. 313—141 12 Claims



1. A spark plug for igniting a fuel charge within an internal combustion engine, which comprises:

a metal housing which is provided with external threads for threadable engagement with such engine;

an elongated insulator, having a central axis and carried by said housing, said insulator having a first end to extend within such engine, and a second end;

an elongated central electrode along said central axis of said central insulator, said central electrode having a first end with a peripheral surface extending beyond said first end of said insulator to define a first surface of a spark gap, and a second end extending beyond said second end of said insulator for connection to a voltage source for spark initiation; and

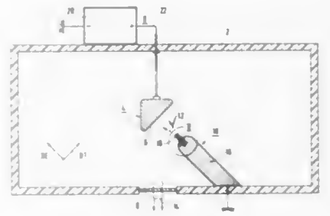
a ground electrode having a first portion connected to said housing and extending therefrom substantially parallel to said central electrode, and a second portion extending from said first portion in a plane substantially perpendicular to said central axis to define a second surface of said spark gap, said second portion of said ground electrode being divided into two equal width substantially linear prongs terminating in free ends, said prongs being joined at a vertex and initially diverging uniformly from each other and linearly from said vertex, with at least one of said prongs being redirected toward the other of said prongs proximate said free ends whereby said spark is created first between said central electrode and said vertex, and caused to travel along both of said diverging prongs, forming and maintaining, by means of the reconverging free ends and said equal width and linear shape of said prongs, a spark of increased area, burning the fuel more efficiently.

4,916,355

GENERATOR FOR GENERATING HIGH ENERGY ELECTRONS IN A GAS

Franck Collier, Boudoufle, France, assignor to Societe Anonyme dite: Compagnie General d'Electricite, Paris, France

Filed Nov. 10, 1988, Ser. No. 269,333
Claims priority, application France, Nov. 17, 1987, 87 15849
Int. Cl.[4] H01J *1/14*, *1/16*, *17/06*, *35/06*
U.S. Cl. 313—233 9 Claims



1. A generator for generating high energy electrons in a gas, said generator comprising:

an enclosure;

an ambient gas present in said enclosure at an ambient pressure of more than about 5 Pa in order to facilitate the construction of said generator, and less than about 100 Pa in order to enable said high energy electrons to be produced;

an anode in said enclosure;

a cathode situated in said enclosure facing said anode and including emission means for emitting electrons;

dielectric support means for holding the said anode and said cathode and forming a flashover distance which is long enough to avoid any surface arcing; and

a source of electric current for applying an accelerating field suitable for emitting electrons from said cathode and accelerating them towards said anode through said ambient gas, the ratio of said accelerating field to said ambient pressure being selected to be high enough to create a diffuse discharge in which the majority of the electrons emitted by said cathode initially acquire sufficient energy to substantially reduce their collision cross-section with the molecules of said ambient gas such that they subsequently acquire more energy between two collisions, on average, than they lose during each collision, with the electrons thus becoming runaway electrons having sufficient energy to constitute said high energy electrons;

wherein said emission means are in the form of an emission plate constituted by interlaced carbon fibers oriented along an emission direction directed towards said anode.

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4,916,356
HIGH EMISSIVITY COLD CATHODE ULTRASTRUCTURE
Brian S. Ahern, Boxboro, and David W. Weyhurne, Maynard, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Sep. 26, 1988, Ser. No. 249,628
Int. Cl.[4] H01J *1/30*
U.S. Cl. 313—336 8 Claims

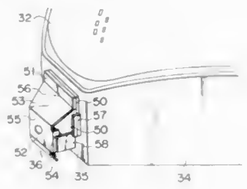
1. A high emissivity cold cathode, said high emissivity cold cathode comprising:
a central rod, said central rod being made of a refractory and insulating material;
a metal cylindrical tube, said tube being deposited by vapor deposition onto said central rod, said tube being made of a refractory metal, said tube having a wall thickness of less than or about 1,000 angstroms wherein the exposed top edge radius (r) is of a dimension to obtain an electric field strength of about 2 to 5×10^7 volts per centimeter for spontaneous electron emission therefrom, said field strength (E) given by

$$E=kV/r$$

where V is the applied voltage and k is a constant;
an insulator cylindrical tube, said insulator cylindrical tube being vapor deposited on said metal cylindrical tube, said insulator cylindrical tube being made of a refractory material, said insulation cylindrical tube having a thickness of about 20 times that of said metal cylindrical tube, and
additional tubes being deposited thereon in an alternating manner until a determined diameter of said cold cathode is obtained

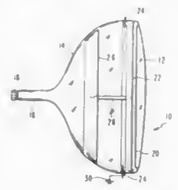
4,916,357
SHADOW MASK ASSEMBLY OF A COLOR CATHODE RAY TUBE
Michio Nakamura, Saitama; Toshinao Sone, Kumagaya; Tohru Takahashi, and Masami Hasegawa, both of Fukaya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Apr. 15, 1988, Ser. No. 182,155
Claims priority, application Japan, Apr. 16, 1987, 62-91919; Dec. 17, 1987, 62-317539
Int. Cl.[4] H01J *29/07*
U.S. Cl. 313—402 8 Claims

1. A color cathode ray tube comprising:
a vacuum envelope having an axis and including a panel section, a funnel section, and a neck section, said panel section having a faceplate, a front view shape of which is substantially rectangular in shape and has an inner surface, and a skirt having a peripheral inner surface extending from a peripheral edge of said faceplate, said funnel section being contiguous to said skirt of said panel section, and said neck section being contiguous of said funnel section;
a phosphor screen formed on said inner surface of said faceplate;
an electron gun assembly, arranged in said neck section, for emitting three electron beams which land on said phosphor screen;
a shadow mask arranged in said panel section opposing said phosphor screen and having a large number of apertures for allowing passage therethrough of said three electron beams;
frame means, substantially rectangular in shape, for fixing said shadow mask in place;



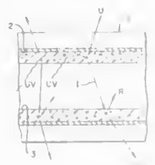
a plurality of panel pins fixed on an inner surface of said skirt and protruding toward the inside; and
unitary supporting structures for supporting said frame means on said peripheral inner surface of said skirt, each of said unitary supporting structures including a fixed section fixed to said frame means, a resiliently deformable section having one end portion fixed on said fixed section and a hole into which one of said plurality of panel pins is fit, and twist-prevention sections for preventing twisting of said resiliently deformable section, said twist-prevention sections extending from said fixed section.

4,916,358
KINESCOPE GROUNDING SYSTEM
Terry W. Bunton, Martinsville, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.
Filed Oct. 25, 1988, Ser. No. 262,396
Int. Cl.[4] H01J *29/87;* H01F *13/00;* H04N *5/65*
U.S. Cl. 313—479 6 Claims



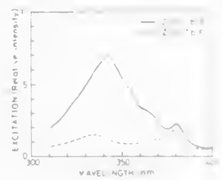
1. In a kinescope having a conductive outer coating and a peripheral tension band, said band being connected to an electrical ground, the improvement comprising
a conductive metal tape having an adhesive on one surface thereof and exposed metal on the other surface thereof, said tape being adhered to said kindescope by it adhesive side, said tape extending from said conductive outer coating to said tension band, and said tape being in electrical contact with both said coating and band, said kinescope including a patch of additional conductive coating, said metal tape including a folded portion placing the exposed metal surface of said tape in contact with said patch, and said conductive outer coating overlapping said patch and said folded portion of said tape.

4,916,359
GAS DISCHARGE LAMP ENVELOPE COMPRISING A BARIUM SULPHATE PROTECTIVE LAYER DISPOSED ON ITS INNER SURFACE
Günther Jönsson, Karlskrona, Sweden, assignor to Lumalampan Aktiebolag, Sweden
Filed Apr. 13, 1988, Ser. No. 181,075
Claims priority, application Sweden, Apr. 27, 1987, 8701724
Int. Cl.[4] H01J *61/35*
U.S. Cl. 313—489 11 Claims



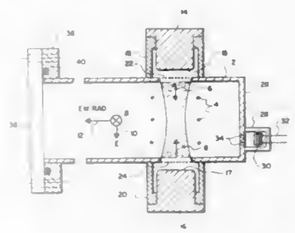
1. A glass envelope particularly adapted for use in a metal vapour gas discharge lamp, said lamp being of a type filled with a noble gas, comprising:
a glass envelope, a protective layer coating the inner surface of said glass envelope, a fluorescent substance coating over said protective layer coating, whereby said protective layer is between said glass envelope and fluorescent substance coating, and said protective layer comprising a mixture of barium sulphate and amorphous, highly dispersed silicon dioxide.

4,916,360
THIN FILM ELECTROLUMINESCENT DEVICE WITH ZNS AS HOST MATERIAL
Akiyoshi Mikami, Yamatotakada; Takashi Ogura, Nara; Kouji Taniguchi, and Masaru Yoshida, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jul. 7, 1988, Ser. No. 216,270
Claims priority, application Japan, Jul. 8, 1987, 62-170314
Int. Cl.[4] H05B *33/14, 33/18*
U.S. Cl. 313—503 15 Claims



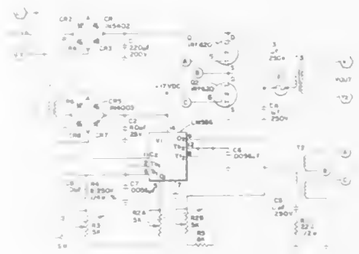
1. A thin film EL device which comprises an EL film made of ZnS serving as its host material and doped with a rare earth element to provide luminescent centers, the EL film having a ratio of S atoms to Zn atoms (S/Zn) in the controlled range of $1.02 \leqq S/Zn \leqq 1.13$, insulating layers sandwiching the EL film and a pair of electrodes provided on the respective outer surfaces of the insulating layers.

4,916,361
PLASMA WAVE TUBE
Robert W. Schumacher, Canoga Park, and Joseph Santoru, Valencia, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Apr. 14, 1988, Ser. No. 181,340
Int. Cl.[4] H01J *7/24;* H05B *31/26*
U.S. Cl. 315—111.21 26 Claims



1 An improved plasma wave tube, comprising:
a waveguide housing having first and second ends,
means for introducing an ionizable gas into said housing,
a plurality of wire anodes extending into said waveguide housing to form a discharge plasma from ionizable gas therein, and
electron beam generating means mounted in alignment with each other on opposite faces of the waveguide housing for generating a pair of counterpropagating electron beams through the plasma within said housing at a sufficient voltage, relative to the waveguide housing, to establish a pair of electrostatic plasma waves which mutually couple to emit electromagnetic radiation within the waveguide housing, the eletrostatic plasma wave propagating in a direction perpendicular to the length of the waveguide housing, and
an output window, at the first end of the waveguide housing, for coupling the electromagnetic radiation out of the waveguide housing,k

4,916,362
EXCITATION SUPPLY FOR GAS DISCHARGE TUBES
Edward D. Orenstein, Edina, Minn., assignor to Neon Dynamics Corporation, Minnetonka, Minn.
Filed Apr. 5, 1988, Ser. No. 177,694
Int. Cl.[4] H05B *41/36*
U.S. Cl. 315—219 9 Claims



1. An excitation device for use with gas discharge tubes having an impedance, comprising:
oscillator means for producing a first switching signal of a first selectable frequency;

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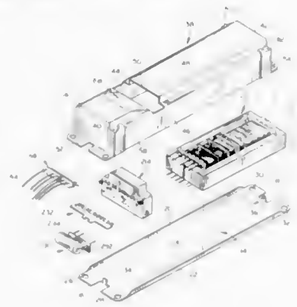
means for producing a second switching signal of a second selectable frequency;
conversion means responsive to said first switching signal and said second switching signal for producing high voltage;
said high voltage being affected by said first selectable frequency, said second selectable frequency and the impedance of the gas discharge tube; and
means for connecting said conversion means to the gas discharge tube.

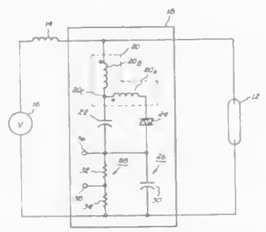
4,916,363
BALLAST
Charles A. Burton, Columbus, Ohio; Larry J. Costa, and Dail L. Swanson, both of Danville, Ill., assignors to Valmont Industries, Inc., Valley, Nebr.
Filed Oct. 14, 1988, Ser. No. 257,528
Int. Cl.[4] H05K *5/04*
U.S. Cl. 315—276 **38 Claims**



1. A ballast for a fluorescent lamp, comprising,
a base,
a core means mounted on said base,
a plurality of coils operatively electrically associated with said core means, each of said coils having at least one conductor extending therefrom,
an electrical connector means positioned adjacent said coils and having a plurality of connectors associated therewith,
means electrically connecting predetermined connectors to predetermined conductors,
a component subassembly means electrically operatively connected to predetermined connectors of said electrical connector means,
a case means positioned over said core means, coils, connector means and said component subassembly means, and being secured to said base,
said case means having an access opening for providing access to at least a portion of said connector means whereby at least a portion of a wiring harness means may be inserted therethrough for selective connection to predetermined connectors of said electrical connector means.

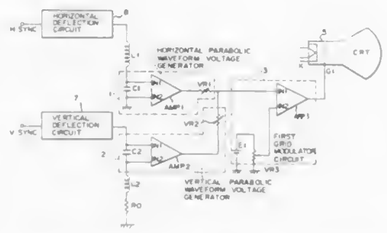
4,916,364
PARALLEL ARRANGED STARTING CIRCUIT FOR GASEOUS DISCHARGE LAMPS
Byron R. Collins, Hendersonville, N.C., assignor to General Electric Company, Schenectady, N.Y.
Filed Jul. 27, 1988, Ser. No. 224,951
Int. Cl.[4] H05B *41/14*
U.S. Cl. 315—290 **2 Claims**

1. A starting aid for a gaseous discharge lamp which has one end connected to an inductive means having one end connected to one end of a source of alternating current (a.c.), said gaseous discharge lamp having its other end connected to the other end of said source of a.c., said starting aid connected across said gaseous discharge lamp and comprising;
(a) an autotransformer having a first and a second serially arranged winding each having a respective first end connected to a tap, said second winding having its second end connected to the other end of said inductance means and also connected to one said end of said gaseous discharge lamp;
(b) a charging capacitor having one end connected to said tap;
(c) a semiconductor device having a voltage threshold value which when said voltage is applied across said device and



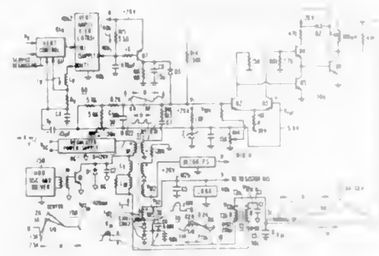
said threshold value is equalled or exceeded said semiconductor device is rendered conductive, said semiconductor device having one end connected to a second end of said first winding and its other end connected to the other end of said charging capacitor forming a node therebetween;
(d) a resistor-capacitor network having one end connected to said node and its other end connected to said other end of said gaseous discharge lamp, said resistor-capacitor network comprising;
(d_i) a selectable resistor network; and
(d_{ii}) a capacitor arranged across said selectable resistor network.

4,916,365
COLOR CRT DISPLAYING CORRECTION CIRCUIT
Chiharu Arai, Tokyo, Japan, assignor to Anritsu Corporation, Tokyo, Japan
Filed Aug. 29, 1988, Ser. No. 237,908
Claims priority, application Japan, Aug. 31, 1987, 62-215420; Aug. 31, 1987, 62-215421; Mar. 4, 1988, 63-49796; Mar. 7, 1988, 63-51556
Int. Cl.[4] H01J *29/52, 29/58*
U.S. Cl. 315—383 **11 Claims**



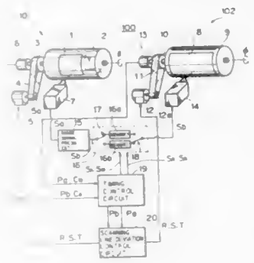
1. A color CRT displaying correction circuit comprising:
a color cathode-ray tube including a screen to effect display by being illuminated by electron beams and at least one grid for controlling a character of the display on the screen;
a horizontal deflection coil provided on said color cathode-ray tube at a predetermined position thereof for horizontal deflection of said electron beams;
a vertical deflection coil provided on said color cathode-ray tube at a predetermined position thereof for vertical deflection of said electron beams;
a bias voltage source for supplying bias voltages to grids of said color cathode-ray tube;
horizontal deflection circuit means for supplying a horizontal deflection current to said horizontal deflection coil, and including an S-shaped capacitor for horizontal linearity correction on the screen of said color cathode-ray tube; vertical deflection circuit means for supplying a vertical deflection current to said vertical deflection coil;
horizontal parabolic waveform voltage generator means for generating a horizontal parabolic waveform voltage according to a voltage appearing across said S-shaped capacitor; with the level thereof increasing for positions from the center to the edges of the screen of said color cathode-ray tube according to said horizontal deflection current supplied from said horizontal deflection circuit means to said horizontal deflection coil and in synchronism to said horizontal deflection, and wherein said horizontal parabolic waveform voltage generator means includes differential amplifier means for converting a voltage appearing across said S-shaped capacitor to a low voltage and inverting said low voltage;
vertical parabolic waveform voltage generator means for generating a vertical parabolic waveform voltage with the level thereof increasing for positions from the center to the edges of the screen of said color cathode-ray tube according to said horizontal deflection current supplied from said vertical deflection circuit means to said vertical deflection coil and in synchronism to said vertical deflection; and
grid modulation means for supplying said horizontal parabolic waveform voltage generated by said horizontal parabolic waveform generator means and said vertical parabolic waveform voltage generated by said vertical parabolic waveform voltage generator means in superimposition on said bias voltage from said bias voltage source to a grid of said color cathode-ray tube.

4,916,366
POWER SUPPLY PROTECTION CIRCUIT
James A. Wilber, and Joseph C. Stephens, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Filed Nov. 21, 1988, Ser. No. 273,529
Int. Cl.[4] H01J *29/70, 29/56;* H04N *5/63*
U.S. Cl. 315—411 **28 Claims**



1. A power supply apparatus for a television apparatus, comprising:
a vertical deflection circuit;
means for generating a control signal indicative of normal operation of said vertical deflection circuit being disabled;
a horizontal deflection circuit for producing a horizontal deflection current in a horizontal deflection winding;
a side pincushion distortion correction circuit coupled to said horizontal deflection circuit for producing a modulation of said horizontal deflection current; and
means responsive to said control signal and coupled to said pincushion distortion correction circuit for disabling said pincushion distortion correction circuit when said normal operation of said vertical deflection circuit is disabled.

4,916,367
METHOD OF AND APPARATUS FOR PREVENTING SCANNING LINE DEVIATION IN A PROCESS SCANNER OF A SEPARATED DRUM TYPE
Takuya Yamaguchi, and Osama Kitagawa, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan
Filed Nov. 14, 1988, Ser. No. 270,228
Claims priority, application Japan, Nov. 14, 1987, 62-286466
Int. Cl.[4] G05B *19/28*
U.S. Cl. 318—60 **15 Claims**



1. A method for preventing the development of scanning line deviations between independently driven first and second drums which are driven by respective motors, said method comprising the steps of:
(a) comparing the rotational speeds of said first drum and said second drum and identifying the faster drum and the slower drum thereof,
(b) defining an allowable range for a rotational phase difference between said faster drum and said slower drum,
(c) repeatedly determining the actual magnitude of the rotational phase difference existing between said drums,
(d) comparing said rotational phase difference with said allowable range,
(d1) delivering electrical power to that one of said motors which drives said faster drum by means of a switch, and
(e) interrupting the delivery of electric power to said one of said motors which drives the faster drum by opening said switch for a predetermined time period, when said rotational phase difference strays outside said allowable range.

4,916,368
CONTROLLING METHOD AND DEVICE FOR PERMANENT MAGNET SYNCHRONOUS MOTOR
Yoshimitsu Onoda, Tokyo, and Takato Yamakoshi, Matsudo, both of Japan, assignors to Hitachi Elevator Engineering & Service Company, Ltd., Tokyo, Japan
Filed Nov. 14, 1988, Ser. No. 270,808
Claims priority, application Japan, Nov. 14, 1987, 62-286441
Int. Cl.[4] H02K *19/10;* H62P *5/40*
U.S. Cl. 318—723 **8 Claims**

1. A controlling device for a permanent magnet synchronous motor wherein a permanent magnet is used as a rotor and which includes three-phase armature windings, comprising a detecting means for detecting a rotational position and a rotational speed of said rotor, a comparison means for comparing the rotational speed detected by said detecting means with a predetermined reference speed and for developing a first value

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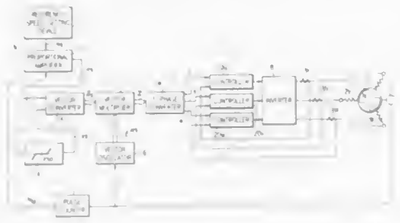
of a difference between the rotational speed and the reference speed, an exciting component generating means for developing a second value only when the first value of the difference exceeds a predetermined value, said second value being an exciting component value for generating in the respective three-phase armature windings exciting currents capable of producing magnetic field components in directions of magnetizing the permanent magnet, having a phase shift of 90 degrees with respect to the currents supplied to the armature windings and increasing or decreasing depending on an increase or



decrease of the value of the difference, a converting means for determining currents to be supplied individually to said armature windings in response to a vector value obtained from the rotational position detected by said detecting means and the value of the difference delivered from said comparison means as well as to the rotational position and the exciting component value obtained by said exciting component generating means, and a current controlling means for controlling current flows through said individual armature windings in response to values obtained by said converting means.

4,916,369

CONTROL SYSTEM FOR A SLIDING-TILTING ROOF OF A MOTOR VEHICLE

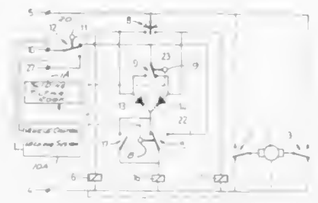
Johannes N. Huyer, Velserbroek, Netherlands, assignor to Vermeulen-Hollandia Octrooien II B.V., Netherlands

Filed Aug. 4, 1988, Ser. No. 228,690

Claims priority, application Netherlands, Sep. 15, 1987, 8702194

Int. Cl.[4] H02P *5/00*

U.S. Cl. 318—286 **8 Claims**



1. Control system for a sliding-tilting roof of a motor vehicle, comprising a motor for moving the sliding-tilting roof and an electrical circuit with a manually operable operating means for energizing said motor for moving the sliding-tilting roof to its closed or open position, respectively, wherein said electrical circuit comprises an input to be connected to a vehicle central locking system which provides a closing signal upon locking of the vehicle, said circuit further comprising a detecting means for determining the position of the sliding-tilting roof and means for energizing the motor for moving the roof to its closed position upon receipt of the central locking system signal when the detecting means indicates an open position of the sliding-tilting roof.

4,916,370

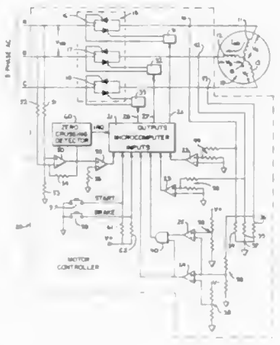
MOTOR STOPPAGE APPARATUS AND METHOD USING BACK EMF VOLTAGE

Timothy M. Rowan, Wauwatosa, and Robert J. DeLange, St. Francis, both of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Apr. 26, 1989, Ser. No. 343,439

Int. Cl.[4] H02P *3/00*

U.S. Cl. 318—368 **23 Claims**



1. An apparatus for determining when an electric motor has stopped comprising:

means for sensing the level of the back emf voltage induced in a winding of the motor;

a first means for comparing the level of the back emf voltage to a first reference voltage level;

a second means for comparing the level of the back emf voltage to a second reference voltage level;

means, responsive to said first and second means for comparing, for determining when the level of the back emf voltage is between the first and second reference voltage levels;

means for calculating the amount of time that the level of the back emf voltage is between the first and second reference voltage levels, and in response thereto producing a signal indicative of motor stoppage when the amount of time reaches a predetermined value.

4,916,371

VERTICAL DEFLECTION CIRCUIT FOR KINESCOPE YOKES, WITH FLYBACK VOLTAGE GENERATOR

Silvano Coccetti, Vittuone; Mauro Merlo, Villasanta, and Roberto Viscardi, Lissone, all of Italy, assignors to SGS Thomson Microelectronics spa, Catania, Italy

Filed Jun. 24, 1988, Ser. No. 210,814

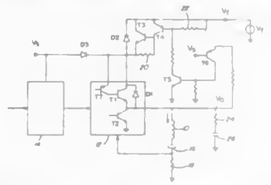
Claims priority, application Italy, Jul. 2, 1988, 21166 A/87

Int. Cl.[4] H01J *29/70, 29/76*

U.S. Cl. 315—397 **7 Claims**

1. Vertical deflection circuit for yokes of kinescopes and monitors, particularly of the high-definition type, wherein a power amplifier is fed by a first supply voltage source to generate in said yoke a deflection current, said vertical deflection circuit comprising switching means activatable to connect to the amplifier a switching means at the beginning of the flyback, characterized in that said switching means comprises at least one normally off transistor coupled to said second supply source and said amplifier and a normally forward biased diode

between said first supply source and said amplifier, and in that said flyback detector means is adapted to make said transistor



conduct when the voltage across the ends of the yoke exceeds the value of the voltage of the first source.

4,916,372

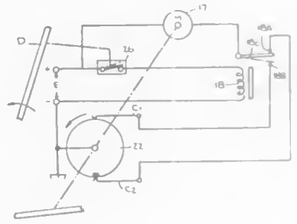
CONTROL SYSTEM FOR SCHOOL BUS SAFETY DEVICE

James Reavell, and Raymond Heath, both of Campbellford, Canada, assignors to School Bus Parts Co. of Canada, Inc., Ontario, Canada

Filed May 1, 1989, Ser. No. 345,188

Int. Cl.[4] G08B *5/22*

U.S. Cl. 318—437 **9 Claims**



1. Apparatus for activating a safety device hingedly mounted on a school bus to cause the device to swing out to a fully outstretched position when the bus door is opened and to return the device to its fully retracted position when the bus door is closed, said apparatus comprising:

(a) a unidirectional DC motor energizable by a DC power source and operatively coupled to the safety device through an eccentric drive and a reciprocating link arm, whereby in the course of a single cycle of motor rotation, during the first half cycle the arm undergoes a forward stroke to swing out the device to its fully outstretched position, and during the second half cycle, the arm undergoes a return stroke to return the device to its fully retracted position;

(b) a commutator having a conductive rotor operatively coupled to the motor and rotated thereby, and first and second brushes engaging the rotor at diametrically opposed position, said rotor having at its zero position an insulating element to disconnect the brush engaging this element from the rotor;

(c) a single-pole, double-throw switch having a movable element and first and second fixed contacts which are selectively engaged by the movable contact, said first and second fixed contacts being connected to said first and second brushes respectively, said motor being connected between the positive terminal of the power source and the movable contact, the negative terminal of the source being grounded and being connected to said rotor; and

(d) means operatively coupling said movable contact to said door, whereby when the door is opened it engages the first fixed contact and thereby supplies power to the motor through the first brush to cause the motor to turn until the safety device reaches its fully outstretched position, at which point said first brush engages the insulating element to cut off the motor, and when the door is thereafter closed, the movable contact then engages the second fixed contact and thereby supplies power to the motor through the second brush to cause the motor to turn until the safety device reaches its fully retracted position, at which point the second brush engages the insulating element to cut off the motor.

4,916,373

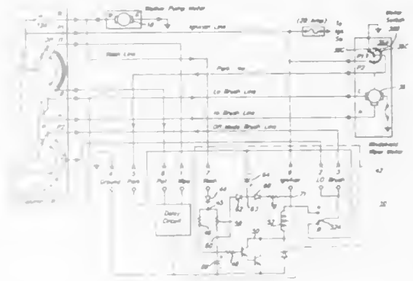
WINDSHIELD WASH AND WIPE AFTER WASH SYSTEM

Rafi A. Al-Attar, Troy; Annaliza O. Sollestre, Royal Oak; Michael P. Williams, Bloomfield Hills, and Patrick D. Dean, Armada, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Jan. 6, 1989, Ser. No. 363,225

Int. Cl.[4] B60S *1/08*

U.S. Cl. 318—443 **13 Claims**



1. In a windshield wash and wipe system responsive to any of a plurality of wash and wipe conditions, in combination comprising:

(a) switch means having an input for receiving a source voltage and producing therefrom at an output terminal a pulse signal of the same polarity as that of the source voltage and of a chosen duration;

(b) windshield wash means adapted to receive the pulse signal and in response to the pulse signal, to supply wash fluid to the windshield;

(c) windshield wipe control means having a first input terminal for receiving the pulse signal, a second input terminal for receiving the source voltage and a third input terminal for receiving a square-wave voltage signal from a motor switch mechanically coupled to a wiper motor, the motor switch providing digital voltage signals in response to movement of a rotor of the wiper motor, and producing therefrom at an output terminal the source voltage from a drive circuit of the control means for energizing the wiper motor which in turn moves a wiper arm and blade assembly back and forth across the windshield to perform the wiping action while the pulse signal is present, and then upon termination of the pulse signal to continue to supply the source voltage to the wiper motor under the control of a step-down voltage circuit within said control means that applies to an input of said drive circuit, the step-down voltage circuit being used to develop a voltage waveform of a chosen format used to turn off the drive circuit during a chosen portion of the waveform, the turning off of the drive circuit occurring in a manner that opposes parking the wiper arm and blade assembly at a position other than at an absolute park position of the windshield out of the vision of an operator.

7. An independent wash and wipe after wash circuit usable in a windshield wiper system that provides Off, continuous (high or low speed) and intermittent wipe modes of operations

by way of a mode select switch, for controlling a wash fluid pump motor and operating a high current wiper motor simultaneously during a manually actuated operation of the circuit, said circuit also providing for automatic control of the wiper motor after ceasing the manual actuated operation in a manner that renders a plurality of oscillations of a wiper arm and blade assembly, which mechanically couples to a rotor of the wiper motor, before ceasing operation and storing the wiper arm and blade assembly in a park storage position, the wiper motor having a motor switch also mechanically coupled to the rotor of the wiper motor for providing digital signals at an output terminal indicative of the position of the rotor and of the wiper arm and blade assembly, said circuit comprising:

(a) an actuating switch means adapted to receive a source voltage signal of a voltage source and during actuation, providing a pulse signal at an output terminal of the same polarity as that of the voltage source for a duration dictated by an actuation period;

(b) a windshield wash means having an input terminal coupled to said actuating switch means for receiving said pulse signal and producing therefrom at output nozzles a continuous spray of windshield wash fluid during the presence of the pulse signal;

(c) a wiper motor control means having a first input terminal coupled to said actuating switch means for receiving the pulse signal, a second input terminal coupled to receive the source voltage signal and a third input terminal adapted to receive the digital signals from the motor switch, and providing at an output terminal the source voltage signal to the wiper motor during the presence of the pulse signal and after termination of the pulse signal, providing the source voltage signal to the wiper motor under the control of an automatically generated stepdown drive voltage signal for a chosen period of time before causing the wiper motor to position the wiper arm and blade assembly in the park storage position.

4,916,374

CONTINUOUSLY ADAPTIVE MOISTURE SENSOR SYSTEM FOR WIPER CONTROL

Kenneth L. Schierbeek, Zeeland; Mark L. Larson, Grand Haven, and Kenneth Schofield, Holland, all of Mich., assignors to Donnelly Corporation, Holland, Mich.

Filed Feb. 28, 1989, Ser. No. 317,288
Int. Cl.[4] B60S *1/08*
U.S. Cl. 318—483 30 Claims

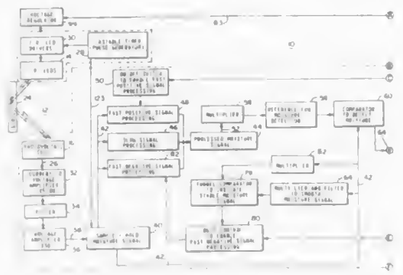
1. A wiper control for use with the window of a vehicle having a window and wiper means operative to remove moisture from a portion of said window, said wiper control comprising:

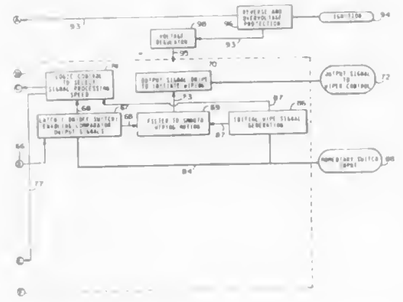
moisture sensing means responsive to the presence of moisture for producing a moisture signal representative of the amount of moisture present;

reference signal generating means for generating a reference signal;

comparison means responsive to said moisture signal and said reference signal for producing an output to the vehicle wiper means indicative of the relationship between said moisture signal and said reference signal; and

wherein the improvement comprises said reference signal generating means being responsive to said moisture signal and including signal processing means for substantially continuously adapting said reference signal to said moisture signal at a faster rate during periods of decreasing sensed moisture than during periods of increasing sensed moisture.



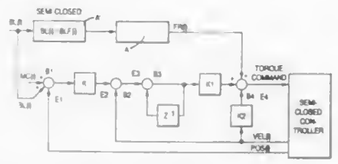


4,916,375

SERVOMOTOR CONTROL APPARATUS

Mitsuo Kurakake, Hino, and Keiji Sakamoto, Hachioji, both of Japan, assignors to Fanuc Ltd., Minamitsura, Japan

PCT No. PCT/JP87/00968, § 371 Date Aug. 4, 1988, § 102(e) Date Aug. 4, 1988, PCT Pub. No. WO88/04446, PCT Pub. Date Jun. 16, 1988
PCT Filed Dec. 11, 1987, Ser. No. 243,032
Claims priority, application Japan, Dec. 12, 1986, 61-296388
Int. Cl.[4] G05B *11/01*
U.S. Cl. 318—630 6 Claims



1. A servomotor control apparatus for controlling movement of a mechanical load in response to a position command and to a backlash correction command for correcting backlash at the mechanical load, comprising:

position detecting means for detecting a position of the mechanical load;

discriminating means for discriminating, based on the backlash correction command, a time at which an operating quadrant of the mechanical load reverses;

correcting means for receiving offset data corresponding to frictional resistance of the mechanical load, and for generating a corrected torque command based on the offset data, the detected position and the position command when the quadrant reverses; and

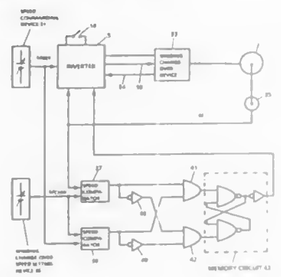
control means for driving and controlling the mechanical load based on the corrected torque command.

4,916,376

INVERTER DRIVING METHOD FOR INDUCTION MOTORS

Tuneo Kume; Toshihiro Sawa, both of Kitakyushu; Masanobu Miyazato, Yukuhashi; Mitsujiro Sawamura, Kitakyushu, and Michihiko Zenke, Yukuhashi, all of Japan, assignors to Kabushiki Kaisha Yaskawa Denki, Fukuoka, Japan

Filed Jun. 24, 1988, Ser. No. 211,319
Claims priority, application Japan, Jun. 26, 1987, 62-160325; Jul. 31, 1987, 62-193458; Jul. 31, 1987, 62-193459
Int. Cl.[4] H02P *5/40*
U.S. Cl. 318—808 1 Claim



1. An inverter driving method for the motor of a variable speed drive system comprising a polyphase induction motor capable of altering winding connections, means for altering a plurality of winding connections of said motor, storage means for a plurality of sets of motor control constants preset to enable optimal vector control with respective winding connections, means for providing a speed reference signal, means for providing a motor speed signal corresponding to the actual speed of the motor and means for providing an answer signal for confirming that the windings have been changed over, said inverter driving method comprising:

(a) setting predetermined speed ranges for the respective winding connections;

(b) when a speed reference signal and an actual motor speed signal are both within a speed range for a given winding connection:

(b1) selecting the given winding connection by activating a winding selection function,

(b2) blocking the currents for the windings to change over the windings during a state of no current flow in the windings,

(b3) continuing calculation of phases of currents using vector control while blocking the currents so that said phases of currents are not changed before and after changing over of the windings,

(b4) then after an answer signal is received from a switch for a winding change-over, reading out the set of motor control constants corresponding to the given windings connection from said storage means,

(b5) controlling said motor by applying said readout set of motor control constants to a vector controller of said motor, and

(b6) shaping the currents after a winding change-over to rise in a ramp from a small value to a required current value with the following phase:

(1) the same phase as calculated when the winding change-over is altered from Δ windings to 2Δ windings,

(2) a phase leading the calculated phase by 30° when the winding change-over is altered from Δ windings to Y windings, and

(3) a phase lagging the calculated phase by 30° when the winding change-over is altered from Y windings to Δ windings,

(c) when a speed reference signal and the actual speed signal of the motor are not within said speed range:

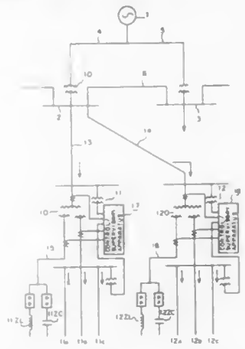
(c1) controlling the motor without activating the winding selection function, and continuing to use the set of motor control constants for the winding connection currently in use.

4,916,377

VOLTAGE-REACTIVE POWER CONTROL APPARATUS

Makoto Terada, and Hiroshi Suzuki, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1989, Ser. No. 323,879
Int. Cl.[4] G05F *1/70*
U.S. Cl. 323—210 5 Claims



1. A voltage-reactive power control apparatus comprising:

measuring means for measuring a power flow and a voltage at a load end of a power system;

power flow supervisory means for calculating a rate of change of effective power and reactive power from the measured power flow and load voltage and supervising such rate of change;

short-circuit capacity calculating means for calculating short-circuitry capacity of said power system changing from time to time;

stability limit calculating means for calculating stability limits of power flow and load voltage with reference to a constant power load and also calculating margin from the measured power flow and load voltage, calculated short-circuit capacity and stability limit; and

VAR supply equipment capacity control means for calculating voltage sensitivity coefficient for change of power flow from the calculated power flow and load voltage and controlling the VAR supply equipment with the corresponding time delay to the sensitivity coefficient.

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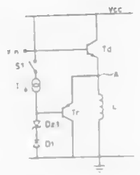
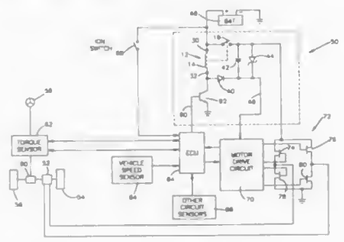
4,916,378
INDUCTIVE LOAD DISCHARGE CURRENT RECIRCULATION CIRCUIT WITH SELECTABLE "FAST" AND "LOW" MODES
Fabio Marchio', Gallarate; Marco Morelli, Leghorn, and Francesco Tricoli, Milan, all of Italy, assignors to SGS-Thomson Microelectronics s.r.l., Brianza, Italy
Filed Jul. 14, 1989, Ser. No. 380,220
Claims priority, application Italy, Jul. 20, 1988, 83649 A/88
Int. Cl.[4] G05F *1/56*
U.S. Cl. 323—222 2 Claims



1. A circuit for recirculating discharge current of an inductive load driven from a supply rail of an electrical supply by means of a switthing power transistor functionally connected between said supply rail and a first terminal of said inductive load, the other terminal of which is grounded, and having a base to which a driving signal generated by a control circuit is fed, capable of permitting recirculation of said discharge current under two different recirculation voltages which is selected for implementing a slow recirculation or a fast recirculation of said discharge current and characterized by comprising
a recirculation NPN transistor having an emitter connected to said first terminal of the inductive load, a collector connected to ground and a base connected to the anode of a zener diode, the cathode of which is connected to the cathode of a second diode, the anode of which is connected to said ground;
a current source capable of delivering to the base of said NPN recirculation transistor a current sufficient to drive the latter to saturation for implementing a slow recirculation of the discharge current of the inductive load through the recirculation NPN transistor itself at a recirculation voltage which is substantially equal to the saturation voltage of the recirculation transistor; and
means for interrupting delivery to the base of the recirculation NPN transistor of said saturating current for implementing a fast recirculation of the discharge current of the inductive load through the NPN recirculation transistor itself at a recirculation voltage which is substantially equal to the sum of the voltage drop across said second diode, the voltage of said zener diode and the baseemitter voltage of said recirculation NPN transistor.

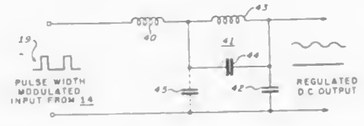
4,916,379
DC-TO-DC CONVERTER USING RELAY COIL
Thomas J. Wand, Clarkston, and Phillip A. Gaubis, Walled Lake, both of Mich., assignors to TRW Inc., Lyndhurst, Ohio
Filed Jun. 7, 1989, Ser. No. 362,578
Int. Cl.[4] H02M *3/155*
U.S. Cl. 323—222 9 Claims

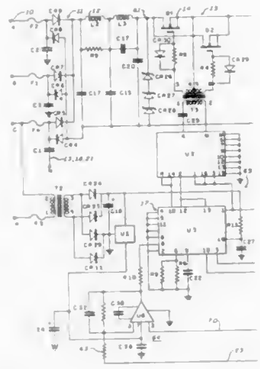
1. A DC-to-DC converter comprising:
a relay having an inductor coil and an associated relay contact, one contact terminal connected to a source of electrical energy and another contact terminal connected to an electrical load, said contact being movable to an open or a closed condition in response to an energization condition of said inductor coil, said relay contacts not changing from a closed condition to an open condition unless the energization condition of said inductor coil necessary for an open condition has existed for a predetermined time period;
drive circuit means connected to said induction coil for energizing and de-energizing said inductor coil with a periodic drive signal, the duration of the portion of the periodic drive signal that would otherwise result in an open condition of the relay contact being less than said predetermined time period so as to maintain the relay contact closed; and



rectifying circuit means connected to said inductor coil for rectifying a voltage signal resulting from the periodic energization and de-energization of said inductor coil and providing a converted DC voltage signal.

4,916,380
REGULATED SWITCHING POWER SUPPLY WITH COMPLEX OUTPUT FILTER
James A. Burroughs, San Jose, Calif., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Feb. 27, 1989, Ser. No. 315,637
Int. Cl.[4] G05F *1/56*
U.S. Cl. 323—282 5 Claims

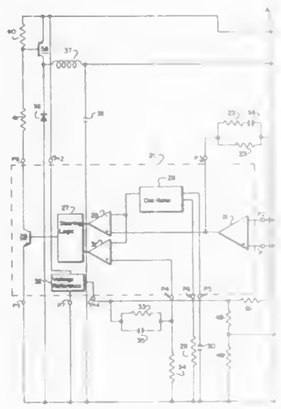


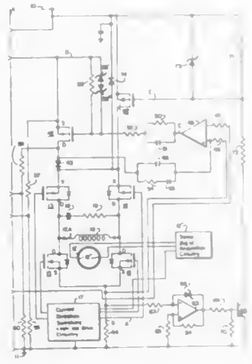


1. Power supply apparatus with switching mode voltage regulation, comprising:
input means for providing an AC input signal;
input rectifier and smoothing means coupled to said input means for rectifying and filtering said AC input signal to provide a smoothed DC signal;

pulse width modulator means coupled to said input rectifier and smoothing means for pulse modulating said smoothed DC signal at a switching frequency to provide a pulsed signal having a duty cycle; and
output filter means responsive to said pulsed signal for providing a smoothed regulated output DC voltage having a response characteristic with a cut-off frequency selected for good ripple rejection of rectified AC input signals and an attenuation notch positioned at a frequency that is at least a frequency decade above said cutoff frequency, said attenuation notch being tuned to said switching frequency.

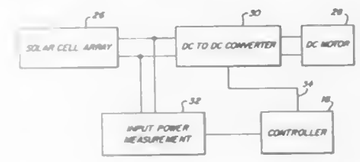
4,916,381
CURRENT SOURCE FOR A VARIABLE LOAD WITH AN INDUCTIVE COMPONENT
George Gelecinskyj, Richfield; Charles E. Goetzinger, Bloomington, and John D. Pro, Burnsville, all of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.
Filed May 12, 1988, Ser. No. 193,353
Int. Cl.[4] G05F *1/56*
U.S. Cl. 323—285 19 Claims





1. A current source adapted to be energized from a supply and having first and second load terminals, said current source being capable of providing a load current between said first and second load terminals, if a selected load device is electrically connected therebetween, which has a substantially constant value over a range of load conditions, comprising:
regulator means coupled to the supply for providing a regulated potential output, the regulator means having a potential adjustment input such that a signal provided at the potential adjustment input regulates the regulated potential output;
current controller means having a current path therethrough coupled in series between the regulated potential output and one of the load terminals, the current path having an adjustable impedance for controlling current flow through a load device if it is electrically connected between the first and second load terminals, the current controller means further having a current controller input for controlling the adjustable impedance;
current sensing means having a current input coupled in series with one of the load terminals for carrying a load current, the current sensing means further providing a current sense output representative of an amplitude of such a load current coupled to the current controller input for maintaining the current substantially constant; and
power sensing means coupled to the adjustable impedance for providing a power output representative of the power dissipated in the adjustable impedance, the power output being coupled to the potential adjustment input for maintaining the power dissipated in the adjustable impedance at a preselected power level.

4,916,382
SYSTEM FOR MAXIMIZING EFFICIENCY OF POWER TRANSFER
William A. Kent, Ft. Lauderdale, Fla., assignor to Horner Equipment of Florida, Inc., Fort Lauderdale, Fla.
Filed Feb. 1, 1988, Ser. No. 151,100
Int. Cl.[4] G05F *1/67*
U.S. Cl. 323—299 6 Claims



1. A solar pumping system for pumping a fluid, including:
an array of photovoltaic cells for generating direct current electrical power having first voltage and current characteristics;
power converting means coupled to the array of photovoltaic cells for converting the first voltage and current characteristics of the electrical power to electrical power having second voltage and current characteristics;
motor means coupled to receive said electrical power having said second voltage and current characteristics;
pump means actuated by operation of the motor means for pumping fluid;
control means for selecting values for the second voltage and current characteristics, and for controlling said power converting means and
means for delivering to said control means signals indicative of values of the first voltage and current characteristics and signals indicative of flow rates of the fluid pumped by the pump means to allow the control means to select optimal values of the second voltage and current characteristics.

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4,916,383

FREQUENCY RESPONSE ANALYSIS

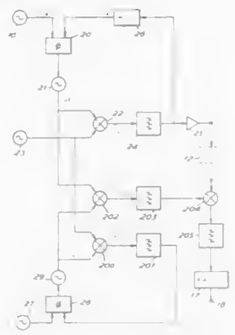
Brian Sayers, Farnborough; Alan Ryder, Hants, and Steve Outram, Surrey, all of England, assignors to Schlumberger Technologies Limited, England

Filed Apr. 28, 1989, Ser. No. 344,927

Claims priority, application United Kingdom, Apr. 29, 1988, 8810321

Int. Cl.[4] G01R *23/14*

U.S. Cl. 324—605 2 Claims



1. A frequency response analyser for testing the response of a system under test at a relatively higher frequency F having a signal generator portion capable of generating a reference signal at a relatively lower frequency F/K including:

a phase locked loop comprising a phase sensitive detector to which the reference signal is applied at a reference input, a voltage controlled oscillator arranged to provide a signal of a frequency being a multiple of the reference signal frequency, but offset in frequency and a divider for dividing by said multiple to generate a signal of frequency F/K from a signal of frequency F connected to a comparison input of the voltage controlled oscillator,

means for generating a fixed frequency signal of the frequency offset of the voltage controlled oscillator,

mixing means intermediate the voltage controlled oscillator and divider of the phase locked loop arranged to receive the fixed frequency at its mixing input, the output of the mixing means being provided to the system under test,

means for generating a second signal of constant frequency, being a frequency of operation of an analysing portion of the frequency response analyser offset by an amount equal to the offset of the voltage controlled oscillator output,

second mixing means arranged to receive said second signal and the voltage controlled oscillator output signal, and,

third mixing means arranged to receive the output of said second mixing means and a signal from the system under test, the third mixing means providing an output for analysis of frequency C to said analysing portion.

4,916,384

APPARATUS FOR MEASURING THE SOOT PARTICLES CONTAINED IN THE EXHAUST GAS EMITTED FROM DIESEL ENGINES

Kozo Ishida, Kyoto, Japan, assignor to Horiba, Ltd., Kyoto, Japan

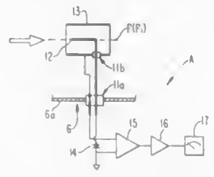
Continuation of Ser. No. 601,843, Apr. 19, 1984, abandoned. This application Dec. 9, 1986, Ser. No. 940,162

Claims priority, application Japan, Apr. 30, 1983, 58-76783

Int. Cl.[4] G01N *27/62, 15/00*

U.S. Cl. 324—71.4 12 Claims

1. An apparatus for measuring the rate of emission of soot particles in the exhaust gas of a diesel engine, comprising a diluting conduit having an interior wall surface, means for injecting air and the exhaust gas into said diluting conduit so as to dilute the exhaust gas and flow within said interior wall surface, and means, disposed in the path of said exhaust gas and responsive to the conductivity of the soot particles in the exhaust gas, for producing an electrical current proportional to the quantity of soot particles in the exhaust gas, said producing means including a pair of spaced electrodes and means for applying a voltage thereacross, said pair of electrodes being disposed in said diluting conduit in spaced relation to said inner



wall surface thereof, the cross-sectional area of a first space between said electrodes being a small proportion of the cross-sectional area of a second space between said interior wall surface and said electrodes whereby only a small proportion of the diluted exhaust gas passes between said electrodes and the remainder of the diluted exhaust gas passes through said second space between said electrodes and said interior wall surface.

4,916,385

INVERTER CIRCUIT

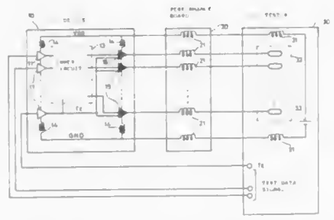
Ichiro Tomioka; Masahiro Ueda; Takahiko Arakawa; Toshiaki Hanibuchi, and Yoshihiro Okuno, all of Hyogo, Japan, assignors to Mitsubishi Denki Kkabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1988, Ser. No. 262,302

Claims priority, application Japan, Nov. 2, 1987, 62-277969

Int. Cl.[4] G01R *31/28;* **H03K** *19/00*

U.S. Cl. 324—158 R 20 Claims



1. An inverter circuit connected between a power supply (V_{DD}) and a ground (GND) for inverting an input signal supplied thereto into an output signal inverted with respect to the input signal comprising:

a first field effect device (3) of one conductivity type and a second field effect device (4) of the opposite conductivity type which are connected in series between said power supply (V_{DD}) and said ground (GND),

said first field effect device (3) having its control electrode connected to receive the input signal, and

said second field effect device (4) having on-resistance lower than said first field effect device (3);

means for receiving a signal for designating a predetermined operating mode; and

delay means connected to receive said input signal for delaying said input signal in response to said operating mode designating signal;

said second field effect device (4) having its control electrode connected to receive said input signal after being delayed by said delay means.

4,916,386

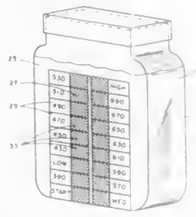
MICROWAVE WATTAGE INDICATOR

James E. Schulz, 13579 Caramel Trail, Eden Prairie, Minn. 55346

Filed Mar. 20, 1989, Ser. No. 325,918

Int. Cl.[4] G01R *21/00, 21/02*

U.S. Cl. 324—95 11 Claims



1. A microwave oven wattage detector comprising:

a microwave transparent container;

a predetermined quantity M of thermally homogenous fluid at an initial temperature T_1 held within said container heated by said microwave oven for a fixed time t;

a wattage indicating strip heated to a final temperature T_2 by said fluid, said strip including a plurality of temperature-sensitive members, each to be activated and change color at a different temperature, such strip having indicia associated with each member corresponding to power levels to determine, for a particular temperature T_2 when the formula:

$$C_p(T_2-T_1)(M)(1/t) = \text{energy/time} = \text{power}$$

where

C_p = heat capacity; units of joules/gram degrees F.

T_1 = temperature initial; units of degrees F.

T_2 = temperature final; units of degrees F.

M = mass of compound being heated; units of grams

t = time of energy exposure; units of seconds

is utilized, the power level of said microwave oven.

4,916,387

OPTICAL SYSTEM FOR A FARADAY EFFECT CURRENT SENSOR

Robert C. Miller, Salem Twp., Westmoreland County, Pa., assignor to Asea Brown Boveri, Inc., Purchase, N.Y.

Filed Oct. 21, 1988, Ser. No. 260,849

Int. Cl.[4] G01R *31/00, 33/00;* **G01J** *1/32*

U.S. Cl. 324—96 8 Claims

1. A system for monitoring an alternating current comprising: a current transducer having first and second optical ports and means providing a light conductive path for causing optical radiation to travel between said optical ports while interacting with the alternating current in a manner to cause the intensity of the optical radiation to vary as a function of variations in the amplitude of the current, with the polarity of the variation being dependent on the direction of travel of optical radiation in said transducer between said optical ports; two optical cables each optically coupled to a respective optical port; light directing means connected to said optical cables for causing optical radiation to travel in both directions in said transducer between said optical ports; and circuit means coupled to said light directing means for deriving a respective representation of the change in intensity experienced by the optical radiation traveling in each direction through said optical cables and said transducer, and for combining the representations relating to both directions in order to derive an indica-

tion of the change in intensity experienced by the optical radiation when traveling through said transducer.

4,916,388

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE EQUIPPED WITH SCAN-PASS TYPE TEST CIRCUIT

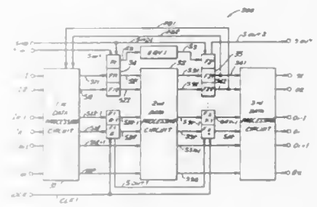
Toshi Sano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 31, 1989, Ser. No. 332,006

Claims priority, application Japan, Apr. 1, 1988, 63-81484

Int. Cl.[4] G01R *31/28, 15/12*

U.S. Cl. 324—158 R 4 Claims



1. A semiconductor device comprising a data processing circuit, first storage means for temporarily storing test data to be processed by said data processing circuit, second storage means for temporarily storing test data outputted from said data processing circuit, a scan-in terminal supplied with test data in a test mode, a scan-out terminal, means coupled to said scan-in terminal and said first storage means for supplying in said test mode said test data to said first storage means in synchronism with a clock signal, means coupled to said scan-out terminal and said second storage means for supplying in said test mode test data stored in said second storage means to said scan-out terminal, third storage means coupled to said scan-in terminal for temporarily storing the test data in synchronism with said clock signal, a delay circuit having an input node connected to said third storage means to receive the test data stored therein and an output node, and fourth storage means coupled between the output node of said delay circuit and said scan-out terminal for temporarily storing test data appearing at the output node of said delay circuit and supplying the stored test data to said scan-out terminal in synchronism with said clock signal.

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4,916,389

SEMICONDUCTOR INTEGRATED CIRCUIT WITH VOLTAGE LIMITER HAVING DIFFERENT OUTPUT RANGES FROM NORMAL OPERATION AND PERFORMING OF AGING TESTS

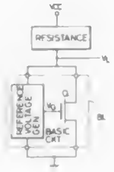
Ryoichi Hori, Hinode; Kiyoo Itoh, Higashikurume and Hitoshi Tanaka, Tachikawa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., both of Tokyo, Japan

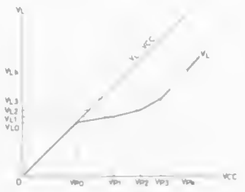
Continuation of Ser. No. 562,969, Dec. 19, 1983, abandoned. This application Jan. 4, 1988, Ser. No. 140,628

Claims priority, application Japan, Dec. 17, 1982, 57-220083

Int. Cl.[4] G01R *31/10*; H02M *3/158*

U.S. Cl. 324—158 T 27 Claims





26. A semiconductor integrated circuit contained within a chip having a regulated voltage comprising:

circuit means contained within the semiconductor integrated circuit which has an input to which is coupled the regulated voltage for powering said circuit means; and

means for producing the regulated voltage having an input adapted to be coupled to a means for supplying an external supply voltage, and an output which is coupled to the input of the circuit means to which the regulated voltage is supplied, the regulated voltage being a function of the external supply voltage whose rate of change with respect to change in the external supply voltage has a first rate of change between an external voltage varying between 0 volts and a first predetermined magnitude and a second non-constant rate of change from the first predetermined magnitude to a greater magnitude, the second non-constant rate of change including a predetermined ordinary operation range for the circuit means and a higher range for conducting an aging test, the rate of change for the ordinary operation range being different from the rate of change for conducting an aging test, and the rate of increase of the regulated voltage as a function of the external voltage in the range between 0 volts and the first predetermined magnitude being greater than the average rate of increase between the first predetermined magnitude and the greater magnitude of the second non-constant rate of change, the regulated voltage provided during the aging test approximately equalizing stress conditions of transistors of small geometries receiving the regulated voltage to stress conditions of transistors of large geometries receiving the external supply voltage.

4,916,390

COIL SPRING TOOTHED WHEEL FOR USE IN MEASURING AN ANGULAR VELOCITY

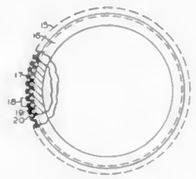
Arno Christoleit, Hanover; Lutz Piesbergen, Barsinghausen, and Reinhard Schmidt, Lehrte, all of Fed. Rep. of Germany, assignors to Wabco Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 94,358, Sep. 8, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 312,502

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1986, 3633705

Int. Cl.[4] G01B *7/14*; G01P *3/48, 3/54*; H02K *17/42*

U.S. Cl. 324—174 41 Claims



1. A coil spring toothed wheel for use with a sensor equipped with a permanent magnet for measurement of at least one of a number of revolutions and an angular velocity of a component, said coil spring toothed wheel comprising: a series of segments oriented in a direction of rotation and constituting areas of differing properties with respect to a magnetic field to be generated and scanned by such sensor, said series of segments formed by a plurality of a winding and an adjoining air gap of a helical coiled ferromagnetic wire of a coil spring, a width of said wire being approximately equal to a width of an adjoining air gap between a winding of said coil spring, said ferromagnetic wire being wound in a direction of a longitudinal axis of said coil spring to form successive segments of ferromagnetic material and non-ferromagnetic material.

4,916,391

LVDT DISPLACEMENT SENSOR WITH SIGNAL NOISE REDUCTION FOR USE IN WEIGHING APPARATUS

Eryk S. Doerman, 45 Cromwell Road, London SW7 2ED; William J. Turner, 83 Twyford Road, Harrow, Middlesex HA2 OSJ; David A. Homer, 35 Kebie Road, Maidenhead, SL6 6BB; Andrew D. G. Stewart, The Old Rectory, Ashampstead, Reading, Berkshire, and Ian Clarke, Thames Cottage, 63 High Street, Wargrave, Berkshire, all of England

Continuation of Ser. No. 70,174, Aug. 11, 1987, abandoned, which is a division of Ser. No. 798,298, Nov. 15, 1985, Pat. No. 4,696,358. This application Mar. 21, 1989, Ser. No. 353,204

Claims priority, application United Kingdom, Nov. 15, 1984, 8428976

Int. Cl.[4] G01B *7/14*; H04B *15/00*; G08C *19/08*; G01G *19/00*

U.S. Cl. 324—207.18 7 Claims

1. Apparatus for sensing displacement at relatively low frequencies comprising:

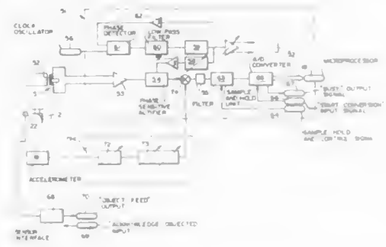
a linear variable differential transformer comprising a core which moves in accordance with said displacement, a primary winding, and two matched secondary windings in series;

means for energizing the primary winding with a signal which varies cyclically;

means for deriving from the output across the secondary windings a signal representative of said displacment which has a principal ripple component derived from the energizing signal;

means for filtering said representative signal, whereby said ripple component is reduced; and

means for taking successive samples from the filtered signal always at the same point in the principal ripple component cycle, which samples are representative of said displacement and means for integrating the successive samples over a predetermined period thereby determining the product of said displacement and time over a predetermined period.



4,916,392

CONTACTLESS CURRENT CONTROL SENSOR IN APPARATUS FOR MAGNETOELECTRIC CRACK DETECTION

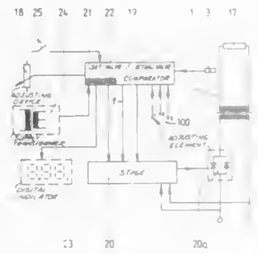
Eduard Sendeff, Aalen-Nesslau, and Johannes Sebulke, Hünsern, both of Fed. Rep. of Germany, assignors to Tiede GmbH & Co. Rissprufanlagen, Fed. Rep. of Germany

Filed Sep. 16, 1987, Ser. No. 97,191

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1986, 3631571

Int. Cl.[4] G01N *27/87*; G01R *33/12*

U.S. Cl. 324—235 7 Claims



1. A contactless test current control device in an apparatus for magnetoelectric crack detection,

having a sensor comprising one of a Hall generator and a magnetoresistor and connected to clamping and retaining means made of a diamagnetic material for adjustably clamping said sensor with respect to a test current conductor at variable distances therefrom; said clamping and retaining means comprising a retaining plate and a guide track defining a slot extending substantially perpendicularly to the test current conductor;

said sensor being mounted upon said retaining plate which is movable along said slot;

further comprising a control circuit having an input connected to said sensor and an output for providing a test current control signal, and test current control means having an input connected to said output of said control circuit for controlling test current through the test current conductor,

whereby magnetic field generated by the current passing through the test current conductor is sensed by said sensor without contacting the test current conductor.

4,916,393

CONTINUOUS VECTORIAL MAGNETOMETER WITH CAPACITIVE MAGNETOSTRICTION PICKUP AND GRADIOMETER INVOLVING THE APPLICATION OF THIS PICKUP

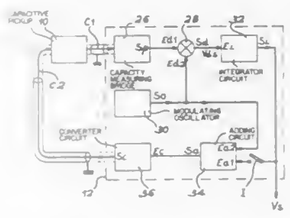
Jean Crescini, Domene, and Denis Duret, Grenoble, both of France, assignors to Commissariat A l'Energie Atomique, France

Filed Dec. 15, 1988, Ser. No. 285,000

Claims priority, application France, Dec. 16, 1987, 87 17566

Int. Cl.[4] G01R *33/02, 33/022, 27/26*

U.S. Cl. 324—244 6 Claims



1 Continuous vectorial magnetometer having a magnetostrictive pickup, including:

a capacitive pickup (**10**) having at least:

on the inside of a modulation and counter reactor coil (**16**), one first electrically conductive electrode,

one second electrically conductive electrode,

a dielectric material (**22**) interposed between the first and the second electrodes, at least one of these electrodes being made of magnetostrictive material,

this capacitive pickup (**10**) being connected to measuring means (**12**) measuring the variation of the capacity of the said capacitive pickup (**10**) under the action of an external magnetic field, these measuring means (12) including:

a capacity measuring bridge (**26**) connected to the capacitive pickup (**10**) by a coaxial connection C1 and delivering a signal at an output Sp,

a synchronous demodulator (**28**) connected by an input Ed1 to the output Sp of the measuring bridge (**26**) and by a input Ed2 to the output So of a modulating oscillator (**30**), and putting out a signal Vds at an output Sd,

an integrator (32) connected by an input Ei to the output Sd of the synchronous demodulator (**28**) and delivering at an output Si a signal Vs proportional to the said external magnetic field,

an adder (**34**) having an input Ea1 connected by a switch I to the output Si of the integrator (32) and having an input Ea2 connected to the output So of the modulating oscillator (**30**) and delivering a signal at an output Sa,

a voltage-to-current converter (**36**) connected by an input Ec to the output Sa of the adder (**34**) and delivering a signal at an output Sc, the output Sc of said converter (**36**) being connected by a coaxial cable C2 to the capacitive detector (**10**).

4,916,394

DEVICE FOR ADJUSTABLE MOUNTING OF MAGNETIC SENSING COILS USED IN PIPE INSPECTION

Carroll R. Thompson, Woodlands, Tex., assignor to Scan Systems, Inc., Channelview, Tex.

Filed Feb. 27, 1989, Ser. No. 315,930

Int. Cl.[4] G01N *27/82*; G01R *33/12*

U.S. Cl. 324—262 14 Claims

1. A mounting shoe or support for a sensor inductance coil or coils which is used in an inspection apparatus for detection

of structural flaws in a pipe of ferromagnetic material where such inspection is performed by inducing magnetization of the pipe and sensing variations in the magnetic field thereabout, said mounting shoe comprising:

a base member of non-magnetic material, said base member having at least one planar surface and an elongate recess formed in said planar surface;

a plurality of inductance coils mounted in said recess;

a shim in the form of a thin sheet of magnetically transparent material which is secured to said base in a position which covers said elongate recess and the inductance coils carried therein;

a pair of elongate contact members supported on said shim

on both sides of said recess in generally symmetric relationship thereto, each of said contact members having a planar contact surface disposed at an angle to the planar surface of the base member and adapted for contact with the exterior surface of a pipe to be inspected; and

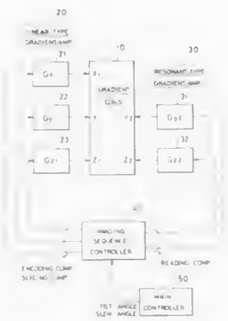
means for adjustably mounting each said contact member for movement on said shim in a direction transverse to said recess whereby the contact members may be positioned on said shim at a selected distance from said recess appropriate for establishing lines of contact with said pipe surface on both sides of said recess such that the shim is closely adjacent the surface of the pipe and the inductance coils are at an optimum sensing range from said pipe surface.

4,916,395

METHOD AND APPARATUS FOR NUCLEAR MAGNETIC RESONANCE IMAGING USING LINEAR AND RESONANT TYPE AMPLIFIERS

Yoshiyuki Usui, Kuroiso, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 18, 1989, Ser. No. 298,626
Claims priority, application Japan, Jan. 29, 1988, 63-17426
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—307 16 Claims



1. An apparatus for nuclear magnetic resonance imaging, comprising:

gradient coils for generating gradient magnetic fields;

linear type amplifier means having three channels for supplying currents to the gradient coils; and

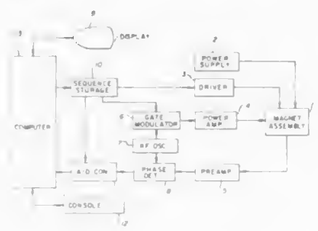
resonant type amplifier means having at least two channels for supplying currents to the gradient coils.

4,916,396

MAGNETIC RESONANCE IMAGING METHOD

Kazuya Hoshino, Tokyo, Japan, assignor to Yokogawa Medical Systems, Limited, Tokyo, Japan

PCT No. PCT/JP86/00631, § 371 Date Jun. 1, 1988, § 102(e) Date Jun. 1, 1988, PCT Pub. No. WO87/03464, PCT Pub. Date Jun. 18, 1987
PCT Filed Dec. 12, 1986, Ser. No. 254,679
Claims priority, application Japan, Dec. 16, 1985, 60-282610
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 4 Claims



1. A magnetic resonance imaging method of taking a tomogram of an object under examination by exciting the spins of the atomic nuclei existing in a desired cross section across the object placed in a uniform and static magnetic field with RF electromagnetic radiation, measuring the resulting NMR signal by Fourier transform, and reconstructing the tomogram from the signal, said method comprising the steps of:

defining a circular region whose center lies at the point in a two-dimensional Fourier plane at which the spatial frequency is zero, the Fourier plane corresponding to a region containing an image to be reconstructed;

observing the spin echo signals emanating from a region inside the circular region by using an exciting RF pulse followed by an inverse exciting RF pulse, and applying reading magnetic gradients; and

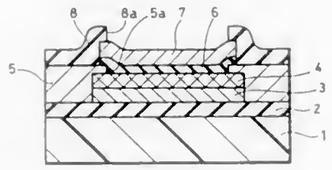
observing the spin echo signals emanating from the remaining region inside the circular region while shortening the time for which a reading gradient magnetic field is applied whenever an excitation is effected and, at the same time, effecting an additional phase shift encoding.

4,916,397

SEMICONDUCTOR DEVICE WITH BONDING PAD

Hisao Masuda, and Syuichi Osaka, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1988, Ser. No. 227,833
Claims priority, application Japan, Aug. 3, 1987, 62-193957
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—71 6 Claims



1. A semiconductor device having a bonding pad for connecting lead wires, comprising:

a semiconductor substrate;

a metal silicide film formed in a portion corresponding to said bonding pad on said semiconductor substrate,

a silicon dioxide film formed on said semiconductor substrate and containing elements selected from the group consisting of phosphorus and boron, said silicon dioxide film having an opening in a portion corresponding to said bonding pad,

a metal nitride film formed on said metal silicide film and adhered to said metal silicide film, and

an aluminum film formed on said metal nitride film and serving as said bonding pad.

4,916,398

EFFICIENT REMOTE TRANSMISSION LINE PROBE TUNING FOR NMR APPARATUS

Alan R. Rath, Fremont, Calif., assignor to Spectroscopy Imaging Systems Corp., Fremont, Calif.

Filed Dec. 21, 1988, Ser. No. 287,789
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—322 5 Claims

1. An NMR apparatus for exciting and detecting rf resonance of gyromagnetic resonators in a sample, comprising:

polarizing magnet means for establishing a magnetic field wherein said resonators precess,

rf source means for furnishing an rf magnetic field for application to precessing resonators, thereby to transfer energy to said resonators through an excitation process,

rf receiver means for acquiring from said resonators a transient signal corresponding to a de-excitation process,

probe means comprising rf coil means for transferring rf power between said rf source and said sample, said probe means comprising an rf coil disposed proximate said sample and a transmission line means for transport of rf power between said rf coil and said rf source,

fixed local tuning means disposed between said coil and said transmission line means for partially matching the transmission line means to the rf coil and approximately tuning said rf coil to a resonant condition at a preselected frequency, said partial matching characterized by a reflection coefficient in the range from approximately 0.65 to no greater than substantially 0.9,

remote variable tuning means disposed between said transmission line and said rf source, said remote variable tuning means for further tuning said rf coil to said resonant condition, whereby the approximate tuning is supplemented by said remote variable tuning means to closely approach an exact resonant condition for dissipation of rf power in said rf coil.

4,916,399

HEAD OR BODY COIL ASSEMBLY FOR MAGNETIC RESONANCE IMAGING APPARATUS

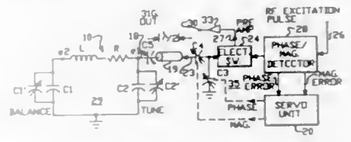
Bernard M. Oliver, Los Altos Hills, Calif., assignor to Resonex, Inc., San Carlos, Calif.

Division of Ser. No. 88,680, Aug. 24, 1987, which is a continuation-in-part of Ser. No. 890,603, Jul. 25, 1986, abandoned. This application Mar. 23, 1989, Ser. No. 327,651
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—322 2 Claims

1. A head or body coil assembly for picking up nuclear magnetic resonance (NMR) signals from a test specimen produced in a magnetic resonance imaging apparatus and for transmitting NMR excitation signals to said test specimen having gradient coils driven by gradient waveforms, such waveforms having an effective relatively low frequency substantially less than the frequency of said induction decay or spin-echo signals;

inductive pick-up coil means for sensing said signals and for producing RF excitation NMR signals of substantially the same frequency as said NMR pick-up signals, said coil means including a substantially cylindrical and continuous thin sheet of conductive material curved around and substantially surrounding said specimen;

said thin sheet of conductive material having a thickness



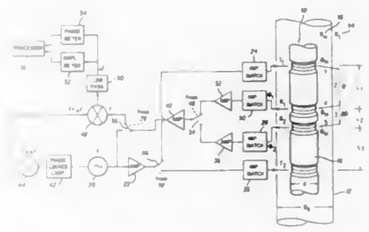
comparable to the skin depth at said frequency of said NMR signals, said thin band having a thickness significantly less than the skin depth at said gradient waveform frequency, whereby said sheet is transparent to said gradient waveforms, said cylindrical thin sheet forming a magnetic flux tube for said NMR signals, where the flux through any circular cross section of said cylindrical sheet is the same, where said magnetic flux is the magnetic field component of said NMR signals, whereby a substantially homogeneous magnetic field at said signal frequency is provided inside said cylindrical coil means.

4,916,400

METHOD FOR DETERMINING CHARACTERISTICS OF THE INTERIOR GEOMETRY OF A WELLBORE

David L. Best, Houston, and Brian Clark, Missouri City, both of Tex., assignors to Schlumberger Technology Corporation, Sugar Land, Tex.

Filed Mar. 3, 1989, Ser. No. 319,013
Int. Cl.[4] G01V *3/30*
U.S. Cl. 324—338 13 Claims



1 A method for investigating characteristics of the interior geometry of a fluid filled passage formed through a medium, said passage having therein a transmitter and a pair of receivers spaced different distances along said passage from said transmitter, comprising the steps of:

a. generating an oscillating signal at said transmitter such that said oscillating signal properties into and through said medium to said receivers;

b. generating a first signal indicative of the phase evolution of said oscillating signal as it propagates from said transmitter to said receivers, said phase evolution including components attributable to traversal of a portion of said passage and components attributable to traversal of said medium between said transmitter and said receivers;

c. generating a second signal indicative of a property of said medium; and

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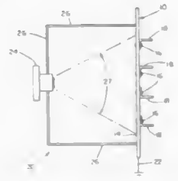
d. in response to said first and second signals, generating a signal indicative of the interior geometry of said passage.

4,916,401

METHOD AND APPARATUS FOR TESTING FASTENER ARCING AND SPARKING

James K. Bogard, Renton; Michael J. Katzer, and Diane L. Heidlebaugh, both of Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 12, 1988, Ser. No. 193,937
Int. Cl.[4] G01R *31/12*
U.S. Cl. 324—536 **8 Claims**



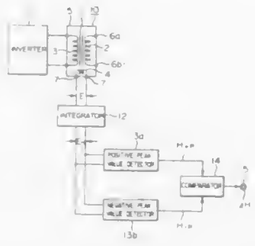
1. An apparatus for testing arcing and sparking of fasteners used with panels of a material, the panels having a first side and a second side opposed to the first side, comprising:
- a light-tight enclosure having walls at least partially including a replaceable panel of the material, the replaceable panel having at least one of the fasteners passing from the first side to the second side of the panel;
- imaging means for producing an image of the light generated by any sparking or arcing that may be induced within the enclosure by an electrical current; and
- means for producing an electrical current through the fastener.

4,916,402

APPARATUS FOR DETECTING DIRECT CURRENT MAGNETIC FLUX DEFLECTIONS OF AN ELECTRICAL TRANSFORMER

Toyokazu Kouan, and Katsumi Shiono, both of Ako, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 20, 1988, Ser. No. 246,745
Claims priority, application Japan, Sep. 22, 1987, 62-238106; Feb. 5, 1988, 63-23851
Int. Cl.[4] G01R *31/06, 31/34*
U.S. Cl. 324—547 **3 Claims**



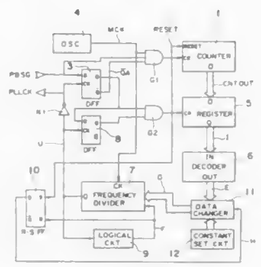
1. An apparatus for detecting direct current magnetic flux deflection in an electrical transformer comprising:
- a transformer having a primary winding and a secondary winding;
- a magnetic detector electrically isolated from the primary and secondary windings of the transformer for detecting the magnetic flux deflection of the transformer and for generating an output voltage waveform in response to the magnetic flux deflection;
- an integrator connected to said magnetic detector for integrating the output voltage waveform from said magnetic detector;
- a positive peak value detector connected to said integrator for detecting positive peak values of the output voltage waveform integrated by said integrator;
- a negative peak value detector connected in series to said integrator and in parallel to said positive peak value detector for detecting negative peak values of the output voltage waveform integrated by said integrator; and
- a comparator connected to said positive and said negative peak value detectors for comparing the positive peak values from said positive peak value detector to the negative peak values from said negative peak value detector to provide peak difference values indicative of the direct current magnetic flux deflection of said transformer.

4,916,403

DIGITAL PHASE-LOCKED LOOP SYSTEM

Kengo Sudoh; Hiroshi Ii, and Hiroyuki Matsuoka, all of Higashi hiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 30, 1988, Ser. No. 251,402
Claims priority, application Japan, Oct. 1, 1987, 62-248725; Nov. 7, 1987, 62-281501; Nov. 7, 1987, 62-281502; Dec. 2, 1987, 62-306224; Dec. 24, 1987, 62-328949
Int. Cl.[4] H03L *7/00*
U.S. Cl. 328—155 **4 Claims**



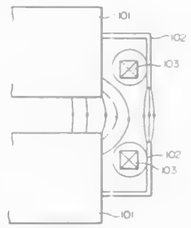
1. A digital phase-locked loop system comprising:
- an oscillator for generating a clock signal of a stationary frequency;
- a frequency divider dividing the clock signal generated by the oscillator to produce a phase-locked loop signal;
- phase difference detecting means for detecting phase difference between an input signal and the phase-locked loop clock signal and output a phase difference detection signal;
- frequency dividing rate setting means for setting frequency dividing rate corresponding to the phase difference in response to the phase difference to the phase difference detecting signal and for supplying the frequency dividing rate to the frequency divider;
- frequency division constant setting means for supplying a predetermined frequency dividing rate to the frequency divider; and
- frequency dividing rate switching means for supplying the frequency divider with an output from the frequency dividing rate setting means in response to the phase difference detection signal when the phase difference is detected and then supplying the frequency divider with an output from the frequency dividing constant setting means.

4,916,404

ELECTRON STORAGE RING

Koji Tsumaki, Kodaira; Masatsugu Nishi, Katsuta; Masashi Kitamura, Hitachi; Jyoji Nakata, Kawasaki, and Masayuki Nakajima, Zama, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan

Filed Jun. 24, 1988, Ser. No. 211,265
Claims priority, application Japan, Jun. 24, 1987, 62-155488
Int. Cl.[4] H05H *7/00*
U.S. Cl. 328—233 **11 Claims**



1. An electron storage ring comprising:
- a high frequency cavity for accelerating electrons;
- at least one focusing magnet for focusing an electron beam;
- at least one defocusing magnet for defocusing an electron beam;
- a superhigh vacuum chamber for storing electrons;
- at least one deflecting magnet having an iron core for reducing magnetomotive force and superconductive coil means for generating a magnetic field, said iron core having upper and lower core portions between which an orbit plane of the electron beam extends; and
- a pair of iron magnetic poles coupled to said deflecting magnet, each of said magnetic poles extending between first and second ends thereof, the respective first ends of said magnetic poles being jointed with said upper and lower core portions of said iron core of said deflecting magnet, respectively, and the respective second ends of said magnetic poles being located symmetrically to each other with respect to the orbit plane, so as to surround the superconductive coil means.

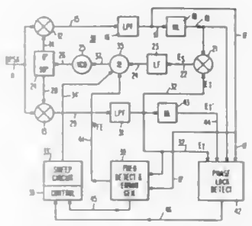
4,916,405

SMART SWEEP APPARATUS FOR DATA RATE RECEIVERS

Christopher R. Keate, Salt Lake City; Jeffrey Mac Thornock, Layton, and Bruce H. Williams, Sandy, all of Utah, assignors to Unisys Corp., Blue Bell, Pa.

Filed Oct. 27, 1988, Ser. No. 263,677
Int. Cl.[4] H04L *27/22*
U.S. Cl. 329—308 **12 Claims**

1. Apparatus for receiving and locking onto doppler shifted data rate signals, comprising:
- a phase lock loop of the type having a data detection branch, a carrier tracking branch and a voltage controlled oscillator branch,
- a voltage controlled oscillator in said voltage controlled oscillator branch,
- a summing circuit connected in said voltage control branch at the input of said voltage control oscillator,
- a sweep control circuit connected to the input of said summing circuit for sweeping said voltage control oscillator through a range of frequencies which contain the doppler shifted carrier frequency,
- an automatic frequency control circuit connected to the input of said summing circuit for automatically adjusting the frequency of said voltage controlled oscillator to the center frequency of the doppler shifted carrier frequency without overshoot to enable the phase lock loop to lock onto the phase of said doppler shifted carrier frequency, and



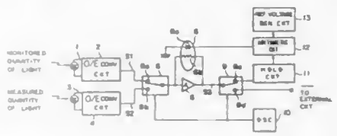
said automatic frequency circuit comprising a frequency detector and threshold reference means for setting threshold voltage signal error values at the frequency detector defining a frequency window which contains the center frequency of said doppler shifted carrier frequency.

4,916,406

AUTOMATIC GAIN CONTROL CIRCUIT

Kiyoshi Ichimura, Tokyo; Kozo Yasuhara, Nishinomiya, and Norio Kawashima, Tokyo, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1989, Ser. No. 310,062
Claims priority, application Japan, Feb. 25, 1988, 63-43165; Feb. 25, 1988, 63-43166
Int. Cl.[4] H03G *3/10;* **H03F** *3/08*
U.S. Cl. 330—281 **6 Claims**



1. An automatic gain control circuit comprising:
- input means (1, 2, 3, 4; 14, 15) for receiving first and second input signals and providing first (S2) and second (S1) signals;
- an amplifier (5) for receiving and amplifying said first and second signals and outputting a first output signal in receipt of said first signal and outputting a second output signal in receipt of said second signal;
- input control means (8, 10; 10, 16, 17, 18) responsive to an operation control signal for separately supplying said first and second signals to said amplifier with a predetermined time interval therebetween;
- control signal generating means (11, 12, 13) responsive to said second output signal of said amplifier for generating a control signal, said control signal generating means including a hold circuit for holding said second output signal of said amplifier, and an arithmetic circuit connected for receiving as two input signals thereof an output signal from said hold circuit and a reference signal, said arithmetic circuit responsive to said two input signals for generating said control signal as a function of a difference between said two input signals;
- selection means (9) connected to said input control means for supplying said second output signal of said amplifier to said control signal generating means when said second

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signal is fed to said amplifier and sending out said first output signal to an external circuit when said first signal is fed to said amplifier; and

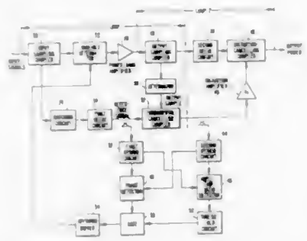
gain control means (6) connected to said amplifier and to said control signal generating means and responsive to said control signal for regulating the gain of said amplifier such that said gain increases and decreases in accordance with said control signal.

4,916,407

GAIN VARIATION COMPENSATING CIRCUIT FOR A FEEDFORWARD LINEAR AMPLIFIER

Terence E. Olver, Catonsville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 29, 1988, Ser. No. 291,600
Int. Cl.[4] H03G 3/10
U.S. Cl. 330—151 14 Claims



1. A gain variation compensating circuit for a feedforward cancellation amplifier, comprising:

means for receiving a reference signal and first and second signals from the feedforward cancellation amplifier and for dividing each of the first and second signals into third and fourth, and fifth and sixth signals, respectively, said receiving means comprising:

first hybrid means, coupled to receive the first signal, for dividing the first signal into third and fourth signals; and

second hybrid means, coupled to receive the second signal, for dividing the second signal into fifth and sixth signals; and

means, connected to said receiving means, for compensating imbalance in the feedforward cancellation amplifier by receiving the third and fifth, and fourth and sixth signals from said receiving means, determining an imbalance, and providing compensation accordingly, said compensating means comprising:

a phase detector, coupled to said first and second hybrid means, for receiving the third and fourth signals from said first and second hybrid means;

amplitude means, coupled to said first and second hybrid means, for receiving the fourth and sixth signals from said first and second hybrid means;

a threshold detector coupled to said amplitude means;

gate means, coupled to said threshold detector and said phase detector, for gating outputs from said phase detector and said threshold detector; and

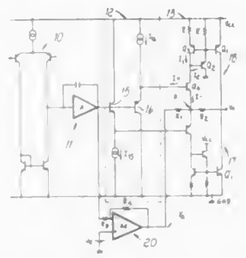
an up/down driver, coupled to said gate means for providing a signal to compensate for imbalance in the feedforward amplifier.

4,916,408

POWER STAGE WITH INCREASED OUTPUT DYNAMICS

Fabrizio Stefani, Varese; Alberto Gola, Pavia, and Gianluigi Pessina, Milano, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza Mi, Italy

Filed Nov. 28, 1988, Ser. No. 277,078
Claims priority, application Italy, Dec. 3, 1987, 22880 A/87
Int. Cl.[4] H03F 3/45
U.S. Cl. 330—255 5 Claims



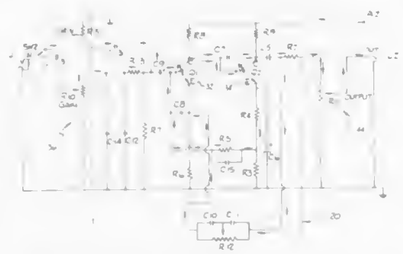
1. An improved power stage with increased output dynamics, comprising a power amplifier having a first inverting input, a second non-inverting input, an output to be connected to a load and a feedback network comprising a first resistor connected between the inverting input and the output of said amplifier and a second resistor connected between said first inverting input and a first line set to a first reference voltage means for generating a voltage drop, and a voltage source generating an input voltage signal to be amplified and connected between said second non-inverting input and a second line set to a second reference voltage different from the first reference voltage, said means for generating a voltage drop generating a voltage variable in inverse proportion to said input voltage signal and referred to said second reference voltage.

4,916,409

SIGNAL CONDITIONER SYSTEM FOR MUSICAL INSTRUMENTS

Daniel L. Tracy, 1500 W. 92nd - Space 37, Thornton, Colo. 80221

Filed Jun. 15, 1988, Ser. No. 207,248
Int. Cl.[4] H03F 1/34
U.S. Cl. 330—294 13 Claims



1. A signal conditioning pre-amplifier means for connecting audio sound output signals from a musical instrument, such as a guitar, to an audio sound amplifier device comprising:

power supply means for providing a direct current having a predetermined voltage;

input gain control means for receiving the audio sound output signals and for controlling gain;

first transistor amplifier means connected to said input gain control means for receiving the audio sound output signals from said input gain control means said first transistor means having a transistor base and collector and emitter for receiving the audio sound output signals at the base thereof and providing a first amplified output signal from the collector thereof;

a second transistor amplifier means connected to said first transistor amplifier means for receiving said first amplified output signal from said first transistor amplifier means said second transistor means having a base and collector and emitter connected to said first transistor amplifier means for receiving said first amplified output signal at the base thereof and providing a second amplified output signal from the collector thereof;

negative feedback circuit means between said first transistor amplifier means and said second transistor amplifier means for transmitting negative feedback signals from the emitter of said second transistor amplifier means to the base of said first transistor amplifier means;

regenerative feedback circuit means and an associated tone control circuit means between said first transistor amplifier means and said second transistor amplifier means for transmitting regenerative feedback signals from the collector of said second transistor amplifier means to the base of said first transistor amplifier means; and

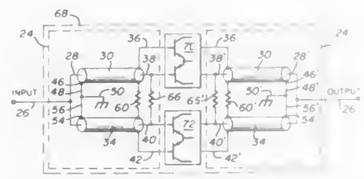
output gain control means for receiving said second amplified output signal from the collector of said second transistor amplifier means.

4,916,410

HYBRID-BALUN FOR SPLITTING/COMBINING RF POWER

E. M. Littlefield, Redington Beach, Fla., assignor to E-Systems, Inc., Dallas, Tex.

Filed May 1, 1989, Ser. No. 345,225
Int. Cl.[4] H03F 3/68; H01P 5/10
U.S. Cl. 330—295 15 Claims



7. An in-phase hybrid-balun, power splitter/combiner comprising:

a first coaxial cable in-phase hybrid-balun having a predetermined characteristic impedance value to provide unbalanced-to-balanced impedance transformation, said first hybrid-balun receiving an unbalanced RF input signal at its input and generating first and second isolated, balanced RF output signals;

power amplifier means coupled to said first in-phase hybrid-balun for receiving and amplifying the isolated, balanced RF output signals; and

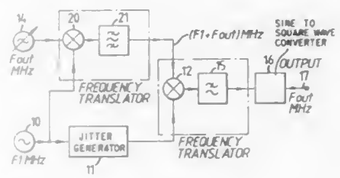
a second coaxial cable in-phase hybrid-balun coupled to the output of said power amplifier means having a predetermined characteristic impedance value to provide balanced-to-unbalanced impedance transformation, said second hybrid-balun having first and second inputs for receiving the amplified balanced, isolated RF output signals and combining the amplified balanced signals to provide an amplified unbalanced RF output signal.

4,916,411

VARIABLE FREQUENCY JITTER GENERATOR

Anthony Lymer, West Lothian, Scotland, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 19, 1989, Ser. No. 354,544
Claims priority, application European Pat. Off., Jan. 8, 1988, 88305206.0
Int. Cl.[4] H03B 21/00, 29/00; H03K 3/84
U.S. Cl. 331—25 10 Claims



1. A circuit for varying the frequency of jitter signals used for testing apparatus using pulse code modulation to convey intelligence comprising:

a first oscillator,

a jitter signal generator coupled to said first oscillator,

a variable frequency oscillator,

a first mixer having two inputs and an output,

means for coupling said jitter signal generator to one input of said first mixer, and

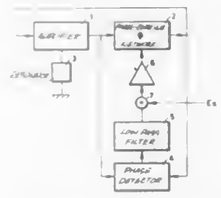
means for coupling said variable oscillator to the other input of said first mixer.

4,916,412

VOLTAGE-CONTROLLED OSCILLATOR USING A PHASE CONTROL LOOP FOR ESTABLISHING AN ACCURATE IDLING FREQUENCY AND TEMPERATURE STABILIZED CONTROL SENSITIVITY

Ernst H. Nordholt, Berkel en Rodenrijs, and Hendrikus C. Nauta, Nootdorp, both of Netherlands, assignors to Nederlandsch Octrooibureau, The Hague, Netherlands

Filed Jan. 19, 1989, Ser. No. 299,667
Claims priority, application Netherlands, Jan. 19, 1988, 8800119
Int. Cl.[4] H03L 7/00
U.S. Cl. 331—34 13 Claims



1. Voltage-controlled oscillator having an oscillator loop provided with a frequency-determining element, an amplifier and a first phase-rotating network having a control input, in which network the value of one or more elements depends on a control signal which is fed to the control input of the phase-rotating network and with which the phase rotation, and thereby the oscillator frequency, can be changed, the oscillator providing an oscillator signal, characterized by a phase control loop, at least including the phase-rotating network to the input of which the oscillator signal is fed, a phase detector having two inputs for receiving an input signal and an output signal of

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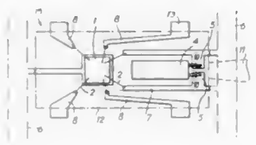
the phase-rotating network, and an amplifier for amplifying the output signal of the phase detector and feeding it to the control input of the phase-rotating network, the phase detector having an accurately known and temperature-independent input-output relation.

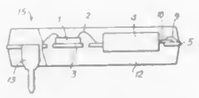
4,916,413

PACKAGE FOR PIEZO-OSCILLATOR

Iwao Nakayama; Kazushige Ichinose, and Hiroyuki Ogiso, all of Minowa, Japan, assignors to Matsushima Kogyo Kabushiki Kaisha, Nagano, Japan

Filed Nov. 18, 1988, Ser. No. 273,456
Claims priority, application Japan, Nov. 20, 1987, 62-293558; Nov. 20, 1987, 62-293559; Nov. 20, 1987, 62-293561; Nov. 20, 1987, 62-293562; Nov. 20, 1987, 62-177439[U]
Int. Cl.[4] H03B *1/00*
U.S. Cl. 331—68 **23 Claims**





1. A piezo-oscillator package comprising a piezo-vibrator having a casing with an end portion, electrode extensions extending proximate the end portion of said casing, a semiconductor element having oscillating circuit means for oscillating said piezo-vibrator, lead terminals coupled to said semiconductor element, said electrode extensions of said piezo-vibrator being coupled to said lead terminals of said semiconductor element, said semiconductor element, lead terminals and piezo-vibrator being packaged in a unitary resin package formed by injecting resin through a resin port positioned proximate the outer periphery of said package proximate said end portion of said casing of said piezo-vibrator, said electrode extensions of said piezo-vibrator being positioned proximate the outer periphery of said package.

4,916,414

PERMANENT MAGNET CIRCULATOR HAVING U-SHAPED FERRITES AND MAGNETS

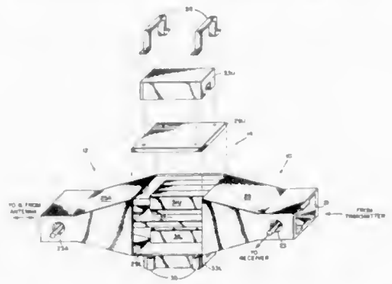
Joseph Ranghelli; John P. Pehowich, both of Brooklyn, and Gerald C. Dorman, Lindenhurst, all of N.Y., assignors to Raytheon Company, Lexington, Mass.

Filed May 30, 1989, Ser. No. 358,225
Int. Cl.[4] H01P *1/397*
U.S. Cl. 333—1.1 **7 Claims**

1. In a microwave transmission line assembly wherein a pair of folded magic-T hybrid junctions, each having an H-plane port, an E-plane port and a pair of parallel ports, and a pair of nonreciprocal phase shifters incorporated in two runs of waveguide interconnecting the parallel ports in such junctions, with each one of such runs having a common H-plane wall and a nonmagnetic H-plane wall, are combined to direct microwave signals entering the H-plane port of a first one of such junctions to the H-plane port of a second one of such junctions and to direct microwave signals entering the H-plane port of the second one of such junctions to the E-plane port of the first one of such junctions, the improvement comprising:

(a) a first nonreciprocal ferrite phase shifter disposed within a first one of the two runs of waveguide and a second nonreciprocal ferrite phase shifter disposed within the second run of waveguide, each of such phase shifters having a substantially U-shaped cross-section, with the open ends of each of such phase shifters in contact with the inner surface of the nonmagnetic H-plane wall of a corresponding one of the runs of waveguide;

(b) a first and a second permanent magnet, each disposed on the outer surface of a corresponding nonmagnetic H-plane



wall and having a substantially U-shaped cross-section corresponding to the U-shaped cross-section of the corresponding nonreciprocal ferrite phase shifter, whereby magnetic flux from each permanent magnet may be linked, through the nonmagnetic H-plane wall, to the portion of the corresponding nonreciprocal ferrite phase shifter underlying each permanent magnet; and

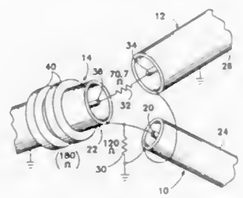
(c) means for changing the position of each permanent magnet along the corresponding nonmagnetic H-plane wall to adjust the length of the underlying portion of the corresponding nonreciprocal ferrite phase shifter underlying each permanent magnet.

4,916,415

BALANCED, IMPEDANCE MATCHED, COUPLING DEVICE

Clifford H. Moulton, Portland, and Valdis E. Garuts, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 17, 1989, Ser. No. 297,211
Int. Cl.[4] H01P *5/10*
U.S. Cl. 333—26 **28 Claims**



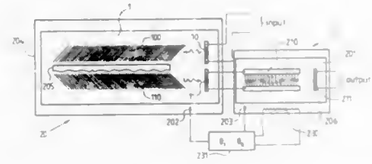
1. A single-ended to differential coupling device
a first transmission line including first and second spaced conductors and characterized by carrying a first signal with respect to a point of common reference potential;
second and third transmission lines characterized by carrying second and third signals with respect to said point of common reference potential and each including first and second spaced conductors, wherein said second and third signals are balanced and out of phase with respect to said point of common reference potential; and
means for coupling said first transmission line to both said second and third transmission lines including means coupling a first conductor of said first transmission line to a first conductor of said second transmission line, means coupling the second conductor of said first transmission line to the first conductor of the third transmission line, and means intercoupling the second conductors of said second and third transmission lines;
at least one of said transmission lines having impedance added thereto to avoid shorting the first signal with respect to the point of common reference potential;
wherein the means intercoupling the second conductors of the second and third transmission lines comprises a second impedance for bringing about a matched condition for means coupled to the second and third transmission lines.

4,916,416

METHOD FOR THE CORRECTION OF A SURFACE WAVE DEVICE, ESPECIALLY FOR A REFLECTIVE ARRAY COMPRESSOR

Jean Desbois, Roquefort Les Pins, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 14, 1983, Ser. No. 167,714
Claims priority, application France, Mar. 19, 1987, 87 03838
Int. Cl.[4] H04H *3/10*
U.S. Cl. 333—195 **11 Claims**



1. A method for implementing frequency response corrections of a surface acoustic wave device, comprising the steps of:
determining a desired transfer function of said surface acoustic wave device and determining a deviation from the desired transfer function, said surface acoustic wave device being enclosed in a package;
designing a surface acoustic wave corrective filter, a transfer function of said corrective filter making adjustments to the measured transfer function of said surface acoustic wave device based on said deviation such that the desired transfer function is obtained;
manufacturing said corrective filter; and
connecting in series said surface acoustic wave device and said corrective filter; and
wherein the received transfer function is determined by the structure of said surface acoustic wave device.

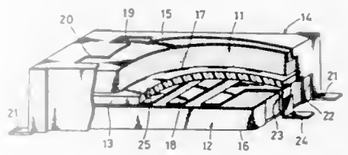
4,916,417

MICROSTRIPLINE FILTER

Youhei Ishikawa; Jun Hattori, and Hideyuki Kato, all of Nagaokakyo, Japan, assignors to Murata Mfg. Co., Ltd., Japan

Continuation of Ser. No. 171,218, Mar. 21, 1988, abandoned, which is a continuation of Ser. No. 909,519, Sep. 19, 1986, abandoned. This application Aug. 22, 1989, Ser. No. 397,642
Claims priority, application Japan, Sep. 24, 1985, 60-210599; May 9, 1986, 61-107199
Int. Cl.[4] H01P *1/203*
U.S. Cl. 333—204 **31 Claims**

1. Microstripline comprising:
a first dielectric substrate having outer and inner opposite major surfaces;
a second dielectric substrate having outer and inner opposite major surfaces;
a first ground electrode formed on said outer major surface of said first dielectric substrate;
a first line electrode formed on said inner major surface of said first dielectric substrate;
a second ground electrode formed on said outer major surface of said second dielectric substrate;
a second line electrode formed on said inner major surface of said second dielectric substrate;



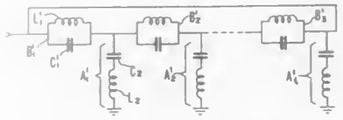
an insulating sheet interposed between said first and second dielectric substrates which are so arranged that said first and second line electrodes are opposite to each other, said insulating sheet being lower in dielectric constant than said first and second dielectric substrates; and
a conducting member passing through said insulating sheet along the direction of thickness thereof to electrically connect said first and second line electrodes with each other.

4,916,418

DOUBLE TUNED BIRD CAGE COIL

Alan R. Rath, Fremont, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Mar. 31, 1989, Ser. No. 331,935
Int. Cl.[4] G01R *33/20*
U.S. Cl. 333—219 **7 Claims**



1. A band reject bird cage coil for providing a substantially uniform rf field in the cylindrical interior space thereof and exhibiting at least lower and higher fundamental resonant frequencies comprising:
a plurality of leg conductors disposed spaced from an axis and parallel therewith, said plurality of leg conductors defining an active volume;
a plurality of annular conductors disposed about said axis and coupling adjacent said leg conductors;
said leg conductors exhibiting a substantially capacitive impedance at frequencies at and below the lower resonant frequency and a substantially inductive impedance at frequencies substantially at and greater than said higher resonant frequency and said annular portion conductors exhibiting a substantially inductive impedance at frequencies substantially at and below said lower resonant frequency and a substantially capacitive impedance at frequencies substantially at and above said higher resonant frequency.

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4,916,419

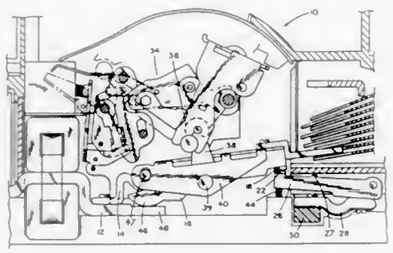
CIRCUIT BREAKER CONTACT ASSEMBLY

John M. Winter, Cedar Rapids, Iowa, assignor to Square D Company, Palatine, Ill.

Continuation of Ser. No. 922,576, Oct. 24, 1986, abandoned. This application Dec. 9, 1988, Ser. No. 282,887

Int. Cl.[4] H01H *75/00*

U.S. Cl. 335—16 5 Claims



1. A circuit breaker comprising:
a first contact mounted on a first movable blade, the first movable blade having a curved surface cooperating with a stationary flat load contact terminal surface to form a floating pivot adjacent to one end;
a second contact mounted on a second movable blade;
an operating mechanism connected to the first movable blade, said operating mechanism moving said first movable blade between an open position and a closed position, wherein in said open position said first contact and said second contact are separated, wherein in said closed position said first contact and said second contact are engaged;
a resilient member acting on the second movable blade to move said second contact toward said first contact;
said resilient member supplying the sole contact pressure between said first contact and said second contact; and
a first flexible connector, said first flexible connector being connected to said first terminal and to said first movable blade;
said floating pivot being under substantially zero loading when said first contact and said second contact are in said open position.

4,916,420

OPERATING MECHANISM OF A MINIATURE ELECTRICAL CIRCUIT BREAKER

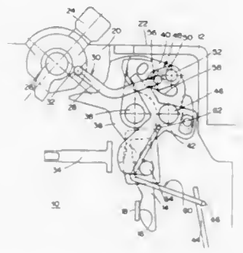
William Bartolo, and Michel Lazareth, both of Eybens, France, assignors to Merlin Gerin, France

Filed May 17, 1988, Ser. No. 194,901

Claims priority, application France, Jun. 9, 1987, 87 08037

Int. Cl.[4] H01H *9/00*

U.S. Cl. 335—172 6 Claims



1. An operating mechanism of a miniature electrical circuit breaker with a molded case housing a pair of stationary and movable contacts, said movable contact being supported by a contact arm actuated by the mechanism between a closed position and an open position, said mechanism comprising:
a manual operating handle coupled to a transmission rod to form a first toggle;
a trip device comprising a thermal overload trip device with a bimetal strip, and/or an electromagnetic trip device with a striker;
a support lever of the contact arm articulated on a pivot of a rotating plate, a relative pivoting movement of small amplitude being allowed between the plate and the support lever due to the presence of a contact pressure spring;
a breakable mechanical link arranged between the plate and the transmission rod;
a trip lever pivotally mounted on the plate and having a first arm controlled by the trip device to cause breaking of said mechanical link in the event of a fault occurring, resulting in automatic tripping of the mechanism, independently from the handle;
a second arm of the trip lever having a retaining catch cooperating with a latch pivotally mounted on a first spindle of the plate, so as to form the breakable mechanical link;
a second spindle of said pivoting trip lever being supported by the plate with a present stagger with respect to the pivot;
and a second toggle formed by the transmission rod coupled to the latch at an intermediate articulation point located between the first spindle and the nose of said latch.

4,916,421

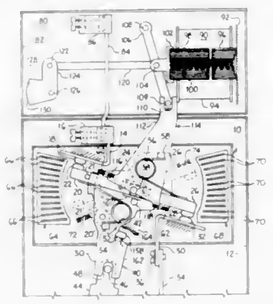
CONTACT ARRANGEMENT FOR A CURRENT LIMITING CIRCUIT BREAKER

Franco Pardini, and Tonino Benetti, both of Milan, Italy, assignors to General Electric Company, New York, N.Y.

Filed Sep. 30, 1988, Ser. No. 251,492

Int. Cl.[4] H01H *3/00*

U.S. Cl. 335—185 8 Claims



1. A current limiting circuit interrupter comprising:
a first insulative case;
a pair of movable contact arms electrically connected together and supported within said first case by means of a first pivot pin, movable contact arms extending away from each other, said pair of movable contact arms being electrically connected together by means of a flexible braid;
a pair of movable contacts within said first case arranged at opposite ends of said pair of movable contact arms and facing in opposite directions from each other;
a corresponding pair of fixed contacts within said first case arranged for electrical connection with said movable contacts and facing in opposite directions from each other;
a support lever pivotally mounted within said first case by means of a second pivot pin and arranged for rotating said movable contact arms to an open position whereby said movable contacts are out of electrical connection with said movable contacts, said first pivot pin being attached to said support lever, one end of said support lever being adapted for interacting with a circuit interrupter operating mechanism;
an electromagnetic actuator in a second insulative case abutting said first case; and
a connecting lever pivotally supported within said first case and adapted for interacting with said electromagnetic actuator for rotating said movable contacts arms to said open position.

4,916,422

APPARATUS FOR ELECTRICALLY OPERATING A CIRCUIT BREAKER

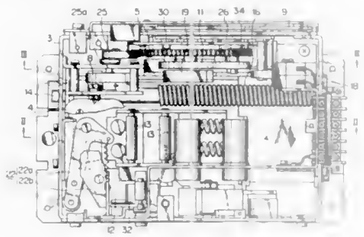
Yoji Ikehata, and Tadayoshi Onoda, both of Hiroshima, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1988, Ser. No. 210,350

Claims priority, application Japan, Jun. 25, 1987, 62-97713

Int. Cl.[4] H01H *3/00*

U.S. Cl. 335—190 2 Claims



1. An apparatus for electrically operating a circuit breaker comprising:
a frame;
a ratchet gear rotatably supported on said frame and provided with a cam thereon, said cam rotating with said ratchet gear in a unitary motion;
an electric motor mechanically coupled to said ratchet gear and provided on said frame for driving said ratchet gear into rotation when an OFF operation signal is supplied;
a limit switch operated through rotation of said cam for switching off said electric motor when said cam rotates to a predetermined position;
a stop lever pivotally supported on said frame and being engaged by said cam, said stop lever actuating said limit switch when said stop lever is driven by the cam in rotational motion;
a guide bar secured at both ends thereof to said frame and a spring mounted on said guide bar;
a slider provided slidably on said guide bar and driven by said cam to slide on said guide bar, said slider compressing said spring while also throwing the circuit breaker into an OFF state when said slider slides to a first position, and throwing the circuit breaker into an ON state when said slider slides back to a second position; and
latch means for latching the slider at said first position and for releasing the latched slider upon an OFF operation signal;
an electrically powered pawl driven by said electric motor for driving said ratchet gear into rotation; and
a release mechanism driven into pivotal motion by rotation of said cam for causing said electrically powered pawl to move out of engagement with said ratchet gear when said cam rotates to said predetermined position.

4,916,423

WATER COVER ARRANGEMENT FOR A SOLENOID APPARATUS

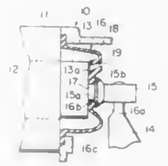
Takeshi Sugiyama, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 5, 1989, Ser. No. 375,785

Claims priority, application Japan, Jul. 6, 1988, 63-168428

Int. Cl.[4] H01F *7/00*

U.S. Cl. 335—278 4 Claims



1. A solenoid apparatus comprising:
a solenoid case having an open end and a substantially closed end;
a plunger electromagnetically movably mounted in said solenoid case; and
a substantially cup-shaped flexible water-tight boot surrounding a plunger end portion projecting from said solenoid case and connected to said open end of said solenoid case, said flexible boot having a bottom wall central portion intimately secured to an end face of said plunger end portion;
said flexible water-tight boot having a vent hole extending through its wall, said vent hole being closed when said plunger is outwardly extended from said solenoid case and being opened when said plunger is retracted into said solenoid case due to the deformation of said flexible boot at its wall portion upon the movement of said plunger.

4,916,424

ELECTRIC PART IN THE FORM OF WINDINGS

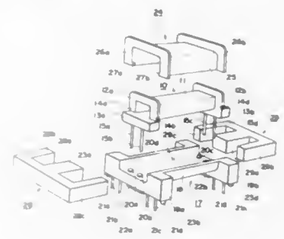
Seiichi Kijima, Tokyo, Japan, assignor to Kijima Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1989, Ser. No. 336,091

Claims priority, application Japan, Apr. 26, 1988, 63-101364

Int. Cl.[4] H01F *27/26, 27/28*

U.S. Cl. 336—160 5 Claims



1. A compact electric part in the form of windings comprising an inner bobbin having a cylindrical coil supporting portion provided at opposit ends with flanges, terminal pins planted on at least one of said flanges and a coil wound around said coil supporting portion; a first outer bobbin having a coil supporting portion substantially square U-shaped in its cross-section with its inner side formed to receive a lower portion of said inner bobbin, said coil supporting portion of said first outer bobbin being provided at opposite ends with flanges and insertion holes into which the respective terminal pins of said

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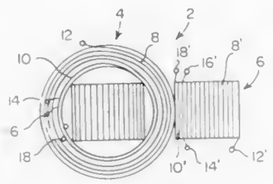
inner bobbin are inserted, and terminal pins planted on at least one of the flanges; and a second outer bobbin having a coil supporting portion substantially square U-shaped in cross-section with its inner side formed to receive an upper portion of said inner bobbin, said coil supporting portion of said second outer bobbin being provided at opposite ends with flanges; wherein said inner bobbin around which said coil has been wound is enclosed by said first and second outer bobbins connected to each other, another coil is wound around the respective coil supporting portions of these first and second outer bobbins, and one leg of a core having legs is inserted into an inner cavity of the coil supporting portion of the inner bobbin.

4,916,425

ELECTROMAGNETIC DEVICE

Nachum Zabar, 4 Ravon Street, Givat Savion, Ganeh Tikvah, Israel

Continuation-in-part of Ser. No. 937,673, Oct. 10, 1986, abandoned. This application Aug. 31, 1988, Ser. No. 238,867
Claims priority, application Israel, Apr. 22, 1986, 78573
Int. Cl.[4] H01F *17/00, 27/24, 27/28*
U.S. Cl. 336—177 12 Claims



1. An electromagnetic device, comprising:
first and second ring-shaped wound units interlinked in a chain-like manner, each unit comprising at least first and a second sequentially wound portions of electrically insulated layers of concentrically wound windings;
said first portion being made of high permeability material;
said second portion being made of a relatively low resistance electrical current-carrying material;
said first and second portions being electrically connected to each other and provided with terminal means for connection to a source of power;
whereby in operation each of said units constitutes a current conducting as well as an electromagnetic field inducing body for the other of said interlinked units.

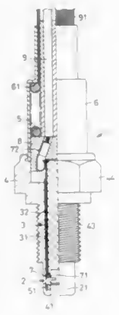
4,916,426

PRESSURE SENSOR

Yasuhito Yajima; Kazuyoshi Shibata, both of Nagoya, and Syunzo Mase, Aichi, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Aug. 22, 1988, Ser. No. 234,571
Claims priority, application Japan, Aug. 28, 1987, 62-132204[U]
Int. Cl.[4] G01L *1/22*
U.S. Cl. 338—4 23 Claims

1. A pressure sensor comprising:
a ceramic pressure sensing element including a bottom wall serving as a diaphragm, and a tubular wall which extends from a periphery of said bottom wall and cooperates with the bottom wall to define a cavity, said diaphragm having at least one resistor formed thereon;
electrically conductive means electrically connected to said ceramic pressure sensing element;
a retainer member for supporting at least a portion of said electrically conductive means and holding said ceramic pressure sensing element such that one end of said retainer member is aligned with an end face of said tubular wall remote from said bottom wall, such that said electrically conductive means is in electrical contact with said sensing element;
a housing accommodating said ceramic pressure sensing element and said retainer member; and



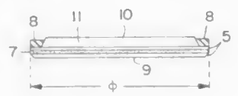
biasing means associated with the other end of said retainer member, for biasing said retainer member toward said ceramic pressure sensing element, to exert a retaining force to said sensing element and thereby hold the sensing element in said housing.

4,916,427

ELECTRONIC ELECTROTHERMAL CONVERSION MATERIAL, ITS PRODUCTS AND METHOD FOR PRODUCTION THEREOF

Kong De-Kai, No. 71 Mian Hua Lane, Wu Xi, Jiang Su, China

Filed Dec. 20, 1988, Ser. No. 287,110
Claims priority, application Taiwan, Jun. 1, 1988, 88100015
Int. Cl.[4] H01C *7/10*
U.S. Cl. 338—22 R 14 Claims



1. An electronic electrothermal conversion material and its products comprising power supply electrodes, high temperature-resistant insulating material and a conductive semiconductor membrane precipitated on a surface of said insulating material, said membrane being made of fluoric molecules as well as high valent metal oxide, low valent metal oxide and metal single substances, metals of which correspond to two kinds of chlorides, the first of which is tin tetrachloride and the second is one of the group consisting of antimony trichloride, lead chloride, zinc chloride and indium chloride.

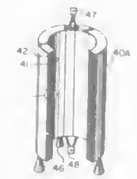
4,916,428

HIGH VOLTAGE, OUTDOOR, AIR COOLED, DYNAMIC BRAKING RESISTORS AND POWER DISTRIBUTION SYSTEM INCORPORATING THE SAME

Patrick E. Burke, North York, Canada, assignor to 501 Guthrie Canadian Investments Limited, Scarborough, Canada

Filed Dec. 19, 1988, Ser. No. 286,161
Claims priority, application Canada, Sep. 9, 1986, 517838
Int. Cl.[4] H01C *3/02*
U.S. Cl. 338—62 7 Claims

4. A high voltage braking resistor for use in a power distribution system comprising at least one pair of first and second cylindrical helical windings of electrical insulated conductor having selected retentivity, said windings being concentric and disposed in a close couple relation with one helical winding overlying the other, said first and second windings of the



respective pairs being wound in opposite directions about said axis, means connecting said helical windings in parallel including terminal means for connecting said resistor to a circuit to provide a resistance in such circuit.

4,916,429

OVERHEIGHT DETECTOR SYSTEM FOR DRIVE THROUGH RESTAURANT

Earl G. Hicks, 6518 Azalea Dr., Spring Lake, N.C. 28390, and David E. Atkins, 6062 Midus Dr., Hope Mills, N.C. 28348

Filed May 19, 1989, Ser. No. 353,954
Int. Cl.[4] G08B *1/04*
U.S. Cl. 340—436 10 Claims

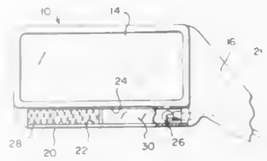
1. A vehicular overheight detection and warning system for a building having a roof or canopy overhang with a fixed clearance above a driveway surface along which a vehicle is required to drive to obtain services from an attendant at a service location available to the driver of the vehicle and within the building is protected by the overhang, comprising:
(a) a detector mounted at a detection location required to be passed by the vehicle before reaching the service location and at an elevated level selected so as to be able to detect any vehicle of a height in excess of said clearance and to actuate an associated switch in response thereto;
(b) first signalling means dependent on actuation of said switch and operative to produce a first selected signal perceptible by the driver of the vehicle at a location prior to reaching the said service location to warn the driver of an overheight condition when so detected;
(c) second signalling means dependent on actuation of said switch and operative to produce a second selected signal at said service location perceptible to said attendant to simultaneously warn said attendant of said overheight vehicle; and
(d) means for delaying the actuation of said switch to discriminate between overheight vehicles and overheight vehicle antennas.

4,916,430

BACK UP REAR VIEW MIRROR LIGHT

Thuan D. Vu, 323 18th St., Brooklyn, N.Y. 11215, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007

Filed Nov. 3, 1988, Ser. No. 266,578
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 340—463 4 Claims



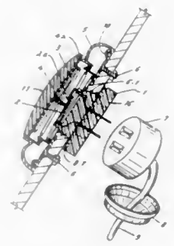
1. A backup sideview mirror light for a motor vehicle which comprises:
(a) a framed sideview mirror adapted for attachment to a door of the motor vehicle;
(b) a housing having an opening, said housing mounted to the underside of said sideview mirror so that said opening is facing rearwardly;
(c) an auxiliary lamp mounted within said housing;
(d) a reflector mirror mounted in said housing and aligned with a portion of said opening wherby reflected light beams from said auxiliary lamp on said reflector mirror causes said reflector mirror to glow thus serving as a clearly visible auxiliary backup warning light; and
(e) a transparent lens to cover another portion of said opening whereby direct light beams from said auxiliary lamp coming through said transparent lens are directed rearwardly to illuminate rear fender of the motor vehicle to help a driver see at night when parking.

4,916,431

EARLY WARNING INDICATOR FOR A BRAKING SYSTEM

John Gearey, PO. Box 2036, Oregon Institute of Technology, Klamath Falls, Oreg. 97601

Continuation of Ser. No. 150,160, Jan. 29, 1988, abandoned. This application Jul. 24, 1989, Ser. No. 384,040
Int. Cl.[4] B60Q *1/44*; H01H *3/14*
U.S. Cl. 340—479 6 Claims



1. A vehicle brake light system comprising:
a brake pedal means for receiving the foot of a driver in order to receive the control of said driver in an attempt to cause said vehicle to brake, and transferring said control to the braking system of said vehicle;
a first switch means integrally formed within said brake pedal means for detecting application to said brake pedal means of said control of said driver of a pressure of at least a first magnitude in an attempt by said driver to cause

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braking, regardless of whether said control is actually transferred to said braking system of said vehicle, and regardless of whether braking actually occurs in response to said control;

first indicator means responsive to said first switch means for providing a first indication of said control of said driver of a pressure of at least a first magnitude to said brake pedal means;

second switch means integrally formed within said brake pedal means for detecting application to said brake pedal means of said control of said driver of a pressure of at least a second magnitude greater than said first magnitude, in an attempt by said driver to cause heavy braking, regardless of whether said control is actually transferred to said braking system of said vehicle, and regardless of whether braking actually occurs in response to said control; and

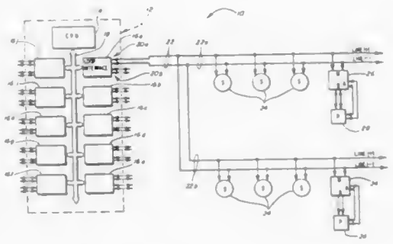
second indicator means, independent of said first indicator means, responsive to said second switch means for providing a second indication of said control of a second magnitude to said brake pedal means.

4,916,432

SMOKE AND FIRE DETECTION SYSTEM COMMUNICATION

Lee D. Tice, Bartlett, Ill.; Todd W. Fritz, Jackson, Mich., and Mark A. Kilcommons, Berwyn, Ill., assignors to Pittway Corporation, Northbrook, Ill.

Filed Oct. 21, 1987, Ser. No. 111,811
Int. Cl.[4] G08B *26/00*; G05B *23/02*
U.S. Cl. 340—518 **17 Claims**



1. A fire detection system of the kind in which a controller sends data to a plurality of transponders via a communication line in the form of a series of pulses, said system comprising:

driver circuitry means associated with said controller for forming a sequence of spaced-apart pulses on said line with each said pulse having a value represented by a selected signal amplitude value on said line including means for spacing each formed pulse apart from each adjacent formed pulse with a selected spacing signal amplitude value on said line different from each said selected signal amplitude value associated with each said pulse value,

decoder circuitry means associated with each said transponder for detecting each said spaced-apart pulse on said line and for decoding each said spaced-apart pulse based solely on its amplitude value,

including means for decoding said pulses without regard to the particular time when each said pulse begins or to its duration, and

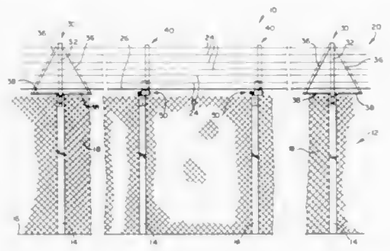
means, associated with each transponder, for returning data to said controller in the form of data signals, each said data signal having a duration based on the data to be returned.

4,916,433

PROTECTION OF PROPERTY

Hendrik M. ver Loren van Themaat, 314 Nevade Crescent, Faerie Glen, Pretoria, South Africa

Filed Nov. 7, 1988, Ser. No. 267,980
Claims priority, application South Africa, Nov. 6, 1987, 87/8356
Int. Cl.[4] H04B *11/00*
U.S. Cl. 340—550 **31 Claims**



12. Warning signal emission means for a security installation comprising a primary barrier section protruding upwardly from a substrate end extending along the substrate in a first direction, and a secondary barrier section protruding from, and extending along, the primary barrier section, the warning signal emission means comprising

a first component mountable to one of the barrier sections;

a second component mountable to the other of the barrier sections, and being pivotal relative to the first component about a pivotal axis;

a plurality of teeth on the second component and spaced apart circumferentially about the pivotal axis;

at least one complementary teeth-engaging member on the first component; and

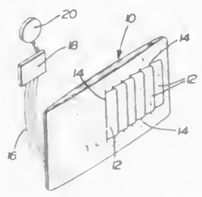
bias means resiliently biassing the teeth of the first component and the member of the second component into engagement with each other.

4,916,434

CREDIT CARD CARRIER WITH ALARM

Charles D. McNeely, Uniontown, Ohio, assignor to Donovan International Corporation, Uniontown, Ohio

Filed Nov. 12, 1986, Ser. No. 926,711
Int. Cl.[4] C08B *13/14*
U.S. Cl. 340—568 **4 Claims**



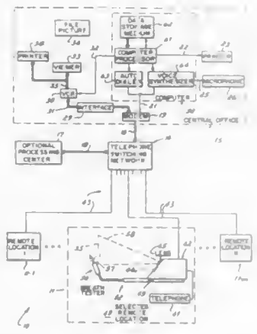
1. A card holder including a plurality of receptacles for receiving and holding cards including sensing means associated with each receptacle for determining the presence or absence of a card therein, alarm means operably connected to each sensing means for emitting a signal upon the absence of a card from any of said receptacles and enabling means connected to said alarm means, said sensing means including a first strip having a conducting surface and an opposite nonconducting surface and a second strip having a conducting surface and an opposite nonconducting surface, said first and second strips being the mirror image of and complementary with each other and being arranged with said conducting surfaces facing each other, said receptacles including a slot formed therein, said sensing means including a plurality of arm means projecting from said first and second strips, with at least a portion of said arm means located within said receptacle slots, said receptacle slots and arm means being arranged in staggered relationship with respect to one another, said receptacles overlapping each other, spring clip means engaging the nonconducting surfaces of the first and second strips of each of the sensing means to urge the conducting surfaces into contact with each other, said spring clip means being deflectable by the insertion of a nonconducting card into the receptacles and between the two conducting surfaces whereby a card inserted within the receptacle between the conducting surfaces of the first and second strip arm means breaks contact between said first and second strip arm means and removal of the card permits said arm means conducting surfaces to be in electrical contact with each other to signal the absence of a card in the receptacle, and means for connecting each of the conducting surfaces in electrical interconnection with the alarm means and enabling means.

4,916,435

REMOTE CONFINEMENT MONITORING STATION AND SYSTEM INCORPORATING SAME

Kip L. Fuller, Denver, Colo., assignor to Guardian Technologies, Inc., Cincinnati, Ohio

Filed May 10, 1988, Ser. No. 192,216
Int. Cl.[4] G08B *23/00*; A61B *5/08*; H04N *7/18*; G06K *9/00*
U.S. Cl. 340—573 **63 Claims**



1. A monitoring station for use in a remote confinement system, said station comprising:

a telecommunications camera connectable to a central station by way of a communications link, said camera defining an image field viewed by said camera;

mechanical locating means for locating a person at a location within said image field such that the face of the person substantially fills said image field;

means for generating a trip signal in response to a flow of breath from the person when the person is located by said locating means at said location, and

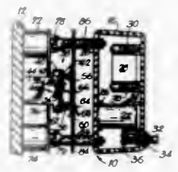
control means responsive to said trip signal for enabling an image of the person to be viewed at said central station.

4,916,436

OVERHEATED STOVE PIPE ALARM

Mike Silliman, Deansboro; Kevin Miles, Manlius, and Edward Reynolds, Liverpool, all of N.Y., assignors to Consumer Products International, Inc., Skaneateles, N.Y.

Filed Nov. 25, 1988, Ser. No. 275,960
Int. Cl.[4] G08B *17/06*
U.S. Cl. 340—586 **14 Claims**



1. An apparatus for warning of an unsafe overheated condition in a stove pipe during burning of a fuel in a stove, comprising:

(a) a housing having walls bounding an interior;

(b) energy means within the interior of the housing, and operative for supplying electrical energy over a working lifetime;

(c) means for attachably mounting the housing and the energy means therein on, and at a spacing from, the stove pipe;

(d) thermal sensor means electrically connected to the energy means and including a heat-sensitive probe and a heat detector operative for detecting the temperature of the stove pipe heated during fuel burning;

(e) means for resiliently mounting and for constantly urging the probe away from the housing and into a direct, intimate, thermal contacting relationship with the stove pipe to directly convey heat from the heated stove pipe along the probe to the heat detector;

(f) alarm means responsive to the thermal sensor means, and operative for signaling the existence of the unsafe overheated condition when the detected temperature exceeds a predetermined magnitude; and

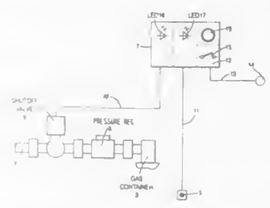
(g) means for shielding the energy means against the heat from the heated stove pipe when the housing and the energy means therein are attached on the heated stove pipe, thereby prolonging the working lifetime of the energy means.

4,916,437

GAS MONITORING SYSTEM WITH LEAK DETECTION AND FLOW CUTOFF

Hesham H. Gazzaz, POB 7932, Jeddah 21472, Saudi Arabia

Continuation-in-part of Ser. No. 85,195, Aug. 14, 1987, abandoned. This application Dec. 6, 1988, Ser. No. 280,369
Int. Cl.[4] G08B *17/10*
U.S. Cl. 340—632 **7 Claims**



1 A gas monitoring system for detecting combustible gas in

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low concentration and shutting off the source of gas when a leak thereof is detected comprising the combination of
gas valve means connected to control the flow of gas from said gas source to a consuming device, said gas valve means including a solenoid having an energized position for opening said valve means to allow gas flow and a deenergized position in which said valve means is urged toward a closed position to prevent gas flow;
valve means comprising
a valve body;
a valve plunger slidable in said body, said valve plunger being movable by said solenoid to an open position when said solenoid is energized, said valve plunger carrying a valve member;
means defining a gas flow path;
a valve seat in said gas flow path; and
spring means urging said valve plunger toward said closed position in which said valve member contacts said valve seat and closes said flow path;
a solid state switch for energizing and deenergized said solenoid;
a gas sensor for detecting the presence of leaked gas;
an integrated alarm circuit responsive to signals from said sensor to operate when said gas sensor senses leaked gas, said alarm circuit including
a visual integrated alarm circuit,
an audible integrated alarm circuit including an audio oscillator,
integrated circuit driver circuits driving said audio oscillator, actuating said visual integrated alarm circuit, and causing said solid state switch to deenergize said solenoid when leaked gas is sensed, and
an integrated circuit voltage comparator for driving said driver circuits;
circuit means for connecting the output of said sensor to the input of said integrated circuit voltage comparator;
a direct current power supply for said sensor and said integrated alarm circuit;
a switch for turning said power supply on and off; and
manual override means for mechanically urging said valve means away from said closed position to allow gas flow without energization of said solenoid said override means comprising
a plug having an axis and an eccentric member thereon eccentric to said axis; and means for rotatably supporting said plug adjacent said valve plunger, said plug being rotatable between a first position in which said eccentric member allows said plunger to move to said closed position and a second position in which said eccentric member moves said plunger away from said closed position against the force of said spring means, thereby separating said valve member from said seat and opening said path to gas flow.

4,916,438

BATTERY CHARGING, MONITORING AND ALARM CIRCUIT

Milton Collins, Northbrook, and Roger A. Anderson, Addison, both of Ill., assignors to Oneac Corporation, Libertyville, Ill.

Continuation of Ser. No. 109,574, Oct. 16, 1987, abandoned. This application May 4, 1989, Ser. No. 348,114
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—636 **8 Claims**

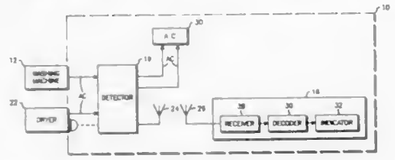
1. A circuit for monitoring a battery to predict a degraded battery capacity with the battery electrically connected in a standby power operating system, the circuit comprising:
charging means for periodically providing a charging current pulse to the monitored battery;
first means for identifying a fully charged battery condition;
means responsive to said first means for detecting a dynamic impedance characteristic of the monitored battery, said dynamic impedance detecting means including:
means responsive to said charging current pulse for detecting a peak voltage across the monitored battery,
means responsive to said charging current pulse for detecting peak current through the monitored battery, and
ratio comparator means for comparing said detected peak voltage with said detected peak current to identify said dynamic impedance characteristic;
means for comparing said identified dynamic impedance characteristic with a predefined value; and
means responsive to said comparator means for generating an alarm signal.

4,916,439

REMOTE DISPLAY ARRANGEMENT FOR APPLIANCES

Bay E. Estes; Robert J. Crawford, and Rolf E. Kowalewski, all of Palatine, Ill., assignors to EAC Technologies Corp., Cary, Ill.

Continuation-in-part of Ser. No. 498, Jan. 5, 1987, abandoned. This application Apr. 30, 1987, Ser. No. 45,725
Int. Cl.[4] G08B *21/00*; D06F *33/00*; G04B *47/00*
U.S. Cl. 340—679 **35 Claims**



1. An arrangement for remotely indicating the status of a laundry appliance, comprising:
detection means electrically connected to the appliance for detecting the status thereof and generating representative status signals;
signal conditioning means electrically connected to said detection means for receiving said status signals and encoding said signals for subsequent transmission therefrom;
transmission means electrically connected to said signal conditioning means for modulating and transmitting said encoded signals over the air; and
receiver means for receiving and demodulating said transmitted signals over the air, said receiver means including decoder means for decoding said encoded signals, indicator means for indicating the status of the appliance, means for timing the operating time of the appliance and means for selectively controlling the indicator means from the decoded signals.

4,916,440

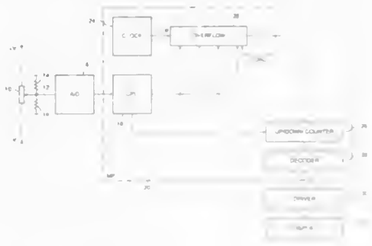
DEVICE FOR INPUTTING NUMERICAL OR ALPHANUMERICAL DATA, RESPECTIVELY INTO AN APPARATUS

Ulrich Faeser, Kronberg; Hans-Dietrich Polaschegg, Oberursel, and Dieter Mahn, Bad Homberg, all of Fed. Rep. of Germany, assignors to Fresenius AG, Fed. Rep. of Germany

Filed Jul. 26, 1988, Ser. No. 224,094
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—706 **8 Claims**

1. Device for inputting alphanumeric data into an apparatus, in particular into medical electromechanical apparatuses comprising circuit means for changing inputted data as a function

of the value and the direction of the displacement of a resistive input element having a tap with said tap being connected to an analog/digital converter and a digital circuit connected to said converter, said circuit means comprising
(a) a presettable counter (22) having connected its presetting inputs to the output of said analog/digital converter (16)



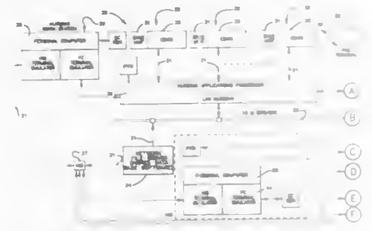
via a subtracting circuit (18), its counting input to a clock generator (24) and its overflow output to a load input of said presettable counter (22); and
(b) an up/down counter (26) being connected to the overflow output of said presettable counter (22) and controlling via decoding and driver circuits (28, 30) a display (32).

4,916,441

PORTABLE HANDHELD TERMINAL

Peter P. Gombrich, Boulder, Colo., assignor to CliniCom Incorporated, Boulder, Colo.

Filed Sep. 19, 1988, Ser. No. 246,520
Int. Cl.[4] H04Q *1/00*; G06F *15/06*
U.S. Cl. 340—712 **13 Claims**



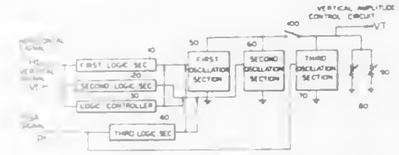
1. A portable handheld terminal, comprising:
(a) a housing;
(b) programmable touch sensitive display means disposed on the housing for display of information and for entry of information whereby the response of the display means to the touch can be varied;
(c) optical sensing means disposed in the housing for sensing optically transmitted information and including bar code reader means for reading bar code indicia on an object;
(d) electromagnetic transceiver means disposed within the housing for transmitting and receiving electromagnetic signals;
(e) detachable keyboard means detachably mounted on the housing for entry of information, the detachable keyboard means including a display for display of information, the detachable keyboard being mounted over touch sensitive the display means, the keyboard means including optical transmitter means for optically transmitting user entered information to the optical sensing means of the portable handheld terminal;
(f) microcomputer control means including microprocessor and associated memory contained in the housing and operatively interconnected to the detachable keyboard means; display means, optical sensor means, and electromagnetic transceiver means for controlling operation of the portable handheld terminal; and
(g) power supply means for powering the portable handheld terminal.

4,916,442

VERTICAL PRE-CONTROL CIRCUIT FOR AN INTERFACE OF A MULTI-SYNCHRONIZATION MONITOR

Kwang-Seok Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Swon, Rep. of Korea

Filed Dec. 27, 1988, Ser. No. 290,742
Claims priority, application Rep. of Korea, Dec. 31, 1987, 87-24382[U]
Int. Cl.[4] H04N *5/04*
U.S. Cl. 340—814 **3 Claims**



1. In a vertical pre-control circuit for an interface of a multi-synchronization monitor that correlates the one of a computer system and adapter connected to the vertical pre-control circuit to a CRT monitor, the improvement wherein the vertical precontrol circuit comprises:
first, second and third oscillation sections (50, 60 and 70) connected to an output terminal (VT) for connection to a CRT monitor, the first, second and third oscillation sections providing, when enabled, respective signals to the output terminal respectively characteristic of one of a computer system and adapter;
first and second logic sections (10, 20) respectively responsive to positive waveforms of horizontal and vertical synchronization signals from respective terminals (Ht and Vt) respectively for connection to the one of the computer system and adapter for enabling, respectively, the first and second oscillation sections;
a logic controller (30) responsive to a specific frequency of the horizontal synchronization signal for overridingly disabling an enabled one of the first and second oscillation sections;
a terminal (Pt) for receiving, when connected to the adapter, a signal characteristic of the adapter, the terminal being connected to the third oscillation section for enabling the same with the signal characteristic of the adapter; and
a third logic section (40) responsive to the signal characteristic of the adapter for overridingly disabling the first and second oscillation sections.

VOL 1113 ISS 2 AP 10 1990 UMI

4,916,443

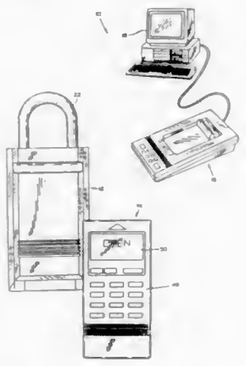
METHOD AND APPARATUS FOR COMPILING DATA RELATING TO OPERATION OF AN ELECTRONIC LOCK SYSTEM

Philip D. Barrett; Gerald R. Daum, and Wayne F. Larson, all of Salem, Oreg., assignors to Supra Products, Inc., Salem, Oreg.

Continuation-in-part of Ser. No. 192,834, May 11, 1988, abandoned, which is a division of Ser. No. 15,864, Feb. 17, 1987, Pat. No. 4,766,746, which is a continuation-in-part of Ser. No. 831,601, Feb. 21, 1986, Pat. No. 4,727,368, which is a continuation-in-part of Ser. No. 814,364, Dec. 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 788,072, Oct. 16, 1985, abandoned. This application Oct. 27, 1988, Ser. No. 263,174

Int. Cl.[4] E05B *49/00*

U.S. Cl. 340—825.31 **11 Claims**



1. An electronic lock system comprising:
an electronic lock;
an electronic key;
lock memory means in the lock for storing data relating to prior interactions of the lock with keys;
key memory means in the key operable without user intervention each time the key interacts with a lock, for obtaining data from the lock relating to at least one prior interaction of the lock with a key;
a database; and
means for downloading data from the key memory means to the database.

4,916,444

METHOD AND APPARATUS FOR MAPPING COMMUNICATIONS MEDIA

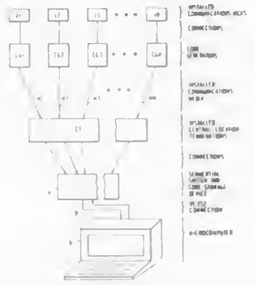
Fred N. King, 1930 Lake Port Way, Reston, Va. 22091

Filed Mar. 25, 1988, Ser. No. 174,280

Int. Cl.[4] H04Q *9/00*; G01R *31/02*

U.S. Cl. 340—825.490 **20 Claims**

1. A method, using computing means, of mapping the respective locations of a plurality of first terminals, comprising communications jacks, connections or devices installed at first locations, to respective second terminals at a second location, said first terminals being connected by a communications medium to said second terminals, comprising the steps of:
generating a unique signal at each first location,
recording in said computing means first information identifying each said unique signal with the location of each device,
transmitting each said unique signal by said communications medium from its respective first location to a second location,
detecting said transmitted unique signal at its respective second location,
identifying each unique signal with second information corrrelating the physical location of each connection at the second location,
comparing, with said computing means, said first information obtained in said recording step and said second information obtained in said identifying step to create a third



information which correlates the physical location of each first terminal to the physical location of the corresponding connection at the second location, thereby providing in said computing means a map of the communications medium which connects said first and second locations.

4,916,445

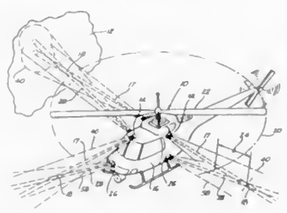
OBSTRUCTION PROXIMITY INDICATION SYSTEM FOR AN AIRCRAFT

Simon M. Crossley, 3117 Teakwood La., Plano, Tex. 75075

Filed Nov. 9, 1988, Ser. No. 269,136

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—946 **11 Claims**



1. A system for providing a visual indication of a safe limit of proximity between an aircraft and a stationary object, comprising:
a first light source mounted on the fuselage of the aircraft and comprising collimation means for providing a collimated beam of light of a first selected color extending outwardly from the aircraft; and
a second light source mounted on the fuselage of the aircraft and comprising collimation means for providing a collimated beam of light of a second selected color extending outwardly from the aircraft to intersect the collimated beam provided by the first light source at a selected proximity limit location outside the volume of space containing all portion of the aircraft.

4,916,446

REMOTE CONTROL DEVICE

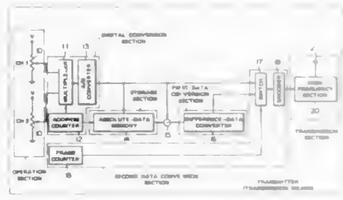
Michio Yamamoto, Mobara, Japan, assignor to Futaba Denshi Kobyo Kabushiki Kaisha, Mobara, Japan

Filed Jul. 6, 1988, Ser. No. 215,527

Claims priority, application Japan, Jul. 11, 1987, 62-172098

Int. Cl.[4] H04Q *9/14*

U.S. Cl. 340—825.570 **9 Claims**



1. A remote control device comprising:
a transmitter including transmission means for alternately arranging an absolute signal corresponding to an absolute position of controlling devices and a difference signal corresponding to a difference in said absolute position over time of said controlling devices, and for generating a modulated control signal consisting of successive frames of data based thereon, each frame including absolute data and difference data;
a receiver mounted on a control drive unit, said receiver including,
receiving means for receiving said control signal and demodulating it into a first absolute data signal and a difference data signal respectively corresponding to said absolute and difference signals derived from said transmission means and alternately generating said first absolute data signal and said difference data signal,
storage means for storing said first absolute data signal and said difference data signal therein,
conversion means for converting said first absolute data signal of an old frame and said difference data signal of a new frame into a second absolute data signal of only an absolute value and outputting said first and second absolute data signals therefrom, and
drive means for driving and controlling controlled devices of said control drive unit alternately in response to said first absolute data signal and said second absolute data signal output by said conversion means.

4,916,447

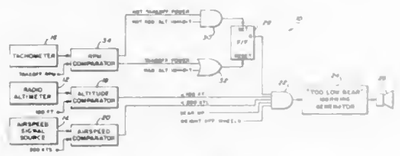
WARNING SYSTEM FOR AIRCRAFT LANDING WITH LANDING GEAR UP

Everette E. Vermilion, Seattle, and Noel S. Paterson, Bothell, both of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed May 13, 1983, Ser. No. 494,594

Int. Cl.[4] G01C *21/00*

U.S. Cl. 340—970 **10 Claims**



1. A warning system for providing a warning to the pilot of an aircraft that is landing with its landing gear up comprising:
means for providing a signal representative of the altitude of the aircraft above the ground;
means for providing a signal representative of the power being developed by an engine of the aircraft;
means for providing a signal representative of the position of the aircraft landing gear;
means for determining whether the aircraft is in a landing or take-off phase of flight, wherein said phase of flight determining means includes means for comparing said engine power representative signal with a reference signal to provide a signal representative of take-off power, bistable means having first and second stable states, said bistable means being responsive to said take-off power representative signal and selectively operable to the first stable state when take-off power is not present and to the second stable state when take-off power is present;
means responsive to the altitude signal providing means and the landing gear position signal providing means for generating a warning if the landing gear is not down and the aircraft is below a predetermined altitude above ground; and
means responsive to said bistable means for inhibiting the generation of said warning when said bistable means is in its second stable state.

4,916,448

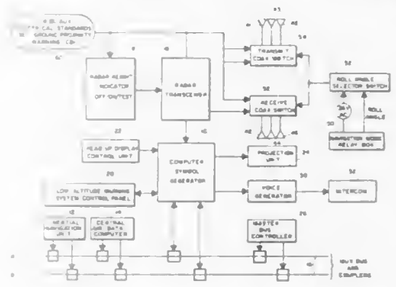
LOW ALTITUDE WARNING SYSTEM FOR AIRCRAFT

Wayne Thor, New Carlisle, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 26, 1988, Ser. No. 163,902

Int. Cl.[4] G08B *23/00*

U.S. Cl. 340—970 **5 Claims**



1. A low altitude warning system for aircraft to provide a warning to the pilot of flight and terrain conditions which will result in a collision with the ground unless the pilot takes immediate action, without issuing excessive nuisance warnings, using a computer on board the aircraft, said low altitude warning system comprising:
input means providing input parameters from other aircraft systems, including radar altitude from a radar altimeter, inertial velocities (Vx, Vy, Vz), pitch and bank angles (theta, phi) from an inertial navigation system (INS), and calibrated airspeed (vc) from a central air data computer (CADC);
filter means for providing filtered signals of vertical inertial veocity (Vz), radar altitude (Hr), and rate of change of Vz and radar altitude from a low-pass (alpha-beta) filter, wherein the filter means receives inputs from the INS and the radar altimeter, and creates rate information;
predictive means having inputs from said input means and said filter means for issuing a warning based on a prediction of the time necessary for recovery from an excessive closure with terrain condition based on pilot reaction time, flight path angle, MDA, bank angle, airspeed, and

terrain slope, a predictive warning being issued if the sum of the following predictive factors is greater than the radar altitude;

i. ΔHD=dynamic altitude effect, which comprises means for providing a factor which accounts for altitude lost until pilot reacts, includes a bank angle factor, and includes an empirical determination for a computed load factor which is a function of the rate of change of the filtered vertical inertial velocity multiplied by a factor which includes the absolute value of the bank angle and predetermined constants,

ii. HDB=dynamic bias, which comprises means for providing an analytical expression for computing the recovery altitude contribution of each of the terms MDA, bank angle, flight path angle, and airspeed,

iii. ΔHM=dive recovery factor, which comprises means for providing a factor which calculates recovery arc for a steady state dive recovery to get to flight path parallel to terrain, using an equation based on constant flight path angle, maximimum load factor and constant velocity at the time of the warning,

iv. ΔHT=terrain extrapolation equation, which comprises means for providing a factor which accounts for terrain growth based on slope of terrain, this being a hybrid of both rolling and diving type of maneuvers to arrive at predicted horizontal travel across terrain during recovery;

predictive inhibit means for inhibiting a warning under given conditions including conditions relating to dive angle, slope of terrain, and velocity;

warning means;

output means for activating the warning means responsive to a predictive warning from the predictive warning means which is not inhibited by the predictive inhibit means.

4,916,449

WIDE DYNAMIC RANGE DIGITAL TO ANALOG CONVERSION METHOD AND SYSTEM

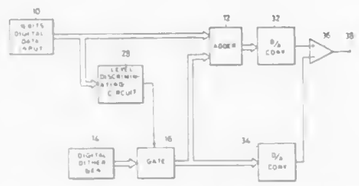
Mitsumasa Kubo, Iruma, and Tetsuro Araki, Hachioji, both of Japan, assignors to Teac Corporation, Tokyo, Japan

Division of Ser. No. 881,396, Jul. 2, 1986, abandoned. This application Nov. 9, 1987, Ser. No. 118,261

Claims priority, application Japan, Jul. 9, 1985, 60-150566; Feb. 28, 1986, 61-43555

Int. Cl.⁴ H03M *1/20*

U.S. Cl. 341—131 **7 Claims**



4. A system for faithfully converting a digital data signal such as a digitized audio signal into an analog signal, comprising:

(a) input means for receiving a digital data signal composed of a first predetermined number of bits;

(b) a dither generator for generating a digital dither signal composed of a second predetermined number of bits less than the first predetermined number of bits;

(c) a level discriminating circuit connected to the input means for discriminating whether the level of the incoming digital data signal exceeds a predetermined limit or not;

(d) a gate circuit connected both to the dither generator and to the level discriminating circuit for permitting the passage therethrough of the digital dither signal when the level of the incoming digital data signal does not exceed the predetermined limit, and for inhibiting the passage of the digital dither signal when the level of the incoming digital data signal exceeds the predetermined limit;

(e) an adder connected both to the input means and to the gate circuit for adding the digital data signal and the digital dither signal to provide a digital data/dither signal;

(f) a first digital to analog converter connected to the adder for converting the data/dither signal from digital to analog form;

(g) a second digital to analog converter connected to the gate circuit for converting the dither signal from digital to analog form; and

(h) a subtracter connected to both the first and second digital to analog converters for subtracting the analog dither signal from the analog data/dither signal to provide an analog data signal equivalent to the digital data signal.

4,916,450

RADAR SYSTEM FOR HEADWAY CONTROL OF A VEHICLE

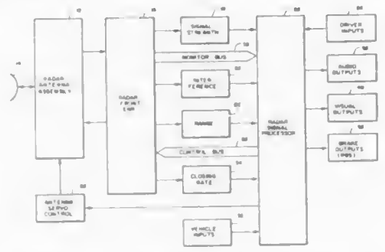
John W. Davis, San Diego, Calif., assignor to Radar Cootrol Systems Corporation, San Diego, Calif.

Filed May 12, 1988, Ser. No. 193,393

The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.

Int. Cl.⁴ G01S *13/93, 13/42*

U.S. Cl. 342—71 **18 Claims**



1. A radar system for use in a vehicle comprising:

an FM CW radar producing range and closing rate signals between said vehicle and an object;

vehicle means for producing a signal relating to the speed of said vehicle;

a reference signal of a fixed unit value, said range, closing rate and vehicle speed signals each having a maximum unit value which is a percentage of said reference signal unit value; and

a radar signal processor, said radar signal processor comprises means for summing together the instantaneous unit value of said range, closing rate and vehicle speed and when the total summed value exceeds said fixed unit value of said reference signal said radar system provides an output signal.

4,916,451

MICROWAVE LANDING SYSTEM

Toru Ishita, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 8, 1987, Ser. No. 130,200

Claims priority, application Japan, Dec. 8, 1986, 61-293138

Int. Cl.⁴ G01S *7/40*

U.S. Cl. 342—35 **21 Claims**

1. A microwave landing system for use in radiating a guidance beam, said microwave landing system comprising:

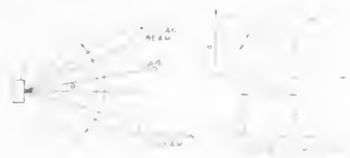
scan means for reciprocally scanning a predetermined region with said guidance beam;

a field monitor antenna located at a predetermined position for receiving said guidance beam at said predetermined position;

conversion means for converting a signal received by said field monitor antenna into a video signal;

test signal generator means for generating a test signal which has paired pulses including a TO-pulse and FRO-pulse with a first time interval therebetween which is outside a predetermined tolerance range based on a second time interval between a TO-pulse and a FRO-pulse received by said field monitor antenna during a TO-scan and a FRO-scan of said guidance beam;

a monitoring circuit, coupled to said conversion means and to said test signal generator means, to monitor normalcy of said microwave landing system, said monitoring circuit including;



switch means, coupled to said conversion means and to said test signal generator means, for outputting said paired pulses from said test signal generator means during a dead time period during which said field monitor antenna receives no electromagnetic waves indicative of meaningful information for guidance;

measurement means for measuring, on the basis of an output of said switch means, an second time interval and said first time interval; and

verification means for verifying said normalcy of said microwave landing system on the basis of a measured second time interval and for verifying a normalcy of said monitoring circuit on a basis of the measured first time interval.

4,916,452

PROCESS FOR RANGE MEASUREMENT WITH A PULSE RADAR OF HIGH PULSE REPETITION FREQUENCY

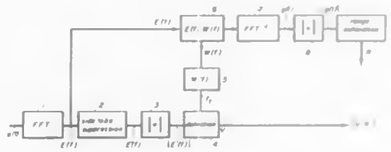
Wolfgang Borchert; Franz Jehle, and Hermann Rohling, all of Ulm, Fed. Rep. of Germany, assignors to AEG, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 930,810, Nov. 13, 1986, abandoned. This application Mar. 30, 1988, Ser. No. 175,232

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1985, 3540717

Int. Cl.⁴ G01S *13/46, 13/24*

U.S. Cl. 342—109 **15 Claims**



1. A process for obtaining range and velocity information for a target using pulsed doppler radar for sending sequential pulsed signals to the target and for receiving signal blocks from the target which are each formed of a plurality of sequential signals, each signal block having a complex time signal, the target having a doppler frequency comprising:

transforming the complex signal (e(t)) of a block into a complex spectrum (E(f)) which is in the frequency domain;

multiplying the complex spectrum by a complex bandpass function whose mean frequency coincides with the doppler frequency of the target, to form a product;

re-transforming the product into a further time signal (g(t));

taking the real signal envelope of the further time signal (g(t)) and

analyzing the leading edge of the real signal envelope of the further time signal by an edge detection technique to obtain an estimated value for the range of the target.

4,916,453

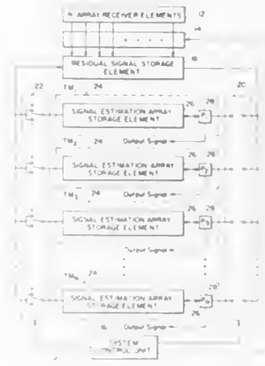
SPATIAL FILTERING SYSTEM

John P. Costas, Wabun, Mass., assignor to Cogent Systems, Inc., Wabun, Mass.

Filed Apr. 3, 1989, Ser. No. 332,719

Int. Cl.⁴ H04B *7/00*

U.S. Cl. 342—368 **15 Claims**



1 A system for isolating selected signals from an array of signal data values collected from a signal environment by at least one receiver element and stored in a residual signal storage element, the system comprising:

a plurality of tracker modules for selectively reading the array of signal data values to isolate a selected signal, each tracker module including:

means for generating, from the array of signal data values, estimated contributions of a selected signal at each of the plurality of receiver elements; and

means, connected to said means for generating, for determining an output signal, based on said estimated contributions, that is representative of the selected signal; and

control means for enabling at least a first tracker module of said plurality of tracker modules to selectively read the array of signal data values and to selectively combine the estimated contributions, generated by said means for generating for that tracker module, with the array of signal data values in said residual signal storage element to alter the array of signal data values during the generation of estimated contributions by other tracker modules.

4,916,454

ADAPTIVE NULLING CIRCULAR ARRAY ANTENNA

Jeffrey F. Bull, Warrington, and Richard P. Flam, Doylestown, both of Pa., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Jun. 5, 1989, Ser. No. 361,851

Int. Cl.⁴ H01Q *3/22, 3/24, 3/26*

U.S. Cl. 342—373 **4 Claims**

1. A method for modifying an antenna pattern of a circular array antenna connected through a Butler matrix and phase shifters to a beam forming network to create nulls in the directions of interfering signal sources comprising the steps of:

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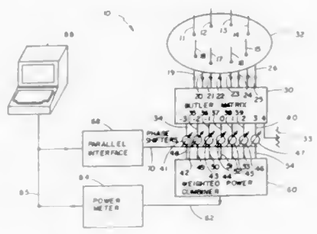
receiving an interfering signal at the outputs of said beam forming network,

varying the phase of each phase shifter connected to a respective mode port of the Butler matrix, one at a time, in a first phase direction and measuring the respective output power of said beam forming network,



estimating the gradient of the output power ∇P where ∇P is $\partial P/\partial \phi_i(k)$ where i is the phase shifter and (k) is the iteration number, and

setting the phase of each phase shifter in response to the gradient of the output power.

4,916,455

LOCATING SYSTEM AND METHOD

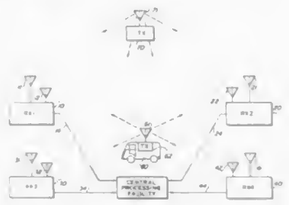
Rodney B. Bent, Indialantic, and Paul W. Casper, West Melbourne, both of Fla., assignors to Scientific Development Inc., Palm Bay, Fla.

Division of Ser. No. 16,788, Feb. 20, 1987, Pat. No. 4,812,852. This application Jan. 6, 1989, Ser. No. 294,736

The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.

Int. Cl.[4] G01S *3/02, 1/24*

U.S. Cl. 342—457 23 Claims



1. A method for determining the origin of a radio signal transmission, the radio transmission being received by at least three spaced radio signal receiving stations, each station having a radio transmission receiver and a synchronizable timer, said method comprising the steps of:

(1) at each of the stations

(a) detecting a signal transmission;

(b) demodulating the detected transmission for obtaining an amplitude varying signal;

(c) detecting the transitions of the amplitude varying signal through a predetermined reference value;

(d) synchronizing the timer to a common time base;

(e) determining the times of occurrence of each of a sequential plurality of transitions of the amplitude varying signal through the predetermined reference level; and

(f) transmitting the times of occurrences to a central processing facility;

(2) at the central processing facility

(g) comparing the pattern of the sequential times of occurrences detected at one of the stations to those detected at another of the stations for identifying common signal transmissions;

(h) aligning the common signal transmissions;

(i) determining a time shift necessary for effecting the steps of aligning; and

(j) computing the origin of the transmission from the determined time shift.

4,916,456

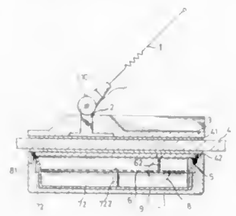
GLASS-MOUNTABLE ANTENNA ASSEMBLY

Don Shyu, No. 957, Po Ai St., Chupei City, Hsingchu Hsien, Taiwan

Filed May 12, 1989, Ser. No. 350,779

Int. Cl.[4] H01Q *1/32*

U.S. Cl. 343—713 1 Claim



1. In a glass mountable antenna assembly comprising an antenna (**1**) secured to an antenna base (**11**), an electrically conductive outer mounting plate (**3**) for receiving said antenna base (**11**) and receiving an electromagnetic signal from said antenna (**1**) and transmitting said electromagnetic signal through a sheet of glass to a pattern foil trace (**51**) of a PCB (**5**) on the opposite side of said sheet of glass, a metal wire (**62**) being electrically connected to said pattern foil trace (**51**) on one end thereof, a microstrip filter (**63**) being electrically bridged by a copper wire (**61**) and connected to said metal wire (**62**) and emulating an inductor, a jack (**8**) electrically connecting to the junction of said copper wire (**61**) and said metal wire (**62**) to receive a signal therefrom, the improvement comprising:

a housing (**7**) being made of a thermoplastic insulating material and having an open top rectangular box shape with said PCB (**5**) including said pattern foil trace (**51**) forming the cover to said housing (**7**) at the top of said housing (**7**) and securing thereto, said housing (**7**) having a support plate (**72**) and a support panel (**71**) disposed therewithin and positioned at opposite sides in the interior of the housing (**7**), said support plate (**72**) and support panel (**71**) having a height approximately half the height of the sides of said housing (**7**) for supporting an inner PCB (**6**) which has said copper wire (**61**), said metal wire (**62**) and said microstrip filter (**63**) disposed thereon,

a ground shield (**9**) housing being composed of a thin metal sheet folded and shaped to essentially cover the interior of said housing (**7**), a substantial portion of the ground shield being positioned along the bottom of the housing (**7**) generally parallel to the inner PCB (**6**); and

said pattern foil trace (**51**) at the top of said housing (**7**) and said ground shield (**9**) at the bottom of said housing (**7**) forming a static capacitor for interacting with said intermediately positioned microstrip filter (**63**).

4,916,457

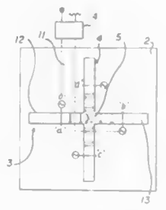
PRINTED-CIRCUIT CROSSED-SLOT ANTENNA

Wong Foy; Hsin-Hsien Chung, both of San Diego, and Sheng Y. Peng, Escondido, all of Calif., assignors to Teledyne Industries, Inc., San Diego, Calif.

Filed Jun. 13, 1988, Ser. No. 205,707

Int. Cl.[4] H01Q *13/10*

U.S. Cl. 343—770 5 Claims



1. An antenna connectable to a radio communication device for transmitting or receiving a radio frequency signal, said antenna consisting of:

a first printed circuit board including a first non-conductive substrate and a conductive layer electro-deposited on a first face of the first non-conductive substrate, said conductive layer having first and second symmetrical slots cross-intersecting at right angles through their centers, each slot having equal leg portions on either side of the other slot;

a second printed circuit board commensurate with said first printed circuit board, said second printed circuit board having a first side mounted against a second face of said first circuit board;

an array of four symmetrical stripline feeders electrodeposited on said first side, one end of each feeder being positioned under one of said leg portions distally from said centers to electro-magnetically couple to said leg portion;

printed circuit means for supplying quadrature phases of the signal to the stripline feeders;

a conductive grounding layer coupled to said stripline feeders;

means for holding said first and second printed circuit board, said means for supplying, and said ground layer in a stacked-layered configuration; and

a conductive cage structure on the periphery of said first and second circuit boards.

4,916,458

SLOTTED WAVEGUIDE ANTENNA

Naohisa Goto, Kawasaki, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Feb. 15, 1989, Ser. No. 310,433

Claims priority, application Japan, Feb. 19, 1988, 63-37203

Int. Cl.[4] H01Q *13/10*

U.S. Cl. 343—771 9 Claims

1. A slotted waveguide antenna comprising:

a plurality of radiating waveguides each having at least one radiating slot;

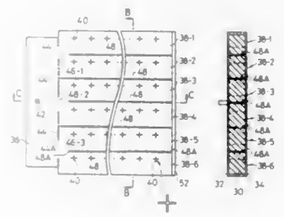
a feed waveguide for feeding to said radiating waveguides; and

a plurality of coupling apertures arranged between said feed waveguide and said radiating waveguides at a distance of an integral multiple of a guide wavelength of said feed waveguide;

said plurality of radiating waveguides being disposed in parallel to form an array, each of at least one radiating slots being directed in the same direction;

said feed waveguide lying in the same plane as the array formed by said radiating waveguides; and

each radiating waveguide having a transverse width equal to one half of the distance between the adjacent coupling apertures, whereby each two of said plurality of radiating



waveguides are excited by one of said plurality of coupling apertures.

4,916,459

PARABOLIC ANTENNA DISH

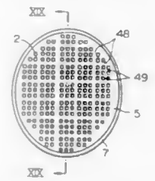
Hiroshi Kurosawa, Tochigi; Izumi Ochiai, Tochigi; Yoshio Asahino, Tochigi, and Yoichi Wakabayashi, Sano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 16, 1987, Ser. No. 26,065

Claims priority, application Japan, Mar. 19, 1986, 61-59123; Aug. 13, 1986, 61-188417; Sep. 8, 1986, 61-209485

Int. Cl.[4] H01Q *15/14*

U.S. Cl. 343—840 1 Claim



1. A parabolic antenna dish comprising:

a ring-like outer peripheral flange portion integrally formed at an outer periphery of a reflector for receiving radio waves and a porous plate portion in which a plurality of air holes are formed, wherein said air holes in said reflector are continuously formed from the center portion of said reflector and approach a ridge line constituting a bent portion of said outer peripheral flange portion so that said air holes continuously cover a region which is greater than 80% of a radius of said reflector, said air holes are arranged in parallel rows, and aligned crosspieces are formed in spaces between said air holes resulting from perforation of said reflector, said crosspieces being of solid reflector metal and comprising first crosspieces of one thickness and second crosspieces of smaller thickness than said first crosspieces such that the spaces between said air holes are nonuniform, said porous plate portion being formed from said first crosspieces linearly arranged in longitudinal and lateral directions, and said air holes being separated by said second crosspieces and disposed in groups separated by said first crosspieces.

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4,916,460

DISTRIBUTED ANTENNA SYSTEM

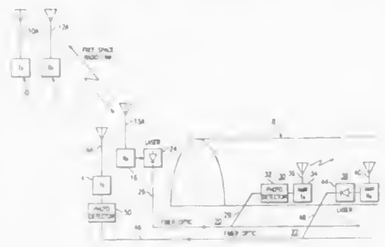
Alan J. Powell, Seale Nr. Farnham, United Kingdom, assignor to Decibel Products, Incorporated, Dallas, Tex.

Filed Sep. 29, 1988, Ser. No. 250,928

Claims priority, application United Kingdom, Jan. 29, 1988, 8801975

Int. Cl.[4] H01Q *21/00*; **H04B** *9/00*

U.S. Cl. 343—853 6 Claims



1. A distributed antenna system comprising:

a primary antenna means for receiving modulated RF carrier signals from a remotely positioned radio frequency antenna means;

a circuit means including a first means connected to the primary antenna means for converting the modulated RF carrier signals to corresponding modulated light signals, an optic fiber network means having a first end and a plurality of second ends, the first end being connected to the first means for receiving and transporting the modulated light signals to the plurality of second ends, a plurality of second means connected to the plurality of second ends for receiving the modulated light signals and outputting corresponding modulated RF carrier signals, and a corresponding plurality of secondary antenna means connected to the plurality of second means for receiving and transmitting the corresponding modulated RF carrier signals, wherein modulated RF carrier signals are received by the first means of the circuit for conversion to light modulated signals for transport through a radio frequency interference environment location by the optic fiber network and conversion back to modulated RF carrier signals by the second means for transmission by the plurality of secondary antenna means.

4,916,461

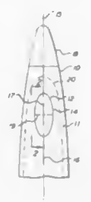
ANTENNA WINDOW COVER

James P. Brazel, Berwyn, Pa., assignor to General Electric Company, Philadelphia, Pa.

Continuation of Ser. No. 133,471, Dec. 15, 1987, abandoned. This application Jul. 13, 1989, Ser. No. 379,683

Int. Cl.[4] H01Q *1/42*; **B32B** *5/12*

U.S. Cl. 343—872 19 Claims



1. A method for protecting the environment of a cavity, the cavity disposed internal a structure having a central longitudinal axis and an external aerodynamic surface disposed about the longitudinal axis, the external surface having a meridian, and the structure further having an aperture disposed between the external surface and the cavity, the aperture terminating at the surface in an elongated orifice and at the cavity, the aperture forming an electromagnetic flow communication path between the cavity and surroundings external to the structure, the orifice having a long axis and a shorter axis transverse the long axis, the long axis of the orifice disposed coincident with the meridian of the surface, the method comprising:

disposing a dielectric material over the aperture at the orifice, the material having a complementary contour to the orifice for sealingly engaging the margin of the orifice, wherein the material includes a plurality of fibers and further wherein a respective portion of the plurality of fibers are disposed in a repeatable cell substantially in a respective one of four directions, the cell including:

a first direction lying in a first plane, the first plane including the central longitudinal axis of the structure and the long axis of the orifice, the first direction substantially parallel to the long axis of the orifice;

a second direction lying in a second plane, the second plane substantially perpendicular to the first direction, the second direction substantially parallel to the shorter axis of the orifice;

a third direction lying in a third plane, the third plane spaced from and parallel to the first plane, the third direction oblique the first direction;

a fourth direction lying in a fourth plane, the fourth plane spaced from and parallel to the first plane and disposed on the opposite side of the first plane from the third plane, the fourth direction oblique the first direction and opposite to the third direction; and

the first direction also lying in a fifth plane, the fifth plane spaced from the fourth plane and parallel to the first plane and further disposed on the opposite side of the fourth plane from the first plane;

disposing filler material including dielectric material in interstices among the plurality of fibers for supporting the plurality of fibers; and

sealing engaging the margin of the orifice with filler material and fibers selected from the group consisting of fibers disposed in the first, third, and fourth directions and any combination thereof, such that elements disposed in the first, third and fourth directions also lie parallel to a plane containing the longitudinal axis and the meridian regardless of the circumferential position of the elongated orifice about the longitudinal axis of the structure.

4,916,462

REFERENCE LINE SETTING SYSTEM FOR GRID PATTERN RECORDERS

Toshiyuki Takeuchi, Chigasaki, Japan, and Alfred S. Krause, Glendora, Calif., assignors to Graphtec Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1988, Ser. No. 257,984

Claims priority, application Japan, Oct. 17, 1987, 62-158929

Int. Cl.[4] G01D *9/00*

U.S. Cl. 346—1.1 20 Claims

1. In a method of recording data on a chart with an elongate thermal recording head having a plurality of clocked heating elements thereacross, the improvement comprising in combination the steps of:

selecting a coordinate grid pattern within which to record said data on said chart;

establishing a line of said grid pattern as a reference line recordable by one of said heating elements;

providing a recordable reference level corresponding to said reference line;

ranking said one heating element in terms of position across said thermal recording head;

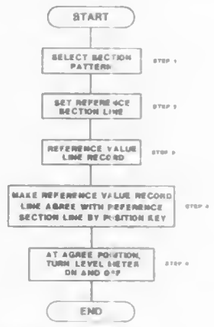
noting a discrepancy in ranking between said one heating element and the heating element of said elongate thermal recording head with which said reference level is recorded on said chart; and

effecting a shifting in ranking of the heating element with which the reference level is recorded pursuant to a noted discrepancy until the heating element with which said reference level is recorded and said one heating element with which said reference line of the grid pattern is recorded have become identical.

10. In apparatus for recording data on a chart, including an elongate thermal recording head having a plurality of clocked heating elements thereacross, the improvement comprising in combination:

means for ranking said heating elements in terms of position across said thermal recording head;

means for providing a coordinate grid pattern within which to record said data on said chart;



means for establishing a line of said grid pattern as a reference line recordable by one of said heating elements;

means for providing a reference level corresponding to said reference line and recordable by a heating element of said elongate thermal recording head;

means connected to said ranking means for noting any discrepancy in ranking between the heating element with which the reference level is recorded and said one heating element which records the reference line;

means connected to said discrepancy noting means for effecting a shifting in ranking of the heating element with which the reference level is recorded pursuant to any noted discrepancy in said ranking; and

means connected to said discrepancy noting means for indicating when said latter heating element with which the reference level is recorded and said one heating element with which said reference line in the grid pattern is recorded have become identical.

4,916,463

SUPPORT ROLLERS FOR THE PRINT ROLLER IN A HIGH-ACCURACY, WIDE-PAPER THERMAL PLOTTER

Paul S. Tzeng, Fountain Valley, and Richard Mansueto, Huntington Beach, both of Calif., assignors to Calcomp Inc., Anaheim, Calif.

Filed Jun. 22, 1989, Ser. No. 370,033

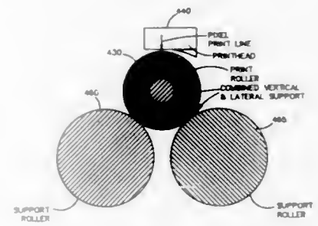
Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH 2 Claims

2. In a thermal printer for thermally printing on a wide media with a composite printhead comprising a plurality of standard thermal printheads intended for printing on a narrow media and having a concave printing surface defining a partial cylindrical space disposed end-to-end and including a print roller for supporting the media adjacent the printing surface and having a cylindrically convex outer surface characterized by a radius sufficiently small so that the print roller congruently fits at least partially within the partial cylindrical space of the concave printing surface, the improvement to improve print quality by preventing bowing of the print roller away from the printhead in two mutually orthogonal directions comprising:

(a) a first cylindrical support roller mounted parallel to the print roller in rolling contact therewith along the length thereof to oppose movement or deformation of the print roller relative to the printing surface; and,

(b) a second cylindrical support roller mounted parallel to said print roller in rolling contact therewith along the length thereof to oppose movement or deformation of the print roller relative to the printing surface, said first and



second support rollers being disposed on opposite sides of a plane passing through the printhead and the print roller whereby said first and second support rollers contact the print roller at respective first and second locations along the circumference of the print roller so that said first and second support rollers together prevent bowing of the print roller with respect to the printing surface in two mutually orthogonal directions, said first and second support rollers having radii larger than the radius of the print roller and sufficiently large so as to render said first and second support rollers in combination stiff enough to prevent the print roller from bowing.

4,916,464

LIGHT EMITTING DIODE ARRAY PRINT HEAD HAVING NO BONDING WIRE CONNECTIONS

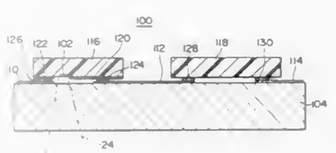
Katsuyuki Ito; Naoji Akutsu, and Yuhei Itasaka, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 189,132, Apr. 22, 1988, abandoned, and a continuation-in-part of Ser. No. 193,681, May 13, 1988, abandoned. This application May 4, 1989, Ser. No. 347,818

Claims priority, application Japan, Apr. 22, 1987, 62-59840; May 15, 1987, 62-71772

Int. Cl.[4] G01D *9/42, 15/06*

U.S. Cl. 346—107 R 16 Claims



1. A light emitting diode array print head comprising:

a first package having opposite major surfaces on a first of which an array of light emitting diodes are positioned, said first major surface being provided with electrode conductor means which is connected to said light emitting diodes,

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said electrode conductor means being provided with first solder bumps which are made of a thermally fusible alloy;

a second package loaded with a driver circuit for driving said array of light emitting diodes, a first of opposite major surface of said second package being provided with second solder bumps which are made of a thermally fusible alloy and are connected to said driver circuit;

a substrate formed of an optically transparent insulative material and having opposite major surfaces on a first of which are provided conductive lead means for electrically connecting said light emitting diodes and said driver circuit; and

said first package and said second package being mounted on said substrate in such an orientation that said first major surface of said first package and said first major surface of said second package face said first major surface of said substrate, said first solder bumps and said second solder bumps being connected to said conductive lead means.

4,916,465

BINARY OPTICAL SIGNAL RECORDER PROVIDING PREHEATING PULSE BEFORE AN INITIAL WRITE PULSE

Hendricus F. J. J. Van Tongeren, and Martin A. J. P. Farla, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 24,937, Mar. 12, 1987, Pat. No. 4,774,522. This application Jun. 15, 1988, Ser. No. 209,443

Claims priority, application Netherlands, Oct. 29, 1986, 8602718

Int. Cl.[4] H04N *1/23;* G01D *15/14*

U.S. Cl. 346—108 5 Claims

1. An apparatus for recording a binary signal comprised of a sequence of bits having a first logic value or a second logic value on an optical record carrier having a layer with an optical property which changes upon heating, said apparatus comprising:

means for producing a beam of radiation which is projected onto said record carrier;

means for producing relative movement between said beam and said record carrier;

means for pulsing said beam in accordance with said binary signal so as to produce a sequence of radiation write pulses corresponding to a sequence of consecutive bits of such signal having said first logic value, and for further producing a preheating pulse a predetermined time interval before the first of said write pulses; said predetermined time interval being such that the areas of impingement of said preheating pulse and said first write pulse on said layer overlap; said first write pulse having an energy content which produces a mark in such area of overlap on said record carrier by heating said layer and thereby changing said optical property thereof; said preheating pulse having an energy content which is inadequate of itself to produce said change of said optical property of said layer; and

each of said write pulses following said first write pulse has an energy content which, as a result of heating of said layer by the immediately preceding write pulse, is sufficient to heat said layer to produce a mark on said record carrier

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4,916,466

PLOTTER HAVING A SUPPORT PLATEN OF ANGULAR PROFILE

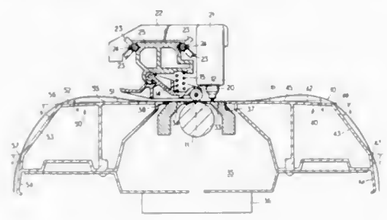
Francois R. Coste, Chennevières sur Marne, France, assignor to Océ Graphics France, S.A., Creteil, France

Filed Nov. 23, 1988, Ser. No. 276,358

Claims priority, application France, Nov. 26, 1987, 87 16432

Int. Cl.[4] G01G *19/08;* B41J *15/00*

U.S. Cl. 346—136 13 Claims



1. An X-Y plotter comprising:

first drive means for displacing a recording sheet in a first direction (X);

second drive means for displacing a writing tool in a second direction (Y) along a write path with respect to the sheet, and

a platen for supporting the sheet and having a horizontal central portion including the write path, and front and rear portions for supporting the sheet in front of and behind the central portion;

each of said front and rear portions comprising a first plane face connected to the central portion by a first horizontal edge and forming, relative to the horizontal, a first angle a and at least one second plane face connected to the first plane face by a second horizontal edge having a radius of curvature less than the estimated value of the natural radius of curvature of the sheet, said second face forming, relative to the horizontal, a second angle b which is greater than the first angle, and having a third horizontal edge at its bottom portion, with the edges and the faces having a geometry chosen so that the sheet by resting on the second and third edges, is constrained to keep off the first and second faces and to lift above the level of the central portion prior to coming into contact therewith.

4,916,467

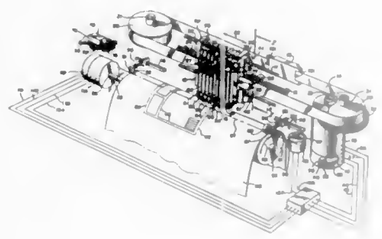
DIRECT WRITING OVER-THE-DRUM GRAPHIC RECORDER

Robert H. Niemeyer, III, Beaverton, Oreg., assignor to AM International Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 75,331, Jul. 20, 1987, Pat. No. 4,794,408. This application Jun. 15, 1988, Ser. No. 207,192

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—139 R 2 Claims



1. A graphic recorder for recording upon a flexible recording media defining edge portions comprising:

a moveable pen carriage having one or more recording pens each having a recording tip supported thereon arranged in a linear array parallel to said carriage path in which said recording pens each define a major axis through said recording tip which are vertically aligned and each of said recording pens are moved along their vertically aligned major axes to and from their recording positions:

carriage drive means for moving said pen carriage along a pen carriage path;

a media drum, said media drum for supporting said flexible media during recording, defining a generally cylindrical media surface textured to grip said media and a major axis, supported such that said major axis is parallel to said pen carriage path;

media drive means, coupled to said media drum, for causing rotation of said media drum about said major axis;

pen means for moving a selected recording pen into a recording position which said recording tip of said selected recording pen contacts said media and presses said media against said media surface of said media drum, the locus of points recordable by said selected recording pen in the absence of media drum rotation defines a recording line extending across said media drum; and

a pair of rollers positioned in a spaced apart relationship overlying and contacting the portions of the flexible media and cooperating to captivate a portion of the flexible media against said media surface such that said flexible media contacts said media surface of said media drum along said recording line,

said recording line and said major axis of said media drum being parallel and coplanar and said vertically aligned major axes of said recording pens being perpendicular to and coplanar with said recording line and said major axis of said media drum.

4,916,468

MOVABLE INK JET THERMAL PRINTING HEAD TO PREVENT INK STOPPAGE

Mamoru Hayamizu, Chiba, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki and Soartec Corporation, Tokyo, both of, Japan

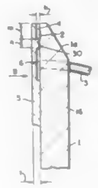
Continuation-in-part of Ser. No. 159,451, Feb. 23, 1988, Pat. No. 4,803,499. This application Jun. 24, 1988, Ser. No. 211,297

Claims priority, application Japan, Mar. 4, 1987, 62-47456

The portion of the term of this patent subsequent to Feb. 7, 2006, has been disclaimed.

Int. Cl.[4] G01D *15/16;* B41J *3/04*

U.S. Cl. 346—140 R 10 Claims



1. An ink jet printing head comprising:

(a) a thermal head having a plurality of thermal dot elements for creating heat; (b) a guide member slideably mounted for reciprocal movement on said thermal head so as to be in operative engagement with said thermal dot elements, said guide member having a plurality of grooves in proximity to said thermal dot elements, said plurality of grooves being of greater number than said plurality of thermal dot elements, each of said grooves having an open first end and a substantially closed second end defining a substantially closed chamber open at one end for expelling ink therefrom, said reciprocal movement being in a direction substantially perpendicular to said grooves, whereby said reciprocal movement of said guide member relative to said thermal head substantially prevents said grooves from becoming blocked and for maintaining a flow of said ink during operation, wherein said guide member and said thermal head when in overlapping relationship form a passageway therebetween to carry ink from an ink gathering recess to each of said substantially closed second ends of each grooves for delivery to said thermal dot elements, wherein the ink within each of said grooves can be heated and caused to bubble and spray substantially all of the ink out of said grooves and thereby aid in substantially preventing said grooves from becoming blocked; and, (c) an ink supplying means for supplying said ink gathering recess with ink.

4,916,469

IMAGE-FORMING APPARATUS

Nobuhiro Imai, Kawasaki; Tadashi Ochiai, Ibaraki, and Fumio Asano, Noda, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1989, Ser. No. 401,153

Claims priority, application Japan, Sep. 1, 1988, 63-216325

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—150 13 Claims

1. An image-forming apparatus, comprising:

a first frame;

a recording electrode provided in said first frame, to which recording electrode voltage for recording is applied;

a belt-like recording medium disposed facing said recording electrode;

toner transporting means for supplying toner to a space between said recording electrode and recording medium;

a drive source for driving said recording medium;

a feed member for said recording for movably supporting said recording;

a second frame mounted on said first frame for movably supporting said feed member; and

locking means for locking said feed member in said second frame at a predetermined position thereof;

whereby said charging electrode and recording medium are positioned relative to each other.

4,916,470

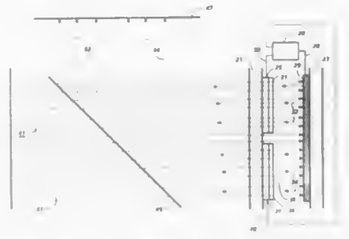
IMAGE BAR WITH ELECTROCHROMIC SWITCHING SYSTEM

Gregory J. Kovacs, Mississauga, and Rafik O. Loutfy, Willowdale, both of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 16, 1988, Ser. No. 272,040

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—160 **36 Claims**



1. An image bar comprising a linear light valve array with a plurality of discrete, independently addressable pixel portions activatable between light transmitting, partially transmitting, and non-transmitting wavelengths by selective application of an electrical field, wherein said pixel portions comprise, in the order stated,

a first transparent substrate;

a transparent electrode in contact with said first transparent substrate and connected to a variable current, variable voltage source;

a single thin film comprising an electrochromic material in contact with said transparent electrode;

a transparent electrolytic material in contact with said thin film;

a counterelectrode in contact with said transparent electrolytic material and connected to said variable current, variable voltage source; and

a second substrate.

4,916,471

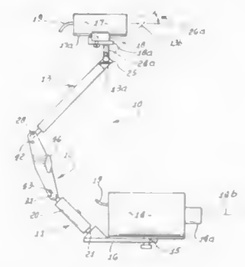
ADJUSTABLE, UNDERWATER CAMERA EQUIPMENT ARM ASSEMBLY

Chester E. Tussey, 5724 Dolphin Pl., La Jolla, Calif. 92037

Filed Aug. 11, 1989, Ser. No. 392,588

Int. Cl.[4] G03B *17/08*

U.S. Cl. 354—64 **10 Claims**



1. In an adjustable, articulated, underwater strobe arm assembly, the combination comprising:

(a) at least three links arranged in end-to-end relation, for adjustably interconnecting items of photographic equipment,

(b) at least one link including longitudinally endwise spaced pairs of sockets to receive and adjustably tighten on balls carried by other links,

(c) said one link including two elongated link sections, each of which carries two of the sockets,

(d) hinge means associated with and interconnecting the sections, to allow relative rotating of the sections about a first axis extending longitudinally,

(e) and clamping means carried by said one link to effect relative rotation of the sections about said longitudinal axis, in response to tightening of the clamping means, whereby the sockets tighten onto the balls to prevent relative rotation.

4,916,472

AUTOMATIC FOCUS CONTROL DEVICE FOR CAMERA

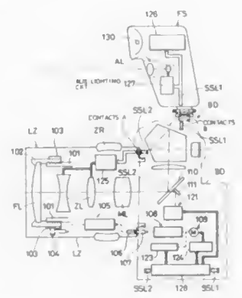
Noriyuki Okisu; Tokuji Ishida; Masataka Hamada, and Kenji Ishibashi, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 16, 1989, Ser. No. 352,364

Claims priority, application Japan, May 16, 1988, 63-118795; May 27, 1988, 63-130844

Int. Cl.[4] G03B *3/10*

U.S. Cl. 354—402 **7 Claims**



1. An auto-focus camera comprising:

focus detection means for detecting the focussing state of a photographic lens:

reliability discriminating means for discriminating whether the result of the focus detection means is reliable;

first drive control means for driving the photographic lens to a position determined from the result of the focus detection means when the reliability discriminating means discriminates that the result is reliable;

second drive control means for driving the photographic lens in a predetermined direction with allowing the focus detection means and the reliability discriminating means to execute when the reliability discriminating means discriminates that the result is unreliable;

judging means for judging whether a reverse driving of the photographic lens is necessary when the reliability discriminating means discriminates that the result of the focus detection means is reliable during the predetermined direction driving; and

third drive control means for driving the photographic lens in the reverse direction to a position determined from the instant result of the focus detection means when the judging means judges that the reverse driving is necessary.

4,916,473

FOCUS DETECTION APPARATUS

Hiromu Mukai, Kawachinagano; Tokuji Ishida, Daito, and Hisashi Tokumaru, Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

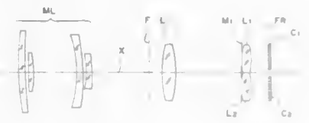
Continuation of Ser. No. 896,391, Aug. 13, 1986, Pat. No. 4,794,416. This application Sep. 27, 1988, Ser. No. 249,899

Claims priority, application Japan, Aug. 14, 1985, 60-179839; Sep. 27, 1985, 60-215688

The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—402 **6 Claims**



1. A focus detection apparatus for a camera capable of using both a cata-dioptric lens system and a dioptric lens system as an objective lens, comprising:

a condenser lens means being arranged close to or behind a predetermined focal plane of the objective lens, and

an image separation means for separating an image of an object formed on the predetermined focal plane by use of light having been passed through said objective lens into two images, including:

a pair of separation lenses arranged, behind said condenser lens means, symmetrically with respect to the optical axis of said objective lens, for forming the two images, and

a mask means having a pair of apertures whose images, when projected on an exit pupil of the objective lens by the condenser lens means and separation lenses, are located within a range determined by an inner shape of the exit pupil of the cata-dioptric lens system and an outer shape of the exit pupil of the dioptric lens system, wherein the correlation distance between the two separately formed images is measured in order to detect the focus condition of the objective lens.

4,916,474

CAMERA HAVING A CPU RESET FUNCTION

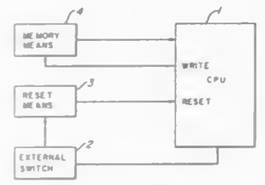
Azuma Miyazawa, Mitaka; Atsushi Maruyama, Yokohama; Akira Inoue, Hachioji; Akira Watanabe, Hachioji, and Akitaru Kimura, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 15, 1989, Ser. No. 311,154

Claims priority, application Japan, Mar. 1, 1988, 63-48219; Aug. 1, 1988, 63-192553

Int. Cl.[4] G03B *1/00, 17/00*

U.S. Cl. 354—412 **16 Claims**



1. A camera having a photographing operation possible state and a photographing operation impossible state, the camera comprising:

a CPU to which power is to be always supplied;

an external switch for changing over between the photographing operation possible state and the photographing operation impossible state;

reset means responsive to the changeover of the external switch for generating a reset signal to reset the CPU; and

memory means for storing data on the state of operation, such as film winding and rewinding, performed by the camera before the operation of the external switch;

after being reset, the CPU executing a prescribed camera operation in accordance with the data stored in the memory means.

4,916,475

CAMERA HAVING ZOOM LENS AND VARIABLE ILLUMINATION ANGLE STROBE

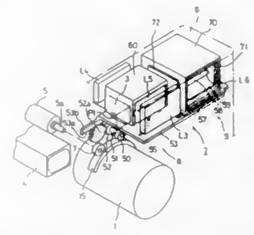
Masakatsu Hori, Tokyo, Japan, assignor to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 236,222, Aug. 25, 1988, abandoned. This application Jun. 21, 1989, Ser. No. 369,647

Claims priority, application Japan, Aug. 29, 1987, 62-214791

Int. Cl.[4] G03B *3/00, 15/03*

U.S. Cl. 354—419 **31 Claims**



1. A camera including a variable illuminating angle strobe said camera, comprising a zoom lens which has a group of variable power lenses varying the focal length; a light emitter which has a condenser lens, a light emitting tube and a reflecting shade and which is movable between a received position in which the light emitter is received in a camera body and a projected position in which the light emitter projects from the camera body; and an illuminating angle varying mechanism

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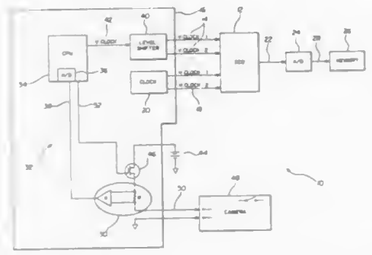
which varies the relative position of the condenser lens, the light emitting tube or the reflecting shade in accordance with the change of the focal length of the zoom lens to vary the illuminating angle, regardless of the position of the light emitter.

4,916,476

METHOD AND CIRCUIT FOR CONVERTING A CONVENTIONAL CAMERA INTO AN ELECTRO-OPTICAL CAMERA

James E. McGarvey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 14, 1989, Ser. No. 311,006
Int. Cl.[4] G03B *17/38, 17/56;* H04N *5/335*
U.S. Cl. 354—432 **6 Claims**



1. A circuit suitable for use with a conventional camera, comprising:
(1) an image-integrating device for producing an electro optical exposure, and having a first operating stage of reading/flushing out stored contents of the device; and a second operating stage of accumulating an image; and
(2) a sensing control circuit connectable in series to the image-integrating device;
the image integrating device and the sensing-control circuit being connectable to a source of electrical power and a camera power line to form an electrical system which can adopt at least one of two steady states in response to two modes of the camera, namely:
(i) a first state in which the sensing-control circuit senses, by way of first information on the camera power line, that the camera is in a light metering mode; the sensing-control circuit then initializing the first operating stage of the image-integrating device., and
(ii) a second state in which the sensing-control circuit senses, by way of second information o the camera power line, that the camera is in an exposure mode; the sensing-control circuit then initializing the second operating stage of the image integrating device.

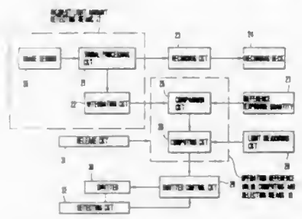
4,916,477

IMAGE SENSING APPARATUS

Nobuaki Date, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1989, Ser. No. 336,204
Claims priority, application Japan, Apr. 15, 1988, 63-092935
Int. Cl.[4] G03B *7/08;* H04N *3/14*
U.S. Cl. 354—436 **10 Claims**

1. An image sensing apparatus comprising:
(a) image sensing means;
(b) diaphragm means of a normally closed type for controlling light entering said image sensing means;
(c) a light measuring element, other than said image sensing means, for detecting a brightness of an object to be photographed to form first information;
(d) control means for performing a first exposure operation in which said diaphragm means is opened from a fully closed state to a predetermined size of aperture opening on the basis of the first information formed by said light measuring element and, after that, is fully closed again and a second exposure operation in which said diaphragm means is opened from the fully closed state to a predetermined size of aperture opening on the basis of second



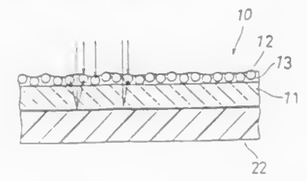
information formed in said image sensing means during said first exposure operation and, after that, is fully closed again; and
(e) recording means for recording an electrical signal formed in said image sensing means during said second exposure operation as still picture information.

4,916,478

METHOD FOR THE FORMATION OF IMAGES AND AN APPARATUS FOR THE SAME

Yoshiharu Tsujimoto, Yamatokohriyama; Kunio Ohashi, Nara; Yoshikazu Fujiwara, Shiki; Hiromu Sasaki, and Syoichi Nagata, both of Yamatokohriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 11, 1988, Ser. No. 217,258
Claims priority, application Japan, Jul. 10, 1987, 62-173707; Aug. 25, 1987, 62-210887; Aug. 25, 1987, 62-210891
Int. Cl.[4] G03B *27/32, 27/52*
U.S. Cl. 355—27 **16 Claims**



1. A sheet-exposure stand supporting a photosensitive sheet on its sheet-placement surface, said photosensitive sheet being composed of a light-permeable substrate that is coated with pressure-rupturable capsules that contain chromogenic materials and photosensitive materials that are hardened when illuminated with light, and said sheet-placement surface being coated with or made of a light-reflective substance.

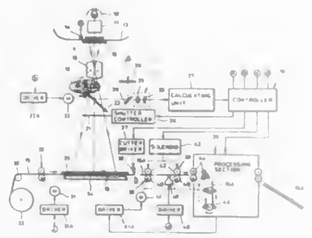
4,916,479

PHOTOGRAPHIC PRINTER-PROCESSOR

Yoichi Ujiie, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 27, 1989, Ser. No. 315,869
Claims priority, application Japan, Feb. 26, 1988, 63-43450
Int. Cl.[4] G03B *29/00*
U.S. Cl. 355—28 **7 Claims**

1. A printer-process having (1) a printing section for successively exposing a plurality of original images on correspondingly successive parts of a strip of photosensitive material which are successively placed in an exposure stage of the printing section and (2) a processing section for succesively developing the exposed parts of the photosensitive material, said printer-processor comprising:
first means capable to feed the strip intermittently at a first speed by a length corresponding to one image of the said original after each printing in order to place an unexposed part of the strip in the exposure stage and release an exposed part of the strip from the exposure stage at the same time;
cutting means operable to cut the strip in order to separate the exposed part from the unexposed part, thereby forming a sheet which includes the exposed part;



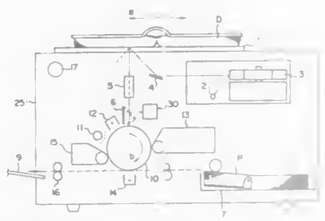
second means operable to feed the sheet into the processing section, after said cutting, at a second speed which is lower than said first speed, and said second means having a nipping state to nip the sheet and a releasing state to release the sheet;
releasing means operable to set second means in said releasing state at least while one of said first feeding means and said cutting means is operated; and
controller means for controlling said first feeding means not to operate until a predetermined period passes from a time when said cutting means last operated time, so that the strip does not overtake the sheet being fed into the processing section.

4,916,480

IMAGE FORMING APPARATUS WITH USE OF A LASER BEAM

Hirofumi Hasegawa; Naoto Ohmori; Yukio Yamada, and Narutaka Yoshida, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 29, 1989, Ser. No. 373,990
Claims priority, application Japan, Jun. 29, 1988, 63-162208; Jun. 29, 1988, 63-162215
Int. Cl.[4] G03B *27/72*
U.S. Cl. 355—71 **11 Claims**



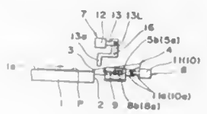
1. An image forming apparatus, comprising:
an original glass for supporting an original;
a rotatable photosensitive member;
laser beam radiating means for radiating a laser beam to said original glass, said laser beam radiating means including a radiant element and a scanning device;
control means for turning on and off said radiant element to radiate a laser beam in accordance with image data;
optical means for projecting an image reflected from an original onto said photosensitive member;
a sensor for receiving the laser beam reflected from the surface of an original so as to output image data; and
scanning means for relatively scanning the reflected image from the surface of an original in the direction perpendicular to the direction in which said scanning device spreads the laser beams on the original.

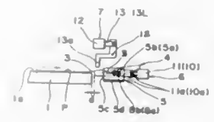
4,916,481

COPYING APPARATUS WITH ORIGINAL DOCUMENT POSITIONING AND GUIDING ARRANGEMENT

Soichi Iwao, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 17, 1988, Ser. No. 169,615
Claims priority, application Japan, Mar. 18, 1987, 62-63397
Int. Cl.[4] G03B *27/62;* G03G *21/00*
U.S. Cl. 355—75 **6 Claims**





1. A copying apparatus which comprises:
an original document platform having a document surface,
original document transport means,
an engaging/guiding member movable between a first position wherein a face thereof contacts one side edge of the original document platform and a second position for guiding an original document,
holding means for holding said engaging/guiding member so that said face is movable upward and downward, and backward and forward,
first driving means for displacing said engaging/guiding member backward and forward,
second driving means for displacing said engaging/guiding member upward and downward, and
control means for controlling said first and second driving means in such steps as to cause said engaging/guiding member to selectively engage and guide the original document whereby the engaging/guiding member is caused
first, to retract from the one side of the original document platform,
then to move back and forth between the first position wherein a portion of the face projects above the one side edge so as to engage the original document and the second position wherein all of the face is displaced below the document surface of the original document platform so as to allow the original document to pass over the engaging/guiding member, and
finally to advance until it contacts the one side edge.

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4,916,482
APPARATUS FOR COMPOSING A PLURALITY OF ORIGINAL FILMS ON A BASE SHEET

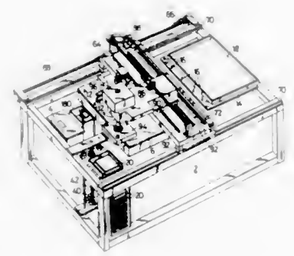
Fumihiko Nishida; Osami Taniuchi; Hideaki Yonetani, all of Kyoto; Toru Kawada, Otsu, and Tatsuo Yazaki, Kyoto, all of Japan, assignors to Ltd. Dainippon Screen Mfg. Co., Japan

Division of Ser. No. 20,334, Feb. 27, 1987, Pat. No. 4,821,078. This application Feb. 10, 1989, Ser. No. 309,828

Claims priority, application Japan, Feb. 28, 1986, 61-41971; Feb. 28, 1986, 61-41972; Mar. 6, 1986, 61-47283; Mar. 7, 1986, 61-31822; Mar. 7, 1986, 61-31823; Apr. 16, 1986, 61-86024; Apr. 23, 1986, 61-92347

Int. Cl.[4] G03B *27/62*

U.S. Cl. 355—75 8 Claims



1. An apparatus for composing a plurality of original films which have register marks on desired positions of a base sheet by positioning and adhering thereon respectively, comprising:
- a main frame;
- a positioning and composing table having a positioning pins at one edge thereof for positioning a base sheet;
- at least one film cassette for storing original films;
- a position detecting stage on which an original film is set prior to being composed at measuring positions of register marks provided therewith;
- an original film carrier for transporting one of said original films from said at least one film cassette onto said stage;
- a working head for transporting said original film from said stage to said positioning and composing table to adhere said original film to said base sheet by pressing it at a desired location;
- photoelectrical sensors provided with said working head for detecting register marks on said original film and measuring the position of said original film;
- position setting means for setting positional data for moving said sensors to positions at which the register marks of the original film of a first color stuck on said base sheet are read out;
- a sliding frame which moves on said main frame in one direction; and
- a saddle provided with said sliding frame so as to be slidable in a cross direction with said sliding frame and supporting said original film carrier and said working head;
- wherein said positioning and composing table positions said base sheet on which the original film of the first color is stuck or the base sheets on which the original films of subsequent colors are to be stuck and composed one by one; and
- said photoelectrical sensors detect the register marks of the original film stuck on the base sheet for the first color on the positioning and composing table and the register marks of the original film mounted on the position detecting stage.

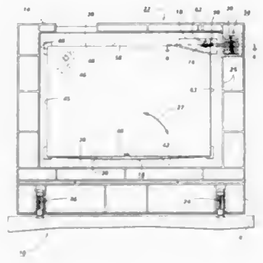
4,916,483
SMALL ANGLE DOCUMENT ROTATOR IN AN IMAGING DEVICE PLATEN COVER

David M. Thompson; Richard C. Hogestyn, both of Webster, and James O. Mitchel, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 1, 1988, Ser. No. 265,627

Int. Cl.[4] G03B *27/62*

U.S. Cl. 355—75 8 Claims



8. In an imaging device having a platen cover, which in a closed position covers a document supporting imaging platen, including a document rotator for rotating documents on the imaging platen with the platen cover in a closed position through a small angle of rotation, the document rotator including:
- a document engagement member rotatably supported on the platen cover, between the imaging platen and the platen cover when the platen cover is in a closed position;
- the document engagement member provided with a document contacting surface providing substantially non-slipping engagement of the document engagement member with documents placed on the platen when the platen cover is in a closed position, said document contacting surface sized to cover said platen and colored to minimize edge shown around; and
- adjustment means accessible from an externally accessible surface of the platen cover in the closed position, and coupled to the document engagement member, for rotating the document engagement member through a small angle increment, and by consequence, documents engaged thereto, with respect to the platen.

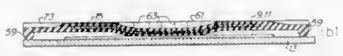
4,916,484
GRAPHIC MATERIAL REGISTRATION APPARATUS AND METHOD

Ernest Oblig, 2306 Holiday Rd., Newport Beach, Calif. 92660

Continuation-in-part of Ser. No. 131,377, Dec. 12, 1987, Pat. No. 4,812,883. This application Mar. 20, 1989, Ser. No. 325,984

Int. Cl.[4] G03B *27/20*

U.S. Cl. 355—91 14 Claims



1. A vacuum blanket assembly for use with a radiation transmissive platen disposed to secure a photographic sheet for exposure to radiation therethrough, the assembly comprising:
- a flexible, substantially gas-impervious membrane disposed on one side of the radiation transmissive platen to form a seal therewith substantially about a peripheral boundary thereof and to receive the photographic sheet within the peripheral boundary;
- a substantially homogeneous layer of soft pliable and resilient material interposed between the blanket and the photographic sheet; and
- a flexible layer of dimensionally stable material disposed beneath the homogeneous layer for maintaining the position of the photographic sheet relative to the radiation transmissive platen as vacuum pressure differential across the peripheral boundary increases.

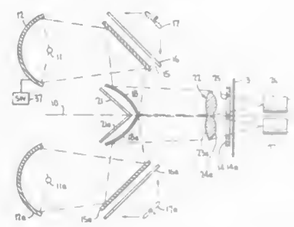
4,916,485
XENON OPTICAL SYSTEM FOR CINEMATOGRAPH PROJECTION

Stanislaw Loth, Nanuet, N.Y., and Anthony Petitto, Los Angeles, Calif., assignors to Parallex Company, Inc., Los Angeles, Calif.

Filed Jul. 18, 1989, Ser. No. 381,370

Int. Cl.[4] G03B *21/00, 21/20*

U.S. Cl. 352—198 14 Claims



1. An optical projection system for cinematograqph projection, comprising: a pair of lamphouses transversely spaced apart equal distances on opposite sides of a central axis of said system; said lamphouses each comprising a xenon light source and a curved reflecting means spaced from said light source for projecting a reflected circular light beam of each said source in a forward direction parallel to said axis; flat reflecting means spaced in said forward direction from each said source for reflecting each said beam perpendicularly toward said axis; spherical convex reflecting means for reflecting each said beam parallel to said central axis along a pair of optical axes; a condensor lens means spaced from each said spherical convex reflecting means along each of said optical axes for collecting the light beams into converging beams; each said lens means comprising a joined pair of plano-spherical and plano-cylindrical lenses for reshaping the circular light beams into horizontal ellipsoidal light beams; openings of an aperture plate spaced along said optical axes forwardly of said lens means for masking said ellipsoidal beams to form horizontal rectangular light images; and a pair of projection lens means repsectively spaced along said optical axes forwardly of said aperture plate.

4,916,486
COPYING AND PRINTING APPARATUS

Keiji Nakatani, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

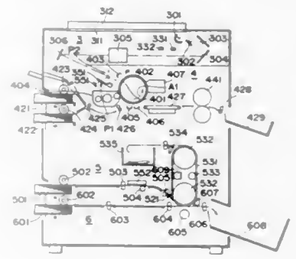
Filed Feb. 24, 1989, Ser. No. 316,464

Claims priority, application Japan, Feb. 25, 1988, 63-42952; Feb. 25, 1988, 63-42953; Feb. 25, 1988, 63-42954; Feb. 25, 1988, 63-42955; Feb. 25, 1988, 63-42956

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—202 15 Claims

1. A copying and printing apparatus comprising:
- a table for supporting a document thereon;
- a copying system for producing a copy of the document supported on said table in an electrophotographic process;
- an image reading system for reading an image of the document supported on said table so as to generate image data according to the read image;
- a master forming system for forming a printing master according to the image data generated by said image reading system; and



- a printing system for printing using the printing master formed by said master forming system.

4,916,487
IMAGE FORMING APPARATUS

Hirokazu Yamada, Azuchi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 15, 1988, Ser. No. 219,999

Claims priority, application Japan, Jul. 15, 1987, 62-176553; Jul. 15, 1987, 62-176554; Jul. 15, 1987, 62-176555; Jul. 15, 1987, 62-176556; Jul. 15, 1987, 62-176557; Jul. 15, 1987, 62-176558; May 13, 1988, 63-117196

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—208 33 Claims

1. An image forming apparatus comprising:
- image forming means for forming an image;
- operable input means which is rotatable and is connected with a rotary encoder outputting a pulse signal in response to rotation of said operable input means;
- condition setting means for setting conditions for an image formation of said image, which is carried out by said image forming means in response to said pulse signal outputted from said rotary encoder; and
- control means for controlling said image forming means depending on said image forming conditions set by said condition setting means.

4,916,488
AUTO-TONER SENSOR

Masashi Kimura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 21, 1988, Ser. No. 288,074

Claims priority, application Japan, Dec. 29, 1987, 62-335037

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—208 8 Claims

1. An auto-toner sensor, comprising:
- sensor means for detecting a toner density, and producing a sensor output signal indicating the detected toner density, the sensitivity of the sensor means being adjustable by a

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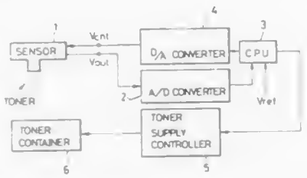
control signal supplied to the sensor means in an initial adjustment;

means for comparing a value of the sensor output signal with a prescribed reference value indicating an appropriate level of toner density, to produce a comparison signal indicating a result of the comparison; and



means for producing a control signal applied to the sensor means, which adjusts the sensitivity of the detection of the toner density in the initial adjustment in accordance with the comparison signal, the control signal having a value such that the value of the sensor output signal is substantially equal to that of the reference value when the toner density is at the appropriate level.

4,916,489

IMAGE FORMING APPARATUS

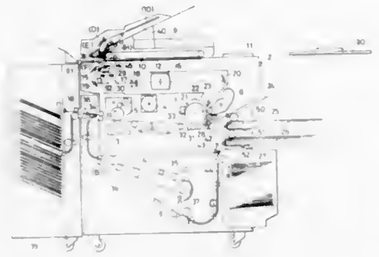
Hiroaki Takeda; Hideki Adachi, both of Kawasaki; Tadashi Suzuki, Yokohama; Naoyuki Ohki, Tokyo, and Masahiro Tomosada, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 233,907, Aug. 17, 1988, abandoned, which is a continuation of Ser. No. 893,358, Aug. 5, 1986, abandoned. This application Mar. 2, 1989, Ser. No. 319,866

Claims priority, application Japan, Aug. 9, 1985, 60-175475; Aug. 9, 1985, 60-175476; Aug. 9, 1985, 60-175477; Aug. 9, 1985, 60-175478; Aug. 9, 1985, 60-175479

Int. Cl.[4] G03G *15/00, 15/01*

U.S. Cl. 355—210 **25 Claims**



1. An image forming apparatus comprising:

image forming means for forming an image on a recording member;

erasure means provided with plural light-emitting elements for erasing unnecessary electric charges on said recording member said erasure means comprising a first light-emitting section in which light-emitting elements are arranged with a first pitch and a second light-emitting section in which light-emitting elements are arranged with a larger second pitch; and

drive means for selectively driving the plural light-emitting elements of said first light-emitting section in accordance with a predetermined image to obtain a composite image of the image formed by said image forming means and said predetermined image.

4,916,490

IMAGE FORMING APPARATUS COMPRISING A PLURALITY OF DEVELOPING DEVICES

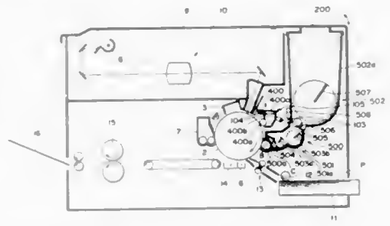
Hidetoshi Tanaka, and Yoshikuni Tohyama, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 802,537, Nov. 27, 1985, abandoned. This application Jan. 9, 1989, Ser. No. 294,641

Claims priority, application Japan, Dec. 1, 1984, 59-254723; Dec. 8, 1984, 59-259814; Mar. 4, 1985, 60-042390

Int. Cl.[4] G03G *15/08*

U.S. Cl. 355—245 **22 Claims**



1. An image forming apparatus, comprising:

a movable image bearing member;

means for forming a latent image on said image bearing member;

first developing means for developing the latent image formed by said latent image forming means, said first developing means having a capacity for accomodating a first amount of a first developer and being detachably mountable in said image forming apparatus; and

second developing means for developing the latent image, said second developing means having a capacity for accomodating a second amount of a second developer different from said first developer, said second developing means being intended for more frequent use than said first developing means and being fixed in said image forming apparatus, and the second amount being larger than the first amount.

4,916,491

CONTROL DEVICE FOR A COPIER

Eiichi Katoh, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 27, 1988, Ser. No. 263,511

Claims priority, application Japan, Oct. 27, 1987, 62-269179; Aug. 29, 1988, 63-212347

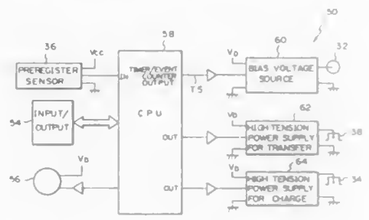
Int. Cl.[4] G03G *21/00, 15/02, 15/06*

U.S. Cl. 355—246 **5 Claims**

1. A control device for an image recording apparatus having a photoconductive element on which an image to be transferred to a paper is provided, charger means for charging said photoconductive element, and a bias voltage source for outputting a variable bias voltage for development, said control device comprising:

sensor means in sensing a first surface portion of said photoconductive element which is associated with a trailing edge portion of the paper when the image is transferred to the paper; and

control means for controlling said charge means and said bias voltage source such that said charger means stops charging the first surface portion of said photoconductive element which is associated with the trailing edge portion of the paper and the bias voltage applied by said bias voltage source to a second surface portion of said photoconductive drum which follows the first surface portion is increased.



4,916,492

DEVELOPER METHOD AND APPARATUS

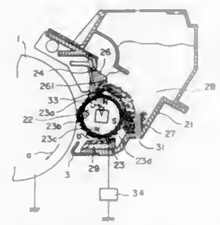
Norihisa Hoshika, Kawasaki; Hatsuo Tajima, Matsudo; Masaaki Yamaji; Atsushi Hosoi, both of Tokyo, and Hiroshi Tajika, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 15,929, Feb. 18, 1987, abandoned. This application Oct. 17, 1988, Ser. No. 258,059

Claims priority, application Japan, Feb. 20, 1986, 61-35458; Jun. 24, 1986, 61-147425; Jun. 24, 1986, 61-147428

Int. Cl.[4] G03G *15/09, 13/09*

U.S. Cl. 355—253 **30 Claims**



14. A developing apparatus for developing a latent image, comprising:

a developer container for containing a developer of a mixture of magnetic carrier particles and toner particles, said container including a regulating member for providing a regulated thickness of a developer layer;

a rotatable developer carrying member of non-magnetic material for carrying the developer layer of toner particles and magnetic particles supplied by said developer container;

a magnet stationarily disposed inside said developer carrying member, said magnet being provided with first and second magnetic poles having different magnetic polarities for forming a magnetic field extending substantially parallel with a surface of the developer carrying member in a developer supplying opening;

a limiting member projected into said container, said limiting member having a surface for substantially stopping the developer moving by rotation of the developer carrying member;

a projection member projecting into said container at a position upstream of said limiting member with respect to the movement direction of said developer carrying member, said projection member and said limiting member forming an angle $\theta 1$ seen from a center of said developer carrying member; and wherein positions where maximum magnetic flux densities of the first and second magnetic poles are formed are outside the angle $\theta 1$, and a substantially stationary layer containing magnetic particles extending from said regulating member is formed along the developer carrying member by the first and second magnetic poles and said limiting member to form in the container a variable toner taking area through which an amount of the toner is substantially taken into the developer layer carried on the developer carrying member upstream of the stationary layer with respect to peripheral movement of the developer carrying member, and wherein the size of the substantially stationary layer changes in accordance with the toner content of the developer carried on the developer carrying member to control the toner taking area.

4,916,493

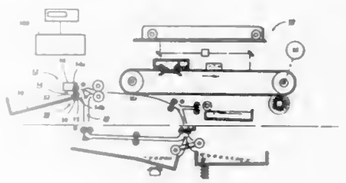
EXIT ROLLER REVERSAL GATE FOR DUPLEX PRINTING

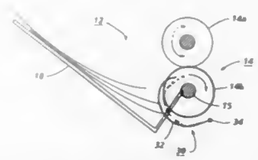
Gerald M. DeVito, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 24, 1989, Ser. No. 398,117

Int. Cl.[4] G03G *21/00, 15/00;* **B65H** *29/66*

U.S. Cl. 355—321 **5 Claims**





1. In a reproduction apparatus with means for outputting copy sheets via exit rollers and stacking the outputted copy sheets adjacent said exit rollers in a stacking tray, and which exit rollers are reversible in their direction of rotation to feed selected copy sheets imaged on one side back into said reproduction apparatus in a return path to be reimaged, the improvement comprising;

actuatable gate means for preventing previously outputted and stacking copy sheets from being recaptured by said reversed rotation exit rollers by interposing guide or baffle means between the stacking copy sheets ins aid stacking tray and said exit rollers to prevent accidental re-acquisition of copy sheets by the reversed rollers,

said actuable gate means including means for automatically interposing said guide or baffle means between the stacking copy sheets and said exit rollers in response to said reversal in direction of rotation of said exit rollers.

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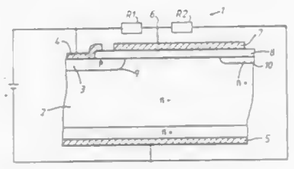
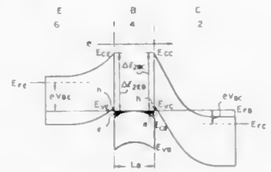
4,916,494
MONOLITHIC INTEGRATED PLANAR SEMICONDUCTOR SYSTEM AND PROCESS FOR MAKING THE SAME
Peter Flohrs, and Hartmut Michel, both of Reutlingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Continuation of Ser. No. 783,221, Sep. 17, 1985, abandoned. This application Oct. 6, 1987, Ser. No. 107,855
Int. Cl.[4] H01L *29/90*
U.S. Cl. 357—13 8 Claims



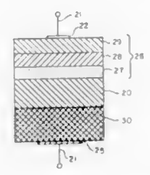
1. A monolithic integrated planar semiconductor device comprising at least one PN-junction including a substrate having a defined type of conductivity and a zone of a type of conductivity which is contrary to that of said substrate and is diffused into said substrate, said substrate having a passivation layer being situated on the surface from which said zone of said type of contrary conductivity is diffused into the substrate and covering space charge zones generated in said substrate when said PN-junction is biased in blocking direction, said PN-junction having a temperature-dependent breakdown voltage (U_{BT}), a cover electrode which is mounted over said passivation layer; a voltage divider including a first integrated resistor and a second integrated resistor, said voltage divider being connected in parallel to said PN-junction and a tap of which being connected with said cover electrode to bias the same with a divider voltage for adjusting said breakdown voltage; said first and second integrated resistors (R1, R2) having different temperature coefficients adjusted with respect to the temperature dependency of said breakdown voltage such that the resulting temperature-dependent divider voltage applied to said cover electrode (7) neutralizes said temperature dependency and makes the breakdown voltage (U_{BT}) of the PN-junction (9) substantially independent of temperature.

4,916,495
SEMICONDUCTOR DEVICE WITH SEMI-METAL
Yuji Awano, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Dec. 23, 1988, Ser. No. 289,031
Claims priority, application Japan, Dec. 26, 1987, 62-328285
Int. Cl.[4] H01L *29/161*
U.S. Cl. 357—16 22 Claims



1. A semiconductor device comprising:
a first semiconductor layer;
a second semiconductor layer;
a third semiconductor layer sandwiched between said first and second semiconductor layers;
a first electrode ohmically contacting said first semiconductor layer;
a second electrode ohmically contacting said second semiconductor layer; and
a third electrode ohmically contacting at least said third semiconductor layer;
said first and second semiconductor layers having substantially the same conduction bands and substantially the same valence bands when a bias voltage is not applied thereto;
at the interface between said first and third semiconductor layers and between said second and third semiconductor layers, the energy level of the conduction band edge of said third semiconductor layer being lower than the energy level of the valence band edge of one of said first and second semiconductor layers,
said third semiconductor layer having a thickness such that at least at the interface between said first and third semiconductor layers and between said second and third semiconductor layers, a semi-metal layer is formed.

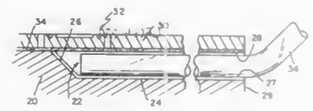
4,916,496
ZNS BLUE LIGHT EMITTING DEVICE
Yoshitaka Tomomura; Satoshi Yamaue, both of Nara; Masahiko Kitagawa, Tenri, and Shigeo Nakajima, Nara, all of Japan, assignors to Sharp Corporation, Osaka, Japan
Continuation of Ser. No. 2,802, Jan. 13, 1987, abandoned. This application Oct. 6, 1988, Ser. No. 256,125
Claims priority, application Japan, Jan. 27, 1986, 61-16408
Int. Cl.[4] H01L *33/00, 29/22*
U.S. Cl. 357—17 7 Claims



1. A ZnS blue light emitting device of metal-insulator-semiconductor structure comprising
a low-resistivity ZnS layer serving as a luminescent layer,
a high-resistivity insulating layer being formed on said low-resistivity ZnS layer and including two or more stacked layers of different insulating materials, said stacked layers including a first insulating layer adjacent said low-resistivity ZnS layer, said first insulating layer comprising a ZnO layer of thickness 50–200 Å, and
an electrode formed on said high-resistivity insulating layer, said high-resistivity insulating layer serving as an injection layer.

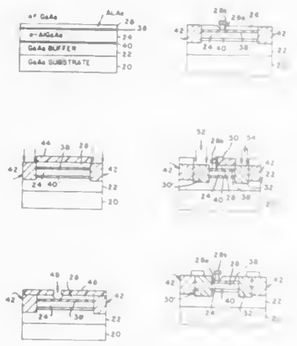
4,916,497
INTEGRATED CIRCUITS INCLUDING PHOTO-OPTICAL DEVICES AND PRESSURE TRANSDUCERS AND METHOD OF FABRICATION
Stephen J. Gaul, Melbourne, and Craig J. McLachlan, Melbourne Beach, both of Fla., assignors to Harris Corporation, Melbourne, Fla.
Filed May 18, 1988, Ser. No. 195,273
Int. Cl.[4] H01L *31/12, 31/16*
U.S. Cl. 357—19 6 Claims
1. An integrated circuit comprising:
a first substrate including a moat, said moat having a bottom wall and at least one slanting side wall with a reflective surface;
a second substrate bonded to said first substrate and extending across said moat;

a fiber optic element in said moat axially extending along said bottom wall and terminating adjacent said slanted side wall; and



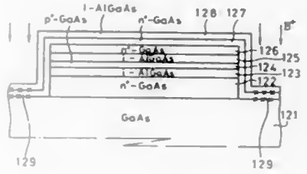
a photoelectric means, in said second substrate and in optical communication with said fiber optic element via said side wall, for interfacing optical signals at said fiber optic element and electrical signals to circuits in said second substrate.

4,916,498
HIGH ELECTRON MOBILITY POWER TRANSISTOR
John J. Berenz, Lawndale, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Continuation of Ser. No. 854,253, Apr. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 774,499, Sep. 10, 1985, abandoned. This application Aug. 29, 1988, Ser. No. 239,023
Int. Cl.[4] H01L *29/80*
U.S. Cl. 357—22 11 Claims



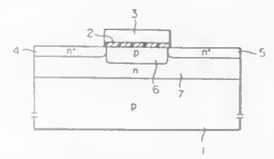
1. A high electron mobility transistor, comprising:
a layer of undoped gallium arsenide;
an overlying layer of aluminum gallium arsenide, forming a beterojunction with the layer of undoped gallium arsenide;
an electrical barrier layer directly overlying the layer of aluminum gallium arsenide, the electrical barrier layer having a wider energy band-gap than the layer of aluminum gallium arsenide;
a cap layer overlying the electrical barrier layer;
a gate electrode formed in an opening in the cap layer; and
source and drain contact means containing the aluminum gallium arsenide layer on opposite sides of the gate electrode;
wherein the wider energy band-gap of the electrical barrier layer provides a barrier to leakage electron paths through the cap layer, thereby increasing the gate-drain breakdown voltage and the maximum power output of the transistor;
and wherein the source contact means is disposed close to the gate electrode to minimize source resistance, and the drain contact means is more widely spaced from the gate electrode.

4,916,499
JUNCTION FIELD EFFECT TRANSISTOR WITH VERTICAL GATE REGION
Hiroji Kawai, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Continuation of Ser. No. 111,027, Oct. 21, 1987, abandoned. This application Sep. 6, 1989, Ser. No. 405,082
Claims priority, application Japan, Oct. 23, 1986, 61-252378; Feb. 18, 1987, 62-35386
Int. Cl.[4] H01L *29/80*
U.S. Cl. 357—22 2 Claims



1. A junction field effect transistor comprising;
a source region comprising a semiconductor layer, a gate region comprising a semiconductor layer, and a drain region comprising a semiconductor layer, said source, gate and drain regions formed in overlapping parallel layers with said gate region between said source and drain regions, to make up a laminated structure, said laminated structure having a side surface transverse to said layers, and
a channel region formed by said side surface across said laminated atructure, said channel region juxtaposed with the edge of said gate region.

4,916,500
MOS FIELD EFFECT TRANSISTOR DEVICE WITH BURIED CHANNEL
Yoshiaki Yazawa, Hitachi; Atsuo Watanabe, Hitachiota; Atsushi Hiraishi, Hitachi; Masataka Minami, Hitachi, and Takahiro Nagano, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 29, 1987, Ser. No. 78,987
Claims priority, application Japan, Jul. 31, 1986, 61-178889
Int. Cl.[4] H01L *29/78, 29/90*
U.S. Cl. 357—23.3 10 Claims



1. A MOS field-effect transistor comprising:
a semiconductor substrate of a first conductivity type or an insulator;
a source, having an upper main surface, comprising an impurity layer of a second conductivity type disposed on said semiconductor substrate or said insulator;
a drain, having an upper main surface, comprising an impurity layer of the second conductivity type disposed on said semiconductor substrate or said insulator;
a first impurity layer of the first conductivity type formed between said source and said drain, said first impurity layer having an upper main surface;
an insulated gate formed on said upper main surface of said

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first impurity layer of the first conductivity type via an insulation film; and

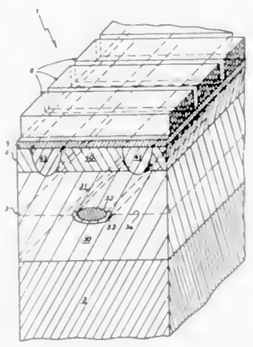
a second impurity layer of the second conductivity type having an impurity concentration lower than that of said source and said drain, said second impurity layer of the second conductivity type being disposed between said source, said drain and said first impurity layer of the first conductivity type, and said semiconductor substrate of the first conductivity type or said insulator, wherein said first impurity layer of the first conductivity type has a depth, extending from said upper main surface thereof toward said second impurity layer, which is greater than the depth of said source and drain.

4,916,501

CCD FRAME TRANSFER PHOTOSENSITIVE MATRIX WITH VERTICAL ANTI-BLOOMING SYSTEM

Yves Thenoz, and Francois Roy, both of Grenoble, France, assignors to Thomson-CSF, Puteaux, France

Filed Jun. 19, 1989, Ser. No. 368,253
Claims priority, application France, Jun. 24, 1988, 88 08520
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—24 7 Claims



1. A CCD frame transfer photosensitive matrix provided with vertical type anti-blooming means with, on a first type of semiconductor substrate, a second type of channel layer separated by narrow insulating zones into a plurality of columns, and surmounted, with the interposition of a thin layer of insulating oxide, by a network of transfer grids, extending perpendicularly to the insulating zones and dividing the columns into a large number of pixels, wherein the anti-blooming means are diodes buried in a base layer, in between the substrate and the channel layer, of the first type and less doped than the substrate, said diodes being placed in columns parallel to the insulation zones and having a narrow drain of the second type which is strongly doped.

4,916,502

SEMICONDUCTOR DEVICE TO BE COUPLED WITH A CONTROL CIRCUIT BY A PHOTOCOUPLER

Seiichi Oshima, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 152,494, Feb. 5, 1988, abandoned. This application Sep. 13, 1989, Ser. No. 406,179
Claims priority, application Japan, Feb. 25, 1987, 62-43427
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 7 Claims

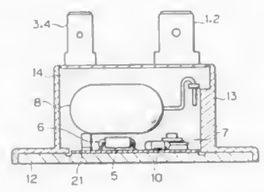
1. A semiconductor device having a operating in response to a signal supplied through a photocoupler, said semiconductor device comprising:

(a) a heat radiation metal plate for diffusing heat generated in said semiconductor device;

(b) a multilayer member provided on said heat radiation metal plate, said multilayer member having:

(b-1) an insulating substrate,

(b-2) a shielding metal layer provided on said insulating substrate for shielding said semiconductor device against external noise, and



(b-3) an insulation layer provided on said shielding metal layer; and

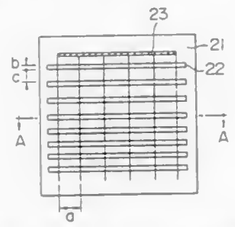
(c) an electronic circuit provided on said multilayer member and having a photocoupler and a thyristor operating in response to a signal supplied through said photocoupler, said shielding metal layer being connected to a main electrode of said thyristor.

4,916,503

PHOTO-ELECTRIC CONVERTING DEVICE

Tsuyoshi Uematsu, Koganei; Tadashi Saitoh, Tokyo, and Yasuhiro Kida, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 8, 1988, Ser. No. 216,537
Claims priority, application Japan, Jul. 8, 1987, 62-168645
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 36 Claims



1. A photo-electric converting device comprising:

a plurality of separate, spaced apart, elongated first semiconductor regions having a first conductivity type;

a second semiconductor region having a second conductivity type, wherein the first semiconductor regions have direct contact with the second semiconductor region so as to form a plurality of pn junctions;

a pair of electrodes, one of said electrodes has a plurality of spaced apart branch electrodes, and the branch electrodes intersect at right angles to the elongation of and at the intersections to the first semiconductor regions; and

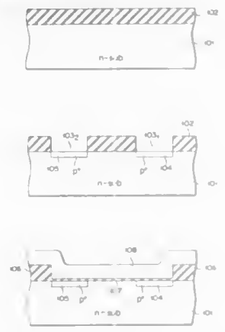
each of the first semiconductor regions has a shape longer in the direction perpendicular to the connected branch electrodes than in the direction in parallel thereto.

4,916,504

THREE-DIMENSIONAL CMOS INVERTER

Moriya Nakahara, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 662,085, Oct. 18, 1984, abandoned. This application Sep. 15, 1986, Ser. No. 907,163
Claims priority, application Japan, Oct. 24, 1983, 58-198688
Int. Cl.[4] H01L *27/12, 29/78, 27/02, 29/04*
U.S. Cl. 357—42 1 Claim



1. A three-dimensional CMOS inverter, comprising:

a semiconductor substrate of a first conductivity type; source and drain regions of a second conductivity type formed in said substrate and electrically isolated from each other, thereby defining a channel region between them;

a first gate oxide film formed on that surface portion of said substrate in which at least said channel region is formed;

a first gate electrode comprising an impurity-doped polysilicon and formed on said first gate oxide film;

a second gate oxide film formed on said first gate electrode;

an active layer of recrystallized polysilicon formed on said gate oxide film and comprising source and drain regions of the first conductivity type and channel region of the second conductivity type sandwiched between the source and drain regions, wherein lengthwise axis of said channel region between said source and drain regions of the second conductivity type extends at right angles to that of the channel region sandwiched between said source and drain regions of the first conductivity type;

a third gate oxide film formed on that surface portion of said active layer in which at least the channel region is formed; and

a second gate electrode formed on said third gate oxide film and connected to said first gate electrode.

4,916,505

COMPOSITE UNIPOLAR-BIPOLAR SEMICONDUCTOR DEVICES

James W. Holm-Kennedy, Lale, Hi., assignor to University of Hawaii, Honolulu, Hi.

Continuation of Ser. No. 231,023, Feb. 3, 1981, abandoned. This application Feb. 7, 1985, Ser. No. 699,375
Int. Cl.[4] H01L *27/02, 27/14*
U.S. Cl. 357—43 3 Claims

1. An electrical device, comprising:

a semiconductor junction structure including a first semiconductor body portion and a second semiconductor body portion and a semiconductor junction between said body portions;

first contact means for making external circuit connections to a first part of said first semiconductor body portion remote from said semiconductor junction;

second contact means for making external circuit connections to a second part of said first semiconductor body portion which surrounds and is spaced from said first part;

a channel region extending between said first and second parts of said first semiconductor body portion;

gate means confronting substantially all of said channel region, without completely covering both semiconductor body portions, for controlling the flow of current therethrough; and

third contact means for making external circuit connections to said second body portion,

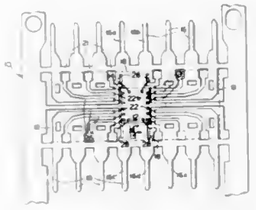
further comprising circuit means connected to said contact means whereby said channel region serves as the collector of a bipolar junction transistor arrangement comprising said first and second body portions.

4,916,506

INTEGRATED-CIRCUIT LEAD-FRAME PACKAGE WITH LOW-RESISTANCE GROUND-LEAD AND HEAT-SINK MEANS

Jay J. Gagnon, Holden, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Nov. 18, 1988, Ser. No. 284,003
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—70 9 Claims



1. An integrated-circuit package comprising:

a semiconductor integrated-circuit die having two major faces, said die having at least two electrical circuit ground terminals on the top one of said faces;

a sheet-metal lead frame including (a) a die-attach pad; (b) a plurality of leads extending away from said die-attach pad, the bottom of said die faces being bonded to said die-attach pad to provide a physical and thermal connection between said die and said pad, at least two adjacent of said leads being contiguous with and extending directly from said die-attach pad in the same direction to provide a low thermal and a low electrical resistance path between said pad and the distal ends of said extending leads and (c) at least two dog-leg fingers each having a first portion extending from said pad, and having a second portion at about right angles to said first portion;

at least two metal wires forming a direct electrical connection respectively between each of said dog-leg fingers and said at least two electrical terminals respectively on said top die face; and

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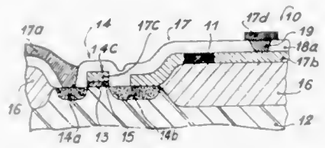
a solid resin body encapsulating said die, said pad, the proximal ends of said leads and said wires, so that said at least two adjacent leads are enabled to function as heat-sink ground tabs conducting heat and current from said die to the outside of said body.

4,916,507

POLYSILICON RESISTOR IMPLANTED WITH RARE GAS

Alain Boudou, Vert, and Jean-Claude Marchetaux, Paris, both of France, assignors to Bull S.A., Paris, France

Filed Oct. 7, 1983, Ser. No. 540,142
Claims priority, application France, Oct. 7, 1982, 82 16803
Int. Cl.[4] H01L *21/265, 23/68*
U.S. Cl. 357—51 18 Claims



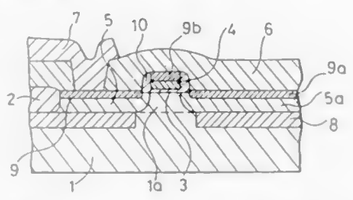
12. A resistor in an integrated circuit comprising a polycrystalline semiconductor material heavily doped with ions that are electrically active with respect to said material, and an intermediate resistor area in said heavily doped material, the resistor area having implanted ions that are electrically inactive with respect to said material and of the family of rare gases.

4,916,508

CMOS TYPE INTEGRATED CIRCUIT AND A METHOD OF PRODUCING SAME

Katsuhiro Tsukamoto; Tatsuhiko Ikeda, and Tatsuo Okamoto, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 7, 1987, Ser. No. 1,027
Claims priority, application Japan, Jan. 10, 1986, 61-3796
Int. Cl.[4] H01L *21/469, 21/401*
U.S. Cl. 357—59 4 Claims



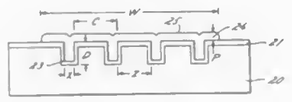
1. A MOS type integrated circuit, comprising:
an embedded insulator film formed on a semiconductor substrate to expose a portion of surface of said semiconductor substrate,
a first conductivity type monocrystalline silicon layer produced on said portion of said semiconductor substrate, to constitute a channel region of a MOS transistor;
polycrystalline silicon layers formed on said embedded insulator film adjacent said monocrystalline silicon layer at each side thereof;
second conductivity type source and drain regions of said MOS transistor formed in said polycrystalline silicon layers;
a gate electrode of said MOS transistor formed on said monocrystalline channel region via a gate insulator; and
high melting point metal silicide layers formed on said source/drain regions, respectively.

4,916,509

METHOD FOR OBTAINING LOW INTERCONNECT RESISTANCE ON A GROOVED SURFACE AND THE RESULTING STRUCTURE

Richard A. Blanchard, Los Altos, and Adrian I. Cogan, San Jose, both of Calif., assignors to Siliconix Incorporated, Santa Clara, Calif.

Continuation of Ser. No. 120,469, Nov. 13, 1987, abandoned.
This application Apr. 7, 1989, Ser. No. 336,619
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—65 12 Claims



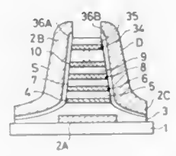
1. A structure comprising:
a substrate;
a first location on the surface of said substrate;
a second location on the surface of said substrate which is to be electrically interconnected via a DC path to said first location;
one or more grooves formed in said substrate, said one or more grooves extending laterally from said first location to said second location; and
a conductive layer formed in said one or more grooves, thereby forming an electrically conductive DC path between said first and second location.

4,916,510

THIN FILM MESA TRANSISTOR OF FIELD EFFECT TYPE WITH SUPERLATTICE

Masafumi Sano, Kawasaki; Katsuji Takasu, Asaka; Hisanori Tsuda, Atsugi, and Yutaka Hirai, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 874,132, Jun. 13, 1986, abandoned.
This application Mar. 11, 1988, Ser. No. 170,101
Claims priority, application Japan, Jun. 20, 1985, 60-133004
Int. Cl.[4] H01L *27/12*
U.S. Cl. 357—4 5 Claims



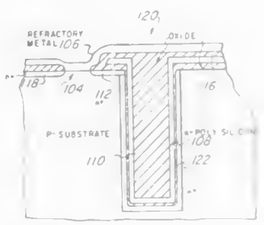
1. A thin film mesa type field effect transistor comprising:
a substrate,
a gate electrode formed on said substrate;
an insulating thin film layer formed on said gate electrode subsequent to formation of the gate electrode on said substrate;
a multilayer structure formed on said insulating thin film layer subsequent to formation of said insulating thin film layer by alternately laminating a number of first solid layers each comprising a non-monocrystalline semiconductor material and a number of second solid layers each comprising non-monocrystalline material,
wherein a difference of an optical energy band gap between said first and second solid layers is set to be greater than 0.4 eV, and a thickness of a single layer of each of said first and second layers has a value such that a quantum effect is obtained; and
a drain electrode and a source electrode, said multilayer structure being sandwiched by said drain electrode and said source electrode.

4,916,511

TRENCH STRUCTURE AND PROCESS

Monte A. Douglas, Coppell, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 10,374, Feb. 3, 1987, abandoned, which is a division of Ser. No. 811,391, Mar. 19, 1986, Pat. No. 4,690,729, which is a continuation-in-part of Ser. No. 730,701, May 3, 1985, Pat. No. 4,702,795. This application Jan. 6, 1989, Ser. No. 296,397
Int. Cl.[4] H01L *29/78, 29/06, 27/04*
U.S. Cl. 357—23.6 51 Claims



1. An integrated circuit incorporating trench capacitors, comprising:
a plurality of capacitors to substrate, each said capacitor comprising an insulated storage plate within a trench;
a plurality of active devices connected in a predetermined circuit configuration including at least some of said trench capacitors to substrate;
wherein said trenches have straight sidewalls without bowing or undercut at a positive sidewall angle in the range of 80 to 89 degrees, and wherein the bottom of said trench does not include any cusping.

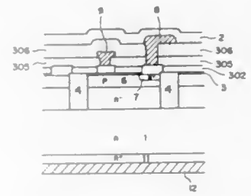
4,916,512

PHOTOELECTRIC CONVERTER

Tadahiro Ohmi, Sendai, and Nobuyoshi Tanaka, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 1,580, Jan. 8, 1987, which is a division of Ser. No. 625,130, Jun. 27, 1984, Pat. No. 4,686,554. This application Sep. 28, 1988, Ser. No. 250,246
Claims priority, application Japan, Jul. 2, 1983, 58-120751; Jul. 2, 1983, 58-120752; Jul. 2, 1983, 58-120753; Jul. 2, 1983, 58-120754; Jul. 2, 1983, 58-120755; Jul. 2, 1983, 58-120756; Jul. 2, 1983, 58-120757
Int. Cl.[4] H01L *27/14, 31/00*
U.S. Cl. 357—30 69 Claims

1. A photoelectric converter for outputting an output signal representative of light energy received, thereby, said photoelectric converter comprising:
a light sensitive transistor comprising a control electrode region and first and second main electrode regions, said second main electrode region being connected to a voltage source and a junction being formed between said control electrode region and said first main electrode region, said control electrode region being for accumulating carriers in response to the light energy received while in a floating state;
an output circuit comprising a capacitive element, said output circuit being connected to said first main electrode region and producing the output signal as a voltage across said capacitive element; and
read-out means for reading a signal representative of the accumulated carriers to said output circuit, wherein during the reading by said read-out means, said control electrode is coupled to a potential source to forward bias the junction, and wherein said control electrode region is coupled to the potential source independently from said second main electrode region.

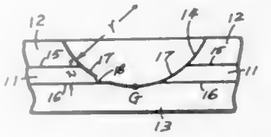


4,916,513

DIELECTRICALLY ISOLATED INTEGRATED CIRCUIT STRUCTURE

Chou H. Li, 379 Elm Dr., Roslyn, N.Y. 11576

Continuation-in-part of Ser. No. 154,300, Jun. 18, 1971, which is a continuation-in-part of Ser. No. 761,646, Sep. 23, 1968, Pat. No. 3,686,714, which is a continuation-in-part of Ser. No. 490,955, Sep. 28, 1965, Pat. No. 3,430,109. This application Oct. 3, 1977, Ser. No. 838,758
Int. Cl.[4] H01L *27/04*
U.S. Cl. 357—50 4 Claims



1. A semiconductor material structure comprising:
a semiconductor material substrate of one conductivity type having an upwardly facing and laterally extending major surface;
a semiconductor material layer of opposite conductivity type disposed on said major surface of the substrate and extending therealong;
an isolating PN junction extending laterally along said structure and forming an isolation barrier between regions of said substrate and layer; and
closed annular grooves of an electrically isolating matter which extend downwardly into the structure from the top surface of said layer, intersect the PN junction and divide a top portion of the structure into a plurality of islands which are laterally spaced from each other by the width of the grooves and are electrically isolated from each other by said grooves and said PN junction, each groove having a bottom which is within one micron of the PN junction;
wherein the distance by which each groove extends downwardly into the structure varies along at least a major portion of the width of the groove; and
wherein the interface between the groove and the semiconductor material is a surface having a curvature in a vertical plane at the intersection thereof with the PN junction to thereby form a differentially expanded PN junction surface.

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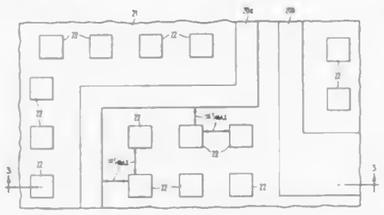
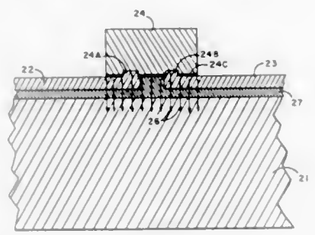
4,916,514
INTEGRATED CIRCUIT EMPLOYING DUMMY CONDUCTORS FOR PLANARITY
Matthew M. Nowak, San Diego, Calif., assignor to Unisys Corporation, Blue Bell, Pa.
Filed May 31, 1988, Ser. No. 200,410
Int. Cl.[4] H01L *23/48, 29/44, 29/52, 29/60*
U.S. Cl. 357—68 14 Claims



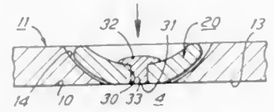
1. An integrated circuit having improved planarity; said integrated circuit being of a type which includes a substrate, a plurality of transistors integrated into one surface of said substrate, and a plurality of insulating layers over said transistors which are interleaved with respective sets of signal conductors; said signal conductors being spaced apart on said insulating layers and routed through holes in said insulating layers to said transistors for carrying signals to and from said transistors, wherein,
said integrated circuit further includes dummy conductors on at least one of the insulating layers in the spaces between said signal conductors;
said dummy conductors being of the same thickness and material as the signal conductors which they lie between and being open circuited; and,
said dummy conductors being spaced apart from each other and from said signal conductors by no more than a certain maximum distance at which the adjacent overlying insulating layer becomes substantially planar.

4,916,515
MICROWAVE CIRCUIT INTEGRATING
Clifford A. Levi, 20 Sylvan Rd., Woburn, Mass. 01801
Filed Jun. 3, 1985, Ser. No. 740,755
Int. Cl.[4] H01L *23/48, 29/44, 29/60*
U.S. Cl. 357—68 5 Claims



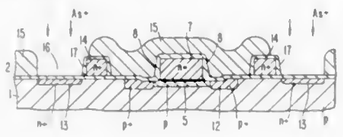
1. A microwave integrated circuit comprising,
an insulating substrate,
a semiconductor chip having at least a rectifying junction formed therein in contact with a first lead comprising a transmission line,
said first lead being bonded to the surface of said substrate substantially parallel thereto and separated therefrom by an adhesive layer of thickness less than that of said first lead for establishing a heat flow between said junction through said first lead to said substrate essentially normal to the plane of said substrate through said first lead and said adhesive layer.
said adhesive layer being an electrically insulating layer of good thermal conductivity.

4,916,516
SEMICONDUCTOR CONTACT ARRANGEMENT
Clifford V. H. Miles, Bath, and Patrick L. T. Bishop, Chippenham, both of England, assignors to Westinghouse Brake and Signal Company Limited, Wiltshire, United Kingdom
Filed Nov. 16, 1988, Ser. No. 271,632
Claims priority, application United Kingdom, Dec. 10, 1987, 8728878
Int. Cl.[4] H01L *23/48, 29/44, 29/52*
U.S. Cl. 357—68 8 Claims



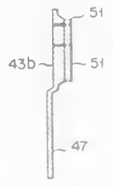
1. A semiconductor contact arrangement comprising:
(a) a semiconductor wafer having first and second major faces, said wafer having on one of said faces an area of a given conductivity type;
(b) a generally planar electrical contact having a face in direct engagement with said area to form a sandwich, said contact defining a hole extending through the contact from said area;
(c) a stud welded on to said area, said stud projecting into said hole to locate said contact on said wafer and secure said contact to said wafer.

4,916,517
SEMICONDUCTOR DEVICES
Peter D. Scovell, Chelmsford; Peter F. Blomley, Bishops Stortford; Roger L. Baker, Chelmsford, and Gary J. Tomkins, Maidstone, all of England, assignors to STC, PLC, London, England
Continuation of Ser. No. 71,474, Jul. 9, 1987, abandoned, which is a division of Ser. No. 831,257, Feb. 20, 1986, abandoned. This application Dec. 5, 1988, Ser. No. 282,956
Claims priority, application United Kingdom, Mar. 23, 1985, 8507602
Int. Cl.[4] H01L *21/74, 29/12*
U.S. Cl. 357—68 3 Claims



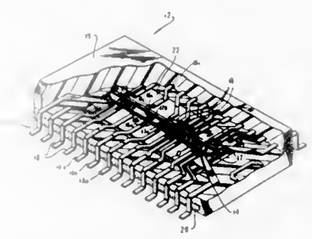
1. A bipolar transistor including a single crystal silicon substrate of one conductivity type, a first region of the substrate comprising a collector of the transistor; a second region of the substrate extending into the first region from a surface of the substrate, which second region is doped to be of the opposite conductivity type; a polycrystalline silicon mesa element of the one conductivity type disposed on said surface substantially centrally of the second region; the mesa element being of less width than the second region when measured in a first direction, the mesa element having oxide sidewall spacers thereon; a pair of spaced apart third regions of the substrate which are doped to be of the opposite conductivity type, the third regions being disposed on opposite sides of the mesa extending into the fierst regions from the said surface, which third regions are more highly doped than the second region, contact the second region and are spaced apart in the first direction by a distance of the order of the width of the mesa with the oxide sidewalls thereon; a fourth region which is of the one conductivity type and more highly doped than the first region extending into the first region from the said surface at a position spaced apart from one said third region in the first direction; and a polycrystalline silicon alignment element laterally spaced from the polycrystalline silicon mesa element in the first direction, the fourth region being laterally spaced from the mesa element in the first direction by a least the width of the one said third region in the first direction taken together; the second region comprising a base of the transistor, the third regions comprising base contacts of the transistor, the mesa comprising a polycrystalline silico emitter of the transistor, and the fourth region comprising a collector contact of the transistor.

4,916,518
PLASTIC ENCAPSULATED SEMICONDUCTOR DEVICE AND METHOD FOR MANUFACTURING THE SAME
Yutaka Yoshimura, Hyogo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Jan. 24, 1984, Ser. No. 573,342
Claims priority, application Japan, Jan. 25, 1983, 58-9298
Int. Cl.[4] H01L *23/48, 23/12*
U.S. Cl. 357—70 3 Claims



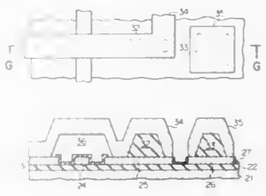
1. A semiconductor device comprising:
a lead frame having a mount portion and a lead portion connected to said mount portion, said mount portion having a mount surface and a heat dissipation surface, said mount surface positioned substantially adjacent said heat dissipation surface, said mount surface and said heat dissipation surface facing substantially opposite directions along said lead frame;
a semiconductor chip mounted on said mount surface;
wiring means extending between said semiconductor chip and said lead portion for electrically connecting said semiconductor chip to said lead portion;
a resinous electrical insulation layer affixed to said heat dissipation surface for dissipating most of the heat generated by said semiconductor chip; and
resin means encapsulating said mount surface, said semiconductor chip, and said lead portion proximate said mount portion for sealing and for insulating the encapsulated portions of the semiconductor device wherein said resin means is formed to abut said insulation layer, and wherein said resin means and said insulation layer define a package encapsulating said mount portion and said lead portion proximate said mount portion.

4,916,519
SEMICONDUCTOR PACKAGE
William C. Ward, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed May 30, 1989, Ser. No. 358,992
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—70 8 Claims



1. An encapsulated module comprising:
a semiconductor chip having a major surface with terminals thereon disposed within an encapsulating material, and
a plurality of discrete and continuous lead frame conductors at spaced locations around said chip and cantilevered out of the encapsulating material, said lead frame conductors including at least two non-adjacent conductors separated by a third, intervening lead frame conductor, and
discrete wires bonded to and connecting selected ones of said lead frame conductors to selected ones of said terminals,
characterized by at least one of said non-adjacent lead conductors being connected to the other of said non-adjacent lead frame conductors by a discrete wire bonded to and connecting said at least one of said non-adjacent lead frame conductors and said other one of said non-adjacent lead frame conductors and passing over said third, intervening lead frame conductor without connection thereto.

4,916,520
SEMICONDUCTOR DEVICE WITH AIRBRIDGE INTERCONNECTION
Yasumi Kurashima, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Sep. 13, 1988, Ser. No. 243,974
Claims priority, application Japan, Sep. 24, 1987, 62-240017
Int. Cl.[4] H01L *23/48, 29/52*
U.S. Cl. 357—71 6 Claims



1. A semiconductor device fabricated on a semiconductor substrate overlain by a first insulating film, comprising:
(a) a plurality of lower level interconnections formed on said first insulating film, said lower level interconnections having first, second and third lower level interconnections, said first and second lower level interconnections being located on both sides of said third lower level interconnection;

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(b) an upper level interconnection connected to said first and second lower level interconnections and extending over said third lower level interconnection, said upper level interconnection being spaced from said third lower level interconnection; and

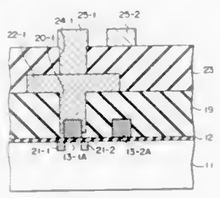
(c) at least one pier formed on a central portion of an upper surface of one of said first and second lower level interconnections, said pier having a width less than that of the aforesaid one of the first and second lower level interconnections and being covered over its entire exposed surface with a film formed of the same material as of said upper level interconnection.

4,916,521

CONTACT PORTION OF SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Susumu Yoshikawa, and Shizuo Sawada, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 25, 1988, Ser. No. 223,971
Claims priority, application Japan, Aug. 20, 1987, 62-206813
Int. Cl.[4] H01L 23/48, 29/44, 29/04
U.S. Cl. 357—71 19 Claims



1. A contact portion of a semiconductor integrated circuit device comprising:

a semiconductor substrate;

a first insulation layer formed on said semiconductor substrate;

a first conductive layer formed on said first insulation layer;

a second insulation layer, formed on said first conductive layer and said first insulation layer;

a first contact hole formed in a portion of said second insulation layer which is located over said first conductive layer, said first contact hole having a width greater than that of said first conductive layer and a depth less than the thickness of said second insulation layer, with the depth of said first contact hole being greater than a value obtained by subtracting the thickness of said first conductive layer from that of said second insulation layer;

a second conductive layer, having a width greater than that of said first contact hole, and formed on said second insulation layer and in said first contact hole, so as to be in contact with upper and side surfaces of said first conductive layer located inside said first contact hole;

a third insulation layer, formed on said second conductive layer and said second insulation layer;

a second contact hole, having a width less than that of said second conductive layer, and formed in said third insulation layer, at a position corresponding to said second conductive layer; and

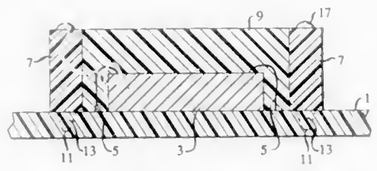
a third conductive layer, formed on said third insulation layer and in said second contact hole.

4,916,522

INTEGRATED CIRCUIT PACKAGE USING PLASTIC ENCAPSULANT

Charles Cohn, Wayne, N.J., assignor to American Telephone and Telegraph Company , AT & T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 21, 1988, Ser. No. 184,214
Int. Cl.[4] H01L 21/56; H05K 5/06
U.S. Cl. 357—72 4 Claims



1. An integrated circuit package comprising a mounting plate having a plurality of plate-surface recesses, and a metallic pattern on said mounting plate between said recesses;

an integrated circuit chip mounted on said plate between said recesses;

a plurality of electrical leads from said chip to said metallic pattern;

an encapsulant frame encircling said chip and said metallic pattern, and having a plurality of retention pins in said recesses; and

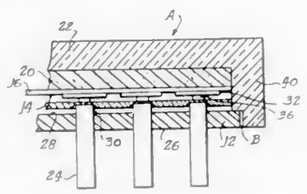
an encapsulant disposed within said encapsulant frame sealing said chip, said electrical leads, and said metallic pattern from the ambient atmosphere.

4,916,523

ELECTRICAL CONNECTIONS VIA UNIDIRECTIONAL CONDUCTIVE ELASTOMER FOR PIN CARRIER OUTSIDE LEAD BOND

Paul J. Sokolovsky, Sunnyvale; John Hunter, San Jose, and James L. Hayward, Sunnyvale, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 19, 1988, Ser. No. 245,501
Int. Cl.[4] H01L 23/02, 23/48, 29/84; H02G 13/08
U.S. Cl. 357—74 3 Claims



1. A PGA integrated circuit package comprising:

a package substrate (12) being formed of a generally rectangular configuration and having top and bottom surfaces;

a plurality of metal terminal pins (24) extending from the bottom surface of said package substrate (12) and protruding slightly above the top surface thereof to form terminal pin ends (30);

a unidirectional electrically conductive elastomeric layer (14) being deposited over said substrate (12) for engagement with said terminal pin ends (30);

a plastic tape layer (16) having a centrally disposed semiconductor chip (18), said tape layer and chip being deposited over said elastomeric layer (14), said tape layer (16) having a metalized trace pattern deposited on its bottom surface, said metalized trace pattern terminating at its outer ends with spaced apart metal terminal pads (32) which are in substantially vertical alignment with said respective terminal pin ends (30);

said terminal pads (32) including a dimple (36) formed on its bottom surface to create contact points to facilitate proper electrical contact;

an insulator layer (20) being deposited over said tape layer (16) and said semiconductor chip (18);

a cover member (22) having a generally rectangular configuration and being deposited over said insulator layer (20); and

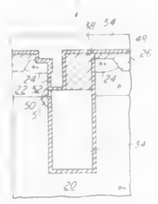
said insulator (16) and said cover member (22) being compressed to establish only electrical conductive paths in the vertical direction between the dimples on said terminal pads and said respective terminal pin ends through said elastomeric layer (14) due to the pressurized contact points.

4,916,524

DRAM CELL AND METHOD

Clarence W. Teng; Robert R. Doering, both of Plano, and Ashwin H. Shah, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 26,356, Mar. 16, 1987. This application Jan. 23, 1989, Ser. No. 300,467
Int. Cl.[4] H01L 29/78, 29/06, 27/02
U.S. Cl. 357—23.6 12 Claims



1. A memory cell comprising a trench formed in a semiconductor substrate;

an insulating layer formed on the walls of said trench;

a conductive connection formed through said insulating layer to said substrate providing a conductive path to a source region formed in said substrate on one side of said trench:

a drain region formed at the mouth of said trench on said one side of said trench defining a channel region between said source and said drain;

an insulating plug filling the remaining portion of said trench excepting a portion of said trench adjacent to said drain region and said source region; and

a conductive gate formed in the remaining portion of said trench.

4,916,525

HIGH DEFINITION TV SYSTEM

J. E. Drummond, Oceanside, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 29, 1988, Ser. No. 237,807
Int. Cl.[4] H04N 11/00, 7/87
U.S. Cl. 358—12 12 Claims

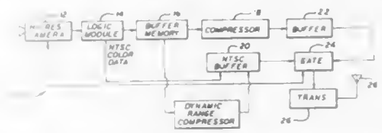
1. A high definition television system comprising:

a source of high definition television (HDTV) video signals comprising a stream of eight bit bytes each representative of a respective pixel;

a dynamic range compressor for receiving and reformating said HDTV video signals to provide a first video signal comprising a stream of eight bit bytes, wherein a first portion of each of three consecutive bytes contains data representative of a respective one of three pixels and a second portion of each of said three consecutive bytes contains a portion of the data representative of a fourth pixel;

first means for transmitting a periodic vertical synchronization signal and said first video signal, said vertical synchronization signal having a flyback interval;

second means for receiving said HDTV video signals and for transmitting a compressed video signal during said vertical flyback interval;



third means for receiving said first video signal and said compressed video signal;

fourth means for decompressing said compressed video signal to form a decompressed video signal; and

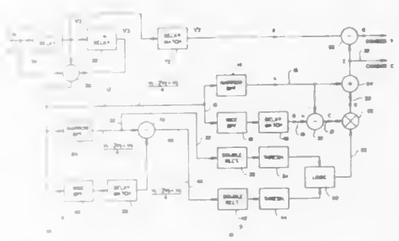
fifth means for displaying said first video signal and said decompressed video signal.

4,916,526

BANDWIDTH CONTROL FOR CHROMINANCE AND LUMINANCE PATHS IN QUADRATURE MODULATED COLOR TELEVISION SYSTEM

Yves C. Faroudja, 26595 Anacapa Dr., Los Altos, Calif. 94022, and Jack J. Campbell, San Francisco, Calif., assignors to Yves C. Faroudja, Los Altos, Calif.

Continuation of Ser. No. 825,051, Jan. 31, 1986, abandoned. This application Apr. 27, 1988, Ser. No. 188,085
Int. Cl.[4] H04N 9/78
U.S. Cl. 358—31 4 Claims



1. A method for reducing bandwidth of a chrominance path to reduce cross-color artifacts in a quadrature modulated color television signal including the steps of:

detecting the level of chrominance transitions of a chrominance component of the signal,

detecting the level of the chrominance component itself,

developing a control signal from the detected chrominance transition level and the detected chrominance level,

controlling the bandwidth of the chrominance path in accordance with the control signal so as to reduce bandwidth only when chrominance transition level and chrominance level are at values below predetermined thresholds.

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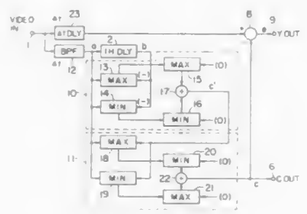
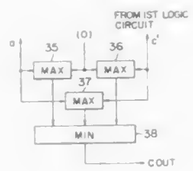
4,916,527

LUMINANCE SIGNAL/COLOR SIGNAL SEPARATION CIRCUIT

Yasutoshi Matsuo, Kawasaki, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jun. 3, 1988, Ser. No. 201,926
Claims priority, application Japan, Jun. 5, 1987, 62-140921
Int. Cl.[4] H04N 9/78
U.S. Cl. 358—31 4 Claims





1. A luminous signal/color signal separation circuit comprising:

bandpass filtering means for separating from a composite image signal a first color signal partially including a luminance signal component;

delay means for outputting as a second color signal, delayed first color signal obtained by delaying the first color signal by a time period which is an integer multiple of a horizontal scanning period;

a first logic circuit for taking out signals of the highest potential from among the first and second color signals and a reference potential, and for algebraically adding the signals of the highest and lowest potentials from among the first and second color signals and the reference potential to obtain a third color signal including a color separation error signal;

a second logic circuit for taking out a signal of the second highest potential from among said first and third color signals and a reference potential, thus to take out therefrom a fourth color signal excluding the color separation error signal; and

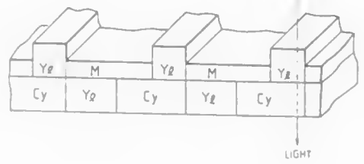
an addition/subtraction means for generating a luminance signal from the composite image signal and said fourth color signal.

4,916,528

COLOR STRIPE FILTER IN COLOR IMAGE PICKUP APPARATUS

Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Fujisawa; Hiroshi Ichimura; Ichiro Negishi, both of Yokohama; Masaru Osada, Yokosuka; Wataru Katase, Yokohama, and Kaoru Kitami, Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Dec. 28, 1988, Ser. No. 291,202
Claims priority, application Japan, Dec. 28, 1987, 62-335481; Feb. 3, 1988, 63-13326[U]; Mar. 9, 1988, 63-31346[U]; Sep. 16, 1988, 63-121956[U]
Int. Cl.[4] H04N 9/07, 9/83
U.S. Cl. 358—44 12 Claims



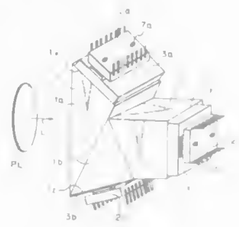
1. In a color image pickup apparatus including a color image pickup tube in which a color image is focused on a photo-electric conversion target through a color separation stripe filter disposed in a light path leading to said photoelectric conversion target and converted to an electrostatic image which is scanned in raster form having a scanning direction by an electron beam under control of a deflection system so as to generate a color multiplexed signal from said photo-electric conversion target, said color separation stripe filter comprising a plurality of recurrent groups of a first color stripe for transmitting red color light, a second color stripe for transmitting green color light and a third color stripe for transmitting cyan color light successively arranged at periodic intervals, wherein said first color stripe has a transmission characteristic showing a peak transmission factor in a red color region, said second color stripe has a transmission characteristic showing a peak transmission factor in a green color region which peak transmission factor is substantially equal to said peak transmission factor of said first color stripe, and said third color stripe has a transmission characteristic showing negative peak transmission factor at a wavelength between 500 nm and 530 nm so as to produce first and second peak transmission factors in a blue region and said green region, said first peak transmission factor being substantially equal to each of said peak transmission factors of said first and second color stripes, the second peak transmission factor of the third color stripe occurring substantially at the same wavelength as the peak transmission factor of the second color stripe, and the ratio of a transmission factor of the third color stripe to that of the second color stripe falling within a range between 50% and 80% in a wavelength region over a wavelength at which the second color stripe has the peak transmission factor and the resulting value of the ratio within this range is substantially maintained in said wavelength region, each stripe of said color separation stripe filter extending in a direction normal to said scanning direction of said electron beam.

4,916,529

IMAGING DEVICE UTILIZING SOLID-STATE IMAGE SENSORS COMBINED WITH A BEAM-SPLITTING PRISM

Haruhisa Yamamoto, Fujisawa, and Ryuji Ohmuro, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1987, Ser. No. 119,093
Claims priority, application Japan, Nov. 14, 1986, 61-174816[U]; Nov. 17, 1986, 61-176533[U]
Int. Cl.[4] H04N 9/09
U.S. Cl. 358—50 27 Claims



1. A device for generating electrical signals in response to the light from an optical system, comprising:

a prism assembly having plural light emitting faces, for separating the light from said optical system into plural component lights;

solid-state image sensors for respective photo-electric conversions of said component lights, provided respectively with adhering areas composed of a material allowing adhesion by fusion of a low-melting metal;

bonding areas formed on one of said prism assembly and optical components of a glass substance adhered thereto with a solder material capable of adhesion by fusion to a glass substance, and adapted to be respectively bonded to said solid-state image sensors; and

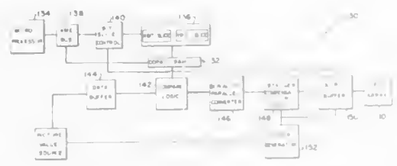
low-melting metal layers each having a metal layer thickness disposed to cause a light receiving surface of a respective solid-state image sensor to correspond to a predetermined imaging plane of the optical system, said low-melting metal layers being disposed between said adhering areas and said bonding areas.

4,916,530

HIGH RESOLUTION HALFTONE DOT GENERATOR SYSTEM INCLUDING LED ARRAY

Peter J. Neilson, Horsley, and Nicholas P. Cook, Cheltenham, both of England, assignors to Itek Graphix Corp., Waltham, Mass.

Filed Sep. 2, 1988, Ser. No. 241,100
Int. Cl.[4] H04N 1/40
U.S. Cl. 358—75 28 Claims



1. A dot generator system for a color scanner including means for providing a picture value for use in exposing a halftone separation comprising:

an LED microchip array having multiple staggered rows of LED's, said LED microchip array being mounted opposite to and imaged upon the exposure surface of a color scanner, said LED microchip array being movable in a two dimensional coordinate system relative to said exposure surface;

an addressable stored dot density profile array, said dot density profile array having a microdot density value stored at each memory address;

bit slice means for determining a dot density profile array address value and recalling the corresponding microdot density value;

compare logic means for comparing said recalled microdot density value with a picture value to determine whether an LED on said LED array will be activated, said compare logic means transmitting an exposure data bit indicating whether the corresponding LED is to be activated;

serial to parallel converter means for receiving said exposure data bits from said compare logic means and accumulating said bits to construct an exposure data word equal in length to the number of active LED's on said LED array;

stagger compensation logic means for receiving said exposure data word from said serial to parallel converter means, said stagger compensation means introducing delay timing to data bits corresponding to at least some of said staggered LED rows, said delay timing being equal to the time required for said LED microchip array to traverse the distance on said exposure surface between each staggered row and the first row;

output buffer means for receiving a modified exposure data word from said stagger compensation means and transmitting said modified exposure data word to said LED array; and

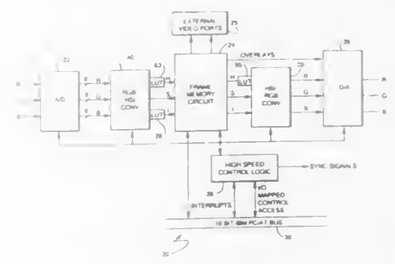
clock generator means for providing a timing reference for said delay timing and transmittal of said modified exposure data word from said output buffer to said LED array, said clock generator means also providing a stroke pulse to said LED array and a picture value request pulse for signaling the color scanner that the dot generator system is ready to receive the next picture value.

4,916,531

COLOR VIDEO PROCESSING CIRCUITRY

Suzanne E. Genz, Sherborn, and John R. Fierke, Southboro, both of Mass., assignors to Data Translation, Inc., Marlboro, Mass.

Filed Mar. 23, 1988, Ser. No. 172,017
Int. Cl.[4] H04N 1/46; G06F 7/52
U.S. Cl. 358—75 64 Claims



1. Circuitry for converting digital red, green, blue (RGB) inputs into digital saturation and hue outputs comprising

hardwired digital components connected to receive said digital RGB inputs and to perform arithmetic manipulations of them so as to provide a digital saturation output representing saturation for said RGB inputs and to provide a digital first intermediate output, and

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a first look-up memory storing digital hue data representing hue of said digital RGB inputs at addresses corresponding to values of said digital first intermediate output, said look-up memory being connected to said hardwired digital components to be addressed by said digital intermediate output, said memory providing a digital hue output.

26. Circuitry for converting digital hue data input (H), saturation data input (S), and data input related to the relative brightness of a signal into digital red, green, blue (RGB) outputs comprising

a look-up memory storing digital intermediate data at addresses corresponding to values of said hue data, said memory providing an intermediate data output when addressed by said hue data, and

hardwired digital components connected to receive said saturation data input (S) and said intermediate data output and to perform arithmetic manipulations of them so as to provide digital RGB outputs.

47. An N-bit fixed point divider for dividing a dividend signal input to it by a divisor signal input to it, the divider comprising bit subcircuits that each provide a single bit output of an N-bit quotient output and, except for the most significant subcircuit, receive a more significant dividend signal and a more significant divisor signal from a more significant subcircuit and output a dividend signal and a divisor signal to a less significant subcircuit,

each bit subcircuit comprising

an adder configured to subtract said more significant divisor signal from said more significant dividend signal and to output a sum signal and a carry-out bit, said carry-out bit being said single bit output of said N-bit quotient output,

a multiplexer connected to receive said sum signal and said more significant dividend signal as data inputs and to receive said carry-out bit as a control signal to output one of said data inputs as a data output depending on the state of said carry-out bit, and

shifting means for passing on said data output as a dividend signal to the next less significant bit subcircuit with said divisor signal, said data output being shifted by one bit to the left with respect to said divisor signal.

55. A floating point divider for dividing a digital fixed point dividend signal input to it by a digital fixed point divisor signal input to it comprising

a dividend decoding circuit connected to receive said dividend signal and output a dividend exponent signal indicating the most significant bit position corresponding to the left-most high bit of said dividend signal,

a divisor decoding circuit connected to receive said divisor signal and output a divisor exponent signal indicating the most significant bit position corresponding to the left-most high bit of said divisor signal,

a dividend shifting circuit connected to receive said dividend signal and output a dividend mantissa signal such that said left-most high bit of said dividend signal is the left-most bit of said dividend mantissa signal,

a divisor shifting circuit connected to receive said divisor signal and output a divisor mantissa signal such that said left-most high bit of said divisor signal is the left-most bit of said divisor mantissa signal,

a subtraction circuit which subtracts said divisor exponent signal from said dividend exponent signal and provides a quotient exponent signal, and

a mantissa division circuit which divides said dividend mantissa signal by said divisor mantissa signal and provides a quotient mantissa signal.

64. A video processing system comprising

a frame memory circuit having first, second, and third inputs and first, second, and third outputs,

first means for converting digital red, green, and blue data inputs into digital hue, saturation, and intensity data outputs, said first, second, and third outputs of said frame memory circuit being connected to be inputted as said red, green, and blue data inputs, said hue, saturation, and intensity data outputs being connected to be inputted as said first, second, and third inputs of said frame memory circuit,

second means for converting digital hue, saturation, and intensity data inputs into digital red, green, and blue data outputs, said first, second, and third outputs of said frame memory circuit being connected to be inputted as said hue, saturation, and intensity data inputs, said red, green, and blue data outputs being connected to be inputted as said first, second, and third inputs of said frame memory circuit, and

control logic means for controlling which of said first and second means for converting is selected to receive signals from and/or output signals to said frame memory circuit for storage or processing.

4,916,532

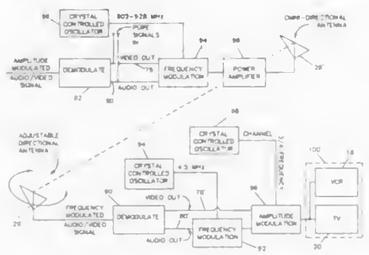
TELEVISION LOCAL WIRELESS TRANSMISSION AND CONTROL

Donald A. Streck, 832 Country Dr., Ojai, Calif. 93023, and Jerry R. Iggulden, 21600 Cleardale St., Newhall, Calif. 91321, assignors to Jerry R. Iggulden, Santa Clarita and Donald A. Streck, Ojai, both of, Calif., a part interest

Filed Sep. 15, 1987, Ser. No. 96,929

Int. Cl.[4] H04N *7/00*

U.S. Cl. 358—83 10 Claims



1. In a television system including a source of a signal including a video portion and a television monitor for displaying a video picture, the improvement for wirelessly transmitting the video portion of the signal from the source to the monitor comprising:

(a) oscillator means disposed at the source for generating a transmitting frequency above any standard UHF and VHF frequencies used for normal television broadcasting;

(b) modulating means disposed at the source for modulating said transmitting frequency with the video portion of the signal to produce a modulated transmitting frequency as an output thereof;

(c) amplifying and transmitting means connected to said output of said modulating means for amplifying and transmitting said modulated transmitting frequency from a transmitting antenna;

(d) receiving antenna means disposed at the monitor for receiving said modulated transmitted frequency;

(e) first demodulating means connected to said antenna means for demodulating said modulated transmitted frequency as received and for reproducing the video portion of the signal as an output; and,

(f) means interconnecting said output of said first demodulating means to the monitor for conducting the video portion of the signal to the monitor to be used thereby in producing a video picture; wherein the source of a signal including a video portion further includes a control system responding to coded infra red energy from a controller/-transmitting striking a detector to produce a coded electrical output and further comprising,

(g) supplemental detector means located at the television monitor for detecting the coded infra red energy from the controller/transmitter and for translating it into a coded electrical signal;

(h) remote control transmitter means connected to receive said electrical signal for transmitting said coded electrical signal at a frequency allocated to the transmission of binary coded information;

(i) remote control receiver means located at the source of a signal including a video portion for receiving said transmitted electrical signal and for recreating said coded electrical signal therefrom; and,

(j) means connected to said receiver means for inputting said coded electrical signal into the control system.

4,916,533

ENDOSCOPE INSERTION DIRECTION DETECTING METHOD

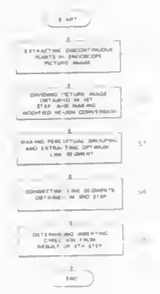
Duncan F. Gillies, and Gul N. Khan, both of London, England, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1989, Ser. No. 330,523

Claims priority, application United Kingdom, Dec. 31, 1988, 8830465

Int. Cl.[4] A61B *1/04, 1/06*

U.S. Cl. 358—98 21 Claims



1. An endoscope insertion direction detecting method provided with a step of extracting the form of a fold existing on the inside wall of an observed part from an endoscope picture image so that the endoscope insertion direction may be judged on the basis of the form of the fold extracted by said step.

4,916,534

ENDOSCOPE

Susumu Takhashi, Kunitachi; Tsutomu Igarashi; Atsushi Miyazaki, both of Hachiouji; Kimihiko Nishioka; Akira Hasegawa, both of Hachiouji; Masahiro Chiba, and Koji Takamura, both of Hachiouji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1988, Ser. No. 187,040

Claims priority, application Japan, Apr. 28, 1987, 62-103117; Jul. 29, 1987, 62-189750; Feb. 16, 1988, 63-18965[U]

Int. Cl.[4] A61B *1/04, 1/06*

U.S. Cl. 358—98 20 Claims

1. An endoscope having an objective optical system comprising:

a plurality of optical components disposed between an object to be observed and a predetermined imaging plane, for forming an image of the object to be observed on said predetermined imaging plane, each said optical component having an entrance surface and an exit surface, at least one of said entrance and exit surfaces of said plurality of optical components, other than the entrance surface of an optical component nearest the object to be observed, being a planar surface inclined relative to an optical axis of said objective optical system and at least one of the immediately preceding and next following surfaces from said one surface of said plurality of components which is being defined in a plane inclined with respect to said one surface.

4,916,535

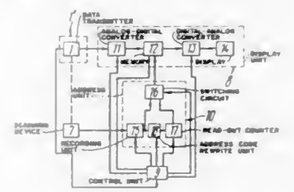
METHOD OF NON-DESTRUCTIVE QUALITY INSPECTION OF MATERIALS AND VIDEOMONITOR REALIZING THIS METHOD

Dmitry B. Volodchenko, Ulitsa Novovilenskaya, 3, kv. 32; Valery S. Kozlov, Leninsky prospekt, 16, kv. 76., both of Minsk; Vladimir A. Troitsky, Ulitsa Sapernoe pole, 26a, kv. 60, Kiev; Vladimir V. Kljuev, ulitsa 3 Frunzenskaya, 14, kv. 5, Moscow; Alexandr V. Stepanenko, ulitsa Surganova, 40, kv. 25, Minsk; Orest S. Semenov, ulitsa Verkhnava Pervomaiskaya, 53/35, korpus 3, kv. 27, Moscow; Jury K. Bondarenko, ulitsa Uritskogo, 31, kv. 37; Jury B. Eskov, ulitsa Surikova, 4, kv. 58, both of Kiev; Semen S. Kulev, Leninsky prospekt, 76a, kv. 39, and Nikolai V. Kotov, ulitsa Kalinovskogo, 83, kv. 37, both of Minsk, all of U.S.S.R.

Filed Aug. 6, 1987, Ser. No. 82,386

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—101 10 Claims



1. A method of non-destructive quality inspection of materials, comprising the steps of:

placing at least one transmitter of data on the quality of a material in the immediate vicinity of the surface of said material to be inspected;

setting said data transmitter and said inspected material in motion relative to each other;

setting a minimal distance to which said data transmitter is displaced in relation to the inspected material, which is taken as a displacement cycle;

sampling information fed by said data transmitter;

entering obtained information to a memory synchronously with said displacement cycles of said data transmitter in relation to said inspected material;

periodically reading this information contained in said memory and, prior to the beginning of each next readout cycle, assigning an address of a location in said memory, from which this readout cycle is to start;

converting information read out in this manner into a colored or black-and-white shadow image indicative of the quality of the inspected material, wherein recording of information to said memory is gated by a pulse whose duration corresponds to the frequency of said sampling of information signals and, when the duration of said gating pulse changes, the frequency of sampling of information signals is also changed.

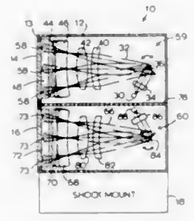
VOL 1113 ISS 2 AP 10 1990 UMI

4,916,536

IMAGING RANGE FINDER AND METHOD

James R. Kerr, Tigard; Michael E. Fossey, Beaverton, both of Oreg.; David M. Aikens, Pleasanton, Calif.; Bruce L. Cannon, Lake Oswego, and John J. McDonald, West Linn, both of Oreg., assignors to FLIR Systems, Inc., Portland, Oreg.

Filed Nov. 7, 1988, Ser. No. 268,337
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—107 14 Claims



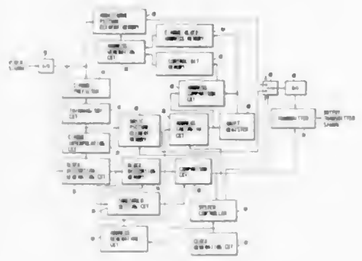
1. A device for imaging and range finding objects within a predetermined angular field of view comprising:
imaging means having an angular field of view greater than 45-degrees horizontal and 30-degrees vertical for video depiction of such an object; and
range finding means operably coupled to said imaging means for determining, throughout the entirety of such field of view, the distance between the device and the object while simultaneously imaging.

4,916,537

IMAGE INFORMATION SIGNAL TRANSMITTING SYSTEM

Tadayoshi Nakayama; Hisashi Ishikawa, both of Kanagawa; Susumu Kozuki, Tokyo; Koji Takahashi, Kanagawa; Katsuji Yoshimura, Kanagawa; Kenichi Nagasawa, Kanagawa, and Tomohiko Sasatani, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1989, Ser. No. 329,006
Claims priority, application Japan, Mar. 28, 1988, 63-071966
Int. Cl.[4] H04N 7/12
U.S. Cl. 358—133 3 Claims



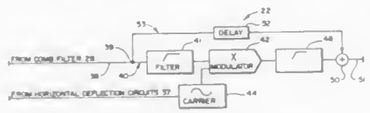
1. An image information signal transmitting system comprising:
(A) first storage means for storing an image information signal composed of a plurality of picture element data corresponding to one picture in units of blocks each of which is composed of a predetermined number of picture element data;
(B) extracting means for dividing the image information signal composed of a plurality of picture element data corresponding to one picture into the blocks, extracting from each of the blocks a smaller number of picture element data than the number of picture element data of which each of the blocks is composed, and outputting the extracted picture element data;
(C) second storage means for storing the picture element data output from said extracting means in units of corresponding blocks;
(D) transmission mode determining means for dividing the image information signal composed of a plurality of picture element data corresponding to one picture into the blocks, and determining a transmission mode for the picture element data of which each of the blocks is composed among a plurality of transmission modes having different numbers of picture element data transmitted;
(E) reading address generating means for generating a reading address of said first storage means which corresponds to a block determined by said transmission mode determining means to be transmitted in a transmitting mode having the greatest number of picture element data transmitted;
(F) discrimination data generating means for generating discrimination data for discriminating an address corresponding to an end portion in each horizontal line direction of a picture from other reading addresses generated by said reading address generating means; and
(G) picture element data reading means for reading out picture element data stored in said first storage means by using the reading address generated by said reading address generating means and discrimination data generated by said discrimination data generating means.

4,916,538

APPARATUS AND METHODS FOR ENHANCING A VIDEO DISPLAY

Robert W. Carver, Snohomish, and Montgomery F. Ross, Woodinville, both of Wash., assignors to Carver Corporation, Lynnwood, Wash.

Filed Feb. 6, 1987, Ser. No. 11,829
Int. Cl.[4] H04N 7/04
U.S. Cl. 358—141 8 Claims



1. A method for enhancing a video display comprising the steps of:
a. providing a first signal for generating the video display, the first signal having
(i) higher frequency components with a first upper frequency limit, and
(ii) lower frequency components;
b. receiving a first portion of the first signal and separating the higher frequency components from the first portion;
c. multiplying the separated higher frequency components by a second signal in a manner that the product of the separated higher frequency components and the second signal is a third signal having frequencies
(i) which are above the first upper frequency limit and
(ii) which is equal to a sum of the frequencies of the high frequency components and the frequency of the second signal;
d. delaying a second portion of the first signal having the higher frequency components and lower frequency components;
e. adding the third signal to the delayed second portion of the first signal so as to generate a composite signal;
f. selecting a delay time of the delaying step so that the second portion of the first signal is added in phase with the third signal; and
g. generating the video display in response to the composite signal.

4,916,539

COMMUNICATIONS SYSTEM HAVING RECEIVERS WHICH CAN BE ADDRESSED IN SELECTED CLASSES

Alan D. Galumbeck, Smyrna, Ga., assignor to The Weather Channel, Inc., Atlanta, Ga.

Continuation of Ser. No. 155,997, Feb. 16, 1988, abandoned, which is a continuation-in-part of Ser. No. 487,244, Apr. 21, 1983, Pat. No. 4,725,886. This application Mar. 14, 1989, Ser. No. 323,089
Int. Cl.[4] H04N 7/08, 7/087
U.S. Cl. 358—142 6 Claims

1. An addressable receiver for receiving video and digital data signals, transmitting video output signals and controlling external devices, comprising:
(a) means for processing the video and digital data signals into a first video signal available for receiver output, a synchronization signal available for receiver output, and a serial digital data stream for controlling the receiver;
(b) means for processing the digital data stream to recognize within such stream control words;
(c) means for storing digital data contained in the digital data stream;
(d) means for recognizing within the digital data stream hierarchical addresses, controlling the means for storing digital data selectively to store data in accordance with the hierarchical address preceding such data and;
(e) means for recognizing within the digital data stream non-hierarchical designator data;
(f) means for converting stored digital data into a second video signal containing characters and available for receiver output; and
(g) means responsive to the digital data stream for controlling the receiver output.

4,916,540

SPECIAL EFFECT APPARATUS FOR VIDEO SIGNAL

Etsuko Kosaka, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jan. 13, 1988, Ser. No. 143,409
Claims priority, application Japan, Jan. 14, 1987, 62-5137
Int. Cl.[4] H04N 5/14
U.S. Cl. 358—160 5 Claims

1. A special effect apparatus comprising
an A/D converter for converting an input analog video signal into a digital video signal,
a video memory means,
a write address generating means for generating a write-in address to store said digital video signal in said video memory means,
a read address generating means for generating a read-out address to read out a stored digital video signal from said video memory means, and
a D/A converter for converting a read-out digital video signal from said video memory means into an analog video signal,
said read address generating means including:
means for generating parameters associated with a desired image transformation, said parameters being predetermined at a plurality of knots on a video image;
means coupled to said parameter generating means for calculating coefficients defining a tracing curve in accordance with said parameters, said tracing curve being constructed by connecting said plurality of knots;
means for sequentially calculating a transition distance on said tracing curve between two knots among said plurality of knots according to a predetermined function, said transition distance varying non-linearly as a function of a time lapse;

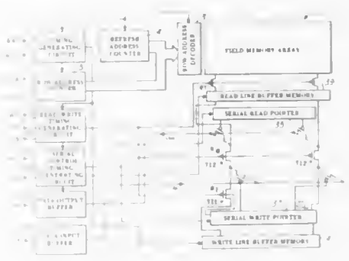
means coupled to said coefficient calculating means and said transition distance calculating means for calculating an interpolated parameter, said interpolated parameter determining an image transformation between said two knots; and
means coupled to said interpolated parameter calculating means for generating said read-out address.

4,916,541

PICTURE PROCESSOR

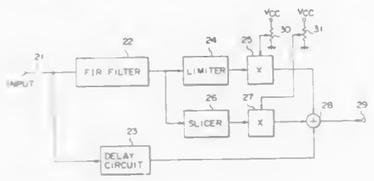
Masashi Hashimoto, and Kenji Sasaki, both of Mibo, Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 16, 1987, Ser. No. 40,453
Claims priority, application Japan, Apr. 21, 1986, 61-091674
Int. Cl.[4] H04N 5/14
U.S. Cl. 358—160 29 Claims



1 A picture processor comprising:
a memory array for storing video data involving at least one picture frame; and
line buffer memory means for processing at a high rate video signals included in one scan line of the picture frame; said line buffer memory means including
a read line buffer memory operatively connected to said memory array, and
a write line buffer memory operatively connected to said memory array.

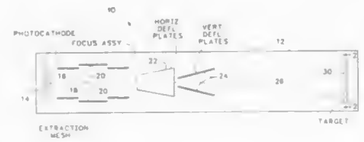
4,916,542
PICTURE QUALITY ADJUSTING CIRCUIT WITH FIR FILTER FOR DIGITAL PROCESSING
Minoru Yoneda, Yokohama; Akihiko Enomoto, Tokyo; Takashi Koga, and Hiroshi Kobata, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Feb. 23, 1989, Ser. No. 313,899
Claims priority, application Japan, Feb. 29, 1988, 63-44261
Int. Cl.[4] H04N 5/213, 9/64
U.S. Cl. 358—167 10 Claims

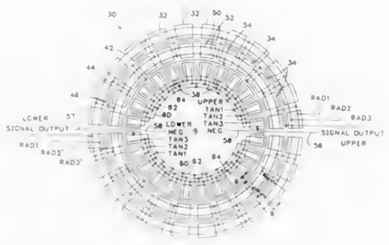


1. A circuit for adjusting a picture quality by processing a video signal, said video signal including a noise, comprising:
filter means for receiving said video signal and extracting a high-frequency component therefrom;
first waveform-shaping means for wave-shaping said high-frequency component extracted by said filter means to provide a noise cancel signal for canceling the noise;
second waveform-shaping means for wave-shaping said high-frequency component extracted by said filter means to provide a contour compensation signal for compensating a contour of a picture; and
adder means for adding said video signal, said noise cancel signal from said first waveform-shaping means and said contour compensation signal from said second waveform-shaping means to provide a signal with adjusted picture quality.

4,916,543
CIRCULAR SCAN STREAK TUBE WITH ELECTRONIC MEMORY AND READOUT
Philip S. Crosby, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Filed Jan. 9, 1989, Ser. No. 294,221
Int. Cl.[4] H04N 5/335
U.S. Cl. 358—217 23 Claims

16. A system for recording high-speed optical data comprising:
a streak tube for providing an electron beam responsive to an optical event;
deflector means associated with the streak tube for deflecting the electron beam along a circular path;
a target within the streak tube comprising
a first array of detection elements disposed along at least a portion of the circular path, said first array including a first set of elements for detecting electrons in the beam and recording event signal data responsive to incident electrons, and a second set of elements including one coupled to a different one of each element of said first set;
a second array of storage elements disposed along at least a portion of a second path parallel with said circular path, each storage element coupled to a corresponding one of the detection elements of the second set and storing event signal data received therefrom;
means for transferring the event signal data in parallel from the detection elements of the first array to the corresponding storage elements of the second array for storage;
output means coupled to an end of the second array for shifting the stored event signal data through the second array and reading the data out of the target as serial data; and
synchronization means for synchronizing the transferring means to the deflection means to transfer event signal data





from the first set of elements in the first array before the electron beam overwrites the data.

4,916,544
METHOD AND DEVICE FOR COMPRESSION BY THE CONDITIONAL ENCODING OF DIGITAL IMAGE SIGNALS WITHOUT LOSS OF DATA
Jean Llenard, Clamart, and Claude Benchimol, Paris, both of France, assignors to Thomson-CGR, Paris, France
PCT No. PCT/FR86/00413, § 371 Date Sep. 24, 1987, § 102(e) Date Sep. 24, 1987, PCT Pub. No. WO87/03769, PCT Pub. Date Jun. 18, 1987
PCT Filed Dec. 2, 1986, Ser. No. 80,532
Claims priority, application France, Dec. 4, 1985, 85 17949
Int. Cl.[4] H04N 1/40
U.S. Cl. 358—262.1 4 Claims

1. A device for the compression of digital image signals by conditional encoding without loss of data, comprising a shift memory with at least two outputs at which, for each incoming pixel value, the values of the neighbouring values are presented, these outputs being each connected to a memory giving a code number, these two memories being connected to a device for the formatting and concatenation of codes.

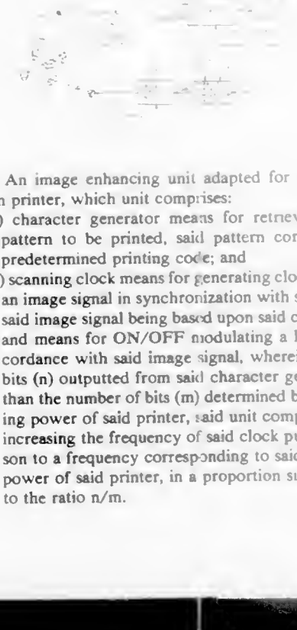
4,916,545
ELECTRONIC GRAPHIC ARTS SCREENER THAT SUPPRESSES MOIRE PATTERNS USING PSEUDO-RANDOM FONT SELECTION
Edward M. Granger, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 16, 1988, Ser. No. 272,592
Int. Cl.[4] H04N 1/40
U.S. Cl. 358—456 21 Claims

1. In a system for generating a raster based writing pattern for use in producing a visual depiction of a stored halftone dot pattern within an image, wherein said visual depiction will be formed of separate pixels having a pre-defined spacing occurring therebetween, apparatus for suppressing a Moire pattern occurring in said image, said apparatus comprising:
means for storing a plurality of different halftone dot fonts, wherein each one of said fonts contains a halftone dot pattern that varies from a corresponding pattern contained in every other one of said fonts;

means for generating a coordinate position of a desired location within any of said fonts residing in said storing means;
means for generating a substantially random value as font selection bits and for applying said font selection bits and said coordinate position to said storing means as adress to select only a corresponding one of said fonts for use in

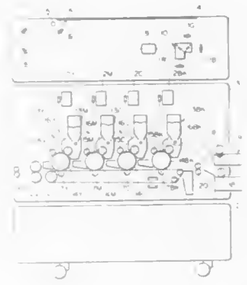
forming a depiction of an entire halftone dot as part of an image and to access a value from said storing means and stored at said location within said corresponding font; and
means, operative in response to said accessed value, for generating a bit that forms a part of a raster based writing pattern that forms said depiction of said entire halftone dot.

4,916,546
IMAGE ORGANIZING UNIT OF A LASER BEAM PRINTER
Kiyoshi Negishi, Tsurugashima, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 16, 1988, Ser. No. 232,766
Claims priority, application Japan, Aug. 21, 1987, 62-127187[U]
Int. Cl.[4] G01D 9/42, 15/14, 15/26; H04N 1/04
U.S. Cl. 358—296 9 Claims



1. An image enhancing unit adapted for use with a laser beam printer, which unit comprises:
(a) character generator means for retrieving a character pattern to be printed, said pattern corresponding to a predetermined printing code; and
(b) scanning clock means for generating clock pulses to form an image signal in synchronization with said clock pulses, said image signal being based upon said character pattern, and means for ON/OFF modulating a laser beam in accordance with said image signal, wherein the number of bits (n) outputted from said character generator is larger than the number of bits (m) determined by a given resolving power of said printer, said unit comprising means for increasing the frequency of said clock pulses, in comparison to a frequency corresponding to said given resolving power of said printer, in a proportion substantially equal to the ratio n/m.

4,916,547
COLOR IMAGE FORMING APPARATUS
Akio Katsumata, Yokohama; Mitsuo Hasebe, Tokyo; Yoshihiro Mitekura, Tokyo; Hiroshi Hosaka, Tokyo; Itaru Matsuda; Kotaro Yonenaga, both of Yokohama; Takayuki Maruta, and Masaaki Kogure, both of Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed May 26, 1988, Ser. No. 198,855
Claims priority, application Japan, May 26, 1987, 62-127020
Int. Cl.[4] G01D 15/06; G03G 15/01; H04N 1/29, 1/46
U.S. Cl. 358—300 8 Claims



1 An image forming apparatus comprising:
a plurality of recording devices each including a photoconductive element, a charger for uniformly charging a surface of said photoconductive element, exposing means for exposing said photoconductive element to imagewise light, developing means for developing an electrostatic latent image which is provided on said photoconductive element, and transferring means for transferring the developed image from said photoconductive element to a paper;
said apparatus further comprising:
pattern image signal generating means for forming pattern images for measurement each being associated with a respective one of a plurality of colors in a part of a surface of said transfer belt outside of a region in which a paper is to be laid;
single sensing means for sensing arrival of each of the pattern images;
counting means for counting a timing at which said signal sensing means senses the arrival;
calculating means for calculating an amount of deviation by comparing a count of said counting means with a predetermined value; and
timing signal generating means for generating a write start timing signal for each of the colors which is variable on the basis of an output of said calculating means.

4,916,548
VIDEO TAPE RECORDER FOR RECORDING/REPRODUCING TWO-CHANNEL COMPONENT COLOR VIDEO SIGNALS
Yoshihiro Morioka, Neyagawa, and Masaaki Kobayashi, Kawanishi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 4, 1987, Ser. No. 21,481
Claims priority, application Japan, Mar. 7, 1986, 61-51175
Int. Cl.[4] H04N 5/782
U.S. Cl. 358—335 2 Claims

1. A video tape recorder for recording two-channel component signals of a video signal on a magnetic tape and reproducing the recorded signals, comprising:
first and second memory means for time-compressing said two-channel component signals by (1+A)/2 and

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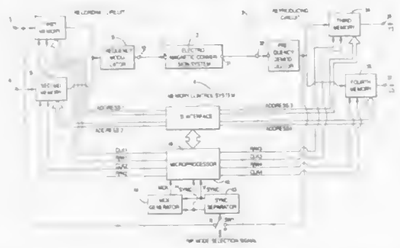
(1−A)/2, respectively, where A is a predetermined value, and alternately outputting the time-compressed two-channel component signals to obtain a time compressed one channel signal in which the time-compressed two-channel component signals occur alternately;

a frequency modulating means for frequency-modulating said time-compressed one-channel signal to obtain a frequency-modulated signal in which frequency-modulated time-compressed two-channel component signals occur alternately;

an electromagnetic conversion means including a pair of rotary magnetic heads for recording said frequency-modulated signal on said magnetic tape and for reproducing the recorded frequency-modulated signal from said magnetic tape, said pair of heads being disposed to be apart by 180 degrees from each other on a circumference of a rotary cylinder which rotates at a rate of one revolution per field of said video signal, the relative heights of said pair of heads in an axial direction of said rotary cylinder being the same, and the widths of said pair of heads being the same;

a frequency demodulating means for frequency-demodulating the reproduced frequency-modulated signal to obtain said time-compressed one-channel signal,



third and fourth memory means respectively alternately receiving the time-compressed two-channel component signals in the time-compressed one-channel signal from said frequency demodulating means for time-expanding the received time-compressed two-channel component signals, respectively, to obtain two-channel component signals; and

a memory control means for controlling address access and read/write timing of each of said first through fourth memory means such that each of said frequency-modulated time-compressed two-channel component signal is recorded to be aligned in a direction perpendicular to a scanning direction of said pair of heads on said magnetic tape,

wherein said memory control means produces a first write clock and a first read clock for each of said first and second memory means, a frequency of said first read clock being twice that of said first write clock, and a second write clock and a second read clock for each of said third and fourth memory means, frequencies of said second write and read clocks being the same as those of said first read and write clock, respectively.

4,916,549

IMAGE SENSING APPARATUS WITH SHADING COMPENSATION

Hidekazu Sekizawa, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

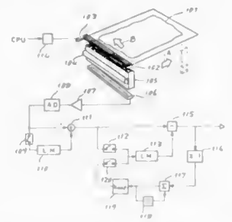
Filed Jun. 24, 1988, Ser. No. 211,266
Claims priority, application Japan, Jun. 24, 1987, 62-155383
Int. Cl.⁴ H04N *1/40*
U.S. Cl. 358—461 **9 Claims**

1. An image sensing apparatus with shading compensation comprising:

means for optically sensing an image of an object by use of light sensors including a plurality of light sensing elements,

means for relatively moving said object and said sensing means,

processing means for obtaining shading compensation infor-



mation by use of image signals sensed with different light sensing elements from the same point of said object before and after movement thereof performed by said moving means, and

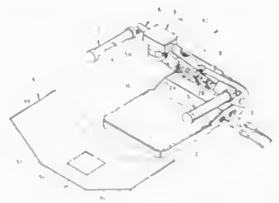
means for storing the thus obtained shading compensation information.

4,916,550

FOLDABLE PORTABLE OPTICAL INSTRUMENT

Michihiro Miyake; Youichi Sawaji; Kazuhisa Horikiri; Kazuhiro Tokuda, and Makoto Nakazawa, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 3, 1989, Ser. No. 305,581
Claims priority, application Japan, Feb. 5, 1988, 63-14219; Feb. 8, 1988, 63-15575; Apr. 15, 1988, 63-50510; Apr. 15, 1988, 63-50511; Apr. 15, 1988, 63-93216
Int. Cl.⁴ H04N *1/00*
U.S. Cl. 358—471 **15 Claims**



1. A foldable optical instrument having a main housing structure with a table provided thereon, and an optical imaging head for providing an image of an original material placed on the table, said foldable optical instrument further comprising:

head supporting structure for raising-up and folding-down of said optical imaging head, the head supporting structure being mounted on said main housing structure for rotatably supporting said optical imaging head and positioning said optical imaging head over said table;

a pair of illumination units for illuminating said original material placed on said table

a pair of illumination unit supporting structures, on each of which a respective one of said pair of illumination units is mounted, for providing raising-up and folding-down movement of said illumination units, said illumination unit supporting structures being mounted on said head supporting structure, each said illumination unit supporting structure positioning each said illumination unit upwardly with respect to said table when said head supporting means is raised up; and

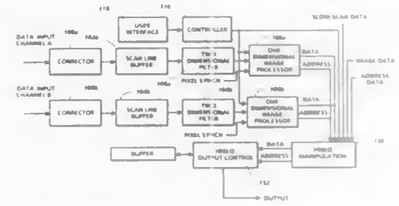
a cover, attached to said head supporting structure, for covering said pair of illumination units and said pair of illumination unit supporting structures when said head supporting structure is folded down.

4,916,551

MULTI-CHANNEL IMAGE PROCESSING WITH CROSS CHANNEL CONTEXT

Ying-wei Lin, Penfield; Anthony F. Calarco, Fairport, and Lian M. Yamonaco, East Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 2, 1989, Ser. No. 289,081
Int. Cl.⁴ H04M *1/04*
U.S. Cl. 358—483 **15 Claims**



6. An image processing method for processing a scan line of pixels in portions, each scan line portion along a separate channel, each channel including at least one element requiring context information for processing each pixel in said groups of pixels, said context information including a selected number of preceding pixels and a selected number of succeeding pixels in the scan line, including the steps of:

directing pixels 1 to n in the scan line to a first channel for processing,

directing pixels n+1 to m in the scan line to a second channel for processing,

deriving context pixels n+1 to q, where q<m from the second channel and directing said context pixels to the first channel as context information to said at least one element requiring context information.

4,916,552

OPTICAL READER HEAD WITH VIDEO COMPENSATION METHOD AND CIRCUIT WHICH INTEGRATES FOUR ADJACENT PIXELS INTO A COMPOSITE PIXEL

Fredrik L. N. Kallin, and Raymond L. Higgins, both of Kitchener, Canada, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 24, 1987, Ser. No. 137,836
Int. Cl.⁴ H04N *1/028, 1/10*
U.S. Cl. 358—494 **3 Claims**

1. An optical reader head comprising:

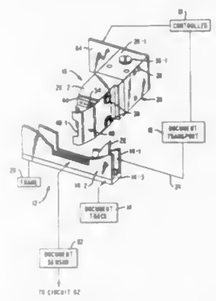
a body having first and second tubular portions, and securing means for detachably securing said first and second tubular portions in axial alignment, with one end of said first tubular portion forming a rear end of said body and with one end of said second tubular portion forming a front end of said body;

a lens, and mounting means for adjustably fixing said lens within said first tubular portion;

an array of light sensors positioned in said first tubular portion at said rear end of said body;

a first line and a second line of light bulbs;

a mounting member for mounting said first and second lines of light bulbs in spaced, parallel relationship thereon to enable the light from said light bulbs to be directed at a scanning line and reflected therefrom through said lens to said array of light sensors, said mounting member being secured to said second tubular portion at said front end of said body; and



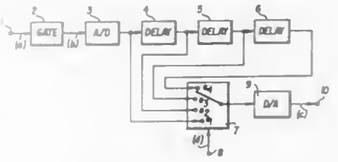
a resilient member adjustably secured to said second tubular portion to maintain a document at said scanning line at a predetermined distance from said lens.

4,916,553

VIDEO SIGNAL RECORDING AND REPRODUCING METHOD AND APPARATUS

Atsushi Yoshioka, Katsuta; Takashi Furuhata, Yokoham; Hitoaki Owashi, Yokohama, and Katsuo Mouri, Yokosuka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 753,609, Jul. 10, 1985, abandoned. This application Mar. 15, 1988, Ser. No. 170,119
Claims priority, application Japan, Jul. 20, 1984, 59-149483; Jan. 18, 1985, 60-5685
Int. Cl.⁴ H04N *5/92*
U.S. Cl. 360—9.1 **57 Claims**



1. A method for recording video signals in a rotary head helical scan type magnetic recording system, comprising the steps of:

dividing a video signal for one vertical scanning period into n blocks,

transforming the time axis of said divided blocks by inserting a redundant period between said divided blocks, and

recording said transformed divided blocks consecutively onto a recording medium with each of said transformed divided blocks being recorded on different oblique tracks of said medium and a recording start point of each of said oblique tracks appearing at the center of said redundant period.

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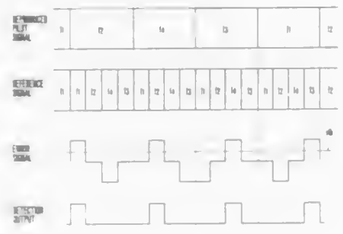
4,916,554

INFORMATION SIGNAL REPRODUCING APPARATUS HAVING A TRACKING CONTROL SYSTEM

Kouji Takahashi, Kanagawa, and Toshiaki Mabuchi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 833,343, Feb. 25, 1986, abandoned. This application Aug. 17, 1988, Ser. No. 235,701
Claims priority, application Japan, Feb. 26, 1985, 60-036767; Feb. 26, 1985, 60-036768
Int. Cl.[4] H04N 5/783
U.S. Cl. 360—10.2 27 Claims



1. An information signal reproducing apparatus for reproducing an information signal from a tape-shaped recording medium on which pilot signals of four different kinds having different frequencies are cyclically recorded in rotation along with said information signal, comprising:

(a) moving means for moving said tape-shaped recording medium in the longitudinal direction of said tape;

(b) a reproducing head arranged to reproduce said information signal;

(c) separating means for separating said pilot signals from a signal reproduced by said reproducing head;

(d) reference signal generating means for generating one by one, in a switch-over cycle, reference signals of four different kinds corresponding to the four kinds of said pilot signals;

(e) tracking control means for controlling the position of said head relative to that of said medium by using said pilot signals separated by said separating means and said reference signals generated by said reference signal generating means;

(f) instruction means for instructing said moving means to shift said medium moving speed thereof from one speed to another;

(g) reference signal control means arranged to have said reference signal switch-over cycle of said reference signal generating means changed to a different cycle during a specific period determined in response to the instruction of said instruction means, said specific period having a predetermined period time; and

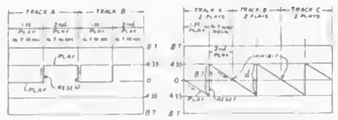
(h) moving control means for controlling said moving means to shift said medium moving speed thereof from one speed to another after said specific period.

4,916,555

METHOD AND APPARATUS FOR PRODUCING TIME BASE ALTERED EFFECTS IN DATA RECORDING AND REPRODUCING APPARATUS

Richard A. Hathaway, Saratoga; Donald B. MacLeod, Woodside, and Raymond F. Ravizza, Cupertino, all of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 89,910, Aug. 24, 1987, abandoned, which is a continuation of Ser. No. 576,623, Feb. 3, 1984, abandoned, which is a continuation of Ser. No. 677,815, Apr. 16, 1976, abandoned, which is a continuation-in-part of Ser. No. 668,652, Mar. 19, 1976, abandoned. This application Nov. 25, 1988, Ser. No. 279,222
Int. Cl.[4] H04N 5/783
U.S. Cl. 360—10.3 57 Claims



1. In a magnetic tape playback apparatus of the type which has at least one transducing head operably supported by rotatable means for scanning a magnetic tape along a plurality of adjacent discrete parallel tracks oriented at an angle relative to the lengthwise direction of tape, the rotatable means including a movable means carrying said head and effecting movement of said head in opposite directions relative to a home position along a path generally transverse to the direction of said tracks, and including means for moving said head along said transverse path to accurately follow the track during playback, a method of providing playback of previously recorded information on said tracks at various tape transport velocities, said information having been recorded at a first tape transport velocity at a speed in a forward direction, comprising the steps of:

maintaining the speed of the rotation of said rotatable means substantially constant and in accordance with the head rotational speed maintained during recording;

adjusting the velocity of said tape being transported to a velocity other than said first velocity;

detecting a signal that is indicative of the transverse movement of the head being at least to a predetermined position at a predetermined time relative to the playback of each track; and

controlling the movable means to position the head to begin following the track subsequently to be played back, said track subsequently to be played back being determined by the detected signal at said predetermined time.

4,916,556

DISK DRIVE CONTROLLER

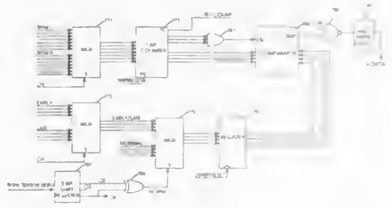
Wendell Sander, and Brian Sander, both of Campbell, Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Division of Ser. No. 55,443, May 28, 1987. This application Dec. 6, 1988, Ser. No. 280,665
Int. Cl.[4] G11B 5/09
U.S. Cl. 360—45 2 Claims

1. In an improved disk drive controller for controlling the transfer of data between a computer and a disk drive, said computer including a clock for generating clocking signals, an address bus and a data bus, said controller including read logic means for converting data received from a signal generated by the drive to data for placement on the data bus, and write logic means for converting data on the data bus to a signal for recording on magnetic media by the drive, the improvement wherein said read logic means includes means for processing the signal received from the drive to compensate for the effects

of peak shift and wherein said peak shift compensation means comprises:

(a) first counter means and second counter means for placing pulses at predetermined time intervals between transitions in said signal from said drive, said predetermined time intervals being determined by setting said first and second counter means with values generated by said computer as a function of the time between previous transitions in said signal from said drive, wherein said first counter means is set with a value corresponding to the shortest expected time between the next two transitions and the second counter means is set to a value greater than the shortest



expected time between the next two transitions and less than the maximum expected time between the next two transitions;

(b) bound detector means coupled to said first and second counter means for counting the number of pulses generated by said first and second counter means between transitions in said signal from said drive; and

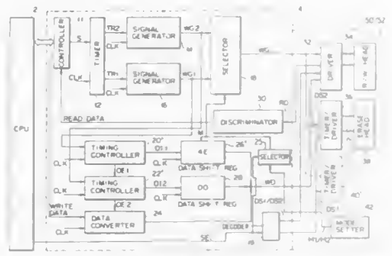
(c) first and second shift registers coupled to said bound detector means for storing the number of pulses generated by said first and second counters respectively to enable said bound detector means to generate peak shift compensated pulses from said signal from said drive.

4,916,557

METHOD OF SHARING VARIOUS TYPES OF MEDIUM DRIVES AND RECORDING/REPRODUCTION APPARATUS WITH MEDIUM CONTROLLER FOR REALIZING THE METHOD

Hiroshi Okamura, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 25, 1988, Ser. No. 160,409
Claims priority, application Japan, Feb. 27, 1987, 62-44523
Int. Cl.[4] G11B 5/09, 15/12
U.S. Cl. 360—48 27 Claims



1. A disk controller in a recording/reproduction apparatus adapted to be able to control various head types of medium drives, each of which performs a write operation in accordance with a write gate (WG) signal, comprising:

sync signal generating means for generating a sync signal from a read data (RD) signal input thereto;

write gate signal generating means responsive to said sync signal from said sync signal generating means, for selectively generating a first WG signal for a first medium drive (MD) and a second WG signal for a second MD of a different type from said first MD, and for selectively outputting one of said first and second WG signals as said WG signal for one of said first and second MDs in accordance with a mode signal input thereto; and

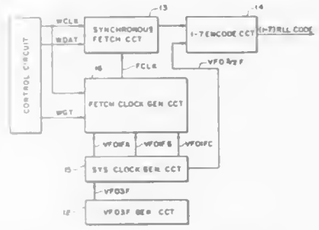
write data signal generating means responsive to said first and second WG signals from said write gate signal generating means and said mode signal input thereto, for selectively generating a first WD signal to output said generated first WD signal as a WD signal for said first MD, for selectively generating a second WD signal to output said generated second WD signal as said WD signal for one of said first and second MDs, and for generating a third WD signal from write data input thereto to output said generated third WD signal as said WD signal for one of said first and second MDs, said second WD signal being generated following generation of said first WD signal when said first WD signal is generated, and said third WD signal being generated following generation of said second WD signal.

4,916,558

CIRCUIT FOR FETCHING (1-7) RUN-LENGTH-LIMITED CODED WRITE DATA

Masahiro Nishimura, Yokohama; Fumiaki Nagakura, Kumagaya, and Hiroyuki Mase, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 19, 1988, Ser. No. 246,339
Claims priority, application Japan, Sep. 18, 1987, 62-232582; Sep. 18, 1987, 62-232583; Sep. 18, 1987, 62-232584
Int. Cl.[4] G11B 5/09
U.S. Cl. 360—51 20 Claims



1. A circuit for fetching run-length-limited (RLL) coded write data upon receiving a write clock signal having a fundamental frequency, a write gate signal, and write data, said circuit comprising:

triple frequency clock signal generating means for generating a triple frequency clock signal having a frequency three times the fundamental frequency of the write clock signal;

system clock signal generating means for receiving the triple frequency clock signal from said triple frequency clock signal generating means and for generating three clock signals, differing from each other by 120° in phase and having output states, and a first frequency divided signal formed by dividing in half the triple frequency clock signal;

fetching clock generating means for receiving the write gate signal, the write clock signal and the three clock signals and for generating a fetching clock signal synchronized with at least one of the three clock signals depending upon the output states of the three clock signals at the time of

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change of the write clock signal directly after the generation of the write gate signal;

synchronization and fetching means for performing a first synchronization and means for performing a first synchronization and fetching operation on the write data by the write clock signal to produce a first synchronized write data and for performing a second synchronization and fetching operation on the first synchronized write data by the fetching clock signal to produce a second synchronized write data; and

RLL encoding means for RLL encoding on the second synchronized write data from said synchronization and fetching means based on the first frequency divided signal from said system clock signal generating means.

4,916,559

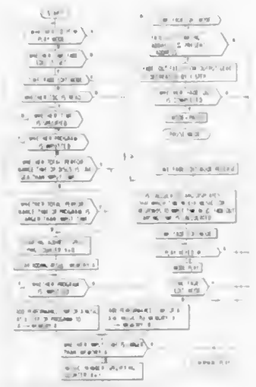
METHOD FOR FADING OUT RECORDED DATA AT END OF PREDETERMINED PERIOD

Koji Yamagishi; Naoki Masaki, and Nobuaki Hisamatsu, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 161,054, Sep. 26, 1988. This application Apr. 5, 1989, Ser. No. 333,507

Int. Cl.[4] G11B *5/27, 5/86*

U.S. Cl. 360—57 4 Claims



1. A data reproducing method comprising the steps of:

inputting in advance a predetermined input period of time;

calculating a period of time which elapses from a start of said input period of time until a time instant earlier by a predetermined period of time than an end of said input period of time;

reproducing a plurality of pieces of data recorded on a recording medium in a specified order;

determining during the reproduction of each of said pieces of data a sum of periods of time of reproduction from the start of reproduction of said pieces of data; and

when said sum of the periods of time of reproduction of said data reaches said period of time thus calculated, gradually decreasing an output level such that said output level is zero when said sum of the periods of time of reproduction of said data becomes equal to said input period of time.

4,916,560

RECORDING SPEED DETECTING APPARATUS

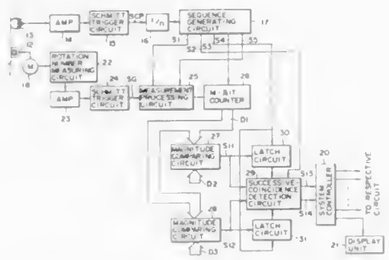
Shintaro Kawaguchi, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 24, 1988, Ser. No. 172,468

Claims priority, application Japan, Mar. 28, 1987, 62-74836

Int. Cl.[4] G11B *15/46*

U.S. Cl. 360—73.09 10 Claims



1. An apparatus for detecting the speed at which a recording medium was written comprising:

frequency ratio detecting means for detecting the ratio of the rotation frequency of a motor for driving a recording medium to the frequency of a reproduction control signal recorded with a constant frequency on the recording medium;

means, responsive to the frequency ratio detecting means, for determining a speed of the recording medium at the time of the recording operation, including at least one means for comparing the frequency ratio with at least one predetermined reference value;

storing means responsive to the determining means for time sequentially storing the determined speed;

cycling means for repeatedly activating the frequency ratio detecting means, determining means, and storing means; and

checking means, responsive to the recording speed determining means and to the storing means, for successively checking whether or not the speed determined in a preceding cycle and stored in the storing means coincides with the speed determined in the current cycle and detecting a recording speed at the time of recording operation based on the checking result.

4,916,561

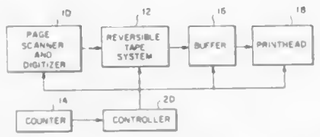
HARD COPY PRINTER HAVING MAGNETIC TAPE IMAGE STORAGE

Yee S. Ng, Fairport, and Eric K. Zeise, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 20, 1988, Ser. No. 246,599

Int. Cl.[4] G11B *15/48*

U.S. Cl. 360—74.1 13 Claims



1. Hard copy printing apparatus having magnetic tape digital storage capabilities, said apparatus being operable to print multiple copies of a stack containing a plurality of pages, said apparatus comprising:

means for acquiring digital data representative of the image contained on each page of the stack, including beginning and ending pages and first and second adjacent pages near the middle of the stack, said first adjacent page being positioned in the stack closer to the beginning page than said second adjacent page;

means for determining the number of pages in the stack;

a reversible magnetic tape system having a tape of predetermined length and a head assembly;

means for recording the digital image data of said beginning page at a first location on the tape, of said first adjacent page at a second location, of said second adjacent page at a third location, and of said ending page at a fourth location, said first and second tape locations being on the same recording track, said third location being substantially at the same distance on the tape as said second location but on a different track, and said fourth location being substantially at the same distance on the tape as said first location but on the same track as said third location;

means for reading said tape tracks in the same order in which they were recorded; and

means for sending the rad data to a means for printing.

4,916,562

MAGNETIC DISK STORAGE EQUIPMENT

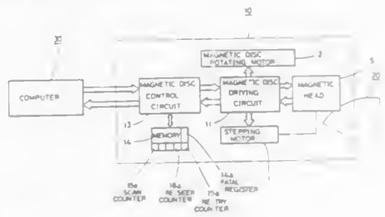
Takahiro Miwa; Yuji Kiyohara; Hiroshi Nishikawa, and Eiji Tanaka, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Continuation of Ser. No. 925,249, Oct. 31, 1986, abandoned. This application Mar. 17, 1989, Ser. No. 324,998

Claims priority, application Japan, Oct. 31, 1985, 60-244731; Nov. 19, 1985, 60-259140

Int. Cl.[4] G11B *5/596*

U.S. Cl. 360—77.06 1 Claim



1. Magnetic disc storage equipment for recording and reproducing signals on a magnetic disc, comprising:

a magnetic head provided on a head carriage;

a shifting bolt which is operably screwed with the head carriage to shift the magnetic head in a radial direction of the magnetic disc, said magnetic disc having recorded thereon recorded data on a respective predetermined number of divided sectors on a track;

a stepping motor so interlocked with the shifting bolt that the magnetic head is shifted or sidestepped for one track gap of the magnetic disc by the rotations of the stepping motor in response to a plurality of pulses;

shift-commanding means for commanding to shift the magnetic head to a first position which is seeked by rotations of the stepping motor by a number of steps corresponding to a desired track position, and to plural positions which are seeked by rotations of the stepping motor by a number of steps which are determined by said plurality of pulses corresponding to one track gap off both sides from said first position;

detecting means for detecting a number of sectors which are read by the magnetic head at said first position and at said plural positions together with scan numbers of the readable sectors;

averaging means for averaging the number of sectors detected by the detecting means and selecting an average position; and

adjust-commanding means for commanding to adjust the position of the magnetic head to said average position by rotations of the stepping motor for a write by the magnetic head.

4,916,563

MAGNETIC HEAD AND METHOD FOR THE PRODUCTION THEREOF

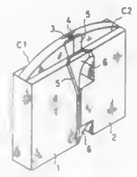
Masahiro Kawase, Chichibu, Japan, assignor to Canon Denshi Kabushiki Kaisha, Chichibu, Japan

Filed Dec. 8, 1987, Ser. No. 130,160

Claims priority, application Japan, Dec. 9, 1986, 61-293156

Int. Cl.[4] G11B *5/187*

U.S. Cl. 360—122 7 Claims



1. A magnetic head comprising:

a pair of core halves having magnetic-gap defining surfaces, disposed in an opposing and aligned relationship with a magnetic gap therebetween at least one of said magnetic-gap-defining surfaces being provided with a thin magnetic film, said core halves having a medium sliding surface on which a recording medium slides;

a groove, having a bottom surface, extending from said medium sliding surface along said magnetic-gap-defining surfaces, said groove defining the width of a track formed on the recording medium by said magnetic head;

a first nonmagnetic member made of a first nonmagnetic material, said first nonmagnetic material being engaged on the bottom surface of said groove; and

a second nonmagnetic member made of another nonmagnetic material, said second non-magnetic material being arranged on said first nonmagnetic member, thereby bonding together said pair of core halves, said pair of core halves further have cutout portions formed in said medium sliding surface to define the width of said medium sliding surface, said core halves being arranged so that a part of said first nonmagnetic member remains on said medium sliding surface and said second nonmagnetic member does not remain on said medium sliding surface.

4,916,564

CLEANING APPARATUS FOR A DISC DRIVE

Joseph F. Fritsch, Dunmore East, Ireland, assignor to Ryan Plastics Ireland Limited, Waterford, Ireland

Continuation of Ser. No. 884,048, Jul. 10, 1986, abandoned, which is a division of Ser. No. 671,742, Nov. 15, 1984, Pat. No. 4,622,617. This application Mar. 28, 1988, Ser. No. 174,213

The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.

Int. Cl.[4] G11B *5/91, 23/02*

U.S. Cl. 360—128 6 Claims

1. An apparatus for cleaning a read and/or write head of a drive unit for a jacketed flexible magnetic disc, comprising:

a. a jacket adapted to be inserted in said drive unit and having at least one cleaning access opening at a cleaning location;

b. an inner rotatable member positioned at a center location in said jacket so as to be engaged by a drive member of the drive unit to be rotated thereby;

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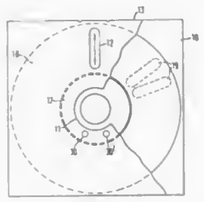
c. a cleaning member mounted in said jacket so as to be located at least partly at said cleaning location so as to be able to come into cleaning engagement with said read and/or write head, said cleaning member being movable



independently of said inner rotatable member in a manner that different portions of said cleaning member can be moved to said cleaning location to perform a cleaning function.

4,916,565

MAGNETIC TAPE CASSETTE HAVING IMPROVED CLOSURE MEANS

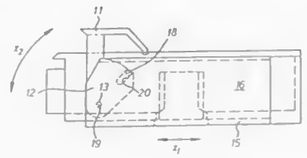
Rudolf Brener, Munich; Hubert Brunner, Weil; August Liepold, Munich; Albert Pertzsch, Munich, and Ludwig Zeroni, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 16, 1987, Ser. No. 133,526

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1986, 3643457

Int. Cl.[4] G11B *23/087*

U.S. Cl. 360—132 **7 Claims**



1. A magnetic tape cassette comprising

a two-part housing having an upper casing and a lower casing fixed together defining an opening, with the upper casing having cassette side walls and an upper surface,

a slide member in the cassette having side walls which side walls are parallel to the cassette side walls and are moveably engaged to the outside of the lower casing such that the slide member is slidable inwardly and outwardly in a direction parallel to the cassette side walls and toward and away from the opening,

at least one point of rotation peg mounted onto the exterior surface of the cassette side wall,

a closure member having a front flap with an upper end and at least one side wall with said closure member side wall positioned between the cassette side wall and the slide side wall and with the closure member side wall receiving the rotation peg and rotatable thereon so that the closure member is swivellably mounted in the cassette to move the front flap and open and close the opening,

a part of the slide side wall being adjacent to the closure member side wall,

at least one guide peg mounted onto the part of the slide side wall adjacent to the closure member side wall at any point not in that line with the rotation peg in the direction of movement in the slide member,

an elongated recess formed in the closure member side wall, the recess being engageable with the guide peg and oriented with its open end being directed away from the rotation peg so that the inward and outward sliding movement of the slide member swivels the closure member.

4,916,566

MAGNETIC TAPE CASSETTE WHICH AVOIDS FLANGE/HOUSING CONTACT

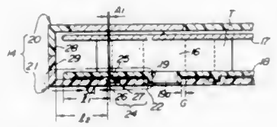
Kiyoshi Urayama, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 20, 1988, Ser. No. 208,770

Claims priority, application Japan, Jul. 14, 1987, 62-108001

Int. Cl.[4] G11B *23/02*

U.S. Cl. 360—132 **14 Claims**



1. A magnetic tape cassette comprising:

a tape reel being rotatable about its axis for receiving a tape, formed with at least a cylindrical drum and a flange radially extending from one end of said drum;

a housing defining a space for enclosing said tape reel, said housing having a first inner surface opposing the surface of said flange which faces away from said drum and a second inner surface perpendicular to said first inner surface;

means for limiting radial displacement of said tape reel within said space to maintain a required distance between the outer circumference of said flange and the respective opposing second inner surface of said housing;

said means including a first contact portion which projects from the surface of said flange facing away from said drum and has an essentially cylindrical outer peripheral surface coaxially arranged about said axis substantially midway between the perimeter of said flange and the central section of said flange, and a second contact portion which is disposed on said first inner surface of said housing and has an essentially cylindrical inner peripheral surface abutting said outer peripheral surface of said first contact portion so as to limit the radial displacement of said tape reel; and

whereby contact between the outer circumference of said flange and the respective opposing second inner surface of said housing is prevented.

4,916,567

STORAGE CASSETTE FOR A DISC-SHAPED INFORMATION CARRIER

Hermann Grobecker, Garbsen; Werner Heuer, Lehrte, and Alois Pichler, Isernhagen, all of Fed. Rep. of Germany, assignors to Philips & Dupont Optical Co., New York, N.Y.

Filed Jul. 26, 1988, Ser. No. 224,104

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1987, 3725616

Int. Cl.[4] G11B *23/02*

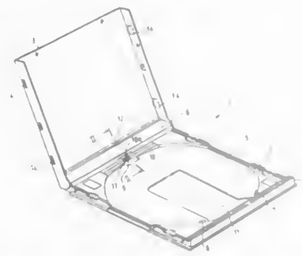
U.S. Cl. 360—133 **5 Claims**

1. A storage cassette for an information disc comprising:

a bottom tray section for receiving said information disc, having first and second rigid guides for limiting movement of said information disc in a first direction, and a movable, resilient guide opposite said first and second rigid guides, forming said disc into contact with said first and second rigid guides;

a cover section hinged to said bottom tray, enclosing said information disc in a closed position, and permitting insertion and withdrawal of said information disc when said cover section is moved to an open position; and

a latching element connected to said cover section for maintaining said resilient guide in position for retaining said



information disc between said first and second guides when said cover section is in said closed position, and for permitting said resilient guide to be deflected away from said first and second guides when said cover section is in said open position.

4,916,568

DECK FOR A RECORDING AND/OR REPRODUCING APPARATUS

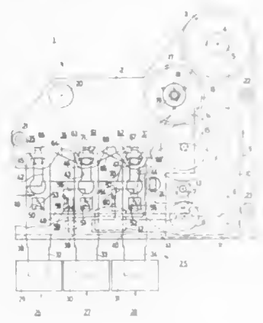
Bürgmann Gerhard, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 19, 1988, Ser. No. 234,022

Claims priority, application Austria, Oct. 19, 1987, 2757/87

Int. Cl.[4] G11B *15/00*

U.S. Cl. 360—137 **3 Claims**



1. A deck for a recording and/or reproducing apparatus, comprising a set of push-buttons for selecting the modes of operation of the apparatus, which set comprises three adjacent push-buttons whose juxtaposed push-button slides are each axially guided by a guide means, are movable from an off-position to an on-position against the force of springs acting on them and cooperate with a latching member which is guided so as to movable transversely of the push-button slides and, when a push-button is actuated, is moved out of a rest position against the force of a spring acting on said member, one spring acting on and being common to two of the three push-button slides, characterized in that a further spring, which is common to the third push-button slide and the latching member, acts on the third push-button slide and on the latching member.

4,916,569

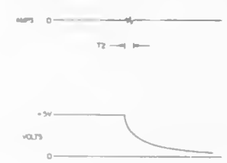
SHORT CIRCUIT PROTECTION FOR SWITCH MODE POWER SUPPLY

John G. Konopka, Barrington, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Nov. 4, 1988, Ser. No. 267,203

Int. Cl.[4] H02H *7/00*

U.S. Cl. 361—18 **8 Claims**



1. In a protection circuit for a switched mode power supply of the type having a high current output and including means for sensing input current, a pulse width modulator driving a transistor switch, and means for disabling the pulse width modulator when an input current overload is sensed including a source of reference voltage, a comparator coupled to said reference voltage source and a latch operated by the comparator for disabling the pulse width modulator, the improvement comprising:

means, including a diode coupled to said high current output, responsive to a large decrease in voltage at said high current output for overriding said input current sensing means and changing the voltage applied to said comparator by said reference voltage source to rapidly disable said pulse width modulator.

4,916,570

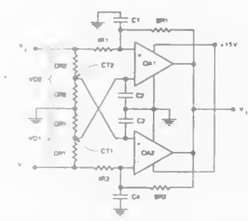
VOLTAGE COMPARATOR CIRCUIT FOR MONITORING A PROCESS OUTPUT VOLTAGE WITHIN A PRESET RANGE

James L. Dale, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed May 11, 1989, Ser. No. 350,753

Int. Cl.[4] H02H *3/00*

U.S. Cl. 361—86 **7 Claims**



1. A voltage comparator circuit for comparing a fluctuating voltage with a stable reference voltage comprising:

(a) a first operational amplifier (op amp), the non-inverting input of which is connected to said fluctuating voltage via a first input resistor,

(b) a second op amp, the inverting input of which is connected to said reference voltage via a second input resistor, and the output of which is tied to the output of said first op amp;

(c) a first voltage divider having a first center tap which is connected to the inverting input of said first op amp, to ground through a first grounding resistor, and to said reference voltage through a first direct connect resistor;

(d) a second voltage divider having a second center tap

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which is connected to the non-inverting input of said second op amp, to ground through a second grounding resistor, and to said fluctuating voltage through a second direct connect resistor;

(e) a first feed-back loop which routes current from the tied output of both op amps to the non-inverting input of said first op amp via a first gain-setting resistor; and

(f) a second feed-back loop which routes current from the tied output of both op amps to the inverting input of said second op amp via a second gain-setting resistor.

4,916,571

SPRAY-COATING DEVICE

Hans Stäheli, Gossau, Switzerland, assignor to Ransburg-Gema AG, Switzerland

Filed Jul. 20, 1988, Ser. No. 221,893

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1987, 3723944

Int. Cl.[4] H01T *19/00*

U.S. Cl. 361—227 13 Claims

1. A spray-coating device, comprising:

at least one electrode for electrostatic charging of coating material;

a transformer for producing an output coupled to the at least one electrode, the transformer having voltage and current waveforms associated therewith;

a voltage multiplier disposed between the transformer and the at least one electrode;

means for producing an alternating voltage for driving the transformer, the alternating voltage producing means including feedback means for detecting the phases of the voltage and current waveforms of the transformer and controlling the alternating voltage such that the voltage and current waveforms are in phase with one another;

the feedback means comprising a phase locked loop for producing an alternating voltage output of a frequency related to the phases of the voltage and current waveform and further comprising comparator means for sensing the voltage and the current waveforms of the transformer and for producing outputs for driving the phase locked loop, the comparator means including first and second comparators for sensing, respectively, the voltage and current waveforms; and

an analog switch arrangement having an analog output, input means for receiving a plurality of voltage levels, and selecting means, coupled to the phase locked loop and to the plurality of voltage levels for outputting an alternating, staircase, shaped, voltage at the analog output of the analog switch arrangement.

4,916,572

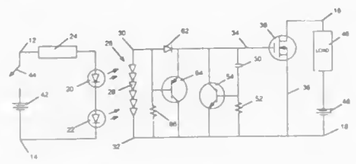
CIRCUITRY FOR PROTECTING AGAINST LOAD VOLTAGE TRANSIENTS IN SOLID STATE RELAY CIRCUITS

Ciro Guajardo, Harbor City, Calif., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Feb. 27, 1989, Ser. No. 316,406

Int. Cl.[4] H02H *3/20*

U.S. Cl. 361—91 9 Claims



1. A solid state relay circuit comprising a power semiconductor for the switching device, the power semiconductor having gate, source, and drain terminals, the source and drain terminals being adapted to be connected across a load circuit, switching means providing a normally non-conducting path between the gate and source terminals, and means for switching the switching device to a conducting condition in response to the appearance of voltage spikes in the output circuit having a vale sufficient to cause the power semiconductor to conduct before the power semiconductor can be caused to conduct.

4,916,573

CONTROL CIRCUIT FOR A CIRCUIT INTERRUPTER

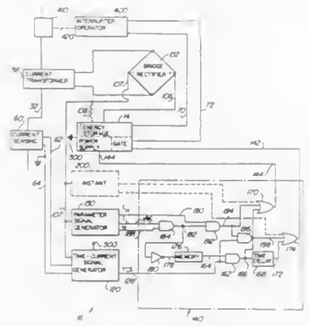
Joseph W. Ruta, Elmhurst, Ill., assignor to S & C Electric Company, Chicago, Ill.

Continuation of Ser. No. 791,195, Oct. 25, 1985, abandoned.

This application Jul. 15, 1988, Ser. No. 223,742

Int. Cl.[4] H02H *3/093*

U.S. Cl. 361—93 18 Claims



1. A control circuit responsive to the line current in an alternating-current line for providing a trip signal in the presence of overcurrents, the control circuit comprising:

signal generator means responsive to the line current for producing a control signal in the presence of overcurrents above a predetermined level and in accordance with a predetermined time-delay characteristic that exceeds the period of the alternating current and that is inversely related to the line current, said control signal being produced on a random basis with respect to the waveform of the alternating current; and

decision control means for predicting whether or not the line current may develop instantaneous levels that will exceed a predetermined instantaneous current level I_3, said decision control means comprising means responsive to the occurrence of said control signal and one or more parameters of the line current for thereafter providing a trip signal in response to said control signal when it has been predicted that the line current will not develop instantaneous levels that will exceed the predetermined instantaneous current level I_3, and when it has been determined that the line current may develop instantaneous levels that exceed I_3, being responsive to the occurrence of said control signal and one or more parameters of the line current for thereafter providing a trip signal at a suitable point in the waveform of the alternating current such that a trip signal is generated when the line current is below a predetermined instantaneous current level I_H, where I_3 is greater than I_H.

4,916,574

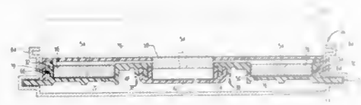
PANELBOARD BUS BAR ARRANGEMENT

Drew S. Hancock, Marietta, and Gregory P. Barner, Atlanta, both of Ga., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Jun. 6, 1989, Ser. No. 362,117

Int. Cl.[4] H01B *17/06*; H02B *1/20*

U.S. Cl. 361—361 10 Claims



1. A panelboard comprising:

an insulative base pan defining a top surface and a bottom surface, the top surface defining a first channel and a second channel and the bottom surface defining a third channel which includes openings passing through the base pan, wherein the first and second channels are substantially parallel and the third channel is intermediate the first channel and the second channel;

a first electrical conductor positioned within the first channel;

a second electrical conductor positioned within the second channel;

a third electrical conductor positioned within the third channel;

insulating means containing the third electrical conductor within the third channel;

an insulating shield member mountable to the top surface of the base pan providing insulation between the electrical conductors, the insulating shield member including a first opening to gain access to the first electrical conductor, a second opening to gain access to the second electrical conductor, a third opening to gain access to the third electrical conductor, a first divider separating the first opening from the second opening, and a second divider separating the second opening from the third opening; and

means fastening the insulating shield member to the base pan.

4,916.575

MULTIPLE CIRCUIT BOARD MODULE

Francis C. Van Asten, 296 Little John Dr., Circle Pines, Minn. 55014

Filed Aug. 8, 1988, Ser. No. 229,430

Int. Cl.[4] H05K *7/20*

U.S. Cl. 361—386 15 Claims

1. An improved standard electronic module (SEM) which comprises:

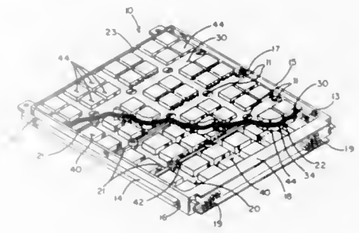
(a) a thermally conductive frame including end walls and side walls;

(b) a plurality of thermally conductive spaced ribs extending between said frame side walls;

(c) a first circuit board secured by a first securing means to said frame above said ribs between said frame side walls and said frame end walls;

(d) a second circuit board secured by a second securing means to said frame below said ribs between said frame side walls and said frame end walls;

(e) a plurality of first discrete electronic components connected to said first circuit board and positioned within spacings of said spaced ribs;



(f) a plurality of second discrete electronic components connected to said second circuit board and positioned within the spacings of said spaced ribs;

said plurality of ribs constituting means for providing vibration resistance and for conducting thermal energy generated by said plurality of first and second discrete electronic components to said thermally conductive frame.

4,916,576

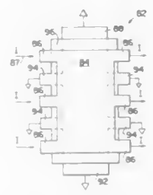
MATRIX CAPACITOR

Edward Herbert, Canton, and John D. Repp, Barkhamsted, both of Conn., assignors to FMTT, Inc., Canton, Conn.

Filed Feb. 27, 1989, Ser. No. 316,091

Int. Cl.[4] H05K *7/00*; H01R *13/66*

U.S. Cl. 361—393 19 Claims



1. A matrix capacitor for use at high frequencies, said capacitor comprising:

a first electrode defining an anode;

a second electrode defining a cathode;

a dielectric material;

said first and second electrodes being located adjavent to and in close proximity to one another and separated by said dielectric material thereby forming a capacitive element;

first means for connecting to said first electrode, said first connecting means being distributed along said first electrode and defining a multiple number of individual connection points with said first electrode, and

second means for connecting to said second electrode, said second connecting means being distributed along said second electrode and defining a multiple number of individual connection points with said second electrode.

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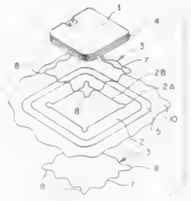
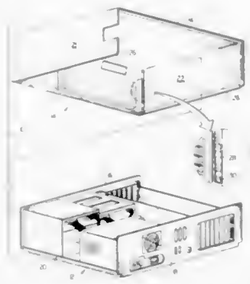
4,916,577
METHOD OF MOUNTING REMOVABLE MODULES
Bertram H. Dawkins, Northport, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Dec. 20, 1988, Ser. No. 286,833
Int. Cl.[4] H05K *9/00*
U.S. Cl. 361—417 9 Claims



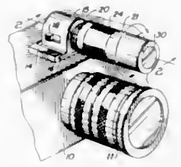
1. A system for mounting a module to a support member comprising:
a groove formed along the periphery of the module;
a flexible flange forming a boundary of a cutout in the support member for engaging the groove when the module is pushed into the cutout; and
continuous spring retainer means having undulating sides which expand when pushed over the module for allowing snap insertion of the retainer into the groove for overlying abutment with the flange;
thereby rigidifying the flange and securing the module to the support member.

4,916,578
PERSONAL COMPUTER CHASSIS CONNECTION AND METHOD
Thomas R. Mast, Austin, Tex., assignor to Compuadd Corporation, Austin, Tex.
Filed Nov. 14, 1988, Ser. No. 270,268
Int. Cl.[4] H05K *9/00*
U.S. Cl. 361—424 16 Claims



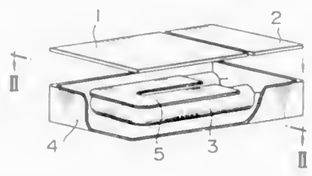
1. An improved connection for retarding the transmission of a radio frequency from between a base and a cover for an electronic device, comprising:
a plurality of L-shaped flanges; and
a plurality of U-shaped channels for receiving said flanges, said flanges and channels being integrally formed with one of said base and cover, to allow slidable connection of the cover to the base and to retard the escape of radio frequency.

4,916,579
GRADIENT INDEX ZOOM ILLUMINATOR
Robert A. Simms, Phoenix, Ariz., assignor to Murasa International, Long Beach, Calif.
Filed Jan. 26, 1989, Ser. No. 301,596
Int. Cl.[4] G03B *15/02*
U.S. Cl. 362—18 20 Claims



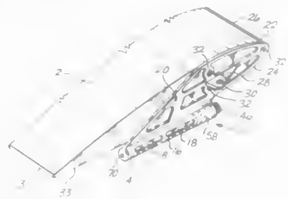
1. A gradient index zoom illuminator including in combination:
a housing having a light exit opening therein;
a light source mounted in said housing;
a power supply;
switch means selectively interconnecting and disconnecting said light source and said power supply;
a gradient index lens means having a central axis and mounted in said housing between said light source and the light exit opening in said housing, said light source located on the axis of said lens means; and
means for changing the relative distance between said light source and said lens to change the focus of light exiting from said light exit opening in said housing from a predetermined maximum divergence to a collimated beam of light produced by said light source.

4,916,580
BACK-LIGHT DEVICE
Toshihiko Sano, Ome, and Soichiro Ogawa, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 22, 1988, Ser. No. 247,650
Claims priority, application Japan, Sep. 24, 1987, 62-237139
Int. Cl.[4] G01D *11/28*
U.S. Cl. 362—29 18 Claims



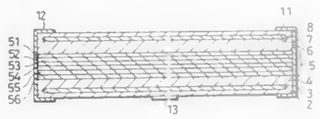
1. A back-light device comprising:
a lamp emitting visible light rays;
a diffusion board disposed on one side of said lamp in parallel to a lamp axis of said lamp in order to diffuse the emitted visible light rays;
a reflector disposed on another side of said lamp for reflecting the emitted visible light rays towards said diffusion board; and
a light transmission controlling film having a planar form in a shape of a projection of said lamp on said diffusion board, said film having a uniform light transmission coefficient and being disposed in parallel to said lamp axis between said lamp and said diffusion board in order distribute said brightness of said emitted visible light rays approximately uniformly over said diffusion board.

4,916,581
ROTOR BLADE ILLUMINATION DEVICE
Ricky J. Authier, 1327 Creso Rd. South, Spanaway, Wash. 98387
Filed May 4, 1988, Ser. No. 190,480
Int. Cl.[4] B64D *47/02*
U.S. Cl. 362—34 14 Claims



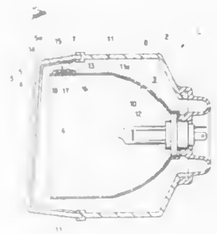
1. A device for providing illumination on a helicopter rotor blade, comprising:
a chemiluminescent light source, including an elongated translucent container tapering in cross-section from substantially one end to another and a chemiluminescent substance within said container; and
means for attaching said light source adjacent the outward end of said helicopter rotor blade such that said light source is viewable by an operator of said helicopter;
wherein said attaching means includes:
a housing portion having an elongated hollow space shaped to receive said container, and an end opening leading into said space for insertion and removal of said container to and from said space, said space decreasing in cross-section from said end opening to an opposite end such that said container is snuggly received therein and said end opening is directed substantially toward the rotor blade's direction of rotation, and
means for opening and closing said end opening to permit such insertion and removal,
said housing portion further having at least one aperture through a sidewall thereof to allow outward emission of light from said light source, and
a bracket portion attached to said housing portion, and bracket portion being shaped for attachment to said outward end of said rotor blade.

4,916,582
ELECTRONIC COMPONENT AND ITS PRODUCTION METHOD
Hisatake Okamura; Teruhisa Tsuru, and Tetsuo Taniguchi, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan
Filed Apr. 10, 1989, Ser. No. 335,258
Claims priority, application Japan, Dec. 20, 1988, 63-323116
Int. Cl.[4] H01G *4/10, 7/00;* H01P *1/20*
U.S. Cl. 361—321 21 Claims



1. An electronic component comprising:
an electronic component core having upper and lower main surfaces, said electronic component core including at least one core layer formed of a non-metal material, which has at least one conductive land forming an inductor on at least one main surface thereof;
a pair of intermediate layers, which are made of non-metal material and formed on both said upper and lower main surfaces of said electronic component core;
at least a pair of shielding electrode layers are out of connection with ground;
a pair of protective layers formed on top of said shielding electrode layers; and
input and output terminals formed on outside surfaces of said layers.

4,916,583
VEHICULAR HEADLAMP
Hidehiko Nagasawa, Kitawaki, Japan, assignor to Koito Seisakusho Company, Limited, Tokyo, Japan
Filed Dec. 27, 1988, Ser. No. 290,277
Claims priority, application Japan, Dec. 26, 1987, 62-330540
Int. Cl.[4] B60Q *1/04*
U.S. Cl. 362—61 10 Claims



1. A vehicular headlamp comprising:
a lamp housing having a front portion opened;
a lens covering the opening of the front portion;
a lamp bulb installed in the lamp housing for generating light when electrically energized;
a light reflector installed in said lamp housing for reflecting the light from said lamp bulb toward said lens;
angular position adjusting means for adjusting an angular position of said light reflector relative to said lamp housing;
a spirit level fixed to an outer surface of said light reflector to move therewith; and
a window structure defined by said lens, through which said spirit level is viewed from the outside of said headlamp, said window structure being positioned in the vicinity of said spirit level.

4,916,584
DISPLAY FOR USE IN COMBINATION WITH A BRAKE LIGHT IN THE REAR WINDOW OF AN AUTOMOBILE
Arnold B. Gustafson, 190 Cordaville Rd., Southboro, Mass. 01772
Filed Mar. 31, 1989, Ser. No. 331,180
Int. Cl.[4] G09F *21/04*
U.S. Cl. 362—61 5 Claims

1. A display comprising a sheet of transparent flexible plastic material having a top edge and a bottom edge, the sheet having on one side thereof directly above the bottom edge a drawing of the upper portion of the head of an animal and having on one side a layer of a non permanent adhesive, whereby the sheet may be affixed to the rear window of an automobile

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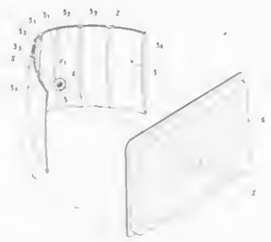
having a brake light in the rear window such that the brake light is aligned with the nose area portion of the head of the animal and removed from the rear window and then reinstalled at anytime, as desired.

4,916,585

HEADLIGHT DEVICE FOR VEHICLE

Naohi Nino, Shizuoka, Japan, assignor to Koito Seisakusho Co., Ltd., Shizuoka, Japan

Filed Apr. 3, 1989, Ser. No. 331,981
Claims priority, application Japan, Apr. 4, 1988, 63-82759
Int. Cl.[4] F21V *7/00*
U.S. Cl. 362—61 5 Claims



1. A headlight device comprising a reflective mirror having a reflective zone comprising principally a plurality of reflective elements of a generally vertically extending rectangular shape, and a light source arranged along an axis of irradiation which extends in the fore and aft direction of the reflective mirror, said reflective elements of said reflective zone being formed to have parabola-ellipse composite surfaces having the form of a parabola in vertical section and an ellipse in horizontal section, with the focus of the parabola being at a first focus of the ellipse.

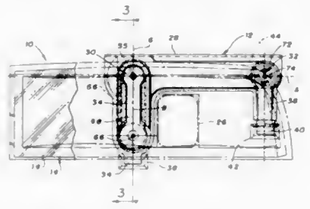
4,916,586

MOUNTING BRACKET FOR HEADLAMP ASSEMBLY

Paul D. Van Duyn, Anderson; Michael E. O'Shaughnessey, Fort Wayne, both of Ind., and Alfred M. Allen, Palm Harbor, Fla., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 237,805, Aug. 29, 1988, abandoned.
This application Jun. 26, 1989, Ser. No. 386,924
Int. Cl.[4] B60Q *1/04*
U.S. Cl. 362—61 4 Claims

1. A headlamp assembly for a motor vehicle including a lamp body and a mounting bracket, said mounting bracket supporting said lamp body for selective adjustable movement about a vertical aim axis and a horizontal aim axis and having a generally L-shaped configuration one leg of which supports a first longitudinally adjustable ball pivot and a fixed ball pivot the centers of both of which are located along said vertical aim axis, a second longitudinally adjustable ball pivot supported by the other leg of said mounting bracket with the center of said second ball pivot being located along said horizontal aim axis, socket means for connecting each of said ball pivots to said lamp body, and means on said mounting bracket for rigidly connecting said mounting bracket to said motor vehicle so that said mounting bracket maintains a stationary position during the selective adjustable movement of said lamp body about said vertical aim axis and said horizontal aim axis.

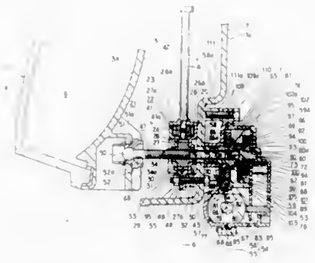


4,916,587

TILTING DEVICE OF VEHICLE HEADLIGHT

Hitoshi Hirose; Masahiro Kusagaya, and Nobumi Yokoyama, all of Shizuoka, Japan, assignors to Koito Seisakusho Co., Ltd., Tokyo, Japan

Filed May 5, 1989, Ser. No. 347,689
Claims priority, application Japan, May 6, 1988, 63-110118
Int. Cl.[4] B60Q *1/06;* F21M *3/18*
U.S. Cl. 362—66 4 Claims



1. A tilting device of a vehicle headlight having a tiltable member which is tiltably supported on a supporting member and is tilted in changing the direction of the light beam; the tilting device comprises:

an adjust rod being supported on the supporting member with the front end being connected to the tiltable member and a rear end of the adjust rod projecting rearward of the supporting member, said adjust rod being displaceable in the fore and aft directions when rotated, and

a drive mechanism for rotating said adjust rod and being mounted on the rear surface of the supporting member;

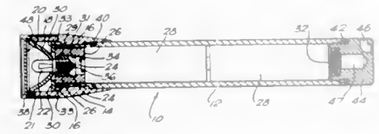
said drive mechanism is connected to said adjust rod and comprises an output shaft slidably and irrotably connected to the rear end of said adjust rod, detecting means for detecting the position of the adjust rod and disposed coaxially with the output shaft, drive means for rotating the output shaft and transmit means for transmitting the rotation of the output shaft to a rotatable portion of the detecting means.

4,916,588

A FLASHLIGHT WITH FOCUS AND SWITCH CONTROL

Tak Y. W. Chu, Hong Kong, Hong Kong, assignor to Akron Industrial Limited, Hong Kong, Hong Kong

Filed Aug. 1, 1988, Ser. No. 226,667
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—203 13 Claims



1. A torch comprising:

a battery housing;

a torch head, which torch head is relatively movable to said battery housing; and

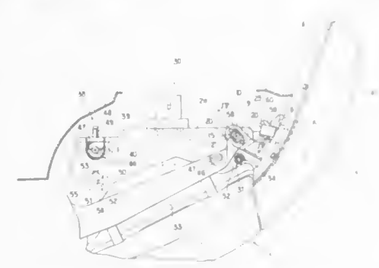
means supported on the inner surface of said torch head and which on relative movement of at least one battery in said battery housing cause movement of at least one battery in said battery housing away from a light bulb fixedly supported at the end of said battery housing.

4,916,589

MOUNTING STRUCTURE FOR AUTOMOBILE LAMP

Yasuhiro Nakamura, and Atsushi Iwase, both of Shizuoka, Japan, assignors to Koito Seisakusho Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1988, Ser. No. 247,777
Claims priority, application Japan, Sep. 22, 1987, 62-145537; Nov. 19, 1987, 62-177161; Sep. 10, 1988, 63-227282
Int. Cl.[4] F21V *21/14*
U.S. Cl. 362—250 21 Claims



1. A mounting structure of an automobile lamp which is mounted contiguous to and at one side of a headlight of a unitary movable type tiltably supported on a housing which is secured to a body of a vehicle, said automobile lamp having a lamp body, said structure comprising:

means for effecting tilting of said lamp body and said headlight as a unit in response to tilting movement of said headlight, said means comprising:

at least one connecting member connecting said lamp body and said housing;

resilient means engaging with a periphery of said connecting member, and

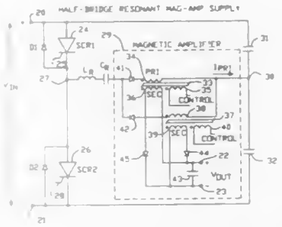
wherein when the headlight is tiltably moved, the resilient means is deformed by the at least one connecting member so as to move said lamp body.

4,916,590

SERIES RESONANT MAGNETIC AMPLIFIER POWER SUPPLY

Alan W. Petersen, Cupertino, Calif., assignor to Spectra-Physics, San Jose, Calif.

Filed Jul. 6, 1989, Ser. No. 376,119
Int. Cl.[4] H02M *3/335;* H02P *13/24*
U.S. Cl. 363—28 12 Claims



1 A series resonant power supply for supplying a regulated DC output in response to an unregulated DC input across a positive input terminal and a negative input terminal, comprising:

magnetic amplifying means, having a first primary terminal, a second primary terminal, a control input, and an output terminal, for generating a DC output voltage at the output terminal regulated in response to a control signal supplied to the control input and to current through the first primary terminal and the second primary terminal;

first switching means, having a first terminal coupled to the positive input terminal and a second terminal coupled to the first primary terminal, for switching current flow from the positive input terminal to the first primary terminal;

second switching means, having a first terminal coupled to the negative input terminal and a second terminal coupled to the first primary terminal, for switching current flow from the first primary terminal to the negative input terminal out of phase with respect to the first switching means;

means for providing a current path between the positive input terminal and the second primary terminal; and

means for providing a current path between the second primary terminal and the negative input terminal.

4,916,591

ILLUMINATED REGULATING DEVICE FOR VEHICLE VENTILATION

Günter Schiele, Augsburg, Fed. Rep. of Germany, assignor to Hoerauf & Kohler KG, Augsburg, Fed. Rep. of Germany

Filed Jul. 21, 1989, Ser. No. 383,937
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1988, 8815072[U]
Int. Cl.[4] G01D *11/28*
U.S. Cl. 362—74 5 Claims

1. Illuminated regulating device for operating a ventilation arrangement or the like in a motor vehicle, with at least one regulating wheel rotatable about its axis, with several light outlets arranged stationarily in the vicinity of the regulating wheel, with a movable light outlet provided at the circumference of the regulating wheel and with a common light source, wherein the light outlets are formed by inserts of clear, rigid plastic and are connected to the common light source by light conducting elements made of clear plastic with total internal reflection, characterized in that all stationary light outlets (13*b*, 14*b*) are formed at the ends of arms (13*a*, 14*a*) of a single-piece light conducting insert (13, 14) with total internal reflection made of clear, rigid plastic, which exteds from the light source (16, 17) to the light outlets (13*b*, 14*b*), said light conducting insert (13, 14) is provided with a lateral light outlet surface (13*d*, 14*d*) in the region of the axis of rotation (A) of the regu-

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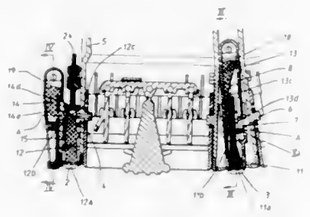
lating wheel (2, 3), and in the regulating wheel (2, 3) is provided a single-piece light insert (11, 12) with total internal reflection made of clear, rigid plastic, which extends from the movable light outlet (11*a*, 12*a*) to the region of the axis of



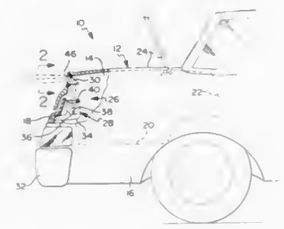
rotation (A), at the radially outer end of which is formed the light outlet (11*a*, 12*a*) and at the radially inner end of which is provided a light inlet surface (11*b*, 12*b*) extending in a radial plane and opposite the light outlet surface (13*d*, 14*d*).

4,916,592

CENTER HIGH MOUNTED STOPLIGHT

Michael F. Sultan, Troy, and Michael J. O'Rourke, Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 17, 1989, Ser. No. 394,916
Int. Cl.[4] B60Q *1/26*
U.S. Cl. 362—80 **3 Claims**



1. In combination with a motor vehicle body the rear end of which is provided with a trunk adapted to be closed by a deck lid supported for pivotal movement about a horizontal axis, a brake light mounted in said trunk for projecting a beam of light in an upward direction, and an optical coupler supported by said deck lid above said brake light for intercepting said beam of light and causing said beam of light to be reflected in a substantially horizontal direction outwardly rearwardly from said deck lid when said deck lid is in a closed position and said brake light is energized.

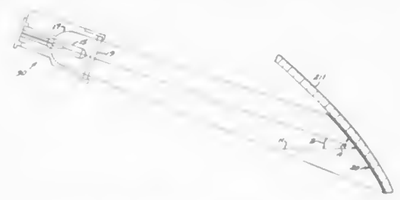
4,916,593

REMOTELY ILLUMINATED TRANSPARENT HOLOGRAPHIC STOPLIGHT FOR AUTOMOBILES

Gaylord E. Moss, Marina del Rey; John E. Wreede, Monrovia; Kevin Yu, Temple City, and Ronald T. Smith, Redondo Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 4, 1989, Ser. No. 293,927
Int. Cl.[4] B60Q *1/26*
U.S. Cl. 362—80.1 **5 Claims**

1. A holographic automobile stoplight system comprising:
a hologram having a recorded image of an automobile stoplight secured adjacent to an automobile rear window; and
illumination means located out of the driver's rearward field of view and forward of said hologram for illuminating said hologram which produces in response to the illumination



a holographic image of said recorded image that is visible from behind the automobile.

4,916,594

CIRCUIT-PROTECTED PORTABLE POWER PACK

Robert W. Headley, 11020 Walpole Rd., Crooksville, Ohio 43731

Filed Dec. 30, 1988, Ser. No. 292,016
Int. Cl.[4] F21L *15/14*
U.S. Cl. 362—108 **26 Claims**

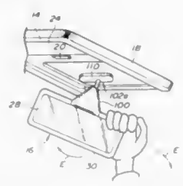
1. A circuit-protected power supply comprising:
a. a power pack;
b. a first circuit connected to said power pack;
c. a first circuit breaker incorporated in said first circuit;
d. a second circuit connected to said power pack;
e. a second circuit breaker incorporated in said second circuit; and
f. a means for supporting said power pack on a user.

4,916,595

AUTOMOTIVE CABIN LIGHT UNIT WITH VANITY MIRROR

Masao Naruke, and Hideyuki Hayashi, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 3, 1988, Ser. No. 266,768
Claims priority, application Japan, Nov. 16, 1987, 62-287523
Int. Cl.[4] F21V *33/00*; B60Q *1/00*
U.S. Cl. 362—142 **10 Claims**



3. A cabin light unit for an automotive vehicle comprising:

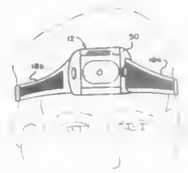
a base plate fixed in the vehicular compartment;
a light section installed on the base plate, said light section having a light source for directing light into the vehicular compartment, and a light lens for covering the light source; and
a mirror section having a vanity mirror, a mirror holder for holding the vanity mirror, and a stay member for connecting said mirror holder to said base plate, one end of the stay member being pivotably supported on said base plate, and the other end of the stay member being pivotably connected to said mirror holder, said mirror holder being movable between a first position in which said vanity mirror is arranged essentially parallel to said base plate, and a second position in which said vanity mirror is arranged essentially perpendicularly to said base plate, said stay member being comprised of a first stay segment which is supported on the base plate so as to be pivotable around a first axis parallel to the base plate, and a second stay segment which supports said mirror holder to allow the holder to rotate around a second axis parallel to the first axis, said second stay segment engaging said first stay segment so as to be rotatable around a third axis perpendicular to the first and second axes.

4,916,596

CONVERTIBLE FLASHLIGHT

Raymond L. Sharrah, Collegeville, Pa.; Hari Matsuda, Evanston, and Craig Cors, Aurora, both of Ill., assignors to Steamlight, Inc., Norristown, Pa.

Filed Jan. 5, 1989, Ser. No. 293,874
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—190 **11 Claims**



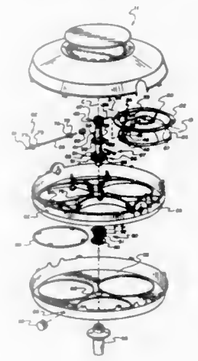
1. A flashlight that is convertible between a hand-held form and a body-mountable form, said flashlight comprising:
a head assembly including a light bulb mounted therein for casting light from said head assembly when energized;
a body assembly operatively connected to said head assembly, said body assembly having a first form suitable for grasping by hand, and a second form suitable for mounting on a person's body,
said body assembly comprising a pair of articulated arm assemblies each pivotally connected at one end to said head assembly such that the free ends of said arm assemblies can swing away from each other to an open position to form a yoke-like device, and toward each other to a closed position to form a handle,
each arm assembly comprising a pair of pivotally coupled together arm segments, each of said arm segments holding a power cell and flexible hinge leaf means intermediate adjacent arm segments that are pivotally coupled together to provide an electrical circuit between power cells in the arm segments;
means for retaining the flashlight on a person's body when said body assembly is in the second form, and
the said means for retaining comprising adjustable elastic strap means to provide a connection between the free end of the arm assemblies, said strap means being adapted to encircle a body part for retaining said body assembly on the body part.

4,916,597

LIGHTHEAD ASSEMBLY

Leonard L. Hallings; Donald W. Bramer, and Bruce A. Sanborn, all of Rochester, N.Y., assignors to MDT Corporation, Rochester, N.Y.

Filed Mar. 6, 1989, Ser. No. 319,047
Int. Cl.[4] F21S *1/14*
U.S. Cl. 362—233 **14 Claims**



1 A lighthead assembly, comprising a lighthead with:
a central axis;
a multiplicity of peripheral pods, each including a lamp, said peripheral pods being mounted within said lighthead symmetrically around said central axis on pivot mounts, said peripheral pods being constructed and arranged so that when said lighthead is energized, said peripheral pods produce peripheral light beams originating symmetrically with respect to said central axis, said pivot mounts permitting displacement of said peripheral pods within a range of pivotal movement, whereby the peripheral light beams originating from said peripheral pods may be caused to intersect said central axis at selected locations corresponding to selected amounts of displacement within said range of movement;
coordination means operably associated with said peripheral pods, constructed and arranged to coordinate the pivotal movement of said peripheral pods so that all of said peripheral light beams simultaneously intersect said central axis at any said selected location throughout said range of movement;
said coordination means including a cylindrical surface rotatably mounted within said lighthead about an axis of rotation approximately parallel said central axis, said cylindrical surface element carrying camming surface means in the form of an inclined spiral surface; and
reaction means, operably associated with each of said peripheral pods and said camming surface means to effect synchronized pivoting of said peripheral pods in a first direction as said cylindrical surface element is rotated clockwise and in a second direction, opposite said first direction, as said cylindrical surface element is rotated counterclockwise;
first handle means parallel said central axis coupled to, and constituting first means for rotating, said cylindrical surface element;
drive means, mechanically coupled to, and constituting second means for rotating, said cylindrical surface element; and
second handle structure external said lighthead, mechanically coupled to said drive means and constituting means for actuating said drive means.

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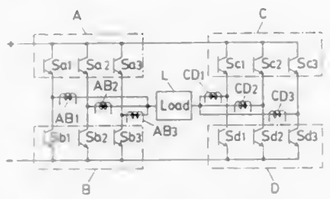
4,916,598

APPARATUS FOR DISCERNING FAULTY SWITCHING DEVICE

Shinichi Takase, Ebina, and Masayuki Ishii, Yokohama, both of Japan, assignors to Neturen Company Limited, Tokyo, Japan

Filed May 4, 1989, Ser. No. 347,820
Int. Cl.[4] H02H *7/125*
U.S. Cl. 363—55 **4 Claims**



1. An apparatus for detecting a faulty switching device of a current-supply type full-bridge inverter having a plurality of arms, each arm including a plurality of parallel connected switching devices, each of said plurality of switching devices of one arm being series connected to a corresponding switching device of one other arm, said apparatus comprising:

first and second current transformer means for outputting first and second detected current valves, said first current transformer having means for connection to one of the series connected switching devices and to a load, said second current transformer having means for connection to another one of the series connected switching devices and to the load;

a differential amplifier means, connected to said first and second transformer means, for subtracting said first and second detected current values, and for outputting a subtracted signal in accordance with the thus subtracted first and second detected values; and

a comparator means, connected to said differential amplifier means, for comparing said subtracted signal with a reference value, and for outputting a first detection signal when said subtracted signal and said reference value are the same, and for outputting a first detection signal which is different from said first detection signal when said subtracted signal and said reference value are different.

4,916,599

SWITCHING POWER SUPPLY

John C. Traxler, and Richard C. Whitham, II, both of Sarasota, Fla., assignors to HyperPower, Inc., Sarasota, Fla.

Filed Mar. 29, 1989, Ser. No. 329,956
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—65 **14 Claims**

1. A switching power supply for providing a regulated DC power output, comprising:

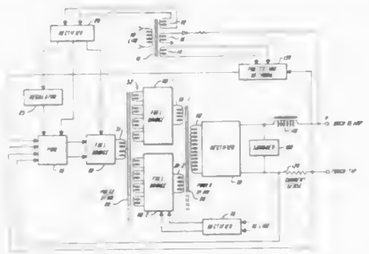
means for producing an input signal representative of a desired DC power output to be supplied by said switching power supply,

a pulse-width modulator (PWM) circuit responsive to said input signal which produces a pulse-width modulated (PWM) output signal with its pulse width varying as a function of the said input signal;

a plurality of switching means operating in parallel and each having at least one signal input and at least one AC power output;

power transformer means having a core, at least one primary winding, and at least one secondary winding, each primary winding being connected to said AC power output of an associated one of said switching means, said PWM circuit and said switching means producing an AC signal across said power transformer means primary windings, said power transformer being characterized by a finite mutual inductance between said primaries to accommodate variations in the operation of said plurality of switching means; and

means for magnetically coupling said PWM circuit to said plurality of switching means to operate said switching means in response to said PWM output signal, said mag-



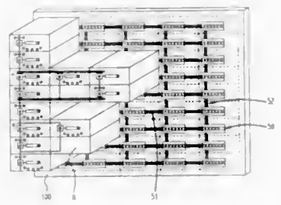
netic coupling means including means for controlling circulating electrical energy in said magnetic coupling means and said switching means to reduce timing uncertainty in the switching of said plurality of switching means to a level that assures a substantially synchronous operation of plurality of said switching means.

4,916,600

MODULAR DEVICE FOR CONTROLLING INDUSTRIAL PROCESSES

Michell Ropelato, 22/24, rue Marceau, F-92170 Vanves, France

Continuation of Ser. No. 236,083, May 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 588,137, Feb. 6, 1984, Pat. No. 4,771,374. This application May 22, 1989, Ser. No. 355,058
Claims priority, application France, Jun. 4, 1982, 8209755
Int. Cl.[4] G05B *19/00*
U.S. Cl. 364—130 **12 Claims**



1. Device for controlling an industrial process, regrouping as a whole the functions of the type necessary for the processing of the action of one single activator, said control device comprising a module comprising an integral collection of primary stages required for directing the functional sequences of said activator, said integral collection comprising a decision mechanism (A) depending on an incident order and a condition (C0), cooperating with an associated action (AS) driver (D), wherein said driver (D) comprises:

an order transmission subunit (D1) adjusted to subordinate the transmission of a signal to authorize the engagement of the associated action from decision mechanism (A) to an outside event (K);

an action subunit (D2) adjusted to subordinate the order to engage the associated action to validation condition (C0),

an alarm subunit (D3) adjusted to detect the presence of the incident order and validation condition (C0), advantageously comprising a delay component (R2) in order to produce an alarm and/or switching signal depending on whether or not condition (C0) is present before a predetermined period of time after the incident order arrives elapses;

a delay subunit (D4) adjusted to defer the acceptance of the incident order by decision mechanism (A);

a reset subunit (D5) adjusted to reset the device to its resting state, selectively simultaneously with the transmission of the stage signal by the control device to one or a plurality of other control devices, either as a result of a signal originating from the one or the plurality of other control devices or of outside occurrences;

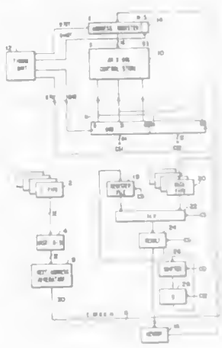
a connector subunit of one or a plurality of parts designed to establish links (5, 6, 7, 8) for exchange of a first set of various emitted or received signals (LVZ, ZAV, OPV, LVO, SSG, ZSG, SSD, CIG, ZIG, CID, ZID, LPZ, ZPP, OAP, LPO) with a contiguous identical control device as well as other links (9, 12) for exchange of a second sset of signals (ZAX, CPXAV, CPXAP AL, AG, AR, K, ZPX, AX) with other identical control devices.

4,916,601

MEANS FOR TRANSFERRING FIRMWARE SIGNALS BETWEEN A CONTROL STORE AND A MICROPROCESSOR MEANS THROUGH A REDUCED NUMBER OF CONNECTIONS BY TRANSFER ACCORDING TO FIRMWARE SIGNAL FUNCTION

Richard P. Kelly, Nashua, N.H.; Jian-Kuo Shen, Belmont, Mass.; Robert V. Ledoux, Litchfield, N.H., and Chester M. Nibby, Jr., Beverly, Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Dec. 19, 1988, Ser. No. 286,581
Int. Cl.[4] G06F *9/22*
U.S. Cl. 364—200 **4 Claims**



1. In a data processing system having a microprocessor means to perform operations in response to instructions and a separate control store means for storing firmware signals for controlling operations of the microprocessor wherein there are firmware signals corresponding to each of the instructions, means for transferring the firmware signals from the control store to the microprocessor means, comprising:

clocking means for generating a first cyclic timing signal defining cycles of operation and a second cyclic timing signal defining a second half cycle in each cycle of operation,

address generator means for generating control store address signals wherein each control store address signal corresponds to an instruction and identifies corresponding operations to be performed by the microprocessor means during each of the cycles of operation,

control store means for storing the firmware signals wherein the firmware signals corresponding to each of the instructions are comprised of

a first plurality of firmware signals representing full cycle operations to be performed during each of the cycles of operation, and

a second plurality of firmware signals representing half cycle operations to be performed during the second half cycles of the cycles of operations, wherein

during each cycle of operation the control atore means in responsive to the address signal corresponding to the present instruction and, and

to the second timing signal for reading out the corresponding first plurality of firmware signals, and

to the next first timing signal for reading out the second plurality of firmware signals, and

in the microprocessor means,

pin connector means connected from the control store means for receiving the first and second pluralities of firmware signals, wherein

the number of individual pin connectors is equal to the larger of the first and second plurality of firmware signals, and

less than the number of firmware signals corresponding to an instruction,

first register means connected from the pin connector means and responsive to the second timing signal during each previous cycle of operation for receiving the first plurality of firmware signals corresponding to the present instruction and providing the first plurality of firmware signals to the microprocessor means during the entire cycle of operation, and

second register means connected from the pin connector means and responsive to the first timing signal during each cycle of operation for receiving the second plurality of firmware signals corresponding to the present instruction and providing the second plurality of firmware signals to the microprocessor means during the second half cycle of the cycle of operation,

the microprocessor means being responsive to the first and second plurality of firmware signals to perform the full and half cycle operations corresponding to the present instruction.

4,916,602

MICROCODE CONTROL SYSTEM IN A MICROCOMPUTER CAPABLE OF BRANCHING TO DIFFERENT MICROCODE ROUTINES

Sakae Itoh, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 16, 1987, Ser. No. 97,250
Claims priority, application Japan, Sep. 20, 1986, 61-222768
Int. Cl.[4] G06F *3/00, 9/22*
U.S. Cl. 364—200 **5 Claims**

1. Apparatus for use in a microcomputer operable under microcode control for controlling the branching of microcode sequences, said microcomputer including a memory for storing microcode and a branch controller responsive to a clock signal for issuing an address signal to said memory for specifying the address of microcode to be executed, said memory providing a branch control signal to said branch controller indicating the presence or absence of branch instructions in said microcode sequences, said apparatus being characterized in that:

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said branch controller is structured and arranged to provide a provisional address to said memory in a first clock period for the next sequential code in a microcode sequence assuming no branch is indicated, said address being provided prior to determining the presence of a branch instruction;

said branch controller includes branch information incorporation means for incorporating branch information into said provisional address, said incorporation means being structured and arranged to change the provisionally provided address, in a subsequent clock period, to reflect the address of the next microcode in a branched sequence whenever said branch control signal indicates a branch instruction is present; and

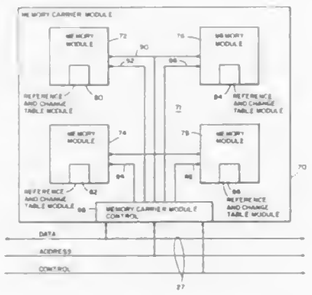
said branch control means provides said changed address to said memory in said same subsequent clock period.

4,916,603

DISTRIBUTED REFERENCE AND CHANGE TABLE FOR A VIRTUAL MEMORY SYSTEM

Robert P. Ryan, Marlborough, and Kin L. Cheung, North Andover, both of Mass., assignors to Wang Labortatories, Inc., Lowell, Mass.

Filed Mar. 18, 1985, Ser. No. 170,483
Int. Cl.[4] G06F *12/08, 12/06*
U.S. Cl. 364—200 **25 Claims**



1. Reference and change table storage means for a virtual memory data processing system for recording an occurrence of an access to and a type of access to a specific physical address location within a physical system memory means, the physical system memory means being organized into n predetermined numbers of blocks each comprising a plurality of physical memory address locations, the n predetermined numbers of blocks of the system memory means being partitioned into one or more memory units coupled to a data processing system bus wherein n is a positive integer, the data processing system bus including a physical system address bus, a system data bus and a system control bus, the reference and change table storage means comprising:

for each of the memory units

means for storing data, said means for storing having a number of storage locations at least equal to a number of blocks corresponding to the memory unit;

means for determining which one of said blocks is specified for access, said determining means being coupled to said physical system address bus and responsive thereto;

means, coupled to said system control bus and responsive to an operation of said determining means, for storing data at a specific storage location within said data storing means, said specific storage location corresponding to the block specified for access, the stored data being indicative of at least the occurrence of the access to the block and also if the access was a data write type of access;

means, responsive to a first type of access by the data processing system, for outputting to predetermined signals lines of the system data bus a content of a specific storage location within said data storing means; and

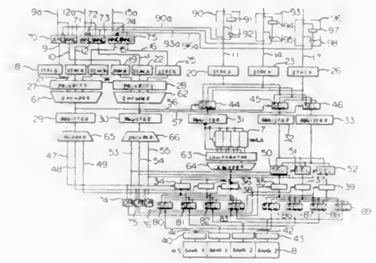
means, responsive to a second type of access by the data processing system, for storing data at a specific storage location within said data storing means to indicate, for the corresponding block, a nonaccessed condition.

4,916,604

CACHE STORAGE APPARATUS

Akio Yamamoto, and Kanji Kubo, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 24, 1988, Ser. No. 211,451
Claims priority, application Japan, Jun. 26, 1987, 62-159350
Int. Cl.[4] G06F *12/08*
U.S. Cl. 364—200 **4 Claims**



1. A cache storage apparatus which copies and stores a part of data of a main storage and is accessed in accordance with an access request from a plurality of access requestors, said cache storage apparatus comprising:

a cache storage means having a plurality of storage areas for copying and storing a part of data of said main storage in said plurality of storage areas, said stored data in a manner that each of said storage areas has each having a predetermined storage unit;

a cache directory means for storing access information of data to be stored in said cache storage means;

judgement means for judging access requests from said plurality of access requestors such that in consecutive access requests from the same requestor, if a storage unit of a succeeding access request is the same as that of a preceding access request, said succeeding access request is judged as a same storage unit request, and if not, said succeeding request is judged as an ordinary request, and a first access request from each requestor is judged as said ordinary access request;

search means responsive to said ordinary access request judged by said judgement means for searching said cache directory means to read access information on said cache storage means; and

stack means for storing said read-out access information for each requestor and accessing said cache storage means in accordance with said stored access information; wherein

if an access request from a requestor is judged as said same storage unit access request by said judgement means, said search means does not search said cache directory means but actuates said stack means to read therefrom said access information of said preceding access request of said requestor, and said cache storage means is accessed in accordance with said read-out access information.

4,916,605

FAST WRITE OPERATIONS

Brent C. Beardsley, Tucson, Ariz.; Michael D. Canon; Malcolm C. Easton, both of San Jose, Calif.; Michael H. Hartung, Tucson, Ariz.; John H. Howard, San Jose, Calif., and Robert H. Vosacek, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 593,747, Mar. 27, 1984, abandoned. This application Aug. 31, 1987, Ser. No. 91,406
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **15 Claims**

1. In a data processing system having a host system, a controller attached to said host system, and a plurality of data storage devices connected to said controller, said controller including a cache, a nonvolatile storage, and a memory containing a status table, said controller comprising attaching means for said plurality of data storage devices, each of said data storage devices having a device status track having a device identification number and controller identification number recorded thereon, said status table in said memory comprising status information on said nonvolatile storage, said cache, a fast write condition indicating a delayed writing of data stored in said nonvolatile storage to one of said data storage devices when active, and a device identification number and a controller identification number of each of said data storage devices, a method of performing a fast write operation comprising the steps of:

accepting a write request from said host for writing data to one of said data storage devices;

checking said status table to determine if said nonvolatile storage is available, if said cache is active, and if said fast write condition is active;

if said nonvolatile storage is available, said cache is active and said fast write condition is active, then storing duplicate copies of said data in said nonvolatile storage and said cache;

signalling said host that a write operation completed successfully as soon as said duplicate copies of said data are successfully written to said nonvolatile storage and said cache; and

writing said data stored in said nonvolatile storage to one of said data storage devices at a later time;

but if either said nonvolatile storage is unavailable or said fast write condition is inactive, then immediately destaging data stored in said cache to one of said data storage devices; and

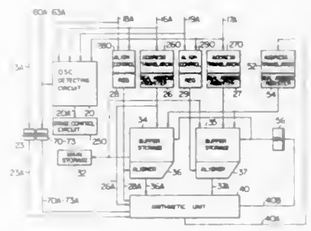
in the case where said cache is inactive, then immediately destaging data stored in said nonvolatile storage to one of said data storage devices.

4,916,606

PIPELINED PARALLEL DATA PROCESSING APPARATUS FOR DIRECTLY TRANSFERRING OPERAND DATA BETWEEN PRECEDING AND SUCCEEDING INSTRUCTIONS

Akira Yamaoka, Hadano; Kenichi Wada, Zama; Kazunori Kuriyama, Hadano, and Yoichi Shintani, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 627,922, Jul. 5, 1984. This application Jul. 20, 1987, Ser. No. 75,528
Claims priority, application Japan, Jul. 8, 1983, 58-123246
Int. Cl.[4] G06F *9/34, 9/38, 9/26*
U.S. Cl. 364—200 **12 Claims**



1. A data processing system for processing instructions in a pipelined manner, including processing a preceding instruction which provides for writing of operand data resulting from the processing of said preceding instruction into a first data storage and processing a succeeding instruction which provides for reading of operand data from the first data storage, comprising:

a first data storage;

an operation unit connected to said first data storage said operation unit performing an operation on input data stored in said first data storage;

a second data storage connected to said operation unit for holding operand data resulting from an operation thereby;

first control means, connected to receive instructions in succession, including a first instruction which requires reading of first operand data from a first storage region, of the first data storage, for detecting whether there is a second instruction already under processing which requires writing of second operand data obtained as the result of processing of the second instruction into a second storage region of the first data storage and for detecting a condition when the first storage region is the same as or part of the second storage region said condition being detected by comparing a length and end address of the first storage region as designated by said first instruction and a length and end address of the second storage region as designated by said second instruction; and

second control means, connected to said first control means and said second data storage for receiving a signal indicating detection of said condition by said first control means, for transferring the second operand data resulting from the processing of said second instruction from said second data storage to said first control means for use in the processing of the first instruction.

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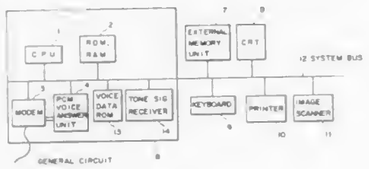
4,916,607

COMPUTER FOR EXECUTING A PROCESS CONTROL PROGRAM AND A COMMUNICATION CONTROL PROGRAM IN PARALLEL

Hiroo Teraichi, Fujisawa; Naoshi Inoue, Tokyo; Yoji Furuya, Inagi, and Shigehiro Kadota, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1987, Ser. No. 103,304
Claims priority, application Japan, Oct. 2, 1986, 61-235951
Int. Cl.[4] G06F *9/06*; H04M *11/00*
U.S. Cl. 364—200 14 Claims



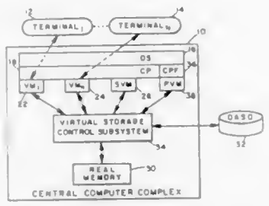
1. A computer, comprising:
process means for effecting a data process;
means for effecting data communication through a communication line;
means for effecting voice message communication through the communication line;
means for detecting a request for communication from the communication line;
a memory storing both a program from controlling said process means and a program for controlling said data communication means and said voice message communication means;
control means for controlling said process means, and said data communication means and said voice message communication means in accordance with the programs of said memory,
wherein said control means executes said data and voice message communication means controlling program in response to a detection signal from said detection means, and wherein upon receipt of the detection signal from said detection means during the execution of the process means controlling program, said control means alternately executes the process means controlling program and the data and voice message communication means controlling program so that said process means controlling program and said data and voice message communication means controlling program are executed in parallel.

4,916,608

PROVISION OF VIRTUAL STORAGE RESOURCES TO AN OPERATING SYSTEM CONTROL PROGRAM

Steven S. Shultz, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 30, 1986, Ser. No. 869,084
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 4 Claims



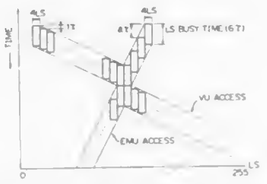
1. A method for dynamically providing virtual storage resources to a computer operating system control program controlling the concurrent execution of multiple virtual machines on a computing complex with a virtual storage facility shared by said virtual machines, comprising the steps of:
requesting virtual storage resources for supporting a control program processing requirement; and
in response to a control program virtual storage resource request:
establishing a non-dispatchable, pseudo-virtual machine control block including virtual storage resource linkages; and
devoting virtual storage resources to the processing requirement and connecting the devoted resources to the storage resource linkages of the devoted resources machine control block.

4,916,609

DATA PROCESSING SYSTEM FOR PROCESSING UNITS HAVING DIFFERENT THROUGHPUTS

Akihiko Hoshino, Mitaka; Mikio Itoh, Yokohama, and Nobuhiko Kuribayashi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 11, 1986, Ser. No. 905,971
Claims priority, application Japan, Sep. 11, 1985, 60-200966; Sep. 19, 1985, 60-207537
Int. Cl.[4] G06F *12/02, 12/04, 15/16*
U.S. Cl. 364—200 2 Claims



1. A data processing system, comprising:
a main storage unit comprising interleaved storage elements;
a first processing unit, connected to said main storage unit, for performing sequential access of said main storage unit at a first rate, said first processing unit comprising first accessing means for simultaneously accessing a first definite number of the storage elements in said main storage unit; and
a second processing unit, connected to said main storage unit, for performing sequential access of said main storage unit at a second rate slower than the first rate, said second processing unit comprising means for simultaneously accessing a second definite number of the storage elements in said main storage unit, the second definite number being larger than the first definite number and a ratio of said second definite number to said first definite number being at least as large as

$$bc/(a-b),$$

where a is the first rate of performing sequential access of said main storage unit by said first processing unit, b is the second rate of performing sequential access of said main storage unit by said second processing unit and c is a busy time of said main storage unit during each access.

4,916,610

MULTILANGUAGE SOFTWARE INTEGRATION THROUGH PREPROCESSING

Subodh Bapat, Fort Lauderdale, Fla., assignor to Racal Data Communications Inc., Sunrise, Fla.

Filed Oct. 5, 1988, Ser. No. 253,464
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—300 11 Claims

1. A method of assuring consistency of constants in a multilanguage software system, comprising the steps performed by a computer of:
providing a first set of code written in a first language using a plurality of symbolic constants to represent a corresponding plurality of actual constants;
providing a second set of code written in a second language using said plurality of symbolic constants to represent said corresponding plurality of actual constants;
providing a header which contains information which relates said plurality of symbolic constants to said corresponding plurality of actual constants;
including said header within said first and second sets of code;
preprocessing said first and second sets of cody by:
replacing said symbolic constants in said first and second sets of code with their corresponding actual constants; and
stripping any constructs which are no. a part of said first language from said second set of code including said header.

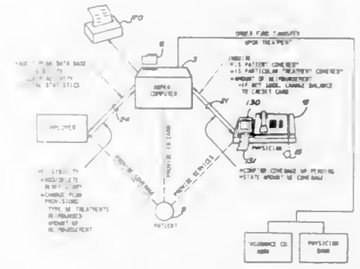
4,916,611

INSURANCE ADMINISTRATION SYSTEM WITH MEANS TO ALLOW AN EMPLOYER TO DIRECTLY COMMUNICATE EMPLOYEE STATUS DATA TO CENTRALIZED DATA STORAGE MEANS

Findley C. Doyle, Jr., Rochester, and William D. Alcott, III, Grosse Pointe Farms, both of Mich., assignors to Northern Group Services, Inc., St. Clair Shores, Mich.

Filed Jun. 30, 1987, Ser. No. 68,240
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—401 18 Claims

1. In a health care benefits administration system of the type having a computer system for storing and processing information in a database containing records of patients and medical benefits, the improvement comprising:
said database having an eligibility file of a plurality of patients for which medical benefits are provided by a given benefits sponsor;
said eligibility file including a benefits status record for storing one of a plurality of states, including at least an active state and a pending state, for each patient;
a benefits sponsor terminal communicating on line with said computer system and directly accessible by said benefits sponsor for input of data indicating that benefits provided by said sponsor for a particular patient should be added or terminated;
said computer system being preprogrammed to automatically alter said status record for said given patient to said active state when said data input by said benefits sponsor indicates that benefits are to be added for said patient;



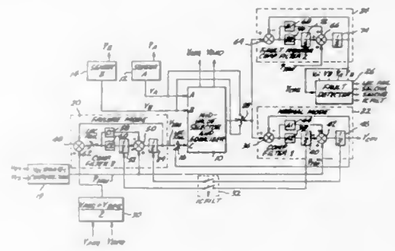
said computer system being preprogrammed to automatically alter said status record for said given patient to said pending state when said data input by said benefits sponsor indicates that benefits are to be terminated for said patient;
notification generating means controlled by said computer system for automatically providing notice to a patient of a change in said status record from an active state to a pending state.

4,916,612

DUAL CHANNEL SIGNAL SELECTION AND FAULT DETECTION SYSTEM

Richard H. Chin, Seattle; Asamitsu Maeshiro, Renton, and Richard W. Hess, Redmond, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 2, 1987, Ser. No. 115,853
Int. Cl.[4] G05B *9/03*
U.S. Cl. 364—424.01 13 Claims



1. An aircraft signal selection and fault detection system, comprising:
a midvalue selector having an output and first, second, and third inputs, said first and second inputs being connected to receive first and second redundant localizer signals that are representative of the deviation of an aircraft from a runway centerline, said third input being connected to receive a third input signal that is representative of said deviation, said midvalue selector producing at its output the input signal corresponding to the midvalue of said input signals;
means for producing a synthesized rate signal that is repre-

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sentative of the rate of deviation of the aircraft from said runway centerline;

a normal mode complementary filter connected to receive said synthesized rate signal and the output of said midvalue selector, said filter being responsive to said signals to produce a normal mode complementary filter output signal that is representative of said deviation; and

means for coupling said normal mode complementary filter output signal as the third input signal to said midvalue selector.

4,916,613

REMOTE LOW POWER INDICATOR FOR BATTERY DRIVEN APPARATUS

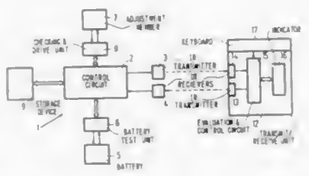
Jürgen Lange, and Ralph A. Von Vignau, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 13, 1988, Ser. No. 257,240

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1987, 3735854

Int. Cl.[4] E03D *13/00*; G06F *15/20*

U.S. Cl. 364—400 12 Claims



1. An arrangement for control and remote control of a battery-driven apparatus that can be switched on and off upo approach and withdrawal, respectively, of a user, more particularly a water rinsing system, comprising:

an electrical adajustment member which can be activated upon approach of the user,

a control circuit which drives an infrared transmitter for transmitting detection pulses and conditions the adjustment member for switching-on after reception in an infrared receiver of the detection pulses reflected by a user, and

a test unit for measuring the charge state of the battery,

wherein, after reception of the reflected detection pulses, the control circuit

interrogates the test unit as to the measured charge state of the battery,

conditions the adjustment member for switching-on only if the battery has a charge state such that the adjustment member can be switched off again, and

subsequently causes the infrared transmitter to transmit state pulses instead of the detection pulses, which state pulses contain information about the charge state of the battery, for reception by a transmit/receive unit which comprises an evaluation circuit for evaluating the state pulses and an indication device for indicating the charge state of the battery.

4,916,614

SENTENCE TRANSLATOR USING A THESAURUS AND A CONCEPT-ORGANIZED CO- OCCURRENCE DICTIONARY TO SELECT FROM A PLURALITY OF EQUIVALENT TARGET WORDS

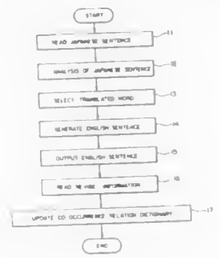
Hiroyuki Kaji, Tama, and Fumon Shimizu, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 23, 1987, Ser. No. 123,791

Claims priority, application Japan, Nov. 25, 1986, 61-280033; Aug. 7, 1987, 62-197423

Int. Cl.[4] G06F *15/38*

U.S. Cl. 364—419 7 Claims



1. A natural language generating system, which translates a source language text into a target language, said system comprises:

a word dictionary memory storing a predicate concept represented by a source language word and at least one target language word corresponding thereto;

a co-occurrence relation dictionary memory storing co-occurrence relation between a target language word and the predicate concept;

a thesaurus memory representing implication among predicate concepts represented by source language words; and,

a processing device referring to the co-occurrence relation dictionary memory and the thesaurus memory when a plurality of target language words exist corresponding to a predicate concept represented by a source language word to be translated in the word dictionary memory, and selecting a target language word having co-occurrence relation with an argument concept corresponding to the predicate concept represented by the source language word to be translated or with the general concept thereof.

2. A natural language generating system according to claim 1,

wherein said word dictionary memory comprises:

a source language analysis dictionary constituted by records, each including a word of a source language, a part of speech of the word, and a concept symbol representative of the concept of the word, and further including a case frame when the word is one representing a predicate concept;

said case frame including case codes representing semantic roles of arguments governed by the predicate concept, and surface case markers;

a target language generation dictionary constituted by records, each including a concept symbol, one or more words of the target language corresponding to the concept symbol, and parts of speech of the respective words, and further including a case frame when the word is one representing a predicate concept; and,

wherein said processing device comprises means for analyzing the syntactic and semantic structure of the source language sentence by referring to words of source language, parts of speech, and case frames in source language dictionary records; mapping source language words onto concept symbols by referring to source language words and concept symbols in source language dictionary records; mapping concept symbols and target language words in target language dictionary records; and generating a target language sentence by referring to target language words, parts of speech and case frames in target language dictionary records.

4,916,615

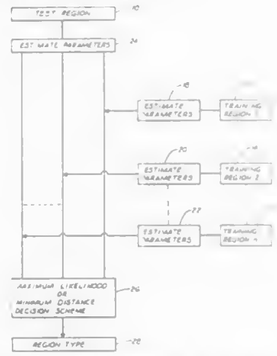
METHOD FOR STRATIGRAPHIC CORRELATION AND REFLECTION CHARACTER ANALYSIS OF SETSMIC SIGNALS

Chittibabu Chittineni, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Jul. 14, 1986, Ser. No. 885,516

Int. Cl.[4] G01V *1/30*

U.S. Cl. 364—421 9 Claims



1. A method for classifying seismic signal data for comparison and evaluation of discontinuous seismic section data, comprising the steps of:

inputting a selected section of seismic signal data;

examining seismic signal data for a selected two-dimensional test area and at least one two-dimensional training area to establish a stochastic model of reflection character data for said test area and the at least one training area; and

using the test area reflection character data in comparison with reflection character data derived for the at least one training area to provide relative classification as between the data characteristics for said test area and the at least one training area.

4,916,616

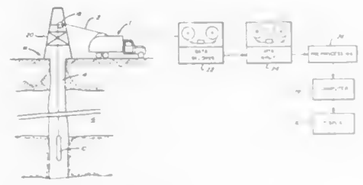
SELF-CONSISTENT LOG INTERPRETATION METHOD

Robert Freedman, Houston, and John E. Puffer, Sugarland, both of Tex., assignors to BP Exploration, Inc., Houston, Tex.

Filed Dec. 8, 1986, Ser. No. 939,400

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—422 23 Claims



1. A method of obtaining self-consistent measures of parameters indicative of petroleum content from measurements obtained in subsurface formations adjacent a well bore, comprising the steps of:

(a) obtaining, from one or more well logging instruments in a well borehole, measurements indicative of reservoir properties of the formations adjacent the well borehole;

(b) storing the measurements so obtained in a data memory;

(c) establishing a set of response equations in which the measurements obtained are expressed as functions of the parameters indicative of petroleum content;

(d) constraining each of the parameters indicative of petroleum content to have a self-consistent value, namely that its contribution to the measurements is based on the same value for the parameter, in its effect where such parameter is present through the set of response equations;

(e) calculating theoretical response values for the measurements obtained using an array of test sets of values for the constrained parameters indicative of petroleum content;

(f) obtaining a measure of the difference between the measurements obtained and the calculated theoretical response values for each of the array of test sets of values;

(g) determining which one of the array of test sets of values produces the minimum measure of difference between the measurements obtained and the calculated theoretical response values to thereby ascertain the values of measures of parameters indicative of petroleum content; and

(h) forming an output display of the ascertained values of measures of parameters indicative of petroleum content.

4,916,617

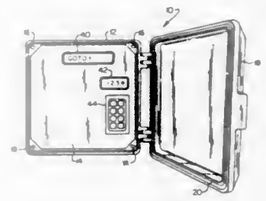
CONTROLLER FOR WELL INSTALLATIONS

William L. Norwood, San Antonio, Tex., assignor to Delaware Capital Formation, Wilmington, Del.

Filed Jan. 20, 1988, Ser. No. 146,272

Int. Cl.[4] E21B *43/12*

U.S. Cl. 364—422 17 Claims



1 A controller for use in conjunction with the control of well installations wherein control components regulating the production of fluid hydrocarbons are selectively actuated in response to control inputs and wherein monitoring devices provide inputs representing operational parameters of said installations, comprising:

input means responsive to said operational parameter inputs for providing parameter state conditions;

communicators means for providing selectable parameter control conditions;

output means responsive to output control signals for deriving said control inputs;

memory means for retaining a predetermined sequence of values for control state variables, groupings of mask variable selection sequences, pattern control conditions and response data corresponding with said parameter control conditions; and

processor means;

responsive to said parameter state conditions and said parameter control conditions for generating said control state variable values for retention by said memory means,

responsive to said control state variable and said mask variable selection sequences to derive corresponding sequences of masked control state variable values,

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responsive to compare said masked control state variable values with said pattern control conditions and, in the presence of correspondence therebetween, to access said response data; and

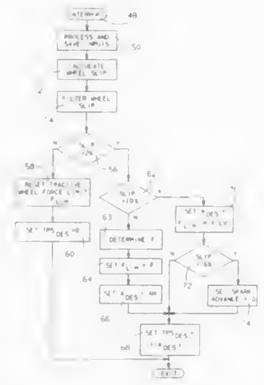
responsive to said accessed response data to derive said output control signals.

4,916,618

VEHICLE TRACTION CONTROLLER

Donald D. Stoltman, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 12, 1988, Ser. No. 242,925
Int. Cl.[4] B60K *28/16*
U.S. Cl. 364—426.02 **4 Claims**



2. A system for limiting the slip of a vehicle wheel driven by an engine having a throttle bore through which air is drawn into the engine and a rotatable throttle valve in the throttle bore for limiting the effective area of the throttle bore and therefore the mass air flow rate into the engine, the system comprising:

means for determining the slip of the vehicle wheel;

means effective when the determined slip is less than a predetermined maximum value for repeatedly determining a value F representing the tractive force between the wheel and the road surface in accord with a predetermined function defined by the expression $F = A \cdot X$ where A is the effective area of the throttle bore and X is a function of predetermined operating parameters;

means for storing a value F_{lim} equal to the last determined value of F;

means effective when the determined slip is greater than the predetermined maximum value for repeatedly determining a desired effective area A_{DES} of the throttle bore for establishing the tractive force between the wheel and the road surface at a value equal to the stored value F_{lim}, the desired effective area being determined in accord with the expression $A_{DES\ l} = F_{lim} \cdot (1/X)$; and

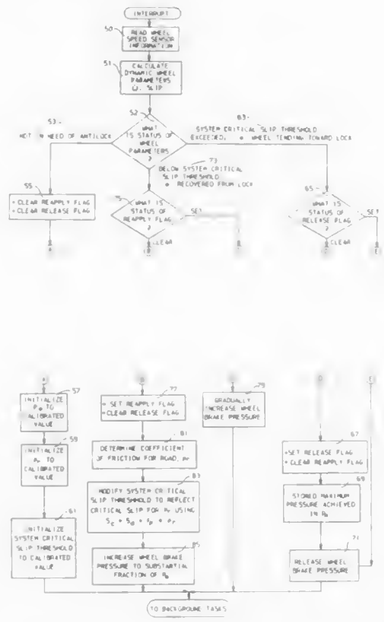
means for limiting the effective area of the throttle bore to A_{DES} while the determined slip is greater than the predetermined maximum value, whereby the tractive force between the wheel and the road surface is limited to the value F_{lim} to limit the wheel slip at the predetermined maximum value.

4,916,619

ADAPTIVE WHEEL SLIP THRESHOLD

Allen J. Walenty, Utica; Kevin G. Leppek, W. Bloomfield, and Alex Kade, Grosse Pte. Woods, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 13, 1989, Ser. No. 337,726
Int. Cl.[4] B60T *8/00*
U.S. Cl. 364—426.02 **4 Claims**



3. A method for limiting a pressure applied to a brake of a vehicle wheel traveling over a road surface comprising the steps of:

measuring an amount of slip between the vehicle wheel and the road surface;

detecting an incipient wheel lock condition when the measured amount of slip exceeds an adjustable slip threshold value;

decreasing pressure to the brake of the vehicle wheel in response to the detected incipient wheel lock condition;

measuring a coefficient of friction between the vehicle wheel and the road surface;

determining a critical slip value, s_c, at which the braking force is a maximum for the measured coefficient of friction in accord with the expression $s_c = s_d + f_\mu \cdot \mu_r$ where s_d is a calibrated value of slip, f_μ is a calibrated factor for determining a variance from the calibrated value of slip and μ_r is the measured coefficient of friction between the vehicle wheel and the road surface;

adjusting the adjustable slip threshold value equal to the determined critical slip value s_c;

detecting a wheel recovery condition resulting from the amount of slip falling below the adjustable slip threshold value; and

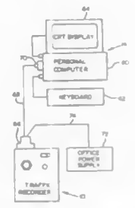
increasing pressure applied to the brake of the vehicle wheel in response to the detected recovery condition.

4,916,621

MICROCOMPUTER TRAFFIC COUNTER AND DATA COLLECTION METHOD

John E. Bean, 28701 N. Main St., Ridgefield, Wash. 98642, and Thayer K. Rorabaugh, 14509 NE. 280th, Battle Ground, Wash. 98604

Filed May 18, 1987, Ser. No. 52,615
Int. Cl.[4] G06F *15/48*
U.S. Cl. 364—436 **32 Claims**



23. A system for collecting and processing traffic data, comprising:

a traffic detection means including a transducer for detecting passage of vehicles and providing a corresponding output signal responsive to each passing vehicle;

a portable field data recording unit including a microprocessor means programmed for receiving and processing the transducer output signals in a field location and tabulating traffic data therefrom over predetermined time intervals and memory means for storing the traffic data;

a traffic data processing computer means programmed for receiving, storing and further processing the traffic data from the field data recording unit at a location removed from the field location; and

connector means for connecting the data recording unit to one of the transducer and the computer means;

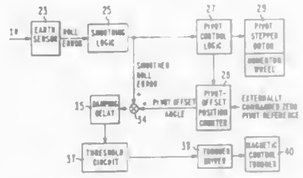
the data recording unit including a CPU clock for clocking the microprocessor means and a real-time clock for providing a time of day to the microprocessor means, the CPU clock and the real-time clock operable independently of each other.

4,916,622

ATTITUDE CONTROL SYSTEM

Kidambi V. Raman, East Windsor; Ludwig Muhlfelder, Livingston; Carl H. Hubert, Cranbury, all of N.J., and Thomas J. Furia, Ambler, Pa., assignors to General Electric Company, East Windsor, N.J.

Filed Jan. 16, 1988, Ser. No. 207,560
Int. Cl.[4] B64G *1/32*
U.S. Cl. 364—459 **21 Claims**



1. An attitude control system for a spacecraft having a momentum bias comprising:

a momentum wheel spinning about an axis substantially parallel to a first axis of said spacecraft to produce angular momentum for providing said momentum bias;

means for rotating the angular momentum of said momentum wheel with respect to said spacecraft;

means for providing an attitude error signal responsive to angular deviation of the spacecraft about one or more axes perpendicular to the first axis;

magnetic torquing means for providing, when energized, magnetic dipoles for developing torque about one or more selected axes;

first control means responsive to said attitude error signal exceeding a first threshold for energizing said magnetic torquing means for developing correcting torque for reducing said deviation; and

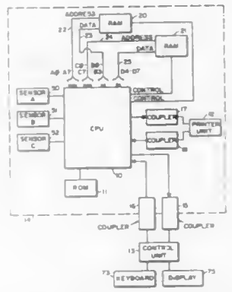
second control means coupled to said means for rotating and responsive to said attitude error signal exceeding a second threshold greater than said first threshold, said second control means for causing the angular momentum of said momentum wheel to rotate in a direction to reduce said deviation.

4,916,623

ELECTRONIC POSTAGE METER HAVING REDUNDANT MEMORY

Frank T. Cheek, Jr., Orange, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 692,720, Jan. 18, 1985, abandoned, which is a division of Ser. No. 343,877, Jan. 29, 1982, abandoned. This application Nov. 25, 1988, Ser. No. 275,610
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—464.02 **16 Claims**



1. In an electronic postage meter system having a microprocessor connected to a plurality of address lines, a plurality of data lines, and control line means, and random access memory means connected to said address and data lines and to said control line means to enable storage of data in said random access memory means and reading of data from said random access memory means under control of said microprocessor; the improvement wherein said random access memory means comprises first and second random access memories each connected to separate groups of said address lines and separate groups of said data lines, whereby data may be transferred to and from said first and second random access memories independently of any common interconnection.

4,916,624

COMPUTERIZED SYSTEM FOR PREALTERATION OF GARMENT PATTERN DATA

John E. Collins; Mitchell B. Grunes, and Darryn J. Kozak, all of Minneapolis, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 16, 1988, Ser. No. 169,047
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—470 **26 Claims**

1. A computerized system for prealtering garment pattern data based on standard or individual body measurements, comprising:

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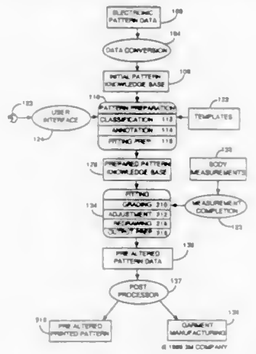
body measurement acceptance means for accepting standard or individual body measurements;

pattern acceptance means for accepting garment pattern data, the pattern acceptance means comprising:

coordinate data means for accepting coordinate data comprising points and lines depicting a garment; and

garment description means for accepting a description of the garment, the garment description means comprising:

geometric constraint means for accepting geometric constraints that specify limits on relationships among the points and lines that depict the garment; and



garment measurement means for accepting one or more measurement constraints that map the physical dimensions of the garment onto the points and lines and specify relationships between the physical dimensions of the garment and the standard or individual body measurements; and

constraint satisfaction means for producing prealtered pattern data by satisfying the geometric and measurement constraints through altering points and lines in the garment pattern data.

4,916,625

INFERENTIAL TIME-OPTIMIZED OPERATION OF A FIBER PRODUCING SPINNING MACHINE BY COMPUTERIZED KNOWLEDGE BASED SYSTEM

Scott L. Davidson, Seaford; Michael J. Piovoso, Newark; John J. Turner, Wilmington, and Mark D. Wetzel, Bear, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 8, 1988, Ser. No. 241,994

Int. Cl.[4] G06F *15/46;* **H03K** *21/40;* **D01H** *13/00*

U.S. Cl. 364—470 **4 Claims**

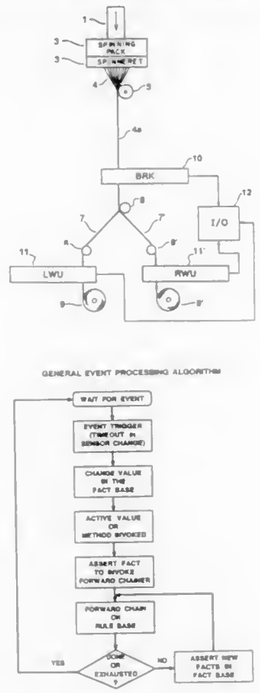
1. A method for monitoring the operation of a multiposition spinning machine wherein filaments are extruded from a spinning pack at each position and advanced as a yarn bundle in a path, then split at a location into a plurality of threadlines to be forwarded to a plurality of windups to be wound on packages, and scheduling events at predetermined times in the preparation of said packages with the aid of a digital computer, said method comprising:

(a) providing said computer with a knowledge database that includes the operative state of each position, the elapsed time since the initiation of each package, predetermined event times unique to the filaments being wound, the positional configuration of said machine, and a hueristic rule base;

(b) sensing the operative state of each position by monitoring the presence or absence of the advancing yarn bundle and said threadlines as a function of time;

(c) providing the computer with the operative status of each position as sensed in step (b) and the elapsed time since the initiation of each package of the position;

(d) comparing in the computer the operative state of each position and the elapsed time since initiation of each package of said position with predetermined event times and said hueristic rule base; and



(e) performing said events on said spinning machine when said computer indicates that the time for performing said events has been reached.

4,916,626

COUPLING CIRCUIT FOR NON-VOLATILE MEMORIES IN AN ELECTRONIC MACHINE, AND FRANKING MACHINE APPLYING SAID CIRCUIT

Bernard Vermesse, L'Hay Les Roses, France, assignor to Societe Anonyme dite : SMH Alcatel, Paris, France

Filed Mar. 29, 1988, Ser. No. 174,756

Claims priority, application France, Mar. 31, 1987, 87 04480

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—480 **8 Claims**

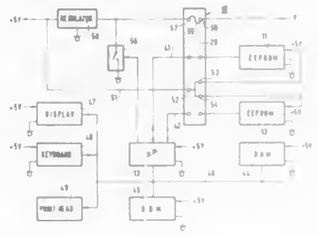
1. A circuit for coupling non-volatile memories in an electronic machine, the circuit enabling said memories to be coupled to a microprocessor equipment of said machine and also to be coupled to an external test tool having a first terminal connector referred to as a test connector, the circuit comprising:

links connected to the access terminals of said memories and to the access terminals of said equipment for coupling thereto; and

a second connector complementary to the test connector and connected to said links;

wherein said second connector is mounted directly as a terminal connector on said links going to said memories and interrupts their connection to said microprocessor equipment;

wherein said circuit further includes a third connector mounted directly as a terminal connector on said links going to the microprocessor equipment, and also a connection circuit removably mounted between said second and third connectors, thereby selectably providing direct



coupling between corresponding pins of the second and third connectors in order to ensure continuity in the links between the memories and the equipment when said connection circuit is interposed between said second and third connectors, and enabling the test connector to be connected to said second connector while isolating said memories from one another and from said equipment, when said connection circuit is removed therefrom.

4,916,627

LOGIC PATH LENGTH REDUCTION USING BOOLEAN MINIMIZATION

David J. Hathaway, Richmond, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 2, 1987, Ser. No. 127,323

Int. Cl.[4] G06F *15/60*

U.S. Cl. 364—490 **16 Claims**

1. A method for reducing a logic network to a specified number of gate levels, the logic network having a plurality of gates, a number of gate levels, at least one input, at least one output, and at least one worst path which represents a path through the logic network having at least as many gate levels as any other path through the logic network, the method comprising the steps of:

receiving data representing the topology of the logic network;

levelizing the gates of the logic network in a forward and a backward direction;

determining all of the gates of the logic network which are in the at least one worst path;

specifying a scoring function;

selecting, in accordance with the scoring function, one of the gates in the at least one worst path;

applying a local Boolean compression to the selected gate, thereby producing a compressed logic network having fewer gate levels than the number of gate levels of the logic network prior to compression;

comparing the number of gate levels of the compressed logic network with the specified number of gate levels; and if the compressed logic network has a number of gate levels which is greater than the specified number of gate levels, then

repeating said levelizing, determining, specifying, selecting, applying, and comparing steps on the compressed logic network until the specified number of gate levels is achieved.

4,916,628

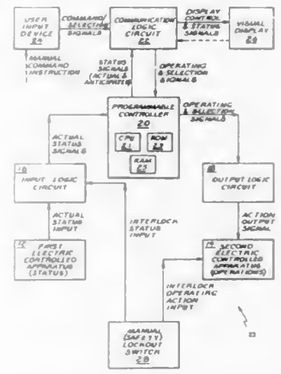
MICROPROCESSOR-BASED CONTROL/STATUS MONITORING ARRANGEMENT

James G. Kugler, Glen Ellyn, Ill., assignor to Commonwealth Edison Company, Chicago, Ill.

Filed Jul. 8, 1988, Ser. No. 216,882

Int. Cl.[4] G01F *15/06;* **H02B** *1/02*

U.S. Cl. 364—492 **12 Claims**



1. An arrangement for generating commands in controlling operation of and displaying status of a plurality of remotely located devices in an operating system, said arrangement comprising:

first operator responsive means for designating a plurality of remotely located devices and for generating display, display control and device control signals;

visual display means coupled to said first means and responsive to said display and display control signals for providing a visual display of the status of, as well as a last command provided to, each of said plurality of designated remotely located devices, to permit the status of said first operator responsive means to be determined by comparison of the visual display of the status of and the last command provided to a remotely located device, and for controlling a manner in which the status of and said last command provided to each of said plurality of designated remotely located devices are presented on said display means; and

signal processing means coupled to said first means as well as to each of said plurality of remotely located devices for providing operator generated control signals to one or a plurality of designated remotely located devices in controlling the operation of said designated remotely located devices.

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4,916,629

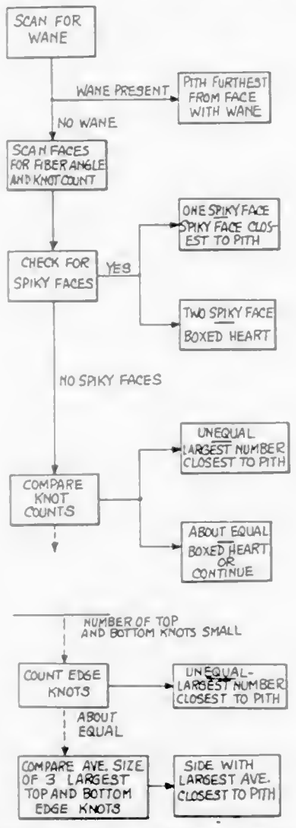
METHOD FOR DETERMINATION OF PITH LOCATION RELATIVE TO LUMBER SURFACES

David N. Bogue, Tacoma; Charles F. Horn, Puyallup; Steven L. Washburn, Federal Way, and Floyd Stanley, Enumclaw, all of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 67,334, Jun. 26, 1987, Pat. No. 4,931,545. This application May 31, 1988, Ser. No. 198,101

Int. Cl.[4] B27B *1/00*; G01N *21/88*; G06F *15/46*

U.S. Cl. 364—507 6 Claims



1. A method of determining pith location relative to at least one face of a piece of lumber which comprises:

conveying the lumber past a scanning station;

scanning at least said one face to determine the direction of wood fiber grain angle relative to three mutually orthogonal reference axes adjacent to any knots which may be present, and

identifying said pith location from said grain angle information,

wherein said pith location is generally away from the scanner position and within or through the piece of lumber when the fibers adjacent a knot are found to converge toward the knot in a direction toward the scanning position, and pith location is toward the scanning position and outside the piece of lumber when the fibers are found to converge toward the knot in a direction away from the scanning position, said pith location knowledge being useful for determining knot shape and orientation within the lumber as an aid to grading the lumber.

4,916,630

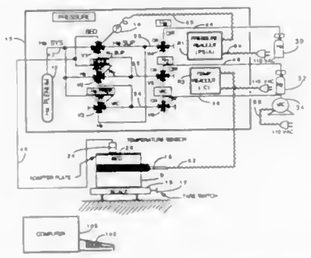
BED TESTER FOR MOLECULAR SIEVE OXYGEN CONCENTRATOR

George W. Miller, San Antonio, Tex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 30, 1988, Ser. No. 251,268

Int. Cl.[4] B01D *53/22*, *53/04*

U.S. Cl. 364—496 12 Claims



1. A bed tester for testing a bed of molecular sieve oxygen concentrator for determining activity, said bed having molecular sieve pellets with beta cages for adsorption of nitrogen, comprising:

bed test apparatus which comprises a helium system with a chamber of known volume, weighing means for measuring the weight gain of the bed due to nitrogen adsorption, pressure measuring means for measuring the pressure in the helium system and in the bed, temperature measuring means for measuring the temperature in the helium system and in the bed;

valve means having positions for selectively connecting the helium system to a vacuum source, for connecting the helium system to a source of helium under pressure, for connecting the helium system to the bed, for connecting the bed to the vacuum source, and for connecting the bed to a source of nitrogen under pressure;

so that the helium system may be filled with helium and the pressure and temperature measured, the helium system may be connected to the bed for the helium to expand and the pressure and temperature measured, and the bed may be evacuated and weighed and then pressurized with nitrogen, and the pressure and temperature measured, and the bed weighed.

4,916,631

PROCESS CONTROL SYSTEM USING REMOTE COMPUTER AND LOCAL SITE CONTROL COMPUTERS FOR MIXING A PROPPANT WITH A FLUID

Stephen F. Crain; Mark A. Clark, and Edward L. Woodall, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Dec. 24, 1986, Ser. No. 947,099

Int. Cl.[4] G06F *15/46*; G06G *7/58*; G05D *11/02*, *11/08*

U.S. Cl. 364—502 3 Claims

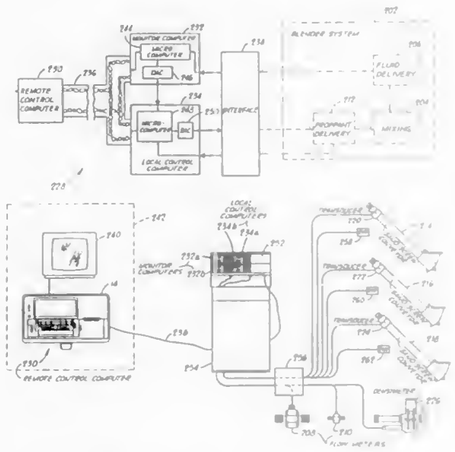
1. A system for controlling at a well site an apparatus, including at least one sand crew, for moving a proppant into a mixing container into which a fluid is flowed for obtaining a blend having a desired concentration of said proppant in said fluid, which blend is to be pumped into the well and which apparatus and mixing container are mounted on a trailer, said system comprising:

a remote control computer spaced from the trailer, said remote control computer including means for entering information defining a desired concentration value of said proppant in said fluid;

a monitor computer mounted on the trailer, for monitoring a flow rate of said fluid and for monitoring a density of said blend, said monitor computer being electrically connected to said remote computer such that said fluid flow rate and said blend density are received by said remote computer;

at least one transducer disposed on said sand screw, said transducer for providing a feedback control signal based upon a quantity of proppant moved;

a local control computer mounted on the trailer and electrically connected to said monitor computer, said remote control computer, and said transducer so that said local control computer receives said desired concentration value, said fluid flow rate, and said feedback control signal, said local control computer for providing a control signal to said sand screw based upon, and varying in accordance with, said fluid flow rate, said desired concentration value and said feedback control signal;



interface means, mounted on the trailer, for connecting said local control computer to said transducer, for connecting said monitor computer to a flow meter which provides said fluid flow rate, and for connecting said monitor computer to a densimeter which provides said blend density; and

a local area network cable connected between said remote control computer and both said monitor computer and said local control computer so that said fluid flow rate and said blend density are communicated therethrough from said monitor computer to said remote control computer and so that said desired concentration value is communicated therethrough from said remote control computer to said local control computer.

4,916,632

VIBRATION CONTROL APPARATUS

Shunichi Doi, Nagoya; Eiichi Yasuda, and Yasutaka Hayashi, both of Seto, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Nov. 3, 1986, Ser. No. 926,628

Claims priority, application Japan, Nov. 7, 1985, 60-249704

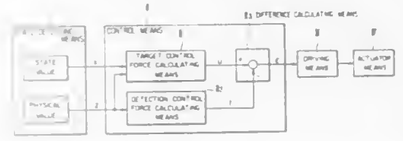
Int. Cl.[4] B60G *11/26*, *17/00*

U.S. Cl. 364—508 14 Claims

1. A vibration control apparatus for a vibrating body supported by a suspension and comprising actuator means for applying a control force to the suspension to control characteristics of the suspension and vibrations of the vibrating body, said apparatus further comprising:

state detecting means comprising a first detecting means associated with the actuator means for detecting a physical value representative of the control force applied by the actuator means and a second detecting means associated with the suspension for detecting a state value representing actual movement of said suspension;

control means including target control force calculating means, detection control force calculating means, and difference calculating means, said target control force calculating means receiving the signals output by said first and second detecting means, for calculating a coefficient in response to optimal target control force in consideration of an external force or disturbance acting on said suspension on the basis of the physical and state values from said first and second detecting means respectively, said detection control force calculating means receiving the signals output from said first detecting means for calculating a coefficient in response to a detection control force corresponding to the physical value from said first detecting means, said difference calculating means being connected to said target control force calculating means and said detection control force calculating means for calculating a difference coefficient representative of a



difference between the optimal target control force and the detection control force;

driving means connected to said control means for amplifying the difference coefficient signal output from said difference calculating means of said control means; and

said actuator means being connected to said driving means for variably continuously controlling the characteristics of the suspension on the basis of the amplified difference coefficient signal from said driving means, so that the suspension characteristics can be continuously variably controlled to equivalently generate the control force applied to the suspension in response to the external force or disturbance acting on said suspension,

said second detecting means of said state detecting means comprising first sensor means for producing a signal representing the damping force of said suspension, said first detecting means comprising second sensor means for producing a signal representing relative vibratory velocity between a suspension member and said vibrating body, said actuator means comprising means for continuously and variably controlling a damping coefficient of the suspension.

4,916,633

EXPERT SYSTEM APPARATUS AND METHODS

Louis P. Tychonievich, Derry, and Richard W. Bolling, Nashua, both of N.H., assignors to Wang Laboratories, Inc., Lowell, Mass.

Continuation of Ser. No. 766,860, Aug. 16, 1985, abandoned. This application Mar. 24, 1987, Ser. No. 30,250

Int. Cl.[4] G06F *11/00*

U.S. Cl. 364—513 33 Claims

1. A digital computer system operable as an expert system, said computer system comprising:

storage means to store a knowledge base including hierarchically-defined terms and their definitions, the corresponding definition of each term defining its respective term using the value of one or more terms, each of whose definitions is at a lower level of the hierarchy, and/or using one or more external values external to the knowledge base; and

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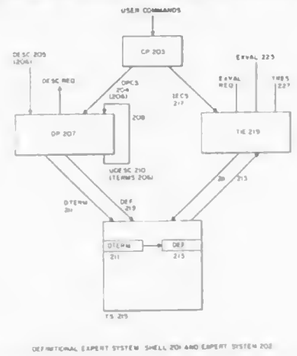
processing means for receiving commands from a user of the system, for producing inference commands in response to said user commands, for interrogating said storage means in response to said commands to obtain the definition of a given



DEFINITIONAL EXPERT SYSTEM SHELL 201 AND EXPERT SYSTEM 202

term, and for computing the value of said given term from its corresponding definition by obtaining the value of any term and any external value in the corresponding definition,

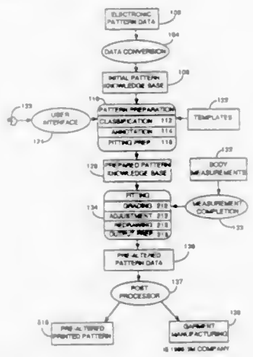
said system employing said computed value to produce an expert response to said user.

4,916,634

SYSTEM FOR PREPARING GARMENT PATTERN DATA TO ENABLE SUBSEQUENT COMPUTERIZED PREALTERATION

John E. Collins; Mitchell B. Grunes; Darryn J. Kozak, and AliciaMae H. Vittal, all of Minneapolis, Minn., assignors to Minnesota Mining and Manufacturing Copany, St. Paul, Minn.

Filed Mar. 16, 1988, Ser. No. 169,046
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—513 **71 Claims**



1. A computerized system related to preparing garment pattern data to enable subsequent computerized prealterations based on standard or individual body measurements, the garment pattern data comprising points and lines, comprising:

pattern storage means for specifying garment pattern data comprising points and lines depicting one or more garments;

garment knowledge storage means for specifying generic garment knowledge for each of a plurality of garment styles, comprising:

feature description storage means for specifying feature descriptions comprising descriptions of landmarks and other garment features that are expected to be found in garments representative of a garment style; and

generic constraint storage means for specifying generic constraints comprising at least one of algorithms and declarative structures for relating body measurement to changes in one or more of the landmarks and other garment features found in garments representative of the garment style; and

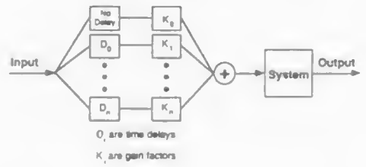
processor means for preparing garment pattern data for modification by relating the generic garment knowledge to the garment pattern data.

4,916,635

SHAPING COMMAND INPUTS TO MINIMIZE UNWANTED DYNAMICS

Neil C. Singer, Brookline; Warren P. Seering, Sherborn, and Kenneth A. Pasch, Brookline, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 12, 1988, Ser. No. 243,315
Int. Cl.[4] G06F *15/00*
U.S. Cl. 364—513 **27 Claims**



1. A method for generating an input to a physical system to minimize unwanted dynamics in the physical system response comprising:

establishing expressions quantifying the unwanted dynamics of the physical system;

establishing first constraints bounding the available input to the physical system;

establishing second contraints on variation in system response with variations in the physical system characteristics; finding a solution which is used to generate the input which minimizes the value of the expressions while satisfying the first and second constraints; and

controlling the physical system based on the input to the physical system whereby unwanted dynamics are minimized.

4,916,636

SYSTEM FOR CONTROLLING ACCELERATION AND DECELERATION OF HORIZONTALLY ARTICULATED ROBOT

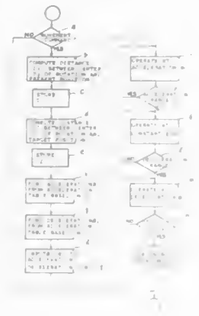
Nobutoshi Torii, Hachioji; Susumu Ito, and Akihiro Terada, both of Hino, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP86/00468, § 371 Date Jun. 11, 1987, § 102(e) Date Jun. 11, 1987, PCT Pub. No. WO87/01833, PCT Pub. Date Mar. 26, 1987
PCT Filed Sep. 11, 1986, Ser. No. 49,860
Claims priority, application Japan, Sep. 11, 1985, 60-200816
Int. Cl.[4] G06F *15/46*; G05B *19/407*
U.S. Cl. 364—513 **4 Claims**

1. A system for controlling acceleration and deceleration of a horizontally articulated robot having a plurality of arms, coupled together to form an arm member having base and distal ends, and angularly movable, relative to a center of rotation at the base end of the arm member, in horizontal planes, said system comprising:

processing means for computing a distance from the center of rotation at the base end of the arm member to a reference position at the distal end of the arm member; and

accelerating/decelerating means for setting an acceleration/deceleration rate for movement of the distal end of



the arm member in dependence upon the distance computed by said processing means.

4,916,637

CUSTOMIZED INSTRUCTION GENERATOR

LindaMay P. Allen; Ronald G. Elshaug; Carrie L. Harney; Wayne L. Lemmon; Irwin Miller, all of Rochester; Irving L. Miller, Pine Island; Gerald D. Murray, Rochester; Michael L. Nordstrom, Oronoco; LaVern F. Peterson; Glen E. Rollings, both of Rochester; James A. Schablitsky, Kasson; Johnnie D. Shanklin; Anthony V. Steinman, both of Rochester; Thomas W. Suther, III, Oronoco; Dennis C. Taylor, Rochester; Darrel C. Walberg, Rochester, and Eugene P. Wojtczak, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 18, 1987, Ser. No. 122,295
Int. Cl.[4] G06F *15/18*
U.S. Cl. 364—513 **44 Claims**

1. A system for generating installation instructions for a device made up of a variable number of components, comprising:

means for specifying desired components for a device;

sorting means coupled to the specifying means for identifying a plurality of installation tasks dependent on the components specified;

sequencing means for sequencing the tasks in a desired order for installation of the components;

memory means for storing individual assembly instructions corresponding to each task; and

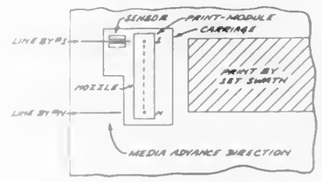
instruction generation means coupled to the sequencing means and to the memory means for assembling the individual assembly instructions for installation of the components, said assembled instructions being different dependent on the particular components specified.

4,916,638

MEDIA ADVANCE SYSTEM FOR SWATH PRINTERS

Robert D. Haselby; Jeffrey S. Best, both of San Diego, and Samuel A. Stodder, Encinitas, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 25, 1989, Ser. No. 342,927
Int. Cl.[4] H04N *1/40*
U.S. Cl. 364—519 **28 Claims**



1. A media advance system for a swath printer, comprising:

a swath-type printing head, said head comprising N spaced printing devices;

means for mounting said printing head for movement along a first predetermined axis;

means for advancing the print media along a second predetermined axis substantially orthogonal to the first axis;

a line sensor mounted adjacent a first one of said printing devices and carried by said mounting means, said line sensor comprising means for imaging lines drawn in the media margin;

system controller responsive to said line sensor for controlling said printing head and said media advancing means for accurately advancing said media upon the printing of a swath, said controller comprising, in combination with said print head, said mounting means and said media advancing means:

(i) means for printing an initial swath with said media positioned appropriately for the beginning of a new plot or page, and for printing two marginal lines in the direction of the swath with the first printing device and with the Nth printing device;

(ii) means for positioning in the swath direction the line sensor over the margin line drawn by said first print device without moving the media from the position at which the first swath was printed, and storing the sensor output signal value as a reference signal indicative of the mounting error between said sensor and the first printing device; and

(iii) means for printing the next and successive swaths, comprising means for advancing the media to a position wherein the sensor provides an output signal equal to said reference value, indicating that the sensor is centered over a marginal line drawn by said Nth printing device, means for advancing the media a predetermined amount equal to one printing device pitch; and means for printing the next swath and a margin line printed by said Nth printing device.

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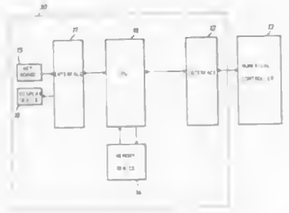
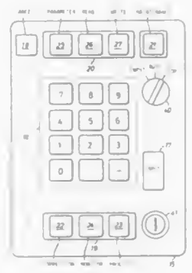
4,916,639

DATA INPUT-OUTPUT DEVICE FOR INTERACTIVE NUMERICAL CONTROLLER

Takao Yoneda, Nagoya; Yasuji Sakakibara, Hekinan; Shoji Ikawa, Okazaki, and Yasunori Sugito, Nagoya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 31, 1988, Ser. No. 264,395
Claims priority, application Japan, Oct. 31, 1987, 62-277228
Int. Cl.[4] G06F *15/00*
U.S. Cl. 364—474.22 3 Claims





1. A data input-output device for an interactive numerical controller which enables an operator to input data necessary for numerical control of a machine tool into a memory device in dependence upon an instruction image selectively displayed on a display device in accordance with a numerical control program stored in the memory device, the data input-output device comprising:

input means having a set of numerical keys arranged to input data used for machining operations of said machine tool into said memory device, a first group of selection keys arranged to correct the input data in accordance with a workpiece to be machined, a second group of selection keys arranged to change process management data of the machining operations, a mode switch arranged to instruct the operation of said numerical controller, and a permission switch arranged to be turned on only by using an authorized key; and

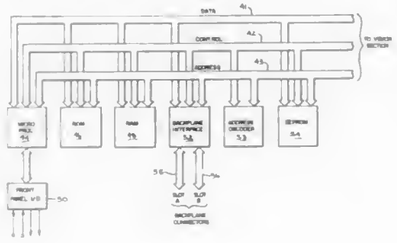
means for disabling data input by manipulation of said second group of selection keys in a condition where said first group of selection keys is being manipulated and for permitting the data input by manipulation of said second group of selection keys in a condition where said permission switch is being turned on after said mode key has been set in an input position under an inoperative condition of said first group of selection keys.

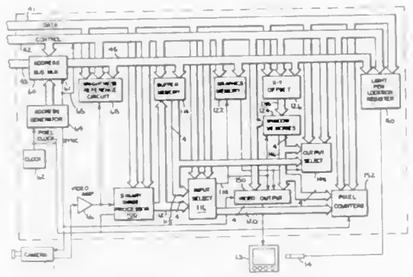
4,916,640

VIDEO IMAGE PROCESSING SYSTEM

Michael L. Gasperi, Racine; Richard M. Roszkowski, Brookfield; Donald J. Christian, New Berlin, and Joseph E. Deklotz, Genesee, all of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Jun. 3, 1987, Ser. No. 57,797
Int. Cl.[4] H04N *7/18*
U.S. Cl. 364—521 20 Claims





1. In a programmable controller having a rack with a backplane for electrically interconnecting a plurality of modules received in the rack, and a program processor for executing a program which operates a machine coupled to the programmable controller; the improvement comprising a video image processor including:

a microprocessor which executes a program that controls the operation of the video image processor;

means responsive to a trigger signal for acquiring a video image, said video image formed by a plurality of pixels each having a luminance;

means for determining the position of an object within the video image;

means for counting pixels in said video image which have predetermined characteristics, and having an output indicating the result of the counting, said means for counting including:

(a) means for comparing the luminance of pixels in the video image to a threshold value,

(b) a memory for storing data defining a region within the video image,

(c) a counter,

(d) means for shifting the region with respect to the video image in response to said means for determining, and

(e) means responsive to said means for comparing and responsive to the shifted region for controlling the counter; and

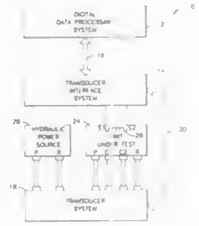
means, responsive to the microprocessor, for signaling the program processor that the video image processor has completed processing the image and for transmitting the output of the means for counting to the program processor via the rack backplane.

4,916,641

SERVOVALVE ANALYZER SYSTEM

Jimmy L. Bybee, Mission Viejo, Calif., assignor to ACL Technologies, Inc., Santa Ana, Calif.

Filed Jan. 16, 1987, Ser. No. 3,958
Int. Cl.[4] G01M *19/00*; F01B *25/26*
U.S. Cl. 364—550 35 Claims



1. An analyzer system for analyzing hydraulic units under test comprising:

a digital data processing system storing a plurality of test unit definition tables and a plurality of transducer definition tables, the transducer definition tables including a transducer definition table for a transducer that senses a physical condition associated with an hydraulic unit that is being tested and a definition table for a servo amplifier transducer, each transducer definition table including an identification of a transducer to which the table corresponds and calibration data defining a relationship between data communicated with the transducer and corresponding physical conditions associated with the transducer; and

a transducer interface system including a digital to analog converter connected to receive a digital command signal from the data processing system and generate an analog signal in response thereto, an analog to digital converter connected to receive an analog signal and provide to the data processing system a digital signal in response thereto, a servo amplifier connected to receive an analog signal from the digital to analog converter and respond thereto by providing a control signal to an hydraulic unit under test, and a signal conditioning circuit connected to receive a transducer signal from a transducer indicating a physical condition associated with an hydraulic unit under test;

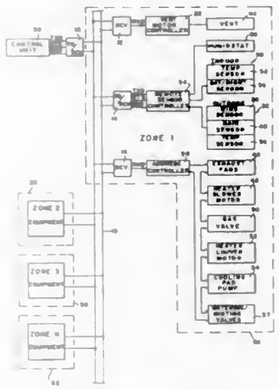
the digital data processing system being responsive to data contained in an operator selected test unit definition table to command at least one test sequence listed in the selected test unit definition table by providing to the digital to analog converter digital command signals corresponding in magnitude to calibration data contained in the transducer definition table for the servo amplifier, the digital data processing system receiving from the analog to digital converter data representing the physical condition, interpreting the received data in response to the calibration data stored in the transducer definition table for the physical condition sensing transducer and generating a human readable output representing results of the test.

4,916,642

ENVIRONMENTAL CONTROL WITH MULTIPLE ZONE CENTRAL PROCESSOR MEANS

Frederick P. Kaiser, Orange, and Theodore R. Lapp, Mission Viejo, both of Calif., assignors to O-Com, Inc., Santa Ana, Calif.

Continuation of Ser. No. 661,558, Oct. 17, 1984, abandoned, which is a continuation-in-part of Ser. No. 655,081, Sep. 26, 1984, Pat. No. 4,742,475, which is a continuation-in-part of Ser. No. 288,740, Jul. 31, 1981, abandoned. This application Jan. 14, 1987, Ser. No. 6,325
Int. Cl.[4] G06F *13/12*; F24F *7/00*
U.S. Cl. 364—550 5 Claims



1 A control system including:

a plurality of remotely controlled peripheral control elements for sensing at least one operating parameter of a plant and for controlling at least one operating parameter of said plant in response to said sensed parameter;

a computer system including a processor, a disk operating system, an operator input means, and a visual monitor, for configuring a control program, for interrogating said at least one peripheral control element for sensing, and for commanding said at least one other peripheral control element for actuating according to said control program;

a communication means, including a memory, for receiving information from said computer system in combination with commands for said communication means, for decoding said commands and storing said received information in said memory, for transmitting said received information to said peripheral control elements, for further receiving information from said peripheral control elements and storing said information in said memory, and for transmitting said stored information to said system processor;

means for interfacing between said system processor and said communication means; and

means for interfacing between said communication means and said peripheral control elements,

said communication means being based on a microprocessor and said means for interfacing between said system processor and said communication means including:

a plurality of bidirectional data registers having a port connected to at least one of the data bus of said system processor and the data bus of said communications processor;

means for loading data into said registers from said system processor bus;

means for reading data from said registers onto said system processor bus;

means for loading data into said registers from said communication processor bus; and

means for reading data from said registers onto said communications processor bus.

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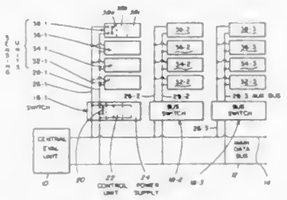
4,916,643
SYSTEM FOR REMOTE SENSING OF A PHYSICAL PARAMETER

Horst Ziegler, and Christof Hoentzsch, both of Paderborn, Fed. Rep. of Germany, assignors to W.C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Jan. 13, 1988, Ser. No. 143,567
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1987, 3701082
Int. Cl.[4] G08C *19/12*; G01B *7/26*
U.S. Cl. 364—557 **15 Claims**



1. Dual-channel modulation system, for remote measurement of a physical parameter at a plurality of measurement points, having

a central evaluation unit (**10**);

a plurality of sensing units (**32–38**);

data bus means (**12, 14; 26, 28**) interconnecting said evaluation unit and said sensing units;

each of said sensing units (**32–38**) comprising a first sensor (52) associated with a respective one of said measurement points, a first modulation circuit (**54**) connected to the output of said sensor and generating a pulse-interval-modulated signal, representing a first data channel, and a phase modulator (**60**), for the pulses generated, each respective modulator being adjusted differently for each of said sensing units (**32–38**),

wherein,

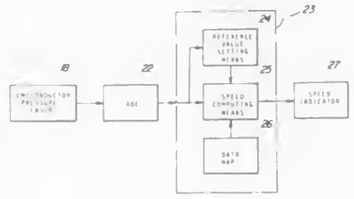
each sensing unit further comprises at least one additional modulation circuit (**58**) having an input for a control signal (62) and modulating at least one of the width and amplitude of said pulses, as a function of said control signal (62), thereby providing a second data channel.

4,916,644
RUNNING SPEED DETECTING DEVICE FOR MARINE VESSELS

Tomoji Nakamura; Ryoji Sawada, both of Iwata; Kazuhiro Nakamura, and Tatsuya Yoshioka, both of Hamamatsu, all of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 7, 1988, Ser. No. 164,513
Claims priority, application Japan, Mar. 6, 1987, 62-50307; Oct. 15, 1987, 62-260122
Int. Cl.[4] G01P *5/14*; G06F *15/20*
U.S. Cl. 364—565 **10 Claims**

1. A water speed indicator for a watercraft comprised of a hull, means carried by said hull for defining an opening to receive water pressure generated by the movement of said hull through the water, conduit means for transmitting said water pressure from said opening to a transducer for providing an output signal, means for obtaining a reference signal indicative of ambient conditions from said output signal, means for subtracting said reference signal from said output signal to obtain a correct signal, means for converting said correct signal into

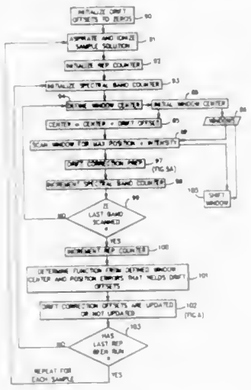


a velocity signal, and means for displaying water velocity in response to said velocity signal.

4,916,645
CONTINUOUS MONOCHROMETER DRIFT COMPENSATION OF A SPECTRAL MONOCHROMATOR

Charles E. Wuest, Norwalk, and John B. Collins, Westport, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 2, 1988, Ser. No. 201,250
Int. Cl.[4] G06F *15/20*; G01C *25/00*
U.S. Cl. 364—571.04 **15 Claims**



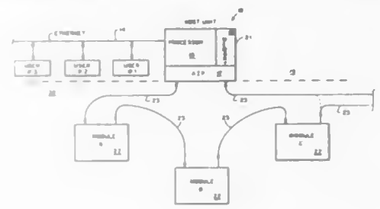
1. A method of continuously compensating for drift of peak positions of spectral lines in a spectral monochromator including radiation means for generating elemental radiation for atomic elements, optical dispersion means receptive of the radiation for producing a series of spectral bands each having a peak spectral position associated with maximum radiation intensity, detector means selectively receptive of a spectral function of a spectral band for producing an intensity signal representative of the intensity of the spectral fraction being received, scanning means responsive of a scanning signal for varying relative orientation of the dispersion means and the detector means such that the series of spectral bands is scanned across the detector means in spectral positions corresponding to successive spectral fractions, and computer means receptive of the intensity signal for generating the scanning signal and calculating spectral position of each peak; the method comprising the steps of, in sequence:

Establishing a series of spectral windows each encompassing a selected spectral band and having an initial window center, successively scanning through each of the windows so as to determine a maximum peak spectral position for a corresponding band, calculating a spectral position error of the peak position from the initial center for each corresponding window, calculating a drift offset equal to a functional average of the position errors, calculating a revised spectral center for each window equal to the initial center plus the corresponding drift offset, shifting each window to its revised center, and repeating the step of successively scanning through each of the windows so as to determine a new peak position for each corresponding band, whereby each new peak position is maintained near a spectral center of each corresponding window.

4,916,647
HARDWIRED PIPELINE PROCESSOR FOR LOGIC SIMULATION

Gary M. Catlin, Cupertino, Calif., assignor to Daisy Systems Corporation, Mountain View, Calif.

Filed Jun. 26, 1987, Ser. No. 67,634
Int. Cl.[4] G06F *15/16, 15/60*
U.S. Cl. 364—578 **7 Claims**



1. A process for implementing an event driven algorithm for simulating circuit elements, including a first circuit element having a first input state and a first output state, by serially pipelining data from one means to a subsequent means of the processor, comprising:

(1) means for updating the first input state of the first circuit element to a second input state;

(2) means for storing circuit element data, including storing (a) a number associated with the circuit element where the number can be received from the means for updating, and storing (b) the second input state received from the means for updating;

(3) means for receiving circuit element data from the means for storing circuit element data and for retrieving (a) circuit element type information associated with the first circuit element and (b) a pointer for the first circuit element;

(4) a first memory for storing a simulation algorithm according to the pointer;

(5) evaluation means for locking up an output state for the first circuit element determined by (a) the simulation algorithm stored in the first memory according to the pointer received from the means for retrieving a circuit element pointer and (b) the second input state of the first circuit element received from the means for storing circuit element data;

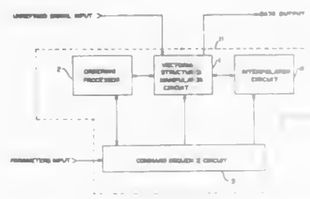
(6) means for scheduling and storing an event signifying that an output state change is required if the output state received from the evaluation means is different from the first output state of the first circuit element;

(7) control means for controlling the flow of data among the means for updating, the means for storing circuit element data, the means for retrieving circuit element type information and a pointer, the evaluation means, and the means for scheduling and storing an event.

4,916,646
SYSTEM FOR SIGNAL TO NOISE SEPARATION FOR ELECTROCHEMICAL INSTRUMENTS

Paolo Papoff; Nicolangelo Fanelli; Roger Fuoco, all of Pisa, and Dante Guidarini, Pontasserchio, all of Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Continuation of Ser. No. 869,738, Jun. 2, 1986, abandoned. This application May 9, 1989, Ser. No. 349,906
Claims priority, application Italy, Jun. 17, 1985, 84126 A/85
Int. Cl.[4] H03F *1/26*
U.S. Cl. 364—574 **16 Claims**



1. A device for separating a signal from noise and background contribution, particularly for computerized electrochemical instruments providing an experimental data curve, comprising:

an experimental data manipulator circuit (1);

an ordering processor (2) connected to said manipulator circuit (1) and arranged to provide the manipulator circuit with the procedures for the correct formatting of the experimental data on the basis of a plurality of selective operative modes;

a command sequencer circuit (3) controlling the operation of the device of the basis of values of characteristic parameters selected for each of said operative modes; and

an iterative interpolator circuit (4), which recalculates each data point (i) of a plurality of discrete data points within plural portions or segments of said curve using algorithms based on polynomial interpolation of data points within a said portion of said curve as a function of at least one adjacent portion of said curve external to said portion and calculated by the Newton interpolating formula with divided differences and the Aitken scheme for accelerating the calculation whereby each experimental point is recalculated by a d_i degree polynomial on the basis of neighboring points belonging to an interval (θ) of a plurality of data points, where $\theta = d_i + 2$ data points, the d_i degree polyonomial being a polynomial through which the conditions of absolute convergence are reached.

4,916,648
ULTRASONIC LOGGING APPARATUS WITH IMPROVED RECEIVER

Michael F. Gard, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 291,627, Dec. 29, 1988, abandoned. This application Jun. 9, 1989, Ser. No. 366,201
Int. Cl.[4] G01V *1/00*
U.S. Cl. 367—35 **7 Claims**

4. An ultrasonic logging apparatus for use in a well borehole, comprising:

(a) ultrasonic transducer means for generating and receiving acoustic signals;

(b) transmitter means for exciting said transducer means so that said transducer means will generate an acoustic wave-

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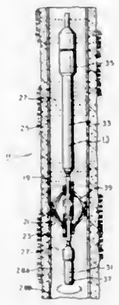
form, said transmitter means connected with said transducer means, said transmitter means exciting said transducer means at periodic intervals of time;

(c) receiver means for receiving an acoustic return from said generated acoustic waveform, said receiver means having an input, said receiver means input connected with said transducer means, said receiver means receiving said acoustic return during an interval of time between said periodic generated acoustic waveforms;

(d) said receiver means comprising said amplifier means, said amplifier means comprising gain switching means for changing the gain of said amplifier means, said gain



switching means comprising a resistive feedback network of plural resistive elements with the gain of said amplifier means dependent upon which resistive elements are connected in feedback, said gain switching means comprising plural junction field-effect transistors connected to said resistive elements, said junction field-effect transistors controlling which resistive elements are connected in feedback;

(e) control means for controlling said junction field-effect transistors so as to automatically switch the gain of said amplifier means during the reception of said acoustic return.

4,916,649

METHOD AND APPARATUS FOR TRANSFORMING A BIT-REVERSED ORDER VECTOR INTO A NATURAL ORDER VECTOR

Jun-Ichi Yorozu, and Norio Masuda, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 28, 1988, Ser. No. 225,353
Claims priority, application Japan, Jul. 29, 1987, 62-187814
Int. Cl.[4] G06F *15/332*
U.S. Cl. 364—726 3 Claims

3. A system for transforming a bit-reversed order vector into a natural order vector, comprising:

a main memory having a plurality of banks said main memory storing bank number information;

a optimal access-address interval determination means for determining an optimal access-address interval of the basis of said bank number information and a bit-reversed order vector length;

a first vector storage area, located within said main memory, for storing said bit-reversed order vector;

a second vector storage area, located within said main memory, for storing said bit-reversed order vector;

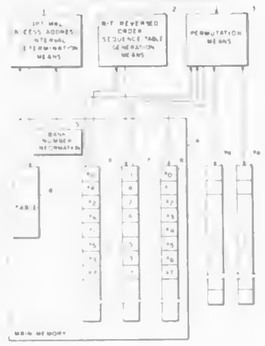
a permutation vector storage area, located within said main memory, for storing a permutation vector;

a bit-reversed order sequence table generation means for performing bit-reversal processing on the basis of said length of said bit-reversed order vector, and for storing a resultant bit-reversed order vector into said permutation vector storage area as a permutation vector;

a first vector register;

a second vector register;

permutation means for receiving information from said optimal access-address interval determination means and information from said first vector storage area and from said



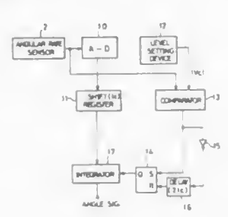
permutation vector storage area and for transferring information to and from said second vector register, said permutation means outputting to said second vector storage area a natural order vector in a sequence such that bank conflict does not occur.

4,916,650

SENSOR SIGNAL INTEGRATING METHOD

Takahiro Oikawa, Shizuoka, Japan, assignor to Yazaki Corporation, Japan

Filed Feb. 19, 1988, Ser. No. 157,949
Int. Cl.[4] G06F *7/38, 15/50*
U.S. Cl. 364—733 3 Claims



3. An apparatus for integrating an input sensor signal f(T) superimposed upon a drift with respect to time, said apparatus comprising:

(a) means (**11**), responsive to the input sensor signal f(T), for shifting the input sensor signal by a first time period t_c;

(b) means (**12**) for presetting a predetermined constant signal level Vc;

(c) means (**13**) responsive to the input sensor signal and coupled to said predetermined signal level presetting means for comparing the input sensor signal with preset predetermined signal level Vc and generating a first signal when the sensor signal exceeds the predetermined constant signal level vc and generating a second signal when the sensor signal drops below the predetermined signal level;

(d) means (**15**) coupled to said comparing means for inverting voltage levels of the first and second signals;

(e) means (**16**) coupled to said inverting means for delaying

the inverted first and second signals by a second time period $2.t_c$;

(f) means (**14**) coupled to said comparing means and said delaying means for generating an integration start signal in response to the first and second signals generated from said comparing means and an integration end signal in response to the inverted and delayed first and second signals generated from said delaying means; and

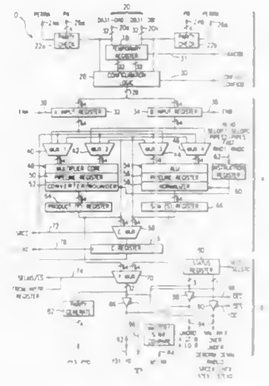
(g) means (**17**) coupled to said shifting means and said integration start and end signal generating means for integrating the shifted sensor signal from when the integration start signal is generated to when the integration end signal is generated, and outputting an integrated signal.

4,916,651

FLOATING POINT PROCESSOR ARCHITECTURE

Michael C. Gill, Dallas; Henry M. Darley, Plano; Edison H. Chiu, Richardson, and Jeffrey A. Niehaus, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 29, 1988, Ser. No. 149,780
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—736 4 Claims



1. An integrated circuit for a data processor, said circuit comprising:

input circuitry receiving data from a source external to the integrated circuit and having an output;

a multiplier having a first and a second multiplier input, said multiplier calculating a product of two data numbers received at said multiplier inputs and having the product as a multiplier output;

an adder having a first and a second adder input, said adder calculating the sum of the two data numbers received at said adder inputs, said adder operating in parallel with said multiplier and having said sum as an adder output;

a first input register coupled between the output of said input circuitry and each of the first multiplier and adder inputs;

a second input register coupled between the output of said input circuitry and each of the second multiplier and adder inputs;

a product register connected to receive and store said multiplier output;

a sum register connected to receive and store said adder output;

a first multiplexer receiving and having a selective output of either the contents of said product register or said sum register;

a storage register coupled between the selective output of said first multiplexer and the first and second multiplier inputs and the first and second adder inputs, and

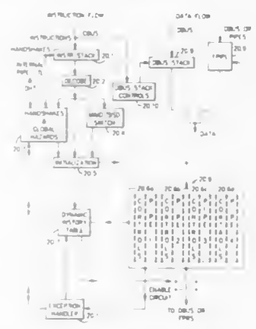
a second multiplexer receiving and having selective output of either the contents of said product register or said sum register to an output stage of said processor.

4,916,652

DYNAMIC MULTIPLE INSTRUCTION STREAM MULTIPLE DATA MULTIPLE PIPELINE APPARATUS FOR FLOATING-POINT SINGLE INSTRUCTION STREAM SINGLE DATA ARCHITECTURES

Eric M. Schwarz, Endicott, and Stamatis Vassiliadis, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1987, Ser. No. 102,985
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—748 17 Claims



1 A pipelined processing apparatus having a plurality of pipelined processors accomodating different types of instructions, comprising:

receiving means for receiving incoming instructions, which receiving means includes decode means for decoding each of the incoming instructions thereby identifying a category type for said each of the incoming instructions;

a plurality of pipelined processors each connected to said receiving means for temporarily holding at least some of the incoming instructions for execution, each pipelined processor being identified by a unique number;

switch means connected to said receiving means and coupled to said plurality of pipelined processors, said switch means changing to a standard single pipelining mode for a first category of instructions identified by said decode means and changing to a dynamic multiple pipelining mode for a second category of instructions identified by said decode means, with each instruction in said second category of instructions having the unique number for the pipelined processor which accomodates that type of instruction;

table means connected to the plurality of pipelined processors and to the receiving means for recording the numbers of one or more pipelined processor means in which said at least some of the incoming instructions are temporarily held for execution, and for controlling the completion of instruction processing by the plurality of pipelined processors so that such completion will be in a predetermined sequence; and

wherein said receiving means determines if a particular one of the pipelined processors is available for use, said receiving means inserting an incoming instruction in said particular one of the pipelined processors for execution when said particular one of the pipelined processors becomes available for use.

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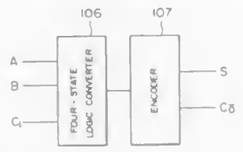
4,916,653

ADDER USING MULTI-STATE LOGIC

Toshihiko Shimizu, Tokyo, and Masao Hotta, Hanno, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 24, 1988, Ser. No. 235,528
Claims priority, application Japan, Aug. 28, 1987, 62-212746
Int. Cl.[4] G06F 7/50
U.S. Cl. 364—784 3 Claims



1. An adder for use as a binary digital full adder applied with two binary input signals and a binary carry-in from the lower digit, said adder comprising:

a four-state logic converter for adding together said three binary signals by current addition and converting the sum of said three binary signals into a four-state logic level, said four-state logic converter comprises three current switches respectively applied with said three binary signals as switching signals and a load resistor, output terminals of said current switches are interconnected together to permit current addition by which voltages representative of four-state logic levels are obtained across said load resistor; and

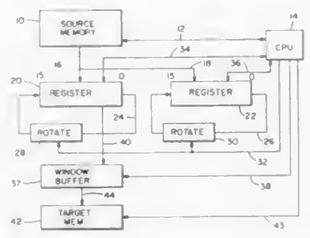
an encoder for deciding the level of said four-state logic level and encoding said decided level of said four-state logic level into a binary sum and a carry-out.

4,916,654

METHOD FOR TRANSFER OF DATA VIA A WINDOW BUFFER FROM A BIT-PLANAR MEMORY TO A SELECTED POSITION IN A TARGET MEMORY

Arthur M. Sherman, Morgan Hill, and Peter C. Yanker, Portola Valley, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 6, 1988, Ser. No. 242,327
Int. Cl.[4] G06F 12/00
U.S. Cl. 364—900 11 Claims



1. In a system comprising a source memory which includes a plurality of bit planes addressable in planar data units, display data units being stored therein on a bit-plane basis; a target memory for storing display data units; window buffer means interposed between said source memory and said target memory; and means for transforming preset data lengths of display data units from bit-planes in said source memory, via said window buffer, to said target memory, wherein a preset data length of said display data units may start at any planar data unit bit position and may bridge between adjacent planar data units, the method comprising:

selecting and aligning a first preset data length of display data unit bits which resides in a first pair of planar data units in said source memory;

selecting and aligning a second preset data length of display data unit bits which resides in a second pair of planar data units in said source memory;

consolidating a third preset data length of display data unit bits which bridges between said first and second pairs of planar data units;

aligning said consolidated third preset data length of display data unit bits; and

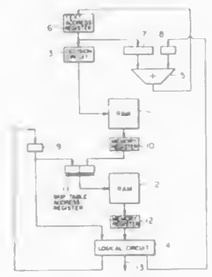
transferring said aligned data lengths of display data unit bits to said window buffer means.

4,916,655

METHOD AND APPARATUS FOR RETRIEVAL OF A SEARCH STRING

Tadashi Ohsone; Akira Yamamoto; Hiroyuki Kitajima, all of Yokohama; Masashi Tsuchida, Tokyo; Nobuhiro Taniguchi, and Yoshiaki Yamashita, both of Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 10, 1987, Ser. No. 13,049
Claims priority, application Japan, Feb. 14, 1986, 61-28808; Mar. 12, 1986, 61-52439
Int. Cl.[4] G06F 15/40
U.S. Cl. 364—900 4 Claims



1. A process, performed on a digital computer, for retrieving a desired character pattern, containing m contiguous characters, from a text, containing n contiguous characters, where $n>m$, said process comprising the steps of:

(a) comparing the character at the j-th character location in the desired character pattern, where $1 \leqq j \leqq m$, with the character in the i-th character location in the text, where $1 \leqq i \leqq n$;

(b) determining whether the comparison resulted in a match or in no match;

(c) when step (b) determines that the comparison resulted in no match, comparing the character at the j-th character location in the desired character pattern with the character at the location in the text $(m+1-1)$ character locations after the character location in the text with which the most recent previous comparison was made, where l is the number of comparisons, including said most recent previous comparison, that have been made and have resulted in a match since that most recent comparison which resulted in no match, and repeating the process from step (b);

(d) when step (b) determines that the comparison resulted in a match and when no comparison has yet resulted in a match of the m-th character in the desired character pattern, then comparing the character in the next character location in the desired character pattern with the character in the next character location in the text and repeating the process from step (b); and

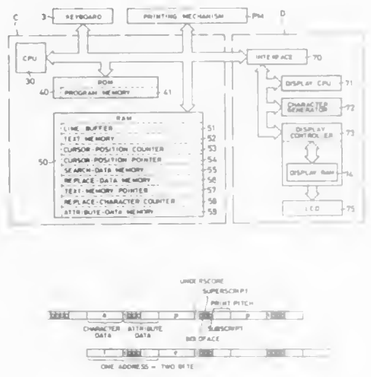
(e) when step (b) determines that the comparison resulted in a match and any comparison has resulted in a match of the m-th character in the desired character pattern, then comparing the character at the character location in the desired character pattern next preceding the character location in the desired character pattern with which the most recent previous comparison was made with the character at the character location in the text next preceding the character location in the text with which said most recent previous comparison was made, and repeating the process from step (b) until the desired character pattern is retrieved from the text.

4,916,656

TEXT PROCESSING SYSTEM HAVING SEARCH-AND-REPLACE FUNCTION FOR BOTH CHARACTER AND ATTRIBUTE DATA

Ryoichi Sasaki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Dec. 29, 1987, Ser. No. 139,204
Claims priority, application Japan, Dec. 29, 1986, 61-315827
Int. Cl.[4] G06F 9/00
U.S. Cl. 364—900 8 Claims



1. A text processing system comprising:

input means for entering text data representative of a text, said input means including character keys for entering character data representative of respective characters and at least one attribute-data entry key for entering attribute data which designates a manner in which the entered characters are printed, said text data including said character data and said attribute data;

text data memory means for storing said text data;

printing means for printing the characters entered through said character keys, in accordance with said character data and said attribute data of said text data;

attribute-data storing control means for providing to said text data memory means attribute data entered in relation to said character data through said at least one attribute-data entry key; and

search-and-replace control means for controlling a search-and-replace operation, said search-and-replace control means being operable to scan said text data memory means in search for a first group of character data representative of successive characters stored in said text data memory means, which first group is identical with a second group of character data representative of successive characters entered through said input means, said search-and-replace control means being operable to replace said first group of character data by a third group of character data representative of successive replacement characters,

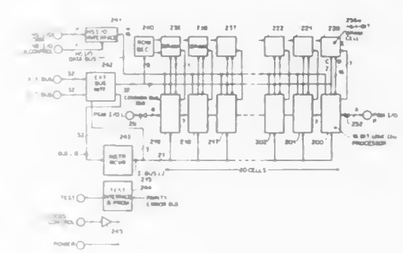
said search-and-replace control means including attribute data-replacing control means operable during said search-and-replace operation, if character data of said first group of character data representative of a first character of said successive characters is accompanied by specific attribute data entered through one of said at least one attribute-data entry key, to provide said specific attribute data to locations of said text data memory means corresponding to locations of said text data memory means at which said third group of character data has replaced said first group of character data, so that all of said replacement characters are printed in a manner designated by said specific attribute data.

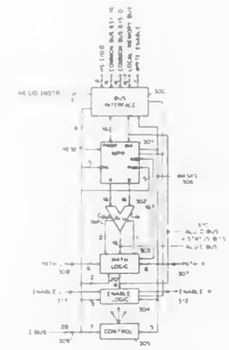
4,916,657

SINGLE INSTRUCTION MULTIPLE DATA (SIMD) CELLULAR ARRAY PROCESSING APPARATUS EMPLOYING MULTIPLE STATE LOGIC FOR COUPLING TO DATA BUSES

Steven G. Morton, Oxford, Conn., assignor to Alcatel USA, Corp., New York, N.Y.

Filed Dec. 12, 1985, Ser. No. 808,315
Int. Cl.[4] G06F 9/00
U.S. Cl. 364—900 15 Claims





1. In a cellular array of the type adapted to be connected to similar arrays via external buses and employing a plurality of

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processor cells arranged in an array of columns and rows, with said cells communicating with one another via a common bus having a plurality of parallel data lines, the combination therewith of an interface for receiving a multi-level logic signal from a single terminal of an external bus and for providing a plurality of data bits to parallel data lines of said common bus, said interface comprising:

logic level converting means, coupled between said terminal and said common bus, for receiving said multi-level logic signal from said terminal and in response thereto for providing first and second binary data bits to data lines of said common bus in accordance with the level of the multi-level logic signal from said single terminal, whereby a multi-level logic signal applied to said single terminal is converted to first and second binary data bits provided on data lines of said common bus.

4,916,658

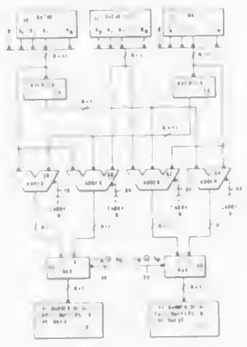
DYNAMIC BUFFER CONTROL

Chien-Chyun Lee, and Charles R. Moore, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1987, Ser. No. 135,170

Int. Cl.[4] G06F *13/14*

U.S. Cl. 364—900 12 Claims



1. An apparatus for storing or retrieving data words comprising:

a plurality of storage locations;

means, connected to said plurality of storage locations, for transferring a plurality of data words simultaneously during a first time cycle,

means for providing a first indicator designating a next of said storage locations to be stored into during said first time cycle;

means for providing a second indicator designating a next of said storage locations to be retrieved from during said first time cycle;

means for providing a number of said storage locations available for storage or retrieving during said first time cycle; and

means connected to the storage locations, said transfer means, said first and second indicator means, and said means for providing the available number of storage locations, for either storing or retrieving a plurality of data words of said storage locations simultaneously during said first time cycle.

4,916,659

PIPELINE SYSTEM WITH PARALLEL DATA IDENTIFICATION AND DELAY OF DATA IDENTIFICATION SIGNALS

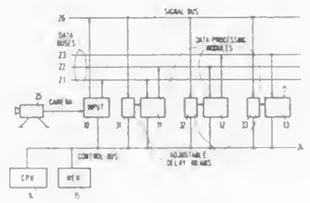
Eric H. J. Persoon, and Johannes A. C. Bernsen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

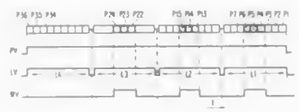
Filed Feb. 18, 1988, Ser. No. 161,566

Claims priority, application Netherlands, Mar. 5, 1987, 8700530

Int. Cl.[4] G06F *9/00*

U.S. Cl. 364—900 13 Claims





1. A pipeline system for processing data accompanied by data identification signals, which pipeline system comprises:

(a) a plurality of data processing modules (**11**, **12**, **13**),

(b) communication means (**21**, **22**, **23**) for interconnecting the data processing modules,

(c) control means (**14**) for controlling the pipeline system,

(d) a control connection (**24**) for coupling the control means to the data processing modules,

(e) a memory (**15**) for storing information describing a configuration of the pipeline system and also describing respective processing delays introduced by each of the data processing modules, which memory is connected to the control means,

(f) a plurality of respective delay means (**31**, **32**, **33**), one for each of the data processing modules, for delaying the data identification signals, and

(g) means (**26**) for applying the data identification signals in parallel to the plurality of delay means.

4,916,660

NEST LEVEL JUDGING HARDWARE DEVICE FOR HIGH SPEED MESSAGE HANDLING SYSTEMS

Kousuke Takahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 11, 1988, Ser. No. 217,198

Claims priority, application Japan, Jul. 9, 1987, 62-172151; Jan. 6, 1988, 63-1483

Int. Cl.[4] G06F *15/00, 7/04*

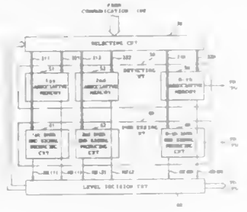
U.S. Cl. 364—900 10 Claims

1. A nest level judging device operated in response to a plurality of tokens one at a time, each of said tokens being given a nest level selected from first through N-th nest levels as a selected level, where N represents a predetermined natural number, said first through said N-th nest levels being a lowest through a highest nest level, respectively, each of said tokens comprising a header and a data set, said data set having a data length and being for nesting one of said tokens that has a higher

nest level than said selected level, said header comprising a data length code representatives of said data length and a data identifier code which includes a nest bit indicative of whether or not said one of the tokens is nested in said data set, said nest level judging device being for judging said selected level and comprising:

detecting means supplied with said data identifier code for detecting said nest bit to produce a nest bit detection signal when said nest bit indicates that said one of the tokens is nested in said data set;

selecting means supplied with said header and having first through N-th output ports in correspondence to said first through said N-th nest levels, respectively, for selecting in response to each of successively supplied selection signals said first through said N-th output ports one as a selected



port at a time to deliver said data length code to said selected port, said selecting means thereby delivering the data length codes of the respective tokens in response to said selection signals to said first through said N-th output ports as first through N-th data codes;

processing means coupled to said selecting means for processing said first through said N-th data codes into a processed signal which is N bits long; and

level decision means coupled to said detecting means and said processing means for deciding in response to said nest bit detection signal and said processed signal a decided nest level indicative of one of said first through said N-th nest levels that is selected as said selected level, said level decision means supplying said selecting means with said decided nest level as one of said selection signals that next follows said each of the selection signals.

4,916,661

SEMICONDUCTOR MEMORY DEVICE WITH BIT LINE PAIRS CROSSED AT LEAST ONCE WITH RESPECT TO EACH OTHER

Masaru Nawaki, Nara; Hirofumi Higashino, and Tomoyuki Tagami, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

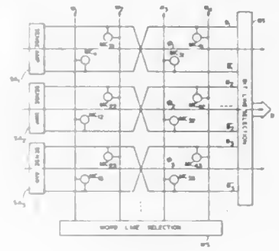
Continuation of Ser. No. 131,589, Dec. 11, 1987, abandoned. This application Mar. 17, 1989, Ser. No. 326,434

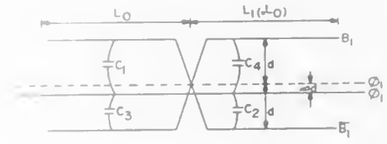
Claims priority, application Japan, Dec. 17, 1986, 61-302376

Int. Cl.[4] G11C *11/40, 13/00*

U.S. Cl. 365—51 5 Claims

1. A semiconductor memory device comprising a plurality of bit line pairs which are sequentially aligned longitudinally between two end positions and signal lines made of a different material from bit lines of said bit line pairs, said signal lines being generally longitudinally extending parallel to said bit line pairs between said end positions, the two bit lines in all of said bit line pairs being crossed at least once with respect to each other at one or more same longitudinal positions between said





end positions so as to prevent imbalance of parasitic capacitances between said bit line pairs and said signal lines.

4,916,662

IC CARD INCLUDING HIGH INPUT VOLTAGE DETECTION AND SUPPRESSION

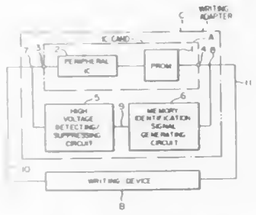
Masaharu Mizuta, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 7, 1988, Ser. No. 241,213

Claims priority, application Japan, Sep. 18, 1987, 62-235884

Int. Cl.[4] G11C *5/00, 7/00*; G06K *5/00, 19/06*

U.S. Cl. 365—52 4 Claims



1. An IC card writing system for writing data in a memory in an IC card comprising:

a data writing device for writing data in a memory of an IC card utilizing a voltage which is below a predetermined value, after receiving a memory identification signal concerning said memory, by applying an input voltage having at least the predetermined value to an input terminal of said IC card;

a high voltage detecting/suppressing means for detecting the input voltage applied to said input terminal of said IC card by said data writing device, and for, when the input voltage equals or exceeds the predetermined value, suppressing the input voltage applied to said input terminal of said IC card to below the predetermined value while outputting a detecting signal; and

a memory identification signal generating means for containing memory identification data concerning said memory

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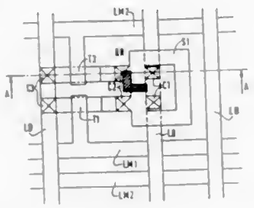
of said IC card and for outputting said memory identification signal to said data writing device on the basis of said memory identification data when the detection signal is output from said high voltage detecting/suppressing means.

4,916,663

FAST-ACCESS DATA STORAGE CIRCUIT HAVING A TWO-DIMENSIONAL CARRIER GAS

Bertrand Gabillard, and Jean-Noël Patillon, both of Paris, France, assignors to U.S. Philips Corp., New York, N.Y.

Filed Feb. 17, 1988, Ser. No. 157,544
Claims priority, application France, Feb. 20, 1987, 87 02232
Int. Cl.[4] G11C *11/44*
U.S. Cl. 365—161 3 Claims



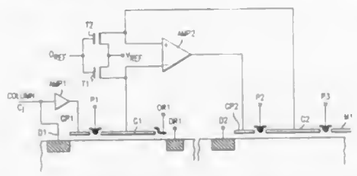
1. A fast-access monolythic integrated data storage circuit on a semi-insulating substrate, characterized in that it comprises a semiconductor material with a two-dimensional electronic carrier gas, which semiconductor material is formed by adjacent layers of a material having a narrow forbidden band and a material having a wider forbidden band, the two-dimensional gas being located at the interface of these two layers, in which circuit said semiconductor material becomes superconducting when the temperature and the magnetic field are suitably chosen, resulting in an extreme reduction of the access time of said circuit and ensuring a quasi-unlimited conservation of the data stored.

4,916,664

CHARGE DUPLICATOR FOR CHARGE TRANSFER DEVICE

Jean-Luc Berger, and Marc Arques, both of Grenoble, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 3, 1989, Ser. No. 292,898
Claims priority, application France, Jan. 5, 1988, 88 00028
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—183 7 Claims



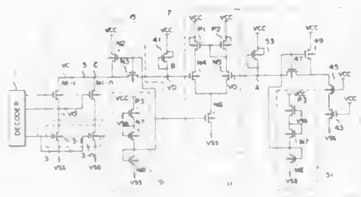
1. A charge duplicator for a charge transfer device, to generate and store, in a second storage region, a replica charge proportionate to the reference charge generated and stored in a first storage region, comprising:
a first storage gate above a first storage region;
a second storage gate above the second storage region;
a first charge injector comprising a first passage gate to introduce, beneath the first storage gate, the reference charge to be duplicated;
a second charge injector comprising a second passage gate near the second storage gate;
a voltage comparator having a first input connected to the first storage gate and a second input connected to the second storage gate and an output connected to the second passage gate;
a means used, initially, to apply a reference voltage to the two inputs of the comparator and, secondly, to leave these inputs and the gates connected to them in a floating state.

4,916,665

SEMICONDUCTOR MEMORY DEVICE WITH P-CHANNEL MOS TRANSISTOR LOAD CIRCUIT

Shigeru Atsumi, and Sumio Tanaka, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 16, 1984, Ser. No. 610,704
Claims priority, application Japan, May 26, 1983, 58-92641
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—185 4 Claims



1. A semiconductor memory device responsive to an address signal comprising:
at least one floating gate memory cell;
selecting means, connected to said at least one memory cell, for receiving said address signal and selecting a memory cell which corresponds to said address signal;
detecting means, connected to said at least one memory cell, for detecting data stored in said memory cell selected by said selecting means and for producing a detection signal corresponding to said detected data;
binary signal generating means, connected to said detecting means and comprising CMOS transistors, for receiving said detection signal and, based on said detection signal, producing a binary signal corresponding to said data stored in said memory cell selected by said selecting means; and
loading means, comprising at least one p-channel enhancement-type MOS transistor having a gate and drain connected to a node of said detecting means and said binary signal generating means, and also having a source and substrate for receiving a predetermined voltage, for amplifying the detection signal produced by said detection means.

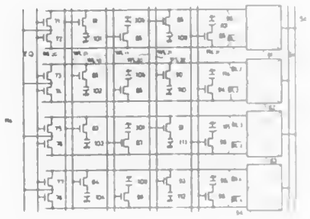
4,916,666

DYNAMIC RANDOM ACCESS MEMORY DEVICE AND OPERATING METHOD THEREFOR

Ryouji Fukuhama, and Hideshi Miyatake, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1988, Ser. No. 261,021
Claims priority, application Japan, Nov. 17, 1987, 62-291318
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—207 11 Claims

1. A dynamic random access memory device formed on a major surface of a semiconductor substrate, comprising:
an array of memory cells arranged in rows and columns;
a plurality of bit line pairs coupled to rows of said memory cells, said plurality of bit line pairs comprising a plurality of first bit line pairs and a plurality of second bit line pairs, said first bit line pairs interposed respectively between said second bit line pairs so that said first and second bit line pairs alternative;
a plurality of word lines coupled respectively to columns of said memory cells;
equalizing means coupled to said plurality of bit line pairs for equalizing said pairs;



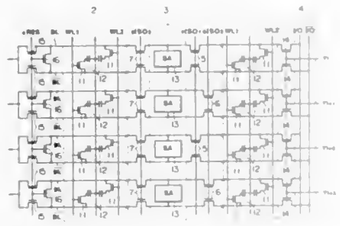
a plurality of first and a plurality of second sense amplifier means coupled respectively to said plurality of first and plurality of second bit line pairs; and
control means for activating alternately a plurality of said first amplifier means and a plurality of said second sense amplifier means.

4,916,667

DYNAMIC RANDOM ACCESS MEMORY HAVING FOLDED BIT LINE-SHARED SENSE AMPLIFIERS

Masayuki Miyabayashi, Kanagawa, and Kaneyoshi Takeshita, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 287,447
Claims priority, application Japan, Dec. 25, 1987, 62-328895
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—207 4 Claims



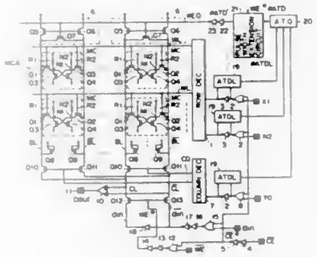
1. A DRAM having folded bit line-shared sense amplifiers comprising
a first array of memory cells;
a second array of memory cells;
an array of sense amplifiers provided between and shared by said memory cell arrays;
a plurality of bit line pairs, each pair having connected therebetween a different memory cell of the first array, a different sense amplifier, and a different memory cell of the second array and wherein the bit line pairs are divided into at least a first group and a second group;
separate input/output means connected to each bit line pair at one end to selectively transfer data to each bit line pair;
separate first switch means provided in series with each bit line pair of the first group between the memory cell of first array and the sense amplifier;
separate second switch means provided in series with each bit line pair of the second group between the memory cell of first array and the sense amplifier; and
separate third switch means provided in series with each bit line pair between and separating the memory cell of the second array and the sense amplifier from each other; and
wherein the first switch means, the second switch means and the third switch means are responsive to separate control signals.

4,916,668

INTERNAL SYNCHRONIZATION TYPE MOS SRAM WITH ADDRESS TRANSITION DETECTING CIRCUIT

Masataka Matsui, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 29, 1989, Ser. No. 330,048
Claims priority, application Japan, Mar. 31, 1988, 63-76606
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—230.01 15 Claims



1 A static random access memory comprising:
a memory cell array having static memory cells arranged in a matrix form;
word lines arranged correspondingly to the rows of said memory cell array, for selecting the memory cell row;
bit line pairs arranged correspondingly to the columns of said memory cell array, data being transferred between said bit line pairs and said memory cell;
address input means for receiving an address signal;
row decoder means for decoding a row address signal from said address input means and selectively driving the word line;
column decoder means for decoding a column address signal from said address input means and selecting the bit line pair;
address transition detecting means for detecting the transition of the address signal to generate an address transition signal which is a monostable pulse of a constant length;
bit line initializing means controlled by the address transition detecting signal for initializing the potentials of said paired bit lines in synchronism with the address transition signal; and
pulse width extension means for forming in a write mode an address transition signal having a longer period than that in a readout mode and supply the long-period address transition signal to said bit line initializing means.

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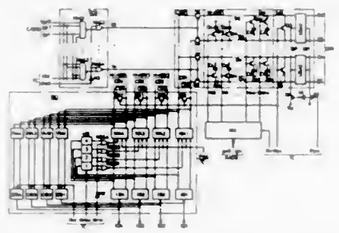
4,916,669

SEMICONDUCTOR MEMORY

Katsuyuki Sato, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 20, 1988, Ser. No. 196,262
Claims priority, application Japan, May 27, 1987, 62-128198
Int. Cl.[4] G11C *11/34*
U.S. Cl. 365—230.05 16 Claims



1. A semiconductor memory comprising: a memory array comprised of a plurality of data lines and word lines disposed in an arrangement of perpendicularly intersecting data lines and word lines, and a plurality of memory cells respectively disposed like a lattice at intersections of said data lines and word lines;

a plurality of sense amplifiers, each one being coupled to a respective data line, and wherein said plurality of sense amplifiers are selectively placed in an operational state in accordance with a predetermined timing signal;

a row address decoder, in response to row address signals, providing word line signals at selected word lines thereby placing them in a selected state condition;

column switches being coupled between said plurality of data lines and common data lines for providing selective or simultaneous connection of said plurality of data lines to said common data lines;

write amplifiers, coupled to said common data lines, supplying predetermined write signals to data lines brought into a state of connection with said common data lines via said column switches; and

wherein said sense amplifiers are place in an operational state during a predetermined operation mode after write signals are supplied from said write amplifiers to data lines brought into a state of connection to said common data lines.

4,916,670

SEMICONDUCTOR MEMORY DEVICE HAVING FUNCTION OF GENERATING WRITE SIGNAL INTERNALLY

Atsushi Suzuki, Kawasaki, and Kazuya Kobayashi, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 31, 1989, Ser. No. 304,318
Claims priority, application Japan, Feb. 2, 1988, 63-021161; Mar. 11, 1988, 63-056311; Mar. 11, 1988, 63-056314
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—233 22 Claims

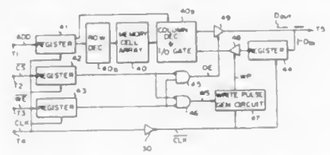
1. A semiconductor memory device receiving an external clock having a rising edge and a falling edge comprising:

a memory cell array,

a first latch circuit operatively connected to said memory cell array, for receiving a control signal designating one of a read cycle and a write cycle for said memory cell array, said first latch circuit latching said control signal in response to one of the rising edge and the falling edge of said external clock;

a second latch circuit operatively connected to said memory cell array, for receiving a write data, said second latch circuit latching said write data in response to another of the rising edge and the falling edge of said external clock; and

a write signal generating circuit operatively connected to



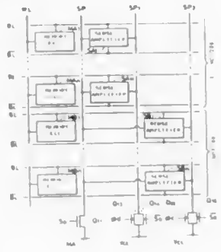
said memory cell array and said first latch circuit, for feeding a write signal to said memory cell array when said control signal latched in said first latch circuit designates said write cycle.

4,916,671

SEMICONDUCTOR MEMORY DEVICE HAVING SENSE AMPLIFIER HAVING IMPROVED ACTIVATION TIMING THEREOF AND OPERATING METHOD THEREOF

Tetsuichiro Ichiguchi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1989, Ser. No. 313,680
Claims priority, application Japan, Sep. 6, 1988, 63-224106
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—233 9 Claims



1. A semiconductor memory device comprising:

a memory array (**58**) comprising a plurality of memory cells for storing a data signal;

means (**54**) for receiving address signals to select a memory cell in said memory array (**58**),

said memory array (**58**) comprising a first memory array region including a memory cell selected by said address signals and a second memory array region not including the selected memory cell;

first amplifying means connected to said first memory array region of said memory array (**58**) for amplifying the data signal stored in the memory cell in said first memory array region;

second amplifying means connected to said second memory array region of said memory array (**58**) for amplifying the data signal stored in a memory cell in said second memory array region; and

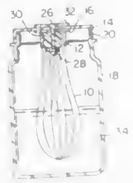
sequentially activating means (**64**) connected to said first and second amplifying means for activating said first and second amplifying means in sequential order in response to the address signals, thereby sequentially amplifying data stored in memory cells in said first and second memory array regions whereby a peak value of current consumption is reduced.

4,916,672

MIXING AND BLENDING SHAKER APPARATUS AND METHOD

Carl E. McCrory, 14901 E. Hornell St., Whittier, Calif. 90604

Filed Aug. 29, 1988, Ser. No. 237,137
Int. Cl.[4] B01F *11/00*
U.S. Cl. 366—130 7 Claims



1. A mixing shaker apparatus for blending fluids with other ingredients such as powdered food substances, comprising:

(a) a mixing container having an upper opening;

(b) a cover adapted to removably engage said container by fastening means in a manner to provide a sealed enclosure with said container; and

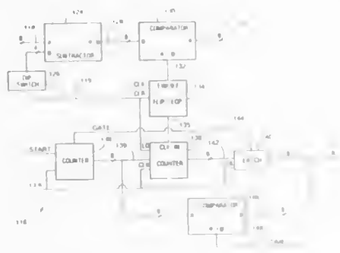
(c) a wire whip mixing baffle formed from multiple loops of spring wire gathered in a ferrule attached centrally to said cover by attachment means in a manner to securely position said wire whip centrally within said container whenever said cover is engaged with said container by said fastening means, whereby when said container is loaded with the fluids and other ingredients, engaged with said cover, and shaken in a manner to intermix said fluids and other ingredients, said wire whip mixing baffle is enabled to interact with said fluids and other ingredients in a manner to expedite and enhance mixing and blending thereof.

4,916,673

METHOD AND APPARATUS FOR DETECTING THE PEAK OF AN ANALOG SIGNAL

Steven A. Morris, Sand Springs, and Houston B. Mount, Tulsa, both of Okla., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 37,305, Apr. 10, 1987, Pat. No. 4,777,629.
This application Jun. 28, 1988, Ser. No. 212,555
Int. Cl.[4] G01V *1/40*, H03K *5/153, 17/00*
U.S. Cl. 367—69 8 Claims



1. A method for associating an electrical pulse generated by a borehole scanning system with a value related to the time at which said electrical pulse occurs, said method comprising the steps of:

detecting a peak value of the electrical pulse;

detecting a second value at which said electrical pulse falls below a preselected level, said preselected level being less than the peak value of said electrical pulse; and

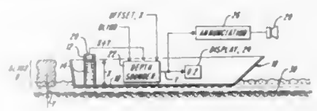
computing the time half way between the time at which said peak value occurs and the time at which said second value occurs.

4,916,674

METHOD AND APPARATUS FOR IMPROVING THE SHALLOW WATER PERFORMANCE OF A DEPTH SOUNDER

Robert K. Tendler, 19 Lawrence Ave., Chestnut Hill, Mass. 02167

Filed Apr. 6, 1989, Ser. No. 334,455
Int. Cl.[4] G01S *15/00*
U.S. Cl. 367—141 7 Claims



1. Apparatus for use in an aquatic vessel for improving the shallow water response of a depth sounding system having a depth sounder for indicating the depth of water beneath said vessel and a transducer coupled to said depth sounder, comprising:

acoustic delay means interposed between the face of said transducer and the water at the bottom of the vessel for coupling acoustic energy for said transducer into the water beneath said vessel and for coupling return pulses to said transducer, said acoustic delay means being provided with a predetermined delay time that exceeds the time associated with transducer ring; and

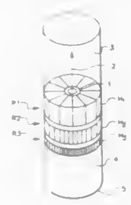
means for automatically subtracting from the indicated depth of the water from said depth sounder the depth added by the interposition of said delay means for permitting indication of shallow water depth.

4,916,675

BROADBAND OMNIDIRECTIONAL ELECTROACOUSTIC TRANSDUCER

Friedrich Hoering, Kiel, Fed. Rep. of Germany, assignor to Honeywell Elac Nautik GmbH, Fed. Rep. of Germany

Filed May 1, 1989, Ser. No. 345,878
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1988, 3812244
Int. Cl.[4] H04R *17/00*
U.S. Cl. 367—153 5 Claims



1. A broadband omnidirectional electroacoustic transducer comprising:

a plurality of transducer rings positioned side-by-side along a common axis wherein each ring is comprised of a plurality of radially directed transducer elements which are located side-by-side around the circumference of said ring and are adapted for radial transmission of sound waves, the natural frequency of the transducer elements of each transducer ring differing from the natural frequency of the transducer elements of said adjacent transducer rings, the

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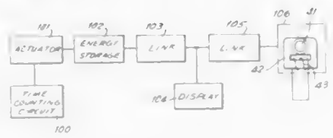
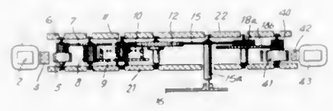
height H of said individual transducer elements of a particular transducer ring along the common axis being chosen such that H is less than or equal to λ/2, with λ being the natural frequency of the transducer in said ring.

4,916,676
ELECTRONIC TIMEPIECE
Osamu Miyazawa, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Dec. 9, 1988, Ser. No. 282,240
Claims priority, application Japan, Dec. 14, 1987, 62-315612; Dec. 23, 1987, 62-325691; Aug. 24, 1988, 63-209984
Int. Cl.[4] G04B *19/04, 15/00*
U.S. Cl. 368—80 13 Claims

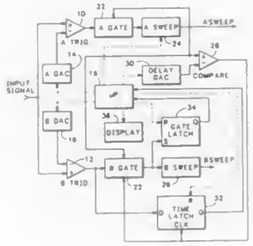




1. An electronic timepiece comprising:
display means for displaying the passage of time;
actuator means for providing rotational energy for driving the display means;
link means for connecting said display means to said actuator means;
energy storage means connecting said actuator means to said display means for storing the rotational energy produced by said actuator means and providing the stored energy to said display means;
control means for controlling the driving of said display means by controlling the application of rotational energy thereto, said control means including a magnet, a power generating yoke and a power generating coil about said yoke, whereby said display means is smoothly driven; and
second link means for connecting said display means to said control means.

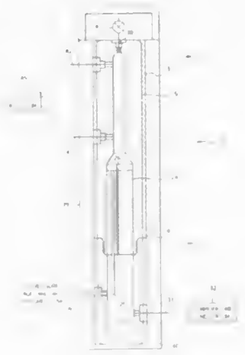
4,916,677
AUTOMATIC PERIOD AND FREQUENCY MEASUREMENTS
Henry G. Fox, Sherwood, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Filed Jun. 19, 1989, Ser. No. 367,596
Int. Cl.[4] G04F *8/00*; G01R *23/16*
U.S. Cl. 368—113 14 Claims

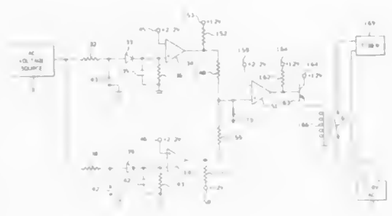
1. A method of automatically determining a time interval between two events in an input signal comprising the steps of:
initiating a sweep signal at a measurement sweep rate having a sweep interval that encompasses at least one cycle of the input signal;
searching the input signal during the sweep interval for a first event as a function of a programmable delay time from the start of the sweep interval, the programmable delay time when the first event occurs being a first event time;
searching the input signal during the sweep interval for a second event that occurs after the first event as a function of the programmable delay time, the programmable delay time when the second event occurs being a second event time; and



computing the time interval between the first and second event times.

4,916,678
VISCOMETER
Timothy W. Johnson, and Marion T. O'Shaughnessy, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Division of Ser. No. 295,460, Aug. 24, 1981, Pat. No. 4,750,359, which is a division of Ser. No. 53,446, Jun. 29, 1979, Pat. No. 4,302,965. This application Apr. 7, 1988, Ser. No. 178,730
Int. Cl.[4] G01F *23/00*; G04F *8/00*
U.S. Cl. 368—113 10 Claims

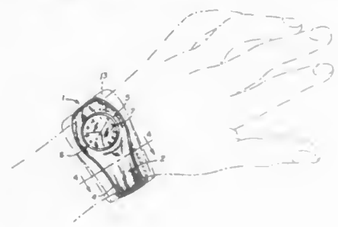




1. A method for measuring the elapsed time between the time a fluid contacts a first conductivity sensor and the time said fluid contacts a second conductivity sensor comprising the steps of:

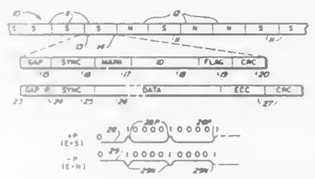
driving a first comparator to a first output state when said fluid contacts said first conductivity sensor;
driving said first comparator to a second output state when said fluid is not contacting said first conductivity sensor;
driving a second comparator to said first output state when said fluid is not contacting said second conductivity sensor;
driving said second comparator to said second output state when said fluid contacts said second conductivity sensor;
driving the output of a third comparator to said first output state when both said first comparator and said second comparator are in said first output state to thereby start a timing device; and
driving said third comparator to said second output state when said first comparator is in said first output state and said second comparator is in said second output state to thereby stop said timing device, the time indicated on said timing device providing a determination of the elapsed time between the time said fluid contacts said first conductivity sensor and the time said fluid contacts said second conductivity sensor.

4,916,679
SPORTS WATCH PROTECTOR
Mark S. Agnello, 510 Playa Blvd., La Selva Beach, Calif. 95076
Filed Oct. 13, 1988, Ser. No. 257,394
Int. Cl.[4] G04B *37/00*
U.S. Cl. 368—283 15 Claims



1. A protector band for a sports wrist watch having a crystal, a surrounding bezel and a watch band, comprising in operative combination:
(a) a continuous uniform band of elastomeric material having fabric material laminated to both sides thereof, said continuous band having a diameter, in a relaxed state thereof, less than the diameter of a normal human wrist;
(b) said continuous band having a main band portion, side margins, and a watch face viewing portion having a central aperture through which said watch crystal and said bezel are accessible;
(c) portions of said band adjacent to said marginal edges being adapted when stretched to curl around the sides of said watch band; and
(d) said aperture having a major axis longer than a minor axis at ninety degrees thereto, said major axis being oriented transverse to the circumferential length of the protector band so that said aperture stretches along the minor axis more than along the major axis.

4,916,680
MAGNETOOPTIC RECORDING MEMBER HAVING SELECTIVELY-REVERSED ERASURE DIRECTIONS IN PREDETERMINED RECORDING AREAS OF THE RECORD MEMBER
David M. Oldham, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 944,407, Dec. 22, 1986, Pat. No. 4,789,972. This application Aug. 10, 1988, Ser. No. 230,389
Int. Cl.[4] G11B *13/04, 15/05*
U.S. Cl. 369—13 7 Claims



1. A record member for storing information-bearing signals, the record member being divided into a plurality of addressable signal-storing areas and having a recording layer capable of recording said information-bearing signals along a plurality of elongated tracks with said addressable signal-storing areas being in said tracks, said layer respectively capable of assuming two sensible states, said sensible states representing first and second information bearing signals, respectively, and said first information bearing signal being an erased signal;
the improvement including, in combination:
each of said addressable signal-storing areas including a sensible mark signal recorded therein which indicates for that respective area the informational representation of each of said sensible states such that each addressable signal storing area can represent stored information differently by said sensible states, respectively, such that in first predetermined ones of said addressable signal-storing areas a first one of the sensible states represents said first information bearing signal and in second predetermined ones of said addressable signal-storing areas a second one of the sensible states represents said first information bearing signal whereby an erasure direction of the addressable signal-storing areas is determined by said sensible mark signals, respectively; and
wherein said information-bearing signals include a plurality of different length half wavelength signals, including a signal having longer half wavelength than other ones of said information-bearing signals, said sensible mark signal includes a signal pattern having a signal with half wavelength equal to and having a length along said tracks in which is resides said longer half wavelength of the information-bearing signals recorded on said record member.

4,916,681
APPARATUS FOR, AND METHOD OF, RECORDING UNDIVIDED COMPOSITIONS IN UNDIVIDED FORM ON A TWO-SIDED RECORDING MEDIUM
Tsutomu Takamatsu, c/o Pioneer Electronic Corporation, Tokorozawa Works, No. 2610, Hanazono 4-chome, Tokorozawa-shi, Saitama, Japan
Continuation of Ser. No. 938,312, Dec. 5, 1986, abandoned. This application Oct. 3, 1988, Ser. No. 253,381
Claims priority, application Japan, Dec. 5, 1985, 60-274449
Int. Cl.[4] G11B *5/86, 13/04*
U.S. Cl. 369—14 8 Claims

1. An apparatus for recording compositions in an undivided composition, from a digital audio disk onto a two-sided recording medium, said apparatus comprising:
data means for receiving and providing data corresponding to a cumulative playing time for a multi-composition

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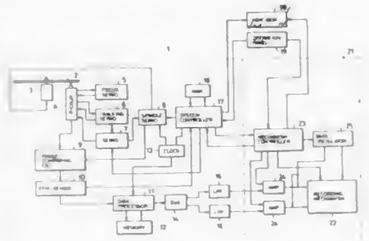
program which is to be recorded, individual playing times for respective compositions in said program, and a playing length of a first or a second side of the two-sided recording medium; and

control means for utilizing said data to calculate and automatically record a first group of said compositions on said first side of said recording medium, and a second group of said compositions on said second side of said recording medium such that each respective composition is completely recorded as said undivided composition on either one of said first or second side of said recording medium.



4,916,682

OPTICAL DISK APPARATUS WITH REMAINING TIME SPECIFICATION

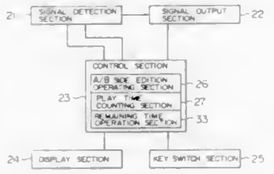
Harubisa Tomoda, Kashihara, and Yasuomi Shimada, Ikoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 30, 1988, Ser. No. 238,218

Claims priority, application Japan, Sep. 2, 1987, 62-219553

Int. Cl.[4] G11B *7/00, 27/00*

U.S. Cl. 369—32 **5 Claims**



1. A reproducing device for optical disks comprising:

a signal detection section for detecting information on an optical disk;

a play time counting section for counting the time from the start of play to the end of play on the basis of the play time information detected by said signal detection section;

a play time input means for inputting a playable time when recording the information on said optical disk by a separate recording device;

an edition time storage section for storing the time inputted by said play time input means;

a subtraction means which operates upon completion of the play for said optical disk to subtract the time obtained by said play time counting section from the time stored in said edition time storage section so as to obtain a remaining time;

said edition time storage section storing the remaining time obtained by the subtraction means;

an edition operating section for calculating music pieces which can be played within the time stored in said edition time storage section;

a playing music number storage section for sequentially storing the numbers of music pieces edited by said edition operating section; and

a remaining time edition specifying means for storing the remaining time and specifying to perform a next edition of the play time for another optical disk on the basis of the remaining time stored in said edition time storage section.

4,916,683

OPTICAL RECORDING/REPRODUCING APPARATUS WITH MEANS TO SHIFT LIGHT BEAM PERIODICALLY TO PREVENT RECORD MEDIUM DETERIORATION

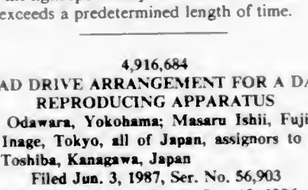
Takuya Mizokami, and Shinichi Arai, both of Odawara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 130,099, Dec. 7, 1987, abandoned. This application Feb. 1, 1989, Ser. No. 304,899

Claims priority, application Japan, Dec. 12, 1986, 61-294946

Int. Cl.[4] G11B *7/85, 7/00*

U.S. Cl. 369—33 **22 Claims**



1. A method for optically recording and reproducing data by projecting a light spot onto one of plural tracks on an optical disk, comprising the following steps of:

detecting that the light spot stays on a same track without doing any data recording/reproduction;

measuring a time for which the light spot stays on said same track, said step of measuring a time comprising the step of measuring the number of rotations of the optical disk; and

moving the light spot to any other track when said measured time exceeds a predetermined length of time.

4,916,684

HEAD DRIVE ARRANGEMENT FOR A DATA REPRODUCING APPARATUS

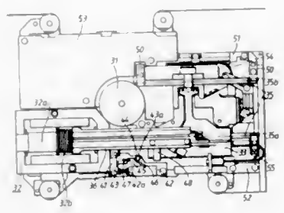
Kazuharu Odawara, Yokohama; Masaru Ishii, Fujisawa, and Nobuo Inage, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jun. 3, 1987, Ser. No. 56,903

Claims priority, application Japan, Jun. 13, 1986, 61-137882

Int. Cl.[4] G11B *7/00, 21/02*

U.S. Cl. 369—43 **8 Claims**



1. A disc data reproducing apparatus, comprising:

a housing;

means for rotating a data disc about a central axis;

head means, spaced from one side of the disc and positioned within said housing, for receiving data from the disc, said head means being disposed on one side of an imaginary line passing through said central axis;

means, having an elongated axis, for supporting and slidably guiding the movement of said head means; and

means for moving the head means along a radial direction of said disc, said moving means being disposed on the other side of said imaginary line;

said moving means, said supporting means, and said head means being arranged such that a resultant force of said moving means is applied within a rectangular having a diagonal extending between the center of gravity of said head means and the axis of said support means.

4,916,685

DETERMINATION OF THE TOTAL TIME REQUIRED FOR REPRODUCING A DESIRED RANGE OF SIGNALS RECORDED ON A RECORDING DISK IN A SIGNAL RECORDING AND REPRODUCTION SYSTEM

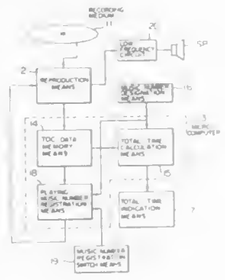
Satoshi Endoh, Katano; Syoichi Henmi, Hirakata; Ryuichi Kusaba, Suita; Katsunori Koukata, Sendai, and Noriyuki Sakamoto, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 1, 1988, Ser. No. 239,305

Claims priority, application Japan, Sep. 4, 1987, 62-222328; Sep. 4, 1987, 62-222329

Int. Cl.[4] G11B *15/52, 3/90*

U.S. Cl. 369—47 **3 Claims**



1. A signal recording and reproducing system for a recording disk having information continuously recorded thereon in a plurality of sections, and having recorded thereon TOC data including a respective start point for each of the plurality of sections, each start point representing a length of time from the origin of the recording disk, said system comprising:

TOC data memory means for storing the TOC data after reproduction thereof from said recording disk;

section designating means for designating one of said plurality of sections, which corresponds to an ending section of a desired reproduction section range when said desired reproduction begins with the first section of said plurality of information sections;

means for reading from said TOC data memory means a start time representing the start point (Ti+1) of a section immediately following the ending section designated by said section designating means and for reading a start time representing the start point (T_1) of the first section of said plurality of sections;

time calculation means for calculating the total time required for reproducing said desired reproduction section range by subtracting the start point (T_1) of the first section from the start point (Ti+1) of the section immediately following the ending section of said desired reproduction section range; and

total time indication means for indicating the total time calculated by said time calculation means.

4,916,686

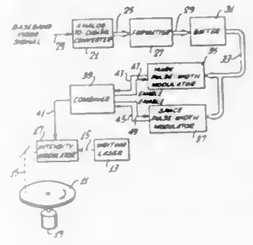
SYSTEM FOR RECORDING DIGITAL INFORMATION IN A PULSE-LENGTH MODULATION FORMAT

Jack H. Bailey, Villa Park, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Continuation of Ser. No. 169,238, Jul. 16, 1980, abandoned. This application Oct. 2, 1985, Ser. No. 782,156

Int. Cl.[4] H04N *5/76;* **G11B** *7/00*

U.S. Cl. 369—59 **7 Claims**



1. A method for recording digital information on a record medium, the digital information being derived from a succession of binary bits, the method comprising steps of:

grouping the binary bits into a succession of code blocks, each code block representing a prescribed number of binary bits; and

recording the succession of code blocks on the record medium as a corresponding succession of alternating marks and spaces, the lengths of the successive marks and spaces being discretely variable in accordance with separate blocks in the succession of code blocks;

whereby the digital information is recorded on the record medium with high efficiency.

4,916,687

APPARATUS FOR MOUNTING AND ROTATING AN OPTICAL CARD FOR RECORDING AND/OR REPRODUCING INFORMATION

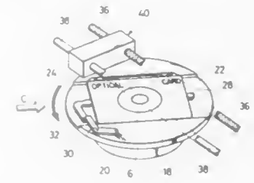
Kiyonobu Endo, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 47,290, May 8, 1987, abandoned. This application Jul. 14, 1989, Ser. No. 380,677

Claims priority, application Japan, May 13, 1986, 61-107747; Jul. 25, 1986, 61-173887

Int. Cl.[4] G11B *17/028*

U.S. Cl. 369—111 **8 Claims**



1. An apparatus for recording and/or reproducing information on a card-like information recording medium, comprising:

a turntable rotatable with the card-like medium placed thereon;

A clamp mechanism for clamping the card-like medium on said turntable, said clamp mechanism comprising a guide wall adapted to abut a side of the card-like medium and

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biasing means for biasing the card-like medium against the guide wall; and

head means for effecting recording and/or reproducing of information concentrically or spirally on the card-like medium while moving radially of its rotation.

4,916,688

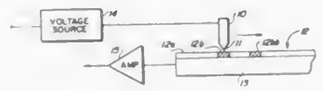
DATA STORAGE METHOD USING STATE TRANSFORMABLE MATERIALS

John S. Foster, San Jose; Kurt A. Rubin, Santa Clara, and Daniel Rugar, Palo Alto, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1988, Ser. No. 175,835

Int. Cl.[4] G11B 9/10; G11C 11/00

U.S. Cl. 369—126 18 Claims



1. A method of recording and reading data bits in a data storage device, said method comprising the steps of:

providing a storage medium comprising a substrate and a film of state-transformable material thereon;

using an STM probe tip and voltage pulses that induce current pulses of sufficient magnitude, selectively heating discrete areas of the film to a preselected temperature, and then cooling said areas at a rapid rate for changing the material in said areas from a first state to a second state wherein an electronic property is changed in said discrete areas from one value to a substantially different value, for thereby causing data bits to be written at said areas; and

using the probe tip and tunneling current sensing circuitry, sensing the film for reading data bits at said discrete areas where said electronic property had been changed to said different value.

4,916,689

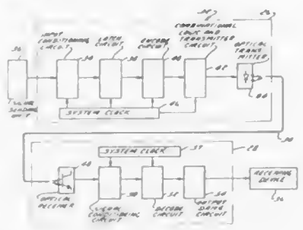
COMMUNICATIONS APPARATUS FOR ENCODING AND DECODING MULTIPLEXED OPTICAL SIGNAL

Ralph F. Bielinski, South Milwaukee, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 29, 1987, Ser. No. 138,936

Int. Cl.[4] H04B 9/00

U.S. Cl. 370—4 27 Claims



1. A fiber optic multiplexing communications apparatus for receiving separate original electrical digital signals originating from a plurality of signal sending units, and for transmitting information based on said separate original electrical digital signals to a plurality of receiving devices to operate the latter, said apparatus comprising:

encoding means for encoding said separate original electrical digital signals into a single multiplexed optical signal comprising discrete portions, including a synchronization signal portion and other portions, each of said other portions being devoted to one of said separate original electrical signals and capable of exhibiting a signal of predetermined frequency when its corresponding original electrical digital signal is in an "on" state and capable of exhibiting no signal when its corresponding original electrical digital signal is in an "off" state;

fiber optic transmission means for transmitting said multiplexed optical signal;

decoding means for receiving the transmitted optical signal from said fiber optic transmission means and for decoding said optical signal into a plurality of received electrical signals, one for each of said plurality of receiving devices, each of said received electrical signals corresponding to one of said separate original electrical digital signals;

a plurality of output drive circuits, one for each of said receiving devices, for distributing said received electrical signals to the proper ones of said receiving devices;

and means for periodically sensing the status of said plurality of separate original electrical digital signals and for providing reset signals to said encoding means to cause the latter to provide a sequence of single multiplexed optical signals.

4,916,690

DIVISION MULTIPLEX PACKET SWITCHING CIRCUIT USING A CIRCULAR SHIFT REGISTER

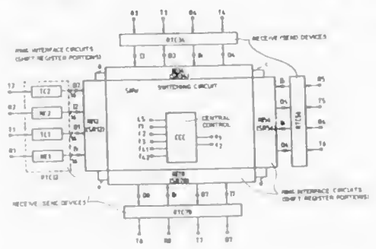
Peter I. A. Barri, Bonheiden, Belgium, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed May 6, 1988, Ser. No. 190,929

Claims priority, application Belgium, May 7, 1987, 08700493

Int. Cl.[4] H04J 3/26

U.S. Cl. 370—60 8 Claims



1. A switching network comprising

a control circuit for providing a clock signal and

at least one time division switching element having input ports and output ports for transporting individual data packets from a designated input port to a designated output port, each said switching element comprising

a plurality of shift register portions each having a predetermined number of stages,

a corresponding plurality of associated input circuits, each such input circuit having a parallel output port for loading in parallel a plurality of bits in more than one stage of its corresponding said shift register portion, and

means for coupling successive ones of said shift register portions of said switching element in series to form a circular shift register which shifts data from each stage of the circular shift register to a next stage immediately adjacent said each stage in response to and in synchronism with said clock signal.

4,916,691

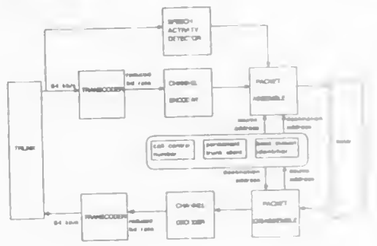
TELECOMMUNICATIONS SWITCHING SYSTEM

David J. Goodman, Aberdeen Township, Monmouth County, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 28, 1988, Ser. No. 263,928

Int. Cl.[4] H04Q 11/04

U.S. Cl. 370—60 4 Claims



1. A telecommunications switching system comprising:

means for establishing a route for transmitting a number of packets of information between a first party and a second party, each packet comprising a header which contains information associated with a terminal of the first party, and information associated with a terminal of the second party,

the invention characterized in that

the established route comprises at least two segments;

the first segment of the route having associated with it constant routing information which is stored in a memory portion of the system, which routing information remains constant during transmission of the said number of packets, the headers of said number of packets having portions associated with said constant routing information, which header portions remains constant during the transmission of the said number of packets; and,

the second segment of the route having associated with it varying routing information which may vary during transmission of the said number of packets, the headers of said number of packets having portions associated with said varying routing information, which header portions may vary from one packet to another during the transmission of the said number of the packets, corresponding to the varying routing information;

the system further comprising means for varying the header information associated with the second segment of the route.

4,916,692

TDM BUS CONTROLLER

George A. Clarke; Juan E. Farias, both of Sunrise; Raul F. Fernandez, Miami; Dale R. Jenkins, Sunrise; Jon S. Miller, Pembroke Pines; Edward J. Sackman, III, Sunrise; Donald L. Wray, Lauderdale, and Leroy D. Young, Cooper City, all of Fla., assignors to Racal Data Communications Inc., Sunrise, Fla.

Filed Mar. 14, 1988, Ser. No. 167,816

Int. Cl.[4] H04J 3/24

U.S. Cl. 370—85.1 39 Claims

1. An apparatus for controlling access to a time division multiplexed (TDM) bus, comprising in combination:

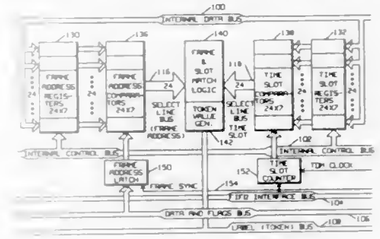
frame address register means having a plurality of storage registers for storing one or more frame addresses designated for use in communicating over said TDM bus;

frame address latching means for storing a current frame address;

frame comparing means, coupled to said frame address register means and said frame address latching means, for comparing said designated frame addresses with said current frame address and for producing a first signal indicative of the storage register containing a frame address matching said current frame address;

time slot register means having a plurality of storage registers for storing a time slot number designated for use in communicating over said TDM bus;

time slot generating means for generating a current time slot number by counting time slots following a frame address;



time slot comparing means, coupled to said time slot register means and said time slot generating means, for comparing said designated time slot number with said current time slot number and for producing a second signal indicative of the storage register containing a slot number matching said current time slot number;

label generating means, coupled to said frame comparing means and said time slot comparing means for receiving said first and second signals and for generating a label unique to said first and second signals; and

data transferring means, responsive to said label, for transferring a data word to or from said TDM bus.

4,916,693

DIGITAL TIME DIVISION MULTIPLEX SYSTEM AND METHOD OF CONTROLLING SAME

Masayoshi Shimada, Amagasaki, and Kazuyoshi Ohshima, Kamakura, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 4, 1988, Ser. No. 153,291

Claims priority, application Japan, May 15, 1987, 62-119239; Jun. 18, 1987, 62-151732; Jun. 18, 1987, 62-151733

Int. Cl.[4] H04J 3/22

U.S. Cl. 370—84 17 Claims

1. A digital time division multiplex system for effecting time division multiplexing of signals in channel bit group units equal in number to combinations of channels, which comprises:

a plurality of data terminal interface units each including sending and receiving data transmission speed converters for converting data transmission speeds of sending and received data between a first data transmission speed and a data transmission speed of a high speed digital line, send and receive gates for controlling flows of data;

a multiplex control unit for controlling said data terminal interface units to thereby control signal transmission between data terminal equipment and said high-speed digital line;

said data terminal interface units each further including a predetermined level code generator for generating a signal of a predetermined level; and

a sending signal switching unit, having a control input, for switching between said predetermined level signal and a signal from said data terminal equipment, in response to a sending control signal, to provide an output to said send date; and

said multiplex control unit further including a sending con-

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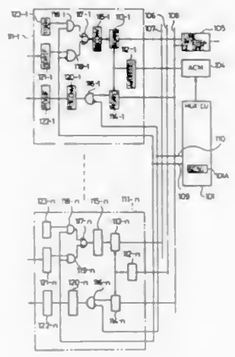
trol signal generator, having an output coupled to said control input, for generating a sending control signal for



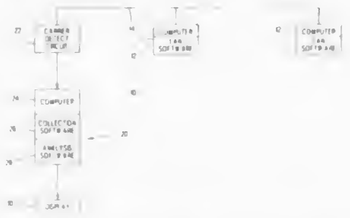
controlling switching functions of said sending signal switching unit.

4,916,694

PACKET NETWORK TIMING ANALYZER

Jacques A. Roth, San Francisco, Calif., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 22, 1988, Ser. No. 289,090
Int. Cl.[4] H04J *3/26*
U.S. Cl. 370—94 **22 Claims**



13. A packet network timing analyzer comprising:
means, responsive to a signal on a packet network, for generating a carrier detect signal in a first state during packet intervals characterized by signalling activity on the packet network and in a second state during gaps characterized by an absence of signalling activity on the packet network;
means for storing a plurality of timing entries indicative of the development in time of the carrier detect signal; and
means for sorting the stored timing entries to locate the stored timing entries that meet selected sorting criteria.

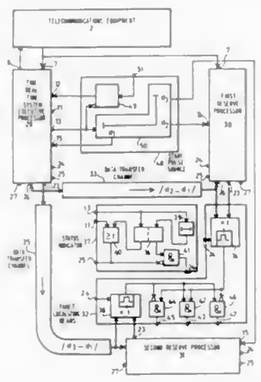
4,916,695

STORED PROGRAM CONTROLLED REAL TIME SYSTEM INCLUDING THREE SUBSTANTIALLY IDENTICAL PROCESSORS

Bengt E. Ossfeldt, ÄlvsjÖ , Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Apr. 1, 1988, Ser. No. 176,759
Claims priority, application Sweden, Apr. 16, 1987, 8701618
Int. Cl.[4] G06F *11/20*
U.S. Cl. 371—9.1 **6 Claims**

1. A stored program controlled real time system, comprising three substantially identical processors for controlling in parallel-synchronous cooperation of equipment of which two processors constitute first and second reserve processors of the system and a third processor constitutes the executive processor of the system for receiving real time signals from the equipment and transmitting control signals to the equipment, said system further including a fault localizing means for indicating one of the processors if it produces faulty data, and a timing generator for providing system synchronization, which is connected to the three processors via a timing bus, as well as a start pulse source for ensuring, by means of a start signal, that



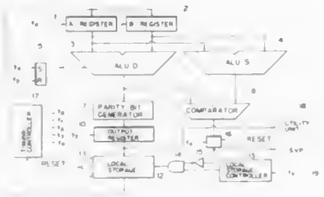
the three processors are updated mutually and supplied with the real time signals, wherein each of the processors contains a plurality of addressable function units and a data bus for transferring data between the function units, the data bus together with said timing bus being included in a bus system for transferring timing pulses and data in periods which are considerably shorter than the periods of said signals, and in that said fault localizing means includes two comparators, which are connected via at least two one-way data transfer channels to the data buses of the three processors.

4,916,696

LOGIC OPERATION DEVICE

Nobuo Funakubo, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 29, 1988, Ser. No. 188,375
Claims priority, application Japan, May 1, 1987, 62-108393
Int. Cl.[4] G06F *15/16*
U.S. Cl. 371—11.3 **30 Claims**



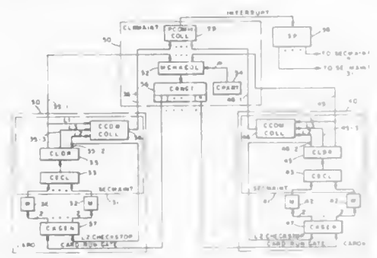
1. A logic operation device for performing ALU operational functions upon data, comprising:
a first, arithmetic and logic unit constructed as a dynamic circuit of a precharge type for performing operational functions on the data and providing an operation output;
a second, arithmetic and logic unit constructed as a static circuit for performing the same operational functions on the data and providing an operation output;
means for feeding the data simultaneously and commonly to said first and second arithmetic and logic units; and
means for controlling said second arithmetic and logic unit for having the same operational function as said first arithmetic and logic unit.

4,916,697

APPARATUS FOR PARTITIONED CLOCK STOPPING IN RESPONSE TO CLASSIFIED PROCESSOR ERRORS

Thomas J. Roche, and Gregory S. Still, both of Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 24, 1988, Ser. No. 211,469
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—14 **14 Claims**



1. In a processing system including a plurality of connected units, each of said units for performing a system function and including a plurality of modules connected in an operable configuration for execution of said system function in response to a unit clock signal, each of said units further including error determining means connected to the modules of said unit for developing a plurality of error signals, each of said error signals indicative of an error in a respective one of the modules of each of said units, an improvement for partitioned clock stopping, wherein said improvement comprises:
a plurality of error classification means, each of said error classification means in a respective one of said units and connected to the error determining means in said respective one of said units to receive error signals generated by said error determining means for classifying said error signals according to a predetermined scheme and for generating first and second level classification signals indicative of a first and second error class, respectively;
a plurality of clock run signal generators, each of said clock run signal generators in a respective one of said units for producing a unit clock signal in response to a unit run gate signal, said each of said clock run signal generators including means connected to the error classification means in said respective one of said units and responsive to a second level classification signal from said error classification means for preventing the clock run signal generators from producing a unit clock signal;
a partition means for generating a plurality of unit partition signals, each partition signal representing a group of units, wherein each group includes at least one of said units; and
a run gate generator connected to said plurality of clock run signal generators for producing a plurality of unit run gate signals, each unit run gate signal being provided to a respective one of said plurality of clock run signal generators, said run gate generator including first means connected to said partition means and to said plurality of error classification means for selecting a first partition signal in response to a first level classification signal generated by an error classification means and second means connected to said first means for cancelling the unit run gate signals produced by said run gate generator for the clock run signal generators in the group of units corresponding to said first partition signal.

4,916,698

FAILURE DETECTION MECHANISM FOR MICROCONTROLLER BASED CONTROL SYSTEM

Gerard O. McCann, Amherst, Ohio, assignor to Allied-Signal Inc., Morristown, N.J.

Filed Sep. 29, 1988, Ser. No. 250,807
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—16.3 **16 Claims**

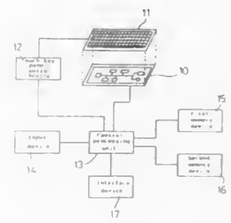
1. Control system comprising a microcontroller, means for transmitting input signals to said microcontroller, means for transmitting output signals from said microcontroller, said microcontroller including means responsive to said input signals for generating said output signals and further including a watchdog port from which a pulsating signal within a predetermined frequency range is transmitted during normal operation of the microcontroller, output signal responsive control means responsive to said output signals, interface means responsive to said output signals and to an enabling signal for normally permitting operation of the control means in response to said output signal but inhibiting said control means even if said output signals are received in the absence of said enabling signal, and enabling signal generating means responsive to said pulsed signal for generating said enabling signal when the frequency of said pulsed signal is within said predetermined frequency range and for removing said enabling signal even if a pulsed signal is present at the watchdog port if the frequency of said pulsed signal is outside of said predetermined frequency range.

4,916,699

DIAGNOSTIC DATA PROCESSING SYSTEM WITH SELECTIVE TOUCH-SENSITIVE DISPLAY

Masakazu Ohashi, Kyoto, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 10, 1988, Ser. No. 166,461
Claims priority, application Japan, Mar. 10, 1987, 62-54400
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—17 **4 Claims**



1. A self diagnostic data processor having plural diagnosable functions comprising:
processing means for performing plural diagnosable functions;
input means for generating a diagnosis mode signal;
said processing means performing diagnosis of at least one of

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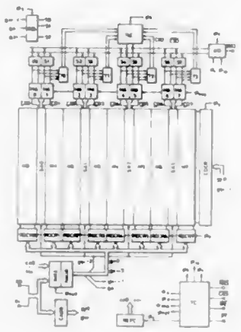
said plural diagnosable functions in response to receipt of said diagnosis mode signal;
display means for displaying said plural diagnosable functions;
display drive means for driving said display means to present said plural diagnosable functions in a block diagram menu format in response to said diagnosis mode signal;
selection means for selecting one of said plural diagnosable functions, said selection means including a transparent touch-sensitive panel overlaying said display means which detects a touched position of said display means in order to provide a function indication signal corresponding to a selected diagnosable function;
said display drive means, in response to receipt of said function indication signal, driving said display means to present a submenu of plural tests applicable to said selected diagnosable function;
said selection means further provides a test indication signal corresponding to a touched position of said display screen which is indicative of a desired test; and
function diagnosis means, responsive to said test indication signal, for carrying out said desired test and for generating a test result;
said display means displaying said test result.

4,916,700

SEMICONDUCTOR STORAGE DEVICE

Kazuya Ito, Kodaira; Katsutaka Kimura, Tokyo, and Kazuyuki Miyazawa, Iruma, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 17, 1988, Ser. No. 156,897
Claims priority, application Japan, Feb. 27, 1987, 62-42512
Int. Cl.[4] G06F *11/16*
U.S. Cl. 371—21.1 **37 Claims**



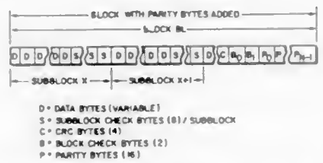
1. A semiconductor storage device comprising:
a plurality of common data lines for delivering information data from plural memory cells selected out of a plurality of memory cells;
a plurality of amplifier circuits being provided which correspond in number to the number of said plurality of common data lines and which provide output signals in accordance with data received from said common data lines, respectively;
a plurality of first testing logical circuits for providing output signals in response to the outputs of said amplifier circuits of which each one of at least one of said first testing logical circuits is coupled to plural amplifier circuits, said plural amplifier circuits being a numerical subset of said plurality of amplifier circuits; and
a second testing logical circuit being coupled to said plurality of testing logical circuits and providing a corresponding test data output in accordance with the output signals received from each one of said plurality of first testing logical circuits,
wherein each one of said plurality of first testing logical circuits includes input and output signal lines for inputting thereto signals outputted by said amplifier circuits and outputting therefrom corresponding output signals, and wherein the required number of output signal lines is less than the number of input signal lines for each one of said plurality of first testing logical circuits.

4,916,701

METHOD AND SYSTEM FOR CORRECTING LONG BURSTS OF CONSECUTIVE ERRORS

John S. Eggenberger, Sunnyvale; Paul Hodges, and Arvind M. Patel, both of San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 21, 1988, Ser. No. 247,461
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—37.7 **11 Claims**



1. A method of correcting multibyte errors in a magnetic medium on which data is recorded in variable length blocks that comprise subblocks of data bytes and corresponding check bytes and include error correction code (ECC) for which ECC syndromes are generated during reading, said method comprising the steps of:
writing at the end of each block a sequence of N sequential parity check bytes;
during reading, after the generation of the ECC syndromes, generating parity syndromes by comparing the parity check bytes computed from the data bytes and check bytes as read with the parity check bytes as written;
in response to a long-burst error condition, generating a pointer to the first of the N consecutive bytes in a block that could have been influenced by the error burst;
using any ECC syndromes which are not affected by the N bytes identified by the pointer, correcting correctable errors in all subblocks not affected by these identified bytes;
adjusting the parity syndromes according to the errors thus corrected;
using the adjusted parity syndromes, correcting the errors in the N bytes indicated by the pointer;
adjusting an unused ECC syndromes according to the errors corrected by the adjusted parity syndromes; and
using the adjusted ECC syndromes, correcting all correctable errors then remaining.

4,916,702

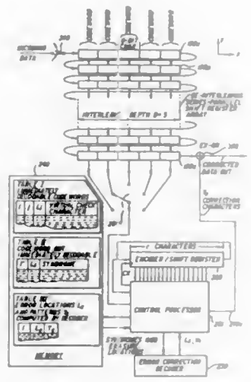
ELONGATED BURST TRAPPING

Elwyn R. Berlekamp, Piedmont, Calif., assignor to Cyclotomics, Inc., Berkeley, Calif.

Filed Jun. 17, 1988, Ser. No. 207,811
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—39.1 **10 Claims**

1. An error correction processor for interleaved codes comprising:
storage means for receiving and storing a block of D interleaved codewords, each codeword being of length n characters including r check characters in a code of size N characters;

encoder means for computing from a given codeword a set of r remainder characters with respect to a chosen set of characters defining a code generator polynomial, said encoder means comprising encoder shift register means for receiving successive characters of said given codeword and for storing said r remainder characters, and r zero detector means for detecting whenever corresponding ones of characters stored in said encoder shift registers are zero value;
a decoder processor adapted to execute an error correction algorithm so as to generate from said set of remainder characters a set of error patterns and corresponding error locations in said given codeword; and
control processor means for:
a. activating said encoder shift register means so as to shift each one of said D codewords in said received block individually from said storage means through said encoder means so that said encoder means generates a set of r remainder characters in said encoder shift register means corresponding to said one codeword,



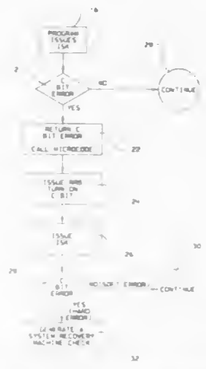
b. isolating said encoder means and causing said encoder means to shift its contents by one character location as many as n times so as to produce as many as n sets of r virtual check characters,
c. sensing said r zero detector means and, whenever said r zero detector means detects in said encoder shift register means a continuous succession of zero-value virtual check characters in excess of a threshold number of zero-value virtual check characters, transmitting to said decoder processor the locations of the corresponding non-zero-value virtual check characters as erasure locations in all other codewords in said received block, whereby said decoder corrects said other codewords in said block from the corresponding remainder characters using said erasure locations, while said control processor means corrects said one codeword by adding said set of virtual check characters corresponding to said one shift to corresponding locations in said one codeword.

4,916,703

HANDLING ERRORS IN THE C BIT OF A STORAGE KEY

Neal T. Christensen, Wappingers Falls; Steven T. Comfort, Poughkeepsie; Robert J. Harbus, Old Bethpage; Bruce L. McGilvray, Pleasant Valley; Arthur J. Sutton, Cold Spring; James R. Urquhart, Fishkill, and David R. Willoughby, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 28, 1988, Ser. No. 276,736
Int. Cl.[4] G06F *11/10, 11/30, 12/12, 12/16*
U.S. Cl. 371—51.1 **9 Claims**



1. In a data processing system having a main storage divided into blocks, an access key for each block, a change bit in each access key indicating whether information has been written into the corresponding block, and a parity bit for indicating if said change bit is in error, a method for handling errors in said change bit, said method comprising:
issuing a command under program control which accesses said change bit and its parity bit;
determining from said change bit and its parity bit if a parity error exists;
in the event that a parity error does exist, completing the steps of:
refreshing said change bit;
testing said change bit and its parity bit to determine if a second parity error exists; and
in the event said second parity error does exist, generating a system recovery machine check thereby indicating a hard error exists.

4,916,704

INTERFACE OF NON-FAULT TOLERANT COMPONENTS TO FAULT TOLERANT SYSTEM

William F. Bruckert, Northboro, Mass.; Thomas D. Bissett, Derry, N.H.; Mitchell O. Norcross, Framingham, and Kenneth A. Ward, Marlboro, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Sep. 4, 1987, Ser. No. 93,539
Int. Cl.[4] G06F *11/16*
U.S. Cl. 371—68.3 **7 Claims**

1. A fault tolerant computer system comprising:
a fault tolerant data processing module including
means for detecting and correcting errors in the operation of said data processing module to maintain a high degree of data integrity,
data transmission control means for controlling the transmission of all data to said fault tolerant data processing module and for controlling the receipt of all data into said fault tolerant data processing module, and
input/output terminals, coupled to said data transmission

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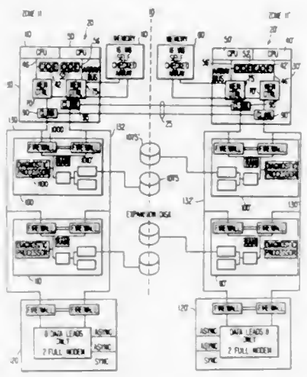
control means, for receiving and transmitting said data; and

a non-fault tolerant input/output module, coupled to transmit said data to said input/output terminals of said fault tolerant data processing module, said non-fault tolerant input/output module including



read means for transferring data to said fault tolerant computing system in response to requests from said data transmission control means, and

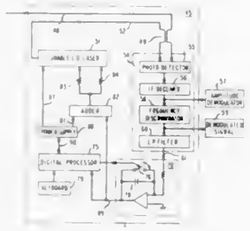
firewall means for preventing said non-fault tolerant input-/output module from initiating transfers of data to said fault tolerant data processing module.

4,916,705

RANDOM-ACCESS DIGITALLY-TUNED COHERENT OPTICAL RECEIVER

Bernard Glance, Colts Neck, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 4, 1989, Ser. No. 347,121
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—20 9 Claims



1. A laser control arrangement for tuning a local oscillator laser, the arrangement comprising

a laser tunable, via a control signal, to a selectable set of local oscillator frequencies, spaced apart over a range of frequencies;

means, responsive to selected ones of the set of local oscillator frequencies mixed with a received optical signal including plural optical channels, for determining a set of values of control signal to produce the selectable set of local oscillator frequencies;

means for storing the set of values of control signal; and

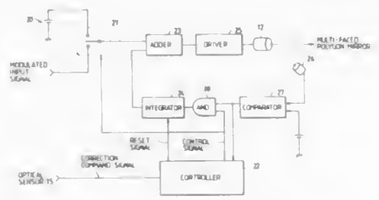
means for selecting one of the stored values of control signal to drive the laser to a desired one of the set of local oscillator frequencies.

4,916,706

EXCITATION SYSTEM FOR EXCITING A SEMICONDUCTOR LASER DEVICE

Tayoshi Ohashi, Hashima, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 14, 1989, Ser. No. 365,706
Claims priority, application Japan, Jun. 14, 1988, 63-146056; Dec. 20, 1988, 63-321666
Int. Cl.[4] H01L *27/14, 31/00, 31/14*
U.S. Cl. 372—31 9 Claims



1. An excitation system for exciting a semiconductor laser device, comprising:

an input terminal for receiving a modulated input signal having a level changed depending upon information;

bias signal supplying means for supplying a bias signal having a level;

an adder for adding the bias signal to the modulated input signal to provide an output signal having an added level, the output signal being applied to the semiconductor laser device for exciting the semiconductor laser device so that a laser beam is emitted therefrom, a quantity of the laser beam emitted from the semiconductor laser device being changed depending upon the level of the output signal;

sensing means for sensing the level of the output signal and providing an output status signal; and

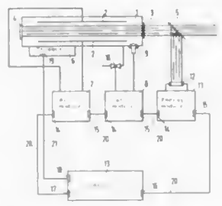
bias signal adjusting means for adjusting the bias signal in response to the output status signal.

4,916,707

CONTROL CIRCUIT FOR A PULSED GAS LASER

Heribert Rosenkranz, Göttingen, Fed. Rep. of Germany, assignor to Lambda Physik, Gottingen, Fed. Rep. of Germany

Filed Apr. 12, 1988, Ser. No. 180,959
Claims priority, applicatioo Fed. Rep. of Germany, Apr. 30, 1987, 3714503
Int. Cl.[4] H01S *3/00*
U.S. Cl. 372—38 10 Claims



1. Control circuit for at least one pulsed gas laser, comprising

a high voltage module (7) connected to the laser,

a plurality of sensors (9,12) for detecting states of the laser and for producing outputs relating to said states, each said sensor being positioned for detecting one said state,

at least one control member (10) connected to one said module for controlling the laser,

a plurality of modules (7, 8, 11, 37, 41), each module including at least one microprocessor, and further including an input (14) and an output (15), with each of said sensors (9, 12) being connected to one of said modules, and

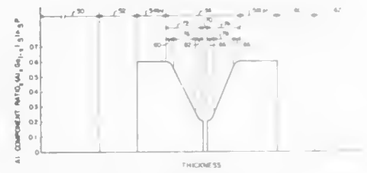
a central control unit (13) having an input (16) and an output (17), with said modules (7, 8, 11, 37, 41) and said control unit (13) being connected via said inputs (14, 16) and said outputs (15, 17) in ring structure by means of optical waveguides (20), said control unit (13) being for processing signals furnished by the sensors (9, 12) and for controlling the control member (10).

4,916,708

SEMICONDUCTOR LIGHT-EMITTING DEVICES

Toshiro Hayakawa, Tokyo, Japan, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 26, 1989, Ser. No. 371,177
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 7 Claims



1. In a semiconductor light-emitting device including a substrate of semiconductor mixed crystal on which is provided a light-emitting structure that includes a light-emitting layer sandwiched between optical guide layers, each of which includes a compositionally graded layer the improvement comprising:

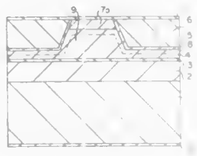
at least one end of each compositionally graded layer being provided with a bridging layer wherein a first derivative of the composition profile with respect to the layer thickness is continuous, so that the bridging layer provides a smooth change of composition profile to an adjacent layer.

4,916,709

SEMICONDUCTOR LASER DEVICE

Yoichiro Ota, and Tetsuya Yagi, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 13, 1989, Ser. No. 322,178
Claims priority, application Japan, Mar. 16, 1988, 63-64221
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—46 8 Claims



1. A semiconductor laser device comprising:

a semiconductor substrate of a first conductivity type;

a first cladding layer of the first conductivity type disposed on the substrate;

an active layer disposed on the first cladding layer;

a second cladding layer of a second conductivity type disposed on the active layer and including a stripe ridge having a top surface, two generally opposite side surfaces oblique to and adjoining the top surface, and two lower surfaces generally parallel to the top surface adjoining the respective side surfaces and a high dopant concentration diffusion region of the second conductivity type disposed adjacent the top, side, and lower surfaces opposite the active layer;

current blocking layers of the first conductivity type disposed on the side and lower surfaces of the stripe ridge;

a contacting layer of the second conductivity type disposed on the top surface; and

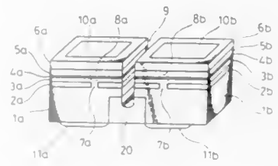
first and second electrodes disposed on the substrate and contacting layers, respectively.

4,916,710

MULTI-POINT EMISSION TYPE SEMICONDUCTOR LASER DEVICE THEREFOR

Ryo Hattori, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 4, 1989, Ser. No. 347,259
Claims priority, application Japan, Jun. 27, 1988, 63-158608
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—50 6 Claims



1. A multi-point light emission type semiconductor laser device including a plurality of light emission points which can be driven independently

comprising:

an electrically insulating or semi-insulating semiconductor region provided intermediate said light emission points ; and

a separation groove

extending from the side of the device opposite said region through said device to said region,

electrically separating said respective light emission points from each other.

4,916,711

LASING COMPOSITIONS AND METHODS FOR USING THE SAME

Joseph H. Boyer, and Lee R. Morgan, both of 3839 Ulloa St., New Orleans, La. 70119

Filed Sep. 29, 1988, Ser. No. 251,188
Int. Cl.[4] H01S *3/20*
U.S. Cl. 372—53 2 Claims

1. A method for producing laser light comprising the steps of

placing at least one lasing dye in a containment vessel, said dye comprising a compound of the formula

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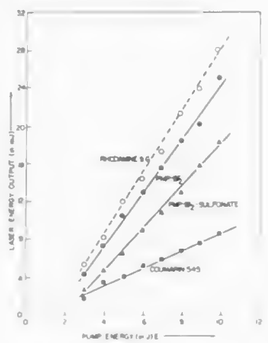
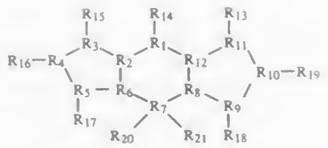
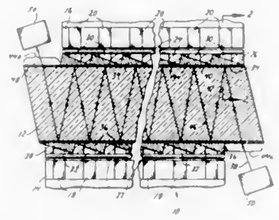




wherein:
R_1=C, N, B, Zn, Mg, or Cu
R_2=C or N
R_3=C or N
R_4=C, N, O or S
R_5=C or N
R_6=C or N
R_7=C, N, B, Zn, Mg, or Cu
R_8=C or N
R_9=C or N
R_{10}=C, N, O, or S
R_{11}=C or N
R_{12}=C or N
R_{13}-R_{19}=H, C_nH_{2n+1} (n=1-3), phenyl, naphthyl, pyrryl, pyrazolyl, triazolyl, tetrazolyl, oxazolyl, isoxazolyl, thiazolyl, isothiazolyl, C_nF_{2n+1} (n=1-3), ArF (Ar=phenyl or naphthyl), RCO (R=C_nH_{2n+1}; n=1-3), (C_nF_{2n+1})CO (n=1-3), SO_3M (M=Na or K), CO_2H, CO_2M (M=Na or K), CO_2R (R=C_nH_{2n+1}; n=1-3), $CO_2C_nF_{2n+1}$ (n=1-3), cyclic alkyl groups having the formula C_nH_{2n-1} (n=4-6), olefin derivatives having the formula C_nH_{2n-1} (n=2-4), C_nH_{2n-2} (n=2-4), C_nH_{2n-m} (n=2-3; m=2-3), $CONH_2$, CONHR (R=C_nH_{2n+1}; n=1-3), $CON(R)_2$ (R=C_nH_{2n+1}; n=1-3), F, Cl, Br, I, CN, NC, NO_2, NO, ArN_2 (Ar=phenyl or naphthyl), NH_2, NHR (R=C_nH_{2n+1}; n=1-3), $N(R)_2$ (R=C_nH_{2n+1}; n=1-3), NHCOR (R=C_nH_{2n+1}; n=1-3), NHCOAr (Ar=phenyl, naphthyl), NCO, C(NOR)R (R=C_nH_{2n+1}; n=1-3), SO_3R (R=C_nH_{2n+1}; n=1-3), SO_2R (R=C_nH_{2n+1}; n=1-3), PO_3R (R=C_nH_{2n+1}; n=1-3), $(CH_2)_n$ Ar (n=1-3; Ar=phenyl, naphthyl, $(CH_2)_n$Het (n=1-3; Het=pyrryl, pyrazolyl, triazolyl, tetrazolyl, oxazolyl, isoxazolyl, thiazolyl, isothiazolyl), $(CH_2)_nCOR$ (R=C_n+H_{2n+1}; n=1-3), $(CH_2)_n$ $CO(C_nF_{2n+1})$ (n=1-3), $(CH_2)_nSO_3M$ (n=1-3; M=Na or K), $(CH_2)_nSO_3R$ (R=C_nH_{2n+1}; n=1-3), $(CH_2)_nSO_2R$ (R=C_nH_{2n+1}; n=1-3); $(CH_2)_nCO_2H$ (n=1-3), $(CH_2)_n$ CO_2R (R=C_nH_{2n+1}; n=1-3), $(CH_2)_nF$ (n=1-3), $(CH_2)_nCl$ (n=1-3), $(CH_2)_n$ Br (n=1-3), $(CH_2)_n$ I (n=1-3), $(CH_2)_n$ CN (n=1-3), $(CH_2)_nNC$ (n=1-3), $(CH_2)_nNO_2$ (n=1-3), $(CH_2)_nNO$ (n=1-3), $(CH_2)_nArN_2$ (n=1-3; Ar=-phenyl, naphthyl), $(CH_2)_nNH_2$ (n=1-3), $CH_2)_nNHR$ (R=C_nH_{2n+1}; n=1-3), $(CH_2)_nN(R)_2$ (R=C_nH_{2n+1}; n=1-3), $(CH_2)_nNHCOR$ (R=C_nH_{2n+1}; n=1-3), and $(CH_2)_nNHCOAr$ (n=1-3; Ar=phenyl, naphthyl),
R_{20}=F, C_nH_{2n+1} (n=1-3), phenyl, naphthyl, or H,
R_{21}=F, C_nH_{2n+1} (n=1-3), phenyl, naphthyl, or H; and
electronically exciting said dye in said vessel in order to produce said laser light.

4,916,712
OPTICALLY PUMPED SLAB LASER
Gerald M. Bender, Marthasville, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.
Filed Jul. 27, 1989, Ser. No. 385,419
Int. Cl.[4] H01S *3/091*
U.S. Cl. 372—75 **6 Claims**

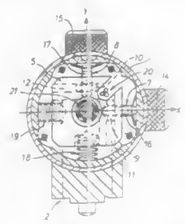


1. A solid optically pumped laser comprising:
(a) a solid ionic material positioned between at least two mirrors forming a resonator wherein spontaneous emission in the material is amplified by stimulated emission;
(b) the ionic material having a highly reflective coating on opposed sides;
(c) the mirrors mounted such that a resonating cavity is formed in the ionic material wherein the emission consists of multiple reflections of radiation between the reflective coatings of the opposed sides producing lasing in a transverse mode;
(d) a plurality of optical pumping means mounted in a linear array along the opposed sides with reflective coatings for providing pumping emission to the material; and
(e) optical alignment means for receiving the stimulating emission from individual optical pumping means and aligning individual stimulating emission such that it is colinear with the reflective radiation within the cavity.

4,916,713
LASER OR LIGHT TARGET DESIGNATOR DEVICE
Peter Gerber, Im Unterzelg 68, 8965 Berikon, Switzerland
Filed May 26, 1988, Ser. No. 199,119
Claims priority, application Switzerland, Jan. 26, 1988, 258/88
Int. Cl.[4] H01S *3/00*
U.S. Cl. 372—109 **11 Claims**

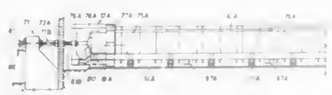
1. A light source aiming device comprising, a light source having an optical axis; a case for said light source and adjusting means for adjustably positioning said light source within said case along an x axis in one direction and along a y axis in another direction, the x and y axes intersecting each other and also being perpendicular to said optical axis, said adjusting means comprising a bracket within said case for supporting said light source and first and second adjustment elements for adjustably positioning said bracket along said x and y axes, respectively, wherein each of said adjustment elements engages said bracket along its respective one of said x and y axes

in a locking relationship for moving said bracket in a direction along its respective axis, and each of said adjustment elements



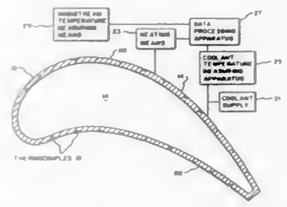
is slidably held in said bracket for movement along the direction of the other one of said x and y axes.

4,916,714
MOVABLE GRAPHITIZING FURNACE
Franco Antoni, Via Alamanni 18, 20141 Milano; Lohengrin Celani, Via delle Campanule 3, 63100 Ascoli Piceno; Emidio Di Fabio, Via dei Tigli, 6-4, 20020 Arese, and Jean L. Genevois, Corso Sempione 3, 20145 Milano, all of Italy
PCT No. PCT/IT87/00039, § 371 Date Oct. 24, 1988, § 102(e) Date Oct. 24, 1988, PCT Pub. No. WO87/06685, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 29, 1987, Ser. No. 286,953
Claims priority, application Italy, Nov. 30, 1986, 47968 A/86
Int. Cl.[4] H05B *3/60*
U.S. Cl. 373—120 **12 Claims**



1. Improved apparatus for graphitizing by Joule effect elongated pieces of amorphous carbon which are axially aligned head by head and are supported, enveloped and covered by a stuffing mass of thermally insulating granular material, said apparatus comprising:
a stationary installation including at least two pressing means adapted to exert an elastic thrust;
first mechanical anchor means associated with the stationary installation;
first electrical contact means for supplying graphitizing current;
means adapted to fill, arrange and remove said thermally insulating stuffing mass;
an elongated graphitizing assembly movable on wheels toward and away from said stationary installation and including first and second end frameworks, said elongated graphitizing assembly adapted to contain the pieces to be graphitized in two side by side tanks provided at one end with at least two bus bar electrodes slideable in the axial direction of said pieces of carbon;
second mechanical anchor means associated with the graphitizing assembly to said engage the first anchor means of the stationary installation to secure the movable graphitizing assembly to the stationary installation;
second electrical contact mean associated with the graphitizing assembly adapted to engage said first electrical contact means of said stationary installation, receive the graphitizing current and supply it to said slideable bus bar electrodes; and
a bus bar head at the end of both tanks opposite the bus bar electrodes,
the apparatus being arranged so that, once the pieces to be graphitized are placed with their stuffing mass in each tank between said slideable bus bar electrodes and said bus bar head and the graphitizing assembly is mechanically and electrically connected to said stationary installation, said pressing means are in a position to each act on one slideable bus bar electrode so that the bus bar electrodes can tighten to one another said carbon pieces to be graphitized.

4,916,715
METHOD AND APPARATUS FOR MEASURING THE DISTRIBUTION OF HEAT FLUX AND HEAT TRANSFER COEFFICIENTS ON THE SURFACE OF A COOLED COMPONENT USED IN A HIGH TEMPERATURE ENVIRONMENT
Eugene F. Adiutori, Westchester, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed Apr. 13, 1988, Ser. No. 180,926
Int. Cl.[4] G01K *17/00*; **G01N** *25/20*
U.S. Cl. 374—29 **35 Claims**



1. A method for determining heat flux on a surface of a component, comprising the steps of:
attaching one or more temperature measuring devices to a predetermined surface of a component for measuring the temperature of the predetermined surface at the location of each temperature measuring device;
attaching a heater to a preselected surface of the component;
applying coolant having predetermined characteristics to the component;
applying a plurality of predetermined amounts of heat to the heater while the coolant having predetermined characteristics is being applied to the component;
measuring the temperature of the coolant and the temperature of the predetermined surface of the component for each predetermined amount of heat; and
deriving heat flux calibration data for each temperature measuring device from the amount of heat applied to the surface, the temperature of the coolant, and the temperature of the predetermined surface to calibrate each said temperature measuring device so that temperature indicated by each said temperature measuring device and temperature of coolant applied to said component define heat flux at the location of said temperature measuring device.

4,916,716
VARACTOR DIODE
Gunther Fenner, Nashua, N.H.; Klaus Gillessen, Untergruppenbach, and Erhard Kohn, Leingarten, both of Fed. Rep. of Germany, assignors to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany
Filed Feb. 12, 1981, Ser. No. 233,956
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1980, 3005301
Int. Cl.[4] H01L *29/48*
U.S. Cl. 357—15 **15 Claims**

1. An encased varactor diode comprising: a compound semi-

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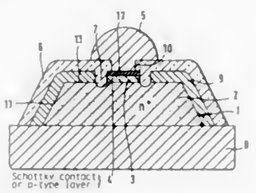
conductor element which has a rectifying metal semiconductor junction on a first outer face and an ohmic substrate contact on a second outer face of said semiconductor element which is opposite said first outer face; and a glass casing in which said diode is hermetically sealed, with said diode having contacts made of a material which withstands the temperature due to forming when the diode is sealed into said glass casing; the improvement wherein: said semiconductor element is mesa shaped; said substrate contact extends completely over side faces of the said semiconductor element onto said first outer



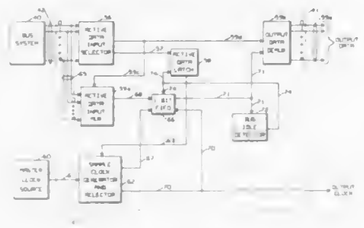
face and ends at a small spacing from said junction; said substrate contact on the side faces and on said first outer face of said semiconductor element is covered by a glass passivating layer; said diode is arranged between two metal pressure bodies with each diode contact being in pressure contact with a respective said pressure body; and the overall arrangement of said pressure bodies and said diode are enclosed in a glass capillary tube which is fused to said pressure bodies and out of which project electrode leads which are connected to said pressure bodies.

4,916,717

CLOCK RESYNCHRONIZATION MECHANISM

Edward J. Sackman, III, Sunrise, and Donald L. Wray, Lauderhill, both of Fla., assignors to Racal Data Communications Inc., Sunrise, Fla.

Filed Jan. 23, 1989, Ser. No. 299,600
Int. Cl.[4] H04L *7/02*
U.S. Cl. 375—107 6 Claims



1. In an arrangement having a main card cage, a plurality of remote card cages, and a data transport system for transmitting a plurality of data messages of synchronous binary information, said data transport system having at least one bus electrically coupling said card cages to define a plurality of data lines between said main card cage and each of said remote card cages, wherein the improvement in said data transport system comprises:

master clock generator means associated with said master card cage for generating a single master clock; and

clock resynchronizer means associated with said main card cage for resynchronizing a received one of said data messages from one of said remote card cages and including:

(a) data line selector means electrically coupled to said bus for detecting a first binary transition at the beginning of said received data message to determine that said received data message has been received and to determine which one of said received data lines has transported said received data message;

(b) sample clock generator means for dividing said master clock to generate a plurality of sample clocks;

(c) sample clock selector means for selecting one of said plurality of sample clocks based upon detecting said first binary transition;

(d) first-in first-out means wherein said received data message is clocked into said first-in first-out means using said selected sample clock and said received data message is clocked out of said first-in first-out means using said master clock; and

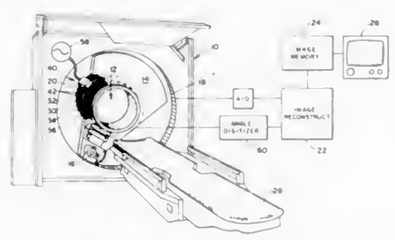
(e) line idle detector means for detecting an end to said received data message and for clearing said ressynchronizer means to receive a new one of said data messages.

4,916,718

PRECISION SCAN POSITION RESOLVER FOR CT SCANNERS

John M. Manring, Cleveland Hts., Ohio, assignor to Picker International, Inc., Highland Hts., Ohio

Filed Nov. 23, 1988, Ser. No. 275,783
Int. Cl.[4] H05G *1/60*
U.S. Cl. 378—4 16 Claims



15. A CT scanner comprising:

a scan frame for rotating an x-ray tube about a scan circle, the scan frame being rotatably mounted relative to a stationary frame; and,

a two speed resolver surrounding the scan circle, the two speed resolver being mounted in part to the stationary frame and in part to the scan frame for producing output signals indicative of a rotation and relative angular position of the scan frame and the stationary frame.

4,916,719

ON-LINE ANALYSIS OF ASH CONTAINING SLURRIES

Surendra K. Kawatra; Lawrence L. Sutter, and Timothy C. Eisele, all of Houghton, Mich., assignors to Board of Control of Michigan Technological University, Houghton, Mich.

Filed Jun. 7, 1988, Ser. No. 203,323
Int. Cl.[4] G01N *23/223*
U.S. Cl. 378—46 5 Claims

1. A device for measuring the ash content of coal suspended in a slurry comprising

a pressure control unit for receiving a continuous flow of the coal slurry to be measured, said pressure control unit comprises

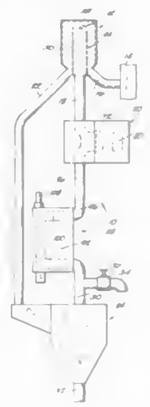
a tank located above said measuring chamber and having a slurry inlet, a sample outlet and an overflow outlet,

an upwardly extending inlet baffle in said tank having an upper edge and defining an inlet chamber communicating with said slurry inlet, and

an upwardly extending overflow baffle in said tank having an upper edge and spaced from said baffle to define a sample chamber communicating with said sample outlet, said overflow bubble having an upper edge located above the upper edge of said inlet baffle so as to maintain the coal slurry sample in said sample chamber at a substantially constant level; a backscatter sensing unit comprising

a measuring chamber having a first inlet in communication with said sample outlet of said pressure control unit, a first outlet, a flow passage extending between said first inlet and said first outlet and a measuring chamber at side of said flow passage between said first inlet and said outlet, said flow passage being arranged so that a coal slurry sample passing therethrough impinges directly upon said measuring window,

an annular nucleonic source having a central opening for emitting radiation within the range of about 7 to about 30 KeV through said measuring window and uniformly radiating the sample impinging on said measuring window, and



a radiation detector for measuring backscattered and iron fluorescent X-rays emitted from the irradiated sample and passing through the central opening of said source and for producing second electrical signals representative of the intensity of the backscattered X-rays and the iron fluorescent X-rays, respectively;

means for measuring the density of the sample and producing a third electrical signal representative of the sample density; and

computer means for receiving said first, second and third electrical signals, for using said first electrical signal as an approximation of the ash content of the slurry, said second electrical signal as a correction for high atomic number elements in the coal and said third electrical signal as a correction for the quantity of water in the slurry and for producing a fourth electrical signal representative of the ash content of the coal in the sample.

4,916,720

X-RAY ANALYZER

Naoki Yamamoto, Saitama; Yukio Takano, Tokyo; Yoshinori Hosokawa, Tsuzuki, and Kenji Yoshino, Kyoto, all of Japan, assignors to Horiba, Ltd., Kyoto and Hitachi, Ltd., Tokyo, both of, Japan

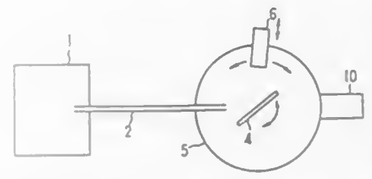
Filed Nov. 15, 1988, Ser. No. 271,534
Claims priority, application Japan, Nov. 27, 1987, 62-297754
Int. Cl.[4] G01N *23/20*
U.S. Cl. 378—81 14 Claims

9. A system for conducting both X-ray fluorescence analysis and X-ray diffraction analysis, comprising:

a vacuumable environment;

a guide means for guiding X-rays towards a sample, said guide means being disposed in said environment;

holding means for holding said sample in said environment while said sample is impinged by said X-rays, said holding means being rotatable, and



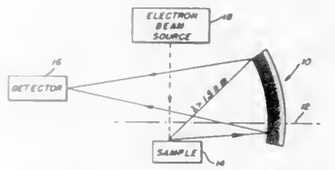
detection means for detecting X-rays from said sample, said detection means being translatable and rotatable independent of said holding means, said detection means is translatable towards and away from said sample.

4,916,721

NORMAL INCIDENCE X-RAY MIRROR FOR CHEMICAL MICROANALYSIS

Martin J. Garr, Tijeras, and Alton D. Romig, Jr., Albuquerque, both of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 5, 1987, Ser. No. 81,964
Int. Cl.[4] G21K *1/06*
U.S. Cl. 378—84 19 Claims



1. An x-ray mirror for a chemical analytical instrument comprising:

a non-planar mirror for collecting and focusing x-rays, having a concave reflecting surface, and further including a base member and a plurality of contiguous non-planar alternating layers of selected high atomic number material and low atomic material, respectively, formed on said base,

wherein the selection of said materials and the number of said layers is a function of the wavelength being focused, and

wherein the thickness of each of said layers is substantially an integral multiple of the wavelength of x-rays being focused, and varies at each point along the curve of the layer according to a predetermined design for focusing.

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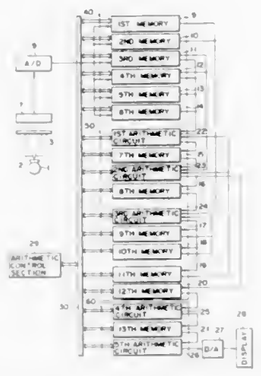
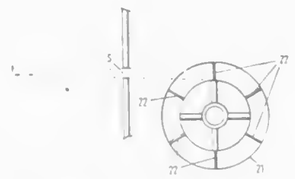
4,916,722
X-RAY IMAGE PROCESSING APPARATUS
Takehiro Ema, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 24, 1987, Ser. No. 66,093
Claims priority, application Japan, Jun. 26, 1986, 61-148233; Jun. 26, 1986, 61-148234; Jun. 26, 1986, 61-148235
Int. Cl.[4] H05G *1/64*
U.S. Cl. 378—99 14 Claims



1. An x-ray image processing apparatus comprising:
X-ray radiating means for radiating at least one of a first, second, third, and fourth object, with X-rays;
output means for outputting first image data corresponding to the first object including an X-ray shielding member, second image data corresponding to the second object including an X-ray shielding member and an X-ray absorption member, third image data corresponding to the third object which excludes the X-ray absorption member, and fourth image data corresponding to the fourth object including the X-ray absorption member, upon X-ray radiation;
first arithmetic operation processing means, for subtracting the third X-ray image data from the first X-ray image data, to output first corrected image data from which scattered X-ray components are removed, and for subtracting the fourth X-ray image data from the second X-ray image data, to output second corrected image data from which scattered X-ray components are removed;
second arithmetic operation processing means, for subtracting the second corrected image data from the first corrected image data, for outputting third corrected image data; and
filter data output means for arithmetically processing the third corrected image data, in accordance with predetermined equations, to obtain restoration filter information.

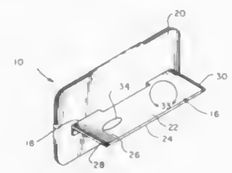
4,916,723
METHOD FOR SLIT RADIOGRAPHY
Ronald J. Geluk, Nootdorp, Netherlands, assignor to B.V. Optische Industrie "De Oude Delft" , Delft, Netherlands
Filed Jun. 17, 1987, Ser. No. 63,176
Claims priority, application Netherlands, Jun. 26, 1986, 8601678
Int. Cl.[4] G21K *5/10*
U.S. Cl. 378—146 12 Claims

1. Method for slit radiography, in which use is made of an X-ray source and a slit-type diaphragm placed in front of the X-ray source to form a fan-shaped X-ray beam with which a body to be investigated is at least partially scanned to form an X-ray shadow image on an X-ray detector placed behind the body, and in which the quantity of X-ray radiation transmitted by the slit-type diaphragm is controlled instantaneously for each sector of the X-ray beam during the scanning movement by means of controllable beam sector modulators acting in conjunction with the slit-type diaphragm as a function of the quantity of X-ray radiation transmitted in the sector by the body, characterized in that the X-ray beam is cyclically modulated during operation in a predetermined manner, in that the quantity of radiation transmitted by the body in each sector is measured in synchronism with the cyclic modulation during measurement intervals, in that the beam sector modulators are



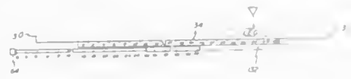
each brought, in a manner synchronized with the cyclic modulation during at least a part of first time intervals, which are alternated with second time intervals to the open position in which the X-ray radiation is transmitted in the sector corresponding to the beam sector modulator concerned, in that the measurement intervals at least partially coincide with at least the first time intervals, and in that each beam sector modulator is brought during at least a part of the second time intervals, to a position which is dependent on the quantity of radiation transmitted by the body measured in at least one preceding measurement interval in the associated sector.

4,916,724
BITEWING X-RAY FILM HOLDERS
Trudy Kilber, 527 Birchwood Dr., Bismarck, N. Dak. 58504
Filed Jul. 13, 1989, Ser. No. 379,217
Int. Cl.[4] G03B *42/06*
U.S. Cl. 378—168 6 Claims



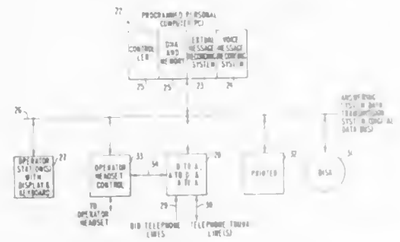
1. A bitewing x-ray film holder comprising:
(A) a backing plate element adapted to hold a dental x-ray film adjacent to a patient's upper and lower molars;
(B) a tab element adapted to be held between occlusal surfaces of the patient's upper and lower molars; and
(C) a means on said tab element and containing a liquid product and being openable upon insertion into the patient's mouth by action of the patient's mouth to release the liquid product into the patient's mouth during a bitewing x-ray procedure.

4,916,725
PATIENT SUPPORT APPARATUS HAVING X-RAY FILM CARTRIDGE SHUTTLE POSITIONING MEANS
Rudolph F. Quinter, Troy; Michael L. Berger, Versailles, and Jay L. Kuck, St. Marys, all of Ohio, assignors to Midmark Corporation, Versailles, Ohio
Filed Jan. 29, 1988, Ser. No. 149,750
Int. Cl.[4] G03B *42/02*
U.S. Cl. 378—177 7 Claims



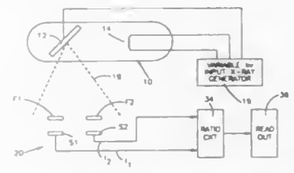
3. In a patient support apparatus useful during x-raying comprising a frame for supporting a bed surface having a length and a width and a head end and a foot end, a base for supporting said frame; an x-ray film cartridge shuttle; means located on said frame for supporting said x-ray film cartridge shuttle thereon and permitting movement of said x-ray film cartridge shuttle along the length of said frame; and a rod for positioning said x-ray film cartridge shuttle along the length of said frame, the improvement comprising:
means defining a graduated scale along the length of at least one side of said frame, and means defining a corresponding graduated scale along the length of said rod such that a technician standing at an end of said frame may precisely position said shuttle to a selected position along said frame, as determined from a selected point on said scale along said frame, by reference to a corresponding point on said scale along said rod.

4,916,726
TELEPHONE ANSWERING SERVICE WITH INTEGRATED VOICE AND TEXTUAL MESSAGE STORAGE
John F. Morley, Jr., and Kent D. Anderson, both of Madison, Wis., assignors to American Tel-A-System, Inc., McFarland, Wis.
Filed Sep. 29, 1988, Ser. No. 251,140
Int. Cl.[4] H04M *1/64, 3/50*
U.S. Cl. 379—88 51 Claims
MICROFICHE APPENDIX INCLUDED
(4 Microfiche, 296 Pages)



51. A telephone answering system for providing textual messages and voice messages produced by the telephone answering system answering telephone calls to persons having telephones calls answered by the telephone answering system comprising:
a voice message recording system for recording voice messages provided by a caller to persons having telephone calls answered by the telephone answering system in response to the answering of a telephone call by the telephone answering system;
a textual message recording system for recording textual messages provided by an operator who answers telephone calls made to persons having telephone calls answered by the telephone answering system; and
a controller controlling the recording of messages by the telephone answering system and controlling the reproduction of the recorded messages to provide direct caller access to messages recorded by the voice message recording system and access through an operator to messages recorded by the textual message recording system under the control of a single control program.

4,916,727
APPARATUS FOR MEASURING THE VOLTAGE APPLIED TO A RADIATION SOURCE
Terrence E. Sheridan, North Bloomfield, Ohio, assignor to Keithley Instruments Inc., Solon, Ohio
Continuation-in-part of Ser. No. 185,138, Apr. 22, 1988, Pat. No. 4,843,619. This application Jun. 14, 1989, Ser. No. 366,666
Int. Cl.[4] G01D *18/00*
U.S. Cl. 378—207 7 Claims



1 Apparatus for measuring the input voltage applied to an X-ray radiation source operating at an unknown voltage within a given voltage range comprising:
a pair of radiation absorbing filters including a first filter which includes a first chemical element and a second filter which includes a second chemical element;
said elements being chosen so that said filters exhibit different radiation absorption characteristics within said voltage range;
said filters adapted to be positioned so that said first and second filters are irradiated by said radiation source with the radiation impinging upon a surface of each said filter being partially absorbed thereby as it passes therethrough so as to exit therefrom as attenuated radiation;
detector means positioned for receiving the attenuated radiation passed by said first and second filters and providing first and second signals having magnitudes which vary with the attenuated radiation respectively passed by said first and second filters;
ratio means for providing a ratio indication representative of the ratio of the magnitude of said first signal to that of said second signal wherein the magnitude of said ratio varies with that of said input voltage;
wherein at least one of said first and second elements exhibits a known K absorption edge within said voltage range so that if said input voltage is increased to exceed said known K absorption edge the said one of said chemical elements exhibits greater attenuation characteristics.

4,916,728
CELLULAR TELEPHONE UNIT WITH PRIORITIZED FREQUENCY ACQUISITION
Kevin B. Blair, Spring, Tex., assignor to GTE Mobilnet Incorporated, Houston, Tex.
Filed Jul. 25, 1988, Ser. No. 223,865
Int. Cl.[4] H01Q *7/04*
U.S. Cl. 379—59 7 Claims

1. A cellular telephone unit with control logic circuit means including:

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scanning means for scanning a plurality of frequencies to identify a home SID signal,

means responsive to said scanning means, in the absence of a home SID signal, for alternatively scanning for any non-negative SID,

WHEN SID ON HOME FREQ'S IS	AND SID ON NON-HOME FREQ'S IS	THEN STATUS DISPLAY IS
HOME SID	NO SID OR NEG SID OR NON-NEG SID	NO LIGHTS (AVAIL FOR USE)
NON-HOME AND NON-NEG SID	NO SID OR NEG SID OR NON-NEG	STEADY ROAM LIGHT
NO SID OR NEG SID	NON-HOME AND NON-NEG SID	BLINKING ROAM LIGHT
NO SID OR NEG SID (a)	NO SID OR NEG SID (a)	NO-SERVICE LIGHT

(a) WHEN "NO-SERVICE" LIGHT IS CAUSED BY NEG SID, EMERGENCY (911) CALLS OVERRIDE LOCKOUT

means for acquiring a carrier signal corresponding to an SID signal found by said scanning means, and

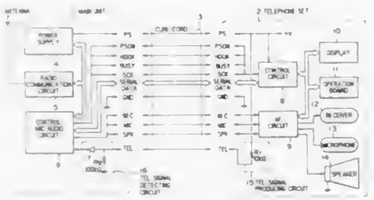
means for activating a display indicating the availability of any SID so found.

4,916,729

MOBILE STATION FOR AN AUTOMOBILE TELEPHONE SYSTEM

Hisayoshi Usui, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 23, 1989, Ser. No. 355,626
Claims priority, application Japan, May 23, 1988, 63-123892
Int. Cl.[4] H01Q *7/04*
U.S. Cl. 379—61 **4 Claims**



1. A mobile station for an automobile telephone system: comprising,

a main unit including a radio communication circuit for transmitting signals to an external station and receiving signals from said external station, and a power supply for supplying electric power of a predetermined voltage which is required for operation;

a telephone set including an operation means for turning said power supply on and off, said telephone set being separatable from said main unit;

means for detecting the separation of said telephone set from said main unit; and

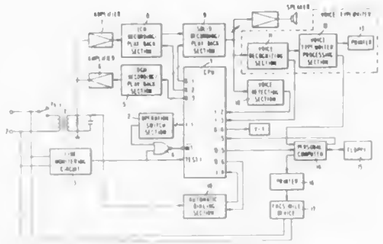
means for controlling said power supply to be turned off when said detecting means detects the separation of said telephone set from said main unit under a state that a power supply turning-off signal is not produced in said operation part.

4,916,730

TELEPHONE ANSWERING DEVICE WITH AUTOMATIC TRANSLATING MACHINE

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Dec. 28, 1987, Ser. No. 138,896
Claims priority, application Japan, Dec. 29, 1986, 61-313325
Int. Cl.[4] H04M *1/65*
U.S. Cl. 379—70 **4 Claims**



1. A telephone answering system with automatic translating device, comprising:

means for recording an incoming message after an outgoing message is sent out in response to an incoming call;

means for transferring, successively, portions of the recorded incoming message to a solid-state memory after the recording by said incoming message recording means for a predetermined period of time;

means for determining the kind of language of the message being transferred to the solid-state memory;

means for introducing said message into a voice recognizing means;

means for detecting pauses of phrases during said introduction into the voice recognizing means, to distinguish each one phrase of the message by the translating device;

means for reading out a corresponding language's translation program from a memorizing medium and entering it into a computer after said recognition of language;

means for resetting an address of said solid-state memory, and entering said each phrase one by one into the translating device by playing back the message from the beginning; and

means for returning the system to the standby mode after said translation is completed.

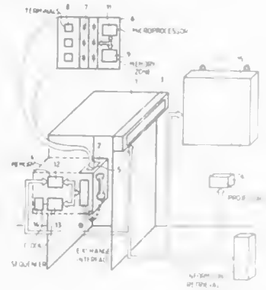
4,916,731

DEVICE TO MONITOR THE CONTENT AND/OR DURATION OF THE DISPLAY OF ADVERTISEMENTS

Pierre Brisson, Meyrargues, France, assignor to SGS-Thomson Microelectronics SA, Gentilly, France

Filed Sep. 20, 1988, Ser. No. 246,998
Claims priority, application France, Sep. 28, 1987, 87 13353
Int. Cl.[4] H04M *11/00, 17/00*
U.S. Cl. 379—96 **8 Claims**

1. A device to display advertisements, comprising a public telephone, a display panel connected to the public telephone, means to display a message on the display panel depending on the duration of a telephone communication, means so that the public telephone is accessible by an electronic pre-payment means, said pre-payment means comprising a memorizing zone, and said device comprising means to retrieve an advertisement to be displayed in accordance with information contained in this memorizing zone.

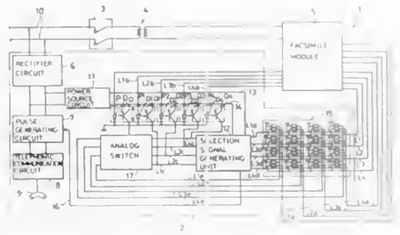


4,916,732

COMMUNICATION SYSTEM HAVING TELEPHONIC FUNCTION

Matahira Kotani, Nara, and Motohiko Hayashi, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Nara, Japan

Filed Sep. 30, 1988, Ser. No. 251,764
Claims priority, application Japan, Sep. 30, 1987, 62-247635
Int. Cl.[4] H04M *11/00;* **H04N** *1/32*
U.S. Cl. 379—100 **13 Claims**



1. A communication system having a telephonic function and including a telephonic communication module and an information transmitting module, the system comprising:

call signal selecting means for selecting a call signal to be outputted to a telephone line,

input operating means having a first set of input and output lines connected to the call signal selecting means and a second set of input and output lines connected to the information transmitting module, for outputting information through the output lines in the first and second set,

change-over means, interposed in the output lines of the first set, being disabled, upon receipt of an operative signal from the information transmitting module and for enabling said first set of input and output lines to be conductive when receiving a nonoperative signal from the information transmitting module,

a third set of input and output lines connected to each of output lines in the first system between the change-over means and the all signal selecting means, for inputting information from the information transmitting module, and

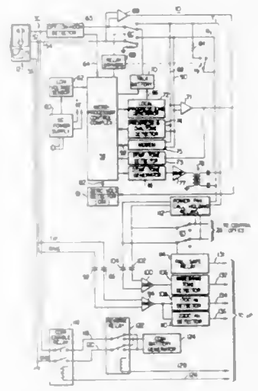
a plurality of switching means interposed in the third set of input and output lines, for inputting the information to the call signal selecting means when receiving an operative signal from the information transmitting module, and for electrically shutting off the third system input lines when receiving a non-operative signal from the information transmitting module.

4,916,733

PAY STATION TELEPHONE CALL ANSWER SUPERVISION APPARATUS

Benjamin A. Smith, Celeste, and Conaway K. Hoback, Dallas, both of Tex., assignors to Digital Telecommunications Systems, Inc., Richardson, Tex.

Division of Ser. No. 912,984, Sep. 29, 1986, Pat. No. 4,777,647.
This application Jun. 22, 1988, Ser. No. 210,075
Int. Cl.[4] H04M *17/00*
U.S. Cl. 379—132 **28 Claims**



1. Apparatus for providing call answer supervision for controlling the charges to the user of a pay station telephone, comprising:

means for sensing the duration of audio signals on a telephone line connected to the pay station telephone after the completion of dialing by the user;

means for detecting the longest sensed duration audio signal;

means responsive to said detecting means for generating an identification signal representative of said longest sensed audio signal; and

means responsive to said identification signal for controlling the charges to the user of the pay station telephone.

4,916,734

APPARATUS FOR SEPARATING DC CURRENT AND AC CURRENT COMPONENTS OF A COMPOSITE SIGNAL

Harald Stader, and Hans W. Rudolf, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 61,379, Jun. 15, 1987, Pat. No. 4,896,351, which is a continuation-in-part of Ser. No. 872,063, Jun. 9, 1986, abandoned. This application Apr. 3, 1989, Ser. No. 332,825
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1986, 3625872
The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.
Int. Cl.[4] H03H *7/00*
U.S. Cl. 379—399 **4 Claims**

1. An apparatus for separating dc current and ac current components of a composite signal, comprising:

(a) a main current path for carrying the composite signal,

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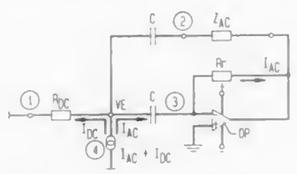
said current path having a node where it branches out into:

(b) a first current path including a resistor for receiving the dc current components;

(c) a second current path including an impedance for tapping the ac current components and a first dc blocking filter for preventing the dc current components from flowing through the impedance, said first dc blocking filter being disposed between the node and the impedance; and

(d) a third current path including an inverting amplifier and a second dc blocking filter for preventing dc current components from flowing through the inverting amplifier, said second dc blocking filter being disposed between the node and the inverting amplifier, wherein:



the impedance is disposed between the first dc blocking filter and the inverting amplifier and the output signal of the inverting amplifier is superimposed on the voltage drop in the second current path and is set is such a manner that it compensates for said voltage drop in at least a specific frequency range of interest so that the node acts as a virtual ground for the ac current components in said frequency range;

each dc blocking filter comprises a capacitor; and

the inverting amplifier comprises an operational amplifier, whose non-inverting input is tied to ground potential, whose inverting input is connected to the respective capacitor and whose output is connected both with the inverting input via an ohmic negative feedback resistor and with the impedance.

4,916,735

POWER-SUPPLY TRANSFER APPARATUS FOR TELEPHONE

Masayuki Iida, Yawata, and Shinichi Tsurufuji, Nara, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Oct. 6, 1987, Ser. No. 106,484

Claims priority, application Japan, Oct. 7, 1986, 61-238504; Oct. 7, 1986, 61-238505; Oct. 13, 1986, 61-242554

Int. Cl.[4] H04M *19/08*

U.S. Cl. 379—413 11 Claims

4. A telephone apparatus comprising:

telephone communication means including transmitting means for converting a voice input into signals;

voice recognition means for extracting and identifying characteristics of the signals; and

power supply transferring means for switching between a first power source and a second power source, said power supply transferring means switching from the second power source to the first power source in response to an operation of said voice recognition means so as to supply power to said voice recognition means, said power supply transferring means switching from said first power source to said second power source so as to supply power to said telephone communication means in response to any one of a cessation of said operation of said voice recognition means, a stoppage of power supplied by said first power source, and a power level supplied by said first power source falling below a predetermined level.

4,916,736

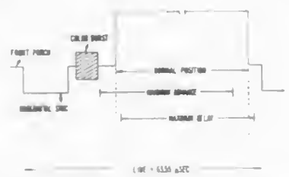
METHOD AND APPARATUS FOR ENCRYPTING AND DECRYPTING TIME DOMAIN SIGNALS

John O. Ryan, Cupertino, Calif., assignor to Macrovision Corporatioo

Filed Jun. 7, 1988, Ser. No. 203,676

Int. Cl.[4] H04N *7/167*

U.S. Cl. 380—11 50 Claims



1. A method for encrypting video information signals to prevent unauthorized use thereof, said signals being normally arranged as a succession of lines of active information, each line having a line sync portion, said method comprising the steps of:

(a) individually time shifting the active information portion of at least some of the lines of said signals with respect to the line sync portion by selected amounts and inhibiting time shifting of the line sync portion; and

(b) providing an indication of the time shifting performed in step (a) to enable subsequent decrypting.

4,916,737

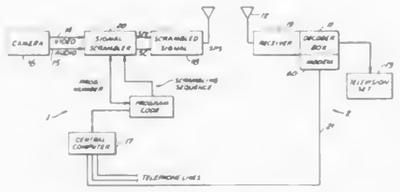
SECURE ANTI-PIRACY ENCODED TELEVISION SYSTEM AND METHOD

Marc Chomet, Huntington, and George Sintchak, Stony Brook, both of N.Y., assignors to Teleglobe Pay-TV System, Inc., New York, N.Y.

Filed Nov. 14, 1988, Ser. No. 269,997

Int. Cl.[4] H04N *7/167, 7/00*

U.S. Cl. 380—20 13 Claims



1. A method of scrambling a broadcast signal including the steps of:

converting an unscrambled signal into a scrambled signal, broadcasting said scrambled signal and concurrently broadcasting a descrambling program identification digital code signal, associated with each program of said scrambled signal;

placing a resident ID digital code box identification number

in the read-only memory of a decoder box so that said resident ID code may not be read externally of said decoder box;

receiving the broadcast signals and descrambling the said scrambled broadcast signals in the decoder box by conveying the descrambling information digital code signal to a descrambling system in said decoder box; enabling the descrambling system under the control of an erasable electrically alterable non-volatile memory in said decoder box having a look-up table consisting of a plurality of digital descrambling codes and corresponding in a one-to-one relationship therewith a plurality of said program identification codes;

periodically broadcasting a modem enabling code signal to enable the modem in the decoder box; and

periodically establishing a telephone-modem connection between the decoder box and a central computer immediately after said modem has been enabled, communicating the resident ID code over the telephone connection from the central computer to the decoder box to enable the decoder box to continue to descramble and having the central computer change the entries of the said look-up table.

4,916,738

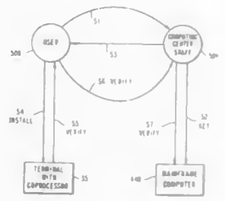
REMOTE ACCESS TERMINAL SECURITY

Akhileshwari N. Chandra, Mahopac; Liam D. Comerford, Carmel, and Steve R. White, New York, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Nov. 5, 1986, Ser. No. 927,306

Int. Cl.[4] H04K *1/00*

U.S. Cl. 380—25 14 Claims



1. A method of remote terminal access comprising the steps of:

(a) transferring an encrypted decryption key from a central computer to a physically secure coprocessor,

(b) coupling said physically secure coprocessor to said remote terminal,

(c) transferring an encrypted file from said coprocessor to said central computer to enable the central computer to identify the coprocessor which generated the encrypted file, and

(d) examining said encrypted file at said central computer to verify that a specific coprocessor has created said encrypted file before authorizing access to said central computer by said remote terminal.

4,916,739

ADHESIVE PHOTOCOPYABLE TRANSPARENCY FOR USE IN A SECURE FACSIMILE TRANSMISSION SYSTEM

Jerry R. Iggulden, 21600 Cleardale St., Santa Clarita, Calif. 91321, and Donald A. Streck, 832 Country Dr., Ojai, Calif. 93023, assignors to Jerry R. Iggulden, Santa Clarita and Donald A. Streck, Ojai, both of, Calif., a part interest

Continuation-in-part of Ser. No. 312,700, Feb. 21, 1989, which is a continuation-in-part of Ser. No. 175,947, Mar. 31, 1988, abandoned. This application Mar. 22, 1989, Ser. No. 326,975

Int. Cl.[4] G09C *5/00*

U.S. Cl. 380—54 15 Claims

1. An adhesive photocopyable transparency for use in a secure facsimile transmission system wherein one of two partial documents each containing portions of an original document which are complementary and mutually exclusive is photocopied onto the transparency and overlayed on the other of the two partial documents in registration therewith to recreate the original document, said transparency comprising:

(a) a rectangular sheet of a transparent plastic material having a surface for accepting and holding a photocopy image;

(b) an adhesive material disposed at an edge of said sheet of plastic material; and,

(c) a removable protective covering disposed over said adhesive material so as to allow the transparency to pass freely through a photocopy machine and be slid on the surface of a document without said adhesive material interfering therewith thereby after photocopying the one of two partial documents onto the transparency and placing it in registration on the other of the two partial documents said protective covering can be removed in place to bond the transparency to the one of the two partial documents.

4,916,740

INPUT APPARATUS FOR COMPUTER

Atsushi Noda, Takatsuki; Haruyuki Kotzumi; Shinya Sonoda, both of Kyoto, and Shinji Maeda, Kurayoshi, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 130,608, Dec. 9, 1987, abandoned. This application Jun. 2, 1989, Ser. No. 361,716

Claims priority, application Japan, Dec. 15, 1986, 61-298164; Dec. 17, 1986, 61-300626

Int. Cl.[4] G06K *9/22, 9/20*

U.S. Cl. 382—59 22 Claims

1. An input apparatus for computers comprising:

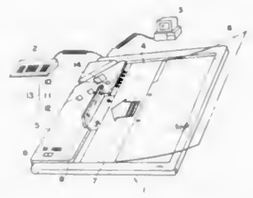
area designating means on which a visible information sheet having predetermined visible information can be disposed and which outputs a designation area signal indicative of a designated area of said visible information;

receiving means for receiving registration data comprising areas of the visible information and respective key codes representative one or more keys corresponding to said areas;

memory means for storing the registration data received by said receiving means;

data fetching means for retrieving the corresponding key code from the memory means by reference to said regis-

tration data in response to said designation area signal which is given from said area designating means; and



transmitting means for transmitting the retrieved key code to a computer.

4,916,741

FM/FMX STEREOPHONIC RECEIVER

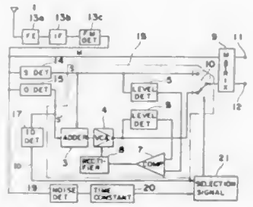
Tsutomu Ishikawa, Oota, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Mar. 21, 1988, Ser. No. 170,908

Claims priority, application Japan, Mar. 27, 1987, 62-75370; May 18, 1987, 62-120814

Int. Cl.[4] H04H *5/00*

U.S. Cl. 381—13 5 Claims



1. An FM/FMX stereophonic receiver for receiving an FMX stereophonic broadcast signal or FM stereophonic broadcast signal, said FM/FMX stereophonic receiver comprising:

means for detecting multipath noise signal contained in said FMX stereophonic broadcast signal and for producing a detection signal when said multipath noise signal is detected; and

means for selecting either one of FM receiving mode or FMX receiving mode, said selecting means automatically selecting said FM receiving mode when said multipath noise signal detecting means produces said detection signal.

4,916,742

METHOD OF RECORDING AND READING AUDIO INFORMATION SIGNALS IN DIGITAL FORM, AND APPARATUS FOR PERFORMING SAME

Viktor M. Kolesnikov, ulitsa Dibunovskaya, 37, kv. 31; Mikhail U. Bank, ulitsa Sofiiskaya, 40, korpus 1, kv. 121; Ilya M. Lazer, prospekt Toreza, 33, kv. 44; Gennady S. Brailovsky, 7 Sovetskaya ulitsa, 16, kv. 17, and Viktor I. Prygun, ulitsa Dzerzhinskogo, 33/37, kv. 31, all of, Leningrad, U.S.S.R.

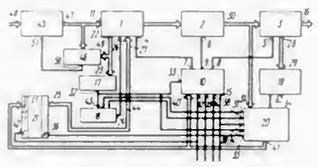
PCT No. PCT/SU86/00036, § 371 Date Dec. 18, 1987, § 102(e) Date Dec. 18, 1987, PCT Pub. No. WO87/06783, PCT Pub. Date Nov. 5, 1987

PCT Filed Apr. 24, 1986, Ser. No. 171,007

Int. Cl.[4] G10L *3/02*

U.S. Cl. 381—30 19 Claims

1. A method of recording and reading audio information signals in digital form, comprising the steps of: comparing the code values of the digital signal with a predetermined pause identifier code; distorting the code value of the digital signal by altering one of the minor symbols of the code value of the digital signal if the result of the comparison coincides; detecting a chain of code values corresponding to a pause in an audio signal; measuring the duration of the chain of code values of the digital signal corresponding to the pause in the audio sig-



nal; compressing the digital signal, which is performed by generating a pause identifier code and a pause duration code for their subsequent recording with the digital signal; reading out of the digital signal; detecting the pause identifier code and the pause duration code by which the time decompression is performed and using them for restoring the duration of the chain of code values of the digital signal corresponding to the pause in the audio signal.

4,916,743

PATTERN MATCHING SYSTEM

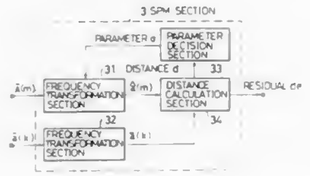
Yumi Takizawa; Shinichi Sato; Atsushi Fukasawa; Takuro Sato; Hiromi Ando, and Yukio Suzuki, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1988, Ser. No. 186,577

Claims priority, application Japan, Apr. 30, 1987, 62-104632; May 1, 1987, 62-106420; May 1, 1987, 62-106421; May 6, 1987, 62-108815; May 6, 1987, 62-108818

Int. Cl.[4] G10L *7/06, 9/18*

U.S. Cl. 381—45 8 Claims



1. A circuit for pattern matching on the frequency axis, comprising:

(a) a first transformation means having an input for receiving a unit impulse and having a first adaptive filter generally identical to an adaptive finite impulse response filter with its delay elements having been replaced by all-pass filters, for performing frequency transformation on an input signal, said first transformation means including means for receiving linear predictive analysis coefficients of the input speech signal as tap coefficients of the first adaptive filter, and for outputting linear predictive analysis coefficients of the frequency-transformed input signal,

(b) a second transformation means having an input for receiving a unit impulse and having a second adaptive filter generally identical to an adaptive finite impulse response filter with its delay elements having been replaced by all-pass filters, for performing frequency transformation on a reference signal, said second transformation means including means for receiving linear predictive analysis coefficients of a reference speech signal as tap coefficient of the second adaptive filter, said second transformation means outputting linear predictive analysis coefficients of the frequency-transformed reference signal; and

(c) a control means for calculating a distance between the respective linear predictive analysis coefficients output from the first transformation means and the second transformation means, controlling parameters of all-pass filters of at least one of the first and second transformation means so as to minimize this distance, and generating a pattern matching residual output on the frequency axis.

4,916,744

IMAGE SIGNAL PROCESSING METHOD

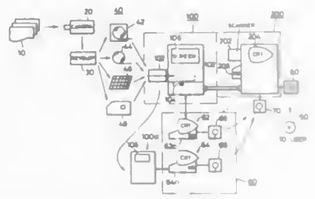
Ryoichi Watanabe, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 939,975, Dec. 10, 1986, abandoned. This application May 16, 1988, Ser. No. 195,405

Claims priority, application Japan, Dec. 10, 1985, 60-277407; Dec. 10, 1985, 60-277408

Int. Cl.[4] G06K *9/38*

U.S. Cl. 382—53 2 Claims



1. A signal processor comprising:

means for scanning an image having foreground and background densities and for producing output signals representing image data said signals having a value in a first range for background densities and a second range for foreground densities said first range being different from said second range;

means responsive solely to said background density image data output signals for obtaining an extremum signal value from a distribution of said image data;

means for obtaining a background density value of said image data from said extremum value;

a memory stored with a plurality of threshold values corresponding respectively to a plurality of background densities without considering foreground density;

means for reading said memory and for setting a threshold value for binary digitization in response to said obtained background density;

means for binary digitizing said image data according to said threshold value; and

wherein the contrast between the foreground density and background density of the image data is low at a given frequency level, said signal processor further including a means responsive to said image data output for modifying said image data output in response to the contrast between the foreground and background of signals from said image data.

4,916,745

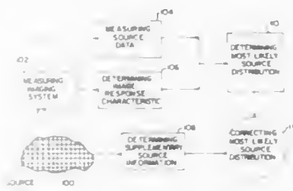
BAYESIAN IMAGE PROCESSING METHOD AND APPARATUS

Hiram E. Hart, 3400 Wayne Ave., and Zhengrong Liang, 44 E. 208th St., both of Bronx, N.Y. 10467

Filed Feb. 7, 1986, Ser. No. 827,253

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—6 4 Claims



1. In an improved image processing method of processing data imaged from a source, comprising the steps of:

(a) determining an image response characteristic of a measuring imaging system;

(b) imaging a source having multiple source elements with the measuring imaging system, and obtaining measured source data having multiple measured data elements, each measured by a plurality of the source elements in accordance with the image response characteristic; and

(c) determining a most likely source distribution which gives rise to the measured source data as a function of the measured data elements and the image response characteristic;

the improvement which comprises:

(d) independently determining supplementary source information about the source from means other than from the measuring imaging system; and

(e) correcting the most likely source distribution determined in step (c) by factoring in the independently determined supplementary source information, thereby more accurately specifying the most likely source distribution.

4,916,746

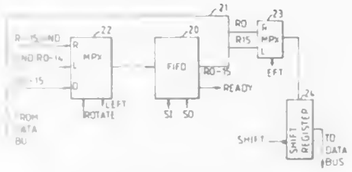
IMAGE ROTATION CIRCUIT

Waldemar E. Yeschick, Herkimer, N.Y., assignor to International Computers Limited, London, England

Continuation of Ser. No. 104,504, Oct. 5, 1987, abandoned. This application May 22, 1989, Ser. No. 354,737

Int. Cl.[4] G06K *9/32*

U.S. Cl. 382—46 5 Claims



1. An image rotation circuit for rotating a block of data representing at least a portion of an image, comprising:

(a) a first-in-first-out (FIFO) memory, for storing the block of data as a sequence of data words, each word having a plurality of bits, the FIFO having an input and an output,

(b) feedback means for connecting the output of the FIFO back to the input of the FIFO with a displacement of one bit position in a predetermined direction, to form a spiral serial data path, passing through all the bits in the FIFO,

(c) means connected to one bit position of the output of the

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FIFO for serially reading data bits from the spiral serial data path, one bit at a time, and

(d) output means for assembling the bits read from the spiral serial data path into output parallel data words.

4,916,747

IMAGE PROCESSING SYSTEM

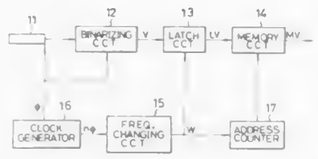
Shinobu Arimoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 31,223, Mar. 27, 1987, abandoned, which is a continuation of Ser. No. 920,917, Oct. 21, 1986, abandoned, which is a continuation of Ser. No. 615,174, May 30, 1984, abandoned. This application Jun. 10, 1988, Ser. No. 205,601

Claims priority, application Japan, Jun. 6, 1983, 58-99462

Int. Cl.⁴ G06K *9/42*

U.S. Cl. 382—47 **11 Claims**



1. An image processing system comprising:

image data input means for inputting image data;

memory means for storing image data input from said image data input means;

clock signal generating means for generating a clock signal which serves as a reference clock signal for writing image data in said memory means;

dividing means for dividing a clock signal from said clock signal generating means to produce a divided clock signal corresponding to a magnification factor; and

control means for controlling the writing of image data in said memory means in response to the divided clock signal produced by said dividing means,

wherein said dividing means comprises a counter for counting up to a number R+1 of clock pulses where R+1 is equal to an integer multiple of ten, and said dividing means divides a clock signal from said clock signal generating means into a divided clock signal having clock pulses of period

$$\frac{S}{R+1}$$

where S is a value set in accordance with the magnification factor.

4,916,748

INTERNAL SUPPORT ELEMENT FOR A HYDROSTATICALLY SUPPORTED ROLL

Günter Schrörs, Tööisvorst, Fed. Rep. of Germany, assignor to Eduard Küsters Maschinenfabrik GmbH & Co. KG, Krefeld, Fed. Rep. of Germany

Filed May 8, 1989, Ser. No. 348,696

Claims priority, application Fed. Rep. of Germany, May 6, 1988, 3815462

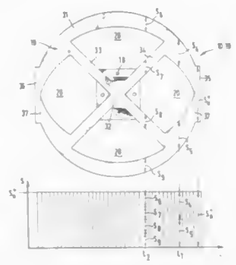
Int. Cl.⁴ B21B *13/02;* **F16C** *32/06*

U.S. Cl. 384—99 **3 Claims**

1. A support element for a hydrostatically supported roll having a rotatable hollow cylinder forming an outer working roll circumference and a stationary crosshead extending lengthwise through the hollow cylinder to form a surrounding clearance space between an outer circumference of the crosshead and an inner circumference of the hollow cylinder in which the support element is one of several support elements supported by the crosshead in at least one row formed along the length of the crosshead, said support element comprising:

(a) a pressure chamber to which hydraulic fluid is conducted for pressing the support element against the inner circumference of the hollow cylinder;

(b) hydrostatic supply pockets formed in a curved contact surface at a top portion of the support element, said curved contact surface having a radius corresponding to the radius of the inner circumference of the hollow cylinder, whereby hydraulic fluid is conducted to the hydrostatic supply pockets for forming a supporting fluid film between the curved contact surface and the inner circumference to support the hollow cylinder; and



(c) segments formed in the top portion of the support element having surfaces that surround said hydrostatic supply pockets and define said curved contact surface wherein the total extent of the segments in the circumferential direction of the hollow cylinder is constant over the length of the support element along the longitudinal direction of the hollow cylinder.

4,916,749

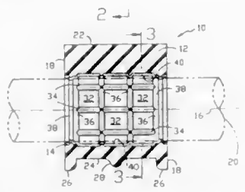
ELASTOMERIC BUSHING AND METHOD OF MANUFACTURING THE SAME

Henry F. Urban, Sandusky, and Jay W. Thornhill, Huron, both of Ohio, assignors to The Pullman Company, Princeton, N.J.

Filed Apr. 20, 1989, Ser. No. 341,002

Int. Cl.⁴ F16C *27/06*

U.S. Cl. 384—298 **14 Claims**



1. A bushing for rotatably supporting a bar-shaped suspension link, the bushing comprising an elastomeric body having a central axis and including an axial bore adapted to receive the suspension link therethrough in direct sliding relationship, said bore including a circumferential surface covered with a low friction fabric liner, said low friction liner conforming to the contour of said circumferential surface, said circumferential surface having projected surface portions and recessed surface portions, said projected surface portions projecting radially inwardly to provide a radial clearance between the suspension link and said recessed surface portions to provide an area for contaminants to collect thus minimizing audible noise occurring between said bushing and said link.

4,916,750

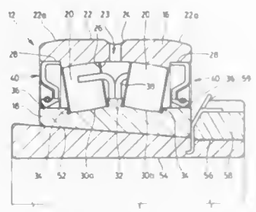
SEALED DOUBLE ROW SPHERICAL ROLLER BEARING

James W. Scott, Burlington, Canada, assignor to NTN Toyo Bearing Co. Ltd., Osaka, Japan

Filed Dec. 23, 1988, Ser. No. 289,003

Int. Cl.⁴ F16C *33/78*

U.S. Cl. 384—484 **10 Claims**



1. A sealed double row spherical roller bearing, comprising:

an outer race providing two spaced-apart outer roller tracks, and defining in section an arc of a sphere;

an inner race defining two parallel spaced-apart inner roller tracks, each said inner track, in turn, defining in section an arc of a sphere;

a plurality of rollers located in respective said inner and outer tracks, each of said rollers defining in section an arc of a sphere corresponding to said arcs of respective said inner and outer tracks;

respective right angular seal retaining shoulders formed on respective ends of said outer race;

respective seal engaging surfaces formed on respective ends of said inner race, and registering with said right angular shoulders;

means defining two metallic lubricant reservoir rings, each of said reservoir rings defining in section an outer generally cylindrical wall portion received in respective right angular seal retaining shoulders on said outer race, and an annular closure wall portion extending from said outer cylindrical surface spaced apart from said rollers to define a lubricant reservoir, said outer wall portions and said closure wall portions being substantially normal to one another, and said rings further defining seal mounting portions angled relative to said closure wall portions and extending towards said rollers, said ring means defining generally asymmetrical channel-shaped recesses adjacent the edges of said outer race whereby to permit displacement of said rollers into said recesses in response to shaft misalignment, and,

two annular flexible seal members mounted on respective said seal mounting portions, and extending into engagement with respective said seal engaging surfaces on said inner race.

4,916,751

ROLLING BEARING

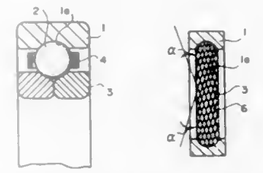
Yuichi Sumita, Fujisawa; Yukio Ohara, Hiratsuka, and Katsuya Toma, Chigasaki, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1989, Ser. No. 314,907

Claims priority, application Japan, Feb. 29, 1988, 63-46690

Int. Cl.⁴ F16C *33/58, 41/04*

U.S. Cl. 384—516 **6 Claims**



1. In a rolling bearing comprising an outer ring having a raceway surface, an inner ring having a raceway surface, and rolling elements interposed between said outer and inner rings in rolling contact therewith, the improvement wherein:

at least one of the contacting surfaces of said outer ring, said inner ring and said rolling elements is formed with a plurality of groove-shaped recess portions having a depth of 0.0005 to 0.008 mm and with a plurality of smooth surface portions, partitioned by said groove-shaped recess portions, having a roughness equal to or smaller than 0.08 μmRa; and

said groove-shaped recess portions are not worn completely during rotation of said rolling bearing after starting.

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DESIGN PATENTS

GRANTED APR 10, 1990

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For CLASS	See PATENT NO.
D28-008	 307,091
D11 151	 307,123

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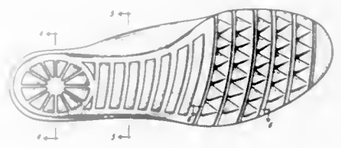
307,070
TRAVELER'S BIB
Elizabeth A. Wymer, 1033 E. 35th Ct., Gary, Ind. 46409
Filed Apr. 17, 1989, Ser. No. 338,772
Term of patent 14 years
U.S. Cl. D2—229

307,071
SHOE HEEL AND COUNTER PROTECTOR
Jill L. Kemna, Bloomington, and Thomas R. Freeman, St. Paul, both of Minn., assignors to Summerfield Industries, Inc., Roseville, Minn.
Filed May 14, 1987, Ser. No. 49,414
Term of patent 14 years
U.S. Cl. D2—277

307,072
INSOLE
Kenneth Graham, Wakefield, Mass.; Keaton D. Geer, Exeter, N.H., and Kathryn Bednarski, Amesbury, Mass., assignors to Hyde Athletic Industries, Inc., Peabody, Mass.
Filed Sep. 4, 1987, Ser. No. 94,484
Term of patent 14 years
U.S. Cl. D2—318



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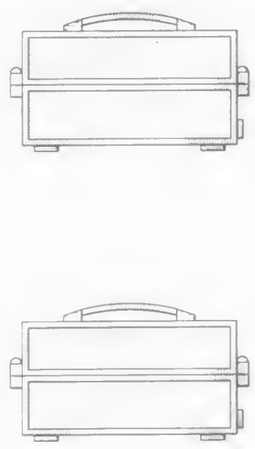
307,073
SEWING MACHINE PIN CUSHION
Bertha Butler, 15062 Brandt, Romulus, Mich. 48174
Filed Oct. 8, 1987, Ser. No. 106,317
Term of patent 14 years
U.S. Cl. D3—27

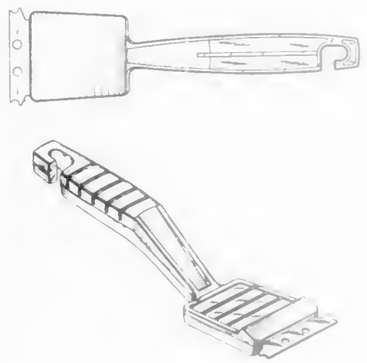
307,074
CASE FOR A VEHICULAR CASSETTE PLAYER
Bennie E. Dye, 9616 Rolling Rock #231-E, Dallas, Tex. 75238
Filed Oct. 13, 1987, Ser. No. 108,029
Term of patent 14 years
U.S. Cl. D3—30.1



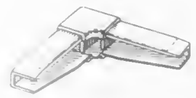
307,075
DISKETTE STORAGE CONTAINER
Robert Pollack, Culver City, Calif., assignor to MicroComputer Accessories, Inc., Los Angeles, Calif.
Filed Jun. 27, 1986, Ser. No. 879,556
Term of patent 14 years
U.S. Cl. D3—35

307,076
CASE FOR RECEIVING MAGNETIC RECORDING MEDIUMS
Jiro Ozeki, Tokyo, Japan, assignor to Slidex Corporation, Tokyo, Japan
Filed Jul. 3, 1986, Ser. No. 881,719
Claims priority, application Japan, Feb. 14, 1986, 61-4743
Term of patent 14 years
U.S. Cl. D3—35

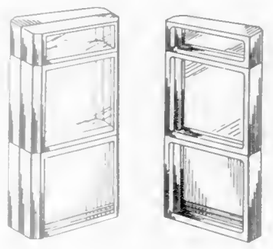
307,077
COMBINED BRUSH HANDLE AND BACK UNIT AND SCRAPER THEREFOR
William C. Bryant, Bell Arthur, N.C., assignor to Empire Brushes, Inc., Greenville, N.C.
Filed Jul. 20, 1987, Ser. No. 75,073
Term of patent 14 years
U.S. Cl. D4—138



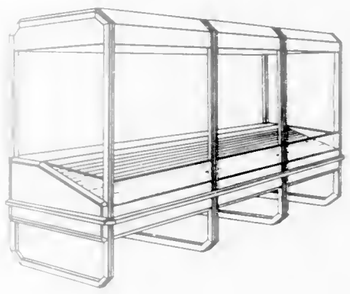
307,078
FRAME CORNER BRACKET
Guy Guillemet, Quebec, Canada, assignor to Les Produits Duvernay Ltée, St-Leonard, Canada
Filed Oct. 17, 1988, Ser. No. 258,435
Term of patent 14 years
U.S. Cl. D6—300



307,079
MODULAR DISPLAY UNIT
Bruce G. Robertson, 854 Bluff, Glencoe, Ill. 60022
Filed Mar. 18, 1986, Ser. No. 845,000
Term of patent 14 years
U.S. Cl. D6—302



307,080
REFRIGERATED DISPLAY CASE
Pierre Cocagne, Bidart, France, assignor to Bonnet Refrigeration, Hauts de Seine, France
Division of Ser. No. 850,377, Apr. 7, 1986. This application Oct. 3, 1988, Ser. No. 252,906
Claims priority, application France, Oct. 16, 1985, 85 4823
Term of patent 14 years
U.S. Cl. D6—470



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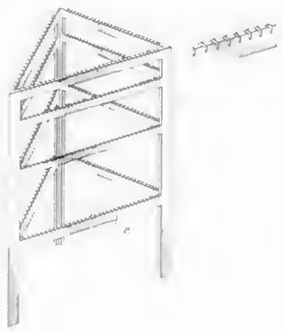
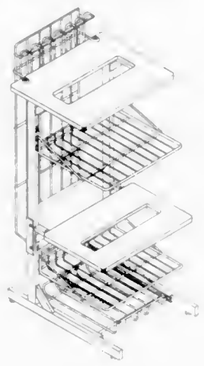
307,081
FILM DEPOSIT BOOTH
Donald F. Allen, Scottsdale, Ariz., assignor to Scott J. Allen and Timothy B. Allen, both of Scottsdale, Ariz., a part interest to each
Filed Aug. 7, 1987, Ser. No. 83,053
Term of patent 14 years
U.S. Cl. D6—421

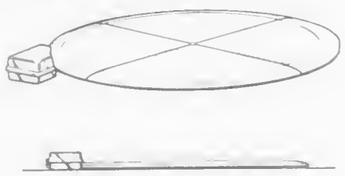
307,083
JEWELRY DISPLAY RACK
Paul D. Knudsen, 3823 W. Sandra Ter., Phoenix, Ariz. 85023
Filed Jun. 15, 1987, Ser. No. 62,056
Term of patent 14 years
U.S. Cl. D6—457



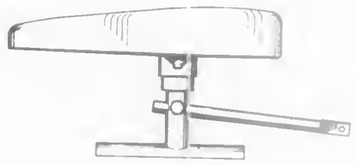
307,084
PRINTER STAND
Wallace R. Currie, Dallas, Tex., assignor to Balt, Inc., Cameron, Tex.
Filed Jun. 29, 1987, Ser. No. 67,359
Term of patent 14 years
U.S. Cl. D6—464

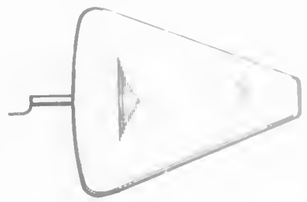


307,082
TURNTABLE DISPLAY FOR TRANSPORT VEHICLES, HEAVY EQUIPMENT AND THE LIKE
Stanley D. James, 35091 Hunt Club, Gurnee, Ill. 60031
Filed Apr. 11, 1986, Ser. No. 851,658
Term of patent 14 years
U.S. Cl. D6—449

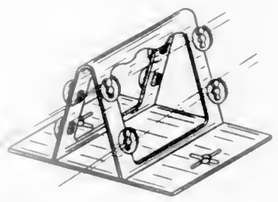


307,085
CHILD'S SEAT
Virginia L. Cook, and James T. Cook, Jr., both of P.O. Box 181, Livingston, La. 70754
Filed Jul. 23, 1987, Ser. No. 76,938
Term of patent 14 years
U.S. Cl. D6—502





307,087
PORTABLE HOLDER FOR FISHING RODS
Gary Gibson, 2932 Helena Ave., N., Oakdale, Minn. 55119, and Kenneth Tannehill, 1200 W. 96th St., Minneapolis, Minn. 55431
Filed Dec. 21, 1987, Ser. No. 135,758
Term of patent 14 years
U.S. Cl. D6—552



307,086
BATHROOM TISSUE ROLL DISPENSER
Maurice C. Van Marcke, 30645 Gratiot, and Cyril Van Marcke, 19360 McKinnon, both of Roseville, Mich. 48066
Filed Aug. 21, 1985, Ser. No. 767,880
Term of patent 14 years
U.S. Cl. D6—520

307,088
WALL MOUNTED MERCHANDISE DISPLAY STAND
Fred Frieden, Jr., Lombard, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio
Division of Ser. No. 659,977, Oct. 12, 1984, Pat. No. D. 297,191.
This application Jul. 6, 1987, Ser. No. 73,771
Term of patent 14 years
U.S. Cl. D6—570

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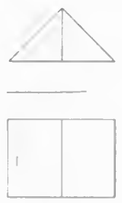
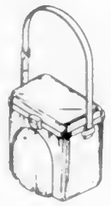
307,089
BEVERAGE MUG
David P. Lage, St. Louis County, Mo., assignor to Quick Point, Inc., Fenton, Mo.
Filed Jun. 25, 1987, Ser. No. 66,400
Term of patent 14 years
U.S. Cl. D7—536

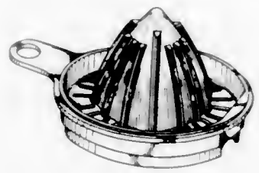
307,091
MULTICOLORED TOOTHPASTE
Raymond L. Mobrie, Denville, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Dec. 18, 1985, Ser. No. 810,150
Term of patent 14 years
U.S. Cl. D28—8.1



307,092
COMBINED ICE BOX AND UTENSIL CASE
Atsushi Ishimaru, Tsubame, Japan, assignor to Twinbird Industrial Company Limited, Japan
Filed Nov. 24, 1987, Ser. No. 124,774
Term of patent 14 years
U.S. Cl. D7—605

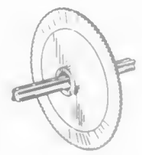


307,090
CITRUS JUICER
Pieter K. J. DeCoster, Aalst, Belgium, assignor to Dart Industries Inc., Deerfield, Ill.
Filed Aug. 10, 1987, Ser. No. 83,769
Term of patent 14 years
U.S. Cl. D7—665



307,093
COMBINED ICE BOX AND UTENSIL CASE
Kenichi Kobayashi, Kamo, Japan, assignor to Twinbird Industrial Company Limited, Japan
Filed Nov. 24, 1987, Ser. No. 124,775
Term of patent 14 years
U.S. Cl. D7—605

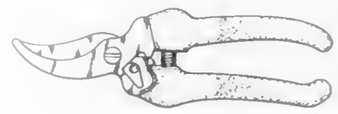
307,094
PIZZA CUTTER
Martin P. Belokin, and Norman P. Belokin, both of 7801 I-35N and Milam Rd., Denton, Tex. 76201
Filed Nov. 17, 1986, Ser. No. 931,634
Term of patent 14 years
U.S. Cl. D7—694



307,095
SERVING SPOON
David A. Juergens, Winchester, Va., assignor to Rubbermaid Commercial Products, Inc., Winchester, Va.
Filed Aug. 25, 1986, Ser. No. 900,107
Term of patent 14 years
U.S. Cl. D7—653

307,096
HANDLE FOR A FORK OR SIMILAR ARTICLE OF FLATWARE
Henri Bouilhet, Paris, France, assignor to Orfevrerie Christofle S.A., Paris, France
Filed Jul. 27, 1987, Ser. No. 78,062
Term of patent 14 years
U.S. Cl. D7—654

307,097
HAND PRUNER
Stephen Jaspersen, Riverside, Calif., assignor to Corona Clipper Company, Corona, Calif.
Filed Oct. 31, 1988, Ser. No. 264,511
Term of patent 14 years
U.S. Cl. D8—5



307,098
HEDGE TRIMMER
Franco Clivio, Zürich, Switzerland, assignor to Gardena Kress & Kastner GmbH, Fed. Rep. of Germany
Filed Jan. 9, 1987, Ser. No. 1,998
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1986, 1113GRAI12610/
Term of patent 14 years
U.S. Cl. D8—8

307,099
TRENCHER TOOL
Ron Zabarte, 70 Alberta Terr., Walnut Creek, Calif. 94596
Filed Oct. 5, 1987, Ser. No. 104,390
The portion of the term of this patent subsequent to Mar. 7, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—11

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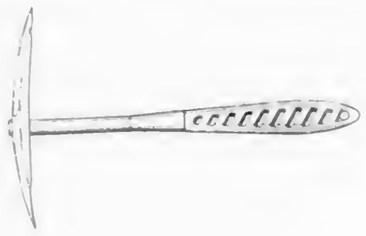
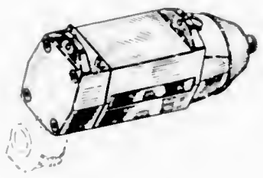
307,100
HAND TOOL FOR GARDENING PURPOSES
Gianfranco Roman, Pasiano, Italy, assignor to Claber S.p.A., Italy
Filed Dec. 2, 1987, Ser. No. 127,698
Claims priority, application Italy, Jun. 12, 1987, 21795/87[U]
Term of patent 14 years
U.S. Cl. D8—11



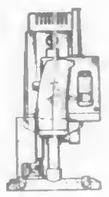
307,101
OIL FILTER WRENCH
James L. Anderson, Rte. 4, Box 320-F, Fernandina Beach, Fla. 32034
Filed Sep. 28, 1987, Ser. No. 102,595
Term of patent 14 years
U.S. Cl. D8—22

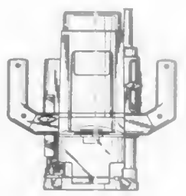
307,102
CORKSCREW
Bruno Desnoulez, Neuilly, France, assignor to Anne-Marie Prevost, Paris, France
Filed Mar. 9, 1987, Ser. No. 23,731
Term of patent 14 years
U.S. Cl. D8—42

307,103
PORTABLE PNEUMATIC TOOL
Hugh T. Greenlee, and Roy P. Hess, both of Gates Mills, Ohio, assignors to Upneumat International, Inc., New Fairfield, Conn.
Filed Dec. 8, 1986, Ser. No. 939,450
Term of patent 14 years
U.S. Cl. D8—61

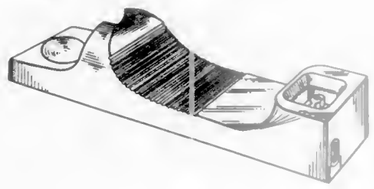


307,104
ELECTRIC ROUTER
Juzaburo Monobe, Hiroshima, and Kiyoshi Hoshino, Tokyo, both of Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed May 6, 1987, Ser. No. 46,493
Claims priority, application Japan, Nov. 28, 1986, 61-47302
Term of patent 14 years
U.S. Cl. D8—67





307,105
BASE FOR CORDLESS HOT MELT DISPENSER
Oktavio K. Nüsse, and Wolf-Dieter Krause, both of Münster, Fed. Rep. of Germany, assignors to Emhart Industries, Inc., Towson, Md.
Filed Nov. 30, 1987, Ser. No. 127,007
Term of patent 14 years
U.S. Cl. D8—71



307,106
HOUSING FOR A COMBINATION TOOL
Klaus Krebs, Auf der Schlicht 4, D-6232 Bad Soden 2, Fed. Rep. of Germany
Filed Jan. 5, 1988, Ser. No. 140,803
Term of patent 14 years
U.S. Cl. D8—99

307,107
TRUCK BED TIE-DOWN HOLDER
Michael N. Wensien, 2627 N. Spring Dr., Spring, Tex. 77373
Filed Jan. 25, 1988, Ser. No. 147,687
Term of patent 14 years
U.S. Cl. D8—367

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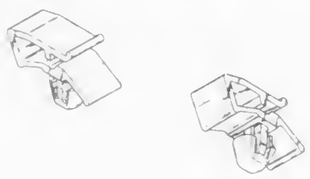
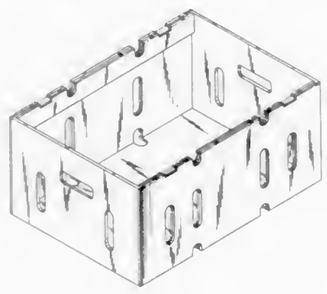
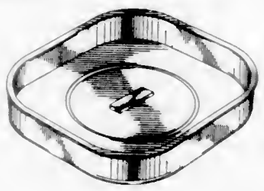
307,108
CLAMP FOR CLAMPING WIRES
Katsuyuki Morita, Kasugai, Japan, assignor to Kitagawa Industries Co., Ltd., Aichi, Japan
Filed Dec. 18, 1987, Ser. No. 135,099
Claims priority, application Japan, Jun. 19, 1987, 62-25252
Term of patent 14 years
U.S. Cl. D8—396



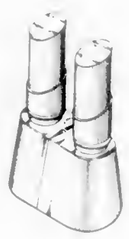
307,109
FOLDING CARTON
Gerald W. Dasher, Rte. 3, Box 35, and Robert E. Dasher, Rte. 3, Box 19, both of Glennville, Ga. 30427
Filed Oct. 26, 1987, Ser. No. 112,129
Term of patent 14 years
U.S. Cl. D9—418



307,110
PAINT CAN TRAY
Jennifer S. Loomis, 1231 E. Tierra Buena La., Phoenix, Ariz. 85022
Filed Nov. 24, 1986, Ser. No. 934,313
Term of patent 14 years
U.S. Cl. D9—425



307,111
DUAL COMPARTMENT BOTTLE
Richard D. Green, 12979 Culver Blvd., Los Angeles, Calif. 90066
Filed Oct. 5, 1987, Ser. No. 104,363
Term of patent 14 years
U.S. Cl. D9—341



307,112
CONTAINER FOR SPRAYING LIQUIDS OR THE LIKE
David N. Huck, New Providence, N.J., assignor to Fertilizer Solutions, Inc., Lebanon, N.J.
Filed Aug. 6, 1987, Ser. No. 60,433
Term of patent 14 years
U.S. Cl. D9—375

307,113
BOTTLE
Joseph Thompson, Upper Saddle River, N.J., assignor to Sterling Drug Inc., New York, N.Y.
Filed May 7, 1987, Ser. No. 46,852
Term of patent 14 years
U.S. Cl. D9—373

307,114
DECANTER WITH STOPPER
Michel Daucourt, Cognac, France, assignor to Camus La Grande Marque, Cognac, France
Filed Apr. 26, 1988, Ser. No. 197,893
Term of patent 14 years
U.S. Cl. D9—384

307,115
NONSPILL DISPENSER FOR FLUID CONTAINERS
Edward J. Waymack, 5200 Irvine Blvd., 243, Irvine, Calif. 92720
Filed Nov. 21, 1988, Ser. No. 274,037
Term of patent 14 years
U.S. Cl. D9—447

307,116
FLASHING EMERGENCY ALERT SIGNAL LIGHT
Robert G. Jacobs, R.D. #8, Box 139, Greensburg, Pa. 15601
Filed Jun. 5, 1986, Ser. No. 871,568
Term of patent 14 years
U.S. Cl. D10—114

307,117
MEDALLION
Frances Thompson, 107 Basswood, Davison, Mich. 48423
Filed Dec. 21, 1987, Ser. No. 135,754
Term of patent 14 years
U.S. Cl. D11—99

307,118
REAR BUMPER FOR AUTOMOTIVE VEHICLE
Giorgio Guelfi, Milan; Ezio Villa; Franco Mendicino, both of Arese; Renato Pasquali, Garbagnate, and Alberto Alberti, Legnano, all of Italy, assignors to Alfa Lancia Industriale S.r.l., Arese, Italy
Filed Feb. 25, 1987, Ser. No. 18,966
Term of patent 14 years
U.S. Cl. D12—169

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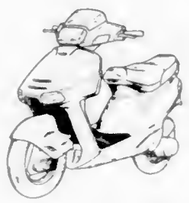
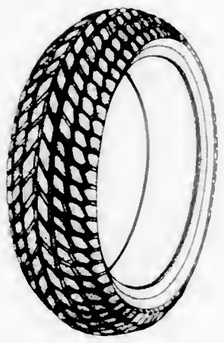
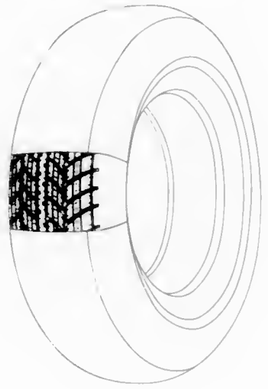
307,119
MOTORCYCLE
Bean-Shung Yeh, Hsin Chu Hsien, Taiwan, assignor to Industrial Technology Research Institute, Hsin Chu Hsien, Taiwan
Filed Sep. 3, 1987, Ser. No. 92,711
Term of patent 14 years
U.S. Cl. D12—110



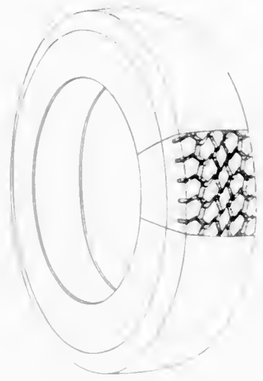
307,120
VEHICLE TIRE
Peter Ingley, Tamworth; Gerald A. Griffiths, Lichfield, and David J. Rawlins, Cannock, all of England, assignors to SP Typres UK Ltd., Birmingham, United Kingdom
Filed Aug. 22, 1986, Ser. No. 899,081
Claims priority, application United Kingdom, Feb. 22, 1986, 1032444
Term of patent 14 years
U.S. Cl. D12—146



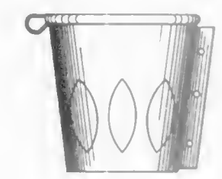
307,121
TIRE
Ron L. Messer, Simpsonville, S.C., assignor to Michelin Recherche Et Technique, Switzerland
Filed Aug. 6, 1987, Ser. No. 82,183
Term of patent 14 years
U.S. Cl. D12—147

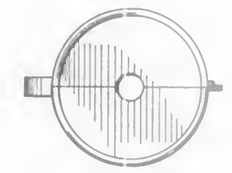


307,122
TIRE
Michael I. Wischhusen, Greenville, S.C., assignor to Michelin Recherche et Technique, Switzerland
Filed Oct. 26, 1987, Ser. No. 113,809
Term of patent 14 years
U.S. Cl. D12—147



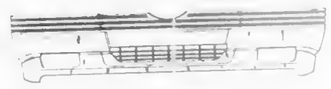
307,123
PLANT STARTER POT
Terry L. Lene, Rte. 9, Box 1410, Beaumont, Tex. 77706
Filed Nov. 9, 1987, Ser. No. 118,642
Term of patent 14 years
U.S. Cl. D11—151





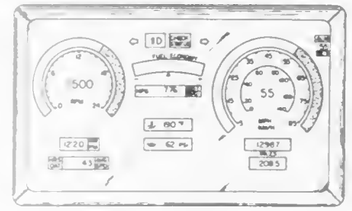
307,124
RADIATOR GRILLE FOR AN AUTOMOBILE
Akikazu Hayashi, Aichi; Naoto Furukado, and Nobuyuki Matsukuma, both of Kariya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed May 13, 1987, Ser. No. 49,241
Term of patent 14 years
U.S. Cl. D12—163

307,125
FRONT BUMPER FOR AUTOMOTIVE VEHICLE
Giorgio Guelfi, Milan; Ezio Villa; Franco Mendicino, both of Arese; Renato Pasquali, Garbagnate, and Alberto Alberti, Legnano, all of Italy, assignors to Alfa Lancia Industriale S.r.l., Arese, Italy
Filed Feb. 25, 1987, Ser. No. 18,985
Term of patent 14 years
U.S. Cl. D12—169

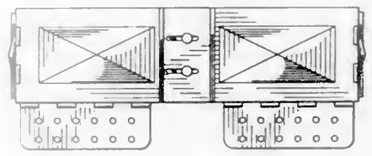


307,126
EXTERIOR SHELL OF A VEHICLE HOOD
L. David Allendorph, and Larry N. Reynard, both of Fort Wayne, Ind., assignors to Navistar International Transportation Corp., Chicago, Ill.
Continuation-in-part of Ser. No. 15,183, Feb. 17, 1987. This application Aug. 14, 1987, Ser. No. 85,927
The portion of the term of this patent subsequent to Mar. 6, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—173

307,127
VEHICLE INSTRUMENT PANEL
Wayne K. Simons, Kent, and Donald D. Barnes, Seattle, both of Wash., assignors to Paccar Inc., Bellevue, Wash.
Filed Feb. 11, 1987, Ser. No. 8,980
Term of patent 14 years
U.S. Cl. D12—192



307,128
ADJUSTABLE WIDTH TAILGATE
Tony Maziarz, 2059 Northampton St., Holyoke, Mass. 01040
Filed Sep. 18, 1987, Ser. No. 98,136
Term of patent 14 years
U.S. Cl. D12—196



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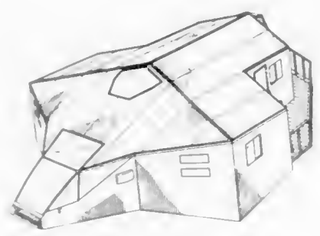
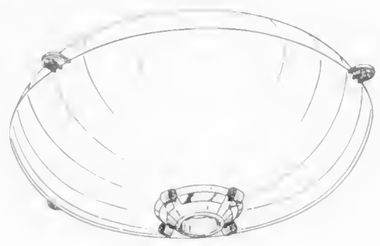
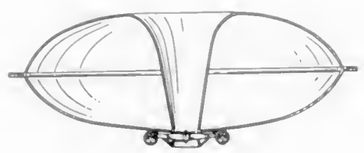
307,129
HOUSE BOAT
Jacques Caouette, 398 Fecteau, Thetford Mines, Quebec, Canada G6G 3E7
Filed Dec. 17, 1987, Ser. No. 135,289
Term of patent 14 years
U.S. Cl. D12—315



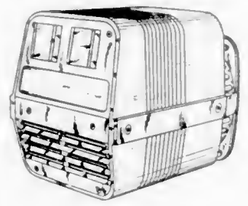
307,130
TRIMMING PLANE
Ernest M. Ellis, 32 Punga Grove, Whangarei, New Zealand
Filed Jan. 7, 1987, Ser. No. 1,096
Term of patent 14 years
U.S. Cl. D12—317

307,131
AIR VEHICLE
Dale C. Kramer, Port Colborne, Canada, assignor to Hystar Aerospace Development Corporation, Vancouver, Canada
Filed Jan. 20, 1987, Ser. No. 5,522
Claims priority, application Japan, Oct. 29, 1986, 61-042961
Term of patent 14 years
U.S. Cl. D12—325

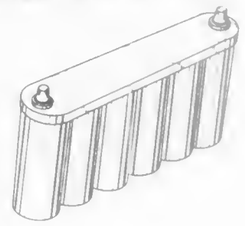




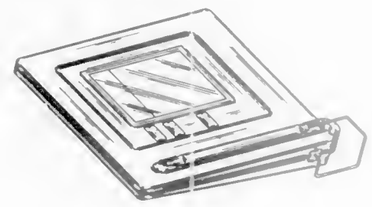
307,132
ALTERNATOR HOUSING
M. Jean Fouin, Linars, France, assignor to Moteurs Leroy-Somer, Angouleme, France
Filed Jan. 28, 1987, Ser. No. 7,565
Claims priority, application France, Jul. 30, 1986, 86 4138
Term of patent 14 years
U.S. Cl. D13—114



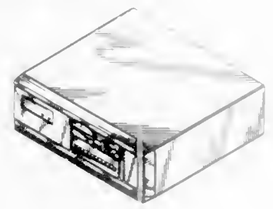
307,133
BATTERY
Larry K. W. Ching, Jr., Littleton, Colo., assignor to Gates Energy Products, Inc., Gainesville, Fla.
Filed May 13, 1988, Ser. No. 193,982
Term of patent 14 years
U.S. Cl. D13—103



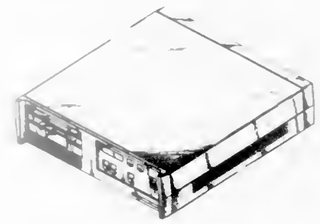
307,134
DATA ENTRY WRITING PAD FOR ELECTRONIC FILING SYSTEM
Tooru Makidera, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Apr. 13, 1987, Ser. No. 37,564
Claims priority, application Japan, Oct. 17, 1986, 61-41428
Term of patent 14 years
U.S. Cl. D14—100



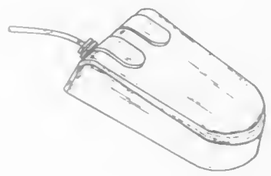
307,135
CONTROL UNIT FOR A PERSONAL COMPUTER
Yasuharu Sato, and Kimio Nobeshi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Jun. 5, 1987, Ser. No. 59,678
Claims priority, application Japan, Dec. 9, 1986, 61-48909; Dec. 9, 1986, 61-48910; Dec. 9, 1986, 61-48911
Term of patent 14 years
U.S. Cl. D14—100



307,136
CONTROL DEVICE FOR DISPLAYS
Harold R. Boyer, Woodstock, and David J. Jalanti, Accord, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.N.Y.
Filed Feb. 12, 1987, Ser. No. 13,616
Term of patent 14 years
U.S. Cl. D14—113



307,137
CURSOR CONTROL FOR A COMPUTER SYSTEM
Pedro M. Alfonso, Delray Beach, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 6, 1987, Ser. No. 18,052
Term of patent 14 years
U.S. Cl. D14—114



307,138
ULTRA-COMPACT, HAND-HELD LASER SCANNER
Carl H. Knowles, Moorestown, N.J., assignor to Metrologic Instruments, Inc., Bellmawr, N.J.
Filed Sep. 29, 1987, Ser. No. 102,526
Term of patent 14 years
U.S. Cl. D14—116

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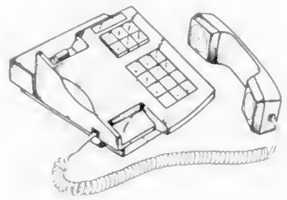
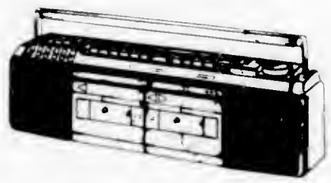
307,139
MICROFILM CARTRIDGE
Hiroshi Fukuda, and Masahiro Fukuda, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed May 14, 1986, Ser. No. 865,905
Term of patent 14 years
U.S. Cl. D14—121

307,140
TELEPHONE SET
Shinji Ikeya; Kenichi Ogawa; Chihiro Fuse; Yasuhiro Obe; Hiroyuki Miyai; Koji Nobuchi, and Hiroko Kitano, all of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Aug. 18, 1988, Ser. No. 234,220
Claims priority, application Japan, Feb. 24, 1988, 63-7372
Term of patent 14 years
U.S. Cl. D14—150

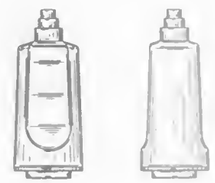
307,141
TELEPHONE SET
Franco Raggi; Alberto Meda, both of Milan; Denys Santachiara, Campagnola Emilia; Piercarlo Ravasio, Arlate di Calco, and Antonio Martusciello, S. Nicola, all of Italy, assignors to Italtel Telematica S.p.A., Localita Cappuccini, Italy
Filed Mar. 21, 1989, Ser. No. 326,250
Claims priority, application Italy, Sep. 28, 1988, 21928/88[U]
Term of patent 14 years
U.S. Cl. D14—151



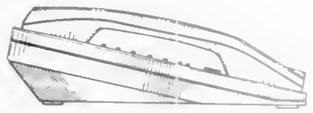
307,142
COMBINED TAPE RECORDER AND RADIO RECEIVER
Shin-Ichi Morinaga, 4-25-4 Yawata-cho, Musashino-shi Tokyo, Japan
Filed Feb. 18, 1987, Ser. No. 15,874
Claims priority, application Japan, Aug. 18, 1986, 61-32170
Term of patent 14 years
U.S. Cl. D14—163

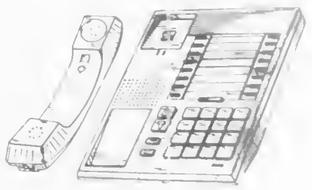


307,143
FREQUENCY CONVERTER FOR AN ANTENNA
Kazuhiko Ashihara, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Oct. 15, 1987, Ser. No. 109,248
Claims priority, application Japan, Apr. 17, 1987, 62-15190
Term of patent 14 years
U.S. Cl. D14—230

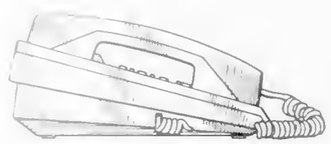


307,144
KEY TELEPHONE SET
Akiyoshi Hattori, Kawasaki, Japan, assignor to Nitsuko Corporation, Kawasaki, Japan
Filed Jun. 17, 1987, Ser. No. 63,290
Claims priority, application Japan, Dec. 17, 1986, 61-49687
The portion of the term of this patent subsequent to Feb. 14, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—241





307,145
TELEPHONE UNIT
Takashi Oshima, Tokyo; Ryoji Yamaguchi, Kokubunji, and Masayuki Ikeda, Tokyo, all of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan
Filed Apr. 7, 1988, Ser. No. 178,448
Claims priority, application Japan, Nov. 12, 1987, 62-46316
Term of patent 14 years
U.S. Cl. D14—241



307,146
RANDOM NOISE GENERATOR
Smadar Samson, Tel-Aviv, Israel, assignor to Ilan Samson, Tel-Aviv, Israel
Filed Apr. 3, 1986, Ser. No. 847,872
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1985, 1234/85
Term of patent 14 years
U.S. Cl. D14—299

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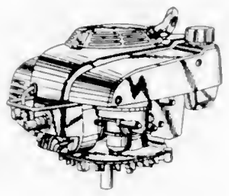
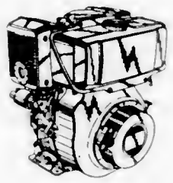
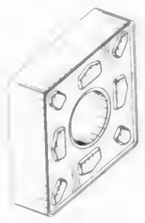
307,147
INTERNAL COMBUSTION ENGINE
Koichi Sasaki, and Masahiko Kagawa, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 3, 1987, Ser. No. 81,137
Claims priority, application Japan, Feb. 3, 1987, 62-3841
Term of patent 14 years
U.S. Cl. D15—1



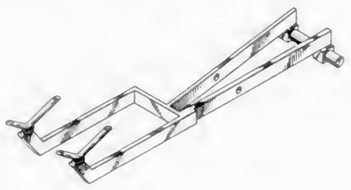
307,148
INTERNAL COMBUSTION ENGINE
Yoshio Mikado, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 22, 1987, Ser. No. 111,800
Claims priority, application Japan, May 12, 1987, 62-18602
Term of patent 14 years
U.S. Cl. D15—1



307,149
CUTTING TOOL INSERT
Kenneth L. Niebauer, Raleigh, N.C., assignor to Kennametal Inc., Latrobe, Pa.
Filed Jan. 22, 1988, Ser. No. 147,004
Term of patent 14 years
U.S. Cl. D15—139



307,150
SUPPORTING ARM FOR A TIRE HANDLING ROBOT
Karl R. Hemmingsen, Hojmarksvanget 77, DK-8600 Slikeborg, Denmark
Filed Sep. 3, 1987, Ser. No. 92,697
Term of patent 14 years
U.S. Cl. D15—199

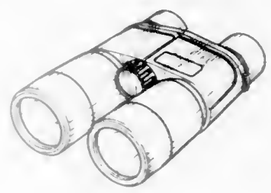


307,151
EYEGLASS FRAME
Ulrich J. Hass, Vienna, Austria, assignor to Optyl Eyewear Fashion International Corp., Norwood, N.J.
Filed Feb. 16, 1989, Ser. No. 311,720
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1988, M8801070.8
Term of patent 14 years
U.S. Cl. D16—112

307,152
TEMPLE END PIECE FOR EYEGLASSES
Jeongyil Shin, 53-90, Chungwon-dong, Jongro-ku, Seoul 110, Rep. of Korea
Filed Mar. 2, 1987, Ser. No. 20,822
Claims priority, application Rep. of Korea, Sep. 1, 1986, 86-12490
Term of patent 14 years
U.S. Cl. D16—127

307,153
VIEWER FOR A DOOR
Dale W. Martin, Beaverton, Oreg., assignor to Rejan, Inc., Beaverton, Oreg.
Filed Apr. 20, 1987, Ser. No. 40,150
Term of patent 14 years
U.S. Cl. D16—130

307,154
PAIR OF BINOCULARS
Takenao Shishikura, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 5, 1989, Ser. No. 293,903
Claims priority, application Japan, Jul. 18, 1988, 63-28603
Term of patent 14 years
U.S. Cl. D16—133



307,155
INTERNAL COMBUSTION ENGINE
Yoshio Mikado, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 22, 1987, Ser. No. 111,801
Claims priority, application Japan, May 12, 1987, 62-18601
Term of patent 14 years
U.S. Cl. D15—1

307,156
INTERNAL COMBUSTION ENGINE
Yoshio Mikado, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 22, 1987, Ser. No. 111,802
Claims priority, application Japan, May 12, 1987, 62-18603
Term of patent 14 years
U.S. Cl. D15—1

307,157
INTERNAL COMBUSTION ENGINE
Yoshio Mikado, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 22, 1987, Ser. No. 111,803
Claims priority, application Japan, May 12, 1987, 62-18604
Term of patent 14 years
U.S. Cl. D15—1

307,158
INTERNAL COMBUSTION ENGINE
Yoshio Mikado, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 22, 1987, Ser. No. 111,804
Claims priority, application Japan, May 12, 1987, 62-18605
Term of patent 14 years
U.S. Cl. D15—1

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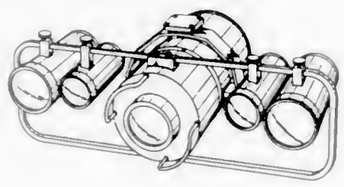
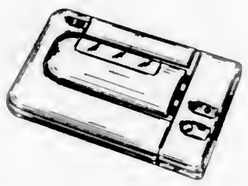
307,155
REMOTE CONTROLLED UNDERWATER CAMERA
Börje Försäter, Varberg, Sweden, assignor to Borje Forsater, Varberg, Sweden
Filed Nov. 5, 1987, Ser. No. 117,736
Claims priority, application Sweden, Jun. 5, 1987, 871312
Term of patent 14 years
U.S. Cl. D16—204

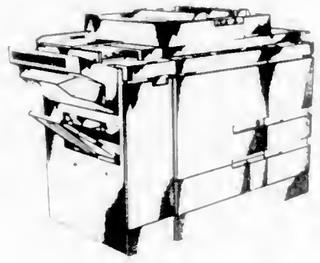


307,156
CALCULATOR OR SIMILAR ARTICLE
Ray Chen, Taipei, Taiwan, assignor to Cal-Comp Electronics, Inc., Taipei, Taiwan
Filed Nov. 25, 1987, Ser. No. 125,075
Term of patent 14 years
U.S. Cl. D18—7

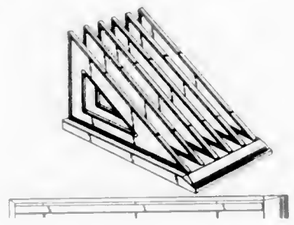
307,157
PRINTER
Hiroshi Sakaguchi, and Tadahiko Saimen, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Apr. 22, 1987, Ser. No. 41,343
Claims priority, application Japan, Oct. 23, 1986, 61-42221
Term of patent 14 years
U.S. Cl. D18—13



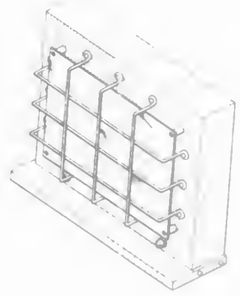
307,158
OFFICE COPIER
Ronald J. Perry, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Feb. 27, 1987, Ser. No. 19,994
Term of patent 14 years
U.S. Cl. D18—38



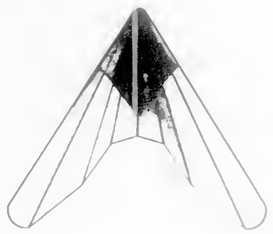
307,159
LETTER ORGANIZER FILE
Kenneth C. Foran, Wooster, and Thomas J. David, Worthington, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Aug. 7, 1986, Ser. No. 894,242
Term of patent 14 years
U.S. Cl. D19—90



307,160
ILLUMINABLE HOUSE ADDRESS SIGN
Mark A. Nosal, 401 N. 4th, Norfolk, Nebr. 68701
Filed Jun. 12, 1987, Ser. No. 61,174
Term of patent 14 years
U.S. Cl. D20—17

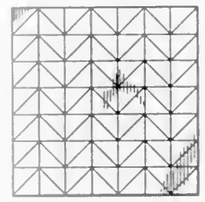


307,161
TOY GLIDER
Ricky A. Trantham, Montague, Calif., assignor to O. J. LeBaron, Yreka, Calif.
Filed Mar. 14, 1988, Ser. No. 168,343
Term of patent 14 years
U.S. Cl. D21—89



307,162
KALEIDOSCOPE
William M. Hanlon, III, 5063 Camino Alta Mira, Castro Valley, Calif. 94546
Filed Mar. 14, 1988, Ser. No. 167,449
Term of patent 14 years
U.S. Cl. D21—60

307,163
GAME BOARD
John B. Herring, Belleville, Canada, assignor to Cornerstone Games Company Inc., Belleville, Canada
Filed May 29, 1987, Ser. No. 55,755
Claims priority, application Canada, Dec. 1, 1986, 01128616
Term of patent 14 years
U.S. Cl. D21—34



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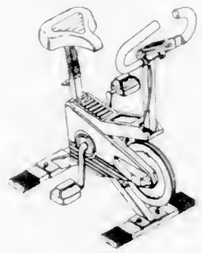
307,164
HOBBY HORSE
Penny L. Peters, C 19 Centennial Dr., Powell River, BC, Canada V8A 4Z2
Filed Dec. 6, 1988, Ser. No. 280,524
Term of patent 14 years
U.S. Cl. D21—75

307,165
TOY ANIMAL FIGURE
Ken Havelock, 1401 W. 14th St., Sault Ste. Marie, Mich. 49783
Filed Feb. 13, 1987, Ser. No. 14,672
Term of patent 14 years
U.S. Cl. D21—148

307,166
EXERCISE BIKE
Mu-Chyuan Wu, No. 23, Hai-Huan Street, Tainan, Taiwan
Filed May 5, 1988, Ser. No. 190,516
Term of patent 14 years
U.S. Cl. D21—194

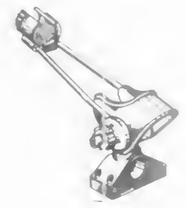


307,167
CYCLE EXERCISER
James F. Lucas, Auburn; Michael R. Byrd, and Bruce F. Coody, both of Opelika, all of Ala., assignors to Diversified Products Corporation, Opelika, Ala.
Filed Dec. 23, 1988, Ser. No. 289,571
Term of patent 14 years
U.S. Cl. D21—194

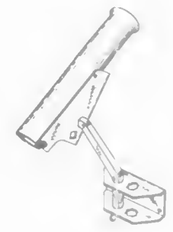
307,168
DUMBELL
Joseph J. Vodhanel, 10937 S. Groveland Ave., Whittier, Calif. 90603
Filed Dec. 2, 1985, Ser. No. 804,051
Term of patent 14 years
U.S. Cl. D21—197

307,169
GOLF CLUB GRIP
James S. Aldridge, Devizes, England, assignor to Avon Industrial Polymers Limited, England
Filed Sep. 29, 1986, Ser. No. 912,555
Claims priority, application United Kingdom, Jul. 15, 1986, 1 035 351
Term of patent 14 years
U.S. Cl. D21—222

307,170
FISHING ROD HOLDER
Blayney J. Scott, 306 Dallas Rd., Victoria, British Columbia, Canada V8V 1A7
Filed Aug. 5, 1987, Ser. No. 81,901
Term of patent 14 years
U.S. Cl. D22—147



307,171
FISHING POLE HOLDER
Arnold R. Engle, 1644 NE. 143rd Ave., Portland, Oreg. 97230
Filed May 8, 1989, Ser. No. 348,478
Term of patent 14 years
U.S. Cl. D22—147



307,172
WATER PRESSURE TANK
Robert Downing, Rte. 1, Box 75, Valliant, Okla. 74764
Filed Mar. 3, 1988, Ser. No. 163,468
Term of patent 14 years
U.S. Cl. D23—205

307,173
COUNTERTOP WATER FILTER
Ulrich K. Bochnke, Ft. Myers, Fla., assignor to Diemold Machine Company, Inc., Fort Myers, Fla.
Filed Mar. 26, 1987, Ser. No. 31,501
Term of patent 14 years
U.S. Cl. D23—209

307,174
TUBE OR THE LIKE
Gunnar Bjorkman, Fristad, Sweden, and Jyri Jarvenkyla, Hollola, Finland, assignors to Oy Uponor AB, Nastola, Finland
Filed Mar. 13, 1986, Ser. No. 844,735
Claims priority, application Sweden, Sep. 13, 1985, 85-2154
Term of patent 14 years
U.S. Cl. D23—266

307,175
AIR CONDITIONER
Shosuke Yamazaki; Yoshinori Katagami, both of Yokohama, and Tomoyasu Shinozaki, Chiba, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Nov. 30, 1988, Ser. No. 278,261
Claims priority, application Japan, Jun. 20, 1988, 63-24179
Term of patent 14 years
U.S. Cl. D23—351

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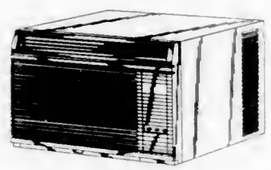
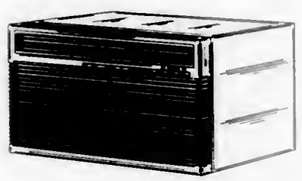
307,176
AIR CONDITIONER
Shusuke Yamazaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Oct. 13, 1988, Ser. No. 257,049
Claims priority, application Japan, Apr. 22, 1988, 63-16103
Term of patent 14 years
U.S. Cl. D23—351

307,177
AIR CONDITIONER
Shuzuke Yamazaki, Tokyo, and Yoshinori Katagami, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed May 3, 1988, Ser. No. 189,742
Claims priority, application Japan, Nov. 5, 1987, 62-44923
Term of patent 14 years
U.S. Cl. D23—353



307,178
AIR CONDITIONER
Hiroshi Moritani, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 25, 1987, Ser. No. 125,055
Claims priority, application Japan, Jun. 5, 1987, 62-23224
Term of patent 14 years
U.S. Cl. D23—353



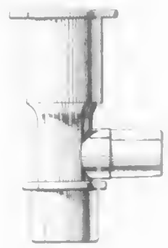
307,179
CEDER WOOD AROMA AIR FRESHENER FOR CLOSETS
Richard L. Cole, P.O. Box 7175, Bloomfield Hills, Mich. 48302
Filed Dec. 22, 1987, Ser. No. 136,387
Term of patent 14 years
U.S. Cl. D23—368

307,180
ELECTRIC FRAGRANCE DISPENSER
Chella Luthy, New York, N.Y., assignor to Creative Environments Inc., New York, N.Y.
Filed Oct. 30, 1987, Ser. No. 114,774
Term of patent 14 years
U.S. Cl. D23—366

307,181
AURICULAR STIMULATOR
Onje Erfan, 2010 W. 120th Ave., Suite 101B, Denver, Colo. 80234
Filed Jun. 17, 1987, Ser. No. 63,593
Term of patent 14 years
U.S. Cl. D24—36

307,182
SUPPORT STAND FOR IRRIGATION BAG
Randall L. Smith, Rt. 1, Box 12, Scottville, N.C. 28672
Filed Jan. 9, 1989, Ser. No. 294,670
Term of patent 14 years
U.S. Cl. D24—51

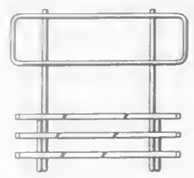
307,183
ENDOTRACHEAL INHALATOR
Robert W. Kalayjian, Rte. 8, Box 65A, Turkey Farm Rd., Chapel Hill, N.C. 27514
Filed Jun. 23, 1987, Ser. No. 66,100
Term of patent 14 years
U.S. Cl. D24—62



307,184
HAND TRACTION WRAP
Bernard E. McConnell, 4725 Wellington, Greenville, Tex. 75401
Filed Jun. 15, 1987, Ser. No. 61,575
Term of patent 14 years
U.S. Cl. D24—64

307,185
DUAL-LEVEL CEILING STORE INTERIOR
Tobia Scarpa, and Afra Bianchin-Scarpa, both of Trevignano, Italy, assignors to Centro Studi e Servizi Moda S.R.L., Villorba, Italy
Filed Oct. 30, 1986, Ser. No. 925,883
Claims priority, application Italy, Apr. 30, 1986, 21694/86[U]
Term of patent 14 years
U.S. Cl. D25—58

307,186
FOLDING STAGE RISER
Orley D. Rogers, Farwell, and Kenneth E. Staten, Clare, both of Mich., assignors to Stageright Corporation, Clare, Mich.
Filed Nov. 6, 1987, Ser. No. 117,312
Term of patent 14 years
U.S. Cl. D25—62



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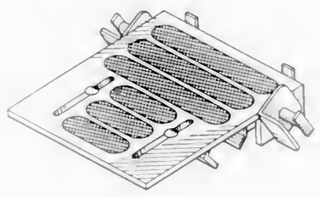
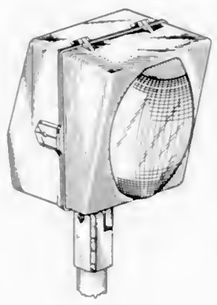
307,187
WORK PLATFORM FOR EXTENSION LADDERS
Bernard Schaf, 2754 Fairlane Ave., Columbus, Nebr. 68601
Filed Sep. 2, 1988, Ser. No. 240,046
Term of patent 14 years
U.S. Cl. D25—68



307,188
LUMINAIRE
James E. Denney; Robert L. Ewing, and Douglas S. Hammond, all of Newark, Ohio, assignors to Holophane Company, Inc., Newark, Ohio
Filed Jan. 28, 1987, Ser. No. 7,887
Term of patent 14 years
U.S. Cl. D26—63



307,189
WALL LAMP
Marco Pezzolo, Bovezzo, Italy, assignor to Flos S.p.A., Brescia, Italy
Filed Jul. 10, 1987, Ser. No. 71,998
Claims priority, application Italy, Feb. 6, 1987, 6925/787[U]
Term of patent 14 years
U.S. Cl. D26—86

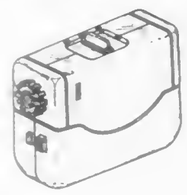
307,190
COMBINED COSMETIC COMPACT AND APPLICATOR
Karena Bakic, Varese, Italy, assignor to Cosmede Anstalt, Vaduz, Liechtenstein
Filed Feb. 6, 1987, Ser. No. 11,724
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1986, URA 1051/86; Dec. 2, 1986, URA 1588/86; Feb. 2, 1987, URA 114/87
Term of patent 14 years
U.S. Cl. D28—7

307,191
LIP MEDICATION APPLICATOR OR SIMILAR ARTICLE
John E. Blatenthal, Midlothian, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.
Continuation of Ser. No. 873,341, Jun. 12, 1986. This application Jun. 22, 1987, Ser. No. 64,348
Term of patent 14 years
U.S. Cl. D28—7

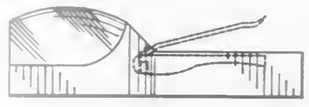
307,192
ADJUSTABLE LICE COMB
Albert Saferstein; Gilbert Spector, both of 2500 Westchester Ave., Purchase, N.Y. 10577, and Larry Tsuyuki, 116 Brown Rd., Scarsdale, N.Y. 10583
Filed Mar. 9, 1987, Ser. No. 28,163
Term of patent 14 years
U.S. Cl. D28—25

307,193
HAIR CLIPPER
Carol J. Nikolaus, 2825A N. 52 St., Milwaukee, Wis. 53210
Filed May 1, 1987, Ser. No. 45,112
Term of patent 14 years
U.S. Cl. D28—53

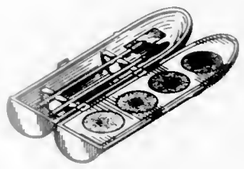
307,194
BI-DIRECTIONAL NAIL TRIMMER
Fargo Chou, P.O. Box 10160, Taipei, Taiwan
Filed Apr. 3, 1989, Ser. No. 331,888
Term of patent 14 years
U.S. Cl. D28—58



307,195
FINGER NAIL RECEPTACLE
Stan D. Suppes, 2329 Dalton Dr., Ft. Collins, Colo. 80526
Filed Jul. 7, 1988, Ser. No. 216,236
Term of patent 14 years
U.S. Cl. D28—60



307,196
LIP GLOSS COMPACT
Mina E. McClure, 862 Kirkwall Dr., Copley, Ohio 44321
Filed Aug. 12, 1987, Ser. No. 84,111
Term of patent 14 years
U.S. Cl. D28—79



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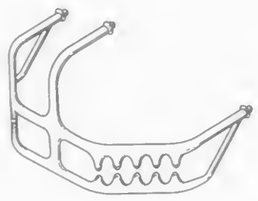
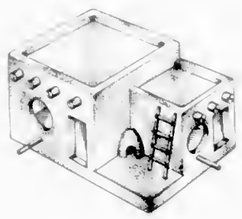
307,197
HELMET FACE GUARD
Roland L. Bandy, 401 S. Curry St., Hampton, Va. 23663
Filed Feb. 24, 1987, Ser. No. 18,002
Term of patent 14 years
U.S. Cl. D29—16



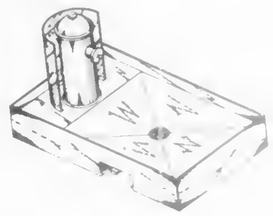
307,198
WASH MITT FOR WIPING BABIES AND THE LIKE
Josef Rojko; Maria Rojko, both of Leinz, Austria; Norbert Leopoldi, Chicago, and Roy A. Weidemann, Lake Bluff, both of Ill., assignors to L.R.W. Enterprises, Inc., Chicago, Ill.
Continuation-in-part of Ser. No. 206,626, Jun. 13, 1988. This application Oct. 11, 1988, Ser. No. 255,416
The portion of the term of this patent subsequent to Apr. 10, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D29—20

307,199
WASH MITT FOR WIPING BABIES AND THE LIKE
Josef Rojko; Maria Rojko, both of Lienz, Austria; Norbert Leopoldi, Chicago, and Roy A. Weidemann, Lake Bluff, both of Ill., assignors to L.R.W. Enterprises, Inc., Chicago, Ill.
Continuation-in-part of Ser. No. 206,626, Jun. 13, 1988. This application Oct. 11, 1988, Ser. No. 256,891
The portion of the term of this patent subsequent to Apr. 10, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D29—20

307,200
BIRD HOUSE
Charles R. Posenauer, 7707 N. 13th St., Phoenix, Ariz. 85020
Filed Sep. 1, 1989, Ser. No. 402,242
Term of patent 14 years
U.S. Cl. D30—111

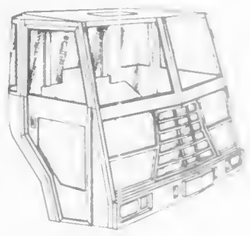


307,201
DOG COMFORT STATION
Robert S. Gold, 275 Firestone Dr., Roseville, Calif. 95678
Filed Jul. 21, 1988, Ser. No. 222,645
Term of patent 14 years
U.S. Cl. D30—161

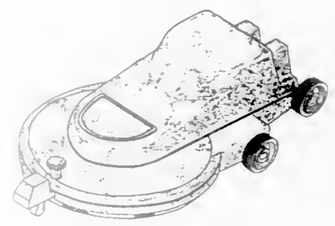


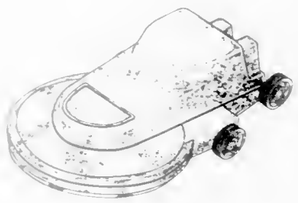
307,202
TAPE HOUSING FOR PIPE CLEANING
Nicholas W. Moss, Cherry Hill, N.J., assignor to Cobra Products, Inc., Willingboro, N.J.
Filed Oct. 27, 1986, Ser. No. 923,355
Term of patent 14 years
U.S. Cl. D32—14

307,203
CAB FOR STREET SWEEPER
Mario J. Martinez, Elgin, Ill., and William A. Lee, Battle Creek, Mich., assignors to Elgin Sweeper Co., Elgin, Ill.
Filed Aug. 28, 1987, Ser. No. 90,771
Term of patent 14 years
U.S. Cl. D32—15



307,204
FLOOR BURNISHER MACHINE BASE
Sidney H. Bradd, Solon, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Jul. 13, 1987, Ser. No. 72,610
Term of patent 14 years
U.S. Cl. D32—25





307,205
APPLICATOR FOR APPLYING PARTICULATE COMPOSITIONS TO CARPET
William F. Galeser, Milwaukee, and Bruce L. Renquist, Racine, both of Wis., assignors to Racine Industries, Inc., Racine, Wis.
Filed May 11, 1987, Ser. No. 47,455
Term of patent 14 years
U.S. Cl. D32—35

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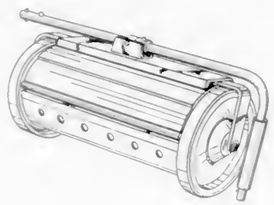
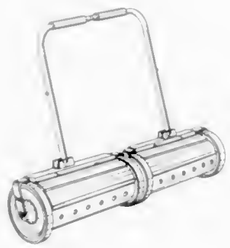
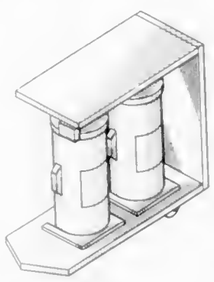


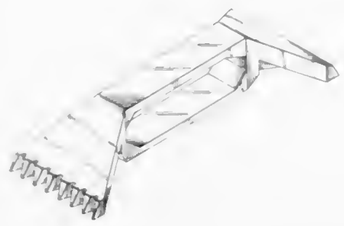
307,207
SCRAPER HANDLE
Kenneth T. Wolf, 25 Demby Pl., Yonkers, N.Y. 10010
Filed Oct. 23, 1987, Ser. No. 112,751
Term of patent 14 years
U.S. Cl. D32—46



307,208
TRASH CART
Allen T. Hemphill, 5822 S. Arlington Ave., Los Angeles, Calif. 90043
Filed May 21, 1987, Ser. No. 52,567
Term of patent 14 years
U.S. Cl. D34—5



307,206
FROST AND ICE SCRAPER
Bill E. Boyd, Rte. 4, Box 310, Ottumwa, Iowa 52501
Filed Mar. 13, 1987, Ser. No. 25,781
Term of patent 14 years
U.S. Cl. D32—46



307,209
BATTERY CART
Gary G. Gallagher, 4300 Estrella Rd., San Miguel, Calif. 93451
Filed Oct. 16, 1987, Ser. No. 108,977
Term of patent 14 years
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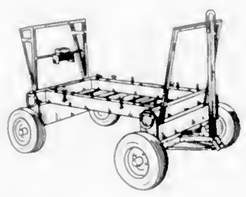

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF APRIL, 1990

NOTE —Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Acker, Thomas W. Fish lure. 4,914,851, Cl. 43-42.410.
Ackerman, Bob J. Basketball rebounder. 4,915,380, Cl. 273-15.00A.
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Takenaga, Mutsuo: *See*—
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Takeuchi, Kunio. Special lens for eyeglasses. 4,915,495, Cl. 351-49.000.

Takeuchi, Toshiyuki; and Krause, Alfred S., to Graphtec Kabushiki Kaisha. Reference line setting system for grid pattern recorders. 4,916,462, Cl. 346-1.100.

Takeuchi, Tsutomu: *See*—
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Takhashi, Susumu; Igarashi, Tsutomu; Miyazaki, Atsushi, Nishioka, Kimihiko; Hasegawa, Akira, Chiba, Masahiro; and Takamura, Koji, to Olympus Optical Co., Ltd. Endoscope. 4,916,534, Cl. 358-98.000.

Takiue, Tomoyuki: *See*—
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Takizawa, Satoshi, to Nissan Motor Company, Limited. Internal combustion engine output torque control system. 4,915,076, Cl. 123-418.000.

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Takizawa, Yumi; Sato, Shinichi; Fukasawa, Atsushi; Sato, Takuro; Ando, Hiromi; and Suzuki, Yukio, to Oki Electric Industry Co., Ltd. Pattern matching system. 4,916,743, Cl. 381-45.000.

Takusagawa, Takashi; Kurima, Akira, Tateo, Yuji; and Kasahara, Nobuyuki, to Bridgestone Corporation. Pneumatic tires with round and square shoulders. 4,915,150, Cl. 152-209.00B.

Talavera, Dino. Method of temperature treating granular material. 4,914,922, Cl. 62-63.000.

Tamaki, Shoji; and Matusato, Hisami, to Kokuyo Co., Ltd. Movable partition wall. 4,914,878, Cl. 52-239.000.

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Tan, Loon-Seng; and Arnold, Fred E., to University of Dayton. Resin systems derived from benzocyclobutene-maleimide compounds. 4,916,235, Cl. 548-461.000.

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Tanaka, Masanori, to Hosiden Electronics Co., Ltd. Telephone connector. 4,915,655, Cl. 439-676.000.

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Tanaka, Yoshiaki; Aotsuka, Tomoji; Kobayashi, Naomi, Nakata, Naoki; Ogura, Kuniyoshi; Torizuka, Motoki; Miura, Naoyoshi; and Arai, Heihachiro, to Zeria Pharmaceutical Co., Ltd. Amino acid imide derivatives, usage thereof, and medicinal composition containing the same. 4,916,146, Cl. 574-365.000.

Tanaka, Yoshio. Vacuum-packed food containing dunaliella algae and process for the production thereof. 4,915,961, Cl. 426-72.000.

Tanaka, Yoshio. Process for production of encapsulated foodstuff containing dunaliella algae. 4,915,965, Cl. 426-282.000.

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Ziauddin, Habeeb M. *See—*
Matthews, Bernard T.; Joll, David J.; Ziauddin, Habeeb M.; and Wilson, David N., 4,915,968, Cl. 426-513.000.
Ziegler, Horst, and Hoentzsch, Christof, to W.C. Heraeus GmbH. System for remote sensing of a physical parameter. 4,916,643, Cl. 364-557.000.
Zimmermann, Bernd D., Claus, Richard O.; and Murphy, Kent A., to Center for Innovative Technology. Optical splice and method for making the same. 4,915,471, Cl. 350-96.210.
Zink, Peter: *See—*
Kuckhermann, Gustav; Tolle, Klaus, Turnwald, Eduard, Zink, Peter; Schafer, Rainer; and Hodapp, Josef, 4,914,895, Cl. 53-571.000.
Zinn, Bernd, to Grote & Hartmann GmbH & Co. KG. Electric plug connector. 4,915,654, Cl. 439-595.000.
Zinn, Bernd. *See—*
Konnemann, Alfred; and Zinn, Bernd, 4,915,645, Cl. 439-417.000.
Zinnerstrom, Margareta, executrix: *See—*
Mannerstedt, Folke K. E., deceased, and Zinnerstrom, Margareta, executrix, 4,915,064, Cl. 123-58.0AM.
Ziolkowski, Philip C. Bonnet for lawn chairs. 4,915,120, Cl. 135-90.000.
Zlamal, Vlastimil, to Siemens Aktiengesellschaft. Control device. 4,914,954, Cl. 73-756.000.
Zohler, Steven R., to Carrier Corporation. Apparatus for measuring the pore size of enhanced tubes. 4,914,810, Cl. 73-38.000.
Zook, J. David: *See—*
Bonne, Ulrich; Deetz, David W., Lai, Juey H., Odde, David J., and Zook, J. David, 4,915,838, Cl. 210-640.000.
Zuk, Bernard T. *See—*
Bayonnet, Jack L.; Zuk, Bernard T.; and Brown, Robert L., 4,914,869, Cl. 51-165.00R.
Zuk, Robert F.: *See—*
Parce, John W.; and Zuk, Robert F., 4,915,812, Cl. 204-403.000.
Zumsteg, Horst, to Alcan Rorschach AG. Closure unit made of sheet metal or plating, method of manufacturing such a closure unit and container having a closure unit obtained thereby. 4,915,254, Cl. 220-359.000.
Zwicker, Harry R.: *See—*
Newkirk, Marc S.; Urquhart, Andrew W.; Zwicker, Harry R.; and Lesher, H. Daniel, 4,916,113, Cl. 501-89.000.
501 Guthrie Canadian Investments Limited: *See—*
Burke, Patrick E., 4,916,428, Cl. 338-62.000.
501 Nippon Steel Corporation. *See—*
Nosaka, Shoji, Kawano, Tsuyoshi; Anami, Hidenobu, and Tanimoto, Shinji, 4,915,246, Cl. 220-270.000.
501 Sloan Valve Company: *See—*
Pilolla, Joseph J.; and Wilson, John R., 4,914,833, Cl. 34-44.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF APRIL, 1990

NOTE —Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Asten Group, Inc.: *See—*
McDonald, Robert L.; and Biasone, Frank, Re. 33,195, Cl. 139-425.00A.
Biasone, Frank: *See—*
McDonald, Robert L.; and Biasone, Frank, Re. 33,195, Cl. 139-425.00A.
Deambrosio, Carlos A., to Electrover Limited. Vibrator wave soldering. Re. 33,197, Cl. 228-180.100.
Dumoutier, Gerard M.: *See—*
Marck, Thierry; and Dumoutier, Gerard M., Re. 33,194, Cl. 128-80.00J.
Electrover Limited. *See—*
Deambrosio, Carlos A., Re. 33,197, Cl. 228-180.100.
Foster, Raymond K. Reciprocating channel floor conveyor. Re. 33,196, Cl. 198-750.000.
Marck, Thierry; and Dumoutier, Gerard M. Orthopedic device for aligning joints. Re. 33,194, Cl. 128-80.00J.
McDonald, Robert L.; and Biasone, Frank, to Asten Group, Inc. Fabrics for papermaking machines. Re. 33,195, Cl. 139-425.00A.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Ausimont S.p.A.: *See—*
Lunardon, Gianflavio; Credali, Lino; Benetti, Ermanno, and Mulas, Carlo, B1 4,769,435, Cl. 528-28.000.
Benetti, Ermanno: *See—*
Lunardon, Gianflavio; Credali, Lino; Benetti, Ermanno, and Mulas, Carlo, B1 4,769,435, Cl. 528-28.000.
Brenner, John A.: *See—*
Brueggemann, Walter H., and Brenner, John A., B1 4,349,601, Cl. 428-323.000.
Brueggemann, Walter H.; and Brenner, John A., to Ferro Corporation. Protective skin on intricately molded product. B1 4,349,601, 4-10-90, Cl. 428-323.000.
BW/IP International, Inc.: *See—*
Wentworth, Robert S., B1 4,509,773, Cl. 277-82.000.
Conrad, Neal D.; McClelland, Sandra K.; and Roach, William R., to RCA Corporation. Display device having different alignment layers. B1 4,726,659, 4-10-90, Cl. 350-341.000.
Credali, Lino: *See—*
Lunardon, Gianflavio; Credali, Lino; Benetti, Ermanno; and Mulas, Carlo, B1 4,769,435, Cl. 528-28.000.
Ferro Corporation: *See—*
Brueggemann, Walter H.; and Brenner, John A., B1 4,349,601, Cl. 428-323.000.
Hasbeck, Joseph, to Hubbell Incorporated. Electrical box. B1 4,335,271, 4-10-90, Cl. 174-65.00R.
Heald, Jesse H., Jr., to Lannom Manufacturing Co. Inc. Game ball. B1 3,976,295, 4-10-90, Cl. 273-60.00R.
Hubbell Incorporated: *See—*
Hasbeck, Joseph, B1 4,335,271, Cl. 174-65.00R.
Kozloski, Edward, to Vicon Industries, Inc. Surveillance camera housing. B1 8,273,012, 4-10-90, Cl. D16-203.000.
Lannom Manufacturing Co. Inc.: *See—*
Heald, Jesse H., Jr., B1 3,976,295, Cl. 273-60.00R.
Lemelson, Jerome H. Magnetic tape transducing system. B1 3,842,432, 4-10-90, Cl. 360-105.000.
Lemelson, Jerome H. Form filling system and method. B1 3,872,462, 4-10-90, Cl. 340-705.000.
Lunardon, Gianflavio; Credali, Lino; Benetti, Ermanno; and Mulas, Carlo, to Ausimont S.p.A. Process for the manufacture of thermoplastic polyurethanes. B1 4,769,435, 4-10-90, Cl. 528-28.000.
McClelland, Sandra K.: *See—*
Conrad, Neal D.; McClelland, Sandra K.; and Roach, William R., B1 4,726,659, Cl. 350-341.000.
Mima, Hiroshi, to Murata Kikai Kabushiki Kaisha. Method and apparatus for splicing spun yarns. B1 4,411,128, 4-10-90, Cl. 57-22.000.
Mulas, Carlo: *See—*
Lunardon, Gianflavio; Credali, Lino; Benetti, Ermanno; and Mulas, Carlo, B1 4,769,435, Cl. 528-28.000.
Murata Kikai Kabushiki Kaisha: *See—*
Mima, Hiroshi, B1 4,411,128, Cl. 57-22.000.
RCA Corporation: *See—*
Conrad, Neal D.; McClelland, Sandra K.; and Roach, William R., B1 4,726,659, Cl. 350-341.000.
RCA Licensing Corporation: *See—*
Reitmeier, Glenn A., B1 4,626,895, Cl. 358-31.000.
Reitmeier, Glenn A., to RCA Licensing Corporation. Sampled data video signal chrominance/luminance separation system. B1 4,626,895, 4-10-90, Cl. 358-31.000.
Roach, William R.: *See—*
Conrad, Neal D.; McClelland, Sandra K.; and Roach, William R., B1 4,726,659, Cl. 350-341.000.
Vicon Industries, Inc.: *See—*
Kozloski, Edward, B1 8,273,012, Cl. D16-203.000.
Wentworth, Robert S., to BW/IP International, Inc. Pump-mechanical seal construction with axial adjustment means. B1 4,509,773, 4-10-90, Cl. 277-82.000.

LIST OF DESIGN PATENTEES

A. H. Robins Company, Incorporated: *See—*
Blutenthal, John E., 307,191, Cl. D28-7.000.
Alberti, Alberto: *See—*
Guelfi, Giorgio; Villa, Ezio; Mendicino, Franco; Pasquali, Renato, and Alberti, Alberto, 307,118, Cl. D12-169.000.
Guelfi, Giorgio, Villa, Ezio; Mendicino, Franco; Pasquali, Renato, and Alberti, Alberto, 307,125, Cl. D12-169.000.
Aldridge, James S., to Avon Industrial Polymers Limited. Golf club grip. 307,169, 4-10-90, Cl. D21-222.000.
Alfa Lancia Industriale S.r.l.: *See—*
Guelfi, Giorgio; Villa, Ezio; Mendicino, Franco; Pasquali, Renato and Alberti, Alberto, 307,118, Cl. D12-169.000.
Guelfi, Giorgio; Villa, Ezio; Mendicino, Franco; Pasquali, Renato; and Alberti, Alberto, 307,125, Cl. D12-169.000.
Alfonso, Pedro M., to International Business Machines Corporation. Cursor control for a computer system. 307,137, 4-10-90, Cl. D14-114.000.
Allen, Donald F., to Allen, Scott J.; and Allen, Timothy B., a part interest to each. Film deposit booth. 307,081, 4-10-90, Cl. D6-421.000.
Allen, Scott J.: *See—*
Allen, Donald F., 307,081, Cl. D6-421.000.
Allen, Timothy B.: *See—*
Allen, Donald F., 307,081, Cl. D6-421.000.

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Allendorph, L. David; and Reynard, Larry N., to Navistar International Transportation Corp. Exterior shell of a vehicle hood. 307,126, 4-10-90, Cl. D12-173.000.

Anderson, James L. Oil filter wrench. 307,101, 4-10-90, Cl. D8-22.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Shishikura, Takenao, 307,154, Cl. D16-133.000.

Ashihara, Kazuhiko, to Sharp Corporation. Frequency converter for an antenna. 307,143, 4-10-90, Cl. D14-230.000.

Avon Industrial Polymers Limited. *See*—
Aldridge, James S., 307,169, Cl. D21-222.000.

Bakic, Karena, to Cosmede Anstalt. Combined cosmetic compact and applicator. 307,190, 4-10-90, Cl. D28-7.000.

Balt, Inc.: *See*—
Currie, Wallace R., 307,084, Cl. D6-464.000.

Bandy, Roland L. Helmet face guard. 307,197, 4-10-90, Cl. D29-16.000.

Barnes, Donald D.: *See*—
Simons, Wayne K.; and Barnes, Donald D., 307,127, Cl. D12-192.000.

Bednarski, Kathryn: *See*—
Graham, Kenneth; Geer, Kenton D.; and Bednarski, Kathryn, 307,072, Cl. D2-318.000.

Belokin, Martin P.; and Belokin, Norman P. Pizza cutter. 307,094, 4-10-90, Cl. D7-694.000.

Belokin, Norman P.: *See*—
Belokin, Martin P.; and Belokin, Norman P., 307,094, Cl. D7-694.000.

Bianchin-Scarpa, Afra: *See*—
Scarpa, Tobia; and Bianchin-Scarpa, Afra, 307,185, Cl. D25-58.000.

Bjorkman, Gunnar; and Jarvenkyla, Jyri, to Oy Uponor AB. Tube or the like. 307,174, 4-10-90, Cl. D23-266.000.

Blutenthal, John E., to A. H. Robins Company, Incorporated. Lip medication applicator or similar article. 307,191, 4-10-90, Cl. D28-7.000.

Boehnke, Ulrich K., to Diemold Machine Company, Inc. Countertop water filter. 307,173, 4-10-90, Cl. D23-209.000.

Bonnet Refrigeration. *See*—
Cocagne, Pierre, 307,080, Cl. D6-470.000.

Borje Forsater: *See*—
Forsater, Borje, 307,155, Cl. D16-204.000.

Bouilhet, Henri, to Orfevrerie Christofle S.A. Handle for a fork or similar article of flatware. 307,096, 4-10-90, Cl. D7-654.000.

Boyd, Bill E. Frost and ice scraper. 307,206, 4-10-90, Cl. D32-46.000.

Boyer, Harold R.; and Jalanti, David J., to International Business Machines Corporation. Control device for displays. 307,136, 4-10-90, Cl. D14-113.000.

Bradd, Sidney H., to Hoover Company, The. Floor burnisher machine base. 307,204, 4-10-90, Cl. D32-25.000.

Bryant, William C., to Empire Brushes, Inc. Combined brush handle and back unit and scraper therefor. 307,077, 4-10-90, Cl. D4-138.000.

Butler, Bertha. Sewing machine pin cushion. 307,073, 4-10-90, Cl. D3-27.000.

Byrd, Michael R.: *See*—
Lucas, James F.; Byrd, Michael R.; and Coody, Bruce F., 307,167, Cl. D21-194.000.

Cal-Comp Electronics, Inc.: *See*—
Chen, Ray, 307,156, Cl. D18-7.000.

Camus La Grande Marque: *See*—
Daucourt, Michel, 307,114, Cl. D9-384.000.

Caouette, Jacques. House boat. 307,129, 4-10-90, Cl. D12-315.000.

Centro Studi e Servizi Moda S.R.L.: *See*—
Scarpa, Tobia; and Bianchin-Scarpa, Afra, 307,185, Cl. D25-58.000.

Chen, Ray, to Cal-Comp Electronics, Inc. Calculator or similar article. 307,156, 4-10-90, Cl. D18-7.000.

Ching, Larry K. W., Jr., to Gates Energy Products, Inc. Battery. 307,133, 4-10-90, Cl. D13-103.000.

Chou, Fargo. Bi-directional nail trimmer. 307,194, 4-10-90, Cl. D28-58.000.

Claber S.p.A.: *See*—
Roman, Gianfranco, 307,100, Cl. D8-11.000.

Clivio, Franco, to Gardena Kress & Kastner GmbH. Hedge Trimmer. 307,098, 4-10-90, Cl. D8-8.000.

Cobra Products, Inc.: *See*—
Moss, Nicholas W., 307,202, Cl. D32-14.000.

Cocagne, Pierre, to Bonnet Refrigeration. Refrigerated display case. 307,080, 4-10-90, Cl. D6-470.000.

Cole, Richard L. Ceder wood aroma air freshener for closets. 307,179, 4-10-90, Cl. D23-368.000.

Coody, Bruce F.: *See*—
Lucas, James F.; Byrd, Michael R.; and Coody, Bruce F., 307,167, Cl. D21-194.000.

Cook, James T., Jr.: *See*—
Cook, Virginia L.; and Cook, James T., Jr., 307,085, Cl. D6-502.000.

Cook, Virginia L.; and Cook, James T., Jr. Child's seat. 307,085, 4-10-90, Cl. D6-502.000.

Cornerstone Games Company Inc.: *See*—
Herring, John B., 307,163, Cl. D21-34.000.

Corona Clipper Company: *See*—
Jasperson, Stephen, 307,097, Cl. D8-5.000.

Cosmede Anstalt: *See*—
Bakic, Karena, 307,190, Cl. D28-7.000.

Creative Environments Inc.: *See*—
Luthy, Chella, 307,180, Cl. D23-366.000.

Currie, Wallace R., to Balt, Inc. Printer stand. 307,084, 4-10-90, Cl. D6-464.000.

Dart Industries Inc.: *See*—
DeCoster, Pieter K. J., 307,090, Cl. D7-665.000.

Dasher, Gerald W.; and Dasher, Robert E. Folding carton. 307,109, 4-10-90, Cl. D9-418.000.

Dasher, Robert E.: *See*—
Dasher, Gerald W.; and Dasher, Robert E., 307,109, Cl. D9-418.000.

Daucourt, Michel, to Camus La Grande Marque. Decanter with stopper. 307,114, 4-10-90, Cl. D9-384.000.

David, Thomas J.: *See*—
Foran, Kenneth C.; and David, Thomas J., 307,159, Cl. D19-90.000.

DeCoster, Pieter K. J., to Dart Industries Inc. Citrus juicer. 307,090, 4-10-90, Cl. D7-665.000.

Denney, James E.; Ewing, Robert L.; and Hammond, Douglas S., to Holophane Company, Inc. Luminaire. 307,188, 4-10-90, Cl. D26-63.000.

Desnoulez, Bruno, to Prevost, Anne-Marie. Corkscrew. 307,102, 4-10-90, Cl. D8-42.000.

Diemold Machine Company, Inc.: *See*—
Boehnke, Ulrich K., 307,173, Cl. D23-209.000.

Diversified Products Corporation: *See*—
Lucas, James F.; Byrd, Michael R.; and Coody, Bruce F., 307,167, Cl. D21-194.000.

Downing, Robert. Water pressure tank. 307,172, 4-10-90, Cl. D23-205.000.

Dye, Bennie E. Case for a vehicular cassette player. 307,074, 4-10-90, Cl. D3-30.100.

Elgin Sweeper Co.: *See*—
Martinez, Mario J.; and Lee, William A., 307,203, Cl. D32-15.000.

Ellis, Ernest M. Trimming plane. 307,130, 4-10-90, Cl. D12-317.000.

Emhart Industries, Inc.: *See*—
Nusse, Oktavio K.; and Krause, Wolf-Dieter, 307,105, Cl. D8-71.000.

Empire Brushes, Inc.: *See*—
Bryant, William C., 307,077, Cl. D4-138.000.

Engle, Arnold R. Fishing pole holder. 307,171, 4-10-90, Cl. D22-147.000.

Erfan, Onje. Auricular stimulator. 307,181, 4-10-90, Cl. D24-36.000.

Ewing, Robert L.: *See*—
Denney, James E.; Ewing, Robert L.; and Hammond, Douglas S., 307,188, Cl. D26-63.000.

Fertilizer Solutions, Inc.: *See*—
Huck, David N., 307,112, Cl. D9-375.000.

Flos S.p.A.: *See*—
Pezzolo, Marco, 307,189, Cl. D26-86.000.

Foran, Kenneth C.; and David, Thomas J., to Rubbermaid Incorporated. Letter organizer file. 307,159, 4-10-90, Cl. D19-90.000.

Forsater, Borje, to Borje Forsater. Remote controlled underwater camera. 307,155, 4-10-90, Cl. D16-204.000.

Fouin, M. Jean, to Moteurs Leroy-Somer. Alternator housing. 307,132, 4-10-90, Cl. D13-114.000.

Freeman, Thomas R.: *See*—
Kemna, Jill L.; and Freeman, Thomas R., 307,071, Cl. D2-277.000.

Frieden, Fred, Jr., to Sherwin-Williams Company, The. Wall mounted merchandise display stand. 307,088, 4-10-90, Cl. D6-570.000.

Fuji Photo Film Co., Ltd.: *See*—
Fukuda, Hiroshi; and Fukuda, Masahiro, 307,139, Cl. D14-121.000.

Fukuda, Hiroshi; and Fukuda, Masahiro, to Fuji Photo Film Co., Ltd. Microfilm cartridge. 307,139, 4-10-90, Cl. D14-121.000.

Fukuda, Masahiro: *See*—
Fukuda, Hiroshi; and Fukuda, Masahiro, 307,139, Cl. D14-121.000.

Furukado, Naoto: *See*—
Hayashi, Akikazu; Furukado, Naoto; and Matsukuma, Nobuyuki, 307,124, Cl. D12-163.000.

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Galeser, William F.; and Renquist, Bruce L., to Racine Industries, Inc. Applicator for applying particulate compositions to carpet. 307,205, 4-10-90, Cl. D32-35.000.

Gallagher, Gary G. Battery cart. 307,209, 4-10-90, Cl. D34-17.000.

Gardena Kress & Kastner GmbH: *See*—
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Gates Energy Products, Inc.: *See*—
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Geer, Kenton D.: *See*—
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Gibson, Gary; and Tannehill, Kenneth. Portable holder for fishing rods. 307,087, 4-10-90, Cl. D6-552.000.

Gold, Robert S. Dog comfort station. 307,201, 4-10-90, Cl. D30-161.000.

Graham, Kenneth; Geer, Kenton D.; and Bednarski, Kathryn, to Hyde Athletic Industries, Inc. Insole. 307,072, 4-10-90, Cl. D2-318.000.

Green, Richard D. Dual compartment bottle. 307,111, 4-10-90, Cl. D9-341.000.

Greenlee, Hugh T.; and Hess, Roy P., to Upneumat International, Inc. Portable pneumatic tool. 307,103, 4-10-90, Cl. D8-61.000.

Griffiths, Gerald A.: *See*—
Ingley, Peter; Griffiths, Gerald A.; and Rawlins, David J., 307,120, Cl. D12-146.000.

Guelfi, Giorgio; Villa, Ezio; Mendicino, Franco; Pasquali, Renato; and Alberti, Alberto, to Alfa Lancia Industriale S.r.l. Rear bumper for automotive vehicle. 307,118, 4-10-90, Cl. D12-169.000.

Guelfi, Giorgio; Villa, Ezio; Mendicino, Franco; Pasquali, Renato; and Alberti, Alberto, to Alfa Lancia Industriale S.r.l. Front bumper for automotive vehicle. 307,125, 4-10-90, Cl. D12-169.000.

Guillemet, Guy, to Les Produits Duvernay Ltee. Frame corner bracket. 307,078, 4-10-90, Cl. D6-300.000.

Hammond, Douglas S.: *See*—
Denney, James E.; Ewing, Robert L.; and Hammond, Douglas S., 307,188, Cl. D26-63.000.

Hanlon, William M., III. Kaleidoscope. 307,162, 4-10-90, Cl. D21-60.000.

Hass, Ulrich J., to Optyl Eyewear Fashion International Corp. Eyeglass frame. 307,151, 4-10-90, Cl. D16-112.000.

Hattori, Akiyoshi, to Nitsuko Corporation. Key telephone set. 307,144, 4-10-90, Cl. D14-241.000.

Havelock, Ken. Toy animal figure. 307,165, 4-10-90, Cl. D21-148.000.

Hayashi, Akikazu; Furukado, Naoto; and Matsukuma, Nobuyuki, to Toyota Jidosha Kabushiki Kaisha. Radiator grille for an automobile. 307,124, 4-10-90, Cl. D12-163.000.

Hemmingsen, Karl R. Supporting arm for a tire handling robot. 307,150, 4-10-90, Cl. D15-199.000.

Hemphill, Allen T. Trash cart. 307,208, 4-10-90, Cl. D34-5.000.

Herring, John B., to Cornerstone Games Company Inc. Game board. 307,163, 4-10-90, Cl. D21-34.000.

Hess, Roy P.: *See*—
Greenlee, Hugh T., and Hess, Roy P., 307,103, Cl. D8-61.000.

Holophane Company, Inc.: *See*—
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Honda Giken Kogyo Kabushiki Kaisha: *See*—
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Hoover Company, The: *See*—
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Hoshino, Kiyoshi: *See*—
Monobe, Juzaburo; and Hoshino, Kiyoshi, 307,104, Cl. D8-67.000.

Huck, David N., to Fertilizer Solutions, Inc. Container for spraying liquids or the like. 307,112, 4-10-90, Cl. D9-375.000.

Hyde Athletic Industries, Inc.: *See*—
Graham, Kenneth; Geer, Kenton D.; and Bednarski, Kathryn, 307,072, Cl. D2-318.000.

Hystar Aerospace Development Corporation: *See*—
Kramer, Dale C., 307,131, Cl. D12-325.000.

Ikeda, Masayuki: *See*—
Oshima, Takashi; Yamaguchi, Ryoji; and Ikeda, Masayuki, 307,145, Cl. D14-241.000.

Ikeya, Shinji; Ogawa, Kenichi; Fuse, Chihiro; Ohe, Yasuhiro; Miyai, Hiroyuki; Nobuchi, Koji; and Kitano, Hiroko, to Sanyo Electric Co., Ltd. Telephone set. 307,140, 4-10-90, Cl. D14-150.000.

Industrial Technology Research Institute: *See*—
Yeh, Bean-Shung, 307,119, Cl. D12-110.000.

Ingley, Peter; Griffiths, Gerald A.; and Rawlins, David J., to SP Tyres UK Ltd. Vehicle tire. 307,120, 4-10-90, Cl. D12-146.000.

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Boyer, Harold R.; and Jalanti, David J., 307,136, Cl. D14-113.000.

Ishimaru, Atsushi, to Twinbird Industrial Company Limited. Combined ice box and utensil case. 307,092, 4-10-90, Cl. D7-605.000.

Italtel Telematica S.p.A.: *See*—
Raggi, Franco; Meda, Alberto; Santachiara, Denys; Ravasio, Piercarlo; and Martusciello, Antonio, 307,141, Cl. D14-151.000.

Iwatsu Electric Co., Ltd.: *See*—
Oshima, Takashi; Yamaguchi, Ryoji; and Ikeda, Masayuki, 307,145, Cl. D14-241.000.

Jacobs, Robert G. Flashing emergency alert signal light. 307,116, 4-10-90, Cl. D10-114.000.

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45 4,914,816
77 4,914,817
90.1 4,914,818
147 4,914,819
254 4,914,820

CLASS 33
197 4,914,822
378 4,914,823
449 4,914,824
464 4,914,825
544 4,914,826
552 4,914,827
554 4,914,828
555.4 4,914,821
613 4,914,829
668 4,914,830
780 4,914,831

CLASS 34
9 4,914,832
21 4,914,835
44 4,914,833
169 4,914,834

CLASS 36
28 4,914,836
88 4,914,837
114 4,914,838
119 4,914,839

CLASS 37
142.5 4,914,840
195 4,914,841

CLASS 40
158.1 4,914,842
633 4,914,843
642 4,914,844

CLASS 42
40 4,914,845
65 4,914,846

CLASS 43
4 4,914,847
4,915,631
9.1 4,914,848
42.08 4,914,849
42.24 4,914,850
42.41 4,914,851
44.82 4,914,852
53.5 4,914,853
55 4,914,856
112 4,914,854
136 4,914,855

CLASS 44
51 4,915,706
62 4,915,707
90 4,915,708

CLASS 47
47 4,914,857
58 4,914,858
72 4,914,860

CLASS 49
25 4,914,859
181 4,914,861
322 4,914,862
502 4,914,863
506 4,914,864

CLASS 51
55 4,914,865
72 R 4,914,866
109 BS 4,915,709
134 4,914,867
165 R 4,914,869
165.71 4,914,868
283 R 4,914,870
290 4,914,871
309 4,915,710
328 4,914,872

CLASS 52
36 4,914,873
79.1 4,914,874
126.6 4,914,875
169.4 4,914,876
171 4,914,877
239 4,914,878
242 4,914,879
243 4,914,880
263 4,914,881
287 4,914,882
309.5 4,914,883
396 4,914,884
520 4,914,885
537 4,914,886
565 4,914,887
768 4,914,888

CLASS 53
51 4,914,889
397 4,914,890
399 4,914,891
4,914,892
567 4,914,893
571 4,914,895

CLASS 55
26 4,915,711
55 4,915,713
84 4,915,712
208 4,915,715
486 4,915,714

CLASS 56
1 4,914,909
12.9 4,914,896
13.2 4,914,897
14.7 4,914,894
15.2 4,914,898
16.7 4,914,899
341 4,914,900
370 4,914,901

CLASS 57
22 B1 4,411,128
210 4,914,902

CLASS 59
86 4,914,903

CLASS 60
39.142 4,914,906
39.511 4,914,910
226.1 4,914,904
226.2 4,914,905
313 4,914,911
323 4,914,912
384 4,914,913
487 4,914,907
489 4,914,914
502 4,914,915
527 4,914,903
534 4,914,916
545 4,914,917
756 4,914,918

CLASS 62
3.3 4,914,920
59 4,914,921
63 4,914,922
71 4,914,923
133 4,914,924
160 4,914,925
196.4 4,914,926
236 4,914,919
381 4,914,927
408 4,914,926
515 4,914,929

CLASS 63
28 4,914,930

CLASS 65
2 4,915,716
3.12 4,915,717
31 4,915,718
32.2 4,915,719
64 4,915,720
66 4,915,721
106 4,915,722
144 4,915,723

CLASS 70
213 4,914,931
367 4,914,932

CLASS 71
65 4,915,724
79 4,915,726
87 4,915,725
92 4,915,727

CLASS 72
114 4,914,933
135 4,914,934
201 4,914,935
345 4,914,936
349 4,914,937
354 4,914,938
392 4,914,939
449 4,914,941
463 4,914,942

CLASS 73
38 4,914,810
40 4,914,957
49.2 4,914,943
152 4,914,944
182 4,914,945
4,914,946
202.5 4,914,947
298 R 4,914,948
597 4,914,951
598 4,914,952
660 4,914,953
756 4,914,954
799 4,914,965
861.35 4,914,955
861.12 4,914,950
861.28 4,914,959
861.38 4,914,956
862.48 4,914,960
862.59 4,914,961
4,914,962
4,914,963
863.01 4,914,966
865.9 4,914,964
866.4 4,914,958

CLASS 74
57 4,914,967
467 4,914,968
476 4,914,969
492 4,914,970
502.1 4,914,972
502.2 4,914,971
502.5 4,914,973
4,914,974
4,914,975
523 4,914,976
571.1 4,914,977
574 4,914,949
837 4,914,981
844 4,914,982
866 4,914,983
867 4,914,984

CLASS 75
7 4,915,730
26 4,915,731
228 4,915,733
229 4,915,734
230 4,915,735
238 4,915,736
246 4,915,737
4,915,738
330 4,915,729
347 4,915,728
536 4,915,732

CLASS 81
3.44 4,914,985
9.22 4,914,988
9.51 4,914,986
57.46 4,914,987
462 4,914,989

CLASS 82
54 4,914,990
104 4,914,991
127 4,914,992
4,914,993

CLASS 83
18 4,914,994
14.5 4,914,995
158 4,914,996
156 4,914,997
165 4,914,998
650.1 4,915,000

CLASS 84
298 4,915,003
4,915,004
314.N 4,915,006
314.R 4,915,005
423.R 4,914,999
600 4,915,001
622 4,915,007
658 4,915,008
695 4,915,002
743 4,915,009

CLASS 89
7 4,915,010
176 4,915,011

CLASS 91
217 4,915,012
307 4,915,013
420 4,915,014
459 4,915,015
482 4,915,016

CLASS 92
5 R 4,915,017
98 D 4,915,018
136 4,915,019

CLASS 98
1.5 4,915,020
2 4,915,021
42.2 4,915,022
121.1 4,915,023

CLASS D16
203 B1 8,273,012

CLASS 100
162 B 4,915,024
162 R 4,915,026

CLASS 101
424.1 4,915,023
486 4,915,027

CLASS 102
238 4,915,028
310 4,915,029

CLASS 104
88 4,915,030

CLASS 105
198.2 4,915,031
329.1 4,915,032

CLASS 106
99 4,915,739
104 4,915,740
314 4,915,741
418 4,915,742

CLASS 108
44 4,915,035
55.1 4,915,033
65 4,915,034

CLASS 110
215 4,915,036
342 4,915,037
346 4,915,038
4,915,039

CLASS 112
2 4,915,040
121.12 4,915,041
121.26 4,915,042
147 4,915,043
236 4,915,044
275 4,915,045
419 4,915,046

CLASS 114
39.1 4,915,047
56 4,915,048
144 R 4,915,049
144 RE 4,915,050
170 4,915,051
267 4,915,052
343 4,915,053

CLASS 116
142 FP 4,915,054
209 4,915,055

CLASS 118
13 4,915,056
505 4,915,057
4,915,058

CLASS 119
3 4,915,059
61 4,915,060

CLASS 122
4 D 4,915,061
379 4,915,073
406 ST 4,915,062

CLASS 123
41.31 4,915,063
58 AM 4,915,064
90.27 4,915,065
4,915,066
90.34 4,915,067
149 R 4,915,068
188 P 4,915,069
196 R 4,915,070
357 4,915,072
399 4,915,074
4,915,075
418 4,915,076
419 4,915,079
440 4,915,077
478 4,915,078
489 4,915,080
4,915,081
4,915,082
571 4,915,083
575 4,915,084
587 4,915,085
609 4,915,086
620 4,915,087

CLASS 124
87 4,915,088

CLASS 125
11 CD 4,915,089

CLASS 126
9 R 4,915,090
65 4,915,091
450 4,915,093

CLASS 128
24 A 4,915,094
28 4,915,095
63 4,915,096
73 4,915,101
77 4,915,097
80 J Re.33,194
88 4,915,098
156 4,915,102
201.19 4,915,099
204.23 4,915,103
205.27 4,915,105
207.11 4,915,106
207.18 4,915,104
402 4,915,108
419 D 4,915,109
653 AF 4,915,111
653 R 4,915,112
660.03 4,915,114
660.05 4,915,115
666 4,915,116
691 4,915,113
783 4,915,110

CLASS 131
365 4,915,117
4,915,118

CLASS 134
57 R 4,915,119

CLASS 135
90 4,915,120

CLASS 136
256 4,915,743
262 4,915,744
265 4,915,745

CLASS 137
15 4,915,121
38 4,915,122
223 4,915,124
368 4,915,125
495 4,915,126
505.42 4,915,127
512.15 4,915,128
514 4,915,129
579 4,915,130
598 4,915,131
599 4,915,123
625.41 4,915,132
625.47 4,915,133
625.65 4,915,134

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CLASS 138
44 4,915,135
89 4,915,136
96 R 4,915,137
125 4,915,139

CLASS 139
40 4,915,138
384 B 4,915,140
425 A Re 33,195
435 2 4,915,142
435 5 4,915,141
438 4,915,143
453 4,915,144

CLASS 141
95 4,915,145
144 4,915,146
181 4,915,147

CLASS 144
1 C 4,915,148
84 4,915,149

CLASS 148
4 4,915,746
12 7 A 4,915,747
4,915,748
112 4,915,749
4,915,750
280 4,915,751
327 4,915,752

CLASS 149
5 4,915,753
19 4 4,915,754
4,915,755
19 9 4,915,756

CLASS 152
209 B 4,915,150
454 4,915,151

CLASS 156
64 4,915,757
73 1 4,915,758
89 4,915,759
4,915,760
111 4,915,761
143 4,915,762
209 4,915,763
244 19 4,915,764
267 4,915,765
335 4,915,766
344 4,915,770
440 4,915,767
527 4,915,768
4,915,769
574 4,915,771
616 4 4,915,882
617 1 4,915,773
4,915,774
620 7 4,915,772
642 4,915,776
643 4,915,777
4,915,778
4,915,779
661 1 4,915,780
664 4,915,781
665 4,915,782

CLASS 160
31 4,915,152
84 1 4,915,153

CLASS 162
8 4,915,783
15 4,915,784
78 4,915,785
158 4,915,786
199 4,915,787
207 4,915,154
4,915,788
259 4,915,789
305 4,915,790
351 4,915,791

CLASS 164
255 4,915,155
265 4,915,156
412 4,915,157
431 4,915,158
456 4,915,159
4,915,160
460 4,915,161

CLASS 165
2 4,915,162
153 4,915,163
164 4,915,164
166 4,915,165
184 4,915,166
185 4,915,167

CLASS 166
250 4,915,168
252 4,915,169
4,915,170
264 4,915,171
278 4,915,172
4,915,173
305 1 4,915,174
332 4,915,175
371 4,915,176
380 4,915,177
385 4,915,178

CLASS 172
375 4,915,179

CLASS 173
22 4,915,180

CLASS 174
48 4,916,258
65 R B1 4,335,271
255 4,916,261
256 4,916,259
268 4,916,260

CLASS 175
263 4,915,181
403 4,915,182

CLASS 177
137 4,915,183

CLASS 180
8 2 4,915,184
19 2 4,915,185
132 4,915,186
219 4,915,187
4,915,188
247 4,915,189
4,915,190
248 4,915,191
309 4,915,192

CLASS 184
3 2 4,915,195
6 12 4,915,193
6 18 4,915,194

CLASS 185
27 4,915,196

CLASS 187
121 4,915,197

CLASS 188
73 39 4,915,198
181 A 4,915,199

CLASS 192
30 W 4,915,200
45 4,915,201
48 5 4,915,203
85 CA 4,915,202
87 17 4,915,204

CLASS 194
205 4,915,205
227 4,915,206

CLASS 198
323 4,915,207
346 1 4,915,208
357 4,915,209
476 1 4,915,210
499 4,915,211
750 Re 33,196
803 01 4,915,212
819 4,915,213

CLASS 200
5 A 4,916,262
11 DA 4,916,263
24 4,916,264
47 4,916,265
61 45 R 4,916,266
61 62 4,916,267
400 4,916,268
408 4,916,269
457 4,916,274
516 4,916,275
524 4,916,276
4,916,277

CLASS 202
202 4,915,793

CLASS 203
22 4,915,792
29 4,915,794

CLASS 204
15 4,915,795
4,915,796
28 4,915,797
29 4,915,798
35 1 4,915,799
4,915,800
66 4,915,802
128 4,915,803
157 5 4,915,804
192 12 4,915,805
192 31 4,915,806
192 32 4,915,807
196 4,915,808
243 R 4,915,809
298 04 4,915,810
299 R 4,915,811
376 4,915,801
403 4,915,812
406 4,915,813
425 4,915,814
429 4,915,815
430 4,915,816

CLASS 206
0 82 4,915,214
39 4,915,215
150 4,915,217
178 4,915,218
209 1 4,915,219
278 4,915,220
315 6 4,915,221
328 4,915,222
345 4,915,223
368 4,915,225
423 4,915,224
438 4,915,226
441 4,915,227
4,915,228
455 4,915,229
459 4,915,230
461 4,915,231
520 4,915,216
541 4,915,232
571 4,915,233
581 4,915,234
611 4,915,235
621 6 4,915,236

CLASS 208
97 4,915,817
251 R 4,915,818
253 4,915,820
309 4,915,819

CLASS 209
17 4,915,821
139 1 4,915,824
166 4,915,825
273 4,915,822
288 4,915,826
524 4,915,237
577 4,915,827

CLASS 210
95 4,915,823
110 4,915,828
151 4,915,829
209 4,915,830
232 4,915,831
321 67 4,915,833
321 8 4,915,832
321 84 4,915,834
350 4,915,835
416 1 4,915,836
456 4,915,837
500 23 4,915,839
605 4,915,840
4,915,841
617 4,915,842
635 4,915,843
640 4,915,838
651 4,915,844
701 4,915,845
702 4,915,846
737 4,915,847
749 4,915,848
759 4,915,849
771 4,915,850
781 4,915,851
805 4,915,852

CLASS 211
4,915,238
74 4,915,239
151 4,915,240

CLASS 215
11 1 4,915,242
100 A 4,915,241
247 4,915,243
252 4,915,244
326 4,915,245

CLASS 217
121 47 4,916,273

CLASS 219
10 41 4,916,278
10 55 E 4,916,279
4,916,280
61 4,916,281
69 2 4,916,282
70 4,916,270
84 4,916,271
121 51 4,916,283
121 64 4,916,284
121 7 4,916,272
121 72 4,916,285
124 34 4,916,286
202 4,916,287
228 4,916,288
230 4,916,289
385 4,916,290
492 4,916,291
553 4,916,292

CLASS 220
4 F 4,915,247
19 4,915,248
86 R 4,915,249
90 4 4,915,250
270 4,915,246
306 4,915,251
307 4,915,252
314 4,915,253
359 4,915,254
408 4,915,255

CLASS 221
5 4,915,256
48 4,915,257
120 4,915,259
211 4,915,258

CLASS 222
1 4,915,260
92 4,915,261
207 4,915,262
250 4,915,264
321 4,915,263
368 4,915,265
402 16 4,915,266
463 4,915,267
498 4,915,268
590 4,915,269
606 4,915,270

CLASS 223
69 4,915,271
111 4,915,272

CLASS 224
30 A 4,915,273
42 24 4,915,274
42 42 4,915,275
42 43 4,915,276
159 4,915,277
205 4,915,278
230 4,915,279

CLASS 226
74 4,915,280
112 4,915,281
119 4,915,282
173 4,915,283
177 4,915,284

CLASS 227
176 4,915,100

CLASS 228
173 5 4,915,286
180 1 Re 33,197
212 4,915,285

CLASS 229
70 4,915,287
80 4,915,288
123 1 4,915,289
125 08 4,915,290
125 26 4,915,291
132 4,915,292

CLASS 232
39 4,915,293

CLASS 235
375 4,916,293
449 4,916,294
4,916,295
454 4,916,296
462 4,916,297
463 4,916,298
482 4,916,299
487 4,916,300

CLASS 236
12 16 4,915,295
49 3 4,915,294

CLASS 237
8 A 4,915,297
8 R 4,915,296

CLASS 238
283 4,915,298
351 4,915,299

CLASS 239
9 4,915,300
14 2 4,915,302
45 4,915,301
229 4,915,312
300 4,915,303
473 4,915,304
550 4,915,305

CLASS 241
18 4,915,306
65 4,915,307
152 R 4,915,308
191 4,915,309
197 4,915,310
226 4,915,311

CLASS 242
7 05 B 4,915,313
18 R 4,915,314
43 A 4,915,315
47 01 4,915,323
55 2 4,915,316
56 R 4,915,317
56 2 4,915,318
67 3 R 4,915,319
96 4,915,320
107 4 A 4,915,321
198 4,915,322

CLASS 244
102 R 4,915,324
118 5 4,915,325
129 5 4,915,326
210 4,915,327

CLASS 246
186 4,915,328

CLASS 248
98 4,915,329
99 4,915,330
118 4,915,331
171 4,915,332
181 4,915,333
188 4 4,915,334
188 8 4,915,335
222 1 4,915,336
250 4,915,338
311 2 4,915,337
351 4,915,339
429 4,915,340
500 4,915,341
4,915,342
546 4,915,343

CLASS 249
15 4,915,344
18 4,915,345
91 4,915,346

CLASS 250
211 3 4,916,305
4,916,306
211 R 4,916,303
4,916,304
214 C 4,916,307
221 4,916,308
227 29 4,916,309
236 4,916,310
251 4,916,311
260 4,916,312
282 4,916,313
307 4,916,314
310 4,916,315
327 2 4,916,316
341 4,916,317
461 1 4,916,319
483 1 4,916,320
484 1 4,916,321
492 2 4,916,322
551 4,916,323
561 4,916,324
568 4,916,318
573 4,916,325
578 1 4,916,326

CLASS 251
30 03 4,915,347
122 4,915,348
129 03 4,915,349
129 15 4,915,350
149 1 4,915,351
175 4,915,352
331 4,915,353
334 4,915,354
340 4,915,356
357 4,915,355

CLASS 252
2 4,915,853
8 8 4,915,854
8 9 4,915,855
26 4,915,856
32 7 E 4,915,857
47 5 4,915,858
49 5 4,915,859
51 5 R 4,915,860
62 2 4,915,861
90 4,915,862
102 4,915,863
117 4,915,864
157 4,915,865
174 11 4,915,866
299 5 4,915,867
299 61 4,915,868
301 4 R 4,915,869
313 2 4,915,870
378 R 4,915,871
389 3 4,915,872
402 4,915,873
511 4,915,874

CLASS 254
266 4,915,357
323 4,915,358

CLASS 256
10 4,915,359

CLASS 260
398 5 4,915,876

CLASS 261
111 4,915,877
112 2 4,915,878
122 4,915,879
124 4,915,880
152 4,915,881

CLASS 264
3 4 4,915,883
15 4,915,884
28 4,915,885
41 4,915,886
56 4,915,887
71 4,915,888
83 4,915,889
87 4,915,890
112 4,915,891
138 4,915,892
205 4,915,893
212 4,915,894
258 4,915,895
511 4,915,896
517 4,915,897

CLASS 266
48 4,915,360
249 4,915,361
266 4,915,362

CLASS 267
64 15 4,915,363
64 26 4,915,364
140 1 4,915,365
167 4,915,366

CLASS 269
101 4,915,367

CLASS 270
58 4,915,368

CLASS 271
2 4,915,369
162 4,915,370
164 4,915,372
280 4,915,371

CLASS 272
70 4,915,373
73 4,915,374
4,915,375
4,915,376
93 4,915,396
118 4,915,377
134 4,915,378
4,915,379

CLASS 273
1 5 A 4,915,381
15 A 4,915,380
25 4,915,383
26 R 4,915,384
60 R B1 3,976,295
73 G 4,915,382
164 4,915,385
167 F 4,915,386
187 A 4,915,387
196 4,915,388
232 4,915,389
4,915,390
256 4,915,391
258 4,915,392
292 4,915,393
330 4,915,394

CLASS 277
12 4,915,395
82 B1 4,509,773
206 R 4,915,397
207 R 4,915,398

CLASS 280
11 28 4,915,399
14 2 4,915,400
30 4,915,401
37 4,915,402
221 4,915,403
615 4,915,406

626 4,915,407
634 4,915,405
655 4,915,408
721 4,915,409
732 4,915,410
734 4,915,411
775 4,915,412
801 4,915,413
4,915,414

CLASS 281
15 1 4,915,415

CLASS 285
18 4,915,416
21 4,915,417
24 4,915,418
26 4,915,419
39 4,915,420
4,915,421
4,915,422
91 4,915,423
156 4,915,424
179 4,915,425
286 4,915,426
342 4,915,427

CLASS 290
38 R 4,916,327

CLASS 292
29 4,915,428
113 4,915,429
145 4,915,430
251 5 4,915,431
336 3 4,915,432

CLASS 294
12 4,915,433
74 4,915,434

CLASS 295
36 1 4,915,436
180 2 4,915,441

CLASS 296
37 6 4,915,437
65 1 4,915,438
74 1 4,915,435
98 4,915,439
104 4,915,440
188 4,915,442
216 4,915,443

CLASS 297
68 4,915,444
151 4,915,445
250 4,915,446
284 4,915,447
4,915,448
326 4,915,449
423 4,915,450
468 4,915,451

CLASS 299
17 4,915,452
31 4,915,453
80 4,915,454
91 4,915,455

CLASS 303
9 4,915,456
22 8 4,915,457
40 4,915,458
119 4,915,459

CLASS 307
39 4,916,328
66 4,916,329
264 4,916,330
269 4,916,331
296 4 4,916,332
296 5 4,916,333
4,916,334
306 4,916,335
449 4,916,336
475 4,916,337
495 4,916,338
518 4,916,339

CLASS 310
12 4,916,340
50 4,916,341
51 4,916,342
153 4,916,343
154 4,916,344
208 4,916,345
216 4,916,346
239 4,916,347
313 D 4,916,348
332 4,916,349
338 4,916,350

CLASS 312
138 1 4,915,460
247 4,915,461
250 4,915,462

CLASS 313
25 4,916,351
4,916,352
113 4,916,353
141 4,916,354
233 4,916,355
336 4,916,356
402 4,916,357
479 4,916,358
489 4,916,359
503 4,916,360

CLASS 315
111 21 4,916,361
219 4,916,362
276 4,916,363
290 4,916,364
383 4,916,365
397 4,916,371
411 4,916,366

CLASS 318
60 4,916,367
286 4,916,369
368 4,916,370
437 4,916,372
443 4,916,373
483 4,916,374
630 4,916,375
723 4,916,368
808 4,916,376

CLASS 323
210 4,916,377
222 4,916,378
4,916,379
282 4,916,380
285 4,916,381
299 4,916,382

CLASS 324
71 4 4,916,384
95 4,916,386
96 4,916,387
158 R 4,916,385
4,916,388
158 T 4,916,389
174 4,916,390
207 18 4,916,391
235 4,916,392
244 4,916,393
262 4,916,394
307 4,916,395
309 4,916,396
322 4,916,398
4,916,399
338 4,916,400
536 4,916,401
547 4,916,402
605 4,916,383

CLASS 328
155 4,916,403
233 4,916,404

CLASS 329
308 4,916,405

CLASS 330
151 4,916,407
255 4,916,408
281 4,916,406
294 4,916,409
295 4,916,410

CLASS 331
25 4,916,411
34 4,916,412
68 4,916,413

CLASS 333
11 4,916,414
26 4,916,415
195 4,916,416
204 4,916,417
219 4,916,418

CLASS 335
16 4,916,419
172 4,916,420
185 4,916,421
190 4,916,422
278 4,916,423

CLASS 336
160 4,916,424
177 4,916,425

CLASS 338
4 4,916,426
22 R 4,916,427
62 4,916,428

CLASS 340
436 4,916,429
463 4,916,430
479 4,916,431
518 4,916,432
550 4,916,433
568 4,916,434
573 4,916,435
586 4,916,436
632 4,916,437
636 4,916,438
679 4,916,439
705 B1 3,872,462
706 4,916,440
712 4,916,441
747 4,916,301
814 4,916,442
825 31 4,916,443
825 490 4,916,444
825 570 4,916,446
946 4,916,445
970 4,916,447
4,916,448

CLASS 341
131 4,916,449

CLASS 342
35 4,916,451
71 4,916,450
109 4,916,452
368 4,916,453
373 4,916,454
457 4,916,455

CLASS 343
713 4,916,456
770 4,916,457
771 4,916,458
840 4,916,459
853 4,916,460
872 4,916,461

CLASS 346
1 1 4,916,462
76 PH 4,916,463
107 R 4,916,464
108 4,916,465
136 4,916,466
139 R 4,916,467
140 R 4,916,468
150 4,916,469
160 4,916,470

CLASS 350
1 1 4,915,463
3 69 4,915,464
5 5 4,915,465
96 15 4,915,467
4,915,468
96 16 4,915,469
96 2 4,915,466
96 20 4,915,470
96 21 4,915,471
4,915,472
96 29 4,915,473
96 30 4,915,474
162 2 4,915,475
163 4,915,476
171 4,915,486
174 4,915,487
277 4,915,488
286 4,915,489
320 4,915,490
330 4,915,491
333 4,915,477
338 4,915,478
341 B1 4,726,659
345 4,915,479
350 R 4,915,480
355 4,915,481
4,915,482
418 4,915,483
420 4,915,484
604 4,915,485
632 4,915,492
634 4,915,493
641 4,915,494

CLASS 351
49 4,915,495

CLASS 352
57 4,915,497
69 4,915,496
198 4,916,485

CLASS 354
64 4,916,471
402 4,916,472
4,916,473
412 4,916,474
419 4,916,475
432 4,916,476
436 4,916,477

CLASS 355
27 4,916,478
28 4,916,479
71 4,916,480
75 4,916,481
4,916,482
4,916,483
91 4,916,484
202 4,916,486
208 4,916,487
4,916,488
210 4,916,489
245 4,916,490
246 4,916,491
253 4,916,492
321 4,916,493

CLASS 356
1 4,916,302
5 4,915,498
28 5 4,915,499
221 4,915,500
343 4,915,501
346 4,915,502
350 4,915,503
3 6 4,915,504

CLASS 357
4 4,916,510
13 4,916,494
15 4,916,716
16 4,916,495
17 4,916,496
19 4,916,497
22 4,916,498
4,916,499
23 3 4,916,500
23 6 4,916,511
4,916,524
24 4,916,501
4,916,502
4,916,503
4,916,512
42 4,916,504
43 4,916,505
50 4,916,513
51 4,916,507
59 4,916,508
65 4,916,509
68 4,916,514
4,916,515
4,916,516
4,916,517
70 4,916,506
4,916,518
4,916,519
4,916,397
4,916,520
4,916,521
4,916,522
74 4,916,523

CLASS 358
12 4,916,525
38 4,916,526
4,916,527
B1 4,626,895
44 4,916,528
50 4,916,529
75 4,916,530
4,916,531
83 4,916,532
98 4,916,533
4,916,534
101 4,916,535
107 4,916,536
133 4,916,537
141 4,916,538
142 4,916,539
160 4,916,540
4,916,541
167 4,916,542
217 4,916,543
262 1 4,916,544
296 4,916,546
308 4,916,547
335 4,916,548
456 4,916,545
461 4,916,549
471 4,916,550
483 4,916,551
494 4,916,552

CLASS 360
9 4,916,553
10 2 4,916,554
10 3 4,916,555
45 4,916,556
48 4,916,557
51 4,916,558
57 4,916,559
73 09 4,916,560
74 1 4,916,561
77 06 4,916,562
105 B1 3,842,432
122 4,916,563
128 4,916,564
132 4,916,565
4,916,566
133 4,916,567
137 4,916,568

CLASS 361
18 4,916,569
86 4,916,570
91 4,916,572
93 4,916,573
227 4,916,571
321 4,916,582
361 4,916,574
386 4,916,575
393 4,916,576
417 4,916,577
424 4,916,578

CLASS 362
18 4,916,579
29 4,916,580
34 4,916,581
61 4,916,583
4,916,584
4,916,585
4,916,586
66 4,916,587
74 4,916,591
80 4,916,592
80 1 4,916,593
108 4,916,594
142 4,916,595
190 4,916,596
203 4,916,588
233 4,916,597
250 4,916,589

CLASS 363
28 4,916,590
55 4,916,598
65 4,916,599

CLASS 364
130 4,916,600
200 4,916,601
4,916,602
4,916,603
4,916,604
4,916,605
4,916,606
4,916,607
4,916,608
4,916,609
300 4,916,610
400 4,916,613
401 4,916,611
419 4,916,614
421 4,916,615
422 4,916,616
4,916,617
424 01 4,916,612
426 02 4,916,618
4,916,619
436 4,916,621
459 4,916,622
464 02 4,916,623
470 4,916,624
4,916,625
474 22 4,916,639
480 4,916,626
490 4,916,627
492 4,916,628
496 4,916,630
502 4,916,631
507 4,916,629
508 4,916,632
513 4,916,633
4,916,634
4,916,635
4,916,636
4,916,637
519 4,916,638
521 4,916,640
550 4,916,641
4,916,642
557 4,916,643
565 4,916,644
571 04 4,916,645
574 4,916,646
578 4,916,647
726 4,916,649
733 4,916,650
736 4,916,651
748 4,916,652
784 4,916,653
900 4,916,654
4,916,655
4,916,656
4,916,657
4,916,658
4,916,659
4,916,660

CLASS 365
51 4,916,661
52 4,916,662
161 4,916,663
183 4,916,664
185 4,916,665
207 4,916,666
4,916,667
4,916,668
230 01 4,916,669
233 4,916,670
4,916,671

CLASS 366
130 4,916,672
136 4,915,505
146 4,915,506
171 4,915,509

CLASS 367
35 4,916,648
69 4,916,673
141 4,916,674
153 4,916,675

CLASS 368
80 4,916,676
113 4,916,677
4,916,678
283 4,916,679

CLASS 369
13 4,916,680
14 4,916,681
32 4,916,682
33 4,916,683
43 4,916,684
47 4,916,685
59 4,916,686
111 4,916,687
126 4,916,688

CLASS 370
4 4,916,689
60 4,916,690
4,916,691
84 4,916,693
85 1 4,916,692
94 4,916,694

CLASS 371
9 1 4,916,695
11 3 4,916,696
14 4,916,697
16 3 4,916,698
17 4,916,699
21 1 4,916,700
37 7 4,916,701
39 1 4,916,702
51 1 4,916,703
68 3 4,916,704

CLASS 372
20 4,916,705
31 4,916,706
38 4,916,707
45 4,916,708
46 4,916,709
50 4,916,710
53 4,916,711
66 4,916,712
109 4,916,713

CLASS 373
120 4,916,714

CLASS 374
29 4,916,715
115 4,915,507
166 4,915,508

CLASS 375
107 4,916,717

CLASS 378
4 4,916,718
46 4,916,719
81 4,916,720
84 4,916,721
99 4,916,722
146 4,916,723
168 4,916,724
177 4,916,725
207 4,916,727

CLASS 379
59 4,916,728
61 4,916,729
70 4,916,730
88 4,916,726
96 4,916,731
100 4,916,732
132 4,916,733
399 4,916,734
413 4,916,735

CLASS 380
11 4,916,736
20 4,916,737
25 4,916,738
54 4,916,739

CLASS 381
13 4,916,741
30 4,916,742
45 4,916,743

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CLASS 382
6 4,916,745
46 4,916,746
47 4,916,747
53 4,916,744
59 4,916,740

CLASS 384
99 4,915,510
4,916,748
127 4,915,511
298 4,916,749
446 4,915,512
447 4,915,513
465 4,915,515
484 4,916,750
516 4,916,751
616 4,915,514

CLASS 400
120 4,915,516
4,915,519
124 4,915,517
4,915,524
279 4,915,520
583 4,915,525
642 4,915,526
681 4,915,518
697 4,915,546

CLASS 401
56 4,915,521
60 4,915,527
68 4,915,528
202 4,915,529

CLASS 402
79 4,915,522

CLASS 403
11 4,915,523
158 4,915,530
171 4,915,532
4,915,533
189 4,915,534
191 4,915,535
267 4,915,536
277 4,915,537
337 4,915,531
362 4,915,538

CLASS 404
31 4,915,539

CLASS 405
53 4,915,545
132 4,915,540
146 4,915,541
150 4,915,542
156 4,915,543
243 4,915,544

CLASS 406
87 4,915,547

CLASS 407
114 4,915,548

CLASS 408
43 4,915,549
56 4,915,550
72 R 4,915,551
125 4,915,552
240 4,915,555

CLASS 409
233 4,915,553

CLASS 410
110 4,915,556

CLASS 411
107 4,915,557
179 4,915,558
366 4,915,559
386 4,915,560
439 4,915,561

CLASS 413
69 4,915,562

CLASS 414
1 4,915,563
217 4,915,564
255 4,915,565
276 4,915,566
345 4,915,567
401 4,915,568
4,915,569
409 4,915,570
414 4,915,571
416 4,915,572
476 4,915,573
540 4,915,574
680 4,915,575
703 4,915,576
786 4,915,577
797.6 4,915,578

CLASS 415
2.1 4,915,580
55.1 4,915,582
171.1 4,915,579
206 4,915,583
213.1 4,915,581

CLASS 416
64 4,915,584
89 4,915,586
140 4,915,585
189 4,915,588
220 R 4,915,587
225 4,915,590
241 B 4,915,589

CLASS 417
18 4,915,591
206 4,915,592
245 4,915,593
265 4,915,594
273 4,915,595
4,915,596
313 4,915,597
380 4,915,598
393 4,915,599
440 4,915,600
472 4,915,601
503 4,915,602

CLASS 418
83 4,915,603
94 4,915,554
201 4,915,604

CLASS 419
3 4,915,898
6 4,915,605
8 4,915,599

CLASS 420
84 4,915,900
119 4,915,901
129 4,915,902
4,915,903
418 4,915,904
4,915,905
441 4,915,906
448 4,915,907
590 4,915,908

CLASS 421
101 4,915,945

CLASS 422
28 4,915,909
53 4,915,910
72 4,915,911
119 4,915,913
160 4,915,912
168 4,915,914
186 4,915,916
186.05 4,915,917
186.24 4,915,915
249 4,915,775
292 4,915,918
295 4,915,606

CLASS 423
89 4,915,919
239 4,915,920
4,915,921
4,915,922
242 4,915,071
335 4,915,923
345 4,915,924
447.1 4,915,925
4,915,926
472 4,915,927
510 4,915,928
580 4,915,929
629 4,915,930

CLASS 424
1.1 4,915,931
4,915,932
9 4,915,933
45 4,915,934
47 4,915,935
49 4,915,936
52 4,915,937
70 4,915,938
76.21 4,915,939
81 4,915,940
85.5 4,915,941
88 4,915,942
93 4,915,943
4,915,944
195.1 4,915,946
408 4,915,947
435 4,915,948
438 4,915,949
448 4,915,950
450 4,915,951
467 4,915,952
473 4,915,953
4,915,954
616 4,915,955
649 4,915,956
667 4,915,973
690 4,915,957

CLASS 425
116 4,915,607
121 4,915,608
384 4,915,609
458 4,915,610
464 4,915,612
556 4,915,611

CLASS 426
3 4,915,958
13 4,915,959
31 4,915,960
4,915,961
74 4,915,962
113 4,915,963
282 4,915,964
4,915,965
451 4,915,966
489 4,915,967
513 4,915,968
548 4,915,969
573 4,915,970
578 4,915,971
598 4,915,972
611 4,915,974

CLASS 427
8 4,915,975
4,915,976
37 4,915,977
38 4,915,978
39 4,915,979
53.1 4,915,980
4,915,981
69 4,915,982
98 4,915,983
113 4,915,984
126.6 4,915,985
164 4,915,986
180 4,915,987
252 4,915,988
434.2 4,915,989

CLASS 428
34.9 4,915,990
35.8 4,915,991
36.92 4,915,992
40 4,915,993
4,915,994
4,915,995
4,915,996
64 4,915,997
76 4,915,998
95 4,915,999
105 4,916,000
116 4,916,001
139 4,916,002
174 4,916,003
192 4,916,004
4,916,005
195 4,916,006
203 4,916,007
205 4,916,008
220 4,916,009
283 4,916,010
323 4,916,024
B1 4,349,601
341 4,916,011
367 4,916,012
374 4,916,013
403 4,916,014
408 4,916,015
411.1 4,916,016
413 4,916,017
414 4,916,018
418 4,916,019
421 4,916,020
425.9 4,916,021
447 4,916,038
482 4,916,023
516 4,916,025
555 4,915,026
586 4,916,027
614 4,916,028
4,916,029
4,916,030
623 4,916,022
626 4,916,031
683 4,916,032

CLASS 429
49 4,916,033
86 4,916,034
111 4,916,035
127 4,916,036

CLASS 430
57 4,916,039
72 4,916,040
138 4,916,041
4,916,042
203 4,916,043
216 4,916,044
270 4,916,045
281 4,916,046
353 4,916,047
523 4,916,048
531 4,916,049
546 4,916,050
558 4,916,051
567 4,916,052
599 4,916,053
636 4,916,054

CLASS 431
6 4,915,613
25 4,915,614
41 4,915,615
126 4,915,616
173 4,915,617
267 4,915,618
284 4,915,619
347 4,915,620
350 4,915,621

CLASS 432
59 4,915,624
64 4,915,622
139 4,915,623

CLASS 433
8 4,915,625
31 4,915,626
155 4,915,627
173 4,915,628
4,915,629
215 4,915,630

CLASS 434
112 4,915,632
159 4,915,633
209 4,915,634
396 4,915,635

CLASS 435
7 4,916,055
4,916,056
4,916,057
10 4,916,058
15 4,916,059
29 4,916,060
34 4,916,061
68.1 4,916,062
71.3 4,916,063
99 4,916,064
119 4,916,065
134 4,916,066
136 4,916,067
138 4,916,068
147 4,916,069
172.2 4,916,070
212 4,916,071
240.27 4,916,072
252.3 4,916,073
280 4,916,074
291 4,916,075

CLASS 436
6 4,916,076
160 4,916,077
165 4,916,078
174 4,916,079
518 4,916,080
526 4,916,081

CLASS 437
20 4,916,082
31 4,916,083
41 4,916,084
44 4,916,085
62 4,916,086
67 4,916,087
81 4,916,088
4,916,089
141 4,916,090
238 4,916,091

CLASS 439
65 4,915,636
76 4,915,637
142 4,915,638
188 4,915,639
191 4,915,640
247 4,915,641
257 4,915,667
352 4,915,642
357 4,915,643
417 4,915,645
425 4,915,646
441 4,915,647
490 4,915,648
4,915,649
498 4,915,650
578 4,915,651
595 4,915,654
607 4,915,652
676 4,915,655
729 4,915,656
781 4,915,653
879 4,915,657

CLASS 440
69 4,915,668

CLASS 441
76 4,915,659
127 4,915,662

CLASS 445
30 4,915,658

CLASS 446
48 4,915,661
62 4,915,664
66 4,915,665
207 4,915,660
219 4,915,663
221 4,915,669
242 4,915,666

CLASS 455
344 4,915,670

CLASS 460
59 4,915,671

CLASS 464
145 4,915,672

CLASS 474
49 4,915,673
153 4,915,674
213 4,915,675
4,915,676
242 4,915,677

CLASS 475
71 4,914,978
89 4,914,980
221 4,914,979

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CLASS 494
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01	4,914,759	4,915,153	4,915,713	4,916,526	4,915,839	4,915,552
	4,915,166	4,915,169	4,915,718	4,916,532	4,915,873	4,915,581
	4,915,450	4,915,179	4,915,744	4,916,555	4,915,886	4,915,587
	4,915,731	4,915,184	4,915,745	4,916,556	4,915,907	4,915,695
	4,915,754	4,915,185	4,915,753	4,916,572	4,915,935	4,915,699
	4,915,883	4,915,222	4,915,755	4,916,590	4,915,981	4,915,784
02	4,914,922	4,915,233	4,915,757	4,916,593	4,915,998	4,915,823
04	4,914,768	4,915,245	4,915,786	4,916,638	4,916,184	4,915,915
	4,914,794	4,915,251	4,915,816	4,916,641	4,916,206	4,915,936
	4,914,813	4,915,255	4,915,828	4,916,642	4,916,209	4,916,094
	4,914,837	4,915,257	4,915,843	4,916,647	4,916,217	4,916,382
	4,914,906	4,915,284	4,915,848	4,916,654	4,916,226	4,916,410
	4,915,113	4,915,288	4,915,852	4,916,672	4,916,271	4,916,455
	4,915,300	4,915,292	4,915,928	4,916,679	4,916,274	4,916,497
	4,915,346	4,915,294	4,915,949	4,916,686	4,916,278	4,916,599
	4,915,393	4,915,302	4,915,950	4,916,688	4,916,319	4,916,610
	4,915,644	4,915,325	4,915,951	4,916,694	4,916,332	4,916,692
	4,915,650	4,915,335	4,915,952	4,916,701	4,916,576	4,916,717
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	4,916,082	4,915,377	4,915,964	4,916,739	4,916,657	4,914,825
	4,916,579	4,915,385	4,915,986	4,509,773	10 4,915,133	4,914,862
	4,916,605	4,915,409	4,915,990	08 4,914,887	4,915,630	4,914,866
	4,916,680	4,915,417	4,916,002	4,915,051	4,915,736	4,914,985
05	4,915,226	4,915,422	4,916,015	4,915,215	4,915,840	4,915,161
	4,915,930	4,915,424	4,916,021	4,915,252	4,915,926	4,915,334
06	4,914,754	4,915,432	4,916,027	4,915,387	4,916,016	4,915,472
	4,914,763	4,915,435	4,916,036	4,915,429	4,916,110	4,915,568
	4,914,783	4,915,463	4,916,038	4,915,505	4,916,113	4,915,660
	4,914,786	4,915,468	4,916,088	4,915,579	4,916,129	4,915,766
	4,914,868	4,915,473	4,916,091	4,915,763	4,916,198	4,915,988
	4,914,893	4,915,476	4,916,213	4,916,275	4,916,625	4,915,999
	4,914,910	4,915,483	4,916,238	4,916,409	12 4,914,756	4,916,122
	4,914,915	4,915,500	4,916,296	4,916,435	4,914,758	4,916,539
	4,914,933	4,915,503	4,916,320	4,916,441	4,914,767	4,916,574
	4,914,955	4,915,522	4,916,329	09 4,914,755	4,914,822	15 4,915,052
	4,914,956	4,915,526	4,916,337	4,914,816	4,914,832	4,915,337
	4,914,964	4,915,549	4,916,350	4,914,872	4,914,851	4,916,294
	4,914,969	4,915,555	4,916,361	4,914,904	4,914,853	4,916,505
	4,914,994	4,915,557	4,916,380	4,914,918	4,914,859	16 4,915,437
	4,915,005	4,915,559	4,916,398	4,914,935	4,914,885	4,915,517
	4,915,038	4,915,574	4,916,399	4,914,944	4,914,894	4,915,597
	4,915,046	4,915,590	4,916,418	4,915,012	4,914,953	4,915,730
	4,915,048	4,915,596	4,916,450	4,915,032	4,914,976	4,916,570
	4,915,053	4,915,605	4,916,457	4,915,036	4,915,216	17 4,914,781
	4,915,056	4,915,631	4,916,463	4,915,100	4,915,227	4,914,784
	4,915,090	4,915,659	4,916,471	4,915,196	4,915,228	4,914,829
	4,915,091	4,915,664	4,916,484	4,915,319	4,915,237	4,914,833
	4,915,096	4,915,671	4,916,498	4,915,512	4,915,295	4,914,841
	4,915,103	4,915,689	4,916,509	4,915,528	4,915,392	4,914,844
	4,915,121	4,915,693	4,916,514	4,915,560	4,915,452	4,914,845
	4,915,124	4,915,694	4,916,523	4,915,709	4,915,494	4,914,890
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4,915,016	4,915,440	4,915,680	4,916,135	4,915,444	4,915,018
4,915,072	4,915,488	4,915,697	4,916,139	4,915,471	4,915,031
4,915,075	4,915,705	4,915,751	4,916,142	4,915,714	4,915,037
4,915,119	4,916,192	4,915,875	4,916,145	4,915,812	4,915,054
4,915,146	4,916,245	4,915,898	4,916,154	4,915,824	4,915,127
4,915,200	4,916,711	4,915,912	4,916,161	4,916,011	4,915,242
4,915,221	23 4,915,381	4,915,970	4,916,193	4,916,199	4,915,270
4,915,240	4,915,914	4,916,095	4,916,207	4,916,218	4,915,285
4,915,248	24 4,914,854	4,916,115	4,916,222	4,916,364	4,915,316
4,915,258	4,914,855	4,916,141	4,916,239	4,916,429	4,915,344
4,915,261	4,915,047	4,916,163	4,916,241	38 4,916,724	4,915,356
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4,915,266	4,915,167	4,916,200	4,916,622	4,914,775	4,915,455
4,915,268	4,915,180	4,916,201	4,916,691	4,914,777	4,915,496
4,915,282	4,915,386	4,916,229	4,916,705	4,914,863	4,915,610
4,915,293	4,915,478	4,916,251	3,842,432	4,914,864	4,915,622
4,915,305	4,915,684	4,916,284	3,872,462	4,914,869	4,915,633
4,915,320	4,915,827	4,916,345	4,626,895	4,914,937	4,915,638
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4,915,576	4,915,917	4,916,719	4,914,804	4,915,260	4,915,830
4,915,593	4,915,982	27 4,914,792	4,914,810	4,915,269	4,915,891
4,915,641	4,916,029	4,914,834	4,914,812	4,915,290	4,915,925
4,915,647	4,916,030	4,914,861	4,914,814	4,915,303	4,915,976
4,915,701	4,916,105	4,914,876	4,914,930	4,915,308	4,915,994
4,915,719	4,916,309	4,914,877	4,914,987	4,915,313	4,916,014
4,915,758	4,916,407	4,915,063	4,914,995	4,915,353	4,916,071
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4,915,804	4,914,836	4,915,104	4,915,006	4,915,402	4,916,101
4,915,825	4,915,112	4,915,148	4,915,009	4,915,427	4,916,108
4,915,859	4,915,125	4,915,492	4,915,101	4,915,445	4,916,162
4,915,870	4,915,238	4,915,613	4,915,219	4,915,461	4,916,171
4,915,879	4,915,390	4,915,657	4,915,235	4,915,487	4,916,181
4,915,880	4,915,391	4,915,781	4,915,272	4,915,569	4,916,223
4,915,909	4,915,573	4,915,838	4,915,301	4,915,584	4,916,248
4,915,956	4,915,577	4,915,872	4,915,329	4,915,594	4,916,387
4,915,963	4,915,634	4,916,057	4,915,415	4,915,619	4,916,454
4,916,004	4,915,663	4,916,169	4,915,467	4,915,661	4,916,461
4,916,056	4,915,700	4,916,224	4,915,482	4,915,665	4,916,596
4,916,068	4,915,765	4,916,270	4,915,497	4,915,698	44 4,915,220
4,916,250	4,915,810	4,916,362	4,915,519	4,915,746	4,915,690
4,916,262	4,915,847	4,916,381	4,915,612	4,915,761	45 4,914,760
4,916,264	4,915,938	4,916,386	4,915,626	4,915,854	4,914,840
4,916,267	4,915,983	4,916,575	4,915,628	4,915,858	4,915,787
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4,916,569	4,916,322	4,914,843	4,915,887	4,916,151	4,916,183
4,916,573	4,916,351	4,914,847	4,915,942	4,916,166	4,916,205
4,916,628	4,916,356	4,915,001	4,915,974	4,916,187	4,916,354
18 4,914,819	4,916,453	4,915,106	4,915,995	4,916,188	3,976,295
4,914,928	4,916,506	4,915,566	4,915,996	4,916,202	48 4,914,798
4,914,934	4,916,515	4,915,662	4,916,025	4,916,235	4,914,823
4,915,015	4,916,531	4,915,752	4,916,028	4,916,258	4,914,826
4,915,069	4,916,584	4,915,782	4,916,052	4,916,344	4,914,899
4,915,130	4,916,603	4,915,783	4,916,083	4,916,353	4,914,943
4,915,274	4,916,635	4,916,712	4,916,112	4,916,363	4,915,020
4,915,446	4,916,674	31 4,915,135	4,916,127	4,916,434	4,915,029
4,915,536	4,916,704	4,915,696	4,916,137	4,916,448	4,915,137
4,915,578	26 4,914,799	32 4,915,332	4,916,150	4,916,594	4,915,168
4,915,586	4,914,827	4,915,836	4,916,185	4,916,698	4,915,172
4,915,675	4,914,852	33 4,914,860	4,916,189	4,916,715	4,915,173
4,915,895	4,914,865	4,915,057	4,916,194	4,916,718	4,915,175
4,915,989	4,914,871	4,915,139	4,916,237	4,916,725	4,915,177
4,916,265	4,914,873	4,915,394	4,916,259	4,916,727	4,915,195
4,916,281	4,914,883	4,916,273	4,916,260	4,916,749	4,915,206
4,916,327	4,914,916	4,916,352	4,916,266	4,349,601	4,915,234
4,916,358	4,914,970	4,916,601	4,916,287	40 4,914,989	4,915,273
4,916,366	4,914,998	4,916,633	4,916,331	4,915,171	4,915,275
4,916,586	4,915,003	4,916,716	4,916,346	4,916,179	4,915,345
19 4,914,800	4,915,004	34 4,914,846	4,916,349	4,916,314	4,915,376
4,914,807	4,915,033	4,914,879	4,916,414	4,916,615	4,915,419
4,914,821	4,915,084	4,914,957	4,916,430	4,916,631	4,915,426
4,914,857	4,915,087	4,914,960	4,916,436	4,916,673	4,915,470
4,915,014	4,915,088	4,915,061	4,916,476	4,916,678	4,915,541
4,915,095	4,915,134	4,915,170	4,916,483	41 Re.33,196	4,915,565
4,915,157	4,915,136	4,915,256	4,916,485	4,914,838	4,915,607
4,915,186	4,915,202	4,915,276	4,916,493	4,915,055	4,915,629
4,915,193	4,915,204	4,915,411	4,916,513	4,915,120	4,915,668
4,915,310	4,915,279	4,915,491	4,916,545	4,915,331	4,915,691
4,915,447	4,915,287	4,915,564	4,916,551	4,915,466	4,915,707
4,915,575	4,915,321	4,915,652	4,916,561	4,916,306	4,915,725
4,915,595	4,915,351	4,915,728	4,916,577	4,916,308	4,915,777
4,915,670	4,915,354	4,915,797	4,916,597	4,916,338	4,915,794
4,915,929	4,915,358	4,915,805	4,916,608	4,916,415	4,915,795
4,916,219	4,915,384	4,915,845	4,916,618	4,916,431	4,915,807
4,916,419	4,915,395	4,915,849	4,916,652	4,916,443	4,915,877
20 4,915,058	4,915,410	4,915,855	4,916,697	4,916,467	4,915,890
4,915,826	4,915,413	4,915,866	4,916,703	4,916,536	4,915,896
4,915,829	4,915,421	4,915,897	4,916,737	4,916,543	4,915,918
4,916,230	4,915,433	4,915,948	4,916,738	4,916,677	4,916,020
4,916,290	4,915,456	4,915,958	4,916,745	42 4,914,774	4,916,033
21 4,914,920	4,915,460	4,915,985	4,916,746	4,914,793	4,916,055
4,915,687	4,915,489	4,916,000	8,273,012	4,914,811	4,916,077

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	4,916,079		4,916,617		4,914,974		4,915,250
	4,916,118		4,916,630		4,914,975		4,915,326
	4,916,123		4,916,648		4,915,155		4,915,379
	4,916,158		4,916,651		4,915,225		4,915,401
	4,916,159		4,916,658		4,915,232		4,915,453
	4,916,164		4,916,728		4,915,481		4,915,534
	4,916,190		4,916,733		4,915,504		4,915,567
	4,916,203	49	4,914,888		4,915,636		4,915,600
	4,916,208		4,915,023		4,915,846		4,915,656
	4,916,210		4,915,338		4,915,913		4,915,712
	4,916,227		4,915,382		4,916,303		4,915,771
	4,916,301		4,915,685		4,916,444		4,915,802
	4,916,336		4,916,405	53	4,914,789		4,915,856
	4,916,394	50	4,914,967		4,914,849		4,916,076
	4,916,400		4,915,102		4,914,856		4,916,401
	4,916,445		4,915,158		4,914,875		4,916,447
	4,916,511		4,916,519		4,915,059		4,916,538
	4,916,524		4,916,627		4,915,109		4,916,581
	4,916,578		4,914,973		4,915,164		4,916,612
	4,916,616	51					

	4,916,621		4,915,502
	4,916,629		4,915,553
54	4,915,454		4,915,603
	4,916,243		4,915,632
55	Re 33,195		4,915,683
	4,914,776		4,915,726
	4,914,898		4,915,767
	4,914,911		4,915,769
	4,914,971		4,915,876
	4,915,068		4,915,971
	4,915,085		4,916,005
	4,915,203		4,916,034
	4,915,214		4,916,279
	4,915,224		4,916,370
	4,915,263		4,916,640
	4,915,283		4,916,689
	4,915,343		4,916,726
	4,915,347	56	4,915,035
	4,915,441		4,915,050

DESIGN PATENTS

01	307,167		307,208		307,126	31	307,160		307,149		307,122
04	307,081		307,209	19	307,206		307,187		307,182	48	307,074
	307,083	08	307,133	22	307,085	34	307,091		307,183		307,084
	307,110		307,181	25	307,072		307,112	39	307,103		307,094
	307,200		307,195		307,128		307,113		307,159		307,107
06	307,075	12	307,101	26	307,073		307,138		307,188		307,123
	307,097		307,137		307,086		307,202		307,196		307,184
	307,099		307,173		307,117	36	307,136		307,204	51	307,095
	307,111	13	307,109		307,165		307,158	40	307,172		307,191
	307,115	17	307,079		307,179		307,180	41	307,153		307,197
	307,161		307,082		307,186		307,192		307,171	53	307,127
	307,162		307,088	27	307,071		307,207	42	307,116	55	307,193
	307,168		307,203		307,087	37	307,077	45	307,121		307,205
	307,201	18	307,070	29	307,089						

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34	7,217	39	7,216	41	7,219		

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GENERAL INFORMATION concerning PATENTS
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of March 1, 1990, and was announced in the *Official Gazette* at 1111 O.G. 24 on Feb. 20, 1990.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1242.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Jan. 26, 1990

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on April 14, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,656,667 through 4,658,440
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on April 12, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,379,349 through 4,380,089
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JANUARY 28, 1990
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,312,467	06/224,629	1/26/82
4,312,749	06/258,165	1/26/82
4,312,759	06/215,695	1/26/82
4,312,959	06/234,525	1/26/82
4,566,142	06/501,131	1/28/82
4,566,155	06/615,909	1/28/86
4,566,157	06/622,791	1/28/86
4,566,159	06/515,120	1/28/86
4,566,169	06/559,904	1/28/86
4,566,187	06/608,650	1/28/86
4,566,190	06/697,729	1/28/86
4,566,191	06/601,566	1/28/86
4,566,198	06/639,677	1/28/86
4,566,200	06/671,996	1/28/86
4,566,202	06/558,624	1/28/86
4,566,203	06/637,965	1/28/86
4,566,206	06/600,886	1/28/86
4,566,209	06/627,914	1/28/86
4,566,211	06/664,543	1/28/86
4,566,213	06/607,215	1/28/86
4,566,214	06/583,649	1/28/86
4,566,216	06/669,639	1/28/86
4,566,217	06/366,044	1/28/86
4,566,219	06/624,207	1/28/86
4,566,221	06/637,493	1/28/86
4,566,227	06/625,236	1/28/86
4,566,230	06/621,483	1/28/86
4,566,235	06/549,616	1/28/86
4,566,239	06/538,511	1/28/86
4,566,246	06/619,230	1/28/86
4,566,247	06/579,270	1/28/86
4,566,253	06/613,229	1/28/86
4,566,265	06/631,175	1/28/86
4,566,271	06/551,175	1/28/86
4,566,274	06/538,415	1/28/86
4,566,275	06/681,696	1/28/86
4,566,277	06/365,208	1/28/86
4,566,283	06/646,561	1/28/86
4,566,291	06/660,549	1/28/86
4,566,296	06/633,059	1/28/86
4,566,303	06/620,372	1/28/86
4,566,304	06/458,958	1/28/86
4,566,307	06/666,122	1/28/86
4,566,315	06/638,248	1/28/86
4,566,321	06/692,576	1/28/86
4,566,329	06/692,546	1/28/86
4,566,336	06/508,458	1/28/86
4,566,344	06/561,864	1/28/86
4,566,346	06/441,532	1/28/86
4,566,349	06/539,697	1/28/86
4,566,351	06/541,636	1/28/86
4,566,352	06/669,637	1/28/86
4,566,353	06/468,156	1/28/86
4,566,357	06/564,846	1/28/86
4,566,365	06/658,358	1/28/86
4,566,373	06/557,883	1/28/86
4,566,377	06/624,208	1/28/86
4,566,382	06/701,251	1/28/86
4,566,393	06/580,329	1/28/86
4,566,394	06/740,683	1/28/86
4,566,397	06/731,337	1/28/86
4,566,411	06/475,178	1/28/86
4,566,418	06/645,766	1/28/86
4,566,421	06/539,881	1/28/86
4,566,447	06/280,152	1/28/86
4,566,449	06/547,009	1/28/86
4,566,451	06/510,233	1/28/86
4,566,455	06/593,861	1/28/86
4,566,461	06/466,671	1/28/86
4,566,464	06/286,851	1/28/86
4,566,473	06/482,055	1/28/86
4,566,478	06/613,439	1/28/86
4,566,491	06/571,776	1/28/86
4,566,502	06/626,347	1/28/86
4,566,503	06/560,846	1/28/86
4,566,508	06/682,088	1/28/86
4,566,518	06/531,048	1/28/86
4,566,523	06/500,761	1/28/86
4,566,533	06/471,014	1/28/86
4,566,543	06/521,932	1/28/86
4,566,553	06/647,653	1/28/86
4,566,555	06/579,690	1/28/86
4,566,556	06/607,801	1/28/86
4,566,558	06/703,728	1/28/86
4,566,561	06/594,232	1/28/86
4,566,563	06/671,806	1/28/86
4,566,565	06/605,628	1/28/86
4,566,566	06/648,323	1/28/86

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Patent Number	Serial Number	Issue Date
4,566,569	06/598,302	1/28/86
4,566,571	06/578,814	1/28/86
4,566,579	06/614,999	1/28/86
4,566,588	06/548,036	1/28/86
4,566,590	06/648,000	1/28/86
4,566,591	06/644,779	1/28/86
4,566,595	06/483,170	1/28/86
4,566,602	06/686,302	1/28/86
4,566,604	06/561,162	1/28/86
4,566,606	06/499,764	1/28/86
4,566,607	06/613,789	1/28/86
4,566,609	06/596,341	1/28/86
4,566,612	06/532,638	1/28/86
4,566,614	06/541,053	1/28/86
4,566,617	06/630,856	1/28/86
4,566,623	06/624,838	1/28/86
4,566,628	06/585,897	1/28/86
4,566,636	06/707,531	1/28/86
4,566,645	06/702,446	1/28/86
4,566,650	06/515,131	1/28/86
4,566,651	06/518,366	1/28/86
4,566,662	06/617,923	1/28/86
4,566,665	06/632,692	1/28/86
4,566,669	06/560,604	1/28/86
4,566,670	06/653,270	1/28/86
4,566,681	06/412,320	1/28/86
4,566,695	06/476,034	1/28/86
4,566,696	06/518,625	1/28/86
4,566,697	06/568,789	1/28/86
4,566,701	06/533,844	1/28/86
4,566,716	06/571,070	1/28/86
4,566,717	06/588,651	1/28/86
4,566,721	06/578,553	1/28/86
4,566,722	06/684,809	1/28/86
4,566,725	06/579,193	1/28/86
4,566,739	06/637,271	1/28/86
4,566,743	06/619,027	1/28/86
4,566,744	06/508,611	1/28/86
4,566,747	06/634,605	1/28/86
4,566,749	06/639,242	1/28/86
4,566,752	06/701,909	1/28/86
4,566,768	06/544,737	1/28/86
4,566,781	06/510,281	1/28/86
4,566,783	06/609,424	1/28/86
4,566,790	06/485,174	1/28/86
4,566,791	06/547,239	1/28/86
4,566,799	06/717,593	1/28/86
4,566,809	06/579,591	1/28/86
4,566,814	06/482,458	1/28/86
4,566,838	06/521,947	1/28/86
4,566,842	06/605,302	1/28/86
4,566,844	06/560,363	1/28/86
4,566,853	06/507,431	1/28/86
4,566,872	06/619,309	1/28/86
4,566,887	06/531,252	1/28/86
4,566,890	06/682,401	1/28/86
4,565,899	06/560,922	1/28/86
4,566,900	06/445,702	1/28/86
4,566,906	06/602,202	1/28/86
4,566,922	06/687,386	1/28/86
4,566,932	06/621,560	1/28/86
4,566,948	06/684,367	1/28/86
4,566,950	06/730,883	1/28/86
4,566,955	06/631,946	1/28/86
4,566,986	06/646,012	1/28/86
4,566,992	06/335,282	1/28/86
4,567,013	06/534,717	1/28/86
4,567,016	06/507,464	1/28/86
4,567,025	06/525,590	1/28/86
4,567,026	06/664,359	1/28/86
4,567,032	06/741,580	1/28/86
4,567,045	06/572,714	1/28/86
4,567,054	06/730,479	1/28/86
4,567,067	06/726,684	1/28/86
4,567,068	06/587,766	1/28/86
4,567,074	06/714,476	1/28/86
4,567,092	06/539,950	1/28/86
4,567,094	06/590,640	1/28/86
4,567,141	06/488,036	1/28/86
4,567,146	06/318,417	1/28/86
4,567,156	06/728,485	1/28/86
4,567,161	06/508,664	1/28/86
4,567,172	06/498,636	1/28/86
4,567,174	06/607,703	1/28/86
4,567,192	06/605,138	1/28/86
4,567,196	06/667,909	1/28/86
4,567,201	06/440,297	1/28/86
4,567,220	06/664,838	1/28/86
4,567,252	06/492,240	1/28/86
4,567,253	06/576,981	1/28/86
4,567,260	06/509,764	1/28/86
4,567,268	06/596,333	1/28/86
4,567,285	06/753,537	1/28/86
4,567,317	06/511,452	1/28/86
4,567,320	06/488,649	1/28/86
4,567,330	06/620,735	1/28/86
4,567,332	06/606,897	1/28/86
4,567,334	06/466,341	1/28/86
4,567,337	06/568,031	1/28/86
4,567,338	06/625,721	1/28/86
4,567,369	06/504,947	1/28/86
4,567,377	06/444,839	1/28/86
4,567,404	06/562,919	1/28/86
4,567,406	06/609,788	1/28/86
4,567,421	06/539,385	1/28/86
4,567,452	06/591,651	1/28/86
4,567,471	06/521,615	1/28/86
4,567,475	06/481,375	1/28/86
4,567,477	06/647,266	1/28/86
4,567,479	06/452,687	1/28/86
4,567,484	06/611,926	1/28/86
4,567,489	06/568,095	1/28/86
4,567,492	06/413,168	1/28/86
4,567,504	06/589,392	1/28/86
4,567,511	06/614,320	1/28/86
4,567,514	06/583,700	1/28/86
4,567,515	06/486,767	1/28/86
4,567,519	06/591,479	1/28/86
4,567,528	06/549,197	1/28/86
4,567,531	06/401,587	1/28/86
4,567,547	06/655,709	1/28/86
4,567,550	06,604,737	1/28/86
4,567,554	06/503,115	1/28/86
4,567,571	06/702,112	1/28/86
4,567,592	06/528,378	1/28/86
4,567,601	06/514,956	1/28/86
4,567,607	06/554,385	1/28/86

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,331,739, Re. S. N. 07/485,791, Filed Feb. 22, 1990, Cl. 428, AMORPHOUS METALLIC STRIPS, Mandayam C. Narasimhan, Owner of Record: *Allied Signal, Inc., Morristown, N.J.*, Attorney or Agent: Ernest D. Buff, Ex. Gp.: 111

4,470,614, Re. S. N. 07/489,344, Filed Mar. 5, 1990, Cl. 280/605, SKI BRAKE, Gerhard J. Sedlmair, Owner of Record: *Marker International Company, Salt Lake City, Utah*, Attorney or Agent: D. Peter Hochberg, Ex. Gp.: 316

4,564,102, Re. S. N. 07/454,860, Filed Dec. 22, 1989, Cl. 198/341, METHOD AND APPARATUS FOR TRANSPORTATION OF MATERIALS, Kinji Mori, et al., Owner of Record: *Hitachi Ltd., Tokyo, Japan*, Attorney or Agent: James F. Mckeown, Ex. Gp.: 317

4,582,181, Re. S. N. 07/482,191, Filed Feb. 20, 1990, Cl. 606/194, STEERABLE DILATATION CATHETER, Wilford J. Samson, Owner of Record: *Advanced Cardiovascular Systems Inc., Mounatin View, Calif.*, Attorney or Agent: Edward J. Lynch, Ex. Gp.: 336

4,730,346, Re. S. N. 07/490,801, Filed Mar. 8, 1990, Cl. 375/11.6, METHOD AND APPARATUS FOR EXTRACTING A PREDETERMINED BIT PATTERN FROM A SERIAL BIT STREAM, Ching-Lin Jiang, Owner of Record: *Dallas Semi Conductor Corp., Dallas, Tex.*, Attorney or Agent: Robert Groover, Ex. Gp.: 263

4,734,561, Re. S. N. 07/491,185, Filed Mar. 9, 1990, Cl. 219/275, HUMIDIFIER, Molly S. Miller, Owner of Record: *Inventor*, Attorney or Agent: Timothy A. French, Ex. Gp.: 216

4,771,344, Re. S. N. 07/487,451, Filed Mar. 2, 1990, Cl. 358/335, SYSTEMS FOR ENHANCING AUDIO AND/OR VISUAL PRESENTATION, James Fallarcora, et al., Owner of Record: *Inventor*, Attorney or Agent: Alan E. Kopecki, Ex. Gp.: 235

Requests for Reexamination Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,585,411, Reexam. No. 90/001,950, Requested Mar. 2, 1990, Cl. 432/11, METHOD AND WALKING BEAM FURNACE FOR THE INTERMEDIATE HEATING OF PIPES IN HOT ROLLLING MILLS, Giorgio Bocci, et al., Owner of Record: *Italimpianti Societe Italiana Impoanti P.A., Genoa, Italy*, Attorney or Agent: Berman, Aisenberg & Platt, Ex. Gp.: 340, Requester: Sandler, Greenblum & Bernstein, 2120 S. Glebe Rd., Arlington, Va.

4,683,195, Reexam. No. 90/001,954, Requested Mar. 3, 1990, Cl. 435/6, PROCESS FOR AMPLYIFYING, DETECTING, AND/OR CLONING NUCLEIC ACID SEQUENCES, Kary B. Mullis, et al., Owner of Record: *Cetus Corp., Emeryville, Calif.*, Attorney or Agent: Albert P. Halluim, Ex. Gp.: 120, Requester: E.I. Du Pont De Nemours & Co., Wilmington, Del.

4,683,202, Reexam. No. 90/001,955, Requested Mar. 9, 1990, Cl. 435/91, PROCESS FOR AMPLIFYING NULCEIC ACID SEQUENCES, Kary B. Mullis, Owner of Record: *Cetus Corp., Emeryville, Calif.*, Attorney or Agent: Albert P. Halluin, Ex. Gp.: 120, Requester: E.I. Du Pont De Nemours & Co., Wilmington, Del.

4,685,239, Reexam. No. 90/001,956, Requested Mar. 13, 1990, Cl. 43/6, SPEAR POINT FOR FISHING SPEAR GUNS, Joseph B. Lamonica, Owner of Record: *Ann Runnels, Orange, Calif.*, Attorney or Agent: Plante, Strauss, Vanderburgh & Connors, Ex. Gp.: 320, Requester: The A.B. Biller Co., Bloomingdale, Ill.

4,721,720, Reexam. No. 90/001,951, Requested Feb. 28, 1990, Cl. 514/304, METHOD OF TREATING EMESIS ANXIETY AND/OR IBS, Gordon Wooten, et al., Owner of Record: *Beecham Group, Plc., Brentford, England*, Attorney or Agent: James F. Haley, Ex. Gp.: 120, Requester: Owner

4,783,938, Reexam. No. 90/001,952, Requested: Mar. 9, 1990, Cl. 52/171, WINDOW PANEL ASSEMBLY, Douglas L. Palmer, Owner of Record: *SNE Enterprises, Inc., Wausau, Wis.*, Attorney or Agent: Hill, Van Santen, Steadman & Simpson, Ex. Gp.: 350, Requester: Owner

4,865,326, Reexam. No. 90/001,953, Requested Mar. 9, 1990, Cl. 273/235, OPTICAL BRIGHTENERS IN GOLF BALL CLEAR COATINGS, Sharon R. Isaac, et al., Owner of Record: *Acushnet Co., New Bedford, Mass.*, Attorney or Agent: Lucas & Just, Ex. Gp.: 110, Requester: Gerald M. Murphy, Birch, Stewart, Kolash & Birch, Falls Church, Va.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Jnp, Inc., Dallas, Tex., Reg. No. 1,403,571, for the mark "HANK'S", Canc. No. 18,443

JEAN BROWN
Administrator, Trademark
Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner
for Trademarks

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Comfax, Inc., Syosset, N.Y., Reg. No. 1,390,269, for the mark "COMFAX", Canc. No. 18,515.

JEAN BROWN
Administrator of the
Trademark Trial
and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner
for Trademarks

Filing of a Notice of Appeal to the Court of Appeals for the Federal Circuit in the Patent And Trademark Office

This notice supersedes a notice entitled Filing of a Notice of Appeal to the Federal Circuit and Service of Court Papers on the Commissioner of Patents and Trademarks published at 1079 Off. Gaz. Office 72 (June 30, 1987).

A notice of appeal to the Court of Appeals for the Federal Circuit may be filed in the Patent and Trademark Office in any one of the following ways:

A. By first-class mail addressed as follows, in which case the notice of appeal must actually reach the Patent and Trademark Office by the due date:

Box 8
Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attention: Office of the Solicitor

B. By "Express Mail" (U.S. Postal Service only) under 37 CFR § 1.10 addressed as follows, in which case the notice of appeal is deemed filed on the date of the Express Mail certificate:

Box 8
Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attention: Office of the Solicitor

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C. By hand (on or before the due date) to the Office of the Solicitor. The Office of the Solicitor is located at:
Crystal Park II
Suite 918
2121 Crystal Drive
Arlington, Va.

D. By facsimile transmission to the Office of the Solicitor. The telephone number for accessing the Office of the Solicitor facsimile machine is (703) 557-9373. A notice of appeal will be deemed timely filed on the date the facsimile transmission is *received* by the Office of the Solicitor, provided an original notice of appeal is subsequently received in either of the following ways:

(1) An original, signed copy of the notice of appeal is actually received in the Office of the Solicitor within five calendar days of the facsimile transmission; or,
(2) An original, signed copy of the notice of appeal is mailed by "Express Mail" (U.S. Postal Service only) under 37 CFR § 1.10 on the day of the facsimile transmission.

The facsimile machine for receiving a notice of appeal is located in the Office of the Solicitor and is staffed during the business hours of 8:30 a.m. to 5:00 p.m., Monday through Friday, excluding holidays. Due to possible equipment failure or maintenance requirements, precautions must be taken when relying on the availability of this service near the end of the time for filing a notice of appeal.

March 22, 1990 FRED E. McKELVEY
Solicitor

Service of Court Papers on the Commissioner of Patents and Trademarks

Court papers other than a notice of appeal to the U.S. Court of Appeals for the Federal Circuit may be served on the Commissioner in either of the following ways:

A. By *hand* between 8:30 a.m. and 5:00 p.m. at the Office of the Solicitor, located in Crystal Park II, Suite 918, 2121 Crystal Drive, Arlington, Va.

B. By *mail* in an envelope addressed as follows:
Office of the Solicitor
P.O. Box 15667
Arlington, Va. 22215

While the above mail service address may be supplemetned to include the name of the particular attorney assigned to the court case, it must *not* be supplemented to refer to either the Commissioner of Patents and Trademarks or the U.S. Patent and Trademark Office (PTO).

Court papers mailed to an address other than the above mail service address and court papers delivered by hand are deemed to have been served on the Commissioner when actually received in the Office of the Solicitor.

Papers which are not court papers and are intended to be filed in the PTO in connection with an application or other proceeding pending in the Office shall not be mailed to the Solicitor's mail service address. Any such papers which are mailed to the Solicitor's mail service address will not be considered to have been filed in the PTO. Instead, all such papers will be returned. No exceptions will be made to this policy.

Mar. 22, 1990 FRED E. McKELVEY
Solicitor.

PATENT NOTICES

Certificates of Correction For Week of April 17, 1990

4,179,081	4,804,763	4,829,006	4,842,157
4,410,570	4,804,842	4,829,031	4,842,161
4,461,894	4,805,247	4,829,173	4,842,212
4,521,717	4,805,399	4,829,331	4,842,452
4,561,623	4,805,400	4,829,485	4,842,467
4,619,872	4,806,675	4,829,795	4,842,557
4,621,230	4,806,739	4,830,279	4,842,636
4,697,808	4,806,816	4,830,280	4,842,761
4,702,036	4,807,124	4,830,382	4,842,925
4,703,330	4,807,267	4,830,406	4,843,055
4,709,144	4,808,086	4,830,787	4,843,192
4,709,892	4,808,812	4,830,855	4,843,924
4,710,167	4,809,288	4,831,018	4,844,051
4,729,215	4,811,211	4,831,520	4,844,072
4,729,284	4,811,377	4,831,916	4,844,142
4,742,215	4,811,843	4,832,561	4,844,185
4,746,740	4,812,120	4,832,969	4,844,327
4,747,342	4,812,276	4,833,236	4,844,744
4,757,170	4,812,458	4,834,971	4,844,960
4,766,638	4,813,269	4,835,530	4,845,055
4,767,865	4,813,496	4,835,951	4,845,207
4,780,479	4,813,587	4,836,211	4,845,365
4,781,752	4,813,834	4,836,561	4,845,541
4,783,504	4,815,084	4,837,079	4,845,674
4,784,684	4,815,099	4,837,653	4,845,681
4,785,124	4,815,474	4,837,794	4,845,899
4,786,287	4,817,116	4,837,832	4,846,182
4,786,740	4,817,573	4,837,980	4,846,191
4,788,364	4,818,557	4,838,212	4,846,887
4,788,956	4,819,349	4,838,703	4,847,625
4,789,222	4,821,214	4,838,724	4,847,987
4,794,570	4,822,029	4,839,198	4,848,518
4,795,083	4,822,100	4,839,213	4,849,092
4,795,344	4,822,765	4,839,388	4,852,796
4,797,440	4,823,212	4,839,399	4,856,193
4,797,484	4,823,309	4,839,432	4,858,067
4,797,947	4,823,839	4,839,753	4,859,298
4,798,450	4,823,853	4,839,993	4,859,700
4,798,809	4,823,879	4,840,112	4,862,293
4,799,791	4,824,836	4,840,483	4,864,354
4,800,010	4,825,428	4,840,495	4,870,067
4,800,410	4,825,688	4,840,673	4,876,074
4,801,691	4,825,800	4,840,817	4,882,569
4,801,808	4,825,977	4,841,014	4,887,033
4,802,552	4,826,605	4,841,101	4,891,254
4,803,078	4,826,899	4,841,477	
4,803,197	4,827,256	4,841,863	
4,803,579	4,827,953	4,841,981	

Disclaimers

3,718,300.—*Edward I. Aronoff*, Quebec, Canada. APPARATUS FOR ROLLING TUBULAR FABRICS. Patent dated Feb. 27, 1973. Disclaimer filed Dec. 29, 1989, by the inventor.

The term of this patent subsequent to Dec. 31, 1989, has been disclaimed.

4,068,501.—*Edward I. Aronoff*, St. Laurent; *William J. McLay*, Montreal, both of Canada. APPARATUS FOR TREATING TUBULAR FABRICS. Patent dated Jan. 17, 1978. Disclaimer filed Jan. 24, 1990, by the assignee, Knit-Fin Machinery, Ltd.

The term of this patent subsequent to Dec. 31, 1989, has been disclaimed.

4,483,247.—*Jean-Pierre Coeffic*, Ottumwa, Iowa. CYNDRICAL BALER WITH BALER DISCHARGE EJECTOR. Patent dated Nov. 20, 1984. Disclaimer filed June 12, 1989, by the assignee, Deere & Co.

Hereby enters this disclaimer to claim 1 of said patent.

4,610,916.—*Larry Ballard*, Columbia, S.C. MONOFILAMENTS, AND FABRICS THEREOF. Patent dated Sept. 9, 1986. Disclaimer filed Feb. 9, 1990, by the assignee, Shakespeare Co.

Hereby enters this disclaimer to claims 18 through 29 of said patent.

4,652,533.—*Michael E. Jolley*, Round Lake, Ill. METHOD OF SOLID PHASE IMMUNOASSAY INCORPORATING A LUMINESCENT LABEL. Patent dated Mar. 24, 1987. Disclaimer filed Aug. 15, 1988, by the assignee, Baxter Healthcare Corp.

Hereby enters this disclaimer to claim 26 of said patent.

Dedications

4,269,505.—*Herbert E. Mayer*, Eschen, Austria. DEVICE FOR THE PROJECTION PRINTING OF THE MASKS OF A MASK SET ONTO A SEMICONDUCTOR SUBSTRATE. Patent dated May 26, 1981. Dedication filed Feb. 20, 1990, by the assignee, Mercotrust Aktiengesellschaft.

Hereby dedicates to the Public the remaining term of said patent.

4,355,892.—*Herbert E. Mayer; Ernst W. Lobach*, both of Eschen, Liechtenstein. METHOD FOR THE PROJECTION PRINTING. Patent dated Oct. 26, 1982. Dedication filed Feb. 20, 1990, by the assignee, Mercotrust Aktiengesellschaft.

Hereby dedicates to the Public the remaining term of said patent.

4,357,100.—*Herbert E. Mayer; Ernst W. Lobach*, both of Eschen, Liechtenstein. ARRANGEMENT FOR PROJECTION COPYING MASKS ON TO A WORK PIECE. Patent dated Nov. 2, 1982. Dedication filed Feb. 20, 1990, by the assignee, Mercotrust Aktiengesellschaft.

Hereby dedicates to the Public the remaining term of said patent.

4,362,385.—*Ernst Lobach*, Eschen, Liechtenstein. PROCESS AND ARRANGEMENT FOR COPYING MASKS ON A WORKPIECE WITH ARRANGEMENT FOR CORRECTION OF ALIGNMENT ERRORS. Patent dated Dec. 7, 1982. Dedication filed Feb. 20, 1990, by the assignee, Mercotrust Aktiengesellschaft.

Hereby dedicates to the Public the remaining term of said patent.

4,376,581.—*Herbert E. Mayer*, Eschen, Liechtenstein. METHOD OF POSITIONING DISK-SHAPED WORKPIECES, PREFERABLY SEMICONDUCTOR WAFERS. Patent dated Mar. 15, 1983. Dedication filed Feb. 20, 1990, by the assignee, Mercotrust Aktiengesellschaft.

Hereby dedicates to the Public the remaining term of said patent.

4,405,229.—*Herbert E. Mayer*, Eschen, Austria. METHOD OF PROJECTING ON SEMICONDUCTOR SUBSTRATE AND WORKPIECE INCLUDING SUCH SUBSTRATE. Patent dated Sept. 20, 1983. Dedication filed Feb. 20, 1990, by the assignee, Mercotrust Aktiengesellschaft.

Hereby dedicates to the Public the remaining term of said patent.

4,431,304.—*Herbert E. Mayer*, Eschen, Austria. APPARATUS FOR THE PROJECTION COPYING OF MASK PATTERNS

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ON A WORKPIECE. Patent dated Feb. 14, 1984. Dedication filed Feb. 20, 1990, by the assignee, Mercotrust Aktiengesellschaft.

Hereby dedicates to the Public the remaining term of said patent.

4,432,635.—*Herbert E. Mayer*, Eschen, Liechtenstein. TEMPERATURE-CONTROLLED SUPPORT FOR SEMICONDUCTOR WAFER. Patent dated Feb. 21, 1984. Dedication filed Feb. 20, 1990, by the assignee, Mercotrust Aktiengesellschaft.

Hereby dedicates to the Public the remaining term of said patent.

4,461,567.—*Herbert E. Mayer*, Eschen, Liechtenstein. METHOD OF AND APPARATUS FOR THE POSITIONING OF DISK-SHAPED WORKPIECES, PARTICULARLY SEMICONDUCTOR WAFERS. Patent dated July 24, 1984. Dedication filed Feb. 20, 1990, by the assignee, Mercotrust Aktiengesellschaft.

Hereby dedicates to the Public the remaining term of said patent.

4,509,852.—*Werner Tabarelli*, Vaduz, Liechtenstein, *Ernst W. Lobach*, Eschen, Liechtenstein. APPARATUS FOR THE PHOTOLITHOGRAPHIC MANUFACTURE OF INTEGRATED CIRCUIT ELEMENTS. Patent dated Apr. 9, 1985. Dedication filed Feb. 20, 1990, by the assignee, Mercotrust Aktiengesellschaft.

Hereby dedicates to the Public the remaining term of said patent.

4,592,650.—*Werner Tabarelli*, Vaduz; *Herbert E. Mayer*, Eschen, both of Liechtenstein. APPARATUS FOR PROJECTING A PATTERN ON A SEMICONDUCTOR SUBSTRATE. Patent dated June 3, 1986. Dedication filed Feb. 20, 1990, by the assignee, Mercotrust Aktiengesellschaft.

Hereby dedicates to the Public the remaining term of said patent.

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PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	7-7-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-5-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
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COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 STEWART LEVY, Acting Director	11-17-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
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GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-2-89

Expiration of patents: The patents within the range of numbers indicated below expire during February 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,714,668 to 3,718,936 inclusive
Plant Patents ..... 3,297 to 3,313 inclusive

REEXAMINATIONS

APRIL 17, 1990

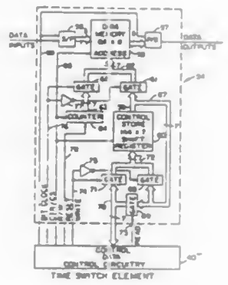
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,956,593 (1252nd)

TIME SPACE TIME (TST) SWITCH WITH COMBINED AND DISTRIBUTED STATE STORE AND CONTROL STORE

Arthur A. Collins; John C. Bellamy, II, both of Dallas, and Richard L. Christensen, Richardson, all of Tex., assignors to Sevin Rosen Bayless Borovoy, Dallas, Tex.

Reexamination Request No. 90/001,797, Jun. 21, 1989.
Reexamination Certificate for Patent No. 3,956,593, issued May 11, 1976, Ser. No. 514,828, Oct. 15, 1974.
Filed Jun. 21, 1989, Ser. No. 514,828
Int. Cl.[5] H04Q *11/04*; H04J *3/00*
U.S. Cl. 370—63



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–26 and 29–33 is confirmed.

Claims 27 and 28 are cancelled.

New claims 34–53 are added and determined to be patentable.

1. In a switch for interconnecting between data incoming and outgoing digital time division multiplex communication lines: time division digital signal switch element means including, multi-word end around shift register means having an input end and an output end; through digital data transmitting means; multi-path control signal bus means interconnecting the output end of said multi-word end around shift register means and said through digital data transmitting means; said multi-word end around shift register means including recirculation loop bus means with first gate means through to the input end of the shift register; control data source means; control data bus means with second gate means interconnecting said control data source means and said input end of the shift register; activating control means for said first and second gate means; and step control signal input means to said multi-word end around shift register means.

B1 4,169,290 (1253rd)

DATA RECORDING METHOD AND APPARATUS

Alan C. Reed, Salt Lake City, and John H. Sherwood, Bountiful, both of Utah, assignors to Utility Devices, Inc., Salt Lake City, Utah

Reexamination Request No. 90/000,432, Aug. 8, 1983.
Reexamination Certificate for Patent No. 4,169,290, issued Sep. 25, 1979, Ser. No. 872,648, Jan. 26, 1978.
Continuation of Ser. No. 755,846, Dec. 30, 1976, abandoned, which is a continuation of Ser. No. 592,057, Jun. 30, 1975, abandoned. This application Aug. 8, 1983, Ser. No. 872,648
Int. Cl.[4] G06F *3/14*
U.S. Cl. 364—900

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–16 are cancelled.

[1. A portable electronic recording apparatus for recording the data displayed on each of a plurality of designated utility meters, wherein said meters are positioned at a plurality of different locations and each of said meters has a unique identification number, the recording apparatus comprising:

a solid state memory means for storing meter location, meter identification and meter data therein;

first means for writing into selected locations of said memory, in sequence, the meter location information of each of a plurality of meters and the meter identification of each of said plurality of meters;

a temporary memory for temporarily storing said meter data as said meter data is keyed into said recording apparatus;

a keyboard means for introducing said meter data for each of said meters into said temporary memory;

comparator means for comparing said temporarily stored meter data with at least one preselected limit;

second means for writing said meter data into an addressed meter data storage location in said solid state memory means if said meter data is within said at least one predetermined limit;

selective means in said keyboard means for erasing the meter data in said temporary memory location if said meter data is outside said at least one preselected limit;

a display means for visually displaying in sequence for each meter the meter location, the meter identification and the meter data keyed into said memory means;

means for addressing said memory means to couple the information in the addressed memory location to said display means; and

means for advancing said addressing means after said meter location information is displayed to the memory location of at least one meter identification number corresponding to said location, said addressing means being responsive to said advancing means to address a meter data storage location after said meter identification number has been displayed, said addressing means being responsive to said advancing means to address the next meter location after said meter data has been stored in said addressed memory location.]

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B1 4,474,878 (1254th)

SANDWICH EIA FOR ANTIGEN ASSOCIATED WITH HEPATITIS

Seymour P. Halbert, Miami, and Milton Anken, N. Miami Beach, both of Fla., assignors to Diamedix Corporation, Miami, Fla.

Reexamination Request No. 90/001,694, Jan. 24, 1989.
Reexamination Certificate for Patent No. 4,474,878, issued Oct. 2, 1984, Ser. No. 617,743, Sep. 29, 1975.
Filed Jan. 24, 1989, Ser. No. 617,743
Int. Cl.[5] G01N *33/535, 33/545*
U.S. Cl. 435—7

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–13 is confirmed.

1. A process for determining the presence of antigens associated with hepatitis in a sample comprising the following steps:

(a) incubating the sample with an antibody immobilized on an insoluble member, the antibody being reactive with the antigens associated with hepatitis, the incubation enabling a bond to be formed between the antibody and an antigen present in the sample to produce an insoluble member having an antigen bonded thereto in the event antigens associated with hepatitis are present in the sample;

(b) separating the insoluble member from any unbonded substances;

(c) incubating the insoluble member with a solution containing tagged antibody reactive with an antigen associated with hepatitis, the tagged antibody being tagged with an enzyme capable of effecting a reaction of a substrate to produce a detectable reaction product, the incubation being conducted to enable the tagged antibody to bond to any antigen bonded in step (a) to the antibody on the insoluble member;

(d) separating the insoluble member from the enzyme tagged antibody solution to remove any unbonded tagged antibody therefrom;

(e) exposing the insoluble member to a substrate solution which the enzyme of the tagged antibody reacts upon to enable a chemical change in the substrate to take place and to produce a detectable reaction product; and,

(f) detecting any reaction product present in the solution to determine the presence of antigens associated with hepatitis.

B1 4,642,285 (1255th)

SANDWICH EIA FOR ANTIGEN

Seymour P. Halbert, Miami, and Milton Anken, N. Miami Beach, both of Fla., assignors to Diamedix Corporation, Miami, Fla.

Reexamination Request No. 90/001,695, Jan. 24, 1989.
Reexamination Certificate for Patent No. 4,642,285, issued Feb. 10, 1987, Ser. No. 606,122, May 2, 1984.
Continuation of Ser. No. 617,743, Sep. 29, 1975, Pat. No. 4,474,878. This application Jan. 24, 1989, Ser. No. 606,122
Int. Cl.[4] G01N *33/53, 33/535, 33/545, 33/576*
U.S. Cl. 435—7

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–18 is confirmed.

1. A method for detecting an antigen in a test serum containing said antigen, comprising the steps of:

a. providing a first quantity of an antibody associated with an antigen, said first quantity of said antibody being covalently bound to a water-insoluble, water insuspensible, solid carrier,

b. contacting and incubating a test serum containing said antigen with said antibody covalently bound to said water-insoluble, water-insuspensible solid carrier of step (a) whereby said antigen reacts with said antibody covalently bound to said solid carrier to immobilize said antigen;

c. providing a solution of a second quantity of said antibody, said second quantity of said antibody being covalently linked to an enzyme;

d. contacting and incubating said immobilized antigen resulting from step (b) with said solution of enzyme-linked antibody of step (c) whereby said enzyme-linked antibody reacts with said immobilized antigen to immobilize said enzyme-linked antibody;

e. separating the solid carrier from the solution of enzyme-linked antibody;

f. contacting and incubating said immobilized enzyme-linked antibody with a substrate solution wherein said enzyme linked to said antibody catalyzes a reaction of said substrate and produces a detectable reaction product; and

g. correlating said detectable reaction product to the presence of said antigen to be detected.

B1 4,658,892 (1256th)

HEAT-TRANSFER TUBES WITH GROOVED INNER SURFACE

Yoshihiro Shinobara; Kiyoshi Oizumi; Yasuhiko Itoh, and Makoto Hori, all of Tsuchiura, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Reexamination Request No. 90/001,636, Nov. 9, 1988.
Reexamination Certificate for Patent No. 4,658,892, issued Apr. 21, 1987, Ser. No. 684,622, Dec. 21, 1984.
Filed Nov. 9, 1988, Ser. No. 684,622
Claims priority, application Japan, Dec. 28, 1983, 58-252191
Int. Cl.[5] F28F *1/40*
U.S. Cl. 165—133

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is determined to be patentable as amended.

Claims 2 and 3, dependent on an amended claim, are determined to be patentable.

New claims 4 and 5 are added and determined to be patentable.

1. In a heat-transfer tube with a grooved inner surface adapted to phase-transition of fluid flowing inside the tube and having a number of special grooves having a helix angle (β) and ridges between said grooves having an apex angle formed on the inner surface of the tube, the ratio (Hf/Di) of the depth (Hf) of said grooves to the diameter (Di) of said inner surface of the tube being 0.02 to 0.03, and the helix angle (β) of said grooves to an axis of the tube being 7° to 30°, the improvements comprising:

each of said grooves being substantially trapezoidal in shape;

the ratio (S/Hf) of the cross-sectional area (S) of respective grooved section to said groove depth (Hf) ranging from [0.15 to 0.40] *0.22 to 0.33;*

each of said ridges being substantially triangular in cross-section; and

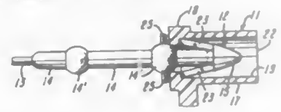
the apex angle (α) in cross-section of a ridge located between said respective grooves ranging from 30° to 60°.

B1 4,680,836 (1257th)

ONE-PIECE PLASTICS FASTENER

David R. Wisecup, Xenia, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Reexamination Request No. 90/001,363, Oct. 30, 1987.
Reexamination Certificate for Patent No. 4,680,836, issued Jul. 21, 1987, Ser. No. 812,539, Dec. 23, 1985.
Filed Oct. 30, 1987, Ser. No. 812,539
Int. Cl.[4] F65D *33/34*
U.S. Cl. 24—704.2



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1 and 2 are determined to be patentable as amended.

Claims 3, 4 and 5, dependent on an amended claim, are determined to be patentable.

New claims 6–10 are added and determined to be patentable.

1. A one-piece fastener composed of flexible, molded, plastics material, the fastener comprising a socket, a head and a flexible filament connected at its one end to the socket and at its other end to the head, the socket having a passage therethrough, the socket having opposite first and second ends, the head being insertable into the passage from either end of the socket, the socket having flexible resilient prongs disposed in the passage for non-releasably gripping the head when inserted through the first end and adapted to releasably grip the head in the event the head could be inserted through the second end to a sufficient depth, and means on the head and contactable with the socket for limiting the depth to which the head can be inserted through the second end of the socket to prevent the head from being *held* releasably engaged with the prongs.

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,198

STRATA ROCK BUCKET

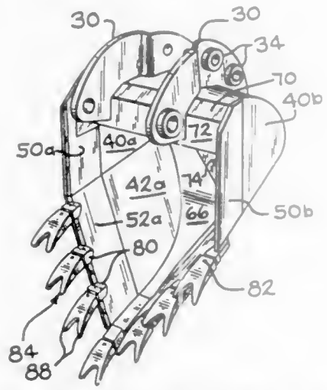
Paul V. Ballinger, 2047 Old Mill Rd., Findlay, Ohio 45840

Original No. 4,476,641, dated Oct. 16, 1984, Ser. No. 510,383, Jul. 1, 1983. Continuation of Ser. No. 815,228, Dec. 31, 1985, abandoned, which is a continuation of Ser. No. 251,471, Apr. 6, 1981, abandoned. Application for reissue Aug. 24, 1987, Ser. No. 89,030

Int. Cl.[4] E02F *9/28*

U.S. Cl. 37—118 R

13 Claims



1. An excavating bucket for use with backhoes and similar machines comprising, in combination, a bucket assembly having a top portion, means disposed on said top portion for removably securing said bucket to associated equipment, a first pair of upper sidewalls [disposed substantially but not parallel to one another], a first pair of lower sidewalls intersecting a respective one of each of said first pair of upper sidewalls along a first pair of hip lines, said first pair of lower sidewalls extending from a respective one of each of said first pair of upper sidewalls away from said top portion and toward one another at an acute angle, a bottom panel extending between said first pair of lower sidewalls, a back wall extending between said bottom panel and said top portion, a second pair of upper sidewalls extending between a respective one of said first pair of upper sidewalls and said back wall [and disposed substantially but not parallel to one another], a second pair of lower sidewalls intersecting a respective one of each of said second pair of upper sidewalls along a second pair of hip lines, said second pair of lower sidewalls extending between a respective one of said first pair of lower sidewalls and said back wall, said first pair of lower sidewalls defining a respective pair of inclined leading edges extending from said bottom panel in a diverging manner generally toward said back wall and said top portion to said first pair of hip lines, and a plurality of teeth disposed in mirror-image pairs on said pair of leading edges and in substantially uniformly spaced-apart position along the length of said leading edges between said bottom panel and said first pair of hip lines, *said hip lines being disposed generally medially between said bottom panel and said top portion,* said bucket having its maximum width at said hip lines, the width of said bucket decreasing in [both upper and lower directions] *at least the downward direction* from said hip lines and said bucket having its most widely spaced pair of said teeth located substantially at said hip lines.

Re. 33,199

TEMPERATURE RESISTANT JOINT PACKING WITH E-SHAPED SPRING SEAL

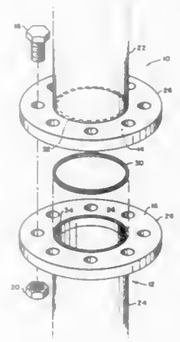
Michael A. Karr, Jr., Houston, Tex., assignor to Vetco Gray Inc., Houston, Tex.

Original No. 4,452,462, dated Jun. 5, 1984, Ser. No. 539,595, Oct. 6, 1983. Continuation of Ser. No. 776,262, Sep. 16, 1985, abandoned. Application for reissue Oct. 13, 1987, Ser. No. 110,094

Int. Cl.[4] F16J *15/08*

U.S. Cl. 277—105

10 Claims



1 A system for establishing a temperature resistant pressure seal between two flat-faced surfaces, comprising:

a first groove in the first flat-faced surface disposed along a desired closed sealing line, said groove in cross section having two side surfaces and a bottom surface [, the separation of the side surfaces decreasing with increasing depth below the first flat-faced surface];

a second groove in the second flat-faced surface, symmetrical in shape with the first groove about the plane of the corresponding flat-faced surface and also disposed along the desired sealing line;

a spring member of resilient metal for placement within the first and second grooves for formation of the desired seal, the spring member having an approximately E-shaped cross section facing the pressurized region, including a central web portion forming the central part of the E-shape and two outer arms, symmetric about and secured to the central web forming the two outer parts of the E-shape, each arm having a curved portion with an overall uncompressed horizontal dimension greater than the separation of the side walls of the first and second grooves at a depth intermediate the corresponding flat-faced surface and the grooved bottom surface, and the overall dimension of the spring member cross section taken vertically across the E-shape being greater than the separation of the first and second groove bottom surfaces when the two flat-faced surfaces are placed in contact, for causing the curved portion of each arm of the spring member to contact and be progressively compressed between the side walls of the corresponding groove as the spring member is inserted progressively more deeply within the corresponding grooves and for causing vertical compression of the entire spring member between the bottom surfaces of the first and second grooves when the flat-faced surfaces are in contact, thereby resulting in each arm of the spring

member contacting the corresponding groove for forming the desired seal; and

means for urging and clamping the two flat-faced surfaces together, with the first and second grooves in a corresponding relationship.

Re. 33,200

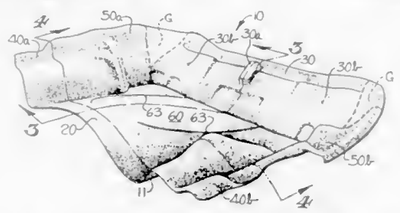
ONE-PIECE AUTOMOTIVE TRUNK LINER

David P. Reynolds, Charlotte; John D. Shepard, Marion, and Samuel L. Stone, Jr., Old Fort, all of N.C., assignors to Collins & Aikman, New York, N.Y.

Original No. 46,732,071, dated Jun. 16, 1987, Ser. No. 918,515, Oct. 14, 1986. Application for reissue Apr. 4, 1989, Ser. No. 333,643

Int. Cl.[4] B62D *33/02*

U.S. Cl. 296—39.1 **27 Claims**



1. A one-piece trunk liner for an automobile trunk compartment, said trunk liner comprising an integral molded relatively stiff fibrous body having a center floor cover panel, and a plurality of panels extending along the sides of said center floor cover panel and integrally connected thereto, said plurality of panels extending upwardly and outwardly from said center floor cover panel so as to be in outwardly diverging relation to said center floor cover panel, said stiffness of said molded fibrous body and the outwardly diverging relationship of said plurality of panels causing said panels to **[**resiliently engage**]** *be resiliently biased into close proximity to* inner wall surfaces of the trunk when the panels are **[**biased inwardly**]** *moved* toward an upright position when mounted in the trunk to thereby facilitate mounting the trunk liner in the trunk of the automobile and maintaining the trunk liner in the installed position in **[**engagement with**]** *said close proximity to* the walls of the trunk.

Re. 33,201

HYDRAULIC SAFETY BARRIER TRAFFIC-WAY CONTROLLER

Harry D. Dickinson, 1551 Melwood Dr., Glendale, Calif. 91207

Original No. 4,490,068, dated Dec. 25, 1984, Ser. No. 488,106, Apr. 25, 1983. Application for reissue Mar. 21, 1986, Ser. No. 842,223

Int. Cl.[4] E01F *13/00*

U.S. Cl. 404—6 **9 Claims**

[1. A self contained vehicle traffic-way controller of retractile barrier configuration subject to upward and downward impacts and wherein actuation and control is by instantly reversible hydraulics, and including;

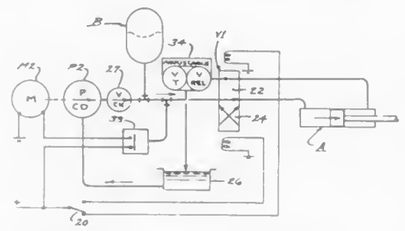
a barrier disposed across a traffic-way and pivoted to a frame for extension through intermediate positions to an UP position projecting as an abutment exposed to impact in the traffic-way and to a DOWN position substantially coplanar with the traffic-way,

at least one double acting cylinder and piston actuator connected between the barrier and frame and operable between a normally extended UP position of the barrier and a retracted DOWN position of the barrier,

an intermittent running motor driven pump means supplying fluid from a reservoir at a variable pressure and a volume rate complementary to the time-demand requirement of said at least one cylinder and piston actuator,

a pressure-volume accumulator open into a supply line from the motor driven pump means and storing potential energy as fluid volume under low to high pressure,

an instantly reversible valve means in a supply line between the pressure-volume accumulator and the cylinder and piston actuator and having two controlled operating positions, an UP position pressuring a lower end and exhausting an upper end of the actuator and extending said actuator, and a DOWN position pressuring the upper end and exhausting the lower end of the actuator and retracting said actuator,



a high-low pressure switch open to and responsive to accumulator pressure to close an energizing circuit to the motor at a predetermined low accumulator pressure and to open the energizing circuit at a predetermined high accumulator pressure thereby maintaining a variable pressure and proportionate volume of fluid in the accumulator,

a check valve in and preventing reverse flow in the supply line between the motor driven pump means and the pressure-volume accumulator to hold a fluid volume in the accumulator for yielding to retraction of the actuator when moving and when held to said UP position to protect both the actuator and pump and related structure from hydraulic impact,

and control means switching the valve means alternately into said UP and DOWN positions.**]**

PLANT PATENTS

GRANTED APRIL 17, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,220

ROSE PLANT NAMED 'AUSBOARD'

David C. H. Austin, Bowling Green Farm, Bowling Green Lane, Albrighton, Wolverhampton, England

Filed Oct. 18, 1988, Ser. No. 259,278

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—1 **1 Claim**

1. A new and distinct variety of rose plant of the shrub class, characterized as to novelty by its fully double, deep pink flowers with abundant and continual blooming the unusual blend of coloring and shaping of the flower being substantially as shown and described.

7,221

ROSE PLANT JACRORED

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Dec. 14, 1988, Ser. No. 284,471

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the bybrid tea class substantially as herein shown and described, characterized particularly as to novelty by the bright medium red flower color with lighter red petal base and reverse, medium-large flower size, excellent plant vigor, long heavily appendaged sepals, distinctive red rachis and thick leathery petals.

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GRANTED APR. 17, 1990

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365-226 4,918,663
365-230 4,918,664

PATENTS

GRANTED APRIL 17, 1990

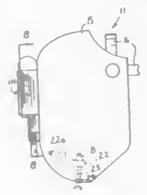
GENERAL AND MECHANICAL

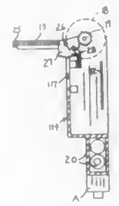
4,916,752
HELICAL VISUAL DISPLAY DEVICE
John G. Thompson, P.O. Box 1236, Orange, Va. 22960
Filed Apr. 3, 1989, Ser. No. 331,753
Int. Cl.[4] A47F *11/06*; B44F *1/00*; G09F *19/12*
U.S. Cl. 40—427 5 Claims

1. A visual display device having aesthetic appeal, comprising
a single tubular-like material forming an elongated helical structure having a continuous series of helices,
a first portion of said helical structure having helices smaller in diameter than the helices of a second remaining portion of said helical structure,
said tubular-like material having a transition section between said first portion and said second portion of said helical structure for allowing said first portion of said helical structure to extend within the peripheral confines of the helices of said second portion of said helical structure, and
means for rotating said elongated helical structure, whereby said first portion and said second portion of said helical structure rotate as a unit and the helices of said first portion appear to move in the opposite direction to those of said second portion.

4,916,753
SAFETY WELDING MASK
Do Khacdung, 33 High St., Apt. #22, Orange, N.J. 07050
Filed Dec. 12, 1988, Ser. No. 282,746
Int. Cl.[4] A61F *9/06*
U.S. Cl. 2—8 1 Claim

1. An improved welding hood formed with a viewing window for use by an operator to include electric power for manipulating a first lens relative said viewing window by an operator's chin, said welding hood comprising,
a framework integrally secured exteriorly of said welding hood, and said framework including an opening in alignment with said viewing window, and
motor means including a drive means mounted within said framework to manipulate said first lens from a first position removed from said viewing window and said opening to a second position aligned with said viewing window and said opening, and
first electrical switch means positioned interiorly of said welding hood for actuation by said operator's chin for moving said first lens from said second position to said first position, and
wherein a second switch is positioned within said framework for actuating said first lens from said first position to said second position, and
wherein said drive means includes a rotatable pinion gear mounted to said motor means and a rack mounted to said lens, and
further including a third switch positioned interiorly of said hood and positioned adjacent to and cooperating with said rack to de-energize said motor wherein said rack is integrally secured to said first lens, and said first lens is positioned to said third switch when said viewing lens is in said second position, and
wherein a fourth switch is positioned in alignment and underlying said third switch engageable by said rack to



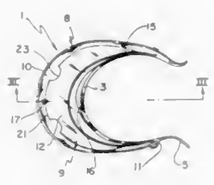


de-energize said motor when said first lens is repositioned from said second position to said first position, and
wherein said first lens pivots relative to said opening and is mounted to an arcuate gear engageable by said motor means and said arcuate gear includes an integrally secured shut-off arm to engage said third switch when said first lens is in said first position and said first lens pivotal to said second position to engage said fourth switch, and
wherein said second switch is a triple pole double throw switch.

4,916,754
ANTIGLARE APPARATUS
Hyung B. Kang, 18122 Santa Cecilia Dr., Fountain Valley, Calif. 92708
Filed Jan. 27, 1989, Ser. No. 302,384
Int. Cl.[4] A61F *9/04*
U.S. Cl. 2—12 4 Claims

1 An antiglare visor comprising:
an engaging band including a periphery which conforms to the shape of the forehead and providing for attachment to the wearer by pressure fit above each ear,
a primary visor with upper and lower surfaces which is attached to said engaging band and projects outward from same to provide shade for the face of the wearer,
a secondary visor with upper and lower surfaces and a forward edge which is pivotally attached to said engaging band,
said secondary visor is storable on said lower surface of said primary visor,

said primary visor having on said lower surface retaining means to grip said forward edge of said secondary visor,
said secondary visor is downwardly movable from said primary visor lower surface upon disengagement with said retaining means to rest upon the nose of the wearer thereby providing an aperture between said upper and lower visors, whereby both direct and reflected light are reduced.

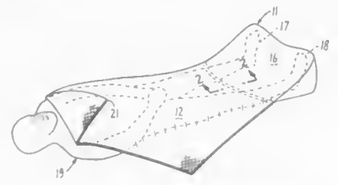


said upper surface of said secondary visor is provided a ridged contour to reflect light away from the wearer's eyes,
said forward edge of said secondary visor having a plurality of indentations allowing grasping of said secondary visor by the fingers of the wearer for removal of said secondary visor form said retaining means.

4,916,755
SWIMSUIT
Jay Feigenbaum, Hamden, and Janna Parris, Branford, both of Conn., assignors to Robby Len Fashions, Inc., New Haven, Conn.
Filed Oct. 19, 1988, Ser. No. 259,973
Int. Cl.[4] A41D *7/00*
U.S. Cl. 2—67 33 Claims

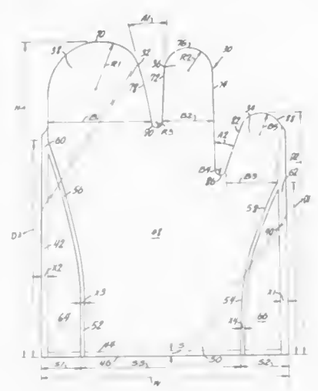
1. A swimsuit comprising:
a tightly fitting, body-controlling inner liner of stretchable, resilient synthetic or synthetic blend fabric selected from the group consisting of nylon, polyester, spandex, and blends thereof for encasing at least a portion of a person's torso, including the abdomen, hips and rear area, and having legholes in the liner lower portion;
a bra portion secured to said inner liner;
a plurality of control panels of soft, flexible synthetic fabric or plastic having less than 25% of the stretch of said inner liner fabric alone in both warp and fill directions laminated on the abdomen and upper rear hip areas of said inner liner by directly contacting the surfaces of the panels and liner and applying heat and pressure to fuse the panels and liner together for restricting the stretching of said inner liner fabric and controlling bulging at said areas to provide a more appealing shape to the torso; and
an outer swimsuit fabric covering over said inner liner, including said bra portion, said outer swimsuit secured to said inner liner at said bra portion and said legholes.

4,916,756
BLANKET CONSTRUCTION
Nancy D. Barrett, 306 Sunrise Ct., Benicia, Calif. 94510
Filed Jun. 19, 1989, Ser. No. 367,793
Int. Cl.[4] A47G *9/02*
U.S. Cl. 2—69.5 6 Claims



1. A blanket to be worn in covering relation to the front of the user's body, comprising
a substantially square body of blanket material having one corner removed at substantially a 45° angle when measured between an extension of the cut line and one side of said square,
a piece of blanket material sewn onto the underside of said body at said removed corner and cooperative with said body to provide a pocket formed for accommodating the feet of a person reclining under said substantially square body of blanket material.

4,916,757
PLASTIC GLOVE HAVING A TRIGGER FINGER AND PROVIDED WITH LATERAL RECEPTACLES AND RELATED METHOD AND TOOLING
Frank Berlin, New York, N.Y.; Leonard McGuire, and Eugene E. Campbell, both of Tulsa, Okla., assignors to Armin, Jersey City, N.J.
Filed Apr. 1, 1988, Ser. No. 176,714
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—159 25 Claims

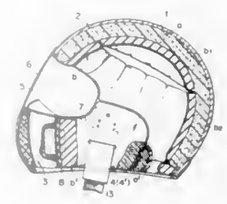


1. An article of manufacture comprising a hand cover including plastic films in face-to-face relation and having peripheral seals in part providing a contour defining thumb and forefinger receptacles and a further receptacle for three fingers, said films having sealed lateral edges and edges distal from said receptacles, said films having interior seals in generally spaced from said lateral edges, the edges distant from said receptacles being unconnected and therefore separable from each other except at said lateral and interior seals and between said interior seals defining an opening whereby access is provided for a hand, the interior seals merging with the peripheral seals adjacent the thumb and further receptacles, and the interior seals and the seals along the lateral edges defining lateral receptacles.
19. A method comprising bringing plastic films together in face-to-face relationship to form at least one glove, sealing the films together along a contour defining a thumb, a forefinger, and a further receptacle with the further receptacle being adapted to accommodate three fingers, sealing the films together along lateral edges bracketing said contour, and sealing the films together along interior seals which are generally parallel to and spaced from said lateral edges for a portion of their lengths but which merge with the latter to define lateral receptacles, the films having edges which are distal from said contour and which remain detached from each other between said interior seals and between each interior seal and adjacent lateral edge whereby access is provided for a hand and access is provided for said lateral receptacles.

4,916,758
DISPOSABLE FULL EAR PROTECTOR FOR BEAUTICIAN USE
Erma Jordan-Ross, 8370 Greensboro Dr., Apt. 401, McLean, Va. 22102
Filed Jul. 1, 1988, Ser. No. 214,537
Int. Cl.[4] A41D *21/00*
U.S. Cl. 2—174 11 Claims

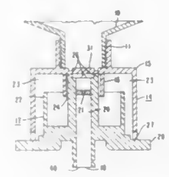
1. A full ear protector for beautician use and the like comprising,
a web of flexible generally liquidproof material of sufficient area to cover a human ear for generally preventing unwanted liquid from entering the ear,
said web having means for releasably attaching the same to the ear so as to substantially enclose the ear,
ear plug means having a configuration for slidably fitting within the ear canal to prevent unwanted liquid from entering the ear canal,
said ear plug means having a tubular configuration terminating at one end in a rounded tip for ready insertion into the ear and at the other end in an enlarged head for ready manipulation thereof and being formed from relatively rigid material, said ear plug means further including a central bore accessible from said enlarged head, and liquid absorbent material in said bore to assist in trapping any unwanted liquid within the web, and,
means attaching said ear plug means to said ear cover web to provide a unit-handled assembly,
whereby a user may initially insert the ear plug means into the ear canal and thereafter enclose the ear with said web in hair and scalp treatment operations.

4,916,759
FULL FACE TYPE HELMET
Michio Arai, 1-164, Horinouchi, Ohmiya-shi, Saitama-ken, Japan
Filed May 23, 1989, Ser. No. 355,995
Int. Cl.[4] A42B *3/02*
U.S. Cl. 2—414 8 Claims



1. A full face type helmet including a cap, a shock absorbing liner disposed throughout the entire inner surface of the cap, and an inner pad mounted inwardly with respect to the shock absorbing liner, said shock absorbing liner being divided into four portions which are a body portion including a head top part with an inner pad adhered onto the inner surface thereof, a jaw guard portion, and right and left cheek pad portions, the body portion and the jaw guard portion being fixed to the inner surface of the cap to define concave portions for mounting therein of the cheek pad portions; an elastic member interposed between the cheek pad portions on one hand and one of the body portion and the jaw guard portion on the other hand; and each said cheek pad portion being fitted in each said concave portion while pressing said elastic members and being held removably in engagement with the concave portions by an elastic force of the elastic member acting in a direction parallel to the cap surface.

4,916,760
DISPENSING DEVICE
Arie Shahar, 1314 Wellington Pl., Aberdeen, N.J. 07747
Filed Oct. 24, 1988, Ser. No. 261,099
Int. Cl.[4] E03D *9/02*
U.S. Cl. 4—228 13 Claims



1. In a device for controlling the passage of a cleaning agent from a container having an opening through which the cleaning agent passes into a tank holding a flushing liquid which ebbs and flows, the combination comprising:
cap means adapted to fit said opening and having a projecting collar and a projecting shroud ending in a lip, said collar and shroud cooperating to form a space having on open end ending on a first plane wherein said first plane is disposed orthogonally to said opening, contains a portion of said lip nearest to said container and defines a first pressure interface between said cleaning agent and said flushing liquid,
dispensing means for regulating the passage of said cleaning agent into said flushing liquid, said dispensing means being disposed in said space and including an elongated central core having an open end and a closed end, said open end

being defined by a second plane disposed in parallel with said first plane and said closed end being perforated and surrounded by a cup, said second plane defining a second pressure interface between said cleaning agent and said flushing liquid, and

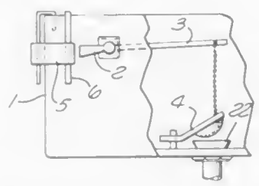
adjusting means for selectively modifying the spacing between said first and second planes whereby the amount of cleaning agent flowing out of said cup and into said space on flow of said flushing liquid and and out of the perforated end of said cone on ebb of said flushing liquid is regulated.

4,916,761

TOILET FLUSH-ECONOMIZER

John P. Pavlik, 20411 Lassen St., Chatsworth, Calif. 91311

Filed May 5, 1989, Ser. No. 348,289
Int. Cl.[4] E03D *1/14*
U.S. Cl. 4—324 13 Claims



1. A water saving device for use with a conventional domestic toilet flush tank having a bowl, said tank being of the type which is flushed by an external flush actuator attached to an internal linkage to which a seated movable component of a flush valve is flexibly connected so that movement of the flush actuator in one direction causes the linkage to rise and lift the movable component off its seat so as to open the flush valve thereby releasing flushing water into the toilet bowl, said flush actuator having a contact surface and being sized and shaped so as to travel in a predetermined path when the flush actuator is actuated to flush the toilet, the device comprising:

a rigid stop-body; and, means for fixedly attaching said stop-body on an external wall of the tank close to but not intersecting said predetermined path of travel of the flush actuator such that a contact surface of the stop-body is substantially aligned with the contact surface of the flush actuator when the flush actuator is actuated to move the flush valve to a partly-open position whereby a user is given indication of the partly-open position of the flush valve through simultaneous contact with the contact surfaces of both the flush actuator and the stop-body thereby allowing the flush valve to be held partly open for a user selected flush time.

4,916,762

POSITIVE SHUT-OFF, METERED WATER CONTROL SYSTEM FOR FLUSH TANKS

William S. Shaw, 7606 Silvercrest Cir., Austin, Tex. 78757

Filed Jan. 18, 1989, Ser. No. 298,029
Int. Cl.[4] E03D *1/36*
U.S. Cl. 4—366 18 Claims

1. A positive shut-off, metered water control system for flush toilet tanks comprising:

a housing assembly, said housing assembly sealed so as to be capable of mounting below the water line in the toilet tank;

an inlet fitting means attached to said housing assembly for mounting said control system in the flush tank and providing a connection to a source of water under pressure;

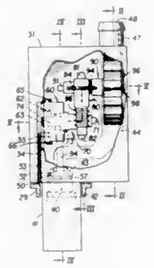
an outlet on said housing assembly;

means for directing the flow of water into the toilet tank removably attached to said outlet;

stopper means mounted between said inlet fitting means and said outlet for movement between sealed and open positions for shutting off or permitting water flow;

flow channel means within said housing assembly for directing the flow of water when said stopper means is in an open position;

start means for placing said metered water control into operation;



an impeller rotatably mounted in a cavity portion of said flow channel means in said housing assembly between said inlet fitting means and said outlet;

cam means for controlling said positions of said stopper means, said cam means being linked to said start means;

linkage means for transferring the rotation of said impeller into a rotation of said cam means; and

disengagement means for permitting said cam means to be rotated by the linked said start means without imparting rotation to said linkage means and said impeller.

4,916,763

POOL DECK PROTECTOR

Lincoln H. Christensen, County of Vanderburgh, Ind., assignor to Anchor Industries, Inc., Evansville, Ind.

Filed Apr. 17, 1989, Ser. No. 338,746
Int. Cl.[4] E04H *3/19, 3/18*
U.S. Cl. 4—503 4 Claims

1. A pool deck protector for use in combination with a tie-down arrangement for a pool cover surrounded by a pool deck which includes an anchoring member, a tension spring overlying said deck and webbing interconnecting the pool cover with the anchoring member said protector, comprising an enlarged body portion adapted to extend longitudinally with respect to said spring between said spring and said pool deck and tapering into narrow elongated strips at either end

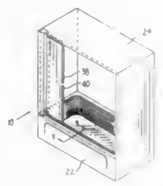
thereof, where said protector is retained in position by the placement of each of said elongated strips within said spring.

4,916,764

BATHTUB SHOWER CURTAIN ASSEMBLY

Clive Meaden, 79 Arthur St., Holyoke, Mass. 01040, and Christopher P. Dunn, 197 Celia Dr., Waterbury, Conn. 96705

Filed Nov. 14, 1988, Ser. No. 270,618
Int. Cl.[4] A47K *3/14*
U.S. Cl. 4—558 1 Claim



1. A new and improved bathtub shower curtain assembly, in combination with a bathtub, comprising:

frame support means including shower curtain guide track means; the curtain guide track means including a lower track secured to a topmost surface of said bathtub and an upper track spaced above and parallel to the lower track, and

a flexible shower curtain means including upper and lower ends of a guide rod slidably movable and receivable within respective upper and lower troughs in said upper and lower tracks;

shower curtain retraction means; and

a casing means orthogonally and fixedly mounted between opposed and aligned ends of said upper and lower tracks, and

wherein said frame support means is of a substantially rectangular construction, and

wherein said shower curtain retraction means includes roller means of a spring biased construction about which said flexible shower curtain means may be selectively rolled, and

further including slot means positioned within said casing means, with said flexible shower curtain means being movable through said slot means during a rolling thereof about said roller means, and

further including flexible elongate polymeric wiper means positioned coextensively along said slot means said wiper means mounted for engaging opposed sides of said flexible shower curtain means during a movement thereof through a slot means, and

wherein said guide track means includes a downwardly-sloped topmost surface, thereby to facilitate water drainage from said flexible shower curtain onto said topmost surface of said guide track means and thence downwardly into an interior portion of said bathtub.

4,916,765

PILLOW KIT

Joseph A. Castronovo, Jr., Miami, Fla., assignor to Florifoam, Inc., Miami, Fla.

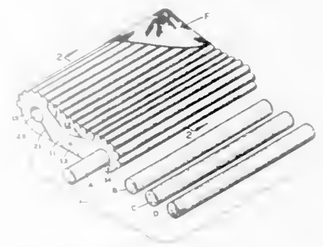
Filed Jul. 17, 1989, Ser. No. 380,383
Int. Cl.[4] A47C *20/00*
U.S. Cl. 5—437 7 Claims

1. A pillow kit comprising:

a compressible and resilient body having a top and a bottom, a recess therein extending across the width of said body, and a narrow opening extending from the outside of said body into said recess along substantially the complete extent of said recess across the width of said body;

a set of compressible and resilient inserts shaped and dimensioned for snug reception one at a time in said recess, each of said inserts having a predetermined compressibility different from every other insert in said set;

said cushion body having a trough in said top;



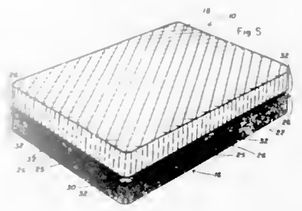
and a compressible and resilient top piece substantially filling said trough and removably received therein.

4,916,766

BED SHEET AND MATTRESS ATTACHMENT MEANS

Malcolm B. Grandy, 420 S. McDowell St., Suite 401, Raleigh, N.C. 27601

Filed Aug. 18, 1989, Ser. No. 395,541
Int. Cl.[4] A47G *9/02*
U.S. Cl. 5—496 7 Claims



6. A sheet, mattress and mattress support structure comprising:

(a) a sheet having a plurality of first attachment means secured about the perimeter of the sheet;

(b) a mattress with an underside and a plurality of second attaching means stationed about the perimeter of the mattress underside for cooperating with the first attachment means of the sheet for securing the sheet to the mattress;

(c) a mattress support structure for supporting the mattress and having an upper side;

(d) a series of recesses spaced about the perimeter of the upper side of the mattress support; and

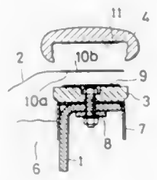
(e) the recesses being particularly spaced to correspond to the spacing of the second attachment means such that when the mattress is supported by the mattress support the respective second attachment means formed on the underside of the mattress overlay respective recesses such that one may conveniently secure the first attachment means of the sheet with the second attachment means formed on the underside of the mattress.

4,916,767

DEVICE FOR SECURING DETACHABLY FILTERING SHEET TO AIR BED

Tsuyoshi Uetake, and Iwao Ueno, both of Tokyo, Japan, assignors to Keisei Medical Industrial Company Limited, Tokyo, Japan

Filed Feb. 18, 1988, Ser. No. 157,030
Claims priority, application Japan, Feb. 21, 1987, 62-24657[U]
Int. Cl.[4] A47G *9/04*; A47C *21/02*
U.S. Cl. 5—498 3 Claims



1. A device for securing detachably a filtering sheet to an air bed including a bed body, having an upper edge defining an opening, and solid particles contained in the bed body, comprising:
- a flange fixed to the upper edge of the bed body;
- a cover made of resilient material and being detachably clamped onto the flange, while a periphery of the filtering sheet is clamped between nonlinear boundary surfaces of the flange and the cover;
- a face fastener having a hook tape and a loop tape, one of which is secured to an upper surface of the flange and the other of which is secured to a lower surface of the periphery of the filtering sheet; and
- an additional face fastener having a second hook tape and a second loop tape, one of which is secured to an upper surface of the periphery of the filtering sheet and the other of which is secured to a lower surface of the cover.

4,916,768

WASHING AND EXTRACTING METHOD

John Broadbent, Bloomingdale, Ill., assignor to Ellis Corporation, Itasca, Ill.

Division of Ser. No. 130,311, Dec. 8, 1987, Pat. No. 4,856,301.
This application May 2, 1989, Ser. No. 346,567
Int. Cl.[4] D06F *33/02*
U.S. Cl. 8—159 11 Claims

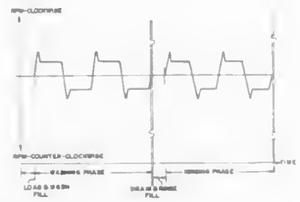
1. A method of laundering a plurality of different types of laundry materials loaded in a rotatable cylinder having a drive mechanism for rotating the cylinder at a variable speed, said method comprising the steps of:
- storing a plurality of predefined acceleration profiles, each said predefined acceleration profile including a plurality of predetermined time intervals for varying the rotational speed of said cylinder between predetermined first and second speeds for each of said time intervals, thereby to accelerate said laundering cylinder at a predetermined rate within each of said time intervals;
- identifying a particular one of said laundry materials to be laundered;
- identifying one of said stored predefined acceleration profiles responsive to said identified laundry material; and
- controlling said drive mechanism to vary the rotational speed of said cylinder in accordance with said identified predefined acceleration profile.

4,916,769

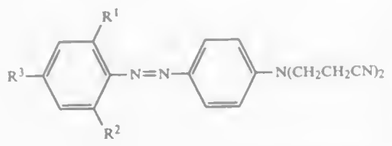
DISPERSE MONO-AZO DYE MIXTURE FOR DYEING SYNTHETIC TEXTILES

David Brierley, Royton; Leslie A. Mather, Westhoughton, and Barry H. Meyrick, Urmston, all of Great Britain, assignors to Imperial Chemical Industries plc, London, England

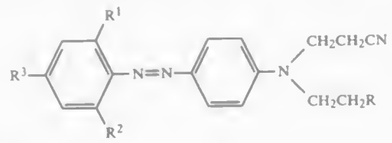
Filed Mar. 6, 1989, Ser. No. 319,185
Claims priority, application United Kingdom, Mar. 10, 1988, 8805690
Int. Cl.[4] C09B *29/00*
U.S. Cl. 8—639 13 Claims



1. A disperse dye mixture comprising from 85 to 95% by weight of a dye of the formula:



and from 15 to 5% by weight of a dye of the formula:



wherein
- R represents —OH or —OCOR[4] wherein R[4] represents C_{1-4}-alkyl or C_{1-4}-alkoxy;
- each of R^1 and R^2, independently, represents hydrogen, halogen, C_{1-4}-alkyl or C_{1-4}-alkoxy; and
- R^3 represents hydrogen, halogen or nitro.

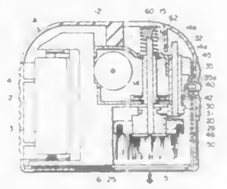
4,916,770

PORTABLE ELECTRIC SHOE SHINER

Tamotsu Matsumoto, Narashino, Japan, assignor to Midori Co., Ltd., Tokyo and Form Design Iocorporation, Chiba, both of, Japan

Filed Sep. 16, 1988, Ser. No. 245,762
Claims priority, application Japan, Feb. 17, 1988, 63-19389
Int. Cl.[4] A47L *23/06*
U.S. Cl. 15—28 5 Claims

1. A portable shoe shiner comprising:
- a shining member for shining shoes;
- a driving means for rotating the shining member;
- a housing for accommodating the shining member and the driving means therein; and
- a sliding means for slidably supporting the shining member between a projected position and a retracted position relative to the housing, the shining member projecting from the housing at the projected position and being retracted into the housing at the retracted position; and
- switch means for activating and deactivating said driving means so that movement of said shining member by said sliding means from said projected position to said retracted position causes said switch means to deactivate said driving means and so that movement of said shining member from said retracted position to said projected position causes said switch means to activate said driving means.

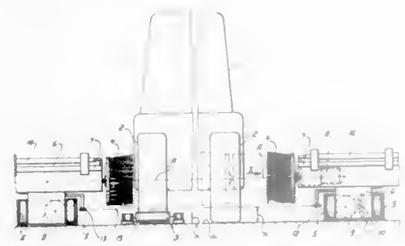


4,916,771

APPARATUS FOR WASHING THE WHEELS OF VEHICLES IN A WASHING PLANT

Gebhard Weigele, Am Schoenblick 1a, 8902 Neusaess, Fed. Rep. of Germany

Filed Feb. 22, 1989, Ser. No. 314,039
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1988, 8804404[U]
Int. Cl.[4] B60S *3/06*
U.S. Cl. 15—53 B 5 Claims



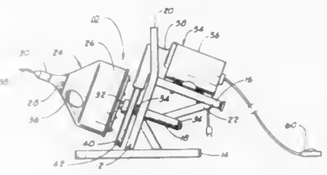
1. Apparatus for washing the wheels of vehicles in a washing plant, with two oppositely arranged rotating wash brushes each of which is associated with the wheels of one side of a vehicle and adjustable transverse to the direction of movement of the vehicle on a carriage movable together with the vehicle in the direction of movement of the vehicle by means of a drive motor and which during the washing phase can be pressed against one wheel at a time, and the drive motors are acted upon by an electrical control device having a light barrier for scanning the position of the wheels with a light beam extending transverse to the direction of movement of the vehicle, characterised in that the light barrier (12, 13) is provided between the oppositely arranged carriages (6) and is connected thereto and its light beam (axis) (15) is spaced from the axes of rotation (A) if the wash brushes (4) at a radial distance (R1) which corresponds approximately to the radius (R) of an average wheel size, and that the control device is of the follower control type which is designed in such a way that during the washing phase the carriages (6) can be advanced further in the vehicle's direction of movement (B) by the drive motors (9) according to the respective position of the wheel (2) about to be washed, which is scanned by the light barrier (12, 13).

4,916,772

PORTABLE DRAIN CLEANING APPARATUS

V. L. Russell, Bethany, and Kerry Cannon, Moore, both of Okla., assignors to National Manufacturing & Supply Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 166,916, Mar. 11, 1988. This application Oct. 12, 1988, Ser. No. 256,744
Int. Cl.[4] B08B *9/02*
U.S. Cl. 15—104.33 5 Claims



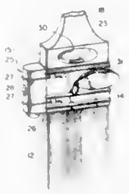
1. A portable drain cleaning apparatus comprising:
- a frame assembly having a plurality of frame members; a drive shaft rotatably supported by the frame assembly;
- a drum assembly removably supported by the drive shaft comprising a payout drum, a chuck holder adapter,-and a contractable jaw chuck;
- a coil spring cleaning snake supported by the payout drum and extendable through and grippingly connected to the contractable jaw chuck; and
- power means supported by the frame assembly for selectively rotating the drive shaft so that the payout drum is rotated thereby.

4,916,773

PAINT BRUSH WITH INTEGRAL CLEANING MEANS

Joseph H. McCoy, 4180 B. W. 118th, Hawthorne, Calif. 90250

Filed Feb. 29, 1988, Ser. No. 162,138
Int. Cl.[4] A46B *3/00*
U.S. Cl. 15—191 A 1 Claim



1. A paint brush comprising the combination of:
- an elongated block having a plurality of open-ended apertures extending through said block between its opposite ends;
- a plurality of bristles secured at one end to said block in close proximity to said plurality of apertures;
- a frame member having a continuous sidewall defining an intense flushing chamber between its opposite and opposing inner surfaces in fluid communication with said open-ended apertures;
- a handle carried on one end of said frame member and said block secured to the other end of said frame member so as to define a cleansing solution storage compartment between opposing ends of said handle and said block respectively;

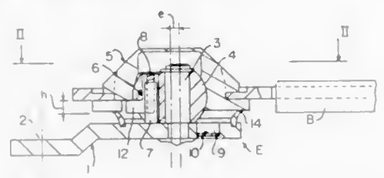
an access opening in said handle and an internal channel communicating with said storage compartment;
means carried on said handle releasably closing said access opening in a sealing relationship with said handle;
a handle grip integrally formed with said handle having a lazy "S" shape conformal to the hand of the user for holding said handle during a painting procedure;
illumination means carried on said frame member for directing an illumination beam in a work site area immediately about said bristles;
said handle, said frame member and said block are integrally formed together as a unit; and
said bristle ends are force-fitted into a portion of aid apertures whereby cleansing solution in said storage compartment and flushing chamber can engage with said bristle during a cleansing procedure.

4,916,774

WINDSHIELD WIPER DRIVE MECHANISM WITH RETRACTED PARKING POSITION

Philippe Arlon, Ozoir; Jean-Pierre Eustache, Antony, and Daniel Maubray, Issy, all of France, assignors to Valeo Systemes D'Essuyage, Issy-les-Moulineaux, France

Filed Apr. 13, 1989, Ser. No. 337,405
Claims priority, application France, Apr. 13, 1988, 88 04891
Int. Cl.[4] B60S *1/22*
U.S. Cl. 15—250.16 9 Claims



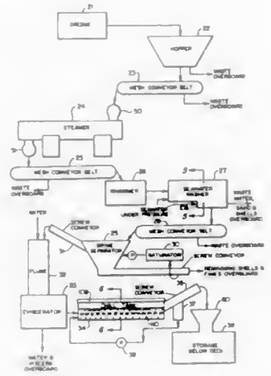
1. A drive mechanism for a windshield wiper allowing a windshield wiper blade associated with the mechanism to be placed in a retracted, parking state, the mechanism comprising a crank having means at a first end thereof for coupling it with a drive motor, a crank pin closer to the other end of said crank and carried thereby, a crank head piece carried eccentrically on said crank pin, a crosshead pivoted on said crank head piece, a latch carried by said crank head piece, said latch comprising a latch finger and resilient means associated with said latch finger for urging the latter in a direction substantially parallel with the axis of said crank pin, selective coupling means including said latch for, in a first direction of rotation of said crank, maintaining said crank and crank head piece uncoupled from each other and, in a second opposite direction of rotation, coupling them together for simultaneous rotational movement, stop means for coupling said crosshead and crank head piece for rotation together during rotation of said crank in said first direction, the arrangement being such that, in normal wiping operation, said crank rotates in a direction in which the position of the eccentric said head piece remains constant with respect to one of said crosshead and said crank, whereas, when the direction of rotation of said crank is reversed, said crank head piece and said one of said crosshead and said crank are caused to undergo relative rotation, whereby to cause the degree of eccentricity to change so as to bring the wiper into the retracted parking state, and said latch finger including an outwardly directed radial latch arm, said crosshead having a recess to receive said latch arm, and said crank having an opening for receiving a free end of said latch finger, the position and thickness of said latch arm being such that, when said latch finger is engaged in said opening in said crank, said latch arm is situated between face to face surfaces of said crosshead and of said crank, respectively, to prevent said latch from disengaging from said opening by abutment of said latch finger against said crosshead, said crank head piece being mounted in facing relationship with said crank.

4,916,775

HARVESTING, SHUCKING AND EVISCERATING CLAMS AT SEA

William E. Gallant, Scarborough, Me., assignor to Borden, Inc., Columbus, Ohio

Filed Nov. 17, 1987, Ser. No. 122,014
Int. Cl.[4] A22C *25/16, 29/00*
U.S. Cl. 17—46 11 Claims



1. The method of processing clams or the like on board a sea-going vessel while at sea which comprises sequentially:
(1) providing a supply of the clams on board the deck of the vessel,
(2) feeding the clams to a high pressure steamer on the deck, the steam of which is sufficient to cause the shells to open and the muscle tissue to release its hold on the shells,
(3) feeding the opened clams to a crusher on the deck, which crushes them and allows separation of the meat from the shells,
(4) feeding the crushed clams to a washer which receives its water supply from the sea and moves the shells and meat in a turbulent manner to separate the clam meat from the shell particles and the like,
(5) directing waste water sand and shell particles overboard,
(6) feeding the clam meat to an eviscerator which separates the meat from the viscera,
(7) directing the viscera overboard and
(8) delivering the clam meat to a chill tank.

4,916,776

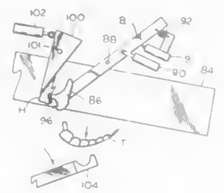
METHOD AND APPARATUS FOR PROCESSING SHRIMP

Reid P. Allain, Marietta, Ga., assignor to Robert B. Kennedy, Atlanta, Ga., a part interest

Continuation-in-part of Ser. No. 288,425, Dec. 22, 1988. This application Sep. 20, 1989, Ser. No. 409,948
Int. Cl.[4] A22C *29/00*
U.S. Cl. 17—71 16 Claims

1. Apparatus for deheading shrimp comprising means for supporting a shrimp in a generally upright orientation; a pinch block mounted adjacent said support means against which the head of the shrimp may be placed; a clamp mounted adjacent said support means for movement of the head of a shrimp supported upon said support means into clamped engagement

with said pinch block; and a pinch finger mounted for movement along a path of travel passing closely adjacent to said



pinch block for pinching off the body of a shrimp as its head is held clamped by said clamp to said pinch block.

4,916,777

RING MOUNTING FOR OPENING ROLLERS OF SPINNING MACHINES

Fritz Stahlecker, Bad Uberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker, Fed. Rep. of Germany, a part interest

Filed Oct. 7, 1988, Ser. No. 254,813
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1988, 3827344
Int. Cl.[4] D01B *1/00*; D01G *15/12*
U.S. Cl. 19—97 17 Claims

1. A ring mounting for opening rollers of spinning machines having a ring-shaped basic body, out of the outer circumference of which a set of teeth is integrally formed by means of notches extending essentially in axial direction and by means of grooves extending essentially in circumferential direction with said teeth being bounded by the respective notches and grooves, wherein the groves are deeper than the notches.

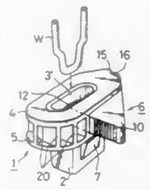
4,916,778

DEVICE FOR SECURING CAR SEAT

Tatsuya Iguchi, Toyota, Japan, assignor to Nifco, Inc., Yokohama, Japan

Filed Aug. 9. 1989, Ser. No. 391,007
Claims priority, application Japan, Aug. 26, 1988, 63-111302
Int. Cl.[4] A44B *21/00*
U.S. Cl. 24—458 7 Claims

1. A device for securing a seat of a car to a support panel, comprising:
a body made of a plastic material and integrally having a leg-like lower portion open at the top, an upper portion united to said top of said leg-like portion, and upper and lower flange portions extending outwardly in a spaced-apart relation with respect to each other from the respective upper and lower ends of said upper portion; and
a lever arm made of a plastic material and pivotally coupled to said upper and lower flange portions of said body,
said leg-like lower portions of said body having engaging means for cooperating with said lower flange portion so as to clamp an edge portion surrounding a hole defined within said support panel so as to secure said body to said support panel, said upper portion having a side hole,
said lever arm integrally having a traverse portion penetrating said side hole and traversing the interior of said upper portion, an operating portion extending away from said traverse portion and projecting outwardly from a space



defined between said upper and lower flange portions, and a spring portion in frictional contact with the outer periphery of said upper portion, said traverse portion being biased by said spring portion so as to penetrate said side hole, the upper surface of said traverse portion having an inclined portion inclined downwardly toward the free end thereof.

4,916,779

ADJUSTABLE FASTENER

Yasuharu Terada, Uozu; Yukio Shimada, Osaka, and Yoshiyuki Horita, Toyama, all of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 26, 1989, Ser. No. 357,606
Claims priority, application Japan, May 31, 1988, 63-135133
Int. Cl.[4] A41F *1/00*; A44B *11/10*
U.S. Cl. 24—585 17 Claims

1 An adjustable fastener for interconnecting a first part and a second part, comprising:
(a) a flat hollow sleeve having a longitudinal guide channel extending from an end of said sleeve, a guide groove extending transversely of and opening to the guide channel, and a first connecting portion for attachment to the first part;
(b) a plug having a flat body slidably receivable in said guide channel, a row of teeth disposed on and extending along a longitudinal edge of said body, and a second connecting portion disposed at an end of said body for attachment to the second part;
(c) a locking member slidably held within said guide groove and having a pusher head at an end thereof, and at least one locking projection releasably engageable with one of said teeth on said plug body for locking said plug in position against displacement; and
(d) spring means held within said sleeve for normally retain-

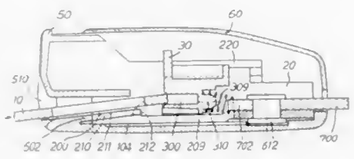
ing said locking projection in locking engagement with said one of said teeth and keeping said pusher head to project outwardly of said sleeve, said locking member being movable along said guide groove to disengage said locking projection from said one of said teeth against the force of said spring means when said pusher head is depressed.

4,916,780

SAFEGUARDING BUCKLE FOR A SAFETY BELT

Jean-Noël Ballet, Aillevilliers, France, assignor to ECIA-Equipements Et Composants Pour l'Industrie Automobile, Audincourt, France

Filed May 19, 1989, Ser. No. 354,176
Claims priority, application France, Jun. 2, 1988, 88 07370
Int. Cl.[4] A44B *11/25*
U.S. Cl. 24—642 **20 Claims**



1. Buckle for a safetybelt, especially of motor vehicles used on land, which is intended for connecting a band to an anchorage point and which is composed, among other things, of a latch (**10**) and of a keeper comprising particularly a base (**20**) which delimits a channel (**200**) for receiving the latch (**10**) at least partially and which is equipped with a nose (**210**), on which the latch (**10**) can catch directly when it is locked on the keeper, and, carried by this base, an ejecting guide bolt (**30**) which delimits a receptacle (**300**) for receiving the latch (**10**) at least partially and which is mounted on the base (**20**) movably between a first retaining position, towards which it is normally stressed elastically, and a second position, towards which it is pushed momentarily during the introduction of the latch. (**10**) into the keeper for locking it, and an actuating button (**50**) mounted on the base (**20**) movably in terms of translational motion parallel to the receptacle (**300**) between an inactive position, towards which it is normally stressed elastically and which it occupies when the ejecting guide bolt (**30**) is in its first position, and an active position for causing the ejecting guide bolt (**30**) to pass from its first position to its second position in order to release the latch (**10**) from the keeper, wherein the channel (**200**) and the receptacle (**300**) are inclined relative to one another and are oriented in such a way that the channel (**200**) has a slant rising in the direction of the receptacle (**300**), the ejecting guide bolt (**30**), when it moves from its first position to its second position, follows a path in the form of a broken line, first approximately parallel to the receptacle (**300**) and then oblique relative to the latter, and vice versa, and it possesses means (**40**) for safeguarding the bolt (**30**) in its first position, for inserting and retaining the latch (**10**)in the receptacle (**300**) of the ejecting guide bolt (**30**) and for guiding the ejecting guide bolt (**30**) on its path in the form of a broken line when it moves from one of its two positions to the other.

4,916,781

FASTENING DEVICE

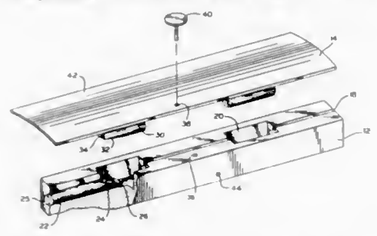
Arthur Ball, 12240 - 131 Street, Edmonton, Alberta, Canada (T5L 1M9)

Filed Sep. 8, 1988, Ser. No. 241,583
Int. Cl.[4] F16B *12/22*
U.S. Cl. 24—697 **5 Claims**

1. A fastening device, comprising:

a. a first bar having a longitudinally extending interior channel and a longitudinally extending groove communicating with the interior channel, the groove having enlarged openings at spaced intervals; and

b. a second bar having a plurality of tongues extending substantially perpendicularly and terminating with an enlarged appendage, the tongues being spaced at intervals corresponding to the interval spacing of the enlarged



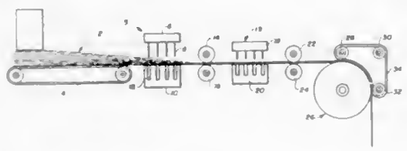
openings in the first bar thereby enabling the appendages to be inserted through the openings into the channel and enabling the tongues to be moved longitudinally along the groove to position the appendages out of register with the openings thereby coupling the second bar with the first bar.

4,916,782

METHOD FOR MAKING A NON-WOVEN FLANNEL FABRIC

Kenneth G. Caldwell, Maytown, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Division of Ser. No. 133,124, Dec. 14, 1987, Pat. No. 4,828,914.
This application Jan. 27, 1989, Ser. No. 302,445
Int. Cl.[4] D04H *18/00*
U.S. Cl. 28—111 **4 Claims**



1. The method of making a non-woven flannel fabric comprising the steps of:

a) providing a web of blended fibers of two shades of color of polyester fibers said web being formed of plural deposited layers of fibers that have the two colors of fiber non-uniformly blended,

b) needling through the web of fibers to lock together the plural layers of fibers and cause the fibers of different colors to form small, distinct different color spots with holes on one surface of the web,

c) needling the web of fibers a second time, and

d) ironing the one surface of the web with the color spots to smooth the surface of the web and eliminate the needle holes in the surface.

4,916,783

APPARATUS FOR CONTROLLED BRAKING OF A DRIVEN YARN ENGAGING ROLL

John F. Hagewood, Matthews; Julius Darigo, Charlotte; Bruce S. McCoy, Monroe, and John M. Single, Matthews, all of N.C., assignors to McCoy-Ellison, Inc., Monroe, N.C.

Filed Oct. 13, 1988, Ser. No. 257,052
Int. Cl.[4] D02H *13/12*
U.S. Cl. 28—172 **8 Claims**

1. In a textile draw warping system having a first set up upstream guide rolls driven by a common first drive means and a second set of downstream guide rolls driven by a common second drive means at a greater surface speed than said first set of rolls for drawing a plurality of synthetic continuous filaments traveling peripherally in sequence over said rolls, apparatus for controlled braking of said first and second sets of rolls, said apparatus comprising:

(a) a plurality of fluid actuated braking means each respectively associated with one of said rolls,

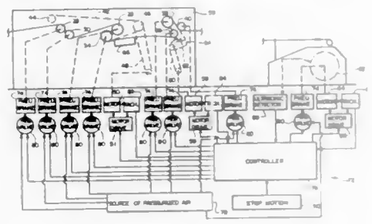
(b) a plurality of adjustable valve means each respectively associated with one of said braking means for individually supplying a pressurized operating fluid to each said braking means at independently selectively variable pressures for generation of a correspondingly variable braking force by each said braking means,

(c) first means for detecting the common speed of said first set of rolls,

(d) second means for detecting the common speed of said second set of rolls, and

(e) braking program means including:

(i) primary control means for individually controlling adjustment of each said valve means for controlling the



pressure at which the pressurized operating fluid is supplied respectively to each said braking means for individually controlling deceleration of each said roll of said first set in a common predetermined relationship of decreasing roll speed to elapsed time of actuation of said braking means and for individually controlling deceleration of each said roll of said second set in another common predetermined relationship of decreasing roll speed to elapsed time of actuation of said braking means related to said common relationship of said first set of rolls for maintaining a predetermined ratio between the common speed of said first set of rolls and the common speed of said second set of rolls during braking, and

(ii) auxiliary control means independently responsive to each said first and second detecting means for independently controlling dynamic braking and driving of said first and second drive means in conjunction with said plurality of fluid-actuated braking means for independently correcting deviations in the detected common speeds of said first and second sets of rolls from their respective said common speed-to-time relationships.

4,916,784

WARP-DRAWING APPARATUS

Juro Tachibana, Matsuyama, and Yoshihide Nishimura, Iyo, both of Japan, assignors to Teijin Seiki Company Limited, Osaka, Japan

Filed Jun. 8, 1988, Ser. No. 204,123
Claims priority, application Japan, Jun. 18, 1987, 62-153002; Jun. 18, 1987, 62-153003; Jun. 18, 1987, 62-153004; Jun. 18, 1987, 62-153006
Int. Cl.[4] D03J *1/14*
U.S. Cl. 28—203 **12 Claims**

1. A warp-drawing apparatus for drawing a warp thread through an aperture of a drop or an eye of a heddle, comprising means for supplying said warp thread,

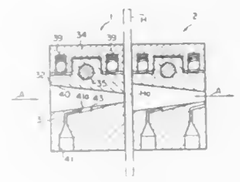
means for positioning said drop or heddle at a predetermined position,

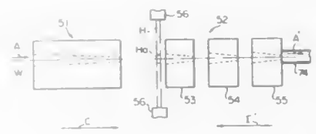
a compression nozzle which is provided in one side of said drop or heddle and formed with a compression passageway through which said warp thread is drawn and formed with a nozzle passageway through which compression air is injected, the compression nozzle having a first nozzle block and a second nozzle block movable toward and away from said first nozzle block, the blocks defining said compression passageway,

means for supplying said compression air to said nozzle passageway of said compression nozzle,

means to open and close said nozzle blocks of said compression nozzle,

a suction nozzle which is provided in the other side of said drop or heddle and formed with a suction passageway through which said warp thread is drawn and formed with a nozzle passageway through which compression air





is injected, the suction nozzle having a first nozzle block and a second nozzle block movable toward and away from said first nozzle block, the blocks defining said suction passageway,

means for supplying said compression air to said nozzle passageway of said suction nozzle,

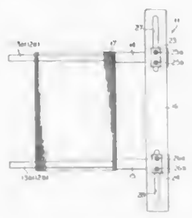
means to open and close said nozzle blocks of said suction nozzle,

means for moving said compression and suction nozzles relative to said drop or heddle,

suction means for drawing air from an exit of said suction passageway of said suction nozzle in a yarn drawing direction in which said warp thread is drawn through the aperture of said drop or the eye of said heddle, and

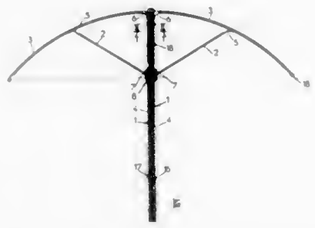
means for removing said warp thread from said compression and suction nozzles after said warp thread has been drawn through the aperture of said drop or the eye of said heddle.

4,916,785
HEDDLE MAGAZINE
Juro Tachibana, Matsuyama, and Yoshibide Nishimura, Iyo, both of Japan, assignors to Teijin Seiki Company Limited, Osaka, Japan
Filed Jul. 5, 1988, Ser. No. 215,391
Claims priority, application Japan, Jul. 10, 1987, 62-122349
Int. Cl.[4] D03J *1/14*
U.S. Cl. 28—206 9 Claims



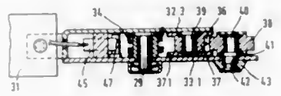
2. A heddle magazine as set forth in claim 1, wherein said stationary magazine support is fixedly mounted on a stationary frame member of a warp-drawing apparatus.

4,916,786
METHOD OF ASSEMBLING AN ARMATURE OF AN UMBRELLA
Michel Chollet, Fontenay-sous-Bois; Pascal Bierling, Bry-sur-Marne, and Christian Facoetti, Saint-Maurice, all of France, assignors to Interligne, Maisons-Alfort, France
Filed Mar. 11, 1988, Ser. No. 177,514
Claims priority, application France, Mar. 23, 1987, 87 03966
Int. Cl.[4] B21F *41/00*
U.S. Cl. 29—25 5 Claims



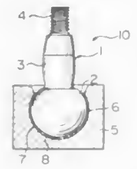
1. An element for fabricating an armature of an umbrella, wherein said armature comprises a handle, a plurality of spokes joined to said handle, a ring slidably mounted on said handle and a plurality of tension arms each of which is joined to a respective spoke at one end and to said ring at the opposite end, said element being a unitary assembly comprising a spoke having a first and second end, a tension arm having a first and second end, a first flexible tab integrally molded with said spoke intermediate between said first and second spoke ends and said first end of said tension arm and constituting a hinge therebetween, coupling means integrally molded with said second end of said tension arm for pivotally interlocking said tension arm with a ring element, a longitudinal handle portion, and a second flexible tab integrally molded with said second end of said spoke and said longitudinal handle portion and constituting a hinge therebetween, said element being constructed and arranged whereby a plurality of said elements when mated together form an armature as defined.

4,916,787
KNOT CATCHER FOR YARNS AND THREADS
Heinz Brunner, Albstadt-Ebingen, Fed. Rep. of Germany, assignor to Sipra Patententwicklungs-und Beteiligungsgesellschaft mbH, Albstadt, Fed. Rep. of Germany
Filed Mar. 24, 1988, Ser. No. 173,152
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1987, 3710345
Int. Cl.[4] D02J *3/14*; B65H *63/06*
U.S. Cl. 28—232 15 Claims



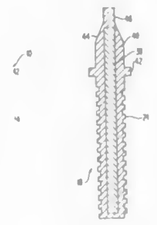
1. A knot catcher for yarns and threads, comprising two elements adjustable relative to each other and forming between each other a thread-receiving through opening, said elements being two rotation-symmetrical bodies of which at least one is rotationally supported and at least one is adjustable relative to the other rotation-symmetrical body to adjust a size of said through opening for insertion of a thread thereinto, said two rotation-symmetrical bodies having cylindrical peripheral surfaces which form said through opening, rotation axles and two end flanges, said two end flanges providing wall means extending perpendicular to said axles and limiting said through opening at two ends thereof.

4,916,788
METHOD OF MANUFACTURING BALL JOINT
Yasunobu Mitoya, Nagoya, Japan, assignor to Tokai TRW & Co., Ltd., Kasugai, Japan
Continuation of Ser. No. 218,633, Jul. 13, 1988, abandoned. This application Aug. 3, 1989, Ser. No. 389,168
Claims priority, application Japan, Aug. 10, 1987, 62-198170
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—898.044 1 Claim



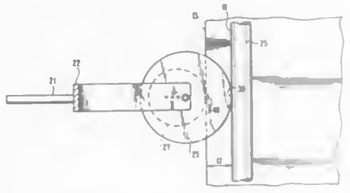
1. A method of manufacturing a ball joint, said method comprising the steps of:
placing a ball portion of a ball stud of said joint in a mold;
casting a socket in said mold in the form of an integral structure surrounding said ball portion;
applying a rolling force to an outer wall of said cast socket by means of a plurality of mill rolls in such a manner that the rolling force causes deformation of said socket so as to allow said ball portion of said ball stud to be slidable rotated relative to said socket; and
supplying a lubricating oil into an annular recess defined by said socket and said ball stud before completing the application of the rolling force so as to allow the lubricating oil to be forced into a gap formed, under a negative pressure, between said socket and said ball portion during the application of the rolling force due to a difference in pressures at a side of the applied lubricating oil exposed to the gap under the negative pressure and the other side of the applied oil exposed to an ambient pressure.

4,916,789
VALVE STEM CONSTRUCTION
Joseph H. Robinson, Alexander City, Ala., assignor to Robinson Foundry, Inc., Alexander City, Ala.
Filed Apr. 13, 1989, Ser. No. 337,673
Int. Cl.[4] F16K *1/02*
U.S. Cl. 29—890.123 8 Claims



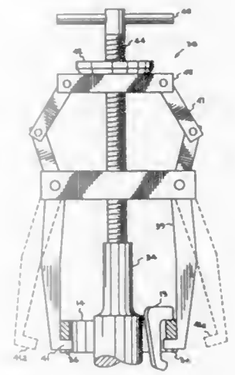
1. A method of constructing a valve stem comprising:
evaporative foam casting to at least near net shape an elongated member having an outside valve stem surface including a threaded portion and an engagement surface turning portion, and with a rod member of substantially the same length as and of a different material than that of the elongated member cast in the elongated member.

4,916,790
BACKER-ROD INSTALLATION TOOL
John T. Vlahogeorge, Lafayette, Ind., assignor to Control Tool Company, Inc., Lafayette, Ind.
Filed Jul. 20, 1989, Ser. No. 383,000
Int. Cl.[4] B23P *19/02*
U.S. Cl. 29—235 18 Claims



1. A tool for installing a sealant backer-rod to a desired depth in a joint between building surfaces comprising:
a frame for a worker to hold;
a joint wheel rotatably mounted to said frame about a first axis of rotation, said wheel having a width in the direction of said axis sized to fit into said joint and further having an outer circumferential surface to contact a sealant backer-rod in said joint as said frame is moved along said joint;
backer-rod depth control means on said frame and adjacent said wheel having a first contact surface spaced inwardly from said outer circumferential surface a distance equal to the desired depth of said backer-rod, said control means with said first contact surface operable to contact and move along one of said building surfaces limiting inward movement of said wheel in said joint when said frame is forced toward and along the length of said joint forcing said backer-rod to said desired depth; and,
first adjustment means on said frame operable to adjust the inward spacing between said first contact surface and said outer circumferential surface equal to said desired depth.

4,916,791
BALL BEARING PULLER ATTACHMENT
Mary A. Clouse, 2249 E. Leland Rd., Apt. 238, Pittsburg, Calif. 94565, and David E. Voorhis, 815 Murray Ave., San Luis Obispo, Calif. 93401
Filed Jul. 26, 1989, Ser. No. 385,073
Int. Cl.[4] B23P *17/04*
U.S. Cl. 29—261 18 Claims

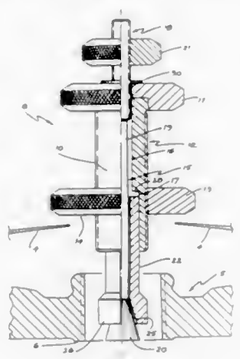


1. A ball bearing puller attachment for a standard ball bearing puller for removing a ball bearing assembly in an axial direction from a shaft and a housing, said assembly having an inner race and an outer race, each of said races having an internal groove, comprising:
a ring having means including notches for pulling engagement in the axial direction with the standard ball bearing puller; and
a linking means having means for pulling engagement in the axial direction with the internal groove of the outer race, said linking means having means for pulling engagement with said ring in the axial direction, said linking means axially engaging the groove only in the outer race for pulling the assembly from the housing and shaft when force is applied to the ring by the standard ball bearing puller.

4,916,792
CLUTCH ALIGNMENT TOOL
Waldemar Haubus, 24 Federal Parade, Brookvale, New South Wales, 2011, Australia
Continuation-in-part of Ser. No. 894,417, Aug. 8, 1986, abandoned. This application May 6, 1988, Ser. No. 190,870
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—262 6 Claims

1. A tool for centering a clutch plate and a clutch pressure plate having a spring diaphragm, comprising a tube having an elongate bore extending therethrough; an axially slidable bolt extending through said bore and having a draw nut at one end and a head at its other end; the bore of said tube being stepped along its length; an elongate hollow insert being provided within said bore; said axially slidable bolt extending therethrough; said insert having a resiliently deformable enlargement at one end thereof; the other end of said insert being adapted in use to be seated against a step in said bore; tightening of said draw nut causing the the head of said bolt to be drawn into an interior region of said enlargement of said insert, such as to hold an inner end of said insert against the step of said bore and so as to radially expand said enlargement such that the expanded enlargement is able to be brought into engagement with a splined hub of a clutch plate; adjustable clamping means being engaged with an outer surface of said

tube so as to be axially displaceable along and relative to the longitudinal axis of said tube, and extending radially outwardly of the longitudinal axis of said tube, such that in use, and on advancement along said tube towards said enlargement, said adjustable clamping means will overlap, engage with and compress the spring diaphragm of said clutch pressure plate; such that when said enlargement is expanded to be brought



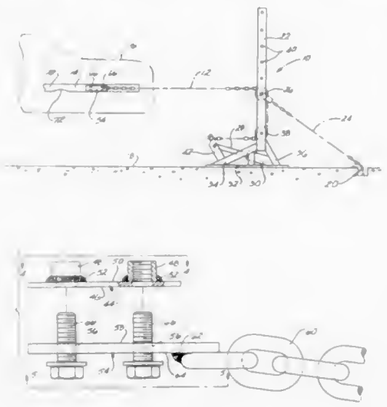
into engagement with said splined hub, and when said adjustable clamping means is so axially advanced along said tube, so as to overlap, engage with and compress said spring diaphragm of the clutch pressure plate, said adjustable clamping means and said enlargement, operate and co-act to hold said clutch plate and said clutch pressure plate in juxtaposition, such as to allow for relative alignment and mounting thereof.

4,916,793

STRAIGHTENING OF UNIBODY FRAMES

Charles J. Kuhn, 10520 Plainview Ave., Tujunga, Calif. 91042, assignor to Charles J. Kuhn, Sun Valley, Calif.

Filed Aug. 2, 1988, Ser. No. 227,507
Int. Cl.[4] B21D *1/14, 3/12;* B23K *31/00*
U.S. Cl. 29—402.19 19 Claims



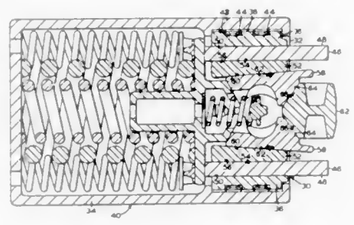
8. A method for straightening collision damage to a unibody frame member or the like, comprising:
drilling at least one anchor hole in a side wall of the frame member to be straightened;
positioning a weld plate against the side wall of the frame member, the weld plate having an internally threaded sleeve rigidly affixed thereto in alignment with a hole through the weld plate, the weld plate being positioned against the side wall of the frame member with the rigidly affixed sleeve projecting into the drilled anchor hole;
welding the weld plate to the side wall of the frame member, the weld plate being welded to the frame member so the internally threaded sleeve projects away from the weld plate and into the anchor hole drilled in the frame member for reinforcing the anchor hole;
releasably securing an anchor plate to the side of the weld plate opposite from the frame member by a fastening bolt tightened against the anchor plate and threaded into engagement with the internally threaded sleeve affixed to the weld plate;
applying a pulling force to the anchor plate fastened to the frame member to straighten the frame member without tearing the metal in the frame member; and
removing the anchor plate from the weld plate following straightening and leaving the weld plate permanently affixed to the straightened frame member.

4,916,794

METHOD OF AND APPARATUS FOR RECONDITIONING RAILWAY CAR DRAFT GEARS

Peter A. Loonam, 8805 Skyline Dr., Hinsdale, Ill. 60521

Division of Ser. No. 146,667, Jan. 21, 1988, Pat. No. 4,809,419.
This application Oct. 20, 1988, Ser. No. 260,101
Int. Cl.[4] B23P *6/00*
U.S. Cl. 29—402.04 9 Claims



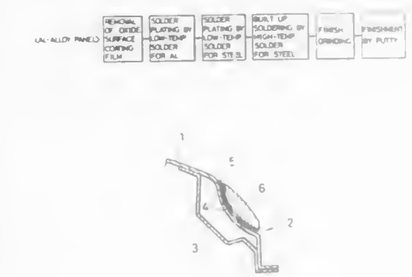
1. A method of reconditioning a worn friction clutch mechanism of a railway car draft gear assembly to restore said worn friction clutch mechanism to a useable capacity, said method including the steps of:
(a) removing each individual friction clutch component forming a part of said friction clutch mechanism from an open end of a housing member of said draft gear assembly, said friction clutch mechanism including a pair of outer stationary plates, at least one of said stationary plates including at least one cavity formed therein on an outer surface thereof, with said outer surface facing a portion of a wall surface of said housing member;
(b) engaging a first surface of an at least one substantially flat plate member having at least one protuberance extending outwardly from said first surface with said outer surface of at least one of said pair of said outer stationary plates of said friction clutch mechanism in a position such that said at least one protuberance extends into said cavity located in said outer surface of said at least one of said pair of said outer stationary plates; and
(c) reassembling said each individual friction clutch component forming said part of said friction clutch mechanism into said open end of said housing member of said draft gear assembly such that a second surface of said at least one flat plate member is in abutting engagement with said portion of said wall surface of said housing member adjacent said open end.

4,916,795

METHOD FOR MENDING A DENT ON A MEMBER MADE OF ALUMINUM ALLOY

Ryou Tan, Saitama, Japan, assignor to Honda Gikeu Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1989, Ser. No. 299,033
Claims priority, application Japan, Jan. 20, 1988, 63-8533
Int. Cl.[4] B23P *6/04*
U.S. Cl. 29—402.18 2 Claims



1. A method for mending a dent formed on an outer surface of a member made of an aluminum alloy comprising the steps of effecting a first solder plating on the surface of said dent using a low-temperature solder for aluminum, effecting a second solder plating on said plating layer using a low-temperature solder, and subsequently effecting a built-up high temperature solder layer on the plated surface of said dent using a high-temperature solder.

4,916,796

METHOD FOR ASSEMBLY OF STAIR FORMS

David Baumgartner, 140 B N. Canyon Blvd., Monrovia, Calif. 91016

Division of Ser. No. 880,694, Jun. 30, 1986, Pat. No. 4,775,131.
This application Oct. 3, 1988, Ser. No. 253,130
Int. Cl.[4] B23Q *17/00*
U.S. Cl. 29—407 8 Claims

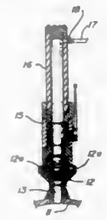
1. A method for creating a form for laying concrete steps, the method comprising the steps of:
placing a stringer on a planar surface;
rotatably fixing a first brace on the stringer;
placing measurement means adjacent the first brace, placing a second brace adjacent the stringer and the measurement means and adjusting a position of the second brace on the stringer to give a proper rise and run between the first brace and the second brace;
rotatably fixing the second brace through a pivot point to the stringer;
fixing the first and second braces with respect to the stringer so that the first and second braces are prevented from substantial rotational movement
measuring a first distance between a pilot point on the first brace and a pivot point on the second brace;
rotatably fixing a third brace on the stringer at a pilot point a second distance from the second pilot point substantially equal to the first distance; and
fixing the third brace to the stringer such that a scale on the third stringer intersects a line on the stringer intersected by a scale on the second brace.

4,916,797

HYDRAULIC RETRIEVER AND METHOD FOR CHANGING PROBES ARRANGED IN PIPES OR VESSELS UNDER PRESSURE

Roe D. Strömmen, Bracaesv. 24, 7022 Trondheim; Jarle Mjöen, Övertröa 2, 7080 Heimdal, and Kjetil Wang, Wesselgt. 19, 7043 Trondheim, all of Norway

Filed Jul. 1, 1988, Ser. No. 124,684
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—426.5 10 Claims



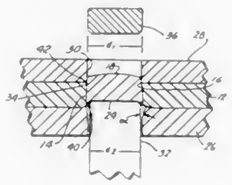
1. A retriever tool for the insertion and removal of a sensing probe from the wall of a pressurized vessel, said probe being mounted in a threaded nipple attached to the wall of the pressurized vessel, the tool comprising:
(a) a nipple means which is arranged to be permanently attached to a corresponding aperture in a pressure vessel or pipe, said nipple means having a smooth tapered inner bore and an outer end when attached to said vessel, the inside diameter of said bore being greater at the outer end of said nipple means;
(b) a plug means sized to slidably fit into the inner bore of said nipple means said plug means having a sealing means for sealing with said nipple means to prevent leakage from said pressure vessel, said plug means being adapted to removably receive and mount a sensing probe therein, whereby said probe will be in communication with the fluid within said vessel, said nipple means and plug means including a releasable means for retaining the plug and probe within said nipple means;
(c) valve means having means for sealingly attaching the valve means to the nipple means, said valve means having a straight through internal passageway permitting passage of the plug means and probe when the valve is in the open position and sealing said nipple means when in the closed position; and
(d) a retriever means having a hollow tubular cylinder which is large enough to receive said plug means, said cylinder having a closed end and an opposite open end, said open end being connected to said valve means, the closed end of said cylinder being connected to a means for controllably pressurizing said cylinder with fluid whereby when the valve means and retriever means are mounted on said nipple means, the retriever cylinder means can be pressurized to the same pressure as the vessel and the plug means and probe can be removed when the retainer means is released and the cylinder pressure is slowly reduced.

4,916,798

METHOD OF APPLYING APPLIQUE OR LIKE OBJECT TO A BASEPLATE

Rodney G. Ballast, Wyoming, Mich., assignor to Jack Toering, Wyoming, Mich.

Continuation of Ser. No. 237,519, Aug. 26, 1988, abandoned.
This application Aug. 8, 1989, Ser. No. 391,739
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—432 17 Claims



1. A method producing a composite article by simultaneously forming an object and permanently retaining said object to a baseplate comprising the steps of:

providing a baseplate and a plate of contributing material, each of said baseplate and said plate contributing material being responsive to a shearing force by fracturing at a substantial angle with respect to the direction of said force;

juxtaposing said plate of contributing material adjacent said baseplate;

positioning said plates between a punch and die configured to the approximate shape of said object;

forcing said punch into said contributing material to shear said object with a positive breakout angle from said plate of contributing material; and

applying sufficient force to said punch to cause said object to shear a slug from said baseplate, thereby forming an opening in said baseplate and pressing said object into said baseplate opening, said slug having a size substantially determined by the shape of said die, said die having a size predetermined to cause said slug to be smaller than said object such that said object is retained in said baseplate opening by interference fit.

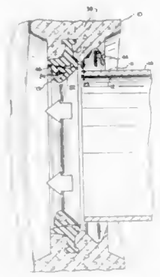
4,916,799

METHOD OF MAKING A PIPE JOINT SEAL WITH BISTABLE ELASTOMERIC SEALING PROJECTION

James W. Skinner, and Fouad M. Deeb, both of Fort Wayne, Ind., assignors to Press-Seal Gasket Corporation, Fort Wayne, Ind.

Division of Ser. No. 919,470, Oct. 16, 1986, Pat. No. 4,809,994.
This application Oct. 24, 1988, Ser. No. 261,400
Int. Cl.[4] B23P *11/00*; B29C *41/20, 53/02, 65/70*
U.S. Cl. 29—450 6 Claims

1. A method of providing a seal between a first member having a circular opening therein and an outer cylindrical surface of a second member comprising forming a circular elastomeric gasket with a generally cylindrical mounting portion, an anchoring projection extending radially outward therefrom, and a sealing projection joined to said mounting portion by a hinged section, positioning said gasket around a generally cylindrical core with an inner surface of said mounting portion and an inner surface of said sealing projection in substantial alignment, casting said first member from a settable material to embed an outer surface of said gasket including said anchoring projection in said settable material and to releasably embed said sealing projection in said settable material, curing said settable material, removing said core to provide said circular opening, releasing said sealing projection from said settable material, positioning said sealing projection in an inwardly directed sealing position, and inserting said second member



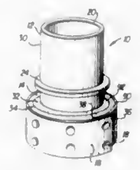
through said sealing projection to form a fluidtight joint with said outer cylindrical surface of said second member.

4,916,800

FIRE-RETARDANT FLUID COUPLING ASSEMBLY AND METHOD

Gerold J. Harbeke, 2807 S. Military Trail, West Palm Beach, Fla. 33415

Continuation of Ser. No. 116,174, Nov. 3, 1987, abandoned. This application Jul. 6, 1989, Ser. No. 375,995
Int. Cl.[4] E04C *2/00*
U.S. Cl. 29—469 5 Claims



1. A method of constructing a pipe coupling assembly product at a factory separate from an installment site and then transporting the pipe coupling assembly product to said installment site for permanent engagement with other pipes, said method comprising the steps of:

at said factory, choosing a pipe coupling having an elongated tubularly-shaped main body with opposite first and second ends and inner and outer surfaces;

at said factory, wrapping an intumescent collar about the outer surface of said tubularly-shaped main body near the first end thereof with a corresponding first end edge of said intumescent collar being adjacent said first end of said elongated tubularly-shaped main body, said intumescent collar being constructed of a material which expands when it gets hot to close off the inner surface of said tubularly-shaped main body;

at said factory, placing a metallic band about the circumferential periphery of said intumescent collar, said metallic band having one heat receiving edge extending to the end of said elongated tubularly-shaped main body at which said intumescent collar is wrapped but leaving said first end edge of said intumescent collar at least partially uncovered;

at said factory, fastening said metallic band to said intumescent collar and said intumescent collar to the outer surface of said tubularly-shaped main body thereby forming said pipe coupling assembly product;

shipping said pipe coupling assembly product as a unit from said factory to said installment site for permanent engagement with other pipes;

thereby forming a pipe-coupling assembly product at said factory separate from said installment site, which is then shipped and stored as a unit and which can be later placed at said installment site and attached to a concrete form, with wet concrete being poured into said form about said pipe coupling assembly product and allowed to cure around said pipe coupling assembly product to form a barrier, the form being thereafter removed from said barrier and pipes being attached to opposite ends of the tubularly-shaped main body with the first end of the intumescent collar and the heat receiving edge of the metallic band being exposed at a surface of said barrier to form a fire proof pipe string.

4,916,801

METHOD OF FORMING A STEM WITH A GROOVE AND A SNAP RING

Kenneth E. Cooper, South Bend, Ind., assignor to Shepherd Products, U.S., Inc., St. Joseph, Mich.

Continuation of Ser. No. 257,058, Oct. 13, 1988, abandoned, which is a division of Ser. No. 158,786, Feb. 22, 1988, abandoned.
This application Jun. 30, 1989, Ser. No. 374,630
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—512 4 Claims

1. A method of forming a stem with a groove and assembling a snap ring in said groove without expansion of said ring, the steps of the method comprising:

(a) cutting a length of wire, thereby providing a stem blank with a top end and a bottom end;

(b) piercing said top end of said stem blank thereby forming a recess in said top end, such that said stem blank now comprises a stem body;

(c) reducing the diameter of said pierced top end thereby forming a pierced extension extending from said top end of said stem body;

(d) forming a support surface about said stem body at a base of said pierced extension, said support surface having a diameter greater than the diameter of said extension;

(e) sliding a snap ring over said pierced extension without expansion of said ring and positioning said snap ring on said support surface;

(f) inserting a punch into said recess defined in said pierced extension and applying downward force with said punch, thereby peening said pierced extension over said snap ring and forming a collar, said collar spaced from said snap ring forming an upper wall of a groove, defined between said upper wall and said support surface, said snap ring lying within said groove and being free to move from said support surface towards said collar.

4,916,802

METHOD FOR PRODUCING A MAGNETIC HEAD CORE

Soichiro Matsuzawa, Kuwana, Japan, assignor to NGK Insulators, Ltd., Japan

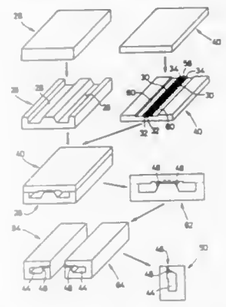
Continuation of Ser. No. 683,492, Feb. 19, 1984, abandoned.
This application Oct. 26, 1988, Ser. No. 262,088
Claims priority, application Japan, Dec. 27, 1983, 58-246261
Int. Cl.[4] G11B *5/42*
U.S. Cl. 29—603 6 Claims

1. A method of producing a magnetic head core of a generally ring-shaped structure including a pair of core elements of ferrite which include opposed surfaces defining a magnetic gap, comprising the steps of:

preparing said pair of core elements of ferrite such that each includes at least one surface, which surfaces ultimately abut each other, and such that at least a portion of at least one of the ferrite core elements which assists in defining the magnetic gap is made of a ferrite single crystal;

subjecting at least said portion of said at least one of said ferrite core elements to a chemical etching process, to remove material therefrom to a predetermined depth to form at least one of said opposed surfaces defining said magnetic gap;

forming a groove in at least one of said ferrite core elements, said groove serving to define an aperture for facilitating a process of winding coils around said core elements;



treating the surfaces of the pair of core elements which ultimately abut each other with at least one solution selected from the group consisting of ferrite-dissolving acid and inorganic salt including a ferrite component;

butting said pair of core elements together after the above steps, such that said groove is located internally in the butted core elements so as to form said aperture between the core elements, and such that said opposed surfaces define said magnetic gap; and

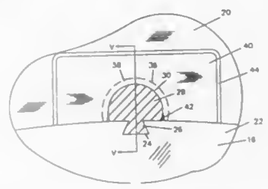
heating said pair of ferrite core elements to directly bond abutting surfaces thereof together by means of a solid-solid reaction, thereby obtaining an integral ring-shaped assembly.

4,916,803

STATOR KEYBAR INSTALLATION USING AUXILIARY PLATES

Luis A. Estrada, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 258,401, Oct. 17, 1988, abandoned.
This application May 30, 1989, Ser. No. 361,811
Int. Cl.[4] H02K *15/14*
U.S. Cl. 29—596 3 Claims



1. A method of manufacturing a dynamoelectric machine, the dynamoelectric machine including a stator having a plurality of outer circumferentially spaced dovetail slots, a stator

frame having a plurality of spaced support plates, and a plurality of auxiliary plates, the method comprising the steps of:

forming a plurality of keybars each having a substantially semi-circular portion with an extending dovetail shaped portion;

machining a plurality of circumferentially spaced enlarged slots into each support plate for receiving the semi-circular portions of the keybars, each enlarged slot being large enough to provide a clearance between itself and a respective one of the keybars at each of the support plates and each of the slots being axially aligned with other corresponding slots in others of the support plates for establishing a substantially straight array of axially aligned slots for receiving a keybar;

forming a semi-circular slot in each of the auxiliary plates having a dimension to provide a close interface with the semi-circular portion of the respective one of the keybars;

welding each of the auxiliary plates to the respective one of the keybars with a continuous weld extending along the interface therebetween;

welding each of the auxiliary plates to a respective one of the support plates for positioning each of the keybars at a preselected position with respect to a centerline of the stator frame; and

assembling the stator into the stator frame with each dovetail portion of the keybars extending into a respective one of the dovetail slots in the stator for supporting the stator in the stator frame.

4,916,804

SHIELDED ELECTRIC CONNECTOR AND WIRE CONNECTING METHOD

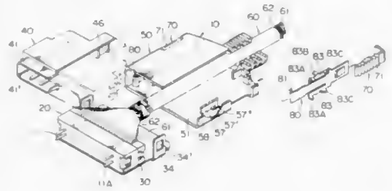
Yoshikazu Yoshimura, and Kihachiro Koike, both of Tokyo, Japan, assignors to Hirose Electric Co., Ltd. and NEC Corporation, both of Tokyo, Japan

Division of Ser. No. 186,227, Apr. 26, 1988, Pat. No. 4,838,812. This application Jan. 31, 1989, Ser. No. 304,271

Claims priority, application Japan, Apr. 30, 1987, 62-106598

Int. Cl.⁴ H01R *13/648*

U.S. Cl. 29—592.1 **5 Claims**



1. A method of connecting electrical wires to a shielded electrical connector, said method comprising:

providing contact pins each having a mating contact piece on one end thereof and a joint portion on the other end thereof for connecting an electric wire;

disposing and holding said contact pins in an insulating housing, said insulating housing having an elongated rectangular cross-section having long sides and short sides;

providing a shield hood member;

providing a shield lid member;

placing a flat portion of said shield lid member on said insulating housing with a said long side of said insulating housing on a surface of said flat portion,

providing a shield connecting portion at a generally central portion of a rear end of said flat portion, said shield connecting portion being substantially U-shaped and extending in a direction substantially perpendicular to the plane of said flat portion and to the surface of said flat portion on which said insulating housing is placed, and

providing a pair of engaging arms, one at each side of said flat portion and extending in a direction substantially perpendicular to the plane of said flat portion and to the surface of said flat portion on which said insulating housing is placed, said shield hood member having a front envelope which surrounds at least said contact portions of said contact pins disposed in said insulating housing, said front envelope being hollow and having an elongatedly rectangular cross-section having long sides and short sides, a rear envelope being attached to a rear end of said front envelope and having an electric wire lead-out portion extending from a generally central portion of the rear end of said rear envelope, said lead-out portion having a U-shaped groove, said rear envelope having walls which are completely continuous, except for an opening which is completely closed by said flat portion of said shield lid member, said walls including an enveloping flat wall portion extending from one of the long sides of the rear end of said front envelope to said electric wire lead-out portion, side wall portions upright at each side of said enveloping flat wall portion and extending rearwardly from each of the short sides of the rear end of said front envelope, and shoulder side wall portions upright at each side of said enveloping flat wall portion and extending from a rear end of each of said side wall portions to each side of said electric wire lead-out portion, providing each of said side wall portions with an engaging portion which is engaged by one of said engaging arms of said shield lid member,

connecting terminal end parts of said electric wires to said joint portions of the corresponding contact pins and a shield layer of said electric wires to said shield connecting portion by crimping, and installing said insulating housing in said shield hood member with the contact portions of said contact pins being surrounded by said front envelope of said shield hood member and said shield connecting portion being disposed in said U-shaped groove of said electric wire lead-out portion, and coupling said shield lid member to said shield hood member to close said opening of said shield hood member by engaging each of said engaging arms with the corresponding engaging portion of said shield hood member.

4,916,805

METHOD FOR THE ATTACHMENT OF COMPONENTS TO A CIRCUIT BOARD USING PHOTOACTUATABLE ADHESIVE

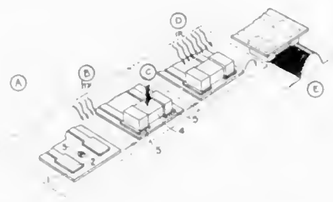
Klaus Ellrich, Wörthsee; Oswald Gasser, Seefeld; Rainer Guggenberger, Hechendorf, and Erich Wanek, Seefeld, all of Fed. Rep. of Germany, assignors to Espe Stiftung & Co. Produktions- und Vertriebs KG, Fed. Rep. of Germany

Filed Mar. 1, 1989, Ser. No. 317,671

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1988, 3806738

Int. Cl.⁴ H05K *3/30*

U.S. Cl. 29—832 **14 Claims**



1. A method for the attachment of components to a circuit board comprising applying a photoactivatable adhesive to selected areas of the components or of the circuit board, activating said adhesive prior to or after application thereof by irradiation with light having a wavelength in a range of 200 to 600 nm to such an extent that a desired initial tackiness is maintained and no skin formation on the surface of the adhesive takes place, subsequently fitting the components to the circuit board thereby establishing contact between said components, adhesive and circuit board, curing said adhesive at a temperature between 60° and 140° C. and subsequently producing soldered joints between the components and the circuit board.

4,916,806

METHOD AND DEVICE FOR MOUNTING ELECTRIC COMPONENTS ON A CIRCUIT BOARD

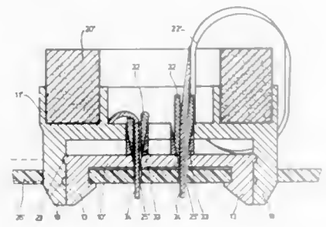
Klaus Lorenzen, Robert-Bosch-Strasse 18, D-7160 Gaildorf 3, Fed. Rep. of Germany

Division of Ser. No. 112,388, Oct. 22, 1987, Pat. No. 4,821,152. This application Jan. 9, 1989, Ser. No. 294,737

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1986, 3636065

Int. Cl.⁴ H05K *3/34*

U.S. Cl. 29—837 **7 Claims**



1. A method for positioning an electric component on a printed circuit board, comprising the steps of:

providing a housing having first and second sections and first and second locking means;

positioning the electric component on said first section of said housing so that the electric component is movable with the first section;

mounting the housing on the circuit board by engaging said first locking means on said second section of the housing with the circuit board to effect a locking state; and

moving the first section of the housing toward the second section of the housing and the circuit board so as to effect operation of said second locking means on the housing and to position the electric component on the circuit board, the first section remaining in the locked state on the second section throughout the step of moving.

4,916,807

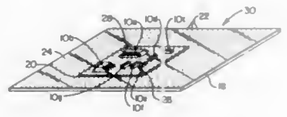
METHOD AND APPARATUS FOR ASSEMBLING CIRCUITS HAVING SURFACE MOUNTED COMPONENTS

Paul H. Wiese, 416 Paddlewheel Ct., Westerville, Ohio 43081

Filed Jan. 5, 1989, Ser. No. 293,639

Int. Cl.⁴ H05K *3/34*

U.S. Cl. 29—840 **16 Claims**



1. The method for assembling circuits formed of supporting circuit substrates carrying circuit configurations having surface mount pads of predetermined pattern located on a surface thereof for abutting connection with circuit component surface mount leads of corresponding mating pattern, comprising the steps of:

providing a transparent spacer having a flat upwardly disposed surface;

positioning said spacer over a mold defining said substrate;

positioning mold defining components upon said spacer flat surface in lead matable alignment with corresponding said surface mount pad patterns to provide a male mold;

forming a polymeric female mold from said male mold;

inserting circuit components corresponding with said mold defining components within said female mold;

positioning a circuit substrate upon said female mold over said inserted circuit components; and

substantially simultaneously electrically coupling the surface mount leads of said inserted circuit components with corresponding said surface mount pads of said circuit substrate.

4,916,808

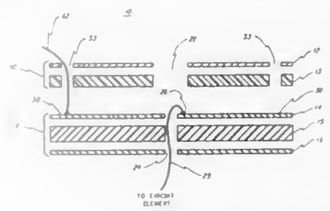
PROCESS FOR FABRICATING A SCULPTURED STRIPLING INTERFACE CONDUCTOR

James A. Sanborn, Satellite Beach; Janet D. Sadlon, Melbourne; Marc H. Popek, Indian Harbour Bch., and Ralph D. DiStefano, Palm Bay, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Feb. 22, 1988, Ser. No. 158,802

Int. Cl.⁴ H01P *5/12*

U.S. Cl. 29—847 **4 Claims**



1. A method for forming a stripline interface conductor adapted for receiving a circuit element and providing spaced-apart connections to each lead of the circuit element, said method comprising the steps of:

forming a first access opening and a plurality of second access openings in a first piece having a conductive layer atop a dielectric layer, wherein said plurality of second access openings are spaced at a predetermined distance from said first access opening;

in a second piece having a dielectric layer between a top and a bottom conductive layer, forming a plurality of signal traces on said top conductive layer;

masking said plurality of signal traces by applying a masking material thereto;

forming a third access opening in said second place, wherein said third access opening is smaller than said first access opening;

applying a liquid adhesive to at least one of said dielectric layer of said first piece and said top conductive layer of said second piece;

placing said dielectric layer of said first piece proximate said top conductive layer of said second piece, and wherein said first access opening is in registry with said third access opening, wherein a first portion of at least one of said plurality of signal traces is exposed through said first access opening, and wherein a second portion of at least one of said plurality of signal traces is accessible through one of said plurality of second access openings, and

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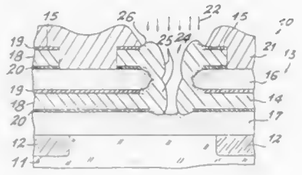
wherein said circuit traces are closely spaced near said first access opening and are spaced farther apart near said plurality of second access openings;
removing the masking material from exposed portions of said signal traces.

4,916,809

METHOD FOR PROGRAMMABLE LASER CONNECTION OF TWO SUPERIMPOSED CONDUCTORS OF THE INTERCONNECT SYSTEM OF AN INTEGRATED CIRCUIT

Alain Boudou, Vert, and Marie-Francoise Bonnal, Fontenay Le Fleury, both of France, assignors to Bull S.A., Paris, France

Division of Ser. No. 71,473, Jul. 9, 1987, abandoned. This application Aug. 17, 1988, Ser. No. 232,942
Claims priority, application France, Jul. 11, 1986, 86 10205
Int. Cl.[4] H01K *3/10*
U.S. Cl. 29—852 30 Claims



1. A method for creating a programmable connection of an upper and lower superimposed conductor of an interconnect system of an integrated circuit, each of said conductors being formed of a metal strip provided with an upper and a lower film of a material having a melting point substantially higher than a melting point of said metal strip, said conductors being separated by a dielectric layer and said upper conductor being covered by an insulating passivation layer, said connection being effected through an opening in said insulating layer, said upper conductor, said dielectric layer, and at least a portion of said lower conductor, comprising the steps of:
(a) applying at least a first laser beam pulse to make an initial opening in at least said insulating layer; and
(b) selectively controlling one or more of a power, a diameter, a number of pulses and a duration of pulses of said laser beam; whereby said application of at least said first laser beam pulse, and said control of said power, diameter and duration of said pulse, and said number of pulses of said laser beam create said opening through said insulating layer, through said upper conductor, through said dielectric layer, and through at least said portion of said lower conductor and further form a substantially continuous ring by controlled melting, beginning respectively at said upper and lower conductors, and wherein said ring extends between said conductors in forming said connection.

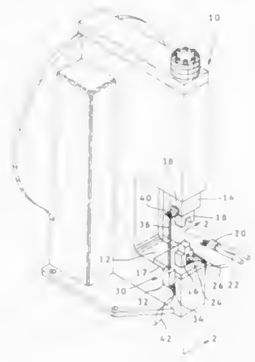
4,916,810

METHOD AND APPARATUS FOR TERMINATING WIRES TO TERMINALS

Michael A. Yeomans, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 12, 1989, Ser. No. 351,108
Int. Cl.[4] H01R *43/04;* **B23P** *19/00*
U.S. Cl. 29—863 9 Claims

1. A method of terminating a plurality of wires in a plurality of respective terminals by means of an automated machine having:
a base;
a ram arranged for reciprocating movement with respect to said base;
a die set means comprising an anvil and a mating punch for effecting the termination of one of said wires in its said respective terminal, said anvil being coupled to said base and said punch being coupled to said ram;
means for determining and recording the force applied to said die set means by said ram during said termination;
means for determining and recording the position of said ram with respect to said base during said reciprocating movement;
means for determining the value of the crimp height of said termination based upon said determined ram position and corresponding force, and for comparing said determined value with a desired value and upon an unfavorable comparison generating an adjust signal; and
means responsive to said adjust signal for adjusting the height of said anvil above said base,
said method characterized by
Inputting a code indicative of a desired crimp height;
(b) Automatically adjusting the height of said anvil above said base in response to said inputting of step (a) or to said comparing of steps (f)(i);
(c) Testing for completion of the job:
(i) if no further terminations are needed, generating an end-of-job signal and ceasing operation of the machine;
(ii) otherwise actuating said machine for effecting a termination of one of said plurality of wires to a respective terminal;



(d) During said terminating of steps (c)(ii), determining and recording force applied to said die set and concurrently a corresponding ram position for different incremental values of either force or ram position;
(e) Determining said value of said crimp height of said termination;
(f) Comparing said determined value of said crimp height with the value of said desired crimp height,
(i) if said crimp height is out of tolerance, generate a reject signal and go to step (b);
(ii) otherwise generate an accept signal; and
(g) Go to step (c).

5. In an automated machine for terminating a plurality of wires in a plurality of respective terminals having a base; a ram arranged for reciprocating movement with respect to said base; a die set means comprising an anvil and a mating punch for effecting the termination of one of said wires in its respective terminal, said anvil being coupled to said base and said punch being coupled to said ram; said machine being characterized by the combination:
(a) means for determining and recording the force applied to said die set means by said ram during said termination;
(b) means for determining and recording the position of said ram with respect to said base during said reciprocating movement;

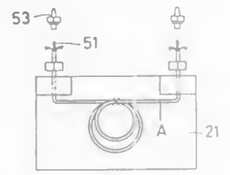
(c) means for determining the value of the crimp height of said termination based upon said determined ram position and corresponding force for plurality of different incremental values of either force or ram position;
(d) means for comparing said determined value of the crimp height with a desired value thereof, and when the result of said comparing is an amount that exceeds a predetermined value, an adjust signal is generated; and
(e) coupling means attached to said base for supporting said anvil a distance above said base toward said ram, said coupling means being responsive to said adjust signal for varying the crimp height of a subsequently formed termination.

4,916,811

PROCESS AND APPARATUS FOR AUTOMATICALLY ATTACHING TERMINALS TO CABLE ENDS

Kenichiro Uehara; Toshio Nagasaka, and Kohji Fujii, all of Osaka, Japan, assignors to Sumitomo Electric Industries Ltd., Osaka, Japan

Continuation of Ser. No. 512,427, Jul. 11, 1983. This application Jan. 10, 1985, Ser. No. 690,174
Claims priority, application Japan, Jan. 22, 1983, 58-9681; Jan. 22, 1983, 58-9682; Jan. 22, 1983, 58-9683; Feb. 10, 1983, 58-21880; Feb. 10, 1983, 58-21881; Feb. 10, 1983, 58-21882; Apr. 15, 1983, 58-67629
Int. Cl.[4] H01R *43/04;* **B23P** *19/00*
U.S. Cl. 29—863 3 Claims



1. Process for automatically attaching a terminal to at least one end of a cable, comprising the steps of cutting the cable into predetermined lengths, coiling the cut pieces of the cable, stripping the sheath of the cable loop at said end to expose its core, mounting a spring on said end of the cable loop, applying an adhesive to the exposed core of the cable loop, mounting a terminal on the end of the cable loop, and clamping said terminal on the cable, all being done automatically, the stripping step and all other subsequent steps being done while the coiled cable loop laid down on a conveyor rack is conveyed intermittently from one step to another.

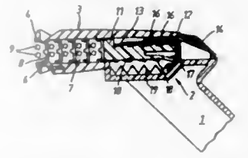
2. Apparatus for automatically attaching a terminal to at least one end of a cable, comprising:
cutting means for cutting the cable into predetermined lengths,
coiling means for coiling the cut pieces of the cable,
transfer means for transferring the coiled cable loop to the next station,
stripping means for stripping the sheath of the cable at end thereof to expose its core,
spring mounting means for mounting a spring on said end of the cable loop,
adhesive applying means for applying an adhesive to said end,
terminal mounting means for mounting a terminal on said end of the cable loop,
clamping means for clamping said terminal on the cable loop,
conveyor means having a plurality of conveyor racks adapted to move intermittently carrying said cable loop from one means to another in turn among said stripping means, spring mounting means, adhesive applying means, terminal mounting means and clamping means, and
disposed adjacent said transfer means for bringing down said cable loop on one of said conveyer racks while it is transferred by said transfer means from said coiling means to said conveyor means.

4,916,812

SAFETY RAZORS MAGAZINES

John F. Francis, Woking, England, assignor to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 304,171, Jan. 31, 1989, abandoned. This application Jul. 3, 1989, Ser. No. 376,209
Int. Cl.[4] B26B *21/24*
U.S. Cl. 30—40 15 Claims



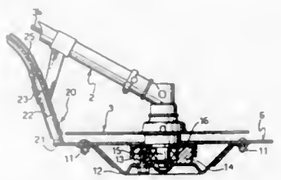
1. A blade unit magazine for a magazine type safety razor, the magazine being of generally rectangular cross-section and open at one end, at which the magazine is provided with a cap and a guard, and a plurality of razor blade units housed as a stack within the magazine, each unit comprising at least one razor blade secured by mounting means above an imperforate support plate, the outermost unit of the stack being located at the open end of the magazine, with its blade or blades positioned between the cap and guard and with its support plate cooperating with the walls of the magazine to seal against the ingress of debris and moisture, feeding means being provided in the magazine and/or in the razor to enable the outermost unit in the stack to be ejected from the magazine and to be replaced by the next unit in the stack.

4,916,813

UNIT FOR PROTECTING THE BLADE OF A ROTARY-BLADE SCRUB-CLEARING TOOL AND A SCRUB-CLEARING TOOL USING THE UNIT

Pietro Elia, Turin, Italy, assignor to Consiglio Nazionale Delle Ricerche, Rome, Italy

Filed Dec. 30, 1988, Ser. No. 292,154
Claims priority, application Italy, Dec. 31, 1987, 68151 A/87
Int. Cl.[4] A01D *34/67, 75/18*
U.S. Cl. 30—276 7 Claims



1. A scrub-clearing tool of the type comprising a tube, a blade having an outer diameter supported for rotation at one end of the tube, a motor for driving the blade and a transmission shaft for connecting the drive motor to the blade, wherein said tool further includes:
a disc for protecting said blade mounted for rotation relative to said transmission shaft on a side of said blade opposite said drive motor and having a diameter larger than the

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outer diameter of said blade and defining a plurality of recesses around its periphery, said recesses having inner edges spaced from the center of said disc by a distance less than the radius of the outer circumference of said blade; and

bearing means interposed between said transmission shaft and said disc, said bearing means supporting a hub for rotation on said transmission shaft with said hub carrying a sheet-metal bowl to which said disc is firmly fixed such that said disc is located immediately beneath said blade.

4,916,814

WET-SHAVE RAZOR

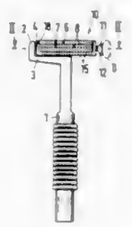
Wolfgang Althaus, Wuppertal, Fed. Rep. of Germany, assignor to Wilkinson Sword Gesellschaft Mit Beschränkter Haftung, Fed. Rep. of Germany

Filed Dec. 30, 1987, Ser. No. 139,816

Claims priority, application European Pat. Off., Jan. 3, 1987, 87100035.2

Int. Cl.[4] B26B *21/20, 21/24, 21/60*

U.S. Cl. 30—40.2 20 Claims



1. A razor assembly comprising:

a handle;

a blade holder rotatably mounted on said handle for rotation about an axis;

a plurality of blades mounted around the periphery of said blade holder and having edges generally parallel to said axis; and

actuator means mounted on said blade holder for rotating said blade holder relative to said handle, said actuator means including a portion having a shape which is grippable and movable by the user's fingers in a substantially unrestricted manner in a direction generally parallel to said axis between a first position proximate to said blade holder for shaving and a second position extended from but engaged with said blade holder for facilitating rotation of said actuator means and said blade holder relative to said handle by rotation of the actuator means with the user's fingers.

4,916,815

SHEATHED SCISSORS

Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Shizuoka, Japan

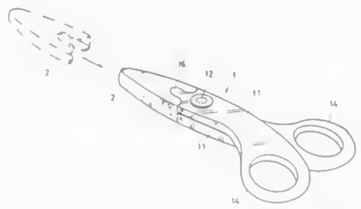
Filed Aug. 11, 1983, Ser. No. 522,263

Claims priority, application Japan, Oct. 18, 1982, 57-157215[U]

Int. Cl.[4] B26B *3/06*

U.S. Cl. 30—151 2 Claims

1. Sheathable scissors comprising a pair of scissors members pivotally joined to form a pair of handles at one end and a pair of juxtaposed blades at the other end, each of said scissors members comprising a handle portion and a blade portion and having an inner surface serving as a bearing surface, and outer surfaces, said handle portion being stepped down to said blade portion at the outer surfaces, said handle portion including an engaging lug projecting into the blade portion for engaging a



corresponding slot in a sheath, said step having a height approximately equal to the thickness of said sheath.

4,916,816

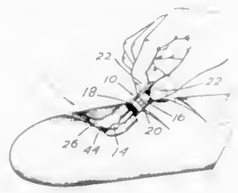
RAZOR BLADE HOLDER

Scott D. Richman, 184 E. Washington Ave., Chico, Calif. 95926

Filed Jun. 26, 1989, Ser. No. 371,610

Int. Cl.[4] B26B *1/00*

U.S. Cl. 30—339 1 Claim



1. A razor blade holder, comprising:

a handle having a first end and a second end;

said handle first end adapted for gripping by a human hand;

a groove generally centrally positioned in said handle second end adapted to releasably retain one edge of a razor blade in said groove by tight fitting frictional retention;

an elongated malleable strip of material attached to said handle second end generally adjacent said groove;

said razor blade holder adapted for use with said razor blade being of a type having apertures therethrough with said apertures spaced longitudinally centrally in said razor blade;

said razor blade holder adapted to hold said razor blade with said malleable strip of material threaded through said apertures in said razor blade and said one edge of said razor blade retained in said groove of said handle second end;

said razor blade holder when holding said razor blade adapted to allow curving of said malleable strip of material whereby said held razor blade is curved;

said malleable strip of material adapted to remain in said curved position while holding said razor blade curved.

4,916,817

RAZOR BLADE CUTTING EDGE STRUCTURE

Robert M. Atwater, Centerville, Mass., assignor to The Gillette Company, Boston, Mass.

Division of Ser. No. 62,911, Jun. 17, 1987, Pat. No. 4,807,401.

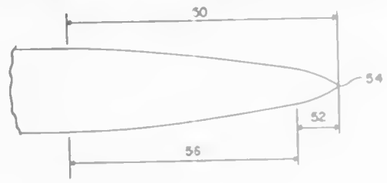
This application Sep. 15, 1988, Ser. No. 244,371

Int. Cl.[4] B26B *21/54*

U.S. Cl. 30—346.55 6 Claims

1. A razor blade comprising a cutting surface defined by opposed surfaces terminating at an edge, each opposed surface

carrying a cutting edge facet portion and a convex, rough honed facet portion in which the included angle of the rough honed facet portion progressively decreases in the direction from the edge, said rough honed facet portion extending in the



direction from the edge for a distance between about 0.010 to about 0.025 inches with the cutting edge facet portion extending in the direction from the edge to the rough honed facet portion for a distance between about 0.0006 to about 0.008 inches.

4,916,818

LONG REACH TREE TRIMMER

Gregory E. Panek, 20738 Woodburn, Southfield, Mich. 48075

Filed Mar. 27, 1989, Ser. No. 329,362

Int. Cl.[4] B23D *57/02*

U.S. Cl. 30—383 8 Claims

1. A saw operated by a person standing on the ground for cutting tree branches above the person's reach, comprising:

an engine located at ground level;

a right angle drive gear box located an appreciable distance above the engine; said gear box including a housing, an input gear rotatable on a first axis, and an output gear rotatable on a second axis at right angles to the first axis;

telescopic tube means interconnecting the engine and the gear box housing, whereby the gear box can be raised or lowered;

a chain saw guide bar attached to the gear box housing; a chain drive sprocket connected to the output gear, and a cutter chain trained around the guide bar and sprocket;

and a rotary shaft means extending within the telescopic tube means for transmitting a rotary drive force from the engine to the input gear in the gear box; said shaft means comprising telescoping shaft sections adjustable axially within the telescopic tube means;

said gear box housing comprising a flat wall positioned against the chain saw guide bar, and arcuately adjustable attachment means extending through the flat wall and guide bar for attaching said guide bar to the gear box housing; said arcuately adjustable attachment means being centered on said second axis, whereby the housing and chain saw guide bar can be adjusted around said second axis without disturbing the relation between the sprocket and the output gear.

4,916,819

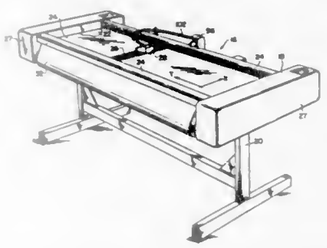
PROGRESSIVE PLOTTER WITH UNIDIRECTIONAL PAPER MOVEMENT

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., Tolland, Conn.

Filed May 17, 1988, Ser. No. 195,128

Int. Cl.[4] G01D *15/00*

U.S. Cl. 33—18.1 35 Claims



1. A plotter for producing graphics on an elongated sheet of paper, said plotter comprising: means providing a paper support surface, means for moving an elongated sheet of paper over said support surface in one direction parallel to the longitudinal axis of the paper, two parallel guide rails fixed relative to said support surface perpendicular to said direction of paper movement, an elongated main carriage extending between said guide rails parallel to said direction of paper movement and supported at its opposite ends by said guide rails for movement in a Y coordinate direction along the length of said guide rails said main carriage having a given range of movement in said Y coordinate direction and said guide rails being spaced from one another along said direction of paper movement by a distance less than said range of movement of said main carriage in the Y coordinate direction, a pen, a pen carriage carrying said pen and supported on said main carriage for movement along said main carriage in the X coordinate direction parallel to said direction of paper movement, and means for moving said main carriage and said pen carriage in said Y and X coordinate directions respectively to draw lines with said pen on paper supported by said support surface.

4,916,820

CIRCLE AND STRIP CUTTING SYSTEM

Vincent T. Kozyraki, and Claude R. Millett, both of Plainville, Conn., assignors to The Fletcher-Terry Company, Farmington, Conn.

Filed Aug. 12, 1988, Ser. No. 231,728

Int. Cl.[4] B26D *3/08;* **C03B** *33/10*

U.S. Cl. 33—42 4 Claims

1. A mechanical system for cutting strips from glass and the like, comprising:

a rigid, elongated, rectilinear rule having a scale with distance-indicating indicia thereon and with a zero reference point adjacent to, but spaced from, one end thereof;

a reversible cutting head, including a body with a laterally extending passageway having opposite ends and configured to receive said rule, inserted longitudinally thereinto, for slidably mounting said head thereon, and means for disengageably securing said head on said rule at selected positions therealong, said body having registry elements thereon lying in lateral planes at said opposite ends of said passageway and adapted for readable registry with said indicia of said rule scale, said body also having first and

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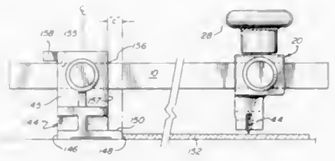
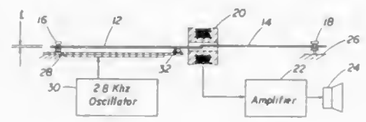
second cutting component-mounting means, each adapted for disengageably mounting a cutting component thereon, said first mounting means being adapted to mount a cutting component to act in a first plane of said body, said first plane lying nonsymmetrically between said lateral planes and being laterally spaced by a certain distance from one of said registry elements, said second mounting means being adapted to mount a cutting component to act in a second plane of said body, said second plane lying nonsymmetrically between said lateral planes and being laterally spaced by said certain distance from the other of said registry elements; and

a strip guide, including an elongated body with a laterally extending passageway having opposite ends and configured to receive a portion of said rule at said one end of said rule, with said guide body disposed to either side of said zero reference point, and means for securing said guide body on said rule, said guide body having a bottom portion with at least two lateral bearing surfaces extending, respectively, along axes that are perpendicular to the axis of said guide body passageway, and that are parallel to, but spaced to the opposite sides of, a longitudinal centerline of said guide body and adapted for slidable engage-



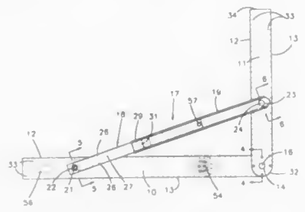
ment on a cooperating surface, said bearing surface on one side of said guide body being spaced further from said centerline that is said bearing surface on the other side thereof, said guide body also having a top portion with lateral reference elements, at said opposite ends of said guide body passageway, adapted for readable registry with said indicia of said rule scale, said reference element on said one side of said guide body being nearer to said centerline than is said reference element on said other side thereof, the distance differential of said bearing surface axes, relative to said centerline, being the same as the distance differential of said reference elements relative thereto, and being equal to said certain distance, whereby a cutting element mounted to act in either said first plane or said second plane of said cutting head body can be disposed in any selected plane, transverse to the longitudinal axis of said rule, by registry of said one or said other registry element of said cutting head body with a selected indicium of said scale, and whereby the distance between said selected plane and a chosen one of either of said bearing surfaces of said strip guide body can be set by bringing said reference element, disposed on the same side of guide body as said chosen bearing surface, into registry with said zero reference point of said rule scale.

4,916,821
ELECTRONIC COMPASS AND OTHER MAGNETIC DEVICES
Bronson R. Potter, P.O. Box 332, Greenville, N.H. 03048
Filed Mar. 4, 1988, Ser. No. 164,091
Int. Cl.[4] G01C *17/30*
U.S. Cl. 33—362 14 Claims



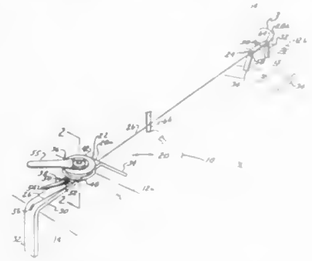
1. A device for detecting the presence or absence of magnetic flux in a chosen direction of the type comprises a flux-concentrating element adapted to be disposed in a region of interest, an excitation means for exciting vibrations in said element and a pickup means arranged to detect change in magnetic flux associated with said element, said flux-concentrating element being mounted to make and break mechanical contact with a second flux-concentrating element in the manner that a flux path of greater or lesser flux capacity occurs depending upon the relationship of the flux concentrating elements to each other, said excitation means comprising means to cause motion of one of said elements relative to the other to cause rapid, repeated making and breaking of mechanical contact between said elements and said pickup means adapted to produce a response to the attendant change of flux associated with said repeatedly contacting elements, the absence of such response denoting the absence of magnetic flux extending in said direction, and said flux-concentrating elements and said excitation means being cooperatively related to produce irregular modulation of the spacial relationship between said flux-concentrating elements.

4,916,822
ANGLE AND DISTANCE MEASURING INSTRUMENT
Robert U. Johnson, 2937 Westbrook Dr., Apt. 213, Building A, Ft. Wayne, Ind. 46805
Filed Dec. 1, 1988, Ser. No. 278,587
Int. Cl.[4] G01B *3/06, 3/56*
U.S. Cl. 33—458 20 Claims



1. An angle measuring instrument comprising first and second elongated arms each having ends and at least one straight side, a first permanent pivot connecting one end of said first arm to one end of said second arm for relative pivotal movement about a first fixed pivot axis, a telescoping assembly providing first and second elongated members connected for relative longitudinal telescoping movement, said first and second members each having a free end, a second permanent pivot connecting said free end of said first member to said first arm for relative pivotal movement about a second fixed pivot axis spaced from said first pivot axis, a third permanent pivot connecting said free end of said second member to said second arm for relative pivotal movement about a third fixed pivot axis spaced from said first pivot axis, scale means on one of said first and second members and a cursor on the other of said first and second member movable along said scale means as said first and second arms pivot around said first pivot axis, said scale and cursor cooperating to indicate the angle between said straight sides of said first and second arms, said second arm extending from said first pivot axis a distance less than the spacing between said first pivot axis and said second pivot axis, said second arm being movable relative to said first arm through 360 degrees and to a folded position overlying said first arm in which said telescoping assembly overlies said first arm.

4,916,823
APPARATUS FOR FACILITATING ROADWAY GRADE MEASUREMENTS
Edward L. Kunze, 17988 Lakeshore Dr., Lake Elsinore, Calif. 92330
Filed Jan. 26, 1989, Ser. No. 302,548
Int. Cl.[4] G01B *5/28*
U.S. Cl. 33—521 19 Claims



1. An apparatus for facilitating grade measurements between opposite roadway curb structures, each curb structure having a top surface and a back surface facing away from the other curb structure, the apparatus comprising:

(a) a first hook unit comprising:

(i) a rigid first frame structure having a top segment for resting on the top surface of one of the curb structures, and a back segment for engaging the back surface;

(ii) spool means rigidly connected to the first frame structure for storing and playing out a string line, including means for holding the string line to a predetermined extension; and

(iii) means for positioning the string line in contact with the top surface of the curb structure and extending directly toward the top surface of the other curb structure; and

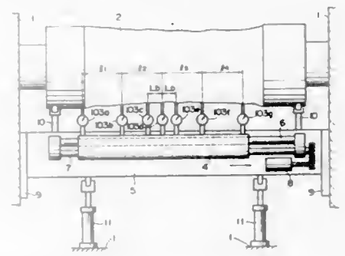
(b) a second hook unit comprising:

(i) a rigid second frame structure having a top segment for resting on the top surface of the other curb structure, and a back segment for engaging the back surface;

(ii) means for connecting a free end of the string line to the second frame structure, comprising a supporting surface of the second frame structure for supporting an enlargement at the free end of the string line; and

(iii) means for positioning the string line in contact with the top surface of the other curb structure and extending directly toward the top surface of the one curb structure, comprising a passage in the second frame structure for receiving the free end of the string line, including the enlargement, the passage being located proximate an intersection of the top segment with the back segment and adjacent to the supporting surface.

4,916,824
METHOD FOR MEASURING ROLL PROFILE AND APPARATUS THEREFOR
Hiroaki Shimazatsu; Teruyuki Matsumoto; Osamu Miyamoto, and Kanji Hayashi, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 19, 1988, Ser. No. 234,265
Claims priority, application Japan, Sep. 1, 1987, 62-218363
Int. Cl.[4] G01B *7/28, 7/34*
U.S. Cl. 33—551 7 Claims



1. A method of measuring a roll profile with radial deviations along the axis of a work roll of a rolling mill, which comprising the steps of:

providing a plurality of profile measuring displacement detector means at locations spaced along an elongated displacement detector mount means adapted to reciprocally move along the axis of said work roll for measuring said roll profile over one of a plurality of divided zones extending along the axis of said work roll;

providing at least three motion error measuring detector means at intervals La and Lb along said displacement detector mount means for measuring errors in motion of said displacement detector mount means at intervals of La and Lb along the axis of said work roll;

shifting said displacement detector mount means along the axis of said work roll to locally measure fractional deviations of the work roll existing along the axis thereof with said profile measuring displacement detector means and with said motion error measuring detector means;

calculating a current error in motion of said displacement detector mount means from the result of measurement from said motion error measuring detector means; correcting the measurement of said profile measuring displacement detector means in conjunction with the errors in motion of said displacement detector mount means obtained from said calculation; and

summing the measured profile deviations after having been corrected in conjunction with the motion errors of said detector mount means to obtain deviations along the entire axis of said work roll.

4,916,825
WORK-CONTACTING PROBE SYSTEM FOR A COORDINATE-MEASURING INSTRUMENT
Karl-Hermann Breyer, Heidenheim, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany
Filed Aug. 22, 1988, Ser. No. 234,510
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1987, 3728578
Int. Cl.[4] G01B *7/28*
U.S. Cl. 33—561 13 Claims

1. In a probe system for a coordinate-measuring instrument wherein a probe head includes (1) a receptacle for interchangeable installation of a selected one of a plurality of rigid probe pins with (2) first probe means producing a first electrical signal in response to a condition of workpiece contact via an

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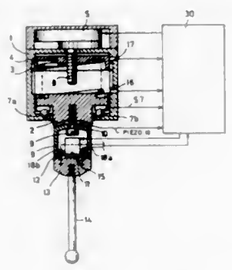
installed one of said probe pins, the improvement wherein an auxiliary probe head is provided for optional use in the system said auxiliary probe head being adapted for selective installation to said receptacle with said first probe means and having second probe means producing a second electrical signal in response to a condition of workpiece contact, and associated



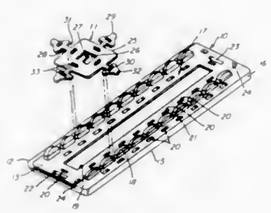
electronics for delivering probe-signal outputs to said instrument, said electronics including switching means operative (a) in a first mode to deliver said first electrical signal as its work-contact output as long as said receptacle accommodates one of said rigid probe pins, and (b) in a second mode to deliver said second electrical signal as its work-contact output as long as said receptacle accommodates said auxiliary probe head.

4,916,826

STENCIL FOR HANDPRINTING EQUALLY SPACED, ACCURATELY ALIGNED CHARACTERS

John L. McKeown, 53, Dunlambert Park, Belfast, United Kingdom (BT15 3NL)

PCT No. PCT/GB86/00641, § 371 Date Aug. 19, 1987, § 102(e) Date Aug. 19, 1987, PCT Pub. No. WO87/02315, PCT Pub. Date Apr. 23, 1987
PCT Filed Oct. 20, 1986, Ser. No. 75,750
Claims priority, application United Kingdom, Oct. 21, 1985, 8525872
Int. Cl.⁴ B43L *13/20*
U.S. Cl. 33—564 **32 Claims**



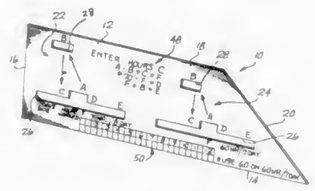
1. A handprint stencil comprising:
(a) a base unit provided with:
(i) at least one opening in said base unit to provide a writing path,
(ii) a substantially planar area adjacent said opening,
(iii) a plurality of mating connections located on said planar area, said mating connections including abutment walls arrayed perpendicularly to the plane of said planar area, said walls being adapted to allow engagement of the plurality of mating connections only in a plane substantially perpendicular to said planar area; and
(b) a movable unit having:
(i) at least one character aperture, and
(ii) a set of mating connections extending perpendicularly to the plane of said movable unit, said set of mating connections being adapted for coupling releasably, perpendicular to the plane of said planar area and immovable, parallel to the plane of said planar area, with the plurality of mating connections on said base unit.

4,916,827

GUIDE DEVICE FOR MAKING ENTRIES IN TRUCKER'S LOG BOOK

William H. Rayburn, Tacoma, Wash., assignor to Premium Technologies, Inc., Tacoma, Wash.

Filed May 23, 1989, Ser. No. 356,009
Int. Cl.⁴ E07C *1/18*
U.S. Cl. 33—563 **8 Claims**



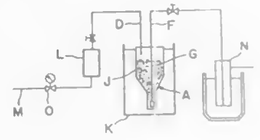
1. For use in connection with a trucker's log book, said log book having a monthly summary sheet with daily entries indicating the total number of on-duty hours which a trucker has worked during a given regulated operating period consisting of a certain number of days, such total not to exceed a regulated number of hours during such operating period, and each daily entry also indicating the available on-duty hours the trucker may work on the day following each entry, so that said trucker will not work more than said regulated number of hours during said given operating period, wherein the daily entries are determined by using a calculation period which is one day less than the length of said operating period, and with said monthly summary sheet being further characterized in that it includes
at least one table of five side-by-side columns organized into rows for listing the daily entries for each day of the particular month to be summarized, and wherein
the first column lists each day of said particular month to be summarized; and
the second column lists the trucker's daily entries of the number of on-duty hours for each day of said particular month, said second column also listing the daily on-duty hours for each day of the last calculation period of the preceding month, the last day of such period being the last day of the preceding month; and
the third column lists the trucker's daily entry of the total on-duty hours during any given calculation period preceding and including the day of entry, the day of entry being the last day of the calculation period, said third column also listing the total on-duty hours during the last calculation period of the preceding month as set forth in the second column; and
the fourth column lists the trucker's daily entry of the total available hours which e trucker may work on the day following each daily entry, said fourth column also listing the total hours available for the first day of said month; and
the fifth column lists the trucker's daily entries of the total hours on-duty during the operating period immediately preceding and including the day of entry, the day of entry being the last day of the operating period;
a device for assisting the trucker in calculating and entering the daily entries on said table, comprising:
a guide member shaped to be laid flatly across the columns of said table, said guide member having at least one window set including a first and second cut-out portion,
said cut-out portions being shaped in a manner so that when said guide member is positioned across said columns in a certain manner, said first cut-out portion displays one day of said particular month to be summarized as listed in the first column, and the corresponding entry locations for such day on the remaining columns, and said first cut-out portion further displays the daily entry for the day preceding said one day as listed in said table's third column, and said second cut-out portion displays a certain prior daily entry listed in said table's second column, said prior entry corresponding to the first day of the calculation period for said trucker's regulated operating period, and
a communication displayed on the guide member which instructs the trucker as to how to calculate the daily entries in the third, fourth and fifth columns for said one day.

4,916,828

METHOD OF PRODUCING SATURATED VAPOR OF SOLID METAL ORGANIC COMPOUNDS IN THE METAL ORGANIC CHEMICAL VAPOR DEPOSITION METHOD

Akira Yamane, Kudamatsu, and Masao Fujisawa, Houfu, both of Japan, assignors to Tosoh Akzo Corporation, Tokyo, Japan

Filed Jul. 5, 1989, Ser. No. 375,683
Claims priority, application Japan, Aug. 31, 1988, 63-215155
Int. Cl.⁴ C30B *25/14*
U.S. Cl. 34—10 **1 Claim**



1. A method of producing saturated vapor of solid metal organic compounds in the metal organic chemical vapor deposition method, characterized in that, into a cylinder for metal organic chemical deposition having a structure that an introducing port and a discharging port of carrier gas are provided respectively to the cylinder for metal organic chemical vapor deposition and a tube directly connected to either of these is inserted into the cylinder, a solid metal organic compound and a packing material are charged and a carrier gas fed from introducing port into cylinder is discharged from discharging port to outside of cylinder.

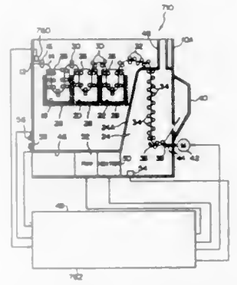
4,916,829

METHOD OF AND APPARATUS FOR DRYING PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL IN PHOTOGRAPHIC PROCESSING MACHINE

Tomoyuki Takine; Kimitaka Kameoka; Takashi Naoi, all of Kanagawa, and Yasunobu Tanaka, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 172,687, Mar. 23, 1988. This application Oct. 3, 1988, Ser. No. 252,316
Claims priority, application Japan, Mar. 23, 1987, 62-68530; Mar. 25, 1987, 62-71127; Mar. 25, 1987, 62-71126; May 6, 1987, 62-109984; Mar. 18, 1988, 63-65127
Int. Cl.⁴ F28B *3/08*; G03D *15/02*
U.S. Cl. 34—30 **4 Claims**

1. A method of drying photographic light sensitive material by use of drying air in a drying chamber after said photographic light-sensitive material has been processed in a processing machine for photographic light-sensitive material, comprising the steps of:
(a) detecting the ambient temperature and humidity around said processing machine; and
(b) controlling a temperature of said drying air in said drying



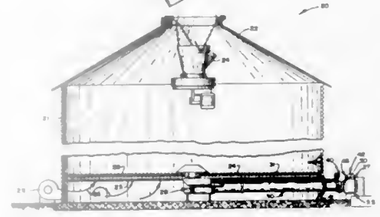
chamber on the basis of the ambient temperature and humidity wherein the water content of the photographic light-sensitive material which has been just discharged from the drying chamber is equivalent substantially to the water content in the ambient condition around said processing machine.

4,916,830

GRAIN DRYER CONTROL SYSTEM AND METHOD USING MOISTURE SENSOR

Keith Braun, Northwood; Larry Stille, Rockford, both of Iowa, and Dennis Brunwell, Bloomington, Minn., assignors to David Manufacturing Company, Mason City, Iowa

Filed Dec. 1, 1986, Ser. No. 936,283
Int. Cl.⁴ F26B *19/00*
U.S. Cl. 34—48 **24 Claims**



1. A control system for a drying system of the type which includes a drying bin, means for circulating drying air therethrough, and a discharge auger for removing dried particulate material from the bin, comprising:
(a) discharge particulate material moisture sensing means including a sensor assembly, positioned inside of discharge auger for directly sensing the moisture content of particulate material in said discharge auger, said moisture sensing means including crystal oscillator means for driving capacitor means; and
(b) control means connected to said discharge particulate material moisture sensing means and said discharge auger for controlling operation of said discharge auger.

4,916,831

VACUUM ROTARY DRYER

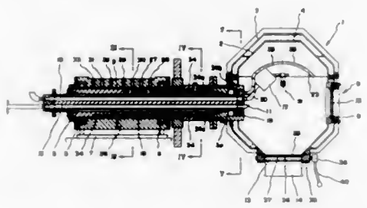
Mitsuru Yasumura; Atsuo Ohike, both of Nishinomiya; Takao Ueda, Daito; Masayoshi Aoki, Hiratsuka; Tomio Suzuki, Manazurumachi, and Makoto Horiai, Yokosuka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka and Tokuju Kosakusho Co., Ltd., Tokyo, both of, Japan

Filed Nov. 1, 1988, Ser. No. 265,701

Claims priority, application Japan, Nov. 2, 1987, 62-277599; Nov. 2, 1987, 62-167986

Int. Cl.[4] F26B *11/02*

U.S. Cl. 34—134 **5 Claims**



1. Rotary dryer for drying and mixing particulate material comprising:

a shell having a pair of conical portions, provided with a jacket to which a hot fluid may be fed, and defining a chamber for the material to be dried and mixed;

an air-tight closure for said chamber, provided with a jacket to which a hot fluid may be fed, and through which the material is charged and discharged;

a rotary tube shaft extending horizontally from one end of said shell and along the horizontal axis of said shell, said rotary tube shaft behind sheathed by a rotary joint pipe equipped with bearing means rotatably supporting the rotary tube shaft, said rotary tube shaft being provided with a plurality of communication paths which communicate with charge/discharge ports located on the rotary joint pipe during rotation of said rotary tube shaft in said rotary joint pipe, said communication paths connecting to said jackets of said shell and said closure for feeding the hot fluid;

an air nozzle disposed along an internal wall of said shell;

stirring means including a rotational mixing blade located within said shell to agitate the material, said stirring means being supported by the wall of the shell;

a feeder pipe air-tightly inserted in said rotary tube shaft, sheathing an evacuating pipe to communicate with a vacuum line and an air supply pipe connecting to said air nozzle.

4,916,832

DEVICE FOR REVERSING AN AIR FLOW IN A DRYING CHAMBER

Gustav Forssén, Skellefteå, Sweden, assignor to Utec S.M. AB, Skellefteå, Sweden

PCT No. PCT/SE87/00371, § 371 Date Feb. 21, 1989, § 102(e) Date Feb. 21, 1989, PCT Pub. No. WO88/01718, PCT Pub. Date Mar. 10, 1988

PCT Filed Aug. 24, 1987, Ser. No. 319,082

Claims priority, application Sweden, Sep. 4, 1986, 8603714

Int. Cl.[4] F26B *21/06*

U.S. Cl. 34—191 **7 Claims**

1. A device for reversing air flow direction in a drying chamber which includes a floor, a roof, perimetrical sidewalls, and an internal wall extending from the floor to the roof but including two horizontally spaced openings for permitting air circulation in a horizontal circuit around the internal wall in the drying chamber,

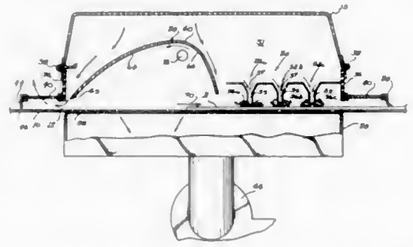
said device comprising:

at least one blower having fan means mounted on at least one rotary shaft to rotate therewith, which shaft is mounted for rotation about a horizontal axis, and which, when rotating, provides said blower with a suction side and a pressure side with regard to an annular shield which surrounds each blower; each said blower being disposed between said internal wall, between said two openings therethrough, and one said perimetrical sidewall;

a vertically-oriented drum enclosing each said blower and having a vertically-extending longitudinal axis;

means defining at least two types of openings horizontally through said drum, these two types of openings being spaced substantially from one another around said drum;

said drum extending, widthwise thereof, generally from said internal wall to said one perimetrical sidewall and from near said floor to near said roof, so that most air circulating horizontally about said internal wall must pass through one of said two types of openings, into said



drum, past said at least one blower, and out of said drum through the other of said two types of openings; and

means mounting said drum for rotation about said vertically-extending longitudinal axis between a first position in which one said type of opening thereof is associated with said suction side of said at least one blower and the other said type of opening thereof is associated with said pressure side of said at least one blower, so that operation of said at least one blower establishes and maintains a horizontal air flow circulation pattern in one direction around said chamber, and a second position in which the other said type of opening of said drum is associated with said suction side of said at least one blower and the one said type of opening of said drum is associated with said pressure side of said at least one blower, so that operation of said at least one blower establishes and maintains a horizontal air flow circulation pattern in a direction opposite to said one direction around said chamber.

4,916,833

ENHANCED SPEED LACING DEVICE WITH AN INTEGRATED ADJUSTABLE WIDTH, ADJUSTABLE TENSION SYSTEM

Luck Nwoko, 1629 Columbia Rd. NW. #110, Washington, D.C. 20009

Filed Nov. 25, 1988, Ser. No. 277,662

Int. Cl.[4] A43B *11/00*; A43C *5/00*

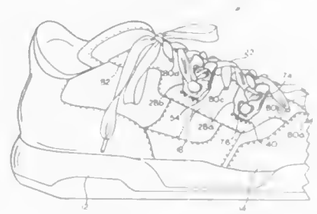
U.S. Cl. 36—50 **10 Claims**

1. A lacing device, for attachment along the periphery of the throat of an article of footwear to uniquely receive and provide guidance to shoelaces of a lacing configuration, comprising:

An integral, eyelet-bearing lacing device adapted to be attached along the periphery of the shoe throat, said lacing device provided with a pair of rigid, upwardly elongated, laterally spaced, sinuous side members, said side members curving inwards and downwards at the top along convex lines to form outwardly bevelled, converging primary hook members, said convex line configuration of said primary hook members resulting in the formation of a V-shaped, lace-introducing primary notch;

said primary notch communicating with a central slit which leads into a primary eyelet, said primary eyelet having an opening large enough to loosely receive a shoelace, and formed on each side of said primary eyelet, front and back, a substantially bevelled, oblique upward groove which provides security and guidance, to said shoelace drawn taut in a diagonal manner;

a pair of upwardly bevelled, converging secondary hook members, said secondary hook members curving inwardly



and downwardly along convex lines and being extensions of said side members as well as circumscribing a downward interior portion of said primary eyelet, convex line configuration of said secondary hook members creating a flared, lace-introducing secondary notch, said secondary notch being sufficiently wide to engage said shoelace and communicating with a central slit which leads into a secondary eyelet, said secondary eyelet having an opening large enough to loosely receive said shoelace, and formed on each side of said secondary eyelet, front and back, a substantially bevelled, oblique, upward groove which provides security and guidance, to said shoelace when drawn taut in a diagonal manner.

4,916,834

HEEL SECURING DEVICE PARTICULARLY FOR SKI BOOTS

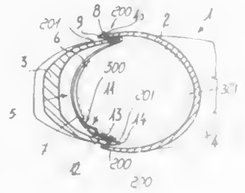
Giorgio Baggio, San Martino Di Lupari, and Giuseppe De Bortoli, Montebelluna, both of Italy, assignors to Nordica S.p.A., Montebelluna TV, Italy

Filed Dec. 14, 1988, Ser. No. 284,567

Claims priority, application Italy, Dec. 22, 1987, 82624 A/87

Int. Cl.[4] A43B *5/04, 23/28*

U.S. Cl. 36—117 **16 Claims**



1. In combination, a ski boot and a heel securing device, said ski boot comprising:

a shell,

a lateral surface defined on said shell,

a front quarter associated with said shell,

an anterior lateral portion defined on said front quarter,

a rear quarter associated with said shell,

a rear lateral portion defined on said rear quarter,

an opposite lateral portion defined on said rear quarter,

a longitudinal extension defined by said rear quarter, and

a heel region defined in said rear quarter, said heel securing device comprising;

at least one elongate element, said elongate element extending internally and transversely to said longitudinal extension of said rear quarter at said heel region,

at least one end defined by said elongate element, said end being at least temporarily connected to at least one lateral portion of said ski boot, said lateral portion of said ski boot being selected from among said anterior lateral portion defined on said front quarter, said lateral portion defined by said shell, and said rear lateral portion defined on said rear quarter,

at least one other end defined by said elongate element, said other end being at least temporarily connected to said opposite lateral portion of said rear quarter,

a useful length defined by said elongate element, and

means for adjusting said useful length of said elongate element, said means being associated with said elongate element.

4,916,835

SPORT SHOE

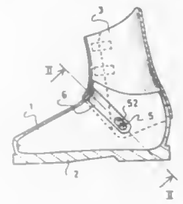
Jean Marie Begey, Bonne; Philippe Billet, Vieux, and Claude Perrissoud, Saint-Jorioz, all of France, assignors to Salomon S.A., Annecy Cedex, France

Filed Jul. 5, 1988, Ser. No. 215,157

Claims priority, application France, Jul. 3, 1987, 87 9971

Int. Cl.[4] A43B *5/04, 5/00*

U.S. Cl. 36—119 **15 Claims**



1. A shoe comprising a shaft (3) articulated to a shell base (1) along a transverse axis (5') connecting two end pieces (5) on each side of said shoe, said end pieces being fixed with respect to said shaft (3) but being adjustable in a substantially vertical direction in relation to said shell base (1), said end pieces (5) being connected to one another by stirrup means (6), said means (6) being located inside said shell base (1) in such a way that said shell base (1) is sandwiched between a bottom portion of said shaft and said stirrup means in an area corresponding to an instep of a wearer of said shoe.

4,916,836

SECURING AND ADJUSTMENT DEVICE PARTICULARLY FOR SKI BOOTS

Giorgio Baggio, San Martino Di Lupari, and Alessandro Bambace, Castelfranco Veneto, both of Italy, assignors to Nordica S.P.A., Montebelluna, Italy

Filed Nov. 28, 1988, Ser. No. 277,076

Claims priority, application Italy, Dec. 3, 1987, 82610 A/87

Int. Cl.[4] A43B *5/04, 7/14*

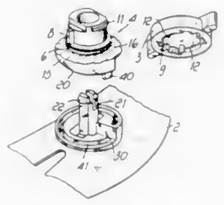
U.S. Cl. 36—119 **12 Claims**

1. In combination, a ski boot and a securing and adjusting device, said ski boot comprising;

a shell,

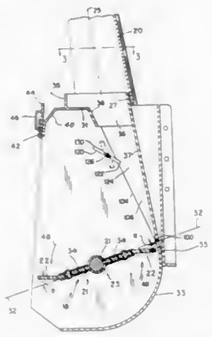
a foot pressing region inside said shell, said shell having a through hole at said foot pressing region,

said securing and adjusting device comprising;
a central bush-like body extending into said through hole and having a longitudinal axis substantially coaxial therewith,
a first body portion element associated with said central bush-like body and arranged inside said shell and having at least one first substantially inclined-plane surface transverse to said longitudinal axis,
a coupling body being axially movable with respect to said central bush-like body.



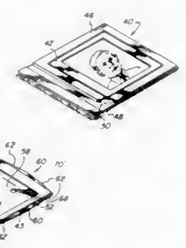
a second body portion element associated with said coupling body and arranged inside said shell and having at least one second substantially inclined-plane surface facing said first inclined-plane surface for interacting therewith, said first and said second body portion elements forming a pair of cooperating body portion elements,
an external actuation element arranged outside said shell for actuating one of said body portion elements thereby to cause a relative sliding movement between said first and said second substantially inclined-plane surfaces,
at least one presser arranged at said foot pressing region and cooperating with said second body portion element.

4,916,837
SINGLE STAGE SNOWTHROWER
Jaroslav J. Olmr, Rock Hill, S.C.; Robert D. Batting, and John W. Hopkins, both of Charlotte, N.C., assignors to Textron, Inc., Providence, R.I.
Continuation-in-part of Ser. No. 75,433, Jul. 20, 1987, abandoned. This application Jul. 27, 1988, Ser. No. 224,907
Int. Cl.[4] 0000 *00/00*
U.S. Cl. 37—252 6 Claims



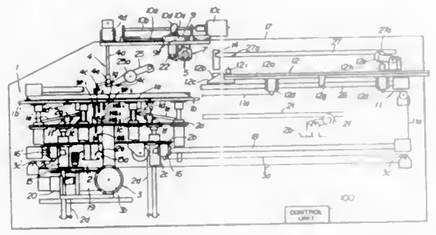
1. A single stage snowthrower, comprising:
an impeller housing having a top wall, opposing side walls and a front opening through which snow is ingested;
a cylindrical wall section defining a lower bottom wall of said impeller housing;
an impeller having a substantially flat central paddle section extending from a shaft mounted for rotation within said impeller housing, said impeller extending across a substantial portion of said impeller housing;
spaced front and rear walls separated by end walls forming a chute opening in said top wall of said impeller housing, said chute opening having a predetermined cross-sectional area;
an external chute having a central axis positioned over said chute opening;
a flat transitional rear wall section joining said cylindrical wall section to said rear wall of said chute opening, said central paddle section having outermost end portions bent rearwardly, relative to the direction of rotation of said impeller, from a radial line extending through said shaft such that said outermost end portions are disposed substantially perpendicularly to said transitional rear wall at the junction of said transitional rear wall section and said cylindrical wall section; and
a pivotable gate, having a bottom end, mounted between said sidewalls and spaced from said rear walls to define a variable throat area below said chute opening through which snow thrown by said impeller passes, said gate being pivotable about an axis substantially parallel to said rear walls to vary the distance between said bottom end of said gate and said rear walls to thereby selectively adjust said throat area in accordance with the condition of the snow being thrown by said impeller.

4,916,838
PHOTO HOLDER FOR PHOTO ALBUMS
Sheldon Holson, Norwalk, Conn., assignor to The Holson Company, Forestdale, R.I.
Filed Jun. 17, 1988, Ser. No. 208,744
Int. Cl.[4] A47G *1/06*
U.S. Cl. 40—159 18 Claims



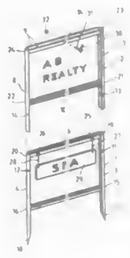
1. A photo insert for use in a photo album, comprising:
a photo holder;
a panel;
a retainer frame affixed to the panel, said retainer frame being shaped to border a viewing aperture, a side of said retainer frame being unattached to the panel so as to form an entry slit between the panel and the retainer frame for said photo holder;
said photo holder having a peripheral holding edge, said photo holder and its peripheral edge being sized to slidingly fit through said entry slit and extend beneath a retainer frame portion that borders the photo viewing aperture; and includes a rear edge located opposite to the entry slit;
said peripheral holding edge being selectively shaped to have a protruding guide portion that slidingly slips beneath the rear edge of the retainer frame, without its manual defacement when the photo holder is installed.

4,916,839
PAGE TURNING APPARATUS
Akira Nakanishi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jun. 23, 1988, Ser. No. 210,760
Claims priority, application Japan, Jun. 29, 1987, 62-161947
Int. Cl.[4] G09F *11/02*
U.S. Cl. 40—475 16 Claims



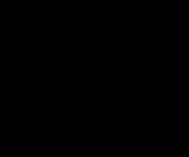
1. A method of mechanically turning the pages of a bound volume placed face up on a document table, comprising the steps of:
mechanically applying a frictional force to the uppermost one of the pages in a direction toward the center of the book to buckle the uppermost page and thereby permit air to enter a space between the buckled page and the next page;
disengaging the frictional force from uppermost page to permit the uppermost page to return toward its initial position due to its rigidity so as to form an air layer between the uppermost page and the next page;
mechanically applying an attracting force to the uppermost page in an upward direction so as to lift the uppermost page off of the underlying page; and
moving an engaging member along a path crossing the attracted uppermost page to turn the uppermost page.

4,916,840
MODULAR SIGN SYSTEM
Alan J. Getz, 6750 W. Loop South, Suite 685, Bellaire, Tex. 77401
Filed Feb. 2, 1988, Ser. No. 151,561
Int. Cl.[4] G09F *7/00, 7/02*
U.S. Cl. 40—605 6 Claims



1. A sign frame comprising a plurality of inter-changeable prefabricated frame modules which can be stacked together to form a single unit wherein each prefabricated frame module is comprised of:
two upright members each terminating on the lower end in a configuration capable of insertion in the earth and connected by vertically spaced, upper and lower horizontal members to form a generally rectangular structure in a vertical plane;
the lower horizontal member being capable of supporting a sign placard and attached to the upright members at a distance sufficiently above the lower ends of said upright members such that said lower ends may be inserted in the earth for support;
the upper horizontal member being attached to the top of the upright members and adapted to slidably admit a sign placard into the generally rectangular structure formed by the upright and horizontal members; and
the upright members being inclined inwardly toward the top such that the lower ends of the upright members of one module will slide over and be received by the upper ends of the upright members of a second such module.

4,916,841
LUGGAGE TAG CODISPENSABLE WITH PASSAGE TICKETS AND CONVERTIBLE INTO A HANDLE ENCIRCLING TAG AND METHOD
Murray Dawson, Clarendon Hills, Ill., assignor to Rand McNally & Company, Skokie, Ill.
Filed Oct. 24, 1988, Ser. No. 261,602
Int. Cl.[4] G09F *3/14*
U.S. Cl. 40—665 14 Claims

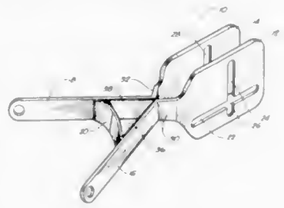


1. A disposable luggage identifying ticket convertible into a luggage handle encircling baggage tag, said ticket comprising
a pair of elongated generally coextensive sheets of stock secured to each other, each said sheet having a pair of parallel sides and a pair of parallel ends, and configured to be separable into a main portion and a loop forming strap adhesively securable to said main portion,
said sheets being adhesively secured in an overlying confronting relationship along one of their respective confronting sides, and
a line of severance dividing one of said sheets along a line between, and generally parallel to, its sides into a strap zone on one side of the line of severance and being separable from said one sheet, said strap zone when separated being adapted to be formed into a loop, and a second zone on the other side of the line of severance, said other side being adhesively secured to the other sheet.

4,916,842
PROTECTIVE DEVICE FOR THE TRIGGER GUARD OF A GUN
Mark L. Hardy, 124 Hwy. 75 N., Huntsville, Tex. 77340
Filed Jul. 27, 1989, Ser. No. 385,828
Int. Cl.[4] F41C *27/10*
U.S. Cl. 42—70.07 20 Claims

1. A protective device for a trigger guard of a gun comprising:
a first plate member;
a second plate member;
a plurality of pins affixed to one of said first and second plate members, said plurality of pins extending between said first and second plate members; and

compression means connected to said first and second plate members, said compression means for causing said first



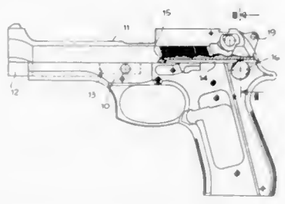
and second plate members to separate from each other upon receiving a desired compression force.

4,916,843

SAFETY MEANS FOR THE BOLT OF AUTOMATIC AND SEMIAUTOMATIC PISTOLS

Pier G. Beretta, Gardone V.T., Italy, assignor to Fabrica D'Armi P. Beretta, S.p.A., Brescia, Italy

Filed Sep. 15, 1988, Ser. No. 244,932
Int. Cl.[4] F41C *17/00*
U.S. Cl. 42—70.01 5 Claims



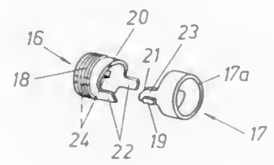
1. Pistol arrangement, comprising:
a pistol body including an upper bolt engaging portion with a fixed shoulder; a bolt connected to said pistol body for retromovement along the pistol body by propelling gases of a shell, said bolt including an arresting portion positioned adjacent a front end of said bolt, said arresting portion engaging said fixed shoulder, for limiting the retromovement of said bolt with respect to said pistol body; a longitudinal throat defined by said bolt, said longitudinal throat having a front end providing a striking step, said striking step facing toward a rear end of said bolt; and, a stationary arresting element, fixed to said pistol body, said stationary arresting element including a portion projecting into said throat for engaging said striking step to arrest said bolt with respect to said pistol body, in the event of breakage of said bolt and said portion projecting into said throat, not engaging said striking step during normal retromovement of said bolt along said pistol body.

4,916,844

HAND-HELD FIREARM

Ulrich Zedrosser, Steyr, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Sep. 7, 1989, Ser. No. 404,103
Claims priority, application Austria, Sep. 23, 1988, A2350/88
Int. Cl.[4] F41C *17/00, 21/22*
U.S. Cl. 42—75.02 3 Claims



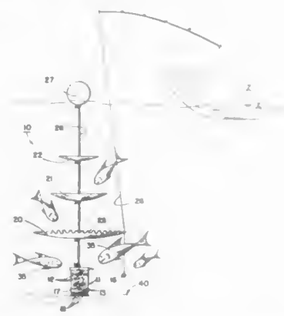
1. In a hand-held firearm comprising
a receiver defining a slider path having a forward end,
a barrel having a rear end portion, which is detachably mounted in said receiver and extends in the same direction as said slider path,
a firing mechanism, which is operable to perform loading and firing operations,
a slider, which is slidably mounted in said receiver for a movement along said slider path and arranged to cooperate with said firing mechanism during at least part of said loading and firing operations,
means operable to impart a rearward movement to said slider along said slider path,
a return spring urging said slider forwardly,
a locking sleeve, which is fixed to said receiver, said rear end portion of said barrel being detachably mounted in said locking sleeve and being rotatable in said locking sleeve between locked and unlocked positions, said locking sleeve and said rear end portion of said barrel being provided with means arranged to axially lock and unlock said barrel in said locking sleeve when said barrel is in said locking and unlocking positions, respectively,
a barrel bearing provided in said receiver, and
a bushing mounted in said barrel bearing in front of said forward end of said slider path and surrounding said barrel forwardly of said rear end portion of said barrel,
the improvement residing in that said bushing contains an actuating sleeve and a restraining sleeve, which is axially aligned with and extends rearwardly of said actuating sleeve,
said actuating sleeve and said restraining sleeve are respectively formed with first and second helical guiding edges in sliding contact with each other,
said actuating sleeve is rotatably mounted and axially fixed in said bushing,
said restraining sleeve is axially slidably and non-rotatably mounted in said bushing,
said actuating sleeve has at least one forwardly open axial groove,
said barrel has at least one radially outwardly protruding coupling nose extending into said at least one groove, and
the arrangement is such that upon a rotation of said barrel from said locked position to said unlocked position said coupling sleeve will perform a corresponding rotation and owing to the slidable contact between said first and second helical guiding edges will impart to said restraining sleeve a rearward movement out of said bushing into said slider path to limit the forward movement of said slider along said slider path.

4,916,845

DEVICE TO ATTRACT FISH

Charles B. Aydelette, Sr., Rte. 19, Box 2890, Lexington, N.C. 27292

Filed Dec. 15, 1988, Ser. No. 284,600
Int. Cl.[4] A01K *91/00*
U.S. Cl. 43—4 17 Claims



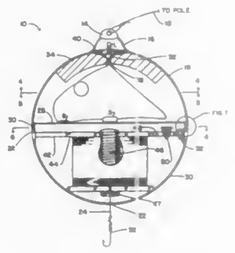
1. A device for attracting fish comprising: a disk, said disk having an upward concave shape when positioned in the water, anchor means, said disk joined to said anchor means, said anchor means for limiting the movement of said disk.

4,916,846

ILLUMINATED FISHING BOBBER

Joseph K. Pehm, 6636 W. Coolidge, Phoenix, Ariz. 85033

Filed Jun. 23, 1989, Ser. No. 370,858
Int. Cl.[4] A01K *13/00*
U.S. Cl. 43—17.5 15 Claims



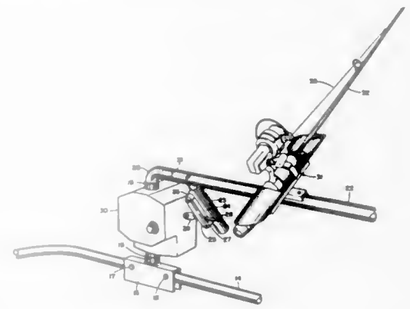
1. An illuminated fishing bobber, comprising:
a hollow body member;
a light in said body member;
a battery in said body member,
a position sensitive switch in said body member for connecting said battery to energize said light;
eyelet means for securing a fishing line from a fishing rod to said body member;
a rotationally mounted spool of line in said body member; and
an aperture receiving an end of said line on said spool for connection to an external hook.

4,916,847

JIGGING DEVICE

David E. Ruego, 611 Lankamp, NW., Grand Rapids, Mich. 49504

Continuation-in-part of Ser. No. 25,404, Mar. 13, 1987, abandoned. This application Jan. 5, 1989, Ser. No. 293,687
Int. Cl.[4] A01K *97/10*
U.S. Cl. 43—19.2 9 Claims



1. A fish line jigging device, comprising:
a beam having a radius arm;
means supporting said beam for rotation on a substantially horizontal axis;
at least one receptacle for fishing rods mounted on said beam; and
oscillating means adapted to engage said radius arm and induce reciprocating rotation to said beam, said radius arm including means forming a slot substantially radial with respect to said axis, and said oscillating means including a motor having a crank arm with a portion thereof slidably and rotatably engaging said slot, said crank arm rotating on an axis parallel to said beam axis.

4,916,848

HANDLE BODY ASSEMBLY FOR A FISHING ROD

Casey J. Childre, Foley, Ala., assignor to Lew Childre & Sons, Inc., Foley, Ala.

Filed Jan. 24, 1989, Ser. No. 301,235
Int. Cl.[4] A01K *87/02*
U.S. Cl. 43—23 9 Claims

1. A fishing rod of the through rod construction type comprising a grip, a handle body, and a rod blank axially extending from the grip through the handle body;
said grip being a generally elongated hollow body adapted to axially receive the rod blank substantially throughout the entire body thereof;
said grip having a fore end and an aft end, said grip fore end having a preselected exterior shape, preselected exterior dimensions and a preselected first angular orientation to the rod;
said handle body also being a generally elongated hollow body adapted to axially receive the rod blank throughout the entire body thereof;
said handle body having a fore end and an aft end, said handle body aft end having a preselected exterior shape,

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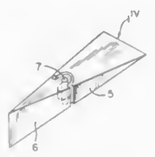
preselected exterior dimensions and a preselected second angular orientation to the rod;
said first angular orientation and said second angular orientation being different;
said handle body being positioned fore of said grip along said rod blank;
said fishing rod further including a transition collar having a bore through which said rod blank is received, said transition collar being interposed between said handle body and the said grip;
said transition collar having a fore end exterior shape and exterior dimensions substantially equivalent to the preselected exterior shape and exterior dimensions of said handle body aft end;
said transition collar having an aft end exterior shape and exterior dimensions substantially equivalent to the preselected exterior shape and exterior dimensions of said grip fore end;
said transition collar having top, bottom and side portions; and
said transition collar having a graduated shape and graduated exterior dimensions which provide a smooth transition between said handle body and said grip.

4,916,849
ARTIFICIAL LURE WITH TRAPEZOIDAL SHAPE
Konstantin Radtchenko, 235 Manhattan Ave., Jersey City, N.J. 07307
Filed Jan. 24, 1989, Ser. No. 300,850
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.32 18 Claims



1. An artificial lure, comprising
an elongated body having a shape of tetrahedron with two congruent plane triangles forming upper and lower surfaces and two further congruent plane triangles forming lateral surfaces of said body, said body having two opposite ends, said upper and lower surfaces intersecting one another at one of said ends and forming a horizontally disposed edge, said lateral surfaces intersecting one another at the other of said ends and forming a vertically disposed edge, said body having any cross section along a longitudinal axis formed as a rectangle.

4,916,850
LINE ATTACHMENT DEVICE
Paul A. Dodge, Rte. 3, Menomonie, Wis. 54751
Filed Aug. 21, 1989, Ser. No. 396,071
Int. Cl.[4] A01K *93/00*
U.S. Cl. 43—44.86 23 Claims

1. A line attachment device for attachment of an object to a line segment formed into an open loop, comprising:
a plug;
a cleat attached to one end of the plug and extended outwardly from the plug;
a cap having a central opening with a dimension and shape to fit over the end of the plug opposite the cleat in snug relationship whereby an open loop can be formed in the line segment and trained through the opening in the cap from a direction opposite the cleat, and trained over the plug and the cleat whereby the cap can be positioned on

the plug to secure the line segment with respect to the plug, the cleat and the cap; and
means for connecting said object to said plug.

4,916,851
PASSIVELY ANCHORED FISHING TACKLE
Didrik Pedersen, Kjollefjord, Norway, assignor to Alternativt Fiskeredskap AS, Kjollefjord, Norway
Filed May 8, 1989, Ser. No. 348,537
Claims priority, application Norway, May 16, 1988, 882132
Int. Cl.[4] A01K *69/10*
U.S. Cl. 43—101 3 Claims

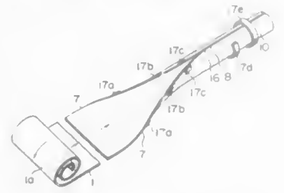
1. A passively anchored fishing tackle of the net kind, including bottom nets, top nets, lateral nets, inlet nets and lead-in nets, which cooperate to form a catching space, wherein the lateral nets, inlet nets, and lead-in nets are provided with top lines having incorporated buoyancy, and bottom sink lines and wherein all nets are square-meshed in the inlet portion whereas the rest are normally meshed.

4,916,852
COVER FOR A FISHING ROD
Richard Zebleckis, 8652 S. 86th Ave., Justice, Ill. 60458, assignor to Richard Zebleckis and Richard E. Quradnik, both of Glen Ellyn, Ill.
Filed Apr. 28, 1989, Ser. No. 345,023
Int. Cl.[4] A01K *97/08*
U.S. Cl. 43—26 4 Claims

1. A protective cover for a fishing rod comprising:
an elongated woven and conformable plastic sleeve for encasing a fishing rod having an open bottom end and a fused and closed top end, said open end being shaped and constructed to receive a fishing rod therethrough to be inserted into said cover or withdrawn from said cover;
a grommet-like member positioned adjacent the top end of the sleeve and extending through said sleeve so as to form an opening for hanging of the cover and a rod therein; and

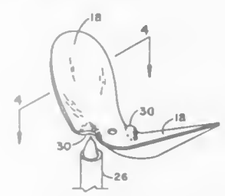
wherein said cover includes elongated tag means which are folded so as to overlie said top end and which includes depending leg portions through which said grommet-like member passes so as to secure said tag means to said cover in position to extend across said top end.

4,916,853
METHOD FOR MANUFACTURING WELDED PIPES
Shigetomo Matsui, 4-25, Higashiyama-Cho, Higashiosaka-Shi, Osaka-Fu, and Hisao Hasegawa, 13-24, Nishiokamoto 2-Chome, Higashinada-Ku, Kobe-Shi, Hyogo-Ken, both of Japan
Continuation of Ser. No. 754,202, Jul. 11, 1985, Pat. No. 4,717,065, which is a continuation of Ser. No. 498,596, May 26, 1983, abandoned. This application Jun. 30, 1987, Ser. No. 68,183
Int. Cl.[4] B23K *31/06*
U.S. Cl. 228—147 7 Claims



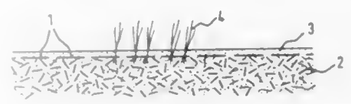
1. In a method for the manufacture of welded pipes in which a strip having a flat shape is fed through shaping rolls which gradually bring together the longitudinal edges of the strip in opposed abutting relation to bend the same into tubular form, and then the thus opposed edges of the bent tubular section are welded together, the improvement comprising preventing buckling or waving of said longitudinal edges by the steps of:
during the process during which said strip has begun to be bent from its flat shape into tubular form, reducing tensile stress exerted on regions of said strip adjacent said longitudinal edges which are being brought together gradually by heating said regions while maintaining the middle part of said strip between said regions substantially free of such heating; and
after said longitudinal edges have been abutted against each other and until immediately before said edges are welded together, reducing the compressive stress exerted on said longitudinal edges by heating said strip around substantially the entire circumference thereof.

4,916,854
FISHING SPINNER AND METHOD OF MAKING IT
Donald G. Martin, 7608 SE. 70th Ave., Portland, Oreg. 97206
Filed Aug. 14, 1989, Ser. No. 393,232
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.19 8 Claims



4. The method of forming a propeller-like fishing spinner comprising the steps of:
forming a flat blank of material of a type and gauge that normally retains its shape but is flexible,
shaping the blank by rounding end portions which are joined at the longitudinal center of the blank by a narrowed body portion,
and forming said blank into a propeller-like spinner having cupped blades and a propeller pitch by shrinking said film at points on said rounded ends portion which are offset from each other on opposite sides of the longitudinal center.

4,916,855
REINFORCING A GRASSED SURFACE
John Halliday, Edinburgh, Scotland, and Keith F. Martin, Wiswell, Great Britain, assignors to The Royal Hong Kong Jockey Club, Happy Valley, Hong Kong and Netlon Limited, Blackburn, Great Britain
Filed Mar. 30, 1988, Ser. No. 175,447
Claims priority, application United Kingdom, Mar. 30, 1987, 8707544; Oct. 21, 1987, 8724616
Int. Cl.[4] E02D *3/00;* **A01B** *79/02*
U.S. Cl. 47—58 2 Claims



1. A method of reinforcing a grassed surface layer, comprising providing in the surface layer a flexible mesh structure layer having strands forming mesh openings by laying a web of mesh structure comprising a plurality of pieces, each said piece having a plurality of complete mesh openings and at least 50% but not all of those strands around the periphery of each piece which would otherwise connect the piece to the adjacent pieces, being interrupted, sufficient uninterrupted strands being left at the peripheries of the pieces to provide a coherent mesh structure for laying.

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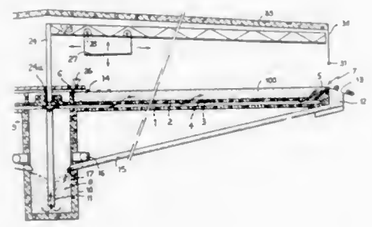
4,916,856

PROCESS FOR THE AUTOMATED GROWING OF A GROUP OF PLANTS AND CORRESPONDING INSTALLATION

Pierre M. Bourgogne, 2 bis, Rue des Ponchettes, 06300 Nice, France

Continuation-in-part of Ser. No. 800,121, Oct. 29, 1985, abandoned. This application Dec. 9, 1987, Ser. No. 130,583
Claims priority, application France, Mar. 7, 1984, 84 04313; Feb. 27, 1985, 85 03245; European Pat. Off., Mar. 4, 1985, 85430004.3-230
Int. Cl.[4] A01G *31/02*
U.S. Cl. 47—65 52 Claims



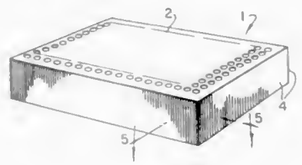
1. A process for an automated growing of non-potted plant objects in an artificial medium, said process comprising providing a container of such configuration as to comprise a bottom wall, a first upwardly-extending wall defining a first edge, a second upwardly-extending wall defining a second edge in spaced relation to and substantially parallel to said first edge, said second edge having an extent larger than the extent of said first edge, and the container having a progressively increasing extent in directions parallel to said edges from said first edge to said second edge, providing said medium in the form comprising a nutrient solution and support members selected from the group consisting of granulates, and pairs of threads or wires held taut between the first edge and the second edge of the container and spaced apart a distance suitable for holding each plant object therebetween as the plant object travels from the first edge to the second edge of the container, median axes of the pairs of threads or wires being arranged in radiating planes divergent from the first edge to the second edge, disposing said medium in the container, with the support members occupying at least an upper part of the medium and being in supported relation to the container, collectively planting bare plant objects selected from the group consisting of seeds and young plants directly in said support members adjacent to said first edge of the container substantially as close together as possible, periodically exerting thrusts on the plant objects supported on said support members in directions from said first edge toward said second edge so as to periodically displace the plant objects relative to the container in said directions substantially in accordance with the rate of growth of the plant objects so that suitable grown plant objects finally reach said second edge in supported relation to said support members at a substantially correct spacing from one another for the size of the plant objects at said second edge, said increasing extent of the container making available to the plant objects an increasing space in the container which allows an increasing spacing between the plant objects transversely of said directions of thrust as the plant objects travel from said first edge to said second edge, and removing the suitably grown plant objects from said container at said second edge.

4,916,857

CASTELLATED CHEMICALLY COATED SEEDLING BOX

James Kinghorn, Victoria, Canada, assignor to Beaver Plastics, Ltd., Alberta, Canada

Filed Sep. 19, 1988, Ser. No. 248,551
Claims priority, application Canada, Sep. 25, 1987, 547855
Int. Cl.[4] A01G *9/02*
U.S. Cl. 47—66 7 Claims



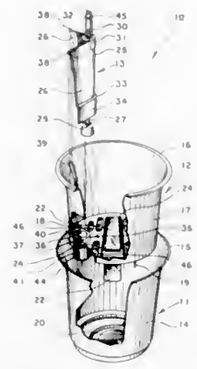
1. A seedling container comprising a plurality of cavities suitable for holding soil medium for propagating tree seedlings; said cavities each having an opening in the bottom thereof and having substantially vertical longitudinal axes; the inner wall of each of said cavities including raised and lowered portions in the form of a castellated construction, said raised portions comprising downwardly directed raised bands which thereby define interspersed grooves which comprise said lowered portions; said bands and said grooves defining peripheral faces joined by radially extending portions; and a suitable root pruning chemical applied to alternate ones of said faces.

4,916,858

SELF-WATERING PLANTER

Jody A. Hobson, Rocky River, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Aug. 3, 1987, Ser. No. 81,287
Int. Cl.[4] A01G *27/00*
U.S. Cl. 47—81 16 Claims



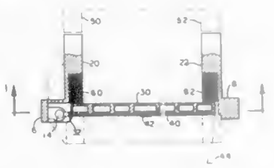
1. A planter comprising an outer shell having a sidewall and a bottom, an inner linear having a sidewall and a bottom and being nested within said outer shell, said bottom of said outer shell and said bottom of said inner liner being spaced to form a reservoir for water, a water intake and float tube assembly defining a water intake column for transmitting water from the top of the planter to said reservoir, means to transmit water in said reservoir to the inside of said inner liner, float indicator means in said water intake and float tube assembly and extending into said reservoir, said float indicator means being generally vertically movable dependent on the amount of water in said reservoir, said water intake and float tube assembly including a hollow open-ended tube extending generally from the top to the bottom of said inner liner, said float indicator means being within said tube and extending through the open ends thereof, said water intake and float tube assembly also including wings extending generally tangentially from said tube and defining, with the sidewall of said inner liner, said water intake column, and means in said reservoir to protect said float indicator means from turbulence which might be caused when water is provided to said reservoir through said water intake column.

4,916,859

ASSAULT-RESISTANT GATE

Colin Butler, Putney, Vt., assignor to Embassy Gate Associates, L.P., Cressona, Pa.

Continuation-in-part of Ser. No. 157,828, Feb. 19, 1988, which is a continuation of Ser. No. 70,272, Jul. 6, 1987, abandoned, which is a continuation of Ser. No. 751,092, Jul. 2, 1985, abandoned. This application Aug. 29, 1988, Ser. No. 240,537
Int. Cl.[4] E01F *13/00*
U.S. Cl. 49—9 26 Claims



1. An assault-resistant gate for barring passage, through an opening, of vehicles, said gate comprising.

a hinge-post means;

beams means, extending from the hinge-post means across the opening, said beam means being relatively rigid in a horizontal plane;

breakaway beam mounting means attaching the beam means to the hinge-post means, which mounting means is weaker than the hinge-post means;

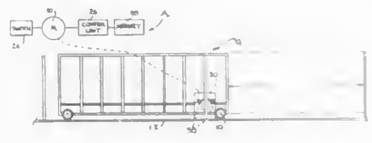
energy-absorbing means, disposed behind said beam means at a hinge-post side and at a distal side of the opening for absorbing impact from the beam.

4,916,860

APPARATUS AND METHOD FOR OPENING AND CLOSING A GATE

Moscow K. Richmond, Los Angeles; R. Richmond Thomas, Santa Ana, and Patrick S. Kochie, Simi Valley, all of Calif., assignors to Doorking, Inc., Inglewood, Calif.

Filed Apr. 25, 1988, Ser. No. 185,444
Int. Cl.[4] E05F *15/14*
U.S. Cl. 49—28 14 Claims



1. A gate opening and closing apparatus for moving a gate between a gate closed position and a gate opened position, said apparatus comprising:

(a) motive means to drive the gate between the gate opened position and the gate closed position,

(b) means connecting said motive means to said gate to cause powered movement of the gate between the gate opened and gate closed positions, and

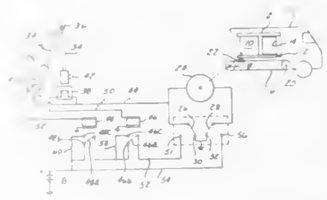
(c) control means operatively connected to said motive means to control operation of said motive means and hence to control movement of said gate between the gate opened and gate closed positions, said control means causing said gate to move to the closed position and remain at the gate closed position in an unlocked condition, said motive means causing generation of an electrical signal when a force is applied to the gate to move the gate away from the gate closed position and which force is from a source other than from the motive means, said electrical signal being transmitted to said control means which causes the control means to initiate a locking action upon the application of the force which tends to move the gate away from the gate closed position.

4,916,861

VARIABLE POWER DRIVE FOR SLIDING DOOR

William W. Schap, Jackson, Mich., assignor to ITT Corporation, New York, N.Y.

Filed Mar. 3, 1989, Ser. No. 318,564
Int. Cl.[4] E05F *15/20*
U.S. Cl. 49—31 6 Claims



1. In a power drive system for a sliding door mounted on a side of a vehicle for sliding movement forwardly and rearwardly of the vehicle between an open and a closed position, said system including reversible power drive means operable when actuated to selectively drive said door in opening or closing movement;

the improvement comprising inclination detecting means for detecting the front to rear inclination of the vehicle, and control means including regulating means operable by said detecting means for regulating the power applied by said drive means to move said door toward its closed position in approximate proportion to the degree of inclination detected by said detecting means.

4,916,862

CEILING ACCESS PANEL

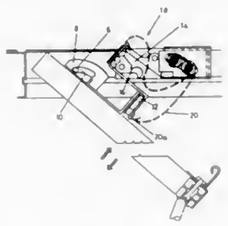
Barrie W. Storer, Warwickshire, United Kingdom, assignor to Profilex Limited, Hinckley, United Kingdom

Filed Dec. 8, 1988, Ser. No. 281,539
Claims priority, application United Kingdom, Dec. 9, 1987, 8728728
Int. Cl.[4] E05F *1/10*
U.S. Cl. 49—386 11 Claims

1. A ceiling access panel assembly comprising:

an access panel mounted for pivotal movement with respect to a frame, a friction brake which is operable to retard such pivotal movement of said panel from a raised condition flush with a ceiling to a lowered condition exposing a ceiling access opening, said friction brake comprising a flexible band having a first end anchored on said access panel and a second end fast to a bracket upstanding from said access panel, a pair of rollers mounted on said frame for rotation on adjacent axes, said flexible band having an intermediate portion between said first and second ends

which passes around and between said rollers so that when the weight of said access panel is applied to said first



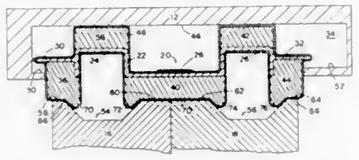
end, said band is drawn onto itself, frictionally to resist further pivotal movement of said access panel toward such a lowered condition.

4,916,863

JAMB LINER WEATHERSEAL

Allen J. Burrous, Macedon, and David W. Kehrli, Fairport, both of N.Y., assignors to Schlegel Corporation, Rochester, N.Y.

Filed Jun. 2, 1989, Ser. No. 360,309
Int. Cl.[4] E05D *15/16*
U.S. Cl. 49—419 **32 Claims**



17. A window system comprising first and second spaced apart parallel frame members;
first and second elongated grooves formed in facing surfaces of said frame members;
first and second sashes slidably mounted between said frame members;
first and second weatherseal elements disposed in said grooves and extending into the space between said frame members and said sashes, said weatherseal elements comprising an elongated firm substrate having two sides;
at least one resilient body member attached to a first side of said substrate and engaging at least one of said sashes;
a second body member disposed on said substrate opposite said first body member and resiliently engaging said frame member; and
an at least relatively low friction surface on said first body member for reducing sliding friction between said sash and said weatherseal.

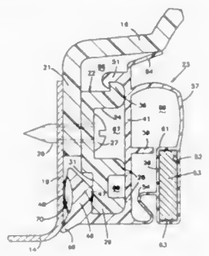
4,916,864

SNAP-IN GASKET SYSTEM FOR REFRIGERATOR AND FREEZER DOORS

Thomas R. Thompson, Anderson, S.C., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed May 5, 1989, Ser. No. 347,680
Int. Cl.[4] E06B *7/16*
U.S. Cl. 49—478 **13 Claims**

1. A magnetic gasket assembly for establishing a seal between the cabinet and door of a refrigeration appliance, comprising a retainer having inner and outer edges, said retainer being adapted to be mounted along the periphery of a door and providing along said outer edge thereof a lateral first shoulder positioned opposite to and spaced from an adjacent door surface when said retainer is installed and cooperating therewith to define an outwardly open channel, said inner edge of said retainer providing a second shoulder substantially extending in a direction opposite from said first shoulder, the gasket providing a base having inner and outer ends mountable on said retainer after said retainer is mounted, said gasket providing an inturned flange projection at said outer end of said base sized to fit said channel and secure said outer edge and to provide a seal with a door and the outer edge of said retainer, said inturned flange providing an outwardly extending hook portion diverging from the adjacent portions of said inturned flange when in its unstressed condition, said outwardly extending hook portion being deformed from its unstressed condition into engagement with said adjacent portions of said inturned flange by engagement with said first shoulder when said inturned flange is positioned in said channel to produce a tight seal with said retainer, said gasket also providing an inturned hook portion sized to hook onto said second shoulder to secure said inner side of said gasket on said retainer.

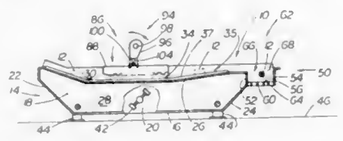


4,916,865

APPARATUS FOR SURFACE TREATING A WORKPIECE

James R. DeSpain, Prospect, and Michael E. Burke, Louisville, both of Ky., assignors to Carrier Vibrating Equipment, Inc., Louisville, Ky.

Division of Ser. No. 720,135, Apr. 5, 1985. This application Nov. 25, 1987, Ser. No. 125,613
Int. Cl.[4] B24B *31/00*
U.S. Cl. 51—7 **20 Claims**



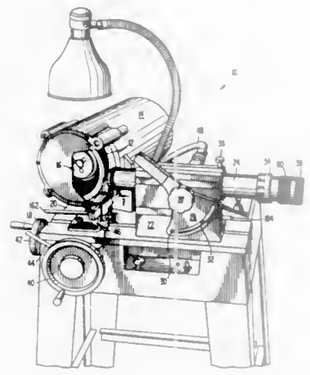
1. An apparatus for surface treating workpieces comprising:
a. means for defining a reservoir for containing a bed of surface treating media;
b. vibrating means for parting a vibrating force to the reservoir defining means;
c. means for passing a gas generally upwardly through the reservoir defining means to fluidize the bed of surface treating media contained therein; and
d. means for clamping the workpieces in a stationary position in the reservoir defining means, the clamping means comprising a plate located over the reservoir defining means and being selectively movable between a workpiece clamping position whereat the plate contacts the workpieces to hold them in a stationary position securing the workpieces against the reservoir defining means in spaced relationship to each other and a release position whereat the plate is out of contact with the workpieces allowing the workpieces to be conveyed through the reservoir defining means.

4,916,866

END MILL SHARPENER

David A. Bernard, Ashland, and William C. Christian, Medford, both of Oreg., assignors to Darex Corporation, Ashland, Oreg.

Filed Feb. 9, 1989, Ser. No. 307,993
Int. Cl.[4] B24B *3/06, 19/04, 5/02*
U.S. Cl. 51—95 LH **11 Claims**



1. An end mill resharpening device comprising a base, having a fixture mounted for vertical sliding motion thereon;
a spindle mounted for horizontal sliding movement relative to the base and for rotation in the fixture;
means for mounting an end mill in one end of the spindle;
a means for mounting a motor on the base, with its shaft positioned parallel to the base, and its shaft positioned at an angle to the axis of the spindle;
threaded means for moving the motor, and an attached grinding wheel toward and away from one end of the spindle; wherein the mounting means for the spindle comprises an air bearing, and the spindle is provided with a hand knob mounted for rotation at the end of the spindle opposite the end mounting the end mill; and
further including a means for mounting a pointed stylus on the base adjacent the grinding wheel with the point thereof positioned to engage a flute of an end mill to be sharpened wherein the mounting means for said stylus includes means for compensating for end mill diameter and means for automatically setting the stylus for primary and secondary angle resharpening.

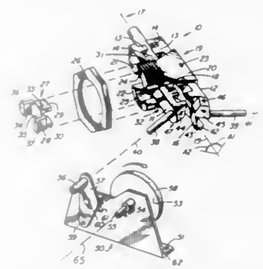
4,916,867

DRILL BIT SHARPENER

David N. Lockwood, 6191 Ewart St., Burnaby, B.C., Canada (V5J 2X4)

Filed Dec. 19, 1988, Ser. No. 286,621
Int. Cl.[4] B24B *3/28*
U.S. Cl. 51—96 **48 Claims**

1. A drill bit sharpening device, for use with a support carrying a rotatable grindstone and having pivot arm retaining means, the device comprising a drill bit jit having:
(a) clamp means for releasably retaining a drill bit therein in a position wherein the drill bit extends forward from the clamp means along a corresponding clamp axis said clamp means having:
(i) a first and second opposed jaw movable toward and away from one another so as to accommodate different diameter drill bits positioned therebetween; and
(ii) a jaw adjuster connected to said first jaw, having a U-shaped frame with upper and lower threaded flanges extending over said second jaw, retaining guide means connected to said second jaw, and a nut for fastening to said threaded flanges, said nut being positioned between said guide means and said second jaw, such that when tightened, said nut and flanges will move toward on another and said nut will but said second jaw to urge said second jaw against said drill bit and said first jaw, and when said nut is loosened, said nut and flanges will move away from one another and said nut will abut said retaining guide means to urge said second jaw away from said first one;
(b) a first and second jig pivot arm connected to said first and second jaw at one end thereof and symmetrically located



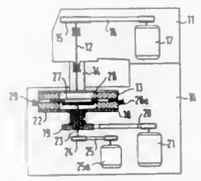
about the axis of a drill bit such that if said clamp means is rotated 180° about its axis said arms will assume identical and diametrically opposed positions; and
(c) said pivot arms being located such that the first pivot arm can rest on a pivot arm retaining means with the axis of the drill bit held in the clamp extending forward to intersect a grinding face of said grindstone carried in said support at a predetermined angle A_1 thereto, and in an inverted clamp position the second arm can rest on a pivot arm retaining means, with the axis of the drill bit held in the clamp extending forwardly to intersect the same grinding face at an identical point of intersection on the drill bit axis and at an equal angle A_2.

4,916,868

HONING, LAPPING OR POLISHING MACHINE

Gerhard Wittstock, Uetersen, Fed. Rep. of Germany, assignor to Peter Wolters AG, Fed. Rep. of Germany

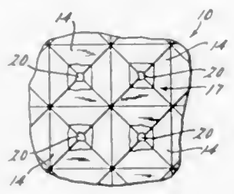
Filed Sep. 8, 1988, Ser. No. 242,335
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1987, 3730795
Int. Cl.[4] B24B *7/17*
U.S. Cl. 51—281 R **16 Claims**



1. Honing, lapping or polishing machine comprising:
upper and lower working discs, at least one of said discs having an abrasive means for honing, lapping, or polishing the surface of a workpiece;
an outer gear member including an annular row of teeth;

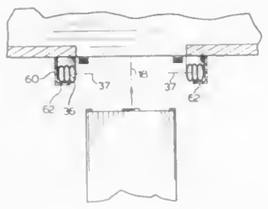
a centrally arranged inner gear member including an annular row of teeth;
a plurality of workpiece holder discs disposed between said working discs and including recesses for receiving workpieces, said discs including teeth at their outer peripheries in driving engagement with the teeth of the outer and inner gear members in a planetary gear type fashion;
the number of teeth of the outer gear member being an integral multiple of the number of teeth on each workpiece holder disc;
loading and unloading means for loading and unloading workpieces into and from the workpiece holder discs;
drive means for rotating said inner gear member to drive said workpiece holder discs in an orbital path, said drive means including a drive motor, a brake means, and a control circuit for controlling operation of said drive motor and brake means, the control circuit including means for providing a stop signal to deactivate said drive motor and activate said brake means; and
position detecting means for detecting when one of the workpiece holder discs is in a predetermined stop position, the detecting means including a first position detector for detecting when one of the discs reaches a first predetermined position in said path, a second position detector, and positioning means responsive to detection by said first position detector of the arrival of one of said discs at said first position for reciprocally moving said second position detector between a retracted, rest position and an extended, sensing position in the path of the discs, said second position detector in said sensing position comprising means for detecting when said one of the workpiece holder discs reaches said predetermined stop position subsequent to said first position to provide a position signal to said control circuit for producing said stop signal when said one of the discs reaches said predetermined stop position relative to said position detector.

4,916,869
BONDED ABRASIVE GRIT STRUCTURE
Lloyd R. Oliver, Algonac, Mich., assignor to L. R. Oliver & Company, Inc., Anchorville, Mich.
Filed Aug. 1, 1988, Ser. No. 226,442
Int. Cl.[4] B24D *03/02*
U.S. Cl. 51—293 **36 Claims**



1. A bonded abrasive grit structure which is selectively attachable to a tool surface, said structure comprising:
a plurality of peaked portions, said peaked portions each having an apex and a base portion, each of said peaked portions having at least one abrasive grit particle at said apex, said peaked portions being substantially equal in height, said abrasive grit particle being substantially surrounded in said apex by a setting material, comprising particulate matter having a melting point higher than a predetermined value;
a hydrocarbon resin binder dispersed throughout said structure for temporarily binding together the abrasive grit particles and said setting material, said hydrocarbon resin binder being drivable from said structure at a first relatively low predetermined temperature, said structure being brazable to a tool surface by the infiltration of a brazing material therethrough and onto said tool surface at a second higher temperature which is lower than the melting point of said particulate matter.

4,916,870
DOCK SEAL
David W. Moore, Ajax, Canada, assignor to Super Seal Mfg. Ltd., Ontario, Canada
Division of Ser. No. 46,273, May 5, 1987, Pat. No. 4,821,468.
This application Feb. 8, 1989, Ser. No. 307,510
Int. Cl.[4] E04H *14/00*
U.S. Cl. 52—2 C **7 Claims**

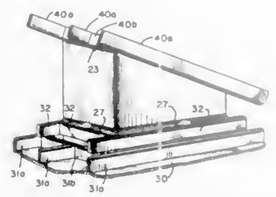


1. A dock seal device for positioning about an opening in a wall face, which opening has a phantom axis of entry extending through the opening generally perpendicularly of the wall face,
a support structure having a rear end adapted to be positioned on the wall face about the opening such that said support structure projects forwardly of the wall face to a front end spaced apart from the wall face,
an inflatable seal supported by said support structure,
said inflatable seal comprising an upper inflatable member in opposed spaced apart relationship with said rear end, and a pair of vertical inflatable members in opposed spaced apart relationship with said rear end,
said vertical inflatable members being in facing spaced apart relationship and being inflatable directly towards each other, laterally of the opening along a phantom axial line of inflation generally perpendicular to the phantom axis of entry,
said facing spaced apart relationship of said vertical inflatable members being maintained throughout inflation along said phantom axial line of inflation, and
said opposed spaced apart relationship of said inflatable seal and said rear end being maintained throughout inflation of said seal device.

4,916,871
UTILITY CONDUIT PROTECTOR
Dwayne B. Anderson, 2762 Blume Dr., Los Alamitos, Calif. 90720
Filed Aug. 21, 1989, Ser. No. 395,974
Int. Cl.[4] E04C *2/54, 2/52*
U.S. Cl. 52—98 **9 Claims**

1. A conduit protector comprising an L-shaped one-piece sheet metal member defining a base portion having a front edge and a vertical portion, the vertical portion being from about two to about eighteen inches wide and from about two to about eight inches high, when installed and in use, for extending upwardly in a wall covering a portion of a wall in which conduit is located, the base portion being from about two to about eighteen inches wide and extending perpendicular from the vertical portion from about two to about eight inches, and in indicia portion formed on the base portion for marking the location of a conduit after installation of a wall with the protector therein.

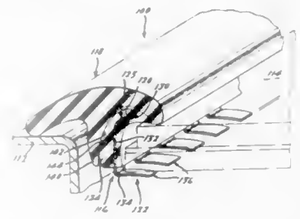
4,916,872
LIGHT WELL
Edgar C. Young, P.O. Box 432, Ironia, N.J. 07845
Filed Feb. 2, 1988, Ser. No. 151,615
Int. Cl.[4] E04B *7/18*
U.S. Cl. 52—200 **6 Claims**



1. A channel, or cube unit, for use in a light well, said light well being of the type comprising an opening through a plaster or sheetrock ceiling supported by ceiling joists, said channel comprising:
a one-piece, circumscribing wall dimensioned to fit through said opening, having first and second open extremities;
a first means integral with and extending outwardly from said first extremity for interfacingly mating with said plaster or sheetrock ceiling about said opening; and
a second means integral with, and extending outwardly from, a location between said first and second extremity, and located such that a linear support means may be interposed between said second means and said ceiling joists to cause said first means to come into mating engagement with said plaster or sheetrock ceiling.

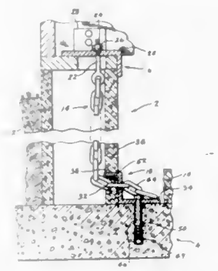
4,916,873
WINDSHIELD REVEAL MOLDING WITH CORE STRUCTURE
James F. Keys, W. Bloomfield, Mich., assignor to The Standard Products Company, Cleveland, Ohio
Filed Feb. 6, 1989, Ser. No. 307,345
Int. Cl.[4] E06B *3/00*
U.S. Cl. 52—208 **8 Claims**

1. A clamp-on resilient elongated molding for edges of glass panels and the like, comprising:
a generally C-shaped, in cross-section, clamping portion having a pair of inwardly directed clamping legs for exerting a clamping force on opposite surface of an edge portion of a glass panel or the like;
means for increasing the bonding area of the glass panel or the like, said means associated with said C-shaped channel and comprised of a plurality of fingers in one of said clamping legs; and



a crown having an umbrella-shaped portion and a stabilizing tail portion, said crown being joined to said C-shaped clamping portion with said tail portion in nesting relationship with said C-shaped portion when said molding is in use.

4,916,874
APPARATUS AND METHOD FOR REINFORCING A CONCRETE BLOCK WALL
Donald M. McCoy, 10016 N. Kirkland Ct., and James M. McCoy, 11249 N. Oriole La., both of Mequon, Wis. 53092
Filed Jul. 18, 1989, Ser. No. 381,783
Int. Cl.[4] E04B *2/16;* **E02D** *27/100*
U.S. Cl. 52—293 **12 Claims**



1. In a block wall erected on a foundation and being formed of consecutive courses of blocks, said blocks having vertical passages therein which cooperate to form a series of generally vertical passages in the wall, an apparatus for reinforcing said wall, comprising:
an elongated reinforcing member adapted for placement within one of the passages in said wall, said reinforcing member having an upper end and a lower end;
anchor means for anchoring the lower end of said reinforcing member, said anchor means being disposed exteriorly of a face of the wall and toward the bottom of the wall and above said foundation;
means interconnecting said anchor means with said foundation exteriorly of said wall;
retainer means for maintaining the upper end of said reinforcing member in position, said retainer means being disposed toward the top of the wall and being connected to the upper end of said reinforcing member; and
tensioning means for tensioning said reinforcing member after the lower end of said reinforcing member is an-

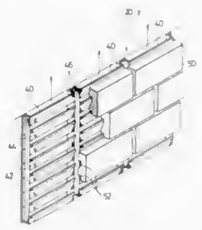
chored to said anchor means and the upper end of the reinforcing member is connected to said retainer means to reinforce said wall, whereby said anchor means prevents upward movement of said reinforcing member when tension is introduced into said reinforcing member by use of said tensioning means.

4,916,875

TILE-MOUNT PLATE FOR USE IN WALL ASSEMBLY

Toshio Kashiwagi, Mitaka, Japan, assignor to ABC Trading Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1988, Ser. No. 220,679
Int. Cl.[4] E04F *13/18*
U.S. Cl. 52—302 **17 Claims**



6. A wall assembly comprising a foundation as a basic wall;
at least one mount plate for tiles having a corrugated plate form fixed to said foundation, said mount plate for tiles comprising:
a plurality of base portions mounted on said foundation, said plurality of base portions being horizontally spaced and extending substantially vertically;
a plurality of projected top surface portions projecting outwardly from and between corresponding adjacent base portions of said plurality of base portions, each of said plurality of projected top surface portions extending substantially vertically and being laterally spaced by base portions, and defining a substantially vertically extending venting passageway between a rear side of a top wall of each of said plurality of projected portions and said foundation; and
engaging members projecting outwardly from said projected top surface portions, said engaging members being vertically spaced so that at least two of said engaging members are capable of engaging each tile; and
a plurality of tiles being located on said plurality of top surface portions, with each of said plurality of tiles including at least two engaging means engaging with at least two vertically spaced engaging members.

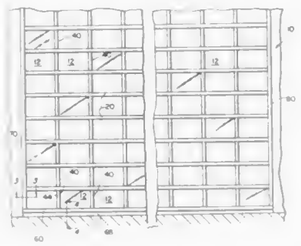
4,916,876

GLASS BLOCK WALL CONSTRUCTION

Stephen V. C. Schuyler, 5515 Randolph Rd., Rockville, Md. 20852

Filed Jun. 3, 1988, Ser. No. 207,612
Int. Cl.[4] E04C *1/42*
U.S. Cl. 52—308 **10 Claims**

1. A wall made of glass blocks and of separator strips, being of substantial strength, and which can be readily erected and disassembled comprising:
a plurality of glass blocks, said glass blocks each being a unitary molded element, said blocks being of the same standard size, said glass blocks having two substantially parallel and square side faces and two side edges, a bottom edge and a top edge transverse to and extending between said side faces, said side faces having a marginal portion adjacent each of said edges, said edges being without means for gripping and preventing movement of said glass blocks with respect to said separator strips, the actual lengths of said edges varying,
said wall comprising a plurality of horizontal rows of said glass blocks, said rows being in vertical array,
horizontal separator strips between the glass blocks in one row and the glass blocks in the adjoining row,
vertical separator strips, each said vertical separator strip extending between two said horizontal separator strips and being between adjoining glass blocks in each said row of glass blocks,
said separator strips each comprising a linearly extending planar web having opposed planar surfaces and sides, and a linearly extending transverse flange at each said side,



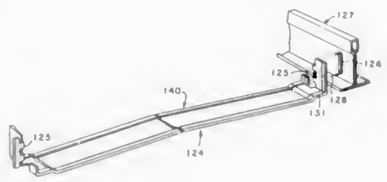
each said flange having coplanar inner surfaces each substantially perpendicular to a said opposed planar surface of said web,
each of said side edges of each said glass block substantially engaging a said web of one of said vertical separator strips,
said wall being without intervening adhesive means for bonding said glass blocks to said vertical and horizontal separator strips to freely permit said vertical separator strips to be positioned during construction to accommodate the actual size variances in the lengths of said edges of said blocks, and
said inner surfaces of said flanges adjoining said marginal portions of said side faces of said glass blocks.

4,916,877

FIRE STRIP CONSTRUCTION

William J. Platt, Collingdale, Pa., assignor to National Rolling Mills, Inc., Frazer, Pa.

Continuation-in-part of Ser. No. 269,921, Nov. 10, 1988, Pat. No. 4,864,791. This application Jnl. 3, 1989, Ser. No. 375,567
Int. Cl.[4] E04B *5/52*
U.S. Cl. 52—317 **1 Claim**



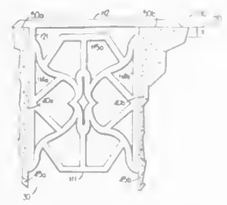
1. A fire strip, including a strip body, having an under side and an upper side, and first and second ends, for a grid ceiling for supporting panels, comprising:
(a) an inner web of spring steel on the upper side of the strip and having a preformed arcuate cross section extending concavely upwardly, and having a top, a bottom and side edges,
(b) an outer web disposed of soft steel at said bottom of the inner web on the under side of the strip and having edge portions wrapped around the side edges of the inner web and bent to lie along the top of the inner web,
(c) end portions at both ends of the strip bent upwardly substantially normal to the strip body, and
(d) fastening means on said end portions securing the ends of the strip to grid members;
wherein the body of the strip has an upwardly extending, spring-like, yieldable arch.

4,916,878

COMPRESSION SEAL WITH INTEGRAL SURFACE COVER PLATE

John D. Nicholas, Lawrenceville, Ga., assignor to MM Systems Corporation, Tucker, Ga.

Continuation-in-part of Ser. No. 12,688, Feb. 9, 1987, Pat. No. 4,815,247. This application Mar. 27, 1989, Ser. No. 329,249
The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.
Int. Cl.[4] E04B *1/68*; E01C *11/10*; E04F *15/14*
U.S. Cl. 52—396 **10 Claims**



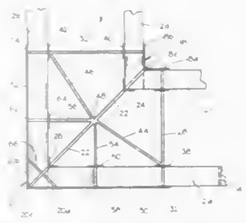
1. A sealing device for sealing a movement tolerance space between adjacent dynamic structures having substantially coplanar upper surfaces and mutually facing vertical walls, said sealing device comprising:
a multitubular elastomeric seal having an upper wall and having outer side walls operatively associated with said upper wall and comprising the sides of said seal which contact said mutually facing walls of said adjacent dynamic structures when said seal is interposed therebetween, said seal being collapsible in response to lateral compressive forces created by the thermal expansion of said adjacent dynamic structures, said seal further resiling upon lateral contraction of said adjacent dynamic structures to maintain constant intimate contact between said outer side walls of said seal and said mutually facing vertical walls of said adjacent dynamic structures, whereby said movement tolerance space is sealed, and said upper wall of said seal further having a point thereon intermediate said outer side wall which remains a fixed distance from the plane defined by said substantially coplanar upper surfaces of said adjacent dynamic structures as said seal collapses and resiles; and
a substantially rigid cover plate attached to said upper wall of said seal at said point thereon intermediate said outer side walls which remains said fixed distance from said plane defined by said substantially coplanar upper surfaces of said adjacent dynamic structures for covering said movement tolerance space, said cover plate lying substantially in said plane defined by said upper surfaces of said adjacent dynamic structures when said seal is installed within said movement tolerance space, said cover plate being moveable relative to at least one of said adjacent dynamic structures.

4,916,879

CORNER TIE

Patrick E. Boeshart, R.R. 1, Box 135, Sioux City, Iowa 51108

Filed Sep. 18, 1989, Ser. No. 408,610
Int. Cl.[4] E04C *1/00*
U.S. Cl. 52—426 **9 Claims**



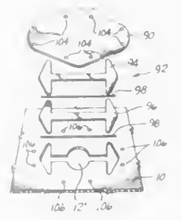
1. A tie for interlocking the ends of parallel, spaced-apart form panels which intersect a second pair of parallel, spaced-apart form panels, comprising:
an interior angular paddle and an exterior angular paddle connected by a central strap means, said interior and exterior angular paddles each having first and second leg portions connected at an angular bend;
said interior and exterior angular paddles being connected to said central strap means such that said first leg portions are parallel, and said second leg portions are parallel;
second strap means having one, end mounted on the first leg portion of said interior angular paddle and extending outwardly therefrom at an acute angle with respect to said central strap means;
an outer paddle mounted on the free end of said second strap means coplanar with the first leg portion of said exterior angular paddle;
third strap means having one end mounted on the second leg portion of said interior angular paddle and extending outwardly therefrom at an acute angle with respect to said central strap means;
a second outer paddle mounted on the free end of said third strap means coplanar with the second leg portion of said exterior angular paddle.

4,916,880

APPARATUS FOR REPAIRING A HOLE IN A STRUCTURAL WALL OF COMPOSITE MATERIAL

Everett A. Westerman, Jr., Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 889,118, Jul. 21, 1986. This application Feb. 18, 1988, Ser. No. 165,938
Int. Cl.[4] B32B *35/00*
U.S. Cl. 52—514 **23 Claims**



4. For use in the repair of a tension carrying wall of compos-

ite material which has been damaged by the formation of a hole in the wall, said composite material comprising layers of structural fibers within a matrix;

a load carrying insert having end portions which in use are situated on opposite sides of the hole along a line which extends in the direction of tension loads in said wall, and a central portion which is substantially narrower than the end portions, said end portions having tension load transfering edges, so that a cavity conforming in size and shape to the insert can be formed in the wall, to span across the opening in the direction of tension loads in said wall, and the insert can be positioned in said cavity and secured in place, to interlock with edges of the cavity and transmit tension loads across the hole;

an overlay patch of a load carrying metal having an inner surface, a recess in said inner surface corresponding in plan form to the insert, so that the overlay patch can be placed over the insert, with an outer portion of the insert situated within said recess, said overlay patch including a border portion generally encircling the recess, and fastener receiving openings in said border portion, spaced about the recess; and

mechanical fastener means extendible through said opening, for securing the overlay patch to the wall.

4,916,881

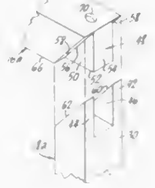
THE METHOD OF FORMING AN INTERLOCKING JOINT FOR A LEAN-TO STRUCTURE

Terry Gilliland, Hayward, Calif., assignor to Four Seasons Solar Products Corporation, Holbrook, N.Y.

Division of Ser. No. 945,768, Dec. 22, 1986, Pat. No. 4,823,519. This application Dec. 27, 1988, Ser. No. 290,153

Int. Cl.[4] E04B *7/00*

U.S. Cl. 52—741 6 Claims



1. A method of forming a lean-to structure of generally vertical and horizontal wooden beams and supporting the lean-to structure against a supporting structure, said method comprising forming the beams with interengageable portions in the shapes of mating tongue and groove while forming the top of the vertical beam with side-by-side oppositely sloped surfaces, the horizontal beam being formed at an end thereof with two parallel sloped surfaces bracketing said groove, spacing the vertical beam from the supporting structure and supporting the horizontal beam between said vertical beam and supporting structure while inserting the tongue into the groove, and supporting the horizontal beam atop the vertical beam on the oppositely sloped surfaces atop the vertical beam in order to counterbalance, at least partly, vectored forced gravitationally developed by the horizontal beam whereby to minimize the possibility of tilting the vertical beam away from said supporting surfaces atop the vertical beam and the sloped surfaces at the end of the horizontal beam being placed against the other sloped surfaces atop the vertical beam.

4,916,882

MEMBER FOR CONNECTING PANELS

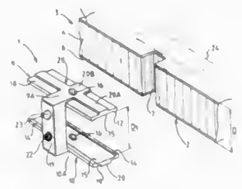
Jean P. Brochard, Rocheville le Cannet; Pierre Laithier, Nice, and Jean A. Massoni, Cannes la Bocca, all of France, assignors to Société Anonyme dite: Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Aug. 1, 1989, Ser. No. 387,843

Claims priority, application France, Aug. 25, 1988, 88 11221

Int. Cl.[4] E04C *2/54*

U.S. Cl. 52—787 11 Claims



1. A member for connecting panels, particularly multilayer panels having one central core covered by sheets, comprising:

at least two oblong small plates, having a small side and a large side, said plates being parallel to each other and having inner faces facing each other and outer faces;

a transverse lug connecting said small plates to each other, and

fixing means provided in said transverse lug, said small plates being adapted to fit by their inner faces on the respective sheets of one of said panels and the distance separating said inner faces corresponding substantially to the thickness of said panel, each of said inner faces having at least one recess communicating with the corresponding outer face through an orifice allowing said recess to be filled with an adhesive after positioning of said member on the edge of said panel, and said outer faces having rigidifying ribs allowing said small plates to be applied substantially uniformly against the corresponding sheet of said panel.

4,916,883

PROCESS AND APPARATUS FOR THE TESTING OF PACKS

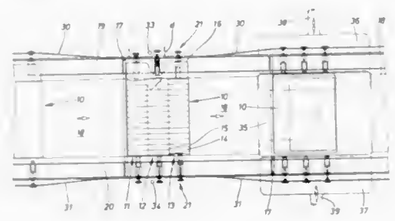
Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Mar. 21, 1988, Ser. No. 171,342

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709289

Int. Cl.[4] B65B *23/10, 57/10*

U.S. Cl. 53—53 22 Claims



1. Process for testing the desired height of a stack of articles (**14**) in a pack wrapped in a deformable wrapping (**15**), the stack height resulting from arranging the articles in layers one adjacent to another, whereby the desired height to be tested is a result of the number of articles and their correct arrangement in the stack, said process comprising the steps of:

positioning a stack, including the wrapping (**15**), between two test feelers (**21**) which are located opposite one another and at least one of which is movable in the direction of the stack height against the wrapping at an end of the pack (**10**);

then moving the movable test member in the height direction against the wrapping (**15**) at the end of the pack until the movable test member meets with resistance at the end of the stack;

determining from an end position of the movable test member whether the stack has the desired height; and

when the end position is indicative of a defective stack having other than the desired height, separating from a series of packs the pack containing the defective stack.

4,916,884

CUBOID PACK FOR CIGARETTES OR THE LIKE AND PROCESS FOR PRODUCING IT

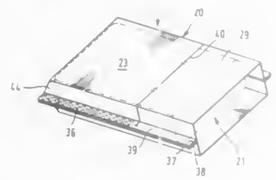
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Division of Ser. No. 163,165, Feb. 25, 1988, Pat. No. 4,789,060, which is a continuation of Ser. No. 896,047, Aug. 13, 1986, abandoned. This application Sep. 14, 1988, Ser. No. 243,754

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1985, 3529119

Int. Cl.[4] B65B *19/22*

U.S. Cl. 53—462 1 Claim



1. Process for making inner wrappings for groups of cigarettes to produce cuboid packs, in which a blank for forming the inner wrapping is folded around a cigarette group (**21**) in the form of a U, starting from a bottom wall (**25**) abutting end faces of the cigarettes, and in which the inner wrapping is then ready-folded in a region of side walls (**27, 28**) and of an end wall (**26**) facing the bottom wall (**25**), comprising the steps of:

folding overlapping strips (**37, 38**) of side tabs (**34, 35**) for forming the side walls (**27, 28**) into an intermediate folding position in which inner faces of the overlapping strips (**37, 38**) are directed outwards;

coating glue onto a portion of the outward-directed inner faces of the overlapping strips (**37, 38**) to form a bonding strip (**36**), while leaving uncoated an end portion (**39**) which extends from an area of the end wall (**26**) which is ready-folded last into an area of the side walls (**27, 28**), when the inner wrapping (**20**) has been completed;

pressing together the overlapping strips (**37, 38**) over their entire length and then folding the overlapping strips (**37, 38**) over towards the rear wall (**24**) until they come up against the side walls (**27, 28**); and

finally, folding over the triangular gussets (**44**) of the side walls (**27, 28**), which project over the bottom wall, and completing the inner wrapping (**20**) by folding the end wall (**26**); said completing step comprising completing the end wall (**26**) by folding over projecting parts of the side walls (**27, 28**), thus forming parts of the end wall (**26**), and folding thereon remaining trapezoidal projecting parts of a front wall (**23**) and of the rear wall (**24**).

4,916,885

FILLING HEAD FOR ASEPTICALLY FILLING A PACK

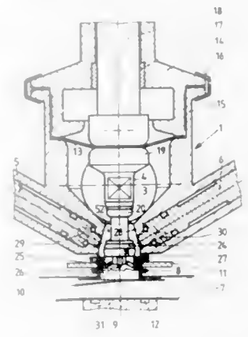
Willi Löliger, Kaiolfingen, Switzerland, assignor to Nestec S.A., Vevey, Switzerland

Filed Nov. 8, 1988, Ser. No. 268,699

Claims priority, application Switzerland, Nov. 25, 1987, 4584/87

Int. Cl.[4] B65B *55/08, 55/10, 43/26, 7/02*

U.S. Cl. 53—570 14 Claims



1 An apparatus for aseptically filling a pack comprising:

a filling head housing part encompassing and defining a filling head space having a top for receiving fluid to be filled in a pack, lateral walls and a bottom for delivering the fluid to a pack;

a vertically displaceable valve comprising a pin connected to a valve opening and closure element which is positioned within the filling head space and which extends to and terminates in a cutting means for opening and closing the top of the filling head space to flow of fluid into the filling head space for controlling delivery and regulating a flow rate of fluid into the filling head space and for, upon being displaced towards the bottom of the filling head space for opening the top of the filling head space for delivery of fluid to the filling head space, cutting a tearable membrane of a sealed pack to be filled for enabling filling of the pack with the fluid;

a fluid inlet and outlet pipe for delivering the fluid to the regulating valve and passing on fluid not delivered by the regulating valve to the filling head space, the fluid inlet and outlet pipe having a longitudinal axis perpendicular to a longitudinal axis of the regulating valve pin; and

an inlet valve and an outlet and emptying valve, for, respectively, delivery of a sterilizing medium selected from a group consisting of sterile air and steam and removal of the sterilizing medium and any residual fluid connected to a bottom of the filling space lateral walls of the filling head space.

4,916,886

CUTTING LINE HEAD ASSEMBLY FOR ROTARY CUTTER

Tetsuo Nakamura, and Kazuhiro Kikuchi, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1988, Ser. No. 252,641

Claims priority, application Japan, Oct. 6, 1987, 62-153912[U]

Int. Cl.[4] A01D *34/67*

U.S. Cl. 56—12.7 6 Claims

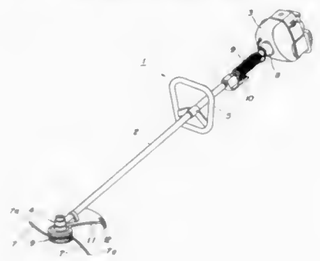
1 A cutting line head assembly in a rotary cutter having driving means, and a power head having drive shaft means

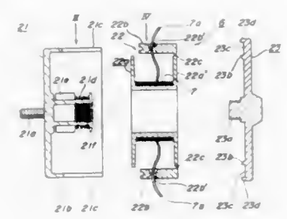
rotatively driven by said driving means for rotating said assembly, comprising:

a housing connectible to said drive shaft means and rotatable in a cutting plane by said drive shaft means;

reel means engageable with said housing, and having a reel portion, and a peripheral wall portion separably connected to said reel portion and having at least one aperture;

at least one flexible cutting line wound on said reel portion and having a free end portion extending outwardly of said housing through said at least one aperture;





covering means covering said reel means in a fashion holding said reel means between said housing and said covering means;

coupling means coupling said covering means to said housing in a fashion clamping said reel means securely to said housing; and

urging means provided on said covering means for urging said reel portion to forcibly separate said reel portion from said peripheral wall portion when said covering means is coupled to said housing.

4,916,887

ROTARY MULCHING MOWER

Paul W. Mullet, Hesston, and Elmer D. Voth, Newton, both of Kans., assignors to Excel Industries, Inc., Hesston, Kans.

Filed Aug. 14, 1989, Ser. No. 393,274

Int. Cl.[4] A01D *55/00, 35/264*

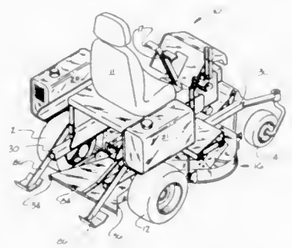
U.S. Cl. 56—13.8 **14 Claims**

1. A rotary type rear discharge mower and mulcher for mounting on a tractor having a pair of drive wheels comprising:

an open bottom housing having a rear discharge opening;

at least two cutting blades rotatably journaled in the housing moving in a common cutting plane in non-overlapping side-by-side relation, the housing having side walls substantially surrounding the circumferential path of the cutting blades;

a plurality of high speed mulching blade means mounted on a vertical spindle journaled within the housing, and positioned in the downstream paths of the cutting blades in partially overlapping relation, with the mulching blades in planes of rotation above the cutting blades and positioned approximate said discharge opening whereby the grass clippings from the cutting blades are finely cut and discharged at increased velocities through said discharge opening; and



a deflection chute positioned between the pair of drive wheels at said discharge opening including a planar top surface.

4,916,888

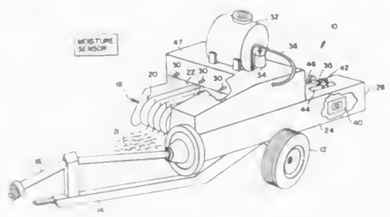
METHOD OF DISPENSING A SUBSTANCE ONTO A CROP MATERIAL AT A CONTROLLED RATE

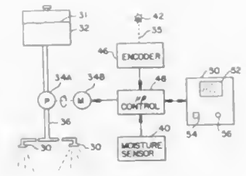
Ronald T. Sheehan, Lancaster, and Shaun A. Seymour, New Holland, both of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Feb. 22, 1989, Ser. No. 313,426

Int. Cl.[4] A01D *75/00*

U.S. Cl. 56—147 **8 Claims**





1. In a round baler for picking up crop material and forming it into bales, a method of dispensing a substance from a container onto said crop material at a controlled rate, said method comprising:

sensing the moisture content of said crop material to develop a first signal;

sensing the size of a bale being formed in the baler to determine the rate of bale size increase;

determining from the rate of bale size increase the bulk rate at which crop material is passing through the baler to develop a second signal;

developing a third signal from said first and second signals; and,

dispensing said substance onto the crop material at a rate determined by said third signal.

4,916,889

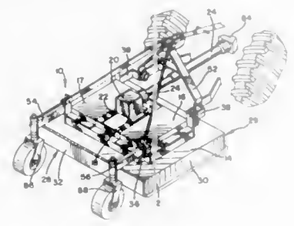
EASILY ADJUSTABLE TOWED MOWER

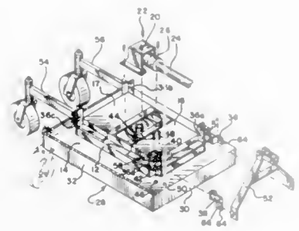
Roger D. Molstad, Sioux Falls, S. Dak., assignor to K-W Manufacturing Co., Inc., Sioux Falls, S. Dak.

Filed Mar. 3, 1989, Ser. No. 318,617

Int. Cl.[4] A01D *34/66, 75/14*

U.S. Cl. 56—14.9 **11 Claims**





1. A mower assembly adapted to be towed by a vehicle having a multi-point hitch and a power take off, said mower assembly comprising, in combination, a rectangular frame, means for mounting a power take off angle drive generally centrally of said frame, a drive input shaft associated with said angle drive, a main blade drive element and a pair of driven elements affixed to spindle units mounted with respect to said mower frame and carrying blades thereon, with said spindles being positioned generally in opposed corners of said frame unit, said angle drive being mounted with respect to said frame so as to permit repositioning of said drive to permit said drive input shaft to be movable between a first and a second position, said mower assembly having a suspension system including a suspension mounting post at each corner of said rectangular frame unit, each of said mounting posts including a mounting pin for pivotally positioning suspension components in operative association with said mounting posts, said suspension components including a pair of wheel suspension arms, each said suspension arm including a wheel support assembly extending downwardly therefrom and a pair of hitch engaging brackets, each of said suspension arms and said hitch engaging brackets including means cooperating with said mounting pins, said brackets and said suspension arms being constructed and arranged for interchangeable pivotal fit with each of said suspension mounting posts, and said mower blades being enclosed by a shroud, said shroud dimensioned to have a long side and a short side such that said mower assembly has a narrow orientation and a wide orientation, one of said suspension arms being pivotally mounted for movement so as to lie rearwardly of either said long side or said short side and the other wheel suspension arm being movable between mounting posts to likewise position said other wheel suspension arm rearwardly of said long side or said short side, both said suspension arms being positioned adjacent a long side door or a short side door provided in said long side and said short side, respectively, with said hitch-engaging brackets being movably positionable between said mounting posts whereby both of said brackets may extend toward a position for engaging portions of a hitch frame, said mower assembly further including means for attaching portions of said hitch-engaging brackets and for attaching portions of said mounting posts to said hitch frame.

4,916,890

APPARATUS FOR SUPPORTING A STOP MEMBER OF A TEXTILE RING SPINNING MACHINE

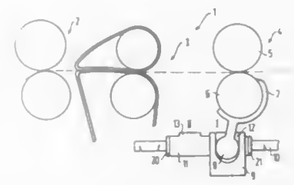
Manfred Lattner, Ebersbach-Sulpach, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Fed. Rep. of Germany

Filed May 26, 1989, Ser. No. 357,339

Claims priority, application Fed. Rep. of Germany, May 26, 1988, 3817891

Int. Cl.[4] D01H *13/16, 13/14*

U.S. Cl. 57—84 **24 Claims**



1. Apparatus for supporting a stop member of a stop motion device of a textile ring spinning machine, the stop member being of the type having a leading tapered end insertable between a drive roller and an opposed driven roller of a drafting device of the ring spinning machine to stop the rotation of the driven roller and the feed of roving through the drafting device and having a projecting cam follower portion, comprising.

a carriage having a cam portion for removably receiving and manipulating the projecting cam follower portion of the stop member;

means for reciprocating said carriage between an operating position in which the stop member is in a roller and roving stopping position and a non-operating position in which the stop member is retracted from said stopping position; and

means for releasably positioning said carriage on said reciprocating means in a predetermined position, said carriage being disengagable from said positioning means for movement therefrom sufficiently to permit removal and replacement of said stop member from said carriage and being reengagable with said positioning means for positioning said carriage in said predetermined position.

4,916,891

OPEN-END ROTOR SPINNING MACHINE

Hans Landwehrkamp, Lilientrasse 4; Eugen Hini, Berggasse 1, both of 8071 Lenting, and Eberhard Grimm, Roemerstrasse 37, 8070 Ingolstadt, all of Fed. Rep. of Germany

Filed Oct. 12, 1988, Ser. No. 257,720

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1987, 3734545

Int. Cl.[4] D01H *7/882, 11/00, 1/20*

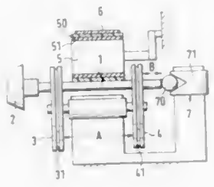
U.S. Cl. 57—406 **27 Claims**

1. Open-end rotor spinning machine comprising:

a rotatable rotor having a shaft;

at least two pairs of supporting disks, each disk being pro-

vided with a plastic covering around the circumferential surface thereof, said surfaces of each said pair of disks forming a nip therebetween which bearingly supports said rotor shaft;
an axial bearing receiving the free end of said shaft,
means for driving said shaft,



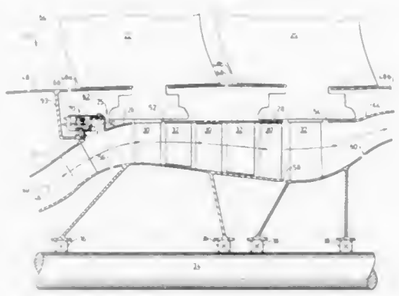
wherein the pairs of supporting disks are at an interior distance of 20 to 69 mm from each other, the center of gravity of the spinning rotor is at a distance of 15 to 28 mm in front of the pair of supporting disks disposed closer to said rotor, the shaft of the spinning rotor has a diameter of 5 to 9 mm and its free end extends 5 to 30 mm beyond the pair of supporting disks disposed farther from said rotor in the direction of the axial bearing.

4,916,892

HIGH PRESSURE SEAL

Adam N. Pope, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed May 6, 1988, Ser. No. 190,970
Int. Cl.[4] F02C *3/067*
U.S. Cl. 60—39.02 **31 Claims**



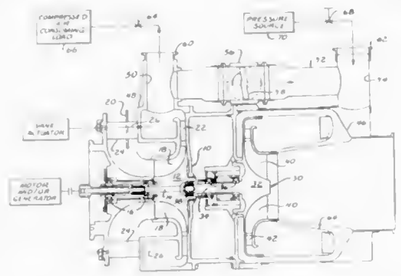
16. In a gas turbine engine including first and second differentially rotating members coaxial with each other, a low pressure region disposed about the first and second differentially rotating members, an annular gas flowpath disposed within the first and second differentially rotating members defining a high pressure region, a method of preventing fluid leakage between the first and second rotating members, comprising the steps of:
(a) coupling an annular carrier to the first rotating member such that the annular carrier is coaxial with the first rotating member;
(b) sandwiching the annular carrier between a first race and a second race, and coupling the first and second races to the second rotating member; and
(c) urging the second race toward the first race such that leakage of a fluid from the high pressure region to the low pressure region is not substantially increased by frictional wear of any of the annular carrier, the first race and the second race.

4,916,893

MULTIPURPOSE AUXILIARY POWER UNIT

Colin Rodgers, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Division of Ser. No. 271,516, Nov. 14, 1988, which is a division of Ser. No. 92,408, Sep. 2, 1987, abandoned. This application Apr. 11, 1989, Ser. No. 336,113
Int. Cl.[4] F02C *7/268*
U.S. Cl. 60—39.07 **5 Claims**



1. A gas turbine alternately useable as an auxiliary power unit, load compressor, air turbine starter or the like, said turbine comprising:
a centrifugal compressor mounted for rotation;
a turbine wheel mounted for rotation;
a clutch interconnecting said compressor and said turbine wheel and selectively operable to couple or decouple said compressor and said turbine wheel;
an inlet to said compressor;
variable inlet guide vanes in said inlet and movable between positions substantially opening and substantially closing said inlet;
a compressed air outlet from said compressor;
a gas inlet to said turbine wheel;
a combustor interconnecting said gas inlet and said turbine wheel;
ducting interconnecting said compressed air outlet and said combustor including a butterfly valve disc movable between a first position halting flow from said compressed air outlet to said gas inlet and a second position allowing flow from said compressed air outlet to said gas inlet;
a first port in said ducting between said compressed air outlet and said valve disc and openable to direct compressed air to a point of use;
a second port in said ducting between said valve disc and said gas inlet and openable to admit pressurized air from an external source.

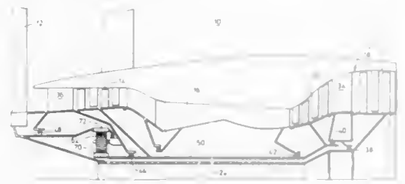
4,916,894

HIGH BYPASS TURBOFAN ENGINE HAVING A PARTIALLY GEARED FAN DRIVE TURBINE

Arthur P. Adamson, and Lawrence Butler, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jan. 3, 1989, Ser. No. 294,091
Int. Cl.[4] F02K *3/04*
U.S. Cl. 60—226.1 **15 Claims**

1. A high bypass ratio turbofan engine, comprising:
a fan section;
fan drive turbine means, for driving said fan section, said fan drive turbine means including first and second turbine sections mounted for independent rotation;
fan drive shaft means for rotating said fan section;
means for coupling said fan drive shaft means to said second turbine section of said fan drive turbine means to turn said fan section at substantially the same rotational speed as said second turbine section; and
gear means for coupling said first turbine section of said fan



drive turbine means to said fan drive shaft means and for reducing the rotational speed of the power output from said first turbine section to match the rotational speed of said fan section.

4,916,895

THRUST REVERSE FOR A TURBOFAN ENGINE

Claude A. G. Dubois, Honfleur, France, assignor to Societe anonyme dite Hispano-Suiza, Saint-Cloud, France

Filed Sep. 30, 1988, Ser. No. 251,513
Claims priority, application France, Sep. 30, 1987, 87 13490
Int. Cl.[4] F02K *1/70*
U.S. Cl. 60—226.2 **4 Claims**

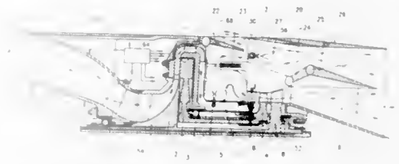
1. In a fan-type turbojet engine having a housing with an outer surface and an inner surface defining the radially outer limits of an axial cold flow airstream from the fan wherein the housing defines at least one substantially laterally facing thrust reversing opening, the improved thrust reversing mechanism comprising:
(a) an outer door pivotally attached to the housing so as to be movable between a first, closed position wherein the outer door closes the thrust reversing opening and an external surface of the outer door is substantially flush with the outer surface of the housing, and a second, opened position wherein the thrust reversing opening is opened;
(b) actuating means interposed between the housing and the outer door to move the outer door between its first and second positions comprising a jack mechanism having a cylinder affixed to the housing, and an extendible and retractable piston rod connected to the outer door;
(c) an inner panel disposed radially inwardly of the outer door; and,
(d) attaching means attaching the inner panel to the outer door such that, as the outer door moves between its first and second positions, the inner panel is moved between a first, closed position wherein the inner panel is substantially flush with the inner surface of the housing and the radial distance between upstream portions of the inner panel and the outer door is d_1, and a second, opened position wherein the distance between upstream portions of the inner panel and outer door is d_2 such the $d_2 < d_1$ wherein the attaching means comprises at least one first link pivotally interconnecting the piston rod and a downstream portion of the inner panel and at least one second link having ends pivotally connected to upstream portions of the inner panel and the outer door.

4,916,896

MULTIPLE PROPULSION WITH QUATRO VECTORIAL DIRECTION SYSTEM

Marius A. Paul, 1100 E. Orangethorpe Ave., Ste. 140, Anaheim, Calif. 92801

Filed Nov. 2, 1988, Ser. No. 266,013
Int. Cl.[4] F02K *11/00*
U.S. Cl. 60—244 **6 Claims**



1. A multimode propulsion system designed for subsonic to hypersonic speed in aerial vehicles comprising:
an engine housing;
a turbine unit having an air compressor component and a gas expansion component with an exhaust jet discharge, the turbine unit having a rotor axis centered in the housing and a central combustion chamber between the air compressor component and the gas expansion component with a fuel injector means for injecting fuel into the central combustion chamber;
a convertible associated combustion unit selectively operable in a rocket mode or in ram jet mode in conjunction with the selective operation of the turbine unit, the convertible combustion unit having at least one associate combustion chamber with discrete fuel and elective oxidizer supply means for injection of fuel in the ram jet mode and injection of fuel and an oxidizer in the rocket mode, wherein the housing has an intake passage through the housing communicating with the associate combustion chamber and means for opening the intake passage and passing ram air to the associate combustion chamber during the ram mode and blocking the intake passage to the combustion chamber during the rocket mode.

4,916,897

EXHAUST GAS PURIFYING APPARATUS BUILT-IN TO A MUFFLER FOR A DIESEL ENGINE

Kotaro Hayashi, Susono; Tokuta Inoue, Mishima; Sumio Ito, Gotenba; Kiyoshi Kobashi, Mishima, and Shinichi Takeshima, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 28, 1988, Ser. No. 291,273
Claims priority, application Japan, Jan. 8, 1988, 63-1169; Mar. 28, 1988, 63-39617[U]; Mar. 28, 1988, 63-39618[U]; Apr. 5, 1988, 63-45289[U]; Apr. 30, 1988, 63-105431
Int. Cl.[4] F01N *3/02*
U.S. Cl. 60—286 **24 Claims**

1. An exhaust gas purifying apparatus built-in to a muffler for a diesel engine, said apparatus comprising:
a first casing having a first expansion chamber formed therein;
a second casing having a second expansion chamber formed therein in series with said first expansion chamber;
at least one of said expansion chambers including a separating wall having a plurality of small holes;
a third casing arranged between said first and second casings

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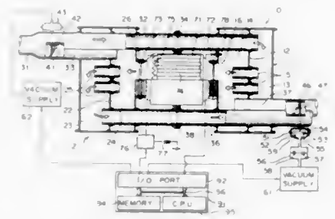
to form a passage between said first and second expansion chambers;
an inlet pipe for introducing an exhaust gas from said engine into said first expansion chamber;
an outlet pipe for discharging the exhaust gas from said second expansion chamber to the outside atmosphere;
a filter arranged in said third casing to trap particulates in the exhaust gas flowing therethrough;
an igniting means arranged adjacent to said filter on the side of said second expansion chamber to burn said particulate matter deposited on said filter, to regenerate said filter; and



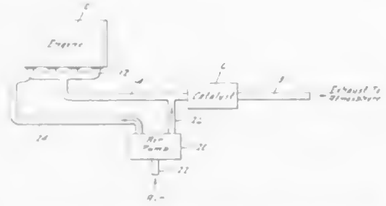
a flow control means arranged such that the exhaust gas normally flows from said first expansion chamber through said filter to said second expansion chamber and when said filter is regenerated at least a part of the exhaust gas is introduced from said inlet pipe into said second expansion chamber and flows in reverse from said second expansion chamber through said filter to said first expansion chamber to be discharged therefrom;
whereby said first and second casings constitute a muffler and said exhaust gas purifying apparatus is built-in to said muffler.

4,916,898

METHOD FOR TREATMENT OF EXHAUST GASES

Haren S. Gandhi, Farmington Hills, and Joseph T. Kummer, Ypsilanti, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 25, 1985, Ser. No. 715,691
Int. Cl.[4] F01N *3/20*
U.S. Cl. 60—274 4 Claims



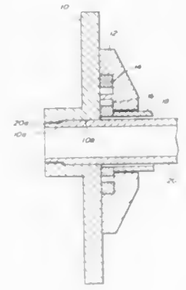
1. A method of treating exhaust gases from an engine variably operated at rich and at stoichioimetric air/fuel ratios, said exhaust gas flowing from said engine through an exhaust manifold and thence through an exhaust pipe containing an oxidation catalytic converter, said catalytic converter being effective to reduce CO, HC and NO_x constituents of said exhaust gas, comprising: introducing secondary air to said exhaust gas, both at the exhaust manifold and at a location adjacent and upstream of said catalytic converter, said air being introduced in a predetermined controlled quantity effective (i) to create a reducing condition for said exhaust gas as it enters said catalyst during rich operating air/fuel ratios of said engine to oxidize 80–95 mole percent of CO while substantially oxidizing all NO_x and HC, and (ii) to create, with said same predetermined quantity of air, an oxidizing condition for said exhaust gas as it enters said catalyst during substantially stoichiometric operating air/fuel ratios for said engine to oxidize substantially all CO and HC.

4,916,899

STATOR SHAFT CONNECTION THROUGH OIL PUMP OF AUTOMATIC TRANSMISSION

Takao Koyama, Atsugi, and Kazuhiko Sugano, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 31, 1988, Ser. No. 264,735
Claims priority, application Japan, Oct. 30, 1987, 62-273227
Int. Cl.[4] F04B *39/12*
U.S. Cl. 60—358 6 Claims



1. In an automatic transmission having a torque converter with a stator shaft,
an oil pump comprising:
a casing having an oil pump gear chamber formed therein, said casing having first and second bores exposed to said oil pump gear chamber, said first and second bores being coaxially spaced from each other with an interposal of said oil pump gear chamber therebetween;
gears operatively disposed in said oil pump gear chamber of said casing;
a first splined portion formed on a leading end portion of said stator shaft; and
a second splined portion formed on an inner surface of said second bore,
wherein the stator shaft is thrust through said first and second bores in this order into a fixed position wherein said first and second splined portions are operatively engaged.

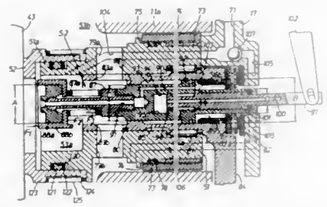
4,916,900

HYDRAULICALLY OPERATED CONTINUOUSLY VARIABLE TRANSMISSION

Takashi Iino; Tsuneaki Seino, and Eiichiro Kawahara, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1987, Ser. No. 132,414
Claims priority, application Japan, Dec. 12, 1986, 61-296240
Int. Cl.[4] F16D *39/00*
U.S. Cl. 60—489 31 Claims

4. A hydraulically operated continuously variable transmission comprising:
an input shaft;
a hydraulic pump coupled to said input shaft and having an outlet port;
an output shaft;
a hydraulic motor coupled to said output shaft, at least one of said hydraulic pump and said hydraulic motor being of the variable-displacement type;
a closed hydraulic circuit interconnecting said hydraulic pump and said hydraulic motor; and
a device for selectively making and breaking said hydraulic



circuit respectively by opening and closing said outlet port, said device comprising valve means hydrodynamically movable toward and away from said outlet port for selectively closing and opening said outlet port, said device operating to break said hydraulic circuit by gradually closing said outlet port.

4,916,901

SWASHPLATE TYPE VARIABLE DISPLACEMENT HYDRAULIC DEVICE

Tsutomu Hayashi; Yoshihiro Nakajima, both of Tokyo; Takushi Matsuto, Saitama; Mitsuru Saito, Tokyo; Kenji Sakakibara; Katsumi Yamazaki, both of Saitama; Nobuyuki Yakigaya, Chiba, and Kazuhiko Nakamura, Kanagawa, all of Japan, assignors to Hooda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 5, 1988, Ser. No. 215,197
Claims priority, application Japan, Jul. 3, 1987, 62-166735; Sep. 30, 1987, 62-247677; Mar. 2, 1988, 63-49399
Int. Cl.[4] F16D *39/00*
U.S. Cl. 60—489 20 Claims

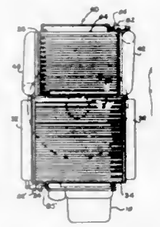
1. A swashplate type variable displacement hydraulic device comprising a transmission shaft, a cylinder disposed around the shaft and having a plurality of cylinder bores annularly arranged to extend in parallel with and surround an axis of rotation of the cylinder, a plurality of plungers slidably received in said cylinder bores, a swashplate having a fore surface against which surface outer ends of said plungers abut, a swashplate holder adapted to support a back surface of said swashplate via a first bearing means, said swashplate holder being disposed to be turnable about a trunnion axis which intersects the axis of rotation of the cylinder at right angles, a stationary swashplate anchor for supporting said swashplate holder, and support member means retained to said transmission shaft for supporting said swashplate anchor via a second bearing means, wherein said swashplate holder and said swashplate anchor have surfaces opposed to each other, said opposed surfaces being formed as spherical surfaces of which a center is located at a position where the axis of rotation intersects said trunnion axis, said swashplate anchor having a thickness which increases toward the outer periphery from the central part thereof, said swashplate holder having a pair of trunnion shafts projected from opposite ends thereof, said trunnion shafts extending along the trunnion axis, and recesses with which said trunnion shafts are rotatably engaged being provided on opposite ends of said swashplate anchor, wherein a thrust load given from the plungers to the swashplate is borne by the transmission shaft via said first bearing means, said swashplate holder, said swashplate anchor, said second bearing means and said support member means.

4,916,902

AMBIENT AIR MODULATOR FOR ENGINE FLUID HEAT EXCHANGER

Howard L. Pratt, 4721 Ottawa Dr., Fort Wayne, Ind. 46815, and Robert J. Selzer, 15021 Aboite Center Rd., Fort Wayne, Ind. 46804

Division of Ser. No. 830,381, Feb. 14, 1986, Pat. No. 4,706,461.
This application Aug. 17, 1987, Ser. No. 86,135
Int. Cl.[4] F02B *29/04;* F01P *7/02*
U.S. Cl. 60—599 2 Claims



1. In a highway truck of the type having a mobile frame, a hood structure, an engine having a turbocharger, said engine being mounted on the frame within the hood structure, a radiator for cooling said engine mounted within said hood structure forwardly of said engine, a charge air cooler operatively disposed between the turbocharger and the engine intake manifold and mounted forwardly of said engine within said hood structure, both said radiator and said charge air cooler being disposed to receive ambient air entering said hood structure and to discharge said ambient air rearwardly toward said engine, the improvement wherein said radiator is provided with an ambient air flow modulator having means responsive to the coolant temperature of said engine for restricting the flow of said ambient air into said radiator without restricting air flow to said charge air cooler and said charge air cooler is provided with a second ambient air flow modulator having means responsive to the intake manifold temperature for restricting air flow to said charge air cooler.

4,916,903

METHOD AND AN ARRANGEMENT FOR CONTROLLING THE WORKING CYCLE OF A TURBOCHARGED INTERNAL COMBUSTION ENGINE

Ernst Holmér, Tryggvegatan 10, S-41729, Göteborg, Sweden

Filed Jan. 11, 1988, Ser. No. 142,662
Claims priority, application Sweden, Jan. 14, 1987, 8700115
Int. Cl.[4] F02B *37/00*
U.S. Cl. 60—605.1 9 Claims

1. A method for controlling the working cycle of a four-stroke internal combustion engine (1) which engine is supercharged by means of at least one exhaust-driven turbo-compressor (4) and each cylinder of which is provided with at least one inlet valve (2) to which the compressor (5) of the turbo-compressor (4) delivers air through an inlet pipe (6), and also provided with at least one outlet valve (3) from which exhaust

gases are conducted through an outlet pipe (8) to the turbine (7) of the turbo-compressor (4), said engine being further provided with a pressure control valve (9) connected to the outlet pipe (8) by means of pressure control line (10), said method comprising the steps of

opening and closing the outlet valve (3) during the exhaust stroke of said engine cycle,

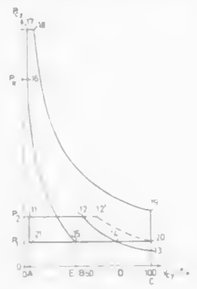
opening the pressure control valve (9) during the compression stroke of said piston when said piston is positioned at a predetermined position (D) in the cylinder at a distance from the bottom-dead-center position (C) of the piston,

closing the pressure control valve (9) when said piston during said compression stroke is positioned at a second predetermined position (E) at a further distance from the bottom-dead-center position (C) of said piston,

opening the inlet valve (2) when said piston is positioned in the vicinity of its top-dead-center position (A) subsequent to the exhaust stroke of said cycle,

closing the inlet valve (2) during the induction stroke of said cycle when said piston is positioned in a third predetermined position (B) at a distance from its top-dead-center position (A) and spaced from its bottom-dead-center position (C).

5. An apparatus for controlling the working cycle of a four-stroke internal combustion engine (1) which engine is super-



charged by means of at least one exhaust-driven turbo-compressor (4) and each cylinder of which is provided with at least one inlet valve (2) to which the compressor (5) of the turbo-compressor (4) delivers air through an inlet pipe (6), and also provided with at least one outlet valve (3) from which exhaust gases are conducted through an outlet pipe (8) to the turbine (7) of the turbo-compressor (4), said engine being further provided with a pressure control valve (9) connected to the outlet pipe (8) by means of pressure control line (10), said apparatus comprising

means to open and close the outlet valve (3) during the exhaust stroke of said engine cycle,

means to open the pressure control valve (9) during the compression stroke of said piston when said piston is positioned at a predetermined position (D) in the cylinder at a distance from the bottom-dead-center position (C) of the piston,

means to close the pressure control valve (9) when said piston during said compression stroke is positioned at a second predetermined position (E) at a further distance from the bottom-dead-center position (C) of said piston,

means to open the inlet valve (2) when said piston is positioned in the vicinity of its top-dead-center position (A) subsequent to the exhaust stroke of said cycle, and

means to close the inlet valve (2) during the induction stroke of said cycle when said piston is positioned in a third predetermined position (B) at a distance from its top-dead-center position (A) and spaced from its bottom-dead-center position (C).

4,916,904

INJECTION ELEMENT FOR A COMBUSTION REACTOR, MORE PARTICULARLY, A STEAM GENERATOR

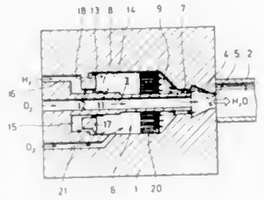
Manfred Ramsaier, Neulautern; Hans J. Sternfeld, Jagsthausen, and Karlheinz Wolfmüller, Eppingen-Adelshofen, all of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 153,500, Feb. 11, 1988, abandoned, which is a continuation of Ser. No. 849,142, Apr. 7, 1986, abandoned. This application Sep. 7, 1989, Ser. No. 405,054

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1985, 3512948

Int. Cl.[4] F02C *3/22*

U.S. Cl. 60—723 **9 Claims**



1. An injection element for a combustion reactor in which hydrogen and oxygen are mixed and reacted prior to being fed in a stoichiometric ratio to a main combustion chamber, comprising

an inlet for the hydrogen,

an inlet for the oxygen,

a mixing chamber for the hydrogen and oxygen,

ignition means for igniting a hydrogen-rich mixture of hydrogen and oxygen,

an ignition chamber into which the hydrogen inlet opens and which has a flow cross-section that widens in the direction of the flow from said hydrogen inlet toward said mixing chamber, the ignition chamber having an outlet with a cross-section smaller than the flow cross-section of the ignition chamber, the outlet of the ignition chamber and the oxygen inlet both opening into the mixing chamber, and

an ignition oxygen inlet opening into the ignition chamber, the ignition means being disposed in the ignition chamber immediately upstream of its outlet, and

said oxygen inlet comprising a conduit extending coaxially through the ignition chamber to said mixing chamber.

4,916,905

COMBUSTORS FOR GAS TURBINE ENGINES

Peter Havercroft, Derby, England, and Brian Henderson, Glasgow, Scotland, assignors to Rolls-Royce plc, Londoo, United Kingdom

Filed Dec. 14, 1988, Ser. No. 284,379

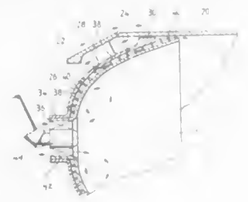
Claims priority, application United Kingdom, Dec. 18, 1987, 8729497

Int. Cl.[4] F23R *3/06*

U.S. Cl. 60—756 **6 Claims**

1. A gas turbine engine combustion chamber comprising wall structure and a head affixed to and within an end of said wall structure in spaced relationship therewith, wherein the head comprises a first perforate member having convex and concave surfaces and a second member having convex and concave surfaces and outer periphery which extends adjacent to but out of contact within the wall structure, the second member being positioned such that its convex surface is spaced from the concave surface of the first member and extends to a

position downstream thereof, close to said wall structure and includes a number of projections which extend therefrom to



positions closely adjacent said concave surface of the first member and the wall structure.

4,916,906

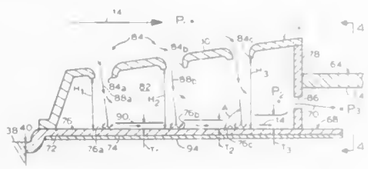
BREACH-COOLED STRUCTURE

Robert L. Vogt, Marblehead, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Mar. 25, 1988, Ser. No. 176,482

Int. Cl.[4] F23R *3/04*

U.S. Cl. 60—757 **27 Claims**



1. A breach-cooled structure comprising:

an imperforate first wall having a first surface;

a second wall spaced from said first wall and joined thereto to define an enclosed plenum;

channeling means including said second wall having a plurality of longitudinally spaced rows of inlets facing said first wall first surface for channeling a cooling fluid through said inlets into said plenum to form a boundary layer of said cooling fluid along said first wall first surface;

said plenum including a plurality of outlets for discharging said cooling fluid therefrom; and

said channeling means further being effective for channeling said cooling fluid as jets from said inlets of a downstream one of said inlet rows across said plenum to breach said boundary layer of said cooling fluid to contact said first wall first surface for the breach cooling thereof.

4,916,907

MAGNETOCALORIC MONOSTABLE AND BISTABLE INDUCTORS FOR ELECTRICAL ENERGY AND REFRIGERATION

Heinz Munk, Ulrichst. 18, 8881 Hausbeim, and Hans W. Stepban, Reiche Gasse 8, 8886 Wittislingen, both of Fed. Rep. of Germany

Filed Sep. 26, 1988, Ser. No. 249,406

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1987, 3732312; Jan. 5, 1988, 3800098; European Pat. Off., Jul. 20, 1988, 88111642.0

Int. Cl.[4] F25D *21/00*

U.S. Cl. 62—3.1 **20 Claims**

1. A magnetocaloric inductor apparatus for inducing electrical power and for producing a cooling effect, comprising:

at least one main permanent magnet having opposite poles;

at least one dynamo pole shoe connected to one pole of said main magnet for receiving lines of magnetic flux;

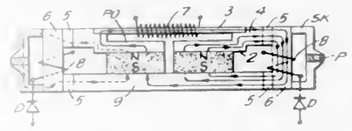
flux return means connected to the other pole of said main magnet for returning lines of flux thereto;

a first monocrystalline metamagnetic disk connected to said shoe;

a second monocrystalline magnetic disc connected to said flux return means;

said first and second disks becoming ferromagnetically inductive above a characteristic threshold field intensity and non-conductive below the threshold field intensity;

a yoke core connected between said first and second disk;



an induction coil connected to said yoke core for receiving induced current due to the passage of lines of magnetic flux through said yoke core;

a control core operatively connected between at least one of the poles of said main magnet and said shoe for diverting lines of flux from said yoke core;

a control coil connected to said control core for receiving control current to determine the amount of flux diverted from said yoke core through said control core for controlling the field intensity at said first and second disks to control ferromagnetic conductivity thereof; and

at least one leakage flux compensation core connected across said yoke core for receiving leakage magnetic flux across said yoke core.

4,916,908

AIR SEPARATION

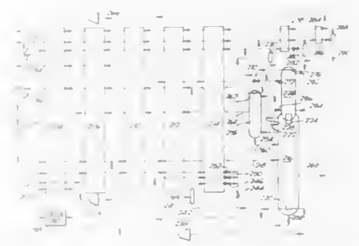
John T. Lavin, Guildford, and David J. Layland, Basingstoke, both of England, assignors to The BOC Group, Inc., Murray Hill, N.J.

Filed Mar. 8, 1989, Ser. No. 320,673

Claims priority, application United Kingdom, Mar. 18, 1988, 8806478

Int. Cl.[4] F25J *3/04*

U.S. Cl. 62—22 **15 Claims**



1. A process of separating air into oxygen, nitrogen and argon, comprising:

(a) extracting carbon dioxide and water vapor from air and cooling it to a cryogenic temperature suitable for separation by fractional distillation;

(b) subjecting the air to fractional distillation in a first distillation column operating at a first pressure and withdrawing therefrom oxygen, nitrogen vapor and argon-enriched oxygen;

(c) subjecting the argon-enriched oxygen to further separa-

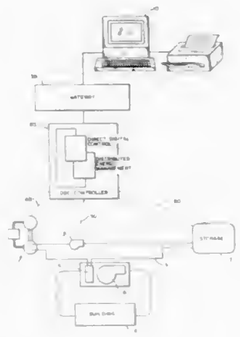
tion in a second distillation column operating at substantially lower pressure than the first column;
(d) withdrawing argon from the second distillation column;
(e) liquefying at least some of the nitrogen vapor formed in step (b) by a cycle which shares at least one heat exchanger in common with the air being cooled in step (a) and which employs compression of nitrogen to a third pressure substantially in excess of the first pressure;
(f) taking a first portion of the liquid nitrogen as product and introducing a second portion thereof into said first distillation column as reflux,
wherein liquid oxygen and impure nitrogen are withdrawn from the first distillation column and remixed in a liquid-vapor contact column, impure liquid nitrogen is withdrawn from the said liquid-vapor contact column and used as reflux in the said first distillation column, and a remixed oxygen-nitrogen stream is withdrawn from the said liquid-vapor contact column and is subjected to expansion to create refrigeration.

4,916,909

COOL STORAGE SUPERVISORY CONTROLLER

Anoop Mathur, Shoreview; Ward J. MacArthur, Minneapolis; Steven D. Gabel, Golden Valley; Donald Taracks, Minneapolis, all of Minn.; Jianliang Zhao, Albany, Calif., and Donald H. Spethman, Northbrook, Ill., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Dec. 29, 1988, Ser. No. 291,734
Int. Cl.[4] F25D *3/00*
U.S. Cl. 62—59 **13 Claims**



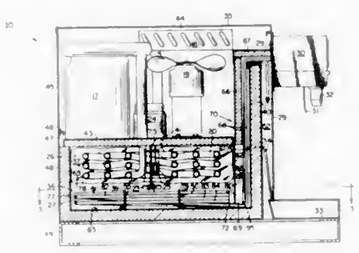
1. For a building having a HVAC system which includes chiller means, pump means, storage means, heat exchanging means and a chilled water loop between said chiller means, storage means, and heat exchanging means, an operating method for a cool storage supervisory controller for controlling the HVAC system where the controller includes a direct digital controller, a first control interface between said direct digital controller and said chiller means, a second control interface between said direct digital controller and said pump means, a third controller interface between said direct digital controller and said ice storage means, computing means including data input means, data storage means, memory means, display means, and processing means and a two-way data transfer gateway for communication between said computing means and said direct digital controller, the operating method comprising the steps of:
(a) operating the computing means to determine the predicted ambient temperatures from a projected high temperature and projected low temperature input by the user, historical data of actual temperatures from the current and previous cycles stored by the storage means, and an array of shape factors which assume a daily temperature pattern can be established by each hour's position relative to high and low temperatures;
(b) operating the data input means to receive data including predicted building load requirements and power company rate structure information; and
(c) determining a new shape factor by operating the computer means to:
(i) calculate temperature charges for the preceding cycle,
(ii) test these changes for reasonableness,
(iii) if reasonable, calculate current shape factors using the temperatures from the previous cycle and the temperature changes,
(iv) determine whether the current shape factors are reasonable, and
(v) if reasonable, calculate a new shape factor profile from the previous and current profiles using weighted averages; and
(d) operating the direct digital controller to implement a charge/discharge strategy for the storage means where the strategy is a function of the predicted ambient temperatures, the predicted building load requirements and the rate structure information.

4,916,910

LOW PROFILE DRINK DISPENSER

Alfred A. Schroeder, San Antonio, Tex., assignor to Lancer Corporation, San Antonio, Tex.

Filed Jul. 11, 1988, Ser. No. 217,169
Int. Cl.[4] F25D *3/00*
U.S. Cl. 62—59 **8 Claims**



1. An apparatus for employment in a beverage dispenser to refrigerate a liquid comprising:
a receptacle defining a cooling chamber for containing said liquid;
means for conducting said liquid through said cooling chamber; and
means for forming a slab of frozen material above said conducting means such that the frozen slab of ice is positioned totally above the means for conducting said liquid.

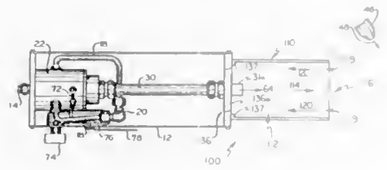
4,916,911

SNOWMAKING PROCESS AND APPARATUS

George R. Duryea, Buffalo, and Michael S. Holden, Williamsville, both of N.Y., assignors to Dendrite Associates, Inc., Hartford, Conn.

Continuation-in-part of Ser. No. 53,143, May 21, 1987, abandoned. This application Nov. 14, 1988, Ser. No. 271,163
Int. Cl.[4] F25C *3/04*
U.S. Cl. 62—70 **19 Claims**

16. A process for producing snow comprising the steps of:
(a) directing a stream of pressurized water into a cylindrical mixing tube along the central cylindrical axis;
(b) directing a stream of pressurized air into the cylindrical mixing tube coaxial with the cylindrical axis so as to surround the water stream;
(c) combining said air stream and said water stream to cool said water and provide a first stream of a mixture of said air and water in said tube;
(d) thereafter aspirating in a direction opposite to stream



flow a portion of air from ambient air into said first stream and mixing therewith to form a second stream of a mixture of air and water, said second stream being coaxial with said first stream; and
(e) dispersing said second stream into freezing temperature atmosphere to freeze the water in said second stream and produce snow.

4,916,912

HEAT PUMP WITH ADAPTIVE FROST DETERMINATION FUNCTION

Michael Levine, Boca Raton, Fla.; James Russo, Ann Arbor; Victor Rigotti, both of Ann Arbor, and Nicholas Skogler, Ypsilanti, all of Mich., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Oct. 12, 1988, Ser. No. 256,916
Int. Cl.[4] F25D *21/06*
U.S. Cl. 62—80 **34 Claims**

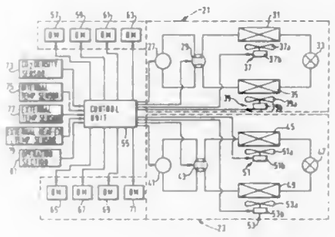
1. A method for detecting the formation of frost in a heat pump having a compressor, an interior heat exchanger, an exterior heat exchanger, an exterior fan for moving exterior air past the exterior heat exchanger, and a thermostatic control means for cycling the compressor ON and OFF in accordance with heating demand, the improvement comprising the steps of:
repetitively forming the difference between the exterior ambient temperature and temperature of the exterior heat exchanger during operation of the compressor;
repetitively comparing said difference to a frost formation difference function of the exterior ambient temperature during operation of the compressor;
interrupting the operation of the compressor and defrosting the exterior heat exchanger if said difference exceeds the value of said frost formation difference function for the current exterior ambient temperature;
measuring the length of time of said defrosting of the exterior heat exchanger; and
altering said frost formation difference function if said measured length of the time of said defrosting of the exterior heat exchanger deviates from a predetermined length of time.

4,916,913

AIR CONDITIONING APPARATUS HAVING TWO REFRIGERATING CIRCUITS IN CENTRAL UNIT AND CONTROL METHOD OF DEFROSTING THE SAME

Hidetoshi Narikiyo, Fuji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 29, 1988, Ser. No. 225,913
Claims priority, application Japan, Sep. 10, 1987, 62-227303
Int. Cl.[4] F25D *21/06*
U.S. Cl. 62—81 **15 Claims**



1. An air conditioning apparatus comprising:
first and second refrigerating circuit means including first and second internal heat exchangers, respectively, the internal heat exchangers being combined within a shared housing, for conditioning air supplied to a defined space, each refrigerating circuit including external heat exchanger means for absorbing heat from air, the external heat exchanger means being subject to the accumulation of frost thereon, the first and second refrigerating circuit means each having a conditioning state wherein the air supplied to the defined space is conditioned, a ventilating state wherein air from an external source is supplied to the defined space in response to the presence of a predetermined density of a prescribed gas in the defined space, and a defrosting state wherein accumulated frost is removed from the external heat exchanger means; and
control means for limiting one of the first and second refrigerating circuit means only to the conditioning state while the other refrigerating circuit means is in the defrosting state regardless of the density of the prescribed gas in the defined space or the presence of frost of the external heat exchanger means of the one of the first and second refrigerating circuit means.

4,916,914

ROTARY DISPLACEMENT COMPRESSION HEAT TRANSFER SYSTEMS INCORPORATING HIGHLY FLUORINATED REFRIGERANT-SYNTHETIC OIL LUBRICANT COMPOSITIONS

Glenn D. Short, Midland, Mich., assignor to CPI Engineering Services, Inc., Midland, Mich.

Filed May 27, 1988, Ser. No. 199,514
Int. Cl.[4] F25B *43/02*
U.S. Cl. 62—84 **20 Claims**

1. In a refrigeration or heat pump system including an oil-

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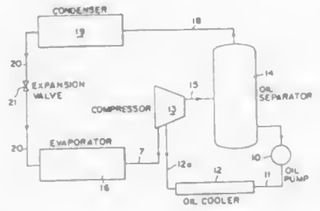
flooded compressor for compressing a refrigerant, a refrigerant, a condenser in connection with the outlet of the compressor, an evaporator in connection with the inlet of the compressor, an oil, an oil injection means for injecting the oil into the compressor, an oil separator and duct means for recirculating the separated oil to the oil injection means, the improvement wherein the refrigerant is a fluorinated non-chlorinated hydrocarbon and the oil comprises a major oil proportion of such a



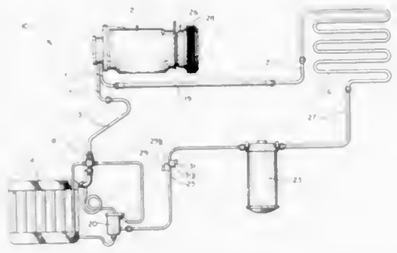
synthetic type as to provide an inverse solubility characteristic that within a temperature range of +30° C. to +121° C. a mixture incorporating the refrigerant and oil, can form two insoluble phases in the compressor, one an oil-rich phase and the second a refrigerant-rich phase, whereas within a temperature range of −40° C. to +20° C. said mixture can form only one soluble phase in the compressor at a weight concentration of oil to refrigerant less than 5%.

4,916,915

METHOD OF AND SYSTEM FOR DETERMINING REFRIGERANT/LUBRICANT RATIO WITHIN ENCLOSED FLOW APPARATUS

David E. Flinchbaugh, Orlando, Fla., assignor to Murray Corporation, Cockeysville, Md.

Filed Aug. 12, 1988, Ser. No. 231,382
Int. Cl.[4] G01K *13/00*
U.S. Cl. 62—129 **12 Claims**



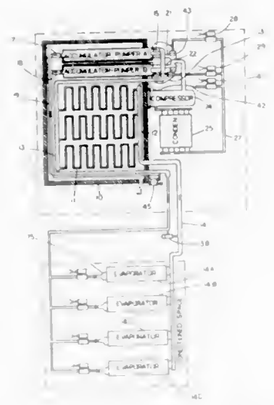
1. A system for measuring refrigerant-to-lubricant ratio of a liquid within a conduit having a wall and constituting a portion of an enclosed-flow air-conditioning or refrigerating apparatus which includes a compressor, a condenser, an evaporator and an expansion work-load means, the system being operative to transmit and to receive ultrasonic energy to and from a portion of the conduit in which refrigerant in the apparatus is in a liquid state between the evaporator and the expansion-work-load means intermediate the condenser and the evaporator, and wherein the system comprises means for generating at least-one pulse of ultrasonic energy, means for coupling the at-least-one pulse of ultrasonic energy via the wall into a path of substantially-predetermined length and having an end within the liquid in the conduit, means for coupling the at-least-one pulse of ultrasonic energy via the wall from the end of the path of substantially-predetermined length, as received at the end thereof, and means responsive to the at-least-one ultrasonic pulse as transmitted and received for determining velocity of the ultrasonic pulse within the liquid in the conduit as a measure of the ratio of refrigerant to lubricant by volume in the conduit.

4,916,916

ENERGY STORAGE APPARATUS AND METHOD

Harry C. Fischer, Rte. 665, Moon, Va. 23119

Filed Nov. 14, 1988, Ser. No. 270,211
Int. Cl.[4] F25B *5/00*
U.S. Cl. 62—199 **19 Claims**



16. A method for regulating the temperature in a conditioned space utilizing a tank containing coils housing refrigerant material and energy storage material, and further utilizing a condensing unit, at least one evaporator, and two accumulator/pumpers, comprising the steps of:

accumulating refrigerant fluid in a portion of one of said accumulator/pumpers; providing liquid refrigerant from said condensing unit;

adiabatically converting at least a portion of refrigerant fluid from said condenser from liquid to gas;

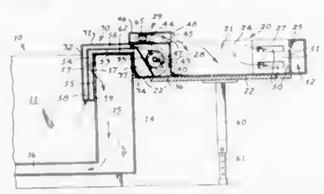
contacting said gas with said refrigerant fluid in said one accumulator/pumper, and pumping said refrigerant fluid in said one of said accumulator/pumpers to said at least one evaporator or to said coils.

4,916,917

REFRIGERATED CASE EXTENDER

McSwain L. Jackson, Jr., Rte. 2, Box 18, Puryear, Tenn. 38251

Filed Aug. 28, 1989, Ser. No. 400,793
Int. Cl.[4] A47F *3/04*
U.S. Cl. 62—249 **11 Claims**



1. A display case extender for attachment to a refrigerated grocery case having an upright front case wall including a return air plenum communicating with a return air intake opening on the rear face of the front case wall, and a display chamber containing cool air behind the front case wall, comprising:

(a) a display bin having a bottom wall, opposed side walls, a front wall and a rear wall enclosing a display storage chamber, and having an open top,

(b) means for supporting said display bin in an elevated operative position in front of the front case wall of a refrigerated grocery case,

(c) an air intake chamber behind said rear wall having an air intake duct extending across and downward behind the front case wall of a refrigerated grocery case when said display bin is in said operative position, whereby said air intake duct communicates with the cool air in the display chamber of the grocery case,

(d) said air intake chamber having a discharge outlet in the upper and rear portion of said display bin,

(e) blower means for moving cool air from the display chamber through said intake duct, said air intake chamber and said discharge outlet into said open display bin,

(f) an air exhaust chamber behind said rear wall having an air exhaust duct extending across and downward behind the front case wall of a refrigerated grocery case and in communication with the return air intake opening of said front case wall when said display bin is in said operative position, and

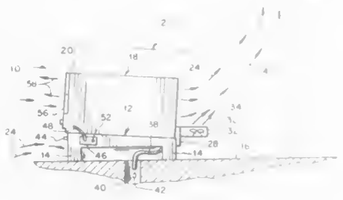
(g) a return air intake vent in one of said walls of said display bin in fluid communication between said display bin and said exhaust chamber.

4,916,918

AIR CONDITIONER STAND

Douglas A. Marelli, 28 Dewey St., Port Jefferson Station, N.Y. 11776

Filed Feb. 17, 1989, Ser. No. 312,210
Int. Cl.[4] F25D *23/12*
U.S. Cl. 62—259.1 **5 Claims**



1. An air conditioner stand, for supporting an operating air conditioner in a fireplace, which comprises:

(a) a base for supporting an air conditioner;

(b) a stop member fixedly secured rearward of said stand;

(c) an auxiliary electric fan mounted at a rear portion of said base;

(d) an electrical circuitry mounted on said base for simultaneously controlling and both said auxiliary electric fan and said air conditioner supported on said base; and

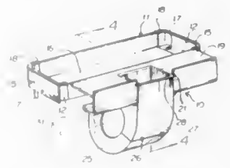
(e) means for draining condensate water from said air conditioner into an existing ash trap of said fireplace.

4,916,919

PLASTIC PAN ASSEMBLY FOR USE IN AIR CONDITIONERS AND REFRIGERATORS

Il Y. Kim, 7953 Audubon Ave. B-7, Alexandria, Va. 22306

Filed Jul. 18, 1989, Ser. No. 381,261
Int. Cl.[4] F25D *21/02*
U.S. Cl. 62—272 **8 Claims**



1. A primary pan assembly adapted to be mounted to the motor of an air conditioning system which comprises:

a plastic primary pan provided with a drainage hole disposed on at least one side thereof,

a plastic support plate extended from said plastic primary pan, said plastic support plate containing a C-shaped circumferential portion on one side thereof and extending a C-shaped plate, said C-shaped plate having a pair of slots in the vicinity of both ends of said C-shaped circumferential portion,

a channeled supporting bracket having a plurality of elongated apertures disposed in the center thereof for supporting said plastic primary pan,

a motor mounted to said channeled supporting bracket by screws through said elongated apertures, and

a fan cover having elongated slots disposed on the top surface thereof for receiving said supporting bracket, circumferential raised portion disposed around a below outlet, and both rails disposed on both side surfaces thereof, said both rails disposed in parallel with said circumferential raised portion for suspending said fan cover on said C-shaped circumferential portion and said C-shaped plate of the plastic support plate through said pair of slots, whereby the primary pan assembly can be mounted to housing walls of the air conditioner system at an inclination for easily draining the condensate water through the drainage hole and can be easily installed without a large number of screws and a large space for working, and the primary pan can be smoothly mounted to and separated from the channeled supporting bracket.

4,916,920

ROTOR STRUCTURE FOR JUICE COLD TEMPERATURE CREAMER

William T. Weis, and Michael R. Weis, both of Salt Lake City, Utah, assignors to Fruit-E-Frost Corporation, Salt Lake City, Utah

Filed Jul. 21, 1988, Ser. No. 222,648
Int. Cl.[4] A23G *9/12*
U.S. Cl. 62—342 **6 Claims**

4. A creamer mechanism for producing an ice cream-like frozen product from fruit juice or like liquid, comprising:

low temperature stationary means comprising a metallic hollow cylinder means in which a frozen ice cream-like product is formed, refrigeration means surrounding the cylinder means, and opposed end means substantially closing the respective ends of the cylinder means;

liquid influent means associated with one end means;

frozen product effluent means associated with the other end means;

synthetic resinous rotor means comprising synthetic resinous shaft means, adapted to be motor-driven, exposed beyond one of the end means, radially-extending synthetic resinous liquid distributor means integral with the shaft means

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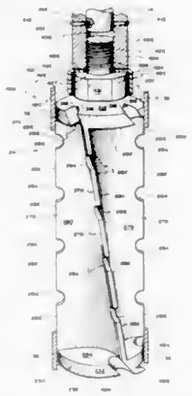
disposed within the cylinder means juxtaposed the liquid influent means;

spaced synthetic resinous blade means integral with the shaft means which blade means scrape frozen liquid from the inside surface of the cylinder means and tumble the same from blade means-to-blade means and radially-extending frozen product discharge means adjacent the frozen product effluent means;



the radially-extending synthetic resinous liquid distributor means comprising a dome-shaped top nonfreeze surface along which the liquid flows downwardly and radially outwardly by force of gravity and by centrifugal force during rotation, the distributor means further comprising edge passageways through which the liquid flows in a downward direction toward the blade means and against the low temperature inside surface of the cylinder means.

4,916,921

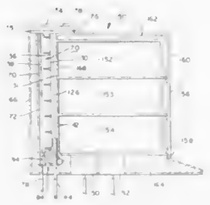
ICE MAKER WITH VERTICAL COOLING MEMBER

Charles J. Fletcher, 7 Valley Rd., Sparta, N.J. 07871

Division of Ser. No. 95,805, Sep. 10, 1987, Pat. No. 4,831,840. This application Mar. 20, 1989, Ser. No. 325,741

Int. Cl.[4] F25C *1/24*

U.S. Cl. 62—356 **20 Claims**



1. An ice making apparatus comprising:

at least one ice cube molding means for holding a plurality of bodies of liquid water while said bodies are being frozen to make ice cubes;

a cooling member of heat conductive material for cooling said molding means and causing heat to be conducted away from said bodies of liquid water;

cooling means for cooling said cooling memmber so as to freeze said bodies of liquid water and form ice cubes in said molding means, said cooling means including a heat exchange means for transferring heat from said cooling member to a heat exchange medium;

housing means including an insulated portion cooperating with said cooling member to define at least one insulated freezing chamber for receiving said at least one molding means and having an opening for providing access to and from said freezing chamber, said cooling member having a substantially vertical cooling surface positioned to cool said freezing chamber;

door means including an insulated door member movable between a closed position for covering and an open position for uncovering said freezing chamber opening; and,

dispensing means for biasing said molding means upwardly along said cooling surface so as to eject out of said freezing chamber at least a gripping portion of said molding means when said freezing chamber opening is uncovered by said door member,

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4,916,922

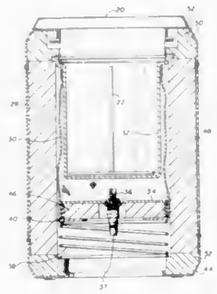
RAPID FREEZING APPARATUS

Patrick L. Mullens, 2124 Santiago St., Covina, Calif. 91724

Filed May 9, 1989, Ser. No. 349,394

Int. Cl.[4] F25D *3/12*

U.S. Cl. 62—384 **4 Claims**



1. A portable self-contained apparatus for rapidly cooling samples comprising:

an exterior housing having a peripheral side wall with an inner wall and an outer wall closed off at the top by an insulated cover and at the bottom by an insulated bottom wall having an opening therethrough;

a cooling chamber having a peripheral side wall with an inner wall and an outer wall and an interconnected bottom wall mounted interiorly of said housing open at the top thereof, said open top of said cooling chamber being closed off by said cover;

a flexible collapsible cloth bag mounted in said housing having a flexible and collapsible peripheral side wall mounted between the outer wall of the side wall of said cooling chamber and the inner wall of said housing with insulating means between the peripheral side wall of said bag and the inner wall of said housing, said bag having an insulated generally rigid bottom wall with an exterior wall and an interior wall closing off the bottom thereof disposed between the bottom wall of said cooling chamber and the bottom wall of said housing;

normally closed valve means fluidly communicating the exterior wall of the bottom wall of said bag with the interior wall thereof thereby providing fluid communication through said valve means between the exterior or said housing via the opening in said housing bottom wall and the area between said bag bottom wall and said cooling chamber; and

resilient means mounted in said housing disposed between the exterior wall of said bag bottom wall and said housing bottom wall normally biasing said bag bottom wall toward said cooling chamber whereby, when carbon dioxide is introduced through said valve means into the area between said bag bottom wall and said cooling chamber, said bag bottom wall moves downwardly away from said cooling chamber against the bias of said resilient means thereby indicating that the area between said bag and said cooling chamber is filled with carbon dioxide.

4,916,923

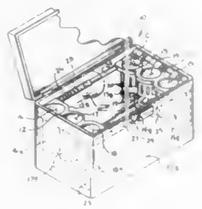
BEVERAGE COOLER INSERT

Carol A. Adams, and James D. Adams, both of 174 N. Rancho Ave., San Bernadino, Calif. 92410

Filed Apr. 17, 1989, Ser. No. 339,214

Int. Cl.[4] F25D *3/08*

U.S. Cl. 62—457.1 **8 Claims**



1. A beverage cooler insert for use in combination with a container wherein said container includes spaced side walls, spaced end walls, a floor integrally formed to the side and end walls, and a closure lid, said insert comprising,

a first tray including a first upper surface and a downwardly directed forward surface, and

a second tray including a second upper surface and a downwardly directed forward surface, and

a first support means and a second support means each adjustably mounted between said first and second trays to adjustably mount the insert interiorly of the container, and

wherein the first support means includes a first rigid rod integrally secured at one end to the first forward surface and telescopingly received at its other end within a first support sleeve, the support secured integrally to the second support surface remote from the rigid rod, and the second support means includes a second rigid rod integrally secured at one end to the first forward surface and telescopingly received at its other end within a second support sleeve, the second support sleeve secured at its other end remote from the rigid rod integrally to the second forward surface, and wherein the first support sleeve and the first rigid rod are coaxially aligned with one another, and the second support sleeve and the second support rod are coaxially aligned with one another.

4,916,924

FINGER RING REDUCING MEANS

Mark Borgenicht, 57 Eugene St., Buffalo, N.Y. 14216

Filed Aug. 16, 1989, Ser. No. 394,492

Int. Cl.[4] A44C *9/02*

U.S. Cl. 63—15.5 **7 Claims**

1. A finger ring guard in combination with a continuous circular finger ring for reducing the inside circumference of the ring, said guard consisting essentially of a U-shaped member having a bight portion and two legs extending therefrom wherein the bight portion is pivotally attached to the ring and the legs terminate in substantially circular pads having central holes therein through which the ends of a peg perpendicularly affixed to an outside edge of the ring extend, and wherein the width of the guard is approximately the same as the width of the ring, and the length of which is sufficient so that it is capable of reducing the inner diameter of the ring by at least about 10 percent.

4,916,925

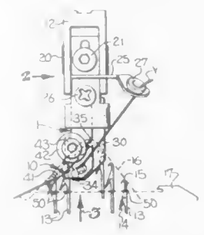
NEEDLE LATCH CUSHIONING MEMBER FOR CIRCULAR KNITTING MACHINES

Bruce M. Pernick, Glendale, N.Y., assignor to Monarch Knitting Machinery Corporation, Glendale, N.Y.

Filed Oct. 31, 1988, Ser. No. 264,813

Int. Cl.[4] D04B *15/58, 15/08*

U.S. Cl. 66—141 **12 Claims**



1. In a circular knitting machine including a circle of latch needles supported for vertical movement in a rotatable needle cylinder, a yarn feed finger adjacent said rotatable needle cylinder and including a yarn feeding passageway for feeding yarn into the hooks of successive needles as the needles are raised and move past the yarn feed finger and then lowered to form stitch loops of the yarn fed into the hooks thereof, and wherein the latches swing to an open position as the needles are raised and then swing to a closed position as the needles are lowered, the combination therewith of latch cushioning means for momentarily interrupting the swinging movement of the latches during the final portion of the swinging movement and to thereby increase the wear life of the needles, said latch cushioning means comprising

(a) a resilient member including an elongate body portion and a free end portion, and

(b) means supporting said elongate body portion of said resilient member on said yarn feed finger with said free end portion maintained in a fixed position to be successively engaged by the latches of the needles during the final portion of the swinging movement to resiliently interrupt the movement of the latches and to thereby reduce the impact force of the latches against the needles.

4,916,926

LOCKING APPARATUS

Jin R. Shieh, No. 178, Shih Chia Rd., Taichung City, Taiwan

Filed Jun. 7, 1988, Ser. No. 211,718

Int. Cl.[4] E05B *65/06*

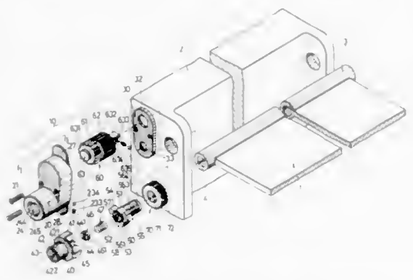
U.S. Cl. 70—135 **8 Claims**

1. A locking apparatus comprising:

a following member having a ratchet wheel and adapted to

be secured to a pivotal axis of a first member pivoting with respect to a second member;

a braking piece having at least a pawl engagable with said ratchet wheel for being capable of preventing said following member from rotating in a first direction in a first position and of freeing said following member in a second position; and



a locking device mounted on said second member and having a tumbler body capable of engaging with said braking piece in a manner that said braking piece is in said first position when said locking device is in a locking state and when in an unlocking state, said tumbler body can urge said braking piece to be in said second position.

4,916,927

LOCK AND METHOD OF SECURING AND RELEASING A MEMBER

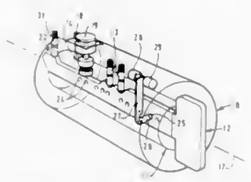
John O'Connell, 12 Honeybourne Road, Halesowen, West Midlands B63 3EN; Roy S. Jefferies, Wilcot Cottage, 64 Linley Brook, and Hugh Trevor-Jones, 82 Cartway, both of Bridgnorth, Shropshire, all of United Kingdom

Division of Ser. No. 75,748, Jun. 25, 1987, Pat. No. 4,854,146. This application Nov. 21, 1988, Ser. No. 273,802

Claims priority, application United Kingdom, Oct. 25, 1985, 8526395; Apr. 22, 1986, 8609785

Int. Cl.[4] E05B *47/00*

U.S. Cl. 70—276 1 Claim



1. A lock comprising two relatively movable members, relative movement of which is required to be restrained, and control means for selectively obstructing relative movement of said members, wherein the control means includes an obstructing element, guide means for guiding the obstructing element for movement between an obstructing position in which the obstructing element engages a first of said members to obstruct said relative movement and a releasing position in which the obstructing element does not so engage said first of the members, and an electrically energisable electromagnetic device for moving the obstructing element between said obstructing and releasing positions, wherein said device has a pole piece in which magnetism is induced by energisation of the device, in which a residual part of said magnetism is retained when the device is de-energised and which, when energisation of said device is terminated, retains the obstructing element by magnetic attraction in a position to which the obstructing element has been set by energisation of the device.

4,916,928

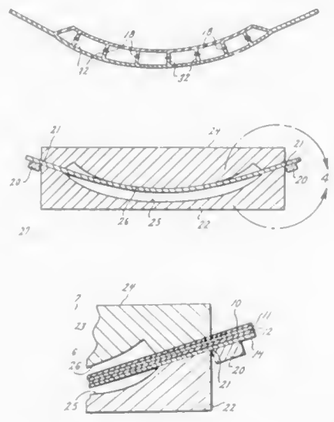
STOPS FOR CURVED SPF/DB SANDWICH FABRICATION

Richard C. Ecklund, Lakewood; Masashi Hayase, Fountain Valley, and Robert J. Walkington, Garden Grove, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Division of Ser. No. 187,601, Apr. 28, 1988, Pat. No. 4,833,768. This application Mar. 6, 1989, Ser. No. 318,967

Int. Cl.[4] B21D *22/10, 28/18, 39/20*

U.S. Cl. 72—60 4 Claims



1. A device for restraining at least two substantially planar peripherally secured work sheets to be deformed in a split limiting fixture which comprises a pair of having opposing first and second surfaces, said first surface having a protruding convex portion and said second surface having a cavity to produce a curved surface partially by direct displacement and partially by a fluid interface;

first means attached around the perimeter of said work sheets so as to provide a stop for said work sheets with respect to said split limiting fixture; and

second means attached to the outer edge of said dies of said split limiting fixture to engage said first means attached to the perimeter of said work sheets during the partially deforming by a fluid interface between said sheets to shape one of said sheets into said cavity to produce a curved surface thereon.

4,916,929

METHOD AND APPARATUS FOR THE PRODUCTION OF PART-CIRCULAR ARC ELEMENTS

Otto Bihler, Schleiferweg 2, D-8959 Halblech, Fed. Rep. of Germany

Filed Feb. 4, 1988, Ser. No. 152,252

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1987, 3704989

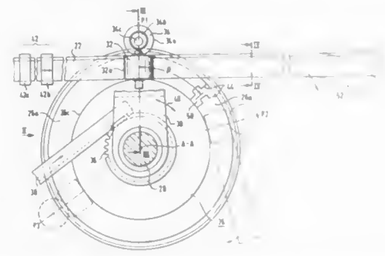
Int. Cl.[4] B21D *11/10, 7/02, 53/10*

U.S. Cl. 72—203 26 Claims

1. A method for producing a part-circular arc element (12), having a cross-sectional area which - considered in a section containing the axis of curvature - possesses a longer extent in the radial direction and a shorter extent in the axial direction and further having faces (12*a*, 12*b*) which are perpendicular to the axis of curvature and are substantially plane-parallel, the method comprising the steps of:

providing a substantially rectilinear metal strip section (22) having two side faces (22*a*, 22*b*) inclined in a wedge form towards one another and having two edge faces (22*c*, 22*d*) connecting the side faces (22*a*, 22*b*), namely an edge face (22*c*) close to the wedge tip and an edge face (22*d*) remote from the wedge tip, the metal strip section (22) having a cross-sectional area with a short axis substantially perpendicular to one of said side faces (22*a*, 22*b*) and a long axis perpendicular to said short axis, said wedge shape extending along a major part of said long axis;

providing a mandrel (26) having an axis and arcuate radially outwardly directed mandrel surface (26*c*) for abutment of the edge face (22*c*) close to the wedge tip and a substantially axially directed mandrel surface (26*a*) along said arcuate radially outwardly directed mandrel surface (26*c*) for abutment of one side face (22*a*) of the metal strip section (22); and



rolling the metal strip section (22) around the mandrel (26) to form the arc element, the edge face (22*c*) close the wedge tip producing an internal circumference (12*c*) and the edge face (22*d*) remote from the wedge tip producing the external circumference (12*d*) over the arc element (12), the rolling step including providing roller means (32, 34) for acting upon each of the other side face (22*b*) and the edge face (22*d*) remote from the wedge tip, the roller means moving in common about the axis (A—A) of the mandrel (26), the roller means (32, 34) having a rolling action effecting a longitudinal stretching of the metal strip section along the length thereof, which stretching is at a maximum adjacent to the edge face (22*d*) remote from the wedge tip, and is reduced towards the edge face (22*c*) close to the wedge tip, the side faces (22*a*, 22*b*) inclined in wedge form towards one another being transformed into the substantially plane-parallel side faces (12*a*, 12*b*) of the arc element (12) by the stretching during rolling action of the roller means.

4,916,930

APPARATUS FOR REALIGNING VEHICLE BODY AND FRAME MEMBERS

Richard J. Belgarde, 4440 Waimea Ct., San Jose, Calif. 95118

Continuation of Ser. No. 121,096, Nov. 16, 1987, Pat. No. 4,854,151. This application Feb. 2, 1989, Ser. No. 305,090

Int. Cl.[4] B21D *1/12*

U.S. Cl. 72—305 2 Claims

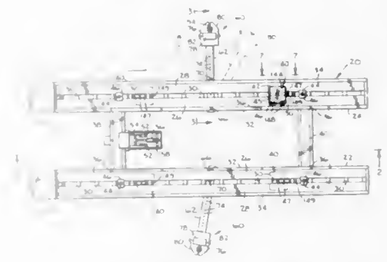
1. A rack for supporting a vehicle during straightening of the frame of the vehicle, such vehicle having a pair of front wheels and a pair of rear wheels with one front wheel and one rear wheel on one side and one front wheel and one rear wheel on the other side of the vehicle, said vehicle also having a frame carried by the wheels and a body mounted on the frame, said rack comprising:

(a) a pair of parallel tracks spaced apart and each formed by a pair of longitudinal members parallel to and spaced from one another, each said track having a plurality of tubular members bridging the space between said longitudinal members and secured thereto and with their tubular cavities in alignment and parallel to the longitudinal members

(b) means bridging the space between the tracks and serving to tie them together

(c) one such track serving to support the wheels on one side of the vehicle, the other track serving to support the wheels on the other side of the vehicle, and

(d) at least one clamp structure mounted on and projecting above each track, such structure having at its upper end



clamping means to clamp to the side portion of such vehicle, said clamp structure including also a bottom portion slidable along the track to any desired position, said clamp structure also including a locking member slidable through said tubular members to any desired position along the longitudinal members and locking means to secure said bottom portion to such locking member, such locking means being releasable to permit movement of the clamp structure and attachable to said locking member to secure the clamp structure in desired position.

4,916,931

APPARATUS FOR REPROCESSING SPOT WELDING ELECTRODES

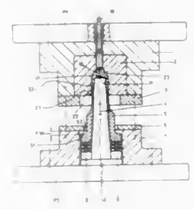
Werner Kaeseler, Meisenweg 8, D-3507 Baunatal-Altenritte, Fed. Rep. of Germany

Filed Mar. 14, 1988, Ser. No. 167,933

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1987, 3735446

Int. Cl.[4] B21D *3/16, 37/00*

U.S. Cl. 72—354 4 Claims



1. Apparatus for reforming used spot welding electrodes, which apparatus comprises:

(a) a press including a die formed with a closed end recess which is extended to include a conical centering area at an open end of the recess,

(b) a punch mounted in a holder of the apparatus with a lateral clearance provided between the opposed surfaces of the punch and the holder to allow said punch to self-align, the punch comprising:

(c) an inner punch movable relative to the die recess between a first position in which the leading end of the inner punch is within the die recess and spaced a predetermined

distance from the closed end of the recess to apply pressure to an electrode to be reformed positioned within the die recess and a second position in which the leading end of the inner punch is spaced from said open end of the recess and from the opposed end surface of the said electrode to be reformed, and

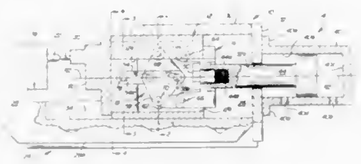
(d) a hollow outer punch mounted about the periphery of the inner punch and spaced laterally therefrom to define a clearance for allowing relative lateral alignment therebetween, the outer punch being movable relative to the die recess between a first position in which the leading edge of the outer punch enters the said centering area of the recess and a second position in which the leading edge of the outer punch is spaced away from said centering area of the recess, and spring means positioned about an end of the second punch remote from the leading edge and operable to apply a force to the outer punch, the arrangement being such that in use of the apparatus with a spot welding electrode to be reformed positioned in the die recess, when the leading edge of the outer punch makes initial contact with the electrode to be reformed, the leading end of the inner punch is spaced a predetermined distance from the internal surface of the end of the electrode, which distance is less than the distance travelled by the inner punch during the reforming operation, means to force at least one of said die and punches toward the other for reforming said spot welding electrodes.

4,916,932

FORCE MULTIPLYING PRESS

Robert E. Obrecht, Bloomfield Hills, and Edward J. Waltonen, Southfield, both of Mich., assignors to Lamb Robo, Inc., Bloomfield Hills, Mich.

Filed Jun. 9, 1988, Ser. No. 204,249
Int. Cl.[4] B21J *9/18*
U.S. Cl. 72—450 21 Claims



1. A press for performing a work operation on a workpiece, said workpiece comprising:

(A) a frame defining a bore having a central axis;

(B) a ram slidably mounted in said bore and having an axially extending circumferential surface of constant diameter slidably engaging said bore so as to constrain said ram for sliding movement in said bore in a direction parallel to said axis, said ram having a first end positioned within said bore and a free end projecting out of said bore;

(C) a first fabricating tool mounted on said ram free end;

(D) a motor including an output shaft powered in response to actuation of said motor and a drive member carried by said output shaft and reciprocably movable in a straight line through power and return strokes in response to powering of said output shaft; and

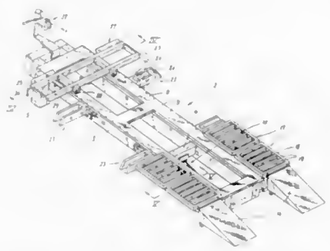
(E) a force multiplying mechanism interconnecting said drive member and said ram and operative in response to straight line power stroking movement of said drive member to move said fabricating tool to a working position and thereafter multiply the force applied to said tool to facilitate the performance of the work operation.

4,916,933

INSTALLATION FOR THE REPAIR AND INSPECTION OF CRASH-DAMAGED VEHICLE BODIES

Germain Celette, Vienne, France, assignor to Celette, S.A., Vienne, France

Filed Sep. 6, 1988, Ser. No. 240,827
Claims priority, application France, Sep. 10, 1987, 87 12993; Japan, Dec. 11, 1987, 87 17954
Int. Cl.[4] B21D *01/12*
U.S. Cl. 72—457 22 Claims



1. An installation for repair and inspection of crash-damaged vehicle bodies, including a straightening device consisting of a frame of general rectangular shape, comprising:

stationary support means disposed close to a first end of the device;

a lifting device disposed close to a second end of the device mounted so as to move the second end vertically between a position in which it rests on the floor and a position in which it is at least at the same height as the first end;

two ramps detachably fastened to the second end of the straightening device;

fastening means connected to the frame for fastening the vehicle to be repaired;

platform means fastened to an upper face of the straightening device extending one each from the ramps towards the first end of the vertically movable straightening device; and

a first carriage intended to receive the front axle assembly of the vehicle to be repaired, longitudinally movable between a position in which the carriage is located opposite platforms near the second end of the device and a position in which it is located at the first end of the device.

4,916,934

OXYGEN SENSORS

Hiroshi Nagata, Seki; Atsushi Iino, Nagoya; Nobuhide Kato, Aichi; Hiroshi Ishikawa, and Yasubiko Hamada, both of Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Dec. 13, 1988, Ser. No. 283,847
Claims priority, application Japan, Dec. 25, 1987, 62-327387
Int. Cl.[4] G01N *27/56*
U.S. Cl. 73—23 4 Claims

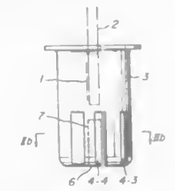
1. An oxygen sensor comprising:

a generally planar sensor element having a measurement gas detecting section provided at least on one outer side surface at an end portion thereof; and

a metallic cover disposed around at least said detecting section, said metallic cover being of a single wall structure comprising:

(a) a plurality of gas inlet openings for introducing the measurement gas into the metallic cover, said gas inlet openings being axially spaced from said detecting section in a longitudinal direction of said planar sensor element;

(b) guide plates provided in each of said gas inlet openings for directionally swirling the measurement gas inside said metallic cover; and



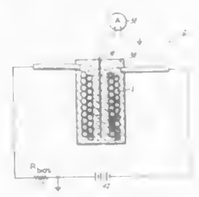
(c) a gas discharge opening located in a bottom surface of said metallic cover.

4,916,935

LOW POWER SOLID STATE GAS SENSOR WITH LINEAR OUTPUT AND METHOD OF MAKING THE SAME

Robert L. Novack, Evans City, and John E. Tozier, Wexford, both of Pa., assignors to Bacharach, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 550,280, Nov. 9, 1983. This application Jan. 23, 1989, Ser. No. 299,690
Int. Cl.[4] G01N *27/12*
U.S. Cl. 73—27 R 8 Claims



1. A metal oxide semiconductor gas senor comprising a heating element formed in a continuous series of coils around a central axis from an electrically conductive wire coated with a porous electrically insulating layer, an electrically conductive sensing element positioned within but spaced from the electrically conductive wire in said heating element and substantially in a plane parallel to said central axis, and a porous metal oxide semiconductive material encapsulating said heating element and said sensing element; with said semiconductive material electrically contacting the conductive wire of said heating element through said porous electrically insulating layer.

4,916,936

DEVICE FOR TESTING PACKAGES

Earl Wilson, Inglesde, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jul. 25, 1983, Ser. No. 223,593
Int. Cl.[4] G01M *3/32*
U.S. Cl. 73—37 1 Claim

1. A device for testing a package, comprising: means for generating a fluid pressure;

first conduit means connecting the generating means and the package;

means for measuring the actual pressure in the package;

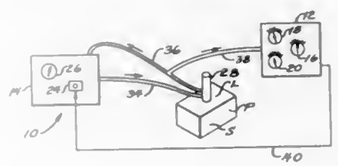
second conduit means connecting the package and measuring means;

means for controlling the rate of pressure increase of the generating means;

means for selecting the rate of pressure increase of the generating means;

means for calculating the actual rate of pressure increase inside the package responsive to the measuring means; and

means for modifying the generating means responsive to comparison of the selecting means and calculating means



to obtain the selected rate of pressure increase in the package.

4,916,937

PRESSURE BARRIER LINER

Andrew M. Robertson, West Vancouver, and Walter Van Woudenberg, Winterburn, both of Canada, assignors to Robertson Barrier Systems Corporation, Vancouver, Canada

Continuation-in-part of Ser. No. 877,116, Jun. 23, 1986, abandoned. This application May 18, 1987, Ser. No. 51,740
Int. Cl.[4] B65D *90/04*
U.S. Cl. 405—270 28 Claims

1. A liner comprising:

(a) a first plurality of low permeability flexible membranes disposed one above the other, each vertically adjacent pair of said membranes being sealed about their respective edges to encapsulate a region of high permeability between each of said sealed membrane pairs;

(b) pressurizing means for pressurizing a selected group of said regions to a selected pressure or pressures; and,

(c) means for preventing separation of said membranes during pressurization of said regions.

4,916,938

VALVE LEAKAGE INSPECTION, TESTING AND MAINTENANCE PROCESS

John A. Aikin; Derek Angus, both of Deep River; John W. Reinwald, Chalk River, and Jack Schaakula, Deep River, all of Canada, assignors to Atomic Energy of Canada Limited, Ontario, Canada

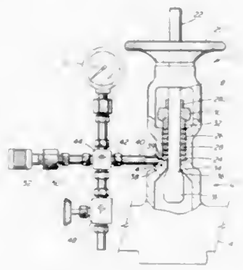
Filed Oct. 26, 1988, Ser. No. 262,659
Claims priority, application Canada, Aug. 25, 1988, 575633
Int. Cl.[4] G01M *3/26*
U.S. Cl. 73—46 15 Claims

3. A maintenance procedure for use with a valve having a valve body defining a flow passage therethrough, a movable flow control member for opening and closing said flow passage, a valve stem connected to said member and movable between first and second positions to effect movement of the flow control member through or between open and closed positions respectively, said valve having a stuffing box through which said stem extends, a packing in said stuffing box surrounding and engaging the stem, and gland means for compressing the packing to inhibit flow of pressurized fluid outwardly along said stem from said flow passage, said stem and valve body further having co-operable sealing surfaces engageable with each other when the stem has been moved to said first position to further prevent or inhibit flow of pressurized fluid outwardly of the valve and along said stuffing box

between the packing and stem disposed therein; said maintenance procedure including the steps of:

(a) moving said stem to said first position wherein said co-operable sealing surfaces are engaged with each other;

(b) flowing a substantially incompressible liquid under pressure into said stuffing box at a location therein such as to apply liquid pressure to said co-operable sealing surfaces and to exert a hydraulic force on the packing which is directed outwardly of the valve along the valve stem;



(c) stopping the flow Of liquid Once a desired pressure has been reached and Observing and/or detecting the rate of decay of pressure and any leakage outwardly along the stem to obtain an indication of the sealing integrity of said co-operable sealing surfaces and/or the ability of said packing to resist leakage along the stem; and

(d) releasing said gland means and again applying a flow of the liquid into the stuffing box at said location and at a pressure and flow volume sufficient to force the packing along the valve stem and substantially out of the stuffing box.

4,916,939

PROTECTIVE LINING ARRANGEMENT

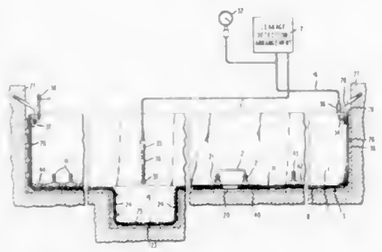
Helmut Mögel, Eduard-Pfeiffer-Str. 30, 7000 Stuttgart 1, Fed. Rep. of Germany

Filed Nov. 24, 1987, Ser. No. 124,817

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1986, 3640739; Apr. 15, 1987, 3712881; Jun. 11, 1987, 3719443

Int. Cl.[4] G01M *3/04*

U.S. Cl. 73—49.2 56 Claims



1. A protective lining arrangement, particularly for industrial halls and especially for large-area halls, for mounting on a preformed foundation, especially of concrete, comprising

at least one protective lining component including at least one lower plate which is connectable to the foundation, at least one upper plate, and

at least one shape- stable distancing layer interposed between said upper and lower plates and separating them from one another while simultaneously forming an air-tightly closable gap space between said upper and lower plates, wherein said distancing layer is constructed as an expanded metal mesh, with a three-dimensional mesh-like structure made of a sheet metal material having apertures and bent portions;

leakage monitoring means;

means for connecting said leakage monitoring means with said gap space;

a holding strip and means for securing said holding strip to the foundation; and

wherein said lower plate of said protective lining component is rigidly connected to said holding strip in an at least partially overlapping relationship to said holding strip.

4,916,940

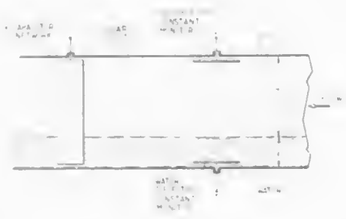
METHOD AND APPARATUS FOR MEASURING AND CALCULATING BULK WATER IN CRUDE OIL

Marcel L. Mougne, 1107 Briarpark Dr., Houston, Tex. 77042

Filed Jul. 5, 1988, Ser. No. 215,058

Int. Cl.[4] G01N *27/22, 33/22*

U.S. Cl. 73—61.1 R 22 Claims



1. An improved apparatus for detecting and calculating bulk water content in crude oil comprising:

(a) a capacitor array, said array conforming to the cross-section of a duct used to transfer the crude oil, said capacitor array inserted in the oil duct;

(b) a capacitance measurement system;

(c) a means to calculate the water content of the crude conveyed in said duct based on the measured capacitance.

4,916,941

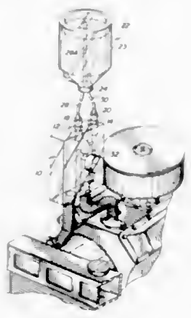
AIR BLEEDING SYSTEM FOR AN AUTOMOTIVE ENGINE COOLING SYSTEM INSTRUMENT MODULE

Stephen W. Briggs, 4141 E. Vernon, Phoenix, Ariz. 85008

Filed Oct. 10, 1989, Ser. No. 420,116

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—118.1 16 Claims



1. In a system for analyzing cooling problems in a closed automotive engine cooling system, wherein a cooling instrument module is inserted in series with a flow path of the automotive cooling system, an improvement comprising in combination:

a first fluid fitting being connected to a first internal point in the cooling instrument module;

a second fluid fitting being connected to a second internal point in the cooling instrument module; and

a coolant reservoir, said coolant reservoir having a first and a second fluid passage through a wall thereof, said first fluid passage being connectable through a first conduit to said first fluid fitting, said second fluid passage being connectable through a second conduit to said second fluid fitting.

4,916,942

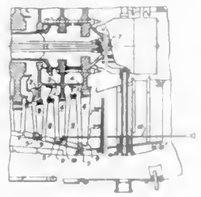
NOTCH GAUGE TOOL

Leonard W. Davidson, 5111 Bentley Dr., Delta, Canada

Filed Jun. 26, 1989, Ser. No. 371,565

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—119 R 9 Claims



1. A tool for measuring turbine blade outer shroud notch wear in situ in a turbine having multiple stages of turbine blades, each stage being arranged in a circular array comprising:

a longitudinal member having first and second ends;

means for applying a separating force between two adjacent turbine blades at said first end;

positioning means mounted about said longitudinal member intermediate said first and second ends;

driving means at said second end;

whereby inserting said first end of said longitudinal member through a first outer stage of blades and into the interior of the turbine such that said positioning means abuts said first outer stage of blades to place said means for applying a separating force between two adjacent blades of an interior stage of blades, and applying a torque force to said tool acts to separate said adjacent blades, the measure of the magnitude of the force required to separate the blades serving as an indication of outer shroud notch wear.

4,916,943

APPARATUS FOR MONITORING AND CONTROLLING THE TIRE INFLATION PRESSURE IN A TIRE TESTING MACHINE

Günther Himmler, Darmstadt, and Werner Lehr, Modautal, both of Fed. Rep. of Germany, assignors to Gebr. Hofmann GmbH & Co. KG Maschinenfabrik, Pfungstadt, Fed. Rep. of Germany

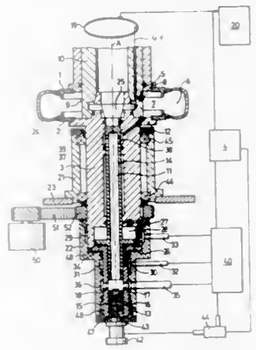
Filed Jul. 13, 1989, Ser. No. 379,070

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1988, 3825505

Int. Cl.[4] G01M *17/02*

U.S. Cl. 73—146 13 Claims

1. Apparatus for monitoring and controlling the inflation pressure of a pneumatic tire to be tested in a tire testing machine, comprising: first and second rim portions which are rotatable about a common axis, for receiving the tire to be tested between them, thereby delimiting a pressure chamber formed by the interior of the tire and the intermediate space between the measuring rim portions; means for relative axial displacement of the measuring rim portions; a spindle connected to and adapted to rotate with a said measuring rim portion; a stationary compressed air source; a compressed air conduit means disposed rotatably with the spindle and the measuring rim portions, for feeding compressed air for inflating the tire from the compressed air source and passing same into said pressure chamber; a pressure sensor mounted rotatably with the measuring rim portions and having at least one pressure-receiving surface operatively disposed in said pressure chamber, thereby to be directly subjected to the effect of



the inflation pressure in the pressure chamber; a closure means adapted to rotate with said spindle and said measuring rim portions and actuable between an open position in which air can pass through said compressed air conduit means and a closed position in which said compressed air conduit means is closed thereby; and a control means adapted to control the feed of compressed air by way of the compressed air conduit means into the pressure chamber in dependence on the air pressure detected in said pressure chamber by the pressure sensor, said control means being operable to actuate said closure means in response to the inflation pressure in said pressure chamber as the control parameter for the control means.

4,916,944

DUAL PURPOSE TIRE GAUGE

King Ho-Chuan, No. 26, Alley 52, Lane 687, Sec. 2, Ta Tung Road, Hsi Chih Chen, Taipei Hsien, Taiwan

Filed Feb. 16, 1989, Ser. No. 310,962

Int. Cl.[4] B60C *23/02;* **G01L** *7/16*

U.S. Cl. 73—146.8 3 Claims

1 A dual purpose tire gauge comprising:

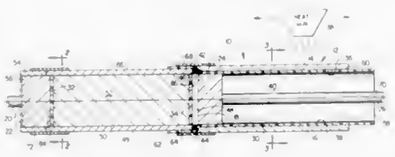
(a) a casing including an inlet end, an outlet end and a measurement scale for indicating tire air pressure and tire tread depth readings, the scale including a zero reading position;

(b) a shaft seat disposed within the casing;

(c) a rotatable shaft carried by the shaft seat, the rotatable

shaft being provided with an indicator needle mounted thereon;
(d) an elongate sliding bar;
(e) means engaging the sliding bar to the rotatable shaft whereby movement of the bar along its longitudinal axis rotates the shaft and produces a corresponding reading by the indicator needle on the measurement scale;
(f) a spring-biased piston positioned adjacent the inlet end, the piston being engageable against a first end of the sliding bar, whereby when the inlet end is disposed in engagement with an air valve of a tire, air pressure moves the piston against the spring bias and causes a second end of the sliding bar to extend outwardly from the outlet end, thereby producing a corresponding reading by the indicator needle of the tire air pressure;
(g) the sliding bar including a stop pin engageable against the shaft seat for terminating retraction of the bar into the casing and disposing the indicator needle at the zero reading position; and
(h) when the second end of the sliding bar is extended a sufficient distance from the outlet end, disposition of the second end within a tread spacing and engagement of the outlet end against the surface of a tire causes the indicator needle to produce a reading corresponding to the tire tread depth.

4,916,945
APPARATUS AND METHOD FOR TRANSFERRING WHOLE CORE SAMPLES
Kirk R. Weisbrod, Celina, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed Feb. 10, 1989, Ser. No. 308,487
Int. Cl.[4] E21B *49/00*
U.S. Cl. 73—153 **23 Claims**

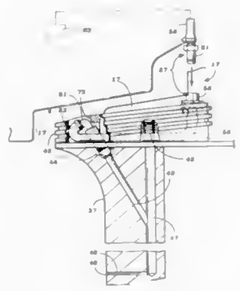


1. An apparatus for transferring a whole core sample having a first end and an opposing second end from the interior of an inner barrel comprising:
a split receiving tube having an interior surface sized and adapted to receive the whole core sample from the inner barrel;
a liner made of heat shrink material extending over a substantial portion of the interior surface of said split receiving tube;
first and second discs sized and adapted to be placed in contact with the first and second ends, respectively, of the whole core sample; and
means for forcing the whole core sample from the inner barrel into said liner in said split receiving tube.

4,916,946
METHOD OF FLOWING A HIGH VISCOSITY SUBSTANCE THROUGH A CONDUIT AT A LOW APPARENT VISCOSITY
John R. Cameron, Broken Arrow, Okla., assignor to Amoco Corporation, Chicago, Ill.
Filed Mar. 23, 1989, Ser. No. 327,942
Int. Cl.[4] E21B *43/267*
U.S. Cl. 73—155 **23 Claims**

1. A method of flowing a high viscosity substance through a conduit at a low apparent viscosity, which comprises the steps of:
selecting a cross-linkable fluid having nonhomogeneous flow properties: and
flowing the fluid through the conduit at fluid conditions which produce nonhomogeneous flow of the fluid at a low apparent viscosity.

4,916,947
SPEED DETECTING DEVICE FOR MARINE PROPULSION UNIT
Takayoshi Suzuki, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan
Filed Nov. 29, 1988, Ser. No. 277,146
Claims priority, application Japan, Nov. 30, 1987, 62-302530
Int. Cl.[4] G01P *5/16*
U.S. Cl. 73—182 **5 Claims**

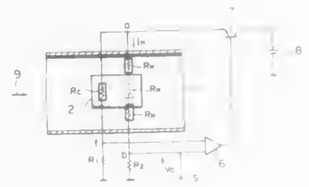


1. In a marine outboard drive adapted to be connected to the transom of a watercraft comprising a lower unit carrying propulsion means, an upper unit adapted to be affixed to the transom and said lower unit, an opening formed in said lower unit for sensing water pressure to provide a signal indicative of watercraft speed and a passage formed in said lower unit and extending from said opening toward said upper unit, the improvement comprising said passage terminating in said lower unit adjacent said upper unit and flexible conduit means comprising a first portion coupled to the termination of said passage and a second portion extending from said first portion through at least a portion of said upper unit and encircled thereby to a speed indicating device positioned within the hull of a watercraft.

4,916,948
THERMAL FLOW SENSOR
Masanori Inada; Hichiro Ohtani, and Tomoya Yamakawa, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 12, 1988, Ser. No. 282,797
Claims priority, application Japan, Dec. 26, 1987, 62-197814[U]
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—202.5 **12 Claims**

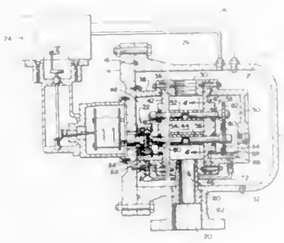
1. A thermal flow sensor comprising:
means for defining a flow of fluid;
supporting means comprising a supporting member having a circular cross section disposed within said flow of said fluid, said flow passing through said supporting means and over the outer periphery of said supporting means;
a plurality of thermosensitive resistors supported in a circumferentially spaced manner by said supporting means and disposed within substantially the same plane normal to said flow of said fluid;
a fluid temperature sensor supported by said supporting means;
a bridge circuit including said thermosensitive resistors, said fluid temperature sensor, and a plurality of resistors;

a control circuit for maintaining a balanced state of said bridge circuit; and



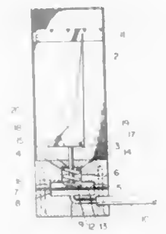
a signal outputting portion for outputting a flow rate signal which is obtained from said bridge circuit when said circuit is in a balanced state.

4,916,949
GAS FLOW METER
Joseph P. Lofink, 979 Lake Shore Dr., Hebron, Ohio 43205
Filed May 3, 1989, Ser. No. 346,633
Int. Cl.[4] G01F *3/10*
U.S. Cl. 73—261 **20 Claims**



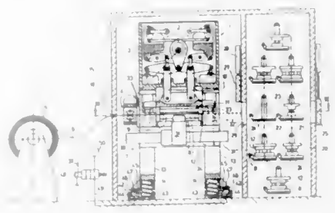
1. A meter for measuring volume flow of gas at high pressures comprising,
a housing including (1) an inlet opening for receiving said gas, (2) an outlet opening for discharging said gas, and (3) an open end, said open end being covered by a plate which seals the housing against any gas leaks,
a gas flow meter mounted in said housing and in fluid communication with said inlet and outlet openings,
said meter being configured to receive gas from the interior of said housing, measure the volume of gas passing through the meter and discharge said gas through said outlet opening,
said meter including an enclosure, said enclosure including wall means for internally dividing the enclosure into a plurality of chambers, one of said chambers being exclusively used to measure and transmit gas, said wall means supporting a movable element in said gas transmission chamber, said movable element being supported on said wall means by a bearing, and
an oil chamber in said enclosure partially filled with lubricating oil, said bearing being located out of direct contact with said lubricating oil, means associated with said movable element for lubricating said bearing with said lubricating oil when said element moves.

4,916,950
DIAPHRAGM GAUGE FOR STAND-ALONE LIQUID STORAGE TANKS
James D. Bergeson; Marion D. Bergeson, both of R.R. #2, Carstairs, Alberta, Canada (T0M 0N0); James C. Bergeson, Box 277, Cremona, Alberta, Canada (T0M 0R0), and Gary W. Dorin, Box 1329, Didsbury, Alberta, Canada (T0M 0W0)
Filed Feb. 13, 1989, Ser. No. 309,660
Int. Cl.[4] G01F *23/16*
U.S. Cl. 73—299 **6 Claims**



1. A gauge for measuring the depth of liquid in a tank comprising:
(a) a housing containing adjacent inner and outer chambers;
(b) a resilient deformable diaphragm positioned within the housing separating said inner and outer chambers;
(c) a rigid indicator needle being pivotally attached at its proximal end to the housing, and having an indicator point at its distal end and a lever arm extending from the proximal end;
(d) means for providing fluid communication between the tank and the inner chamber;
(e) means for mechanically transmitting displacement of the deformable diaphragm resulting from a change of fluid pressure on its inner surface to the lever arm thereby to cause pivotal displacement of the indicator needle.

4,916,951
A PRESS, HAVING A SUBSTRUCTURE WITH VERTICAL SPRING SUPPORTS
Helmut Messaer, Arbon, Switzerland, assignor to Bruderer AG, Switzerland
Filed Nov. 4, 1987, Ser. No. 117,748
Claims priority, application Switzerland, Nov. 4, 1986, 4366/86
Int. Cl.[4] B21D *37/12*
U.S. Cl. 72—455 **14 Claims**



1 In a press, for cooperation with a tool handling device:
(a) drive means;
(b) first and second die means movable relatively to each other, at least one of them being driven by said drive means;
(c) frame means including:
a bearing portion bearing the weight of the press,

a die support portion for supporting said drive means and said die means, and

vertical spring means between said bearing portion and said die support portion for absorbing vibrations resulting from the relative movement of said die means, the spring means thus rendering the die support portion elastically movable in vertical direction relatively to said bearing portion, the spring means having a compressed position in which it is substantially fully compressed so as to exert a maximum force; and

(d) locking means for selectively locking said die support portion in a locking position, in which it is at a predetermined level relative to said bearing portion, and in which the spring means is out of said compressed position,

wherein said locking means comprise stop means and counter-stop means for determining said predetermined level, said stop means and counter-stop means abutting each other in said locking position.

4,916,952

MANDREL FOR BENDING PIPES

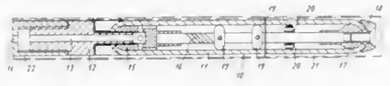
Dieter Thielmann, Willebadessen, and Egon Olszewski, Paderborn-Elsen, both of Fed. Rep. of Germany, assignors to Benteler Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 18, 1987, Ser. No. 135,039

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1987, 3701612

Int. Cl.[4] B21D *9/00*

U.S. Cl. 72—466 2 Claims



1. A pipe supporting mandrel for use in a pipe bending machine having a mandrel rod, comprising a hose-like piece of a flexible material, defining an inner wall and an outer wall; a first supporting member sealingly engaging the inner wall of an end portion of said hose-like piece; a second supporting member having a spherical surface sealingly engaging the inner wall of the opposite end portion of said hose-like piece; a connection piece for attaching said first supporting member to a mandrel rod; a flexible wire rope coaxially extending in said hose-like piece and being secured at the ends thereof to said first- and second supporting members; a concave clamping disk engaging the outer wall of said opposite end portion of the hose-like piece and being clamped against the spherical surface of said second supporting member; said connection piece being provided with an axial passage communicating with a filling opening provided in said first supporting member; and said filling opening communicating with the interior of said hose-like piece to inflate or deflate said hose-like piece by a pressure medium introduced or discharged via said axial passage.

4,916,953

DEVICE FOR MEASURING THE MOVEMENT OF A MOTOR VEHICLE

Jon Lie, Postboks 54, 2391 Moelv, Norway

PCT No. PCT/NO87/00059, § 371 Date Mar. 31, 1988, § 102(e) Date Mar. 31, 1988, PCT Pub. No. WO88/01415, PCT Pub. Date Feb. 25, 1988

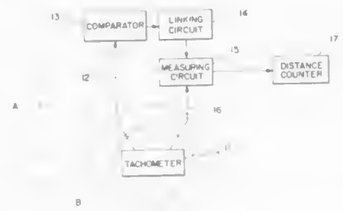
PCT Filed Aug. 11, 1987, Ser. No. 180,988

Claims priority, application Norway, Aug. 12, 1986, 863235

Int. Cl.[4] G01P *3/16, 3/42*

U.S. Cl. 73—535 7 Claims

1. A device for measuring the movements of a motor vehicle, which includes a distance gauge, a meter with a counter mechanism that records the distance travelled by the vehicle and a speedometer which registers the vehicle's speed, is characterized by the speedometer being provided with the means for producing a control signal when the speed of the vehicle is determined to be over a predetermined limit and the distance gauge is equipped with a release mechanism which is activated by the control signal so that a record of the distance driven is only made when a such a control signal is received from the speedometer; and



the distance gauge is equipped with a connecting device which produces an increase in the weighting of the distance registration following increased speed above the first, predetermined limit.

4,916,954

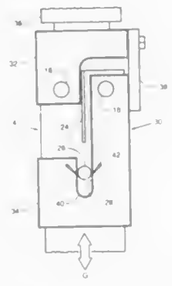
FATIGUE TESTING APPARATUS

Robert J. Buzzard, Berea, Ohio, assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 21, 1989, Ser. No. 396,263

Int. Cl.[4] G01N *3/32*

U.S. Cl. 73—799 20 Claims



1. Apparatus for testing materials under Mode II loading wherein the material being tested is in the form of a plate having a pair of spaced loading holes with a centrally disposed notch extending from one edge between said holes toward a full cutout in the opposite edge thereof comprising

a fixed clevis and movable clevis mounted on a testing machine, each of said clevises having a centrally disposed slot for receiving said plate so that the central axis of loading passes through the centerline of said centrally disposed notch,

a first pin carried by said fixed clevis for insertion into one of said spaced loading holes for transmitting a force thereto in one direction,

a second pin carried by said movable clevis for insertion into the other of said spaced loading holes for transmitting a force thereto in the opposite direction thereby producing a rotational moment in said plate, and

a third pin carried by said movable clevis for mating with said full cutout thereby arresting rotational moment.

4,916,955

CRYSTAL INGOT LIFTING LOAD MEASURING DEVICE

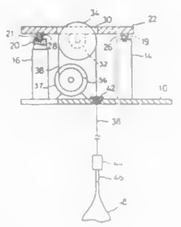
Nobuo Katsuoka, Takasaki; Kouji Mizuishi, Annaka; Yoshihiro Hirano, Annaka; Kenichi Sato, Annaka, and Seiichiro Otsuka, Tomioka, all of Japan, assignors to Shin-Etsu Handotai Company, Limited, Tokyo, Japan

Filed Aug. 10, 1988, Ser. No. 230,777

Claims priority, application Japan, Aug. 18, 1987, 62-204843

Int. Cl.[4] G01L *5/04*

U.S. Cl. 73—862.44 7 Claims



1. A device for measuring the lifting up load of a crystal rod grown by the Czochralski method, comprising:

a wire rope consisting of multiple strands, said wire rope having one end connected to said crystal rod through a seed crystal holder to lift up said crystal rod;

a motor;

a drum driven by said motor, having a helical groove formed in the peripheral surface of said drum for winding and guiding said wire rope, the remaining end of said wire rope connected to said drum;

a first base;

a load cell mounted to said first base;

a second base supported by said first base through said load cell; and

a pulley rotatably supported by said second base, said pulley having a guide groove formed in a peripheral surface thereof for guiding said wire rope between said drum and said crystal holder, a part of the cross-sectional shape of said guide groove being substantially identical to a semicircle circumscribing said wire rope.

4,916,956

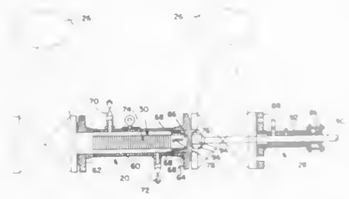
CATALYST SAMPLING DEVICE

Henry J. Semerak, Sarnia; Lawrence M. Schmidt, and Graham J. Griffiths, both of Clearwater, all of Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Mar. 20, 1989, Ser. No. 325,960

Int. Cl.[4] G01N *1/00*

U.S. Cl. 73—863 21 Claims



1. A system for exposing a sample to the interior of a reaction vessel comprising a first chamber located within said reaction vessel, a second chamber located outside said reaction vessel, a conduit interconnecting said chambers, a sample holder movable within said conduit between said chambers, moving means to move said holder between said chambers, first closure means to seal said first chamber from said second chamber, and second closure means to isolate said second chamber and permit detachment thereof from said reaction vessel, characterized in that said moving means are detachable from said holder when said holder is located within said first chamber.

4,916,957

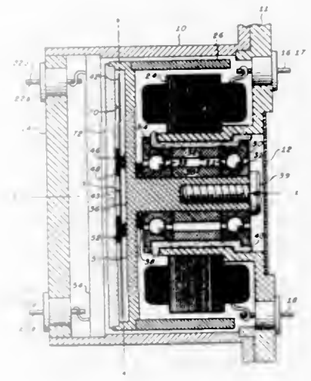
FLEXIBLE DISC ROTOR RATE GYRO

Thomas R. Quermann, Huntington Station, N.Y., assignor to Unisys Corporation, Blue Bell, Pa.

Filed May 9, 1988, Ser. No. 191,504

Int. Cl.[4] G01C *19/06, 19/28*

U.S. Cl. 74—5.5 15 Claims



1. A gyroscopic rate sensor comprising:

housing means,

drive shaft means supported for rotary motion within said housing means,

motor rotor means adapted for spinning about a spin axis of said drive shaft means,

flexible disc rotor means coupled to said motor rotor means and including a rotor body and integrally formed articulating support means for providing a predetermined spring restrain coefficient and a rotor spin axis substantially independent of said spin axis of said drive means, so that said disc rotor means responds to precessional forces as a rigid rotor articulated at said drive shaft means,

squeeze film damping means for damping said flexible disc rotor means, comprising a substantially rigid disc coupled for rotation with said motor rotor means in spaced relationship therewith and in spaced relationship with said flexible disc rotor means and having a diameter greater than said flexible disc rotor and a thickness substantially greater than said flexible disc rotor, fluid means surrounding said flexible disc rotor means and confined within said housing means, so that undesired oscillations of said rotor means are effectively damped while allowing substantially free deflection of said spin axis of said flexible disc rotor means, and

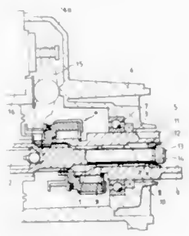
detection means fixed in relation to said drive shaft means and substantially mechanically independent of said housing means for sensing the angular deflection of said rotor spin axis with respect to said spin axis of said drive shaft means in response to gyrodynamic reaction when said flexible diso rotor means is precessed about an axis perpendicular to said spin axis of said drive shaft means.

4,916,958

PINION STOPPER OF ENGINE STARTER

Kyoichi Okamoto, and Kazuo Takami, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1988, Ser. No. 259,388
Claims priority, application Japan, Nov. 2, 1987, 62-168233; Nov. 2, 1987, 62-168234
Int. Cl.[4] F02N *15/02*
U.S. Cl. 74—6 3 Claims



1. A pinion stopper of an engine starter comprising an electric motor having an output shaft, a pinion drive shaft rotatably and axially slidably mounted on said output shaft, a pinion gear formed integrally with an outer end portion of said pinion drive shaft, a large diameer portion of a through hole formed in said pinion drive shaft, said large diameter portion extending from an outer end of said pinion drive shaft by a predetermined distsance to form a space, an annular groove formed in an outer end portion of said output shaft, a stop ring fitted in said annular groove and an annular stopper having a size allowing it to move along said output shaft freely within in said space and adapted to limit a relative movement of said pinion drive shaft to said output shaft when engaged with said stop ring fitted in said annular groove, said output shaft being formed with at least one axial groove extending from an outer end thereof to said annular groove so that said stop ring can be removed from said annular groove by a pin or the like inserted along said axial groove.

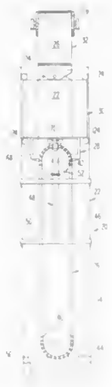
4,916,959

LONG STROKE WELL PUMPING UNIT WITH CARRIAGE

Gordon R. Lively, P.O. Box 3164, Longview, Tex. 75606, assignor to Gordon R. Lively, Longview, Tex.

Filed Feb. 22, 1988, Ser. No. 158,678
Int. Cl.[4] B66B *5/26*
U.S. Cl. 74—37 26 Claims

1. A well pumping unit comprising:
a drive motor;
a pulley and band assembly including first and second pulleys and a continuous band extending between and engaging said pulleys, said first pulley being driven by said drive motor, said pulleys being spaced vertically;
a carriage assembly including a block base, wheels rotatably attached to said block base and an outer frame, said block base being swivelly connected to said continuous band, said wheels rotatably engaging the interior of said frame, said block base and said wheels being located within said frame, said block base and said wheels being horizontally movable relative to said frame but not movable vertically relative said frame, said wheels including four pairs of wheels on four axles, the axles being positioned such that in cross-section the four axles form corners of a square, one of said four pairs of wheels being located on each side of said block base;
a counterweight assembly fixedly attached to said frame; and



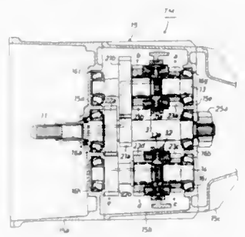
a belt and pulley assembly having first and second ends, said first end being attached to said counterweight, said second end being attachable to a polish rod assembly.

4,916,960

MANUAL TRANSMISSION FOR MOTOR VEHICLE

Masaki Inui, and Masakazu Ishikawa, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Aug. 17, 1988, Ser. No. 233,035
Claims priority, application Japan, Aug. 18, 1987, 62-204391; Aug. 18, 1987, 62-204392; Sep. 3, 1987, 62-134835[U]
The portion of the term of this patent subsequent to Feb. 20, 2007, has been disclaimed.
Int. Cl.[4] F16H *3/08*
U.S. Cl. 74—331 10 Claims



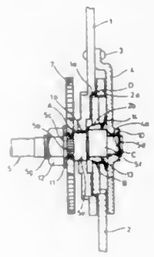
1. A manual transmission for motor vehicles comprising:
a housing assembly;
an input shaft rotatably mounted within said housing assembly and having a first drive gear of small diameter for low speed drive and a second drive gear of large diameter for high speed drive fixed thereon;
an output shaft rotatably mounted within said housing assembly and having an axis of rotation parallel to and spaced from a rotation axis of said input shaft, said output shaft having at least a pair of axially spaced change-speed driven gears mounted thereon;
a first countershaft rotatably mounted within said housing assembly in parallel with said input and output shafts and having a first driven gear fixed thereon and continuously engaged with said first drive gear on said input shaft, a pair of axially spaced low speed drive gears rotatably mounted thereon and continuously engaged with the change-speed driven gears on said output shaft, and a first synchronizer coupling provided thereon to selectively connect said low speed drive gears to said first countershaft; and
a second countershaft rotatably mounted within said housing assembly in parallel with said input and output shafts and said first countershaft and having a second drive gear fixed thereon and continuously engaged with said second drive gear on said input shaft, a pair of axially spaced high speed drive gears rotatably mounted thereon and continuously engaged with the change-speed driven gears on said output shaft, and a second synchronizer coupling provided thereon to selectively connect said high speed drive gears to said second countershaft.

4,916,962

RECLINING ANGLE ADJUSTMENT DEVICE

Yasuhisa Tsutsumi, and Kazuyuki Kurashige, both of Fujisawa, Japan, assignors to Shiroki Kinzoku Kogyo Kabushiki Kaisha, Fujisawa, Japan

Continuation of Ser. No. 143,390, Jan. 13, 1986, abandoned. This application May 2, 1989, Ser. No. 346,309
Int. Cl.[4] B60N *1/02*
U.S. Cl. 74—392 4 Claims



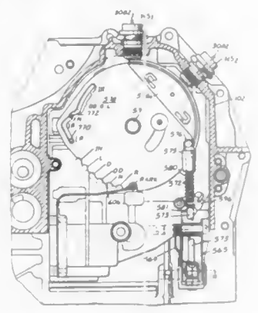
1 A reclining angle adjustment device for a seat, comprising:
a shaft having a concentric portion and an eccentric portion and rotatable for adjusting the reclining angle of the seat, said eccentric portion comprising a tapered ring axially movable relative to said shaft;
a gear train including an external gear and an internal gear meshing with said external gear, said internal gear having more teeth than said external gear;
a first arm having one said external and internal gears, said one of the external and internal gears being rotatably fitted at its center over said concentric portion;
a second arm having the other of said external and internal gears, said other of the external and internal gears being rotatably fitted at its center over said tapered ring; and
a resilient member engaging said tapered ring for normally pressing the tapered ring axially along said shaft in a direction to strengthen meshing engagement between said external and internal gears.

4,916,961

CAM-CONTROLLED MANUAL VALVE IN AN AUTOMATIC TRANSMISSION

Gerald L. Holbrook, Rochester Hills, and Uno Kaustik, Royal Oak, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Continuation of Ser. No. 187,120, Apr. 29, 1988, abandoned. This application Apr. 13, 1989, Ser. No. 338,493
Int. Cl.[4] F16H *5/06*; B60K *20/00*
U.S. Cl. 74—337.5 9 Claims



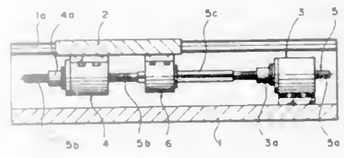
1. A valve assembly in a fluid system of a vehicle transmission for directing fluid flow between a fluid source and at least one fluid actuating device in the transmission, said assembly comprising:
a manual shaft being actuated in response to a manual input to select at least one predetermined operating mode of the transmission;
valve means disposed in a housing and being movable therein for directing fluid flow between a fluid source and at least one fluid actuating device;
a plate member connected to said manual shaft and being rotatable;
a pin member interconnecting said plate member and said valve means; and
cam means for positioning said valve means at a predetermined position for the predetermined operating mode when said plate member is rotated.

4,916,963

MOVING TABLE UNIT

Seiji Takei, Yokohama, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 223,415
Claims priority, application Japan, Oct. 3, 1987, 62-151841
Int. Cl.[4] F16H *25/22*
U.S. Cl. 74—424.8 B 2 Claims



1. A moving table unit having
a substantially U-shaped bed,
a table which is slidably attached to the bed through rectilinear guide devices on the legs of the bed,
a first motor unit with a ball screw which is attached to the upper side of the bottom of the bed,

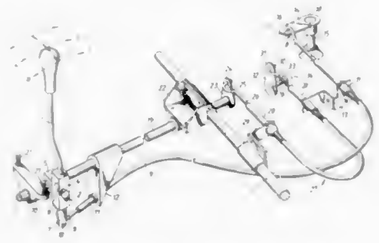
a second motor unit with a ball screw which is attached to the lower side of the table; and
a ball spline unit which is attached to either the lower side of the table or the upper side of the bottom of the bed between said first and second motor units, and
wherein the ball screws of the first and second motor units and the ball spline unit have the same axial center and are coaxially coupled by a drive shaft on which ball screw grooves and a ball spline groove are formed at the positions corresponding to said units.

4,916,964

REMOTE CONTROL MECHANISM

David J. Crack, Chelmsford, England, assignor to Morse Controls Limited, Basildon, England

Filed Mar. 10, 1989, Ser. No. 321,884
Claims priority, application United Kingdom, Mar. 15, 1988, 8806102
Int. Cl.[4] G05G *9/16*
U.S. Cl. 74—473 P 16 Claims



1. A remote control mechanism comprising a control member movable in different control modes, a first control link means interconnected with said control member such as to be caused to make a control movement in response to said control member being moved in a first one of its said control modes, a second control link means interconnected with said control member such as to be caused to make a control movement in response to said control member being moved in a second one of its said control modes, movement of said control member in its said first control mode resulting in movement of the interconnection of the second control link means with said control member, and means interconnecting said first and second link means to cause said second link means to move with said first link means as said first link means is caused to make its said control movement in response to said movement of said control member in its said first control mode by which to compensate for said movement of said interconnection of said second control link means with said control member at that time which otherwise could result in unwanted control movement of said second control link means.

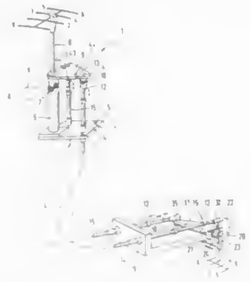
4,916,965

MOTOR-VEHICLE SHIFT LINKAGE

Wilhelm M. T. Wardenier, Wehrheim, and Bruno Hotz, Schwieberdingen, both of Fed. Rep. of Germany, assignors to RCS Remote Control Systems GmbH, Bod Hamburg, Fed. Rep. of Germany

Filed Nov. 29, 1988, Ser. No. 277,339
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1987, 8715835[U]; Jul. 18, 1988, 3424296
Int. Cl.[4] G05G *9/16*
U.S. Cl. 74—473 P 12 Claims

1. In combination with a shift lever having an end displaceable in two substantially perpendicular directions and with a transmission having an operating shaft extending along an axis and displaceable axially and angularly to change gears, a shift linkage comprising:
a first selecting lever extending radially from the shaft, fixed for joint angular movement with the shaft, and having an outer end forming a plurality of like attachment points;
a second selecting lever pivoted on the transmission and having one end engaged with the shaft for joint axial movement while permitting relative angular movement and another end forming a plurality of like attachment points;
a lever plate carried on the end of the shift lever and having offset in the one direction from the lever end an attachment region forming a plurality of like first attachment points and offset in the other direction from the lever another attachment region forming a plurality of like second attachment points;
a pair of tension- and compression-transmitting cables each having a sleeve and a core slidable longitudinally therein and having a pair of opposite ends;
a base plate beneath the shift lever;



a post projecting upward from the base plate and having an upper end carrying the shift lever; and
anchors in the plate beneath the respective pluralities of attachment points for the sleeves of the respective cables; and
connector means securing one end of one of the cores at one of the first points to the lever plate and the opposite end thereof to one of the attachment points of the first selecting lever and securing one end of the other core at one of the second points to the lever plate and the opposite end thereof to one of the attachment points of the second selecting lever, the cores extending generally perpendicularly to the respective directions from the respective attachment points on the lever plate, the connector means being releasable and connectable to any of the respective attachment points.

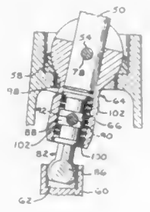
4,916,966

TRANSMISSION SHIFT VIBRATION DAMPER

James F. Weishaupt, and Loren W. Stevens, both of Jackson, Mich., assignors to Dawlen Corporation, Jackson, Mich.

Filed Nov. 4, 1988, Ser. No. 267,322
Int. Cl.[4] F16H *57/06*; G05G *9/12*
U.S. Cl. 74—473 P 4 Claims

1. A vibration absorbing shift lever extension for power transmissions comprising, in combination, an elongated homogeneous body having an upper end and a lower end, a longitudinal axis and a coaxial bore extending from end to end being of a uniform cylindrical diametrical dimension throughout its length, a bulbous bearing surface defined upon said body upper end comprising a segment of a sphere, an elongated shift stem having an upper end region extending into said bore through said body lower end, a pivot pin mounted in said body lower end transverse to said axis and extending through said upper end region, said stem upper end region having a maximum diameter sufficiently less than the diameter of said body bore receiving said end region to permit limited pivoting of said stem end region relative to said body about said pivot pin, and resilient vibration damping means mounted on said stem upper



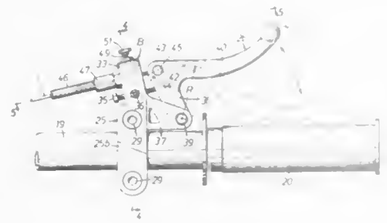
end region interposed between said upper end region and said body bore absorbing and damping vibrations within said stem.

4,916,967

THROTTLE OPERATING DEVICE FOR JET-PROPELLED SMALL-SIZED BOATS

Yukio Nakamura, 5-6, 1 Chome, Tengachayakita, Nishinari-Ku, Osaka-Shi, Osaka-Fu, Japan

Filed May 24, 1989, Ser. No. 356,318
Claims priority, application Japan, Jan. 31, 1989, 64-3316; Feb. 6, 1989, 64-13456
Int. Cl.[4] F16C *1/10*; G05G *11/00*
U.S. Cl. 74—502.2 3 Claims



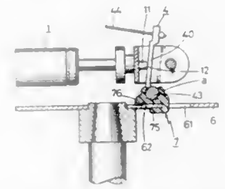
1. A throttle operating device for jet-propelled small-sized boats comprising an attaching bracket (25) integrally fixed to a steering handle bar (19) of a boat body A, and a throttle operating lever (26) pivotally connected to said attaching bracket through a pivot pin so that said operating lever can be raised and lowered,
wherein the turning operation of the operating lever (26) advances and retracts a throttle cable (C) so as to control the opening and closing of a throttle valve of an engine (13) mounted on the boat body A,
said throttle operating device being characterized in that
said attaching bracket (25) is bisected into a pair of bracket segments (25*a*, 25*b*) injection-molded from high strength thermoplastic resin, said bracket segments (25*a*, 25*b*) being clamp-wise fixed to the handle bar (19) by a pair of upper and lower fixing bolts (29) extending through said bracket segments (25*a*, 25*b*) and nuts (30),
a support mast (33) integrally extending upward from one bracket segment (25*b*) is formed with a longitudinally extending threaded through-hole (34) for receiving a mouth piece (47) adapted to hold a cover tube (46) for the throttle cable (C),
a lever support fork (37) corresponding to the operating lever (26) integrally extends rearward from an intermediate height location on the bracket segment (25*b*) having the support mast (33),
the whole of said operating lever (26) is injection-molded from the same synthetic resin as that for the attaching bracket (25) so that said operating lever is substantially in the shape of the Japanese character " " as seen in side view, one side thereof serving as an attaching leg (38) turnably connected to the lever support fork (37) of the attaching bracket (25) through said pivot pin (39) parallel to said fixing bolts (29) so that said operating lever can be raised and lowered,
the other side of the operating lever (26) serves as a hand rest (40) and is disposed above and opposed to a grip cover (20) on the handle bar (19),
the bent boundary between the hand rest (40) and the attaching leg (38) is formed with a hole (42) for receiving a locking block(45) fastened to the end of the throttle cable (C).

4,916,968

DEVICE FOR MOUNTING AN OPERATING LEVER FOR A GAS SPRING

Satoshi Kabaya, Yokosuka, Japan, assignor to Okamura Corporation, Yokohama, Japan

Continuation of Ser. No. 190,342, May 5, 1988, abandoned. This application Sep. 1, 1989, Ser. No. 402,791
Claims priority, application Japan, May 15, 1987, 62-71651
Int. Cl.[4] G05G *1/04*; A47C *3/00*
U.S. Cl. 74—519 5 Claims



1 A device for mounting an operating lever for a gas spring, in which said operating lever is in contact with the free end of a gas pressure control plug of the gas spring while supported on a mounting frame of a seat or the like, which comprises:
a short shaft provided at an end of said operating lever and extending perpendicular to the axis of said gas spring;
an elongated synthetic resin bearing block secured to a mounting frame;
the bearing block having opposite front and rear walls with a semi-arcuate engagement groove extending longitudinally between the front and rear walls;
the bearing block also having a mounting portion with a longitudinally extending mounting groove below said engagement groove which opens towards one of said bearing block walls for receiving a portion of said mounting frame; and
said short shaft being press fitted in said engagement groove such that it will not be readily detached therefrom.

4,916,969

ELECTRIC TROLLING MOTOR STEERING HANDLE

Peter Henning, 405 NE. First St., Belle Glade, Fla. 33430

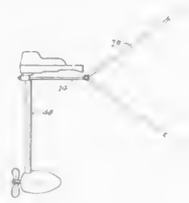
Continuation-in-part of Ser. No. 807,776, Dec. 11, 1985, abandoned, which is a continuation of Ser. No. 564,489, Dec. 22, 1983, abandoned. This application Apr. 13, 1987, Ser. No. 37,830
Int. Cl.[4] G05G *1/10*
U.S. Cl. 74—543 9 Claims

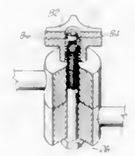
1. A steering handle attachment connected directly to the submersible shaft of electric trolling motors, said trolling motor having a propeller assembly and a control housing, comprising:
a swivel connected to one side of said submersible shaft, said submersible shaft supporting the propeller assembly of said trolling motor, said submersible shaft generally vertically positioned during operation of said trolling motor, said swivel having a freely rotatable swivel portion;

said swivel having a locking means, said locking means including a primary locking means and an auxiliary locking means, for maintaining said swivel in a predesired, locked position;

an adaptive shaft connected directly between said swivel and said submersible shaft, said adaptive shaft connected to said one side of said submersible shaft;

a control handle shaft connected to said freely rotatable swivel portion in order to adjustably connect said control handle shaft to said adaptive shaft, said control handle





shaft connected outward of said adaptive shaft in respect to said submersible shaft;

said control handle shaft being movable upward and downward to a position generally parallel to said submersible shaft;

said adaptive shaft including a clamp means connected to one end of said adaptive shaft, said clamp means connectable to said trolling motor submersible shaft; and

a mounting plate connected to said adaptive shaft between said clamp means and said swivel, said mounting plate connectable to the control housing of the trolling motor.

4,916,970

BICYCLE HANDLEBARD STEM

David K. McMurtrey, Maysville, Ky., assignor to Wald Manufacturing Co., Inc., Maysville, Ky.

Filed Jun. 22, 1989, Ser. No. 369,722
Int. Cl.[4] B62K *21/12*
U.S. Cl. 74—555.1 7 Claims

1. A stem assembly for securing the handlebars of a bicycle to a frame comprising:

a tubular barrel having a longitudinal axis, a top end and a side portion,

a head formed from a first flat sheet of sheet metal, said head having an elongated tubular neck section and a generally annular handlebar clamp section formed on one end of said tubular neck section, the opposite end of said neck section being secured to said side portion of said barrel by a generally annular contoured weld at a location spaced downwardly from said top end of said barrel, said neck section of said head being formed into a generally annular cross-sectional configuration from a portion of said flat sheet metal, which portion has a pair of opposed side edges, said opposed side edges of said neck section abutting one another in said generally annular cross-sectional configuration of said neck section, and

said abutting edges being welded together along said tubular neck section so as to impart resistance to torsional failure of said elongated tubular neck section of said stem assembly

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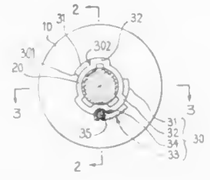
4,916,971

DEVICE FOR THE PROGRESSIVE ANGULAR ADJUSTMENT OF THE KEYING OF A STEERING WHEEL ON A SHAFT WITH A LIMITATION IN THE TRAVEL

Bernard Haldric; Gregorio Benedi, and Sylvie Baudon nee Chardons, all of Vendome, France, assignors to NACAM, Vendome, France

Filed Mar. 23, 1989, Ser. No. 327,774
Claims priority, application France, Mar. 25, 1988, 8803985
Int. Cl.[4] B62D *1/16*
U.S. Cl. 74—552 13 Claims



1. Device comprising, in combination with a steering wheel hub and a shaft terminal element for effecting a progressive angular adjustment between the steering wheel hub and the terminal element while limiting the extent of a circumferential relative travel between the hub and terminal element, locking means comprising a male cone and a female cone engaged one inside the other and a screw-and-nut axial clamping mechanism for creating a wedging between said cones for interconnecting the hub and terminal element, the device further comprising at least one groove and at least one tongue which are cooperative, complementary and extend longitudinally and adapted to engage one inside the other with confronting radial faces spaced from each other by a predetermined clearance, a toothed sector, means defining a confronting cavity for acting as a semi-bearing, and a gear pinion meshed with said toothed sector and engaged in said semi-bearing.

4,916,972

BICYCLE PEDAL AND SHOE CLIP

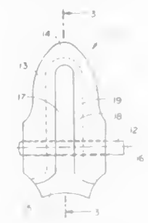
Antonio DeMartin, Ponte Della Priula, Italy, assignor to Quik-Dam Srl, Ispica, Italy

Filed Feb. 24, 1989, Ser. No. 314,795
Claims priority, application Italy, Mar. 8, 1988, 82523 A/88
Int. Cl.[4] G05G *1/14*
U.S. Cl. 74—594.6 1 Claim

1. A pedal device for a bicycle, the pedal device being comprised of:

a pedal means having an upper delimited longitudinal sliding guide means formed therein;

a sliding engagement means including a sliding means inserted in controlled sliding condition in the sliding guide means of the pedal means; and further including an attach-



ing means to fix the sliding engagement means to the shoe of the cyclist; and

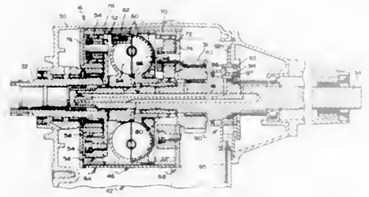
wherein the sliding guide means of the pedal means is inverted "U" shape, having a closed end, the closed end of the sliding guide means directed forwardly.

4,916,973

TORQUE BIASED DIFFERENTIAL MECHANISM

Walter K. Fuelberth, Warren, and Andrew Fedor, Jr., Livonia, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 20, 1988, Ser. No. 196,444
Int. Cl.[4] F16H *47/04, 47/08*
U.S. Cl. 475—53 1 Claim



1. A torque biased differential mechanism comprising:

a first planetary gear differential, for splitting torque, having a planetary carrier input, a first outer ring gear output, and a second sun gear output;

a hydrodynamic fluid coupling, for biasing the torque of the first and second outputs of first differential in response to the speed difference between the first and second outputs of the first differential, having a first rotor which is drivingly connected to the first outer ring gear output of the first differential and a second rotor; and

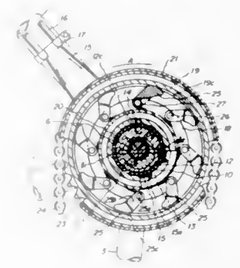
a second planetary gear set, for multiplying the speed difference between the first and second outputs of the first differential, having a first outer ring gear input which is drivingly connected to the first outer ring gear output of the first differential, a second planetary carrier input which is drivingly connected to the second sun gear output of the first differential, and a sun gear output which is drivingly connected to the second rotor of the hydrodynamic fluid coupling.

4,916,974

STEPLESS SPEED CHANGE DEVICE

Kunitoshi Kozakae, and Tohru Takeda, both of Ageo, Japan, assignors to Bridgestone Cycle Co., Ltd., Japan

Filed Feb. 12, 1988, Ser. No. 155,489
Claims priority, application Japan, Feb. 21, 1987, 62-38817; Feb. 21, 1987, 62-38818; Jan. 6, 1988, 63-426; Jan. 6, 1988, 63-427
Int. Cl.[4] F16H *3/44*
U.S. Cl. 475—166 4 Claims



4 A stepless speed change device comprising:

an eccentric cam assembly whose eccentricity is adjustable relative to a center shaft;

a carrier rotatably arranged about said eccentric cam assembly;

rotary members on input and output sides of said device, respectively; and

a plurality of friction pieces arranged in two rows, each row including a plurality of friction pieces, said friction pieces being rockably connected to said carrier such that free ends of said friction pieces in one row engage an inside of the rotary member on the input side over a substantially constant contact area and free ends of said friction pieces int he other row engage an inside of the rotary member on the output side over a substantially constant contact area;

wherein each of said friction pieces in said one row is substantially boot-shaped, a toe-shaped portion of said friction pieces in said one row being a trailing portion when said friction pieces in said one row are engaged in a substantially opposite direction as that in which said center shaft rotates, and each of said friction pieces in said other row is substantially boot-shaped, a toe-shaped portion of said friction pieces in said other row being the leading portion when said friction pieces in said other row are engaged in substantially the same direction as that in which said center shaft rotates.

4,916,975

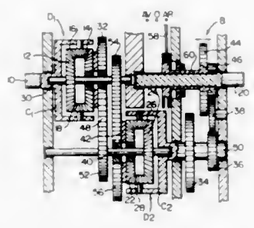
SYSTEM FOR THE CONTROL OF THE OUTPUT SPEED OF A TORQUE CONVERTER WITH TWO DIFFERENTIALS

M. Michel Combastet, 25, rue du Faubourg Saint-Honore, 75008 Paris, France

Continuation-in-part of Ser. No. 38,156, Apr. 14, 1987, Pat. No. 4,800,778. This application Jun. 20, 1988, Ser. No. 208,749
Claims priority, application France, Apr. 24, 1986, 86 05958; Jun. 22, 1987, 87 08711
Int. Cl.[4] F16H *37/06*
U.S. Cl. 475—111 19 Claims

1. A torque converter system comprising a first differential gear and a second differential gear, said first differential gear and said second differential gear each being provided with a cage, wherein the cage of the first differential gear is an input cage for receiving power from an engine motion input shaft and said cage of said second differential gear is an output cage,

said second differential gear being provided with an output shaft for driving a system output shaft, said first differential gear and said second differential gear having four planetary shafts coupled two-by-two, wherein the system output shaft is coaxial with the engine motion input shaft whereby motion is transmitted through each said differential gear by planetary shafts which were coaxial to each other and coaxial to a shaft connected, respectively, to the input cage and the output cage, whereby the motion of the planetary shafts are output on the same side, opposite each shaft which is connected to each said



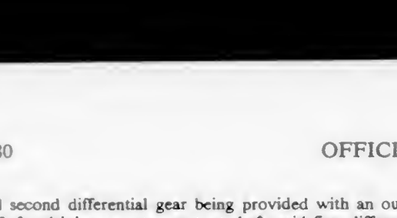
cage; said torque converter system further comprising means for obtaining a staging of fixed ratios between rotation speeds of the output shaft; means for rotating the system output shaft in one direction and in another direction; coupling means for directly connecting the input shaft and the power output shaft and disconnect means for disconnecting the connection between at least one of said first differential gears and said second differential gears and said output shaft; and means for disconnecting the system output shaft in order to obtain a deadpoint, and means for blocking rotation of the system output shaft.

4,916,976

INFINITELY CONTINUOUSLY VARIABLE DRIVE TRANSMISSION

John H. Starr, P.O. Box 332, Hustisford, Wis. 53034

Filed Jan. 30, 1989, Ser. No. 302,916
Int. Cl.[4] F16H *37/10, 37/06*
U.S. Cl. 475—115 11 Claims



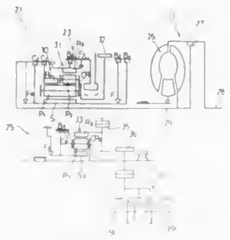
I. A device for transmitting power between an input shaft and an output shaft in a continuously, infinitely variable ratio, comprising a plurality of adhesion rollers mounted radially of said input and output shafts in diammetrically opposed relation to one another and movable radially of said shafts under centrifugal force imparted thereto by the rotation of said shafts, a pair of self-adjusting, floating disks mounted to either side of said adhesion rollers and engageable with said rollers, the said disks being movable relatively of one another and axially of said shafts to vary the radial position of said adhesion rollers relatively thereto whereby to vary the rate of rotation of said disks, and planetary gear means for coupling said input and output shafts to one another and responsive to variations in the rate of rotation of the disks to vary the speed ratio between the input and output shafts, said adhesion rollers having gear teeth formed on their radially inner surfaces and serving to positively couple said input shaft to said output shaft when said adhesion rollers are in a radially inner-most position relatively of said shafts.

4,916,977

AUTOMATIC TRANSMISSION

Hideyuki Aoki, Anjo, and Masakatsu Miura, Kariya, both of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

Filed Aug. 6, 1987, Ser. No. 83,498
Claims priority, application Japan, Aug. 11, 1986, 61-188229
Int. Cl.[4] F16H *37/08*
U.S. Cl. 475—205 4 Claims



1. An automatic transmission comprising:

a main-transmission mechanism including first and second clutches, a single planetary gear unit having a carrier, a sun gear and a ring gear, a dual planetary gear unit having a carrier, a sun gear and a ring gear, said respective carriers and sun gears of the single planetary gear unit and dual planetary gear unit being integrally connected together, an input member coupled with the ring gear of the single planetary gear unit through the first clutch and with the sun gears through the second clutch, said sun gears and ring gear of the dual planetary gear unit being able to be locked, and a counter drive gear connected to the carriers of the single and dual planetary gear units; and

a sub-transmission mechanism including one planetary gear unit, a counter driven gear connected to said planetary gear unit of the sub-transmission mechanism to transmit power from the counter drive gear of the main-transmission mechanism to the planetary gear unit of the sub-transmission mechanism, and an output pinion connected to the planetary gear unit of the sub-transmission mechanism adapted to transmit power from the planetary gear unit of the sub-transmission mechanism to a differential device, said counter driven gear being situated adjacent to the output pinion between the planetary gear unit of the sub-transmission mechanism and the output pinion,

at a low speed stage lower than a certain speed of the main-transmission mechanism, transmission edges at a low speed range being obtained by shifting the main-transmission mechanism while the sub-transmission mechanism is kept at a low speed,

at a high speed stage higher than the certain speed of the main-transmission mechanism, transmission stages at a high speed range being obtained by shifting the main-transmission mechanism while the sub-transmission mechanism is kept at a high speed, and

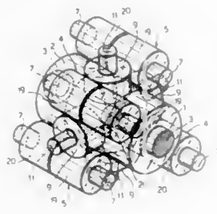
transmission stages at an intermediate speed range being obtained by shifting the sub-transmission mechanism from low speed to high speed while the main-transmission mechanism is kept at the certain speed.

4,916,978

DIFFERENTIAL DEVICE OF THE LIMITED SLIP TYPE

Giovanni B. Razelli, Turin, and Piero Buoncristiani, San Miniato, both of Italy, assignors to Ferrari Engineering S.p.A., Modena and Piaggio & C. S.p.A., Genoa, both of, Italy

Filed Oct. 31, 1988, Ser. No. 264,727
Claims priority, application Italy, Oct. 30, 1987, 67917 A/87
Int. Cl.[4] F16H *1/38, 1/42*
U.S. Cl. 475—226 12 Claims



1. A differential device of the limited slip type for motor vehicles, comprising first (1) and second (2) toothed cylindrical planet wheels having a common axis, first (4) and second (5) pairs of first cylindrical satellite gear wheels meshing respectively with said first and second planet wheels, the two gear wheels of each of said pairs being rotatable in a differential housing (6) and having axes lying respectively in a first and in a second plane orthogonal to one another and passing through said common axis, said housing (6) being coaxial with said planet wheels (1, 2), at least two parallel sets of two pairs of second satellite gear wheels (9) also rotatable on said differential housing and having axes lying in third and fourth planes orthogonal to said common axis, each of said second satellite gear wheels (9) meshing simultaneously with one of said first satellite gear wheels belonging to first of said pairs (4) and with one of said satellite gear wheels belonging to the second (5) of said pairs, in such a way that drive can be transmitted from one of said first satellite gear wheels of one of said pairs (4, 5) simultaneously to two of said first satellite gear wheels of the other (5, 4) of said pairs through a pair of said second satellite gear wheels (9).

4,916,979

ON-GRADE SHIFT LOGIC WITH PROVISION FOR SKIP DOWNSHIFTS

James M. Irwin, Rochester Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

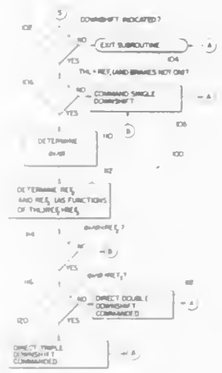
Filed Apr. 18, 1988, Ser. No. 182,546
Int. Cl.[4] G60K *41/06*
U.S. Cl. 74—866 25 Claims

1. An automated transmission system for variable speed variable acceleration vehicles having a throttle-controlled engine provided with a variable amount of fuel, a throttle controlling means having variable positions for controlling the amount of fuel supplied to the engine and a transmission having a plurality of gear ratio combinations selectively engagable between a transmission input shaft and a transmission output shaft, said transmission input shaft being operatively connected to said engine by a coupling device, said transmission system including an information processing unit having means for receiving a plurality of input signals including (1) an input signal indicative of the position of said throttle controlling means, and (2) an input signal indicative of the speed of said vehicle, said processing unit including means for processing said input signals in accordance with a predetermined logic rules to select a desirable gear ratio for a given combination of input signals and for generating command output signals whereby said transmission system is operated in accordance with said predetermined logic rules, and means associated with said transmission effective to actuate said transmission to effect engagement of one of said gear ratio combinations in response to said output signals from said processing unit, the system comprising by:

said processing unit having means for processing said input signals to provide a value indicative of the acceleration of the vehicle,

said predetermined logic rules having a subroutine, effective upon sensing conditions at which a downshift from any ratio greater than the third lowest ratio is normally required, effective to:

(i) determine a first reference value (REF 1), determine a second reference value (REF 2) variable with the position of the throttle controlling means and determine a third reference value (REF 3) variable with the position of the throttle controlling means, said second reference value greater than said third reference value;



(ii) compare the position of the throttle controlling means to said first reference value,

(iii) compare the value indicative of vehicle acceleration to said second and then said third reference values, and

(iv) if the position of the throttle controlling means is greater than said first reference value and the value indicative of vehicle acceleration is less than said second reference value but greater than said third reference value, select a direct single skip downshift

(v) if the position of the throttle controlling means is greater than said first reference value and the value indicative of vehicle acceleration is less than said third reference value, select at least a double skip downshift.

4,916,980

PLANETARY GEAR TYPE SPEED CHANGE DEVICE TO PROVIDE SIX FORWARD SPEED STAGES WITH TWO SINGLE PINION TYPE SIMPLE PLANETARY GEAR MECHANISMS

Toshiyuki Asada, Susono; Fumihiro Ushijima, Okazaki; Yasuhiko Higashiyama, and Toshitake Suzuki, both of Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 18, 1988, Ser. No. 220,801
Claims priority, application Japan, Jul. 22, 1987, 62-183030; Jun. 6, 1988, 63-138698; Jun. 10, 1988, 63-144518
Int. Cl.[4] F16H *57/10*
U.S. Cl. 475—281 7 Claims

1. A planetary gear type speed change device comprising:

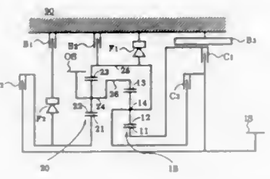
a case;

an input rotational member;

an output rotational member;

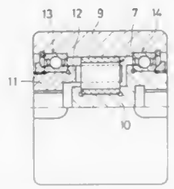
a first planetary gear mechanism having a first sun gear, first planetary pinions, a first ring gear and a first carrier;

a second planetary gear mechanism having a second sun gear, second planetary pinions, a second ring gear and a second carrier;
a first connecting member connecting said first carrier with said second ring gear;
a second connecting member connecting said second carrier with said first ring gear; and
a plurality of friction engaging means selectively engaged and disengaged for changing over a gear ratio between said input rotational member and said output rotational member, including:
a first clutch for selectively connecting said first sun gear with said input rotational member;
a second clutch for selectively connecting said second sun gear with said input rotational member;
a third clutch for selectively connecting the combination of said first carrier and said second ring gear by said first connecting member with said input rotational member;



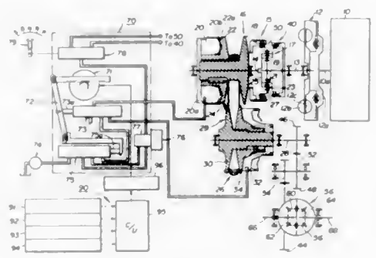
a first brake for selectively braking said second sun gear with respect to said case;
a second brake for selectively braking the combination of said first carrier and said second ring gear by said first connecting member with respect to said case;
a third brake for selectively braking said first sun gear with respect to said case; and
a one-way brake disposed in series with said first brake between said first brake and said second sun gear so as to selectively brake said second sun gear with respect to said case in a forward rotational direction when said first brake is engaged while slipping in a reversed rotational direction opposite to said forward rotational direction;
said output rotational member being connected with the combination of said second carrier and said first ring gear by said second connecting member.

4,916,981
HOLLOW ROLLER
Keiji Suzuki, and Kouichi Ueda, both of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan
Filed Nov. 18, 1988, Ser. No. 272,795
Claims priority, application Japan, Nov. 20, 1987, 62-178126[U]
Int. Cl.[4] F16H *13/06*
U.S. Cl. 475—183 **11 Claims**



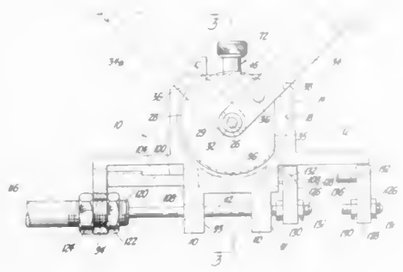
1. A thin-sectional hollow roller, disposed rotatably between a first rotatable member and a second stationary member, comprising:
a hardened outer surface;
a pair of hardened end surfaces adjacent to both sides of said hardened outer surface; and
a non-hardened soft inner surface;
whereby soft portions remain at said inner surface of the hollow roller in order to prevent said inner surface from being cracked in response to external shock.

4,916,982
IMPROVEMENTS IN CONTROLS RELATING TO ENGINE BRAKING IN A CONTINUOUSLY VARIABLE TRANSMISSION
Yutaka Suzuki, Hadano, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Dec. 22, 1988, Ser. No. 288,146
Claims priority, application Japan, Dec. 24, 1987, 62-327888
Int. Cl.[4] F16H *7/14, 9/16*
U.S. Cl. 74—866 **7 Claims**



1. In a continuously variable transmission for a motor vehicle with an engine, comprising:
a driver pulley shaft;
a follower pulley shaft arranged in parallel to said driver pulley shaft;
a driver pulley rotatable with said driver pulley shaft, said driver pulley including a first conical pulley part rotatable with said driver pulley shaft, and a second axially movable conical pulley part defining with said first conical pulley part a first pulley groove, said driver pulley including a driver pulley cylinder chamber, said second axially movable conical pulley part being displaceable in response to hydraulic fluid pressure within said driver pulley cylinder chamber toward said first conical pulley part;
a follower pulley rotatable with said follower pulley shaft, said follower pulley including a third conical pulley part rotatable with said follower pulley shaft, and a fourth axially movable conical pulley part defining with said third conical pulley part a second pulley groove, said follower pulley including a follower pulley cylinder chamber, said fourth axially movable conical pulley part being displaceable in response at least to hydraulic fluid pressure within said follower pulley cylinder chamber toward said third conical pulley part;
a V-belt extending through said first and second pulley grooves and tensioned between said driver and follower pulleys;
said first and second conical pulley parts interposing therebetween said V-belt with a gripping force determined by the hydraulic fluid pressure within said driver pulley cylinder chamber;
an actuator;
means for regulating hydraulic fluid pressure in said driver pulley cylinder chamber in response to a position taken by said actuator, thereby to vary a ratio between said driver and follower pulleys;
means for detecting various kinds of input information and generating output signals indicative of said various kinds of input information;
means receiving said output signals for adjusting the magnitude of said gripping force in response to said output signals of said detecting means,
said adjusting means including means for activating said actuator in response to said output signals, means for detecting a demand for an engine brake running of the motor vehicle, and means for effecting a reduction in magnitude of said gripping force upon detecting said demand for the engine brake running of the motor vehicle.

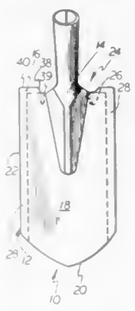
4,916,983
OVERRIDE CONTROL FOR VEHICLE DRIVE TRAIN
Bruce E. Amrein, Bel Air, Md.; George Melnik, Newark, Del.; Curtis L. McCoy, Apg, Md., and James A. Martin, Lancaster, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Nov. 7, 1988, Ser. No. 268,827
Int. Cl.[4] B60K *41/04*
U.S. Cl. 74—878 **20 Claims**



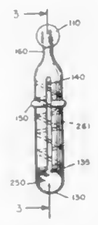
14. A control device comprising:
a plurality of rotatable plates, each plate having a remote edge further from the plate rotational axis than a proximal edge;
a means for mounting the plates wherein the rotational path of a first plate's remote edge intersects the rotational paths of second and third plates' remote edges, the rotational paths of each proximal edge on any one plate being removable from the rotational path of all edges on any other plate;
a means for rotating the second plate;
a means for rotating the third plate.

4,916,984
SHOVEL BLADE AND METHOD OF MANUFACTURE
Barry R. Albert, 203 S. Filey's Rd., Dillsburg, Pa. 17019
Division of Ser. No. 169,511, Mar. 17, 1988, abandoned. This application Nov. 8, 1988, Ser. No. 270,471
Int. Cl.[4] B21D *53/66*
U.S. Cl. 76—113 **2 Claims**

1. A method of forming a relatively narrow width shovel blade comprising the steps of;
trimming a relatively wide shovel blade to produce the relatively narrow width blade;
forming in the blade a pair of longitudinally extending slots spaced on either side of and substantially adjacent to a blade socket; and
bending each edge portion of the blade along a line perpendicular to and disposed radially outwardly of the longitudinally extending slots to form a platform step along the upper edge of the blade on either side of the socket.

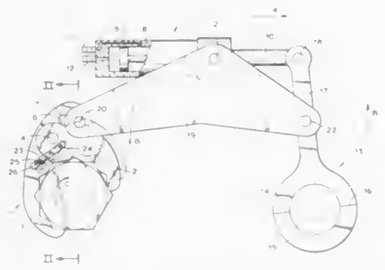


4,916,985
APPARATUS FOR REMOVING A SOFT STOPPER FROM A CONTAINER
Richard C. K. Yen, 4261 Chase Ave., Los Angeles, Calif. 90066
Filed Aug. 31, 1989, Ser. No. 401,186
Int. Cl.[4] B67B *7/02*
U.S. Cl. 81—3.45 **22 Claims**



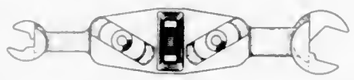
1. An apparatus for removing a soft stopper from a container, comprising:
a. a thin walled hollow generally cylindrical body having a first side which is longer than its opposite second side thereby terminating in a bottom extending at an upward angle from the lower tip of the first side to the lower tip of the second side;
b. the top of the thin walled hollow generally cylindrical body extending into a neck member whose diameter is narrower than the diameter of said thin walled hollow generally cylindrical body;
c. a transverse handle member attached to said neck member at a location remote from the top of the thin walled hollow generally cylindrical body;
d. a longitudinal slit in the wall of said thin walled hollow generally cylindrical body extending from the lower tip of the second side for most of the length of the body;
e. a fixed broken ring extending around the circumference of said thin walled hollow generally cylindrical body at a location remote from the bottom of the body, the break in the ring aligned with the longitudinal slit in the wall of the thin walled hollow generally cylindrical body; and
f. an inwardly extending spiral thread extending from the interior surface of said thin walled hollow generally cylindrical body and winding from the bottom of the body upwardly beyond the location of said broken ring.

4,916,986
FLUID OPERATED WRENCH
John K. Junkers, 7 Arrowhead La., Saddle River, N.J. 07458
Filed May 19, 1988, Ser. No. 196,384
Int. Cl.[4] B25B *13/00*
U.S. Cl. 81—57.39 1 Claim



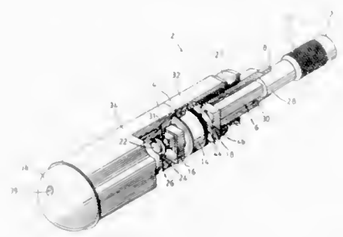
1. A fluid operated wrench for tightening or loosening threaded connectors, comprising drive means performing a forward and a rearward stroke; an abutment element arranged to abut against a neighboring object; an engaging element arranged to engage and turn a threaded connector, said drive means, said abutment element and said engaging element being connected with one another so that when said drive means performs said forward stroke and said abutment element abuts against a neighboring object, said engaging element turns a threaded connector and at the same time a reaction force produced during said forward stroke pushes said engaging element onto the threaded connector, said engaging element including two engaging members which are arranged to surround a threaded connector at its opposite sides and connected with one another movably between a fixed position in which said engaging members fixedly engage a threaded connector for tightening and loosening the same, and a released position in which at least one of said engaging members is released from the threaded connector; and an elongated opening formed in one of said engaging members of said engaging element, a guiding surface formed in the other of said engaging members of said engaging element, a pin displaceable by said drive means in said elongated opening of said one engaging member while being guided on said guiding surface of said other engaging member, said elongated opening of said one engaging member and said guiding surface of said other engaging member having a substantially curved contour.

4,916,987
ADJUSTABLE OPEN END WRENCH, 15 DEGREE DUAL HEAD
Don Le Duc, 2405 Alvarado Dr., Santa Clara, Calif. 95051
Filed Nov. 2, 1989, Ser. No. 430,373
Int. Cl.[4] B25B *13/16*
U.S. Cl. 81—77 1 Claim



1. A wrench comprising two substantially flat wrench-halves each having a jaw at each end of a narrowed neck portion connected to a centered handle portion, and each wrench half having a sliding side for engagement with each other for slidable sideways movement;
each jaw having a shoulder on the sliding side of its corresponding wrench half, said shoulders lying perpendicular to a longitudinal centerline of the tool, at the transition of said neck portions to provide guides for said slidable side movement;
said handle portions each having a recess in the sliding side thereof, each recess having a bottom surface, and a rectangular cutout centered between a pair of angularly equal slanted slots all located in the bottom surface of each recess,
an actuator consisting of a spindle that has a left-hand threaded portion on one end and a right-hand threaded portion on its other end, and a knurled wheel centered on said spindle, said knurled wheel being located in said rectangular cutouts;
first and second wedge pins each having a circular portion, a diamond shaped portion on both sides of said circular portions, and a threaded stud portion extending from each diamond shaped portion;
said circular portions being threaded to respective opposite ends of said spindle, said diamond shaped portions extending within a respective slanted slot;
a pair of slanted guideways provided in an exterior side of each of said handle portions, each guideway being centered over a respective slanted slot;
a long and thin washer extending in each slanted guideway, and having a center clearance hole for mounting over a respective threaded stud portion to cover said slanted slots over the entire wrench adjustment;
a retainer engaging each threaded stud portion for assembling said two wrench-halves.

4,916,988
RATCHET SCREWDRIVER
Harold J. Robertson, Waterloo, and Richard D. Cluthe, Wallenstein, both of Canada, assignors to The George Cluthe Manufacturing Company Limited, Waterloo, Canada
Filed Dec. 20, 1988, Ser. No. 286,807
Claims priority, application Canada, Feb. 10, 1988, 558651
Int. Cl.[4] B25B *13/00*
U.S. Cl. 81—58.3 37 Claims

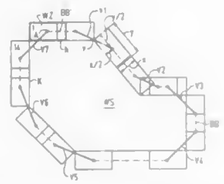


1. A ratchet driver comprises a handle concentrically mounted on a shaft, said shaft protruding from one end of said handle and having means for removably mounting a head at a free end thereof said head rotating as said shaft rotates, with means to retain said shaft partially within said handle, a magnetic clutch assembly being located within said handle between said handle and said shaft, with externally accessible switching means to alternately switch the clutch assembly within a clutch zone from a first position to a second position and vice-versa so that:
(a) when the clutch assembly is in the first position, the handle will be in a fixed relationship with the shaft when the handle is turned in a clockwise direction but will rotate relative to the shaft when the handle is turned in a counterclockwise direction; and
(b) when the clutch assembly is in the second position, the handle will be in a fixed relationship with the shaft when the handle is turned in a counterclockwise direction but will rotate relative to the shaft when the handle is turned in a clockwise direction.

4,916,989
STRIP TENSIONING SYSTEM FOR A STRIP PEELING MACHINE
Robert L. Brown, Boston, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Nov. 3, 1988, Ser. No. 266,773
Int. Cl.[4] B23B *5/00*
U.S. Cl. 82—48 13 Claims

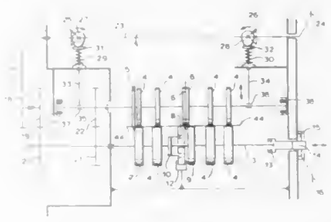
12. The method of tensioning a peeled strip as in claim 11 wherein the shape is controlled by adjusting an angle at which the strip is removed from the billet.

4,916,990
METHOD FOR CONTROLLING THE PATH OF A PUNCHING TOOL
Stefan Dolansky, Nuremberg; Guenter Broemer, Spardorf, and Volker Reetz, Bad Karlshafen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Fed. Rep. of Germany
Filed Dec. 6, 1988, Ser. No. 280,567
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743869
Int. Cl.[4] B23Q *15/14, 15/24*
U.S. Cl. 83—34 2 Claims



1. A method for the numerical control of the path of a polygonal punching tool of a punch press, where the tool can be rotated about an axis of rotation in the punching direction in such a manner that the cutting edge of the tool can be guided tangentially along the contour of a workpiece, having a plurality of corners comprising the steps of:
setting the contour (K) of the workpiece (WS), the polygon dimensions (x, y) specific to the tool (WZ) and the position of the axis of rotation (x/2, y/2) of the tool (WZ) into a control (ST);
in response to a command defining a machining direction for bringing about the punching operation, generating an equidistant motion path (BB) for the tool (WZ) which is at a constant distance between the axis of rotation of the tool (WZ), and the contour (K) of the workplace (WS);
determining the points (1-14) on the equidistant motion path (BB) by the control (ST), at which the front (v) or the rear corner (h) of the cutting edge, respectively, as seen in the machining direction, reaches each corner of the contour (K) of the workpiece (WS);
defining path points of the-equidistant motion path (BB) obtained before and after each corner to define the starting and end point of a linear translation track (V1 to V7) associated with each respective corner of the contour, wherein each path point defines the axis of rotation of the tool (K); and
forming a resulting path of the tool (WZ) by adding the linear translation tracks (V1 to V7) to sections of the equidistant motion track (BB), the translation tracks (V1 to V7) being traversed with the tool (WZ) being lifted off the work piece (WS).

4,916,991
DEVICE FOR PUNCHING AND LONGITUDINAL CUTTING OF A WEB PROCESSED IN A ROTARY FOLDER
Klaus Hertrich, Göhrenz, German Democratic Rep., assignor to VCB Kombinat Polygraph Werner Lamberg, Fed. Rep. of Germany
Filed Jun. 25, 1987, Ser. No. 67,225
Claims priority, application German Democratic Rep., Aug. 27, 1986, 293881
Int. Cl.[4] B26D *1/22*
U.S. Cl. 83—302 4 Claims

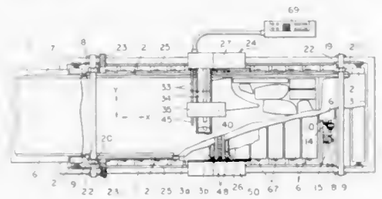


1. Device for perforating and longitudinal cutting a web processed in a rotary folder, comprising a frame supporting for rotation two pairs of web feeding rollers, each of said feeding rollers including a set of feed rolls fixedly arranged in a spaced relation one to another on a shaft; an edge trimming blade and a perforating blade fixedly arranged on one shaft in a first pair; a counter blade and a counter roll assembly arranged on the other shaft of said first pair and cooperating, respectively, with said edge trimming blade and said perforating blade; said counter roll assembly including a carrier secured to said other shaft and supporting for rotation axially shiftable coplanar counter rolls, means attached to said frame for holding said coplanar counter rolls a small distance from one side of said perforating blade, and a counter roll secured to said other shaft opposite the other side of said perforating blade; means arranged on said frame for adjusting in each of said pairs the spacing of said one shaft relative to the other shaft; and means arranged on said frame for adjusting axial position of said other shaft relative to said one shaft to finely adjust the working position of said counter blade and said counter roll assembly.

4,916,992
APPARATUS FOR CUTTING LAMINATED SHEET MATERIAL
Nobuo Nasu, Fukuyama, Japan, assignor to Kabushiki Kaisha Kawakami Seisakusho, Hiroshima, Japan
Filed May 19, 1989, Ser. No. 354,510
Claims priority, application Japan, May 31, 1988, 63-131389
Int. Cl.[4] D06H *7/00*; B27D *5/20*
U.S. Cl. 83—422 3 Claims

1. An apparatus for cutting a laminate of sheet material upper and lower surfaces of which are covered with an air-impermeable sheet, comprising:

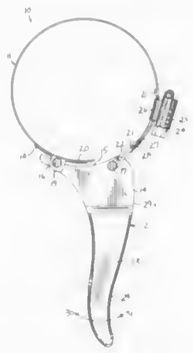
a frame;
a support belt supported on said frame for reciprocating horizontally in a longitudinal direction of said frame and having a support portion for supporting the laminate of sheet material;
a number of support plates arranged side by side in the longitudinal direction of said frame and retained thereon so as to be lowerable independently of one another, said support plates supporting a lower surface of the support portion of said support belt;
suction port members disposed on opposing side portions of said frame and extending in the longitudinal direction for applying suction to side faces of the laminate of sheet material supported on the support portion of said support belt and having its upper and lower surfaces covered with the air-impermeable sheet;
a travelling body supported on said frame for reciprocating in the longitudinal direction;
a cutter head supported on an upper portion of said travelling body for reciprocating in a transverse direction;
a downwardly extending cutter mounted on said cutter head for being raised and lowered so as to penetrate the laminate of sheet material, said cutter being turnable about a vertical axis;



recess forming rollers arranged in opposed relation below said cutter head of said travelling body and extending in the transverse direction for forming the support portion of said support belt into a transversely extending movable recess having an upper surface which is open;
a lower receiving member secured to said travelling body and arranged in parallel with said recess forming rollers within the movable recess, said lower receiving member having a groove-shaped cross section;
a number of interconnected closure plates accommodated within said receiving member for reciprocating in the transverse direction in synchronization with said cutter head;
a cutter receiving sleeve fitted between closure plates so as to be capable of supporting a tip of said cutter, said cutter receiving sleeve being turnable about a vertical axis in synchronization with said cutter; and
a cam plate provided on said travelling body for lowering said support plates to a level below the movable recess of said support belt;
upper surfaces of the support portion of said support belt, said lower receiving member, said closure plates, and said cutter receiving sleeve being made substantially flush with an identical horizontal plane.

4,916,993
ADJUSTABLE OIL FILTER WRENCH
Gary J. Siekawitch, 2222 3rd Ave. SW., Rochester, Minn. 55902
Filed Nov. 14, 1988, Ser. No. 270,615
Int. Cl.[4] B25B *13/52*
U.S. Cl. 81—64 **5 Claims**

1. An oil filter wrench comprising a substantially circular strap means for encircling engagement of an oil filter canister including a metallic strap of a predetermined width including a series of slots spaced along said strap means, and
said strap means including a fixed first end and a relatively movable second end with a housing overlying said second end for overlying said slots and for effecting movement of said second end relative to said first end upon rotation of a worm screw rotatably mounted within said housing, and
elongate handle means including a saddle means pivotally mounted thereto for securing said first end to said handle means at a first position, and
said elongate handle means including an arcuate concave recess at an upper terminal end thereof for enabling pivotment of said saddle means relative to said recess and wherein said saddle means overlie said arcuate concave recess, and a bifurcated flexible outer strap securing said housing to said handle means at a second and said housing secured adjacent a remote terminal end of said outer strap spaced from siad handle means,
wherein said bifurcated flexible outer strap includes a first leg and a second leg wherein said first and second legs are



pivotally secured to aligned second bosses, wherein said second bosses project orthogonally relative to said handle means, and said saddle means includes a plurality of legs projecting downwardly from said saddle means straddling said handle means and pivotally secured to respective aligned first bosses projecting orthogonally relative to said handle means wherein said first bosses are positioned proximate a first end of said arcuate recess and said second bosses are positioned proximate a second end of said arcuate recess remote from said first and adjacent opposite respective ends of said arcuate recess, and
wherein said housing means further includes an underlying band wherein said underlying band has integrally secured therewithin a terminal end portion of said bifurcated flexible outer strap remote from said second bosses and slidingly accepts therethrough said second end of said strap means.

4,916,994
MITER TABLE FOR PORTABLE POWER SAW
David G. Hatala, 9329 Jackson St., Philadelphia, Pa. 19114
Filed Aug. 24, 1988, Ser. No. 235,417
Int. Cl.[4] B27B *5/16, 9/04*
U.S. Cl. 83—763 **7 Claims**

1. A portable device for controlling the travel of a circular power saw while cutting wood board, comprising
(1) a circular base having a flat upper surface
(a) intended to removably rest on a fixed surface during a cut,
(b) having on its upper surface a straight edge raised element intended to position a wood board on the base,
(c) having support means on the outer circumference of the base; and
(2) an outer member having a flat upper surface

(a) an interior circular opening conforming in diameter to the outer diameter of the base,
(b) an outer circumference extending beyond the interior opening,
(c) support means on the interior circular opening intended to cooperate with the support means on the base for rotatably journalling the outer member on the base, and
(d) a pair of horizontal parallel tracks extending above the base and supported at both ends from the outer member

(1) the tracks having a horizontal surface on which the circular power saw can be slidably supported, and
(2) vertically extending portions of the track which laterally restrain movement of the circular power saw while it is positioned horizontally along the tracks;
whereby cuts at different angles can be made through a wood board by a circular saw in a guided manner, by selectively rotationally adjusting the outer member and tracks with respect to the base wherein said flat upper surfaces lie in the same plane.

4,916,995
ELECTRICAL GUITAR
Alejandro S. Soler, No. 22 Coconut Street, Valle Verdi IV Pasig, Metro Manila, Philippines, and Gerardo V. Boromeo, N. Escario Street, Cebu City, Metro Manila, Philippines
Filed Jan. 23, 1989, Ser. No. 300,358
Int. Cl.[4] G10D *3/02*
U.S. Cl. 84—291 **14 Claims**

1. An improved guitar, wherein said improvement comprises:
a plurality of seashell segments affixed to the body of said guitar to form an exterior surface on said guitar for improving the sustained acoustical responses of said guitar

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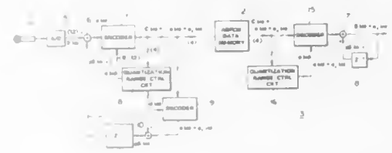
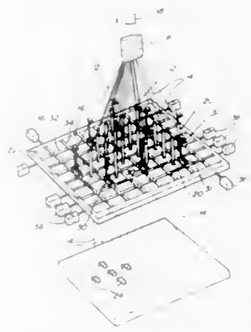
4,916,996
MUSICAL TONE GENERATING APPARATUS WITH REDUCED DATA STORAGE REQUIREMENTS
Hideo Suzuki; Masaki Kudo, and Yasushi Kurakake, all of Hamamatsu, Japan, assignors to Yamaha Corp., Hamamatsu, Japan
Filed Apr. 13, 1987, Ser. No. 37,510
Claims priority, application Japan, Apr. 15, 1986, 61-86832; Apr. 15, 1986, 61-86833; Apr. 15, 1986, 61-86834; Apr. 15, 1986, 61-86835
Int. Cl.[4] G10H *1/057, 1/06, 7/00*
U.S. Cl. 84—603 **41 Claims**



1. A musical tone generating apparatus for an electronic musical instrument comprising:
(a) memory means for storing a series of compressed waveform data therein, said series of compressed waveform data being obtained by compressing a series of waveform data representative of instantaneous values of a waveform of a musical tone by use of a predictive coding method and a differential quantization method;
(b) reading means for reading said series of compressed waveform data from said memory means; and
(c) decoding means for decoding said read series of compressed waveform data by methods corresponding to said predictive coding method and said differential quantization method to obtain a series of decoded waveform data, said musical tone being reproduced based on said series of decoded waveform data.

4,916,997
METHOD FOR MAKING 3D FIBER REINFORCED METAL/GLASS MATRIX COMPOSITE ARTICLE
Raymond G. Spain, Farmington Hills, Mich., assignor to Airfoil Textron Inc., Lima, Ohio
Continuation-in-part of Ser. No. 191,435, May 9, 1988, abandoned. This application May 10, 1988, Ser. No. 192,157
Int. Cl.[4] D04C *1/06;* **B29B** *11/14;* **B29C** *43/00*
U.S. Cl. 87—1 **23 Claims**



1. A method of making a composite article, comprising:
(a) arranging a plurality of braiding fiber bundles, each

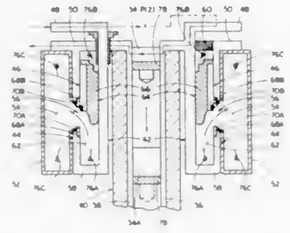
comprising a reinforcing fiber overwrapped by a plurality of matrix-forming fibers, to extend from a braiding device,
(b) arranging a plurality of stuffer fiber bundles, each comprising a reinforcing fiber overwrapped by a plurality of matrix-forming fibers, to extend from said braiding device,
(c) moving the braiding fiber bundles in a braiding pattern relative to one another and to the stuffer fiber bundles to intertwine the braiding fiber bundles with one another and with the stuffer fiber bundles to form a braided preform, and
(d) subjecting the braided preform to a temperature and a pressure to form the matrix-forming fibers into a matrix in which the reinforcing fibers are disposed, including substantially preventing contact between the reinforcing fibers of different braiding fiber bundles and stuffer fiber bundles as a result of each reinforcing fiber being overwrapped by the matrix-forming fibers.

4,916,998

ELECTRIC SWITCH AND INTEGRATED SWITCH-PREACCELERATOR SYSTEM FOR AN ELECTROMAGNETIC PROJECTILE LAUNCHER

Jiing-Liang Wu, Murrysville Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 22, 1988, Ser. No. 209,816
Int. Cl.[4] F41F *1/02*
U.S. Cl. 89—8 **25 Claims**



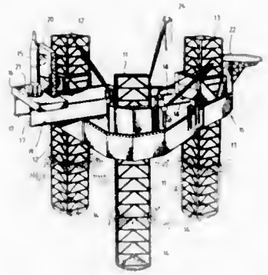
1. An integrated switch-preaccelerator system for use in an electromagnetic launcher, said system comprising:
(a) a pair of spaced generally parallel preaccelerator rails; and
(b) a linear mechanical switch of cylindrical configuration enclosing and extending axially along said rails, said switch being operable to commutate current from a first path wherein current flows through said switch in opposite directions along path segments spaced from one another and coaxially arranged about said rails to a second path wherein current flows across said rails through a solid armature being supported between said preaccelerator rails;
(c) said switch including a plurality of coaxially arranged conductive tubular members enclosing and extending axially along said rails, one of said tubular members being movable relative to the other of said tubular members from conducting to non-conducting positions for causing said switch to commutate current from said first to second paths.

4,916,999

OFFSHORE LAUNCHING SYSTEM

C. R. Palmer; Robert A. Keller, both of Houston, and Daniel F. McNease, Spring, all of Tex., assignors to Rowan Companies, Inc., Houston, Tex.

Filed Oct. 27, 1988, Ser. No. 263,625
Int. Cl.[4] F41F *3/04*
U.S. Cl. 89—1.815 **28 Claims**



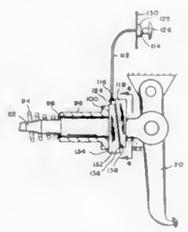
21. A method of offshore launching of rocket vehicles or the like, comprising the steps of:
(a) loading a rocket vehicle onto a floating barge from an on-shore structure;
(b) propelling the floating barge away from said structure and to an offshore rocket launch location;
(c) extending jack-up legs from said barge to ocean bottom to raise the barge to an above-water position and to secure the barge in a fixed position;
(d) and thereafter launching said rocket vehicle from said barge.

4,917,000

ADJUSTABLE RETURN SPRING FOR A PUSH ROD

Douglas A. Fecher, Granger, Ind., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Mar. 14, 1988, Ser. No. 168,037
Int. Cl.[4] F15B *9/12*
U.S. Cl. 91—369.2 **5 Claims**



1. In a vacuum brake booster operated by an input force applied to a brake pedal by an operator, said input force operating a control valve located in a bore of a hub member carried by a movable wall, said control member allowing an operational fluid to be presented to the brake booster to develop an output force corresponding to said input force, the improvement in a linkage connecting said brake pedal with said control valve comprising:
a push rod connecting said brake pedal with said control valve;
a sleeve surrounding a portion of said push rod, said sleeve having a first end and a second end;

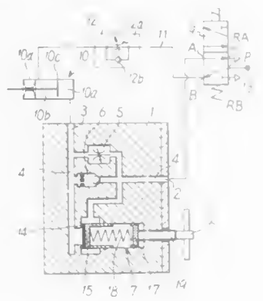
a resilient member having a first end connected to said hub and a second end connected to said second end of said sleeve;
a washer located between said second end of said resilient member and said second end of said sleeve to uniformly transfer the force of said resilient member into said sleeve;
a plurality of radial projections through which the force from said resilient member is transferred into said push rod; and
adjustment means through which said first end of said sleeve is connected to said push rod for urging said control valve against a stop, said adjustment means allowing the operator to change the load on said resilient means and thereby select an input force to initiate the operation of the control valve.

4,917,001

DRIVE CONTROL VALVE FOR CONSTANT SPEED

Akihisa Yoshikawa; Kunio Watanabe, and Akira Saeki, all of Soka, Japan, assignors to SMC Corporation, Tokyo, Japan

Filed Oct. 14, 1988, Ser. No. 257,544
Claims priority, application Japan, Oct. 16, 1987, 62-261482
Int. Cl.[4] F15B *11/08, 13/04*
U.S. Cl. 91—447 **8 Claims**



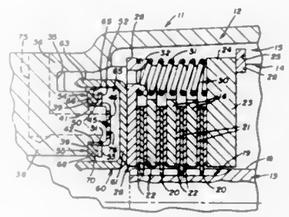
1. A drive control valve for constant speed, which controls drive of a pneumatic actuator having a pressure chamber, comprising:
a supply/discharge port for supplying and discharging a pneumatic pressure fluid;
an outlet port connected to said pressure chamber of said actuator;
a passage having an outlet port side, said passage communicating said pneumatic pressure fluid between said supply/discharge port and said outlet port;
a nonreturn valve having means for blocking a pneumatic fluid flow from said outlet port to said supply/discharge port, said nonreturn valve being provided in said passage; and
a valve having means for controlling said pneumatic fluid flow, said valve being provided in said passage in parallel with said nonreturn valve;
wherein said valve for controlling said pneumatic fluid flow comprises a relief valve having means for controlling said pneumatic fluid pressure at the outlet port side of said passage to a constant setting pressure and having means for adjusting said setting pressure;
whereby the flow rate of air discharged from said pressure chamber is constant and the pneumatic actuator is driven at a constant speed.

4,917,002

ACTUATING PISTON ASSEMBLY, AND COMPONENTS THEREOF, FOR TORQUE TRANSMITTING SYSTEMS

Michael B. Pociask, Martinsville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 8, 1988, Ser. No. 281,362
Int. Cl.[4] F01B *31/00*
U.S. Cl. 92—107 **5 Claims**



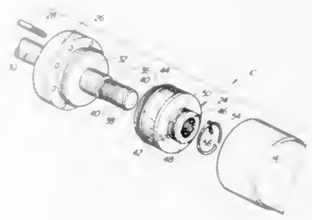
1. A seal retainer for securing sealing means in cooperative interaction with an actuating piston in a friction disk, torque transmitting system, said seal retainer comprising:
a substantially planar, annular web portion having a radially outer periphery and a radially inner boundary;
an outer rim presented from the radially outer periphery of said planar web portion, said outer rim being disposed substantially perpendicularly with respect to said planar web portion;
an inner rim presented from the radially inner boundary of said planar web portion, said inner rim being disposed substantially perpendicularly with respect to said planar web portion to be oriented substantially concentrically of said outer rim;
a plurality of circumferentially spaced blocking flanges extending radially outwardly from said outer rim; and,
a plurality of circumferentially spaced blocking flanges extending radially inwardly from said inner rim.

4,917,003

PISTON TO ROD MOUNTING ASSEMBLY

Robert J. Kollross, Wausau, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Jul. 11, 1988, Ser. No. 217,600
Int. Cl.[4] F16J *1/04*
U.S. Cl. 92—220 **1 Claim**



1 A piston and piston rod assembly for reciprocation within a cylinder comprising:
a removable end wall assembly secured to one end of said cylinder;
a piston rod having a portion that is threaded and an unthreaded end portion having a plurality of circumferentially spaced recesses therein, said piston rod extending through said removable end wall assembly;
an annular piston having an outer larger diameter portion

which is in sealing engagement with an inner wall of said cylinder and an inner smaller diameter portion having a threaded interior which mates with the threaded portion of said piston rod;

said inner portion of said piston includes an exterior periphery which extends from a face of said outer portion, and said exterior periphery having a groove and a plurality of spaced openings therein;

means for connecting the end portion of said piston rod to the inner portion of said piston; and

said connecting means includes a locking pin which extends through one of said openings in said piston inner portion into one of said recesses in said piston rod end portion, a compression ring pivotally attached to said locking pin, and said compression ring engages said groove in the exterior periphery of the inner portion of said piston.

4,917,004

ROBOT TRAVELING DUCT FOR CLEAN ROOM

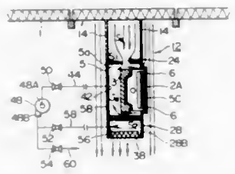
Kenji Okamoto, and Yoshiyuki Iwasawa, both of Tokyo, Japan, assignors to Shimizu Construction Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1989, Ser. No. 311,914

Claims priority, application Japan, Feb. 18, 1988, 63-36292

Int. Cl.[4] F24F *9/00*

U.S. Cl. 98—40.1 5 Claims



1. A robot traveling duct for clean room in which a vertical laminar flow of air is produced from a ceiling filter toward a floor thereof, and in which the robot traveling duct is arranged within the clean room and below the ceiling filter and surrounds a guide rail of the robot, the robot traveling duct including a longitudinal opening for connection between the guide rail and the robot, comprising:

first enclosure means for enclosing the guide rail to extend along the guide rail, the first enclosure means including air intake means for introducing air, issuing from the ceiling filter, into the first enclosure means,;

second enclosure means mounted to the first enclosure means to be located below the first enclosure means, the second enclosure means including a second enclosure filter for filtering air therein and issuing the filtered air downwards into the clean room, the second enclosure extending along the guide rail and being equal in width to the first enclosure means; and

air forcing means for forcing air from the first enclosure means into the second enclosure means, whereby a laminar air flow is substantially produced just below the second enclosure means by actuating the air forcing means.

4,917,005

BEVERAGE BREWER WITH BREWING TEMPERATURE INTERLOCK

John T. Knepler, Chatham, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.

Filed Jun. 9, 1989, Ser. No. 364,974

Int. Cl.[4] A47J *31/00*

U.S. Cl. 99—280 11 Claims

1. A beverage brewing apparatus comprising:

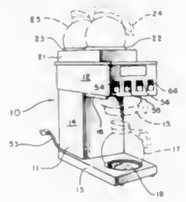
a hot water reservoir;

inlet means for admitting cold water into said reservoir;

a resistance heating element within the reservoir operable from an applied electric current for heating water in the reservoir;

dispensing means including user-actuable solenoid valve for dispensing heated water from the reservoir;

temperature sensing means for producing a signal indicative of the temperature of the water in said reservoir; and



interlock circuit means responsive to said temperature-indicative signal for inhibiting the operation of said valve when the temperature of the water in said reservoir falls below a predetermined minimum brewing temperature.

4,917,006

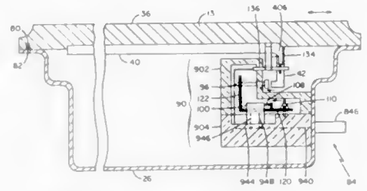
EXPANSION THERMOSTAT FOR COOKING GRILL

Robert F. Bowen, Burlington; Kenneth W. Dudley, Sudbury, and Joseph C. Maiellano, Jr., Chelmsford, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 23, 1988, Ser. No. 197,716

Int. Cl.[4] A47J *27/62;* **H05B** *1/02;* **H01H** *37/46*

U.S. Cl. 99—331 17 Claims



1. A cooking apparatus comprising:

food supporting means for supporting food to be cooked;

a heat source for cooking said food on said supporting means;

said supporting means expanding in response to said heat source; and

means responsive to the expansion of said supporting means for controlling said heat source.

4,917,007

JUICING APPARATUS

Stewart C. Nelson, Forest Hills, N.Y., assignor to The Automatic Orange Juicer Corporation, Forest Hills, N.Y.

Filed Sep. 6, 1989, Ser. No. 403,603

Int. Cl.[4] B23N *1/02;* **B30B** *9/02*

U.S. Cl. 99—509 17 Claims

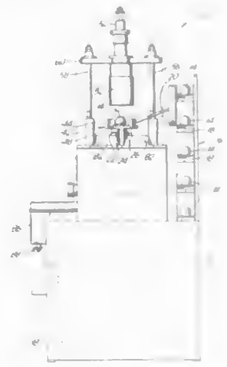
1. A juicing apparatus for expressing juice from citrus fruits, said apparatus comprising:

a convex truncated cone having a major diameter bottom and a minor diameter top, said top defining a generally annular knife, a plug tube extending downwardly through the convex cone from the circular knife thereof;

centering means for supporting a fruit on the circular knife;

a plurality of spaced apart sectioning knives disposed in proximity to the circular knife and generally radially aligned thereto;

a press means for urging the fruit downwardly toward the convex cone such that a generally cylindrical central plug is cut from the fruit and such that portions of the fruit disposed outwardly from the cylindrical plug are cut into sections by the sectioning knives, said press means being



operative to urge the sections of fruit against the convex cone to express juice therefrom;

means for collecting the expressed juice; and

means for ejecting the sections of fruit away from the cone after the juice has been expressed therefrom.

4,917,008

BALING MATERIAL AND BALING DEVICE FOR MAKING BALED ARTICLES

Leonardus J. van den Wildenberg, Budel, Netherlands, assignor to P.J. Zweegers en Zonen Landbouwmachinefabriek B.V., Netherlands

Filed Jul. 25, 1988, Ser. No. 223,444

Claims priority, application Netherlands, Aug. 21, 1987, 8701973

Int. Cl.[4] B65B *63/04, 13/02;* **B65D** *71/00*

U.S. Cl. 100—5 12 Claims

9. A baling device comprising a plurality of feed belts defining a generally cylindrical wrapping chamber, means for feeding a strip of crop material into said chamber to engage said feed belts, said feed belts being arranged to form said strip of crop into a generally cylindrical bale having a circumference and being of predetermined length and having opposite end faces including outer peripheral portions, a source of baling material comprising an elongated strip of baling material having a length and a longitudinal direction extending along the length of the strip, said strip having a width greater than said predetermined length of the bale, said strip having opposite longitudinal edge portions which are elastic in the longitudinal direction and each of which includes an elastic element extending in the longitudinal direction of the strip, and supply means for supplying said strip to said feed belts so that the strip is wrapped around said bale with the opposite longitudinal edges of the strip extending generally radially inwardly of the bale to cover at least the outer peripheral portions of each of the end faces of the bale.

4,917,009

METHOD AND APPARATUS FOR CONTINUOUSLY DEWATERING SLUDGE, FRUITS AND VEGETABLES AND WASTES OF PROCESSED FRUITS AND VEGETABLES

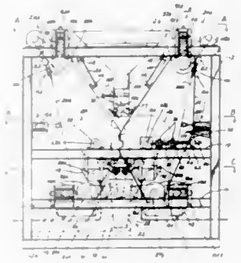
Masahiko Edo, 6-9-2 Kurokami, Kumamoto, Kumamoto, Japan

Filed Aug. 16, 1988, Ser. No. 232,683

Claims priority, application Japan, Mar. 11, 1988, 63-59071; Mar. 11, 1988, 63-59072; Jun. 21, 1988, 63-153881

Int. Cl.[4] B30B *9/24, 9/20*

U.S. Cl. 100—118 1 Claim



1. A continuous dewatering apparatus for dewatering objects such as sludge, fruits and vegetables and wastes of processed fruits and vegetables, comprising:

first and second dewatering drum gears meshing with each other at a meshing location and rotatably disposed within a frame;

a main driving unit for driving said dewatering drum gears;

first and second roller groups disposed on said frame adjacent to said dewatering drum gears respectively for rotation with said drum gears;

first and second endless filter cloth belts stretched around respectively said first and second dewatering drum gears and said roller groups, respectively;

a charging hopper disposed above said meshing location of said said dewatering drum gears to receive said objects to be dewatered; and

collecting means disposed vertically below said dewatering drum gears for collecting water drained from said dewatering drum gears,

each of said dewatering drum gears having a plurality of teeth formed on the periphery thereof with at least some of said teeth having a crest and with bottom lands being provided between adjacent said teeth and water passages formed through the crests and bottom lands,

said objects to be dewatered being charged into said charging hopper and compressed under meshing pressure of said dewatering drum gears so that water contained in said objects is separated from said objects and drained through said endless filter cloth belts into said drum gears and then to the outside of said continuous dewatering apparatus;

said apparatus further comprising annular soft rubber members each stretched along a side edge of one of said first and second endless filter cloth belts, said annular soft rubber members elastically and inwardly tightening said one belt and rotating together with said one belt around the corresponding one of said first and second dewatering drum gears and the corresponding one group of said first and second roller groups, to prevent the dewatered cakes

and separated water of said objects from flowing sideward from said dewatering drum gears meshing with each; and contact position regulating mechanisms for regulating the contact positions of said annular soft rubber members with respect to the side edge portions of said one filter cloth belt, said contact position regulating mechanisms being provided on the traveling paths of said annular soft rubber members at least above said meshing location of said dewatering drum gears and having guide rollers rotatably contacting with said soft rubber members.

4,917,010

FRANKING MACHINE WITH VARIABLE AND FIXED DATA THERMAL PRINTHEAD

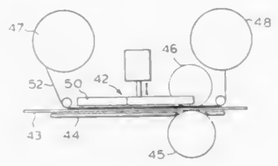
Dennis T. Gilham, Ongar; Raymond J. Herbert, Leigh-on-Sea, and Cyrus Abumehdi, Harlow, all of United Kingdom, assignors to Alcatel Business Systems Limited, Romford, United Kingdom

Continuation of Ser. No. 100,249, Sep. 23, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 297,485

Claims priority, application United Kingdom, Sep. 25, 1986, 8623061

Int. Cl.[4] B41J 7/76

U.S. Cl. 101—93.04 9 Claims



1. A franking machine including a thermal printing device for printing variable and non-variable information at a single printing station said machine including a substrate; a group of first printing elements mounted on said substrate; a plurality of second printing elements mounted on said substrate; electronic control and accounting means operable in a franking printing operation to output print selection signals and a print control signal; a supply of electrical power; a switch responsive to said control signal; first means connecting said supply of electrical power to all said first printing elements in said group through said switch to pass electrical current from said supply through all said first printing elements of said group of printing elements to effect heating of all said first printing elements of said group; print element selection means; second means connecting said supply of electrical power to said print element selection means; said print element selection means being operative in response to said print selection signals to select second print elements which are to be energised and heated by electrical power from said supply and operable in response to said print control signal to pass electrical current through said selected second printing elements to heat said selected second printing elements; means to feed a mail item to the printing station with a print receiving surface of the mail item opposed to said first and second printing elements; ribbon feed means to position a length of thermal transfer inked ribbon between said mail item and said first and second printing elements; all of said first and second printing elements being in engagement with a rear surface of said ribbon and said print receiving surface of said mail item being in engagement with a front ink bearing surface of the ribbon; said heating of all said first printing elements of said group and of said selected second elements being effective to transfer ink from the front surface of the ribbon directly to the print receiving surface of the mail item to print a composite print impression including said non-variable information and said variable at said single print station.

4,917,011

PROCESS AND DEVICE FOR PRINTING A SUCCESSIVE ROW OF NUMBERS OF BAR CODE 2/5 INTERLEAVED

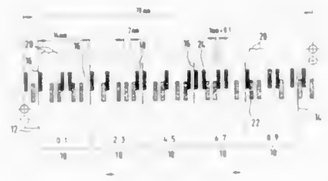
Joachim Bernauer, Oerlinghausen, Fed. Rep. of Germany, assignor to Loewe Druck & Verlag GmbH, Bielefeld, Fed. Rep. of Germany

Filed Jan. 19, 1989, Ser. No. 298,759

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1988, 3801861

Int. Cl.[4] B41J 3/00

U.S. Cl. 101—92 6 Claims



1. A process for printing a successive row of numbers of bar code 2/5 interleaved comprising the steps of:

setting a narrow bar/wide bar printing ratio at 2:1,

dividing a code field into narrow bar areas; and

providing two printing units with adjustable printing forms for printing narrow bars

assigning alternate narrow bar areas to the two different printing units;

printing the code using both printing units successively in exact register;

wherein the printing forms are adjustable to all bar combinations in the bar areas assigned to them.

4,917,012

INKING DEVICE FOR PRINTING PRESS AND AN INKING DOSING MEMBER CONSTRUCTION

Peter Gertsch, Niederscherli; Robert Imbof, and Eugen Zwahlen, both of Bern, all of Switzerland, assignors to Maschinenfabrik Wifag, Bern, Switzerland

Filed May 5, 1988, Ser. No. 190,338

Int. Cl.[4] B41F 31/04; B41L 27/06

U.S. Cl. 101—363 20 Claims

1. An inking device for a printing press having a stereo cylinder bearing a printing block, and an inking roller with an elastic surface which can be engaged with the stereo cylinder, comprising an inking device engaged with said inking roller and inking up said inking roller, a dosing device engaged with said inking roller, said inking device producing a pre-dosed ink layer on said inking roller, said dosing device being composed of at least one dosing strip member having an arcuate edge which forms an engagement area with said inking roller for wiping off a pre-dosed ink layer on the inking roller, leaving a selected quantity for transfer to the stereo cylinder, means

permitting excess ink which is wiped off by said dosing strip to run off freely, mounting means mounting said dosing strip for pivotal movement about a pivotal axis parallel to a rotary axis of the inking roller with at least one part of the area of said dosing strip forming a dosing engagement with said inking device, moving means for effecting continuous to and fro movement of said dosing strip over about said pivotal axis for continuous self-cleaning purposes in substantially the directions of the circumference of said inking roller, so that continuously other arcuately adjacent area parts of said dosing strip are brought into engagement with said inking roller.

4,917,013

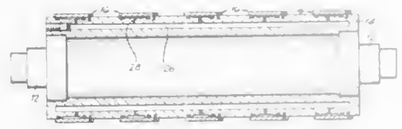
MANDREL WITH MULTIPLE LOCKING HEADS

Sidney Katz, 6 Hedgerow La., Spring Valley, N.Y. 10977

Filed Aug. 31, 1988, Ser. No. 239,181

Int. Cl.[4] B41F 13/10, 27/06

U.S. Cl. 101—375 1 Claim



1. A mandrel for use in the support of printing sleeves, die cutting sleeves, embossing sleeves and the like, comprising:

a hollow cylinder having a circumferentially extending wall

a multiplicity of expansion chambers formed in an outer peripheral surface of said cylinder and extending circumferentially thereof at locations spaced axially of said cylinder;

a corresponding multiplicity of expansion sleeves mounted on said cylinder and respectively providing a hermetic closure for a said expansion chamber;

a corresponding multiplicity of hydraulic conduits formed internally of said wall of said cylinder and respectively communicating with a said expansion chamber, said conduits extending axially within said cylinder wall and terminating at an axial end of said cylinder; and,

a complimentary multiplicity of pneumatic actuators respectively associated with a said hydraulic conduit;

whereby any selected one of said expansion chambers can be pressurized independently of each other said expansion chamber from an axial end of said cylinder in the presence of at least one sleeve positioned on the outer surface of said cylinder.

4,917,014

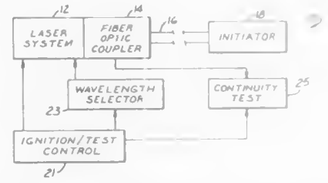
LASER IGNITION OF EXPLOSIVES

Bruce Loughry, and Otho E. Ulrich, both of Ann Arbor, Mich., assignors to KMS Fusion, Inc., Ann Arbor, Mich.

Filed Apr. 24, 1989, Ser. No. 342,184

Int. Cl.[4] F42C 21/00, 19/00

U.S. Cl. 102—201 40 Claims



1. In a system for laser-ignition of explosives that comprises a laser system, optical transmission means having a first end coupled to the laser system for receiving light energy therefrom and a second end remote from said first end, and an initiator that includes a window at said laser-remote second end of said transmission means and explosive means contained within a housing adjacent to a surface of the window remote from said second end, the improvement for testing continuity of the laser-transmission means-initiator light path without igniting said explosive means comprising:

means at said window forming a dichroic reflector for reflecting light energy within a first wavelength range and transmitting light energy within a second wavelength range,

said laser system including means for selectively transmitting light energy within said first and second wavelength ranges,

means coupled to said laser system for controlling the same selectively to transmit light energy within said first and second wavelength ranges, and

means adjacent to said first end and responsive to light energy reflected from said reflector within said first wavelength range for indicating continuity of said laser-transmission means-initiator light path.

4,917,015

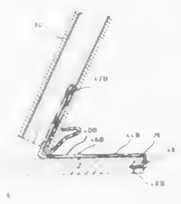
FIREWORKS ROCKET LAUNCH PAD

Charles S. Lowery, 300 Elkmont Rd., Knoxville, Tenn. 37922

Filed Mar. 7, 1988, Ser. No. 164,972

Int. Cl.[4] F42B 4/26

U.S. Cl. 102—342 5 Claims



1. A fireworks rocket launch pad from which a fireworks rocket is fired, said launch pad comprising:

a tubular member having a cylindrical wall and defining a passageway therethrough for slidably receiving said rocket and from which said rocket emerges upon being launched, said tubular member having an upper end portion defining a first opening accessing said passageway and a lower end portion defining a second opening accessing said passageway;

a base for supporting said tubular member; and

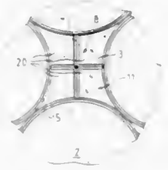
means for mounting said tubular member on said base, said means for mounting including a wire having a first end portion for being secured to said base and a helically-shaped second end portion for being received through said second opening of said tubular member and closely received by said passageway of said tubular member, whereby said helically-shaped second end portion of said wire engages the inner surface of said wall of said tubular member such that obstruction of said passageway is minimized.

4,917,016

WARHEAD CASING HAVING PERIPHERAL COATINGS FOR THE PROJECTILE FORMATION BY MEANS OF EXPLOSIVE

Karl Rudolf, Schrobenhausen, and Siegfried Rhau, Neunkirchen, both of Fed. Rep. of Germany, assignors to DIEHL GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jan. 4, 1989, Ser. No. 293,371
Int. Cl.[4] F42B *13/18*
U.S. Cl. 102—476 7 Claims



1. A warhead having a casing containing an explosive charge, said casing integrally comprising peripheral plate-like portions and splinter-forming portions between the plate-like portions; each said plate-like portion being explosively deformable into a projectile by the charge; peripheral notches formed in the casing surrounding each said plate-like portion; said peripheral notches touching each other between the plate-like portion so that each splinter forming portion is discrete and is surrounded by a group of said plate-like portions, or parts located in close proximity to each other so that each splinter-forming portion is substantially surrounded by a group of said plate-like portions and is connected to others of the splinter-forming portions by narrow connecting portions extending between said proximal parts, said splinter-forming portions being traversed by further cross-shaped notches formed in the casing, and further notches being arranged centrically between and connecting with the peripheral notches of groups of four of the plate-like portions.

4,917,017

MULTI-STRAND IGNITION SYSTEMS

Donald R. Beltz, Allentown, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Filed May 27, 1988, Ser. No. 200,031
Int. Cl.[4] F42B *5/16*
U.S. Cl. 102—470 36 Claims

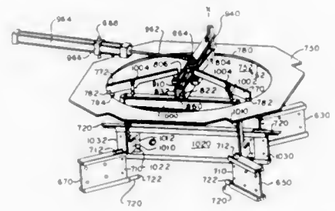
1. In a linear ignition tube, the combination comprising:
an elongated tubular member which is substantially consumable under ignition conditions, said tubular member having a wall thickness and an interior diameter to provide a ratio of interior diameter to wall thickness of at least 4; and
a plurality of ignition strands of oxidizable ignition material extending through said tubular member at a density of at least 1.5 strands/0.001 in^2 of cross sectional area of the internal bore of said tubular member and providing a linear ignition rate for said tube within the range of 3000–6000 ft/sec.

4,917,018

RAIL CONVEYOR AND RAIL SWITCHES THEREFORE

Weston R. Loomer, Boone County, Ky., assignor to Litton Industrial Automation Systems, Inc., Florence, Ky.

Filed Jul. 15, 1988, Ser. No. 219,935
Int. Cl.[4] B61J *1/06*
U.S. Cl. 104—99 40 Claims



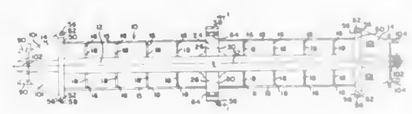
1. A rail switch, for use in a rail arrangement including at least a first rail pathway and a second rail pathway which intersect, the rail switch to be disposed at a predetermined location where the first rail pathway and the second rail pathway intersect and at which the rails within each of said pathways are separated from each other and thus render each of the pathways discontinuous, the rail switch to function to move a shiftable rail section between and into a position of coaction with the separated rails of the first rail pathway to thus render the first rail pathway continuous or to move the shiftable rail section between and into a position of coaction with the separated rails of the second rail pathway to thus render the second rail pathway continuous, the rail switch comprising:
(a) rail switch support means for disposing the rail switch at a predetermined location;
(b) a shiftable rail section carried by said rail switch support means for movement with respect thereto between either a first position wherein said shiftable rail section is positioned to establish the first rail pathway as a continuous rail pathway and a second position wherein said shiftable rail section is positioned to establish the second rail pathway as a continuous rail pathway;
(c) operating means carried by said rail switch support means for shifting said shiftable rail section between said first position and said second position; and
(d) rail cooperating means to be disposed for coaction with said shiftable rail section and the separated rails of the rail pathways which the shiftable rail section is to coact with;
(e) said rail cooperating means including, body means carried either by said shiftable rail section or the rail of the rail arrangement with which said shiftable rail section will coact, and, seat means carried by either said shiftable rail section or the rail of the rail arrangement with which said shiftable rail section will coact, whichever of same is not carrying said shiftable rail section;
(f) said body means and said seat means being disposed for coaction one with the other when said shiftable rails section is positioned to establish either said first rail pathway or such second rail pathway as a continuous rail pathway and when so disposed coacting with each other such that load forces applied to said shiftable rail section will effect an alignment of said shiftable rail section with the separated rails of the rail pathway which the shiftable rail section is to coact with to render the pathway continuous, and will transfer loads applied to said shiftable rail section directly to the separated rails of the rail pathway which the shiftable rail section is to coact with and any support structure therefor.

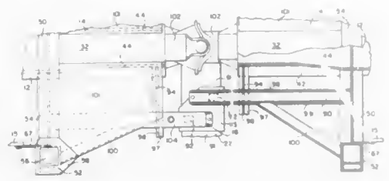
4,917,019

RAILWAY FREIGHT CAR

Harold E. Hesch, St. John; Phillip G. Przybylinski, and Robert P. Sellberg, both of Schererville, all of Ind., assignors to Trinity Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 114,175, Oct. 28, 1987, abandoned.
This application May 12, 1989, Ser. No. 353,167
Int. Cl.[4] B61D *3/10*
U.S. Cl. 105—4.1 28 Claims





1. A freight railcar for transporting containers comprising a single continuous load-opposing center sill extending along a longitudinal axis of said freight car from end to end thereof and having an upper load carrying side lying in a horizontal plane
a series of webs extending transversely of the center sill and having upper edges spaced below said plane; light stiffener members interconnecting the ends of said webs;
and an end frame structure located at each end of the car;
each said end frame structure including straight cantilevered bearing beams projecting toward an adjacent car and beyond the respective end frame structure.

4,917,020

TRANSITION VEHICLE FOR USE WITH CONVERTIBLE RAIL-HIGHWAY TRAILERS

Harry O. Wicks, Hamburg, N.Y., and Theodore E. Danca, Flossmoor, Ill., assignors to The Chamberlain Group, Inc., Elmhurst, Ill.

Filed Sep. 14, 1988, Ser. No. 244,712
Int. Cl.[4] B61F *3/12*
U.S. Cl. 105—4.3 20 Claims

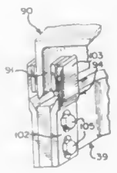
18. A transition vehicle, which is convertible from roadway to rail mode of travel, for interconnecting the leading end of a convertible trailer to either a yard tractor for roadway use or a locomotive or a preceding railcar for rail use, said transition vehicle comprising:
a central tube supported on a centerplate configured to allow rotating and limited rocking movement within the bowl of a bolster supported by said central tube;
a load carrying shelf mounted on the upper surface of said central tube for supporting the lower surface of a convertible trailer and receiving and engaging a trailer king pin mounted thereon;
a female coupler socket mounted on top of said central tube and a coacting coupler pin internal thereto for engaging and holding the coupler tongue of a convertible trailer resting upon said load carrying shelf;
a pair of opposing clamps adjustably mounted transverse to the longitudinal axis of said central tube for engaging and holding a part of a convertible trailer which is coupled to said transition vehicle through said female coupler socket and resting upon said load carrying shelf;
a telescopic gooseneck coupler formed of two tubes slidingly engaged at one end in two pockets fixedly mounted alongside said central tube and secured at the opposite end to a horizontal support plate having a trailer king pin depending downwardly therefrom, said gooseneck coupler being extendable or retractable relative to the leading end of said transition vehicle;
a railway coupler near the leading end of said transition vehicle and located below the plane of such horizontal support plate of said gooseneck coupler;
a rail wheel-set axle unit for engaging a rail during rail use;
a retractable roadway wheel-set axle unit and an air spring suspension system operatively connected to said central tube and said roadway wheel-set axle unit to permit the selective lowering of said roadway wheel-set axle unit into a ground engaging position whereby said transition vehicle is adapted for roadway use; and
support loops depending from the bottom of said central tube and enclosing the axles of said rail-wheel axle unit, said support loops restraining the centerplate of the transition vehicle from becoming disengaged from the bowl of the bolster when said central tube is lifted by a yard tractor using the telescopic gooseneck coupler.

4,917,021

DOOR FINGER GUIDE FOR DOORS ON AUTO RACK CARS

Michael K. Murphy, Aurora, Ill., assignor to Zeftek, Inc., Batavia, Ill.

Filed Feb. 21, 1989, Ser. No. 313,628
Int. Cl.[4] B16D *3/02*
U.S. Cl. 105—378 30 Claims



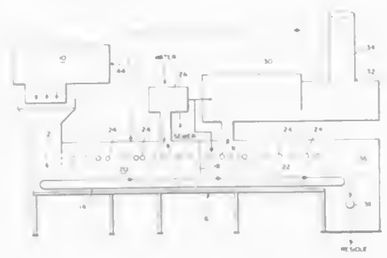
1. A door finger guide for a door on an auto rack car, said door finger guide adapted to be mounted adjacent the upper end of the door in opposing relation to a second guide to coact with and guide the upper end of the door along a metal track fixed to the car during opening and closing of said door, each guide including a metal supporting member having a lower end adapted to be mounted on the door and an upper end aligned with the track, said upper end being offset from the lower end in a direction away from the track, wear pad means secured to the upper ends of said guides including a plastic bearing for engagement with said track, said plastic bearing being of a high compressive strength, self-lubricating, wear-resistant plastic material, and said plastic bearings being dimensioned to provide a relatively close fit with the track in order to minimize the tolerance with said track and thereby reduce vibration in the door and associated components located beneath the guides

4,917,022

SAFE HAVING MOTOR-DRIVEN LOCKING MECHANISM

Toshitaka Ogasawara, and Kouichi Kasai, both of Saitama, Japan, assignors to Olympic Co., Ltd., Saitama, Japan

Filed Dec. 15, 1988, Ser. No. 285,049
Claims priority, application Japan, Sep. 29, 1988, 63-246087
Int. Cl.[4] G08B *13/08*; E05G *1/04*; E05B *49/00*
U.S. Cl. 109—43 8 Claims



1. A safe having a motor-driven locking mechanism comprising;

a lock bar which is slidably provided within a door;

a lock bolt which is provided on one end of said lock bar in such a manner as to protrude from said door and effect locking engagement between said door and the safe body;

an urging means for urging said lock bar to the CLOSE position at which said lock bolt protruding from said door is lockable into said safe body;

a driving member which is engageable with a drive arm provided on said lock bar in such a manner that when said driving member is revolved and comes into contact with said drive arm, said driving member engages said drive arm and, against the urging force of said urging means, moves said lock bar to the OPEN position at which said lock bolt is drawn into said door to release said locking engagement between said door and said safe body and, when said driving member reaches the position at which said driving member is released from said drive arm, said driving means restores said lock bar to said CLOSE position by the urging force of said urging means;

a drive motor for revolving said driving member to the position at which said driving member engages said drive arm and to the position at which said driving member is released from said drive arm;

a lock bar detector for detecting said OPEN position and said CLOSE position of said lock bar; and

a control circuit for receiving a detection signal of said lock bar detector and a safe open/close command signal supplied from the outside of said safe and supplying the desired drive signal to said drive motor.

4,917,023

SYSTEM FOR FIXING, ENCAPSULATING, STABILIZING AND DETOXIFYING HEAVY METALS IN METAL-CONTAINING SLUDGES, SOILS, ASH AND SIMILAR MATERIALS

Bradford H. Jones, 85 Portsmouth Ave., Stratham, N.H. 03885

Continuation-in-part of Ser. No. 831,409, Feb. 20, 1986, Pat. No. 4,781,944. This application Jul. 13, 1988, Ser. No. 218,565
Int. Cl.[4] D06F *75/00*
U.S. Cl. 110—230 8 Claims

1. A system for fixing and stabilizing heavy metals contained in a feed such as a metal-containing sludge, soil, ash or similar material and having a carbon source which comprises:

a two zone pyrolysis unit having

a first drying zone to remove water from the feed as water vapor;

a second substantially oxygen-free pyrolysis stabilization zone downstream of the first drying zone to form char residue with carbon fused to the metal and to form an effluent stream of volatile organics and solvents; means to inhibit the flow of water vapor from the first zone to the second zone;

a condenser in fluid flow communication with the drying zone to condense the water vapor;

an after burner in fluid flow communication with the second zone to oxidize the volative organics and solvents;

a third cooling zone downstream of the second zone to cool the residue;

means to heat said first zone to a first temperature and to heat said second zone to a second temperature distinct from the first temperature;

means to introduce the feed into the first zone;

means to discharge said char from the third zone; and

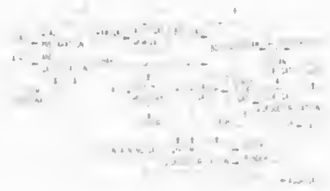
means to transport the feed through said first, second and third zones.

4,917,024

COAL FIRED POWER PLANT WITH POLLUTION CONTROL AND USEFUL BYPRODUCTS

Jerome H. Marten, Baton Rouge, La., and G. Michael Lloyd, Lakeland, Fla., assignors to Florida Institute of Phosphate Research, Lakeland, Fla.

Filed May 24, 1989, Ser. No. 356,754
Int. Cl.[4] E23B *7/00*
U.S. Cl. 110—233 28 Claims



1. A coal fired power plant comprising:

(a) coal gasification means for heating coal in the presence of an oxidant-lean atmosphere under partial coal-gasifying conditions to produce a carbonaceous char and a crude gas stream;

(b) means for separating sulfur-containing compounds from the crude gas stream to produce a combustible gas stream and a sulfur compound-containing stream;

(c) means for converting the sulfur compound containing stream into elemental sulfur;

(d) energy-conversion means for burning a portion of the combustible gas stream and a portion of the carbonaceous char to produce electricity and SO_2-containing flue gas;

(e) flue gas desulfurization means for contacting the SO_2-containing flue gas with lime and limestone to convert sulfur compounds in the flue gas to gypsum;

(f) gypsum desulfurization means for heating the gypsum and the remaining portion of carbonaceous char under reducing conditions utilizing burning of the remaining portion of the combustible gas stream to provide energy to produce a SO_2-containing gas stream and a sintered usable aggregate; and

(g) means for recycling the SO_2-containing gas stream from step (f) to the coal gasification means.

4,917,025

FLUIDIZED-BED FURNACE THAT RECIRCULATES SOLIDS

Horst Buchmüller, Hünxe, and Gerd Morawski, Essen, both of Fed. Rep. of Germany, assignors to Deutsche Babcock Werke Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Oct. 11, 1989, Ser. No. 419,771
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1988, 3835172
Int. Cl.[4] F23G *7/00*
U.S. Cl. 110—245 3 Claims

1. A fluidized-bed furnace for recirculating solids through cyclone precipitator means comprising: a fluidized bed; at least one cyclone precipitator having a solids outlet; a trap and a directly down-stream chute, said solids outlet communicating with said fluidized bed through said trap and said downstream chute; a coal intake opening into said downstream chute; said trap having an outlet; a transitional section tapering out from said outlet of said trap and into said downstream chute, said outlet of said trap communicating with said downstream chute through said transitional section; said transitional section having a wider section, said coal intake being above said wider section of said transitional section.

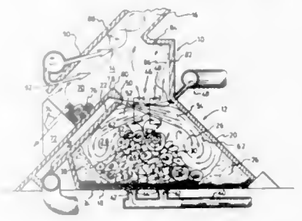
4,917,026

DEBRIS BURNER

Ronald L. Greenough, Surrey, Canada, assignor to MacMillan Bloedal Limited

Filed Mar. 28, 1989, Ser. No. 329,512
Int. Cl.[4] F23L *15/00*
U.S. Cl. 110—297 3 Claims

1. An incinerator comprising incinerating chamber having a floor and a pair of opposite side walls, a top outlet opening between said walls, means for injecting primary air through said floor, a first air jet means on one of said side walls adjacent said top outlet opening, said first air jet means directing a plurality of first streams of air from said one side wall across said chamber toward the other of said pair of side walls, a second air jet means on said other wall adjacent said outlet opening, said second jet means directing a plurality of second streams of air from said other side wall across said chamber toward said one side wall, said first and second air jet means each comprising a plurality of air jet outlets, each said air jet outlet being a source of one of said air streams, said air jet outlets of each of said air jet means being spaced along the axial length of its respective of said side walls with said air jet outlets of said first jet means positioned longitudinally intermediate said air jet outlets of said second jet means along the length of said chamber so that at least a major portion of each of said



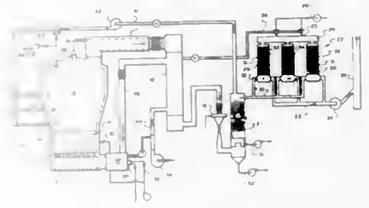
first and second streams of air traverse said chamber without substantial direct interference by said second and said first air streams respectively and wherein said air jet outlets are directed across and downward into said chamber in a manner so that said first and second streams of air as they approach each other and said one wall respectively are deflected toward said floor and into spaces between said side walls and a burning zone within said chamber and spaced from said one and said other walls.

4,917,027

SLUDGE INCINERATION IN SINGLE STAGE COMBUSTOR WITH GAS SCRUBBING FOLLOWED BY AFTERBURNING AND HEAT RECOVERY

Orris E. Albertson, 1915 Wasatch Dr., Salt Lake City, Utah 84108, and Allen Baturay, 4005 Aldie Rd., Catharpen, Va. 22018

Continuation-in-part of Ser. No. 219,721, Jul. 15, 1988, Pat. No. 4,901,654. This application Apr. 10, 1989, Ser. No. 335,231
Int. Cl.[4] F23G *5/00*
U.S. Cl. 110—346 11 Claims



1. The method for disposal of waste organic sludge of the type which contains at least one certain waste material that is either a low melting eutectic that softens or heavy metal that fumes at the highest temperature required to effect incineration of said sludge and cleansing by burning of the resultant gases; comprising the steps of combusting said sludge in a single combustion mass overlain by a gas-filled freeboard thereby to effect burning of substantially the entire content of combustible solids while yielding wet gases which contain entrained particulates as well as combustible and non-combustible constituents, volatiles and condensible matter; maintaining said combustion mass and said overlying freeboard at temperatures below that at which said certain waste material softens or fumes; discharging gases from said freeboard; scrubbing and cooling said gases to yield conditioned gases in the temperature

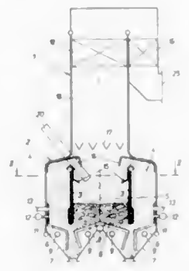
range from 80° F.–120° F.; reheating said conditioned gases to temperatures required to cleanse the same by burning thereby to yield hot clean gases; and cooling said hot clean gases and discharging the same to atmosphere.

4,917,028

FLUIDIZED BED PROCESS AND APPARATUS FOR CARRYING OUT THE PROCESS

Gerhard Ganster, and Peter Steinrueck, both of Vienna, Austria, assignors to SGP-VA Energie-und Umwelttechnik Gesellschaft m.b.H., Vienna, Austria

Filed Jul. 11, 1988, Ser. No. 217,529
Claims priority, application Austria, Jul. 21, 1987, 1849/87
Int. Cl.[4] F23D *1/00*
U.S. Cl. 110—347 **12 Claims**



1. A fluidized bed process for gasification and combustion of fuel in separate and differently fluidized bed zones, comprising:
- charging the fuel in a drying and pyrolysis zone having relatively lower fluidization with solids being transported downwardly;
- conveying said solids from a lower area of said drying and pyrolysis zone to a lower area of a combustion zone having relatively higher fluidization with solids being transported upwardly;
- operating said combustion zone as a fast or turbulent fluidized bed;
- conveying said solids upwardly in said combustion zone beyond the height of a bed in said drying and pyrolysis zone;
- recirculating and forcibly deflecting said solids from the upper area of said combustion zone downwardly toward said bed in said drying and pyrolysis zone as a shower of solid particles;
- directly metering the fuel into said shower of particles;
- passing gases emerging from said combustion zone as a flowing pulse into a turbulence zone in which post-combustion is carried out; and
- adjusting the temperature in said post-combustion turbulence zone by controlling distribution of the total amount of fluidization gas over said combustion zone and said drying and pyrolysis zone.

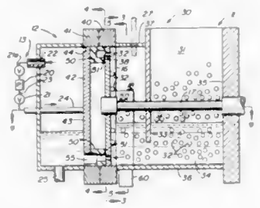
4,917,029

HYDRO-PNEUMATIC SINGULATION OF GEL-ENCAPSULATED PROPAGULES

Shrini K. Upadhyaya, Woodland, and Loren D. Gautz, Davis, both of Calif., assignors to The Regents of the University of Californina, Oakland, Calif.

Filed Jun. 16, 1988, Ser. No. 207,731
Int. Cl.[4] A01C *7/04;* **B23Q** *7/02*
U.S. Cl. 111—185 **3 Claims**

1. A hydro-pneumatic device for singulation and delivery of bare or gel-encapsulated propagules, including in combination:
- a metering unit having a lower portion filled with water and an upper air-filled portion above the water,
- a single, rotatable metering disc in said metering unit, partly in said lower portion and partly in said upper portion, said disc having first and second opposite, radially extending faces,
- propagule-flowing means for forcing a supply of said propagules in said water against said first face of said rotatable metering disc, said disc having an annular series of transverse openings therethrough, each extending from said first face to said second face, said openings being smaller in diameter than said propagules so that the propagules will not pass through said openings,
- suction means exerting suction on said openings from said second face for holding said propagules against said openings at said first face,
- a stationary backing plate with a generally annular race segment facing and sealed rotatable to said metering disc and having a lower end, said race segment extending from near said lower end around about 280° to an upper end of said race segment above said lower end, said suction means being connected to said race segment and therethrough to said metering disc openings in said lower portion and also when they rotate to positions above the water,
- driving means for rotating said metering disc at a constant speed, so that said openings go from said lower portion with propagules held against said openings at said first face to said upper portion above said water,
- an air-water separator on the opposite side of said backing plate from said metering disc and continuously connected to said suction means, with through opening means leading from the lower end of said backing plate to said separator for conducting water thereto from the openings through said metering plate, as the plate rotates those openings through the water, and
- a water pump connected to a lower portion of said air-water separator for pumping water therefrom and connected to said propagule-flowing means for sending water thereto.



4,917,030

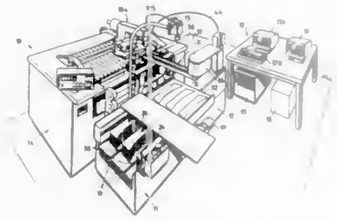
MACHINE FOR SUPPLYING AND SEWING OVERLAPPED FABRIC LAYERS

Flavio Bisson, Cava Manara; Lorenzo Buratti, Arquata Scrivia; Emilia Trento, Turin, all of Italy; André Delgrange, Tourcoing, and Salah Maouche, Sainghin en Melantois, both of France, assignors to NECCHI Societa per Azioni, Pavia, Italy

Filed Jun. 1, 1989, Ser. No. 360,123
Claims priority, application Italy, Jun. 7, 1988, 42905 A/88
Int. Cl.[4] D05B *21/00*
U.S. Cl. 112—121.12 **43 Claims**

1. Machine for supplying unsewn overlapping fabric layers to a sewing unit having a clamping group for sewing comprising:
- a stripping unit providing holding means for the fabric layers and a supporting plane upon to which the holding means release said fabric layers in a position separated one from another;
- mounted means in correspondence to said supporting plane to transform a visual image of said supporting plane and of the fabric layers, layed thereon, into electrical signals;

electronic elaborating means connected to said mounted means transforming the visual image into electrical signals for the determination of the position of the fabric layers on said supporting plane; and
- a driving unit connected to said electronic elaborating means, comprising an assembling device movable along



said supporting plane between said supporting plane and said sewing unit, said driving unit as a result of the data supplied by said electronic elaborating means, moving said assembling device along said supporting plane for assembling one by one in an overlapping manner said fabric layers from said support plane and to said sewing unit for discharging the fabric layers onto the sewing unit.

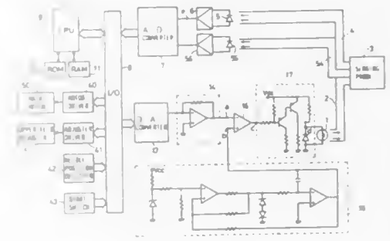
4,917,031

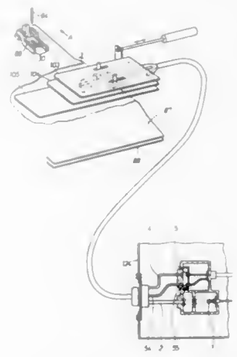
CLOTH-PATTERN SENSING DEVICE FOR A SEWING MACHINE

Hirosumi Itoh, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Dec. 21, 1988, Ser. No. 287,283
Claims priority, application Japan, Dec. 23, 1987, 62-326364
Int. Cl.[4] D05B *19/00, 27/06, 27/08;* **G01J** *1/28*
U.S. Cl. 112—121.11 **9 Claims**

1. A cloth pattern sensing device for a sewing machine, the sensing device comprising:
- a light-emitting element for emitting light on a cloth;
- a light-receiving element for receiving the light influenced by patterns of the cloth and for generating an output corresponding to an intensity of the received light;
- a standard reflection surface for reflecting the light from the light-emitting element to the light receiving element with a fixed reflectance;
- memory means for storing preset upper and lower limit output values for the light-receiving element corresponding the light reflected by the standard reflection surface, the limit values being determined so that all light received by the light-receiving element falls within its normal operable range; and
- an emitter controller for controlling a strength of light emitted from the light emitting element so that the light-receiving element, in response to the light reflected by the





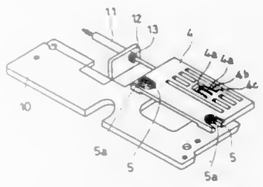
standard reflection surface, generates an output within the upper and lower limit values.

4,917,032

METHOD AND APPARATUS FOR CHANGING THE SEWING DIRECTION OF A MULTIPLE NEEDLE FLAT SEAM STITCH MACHINE

Takeshi Matsumoto, Toyonaka, Japan, assignor to Yamato Mishin Seizo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 3, 1989, Ser. No. 293,007
Claims priority, application Japan, Jul. 26, 1988, 63-185875
Int. Cl.[4] D05B *1/08*
U.S. Cl. 112—262.3 **3 Claims**



1. A method of changing a direction in which a multiple needle flat sewing machine sews a material, comprising:
- moving a throat plate having tongues thereon in a direction contrary to said sewing direction when the needles are stopped at a needle upper dead center point, whereupon thread caught by the tongues of said throat plate is released from the tongues;

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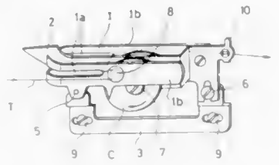
then changing the direction in which the material is being sewn at a desired angle.

4,917,033

THREAD GUIDING DEVICE FOR A ROTARY LOOPER THREAD TAKE-UP

Shiro Satoma, Chofu, Japan, assignor to Juki Corporation, Tokyo, Japan

Filed Mar. 30, 1988, Ser. No. 175,490
Int. Cl.[4] D05B *57/04, 57/06*
U.S. Cl. 112—302 **8 Claims**



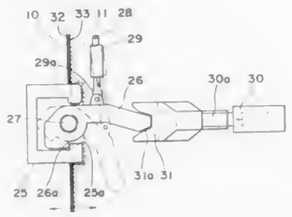
1. A rotary looper thread take-up, comprising:
a first thread guide which is U-shaped and has two parallel leg portions and a head portion connecting said leg portions, said first thread guide providing a slit defining an opening at the head portion thereof and extending along the leg portions of said first thread guide;
a second thread guide placed adjacent to the first thread guide in between and in parallel with said leg portions of the first thread guide;
a cam body placed in the space between said first thread guide and said second thread guide which transfers thread in a direction opposite to the head portion of said first thread guide such that the thread is fed into said second thread guide; and
turn back means for providing thread tension, said turn back means fixed to the outside of one of said leg portions of the first thread guide and positioned in a direction opposite to the head portion of said first thread guide from the end of said slit.

4,917,034

CARRYING BARGE

Masahiko Miyamoto, Fukuoka; Shinji Tanaka; Masami Mitsuse, both of Osaka; Kohei Murata, Toyonaka, and Yoshihiro Masui, Kobe, all of Japan, assignors to Osakawan Marine Corporation, Osaka, Japan

Filed Oct. 7, 1988, Ser. No. 254,692
Int. Cl.[4] B63B *35/30*
U.S. Cl. 114—29 **5 Claims**



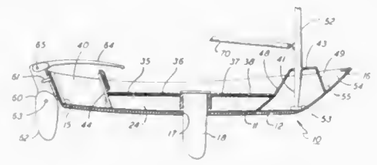
2. In a carrying barge having movable port and starboard side hull parts separable from one another at the bottom of the barge from a closed position, an opening portion of the barge at which said hull parts are separable from one another, said opening portion comprising:
upper and lower opposed surfaces respectively associated with said movable hull parts and inclined at predetermined angles of inclination with respect to the bottom of the barge; and
a rubber packing arrangement effecting a seal between said opposed surfaces when the hull parts are in the closed position, said arrangement including a plate-like rubber member disposed on the upper one of said opposed surfaces at an upper part thereof and extending toward the lower one of said opposed surfaces, a hollow rubber member disposed on the upper one of said opposed surfaces below said plate-like rubber member for receiving fluid therein to expand toward the lower one of said opposed surfaces, and a tubular rubber member disposed on the upper one of said opposed surfaces below said hollow rubber member.

4,917,035

MONOHULL SAILBOAT WITH ENLARGED DECK AREA

John E. Thomson, 405 Hazel Dr., Vestal, N.Y. 13850

Filed Jul. 11, 1988, Ser. No. 217,708
Int. Cl.[4] B63B *35/00*
U.S. Cl. 114—39.1 **2 Claims**



2. A portable, monohulled sailboat comprising:
a hull less than fifteen feet overall in length having a flat bottom and gunwales extending between a stern and bow, with said gunwales flaring outwardly from the vertical at least twenty five degrees at the beam, said beam being at least forty percent of said overall length;
a flotation chamber along the inboard surface of each said gunwale integrally formed therewith in conjunction with said bottom and extending from a point less than twenty percent of said overall length from said stern at the gunwale to a point less than thirty percent of said overall length from said bow along said gunwale, said flotation chambers each having a horizontal planar top surface at the same elevation with said elevation being approximately two thirds of the inboard height of the hull sides above said bottom and above the waterline;
a columnar housing for receiving therein a removable daggerboard and having an opening through said bottom extending upward to a point between said flotation chambers and equal to the elevation of said top surfaces of said chambers; and
a plurality of hatches extending between said top surfaces of said chambers and top of said columnar housing to provide clear, uninterrupted, flat deck area having a length at least fifty percent of said overall length and a width equal to the inboard distance between said gunwales and extending along the length of said chambers.

4,917,036

LIFT GENERATING SAIL SYSTEM FOR MULTIHULL SAILCRAFT

Randy J. Berg, 6813 W. 83rd St., Bloomington, Minn. 55438

Filed Jul. 28, 1989, Ser. No. 386,444
Int. Cl.[4] B63B *15/00*
U.S. Cl. 114—91 **3 Claims**

1. A lift generating sail system for multihull sailcraft which comprises:

(a) a mast;
(b) a number of shroud lines;
(c) an arced track;
(d) a means of attaching the base of the mast to and guiding the travel of the base of the mast along the arced track;
(e) a means of limiting the friction due to travel of the base of the mast along the arced track;

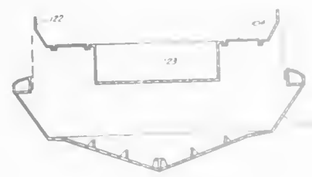
(f) an adjustable means of determining the distance that the base of the mast can travel along the arced track away from the midline of the boat;
(g) a means of rotating the arced track around its central vertical axis;
(h) a means of locking the rotational position of the arced track.

4,917,037

COMPOSITE FIBERGLASS AND METAL BOAT

Dan Hargett, Sr., P.O. Box 51282, Lafayette, La. 70505

Continuation-in-part of Ser. No. 156,445, Feb. 16, 1988, Pat. No. 4,821,667. This application Oct. 3, 1988, Ser. No. 252,110
Int. Cl.[4] B63B *3/09*
U.S. Cl. 114—357 **7 Claims**



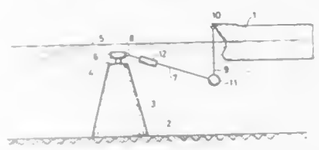
1. A boat comprising:
(a) a lower metallic hull portion, defining an upper common edge around the perimeter of a wall portion, the common edge defining an attachment point interiorly of the common edge of the hull;
(b) a molded fiberglass upper portion, configured to be positioned onto the metal hull, and including an exterior downward depending lip, for matingly engaging an inner depending edge of the hull, so that the upper fiberglass portion is positioned interiorly of the common edge of the metal hull, for preventing contact between the fiberglass upper portion and outside obstacles.

4,917,038

MOORING SYSTEM WITH QUICK-ACTION COUPLING

Leendert Poldervaart, and Michael Stambouzos, both of La Turbie, France, assignors to Single Buoy Moorings Inc., Marly, Switzerland

Filed Mar. 6, 1989, Ser. No. 319,316
Claims priority, application Netherlands, Apr. 11, 1988, 8800927
Int. Cl.[4] B63B *22/02*
U.S. Cl. 114—230 **6 Claims**



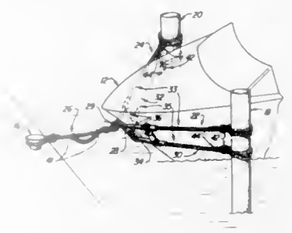
1 Mooring system comprising a mooring device fixed relative to the water bottom, a floating device such as a ship, and a connection between the mooring device and the ship, comprising a rigid arm, one end of which is coupled rotatably about a horizontal axis, either to the mooring device or to the ship, while the other end is fixed to a tensionable connecting element, which is suspended from the other of the ship or mooring device and which is tensioned by a weight disposed adjacent one end of the arm, said connection having a quick-action coupling and means with which the position of the arm can be controlled after releasing the coupling to disconnect the mooring device and the ship from each other, said means being a chamber with adjustable buoyancy, adjacent to the quick-action coupling and adjacent to the end of the arm remote from the weight.

4,917,039

BOAT BOW HARNESS

Joseph C. Siero, 19608 Meier, Roseville, Mich. 48066

Filed Oct. 11, 1988, Ser. No. 255,850
Int. Cl.[4] B63B *21/00*
U.S. Cl. 114—230 **14 Claims**



1 A boat harness apparatus for facilitating docking of a boat in a slip having a single fore mooring point fixed to a dock, a port mooring point and a starboard mooring point comprising:
a port line of fixed length connected to the port mooring point;
a lower port line of fixed length connected to the port mooring point;
a starboard line of fixed length connected to the starboard mooring point and said port side line;
a lower starboard line of fixed length connected to the starboard mooring point and the lower port line, at a lower junction point, said lower port line and said lower star-

board line being connected to the port line and the starboard line by a flexible member; and

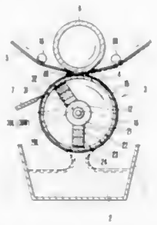
a fore line connected to the fore mooring point and a junction point formed at the interconnection between the port line, starboard line and fore line, whereby the boat may be docked by entering the harness apparatus between the port line and the starboard line which center the boat bow relative to the junction point.

4,917,040

COATING APPARATUS FOR COATING MAGNETIC COATING MATERIAL

Hideo Suzuki, Higashi-Kurume, Japan, assignor to Bellmatic, Ltd., Japan

Filed Dec. 9, 1988, Ser. No. 282,060
Claims priority, application Japan, Dec. 17, 1987, 57-191908[U]
Int. Cl.[4] B05C *1/08*
U.S. Cl. 118—212 **3 Claims**



1. A coating apparatus for coating a coating material onto a substrate, said coating material containing magnetic particles for serving as a magnetic coating material, said apparatus comprising:

a gravure roll for applying said coating material onto said substrate, said gravure roll being provided with a main body having a peripheral surface;

a back up roll disposed in confrontation with said gravure roll for urging said substrate toward said gravure roll;

at least two magnetic members disposed in said main body, said magnetic members being positioned adjacent to said peripheral surface; and,

position adjusting means disposed in said main body for adjusting positions of said at least two magnetic members independent of each other and for adjusting the position of said at least two magnetic members to be adjacent to any portion of said peripheral surface.

4,917,041

INFLATABLE MARKING DEVICE

Klaus D. Weiswurm, San Antonio; Hubert L. Risinger, and Andrew B. Phillips, both of Kerrville, all of Tex., assignors to R & P Enterprises, Kerrville, Tex.

Filed Sep. 22, 1988, Ser. No. 247,745
Int. Cl.[4] B64B *1/50*
U.S. Cl. 116—210 **12 Claims**

1. A device for inflating a balloon with a line attached thereto, comprising:

an elongate member having a spool formed at a first longitudinal end thereof for having a line wound thereon, which line is attachable at a first end to a balloon;

said elongate member further having a handle formed at a second longitudinal end thereof for enabling gripping of said elongate member while said line unwinds from said spool, said handle being adapted to receive the throat of a balloon thereon;

said elongate member further having an opening formed in the first longitudinal end thereof for sealingly receiving a cartridge containing lighter-than-air gas;

said elongate member further having a passageway through said handle for enabling communication of the gas from said opening through said handle; and

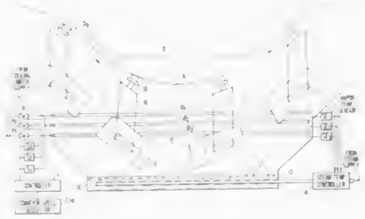
means formed with said elongate member in said opening for engaging the cartridge sealingly received in said opening in a manner which causes the gas therein to escape through said passageway and into a balloon, the throat of which is received on said handle, thereby inflating said balloon.

4,917,042

AUTOMOBILE PART DEGREASING AND PAINTING APPARATUS WITH IMPROVED DEGREASING MEANS

Tadayoshi Kuronaga; Yuji Tanaka, both of Hiroshima, Japan, and Kikuo Kato, Belleville, Mich., assignors to Mazda Motor Manufacturing (USA) Corporation, Flat Rock, Mich.

Filed Aug. 31, 1988, Ser. No. 239,613
Int. Cl.[4] B05C *1/02, 3/10*; B01D *5/00*; B08B *3/10*
U.S. Cl. 118—72 **5 Claims**



1. An apparatus for degreasing plastic automobile parts, comprising:

a degreasing tank having a liquid degreasing agent reservoir in the bottom thereof with a degreasing vapor space thereabove;

heater means in said reservoir for heating degreasing agent for vaporizing it;

a parts conveyor extending through said tank from one end to the other and having a downwardly inclined portion extending downwardly into said degreasing vapor space from one end to a nadir within said degreasing vapor space and an upwardly inclined portion extending out of said degreasing vapor space;

a plurality of separate cooling coils extending around the inside of said tank with an uppermost cooling coil at a level corresponding to the top of said degreasing vapor space and the remaining coils being spaced downwardly into said degreasing vapor space at intervals from said uppermost cooling coil;

means connected to said cooling coils for supplying a cooling medium to said coils, said means separately controlling flow of cooling medium including flow control means for each coil; and

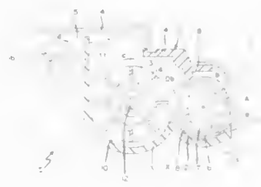
means for controlling the speed of said parts conveyor and said flow control means such as to cause cooling medium to flow selectively through respective cooling coils which are at a height in said degreasing vapor space relative to the other cooling coils which is in direct relation to the speed of said parts conveyor for keeping the time a part being conveyed spends in degreasing vapor substantially constant regardless of the speed of the conveyor.

4,917,043

DEVELOPING DEVICE IN AN IMAGE FORMING APPARATUS

Tomoaki Yokoyama, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 20, 1988, Ser. No. 247,068
Claims priority, application Japan, Sep. 21, 1987, 62-236968
Int. Cl.[4] G03G *15/09*
U.S. Cl. 118—658 **15 Claims**



1. A developing device, comprising:

a developing sleeve for being disposed in face-to-face relationship with a latent image carrier medium;

a magnetic means disposed inside said developing sleeve for forming a magnetic brush of developing material on an outer peripheral surface of said developing sleeve for developing a latent image on said carrier medium;

a casing enclosing said developing sleeve and having a portion for contacting the magnetic brush; and

means for preventing adherence of toner to said portion, said means comprising said portion of said casing being formed of a toner adherence preventive material of a type capable of being charged to the same polarity as that of toner particles when held in frictional contact with material used to charge the toner particles.

4,917,044

ELECTRICAL CONTACT APPARATUS FOR USE WITH PLASMA OR GLOW DISCHARGE REACTION CHAMBER

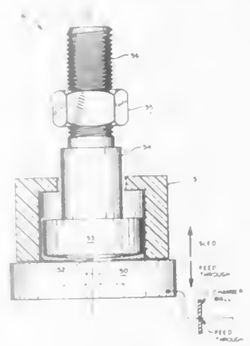
Leopoldo D. Yau, Portland, and Galen H. Kawamoto, Beaverton, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 262,990, Oct. 26, 1988. This application Jun. 2, 1989, Ser. No. 320,526
Int. Cl.[4] C23C *16/50*
U.S. Cl. 118—723 **1 Claim**

1. In a plasma or glow discharge apparatus having a chamber to transfer energy into reactant gases to deposit silicon oxynitride on a plurality of wafers inserted into the chamber on a sled, an improvement to provide electrical contact between an electrode on the sled and a radio frequency generator disposed external to the chamber comprising:

a feedthrough means for providing an electrical path from external of said chamber to internal of said chamber, said feedthrough means terminating in said chamber at a first surface;

an electrode contact member having an outwardly domed surface in engagement with said first surface, said member



providing an electrical path from said first surface to said electrode;

a non-conducting collar disposed about said domed surface and engaging said first surface for limiting the flow of gases around said domed surface.

4,917,045

SILICON COMPOUNDS IN POULTRY HATCHING

Karl E. Wiegand, and Patrick C. Hu, both of Baton Rouge, La., assignors to Ethyl Corporation, Irvine, Calif.

Filed Jul. 22, 1988, Ser. No. 223,020
Int. Cl.[4] A01K *45/00*
U.S. Cl. 119—1 **11 Claims**

1. A method for stimulating the growth of bone tissue in poultry, said method comprising treating a fertile bird egg prior to the hatching of a chick therefrom with (i) a small but effective amount of a physiologically acceptable organic silicon compound in which silicon is solely bonded to oxygen or halogen, preferably chlorine or bromine, such that not less than one-fourth of the valences of silicon are satisfied by bonding to oxygen, or (ii) silicic acid produced by said bird egg from an effective amount of said organic silicon compound administered to said egg.

4,917,046

AEROSOL TESTING METHOD AND CHAMBER FOR EXPERIMENTAL ANIMALS

Charles W. Spengler, 3310 Deforest Ave., Cincinnati, Ohio 45209

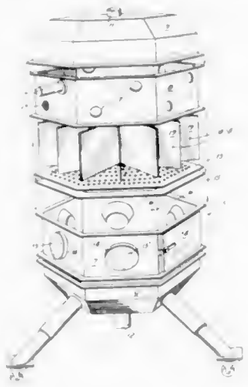
Division of Ser. No. 854,028, Apr. 21, 1986, Pat. No. 4,781,146. This application Jun. 9, 1988, Ser. No. 204,681
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—15 **8 Claims**

1. A method for testing aerosols with experimental animals comprising:

providing a generally tubular chamber having opposite ends,

generating within said chamber a fluidized bed of aerosol particles,

passing a gas through said chamber from one of said ends to another to carry said fluidized aerosol particles, and



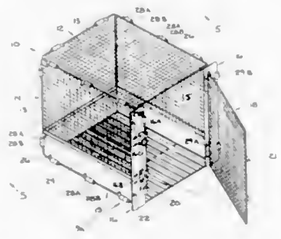
holding an experimental animal in said chamber and exposing said animal to said fluidized aerosol particles passing through said chamber.

4,917,047

MODULAR COMPONENT KNOCK-DOWN ANIMAL CAGE STRUCTURE AND ASSEMBLY

Francis X. Wazeter, III, Kalamazoo, Mich., assignor to International Research and Development Corporation, Mattawan, Mich.

Filed Jun. 7, 1988, Ser. No. 203,699
Int. Cl.[4] A01K *1/03*
U.S. Cl. 119—17 23 Claims



23. Structural knock-down cage elements adapted to be erected into a cage unit for animals or the like which cage unit is capable of rapid assembly and disassembly comprising the following elements;

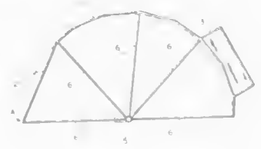
a pair of side wall sections, a top wall, at least one planar side wall face plate and a rear wall section, each of said sections being essentially rectangular and consisting essentially of a plurality of wires framed peripherally by wire or rod, and a bottom wall or floor section having openings therein, and each of said sections comprising at peripheral edges a plurality of short sockets or sleeves adapted to juxtapose and align with complementary sockets or sleeves at peripheral edges of adjacent or contiguous wall sections, the total length of the combined sockets on any section peripheral edge being much less than the total length or reach of that edge, said sockets or sleeves when complementarily juxtaposed and aligned being adapted to be releasably secured together by the insertion of a plurality of unconnected and independently releasable lock pins therein, wherein at least one side wall section and/or rear section comprises a splash guard as a lower segment thereof.

4,917,048

AUTOMATIC TRAPPING SYSTEM

John Beattie, 1 Vaughan Street, Mareeba, Queensland, Australia (4880); Peter J. Marriott, C/- Post Office, Crocodile Station, Lakeland Downs, Queensland, Australia, and Don Blanch, C/- Post Office, Walkamin, Queensland, Australia (4872)

Filed Sep. 14, 1988, Ser. No. 244,143
Claims priority, application Australia, Sep. 15, 1987, PI4355
Int. Cl.[4] A01K *3/00*
U.S. Cl. 119—20 7 Claims



1. Automatic trapping apparatus for trapping livestock comprising first barrier means extending part way around a periphery, gate means rotatably mounted on support means located mid-way between the ends of said first barrier means for rotation about a vertical axis, said gate means comprising a first one or more leaves extending between said support means and one end of said first barrier means and a second one or more leaves extending between said support means and the other end of said first barrier means, an inlet in said first barrier means to admit livestock within the area bounded by said first barrier means and said gate means, second barrier means extending between said one end of said first barrier means and said support means and arranged to allow passage therethrough of said gate means when said gate means is rotated, detector means to detect the presence of livestock within the area bounded by said first barrier means and said gate means, actuator means to rotate said gate means on detection of livestock within said area whereby when livestock are detected by said detector means, said gate means rotates with said second one or more leaves moving outwardly of said area bounded by said first and second barrier means to provide an outlet from said area and said first one or more leaves moves across said bounded area closing said inlet and forcing livestock located in said bounded area through the opening provided by the outward movement of said second one or more leaves.

4,917,049

SAFETY RELEASABLE COLLAR FOR ANIMALS

Linda Peterson, 1247 Gardena Ave. NE., Fridley, Minn. 55432

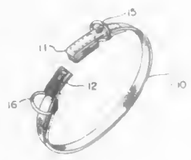
Filed Nov. 7, 1988, Ser. No. 267,580
Int. Cl.[4] A01K *27/00*
U.S. Cl. 119—106 10 Claims

1. A combined safety collar , conventional collar and choke collar for animals comprising:

(a) a length of relatively strong material having first and second ends;

First and second metal rings joined respectively to said material adjacent said first and second ends, wherein at least one of said rings is movable along a substantial length of said collar and said rings being sized and configured so that the first ring can pass through the opening in said second ring;

(c) each of said ends having attached thereto cooperating releasable connecting means for effecting a pressure releasable connection therebetween, said releasable connection means being capable of releasing said ends from connection upon application of a predetermined tension to the collar that is less than the tension which would strangle the animal wearing the collar; and



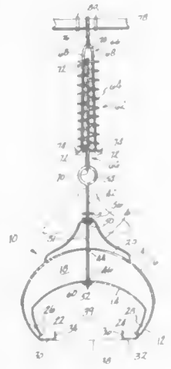
(d) said ends being positioned when joined by said releasable connection means so that the metal rings are in substantial juxtaposition to one another to readily accept a leash clasp to both to form a conventional collar, to one ring only to operate as a safety collar or to said first ring after passage through the opening in said second ring to form a choke collar.

4,917,050

BIRDFEEDER

Stephen G. Clarke, Coventry, Conn., assignor to M H Industries, Inc., North Haven, Conn.

Filed Jul. 12, 1988, Ser. No. 217,835
Int. Cl.[4] A01K *39/01*
U.S. Cl. 119—52.3 5 Claims



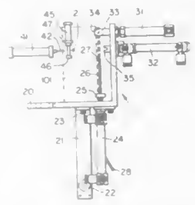
1. A birdfeeder comprising a bottom portion for containing and delivering seed to a birdfeeding tray to which birds have access through a fly up entry into a feeding area, said bottom portion including a dome having a central hole therethrough and a filling port in close proximity to said central hole, said birdfeeder further including a cover having a central hole therethrough and a skirt portion which normally covers said filling port, and a hanger having a straight portion of predetermined diameter and a hook portion spaced above said cover, said straight portion passing through said central holes, and an eccentric cover lock on said straight portion of said hanger between said cover and said hook portion and having an aperture therethrough through which the straight portion of said hanger passes, said cover lock due to its eccentricity being normally held by gravity in a cocked position in which said aperture engages the straight portion of said hanger to hold said cover lock at any location along the straight portion of said hanger above the cover, including a lowermost location in which said skirt portion covers said filling port and said cover lock engages said cover to deter the raising thereof.

4,917,051

FLOATING NEEDLE SEWING MACHINE FOR SIMULATING HAND STITCHING

Mason S. Small, Leeds, Great Britain, assignor to Automated Machinery Systems, Inc., Richmond, Va.

Filed Mar. 6, 1989, Ser. No. 319,158
Claims priority, application United Kingdom, Mar. 16, 1988, 8806236
Int. Cl.[4] D05B *23/00, 65/00*
U.S. Cl. 112—171 10 Claims



1. A sewing machine capable of simulating hand stitching, the machine comprising a throat plate, a needle passage region through the throat plate, a needle, means for driving the needle between a raised position lying wholly above the throat plate and a lowered position lying wholly below the throat plate, and thread-control means lying below the throat plate, and including above the throat plate thread-guide means for guiding supplied thread so that a section thereof lies in a first thread path, first clamp means operable to releasably clamp the thread adjacent to a free end thereof when lying in said first thread path, thread pick-up means, first drive means for moving the pick-up means, from a retracted position to an advanced, thread pick-up position, the pick-up means being cooperable with the raised needle so that during movement back to the retracted position the picked up thread engages and is held by the raised needle and part of the thread is caused to lie in a second thread path extending from the raised needle to the retracted pick-up means, and second clamp means operable to releasably clamp thread lying in the second thread path.

4,917,052

WATER PUMP APPARATUS IN AN INTERNAL COMBUSTION ENGINE

Katsuhiko Eguchi, Kariya, and Atsushi Ohmi, Anjo, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

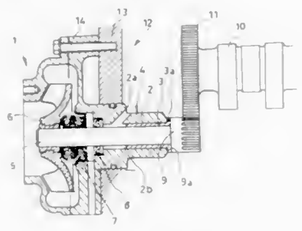
Filed Jan. 6, 1989, Ser. No. 293,981
Claims priority, application Japan, Jan. 28, 1988, 63-009925
Int. Cl.[4] F01P *5/10*
U.S. Cl. 123—41.47 10 Claims

1. A water pump apparatus in a water cooled internal combustion engine having a cylinder head including a rotatable valve camshaft, comprising:

a water pump including a pump shaft positioned eccentrically to said valve camshaft;

drive and driven gears meshing with a predetermined rota-

tional ratio and respectively mounted on said valve camshaft and said pump shaft; and



a sliding bearing supporting said pump shaft and having a bearing portion inserted in the head.

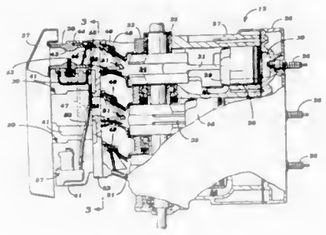
4,917,053

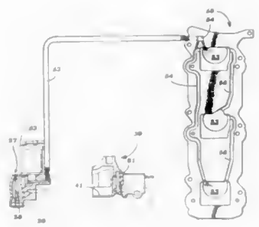
FUEL SUPPLYING SYSTEM FOR PLURAL-CYLINDER INTERNAL COMBUSTION ENGINE

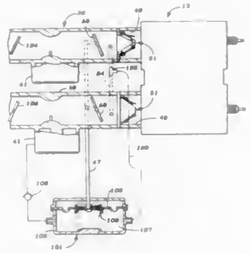
Masaki Okazaki; Junichi Hasegawa, and Hiroaki Fujimoto, all of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 27, 1989, Ser. No. 345,614
Claims priority, application Japan, Apr. 28, 1989, 64-105608
Int. Cl.[4] F02M *35/10*
U.S. Cl. 123—52 MB 18 Claims

1. In a fuel enrichment system for a multi-chamber internal combustion engine comprising a first intake passage for supplying a charge to a first of said chambers, a second intake passage for supplying a charge to a second of said chambers, charge forming means for supplying a fuel/air charge to said intake passages, balance passage means for communicating said first and said second intake passages with each other, and means for introducing supplemental fuel to said balance passage means in response to a predetermined condition comprising a pump for







pumping fuel under pressure and a conduit for delivering fuel from said pump to said balance passage means.

4,917,054

SIX-STROKE INTERNAL COMBUSTION ENGINE

Gerhard B. Schmitz, Silivio Gesell-Strasse, 19, B-4780 Saint-Vith, Belgium

Filed Jul. 26, 1988, Ser. No. 224,496
Claims priority, application Belgium, Jul. 30, 1987, 8700847
Int. Cl.[4] F02B *75/02*
U.S. Cl. 123—59 EC 14 Claims

1. An internal combustion engine comprising

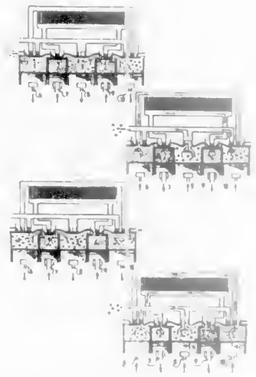
at least one cylinder which includes one working chamber having a volume which is rendered variable by displacement inside the cylinder of a piston between a high dead point position and a low dead point position, under effect of pressure forces periodically produced inside said chamber; and

valve means for admission and discharge of a gaseous fluid associated with said at least one cylinder, the piston and cylinder being connected to a crankshaft of the engine;

wherein the engine comprises at least four cylinders disposed to form two pairs, one cylinder of each pair being a high pressure combustion cylinder and the other cylinder being adapted to work as a low pressure admission cylinder, the working chamber of each low pressure admission cylinder being adapted to communicate:

(a) with an air intake manifold through at least one admission valve, for producing a precompression of admitted air;

(b) with the working chamber of the combustion cylinder of the other pair via communication passageway means for discharging into this combustion cylinder the precompressed air, through at least one discharge valve associated with the admission cylinder and through at least one admission valve associated with the combustion cylinder for producing a compression and combustion at a high



pressure of the air to which fuel has been added and a first expansion of combustion gases in said combustion cylinder;

(c) with the working chamber of the associated combustion cylinder through at least one transfer valve for transferring the high pressure combustion gases produced in said associated combustion cylinder into the admission cylinder, to produce a second expansion; and

(d) with a discharge manifold for the combustion gases which have undergone said second expansion, through at least one discharge valve,

said valves being controlled such that the engine operates as a six-stroke internal combustion engine.

4,917,055

METHOD FOR DETECTING AN IRREGULARITY IN VALVE-TIMING CHANGEOVER IN AN ENGINE

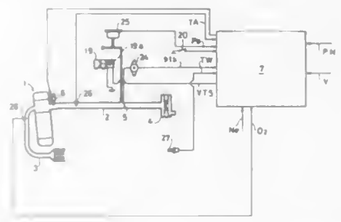
Yasunari Seki; Yuzuru Koike; Takashi Sato, and Masatoshi Obata, all of Tochigi, Japan, assignors to Honda Gikea Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1989, Ser. No. 388,235
Claims priority, application Japan, Aug. 1, 1988, 63-192241; Aug. 1, 1988, 63-192243
Int. Cl.[4] F01L *1/34*
U.S. Cl. 123—90.16 4 Claims

1. A method for detecting an irregularity in valve-timing changeover in a variable valve-timing type engine in which valve timing for at least one of either the intake valves or the exhaust valves in the engine is changed over by a hydraulically operated changeover mechanism controlled by a valve means, said method comprising steps of:

detecting oil pressure in an oil supplying passage for supplying oil to the changeover mechanism;

comparing an open/close instruction given to the valve means to control oil supplied to the oil supplying passage and the detected oil pressure; and



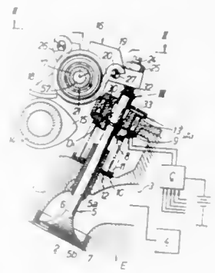
determining through said comparison an irregularity in the valve timing changeover.

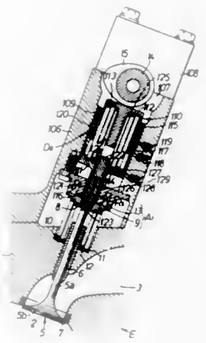
4,917,056

VALVE OPERATION CONTROL SYSTEM IN INTERNAL COMBUSTION ENGINE

Toru Yagi; Yoshiaki Hirosawa; Kaname Tokita, and Yoshihiro Fujiyoshi, all of Saitama, Japan, assignors to Honda Gikea Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1988, Ser. No. 247,952
Claims priority, application Japan, Sep. 22, 1987, 62-237706; Jun. 1, 1988, 63-135253; Jun. 10, 1988, 63-143862; Jun. 27, 1988, 63-158324; Jun. 30, 1988, 63-136835
Int. Cl.[4] F01L *1/34*
U.S. Cl. 123—90.16 33 Claims





1. A valve operation control system in an internal combustion engine, comprising an engine valve openably and closably

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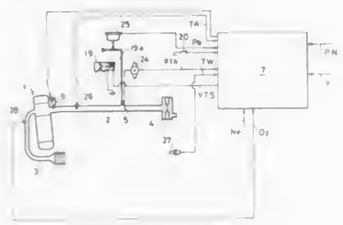
supported on an engine body, a valve spring for biesing said engine valve in a valve-closing direction, and valve driving means interposed between a valve-operating cam and the engine valve to transmit a force in the valve-opening direction provided by the valve-operating cam to the engine valve, wherein said valve driving means includes a valve-opening resilient member for exhibiting a repulsive force in a direction to open said engine valve, and said system includes closed-position retaining means interposed between said engine valve and said valve operating cam for retaining the engine valve in its closed position, with any valve-opening force provided by the valve-operating cam being accumulated by the valve-opening resilient member, said closed-position retaining means being arranged to be switchable between a retaining state and a releasing state during an opening cycle of said engine valve to control the timing of opening said engine valve depending upon the operational condition of the engine and wherein said closed-position retaining means comprises an electromagnetic actuator.

4,917,057

CONTROL METHOD FOR VALVE-TIMING CHANGEOVER IN ENGINE

Yasunari Seki, Tochigi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1989, Ser. No. 388,144
Int. Cl.[4] F01L *1/34*
U.S. Cl. 123—90.16 4 Claims



1. A control method for valve-timing changeover in an engine of the electronically controlled fuel injection type in which valve timing for at least one of either the intake valves or the exhaust valves of the engine can be changed over between a low-speed valve timing suitable for a low-speed revolution range of the engine and a high-speed valve timing suitable for a high-speed revolution range of the engine, said method comprising steps of:

presetting a high-load determinant reference value calculated in terms of a fuel injection quantity; and

changing over the valve timing to the high-speed valve timing when an actual fuel injection quantity exceeds the high-load determinant reference value.

4,917,058

METHOD OF REDUCING PUMPING LOSSES AND IMPROVING BRAKE SPECIFIC FUEL CONSUMPTION FOR AN INTERNAL COMBUSTION ENGINE

Michael T. Nelson, Greenville, and Alvon C. Elrod, Clemson, both of S.C., assignors to Clemson University, Clemson, S.C.

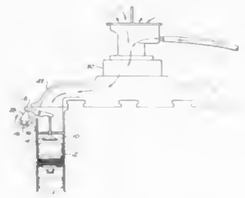
Division of Ser. No. 4,334, Jan. 15, 1987, Pat. No. 4,771,742, which is a continuation-in-part of Ser. No. 831,146, Feb. 19, 1986, Pat. No. 4,770,060. This application Apr. 18, 1988, Ser. No. 182,999
Int. Cl.[4] F02B *75/18;* **F01L** *1/34*
U.S. Cl. 123—90.17 15 Claims

1. A method for improving engine performance for a multi-cylinder internal combustion engine, the engine having more than one combustion chamber with a member for varying the volume of same, a crankshaft, a single induction manifold disposed between the atmosphere and at least two combustion chambers, at least one intake valve disposed between each combustion chamber and the induction manifold, at least one of said valves beginning to open to start an induction process when the angular position of the crankshaft is at an opening angular position for said valve and the induction process being ended when the crankshaft is at a closing angular position and the last one of said intake valves closes, and a variable valve timing system for changing the timing of the induction process via control of at least one of said valves in compliance with predetermined operating conditions of the engine, the variable valve timing system including a camshaft having at least one splittable cam member with camlobe members for actuating the at least one intake valve, the method comprising:

a. beginning a first engine cycle by inducting a first charge of fluid into at least one of the combustion chambers during a first induction period, said first induction period beginning at a first crankshaft opening angular position and ending at a first crankshaft closing angular position;

b. holding the at least one intake valve open during a portion of the compression stroke of the volume varying member;

c. expelling a portion of the inducted charge from the combustion chamber through said intake valve before the crankshaft reaches said first crankshaft closing angular position;



d. preventing the expelled portion of the inducted charge from communicating with the atmosphere;

e. closing the at least one intake valve to terminate expulsion of said portion of the inducted charge;

f. making an adjustment to the camshaft to change the timing of the induction period;

g. after changing the timing of the induction period, beginning a second engine cycle by inducting a second charge of fluid into the combustion chamber during a second induction period beginning at a second crankshaft opening angular position and ending at a second crankshaft closing angular position;

h. expelling a portion of the second inducted charge from the combustion chamber through said intake valve before the crankshaft reaches said second crankshaft closing angular position;

i. preventing the expelled portion of the second inducted charge from communicating with the atmosphere; and

j. closing the at least one intake valve to terminate expulsion of said portion of the second inducted charge.

4,917,059

VALVE LASH ADJUSTER

Minao Umeda, Maebashi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

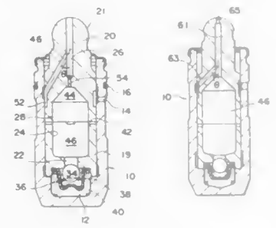
Filed Oct. 7, 1988, Ser. No. 254,815
Claims priority, application Japan, Mar. 31, 1988, 63-42032[U]
Int. Cl.[4] F01L *1/14, 1/24*
U.S. Cl. 123—90.55 6 Claims

1. A valve lash adjuster comprising:

(a) a hollow body of generally cylindrical shape and formed with a high pressure chamber at a bottom thereof and with

a supply hole for supplying operating oil to an interior cylinder portion thereof;

(b) a plunger assembly of generally cylindrical shape relatively movably fitted in said body and having internal means for storing operating oil supplied from the outside through said supply hole of said body, said plunger assembly being formed with an axial hole to a lower side of said storing mean for communicating said storing means with said high pressure chamber, and being formed to an upper side of said storing means with a first passageway extending axially of said plunger assembly and providing fluid communication between said storing means and the exterior of said plunger assembly, and with a second passageway branching off downwardly from said first passageway at an acute angle with respect thereto and opening to the outer periphery of said plunger assembly at an opening portion opposed to said supply hole of said body; and



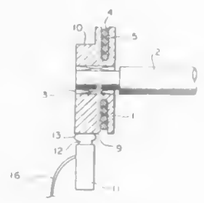
(c) valve means disposed near a bottom end portion of said plunger assembly and adapted to open to permit operating oil stored in said storing means to flow into said high pressure chamber when said plunger assembly moves in a direction to protrude relative to said body, and to close to block flow of operating oil from said high pressure chamber to said storage means when said plunger assembly moves in the opposite direction relative to said body.

4,917,060

IGNITION DEVICE FOR STARTING AN INTERNAL COMBUSTION ENGINE

Ryuzo Harada, Yokohama, and Tadashige Kondo, Tokyo, both of Japan, assignors to Kloritz Corporation, Mitaka, Japan

Filed Oct. 6, 1988, Ser. No. 253,905
Claims priority, application Japan, Oct. 12, 1987, 62-256771
Int. Cl.[4] F02P *3/12, 15/12*
U.S. Cl. 123—179 BG 4 Claims



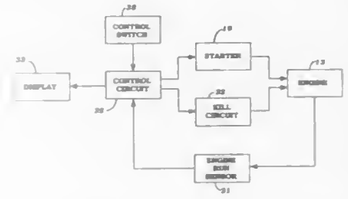
1. An ignition device for starting an internal combustion engine comprising a starting member arranged on a rotor of a manual starter or a self-starter motor, said starting member being engaged with an actuating member of a piezoelectric element, and an output terminal of said piezoelectric element being electrically connected to a magneto ignition system.

4,917,061

ENGINE CONTROL MEANS FOR MARINE PROPULSION

Hodaka Nagakura, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 8, 1988, Ser. No. 229,925
Claims priority, application Japan, Aug. 8, 1987, 62-198726
Int. Cl.[4] F02N *11/08*
U.S. Cl. 123—179 B 5 Claims



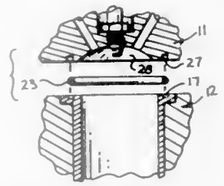
1. A vehicle comprising control circuit for the starting and stopping of an internal combustion engine powering said vehicle, said vehicle having a control switch carried by said vehicle and movable between first and second positions, and engine starting device, and an engine kill device, means for selectively operating either said starting device or said kill device upon actuation of said control switch from its first position to its second position, said means comprising the only means operating said starting device and said kill device.

4,917,062

CYLINDER HEAD GASKET ELIMINATION PROCESS

Thomas E. Tapper, 1128 Solly Ave., Philadelphia, Pa. 19111, and Jeffrey Cesari, 9996 Woodfern Rd., Philadelphia, Pa. 19115

Filed Apr. 17, 1989, Ser. No. 339,213
Int. Cl.[4] F02F *1/00*
U.S. Cl. 123—193 CH 4 Claims



1. A process for eliminating a cylinder head gasket from an internal combustion engine comprising the steps of,

a. providing an internal combustion engine including an engine block with at least one cylinder bore formed to said engine block of a first diameter, and wherein said engine block includes at least one engine block coolant line, and a cylinder head associated and overlying the engine block wherein at least one combustion chamber is formed within said cylinder head in overlying relationship to said cylinder bore, and a cylinder head coolant line in fluid communication with said engine block coolant line, with a plurality of securement bolts directed through said cylinder head and threadedly received within said engine block with a cylinder head gasket sandwiched between said engine block and said cylinder head, and

b. threadedly removing the securement bolts, removing said cylinder head from said engine block, and discarding the cylinder head gasket, and

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c. forming a groove of a second diameter about the cylinder bore wherein the groove's second diameter is greater than the first diameter, and

d. forming a cylinder head groove coaxially aligned with the groove formed in the engine block wherein the cylinder head groove is of a diameter equal to the second diameter, and

e. inserting an easily compressible continuous "O" ring seal of a diameter equal to the second diameter within the engine block groove and cylinder head groove and inserting the securement bolts through the cylinder head and compressing the "O" ring within the overlying engine block groove and cylinder head groove to provide sealing against loss of combustion pressure.

4,917,063

METHOD FOR SETTING THE VEHICLE-ENGINE TORQUE

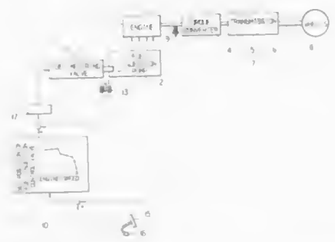
Hikosaburo Hiraki, Oyama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,638

Claims priority, application Japan, Nov. 15, 1985, 60-255008

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—357 **3 Claims**



1. A method for setting vehicle-engine torque, comprising the steps of:

determining operating ranges of engine speed by power output characteristics in said engine, said operating ranges having lower portions;

concentrating, in said lower portions of said operating ranges of said engine speed, at least one of said operating ranges of engine speed, and a majority of operating ranges of engine torque; and

setting said vehicle-engine torque relative to said concentrated operating ranges of said engine speed.

4,917,064

METHOD OF AND APPARATUS FOR GENERATING CYLINDER DISCRIMINATING SIGNAL IN DISTRIBUTOR FOR INTERNAL COMBUSTION ENGINE

Seiki Kodama; Shigemi Murata, and Hideki Maruhashi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 21, 1988, Ser. No. 222,663

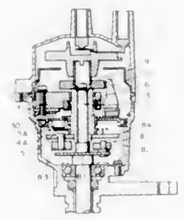
Claims priority, application Japan, Jul. 24, 1987, 62-185936

Int. Cl.[4] F02P *1/00, 5/04*

U.S. Cl. 123—414 **4 Claims**

1. An apparatus for generating a cylinder discriminating signal in a distributor for an internal combustion engine having a rotary shaft rotated synchronously with said internal combustion engine, a centrifugal spark advance member rotated through a centrifugal spark advance mechanism so that said member revolves relative to said rotary shaft, an ignition timing reluctor provided on said centrifugal spark advance member, a vacuum spark advance plate, and ignition timing signal generating means for generating an ignition timing signal by detecting approach and passage of said ignition timing reluctor with respect to sensing means provided on said vacuum spark advance plate,

wherein the improvement comprises a cylinder discriminating reluctor installed on said centrifugal spark advance



member, and a cylinder discriminating sensor attached to said vacuum spark advance plate to generate a cylinder discriminating signal by detecting approach and passage of said cylinder discriminating reluctor.

4,917,065

FUEL INJECTION PUMPING APPARATUS

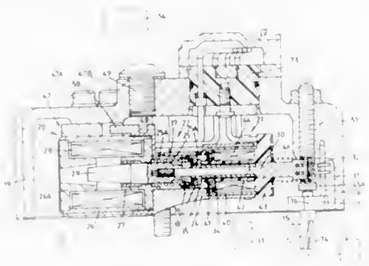
David J. C. Law, London, and Lukhbir S. Panesar, Middlesex, both of Great Britain, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Mar. 20, 1989, Ser. No. 326,154

Claims priority, application United Kingdom, Mar. 25, 1988, 8807137

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—458 **3 Claims**



1. A fuel injection pumping apparatus for supplying fuel to an internal combustion engine comprising a high pressure pump, an adjustable throttle member for controlling fuel flow from a low pressure pump to the high pressure pump, a support member having a transverse bore, an electromagnetic actuator operable in response to a control signal from an electronic control system to adjust the setting of said throttle member, said actuator having an axially movable armature, a connecting rod having a first and a second end, said first end of said rod being connected to said armature and said second end of said rod being connected to said throttle member, a damper piston located between said throttle member and said armature and disposed in predetermined position with and being movable with said rod in said bore, said damper piston being movable transversely relative to said connecting rod to allow for misalignment, an actuator core member mounted in said support and forming a bearing for said armature, and a further bearing spaced from said core member and defined in a boss also mounted on said support, said connecting rod being supported in said further bearing.

4,917,066

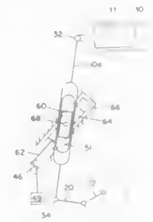
SWING BEAM INTERNAL-COMBUSTION ENGINES

Ferdinand Freudenstein, Bronx, N.Y., and Wayne J. Sohn, Teaneck, N.J., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Continuation-in-part of Ser. No. 870,507, Jun. 4, 1986, abandoned. This application Jan. 24, 1989, Ser. No. 301,313

Int. Cl.[4] F02B *75/04*

U.S. Cl. 123—48 B **12 Claims**



1. In an internal-combustion engine having a cylinder, a piston displaceable in the cylinder, a crankshaft, and a swing beam:

first coupling means between one end of the swing beam and the piston;

second coupling means between the crankshaft and swing beam;

pivot establishing means engaging the swing beam for causing the swing beam to rotate in an oscillating manner about a pivot point; and

control means for controlling the position of the pivot establishing means, comprising:

first slider means positioned in a slideway and engaging said pivot establishing means for permitting movement along a first predetermined path;

first slider positioning means for imparting oscillating movement to said first slider means about an average position on said slideway; and

second slider positioning means acting on said first slider positioning means for selectively varying said average position.

4,917,067

SYSTEM FOR CONTROLLING AIR-FUEL RATIO OF COMBUSTIBLE MIXTURE FED TO INTERNAL COMBUSTION ENGINE

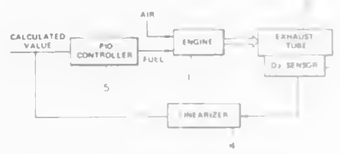
Hideji Yoshida, Hashima, Japan, assignor to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Aug. 8, 1988, Ser. No. 229,466

Claims priority, application Japan, Nov. 5, 1987, 62-279853

Int. Cl.[4] F02D *41/14*

U.S. Cl. 123—488 **9 Claims**



1. A system for controlling air-fuel ratio of a combustion mixture fed to an internal combustion engine, comprising:

an oxygen sensor disposed in an exhaust system of the engine, said oxygen sensor exhibiting a sudden characteristic change when exposed to an exhaust gas produced by a combustible mixture of stoichiometric air-fuel ratio, said oxygen sensor issuing a first signal representative of the oxygen concentration in the exhaust gas;

first means for linearizing said first signal to produce a semi-linearized signal which has a non-sensible zone at a portion which corresponds to the portion of said first signal at which said sudden characteristic change appears; and

second means for controlling the amount of fuel fed to the engine in accordance with said semi-linearized signal.

4,917,068

UNIT INJECTOR FOR AN ENGINE

Takeshi Takahashi, Mishima; Shinya Hirota; Takashi Yamamoto, both of Susono; Daisaku Sawada, Gotenba, and Satoshi Watanabe, Sunto, all of Japan, assignors to Toyoto Jidosh Kabushiki Kaisha, Japan

Filed Dec. 14, 1988, Ser. No. 284,434

Claims priority, application Japan, Dec. 29, 1987, 62-335259; Jan. 11, 1988, 63-2470

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—506 **15 Claims**

1. An engine having a unit injector, the unit injector comprising.

a housing having a nozzle bore;

a plunger movable in the housing and actuated by the engine;

a high pressure fuel chamber formed in the housing and defined by the plunger, the pressure of fuel in the high pressure fuel chamber being increased by the plunger;

a needle substantially aligned with the plunger in the housing and opening the nozzle bore to inject fuel in the high pressure fuel chamber from the nozzle bore when the pressure of fuel in the high pressure fuel chamber exceeds a predetermined pressure;

a fuel spill passage formed in the housing and connected to the high pressure fuel chamber;

a spill valve arranged in the fuel spill passage and slidably inserted into a bore formed in the housing, the bore being spaced from and extending in parallel to a line which intersects an axis of the needle substantially at a right angle;

an actuator for actuating the spill valve to open the spill fuel passage when the fuel injection operation is to be stopped and to close the spill fuel passage when the fuel injection operation is to be carried out;

said high pressure fuel chamber being arranged between the plunger and needle and said fuel spill passage extending substantially linearly from said high pressure fuel chamber to the spill valve;

said bore being arranged at the side of said plunger and said fuel spill passage extending obliquely with respect to the axis of the plunger;

said housing having a pressure control chamber formed therein coaxially with the axis of said spill valve, pressure in said pressure control chamber being controlled by said

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actuator, and said spill valve being controlled by the pressure in said pressure control chamber; and

said actuator being spaced from the axis of said needle, the axis of said needle being in a plane which is substantially at a right angle to the longitudinal axis of the engine, and said actuator being positioned obliquely with respect to said plane.

4,917,069

FUEL PUMP MOUNTED ON AN ENGINE WITH REDUCED HEAT TRANSMISSION THEREFROM

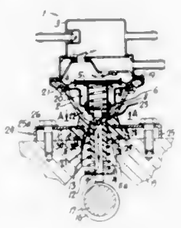
Ernst Kuhlen, Willich, Fed. Rep. of Germany, assignor to Pierburg GmbH, Neuss, Fed. Rep. of Germany

Filed Feb. 6, 1989, Ser. No. 307,419

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1988, 3821888

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—509 12 Claims



1. A fuel pump driven by an internal combustion engine and mounted on the engine at an opening therein, said fuel pump comprising a housing including a base, said base comprising an annular flange bearing on the engine in surrounding relation to said opening therein, and a holder means engaged on said annular flange for securing the base of the housing to the engine, said holder means comprising a claw and a bolt securing said claw to the engine, said base having a groove into which said claw is engaged, said base including a projection outside said groove, said claw having an aperture in which said projection is engaged when said claw is engaged in said groove.

4,917,070

CABLE GUIDE ASSEMBLY FOR A COMPOUND BOW

Robert R. Townsend, Nicholasville, Ky., assignor to Quarters Industries, Inc., Nicholasville, Ky.

Filed Feb. 21, 1989, Ser. No. 312,808

Int. Cl.[4] F41B *5/00*

U.S. Cl. 124—23 R 6 Claims

1. A cable guide assembly for a compound bow, said compound bow including a pair of flexible limbs, wheels rotatably retained at the ends of said limbs, a continuous cable engaging said wheels, and an offset rod, comprising:

a spindle having first and second ends and a longitudinally aligned bore for receiving said offset rod; and

roller means rotatably and slidingly mounted upon said spindle, said roller means including a groove for receiving said cable and retaining said roller means upon said offset rod.

4,917,071

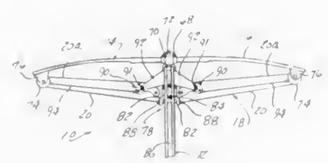
MECHANICAL PROJECTOR WITH VARIABLE LEVERAGE DEVICE

John W. Bozek, 6093 Waterford Dr., Waterford, Mich. 48095

Continuation of Ser. No. 26,278, Mar. 16, 1987, abandoned, which is a continuation-in-part of Ser. No. 778,405, Sep. 20, 1985, Pat. No. 4,649,891. This application Nov. 30, 1988, Ser. No. 279,293

Int. Cl.[4] F41B *5/00*

U.S. Cl. 124—25 9 Claims



1. A mechanical projector for launching projectiles, comprising:

an elongated stock member;

an elongated prod mounted extending across one end of said stock member, said prod having a resilient deflectable limb disposed on either side of said stock member;

a drawstring extending across said stock member and adapted to be drawn rearwardly on said stock member, said drawstring constituted by a pair of drawstring segments each mounted to extend away from either side of said stock member from a central point whereat said segments are connected to each other, said central point engageable with a projectile to be launched on said stock member;

a pair of variable leverage devices mounted on either side of said stock member; each variable leverage device including a rotary element rotatably mounted to one side of said stock member and connected to a respective drawstring segment to be rotated as said drawstring is drawn;

means generating stored energy by resilient deflection of said prod limbs upon rotation of said rotary elements of each of said variable leverage devices by drawing of said drawstring;

said means including a pair of load cables separate from said drawstring, each connecting a respective prod limb tip and wound on a rotary element of a respective variable leverage device;

each of said variable leverage devices including means varying the leverage exerted by said respective drawstring segment on a respective load cable as said drawstring is drawn to reduce the effort required to cause deflection of said prod limbs as said drawstring is fully drawn;

a slide mounted for sliding movement along the length of said elongated stock member; and,

synchronizing means drivingly connecting said slide and said rotary element of each of said variable leverage devices constraining a said rotary elements to rotate in synchronism with each other, comprising said drawstring segments each fixed to said slide so as to prevent lateral movement of said drawstring relative said stock member to thereby constrain rotation of said rotary elements, each of said drawstring segments extending directly from a respective rotary element to said slide.

4,917,072

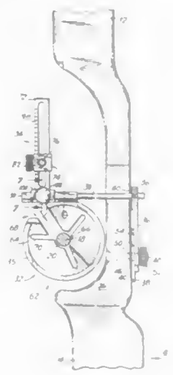
ARROW SIGHTING AND SUPPORT APPARATUS

Steven Chang, Bardonia, N.Y., assignor to C & M Sports Enterprises, Inc., W. Nyack, N.Y.

Continuation-in-part of Ser. No. 217,191, Jul. 11, 1988, Pat. No. 4,858,589. This application Jun. 12, 1989, Ser. No. 296,100

Int. Cl.[4] F41B *5/00*

U.S. Cl. 124—41 A 3 Claims



1. A combination arrow sight and support device for use with an arrow having feathers and an archery bow upon which is adjustably mounted a horizontal bar comprising a generally conical frame mounted to said horizontal bar having a ring portion and a conical portion, said conical portion defining a central and single arrow support aperture and arrow feather slots with a side entrance slot enabling entrance of said arrow to said central aperture for providing guidance and support for said arrow, said arrow sight and support device being operationally connected for mounting on an archery bow with a drawstring and a hand-grip portion, which includes said horizontal bar projecting outwardly from said bow across the plane defined by drawstring action and in front of the undrawn position of the drawstring, peep-sight mounted for adjustable travel along said bar and projecting upwardly therefrom, a mounting plate adapted to be secured to the bow proximate the hand-grip portion thereof, and an intermediate support arm, having first and second ends pivotably mounted to said mounting plate about a horizontal axis at said first end and pivotably mounted to said horizontal bar at said second end.

4,917,073

TWO STROKE ENGINE AND METHOD OF DESIGNING SAME

Pierre Duret, Paris, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

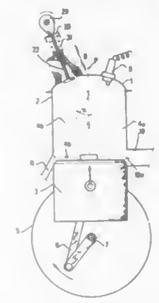
Filed May 19, 1988, Ser. No. 195,795

Claims priority, application France, May 19, 1987, 87 7023

Int. Cl.[4] F02B *33/04*

U.S. Cl. 123—73 C 19 Claims

1. An internal combustion two-stroke engine comprising at least one combustion chamber, a delayed pneumatic fuel injection system for producing a caburetted gas jet opening into a cylinder head means covering a cylinder cooperating with a piston mean, the cylinder head means, the cylinder and the piston means defining said at least one combustion chamber, a wall of the cylinder comprising at least one exhaust port disposed in a vicinity of a first reference point through which passes a first axial plane of the cylinder or an exhaust plane, and at least one intake port situated in a vicinity of a second reference point or an intake reference point, wherein a plane perpendicular to the exhaust plane and containing a longitudinal center axis of the cylinder defines two accommodation zones



in the cylinder, a first of said two accommodation zones, complementary to a second of the two accommodation zones, contains the reference point of the exhaust port, and wherein the pneumatic fuel injection system is disposed in said second of said two accommodation zones.

4,917,074

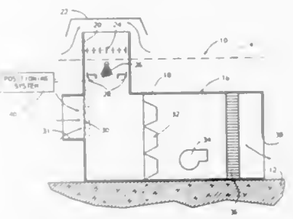
DIRECT GAS-FIRED HEATING AND VENTILATION METHOD AND APPARATUS

Dale J. Brekke, Calleoka, Tenn., assignor to Satura Corporation, Troy, Mich.

Filed Apr. 3, 1989, Ser. No. 331,721

Int. Cl.[4] F24H *3/02*

U.S. Cl. 126—110 A 4 Claims



1. A method of heating and ventilating a building such as industrial and commercial buildings and the like with a direct gas-fired system using variable amounts of fresh outside air comprising the steps of, forcing air to circulate through the building at a variable rate, delivering a variable amount of fresh air from outside the building to a gas flame and thence in a thus heated condition into the building at a rate independent of the forced air circulation, bypassing a variable amount of fresh air from outside the building around the gas flame and thence into the building at a rate independent of the forced air circulation, recirculating a variable amount of air inside the building at a rate independent of the forced air circulation, initially adjusting the system so that a predetermined pressure drop occurs across the gas flame when there is a maximum allowed bypass flow and no recirculation, modulating the fresh air delivered to the gas flame and also the recirculated air at rates independent of the forced air circulation so that said predetermined pressure drop is maintained when there is no bypass flow, and modulating the fresh air delivered to the gas flame and also both the recirculated air and bypass air at rates

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independent of the forced air circulation so that said predetermined pressure drop is maintained when there is both bypass flow and recirculation.

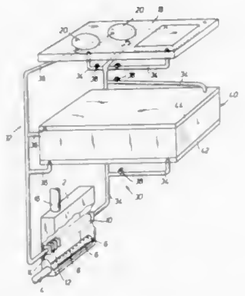
3. Heating and ventilating apparatus for heating and ventilating a building such as industrial and commercial buildings and the like with a direct gas-fired system using variable amounts of fresh outside air comprising, a gas burner, fan means for forcing air to circulate through the building at a variable rate, means for delivering a variable amount of fresh air from outside the building to said gas burner and thence in a thus heated condition into the building at a rate independent of the forced air circulation, means for bypassing a variable amount of fresh air from outside the building around the gas flame and thence into the building at a rate independent of the forced air circulation, means for recirculating a variable amount of air inside the building at a rate independent of the forced air circulation, said apparatus being initially adjusted so that a predetermined pressure drop occurs across the gas flame when there is a maximum allowed bypass flow ad no recirculation, means for modulating the fresh air delivered to the gas flame and also the recirculated air at rates independent of the forced air circulation so that said predetermined pressure drop is maintained when there is no bypass flow, and means for modulating the fresh air delivered to the gas flame and also both the recirculated air and bypass air at rates independent of the forced air circulation so that said predetermined pressure drop is maintained when there is both bypass flow and recirculation.

4,917,075

ARRANGEMENT FOR COOKING BY GAS COMBUSTION

José M. Nacenta Atmella, Barcelona, Spain, assignor to Catalana De Gas, S.A., Barcelona, Spain

Filed Apr. 4, 1989, Ser. No. 332,732
Claims priority, application Spain, Apr. 12, 1988, 8801114
Int. Cl.[4] F24B *9/00*
U.S. Cl. 126—33 6 Claims



1. An arrangement for cooking food in a food cooking container by gas combustion, comprising:

a hob in which there is at least one heater, each heater being formed by a cavity limited at the top thereof with a plate generally flush with the hob, said plate receiving directly said food cooking container thereon, and said cavity being provided with at least one access means

a boiler containing a burner where said gas combustion takes place, as well as a first heat exchanger adapted to receive the heat produced by said combustion, said first heat exchanger being provided with an outlet port and a return port;

an outgoing and return communication circuit between said first heat exchanger and said at least one access means of each said heater, the circuit including a distribution network communicating said outlet port with each said cavity and a return network communicating each said cavity with said return port;

a thermal fluid within said heat exchanger and which is capable of flowing through whole or part of said distribution network, which is capable of reaching one or more of said heaters and which is capable of flowing through said return network back to said heat exchanger,

wherein the plate is in contact with the thermal fluid; and

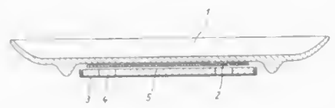
a plurality of valves which control the access of the fluid to the at least one heater.

4,917,076

DEVICE FOR KEEPING WARM OR COOLING FOODS OR BEVERAGES

Bruno Nadolph, and Rene Bucking, both of Haus 79, A-9581 Ledenitzen (Karnten), Austria

Filed Jun. 14, 1988, Ser. No. 206,349
Int. Cl.[4] A47J *36/24*
U.S. Cl. 126—375 3 Claims



1. Device for keeping warm or cooling foods or beverages, comprising a container (1) for holding the food or beverage, a body (5) releasably connected to the container (1) in contact therewith, this body comprising at least in part a material having heat storage capability and being in the form of a disk releasably held in contact with the underside of the container by means of magnetic forces, magnet means (4) in the body (5), a layer (2) of magnetically conductive material attached to the underside of the container (1), and a removable cover (3) of heat-insulating material on the surface of the body (5) facing away from the container (1), the container having a downwardly extending rim on which the container rests, said rim enclosing a cavity on the underside of the container in which said layer (2) and body (5) and cover (3) are disposed, the height of said rim being such that said body extends downward no farther than said rim.

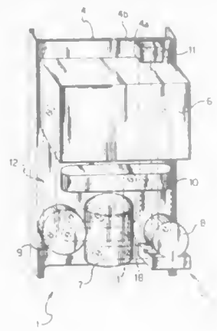
4,917,077

WALL-MOUNTED HOT WATER BOILER OF THE INSTANT TYPE

Giorgio Scanferla, Via O. Marinali, 52, 36061 Bassano del Grappa - Vicenza, Italy

Filed Apr. 7, 1988, Ser. No. 178,921
Int. Cl.[4] F24H *1/08*
U.S. Cl. 126—344 6 Claims

1. A wall mounted hot water heater comprising a substantially flat panel, a fluid inlet, a fluid outlet, water circulating means, a first heat exchanger and a second heat exchanger, all associated with said panel, and a plurality of fluid confining conduits that hydraulically connect said water circulating means and said first and second heat exchangers between said fluid inlet and said fluid outlet, wherein said substantially flat



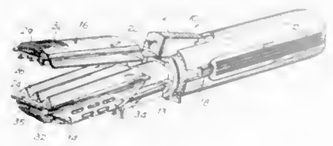
panel constitutes a substantial portion of each of said plurality of fluid confining conduits.

4,917,078

HAIR RADIATING JAW MEMBERS FOR HAIR CRIMPER

Thaddeus Zaborowski, Cambridge, Mass., assignor to The Schawbel Corp., Cambridge, Mass.

Filed Feb. 10, 1989, Ser. No. 310,055
Int. Cl.[4] A45D *1/04*
U.S. Cl. 126—409 4 Claims



1. A heatable hairstyling device comprising:

a. a hand-grippable body section having a proximal end and a distal end;

b. a stationary haristyling jaw member secured to said distal end of said body section and having an interiorly directed heatable plate surface and a first exteriorly directed cooling surface;

c. A movable hairstyling jaw member pivotally secured to said distal end of said body section having an interiorly directed sheet which cooperates with said heatable plate surface to grip a tress of hair therebetween, and a second exteriorly directed cooling surface;

d. heating means for raising the temperature of said heatable plate surface to a temperature such that a hair tress held between said heatable plate surface and said sheet will conform to the predetermined shape defined by said heatable plate surface; and

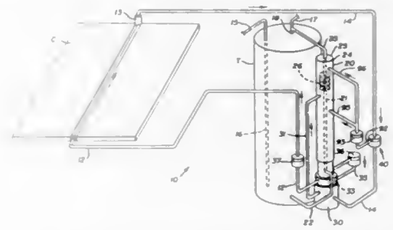
e. said first and second exteriorly directed cooling surfaces of said stationary and said movable hairstyling jaw members, respectively, having raised rib, finger contacting and heat radiating portions which provide surface areas for safe, finger holding of said jaw members at the other end of said jaw members from said distal end of said body section, and for dispersion of heat from said heatable plate surface to surroundings.

4,917,079

SOLAR WATER HEATING SYSTEM

Fred D. Solomon, Akron, Ohio, assignor to MTD Products, Inc., Cleveland, Ohio

Filed Aug. 22, 1988, Ser. No. 234,511
Int. Cl.[4] F24J *7/32*
U.S. Cl. 126—433 8 Claims



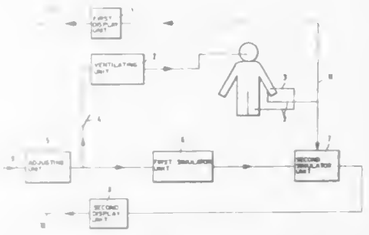
1 A solar powered water heating system for heating water in a storage tank comprising, solar collector means for converting a working fluid from a liquid to a gaseous state, pump means communication with said solar collector means via a working fluid supply line and operable by the gaseous state of the working fluid, heat exchanger means communicating with and receiving working fluid from said pump means, said heat exchanger means transferring heat from the working fluid to water passing therethrough from the storage tank, means supplying condensed working fluid in said heat exchanger means to said pump means for returning circulation to said solar collector means and valve means interposed between said solar collector means and said pump means for supplying working fluid to said pump means when the pressure of the working fluid delivered by said working fluid supply line exceeds a selected opening pressure and for effecting closing of said valve means only upon reaching a selected reduced pressure below the selected opening pressure, thereby obviating repeated opening and closing of said valve means upon minor fluctuations in working fluid pressure.

4,917,080

METHOD FOR CONTROLLING A VENTILATING APPARATUS USING A SIMULATOR ARRANGEMENT

Jörg Bayerlein, Stockelsdorf, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed May 19, 1989, Ser. No. 354,030
Claims priority, application Fed. Rep. of Germany, May 19, 1988, 3817053
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—204.23 3 Claims



1. A method of controlling a ventilating apparatus for which a new adjustment selected according to patient data is to be

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made for optimization after a work-in time period, the method comprising the steps of:

connecting both a first simulator unit defining a model of the ventilating apparatus and simulating the characteristic values of the ventilating apparatus and a second simulator unit defining a model of the patient and simulating the patient parameters derived from the patient data to said ventilating apparatus such that the new adjustment is first carried out on said first simulating unit without changing the adjustment of said ventilating apparatus thereby obtaining resulting output values at the output of said first simulator unit;

coupling said resulting output values of said first simulator unit with said patient data of said second simulator unit such that effects of the new adjustment on the patient can be derived as simulated new patient data; and,

switching over said ventilating apparatus to said new adjustment via a control command.

4,917,081

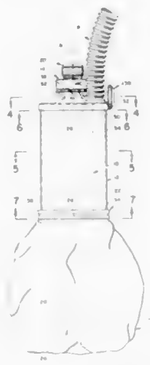
PORTABLE EMERGENCY BREATHING APPARATUS

Josef A. Bartos, Diamond Bar, Calif., assignor to Respirator Research, Ltd., Willoughby, Ohio

Continuation of Ser. No. 762,253, Aug. 5, 1985, abandoned. This application Sep. 24, 1987, Ser. No. 99,650

Int. Cl.[4] A62B *7/10*

U.S. Cl. 128—205.12 4 Claims



1. Portable emergency breathing apparatus comprising a cylindrical breathing gas container having an axis, axially spaced apart open and closed ends and a cylindrical wall between said ends, said open end including a coaxial cylindrical neck having an outer end and a threaded opening therethrough to the interior of said container coaxial with said axis, said neck having a diameter smaller than the diameter of said cylindrical wall, whereby a first annular space exists between said neck and the cylindrical plane of said cylindrical wall, valve body means, threaded mounting means on said valve body means for interengaging with said threaded opening in said container neck to removably mount said valve body means on said container, gas scrubber canister means removably received on said container and including an inner canister wall encircling said cylindrical wall of said container and an outer canister wall surrounding and spaced radially outwardly from said inner canister wall, said inner and outer canister walls having corresponding first ends spaced axially inwardly from said outer end of said container neck and corresponding second ends axially spaced from said first end toward said closed end of said container, apertured plate means surrounding said container and radially interconnecting said inner and outer canister walls at said first ends thereof, first end cap means secured to said outer canister wall at said first end thereof, said first end cap means including a first end cap wall axially spaced from said apertured plate means in the direction toward said outer end of said container neck, and second end cap wall means interconnecting the first end cap wall and said outer canister wall to define therewith a second annular space radially outwardly of said first annular space, wall means connecting said first end of said inner canister wall to said first end cap means to prevent fluid commuication radially between said first and second annular spaces, means releasably interengaging said valve body means and said first end cap means to releasably secure said canister means to said valve body means, said valve body means and said first end cap means closing said first end of said outer canister wall to atmosphere, flow passageway means through said valve body means having an inlet end and an outlet end, said inlet end communicating with the interior of said container through said threaded mounting means on said valve body means, flow control valve means supported within said valve body means for controlling the flow of breathing gas from said container through said passageway means, said flow control valve means including shut-off and pressure reducing valve means between said inlet and outlet ends of said passageway means, said outlet end of said passageway means opening through said valve body means into said first annular space, second end cap means including a plate surrounding said cylindrical wall of said container and radially interconnecting said second ends of said inner and outer canister walls to one another, the space between said inner and outer canister walls axially between said apertured plate means and said plate providing a scrubber chamber, said scrubber chamber being in flow communication with said second annular space through said apertured plate means, granular gas scrubbing material filling said chamber, said plate including openings axially therethrough into said scrubber chamber, said second end cap means further including radially outer peripheral wall means connected to said second end of said outer canister wall and said plate, said closed end of said container extending axially beyond said second ends of said inner and outer canister walls and said second end cap means, a breathing bag having an open end surrounding and secured to said peripheral wall means of said second end cap means such that the interior of said bag receives said closed end of said container and is connected in flow communication with said scrubber chamber at said second ends of said canister walls, means providing a flow path for breathing gas between said cylindrical container wall and said inner canister wall and axially from said first annular space toward said second ends of said canister walls, said flow path communicating at said second ends with the interior of said breathing bag, whereby breathing gas under pressure from said container is adapted to flow through said outlet end of said passageway means to said first annular space and thence directly to said breathing bag, an opening in said first end cap wall of said first end cap means to said second annular space, and a breathing hose connected to said opening in said first end cap wall, whereby the interior of said breathing bag is connected in flow communication with said breathing hose through said scrubber chamber.

4,917,082

RESECTOSCOPE ELECTRODE

Benedetto Grossi, and Raymond Ainger, II, both of Stamford, Conn., assignors to Circon Corporation, Santa Barbara, Calif.

Filed Jun. 2, 1988, Ser. No. 202,153

Int. Cl.[4] A61B *17/36*

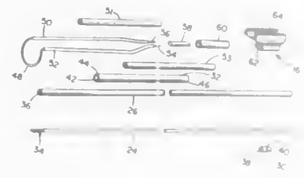
U.S. Cl. 606—46 16 Claims

1. An electrode assembly for use with an endoscope, the assembly comprising:

electrode lead means having an elongate conductor with an insulative cover;

electrode end means having a pair of parallel arms connected at a distal tip of the electrode assembly by an electrode tip and having stiffener means operatively attached to said pair of parallel arms for stiffening said electrode lead means; and

electrode stabilizer means for slideably stabilizing the electrode proximate a distal region of a telescope, said stabilizer means being made of a resilient and flexible dielectric



material for resiliently laterally mounting the electrode to the telescope and for insulating the electrode assembly from the telescope.

4,917,083

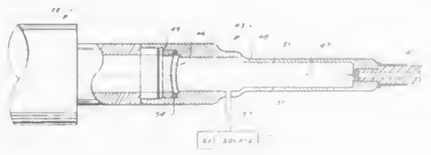
DELIVERY ARRANGEMENT FOR A LASER MEDICAL SYSTEM

James A. Harrington, Westlake Village, Calif., and Michael G. Clancy, Westford, Mass., assignors to Heraeus Lasersonics, Inc., Santa Clara, Calif.

Filed Mar. 4, 1988, Ser. No. 164,236

Int. Cl.[4] A61B *17/36*

U.S. Cl. 606—15 9 Claims



1. A laser radiation delivery arrangement for a laser medical system comprising, in combination:

A. An articulated arm coupled to a laser to receive radiation generated thereby and direct the same via articulations to an output end thereof;

B. A hollow, air core optical waveguide probe to receive laser radiation from said output end of said arm and guide the same from an entry end thereof to an exit end, the cladding material of said waveguide probe having an index of refraction which is smaller than one and being aluminum oxide; and

C. An optical coupler positioned to receive laser radiation emanating from the output end of said articulated arm and condition the same for receipt at the entry end of said optical waveguide probe.

4,917,084

INFRARED LASER CATHETER SYSTEM

Edward L. Sinofsky, Reading, Mass., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Continuation-in-part of Ser. No. 14,990, Feb. 17, 1987, abandoned, which is a continuation of Ser. No. 761,188, Jul. 31, 1985, abandoned. This application Mar. 10, 1988, Ser. No. 166,315

Int. Cl.[4] A61N *5/06*

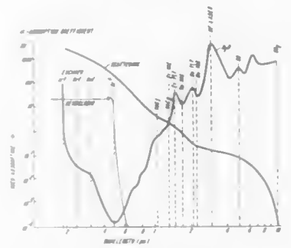
U.S. Cl. 606—7 16 Claims

1. A system for the surgical removal of atherosclerotic plaque comprising:

a laser energy source operating in a pulsed mode with an output wavelength in the range of from about 1.4 to about 2.2 micrometers, said laser energy source operating at an energy density of at least about 0.6 joules per square millimeter per pulse;

an optical fiber;

means for coupling an output of said laser source to a proximal end of said optical fiber; and



means attached to a distal end of said optical fiber for directing laser energy propagating down said optical fiber to a surgical site within the body.

4,917,085

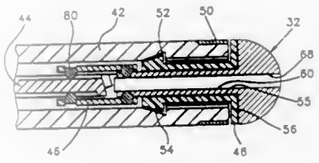
DRIVE CUTTING CATHETER HAVING NEW AND IMPROVED DRIVE MOTOR

Kevin W. Smith, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Continuation of Ser. No. 132,473, Dec. 14, 1987, abandoned. This application Sep. 7, 1989, Ser. No. 405,413

Int. Cl.[4] A61F *17/32*

U.S. Cl. 606—159 8 Claims



1. Apparatus for opening an obstructed region of a blood vessel comprising:

(a) a motor including a motor housing, bearings mounted within the motor housing, a drive shaft supported by the bearings for rotation with respect to the housing, field creating means fixed within the housing, and field responsive means coupled to the drive shaft for rotating the drive shaft with respect to the motor housing; said drive shaft defining a motor throughpassage extending completely through the motor housing;

(b) a flexible elongated cylindrical drive catheter including a non-rotating outer sheath, an inner core that rotates within the outer sheath, and a distal tip coupled to a distal end of the core and extending beyond a distal end of the outer sheath; said core and distal tip defining a catheter throughpassage extending from a proximal end of the core, through the core and out the distal tip of the drive catheter;

(c) structure including a body for coupling the motor housing to the outer sheath of the cylindrical drive catheter and defining a body passageway, a transmission positioned within the body passageway having one end coupled to an output shaft of the motor and having an opposite end coupled to the drive catheter core for imparting rotational

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motion from the motor drive shaft to the drive catheter core, said transmission defining a transmission throughpassage;

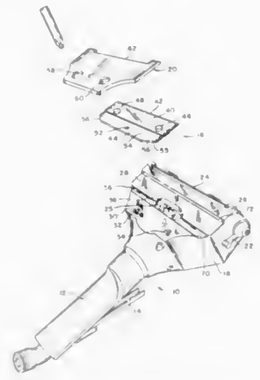
(d) said motor drive shaft, transmission, rotatable core, and distal tip defining a combined throughpassage having a diameter sufficient to allow the drive catheter to be slipped over a guidewire already extending into the patient to route the distal tip into proximity to the obstructed region of the blood vessel and to be rotated by the motor to abrade deposits from an inner wall of the blood vessel.

4,917,086

DERMATOME BLADE ASSEMBLY

Susan M. Feltovich, and Todd B. Grimm, both of Dover, Ohio, assignors to Snyder Laboratories, Inc., Dover, Ohio

Filed May 26, 1988, Ser. No. 199,226
Int. Cl.[4] A61B *17/322*
U.S. Cl. 606—132 6 Claims



2. A dermatome blade assembly comprising a first part forming a cutting edge and a second part secured to the first part to form a unitary assembly for selective attachment to a dermatome, the second part is made from a light weight plastic defining a bearing surface slideably engageable with the dermatome, integral tabs extend outwardly from one surface of the second part to secure the first part to the second part, and at least one post extends outwardly from an opposite surface of the second part to cooperate with the dermatome.

4,917,087

ANASTOMOSIS DEVICES, KITS AND METHOD

David J. Walsh, Mississauga; William M. Lougheed, Toronto; Fred Gentili, Toronto, and Mahmood Fazl, Toronto, all of Canada, assignors to Walsh Manufacturing (Mississuaga) Limited, Oakville, Canada

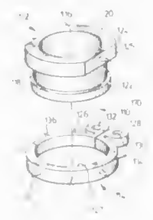
Continuation of Ser. No. 923,490, Oct. 27, 1986, Pat. No. 4,787,386, which is a continuation of Ser. No. 598,900, Apr. 10, 1984, Pat. No. 4,657,019. This application Aug. 30, 1988, Ser. No. 238,730
The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.
Int. Cl.[4] A61B *17/04*
U.S. Cl. 606—153 15 Claims

1. An anastomosis device for non-suture, non-adhesive end-to-side connection of tubular tissue members to be anastomosed with overlapping intima to intima contact comprising:

a tubular connection member of sterilizable, biocompatible material having a smooth inner cylindrical surface, an outer cylindrical surface, and a clip-retaining means on said outer cylindrical surface adjacent a first end of said connection member,

tissue holding elements on said connection member, extending outwardly therefrom remote from said retaining means and adapted to hold the end tissue material of a first vessel passed inwardly through said connection member and everted over said connection member from said first end,

clip means of sterilizable, biocompatible spring material having a ring-shaped body part defining a substantially circular opening, and opposed ends separable under spring pressure to enlarge said opening,



said ring-shaped body part being adapted to circumferentially surround said outer cylindrical surface and apply a radially inward spring force thereon,

a plurality of spaced apart tissue piercing and retaining members on said ring-shaped body part adapted to engage tissue material everted from a side opening in a second tissue member, and

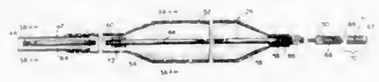
said clip-retaining means being effective to prevent axial dislodgement of the clip member mounted on said tubular member, at said first end.

4,917,088

BALLOON DILATION PROBE

James F. Crittenden, Hollis, N.H., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Division of Ser. No. 729,541, May 2, 1985. This application Jan. 30, 1989, Ser. No. 303,908
Int. Cl.[4] A61M *29/02*
U.S. Cl. 606—194 21 Claims



1 A balloon coronary angioplasty probe comprising:

an elongate, flexible, tubular proximal segment having a proximal end and a distal end;

an elongate distal segment including a support wire having a smaller diameter than the outer diameter of the distal end of the proximal segment, the support wire being connected to the proximal segment and extending distally beyond the distal end of the proximal segment, the support wire being shorter and more flexible than the proximal segment;

a balloon supported on the probe about the support wire with the support wire extending through the balloon, the distal end of the balloon being attached to the distal segment of the probe;

the tubular proximal segment defining a lumen for communicating the proximal end of the probe with the interior of the balloon to enable inflation and deflation of the balloon;

a sleeve extending about the support wire, the sleeve being connected at its distal end to the proximal end of the balloon and at its proximal end to the distal end of the proximal segment;

said sleeve communicating the interior of the balloon with the lumen of the proximal tubular segment;

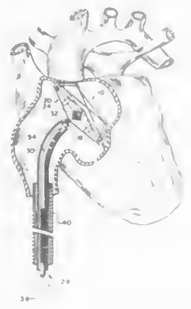
the proximal segment being sufficiently torsionally rigid so that when the probe is in a configuration corresponding to that of a human aortic arch and with the distal segment at least in part in a coronary artery, the probe is capable of transmitting controllably from its proximal to its distal end rotation applied at the proximal end.

4,917,089

BUTTONED DEVICE FOR THE TRANSVENOUS OCCLUSION OF INTRACARDIAC DEFECTS

Eleftherios B. Sideris, 1600 Coulter, Suite 200B, Amarillo, Tex. 79106

Filed Aug. 29, 1988, Ser. No. 237,953
Int. Cl.[4] A61B *17/04*
U.S. Cl. 606—215 3 Claims



1. An intracardiac percutaneously deliverable device for the repair of heart defects comprising:

a. an occluder, said occluder including:

i. a foldable foam polyurethane disc with

ii. a Teflon coated wire skeleton in the form of an "X" sutured to the foam disc, and

iii. a thread sutured to the center of the wire skeleton,

iv. said thread formed into a loop with

v. a knot closing the loop remote from the skeleton,

b. an occluder-holder, said occluder-holder including

i. a foldable foam polyurethane rhomboid disc with

ii. a single wire skeleton sutured to the rhomboid disc, and

iii. a rubber piece sutured at the center of the rhomboid disc,

c. a loading wire including

i. a Teflon coated hollow wire, and

ii. a long thread,

d. said loading wire pierced through an opening in the occluder-holder and its rubber piece,

e. said long thread extending

i. through the hollow wire,

ii. through the thread loop at the occluder, and

iii. back through the hollow wire;

f. so arranged and constructed that

i. the occluder-holder may be pushed toward the occluder and

ii. pulling on the loading wire will pull the knot through the rubber piece on the occluder-holder thereby

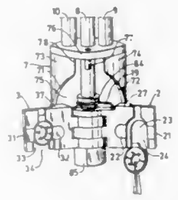
iii. buttoning the occluder-holder to the occluder.

4,917,090

METHOD FOR PERFORMING AN ANASTOMOSIS

Anders Berggren, Linkoping; Hakan A. E. Rohman, Mantorp, and Leif T. Ostrup, Linkoping, all of Sweden, assignors to Unilink, Inc., Mantorp, Sweden

Continuation of Ser. No. 881,898, Jul. 3, 1986, abandoned, which is a division of Ser. No. 588,100, Feb. 21, 1984, Pat. No. 4,624,257. This application Jan. 19, 1988, Ser. No. 144,754
Claims priority, application Sweden, Jun. 24, 1982, 8203966
Int. Cl.[4] A61B *17/04*
U.S. Cl. 606—153 1 Claim



1 A method of joining blood vessels, and establishing a liquid connection between them, comprising:

(a) providing a surgical instrument having clamping means and a plurality of recesses disposed therein;

(b) providing at least two couplable rings having center holes therein, each of said rings having a plurality of fixed axial directed pins and intermediate holes distributed around the centers thereof, a lower end surface and an upper end surface which are plane-parallel, and at least one shoulder disposed parallel to said end surfaces and arranged along at least a portion of the periphery of each of said rings at a definite distance from said lower end surface, each of said shoulders being slidably insertable into a corresponding one of said plurality of recesses of said surgical instrument;

(c) inserting said rings into said clampling means, whereby each of said shoulders is disposed into said corresponding recess of said surgical instrument for aiding in aligning the pins of a first of said couplable rings with the intermediate holes of a second couplable rings;

(d) threading a first of said blood vessels through the center hole of said first of said couplable rings and securing the outer wall of said first blood vessel to the pins of said ring;

(e) threading a second of said blood vessels through the center hole of said second of said couplable rings and securing the outer wall of said second blood vessel to the pins of said second ring; and

(f) actuating said surgical instrument to cause the pins of said first ring to be forced into the intermediate holes of said second ring and to cause the pins of said second ring to be forced into the intermediate holes of said first ring, said actuating step causing said couplable rings to join said blood vessels to establish a liquid connection between them.

4,917,091

ANNULAR FASTENING MEANS

Anders Berggren, Linkoping; Hakan A. E. Rohman, Mantorp, and Leif T. Ostrup, Linkoping, all of Sweden, assignors to Unilink AB, Mantorp, Sweden

Continuation of Ser. No. 144,754, Jan. 19, 1988, which is a continuation of Ser. No. 881,898, Jul. 3, 1986, which is a division of Ser. No. 588,100, Feb. 21, 1984, Pat. No. 4,624,257. This application May 24, 1989, Ser. No. 356,071
Int. Cl.[4] A61B *17/04*
U.S. Cl. 606—153 11 Claims

1. A fastening means for joining portions of generally cylindrical body members, such as blood vessels, and for establish-

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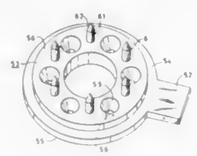
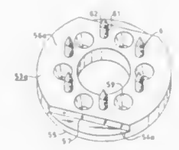
ing connection between them, such as anastomosis, comprising:

at least two coupling rings,

each of said rings comprising a plurality of axially directed pins and intermediate holes distributed on a circumference around the center of each ring, a lower end surface and an





upper end surface which are plane-parallel, and a first shoulder disposed parallel to said end surfaces and arranged along at least a portion of the periphery of each of said rings at a definite distance from the lower end surface,

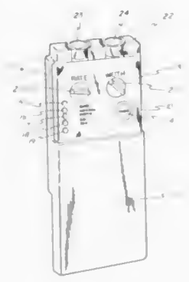
the holes of a first of said rings being sized to a dimension of the pins of a second of said rings so as to form a forced fit when said rings are coupled.

4,917,092

TRANSCUTANEOUS NERVE STIMULATOR FOR TREATMENT OF SYMPATHETIC NERVE DYSFUNCTION

Gregory A. Todd, Westerville, and Michael H. Southworth, Columbus, both of Ohio, assignors to Medical Designs, Inc., Westerville, Ohio

Filed Jul. 13, 1988, Ser. No. 218,722
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—421 **14 Claims**



1. A method for using one T.E.N.S. unit for efficient suppression of pain associated with sympathetic nerve dysfunction which comprises the steps of

generating pulses,

modulating the pulse width and amplitude of the generated pulses over a modulation cycle to vary in a prescribed manner so as to stimulate within each modulation cycle the autonomic and central nervous systems of said person, such that said sympathetic nerve dysfunction is treated with a low frequency of pulses while through the utilization of strength-duration modulation at higher pulse rates, said person's nociceptors are addressed, such that said autonomic nervous system is stimulated for more than 5% of the amount of time as said central nervous system, and

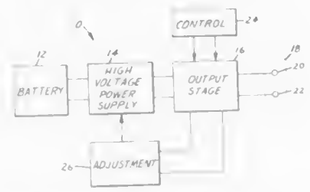
conveying said pulses to a person experiencing pain associated with sympathetic nerve dysfunction.

4,917,093

BIOLOGICAL TISSUE STIMULATOR WITH ADJUSTABLE HIGH VOLTAGE POWER SUPPLY DEPENDENT UPON LOAD IMPEDANCE

Joel R. Dufresne, St. Paul, and William L. Sondermann, Minneapolis, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 12, 1987, Ser. No. 61,695
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—421 **11 Claims**



1. A biological tissue stimulator adapted to supply an electrical stimulation signal to a biological load, comprising:

a battery;

a high voltage power supply operatively coupled to said battery and producing a high voltage signal;

output means receiving said high voltage signal for supplying said electrical stimulation signal of a predetermined current amplitude;

electrode means receiving said electrical stimulation signal and adapted to be coupled to biological tissue for delivering said electrical stimulation signal so that said electrical stimulation signal may be applied to said biological tissue; and

adjustment means responsive to said output means and to said high voltage power supply for comparing the amplitude of said high voltage signal to the amplitude of the voltage drop across said electrode means during the application of said electrical stimulation signal to said biological tissue and adjusting the amplitude of said high voltage signal dependent upon the result of said comparing.

4,917,094

GUIDEWIRE ADVANCEMENT SYSTEM

Arthur S. Lynch, Westwood, and A. Walter MacEachern, Woburn, both of Mass., assignors to Medical Parameters Inc., Woburn, Mass.

Division of Ser. No. 114,451, Oct. 28, 1987. This application Jun. 27, 1989, Ser. No. 372,047
Int. Cl.[4] A61B *6/00*
U.S. Cl. 128—657 **4 Claims**

1. A catheter guidewire advancement system comprising:

a tube for containing a conductive catheter guidewire displaceable within the tube;

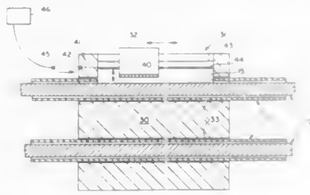
a port at one end of the tube through which a distal end of a guidewire can enter or exit the tube;

an aperture in the tube such that a fictional force applied through the aperture to a guidewire when in place within the tube will displace the guidewire through the tube and the port;

a housing holding the tube and configured about the aperture;

frictional engaging means mounted on the housing for applying a frictional force through the aperture to a guidewire when in place within the tube; and

a conductor mounted within the housing for transmitting an electrical signal from a guidewire when in place within



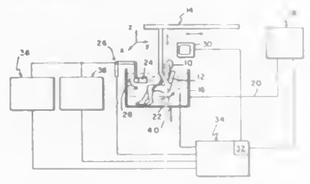
the tube, such that whena guidewire is in place within the tube and the frictional engaigng means is in frictional engagement with the guidewire, the electrical conductor and the guidewire are electrically connected.

4,917,095

ULTRASOUND LOCATION AND THERAPY METHOD AND APPARATUS FOR CALCULI IN THE BODY

Francis J. Fry, and Bryan Burney, both of Indianapolis, Ind., assignors to Indianapolis Center for Advanced Research, Inc., Indianapolis, Ind.

Filed Nov. 18, 1985, Ser. No. 798,973
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660.03 **19 Claims**



1. Means for non-invasively decomposing a calculus within a human body comprising means for locating the calculus, means for ultrasonically irradiating the calculus without appreciably raising the temperature of the calculus or of the surrounding tissue, the means for locating the calculus being relatively more narrowly focussed and less powerful than the means for ultrasonically irradiating the calculus which is less narrowly focussed and more powerful than the means for locating the calculus, and means for coupling the locating means and the irradiating means for movement of the irradiating means under the control of the locating means so that location of the calculus results in appropriate aiming of the irradiating means.

4,917,096

PORTABLE ULTRASONIC PROBE

Theodore M. Englehart; Richard F. Morris, and Narendra T. Sanghvi, all of Indianapolis, Ind., assignors to Laboratory Equipment, Corp., Mooresville, Ind.

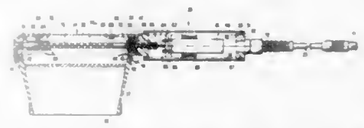
Filed Nov. 25, 1987, Ser. No. 125,403
Int. Cl.[4] A61B *8/00*
U.S. Cl. 128—660.1 **12 Claims**

1. A portable, hand-held, ultrasonic scanning probe for use with energizing and receiving means for imaging sections of a body by transmitting ultrasonic energy into the body and receiving image-representative signals from the body, comprising:

a fluid-tight enclosure;

fluid contained within said enclosure;

transducer means disposed within said enclosure and operable in response to said energizing and receiving means to generate an ultrasound beam into the body and receive image-representative signals back; and



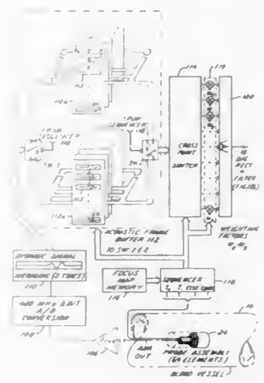
linear drive means for moving said transducer means back and forth on a common axis in a linear path, said linear drive means including a level wind drive screw and a cooperating holder, said transducer means being secured to the said holder, said holder remaining static relative to said transducer means.

4,917,097

APPARATUS AND METHOD FOR IMAGING SMALL CAVITIES

Andrew P. Proudian, deceased, late of Orangevale, Calif. (by Sallee J. Proudian, legal representative); Michael J. Eberle, Citrus Heights; Adam D. Savakus, Loomis; Horst F. Kiepen, Georgetown; Douglas N. Stephens, Carmichael, and David H. Rammler, Woodside, all of Calif., assignors to Endosonics Corporation, Rancho Cordova, Calif.

Filed Oct. 27, 1987, Ser. No. 114,351
Int. Cl.[4] A61B *8/12*
U.S. Cl. 128—662.06 **38 Claims**



1. An imaging device for emitting ultrasonic acoustic waves and providing a useable image in response to detection of reflections of said ultrasonic acoustic waves, said imaging device comprising:

a body for insertion into a cavity;

an array of transducer elements mounted to said body for generating first electrical signals containing imaging information in response to said reflections of said ultrasonic acoustic waves;

a cable connecting said body to an environment external of said cavity and including at least one signal channel for transporting said first electrical signals;

means mounted on said body and proximate to said array of transducer elements for receiving said first electrical signals from said array of transducer elements and converting said first electrical signals to second electrical signals

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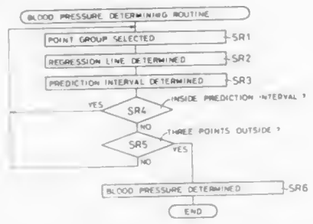
that may be transmitted along said at least one channel in said cable without significant loss of imaging information;
a processor responsive to said second electrical signals from said cable for providing imaging data; and
a display responsive to said imaging data for providing a visual image of said cavity and its surrounding structure.

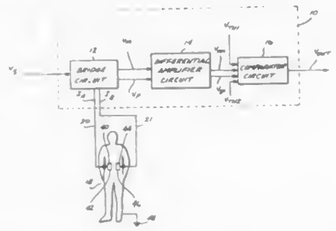
4,917,098
METHOD AND APPARATUS FOR MEASURING BLOOD PRESSURE
Tadashi Murase, Gifu, Japan, assignor to Colin Electronics Co., Ltd., Aichi, Japan
Filed Feb. 23, 1989, Ser. No. 314,096
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—677 **13 Claims**



1. A method of determining a blood pressure of a subject based on heartbeat-synchronous pulses which are produced from the subject by pressing a body portion of the subject with an inflatable cuff, the method comprising the steps of:
detecting said heartbeat-synchronous pulses as pressure in said cuff is varied,
preparing plural sets of point data each of which represents a pressure of said cuff at the time of detection of a corresponding one of said pulses and a magnitude of said corresponding one pulse,
plotting, based on the prepared plural sets of point data, a plurality of points in a two-dimensional table defined by a first axis indicative of said pressure of the cuff and a second axis indicative of said magnitude of the pulses,
selecting a predetemined number of consecutive points from the plotted points such that said predetermined number is not less than three,
determining a regression line of the selected consecutive points,
statistically determining, based on the determined regression line, at least one prediction interval regarding at least one point plotted adjacent to said selected consecutive points, such that each of said at least one point is plotted with a statistically high probability inside a corresponding one of said at least one prediction interval, and
determining a blood pressure of said subject based on said at least one point, if said each of the at least one point is plotted outside said corresponding one of the at least one prediction interval.

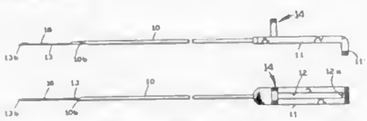
4,917,099
METHOD AND APPARATUS FOR DIFFERENTIAL LEAD IMPEDANCE COMPARISON
John R. Stice, Redmond, Wash., assignor to Physio-Control Corporation, Redmond, Wash.
Filed Jul. 13, 1988, Ser. No. 219,349
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—696 **15 Claims**

1. An appartus for use with devices employing electrodes that senses the integrity of lead connections comprising:
(a) a first lead and a current source means coupled to said first lead and a current source means coupled to said first lead having a first lead impedance, a second lead having a second lead impedance and a reference lead having a reference lead impedance, wherein said current source means:
(i) produces a first AC current and applies said first AC current to said first lead;
(ii) produces a second AC current and applies said second AC current to said second lead; and,
(iii) produces a reference AC current and applies said reference AC current to said reference lead;
(b) a receiver coupled to said first and second leads for receiving a first voltage produced by said first AC current and said first lead impedance and a second voltage produced by said second AC current and said second lead impedance;



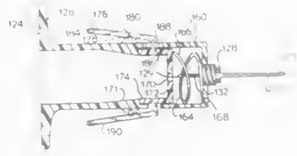
(c) differential amplifying means for differentially amplifying said first and second voltages to produce first and second differential impedance voltages, wherein said first differential impedance voltage is proportional to a first difference between said first and second lead impedances and wherein said second differential impedance voltage is proportional to a second difference between said first and second lead impedances;
(d) an output means coupled to said differential amplifying means for receiving said first and second differential impedance voltages and producing a leads-off output signal when one and only one of said first and second differential impedance voltages equals or exceeds a corresponding first or second threshold level.

4,917,100
BIOPSY NEEDLE FOR USE WITH SPRING-OPERATED ACTUATING MECHANISM
James E. Nottke, 8609 Piper La., Largo, Fla. 34647
Filed May 8, 1989, Ser. No. 348,871
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—749 **5 Claims**



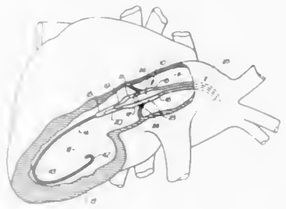
1. A biopsy needle comprising:
an elongated cannula having proximal and distal ends;
a cannula slide attached to said proximal end of said cannula and having a laterally projecting segment which extends transversely on one side;
an elongated obturator slidably extending longitudinally through said cannula and having proximal and distal ends, said obturator having a specimen-receiving recess near its distal end which is open along the outside of the obturator;
and an obturator slide attached to said proximal end of said obturator and slidably engaging said cannula slide for selective adjustment of either slide along the other slide in a direction longitudinally of said cannula and obturator between a first position in which said cannula covers said specimen-receiving recess in said obturator and a second position in which said recess is exposed beyond said distal end of said cannula;
said obturator slide having a laterally projecting segment which extends transversely on the opposite side from said projecting segment of said cannula slide and is offset longitudinally from said projecting segment of said cannula slide in all positions of said slides from said first position to said second position.

4,917,101
VENA PUNCTURE DEVICE AND METHOD
Daniel P. Horn, 516 Belmont Pkwy., Sleepy Hollow, Ill. 60118
Filed Feb. 27, 1989, Ser. No. 315,600
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—763 **18 Claims**



1. A vena puncture device for receiving a vacuum tube with a rupturable seal, said vena puncture device including a vena tube having a spring loaded assembly operably mounted within said vena tube, wherein:
a. said vena tube has a needle end at one end of said vena tube and an open vacuum end oppositely disposed from said needle end;
b. a two-ended needle is removably and centrally mounted within said needle end;
c. a restraining means is secured within said vena tube between said needle ned and said vacuum end;
d. said spring loaded assembly is slidably mounted within said vena tube between said needle end and said restraining means;
e. said two-ended needle is a hollow tube capable of passing blood therethrough;
f. said two-ended needle has a vein end extending outside of said vena tube to puncture a vein of a patient;
g. said two-ended needle has a tube end extending inside of said vena tube capable of puncturing said rupturable seal;
h. said vein end is oppositely disposed from said tube end;
i. a releasable locking means for releasably secures said spring loaded assembly in a compressed spring mode;
j. said spring loaded assembly includes a cylindrical compressing means, having an open, tube-receiving end and a substantially closed end oppositely disposed from said open tube-receiving end;
k. said tube-receiving end contacts said restraining means when said compressible spring is in an uncompressed mode;
l. said open tube-receiving end is removed from said restraining means when said compressible spring is in a compressed mode;
m. said substantially closed end is removed from said needle end when said compressible spring is in an uncompressed mode;
n. said substantially closed end is adjacent said needle end when said compressible spring is in an compressed mode; and
o. said restraining means is an interior tube flange.

4,917,102
GUIDEWIRE ASSEMBLY WITH STEERABLE ADJUSTABLE TIP
Gary H. Miller, Milpitas; Jeffrey L. Kraus, San Jose, and Linda T. Guthrie, Fremont, all of Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.
Filed Sep. 14, 1988, Ser. No. 244,817
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—772 **17 Claims**



1 A guidewire for guiding a catheter through a patient's vasculature comprising:
(a) a flexible outer tubular body which includes a tubular member having proximal and distal extremities and a helical coil which is secured to the distal extremity of the tubular member and which has a rounded plug on the distal end thereof;
(b) a first core member which is disposed within the outer tubular body and which is secured therein by the proximal end thereof to the distal extremity of the tubular member, said first core member having a preshaped set;
(c) a second core member having greater stiffness than the first core member which is disposed within and which extends along essentially the entire length of the outer tubular body and which is axially movable therein; and
(d) means at the proximal end of the second core member to facilitate the proximal movement of the second core member with respect to the first core member to allow the first core member to assume the preshaped set provided thereto.

4,917,103
GUIDE WIRE EXTENSION
Richard A. Gambale, Tyngsboro, Mass.; James F. Crittenden, Hollis, and James P. Ryan, Amherst, both of N.H., assignors to C. R. Bard, Inc., Murray Hill, N.J.
Continuation of Ser. No. 766,762, Sep. 18, 1985, abandoned. This application Feb. 27, 1987, Ser. No. 19,627
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—772 **24 Claims**

1. A guide wire system for guiding an elongate, flexible catheter having a guide wire lumen through a lumen in the body of a patient and adapted to facilitate exchange of the catheter for another catheter comprising:
a guide wire having a proximal and a distal end;
an extension wire having a proximal end and a distal end;
tubular connector means on at least one of said wires for connection of the proximal end of the guide wire with the distal end of the extension wire thereby to extend the effective length of the guide wire;
said tubular connector means being constructed and arranged to be received within the catheter lumen and to have a low profile in which its cross-sectional dimensions

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arc substantially the same as those of the wire to enable the catheter to be passed over the wires and the connector means when the wires are connected by the connector means;

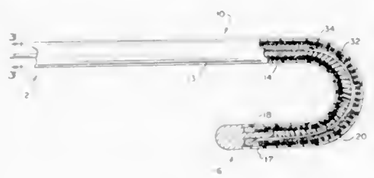
whereby a catheter placed in a patient and having the guide wire extending therethrough may be exchanged for another catheter by connecting the proximal end of the guide wire with the distal end of the extension wire, then removing the catheter over the connected wires and then advancing another catheter onto and along the wires without requiring removal or substantial change of position of the guide wire.

4,917,104

ELECTRICALLY INSULATED "J" STIFFENER WIRE

Allan K. Rebell, North Miami, Fla., assignor to Telectronics Pacing Systems, Inc., Englewood, Colo.

Filed Jun. 10, 1988, Ser. No. 205,297
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—772 **20 Claims**



1. A cardiac lead comprising:

a tubular body having a proximal end and a distal end, a coiled conductor within said tubular body defining a lumen therein and having a distal end and a proximal end, a tip electrode mounted at the distal end of said tubular body, an elongate stiffener wire comprising an elongate member made of a wire having a preset shape and having a distal end and a proximal end positioned within said tubular body, an electrical insulative material covering siad elongate member for the length thereof to prevent short circuiting of the coils of said coiled conductor which may come in contact with said elongate member; means for connecting a portion of the distal end of said coiled conductor to said tip electrode; and means for fixing the distal end of said elongate member at the distal end of said tubular body.

4,917,105

FOOT TESTING METHOD

Antti-Jussi Tiitola, Kaivanto, and Martti Kvist, Kuusisto, both of Finland, assignors to Karhu-Titan, Vantaa, Finland

Filed May 27, 1988, Ser. No. 199,472
Claims priority, application Canada, Dec. 24, 1987, 555405
Int. Cl.[4] A61B *5/10*
U.S. Cl. 128—779 **31 Claims**

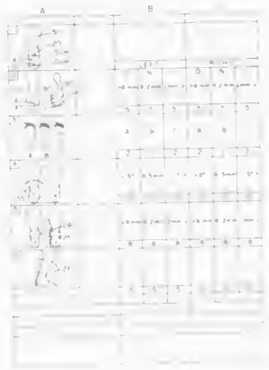
1. A method for determining the functional biomechanic type of a person's foot comprising the following steps:

placing the person's foot in a neutral and unloaded position;

identifying the center line of the heel bone;

identifying the center line of the tendo Achillis;

placing the person tested in a standing position;

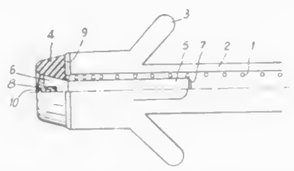
measuring the angle between the heel bone center line and the tendo Achillis center line when the person stands with the knees bent at approximately 45° (or 135° between the upper leg and the lower leg) determining the functional

biomechanic type of the person's foot based on said angle measurement.

4,917,106

CONDUCTIVE TIPS OF CARDIAC STIMULATION PROBES

Stéphane Olivier, Paris, France, assignor to ELA Medical, Montrouge, France

Filed May 26, 1988, Ser. No. 198,987
Claims priority, application France, Jun. 4, 1987, 87 07788
Int. Cl.[4] A61N *1/04*
U.S. Cl. 128—785 **20 Claims**



1. An endocardiac probe for a heart stimulator comprising a helically wound conductive lead arranged inside a flexible sheath, an annular electrode having a central orifice and being electrically connected at a distal end of said lead, an attachment member comprising a stem engaging with and inside of the conductive lead and a head securing the electrode in place, the head forming a stop having a shape complementary to the central orifice of the annular electrode.

4,917,107

ENDOTRACHEAL TUBE/STETHOSCOPE COMBINATION

Floyd R. Bell, Lexington, and Thomas H. McKay, Flatwoods, both of Ky., assignors to Medi-Tube Corporation, Lexington, Ky.

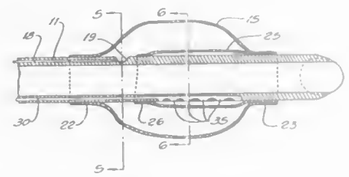
Continuation of Ser. No. 670,371, Nov. 9, 1984, Pat. No. 4,607,643. This application Mar. 31, 1986, Ser. No. 845,959
The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—715 **8 Claims**

1. An assembly for providing endotracheal ventilation and vital sounds monitoring by stethoscope in a patient comprising

a tracheal tube;

means for substantially peripherally sealing the assembly against the trachea wall adjacent the distal end of the tube inserted in the trachea;

means for providing ventilation to the trachea through said tube; and



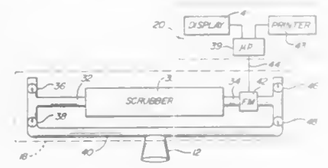
an audio cuff extending along the tube at least partially coextensive with said sealing means and having sufficient resiliency to vibrate in response to patient vital sounds to permit monitoring during patient ventilation.

4,917,108

OXYGEN CONSUMPTION METER

James R. Mault, 2621 W. Cornwallis, Durham, N.C. 27705

Filed Jun. 29, 1988, Ser. No. 213,184
Int. Cl.[4] A61B *5/08*
U.S. Cl. 128—718 **10 Claims**



1. An indirect calorimeter operative to measure the respiratory oxygen consumption per unit time of a subject, comprising:

a respiratory connector operative to be supported in contact with the subject so as to pass respiratory gases as the subject breathes into said respiratory connector;

a scrubber having a gas inlet and a gas outlet and being operative to absorb carbon dioxide from said gases passing between its inlet and outlet;

flow meter means operatively connected to said respiratory connector and operative to generate signals as a function of the gas volume of said gases passed through such meter means;

valves and conduits interconnecting said respiratory connector, scrubber, and flow meter means, operative upon the subject inhaling to cause the gas to pass through the scrubber, then through the flow meter means, and then to the subjects respiratory system through the respiratory connector, and upon the subject exhaling to pass the exhaled gas from the respiratory connector first through scrubber, then through the flow meter means; and

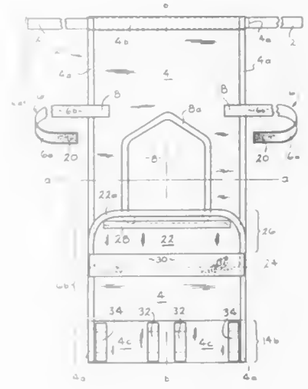
means for receiving the resultant signals from the flow meter means and for generating a signal proportional to the integral of the differences between inhaled and exhaled gas volumes over a period of time.

4,917,109

PATIENT RESTRAINT GARMENT

Randal R. Ruge, Swanton, Ohio, assignor to R. R. Ruge, Inc., Toledo, Ohio

Filed Feb. 8, 1989, Ser. No. 307,461
Int. Cl.[4] A61F *5/37*
U.S. Cl. 128—874 **12 Claims**



1. In a patient restraint garment comprising a flexible panel with an opening to receive the head and neck of a patient to allow said panel to drape about the upper torso of the patient and form an anterior portion and a posterior portion, said panel further comprising tying straps, fasteners, and receiving means to engage said tying straps, which tying straps are for subsequent securement to a structure out of reach of the patient, the improvement comprising in combination with said panel:

(a) a pair of flexible fastening straps, attached to and extending laterally from opposite sides of said anterior portion of said panel at the approximate chest level of the patient for extension under the arms and about the patient, each of said straps having a surface including fastening means attached thereto for engagement with said posterior portion in the approximate upper back region of the patient out of reach of the patient;

(b) a flexible flap attached to the said posterior portion of the said panel along a transverse line in said approximate upper back region of the patient, said flap having an interior surface further comprising fastening means attached thereto for engagement with said posterior portion of said panel; and

(c) a receiving means attached to said posterior portion of said panel in said approximate upper back region of the patient for engagement of said fastening means of said fastening straps, and for engagement of said flexible flap overlapping said engaged fastening straps;

to provide a flexible locking means comprising cooperating relationships between said straps, flap, receiving means, and panel, whereby said anterior portion and said posterior portion of said panel can be custom fitted against the upper torso of the patient while adjustably forming an arm hole of desired size on each side of said garment to limit the ability of the patient to defeat said garment.

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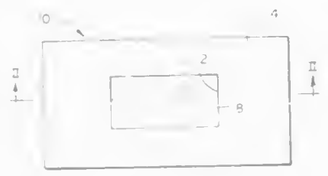
4,917,110
PENILE PROSTHESIS
Robert E. Trick, Racine, Wis., assignor to Medical Engineering Corporation, Racine, Wis.
Continuation-in-part of Ser. No. 145,629, Jan. 19, 1988, which is a continuation-in-part of Ser. No. 887,069, Jul. 17, 1986, Pat. No. 4,726,360. This application Sep. 27, 1988, Ser. No. 249,728
Int. Cl.[4] A61F *2/26*
U.S. Cl. 128—79 8 Claims

1. In an implantable prosthesis for correcting erectile impotence which includes at least one flexible penile implant with a pressure chamber for implanting in a patient's penis, transfer means for transferring fluid to the pressure chamber for implanting in the patient's scrotal sac and tubing connecting said pressure chamber to said transfer means, the improvement which comprises said transfer means being a charged accumulator and means for discharging said accumulator, said means for discharging being a manually operable lever and a valve which can be opened by moving said lever.

4,917,111
INSTRUMENT FOR AIMING AND HOLE FORMING FOR IMPLANTATION OF LOCKING NAILS OF THE LIKE
Dietmar Pennig; Erwin Brug, and Hans E. Harder, all of Pfizer Inc. 235 E. 42nd St., New York, N.Y. 10017-5755
Filed Oct. 15, 1987, Ser. No. 109,139
Int. Cl.[4] A61F *5/04*
U.S. Cl. 606—97 9 Claims

1. Apparatus for aiming and hole forming purposes for the implantation of locking nails or the like in bones, said apparatus comprising:
(A) an elongated shank having a gripping portion to be gripped by a hand at one end of said shank and
(B) an aiming portion at the other end of said shank, said aiming portion including:
(1) a guide member made of a material relatively transparent to X-rays, said guide member having
(a) a guiding bore therethrough and
(b) a first aiming element and a second aiming element each located in a different plane, said guiding bore being dimensioned for the guidance of a bone piercing tool which is to be used in conjunction with said apparatus in order to pierce a bone of a patient, and said first aiming element and said second aiming element being formed from a material relatively impervious to X-rays and being located around said guiding bore in axially spaced apart planes such that when a beam of X-rays is incident upon said aiming elements, X-ray images of said aiming elements coincidentally appear on an image screen which is to be used in conjunction with said apparatus and which is placed downstream with respect to said X-rays when the axis of said guiding bore coincides with the direction of said beam of incident X-rays.

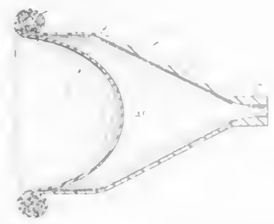
4,917,112
UNIVERSAL BANDAGE WITH TRANSPARENT DRESSING
Glenda G. Kalt, Boca Raton, Fla., assignor to Kalt Medical Corp., Boca Raton, Fla.
Filed Aug. 22, 1988, Ser. No. 234,876
Int. Cl.[4] H61L *15/00*
U.S. Cl. 128—156 25 Claims



1. A dressing for covering a patient's skin comprising:
an outer skin-contacting layer having an opening substantially surrounded by said outer layer
a pliable transparent inner skin-contacting membrane positioned throughout said opening wherein a perimeter of said outer layer substantially surrounds said membrane; and
an adhesive layer on a bottom surface of said outer layer such that said membrane is secured to a portion of said outer layer and said perimeter of said outer layer forms an adhesive perimeter in order that said dressing is adhered to such patient's skin only at said adhesive perimeter.

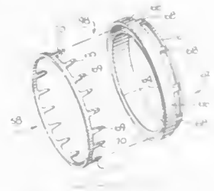
4,917,113
CONTRACEPTIVE HOOD
Anthony J. Conway; Peter R. Conway, both of Chatfield, and Philip J. Conway, Stewartville, all of Minn., assignors to Carter-Wallace, Inc., New York, N.Y.
Continuation of Ser. No. 715,608, Mar. 25, 1985, Pat. No. 4,638,790, which is a continuation-in-part of Ser. No. 577,602, Feb. 10, 1984, abandoned, which is a continuation-in-part of Ser. No. 475,852, Mar. 16, 1983, abandoned. This application Jan. 27, 1987, Ser. No. 6,986
The portion of the term of this patent subsequent to Jan. 27, 2004, has been disclaimed.
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—844 32 Claims

1. A contraceptive hood to be adhesively applied to a penis, said contraceptive hood including:
an inner flexible generally cylindrical member;
an outer generally cylindrical member, in removable overlapping relationship with the inner member;
said cylindrical members being rolled upon themselves from their open ends to form a single roll;
the outer surface of said outer cylindrical member having an adhesive release layer thereon and said members having a layer of adhesive therebetween only when rolled in contact with the inner surface of the inner member and in contact with the release layer so that upon said cylindrical members being unrolled onto a penis, the adhesive adheres only to the inner surface of said inner cylindrical member to cause the inner cylindrical member to adhere to the penis; and



said outer cylindrical member being removable from said inner member after said members have been unrolled onto a penis.

4,917,114
SURGICAL FASTENER AND SURGICAL STAPLING APPARATUS
David T. Green, Norwalk, and Herbert W. Korthoff, Wilton, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Division of Ser. No. 920,581, Oct. 17, 1986, Pat. No. 4,752,024. This application Apr. 1, 1988, Ser. No. 176,695
Int. Cl.[4] A61B *17/04, 17/08, 19/00;* A41F *1/00*
U.S. Cl. 227—179 12 Claims



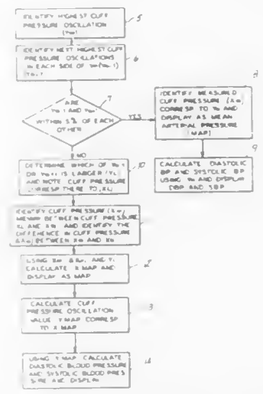
1. A surgical fastener comprising
an annular stapling part having a plurality of axially extending circumferentially spaced prongs, each said prong having a sharp tip for piercing tissue;
an annular retaining part having an annular gap for receiving said prongs, said gap being of an axial length less than an axial length of said prongs to permit passage of said prongs therethrough; and
catching means for holding said prongs in said retaining part to clamp the pierced tissue therebetween.

4,917,115
PACING SYSTEM AND METHOD FOR PHYSIOLOGICAL STIMULATION OF THE HEART UTILIZING DOPPLER MEANS
David Flammang, Angouleme, France; Alexis C. M. Renirie, Berg En Dal, and Malcolm J. S. Begemann, Velp, both of Netherlands, assignors to Vitatron Medical B. V., Dieren, Netherlands
Filed Jul. 11, 1988, Ser. No. 217,239
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 PG 12 Claims

1. A cardiac pacemaker/treatment system having a generator device and a lead means, said generator device having a controllable pulse generator for generating pulses, input means for receiving input signals representative of at least cardiac conditions, and logic means for analyzing said input signals and controlling said pulse generator to deliver generator pulses in response to said analyzing, said lead means having a proximal end connected to said generator device and a distal end portion adapted to be positioned in a patient's ventricle for delivering generated pulses to said ventricle and for sensing heartbeats and delivering input signals representative of said heartbeats to said input means,
characterized by said lead means having atrial sensor means adapted to be positioned in the patient's atrium without

any contact with the atrial wall for sensing atrial wall movement and for generating atrial input signals representative of the velocity and direction of said wall movement, and said logic means having atrial signal means for analyzing said atrial input signals and controlling the delivery of pulses to the ventricle as a function of said analysis.

4,917,116
AUTOMATIC BLOOD PRESSURE MEASURING DEVICE
John La Viola, Orange, and Kevin S. Librett, Westport, both of Conn., assignors to CAS Medical Systems, Inc., Branford, Conn.
Filed Sep. 22, 1988, Ser. No. 247,634
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—681 9 Claims



1. A method for determining a subject's true mean arterial blood pressure, said method comprising the steps of:
(a) inflating a pressure cuff affixed to an appendage of the subject to a pressure which exceeds a predicted systolic blood pressure of the subject;
(b) deflating the pressure cuff in steps, while pausing between each deflation step;
(c) detecting, recording and storing cuff pressure oscillations at each pause between successive cuff pressure deflation steps;
(d) continuing the steps of deflating, detecting, recording

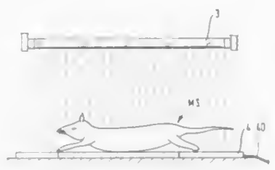
and storing, until a cuff pressure is reached which is below the subject's predicted diastolic blood pressure;
(e) identifying the maximum cuff pressure oscillation noted and a first cuff pressure associated therewith;
(f) identifying second and third next greatest cuff pressure oscillations on each side of said maximum oscillation, and second and third cuff pressures associated therewith; and
(g) using data from steps (e) and (f) and calculating the percentage difference between the second and third next greatest oscillations to calculate the true mean arterial blood pressure of the subject therefrom.

4,917,117

PROCESS AND APPARATUS FOR THE RECORDING AND/OR EVALUATION OF THE MOVEMENT BEHAVIOR OF EXPERIMENTAL ANIMALS

Richard Brom, Habsheim/Brübach, France; Alfred Schweizer, Basel, and Werner Bichsel, Muttenz, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 31, 1987, Ser. No. 91,004
Claims priority, application Switzerland, Sep. 4, 1986, 3560/86
Int. Cl.[4] A61B *5/10*
U.S. Cl. 128—782 **24 Claims**



1. Apparatus for the recording and/or evaluation of the writhing behaviour of experimental animals, comprising an animal cage which is entered from above by the light of a light source, having a bottom (**25**) of the cage (**1**) which is light permeable and extends horizontally, electric detection means (**4**) positioned under the bottom (**25**) provided to form a projection surface or that the photoelectric detection means constitutes the bottom of the cage, the photoelectric detection means (**4**) comprising a single solar cell (**51**) covering approximately all of the area of the projection surface or of the bottom of the cage and being electrically connected via an amplifier (**6**) with a signal recording device (7) and/or an evaluating device (8, 9, 10, 11, 12).

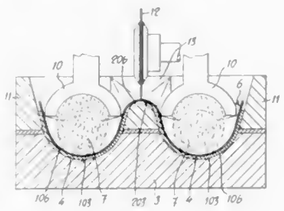
4,917,118

METHOD OF MAKING CIGARETTES BY SIMULTANEOUSLY FORMING TWO SIDE-BY-SIDE ARRANGED RODS, AND CIGARETTE-MAKING MACHINE FOR CARRYING OUT THE SAID METHOD

Luigi Mangiarotti, Bologna, Italy, assignor to Sasib S.p.A., Italy

Filed Nov. 13, 1987, Ser. No. 120,125
Claims priority, application Italy, Dec. 23, 1986, 12606 A/86
Int. Cl.[4] A24C *5/00*
U.S. Cl. 131—84.1 **9 Claims**

1. A method of making cigarettes, or the like, by simultaneously forming two side-by-side arranged rods from only one unit for feeding shredded tobacco, or the like, and from only one twofold wide paper tape (**6**) which is longitudinally split into two paper webs (**61**), from each one of which a cigarette rod is formed by the deposition of two respective tobacco strands and with the aid of two underlying, respective rod-forming folder belts (**4**) which are led about a common driving pulley (**5**), characterized by the following steps carried out in the stated order, in the direction (F) in which the pair of rods is formed:
(a) the twofold wide starting paper tape (**6**) which is fed in a substantially horizontal plane, is gradually deformed transversely between superposed stationary guides (**1** and **2**) so as to be caused to assume a double trough-like profile (**106,206,106**);
(b) the thus deformed starting paper tape (**6**) is then passed onto the two underlying, slidable rod-forming folder belts (**4**) which are located in correspondence of the two troughs (**106**) in the paper tape (**6**), and are matingly deformed;
(c) on the double trough-like deformed (**106,206,106**), starting paper tape (**6**) supported by the two rod-forming



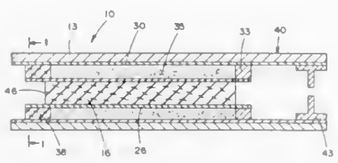
folder belts (**4**), two tobacco strands (**7**) are deposited, one in each trough (**106**) of the said tape (**6**);
(d) the twofold wide starting paper tape (**6**) is longitudinally severed intermediately between the two troughs (**106**) thereof, whereby two trough-like profiled, separate, parallel paper webs (**61**) are formed, which contain each a tobacco strand (**7**);
(e) wrapping each paper web (**61**) transversely around the respective tobacco strand or filler (**7**), and fastening together the longitudinal edges (**161**) thereof, by applying paste thereto.

4,917,119

DRUG DELIVERY ARTICLE

Dennis L. Potter, Kernersville; Mark L. Raker, Clemmons; Henry T. Ridings, Lewisville; Andrew J. Sensabaugh, Jr., Winston-Salem; Amos E. Westmoreland, Winston-Salem; Donna K. Woods, Winston-Salem, and Chandra K. Banerjee, Pfafftown, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Nov. 30, 1988, Ser. No. 277,731
Int. Cl.[4] A61M *15/06*
U.S. Cl. 131—273 **70 Claims**



1. A drug delivery article comprising:
(a) a drug; and
(b) a physically separate, non-combustion heat source for heating the drug, and including
(i) a first chemical agent capable of interacting exothermically with a second chemical agent, and a third chemical agent capable of interacting exothermically with the first chemical agent, and
(ii) a dispersing agent for the first agent.

4,917,120

NICOTINE IMPACT MODIFICATION

Ira D. Hill, Locust, N.J., assignor to Advanced Tobacco Products, Inc., San Antonio, Tex.

Continuation of Ser. No. 866,073, May 21, 1986, abandoned. This application Feb. 7, 1989, Ser. No. 308,936
Int. Cl.[4] A24D *1/00*; A24F *1/00*
U.S. Cl. 131—271 **11 Claims**

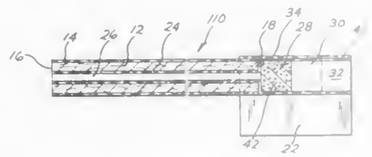
1. A smokeless nicotine inhaler consisting essentially of:
a housing having a first open end and a mouthpiece open end, said housing defining a tubular passageway between the first open end and the mouthpiece open end;
a reservoir in the passageway adapted to contain and liberate a volatile fluid comprising nicotine into air passing through said passageway, said reservoir being a porous solid-form synthetic polymer; and
a fluid contained in said reservoir, the fluid comprising nicotine and a volatile nicotine-miscible substance in a weight/weight ratio between about 2.0 and about 10.0, said volatile substance having a normal boiling point between about 175° C. and about 275° C.

4,917,121

SMOKING ARTICLE

Tilford F. Riehl, and Robert R. Johnson, both of Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Dec. 9, 1988, Ser. No. 281,583
Int. Cl.[4] A24B *15/28*; A24D *1/18*
U.S. Cl. 131—364 **9 Claims**



1. A smoking article comprising:
a tobacco column as a fuel source;
a wrapper circumscribing the tobacco column;
a tube fabricated of gas impermeable material concentrically located within the tobacco column and extending substantially the entire length of the tobacco column, said tube having one end open to the inlet end of said tobacco column and the other end open to the outlet end of said tobacco column;
a granular material filling the tube;
an aerosol generating material coating the granular material in the tube;
a first chamber adjacent the outlet end of the tobacco column with inlet gas flow communication only with the tube;
a tobacco rod coaxially located at the end of the first chamber opposite the tobacco column; and,
a second chamber at flow communication with the tobacco rod.

4,917,122

COMPOSITIONS FOR USE IN THE PRODUCTION OF INTEGRATED CIRCUITS AND METHOD FOR ITS PREPARATION AND USE

David J. Lapham, Widnes, and Geoffrey Hitchmough, Runcorn, both of United Kingdom, assignors to Micro-Image Technology Limited, London, England

Continuation of Ser. No. 75,137, Jul. 20, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 287,520
Claims priority, application United Kingdom, Aug. 9, 1986, 8619476; Dec. 18, 1986, 8630215
Int. Cl.[4] B08B *3/08*
U.S. Cl. 134—3 **11 Claims**

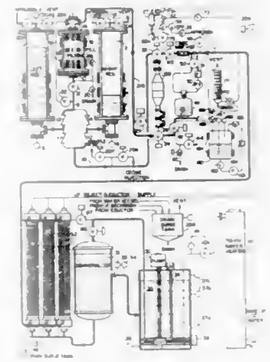
1. A photoresist stripping solution consisting essentially of sulfuric acid in a concentration of at least 75% by weight, not more than 1.43% of hydrogen peroxide, permonosulfuric acid in a concentration of at least 2% by weight and water of not more than 6% by weight, a soluble tin compound in from 0.01 to 1 part per million by weight calculated as Sn and a phosphonate sequestrant in from 0.1% to 0.4% by weight.

4,917,123

APPARATUS FOR TREATING WAFERS WITH PROCESS FLUIDS

Christopher F. McConnell, Gulph Mills, and Alan E. Walter, Exton, both of Pa., assignors to CFM Technologies Limited Partnership, Lionville, Pa.

Division of Ser. No. 765,294, Aug. 13, 1985, Pat. No. 4,778,532, which is a continuation-in-part of Ser. No. 747,894, Jun. 24, 1985, Pat. No. 4,633,893, which is a continuation-in-part of Ser. No. 612,355, May 21, 1984, Pat. No. 4,577,650. This application Oct. 3, 1988, Ser. No. 252,823
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—95 **24 Claims**



1 Apparatus for wet processing of semiconductor wafers comprising:
(a) vessel means for supporting said wafers in a closed circulation process stream wherein process fluids may sequentially flow past said wafers, said vessel being hydraulically full with process fluid when said process fluids flow past said wafers;
(b) means for supplying at least one cleaning fluid to said process stream for removing contaminants from said wafers, and means for withdrawing said cleaning fluid from said process stream;
(c) means for supplying a rinsing fluid to said process stream for removing other fluids from said wafers, means for minimizing gas/liquid interfaces in said rinsing fluid and means for withdrawing said rinsing fluid from said process stream; and
(d) means for supplying a drying fluid to said process stream

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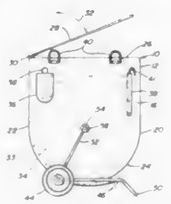
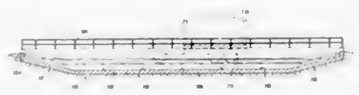
for removing other fluids from said wafers and means for withdrawing said drying fluid from said process stream.

4,917,124
BAR-B-Q RACK CLEANING APPARATUS
Warren Reasor, 15088 Ardmore, Detroit, Mich. 48227
Filed Dec. 19, 1988, Ser. No. 286,229
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—120 2 Claims



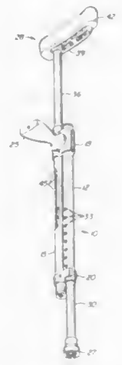
1. Barbeque rack cleaning apparatus comprising a container for cleaning barbeque racks comprising sides, ends and a bottom, and an open top, said sides, ends and bottom forming an interior space for a barbeque rack and a cleaning solution for the barbeque rack, said container having said sides spaced more closely to each other than said ends so that the container is comparatively thin in relation to its height and width, said sides have a U-shape that is semicircular at the bottom, said end walls having rectangular shapes and said bottom wall having a semicircular shape fitting to the bottom of said sides so that both round and rectangular barbeque racks and be received within the container;
further comprising a cart having a triangularly shaped frame including a transverse bar and a pair of converging rods at their one ends connected to end portions of said bar, and at their other ends connected together;
a pair of wheels journaled upon the outer ends of said bar; and
a flexible generally concave cradle of a fabric material and of triangular shape spanning and interconnecting said bar and rods yieldably supportably mounting said container in an upright position;
said container being adapted to rotatably tilt upon said cradle sufficient to pour liquids therefrom.

4,917,125
TRUCK TIRE WASHING APPARATUS
David G. Midkiff, Falls Church, Va., assignor to Marking Designs Inc., Fredericksburg, Va.
Filed Apr. 3, 1989, Ser. No. 331,984
Int. Cl.[4] B60S *3/04*
U.S. Cl. 134—123 6 Claims



1. An in-ground truck tire washing apparatus comprising:
an elongated concrete trough disposed in a ground pit having a configuration substantially the same as that of said trough;
said trough having transversely spaced concrete sidewalls each having a convex portion directed to the center of the trough;
a central member extending longitudinally of the trough;
a first plurality of open-mesh grates supported on one sidewall and the central member;
a second plurality of open-mesh grates supported on the other sidewall and said central member;
a downwardly inclined truck entrance ramp covered by said grates;
an upwardly inclined truck exit ramp covered by said grates; and
means for filling said trough with a tire-cleaning fluid to a level above upper surfaces of said first and second grates positioned over a horizontal portion of the bottom of said trough so that a truck moved over said grates will have its tires at least partially submerged in the tire-cleaning fluid to thereby clean the tires by a combined action of the fluid and the grates.

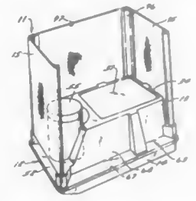
4,917,126
STOWABLE CRUTCH
Austin Ellmore, deceased, Los Gatos, Calif. (Hazel Ellmore, executrix), assignor to Children's Hospital
Filed Jun. 19, 1985, Ser. No. 747,082
Int. Cl.[4] A61H *3/02*
U.S. Cl. 135—69 5 Claims



1. A stowable crutch comprising:
a body consisting of first and second tubular members of substantially the same length nonadjustably affixed to each other and each having a longitudinal axis disposed parallel to and spaced-apart from the other;
a first telescoping member adapted to slide within the first tubular member and having a first end portion extendable from the body, wherein said first telescoping member has a length substantially equal to said body length;
a crutch tip affixed to the first end portion;
a second telescoping member adapted to slide within the second tubular member and having a second end portion extendable from the body in a direction opposite the first end portion, wherein said second telescoping member has a length substantially equal to said body length; and
an underarm portion affixed to the second end portion.

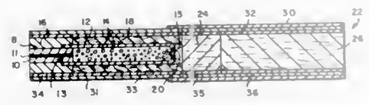
4,917,127
PORTABLE SHELTER
Jeffrey P. Marble, 5346 Woodland Dr., and Alvin L. Giese, 825 E. Washington St., both of West Bend, Wis. 53095
Filed Mar. 31, 1988, Ser. No. 175,855
Int. Cl.[4] E04H *15/00*
U.S. Cl. 135—87 14 Claims

1. A portable shelter, comprising:
a base having a pair of generally parallel top and bottom walls, means defining a storage compartment, and a plurality of upwardly opening sockets disposed in spaced apart positions near the periphery of said base, said top wall having an opening therein which communicates with said storage compartment, and a stepped recess surrounding said opening;
a seat removably disposed in said recess and covering said opening, said seat including a rigid board, a cushion disposed on one face of said board, and a flexible cover secured to said board over said cushion;



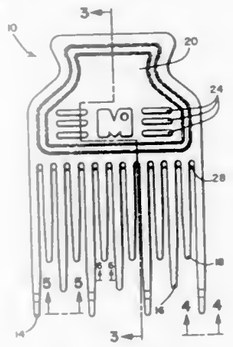
downwardly directed runners disposed on said bottom wall of said base for supporting said base for movement over a surface; and
a removable windscreen assembly configured to fit through said opening for storage within said storage compartment, including a plurality of poles insertable into said sockets, a flexible sheet, and means for mounting said sheet on said poles, said assembly being configured to provide a windscreen for said seat when in an assembled, upright position wherein said end portions of said poles are inserted in said sockets and said sheet is mounted on said poles.

4,917,128
CIGARETTE
Jack F. Clearman, Blakely, Ga.; Thomas L. Gentry, Winston-Salem, and Gary R. Shelar, Greensboro, both of N.C., assignors to R. J. Reynolds Tobacco Co., Winston-Salem, N.C.
Continuation-in-part of Ser. No. 791,721, Oct. 28, 1985, Pat. No. 4,756,318. This application Dec. 22, 1987, Ser. No. 136,261
Int. Cl.[4] A24D *1/18, 1/00, 1/02*
U.S. Cl. 131—359 7 Claims



1. A cigarette comprising:
(a) a rod of tobacco having a longitudinal passage therein;
(b) a heat conductive container located in the passage in the tobacco rod, containing a smoke forming material;
(c) a carbonaceous fuel element less than 30 mm in length and 7 mm in diameter prior to smoking, having a plurality of longitudinal passages, the fuel element being located at one end of the heat conductive container;
(d) a resilient insulating member at least 0.5 mm thick circumscribing the periphery of the fuel element; and
(e) a mouthend piece attached to the tobacco rod for delivering smoke and tobacco flavor from the tobacco rod and the heat conductive container to the smoker.

4,917,129
TEASE COMB/HAIR PICK
Bradley T. Olson, Cohasset, Minn., assignor to Mebco Industries, Inc., Eagan, Minn.
Filed May 6, 1988, Ser. No. 190,763
Int. Cl.[4] A45D *24/00*
U.S. Cl. 132—161 4 Claims



1. A tease comb, which comprises:
a handle;
groups of teeth secured in a straight row to said handle in uniformly spaced-apart relationship;
each tooth including a proximal portion connected to said handle and a distal portion adjacent to a free terminal end;
the distal portions of at least some of said teeth being tapered toward their free terminal ends;
each group of teeth including a pair of relatively long teeth with a single medium length tooth positioned midway therebetween and a single short tooth positioned midway between the medium tooth and each long tooth of the pair in order to form a long/short/medium/short/long teeth arrangement;
the distal portions of at least some of said long teeth being substantially circular in cross section;
the distal portions of at least some of said medium length teeth being substantially oval in cross section;
the distal portions of at least some of said short teeth being substantially oval in cross section; and
said handle and teeth being integrally molded from plastic.

4,917,130
MAKE-UP COMPACT FOR MOUNTING ON A STEERING WHEEL
John J. Sweder, Thunderbird Motor Lodge, Route 2A #118, 299, Luxenberg, Fitchburg, Mass. 01420
Filed Sep. 26, 1988, Ser. No. 248,992
Int. Cl.[4] A45D *42/10*
U.S. Cl. 132—288 1 Claim

1. A make-up compact for mounting on a steering wheel, comprising:
a generally rectangular make-up case having a base with a plurality of compartments for reception of make-up and accessories;
a generally rectangular cover mounted by a hinge on said base for movement between open and close positions;
a mirror mounted on an interior surface of said cover for display in said open position;
electric lighting means mounted adjacent said mirror on said interior surface of said cover;
an adaptor plug for connecting said electric lighting means to a vehicle cigarette lighter socket;
a first hook and loop type fastening strip on a back exterior surface of said cover;
a mounting plate having opposed front and back surfaces;
a second hook and loop type fastening strip on said front

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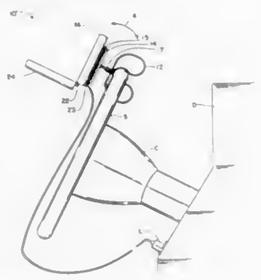
surface of said mounting plate for engagement with said first fastening strip;

a U-shaped spring clip formed from a strip of resilient material configured in a closed curve having no free end edges, said clip dimensioned for frictional engagement with a vehicle steering wheel; and



a ball and socket pivot mechanism adjustably securing said mounting plate to said spring clip, whereby said make-up case is mounted for compound angular adjustment, and is selectively detachable from said mounting plate to allow convenient transportation.

4,917,131

LATCH ASSEMBLY AND FRONT RELEASE MECHANISM FOR COMPACTS AND OTHER CONTAINERS

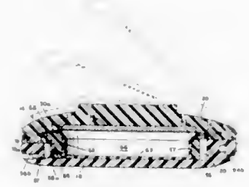
Joseph P. Contreras, Sr., 6 Brockden Dr., Mendham, N.J. 07945

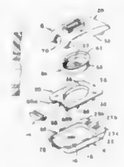
Filed May 6, 1985, Ser. No. 730,450

The portion of the term of this patent subsequent to Jun. 19, 2001, has been disclaimed.

Int. Cl.[4] A45D *33/00*

U.S. Cl. 132—301 3 Claims





1. A container for holding a material, comprising:

a. a base member having a bottom wall and a first peripheral wall connected thereto to define a receptacle in the base member;

b. a cover member having an inner surface and a second peripheral wall connected thereto;

c. hinge means for hingedly connecting the cover member to the base member for pivotal movement between an open position and a closed position;

d. said first peripheral wall on the base member having a cut-out section at a position remote from the hinge means;

e. a latch member extending from the second peripheral wall on the cover member;

f. an insert assembly disposed in the receptacle defined in said member and secured to said base member thereat, said insert assembly including

i. first and second guides positioned interiorly of said cut-out section and on opposite sides thereof;

ii. catch means formed on said insert assembly for engaging said latch member on the cover member in said closed position;

iii. a compartment section for holding said material; and

iv. sealing means disposed to extend into sealing contact with the inner surface of said cover member when the cover is pivoted to the closed position; and

g. front release means positioned in said cut-out section and reciprocal by slidable movement between said first and second guides for biasing said latch member out of engagement with said catch means upon inward movement of the front release means, to permit the cover member to move from said closed to said open position.

4,917,132

COMBINATION BRUSH AND MIRROR

Stephen Tuchman, 17 Allen Rd., Rockville Centre, N.Y. 11500

Filed Feb. 22, 1988, Ser. No. 158,887

Int. Cl.[4] A45D *42/00*

U.S. Cl. 132—316 1 Claim

1. A combination cosmetic brush and mirror article of manufacture comprising an elongated housing for said article having brush bristles extending from one end thereof and a hollow length portion at the opposite second end thereof serving as a handle for manipulating said brush bristles and bounding a cylindrically shaped storage compartment oriented longitudinally inwardly of said housing open at said second end, and a mirror with a cylindrical fingergrip constructed separate from said housing and removable therefrom selectively disposed in an internal storage position in said compartment so as to be frictionally engaged about the said fingergrip by an encircling housing wall bounding said storage compartment to contribute to subsequent convenient use conjointly of said brush and mirror upon withdrawal and separation of said mirror from said compartment, said mirror being comprised of said fingergrip and spaced wall means extending forwardly therefrom so as to be positioned in said longitudinally oriented compartment of said handle, and an image-reflecting mirrored surface disposed on said wall means in a lengthwise orientation in relation to said compartment being sized lengthwise to extend the entire length of said compartment whereby said image-reflecting mirrored surface is of a size to be effective in providing a reflected image of the user to serve as a visual guide for said manipulating of said brush bristles.

4,917,133

APPLICATOR CASE FOR LIPSTICK AND SIMILAR APPLICATIONS

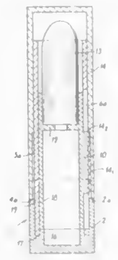
Simone Morel, 15 rue du Faubourg de Paris, 51210 Montmirail, Marne, France

Continuation of Ser. No. 60,282, Jun. 10, 1987, Pat. No. 4,815,485. This application Dec. 8, 1988, Ser. No. 289,661

Claims priority, application France, Jun. 3, 1987, 87 07762

Int. Cl.[4] A45D *40/00*

U.S. Cl. 132—318 10 Claims



1. An applicator case for lipstick and similar applications, comprising a body defining a base forming a bottom, said base being extended by an envelope having a slot, said envelope forming a guide for a sheath defining a protrusion extending through the slot of the envelope, said sheath having a length smaller than that of the envelope and forming an inner ring against which abuts the lipstick and similar applications, wherein the base defines a groove for an introduction of a lower portion of the envelope, the envelope being inserted within said groove and having an outer wall cooperating with a cap, and wherein the cap has an inner wall having at least one recess for passage of the protrusion, said protrusion extending slightly beyond an inner wall of the envelope and defining, with said recess in the cap, means to longitudinally slide the sheath within the body of the applicator case upon inserting the cap on said envelope.

4,917,134

DISPOSABLE MEDICINAL APPLICATOR PAD

Gloria Simonzi, 5890 38th Ave. N. Apt. 101-A, St. Petersburg, Fla. 33710

Filed Aug. 10, 1989, Ser. No. 391,976

Int. Cl.[4] A45D *40/26*

U.S. Cl. 132—320 14 Claims

1. A disposable medicinal applicator pad capable of being reshaped from a substantially flat configuration for storage to a puffed configuration for use with a patient, each said disposable medicinal applicator pad comprises a pair of porous, absorbent membranes secured together by a continuous thread attached about the periphery thereof to retain a predetermined quantity of powder therebetween, an applicator pad grasping means is formed on said continuous thread whereby the continuous thread may be drawn or gathered about the periphery of said pair of porous, absorbent membranes by pulling or drawing said grasping means reshaping said disposable medicinal applicator pad to the puffed configuration such that the medicinal powder may be applied to a specific area of the patient's body to reduce excoriation and maintain the normal pH level.

4,917,135

LIQUID LEVEL REGULATOR DEVICE

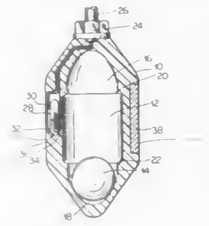
Malcolm Duncan, Barberton, South Africa, assignor to Magnetrol International, Downers Grove, Ill.

Filed Feb. 23, 1989, Ser. No. 314,488

Claims priority, application South Africa, Feb. 29, 1988, 88/1422

Int. Cl.[4] H01H *35/18, 35/02;* **F16K** *33/00*

U.S. Cl. 137—2 22 Claims



21. A method or regulating a liquid level in a vessel comprising:

providing a float body having a first end of an elongate flexible anchor means attached to a first end of said float body, a movable ballast within said float body for determining an orientation of said float body and an attitude sensitive switch within said float body;

attaching a second end of said anchor to a wall of said vessel at a point between a highest and a lowest level of said liquid, said float body being orientated in said liquid with one end being uppermost in said liquid;

changing a level of said liquid;

tensioning said anchor means by a predetermined change in said liquid level for initiating movement of said ballast;

initiating tumbling of said body by said movement of said ballast from a first to a second position near opposite ends of said float body for reversing said orientation;

reversing a state of said attitude sensitive switch for controlling a level of said liquid.

4,917,136

PROCESS GAS SUPPLY PIPING SYSTEM

Tadahiro Ohmi; Kazuhiko Sugiyawa; Fumio Nakahara, all of Sendai, and Masaru Umeda, Tokyo, all of Japan, assignors to Tadahiro OHMI, Miyagi, Japan

Filed May 24, 1988, Ser. No. 198,079

Claims priority, application Japan, May 8, 1988, 63-111152

Int. Cl.[4] B08B *9/02*

U.S. Cl. 137—15 **24 Claims**

1 A process gas supply system for supplying process gas to at least two process units, comprising:

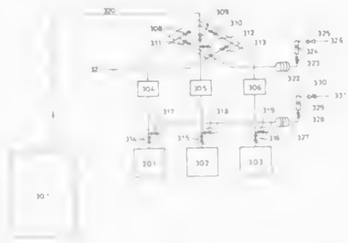
a purge gas supply piping line;

a process gas supply piping line including at least one branching point;

a plurality of process unit piping lines and associated process units, each said process unit piping line connected to said at least one branching point, each said process unit piping line connecting an associated said process unit to said process gas supply line; and

valve means for connecting said process gas supply line, said purge gas supply piping line, and at least one of said process unit piping lines to said at least one branching point, said valve means including at least four valves, whereby each one of said process unit piping lines can be indepen-

dently purged and said process gas supply system can simultaneously supply process gas through at least one of said valves to an associated process unit currently in use,



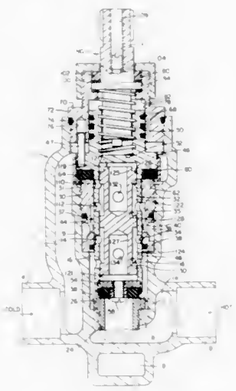
and purge process unit piping lines currently not in use through at least one of said valves without stagnating either the process gas or the purge gas within the piping system in any mode of operation.

4,917,137

PRESSURE-BALANCING MIXING VALVE

Paul C. Symmons, Wellesley, Mass., assignor to Symmons Industries, Inc., Braintree, Mass.

Filed Sep. 7, 1988, Ser. No. 241,912
Int. Cl.[4] F16K *11/04*
U.S. Cl. 137—98 **6 Claims**



1. A mixing valve for two fluids under pressure at different temperatures comprising:

a valve body having means defining a main valve chamber with separate inlet ports for each of said two fluids and an outlet port;

a main valve assembly having first and second valve means for varying the flow of said fluids from said separate inlet ports to said main valve chamber, said main valve assembly comprising a tubular valve cylinder projecting into said main valve chamber; and

rotatably operative means for causing reversible axial movement of said tubular section within said main valve chamber without axial rotation of said valve cylinder assembly relative to said valve body, said reversible axial movement causing said first and second valve means to move between a first closed position and a second open position;

said rotatably operative means comprising a pin mounted to said main valve assembly and projecting therefrom in parallel relationship with the longitudinal axis of said main valve assembly, a spindle rotatably mounted outside of said main valve chamber, screw means connecting said spindle to said main valve assembly whereby rotation of said spindle will cause axial movement of said main valve assembly, and a stationary member having an aperture into which said pin slidably extends, said stationary member and said pin coacting to prevent rotation of said valve cylinder as said valve cylinder is moved axially by rotation of said spindle;

said main valve assembly having a threaded central bore, and said spindle having a threaded section that is screwed into said threaded central bore, whereby rotation of said spindle will cause said main valve assembly to move axially relative to said main valve chamber;

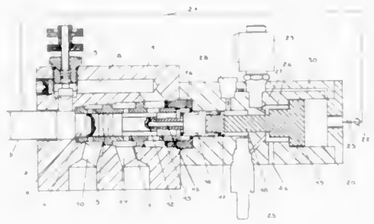
said spindle having a threaded axial bore; and further including a limit pin screwed into said axial bore, said limit pin having a length sufficient for it to project from said spindle far enough to intercept said main valve assembly and thereby limit the range of axial movement of said main valve assembly relative to said valve body.

4,917,138

PRIORITY FLOW CONTROL VALVE FOR HYDRAULIC POWER CIRCUITS

Giorgio Bedogni, Reggio Emilia, Italy, assignor to Oleostar S.r.L., Reggio Emilia, Italy

Filed Jun. 13, 1988, Ser. No. 211,097
Claims priority, application Italy, Jul. 17, 1987, 40091 A/87
Int. Cl.[4] G05D *7/01*
U.S. Cl. 137—101 **6 Claims**



1. A priority flow control valve for hydraulic power circuits, comprising:

an inlet, connecting with a cylindrical bore;

a first piston, slidably accommodated by the bore, that opens and closes an unloading passage and a passage through which oil is directed at a constant rate of flow;

a second piston, slidably accommodated together with a relative bias spring internally of a first chamber disposed coaxial with the bore;

a second chamber, in receipt of oil under pressure, the cross-sectional area of which is greater than that of the first chamber occupied by the bias spring, and

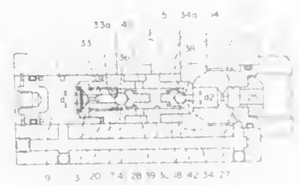
a second piston, slidably accommodated in the second chamber of greater cross-sectional area in associated with a rod that impinges on a movable plate against which the bias spring is seated.

4,917,139

FLOW CONTROL APPARATUS FOR A POWER STEERING DEVICE

Tadataka Narumi, Kariya; Ryutaro Abe, Toyokawa; Susumu Honaga, Hoi, and Yoshiyuki Toyama, Anjo, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 20, 1989, Ser. No. 368,812
Claims priority, application Japan, Jun. 27, 1988, 63-158700
Int. Cl.[4] G05D *7/01, 16/04*
U.S. Cl. 137—110 **3 Claims**



1. A flow control apparatus for supplying pressurized fluid from a pump to a power steering device and for returning an excess part of said pressurized fluid to said pump, comprising:

a housing;

a bore formed in said housing;

a supply passage formed in said housing to be opened into said bore for supplying said pressurized fluid from said pump;

a bypass passage formed in said housing to be opened into said bore in spaced relationship with said supply passage for returing an excess part of said pressurized fluid directly to said pump;

a delivery port formed in said housing and fluidically communicated with said power steering device;

restricted passage means formed between said supply passage and said delivery port;

a spool valve slidably received in said bore and being movable in response to a pressure difference across said restricted passage means so as to maintain the fluid flow delivered to said power steering device constant, said spool valve dividing said bore into a first valve chamber communicating with said supply passage and a second valve chamber communicating with a passage located at the downstream side of said restricted passage means through a connecting passage;

a first relief valve provided in said spool valve to connect said second valve chamber and said bypass passage, said first relief valve operating at a first setting pressure in response to the fluid pressure transmitted from said second valve chamber ; and

a second relief valve connecting said first valve chamber and said bypass passage, and operating at a second setting pressure higher than said first setting pressure in response to the fluid pressure directly transmitted from said first valve chamber.

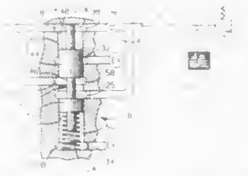
4,917,140

PRESSURE REGULATOR VALVE

Michael F. King, Brownsburg; Charles F. Long, Indianapolis, and Phillip F. McCauley, Danville, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 11, 1989, Ser. No. 350,188
Int. Cl.[4] G05D *16/10*
U.S. Cl. 137—116.3 **2 Claims**

1. A pressure regulator valve comprising a valve bore; a valve spool slidably disposed in said valve bore and including a pair of spaced valve lands, a pair of spaced control edges on one valve land and a reduced area between said valve lands; a main flow inlet passage communicating with said valve bore adjacent one control edge of said one valve land; a main outlet passage in fluid communication with said valve bore adjacent the other control edge of the one valve land; restricted flow passage means disposed for continuous flow communication between said main flow inlet passage and said main flow outlet passage; return passage means adjacent said one valve land and being normally closed thereby; spring means for urging said valve spool in one direction to permit fluid flow from said main



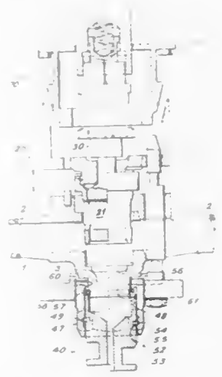
flow inlet passage to said main flow outlet passage; and pressure control means acting one said valve spool for urging said valve spool to move against said spring in a direction to permit closing said main flow inlet passage by said one control edge of the one valve and and to also permit fluid flow from said outlet flow passage to said return passage when fluid pressure in said outlet flow passage is above a predetermined level.

4,917,141

REMOTELY MANIPULATABLE VALVE

Jean Brunel, Bagnolsileze, and Maurice Constant, Bagnols-sur-Ceze, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France

PCT No. PCT/FR88/00071, § 371 Date Oct. 5, 1988, § 102(e) Date Oct. 5, 1988, PCT Pub. No. WO88/05879, PCT Pub. Date Aug. 11, 1988
PCT Filed Feb. 9, 1988, Ser. No. 278,948
Claims priority, application France, Feb. 9, 1987, 87 1542
Int. Cl.[4] F16K *43/00*
U.S. Cl. 137—315 **12 Claims**



1 A valve comprising a body permanently fixed to a pipe, a plurality of assemblies separable from the body by translation movements substantially perpendicular to the pipe and including

a first assembly incorporating an operating member for the valve,

a second assembly located opposite to the first assembly with respect to the body, wherein the second assembly is made of a first component connected to the body and a second component movable relatively to the first component in one mounting and dismantling direction, the second component comprising opposite surfaces which impinge on

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the first assembly so as to lock said first assembly on the body and release said first assembly from the body when the second component is moved, and

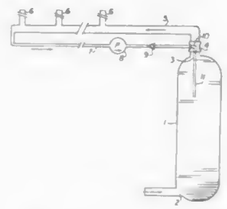
stop means on the body for preventing the first assembly from being disengaged from the opposite surfaces when the first assembly is locked while allowing disengagement when the first assembly is released.

4,917,142

SECONDARY CIRCULATION UNIT

Nikolaus L. Laing, and Ludwig Ludin, both of 632 Marsat Court, Chula Vista, Calif. 92011

Filed Sep. 29, 1989, Ser. No. 414,392
Int. Cl.[4] F16L *5/00*; F24H *1/00*
U.S. Cl. 137—337 **6 Claims**



1. A water circulation system for a commercial or domestic building having a hot water distribution line and a hot water tank having a heat source, a cold water inlet port and a hot water outlet port in the water section of the tank, said system comprising:

a T-connector having two arms and a leg;

the two arms being placed in series with the distribution line near the outlet port;

an internal line extending through the leg, past one arm of the T-connector, through the outlet port, and into the upper region of the water tank;

a return line continuous at one end with the distal end of the distribution line, and at its other end with the internal line; and

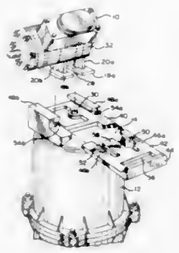
a pump placed in series with the return line.

4,917,143

INLET VACUUM VALVE WITH QUICK-RELEASE MOUNTING APPARATUS FOR UNIT CONTROLLER

John M. Grooms, Rochester, Ind., assignor to Burton Mechanical Contractors, Inc., Rochester, Ind.

Filed Sep. 7, 1989, Ser. No. 405,386
Int. Cl.[4] F16L *3/00*; B65G *53/34*
U.S. Cl. 137—343 **8 Claims**



1. Mounting apparatus for mounting a unit controller assembly to an inlet vacuum valve of a vacuum sewerage system, said unit controller assembly having an exterior housing, said inlet vacuum valve having a lower housing and an upper housing opposite the lower housing, said upper housing having a top surface, said mounting apparatus comprising in combination:

a substantially wedge-shaped member of a predetermined size;

a base support secured to the top surface of said upper housing, said base support having means for slidably receiving said wedge-shaped member; and

a pair of substantially rectangular-shaped mounting supports integrally mounted to a pair of support members extending from said housing of said unit controller,

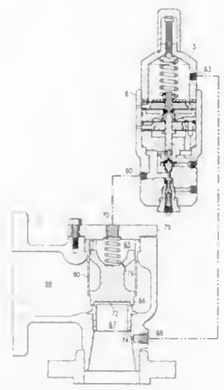
whereby said mounting supports are positioned on top of the base member and said wedge-shaped member is slid into said means for slidably receiving said wedge-shaped member on top of the mounting supports thereby securing said mounting supports to the base support with a press-fit compression connection.

4,917,144

MODULATING PILOT OPERATED SAFETY RELIEF VALVE FOR LOW PRESSURE APPLICATION

Gary J. Giles, Pineville, La., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 7, 1989, Ser. No. 307,424
Int. Cl.[4] G05D *16/00*
U.S. Cl. 137—488 **12 Claims**



1. A modulating pilot valve, comprising:

a signal pressure sensing diaphragm pair comprising a first and second signal sensing diaphragm, mounted adjacent one another to an actuator stem, the signal sensing diaphragm pair having between them a first vent cavity, each signal sensing diaphragm having an interior face exposed to the first vent cavity, and an exterior face, the exterior face of the first signal sensing diaphragm being exposed to an upper signal cavity, the exterior face of the second signal sensing diaphragm being exposed to a lower signal cavity, the upper and lower signal cavities communicating and adapted to respond to a varying signal pressure;

a dome sensing diaphragm pair comprising a first and a second dome sensing diaphragm, mounted adjacent one another to the actuator stem, the dome sensing diaphragm pair having between them a second vent cavity, each dome sensing diaphragm having an interior face exposed to the second vent cavity, and an exterior face, the exterior face of the first dome sensing diaphragm being exposed to an upper dome signal cavity, the exterior face of the second dome sensing diaphragm being exposed to a lower dome signal cavity, the upper and lower dome signal cavities communicating and adapted to contain a dome pressure;

the area of the second signal sensing diaphragm being greater than the area of the first signal sensing diaphragm to thereby define a first area difference, the difference in area acting in response to pressure to displace the actuator stem when the signal pressure is in excess of the pressure in the first vent cavity, in a first direction of travel, the displacement of the stem in the first direction being resisted by a compression spring functioning to bias the actuator stem;

the area of the second dome sensing diaphragm being greater than the area of the first dome sensing diaphragm to define a second area difference, the second difference in area acting in response to pressure to displace the actuator stem when the dome pressure is in excess of the pressure in the second vent cavity, in the first direction of travel, and

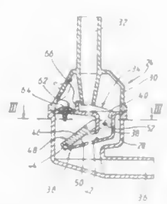
the pilot valve further comprising an exhaust piston which sealingly engages with the actuator stem, the actuator stem having a central fluid passage in communication with the dome sensing cavities and a dome inlet port, and when said actuator stem is disengaged from said exhaust piston, dome pressure is allowed to escape from an exhaust port, the exhaust piston further cooperating with a resiliently biased inlet supply valve adapted to admit a pressure from an inlet port into the dome sensing cavities and the dome inlet port when engaged by the exhaust valve.

4,917,145

VALVE DEVICE FOR AN AERATION AND AIR EVACUATION PIPE LEADING AWAY FROM A MOTOR FUEL TANK

Helmut Wawra, Korb; Wolfgang Kleineberg, Altbach, and Dieter Scheurenbrand, Wolfschlugen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Feb. 6, 1989, Ser. No. 306,291
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1988, 3803670
Int. Cl.[4] F16K *17/194*
U.S. Cl. 137—493 **6 Claims**



1. Valve devices for an aeration and air evacuation pipe of an aeration and air evacuation device arranged in an upper motor fuel tank part, said pipe leading away from the motor fuel tank, the valve device comprising:

a housing formed of two housing parts between which a housing insert is clamped, the housing including a connecting duct and an aeration and air evacuation duct;

an intermediate duct located between the connecting duct and the aeration and air evacuation duct, the intermediate duct having a downwardly extending duct section leading from the housing insert and a laterally and diagonally extending section which projects downwardly from the downwardly extending section;

a negative pressure valve which opens in the case of negative pressure in the tank, the negative pressure valve being located between the connecting duct and the aeration and air evacuation duct; and

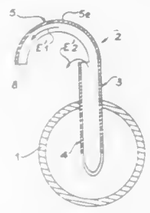
a positive pressure valve which opens in the case of positive pressure in the tank, the positive pressure valve being located between the connecting duct and the aeration and air evacuation duct and having a valve element guided raisably and resting on a valve seat by the effect of gravity, the valve seat being formed by a downward sloping bevelled end face of the downwardly and laterally extending section of the intermediate duct, and the valve element being a weight component which rests upon the bevelled end face of the downwardly and laterally extending section of the intermediate duct exclusively by the effect of gravity.

4,917,146

FLUID DISTRIBUTOR IN A PRESSURIZED RESERVOIR PREVENTING THERMAL STRATIFICATION

Patrick Sundheimer, Saint Maur des Fosses, and Yves Pascal, Nanterre, both of France, assignors to Framatome, Courbevoie, France

Filed Sep. 26, 1988, Ser. No. 248,667
Claims priority, application France, Sep. 25, 1987, 87 13296
Int. Cl.[4] F22B *37/12*
U.S. Cl. 137—561 A **5 Claims**



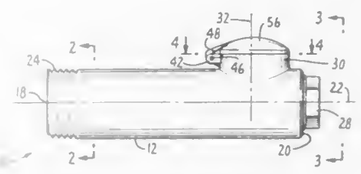
1. Fluid distributor in a pressurized reservoir (11) incorporating a supply pipe (10) for fluid entering the reservoir and terminated by a substantially horizontal distributing part (1) communicating with the interior of the reservoir (11) by tubes (2) passing through an upper generatrix of the distributing part and comprising a circumferential wall terminating in an open end outside the distributing part, the wall being provided with at least one cut between the upper generatrix and the open end.

4,917,147

BACKWATER ESCAPE VALVE

Kenneth R. Jerkins, 1098 Kenwal Rd., Concord, Calif. 94521

Filed Jun. 21, 1989, Ser. No. 369,530
Int. Cl.[4] F16L *55/07*
U.S. Cl. 137—584 **4 Claims**



1 A backwater escape valve, comprising:

an elongate member having a first internal passage extending from end to end thereof;

external threads at one end of said elongate member which are of the same pitch and diameter as external threads of a cleanout sealing plug;

internal threads at the other end of said elongate member

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which are of the same pitch and diameter as threads engaged by said cleanout plug;

a branch extending from said elongate member and containing a second internal passage communicating with said first internal passage; and

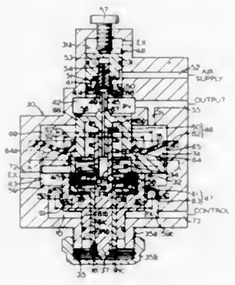
a spring-loaded cover hinged to said branch for closing an end of said second internal passage remote from said first internal passage except when the pressure of water in said passage exceeds a predetermined limit.

4,917,148

LOAD DEPENDENT VALVE FOR RAILWAY VEHICLES

Hideo Tamamori, Kita, Japan, assignor to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Dec. 1, 1988, Ser. No. 278,387
Claims priority, application Japan, Dec. 29, 1987, 62-201557
Int. Cl.[4] G05D *16/00*; F16K *31/126*
U.S. Cl. 137—596.18 6 Claims



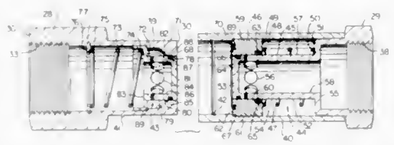
1. A load dependent valve for railway cars comprising, a first spring having one end contacting a balance piston and having the other end supported by a first spring retainer which extends through a center part of a control piston, a second spring having one end contacting the balance piston side and having the other end supported by a second spring retainer, a first spring adjusting mechanism disposed between the first spring retainer and the side of a main valve body for adjusting the compressive force of the first spring, and a second spring adjusting mechanism disposed between the second spring retainer and the side of the control piston for adjusting the compressive force of the second spring, an air supply chamber connected to a compressed air source, an output chamber connected to an output port, an exhaust chamber which opens to the atmosphere, a valve seat disposed in an air supply passage which is connected between the air supply chamber and the output chamber on the adjacent side of the air supply chamber, an air supply valve is biased to seat on the valve seat, an exhaust valve rod having a valve tip which faces the air supply valve and which fits the air supply passage and has an exhaust air bore, one end of which opens at the valve tip and the other end of which opens at the exhaust chamber, said control piston including a control piston diaphragm having an inner edge which is fixed to the main valve body and having an outer edge which is fixed to the control piston main body, and which generates a force to move the exhaust valve rod in the direction of the air supply valve when it receives a control air pressure, said balance piston including a balance piston diaphragm having an inner edge which is fixed to the main valve body and having an outer edge which is fixed to the balance piston main body and which receives the air pressure from the output chamber, and generates the balance force against the force, a middle body member forming the air supply chamber, air supply passage valve seat, and the air supply valve, a position adjusting mechanism by which the middle body member can be moved in the direction of movement of the exhaust valve rod and also which can be fixed in the moved position, a plurality of first fins which are fixed around the piston main body on the low pressure side along the direction of movement facing its upper edges to the diaphragm of the same piston, while the side opposite to that receiving the air pressure of at least one piston of the two pistons is set at a pressure lower than the minimum value of the air pressure, a plurality of second fins which are located in the main valve body and which are placed between the first fins, and in which the first surface which connects the upper edges of the first fins on the side of the diaphragm intersects with the second surface which connects the upper edges of the second fins on the side of the diaphragm.

4,917,149

BREAKAWAY COUPLING, CONDUIT SYSTEM UTILIZING THE COUPLING AND METHODS OF MAKING THE SAME

Rodger P. Grantham, Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Continuation of Ser. No. 181,296, Apr. 14, 1988, abandoned.
This application Oct. 5, 1989, Ser. No. 417,381
Int. Cl.[4] F10L *29/00*
U.S. Cl. 137—614.03 20 Claims



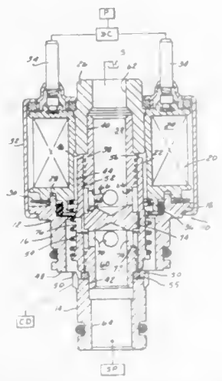
1. In a breakaway coupling for incorporation into a conduit system and comprising a pair of tubular coupling members each having opposed end means one of which is adapted to be interconnected to a part of said conduit system and the other of which is held in sealing and coupling engagement with the other end means of the other coupling member until uncoupled therefrom by a certain axial force means being created therebetween, each of said coupling members having a fixed valve seat means and a movable valve member for opening and closing its respective said valve seat means whereby said valve seat means of said coupling members must both be open before a fluid flow can pass through said coupling members, each of said coupling members having spring means operatively associated with its respective valve member to tend to move that valve member to its closed position, each of said coupling members having abutment means for engaging said valve member of the other coupling member and moving the same to its open position in opposition to its respective spring means as said coupling members are being disposed in their said coupling engagement, said fixed valve seat means of one of said coupling members comprising a cup-shaped member having a closed end interconnected by sidewall means to an open end disposed in fluid communication with the one opposed end means of said one coupling member, said sidewall means having opening means therethrough, said valve member of said one coupling member comprising an annular slide member telescopically receiving said cup-shaped member therein so as to slide on said sidewall means and tend to be urged to a position thereon by its said spring means to close said opening means, the improvement wherein said annular slide member comprises a one-piece member having a rectangular transverse cross-sectional configuration that defines flat parallel opposed annular end surfaces of said slide member and concentrically disposed inner and outer cylindrical peripheral surfaces of said slide member that extend completely between said flat opposed annular end surfaces and that respectively have circular transverse cross-sectional configurations of the same diameters throughout the entire lengths thereof.

4,917,150

SOLENOID OPERATED PRESSURE CONTROL VALVE

Robert O. Koch, Warren; Warren H. Cowles, Farmington Hills, and Keith D. Marsh, St. Clair Shores, all of Mich., assignors to Colt Industries Inc., New York, N.Y.

Filed Jul. 29, 1988, Ser. No. 225,925
Int. Cl.[4] F15B *13/044*
U.S. Cl. 137—625.65 4 Claims



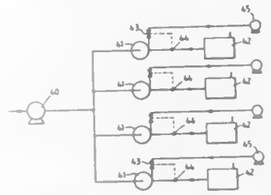
1. A pressure control valve comprising: an elongate fixed valve member having a first blind bore therein extending longitudinally from one end of said member to an inner end communicating with a first valve member port opening at the side of said member and a second blind bore extending longitudinally from the opposite end of said member to an inner end communicating with a second valve member port opening at the side of said member at a location longitudinally spaced from said first port, an elongate tubular valve sleeve of magnetic material slidably and sealingly mounted upon said member for longitudinally sliding movement on said member in longitudinally overlapping relationship with both of said first and second valve member ports, a housing fixedly and sealingly secured to the opposite ends of said fixed valve member and having an elongate internal chamber surrounding the exterior said sleeve and said member, said chamber having a length accommodating sliding movement of said sleeve longitudinally of said member between a first and a second position relative to said member, means in said housing defining an externally accessible supply port, an externally accessible control port and an externally accessible exhaust port, one of said externally accessible ports communicating with said first blind bore, a second of said externally accessible ports communicating with said second blind bore and a third of said externally accessible ports communicating with said chamber, means defining a first annular recess in the outer side of said valve member longitudinally overlapping said first valve member port, means defining a second annular recess in the outer side of said valve member longitudinally spaced from said first annular recess, means defining a third annular recess in the inner side of said sleeve extending longitudinally of said valve member between said first and second recesses to longitudinally overlap said first recess when said sleeve is in said first position and to longitudinally overlap said second recess and said second valve member port when said sleeve is in said second position, means defining a valve port through the wall of said sleeve placing said chamber in constant fluid communication with one of said second and third recesses, spring means biasing said sleeve to one of said first and second positions, and a solenoid coil in said housing operable when energized to establish a magnetic field magnetically biassing said sleeve to the other of said first and second positions against the action of said spring means.

4,917,151

FLUIDIC APPARATUS

Alan Blanchard, Preston, and Lionel H. Ford, Blackpool, both of United Kingdom, assignors to United Kingdom Atomic Energy Authority, Oxfordshire, United Kingdom

Filed Jan. 23, 1989, Ser. No. 300,778
Claims priority, application United Kingdom, Jan. 29, 1988, 8802028
Int. Cl.[4] F15C *1/12*
U.S. Cl. 137—815 11 Claims



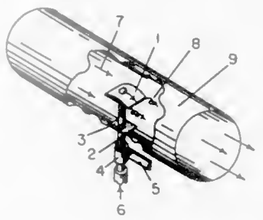
1. A fluidic apparatus comprising a vortex chamber and a main fluid flow line such that fluid in the main fluid flow line enters radially into the vortex chamber and emerges axially from the vortex chamber, a further flow line for introducing a contrl fluid into the vortex chamber and sensing means in the main fluid flow line upstream of the vortex chamber operable thrugh a non-fluid connection to regulate and control the supply of control fluid to the vortex chamber in response to changes in the main fluid flow.

4,917,152

FLUID INJECTOR

William T. Decker, 101 Ridgewood Rd., Bristol, Tenn. 37620

Filed Aug. 14, 1989, Ser. No. 393,416
Int. Cl.[4] B01F *5/04*
U.S. Cl. 137—891 3 Claims



1. A device for injecting a secondary fluid into a flowing stream of primary fluid comprising:

a. a rectangular flat plate inserted within the primary fluid,

b. a hollow tubular support attached perpendicular to the bottom surface of the plate and through which the secondary fluid flows exiting out the top surface of the plate, and

c. a means for adjusting the angle the plate makes with the direction of flow of the primary fluid.

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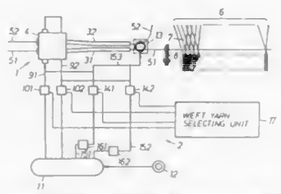
4,917,153

STANDBY WEFT YARN CUTTING PREVENTING DEVICE FOR A MULTICOLOR FLUID JET LOOM

Kiyoaki Mori, and Keiji Kameda, both of Ishikawa, both of Japan, assignors to Tsudakoma Corporation, Ishikawa, Japan

Filed May 26, 1988, Ser. No. 199,007
Claims priority, application Japan, May 29, 1987, 62-080944[U]
Int. Cl.[4] D03D *47/34*
U.S. Cl. 139—435.1 5 Claims



1. In a multicolor fluid jet loom having a plurality of picking nozzles for picking weft yarns and delivering in a picking direction a picked weft yarn to the selvage of a fabric being woven on the loom and a cutter operable for cutting a picked weft yarn, a standby weft yarn cutting preventing device, said standby weft yarn cutting preventing device comprising:

air current generating means disposed adjacent distal ends of the picking nozzles generating an air current for blowing weft yarns other than a picked weft yarn in a direction other than the picking direction;

a compressed air source for supplying compressed air to said air current generating means; and

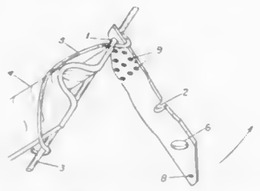
control valve means fluidly connected to said air current generating means and said compressed air source for supplying compressed air to said air current generating means only when the cutter is operated to cut a picked weft yarn.

4,917,154

FENCEWRENCH

Rhubert B. Roberson, Sr., Rte. #1, Box 423, Dunlap, Tenn. 37327

Filed Feb. 10, 1989, Ser. No. 308,799
Int. Cl.[4] B21F *15/04*
U.S. Cl. 140—57 2 Claims



1. A tool for attaching wire clips to fence wire and securing same to metal posts, for removal of wire clips and for tightening sagging wire, comprising

a. a semi-flat, oblong apparatus with tapered ends,

b. one tapered end containing a slot, creating a buttonhook design, said slot being of sufficient depth and width to accommodate a selected wire,

c. a selected number of holes positioned across the width of said apparatus adjacent to said slot, said holes each being of sufficient diameter to accommodate a selected wire,

d. a slot positioned on the opposite side of said holes from said tapered end containing a slot, and being of sufficient depth and width to accommodate a selected wire,

e. one hole positioned in the opposite tapered end from the tapered end containing a slot, and being of sufficient diameter to accommodate a selected wire,

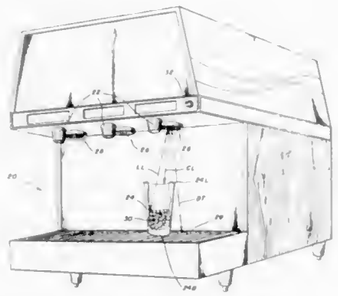
f. one hole positioned near the hole located in the tapered end, and being of sufficient diameter to accommodate means of conveyance.

4,917,155

ULTRASOUND LEVEL DETECTOR AND CONTAINER COUNTER

Arthur Koblasz, Atlanta; James K. Hollister, Richardson; Douglas J. Alexander, Canton, and Jonathan Kirschner, Marietta, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Feb. 25, 1987, Ser. No. 18,463
Int. Cl.[4] B67C *3/28*
U.S. Cl. 141—1 14 Claims



1. A method of automatically filling containers of any size with material and determining the size of the containers filled, comprising the steps of:

initiating the flow of material into a container;

directing a burst of wave energy toward a top edge of the container from a location above the container;

measuring the time it takes for wave energy reflected from said top edge to return to said location;

directing a burst of wave energy toward a support surface which supports a container being filled from a position above the support surface;

measuring the time it takes for wave energy reflected from said support surface to return to said position; and

comparing the respective times that it takes the wave energy reflected from said top edge and support surface to return to said location and position to determine the size of a container being filled.

4,917,156

DEVICE FOR FILLING AN AEROSOL RECEPTACLE WITH GAS THROUGH A PUMP CRIMPED ON THE RECEPTACLE

Jean-Pierre Varlet, Le Neubourg, France, assignor to Valois, Le Neubourg, France

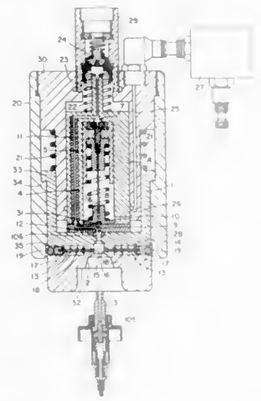
Filed Nov. 28, 1988, Ser. No. 276,770
Claims priority, application France, Nov. 30, 1987, 87 16594
Int. Cl.[4] B65B *31/10*
U.S. Cl. 141—20 5 Claims

1. A valving device for filling an aerosol can with fluid, where the can has a pump including a non-return valve crimped to the can, the device comprising:

a cylinder means having a central bore, a fluid admission orifice opening into said bore, a fluid outlet orifice, a fluid transfer channel to allow fluid to flow from said admission orifice to said outlet orifice, and an exhaust orifice opening into said bore;

a piston, slidably situated in said bore and slidable between a retracted piston position and an extended piston position;

a needle, carried by said piston, said needle extending through said cylinder means and being adapted to open the non-return valve in the pump of the can when said piston is in said extended piston position; and



throttle means for limiting the escape of fluid from said bore through said exhaust orifice when said piston slides into said extended piston position, for damping the sliding motion of said piston and controlling the descent of said needle.

4,917,157

VEHICLE TANK VAPOR VENT VALVE ASSEMBLY

William E. Gifford, Hemlock; Carl H. Sherwood, Brockport; Charles H. Covert, Manchester, and Kenneth W. Turner, Webster, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 27, 1989, Ser. No. 316,002
Int. Cl.[4] B65B *31/06*
U.S. Cl. 141—59 2 Claims

1. A vapor vent valve assembly for a vehicle of the type that has a vapor storage canister with an outside air inlet and a fuel-tank with a filler pipe that is normally closed and is adapted to receive a fuel nozzle when open, and in which said fuel tank is subject to negative and positive pressure fluctuations when said filler pipe is closed, said vapor vent valve assembly comprising,

a downwardly opening sealing flapper door that is normally biased upwardly and closed with a predetermined pressure less than said fuel tank negative pressure fluctuation, but which is adapted to be opened by said fuel nozzle,

a float chamber having an open fitting at the top thereof,

a vapor vent line running from said fitting to said canister,

an overfill prevention float contained within said float chamber which is normally located below said fitting, and,

a passage running from a location within said filler pipe above said flapper door into said float chamber,

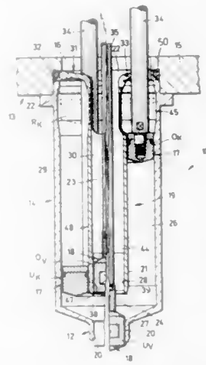
whereby, when said filler pipe is opened and said nozzle inserted to open said flapper door, fuel vapors displaced from said fuel tank may flow freely from said filler pipe to said canister, and when said nozzle is removed and said filler pipe is closed, fuel vapors forced up said filler pipe by a positive fuel tank pressure fluctuation will be prevented from escaping by said normally closed flapper door, while a negative fuel tank pressure fluctuation will pull said flapper door down and open to draw outside air through said canister inlet to relieve said negative tank pressure.

4,917,158

DISPENSING DEVICE FOR FLUID PRODUCTS

Berthold Lingenhoff, Hilden, Fed. Rep. of Germany, assignor to Hamba Maschinenfabrik Hans A. Muiler GmbH and Co. KG, Wuppertal, Fed. Rep. of Germany

Filed Mar. 16, 1988, Ser. No. 168,870
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1987, 3712245
Int. Cl.[4] B67D *5/52*
U.S. Cl. 141—258 15 Claims



1. A fluid product dispensing device which comprises:

mounting means for connection to a product source;

an upright annular dispensing cylinder on said mounting means surrounding an axially extending annular wall;

an annular dispensing piston in said dispensing cylinder riding along an outer surface of said wall, said dispensing piston being movable between an upper and a lower limiting position and making a fluid-tight seal between upper and lower regions of said dispensing cylinder;

a single valve cylinder in said device surrounded by said dispensing cylinder and defined by an inner surface of said wall;

a single valve piston for said device axially displaceable in said valve cylinder, said valve piston riding on said inner surface of said wall and being movable between an upper limiting position and a lower limiting position, and arranged to be in a lower limiting position when said dispensing piston moves toward its upper limiting position;

means at a lower end of said dispensing cylinder defining a flow opening which opens from a space at the lower end of said dispensing cylinder below the lower limiting position of said dispensing piston into said valve cylinder, said flow opening being located between the upper limiting position and the lower limiting position of said valve

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piston and serving as a product inlet from said valve cylinder to said dispensing cylinder when said valve piston is in its lower limiting position blocking outflow from said space, and serving for product outflow from said space when said valve piston is in its upper limiting position; and

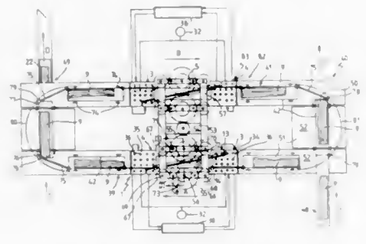
means forming at least one product dispensing channel for conveying said product outflow from said space, so that said dispensing piston moves in said dispensing cylinder toward its lower limiting position when said valve piston is in its upper limiting position to discharge said product from said dispensing channel, said upper limiting position of said dispensing piston lying above a bottom of said wall to permit said product to enter said dispensing cylinder when said valve piston in is its lower limiting position.

4,917,159

LONGITUDINAL WOOD PEELING MACHINE AND A WOOD PEELING INSTALLATION

Michel Martin, 23, rue de Turin, 75008 Paris, France

Filed Dec. 28, 1988, Ser. No. 291,539
Claims priority, application France, Dec. 28, 1987, 8718226
Int. Cl.[4] B27C *1/00*
U.S. Cl. 144—175 10 Claims



1. A longitudinal wood peeling machine utilizable in a wood peeling installation, said machine comprising a generally rectangular cutting table having external longitudinal edges and formed by

an inlet table having flat horizontal upper and lower faces, a rear part and a rear face,

an outlet table having flat horizontal upper and lower faces and a front part,

a knife having a front part and a cutting edge and being adjustably embedded in said front part of said outlet table,

said flat horizontal upper faces of said inlet and outlet tables being disposed to support a lower face of green wood balk during advancement and before and after peeling of a veneer, therefrom,

said tables being adjustable in height with respect to each other according to a thickness of veneer to be peeled,

said cutting edge of said knife and said rear face of said inlet table being disposed to face each other along a diagonal of said cutting table to form an angle of about 10° with an advancing direction of said balk, which is longitudinal with respect to grain of said green wood balk;

a means for driving said balk in a longitudinal direction and a generally vertical means for applying and holding said balk against said cutting table,

a lateral alignment stop provided at a level of said external longitudinal edge of said cutting table which is opposite said knife for holding said balk in said longitudinal direction during peeling;

said rear part of said inlet table and said front parts of said knife and of said outlet table having surfaces of complementary shapes defining an oblique slit therebetween for discharging said veneer downwards during peeling.

said inlet table and said outlet table being thin and having exactly the same thickness,

a plate for receiving and stacking said peeled veneers which is adjustable in height and disposed below said cutting table, wherein the upper face of said plate or of a last peeled veneer

is substantially at a height of said lower face of said inlet table,

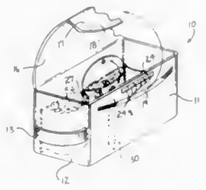
said upper and lower faces of said thin inlet table defining two superimposed stages of an upper peeling stage corresponding to said lower face of said balk before peeling said veneer in progress and a lower reception and stacking stage corresponding to said upper face of said plate or of said last peeled veneer.

4,917,160

STORAGE BAG

Diana L. Hart, 6134 Windamar Rd., and Nancy A. Hames, 4335 Onondaga, both of Toledo, Ohio 43611

Filed Mar. 10, 1989, Ser. No. 321,392
Int. Cl.[4] A45C *3/00, 1/04, 13/10, 15/00*
U.S. Cl. 150—106 6 Claims



1. A storage bag comprising, in combination,

a rectangular compartment defined by an elongate bottom wall, spaced parallel side walls, a forward wall, and a rear wall, and

each of said side walls including a single flexible strap handle mounted to each respective side wall,

said rear wall including a plurality of spaced flexible straps secured at their first ends to an exterior surface of the rear wall at a lower edge of the rear wall, and

a first fastener patch secured adjacent each second end of each flexible strap selectively engageable with a second fastener patch secured to the exterior surface of the rear wall aligned with and overlying each of the first ends of the flexible straps, and

a covering wall including a first hinge means formed between a rear edge of the covering wall and a top edge of the real wall for hingedly maintaining the covering wall to the rear wall, and a flap including a further hinge means for hingedly mounting the flap to a forward edge of the covering wall and

a first hook and loop fastener strip secured adjacent a lower edge of the flap engageable with a second hook and loop fastener strip secured to an exterior surface of the forward wall spaced below a top edge of the forward wall, and

wherein the side walls, forward wall, rear wall, bottom wall, covering wall, and covering flap are each formed of a flexible material, and

including a flexible temperature indicating strip secured to the exterior surface of the forward wall spaced between the second hook and loop fastener strip and the top edge of the forward wall.

4,917,161

CHEWING TOBACCO COMPOS TION AND PROCESS FOR PRODUCING THE SAME

John Townend, Lancaster, Pa., assignor to Helme Tobacco Company, Helmetta, N.J.

Filed Oct. 6, 1987, Ser. No. 105,275
Int. Cl.[4] A24B *5/05, 3/07, 5/04*
U.S. Cl. 131—352 18 Claims

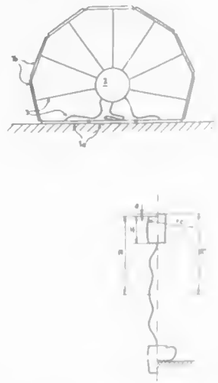
1. A miniature soft plug of chewing tobacco having a moisture content between about 15 to about 35% by weight and a tensile strength of greater than about 150 g/cm when measured with a Scott Tensile Tester at a moisture content of 26% by weight, said plug comprising tobacco in an amount of about 25 to about 80% by weight dry basis; and a casing solids composition adhering to said tobacco in an amount of about 20 to 75% by weight dry basis.

4,917,162

DEFORMABLE WHEEL USEFUL FOR INSTANCE AS A VEHICLE WHEEL OR IN A GEARING

Guy Le Feron De Longcamp, 9 Rue Massenet 75016, Paris, France

Continuation of Ser. No. 825,327, Mar. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 455,939, Jan. 6, 1983, abandoned, which is a continuation-in-part of Ser. No. 171,838, Jul. 24, 1980, abandoned. This application May 18, 1988, Ser. No. 195,714
Claims priority, application France, Jul. 25, 1979, 79 19137
Int. Cl.[4] B60C *7/00*
U.S. Cl. 152—5 6 Claims



1. A wheel capable of functioning without internal pressure, comprising:

a central part;

a radially deformable peripheral tread whose peripheral length is substantially constant surrounding said central part and radially spaced therefrom; and

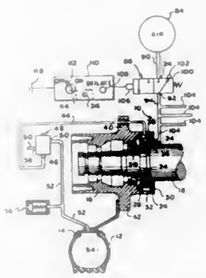
means for connecting said central part to said tread, said means having a first radial dimension when the unpressurized wheel is not loaded and has no internal pressure and a second radial dimension when the wheel is under the load it is intended to support and has no internal pressure and lies on flat ground, said second radial dimension being greater than said first radial dimension by no more than one tenth of said first radial dimension, and said means being substantially unable to generate an outwardly directed resilient force on a part of the tread in response to an inwardly directed displacement of said part of the tread rim from the position it has when said wheel is under said load it is intended to support, said connecting means including at least one ply containing cords which are rigidly connected to and extend between said central part and said tread and which are essentially untensioned and have a first length when said connecting means have said first radial dimension and which are tensioned and have a second length when said connecting means have a second radial dimension, the difference between said first and second lengths resulting in inwardly directed radial forces exerted by said connecting means on said tread, said ply having in a radial plane a curve whose axial radius r is greater than a limit relative to H, H being the radial distance between the central part and the tread when the wheel is unloaded and unpressurized, said limit being equal to 0.75 H under the condition when the ratio H/R equals 0.35 R, R being the radius of the wheel in the same condition, said limit being higher if said ratio is smaller.

4,917,163

RAPID TIRE DEFLATION SYSTEM

Gary R. Schultz, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 142,599, Jan. 11, 1988, abandoned. This application Apr. 17, 1989, Ser. No. 339,467
Int. Cl.[4] B60C *23/00*
U.S. Cl. 152—415 6 Claims



1. A rapid tire deflation system for emergency vehicle tires comprising;

a plurality of wheels each provided with a pressurized tire;

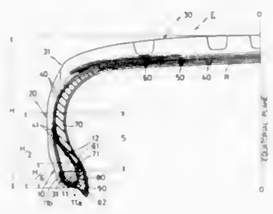
an air actuated two position wheel valve mounted on each wheel which is normally closed and when opened, exhausts the pressurized air in said tire to atmosphere;

an air circuit for actuating said wheel valves including conduits for communicating air between each wheel valve and a single solenoid valve connecting said air circuit to a source of pressurized air on said vehicle;

said solenoid valve mounted on said vehicle and energized by a manually activated switch which when actuated energizes said solenoid valve to pressurize said air circuit to open said wheel valves to deflate said tires; and

an electrical control circuit and timer means for controlling the duration of time said solenoid valve is energized and said duration of time said solenoid valve is energized being the duration of time said wheel valves are opened so that said tires are depressurized to a predetermined lower pressure.

4,917,164
PNEUMATIC SAFETY TIRE
Hisao Ushikubo, Kodaira; Touru Tsuda, Higashimurayama, and Ichiro Takahashi, Niiza, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Continuation of Ser. No. 39,259, Apr. 17, 1987, abandoned. This application Sep. 29, 1988, Ser. No. 251,941
Claims priority, application Japan, Apr. 30, 1986, 61-99552
Int. Cl.[4] B50C *17/00*
U.S. Cl. 152—517 5 Claims

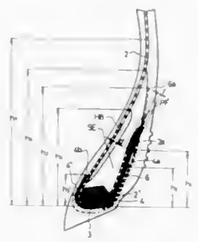


1. A pneumatic safety tire comprising: a carcass layer extending from an outer crown portion, through two side wall portions, to two inner bead portions, axial end portions of said carcass layer being bent around bead wires axially outwardly then upwardly at inner bead portions;
(a) a pair of crescent-shaped cross-section reinforcing layers made of rubber and each having a thickest portion thereof at a sidewall portion and extending from the sidewall portion to the crown portion and the bead portion along an inside surface of the carcass layer;
(b) a pair of beak-shaped cross-section rim-fixed protruding members made of a rubber having a tensile stress at 100% elongation strain in the range of 50 to 120 kg/cm^2 and each extending in one direction from a toe portion of the tire to an innermost end of said reinforcing layer and also extending radially and axially outwardly along an innermost bead portion located radially inside the bead wire, each of said beak-shaped cross-section rim-fixed protruding members supported in a heel portion of said bead portion by a rubber member extending from said innermost bead portion to an axially outward side of the bead portion and by a fabric member extending from said toe portion of the tire to an inner end of said crescent-shaped cross-section reinforcing layer beyond a bonding surface between said reinforcing layer and said protruding member; and
(c) a pair of annular circumferential bonding surfaces between said crescent-shaped cross-section reinforcing layer and said beak-shaped cross-section rim-fixed protruding member being inclined axially outwardly or inwardly so as to form an annular wedge-shaped sloped bonding surface, respectively, and said crescent-shaped cross-section reinforcing layer and said beak-shaped cross-section rim-fixed protruding member being extrusion-formed simultaneously as an integral structure of two rubbers before a green tire is molded.

4,917,165
STEEL CORDS FOR THE REINFORCEMENT OF RUBBER ARTICLES
Yojiro Umezawa, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan
Continuation of Ser. No. 40,676, Apr. 21, 1987, Pat. No. 4,788,815, which is a continuation of Ser. No. 810,460, Dec. 18, 1985, Pat. No. 4,707,975. This applicatioo Oct. 6, 1988, Ser. No. 254,074
Claims priority, application Japan, Feb. 26, 1985, 60-35215; Feb. 26, 1985, 60-35216
The portion of the term of this patent subsequent to Nov. 24, 2004, has been disclaimed.
Int. Cl.[4] B60C *9/00*
U.S. Cl. 152—527 29 Claims

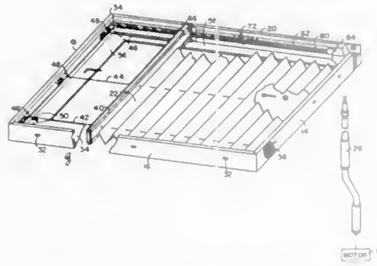
19. A pneumatic radial tire having a steel cord as a reinforcement of a belt ply, comprising a central base structure composed of 2 to 4 steel filaments, and at least one coaxial layer composed of plural steel filaments arranged around the central base structure, the steel filaments of the coaxial layer and the central base structure being twisted in the same direction at the same pitch, the improvement wherein the steel filaments constituting the central base structure have the same diameter (dc), while a steel filament in the coaxial layer which contacts with the adjoining steel filaments of said central base structure has a diameter (dsi) equal to the diameter (dc) and the remaining steel filaments in the coaxial layer have a diameter (dso) smaller than the diameter (dc) and a ratio of dc/dso is within a range of 1.03 to 1.25.

4,917,166
PNEUMATIC RADIAL TIRE HAVING AN IMPROVED DURABILITY IN BEAD SECTION
Munenori Iuchi, Tokyo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Japan
Continuation of Ser. No. 917,301, Oct. 9, 1986, abandoned, which is a continuation of Ser. No. 665,537, Oct. 26, 1984, abandoned. This applicatioo Sep. 26, 1988, Ser. No. 249,193
Claims priority, application Japan, Oct. 28, 1983, 58-203136
Int. Cl.[4] B60C *15/06*
U.S. Cl. 152—554 5 Claims



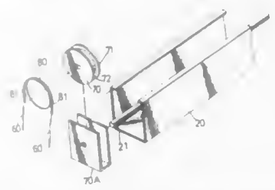
1. A pneumatic radial tire having reinforced bead regions comprising:
a pair of bead cores each having a radially outwardly facing surface and a carcass comprising at least one carcass ply of substantially radially extending rubber coated steel cords having ends which are wrapped around the bead cores from the inside toward the outwide of the tire to form turnup portions extending to a perpendicular radial height h_1 above the bead cores;
a reinforcing layer of rubberized steel cords wrapped around the portion of the turnup on the bead cores, the axial outer edge of said layer extending to a perpendicular radial height h_2 above the bead cores, with h_2 being 0.9 to 0.5 times as high as h_1 and higher than the radial height of the wheel rim to which the tire is fitted;
at least one layer of rubberized organic fiber cord wrapped along and adjacent to the steel cord reinforcing layer, with the axial outer ends of said cords extending to a perpendicular radial height h_3 above the bead cores, with h_3 being 1.3 to 2.5 times as high as h_1 so as to cover the upper ends of both the steel cord reinforcing layer and the turnup portion;
a rubberized strip having a 100% modulus of elasticity of 30 to 80 kg/cm^2 and a thickness of 0.3 to 5 mm positioned and shaped to extend both above and below the carcass ply turnup end so as to overlie said turnup end and to contact the organic fiber cord reinforcing layer and to be in contact with the upper end of the steel cord reinforcing layer;
a bead apex strip of substantially triangular cross-sectional shape having its base substantially covering the radially outwardly facing surface of the bead core and extending radially outwardly from the bead core and interposed between the carcass ply and the carcass ply turnup, comprising an integral soft rubber piece having a JIS hardness of 45°–65° which is lower than that of the carcass ply coating rubber and a 100% modulus of elasticity of 10 to 45 kg/cm^2.

4,917,167
SKYLIGHT WINDOW COVERING AND CONTROL MEANS THEREFOR
Robert J. Voss, Fountain Valley, and Louis G. Valle, Huntington Beach, both of Calif., assignors to Home Fashions, Inc., Westminster, Calif.
Filed Mar. 23, 1989, Ser. No. 328,016
Int. Cl.[4] E06B *9/262*
U.S. Cl. 160—84.1 8 Claims



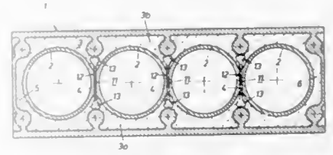
1. A skylight window covering unit comprising:
a frame having two opposite ends and two opposite sides enclosing an open central portion;
a length of pleated fabric;
a first rail secured to one end of the pleated fabric and mounted on one frame end facing the frame open central portion;
a second rail secured to an opposite end of the pleated fabric and having its end portions slidingly related, respectively, to the frame sides;
a gear box mounted within a frame corner and having rotative power input means;
a drive rod having one end drivingly related with the gear box and its other end rotatably journaled in an opposite corner of the frame so that the rod is generally parallel and closely adjacent to one frame side, said rod having a helical groove on its outer surface; and
nut means mounted onto an end of the second rail receives the drive rod therein and is moved along the rod by rotation thereof.

4,917,168
ANGLE-CONTROLLING DEVICE FOR A VENETIAN BLIND
Cheng-Hsiung Chen, No. 32, Chin-Hua N. Rd., Pei-Tun Dist. Taichung City, Taiwan
Filed Sep. 21, 1989, Ser. No. 410,264
Int. Cl.[4] E06B *9/26*
U.S. Cl. 160—176.1 1 Claim



1. A venetian blind including a superposed series of horizontal slats suspended one above another, a bottom rail disposed below said slats, and two angle-controlling devices disposed at two end portions of said series of slats, each of said angle-controlling devices including a rotatable means disposed at a top end portion of said blind, and two tilting cords respectively connected to two sides of each of said slats, said bottom rail being attached to bottom ends of said tilting cords, characterized in that each of said rotatable means includes a rotatable pulley having an annular groove formed therein, and a coiled spring sleeved tightly on said pulley within said annular groove, each of said springs having two ends to which top ends of two associated said tilting cords are respectively fastened, whereby, when said pulleys are rotated to a predetermined position, one end of each of said springs is moved radially outward due to downward pull of said bottom rail, so that said springs are loosened from said pulleys.

4,917,169
CASTING CORE FOR A WATER JACKET
Helmut Melde-Tuczai, Graz; Wilhelm Greylinger, Mürzzuschlag, and Klaus Nowotny, Graz, all of Austria, assignors to AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik, Graz, Austria
Filed Aug. 15, 1988, Ser. No. 232,172
Claims priority, application Austria, Aug. 20, 1987, 2097/87
Int. Cl.[4] B22C *9/10, 21/14*
U.S. Cl. 164—369 5 Claims



1. A casing core for a water jacket of a cylinder block in a multicylinder, reciprocating-piston internal combustion engine, having a cylinder block top deck and cylinders which are arranged in line and are cast in one piece linked by cylinder webs, said casting core comprising two halves arranged on the long sides of said cylinder block being held together by core sections on the front ends of said cylinder block and being

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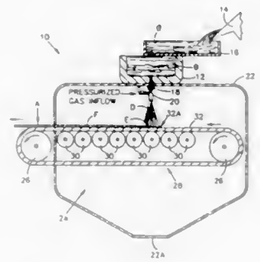
secured by supports piercing said cylinder webs, wherein each of said supports is configured as an essentially rectangular plate of ceramics, having a thickness of 1.5 to 3 mm, and being provided with ceramic anchoring elements along both edges of said plate running parallel to the cylinder axes and wherein said casting core of said water jacket and said supports are combined in a one-piece casting core by means of a core-shooting process.

4,917,170

NON-PREHEATED LOW THERMAL CONDUCTIVITY SUBSTRATE FOR USE IN SPRAY-DEPOSITED STRIP PRODUCTION

Ashok Sankaranarayanan, Bethany; W. Gary Watson, Cheshire, and Harvey P. Cheskis, North Haven, all of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Sep. 20, 1988, Ser. No. 246,845
Int. Cl.[4] B22D *23/00*
U.S. Cl. 164—429 **6 Claims**



1. In a molten metal gas-atomizing spray-depositing apparatus, the combination comprising:

(a) means employing a pressurized gas flow for atomizing a stream of molten metal into a spray pattern of metal particles and producing a flow of said particles in said pattern thereof along with said gas flow in a generally downward direction;

(b) a non-preheated substrate composed of a material having a predetermined thermal conductivity of about fifteen or less (W/M−K) disposed below the atomizing means for receiving thereon a deposit of said particles in said spray pattern and for impinging thereon of said pressurized gas flow for cooling said deposit on said substrate to form a product thereon;

(c) said predetermined thermal conductivity of said substrate of about fifteen or less precluding extraction of heat by said substrate from, and thus solidification of said deposit upon initial contact with said substrate whereby a reduction of porosity is achieved in said deposit;

(d) means for moving said substrate relatively to said atomizing means; and

(e) means for separating said deposit from said substrate located downstream of said atomizing means.

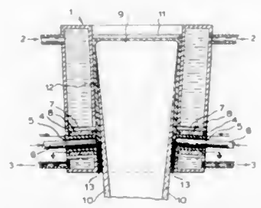
4,917,171

LUBRICATING A CONTINUOUS-CASTING MOLD

Marios Economopoulos, Liege, and Raymond D'Haeyer, Barchon, both of Belgium, assignors to Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie, Brussels, Belgium

Filed Apr. 29, 1985, Ser. No. 728,193
Claims priority, application Belgium, Apr. 27, 1984, 899,544
Int. Cl.[4] B22D *11/07*
U.S. Cl. 164—472 **3 Claims**

1. A method of providing lubrication to a continuous-casting mold comprising introducing a fusible solid lubricant through at least one orifice extending through a peripheral wall in the lower end region of the mold, preheating the lubricant before the lubricant enters the mold from the orifice and melting the



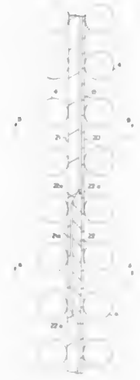
solid lubricant while in the orifice so that it spreads between the lower end region of the peripheral wall and metal cast in the mold.

4,917,172

PROCESS FOR THE ANTIVIBRATORY WEDGING OF COMPONENT PARTS OF AN INSTALLATION, AND IN PARTICULAR A PROCESS FOR WEDGING THE TUBES OF A STEAM GENERATOR

Claude Falduti, Saint Michel sur Orge, France, assignor to Framatome, Courbevoie, France

Filed Apr. 21, 1988, Ser. No. 184,231
Claims priority, application France, Apr. 21, 1987, 87 05630
Int. Cl.[4] F22B *37/20*
U.S. Cl. 165—1 **2 Claims**



1. Process for the antivibratory wedging of tubes of a steam generator operating at a working temperature ts, which in operation are subjected to stresses capable of causing them to vibrate and which are disposed in sequence in such a manner that a separation space is formed between two successive tubes (**4**) for receiving anti-vibratory bars (**15**), each of the anti-vibratory bars (**15**) comprising two relatively transversely displaceable members and between said displaceable members at least one portion (**22**) of shape memory alloy having a first configuration at a temperature t0 and a second configuration at said temperature ts, said anti-vibration bars being in a first state in which their transverse dimension is at a minimum value, said process including the steps of

(a) introducing said anti-vibratory bars into said separation spaces;

(b) causing an increase in said transverse dimension of each of said anti-vibratory bars to wedge said tubes during operation of said steam generator;

(c) wedging said two displaceable members so that said anti-vibratory bars are in their said first state and have at said temperature t0 an initial transverse dimension smaller than the width of said separation spaces between said tubes (**4**), and at said temperature ts a transverse dimension substantially greater than said initial transverse dimension;

(d) introducing said anti-vibratory bars (**15**) between said tubes (**4**) at said temperature t0 substantially different from said temperature ts; and

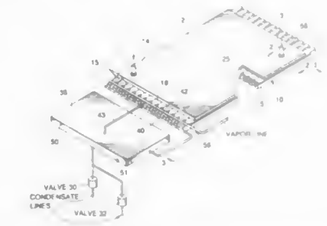
(e) wedging said tubes (**4**) at said temperature ts by passing the temperature of said at least one portion (22) of shape memory alloy from said temperature t0 to said temperature ts at the moment when said steam generator is put into service.

4,917,173

MONOGROOVE LIQUID HEAT EXCHANGER

Richard F. Brown, Bethpage, and Fred Edelstein, Hauppauge, both of N.Y., assignors to The United States of America as represented by the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 15, 1988, Ser. No. 271,266
Int. Cl.[4] F28D *15/02*; F28F *27/00*
U.S. Cl. 165—13 **20 Claims**



1. A liquid supply control for a heat transfer system for transporting heat by liquid-vapor phase change of a working fluid in a monogoove heat pipe assembly, comprising:

(a) a monogroove heat pipe assembly formed of a plurality of monogroove heat pipe legs joined to one another, said heat pipe assembly including liquid and vapor headers coupled respectively to the liquid and vapor channels of said monogroove heat pipe legs in said assembly,

(b) a liquid reservoir connected to said liquid header,

(c) a vapor line for the working fluid vapor phase, said vapor line being operatively connected to a condenser and to said vapor header for supplying and receiving vapor according to the demands of said header,

(d) liquid supply and condensate return lines for the liquid phase of the working fluid,

(e) a fill valve operatively connecting said liquid supply line from a liquid source to said liquid reservoir,

(f) a condensate return valve operatively connecting said condensate return line from a system pump to said liquid reservoir, and

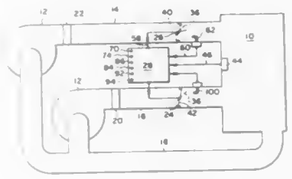
(g) valve control means responsive at least to liquid in said reservoir and connected to said fill and return valves for controlling said valves to admit liquid to said reservoir when said reservoir is becoming depleted and to drain liquid from said reservoir when said reservoir is becoming filled, to cause liquid to enter said reservoir when said heat pipe assembly is evaporating the working fluid, and to cause liquid to exit said reservoir during operation of said heat pipe assembly as a condenser for the working fluid.

4,917,174

SUPPLY AIRFLOW CONTROL FOR DUAL-DUCT SYSTEM

Harry K. Ring, Houston, Minn., assignor to American Standard Inc., New York, N.Y.

Filed Jul. 25, 1988, Ser. No. 223,584
Int. Cl.[4] F25B *29/00*; F24F *3/052*
U.S. Cl. 165—26 **24 Claims**



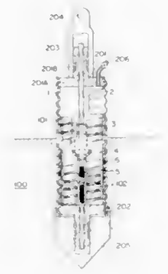
1. An HVAC apparatus for conditioning the temperature of a comfort zone comprising:

a temperature sensor for sensing an actual temperature associated with said zone;

a heating valve operative in a first mode for modulating the flow rate of heated air conveyed to said zone, except for possibly hysteresis range around a set point temperature, when said actual temperature is immediately below said set point temperature and said hysteresis range if present said heating valve is maintained at a first substantially constant intermediate open position within a dead band region and provides a variable degree of opening that varies as a function of said actual temperature beyond said dead band region, said heating valve being maintained at a first substantially constant predetermined minimum position that is less than said first intermediate open position when said actual temperature is immediately above said set point temperature and said hysteresis range if present; and

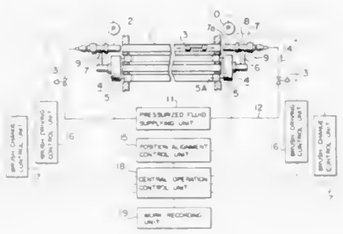
a cooling valve operative in a first mode for modulating the flow rate of cooled air conveyed to said zone, except for possibly some hysteresis range around said set point temperature, when said actual temperature is immediately above said set point temperature and said hysteresis range if present, said cooling valve is maintained at a second substantially constant intermediate open position within said dead band region and provides a variable degree of opening that varies as a function if said actual temperature beyond said dead band region, said cooling valve being maintained at a second substantially constant predetermined minimum position that is less than said second intermediate open position when said actual temperature is immediately below said set point temperature and said hysteresis range if present, whereby said heating and cooling valves assure a predetermined minimum airflow rate around said set point temperature.

4,917,175
CORRUGATED HEAT PIPE
Masuji Sakaya, Narashino; Tsuneaki Motai, Yachiyo; Masataka Mochizuki, Nagareyama, and Kouichi Mashiko, Tokyo, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan
Division of Ser. No. 164,560, Mar. 7, 1988, Pat. No. 4,836,275.
This application Jan. 26, 1989, Ser. No. 302,624
Claims priority, application Japan, Mar. 11, 1987, 62-53975; Apr. 10, 1987, 62-86989; May 15, 1987, 62-117168
Int. Cl.[4] F28D *15/02*; F24J *3/08*
U.S. Cl. 165—45 3 Claims



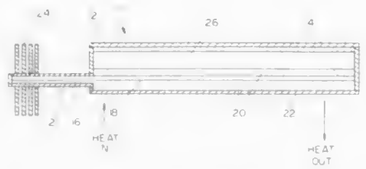
1. A flexible corrugated heat pipe for conducting terrestrial heat, said heat pipe being sealed at both ends and containing an operating liquid therein, said heat pipe comprising:
a longitudinally corrugated peripheral wall for rendering the heat pipe flexible;
a reinforcing member provided on an inner peripheral wall surface of a corrugated portion of said heat pipe;
said reinforcing member extending along at least a portion of the length of said heat pipe and spanning over a plurality of corrugations of said peripheral wall;
an elongated rope-like tension member extending through said heat pipe and secured at end portions of said heat pipe; and
wick means provided between said reinforcing member and said inner peripheral wall surface of said heat pipe.

4,917,176
DEVICE FOR CLEANING INNER SURFACES OF HEAT EXCHANGER TUBES
Toshimasa Shimada; Katsuhei Tanemura, both of Chofu; Yasuo Fujitani; Katsumoto Otake, both of Hitachi; Shigeo Oda, and Yoshio Sumiya, both of Hitachi, all of Japan, assignors to Hitachi, Ltd. and The Tokyo Electric Power Co., Inc., both of Tokyo, Japan
Filed Nov. 17, 1988, Ser. No. 272,256
Claims priority, application Japan, Nov. 20, 1987, 62-292135
Int. Cl.[4] F28G *1/12*; B08B *9/04*
U.S. Cl. 165—95 17 Claims



1. A device for cleaning inner surfaces of heat exchanger tubes constituted in such a manner that opposite opened ends of a plurality of said heat exchanger tubes are secured to corresponding tube plates, brush driving devices supported by main cleaning device bodies having moving devices are made to confront said opened ends of said heat exchanger tubes, and cleaning brushes are moved by pressurized fluid supplied to said brush driving devices so that the inner surfaces of said heat exchanger tubes are cleaned, said device for cleaning inner surfaces of heat exchanger tubes comprising:
a pair of said main cleaning device bodies each having said moving device and said brush driving device an disposed on said tube plates in which said ends of said heat exchanger tubes are respectively opened;
a brush changing device provided for at least one of said pair of main cleaning device bodies, each of said brush driving devices being disposed corresponding to said opened end of the same heat exchanger tube; and
a pressurized fluid supplying unit for moving said cleaning brush by supplying said pressurized fluid to each of said brush driving devices.

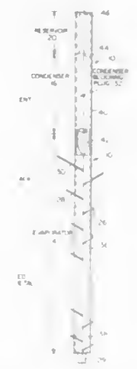
4,917,177
COOLED ARTERY EXTENSION
Nelson J. Gernert, Elizabethtown, Pa., assignor to Thermacore, Inc., Lancaster, Pa.
Filed Sep. 21, 1989, Ser. No. 410,541
Int. Cl.[4] F28D *15/02*
U.S. Cl. 165—104.26 5 Claims



1. In a heat pipe which includes at least one liquid return artery which extends into the evaporator region of the heat pipe, the improvement comprising an extension structure attached to at least one artery at the end of the artery most remote from the condenser region of the heat pipe, with the extension structure extending out of the evaporator region of the heat pipe and into a region which is not subjected to heat.

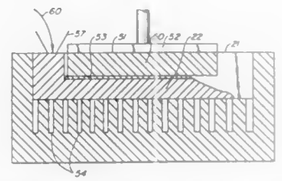
4,917,178
HEAT PIPE FOR RECLAIMING VAPORIZED METAL
Robert L. Kosson, Massapequa; John Quadrini, Northport, and Ronald S. Dluginski, Garden City Park, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed May 18, 1989, Ser. No. 353,417
Int. Cl.[4] F28D *15/02*; F28B *1/02*
U.S. Cl. 165—111 2 Claims

1. A heat pipe assembly for collecting preselected metals from vapors present in an effluent-emitting stack, the assembly comprising:
a generally cylindrical heat pipe housing axially extending through an upper end portion of a stack;
a plurality of spaced arcuately shaped turbulators connected to the housing for mixing a stream of vapor-containing effluent flowing along the length of the pipe and improving heat transfer between the vapor and the heat pipe;
an evaporator section existing along a lower portion of the pipe and located entirely within the stack for cooling the metal vapors flowing across the evaporator section;
a condenser section existing along an upper portion of the pipe and located outside the stack for exchanging heat to a coolant system;
means for introducing a working fluid into the heat pipe;
a reservoir located in the housing and containing non-condensable gas which flows into the condenser section for controlling the conductance of the heat pipe as a directly proportional function of the heat load on the condenser section; and



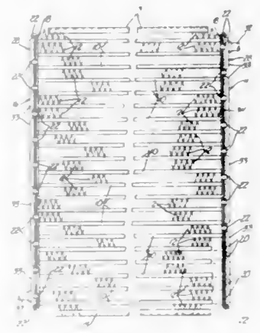
a plug axially extending through the condenser section and having a diameter less tan the inner diameter of the heat pipe housing, thereby creating an annular cross section passage through the condenser section, wherein the plug has a non-blunt bullet shape nose and extending into the condenser section providing higher condenser vapor velocities for improving temperature control and also providing controlled vapor accleration into the condenser section to minimize axial pressure gradient.

4,917,179
THERMOELECTRIC COOLING DESIGN
Robert Giebeler, Cupertino, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.
Continuation of Ser. No. 211,108, Jun. 21, 1988, abandoned, which is a division of Ser. No. 53,190, May 22, 1987, Pat. No. 4,785,637. This application Sep. 14, 1989, Ser. No. 407,679
Int. Cl.[4] F28F *19/06*
U.S. Cl. 165—133 4 Claims



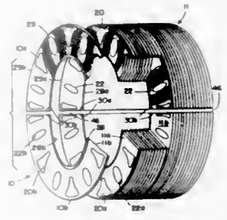
1. An improved thermoelectric discharge heat sink for dispipating heat from a thermoelectric device, said heat sink comprising:
a gold plated copper insert for direct attachment to a heat source; and,
a cast aluminum body surrounding said copper insert for dischaarging heat to ambient.

4,917,180
HEAT EXCHANGER WITH LAMINATED HEADER AND TANK AND METHOD OF MANUFACTURE
Peter G. Wolf, Tonawanda, and George K. Snyder, Lockport, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.
Filed Mar. 27, 1989, Ser. No. 329,172
Int. Cl.[4] F28F *1/02*
U.S. Cl. 165—150 7 Claims



1. A heat exchanger having a plurality of parallel tubes for carrying a working fluid and a header and tank assembly at each end of the tubes for directing the working fluid through the tubes in a desired flow path, each header and tank assembly comprising:
a flat header plate apertured for receiving an end of each of the tubes and serving as one side of a passage means,
a tank plate aligned with and contacting the header plate and serving as a second and only other side of said passage means,
said tank plate having a plurality of indentations in an interface thereof forming individual integral tanks connecting a plurality of the tube ends, and
said tanks having a width at the interface of the respective tank plate narrower than the width of the tubes so as to prevent insertion of the tubes into the tanks at one tube end and out of the header plate at an opposite tube end.

4,917,181
SEGMENTED ANNULAR RECUPERATOR AND METHOD
John D. Kiernan, Jr., Beacon Falls, and Frederick Sembler, Woodbridge, both of Conn., assignors to Textron Lycoming, Stratford, Conn.
Filed Aug. 4, 1988, Ser. No. 228,340
Int. Cl.[4] F28F *3/00*
U.S. Cl. 165—166 5 Claims



1. In a longitudinal annular plate heat exchanger unit for

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recuperating heat from an engine discharge gas for recirculation back to a combustor, said unit comprising a plurality of pairs of annular plates, each plate having correspondingly-located inlet openings and exit openings forming axial gas inlet passages and axial gas outlet passages through the unit, the plates of each plate pair being joined to each other about their inner and outer peripheries by means of inner and outer peripheral welds to form a heat exchange compartment within each plate pair, each plate pair being welded to an adjacent plate pair about their gas inlet and gas outlet openings to form a sealed intercommunication between the heat exchange compartmets of all of the plate pairs, whereby a fluid, such as air, can be forced through the axial inlet passages of the unit, heated by the transfer of heat from an external hot gas discharge passing radially through the unit, externally of the plate pairs, and returned in heated condition through the axial outlet passages to a combustor, the improvement which comprises the use of annular plates to provide plate pairs having at least two opposed radial areas in which the plates of each pair make continuous line contact between their inner and outer peripheries, each of the plate pairs being segmented along said radial areas and the plates of each pair being united by means of radial welds which extend through the inner and outer peripheral welds, to provide at least two companion longitudinal heat exchanger segments designed to be assembled as a unit having axial heat-expansion spaces therebetween.

5. A recuperator for receiving compressed fluid such as air and hot discharge gas in isolated relation to each other and for transferring heat from the discharge gas to the compressed air and for returning the heated compressed air to a combustor, comprising a housing containing assembled heat exchanger segments as defined in claim **1**, said housing comprising a plurality of peripheral compressed gas inlet openings communicating with the axial gas inlet passages of said heat exchanger segments and a plurality of peripheral gas outlet openings communicating with the axial gas outlet passages of said heat exchanger segments, a central hot gas discharge opening to a central axial passage for receiving hot discharge gas at the inner periphery of said annular heat exchanger segments, and a discharge gas exhaust at the outer periphery of said annular heat exchanger segments to receive and exhaust the discharge gas after it has flowed radially through the heat-exchanger segments, between the plate pairs thereof, to transfer heat to the compressed gas isolated within the heat-exchanger segments, said heat exchanger segments being spaced from each other by at least two axial slots, and a narrow elongate gas seal member covering the inner peripheral opening of each said axial slot to block the radial flow of discharge gas from the central axial passage of said housing through the radial slots between said heat exchanger segments.

4,917,182

SEALED TANK AND HEADER ASSEMBLY

Henry E. Beamer, Middleport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

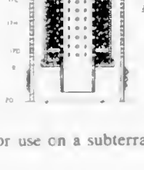
Continuation-in-part of Ser. No. 181,628, Apr. 1, 1988, abandoned. This applicatioo Jan. 23, 1989, Ser. No. 299,598
Int. Cl.[4] F28F 9/02
U.S. Cl. 165—173 3 Claims

1. In a heat exchanger having a tank sealingly secured to a header, the seal assembly comprising;

a tank foot having a flat end surface and an outer shoulder

a peripheral header channel configured to receive the tank foot and formed in a U-shaped cross section having an outer flange for gripping the shoulder of the foot, an inner wall opposed to the flange and spaced from the foot, and a bottom between the flange and the wall, the bottom having a flat surface opposed to and spaced from the flat end surface of the foot, and

a one-piece gasket of elastomeric material having a first seal portion including an enlarged rib compressed between the flat bottom surface and the flat end surface and a web-like second seal portion extending from the rib into the space between the inner wall and the foot, said gasket being sandwiched between said foot and channel and compressed by crimping an edge of said outer flange over said outer shoulder, the rib, when relaxed, having a thickness greater than the web-like portion and greater than the space between the bottom and the end surface and a width less than the width of the bottom, whereby the first seal portion forms a secure seal with moderate clamping pressure due to the deformability of the enlarged rib and the second seal portion excludes fluid from the space between the wall and the foot of the tank,



said rib comprising an O-ring of symmetrical cross section integral with the web-like second seal portion and extending along the periphery of the gasket and toward the flange, and

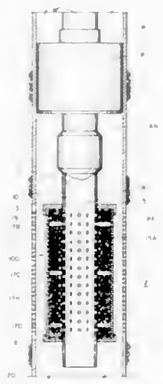
said gasket and foot and channel being configured with nominal dimensions determined so that said gasket does not extrude from between said foot and channel at a predetermined minimum gasket compression and extrudes only an insignificant amount at a predetermined maximum gasket compression that is determined to account for expected variations from said nominal dimensions.

4,917,183

GRAVEL PACK SCREEN HAVING RETENTION MESH SUPPORT AND FLUID PERMEABLE PARTICULATE SOLIDS

John E. Gaidry, Lafayette; Larry J. Quebedeaux, Sunset, both of La.; Joseph F. Donovan, Spring, and Jefferson P. Ashton, Conroe, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Oct. 5, 1988, Ser. No. 253,967
Int. Cl.[4] E21B 43/08
U.S. Cl. 166—278 34 Claims



1. An apparatus for use on a subterranean well conduit to prevent particulate matter in said well of a pre-determinable size from passing into said conduit with the well production fluids, comprising:

a cylindrically shaped inner tubular member having an interior wall and an exterior wall;

a fluid flow passageway defined within the interior wall of said tubular member;

fluid flow passage means extending from the interior of said tubular member through the exterior wall of said tubular member and in communication with said fluid flow passageway;

retention mesh means disposed around the exterior wall of said tubular member and passing across said fluid flow passage means, and having fluid flow openings therethrough;

a fluid permeable bed of particulate solids around the exterior of said retention mesh means sized to prevent effectively all such particulate matter in said well from passing inwardly with the production fluids through said fluid permeable bed and through said fluid flow passage means and into said fluid flow passageway when said conduit and said apparatus are positioned within said subterranean well,

whereby said openings in said retention mesh means are sized to prevent the particulate solids of said fluid permeable bed from passing into said fluid flow passage means and into said fluid flow passageway and further sized to permit any particulate matter in said well passing through said fluid permeable bed to pass through the retention mesh means and through the subterranean well conduit; and

a circumferentially shaped outer fluid permeable housing positioned around the exterior of said fluid permeable bed and having fluid passages therethrough for transmission of the production fluids within said well through said housing, said fluid passages in said outer housing being sized to prevent effectively all of said particulate solids of said fluid permeable bed from passing exteriorly through said housing and into said well, at least one of said inner tubular member and said fluid permeable housing being securable at least one of its respective ends to the subterranean well conduit.

15. A method of gravel packing a subterranean oil or gas well, to prevent particulate matter in said well of a pre-determinable size from passing into said conduit with the well production fluids, comprising the steps of:

(1) introducing into said well a subterranean well conduit having disposed thereon at least one well packer apparatus and at least one gravel packing apparatus, said gravel packing apparatus comprising:

a cylindrically shaped inner tubular member having an interior wall and an exterior wall;

a fluid flow passageway defined within the interior wall of said tubular member;

fluid flow passage means extending from the interior of said tubular member through the exterior wall of said tubular member and in communication with said fluid flow passageway;

retention mesh means disposed around the exterior wall of said tubular member and passing across said fluid flow passage means, and having fluid flow openings therethrough;

a fluid permeable bed of particulate solids around the exterior of said retention mesh means sized to prevent effectively all such particulate matter in said well from passing inwardly with the production fluids through said fluid permeable bed and through said fluid flow passage means and into said fluid flow passageway when said conduit and said apparatus are positioned within said subterranean well,

whereby said openings in said retention mesh means are sized to prevent the particulate solids of said fluid permeable bed from passing into said fluid flow passage means and into said fluid flow passageway and further sized to permit any particulate matter in said well passing through said fluid permeable bed to pass through the retention mesh means and through the subterranean well conduit; and

a circumferentially shaped outer fluid permeable housing positioned around the exterior of said fluid permeable bed and having fluid passages therethrough for transmission of the production fluids within said well through said housing, said fluid passages in said outer housing being sized to prevent effectively all of said particulate solids of said fluid permeable bed from passing exteriorly through said housing and into said well, at least one of said inner tubular member and said fluid permeable housing being securable at least one of its respective ends to the subterranean well conduit.

(2) placing said gravel packing apparatus adjacent a production zone in said well;

(3) setting said well packer; and

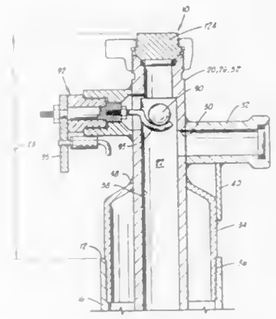
(4) introducing a carrier fluid containing a particulate matter into said well conduit for placement of said particulate matter exterior of said well conduit and adjacent said production formation.

4,917,184

CEMENT HEAD AND PLUG

T. Austin Freeman; Morris G. Baldridge; David D. Szarka, all of Duncan, Okla., and Darrell E. Fontenot, Corpus Christi, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Feb. 14, 1989, Ser. No. 310,439
Int. Cl.[4] E21B 33/068, 23/08
U.S. Cl. 166—285 13 Claims



1 A cement head and casing assembly comprising:

a well casing having an upper end extending above a ground level of a land based well;

a cement head body having a cement passage defined therethrough, said body having a lower portion extending down into said casing and having a upper portion extending a relatively short distance of no greater than about 24 inches above said upper end of said casing, said body including a cement port means communicated with said cement passage for introducing cement into said cement passage;

mounting means for mounting said cement head body on said upper end of said well casing;

a cement plug, closely received within a bore of said casing below said upper end thereof, said plug being releasably connected to said lower portion of said cement head body so that said plug is suspended from said lower portion of said body within said casing, said cement plug having a plug passage defined therethrough which is communicated with said cement passage so that cement can be pumped into said cementing port means, then through said cement passage, then through said plug passage down into said casing; and

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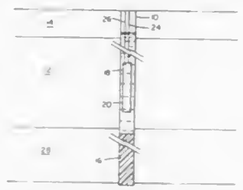
release means for closing said plug passage and releasing said plug from said body.

4,917,185

METHOD TO IMPROVE MATRIX ACIDIZING IN CARBONATES

Alfred R. Jennings, Jr., Plano; Lloyd G. Jones, Dallas, both of Tex., and Paul Shu, Princeton Junction, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 36,742, Apr. 10, 1987, Pat. No. 4,787,456. This application Sep. 12, 1988, Ser. No. 243,532
The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.
Int. Cl.[4] E21B *33/138, 43/263, 43/27*
U.S. Cl. 166—281 **26 Claims**



1. A method for increasing the permeability of a formation which formation has at least one zone of lesser permeability and one zone of greater permeability where high energy impulse fracturing is used in combination with an inhibited acid comprising:

(a) directing into a wellbore within said formation a pumpable solidifiable gel into a zone of the formation having a greater permeability under conditions to selectively close pores in said greater permeability zone where said gel comprises;

(i) water;

(ii) 0.2 to 5.0 wt. percent of a cross-linkable polymer having at least one functional group selected from a member of the group consisting of an amine, an amide, a hydroxyl, or a thiol group; and

(iii) 0.02 to 50.0 wt. percent of a partially methylated aminoplast resin which cross-links with said polymer;

(b) allowing said pumpable gel to solidify and form a gel plug within said wellbore which plug is sufficient to support a desired volume of acid;

(c) placing an inhibited acid into said wellbore above said gel plug adjacent to said zone of lesser permeability;

(d) suspending a canister containing a propellant into the wellbore substantially near said zone of lesser permeability; and

(e) igniting said propellant which releases energy sufficient to form more than two simultaneous radial fractures in said zone of lesser permeability which also causes said acid to enter said fractures and thereafter react within said fractures, thereby increasing the permeability of said zone of lesser permeability.

4,917,186

ALTERING SUBTERRANEAN FORMATION PERMEABILITY

Naim A. Mumallah, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 16, 1989, Ser. No. 310,930
Int. Cl.[4] E21B *33/138, 43/22*
U.S. Cl. 166—295 **18 Claims**

1. A method of altering the permeability of a subterranean formation having a temperature in the range of from about 160° F. to about 210° F., a portion of said subterranean formation being located a long distance from a surface injection point, comprising injecting a composition into said formation which forms a gel therein, said composition being comprised of:

(a) water;

(b) at least one polymer capable of being gelled when contacted with a crosslinking agent;

(c) at least one crosslinking agent comprised of polyvalent metal cation; and

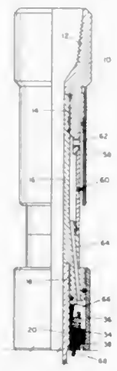
(d) a cation reactivity retarding chelating agent which provides anions for chelating said polyvalent metal cation selected from the group consisting of substantially water soluble dicarboxylic acids containing from 2 to 4 carbon atoms, substantially water soluble di- and polycarboxylic acids containing from 3 to 6 carbon atoms in which a hydrogen atom of the alpha or beta carbon atom is replaced by a hydroxyl group, substantially water soluble alpha and beta ketocarboxylic acids containing from 2 to 4 carbon atoms, the corresponding water soluble salts of said acids, and mixtures of said acids and salts.

4,917,187

METHOD AND APPARATUS FOR HYDRAULICALLY FIRING A PERFORATING GUN BELOW A SET PACKER

Robert E. Burns, Houston, and Elmer R. Peterson, The Woodlands, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Jan. 23, 1989, Ser. No. 300,795
Int. Cl.[4] E21B *33/12, 43/116*
U.S. Cl. 166—297 **31 Claims**



1. A packer positionable along a tubing string in a subterranean well bore interior of a casing and above a pressure responsive device, the packer adapted for sealing the annulus between the tubing string and the casing and including (a) a tubular packer body structurally interconnecting an upper portion of the tubing string having an upper tubing bore diameter and a lower portion of the tubing string having a lower tubing bore diameter of substantially the same diameter as said upper portion, and (b) one or more elastomeric packer sealing elements radially exterior of the packer body for sealing engagement with the casing, the packer further comprising:

the tubular packer body having a cylindrical interior surface defining a bore diameter of substantially the same diameter as said upper portion of the tubing string, such that the packer body has substantially full bore capability for transmitting production fluids and/or equipment through the tubing string and the packer body;

a pressure flow path radially between the packer body and packer sealing elements and axially extending above and below the packer sealing elements, respectively, the flow path being open to annulus pressure at its upper and lower ends when the packer is unset within the well bore;

means for expanding said elastomeric packer sealing elements to set said packer;

means responsive to setting said packer for closing said pressure flow path; and

one or more flow conduits in said pressure flow path, each extending axially from above to below the packer sealing elements and positioned relative to the tubular packer body for transmitting fluid pressure signals from the casing annulus above said packer sealing elements after said packer is set for activating the pressure responsive device.

12. The method of actuating a pressure responsive device positioned below a packer set within a subterranean well bore, the packer including a tubular packer body structurally interconnecting an upper portion of the tubing string and a lower portion of the tubing string and packer sealing elements radially exterior of the packer body for sealing the annulus between the tubing string and the sides of the well bore, the method comprising the steps of:

forming an annular flow path around the packer sealing elements positioned between the packer body and the packer sealing elements;

forming a second flow path through the packer having its upper end adjacent to the annulus pressure above the packer sealing elements and having its lower end below the packer sealing elements, the flow path being positioned within the annular flow path;

interconnecting a flow line positioned exterior of the lower portion of the tubular string for establishing fluid communication between the lower end of the second flow path and the pressure responsive device;

filling said second flow path and said flow line at the surface with a selected fluid;

applying the pressure of fluid in the annulus above the packer sealing elements to said selected fluid; and

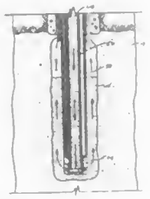
generating an activating signal to actuate the pressure responsive device by selectively controlling pressure in the annulus above the set packer, through the set packer along the second flow path, and through the flow line to the pressure responsive device.

4,917,188

METHOD FOR SETTING WELL CASING USING A RESIN COATED PARTICULATE

Harvey J. Fitzpatrick, Jr., Lafayette, La., assignor to Halliburton Company, Duncan, Okla.

Filed Jan. 9, 1989, Ser. No. 295,263
Int. Cl.[4] E21B *43/04, 43/11, 43/26*
U.S. Cl. 166—295 **21 Claims**



1. An improved method for well completion comprising the steps of:

injecting a consolidatable resin coated particulate slurry through production casing set in the production zone of a producing formation such that said slurry flows up into an annulus formed between the casing and the wellbore to form a zone of high conductivity communicating with said casing and said formation;

perforating the casing, the consolidated zone, and the formation;

mechanically fracturing the formation through the perforations; and

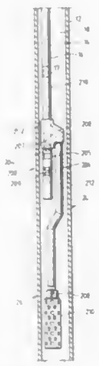
reperforating the same production zone using a large bore, high shot density, shallow penetration tubing conveyed perforation technique.

4,917,189

METHOD AND APPARATUS FOR PERFORATING A WELL

Flint R. George; David S. Wesson, both of Katy, and Kevin R. George, Columbus, all of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Jan. 25, 1988, Ser. No. 147,972
Int. Cl.[4] E21B *43/112*
U.S. Cl. 166—297 **14 Claims**



1. A method of comprising a well penetrating a subsurface formation, comprising:

suspending a perforating gun from a tubing string in said well, said perforating gun placed proximate said formation;

placing a pump assembly in said tubing string;

operating said pump assembly to produce a preselected pressure imbalance between a well annulus, which surrounds said perforating gun, and said tubing string;

actuating said perforating gun to perforate said formation, said perforating gun being actuated by said preselected pressure imbalance;

utilizing said pump assembly to pump fluid from said formation.

6. A tool string for use in perforating a well, comprising:

a perforating gun;

a hydraulically actuated firing head responsive to a hydraulic pressure differential, said firing head cooperatively coupled with said perforating gun to actuate said perforating gun when a specified pressure differential is achieved;

a pump cooperatively arranged in said tool string to establish said pressure differential to actuate said firing head.

4,917,190

OIL WELL BLOWOUT CONTAINMENT SYSTEM

Donnie R. Coppedge, 11671 Norgrove La., Los Alamitos, Calif. 90720

Filed Jun. 27, 1988, Ser. No. 214,198
Int. Cl.[4] E21B *33/08*
U.S. Cl. 166—379 **26 Claims**

5. An oil well packing gland blowout containment system for use with an oil well pump having an oil well tube with an upper discharge end, a stuffing box with an axial passage therethrough, a polished rod enclosed within said stuffing box reciprocated by said oil well pump comprising:

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a stuffing box body having means for connecting the lower end of said body to the top end of said oil well tube;

a stuffing box seal assembly located inside said stuffing box, said stuffing box seal assembly having at least one packing gland surrounding said polished rod, said seal assembly also having adjustable packing gland compression means;

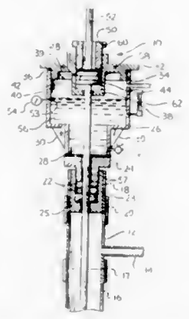
an oil discharge line connected in fluid communication with said upper end of said well tube and, said discharge line terminating in a storage facility;

oil containment means located above said stuffing box having an axial passage therethrough with a polished rod reciprocally disposed therein, said oil containment means also having a tubular base member where the lower end of said tubular base member is connected to the upper end of said stuffing box by welding;

means for providing fluid communication between said oil containment means and said stuffing box packing glands.

26. A method for oil well packing gland blowout containment for use with an oil well pump having an oil well tube with an upper discharge end, a stuffing box with an axial passage there through, a polished rod reciprocating and enclosed within said stuffing box comprising:

providing a stuffing box body having means for connecting the lower end of said body to the top end of said oil well tube;



providing a stuffing box seal assembly located inside said stuffing box, said stuffing box seal assembly having at least one packing gland surrounding said polished rod, said seal assembly also having adjustable packing gland compression means;

providing an oil discharge line connected in fluid communication with said upper discharge end of said well tube;

providing oil containment means located above said stuffing box with said polished rod reciprocally disposed in said oil containment means, said oil containment means having an axial passage there through;

providing means for fluid communication between said oil containment means and said stuffing box packing glands;

providing oil containment sealing means, wear bushing, at least one compressible packing gland and a packing gland spacer, all of which are disposed around said polished rod;

providing an adjustable packing gland not in said oil containment means where said packing gland is compressed by said packing gland nut;

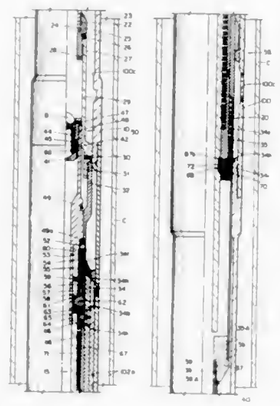
filling said vessel with a lubricating fluid composed of approximately 60% to 80% by volume of high grade 30 weight motor oil, approximately 20% to 30% by volume of polytetrafluoroethylene and approximately 0% to 10% by volume of corrosion inhibitor.

4,917,191

METHOD AND APPARATUS FOR SELECTIVELY SHIFTING A TOOL MEMBER

Mark E. Hopmann, Broken Arrow; Douglas J. Murray, and Scott C. Strattan, both of Tulsa, all of Okla., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Feb. 9, 1989, Ser. No. 308,874
Int. Cl.[4] E21B *34/10, 34/12*
U.S. Cl. 166—381 **17 Claims**



1. An apparatus for introduction into a subterranean well on a first conduit insertable through a second conduit previously positioned within said well, said second conduit carrying thereon at least one auxiliary tool, each of said auxiliary tools having means movable in at least one of first and second directions for manipulating the respective auxiliary tool, said apparatus comprising:

(1) a cylindrical tubular housing having a fluid passageway therethrough communicable with the interior of the first conduit for transmission of fluid from within the first conduit through said apparatus, and positionable in said well in proximity to one of said auxiliary tools;

(2) means for selectively indicating proximity of said apparatus relative to said one of said auxiliary tools when said first conduit is moved in a first direction;

(3) actuating means activatable by longitudinal manipulation of said first conduit and movable into engaging position with said auxiliary tool upon a first movement of said first conduit in a second direction, thereby resisting movement of said apparatus in said second direction;

(4) normally retracted, selectively expandable, shifting means movable into an expanded position by movement of said first conduit in said second direction to interengage said movable means of said auxiliary tool;

(5) hydraulic means activatable to drive said movable means in an actuating direction when said shifting means are in said expanded position; and

(6) hydraulically responsive releasing means for moving said actuating means into disengaging position relative to said movable means and for moving said shifting means into the normally retracted position.

17. A method for selectively shifting a tool member carried within a subterranean well, comprising the steps of:

(1) assembling at the well surface on a continuous length of remedial tubing, an apparatus for introduction into said well on said continuous length of remedial tubing concentrically insertable through production tubing previously positioned within said well, said production tubing carrying thereon at least one ported member, each of said ported members receiving means movable in at least one direction for opening or closing said ported member, said apparatus comprising:

(a) cylindrical tubular housing having a fluid passageway therethrough communicable with the interior of the continuous length of remedial tubing for transmission of fluid from within the continuous length of remedial tubing through said apparatus, and positionable in said well in proximity to one of said ported members;

(b) means carried by said housing for selectively indicating proximity of said apparatus relative to said one of said ported members when said continuous length of remedial tubing is moved in a first direction;

(c) actuating means activatable by longitudinal manipulation of said continuous length of remedial tubing and movable into engaging position with said ported member upon a first movement of said continuous length of remedial tubing in a second direction, thereby resisting movement of said apparatus in said second direction;

(d) normally retracted, selectively expandable, shifting means carried by said housing and movable into an expanded position by movement of said continuous length of remedial tubing in said second direction to move the shifting means into expanded position to interengage said movable means of said ported member;

(e) hydraulic means activatable to drive said movable means in an actuating direction when said shifting means is in said expanded position; and

(f) hydraulically responsive releasing means for moving said actuating means into disengaging position and for moving said shifting means into the normally retracted position;

(2) manipulating said conduit to move said apparatus for actuation of the means carried by the housing to selectively indicate proximity of said apparatus relative to said ported member;

(3) longitudinally manipulating said continuous length of remedial tubing in a second direction to move said actuating means into engaging position with said ported member to thereby resist movement of said apparatus in said second direction;

(4) manipulating said continuous length of remedial tubing in said second direction to move the shifting means into expanded position to interengage the movable mean of said ported member;

(5) applying pressure through said hydraulic means to thereby drive said movable means of said ported member in said actuating direction when the shifting means are in the expanded position; and

(6) manipulating said continuous length of remedial tubing to cause said releasing means to move said actuating means into disengaging position and for moving the shifting means into the normally retracted position.

4,917,192

METHOD AND APPARATUS FOR HOOF REPAIR AND SECURING A SHOE TO A HOOF

Samuel A. Monticello, Lake Charles, La., assignor to Robert L. Young, Davis, Calif., a part interest

Filed Aug. 10, 1988, Ser. No. 230,611
Int. Cl.[4] A01L *15/00*
U.S. Cl. 168—4 **21 Claims**

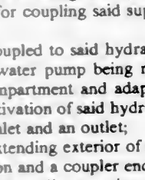
1. Method for repairing a damaged hoof comprising:

applying a horseshoe to the bottom of the damaged hoof;

filling a damaged area of the damaged hoof with hardenable hoof repair material;

initiating the cure of curable resin coated sheet means;

wrapping the curable resin coated sheet means around the applied horseshoe and at least a portion of the damaged



hoof after initiation of cure such that the cured resin sheet means secures the horseshoe to the damaged hoof.

4,917,193

FIRE SUPPRESSION ATTACHMENT FOR RUBBER-TIRED SKIDDER VEHICLES

Lloyd H. Ockler, 337 Conifer Dr., Huson, Mont. 59846

Filed Jan. 20, 1988, Ser. No. 208,878
Int. Cl.[4] A62C *27/06*
U.S. Cl. 169—24 **12 Claims**

1. A log skidder, comprising:

an articulated, rubber-tired skidder having a front skidder portion upon which is supported a cab, a rear skidder portion, a pair of fenders mounted to said rear skidder portion and positioned to define a rearward towing compartment therebetween, a hydraulic winch mounted to said rear skidder portion and coupled to a winch cable, supply means for providing hydraulic power for activating said winch and other devices, and a cable support arc mounted to said rear skidder portion and supporting said cable;

a tank shaped to be positionable within and substantially fully utilize the space of said towing compartment of said rear skidder portion, said tank including an interior water tank compartment adapted to store water and an interior, dry drive tank compartment;

means for attaching said cable to said tank for lifting said tank into position within said towing compartment and supporting said tank therein during use of the log skidder;

a hydraulic motor mounted inside said drive tank compartment;

switch means for activating said hydraulic motor;

coupling means for coupling said supply means to said hydraulic motor;

a water pump coupled to said hydraulic motor and driven thereby, said water pump being mounted inside of said drive tank compartment and adapted to pump water in response to activation of said hydraulic motor, said pump including an inlet and an outlet;

a suction hose extending exterior of said tank and having a free end portion and a coupler end portion;

a discharge hose extending exterior of said tank and having a free exterior end portion and a coupler end portion;

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first valve means mounted to said tank and coupled to said discharge hose coupler end portion, to said water tank compartment and to said water pump for selectively coupling said water pump outlet to discharge water either to said discharge hose or to said water tank compartment; and

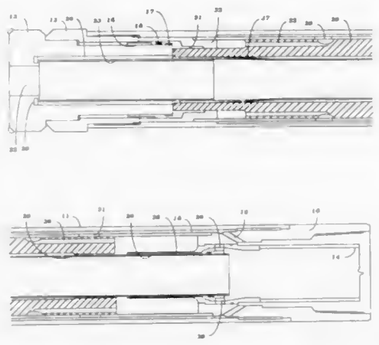
second valve means mounted to said tank and coupled to said suction hose coupler end portion, to said water tank compartment, and to said water pump for selectively coupling said water pump inlet to draw water either from said suction hose or from said water tank compartment as desired.

4,917,194

IMPROVED DOWNHOLE HAMMER

Ronald E. Eaton, Midvale, Australia, assignor to Wallis Industries Pty Ltd., Midvale, Australia

Filed Mar. 16, 1989, Ser. No. 324,566
Claims priority, application Australia, Nov. 9, 1988, 24998/88
Int. Cl.[4] E21B *17/00*
U.S. Cl. 173—136 6 Claims



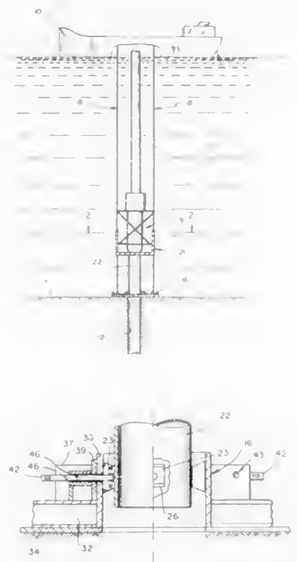
1. A downhole hammer comprising a substantially cylindrical casing having a top sub at one end and a drill bit support at the other end, a central tube extending from the top sub through the casing to the drill bit support to define an annular space between an internal face of the casing and an external face of the central tube, said drill bit support supporting a drill bit having a central axial aperture in alignment with an interior of the central tube, said top sub accommodating a return tube opening into the interior of the central tube, said aperture, central tube and return tube defining a return passageway, an annular piston reciprocally accommodated within the annular space for movement between an impact position at which said piston abuts said drill bit support and a raised position at which said piston is raised from the drill bit support, an annular passageway being formed between the external face of the central tube and an internal bore of the piston capable of receiving exhaust from the annular space during reciprocation of the piston, and two axially spaced flow paths along the central tube for disposing said exhaust into the return passageway from the annular passageway, a first of said two flow paths defined by an opening in the central tube proximal the position at which said piston abuts said drill bit support and distal a cutting face of the drill bit, the opening of said first flow path into the return passageway being directed substantially axially along the return passageway in a direction away from the cutting face.

4,917,195

QUICK LATCH MUD MAT APPARATUS

Gary L. Harper, Houma; Samuel D. Brady, IV, and Robert M. Shivers, III, both of Patterson, all of La., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 3, 1988, Ser. No. 269,342
Int. Cl.[4] E21B *7/128*
U.S. Cl. 175—7 5 Claims



1. In combination with a submergible foundation structure having a base plate for resting on the floor of a body of water, and having a column upstanding from said base plate for registering an elongated conductor, a locking mechanism on the foundation structure being operable to releasably support said elongated conductor, said locking mechanism comprising:

a locking pin sleeve support means mounted to said column and including spaced apart plates and a bracket, said spaced apart plates having aligned first opening means therein,

a locking pin sleeve positioned between said spaced apart plates and having one end engaging said bracket,

a locking pin slidably mounted in said sleeve for movement between an advanced position in which said locking pin engages the conductor and a retracted position in which said locking pin disengages the conductor, and

a locking bolt disposed in said aligned first opening means of said respective spaced apart plates to releasably engage said locking pin when the latter has been adjusted to a desired position.

4,917,196

EXCAVATING TOOTH FOR AN EARTH AUGER

Stephen P. Stiffler, New Enterprise; Wayne H. Beach, Roaring Spring; Don C. Rowlett, Bedford, and Steven D. Shirk, Altoona, all of Pa., assignors to Kennametal Inc., Latrobe, Pa.

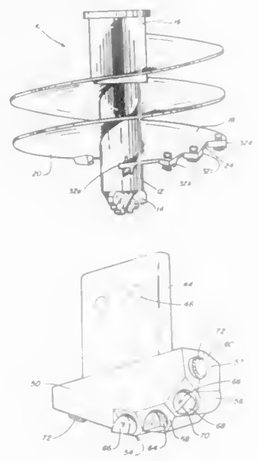
Filed Aug. 15, 1989, Ser. No. 394,045
Int. Cl.[4] E21B *10/44, 10/58, 10/62*
U.S. Cl. 175—385 15 Claims

6. An excavating tooth for an earth auger comprising:

(a) a main body portion having a forward face, a back face, a gauge side and a working end;

(b) a shank extending upwardly from the main body portion and receivable in a support block of an auger; and

(c) a plurality of digging inserts made of a hard, wear resistant material embedded in the working end of the main body section and projecting outwardly therefrom to engage the medium being worked, each of the inserts including a generally cylindrical proximal end and a distal end having forward and rearward inclined faces converging to form a transverse cutting edge, and wherein the axis of each of the inserts inclines forwardly with respect to the plane of the shank.



4,917,197

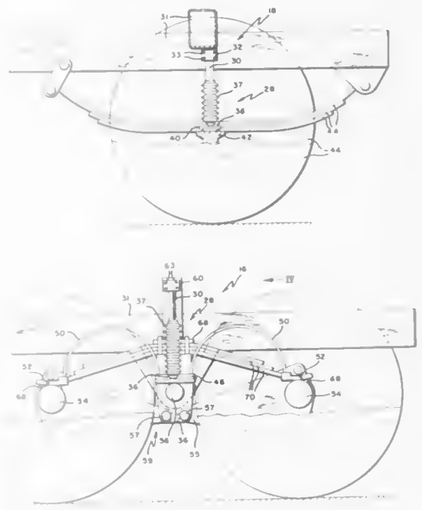
WEIGHING SYSTEM FOR VEHICLES

Robert K. Waite, Jr., Groton, Mass., assignor to Blodgett & Blodgett, P.C., Worcester, Mass.

Filed Feb. 10, 1989, Ser. No. 309,341
Int. Cl.[4] G01G *19/08, 3/14*
U.S. Cl. 177—137 7 Claims

1. A weighing system for a vehicle having a frame, a plurality of axles, a plurality of wheels rotatably mounted on the axles and a plurality of springs operatively connecting the axles and the frame for yieldingly supporting the frame above the axles so that the frame moves vertically toward and away from said axles in response to weight which is added to and subtracted from the frame, said weighing system comprising:

(a) a position indicator for sensing the relative vertical movement between the frame of the vehicle and one of said axles and for providing electrical signals which vary in accordance with the relative vertical position of said frame with respect to said one axle and which are indicative of the load weight on said frame, said position indicator comprising a linear motion position transducer which produces analog electrical signals, and an electrical digitizer for converting said analog signals to digital signals, said linear motion transducer comprising a housing which is fixed against vertical motion relative to said frame, a rod which is slidably mounted within said housing, said rod having a free end which extends from said housing and which operatively engages said one axle, and means for biasing said rod toward said axle and away from said housing so that said rod moves vertically with said one axle and relative to said housing, and



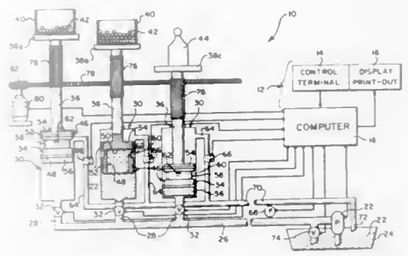
(b) a programmed central processing unit which is operatively connected to said position indicator for receiving said electrical signals and for calculating the weight on said frame based on the value of said electrical signal.

4,917,198

SIMULTANEOUS MULTIPLE WEIGHING INVENTORY SYSTEM

Peter Sing, 43 Donny Brook Rd., Scarsdale, N.Y. 10583

Filed Nov. 2, 1988, Ser. No. 265,921
Int. Cl.[4] G01G *19/42, 5/04;* **G06F** *15/246*
U.S. Cl. 177—25.14 6 Claims



1 Simultaneous multiple weighing inventory system, which comprises:

a plurality of weighing platforms, each of said platforms being supported on the piston of a fluid-pressureoperated cylinder, all of said cylinders being supplied by a common source with fluid at gradually increasing pressures until the weight of and on each of said plurality of weighing platforms is individually and independently balanced and lifted by the fluid pressure; and

means for registering the pressure level at which each of said plurality of weighing platforms is balanced, and for con-

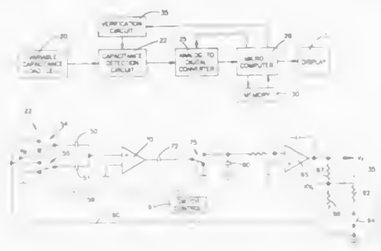
verting, calculating and reporting the resulting count of like objects positioned on each of said platforms.

4,917,199

AUTOMATIC VERIFICATION OF VARIABLE CAPACITANCE WEIGHING APPARATUS

Richard C. Loshbough, Westerville, Ohio, assignor to Toledo Scale Corp., Ohio

Filed Apr. 10, 1989, Ser. No. 335,697
Int. Cl.[4] G01G *3/14, 19/52*
U.S. Cl. 177—210 C 15 Claims



1. Weighing apparatus comprising load responsive means incorporating a capacitor variable in response to applied loads, a circuit for detecting the capacitance of said variable capacitor and providing a signal representative of said capacitance, means for changing a parameter in said capacitance detector circuit, and means for utilizing signals from said capacitance detector circuit obtained with said changed parameter to check the operation of the weighing apparatus.

4,917,200

STEERING METHOD AND APPARATUS FOR SKID-STEERING VEHICLE

Ivan R. Lucius, 106 Columbia Ave., Box 642, Vicksburg, Miss. 39180

Continuation of Ser. No. 885,419, Jul. 14, 1986, abandoned. This application Aug. 10, 1988, Ser. No. 230,719
Int. Cl.[4] B62D *11/10, 11/18*
U.S. Cl. 180—6.2 10 Claims

1. In a track-valve vehicle and the like having port and starboard track-driving mechanisms and the like, an improved driving and steering system comprising

a prime mover having a first rotatable drive shaft for generating driving power for said vehicle,

a second drive shaft positively interconnected with said first drive shaft,

a port planetary gear assembly interconnected positively with and between said second drive shaft and said port track-driving mechanism and including at least one sun gear and at least one set of planetary gears in meshing engagement with said one sun gear therein,

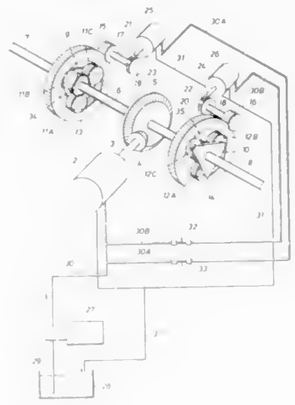
a starboard planetary gear assembly interconnected positively with and between said second drive shaft and said starboard track-driving mechanism and including at least one sun gear and at least one set of planetary gears in meshing engagement with said one sun gear therein,

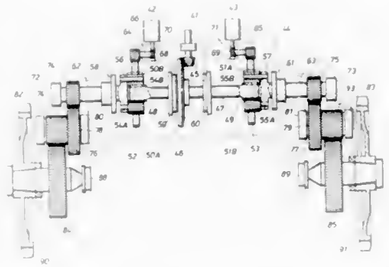
a port steering motor interconnected with said prime mover,

first coupling means for transmitting driving power from said port steering motor to said port planetary gear assembly and for blocking transmission of driving power from said port planetary gear assembly to said port steering motor,

a starboard steering motor interconnected with said prime mover,

second coupling means for transmitting driving power from said starboard steering motor to said starboard planetary gear assembly and for blocking transmission of driving power from said starboard planetary gear assembly to said starboard steering motor, and





control means interconnected separately and independently with each of said steering motors.

4,917,201

MOTOR VEHICLE

Tetsuzo Fujikawa, Kobe, and Shinichi Tamba, Kakogawa, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Division of Ser. No. 808,636, Dec. 13, 1985. This application Oct. 19, 1987, Ser. No. 109,523
Claims priority, application Japan, May 20, 1985, 60-108914; May 24, 1985, 60-112397
Int. Cl.[4] B60K *11/00*
U.S. Cl. 180—68.2 27 Claims

1. A motor vehicle comprising:

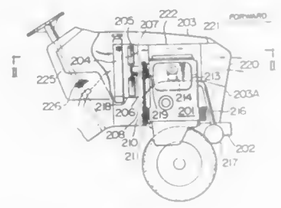
an engine,

a crankshaft driven by said engine,

a radiator located in the vicinity of said engine,

a cooling fan interposed between said engine and said radiator and operatively connected to said crankshaft,

an air exhaust duct interposed between said radiator and said engine, said air exhaust duct being operative to guide cooling air currents that have cooled the radiator and become warn to flow in a direction in which the cooling air currents flow away from the engine without coming into contact therewith, and



an engine exhaust muffler located within said air exhaust duct.

4,917,202

AIR INLET DEFLECTOR ASSEMBLY FOR AN AIR CLEANER

Glen A. Glover, Jr., Washington, Ill.; Walter A. Harrison, Jr., Glendale, Ariz.; Richard E. Guhl, and Danny L. White, both of Decatur, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 19, 1988, Ser. No. 286,416
Int. Cl.[4] B01D *50/00*
U.S. Cl. 180—68.3 3 Claims

1. In an air inlet deflector assembly for an air cleaner or the like of the type having wall means for defining an elongate chamber having a central axis and including a plurality of walls individually having an upper end and a lower end and defining a plurality of inlet ports generally radially disposed with respect with respect to the axis, the deflector assembly includes a plurality of formed shields overlapping the plurality of inlet ports and being connected to the walls to define a plurality of passages adapted to duct air to the plurality of inlet ports, and a splash deflector connected to the lower end of at least a portion of the walls and spaced below the shields, each of the passages defining an entrance adjacent to the splash deflector, the improvement comprising.

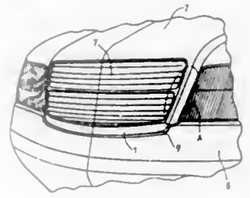
the splash deflector including a peripherally arranged flange extending radially outwardly from the walls to generally block foreign material from the entrance of the passages and including a plurality of downwardly inclined blocking edges to collectively define a labyrinth passage between the splash deflector and the lower edge of the plurality of shields for air entering the passages, each of the downwardly inclined blocking edges having an upper surface to inhibit foreign material from collecting on the upper surface, the splash deflector serves to block and redirect foreign material form the area between the splash deflector and the plurality of formed shields.

4,917,203

RADIATOR COVER FOR MOTOR VEHICLES

Bruno Sacco, and Johann Tomford, both of Sindelfingen, Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 270,690
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1987, 3738505
Int. Cl.[4] B60K *11/04*
U.S. Cl. 180—68.6 7 Claims



1. Radiator cover for motor vehicles comprising an approximately U-shaped frame to receive a radiator grill which is fastened to an engine hood, a surface contour of the radiator grill terminating flush with the engine hood, wherein inner plates, each having a free end and resilient construction, are fastened at an opposite end thereof to an inside of the engine hood and extend into a region of a vehicle bumper on both sides of the engine hood, and wherein the radiator cover, which is produced from an elastic material, is arranged detachably and resiliently on the engine hood by attachment to the inner plates, a recess, into which a lower crossbar of the radiator cover projects, being provided on an upper side of the vehicle bumper.

4,917,204

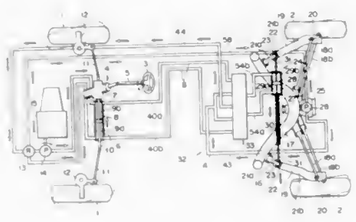
MATERIALS HANDLING VEHICLE

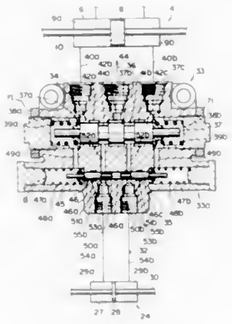
Robert J. Andrew, Congleton; Roger A. Frost, Uttoxeter, and Paul F. Herbert, Stoke-on-Trent, all of United Kingdom, assignors to J. C. Bamford Excavators Limited, Rocester, United Kingdom

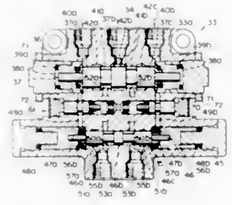
Filed Jul. 20, 1988, Ser. No. 221,762
Claims priority, application United Kingdom, Jul. 21, 1987, 8717192
Int. Cl.[4] B62D *5/06*
U.S. Cl. 180—140 13 Claims

1. A vehicle of the kind comprising an elongate chassis, two pairs of ground wheels, means mounting said ground wheels with the wheels of each pair on opposite sides of the chassis, the ground wheels being movable by an operator to effect steering of the vehicle and at least one pair of the wheels being lockable in the position such that steering is effected solely by

the other pair of wheels, a control means, sensor means associated with each of the two pairs of wheels to provide an electrical signal to the control means when the respective wheels are in an aligned position in which their axes of rotation are generally perpendicular to a longitudinal axis of the vehicle, the control means including a selector means comprising electrical switch means to enable an operator to select one of a simple steering mode in which only one of the pairs of wheels are movable to effect steering and a compound steering mode in which both of the pairs of wheels are movable to effect steering, the control means further comprising means to maintain the selected steering mode until an alternative steering mode is selected by operation of the selector means and the control means receives a signal from at least one of the sensor means associated with one of the pairs of the wheels.







4,917,205

FOUR-WHEEL STEERING SYSTEM

Kazuyoshi Kobayashi, Oobu; Shozo Takizawa, and Kazuo Fukuyama, both of Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1988, Ser. No. 170,868

Claims priority, application Japan, Mar. 23, 1987, 62-42360[U]; Mar. 31, 1987, 62-46819[U]

Int. Cl.[4] B62D *5/087, 7/14*

U.S. Cl. 180—140 10 Claims

1. A four-wheel steering system for a vehicle having steerable front and rear wheels, comprising:

a power steering device for steering the front wheels, said device having a power cylinder connected to the front wheels and adapted to be moved by a steering operation of a steering wheel, and first oil pump means for supplying oil pressure to the power cylinder to assist the movement of the power cylinder in response to the steering operation;

an oil pressure source comprising second oil pump means for generating oil pressure in accordance with the traveling speed of the vehicle, said second oil pump means being connected to a vehicle power transmitting means and being driven thereby;

hydraulic actuating means, connected to the rear wheels, for steering the rear wheels in accordance with a transmitted oil pressure;

first control valve means, arranged between the oil pressure source and the actuating means and connected to the power steering device, and operated by the oil pressure generated by the power steering device, for transmitting the oil pressure from the oil pressure source to the actuating means so that the rear wheels are steered in the same direction as the front wheels; and

second control valve means, arranged between the power steering device and the actuating means, and operated by the oil pressure generated by the power steering device, for transmitting the oil pressure generated by the power steering device to the actuating means so that the rear wheels are steered in the opposite direction to the front wheels, when the oil pressure from the power steering device exceeds a predetermined value.

4,917,206

APPARATUS FOR AUTOMOTIVE VEHICLE SPEED CONTROL

Toshiaki Hara, Zama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 31, 1986, Ser. No. 948,168

Claims priority, application Japan, Jan. 10, 1986, 61-2231

Int. Cl.[4] B60K *31/04*

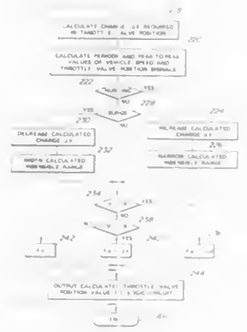
U.S. Cl. 180—179 6 Claims

1. An apparatus for controlling a throttle valve to retain the speed of running of an automotive vehicle within an insensible range having a predetermined width defined by upper and lower limits, comprising:

first sensor means sensitive to vehicle speed for providing a vehicle speed signal indicative of the sensed speed of running of the vehicle;

second sensor means sensitive to throttle valve position for providing a throttle-valve position signal indicative of the sensed position of said throttle valve; and

a control unit coupled to said first and second sensor means for moving said throttle valve a predetermined degree in a closing direction in response to the sensed vehicle speed greater than the upper limit and for moving said throttle valve the predetermined degree in an opening direction in response to the sensed vehicle speed less than the lower limit;



said control unit including means for increasing said predetermined degree and narrowing said predetermined width of said insensible range when the vehicle speed signal has a period within a predetermined range and said vehicle speed signal has a peak-to-peak value greater than a predetermined value and when said throttle-valve position signal has a period within a predetermined range and the throttle-valve position signal has a peak-to-peak value greater than a predetermined value, whereby hunting is prevented.

4,917,207

ENGINE MOUNTING ARRANGEMENT AND DRIVE MECHANISM FOR SMALL SNOWMOBILES

Toshihiro Yasui; Masanori Sugita; Tsuneo Isobe, and Haruhiko Nakanosono, all of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

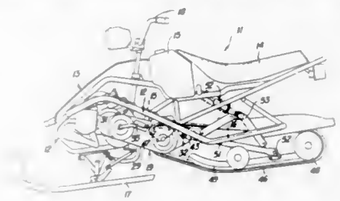
Filed Feb. 29, 1988, Ser. No. 162,179

Claims priority, application Japan, Mar. 4, 1987, 62-49057

Int. Cl.[4] B62M *27/02*

U.S. Cl. 180—193 4 Claims

1. A drive mechanism for a small snowmobile comprising a welded, tubular frame means, pin means disposed centrally of said frame means and extending transversely of said snowmobile, support arms hinged for pivotal movement relative to said frame means on said pin means and extending rearwardly from said pin means, a driving track pivotally supported from said support arms, and a drive unit disposed forwardly of said driving track and within said frame means, said drive unit comprising an engine output shaft and a drive shaft rotatable



about axis parallel to the axis of said pin means, pulley means driving said drive shaft from said engine output shaft, an integral casing encircling said engine output shaft, said drive shaft and said pulley means and means for affixing said casing to said frame means for further rigidifying said frame means.

4,917,208

ENGINE BRAKE CONTROL DEVICE

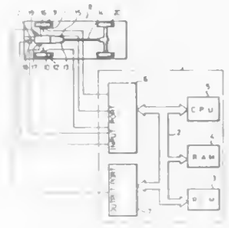
Takao Komoda, Okazaki, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 12, 1988, Ser. No. 243,593

Claims priority, application Japan, Sep. 29, 1987, 62-242736

Int. Cl.[4] B60K *15/00*

U.S. Cl. 180—197 7 Claims



1 An engine brake control device for a vehicle having a non-driven wheel and a driven wheel driven by an engine having a throttle valve, the brake control device comprising:

fuel supply means for supplying fuel to the engine;

a degree of opening detection sensor for detecting a degree of opening of said throttle valve;

an engine speed sensor for detecting an engine speed;

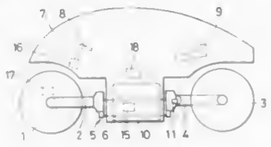
a fuel supply controlling means, responsive to an output signal of said degree of opening detecting sensor and an output signal of said engine speed sensor, for stopping a supply of fuel to the engine when the engine speed is higher than a predetermined speed at which a fuel supply is to be stopped when said throttle valve is closed;

first means for detecting a speed of rotation of said driven wheel;

second means for detecting a speed of rotation of said non-driven wheel;

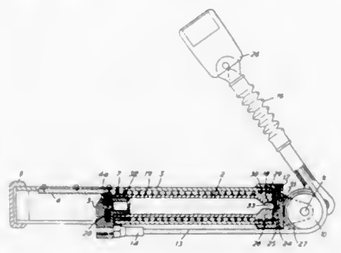
control means for controlling said fuel supply controlling means in response to an output signal of said first means and an output signal of said second means to prohibit a fuel supply stopping operation by said fuel supply controlling means and allow fuel to be supplied to the engine when said speed of rotation of said driven wheel is lower than said speed of rotation of said non-driven wheel.

4,917,209
MOTORCYCLE
Satoru Horiike, Tokyo; Yasuhiko Nakano, Shiki; Shigetarou Okano, Tokorozawa; Shigeru Kimura, Asaki; Masanobu Matsuzaki, Tokyo; Toshiteru Yamamoto, Saitama; Kenji Ooki, Asaka; Eiji Hamano, Tokyo, and Mikio Kubo, Fujimi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 168,110, Mar. 11, 1988. This application Jul. 15, 1988, Ser. No. 219,508
Claims priority, application Japan, Mar. 13, 1987, 62-59236; Aug. 18, 1987, 62-203511; Aug. 19, 1987, 62-204163
Int. Cl.[4] B62M *27/02*; B60G *9/02*
U.S. Cl. 180—219 10 Claims



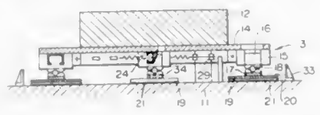
1. A motorcycle comprising:
front and rear wheels, said front and rear wheels including flat tires;
a frame assembly and a main frame, said main frame supporting said front and rear wheels on a central line thereof, said main frame being disposed below said frame assembly;
a connecting means mounted on said main frame between said front and rear wheels;
said frame assembly includes a subframe mounted on said connecting means and disposed above said main frame, said subframe being capable of banking laterally about said connecting means;
a steering handle and a driver's riding seat mounted on said subframe;
at least one of said front and rear wheels being a drive wheel, said front and rear wheels preventing said main frame from banking laterally.

4,917,210
TENSIONING DEVICE
Karel Danicek; Franz Hainz; Martin Specht, all of Munich, and Rudolf Meyer, Odelzhausen, all of Fed. Rep. of Germany, assignors to BSRD Limited, Carlisle, Great Britain
Filed Sep. 2, 1988, Ser. No. 241,537
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1987, 3729505
Int. Cl.[4] B60R *22/46*
U.S. Cl. 180—268 12 Claims



1. A tensioning device comprising a fixed housing and a tensioning member moveably carried by the housing for connection to first means to be tensioned, said tensioning member being part of fluid pressure responsible means and the device including speed change responsive means response to a predetermined rate of change of speed of the housing to apply gas under pressure from a reservoir to said pressure reservoir means in a sense to move the tensioning member in a direction aware from an initial position to cause tensioning movement therefore, wherein said reservoir forming part of said speed change responsive means.

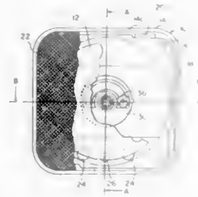
4,917,211
SEISMIC ISOLATOR
Takao Yamada; Katsunori Kurabe; Kengo Tagawa, and Koichi Shibata, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan
Filed Dec. 21, 1988, Ser. Nn. 287,735
Claims priority, application Japan, Dec. 26, 1987, 62-328441
Int. Cl.[4] G10K *11/00*
U.S. Cl. 181—0.5 18 Claims



1. Seismic isolator apparatus placed between a foundation including a floor slab, and an objective to be protected from an earthquake to reduce a responsive acceleration arising therefrom, comprising:
a combination of an upper friction plate and a lower friction plate which are in frictional contact along a friction plane;
the upper friction plate being fixed to the objective;
the upper friction plate being made from a material selected from the group consisting of polyacetal resin containing lubricating oil, a bronze alloy with solid lubricant dispersed therein, a brass alloy with solid lubricant dispersed therein, a sintered alloy with solid lubricant dispersed therein, a porous structure of cast iron with lubricant oil contained therein and a steel backing sintered layer with solid lubricant and oil impregnated therein;
the lower friction plate being fixed to the foundation;
the lower friction plate being made from a material selected from the group consisting of a hard chromium-plated plate and a hard nickel-plated plate; and
a horizontally positioned spring system fixed to the objective and to the foundation.

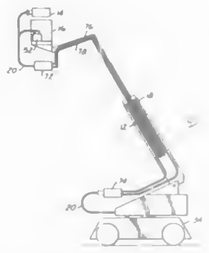
4,917,212
SPEAKER SUPPORTING UNIT
Yutaka Iwaya, Kodaira, Japan, assignor to Nakamichi Co., Ltd., Tokyo, Japan
Filed Dec. 15, 1988, Ser. No. 284,898
Claims priority, application Japan, Dec. 15, 1987, 62-190452[U]
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—141 7 Claims

1. A speaker supporting unit including a base for attachment to an installation surface, said base having an inclined reference surface relative to said installation surface;
means for securing a speaker to said inclined reference surface;
a spacer interposed between said speaker and said base and having a first surface adapted to be in contact with said speaker and a second surface opposite to said first surface and inclined relative thereto, and adapted to be in contact



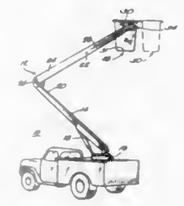
with said inclined reference surface of said base; and
means for relatively rotating said base and said spacer.

4,917,213
POWER TRANSMISSION
James A. Kessler, Troy, and Gerald A. Gyomory, Taylor, both of Mich., assignors to Vickers, Incorporated, Troy, Mich.
Filed Jun. 12, 1989, Ser. No. 364,871
Int. Cl.[4] B66F *11/04*; F16D *31/00*
U.S. Cl. 182—2 16 Claims



13. A man-lift vehicle that includes a wheeled vehicle base, an extensible boom pivotally mounted at one end to said base, a man-lift platform carried at an opposing end of said boom, first and second hydraulic actuators for respectively controlling extension and angle of said boom with respect to said base, first and second electronic controllers carried on said base for dedicated control of respective said actuators, a master controller carried on said platform for operator control of said first and second controllers, a high speed serial bus coupling said master controller to said first and second controllers, said bus including a serial data line and a control line for indicating impending transmission from one of said controllers and means for electrically isolating said master controller from said first and second controllers while maintaining data and control line signal integrity therebetween comprising:
first interface means carried on said platform and including first fiber optic transmitting and receiving means, a first interface driver having signal ports interconnecting said first fiber optic transmitting and receiving means with said data line of said master controller and a control port coupled to said control line of said master controller for conditioning said first interface driver to receive or transmit information on said data line, and first control means having an input coupled to said control line and an output coupled to said first fiber optic transmitting means,
second interface means carried on said base and including second fiber optic transmitting and receiving means, a second interface driver having signal ports interconnecting said second fiber optic transmitting and receiving means with said data line of said first and second controllers and a control port, means coupling said control port of said second interface driver to said control line of said first and second controllers, and second control means having an output coupled to said control port of said second interface driver and an input coupled to said second fiber optic receiving means for conditioning said second interface driver and said first and second controllers to receive or transmit information as a function of signals from said first control means, and
fiber optic transmission means interconnecting said first and second fiber optic transmitting and receiving means.

4,917,214
AERIAL LIFT BUCKET ROTATION DEVICE INCLUDING BUCKET LEVELING MEANS
John J. Mlaker, Milwaukee, and William K. Holmes, Delafield, both of Wis., assignors to Hi-Ranger, Inc., Waukesha, Wis.
Filed Aug. 16, 1989, Ser. No. 394,753
Int. Cl.[4] B66F *11/04*
U.S. Cl. 182—2 9 Claims

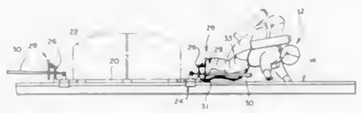


1. An aerial lift comprising:
a frame,
a boom including opposite ends, one of the ends of the boom being supported by the frame, and the boom including a center line,
a bucket supported by an opposite end of the boom,
means for supporting the bucket for pivoting movement about a horizontal axis, the means for supporting the bucket for pivoting movement including a generally horizontal pivot shaft supported by the other end of the boom,
means for supporting the bucket for pivoting movement about a generally vertical axis between a side hung position at one side of the boom and a forward extended position, the means for supporting the bucket for pivoting movement including a rotary actuator having an upper end and a lower end, the rotary actuator including a central axis of rotation,
means for connecting the rotary actuator to the bucket for supporting the bucket, and
means for supporting the rotary actuator such that the upper end of the axis of rotation of the rotary actuator is tipped rearwardly toward the horizontal axis of the horizontal pivot shaft and outwardly away from the boom.

4,917,215
SPACE STATION TRANSPORT SYSTEM FOR EXTRAVEHICULAR ACTIVITY
Raymond L. Pratt, Sterling, Va., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Aug. 23, 1988, Ser. No. 235,076
Int. Cl.[4] B61B *13/04*; A62B *35/00*
U.S. Cl. 182—3 9 Claims

1. A personnel transport system comprising:
an extended rail;
journal means slidably mounted to the rail;
boot binding means connected to the journal means for releasably securing a person's boot thereby enabling the person to slide along the rail;
braking means located in proximity to the binding means for

frictionally engaging the rail to permit speed control of a transported person; and



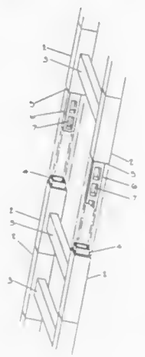
a sled connected to the journal means and the binding means for carrying a load along the rail.

4,917,216

SEGMENTED LADDER CONSTRUCTION

Edward G. Kimber, 5255 Lakeshore Blvd., Burlington, Ontario, Canada (L7L X8)

Filed Jun. 12, 1989, Ser. No. 364,966
Claims priority, application Canada, Jun. 16, 1988, 569687
Int. Cl.[4] E06C *1/10*
U.S. Cl. 182—151 **9 Claims**



1. A construction unit for assembling into a multi- step ladder similar device comprising, a unit provided with two spaced and parallel opposed side rails, a cross member joined at each of its ends to one of the side rails to form a unit having a H like configuration, at least one end of each side rail being reduced to facilitate telescopic insertion into the unreduced end of a further H like unit to form a stepped ladder like construction, and wherein the side rails are adapted to, at least partially, enclose and retain elongated reenforcing members which are inserted into the side rails to reenforce the side rails and act as retainers for securing units in assembled relationship.

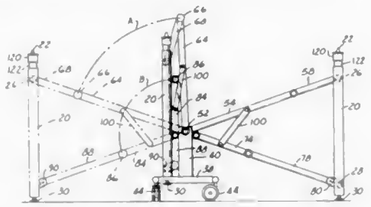
4,917,217

PORTABLE FOLDING STAGING

Orley D. Rogers, Farwell, and Kenneth E. Staten, Clare, both of Mich., assignors to Stageright Corporation, Clare, Mich.

Filed Jan. 23, 1989, Ser. No. 299,345
Int. Cl.[4] E04G *1/34*; E04H *3/10*
U.S. Cl. 182—152 **4 Claims**

4. A stage panel support for portable staging comprising:
(a) a relatively narrow base frame,
(b) roll away casters on said frame,
(c) four vertical stanchions for supporting four corners of a square or rectangular stage panel, and
(d) a plurality of collapsible braces mounted at one end on said base frame and at the other end to said stanchions to move said stanchions from a storage position above said base frame to a support position spaced from said base frame to engage corners of said stage panel, said base frame comprising a horizontal frame, and single spaced vertical uprights at each end of said frame,
(e) said collapsible braces including upper and lower braces on each side of said base frame secured to an upright of said base frame at a localized pivot area above said base frame and secured to said stanchions at upper and lower



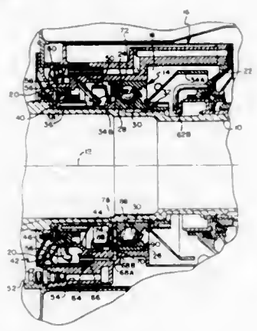
spaced pivot points adjacent the top end and the lower end of said stanchions, and
whereby in a support position said upper and lower braces form triangular supports with two diverging sides connected to the stanchions and the apex connected to a base support upright.

4,917,218

SECONDARY OIL SYSTEM FOR GAS TURBINE ENGINE

Stephen G. Murray, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 3, 1989, Ser. No. 331,781
Int. Cl.[4] F01M *9/10*
U.S. Cl. 184—6.11 **5 Claims**



5. In a gas turbine engine including
a shaft aligned on an axis of said engine,
a generally annular rigid housing of said engine surrounding said shaft,
seal means at opposite ends of said housing engaging said shaft and defining therebetween an annular sump around said shaft,
a bearing in said sump for rotatably supporting said shaft on said rigid housing and including an inner race on said shaft and an outer race on said rigid housing and a plurality of anti-friction rolling elements between said inner and said outer races, and
a primary oil system including a plurality of nozzles in said sump operative to discharge a primary oil flow to said bearing so that said bearing has a normal operating temperature in the presence of said primary oil flow and increases in temperature to a higher threshold temperature when after said primary oil flow stops,
a secondary oil system comprising:

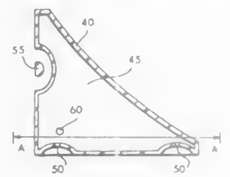
an annular reservoir disposed is said sump and attached to said rigid housing,
means connecting said primary oil system to said reservoir and operative to maintain said reservoir filled with oil when said engine is operating,
means defining a secondary orifice in said housing adjacent said bearing outer race,
means on said rigid housing cooperating therewith in defining a passage between the bottom of said reservoir and said secondary orifice including a segment wherein a part of said passage is defined by said means on said rigid housing and a part of said passage is defined by an annular face of said bearing outer race,
said oil in said reservoir being motivated by gravity to flow through said passage from said reservoir to said secondary orifice,
means defining a transverse slot intersecting said segment of said passage and open toward said annular face of said bearing outer race, and
a low melting temperature metal slug disposed in said transverse slot with a side thereof abutting said annular face of said bearing outer race so that the temperature of said metal slug substantially equals the temperature of said bearing outer race,
said metal slug having a first phase at temperatures below said threshold temperature blocking said segment of said passage and preventing said secondary oil flow and a second phase at temperatures exceeding said threshold temperature unblocking said segment of said passage and permitting said secondary oil flow.

4,917,219

WHEEL CHOCK

Stephen K. Henry, P.O. Box 1061, Golden, Colo. 80401

Filed Nov. 26, 1985, Ser. No. 801,833
Int. Cl.[4] B60T *3/00*
U.S. Cl. 188—32 **1 Claim**



1. A wheel chock comprising:
(a) an exterior shell of polyethylene comprising a base, a back surface, two side surfaces, and a ramp surface as the hypotenuse between the base and back surfaces;
(b) a core of rigid foam of a secondary material;
(c) a number of fill holes through the bottom surface of the exterior shell to allow introduction of a secondary material into the interior of the shell to form a core; and
(d) a number of feet attached to the bottom surface of the exterior shell covering said fill holes.

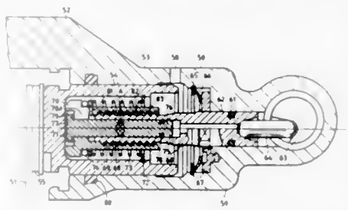
4,917,220

AUTOMATIC GAP CONTROL APPARATUS FOR A DISC BRAKE WITH A PARKING BRAKE

Hiroshi Ikegami, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1988, Ser. No. 205,373
Claims priority, application Japan, Jun. 9, 1987, 142287
Int. Cl.[4] F16D *65/56*
U.S. Cl. 188—196 D **4 Claims**

1. An automatic gap control apparatus for a disc brake with a parking brake, comprising:
a brake main body having a brake operating cylinder;
a cup-shaped piston having a bottom, said piston being slidably mounted inside said brake operating cylinder;
a rod having a through hole slidably fitted inside said body, said rod being prevented from rotating, said rod being provided with a one-way reversible thread;
a sleeve nut having a front end and a rear end, said sleeve nut having a concave portion at an end thereof and being provided at said front end with an abutting portion abutting against said bottom of said piston; said sleeve nut being threadably engaged with said one-way reversible thread of said rod so as to define a length adjusting mechanism, longitudinal movement of said sleeve nut rearwardly relative to said rod a predetermined amount frictionally locking said sleeve nut and said rod so that rotation of said sleeve nut relative to said rod is prevented



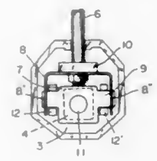
while longitudinal movement of said rod with said sleeve nut locked thereto is possible;
a small piston having a large diameter head, said small piston being fitted in said through hole of said rod, said large diameter head being fitted in said concave portion of said sleeve nut; and
a spring member provided between said cup-shaped piston and said sleeve nut, said spring member urging said sleeve nut against said bottom of said cup-shaped piston,
whereby when the fluid pressure applied to said brake operating cylinder exceeds a predetermined value, the fluid pressure causes said large diameter head to urge said sleeve nut rearwardly against said coil spring and relative to said rod to thereby frictionally lock said rod and said sleeve nut to prevent said sleeve nut from rotating relative to said rod.

4,917,221

SLIDE TYPE EXHAUST BRAKE SYSTEM

Kazunori Takikawa, Numazu, and Ryoichi Suzuki, Mishima, both of Japan, assignors to Usui Kokusai Sangyo Kaisha Ltd., Shizuoka, Japan

Filed Feb. 23, 1989, Ser. No. 314,825
Claims priority, application Japan, Mar. 11, 1988, 63-32373[U]
Int. Cl.[4] F02D *9/06*; F16K *3/02*
U.S. Cl. 88—273 **2 Claims**



1. A slide type exhaust brake system comprising:
a housing having an exhaust passageway extending therethrough and a reciprocatory passageway communicating with the exhaust passageway and angularly aligned thereto;

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a tabular valve member having a bottom wall with an exhaust pressure adjusting hole extending therethrough, said tabular valve member being mounted in the reciprocatory passageway for reciprocal movement into and out of the exhaust passageway;

a piston and cylinder unit mounted in proximity to the housing and comprising a piston rod reciprocally movable in the reciprocatory passageway toward and away from the exhaust passageway, said piston rod comprising an end engageable with the tabular valve member for urging the tabular valve member into the exhaust passageway upon movement of the piston rod toward the exhaust passageway;

a block securely mounted to the piston rod in selected spaced relationship to the end thereof, said block being engageable with the tabular valve member for urging the tabular valve member out of the exhaust passageway upon movement of the piston rod away from the exhaust passageway; and

an auxiliary valve member mounted to the piston rod intermediate the block and the end of the piston rod, said auxiliary valve member comprising a support frame of generally C-shaped configuration with a base mounted to the piston rod adjacent the block and a pair of generally parallel arms extending from the base, each said arm including a slot formed therein, said auxiliary valve member further including a liner having a pair of opposed ends and an intermediate portion, the ends being slidably engaged by the slots of the support frame and the intermediate portion being slidable along the bottom wall of the tabular valve member for alternately at least partly covering and at least partly uncovering the exhaust pressure adjusting hole in the tabular valve member, said liner being provided with at least one exhaust gas escape hole extending therethrough at the intermediate portion thereof and disposed to be aligned with the exhaust pressure adjusting hole of the tabular valve member when the tabular valve member is disposed in the exhaust passageway, such that the exhaust gas escape hole prevents excessive loads on said exhaust brake system when said tabular valve member is disposed in the exhaust passageway.

4,917,222

SHOCK ABSORBER

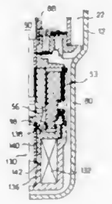
Juan Simon Bacardit, Barcelona, Spain, assignor to Bendix Espana, Barcelona, Spain

Filed Oct. 19, 1988, Ser. No. 259,835

Claims priority, application European Pat. Off., Oct. 26, 1987, 87500071.3

Int. Cl.[4] F16F *9/34*

U.S. Cl. 188—275 **8 Claims**



1. A shock absorber comprising a tubular working cylinder to be mounted on a suspended part of a vehicle, a piston rod assembly slidably received in said working cylinder and having an end to be mounted on a fixed part of a vehicle, said piston rod assembly comprising a tubular piston having at a free end a piston member cooperating with said working cylinder to divide the interior thereof into an upper and a lower working chamber, a telescoping tube received slidably and sealingly in a bore of said piston member, a mass located in an extension of said working cylinder and mounted slidably on a tubular core and displaceable in response to a predetermined acceleration of said shock absorber from a first position in which said mass closes a first passage between said upper working chamber and a reservoir to a second position in which said first passage is open, spring means resiliently urging said mass toward a rest position wherein the first passage is closed and comprising a spring member which opposes slidable movement of the mass in either of two opposed axial directions, the spring member disposed between stops located at the tubular core, and an electromagnetic valve connected with said tubular core and comprising a spool valve displaceable by a solenoid coil between an open and a closed position, said electromagnetic valve being adapted to selectively open and close a second passage between said upper working chamber and reservoir, the electromagnetic valve operating independently of the mass.

4,917,223

BRAKE FOR A WHEEL

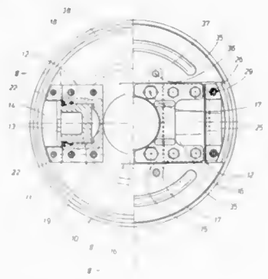
Walter Krauss, Gustav-Stresemann-Strasse 3, 8860 Nördlingen, Fed. Rep. of Germany

Filed Apr. 5, 1988, Ser. No. 177,621

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1987, 3714275

Int. Cl.[4] F16D *51/10*

U.S. Cl. 188—335 **12 Claims**



1. A brake arrangement comprising a wheel support, a wheel borne by said wheel support, a brake drum, at least one brake guide saddle arranged in the brake drum so as to bear against the wheel support, a fluid drive piston arranged in a bore in said guide saddle, said guide saddle having guide lugs extending in a direction parallel to the direction of the bore, said lugs delimiting a channel in the peripheral direction, a brake element placed in the channel so it is capable of being driven by said piston, said at least one brake guide saddle being separate from the wheel support, retainer elements, which are accessible from the inner side of the wheel, detachably connecting the guide saddle with the wheel support, and at their longitudinal sides the guide lugs each delimiting such guide channel are bridged over at their longitudinal sides by ribs delimiting the guide channel at the end, such ribs being detachably secured by retainer elements accessible from the inner side of the wheel, and on the inner side of the wheel each brake element has a grip bar encompassed by the respective rib.

4,917,224

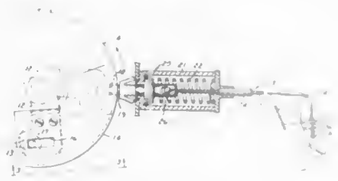
TRANSMISSION AND BRAKE INTERLOCK SYSTEM

Donald J. Gokee, Bowling Green, Ohio, assignor to Babcock Industries Inc., Fairfield, Conn.

Filed Dec. 9, 1988, Ser. No. 282,261

Int. Cl.[4] B60K *41/26*

U.S. Cl. 192—4 A **4 Claims**



1. In an automotive vehicle comprising a transmission, a transmission shift lever on said transmission housing, a gear shift lever on said vehicle, means interconnecting said gear shift lever and said transmission shift lever on said transmission, and a brake pedal,

a transmission and brake interlock system comprising

a lock member mounted directly on said transmission shift lever on the transmission housing for movement therewith, and

an interlock means between mounted adjacent said lock member between the brake pedal of the automotive vehicle and the lock member operable to engage said lock member and prevent movement of the lock member and shifting of the transmission out of park position and operable to disengage said lock member when the brake pedal is depressed permitting the lock member to move and, in turn, the transmission lever to move to shift out of park position.

4,917,225

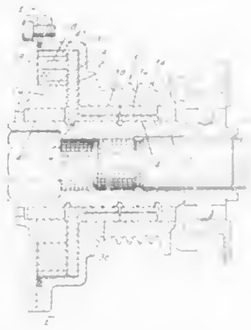
THERMALLY ENGAGED CENTRIFUGAL CLUTCH

Roy E. Diehl, Northville, and Alvin H. Berger, Brownstone, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 5, 1988, Ser. No. 253,825

Int. Cl.[4] F16D *43/04, 43/25*

U.S. Cl. 192—82 T **7 Claims**



1. A centrifugal clutch construction for the slip drive of an internal combustion engine accessory to reduce noise comprising, an accessory drive shaft, an engine driven drive pulley rotatably surrounding the shaft, an expansion ring normally clamped to the pulley for effecting a non-slip drive therebetween at low engine speeds, the ring expanding radially outwardly under the influence of centrifugal forces acting thereon at higher engine speeds to gradually reduce the non-slip drive to effect a slipping frictional heat generating engagement of the ring relative to the pulley, and means connecting the ring to the accessory shaft for driving the shaft during engagement of the ring with the pulley, the ring being constructed of a material having a higher thermal rate of expansion than that of the contiguous parts whereby the slipping of the ring generates frictional heat that increases as a function of time to effect a volumetric expansion of the ring against the pulley to thereby reduce the slipping and generation of heat.

4,917,226

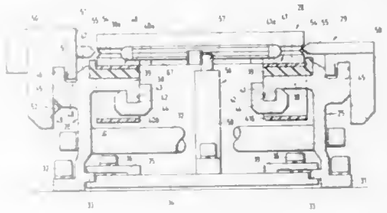
DUPLEX-CONVEYER

Detlef Blöcker, Königswinter, Fed. Rep. of Germany, assignor to Protech Automation GmbH, Cologne, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 237,800

Int. Cl.[4] B65G *21/20*

U.S. Cl. 198—345 **16 Claims**



1. A conveyor particularly adapted for manufacturing installations comprising two generally parallel longitudinal profiles adapted to support a conveyor, each profile including an upright stem defining inner and outer sides, a leg projecting generally transversely from the inner side of each upright stem and carrying a vertical clamping bar, said profiles being disposed with the legs thereof projecting toward each other, said legs being adapted to support thereupon a conveyor, a retaining strip projecting generally transversely from the outer side of each upright stem, each retaining strip in part defining a longitudinal groove, each retaining strip having an exterior longitudinally extending inclined surface disposed in inclined relationship to a longitudinal plane of its associated upright stem, a clamping block carried by at least one of said retaining strips, and locking means carried by said clamping block for bearing against said inclined surface for selectively securing said clamping block to said one retaining strip.

4,917,227

CONVEYANCE SYSTEM FOR ARTICLE CONTAINER CASE

Yukito Matsuo; Tsuyoshi Ishida, both of Yokohama; Masanori Iwamoto, Tokyo; Koichiro Shin, Koshigaya; Tadatoshi Hiramatsu, Tokyo, and Isao Shirai, Fujisawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Nippon Shooter Co., Ltd., Tokyo, both of, Japan

Filed Sep. 9, 1987, Ser. No. 94,707

Claims priority, application Japan, Sep. 11, 1986, 61-214600; Oct. 15, 1986, 61-244654

Int. Cl.[4] B65G *37/00*

U.S. Cl. 198—347 **5 Claims**

1. A conveyance system for conveying an article between the stories of a building comprising:

at least one container case for accommodating the article conveyed;

a plurality of moving carriers for carrying a container case thereon;

horizontal conveyance means disposed on at least one story

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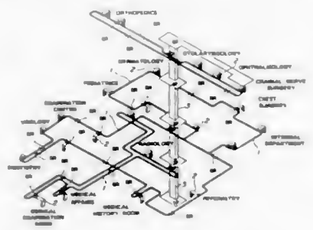
of the building for allowing said carriers to move therealong;

a plurality of driving means disposed along the horizontal conveyance means at a predetermined interval for driving the carriers;

a plurality of first stations provided on the horizontal conveyance means, each first station including first container case transfer means for loading the container case onto each carrier and unloading the container case from each carrier, said first container case transfer means being located at a position where one of the driving means is disposed, each first station further including branch conveyance means for conveying the container case between the horizontal conveyance means and a case receiving and delivering portion;

vertical conveyance means vertically extending through the stories for conveying the container case to at least one



other story, said vertical conveyance means comprising upper conveyance means for conveying the container case in both the upward and downward direction to the upper stories, and lower conveyance means for conveying the container case in both the upward and downward direction to the lower stories;

a plurality of second stations provided on the horizontal conveyance means, each second station including second container case transfer means for loading the container case onto each carrier and unloading the container case from each carrier, said second container case transfer means being located at a position where one of the driving means is disposed; and

connecting means extending horizontally from the second container case transfer means to the vertical conveyance means so that the container case is conveyed between the vertical conveyance means and the horizontal conveyance means.

4,917,228

METHOD OF SORTING VEHICLE BODIES BY THE COLORS OF COATING EXPECTED THEREON IN A VEHICLE BODY COATING LINE

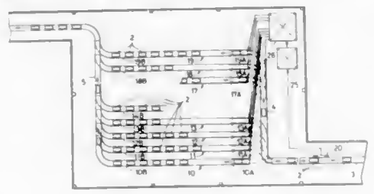
Eishun Ichihashi; Sigetaka Tooka, both of Hiroshima, and Keisi Tanaka, Higashihiroshima, all of Japan, assignors to Mazda Motor Corporation, Tokyo, Japan

Division of Ser. No. 13,126, Feb. 10, 1987, Pat. No. 4,770,122.
This application Apr. 25, 1988, Ser. No. 186,095
Claims priority, application Japan, Feb. 13, 1986, 61-29371
Int. Cl.[4] B65G *37/00*
U.S. Cl. 198—347 17 Claims

1. A method for sorting vehicle bodies by colors of coating expected thereon in a vehicle body coating line by utilizing an arrangement including a vehicle body conveying means having (a) bringing in conveying means for carrying vehicle bodies in the arrangement, (b) a plurality of branch conveying means disposed in parallel with one another for transporting and storing temporarily the vehicle bodies carried into the arrangement by said brining-in conveying means, and (c) a brining-out conveying means for supplying the vehicle bodies transported thereto from said plurality of branch conveying means to a coating process provided in the vehicle body coating lines, said method comprising the steps of:

storing data representing the color of coating expected at least on each of the vehicle bodies stored temporarily on said plurality of branch conveying means; and

driving each of said plurality of branch conveying means selectively in accordance with the stored data so as to



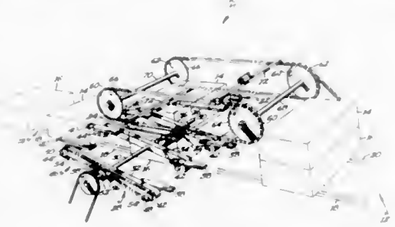
transport the vehicle bodies stored temporarily on said plurality of branch conveying means to said bringing-out conveying means in such a manner that the vehicle bodies from said plurality of branch conveying means are sorted in dependence on the colors of coating expected thereon to form groups of vehicle bodies on the brining-out conveying means which are to be coated in the same color.

4,917,229

METHOD AND APPARATUS FOR STACKING PRODUCTS

James F. Korkowski, Brandon, Minn., assignor to APV Douglas Machine Corporation, Alexandria, Minn.

Filed Dec. 21, 1988, Ser. No. 288,867
Int. Cl.[4] B65G *47/26*
U.S. Cl. 198—418.4 18 Claims



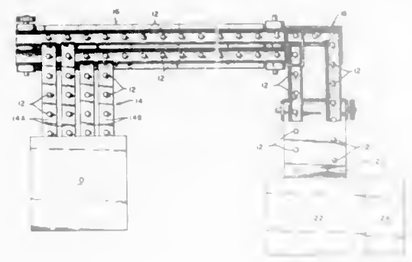
1. Apparatus for stacking products comprising, in combination: means for conveying the products; a platform for holding the product placed thereon, with the platform being located above the conveying means a distance greater than the height of the product; a rotary device moveable between a first position in a noninterfering relation with the products on the conveying means and a second position extending above the conveying means for abutting the bottom of the product on the conveying means, for raising the product from the conveying means, and for placing the raised product on the platform, with the rotary device comprising, in combination: a rotatable shaft defining a pivot axis; at least a first arm rotatably fixed to the shaft and having a free end; and means on the free end of the arm for supporting the product; and means for pushing the product off the platform onto a product which has been conveyed without interference on the conveying means.

4,917,230

APPARATUS FOR HANDLING BAKING PRODUCTS

Joseph Barchman, 2603 Oak St., Point Pleasant, N.J. 08742

Filed Oct. 24, 1988, Ser. No. 261,398
Int. Cl.[4] B65G *47/26*
U.S. Cl. 198—434 4 Claims



1. An automated baking station for the transportation and sequencing of dough pieces from the forming station to the oven comprising:

a first conveyor belt means for transporting said dough pieces from said forming station comprising a plurality of unequal length conveyor belts matched in pairs of equal length;

a second conveyor belt means in communication with said first conveyor belt means and angularly aligned therewith for receipt of said dough pieces in horizontal alignment, said second conveyor belt means comprising a plurality of parallel conveyor belts, each conveyor belt in communication with a respective pair of said equal length conveyor belts of said first converter belt means;

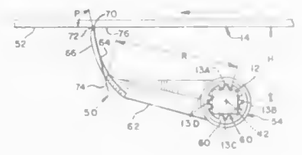
a sequencing hopper in communication with said second conveyor means, said sequencing hopper comprising a plurality of unequal length sequencing chutes in alignment with said second conveyor means, each of said unequal length sequencing chutes in alignment with a respective one of said plurality of parallel conveyor belts and said dough pieces, said unequal length sequencing chutes depositing said dough pieces in sequentially staggered formation on a third conveyor belt means for transportation to a rolling station and said oven.

4,917,231

CONSTANT ANGLE CONVEYOR BELT CLEANER

Robert T. Swinderman, Kewanee, Ill., assignor to Martin Engineering Company, Neponset, Ill.

Filed Apr. 20, 1989, Ser. No. 340,876
Int. Cl.[4] B65G *45/00*
U.S. Cl. 198—497 15 Claims



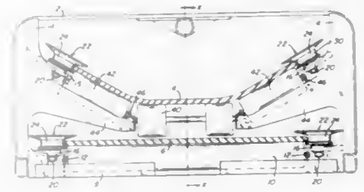
1. A conveyor belt cleaner scraper blade for cleaning the surface of a conveyor belt, said scraper blade adapted to be mounted on a rotatable support member positioned generally transverse to the direction of conveyor belt travel, said scraper blade including a curvilinear surface having a scraping edge at one end for contacting said conveyor belt along a line of contact, adjustment means for rotating and radially adjusting said scraper blade either into or out of contact with said conveyor belt through rotation of said support member, said curvilinear surface having a configuration such that a cleaning angle is formed between a first line tangent to said curvilinear surface and passing through a point in said line of contact, and a second line tangent to said conveyor belt and passing through said same point in said line of contact as said first line, said curvilinear surface having a configuration corresponding to an involute of a circle, whereby said cleaning angle remains constant as the scraper blade wears and as the position of said scraper blade is radially adjusted throughout the wear life of said scraper blade.

4,917,232

FLEXIBLE CONVEYOR BELT SUPPORTING STRUCTURE

Neal W. Densmore, Franklin, Pa., assignor to Joy Technologies Inc., Pittsburgh, Pa.

Continuation of Ser. No. 593,178, Mar. 26, 1984, abandoned, which is a continuation of Ser. No. 145,958, May 2, 1980, abandoned. This application Jun. 13, 1988, Ser. No. 207,010
Int. Cl.[4] B65G *15/08*
U.S. Cl. 198—830 11 Claims



1 In a conveyor structure in which horizontally spaced portions of an elongated horizontally extending selectively curved run of an orbitally moving conveyor belt of substantially uniform cross section having sufficient flexiblity to form an upper troughed conveying run and an underlying flat return run, are supported by horizontally spaced idler roller assemblies with the outer edges of such run being outwardly adjacent the respective outer ends of each of said roller assemblies when such run traverses a straight path and wherein edge rollers are spaced horizontally of such run outwardly adjacent said outer edges, respectively, when such run traverses a straight path, the improvement comprising:

said edge rollers having cylindrical outer surfaces rotatable about stationary central axes thereof, respectively, opposed ones of said outer surfaces being spaced outwardly from such outer edges, respectively, when such run traverses a straight path, each of said axes extending generally in the same direction as the traverse extent of such outer edge adjacent thereto extends when such run traverses a straight path;

each of said edge rollers having a flange extending radially outwardly from the lower end of said cylindrical outer surface thereof;

said flanges having upwardly facing annular surfaces spaced below the undersurface of the seriatim portions of such run adjacent thereto, respectively, when such run traverses a straight path, each of said annular surfaces being spaced below the undersurface of the portion of such run adjacent thereto a distance to permit said seriatim portions to deflect downwardly into engagement therewith;

said cylindrical outer surfaces and said annular surfaces being located with respect to such outer edges that, when such run traverses a curved path and such run is laterally displaced with seriatim portions of one of said outer edges

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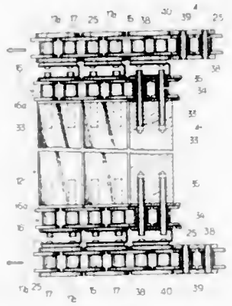
moving into seriatim engagement with a number of said cylindrical outer surfaces on one side of such run, said annular surfaces of the flanges below the engaged cylindrical outer surfaces are engaged by said seriatim portions to prevent said seriatim portions from engaging the roller assemblies of said roller assemblies adjacent said engaged cylindrical outer surfaces.

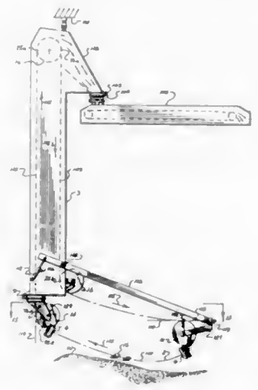
4,917,233
TABLE CONVEYOR
Hiroyuki Tsuda; Keiziro Goto; Kiyoshi Egami; Wataru Maida, and Toshinobu Honda, all of Kitakyushu, Japan, assignors to Chikuchi Tekkosho Co. Ltd., Kitakyushu, Japan
Filed Feb. 27, 1989, Ser. No. 315,765
Int. Cl.[4] B65G *23/14*
U.S. Cl. 198—833 2 Claims



1. A table conveyor comprising:
a frame body;
sprockets;
a driving device disposed on the frame body rotating said sprockets;
a pair of endless driving chains parallelly disposed at both sides of said frame body, said pair of endless driving chains engaging respectively with said sprockets;
guide members disposed within said frame body;
a pair of sectional driven chains parallelly disposed at inner sides of said endless driving chains, said pair of sectional driven chains moving through said guide members;
friction boards operatively attached to said driven chains;
springs connected between said friction boards and said driven chains transmitting power of the driving chains to said driven chains by frictional force; and
table beds including a plurality of connecting rods connected parallelly between said pair of sectional driven chains to define a conveying surface.

4,917,234
WHEEL AND CHAIN POWER TRANSMISSION MACHINE
Timothy H. Seymour, 3350 Moran St., Biloxi, Miss. 39532
Division of Ser. No. 671,403, Nov. 14, 1984, Pat. No. 4,671,783. This application Jul. 30, 1987, Ser. No. 45,036
Int. Cl.[4] B65G *23/06*
U.S. Cl. 198—834 4 Claims

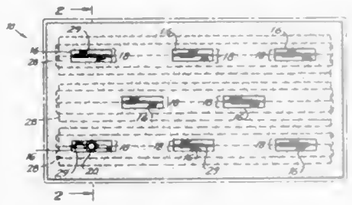
1. A power transmitting machine, comprised of a plurality of wheels, where said wheels circulate a continuous chain made up of links, said links connected together by a hinging means,
wherein, one of said wheels is partially comprised of a rotating housing and having an attached means for driving said rotating housing,
said rotating housing having a plurality of appendages where said appendages are divided into two separate groups,
where each of said two separate groups generally acts independent of the other,
where the first group of the said two separate groups acts to transmit power to and from said chain,
where the second group of the said two separate groups acts to provide radial support for said chain,
where said appendages of second said group are supplied with a means for manipulation,
wherein said manipulation means controls the radial position of said chain as it enters, travels around, and exits one of said wheels,
wherein, said wheels are supported by a support structure,
wherein, said wheels are arranged in an arrangement, where said arrangement is made up of four said wheels,
wherein, the centerlines of said four wheels are contained in a common vertical plane,
wherein, said chain enters the first of said wheels at an entry tangent point,



wherein, said first wheel directs said chain more or less downward into a loop,
wherein, from said loop said chain enters the second of said wheels,
wherein, said second wheel directs said chain around and off of said second wheel at an exit tangent point,
wherein, said chain follows a line from the exit tangent point of said second wheel more or less upward to the entry tangent point of the third of said wheels,
wherein, said third wheel is located generally above said second wheel,
wherein, said chain follows a line dropped more or less down from the exit tangent point of said third wheel to the entry tangent point of a fourth wheel,
wherein, said fourth wheel directs said chain more or less horizontally outward to the entry tangent point of said first wheel,
wherein, said first wheel directs said chain downward into said loop.

4,917,235
UNITARY RING DISPLAY SYSTEM
Robert J. Feiler, c/o Morel Jewel Displays, Inc., 517 West 29th St., New York, N.Y. 10001
Continuation-in-part of Ser. No. 231,359, Aug. 12, 1988. This application Sep. 8, 1988, Ser. No. 241,890
Int. Cl.[4] B65D *6/04*
U.S. Cl. 206—6.1 15 Claims

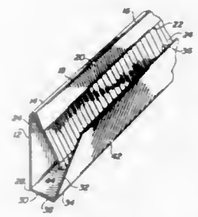
1. A display system for showing rings on a shelf of a showcase, including, in combination,
a support structure,
said support structure including first platform means having a first plurality of ring slots for mounting a first plurality of rings,
said support structure further including second platform means opposed to said first platform means having a second plurality of ring slots for mounting a second plurality of rings,
a first or second plurality of the rings being mountable in said first or said second plurality of ring slots, respectively, a portion of each of the first and said second plurality of the rings extending above said first or said second platform,
said support structure being movable between first and second ring display positions, said first ring display position being when said first platform means is oriented facing upward for viewing and said second platform means is oriented facing downward, and said second ring display position being when said second platform means is oriented facing upward for viewing and said first platform means is oriented facing downward,
said support structure including a base having opposed first and second sides, said base defining a plurality of parallel cutouts extending through said base and opening at said first and second sides, said first and second sides being



adjacent to said first and second platforms, respectively, said first and second plurality of ring slots being located coextensively with said plurality of cutouts,
said support structure further including first and second stiffening boards positioned over said first and second sides, respectively, of said base, said stiffening boards defining elongated holes aligned with said first and said second plurality of ring slots, whereby said cutouts are covered except int he areas of said first and second plurality of ring slots,
said support structure further including gripping means positioned in said cutouts in alignment with said first and second plurality of ring slots for removably holding the first or second plurality of the rings in said first of second plurality of ring slots,
said gripping means including biasable grips defining gripping spaces capable of holding the first and second plurality of the rings in biased relationship when the first or second plurality of the rings is positioned in said first or said second plurality of ring slots,
said support structure further including a pair of spaced flexible blocks positioned in each cutout of said plurality of cutouts, said biasable grips being positioned between said pairs of blocks.

4,917,236
DECORATIVE MATCH BOOK TYPE ASSEMBLY AND PHOTOGRAPHIC DISPLAY
Arnoldo Galvez-Moran, Guatemala City, Guatemala, assignor to World Graphic Resources, Inc., Guatemala City, Guatemala
Filed Aug. 18, 1988, Ser. No. 233,416
Int. Cl.[4] A24F *27/00*
U.S. Cl. 206—102 10 Claims

1. A match book type assembly designed to removably retain and protect a plurality of generally flat items therein, said assembly comprising:
a. housing means having an elongated configuration and secured to said plurality of items and structured for at least partially enclosing and shielding said plurality of items when in a closed position,
b. said plurality of items removably mounted on an interior of said housing means and positioned in adjacent relation to one another and collectively disposed in an elongated row extending along a major portion of the length of said housing,
c. a mounting portion formed on said housing and extending along the length of said housing means, said plurality of items commonly oriented and secured to said mounting portion at a base end thereof,
d. said housing means further comprising a first side flap and a second side flap, said first side flap secured along one longitudinal edge to said mounting portion and extending outwardly therefrom in spaced relation to and on one side of said plurality of items,
e. a base portion extending along the length of said housing means and removably secured to correspondingly positioned longitudinal edges of said first and said second side flap in interconnecting relation therebetween,
f. said second side flap including a free longitudinal edge selectively disposed into and out of retained engagement with said mounting portion to respectively define said closed position and an open position,
g. said base portion comprising a greater transverse dimension than said mounting portion and of sufficient transverse and longitudinal dimension to support said housing in an upright orientation when in a closed position,



h. said base portion spaced from correspondingly positioned free ends of said plurality of items and said first and second side flaps extending outwardly in a divergent orientation from said mounting portion to said base portion when said housing means is in said closed position, and
i. wherein said first side flap and said second side flap each include an outer surface portion, at least one of said outer surface portions including a photograph secured thereto and extending along a length thereof; said mounting portion on said housing comprising an elongated distal base zone, intermediate zone, and a connector zone,
j. said connector zone extending along said one longitudinal edge of said mounting portion and extending outwardly and defining a channel space floor to receive the flat items and said connector zone having an outer edge,
k. said intermediate zone being connected to said outer edge and extending along said outer edge and defining an outer surface portion of said housing means when in said closed position and said intermediate zone having an upper edge spaced from said outer edge,
l. said distal base zone extending along said upper edge and having a terminal edge extending towards said connector zone and in general, parallel relation to said intermediate zone and together with said intermediate zone defining an outer side wall of said mounting means to receive said free longitudinal edge, and
m. said plurality of items being secured to said distal base zone.

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4,917,237

SYSTEM FOR INTRODUCING ADDITIVE INTO A CONTAINER

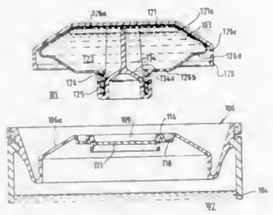
Michael H. Groves; Digby R. Redshaw, and Michael R. Cane, all of Warwick, England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 155,610, Feb. 12, 1988, Pat. No. 4,821,875, which is a continuation-in-part of Ser. No. 61,423, Jun. 12, 1987, Pat. No. 4,798,287. This application Jan. 3, 1989, Ser. No. 293,662

Claims priority, application United Kingdom, Feb. 12, 1987, 8703205

Int. Cl.[4] B65D *25/08*

U.S. Cl. 206—219 21 Claims



1. A system for introducing flowable additive to paint, varnish, woodstain or the like contained in a closed container wherein the system comprises

(a) a closed container containing paint, varnish, woodstain or the like, the container being provided with an inlet which is closed by an inlet closure but which is openable by a force exerted on the inlet closure in a direction inwards of the container,

(b) a closed capsule separate from the closed container which capsule comprises a chamber which defines a volume which contains the flowable additive and which chamber can be opened to create an opening in the chamber which opening can communicate with the inlet into the container after the inlet has been opened,

(c) means for use in positively expelling additive from the chamber through the opening by contracting the volume defined by the chamber and,

(d) co-operable locating means provided on the container and capsule which can at least assist in locating the opening created in the chamber in communication with the inlet into the container.

4,917,238

WASTE CLEANUP KIT

Donovan J. Schumacher, 421 13th Ave. West, Williston, N. Dak. 58801

Continuation of Ser. No. 198,569, May 25, 1988, abandoned. This application Apr. 21, 1989, Ser. No. 342,596

Int. Cl.[4] B65D *69/00*

U.S. Cl. 206—223 8 Claims

1. A waste cleanup kit comprising a main container and a plurality of kit contents including:

an absorbent material;

a disinfectant;

means for scooping up waste material;

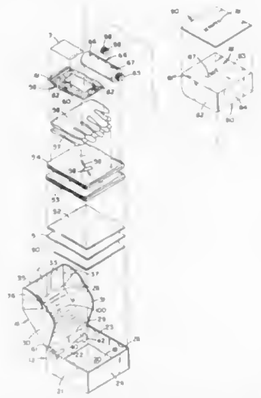
at least one glove for use by an operator using the cleanup kit;

at least one absorbent towel;

at least one germicidal handwipe;

at least one plastic bag sized to contain at least said means for scooping and means for closing said bag;

said absorbent material and said disinfectant disposed in a separate absorbent material container and a separate disinfectant container, respectively;



each of said absorbent material container, disinfectant container, means for scooping, glove, towel, handwipe and bag disposed within said main container.

4,917,239

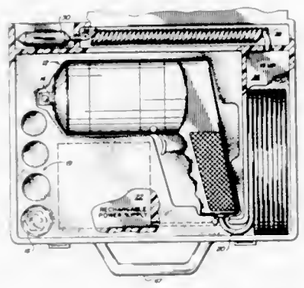
AUTOMOTIVE ELECTRIC POWER TOOL AUTO AND KIT

Vincent K. Smith, 555 Plaza Venetiaway, Apt. 301, Miami, Fla. 33132

Filed Apr. 17, 1989, Ser. No. 339,402

Int. Cl.[4] B65D *69/00*

U.S. Cl. 206—349 1 Claim



1. An automotive electric power tool and kit for use in removing lugs from an automobile wheel of a vehicle equipped with a cigarette lighter comprising,

a portable container including a rechargeable battery means in the container,

step-in transformer means electrically connected to the battery means,

a reversible power tool electrically connected to the battery means and including a drive shaft,

means carried in the container for electrical engagement with the cigarette lighter of the vehicle and lug socket means sized for selective mating driving connection on the drive shaft.

4,917,240

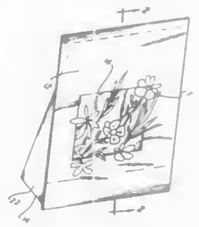
EXPANDABLE FLORAL GREETING CARD

Therese L. Roberts, and Eddie D. Adams, both of Denver, Colo., assignors to Michael C. Huseby, Denver, Colo.

Filed Jan. 9, 1989, Ser. No. 294,656

Int. Cl.[4] B65D *5/36*

U.S. Cl. 206—232 21 Claims



1. An expandable greeting card for special occasions and for displaying a decorative arrangement, the greeting card comprising:

(a) a box-like hollow receptacle base means having front and back panels alternately joined along fold lines with two side panels, a number of bottom flaps are provided at one corresponding end of each of the panels, said bottom flaps being arranged so that the flaps fold back against the inside of the panels when the panels are folded to a first collapsed position with the back and one side panel lying adjacent to the front and other side panel, said bottom flaps folding outwardly when the panels are moved to an expanded position to form an interlocking bottom panel for the receptacle base means, said front panel having an outer edge opposite the edge adjacent the bottom flap and a central cutout opening provided therein; and

(b) face card means having an aperture formed therein, said face card means being attached by suitable fastening means to the front panel of the base means so that the face card aperture and the front panel cutout opening generally correspond whereby a decorative arrangement can be inserted through the aperture and into the receptacle base means for providing a decorative presentation.

13. An expandable greeting card comprising:

(a) two initially flat blanks, a first blank being folded and partially assembled to form a generally flat expandable receptacle base means which can be easily stored and shipped along with a second flat blank;

(b) said first expandable blank being expanded to a three-dimensional assembled condition when folded flaps are fastened and interleaved to form a closed bottom panel for said receptacle base means;

(c) said second flat blank has printed matter one one side, said second flat blank includes fastening means, said second blank being attached to the first assembled blank by means of said fastening means with the printed matter exposed to provide a pleasing presentation;

(d) the first expandable blank is comprised of a front, back, and pair of side panels that are connected alternately to each other along edge fold lines; and

(e) said side panels include a plurality of fold lines which form a pleat extending longitudinally inward from an outer edge opposite the bottom panel so that the outer edge of the front panel can be folded to contact the outer edge of the back panel forming a slanting front surface, and said second flat blank is attached to said slanting front surface.

14. An expandable floral greeting card for displaying a floral arrangement, the greeting card comprising:

(a) a partially assembled receptacle base means having a front and back panel and side panels interspersed between and along each side of said front and back panels, the contiguous edges between said panels are joined by fold lines which allow the front panel and one side panel to be folded into a flat position adjacent to the back panel and other side panel, each of said panels having a suitable flap formed along one corresponding edge, said flaps being arranged to interfit and be attached to each other so that the flaps will form a bottom panel when said front, back and side panels are moved into a hollow expanded position; and

(b) each of said side panels having a plurality of fold lines arranged to form a pleat with the fold lines extending inwardly from the edge of the side panels opposite from said bottom forming flaps, the pleat fold lines in said side panels being arranged to extend only a portion of the longitudinal dimension of said side panels whereby when the pleats are folded toward the interior of the receptacle base means a portion of the front panel will be folded toward the back panel to provide a slanting front portion so that an outer edge of the front panel opposite the bottom forming flaps will be adjacent to an outer edge of the back panel, a securing means is provided to hold the edges of the front and back panels in adjacent position to retain the slanting configuration of the front panel, said slanted portion of the front panel having a central cutout provided therein for displaying a floral arrangement.

4,917,241

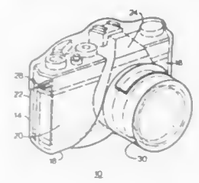
CAMERA CASE

William L. Hanson, 101 Salmo Beach, Tacoma, Wash. 98407

Filed Feb. 27, 1987, Ser. No. 19,645

Int. Cl.[4] A45G *11/38*

U.S. Cl. 206—316.2 2 Claims



1 A camera and lens protective case system comprising:

a case of flexible material covering the bottom two sides, back and front less a cut-out for the lens, of a camera;

a cylindrical housing of flexible material surrounding a lens with a rotatable flap at the lens protective end of the housing;

a flap which is permanently and rotatably affixed to the rear portion of the surrounding lens housing, the length of said rotatable flap being sufficient that when it is unfastened from the surrounding lens material, it can be re-fastened to the rear of the case; and

a flap of flexible material secured to the top of said case capable of rotating free of the camera operating mechanisms and still remaining attached to the protective case.

4,917,242

TRAY FOR PACKAGING SEMI-CIRCULAR SPLIT RING BEARING HALVES

Thomas M. Jeruzal, Brighton, Mich., assignor to Chrysler Motor Corp.

Filed Aug. 18, 1988, Ser. No. 233,389

Int. Cl.[4] B65D *85/58*

U.S. Cl. 206—318 4 Claims

1. A tray for packaging semi-circular split ring bearing halves, the tray including a plurality of elongated compartments each comprising a bottom wall from which extends a

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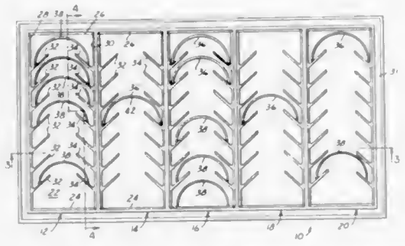
pair of upstanding oppositely disposed end walls and a pair of upstanding oppositely disposed side walls, the compartments being arranged in a row in side-by-side relationship, the upper edges of the side walls of each pair of adjacent compartments being connected, each compartment having a row of spaced apart upstanding ribs on the bottom wall thereof adjacent each side wall, each rib in each row being oppositely disposed with respect to a rib in the other row of the compartment, each rib extending inwardly of the compartment from the adjacent side wall and angled towards one end wall of the compartment to



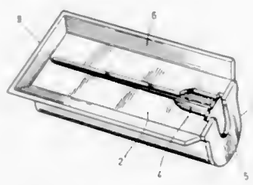
define a herringbone structure, the ribs being of substantially less height than the side and end walls of each compartment and of less height than the width of the bearing halves to be received in the tray, the side and end walls of each compartment being of greater height than the width of the bearing halves to be received in the tray, bearing halves being receivable in the tray compartments with one side edge thereof resting on a bottom wall with the concave surface thereof facing the other of said end walls of the compartment and with a pair of oppositely disposed ribs being present between each pair of adjacent bearing halves.

4,917,243

NEEDLE DISPOSAL DEVICE

Stuart G. Abrams, League City, and Keith E. Dyer, Galveston, both of Tex., assignors to The Board of Regents, University of Texas System, Austin, Tex.

Filed Aug. 16, 1988, Ser. No. 232,921
Int. Cl.[4] B65D *85/64*
U.S. Cl. 206—365 17 Claims



1. A disposal device for a needle, comprising:
a container for the needle, said container having at least one surface including an elongated slit shaped to accommodate the needle along its longitudinal axis;
an end substantially perpendicular to said slitted surface; and
a separator disposed in said end for separating the needle from a syringe.

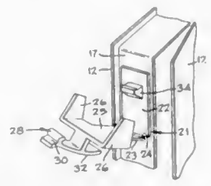
17. A method for inserting a needle into a needle disposal device comprising the steps of:
a. providing a container having at least one surface defining an elongated slit;
b. positioning the needle above said slit so that the longitudinal axis of said needle is substantially parallel to said slitted surface of said container;
c. forcing the positioned needle through said slit and into said container; and
d. separating the needle from the syringe so that the needle is retained in the container.

4,917,244

LIBRARY BOX CLOSURE DEVICE AND HANGER

Richard C. Sayers, Opelika, Ala., assignor to Ampex Corporation, Redwood City, Calif.

Filed Sep. 12, 1988, Ser. No. 243,571
Int. Cl.[4] E04G *5/06*
U.S. Cl. 206—387 3 Claims



1. A closure device mountable on a cassette storage box defined by opposite lateral covers separated by interposed side walls, with one side wall hinged to open and close the box, said device operable to effect closure of the box for storage, and including apparatus for hanging the closed storage box on a suitable apparatus for storage, said device comprising:
a hinge structure;
a first hinge portion of the hinge structure mountable on a side wall of the storage box and disposable opposite from the hinged side wall of the storage box;
a second hinge portion of the hinge structure pivotable about the first hinge portion, said second hinge portion having opposite end walls operable to engage and enclose opposite facing lateral covers of the closed storage box to retain said storage box in the closed position;
a first detent on the first hinge portion;
a complementary detent on the second hinge portion; and
a hook portion disposed on the second hinge portion, the complementary detents operable to retain the closure device in a locking position with respect to the cassette storage box and the hook portion operable for hanging the closed cassette storage box on a suitable apparatus for storage when the box is in the closed position.

4,917,245

STRUCTURE OF VACUUM FORMING PLASTIC PACKING CASE

Paull Wu, Taipei, Taiwan, assignor to All-Prime Enterprise Corp., Taipei, Taiwan

Filed Sep. 19, 1989, Ser. No. 409,107
Int. Cl.[4] B65D *85/20*
U.S. Cl. 206—471 3 Claims

1. A vacuum formed plastic packing case, comprising:
an outer casing with a slotted body for receiving a product, said outer casing having a plurality of retaining slots formed at each of its ends, and a channeled bottom portion formed by folding a periphery of the outer casing inward;
a plurality of inner casings, each having an external channel at its top surface, made according to the shape of the product to be packed, the product to be retained in the channels of said inner casings;
a base member comprising a rigid board for insertion into said channeled bottom portion of said outer casing;
said inner casings being received in said outer casing and secured therein by fitting the inner casings into said retaining slots and by inserting said base member into said channeled bottom portion of the outer casing so that the

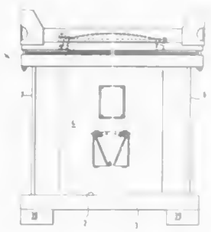
packed product is firmly supported by said inner casings and retained within said outer casing.

4,917,246

STACKABLE, STABLE AND SHOCKPROOF PARALLELEPIPEDIC CONTAINER

Gustav-Dieter Edelhoff, Iserlohn, Fed. Rep. of Germany, assignor to Edelhoff Polytechnik GmbH & Co., Heckenkamp, Fed. Rep. of Germany

Filed Apr. 22, 1987, Ser. No. 41,337
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1986, 3614767
Int. Cl.[4] B65D *45/16*
U.S. Cl. 206—511 7 Claims



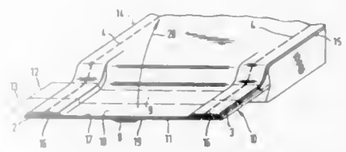
1. A stackable parallelepipedic container comprising a container body having a plurality of side walls, a bottom portion and a top portion, an annular peripheral box-shaped profiled top edge portion located at the top portion of said side walls of said container body and a container cover located on said top portion, characterized in that said container cover consists of a flanged blank having lug-like extensions which protrude from the side edges of the cover and are angled at right angles about the side edges of said cover; profiled metal strips welded to said lug-like extensions and forming an annular peripheral profiled edge portion of said cover; the said profiled edge portion of said cover being supported by a peripheral sealing ring disposed on the top portion of the profiled top edge portion of said container body; said profiled edge portion of said cover and said profiled top edge portion of said container body being provided with aligned bores and being forced against each other by clamp screws extending through said bores; and said container cover having a central portion provided with an opening which is closed by another cover.

4,917,247

PACKAGE FOR PACKING PIECES OF GOODS

Wilfried Jud, Obergrafendorf, Austria, assignor to Teich AG, Obergrafendor-Muehlhofen, Austria

PCT No. PCT/AT87/00041, § 371 Date Apr. 21, 1988, § 102(e) Date Apr. 21, 1988, PCT Pub. No. WO88/00562, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 22, 1987, Ser. No. 180,101
Claims priority, application Austria, Jul. 22, 1986, 1974/86
Int. Cl.[4] B65D *27/34*
U.S. Cl. 206—610 7 Claims



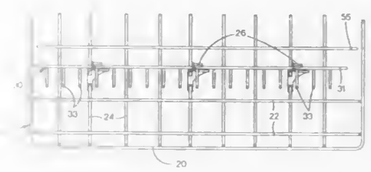
1 Package for packing pieces of goods, especially subdivided or subdividable packing goods having an at least approximately even surface area, with a wrapper made of one piece of flat foldable packing material and having at least two strip-shaped doubling areas, each being formed by two strip-shaped areas of the packing material connected with each other at the surface of the packing material generally facing the packing goods, to form a strip-shaped sealing zone, so that each doubling area shows an outer free edge, whereby the wrapper is opened by severing the sealing of the sealing zone of at least one of the doubling areas, characterized in that the wrapper includes two spaced strip-shaped doubling areas (2,3) at said at least approximately even surface area, that a predetermined break line (4) of the packing material is arranged in one strip-shaped packing material of each strip-shaped doubling area (2,3) within and along its strip-shaped sealing zone, and that a tearing up zone (18) of the wrapper is provided laterally defined by said break lines in said two doubling areas.

4,917,248

DISHWASHER RACK WITH MOVABLE FENCE

Stephen H. Friskney, Connersville, Ind., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jan. 12, 1989, Ser. No. 296,437
Int. Cl.[4] A47G *19/08*
U.S. Cl. 211—41 14 Claims



1. A dishwasher rack assembly comprising wire members secured together to form a generally horizontal bottom wall, a fence pivotally mounted on said bottom wall for movement between a folded horizontal position and an erect vertical position, said fence having a base wire member defining an axis and a plurality of projecting wires secured to said base wire member and extending at an angle to said axis, means journaling said base wire member for both rotational and longitudinal movement with respect to said axis, and detent means secured to said rack engageable with one of said projecting wires for holding said fence in said erect position, said one projecting

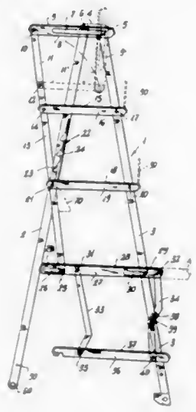
258-452 O.G.-90-7

wire being engageable and disengageable with said detent means by longitudinal movement of said fence along said axis.

4,917,249
COLLAPSIBLE CLOTHING RACK
Shaylor E. King, 52687 Stephen Pl., Elkhart, Ind. 46514
Filed Apr. 18, 1989, Ser. No. 340,045
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—86 3 Claims

1. In combination, a rack adapted to support clothing, and a support structure having a substantially flat support surface, said rack comprising a support frame including a base, a generally L-shaped rod connected to said base and extending upwardly above said support structure, a clothes support rod detachably connected to said L-shaped rod above said support structure flat surface, and support means adjustably connected to said L-shaped rod for contacting said flat surface at a top face thereof, said base abutting said flat surface at a bottom face thereof, said base and support means constituting means for detachably securing said rack to said support structure.

4,917,250
FOLDING SHELF FURNITURE UNIT
Raul Barbieri, and Giorgio Marianelli, both of Via Faruffini, 13, 20149 Milan, Italy
Filed Jun. 24, 1988, Ser. No. 211,371
Claims priority, application Italy, Jul. 16, 1987, 21234 A/87
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—149 13 Claims

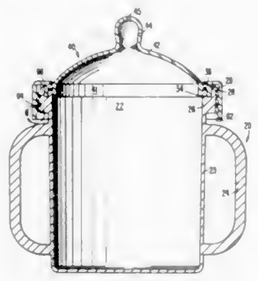


1. A furniture shelf unit, comprising
front legs and rear legs upperly hinged together,
a plurality of shelves rotatably supported upon said front legs,
bars additionally supporting said plurality of shelves, with said front legs, bars, and plurality of shelves together forming an articulated parallelogram structure, and
means for coupling at least one of said plurality of shelves with said rear legs and comprising,
means associated with said at least one shelf and counter-means associated with said rear legs, and both said shelf and said counter-means arranged to cooperate with one another, for modifying attitude or inclination of said plurality of shelves and spacing said front and rear legs closer together or further apart from one another.

4,917,251
CONTAINER FOR PROVIDING FROTHY BEVERAGES
Eric Favre, Saint-Barthelemy, Switzerland, assignor to Nestec S.A., Vevey, Switzerland
Filed Jun. 14, 1988, Ser. No. 206,311
Claims priority, application Switzerland, Jul. 3, 1987, 2541/87
Int. Cl.[4] A47G *19/22, 19/23*
U.S. Cl. 215—1 R 12 Claims

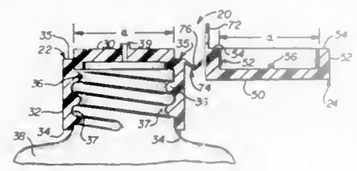
1. A container for improving formation of a surface froth of beverages dispensed therein comprising an interior base portion extending to a sidewall portion, each portion defining an interior beverage containing surface, the base portion having a shape of an ellipsoid of revolution having an eccentricity of from 1.15 to 5.0.

4,917,252
NURSING BOTTLE ASSEMBLY
Debra Chambers, Rte. 3, Box 85-B, Warren, Ark. 71671, and Donald R. Russell, 2017 Archdale St., Broken Arrow, Okla. 74014
Filed Apr. 21, 1989, Ser. No. 341,559
Int. Cl.[4] A61J *9/00, 11/00, 11/04*
U.S. Cl. 215—11.1 20 Claims



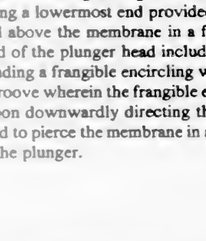
1. A nursing bottle assembly comprising:
a nipple member having at least two openings and an outer annulus which extends downwardly from an end at a widest of said openings of said nipple member;
a bottle member including at least one opening and an upper portion adjacent said opening of said bottle member, said upper portion having:
an outer upwardly extending projection with external threads; and
an inner upwardly extending projection, said inner projection is spaced from said outer projection at a distance sufficient for receiving said outer annulus of said nipple member between said inner and said outer projections of said bottle member to substantially prevent sidewise movement of said widest opening end of said nipple member relative to said bottle member; and
a securing ring having an internally threaded portion engaged with said external threads of said bottle member outer projection and a flange extending over said nipple member a distance sufficient to substantially prevent said widest opening end of said nipple member from being pulled vertically away from the bottle member;
wherein said nipple member further comprises an inner annulus which extends downwardly from the widest of said openings of said nipple member to define, with said outer annulus, a circumferential groove between the outer and inner annulus of said nipple member and said inner annulus is disposed interiorly of said inner projection of said bottle member upper portion.

4,917,253
CONTAINER-CLOSURE WITH FOLD OVER PROJECTIONS
Herbert V. Dutt, Sarasota, Fla., assignor to Continental Plastics, Inc., Triadelphia, W. Va.
Filed Mar. 30, 1989, Ser. No. 330,648
Int. Cl.[4] B67D *3/00*
U.S. Cl. 215—235 21 Claims



1. A closure for a container having a neck with external engagement means for receiving and retaining said closure, said closure comprising:
a closure body having a closure body end wall and a closure body cylindrical skirt member depending from said closure body end wall, said closure body end wall having a dispensing opening and said closure body cylindrical skirt member having internal engagement means complimentary to said external engagement means on the container neck for selectively securing said closure body to said container,
a closure lid having a closure lid end wall and a closure lid cylindrical skirt member depending from said closure lid end wall and terminating in a free end,
a hinge means pivotally connecting said closure body to said closure lid for movement of said closure lid from an open position in which the contents of said container can be dispensed to a closed position in which the contents of said container cannot escape, and
at least one resilient projection extending axially from said free end of said closure lid cylindrical skirt member which contacts said closure body end wall to space said closure lid from said closure body to prevent interference of said closure lid with said closure body while material is being dispensed from said container and which folds over when said closure lid is closed on said closure body.

4,917,254
SANITARY DISPOSABLE CONTAINER
Brian L. Ciriacks, 1995 Hwy. 83 South, Hartford, Wis. 53027
Filed Apr. 17, 1989, Ser. No. 339,222
Int. Cl.[4] B65D *90/00, 25/00*
U.S. Cl. 220—1 T 3 Claims



1 An extensible and retractable sanitary disposable container comprising,
a floor including a right accordion wall, a left accordion wall, a forward accordion wall, and a rear accordion wall wherein each of the walls extend upwardly and orthogonally relative to the floor, and
a lid slidably mounted proximate upper terminal ends of the walls wherein the lid includes securement means for selective securement of the lid in association with the forward accordion wall, and
wherein the accordion walls are integrally secured to one another and to the floor to provide a container of generally rectangular cross-sectional configuration, and
wherein the floor comprises a rigid planar floor, and
wherein an S-shaped rib is secured to an upper terminal edge of the left accordion wall and further including a right S-shaped rib integrally secured to an upper edge of the right accordion wall, and a forward flange secured to the upper terminal end of the forward accordion wall, and a rear flange secured to an upper terminal edge of the rear wall, wherein the forward and rear flanges are generally planar and wherein the forward and rear flanges respectively are secured to the left and right S-shaped ribs to provide a continuous upper perimeter rigid member, and
wherein the lid includes a U-shaped left side extending downwardly from an upper surface of the lid and further including a U-shaped right side extending downwardly from the lid spaced from the left side and wherein the U-shaped left and right sides are of a complementary configuration to sidably receive the respective left and right S-shaped ribs, and
wherein the rear flange includes a slot, and
wherein the lid includes a flexible membrane sealingly secured to a bottom surface of the lid and further including a plunger head extending through the lid with the plunger head including a lowermost end provided with a piercing point spaced above the membrane in a first position, and an upper end of the plunger head including an encircling groove including a frangible encircling washer positioned within the groove wherein the frangible encircling washer is broken upon downwardly directing the plunger interiorly of the lid to pierce the membrane in a second lowered position of the plunger.

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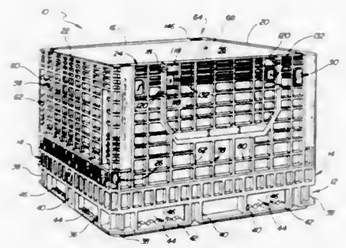
4,917,255

COLLAPSIBLE CONTAINER

Dennis M. Foy, Birmingham, and Charles Baughman, Southfield, both of Mich., assignors to J.I.T. Corporation, Southfield, Mich.

Filed Feb. 24, 1989, Ser. No. 315,478
Int. Cl.[4] B65D *88/52*
U.S. Cl. 220—4 F 16 Claims



1. A collapsible container assembly (**10**) comprising;
a base (**12**) having a plurality of sides (**14**);
a pair of side walls (**16,18**) and a pair of end walls (**20,22**), each wall adapted to be extended vertically upward from a side (**14**) of said base (**12**) to define an interior portion (**24**) of said container (**10**) and including wall hinge means (**26**) interconnecting each of said side and end walls (**16,18,20,22**) to said base (**12**) and moveably supporting said walls as said walls are moved between a collapsed position to an upright position;
locking means (**64**) on adjacent side and end walls (**16,18,20,22**) for providing interlocking engagement therebetween when said walls are in said upright position;
said locking means (**64**) including a flange (**66**) disposed on said side wall (**16,18**) along a substantial portion of the length thereof, said flange (**66**) including at least one locking tab (**68**) extending away from said interior (**24**) of said container (**10**), said locking tab (**68**) including an outermost surface (**70**) disposed furtherest from said interior (**24**) of said container (**10**) and first and second locking surfaces (**72,74**) extending between said outermost surface (**70**) and said side wall flange (**66**) and further including a contact surface (**76**) extending between said outermost surface (**70**) and said side wall flange (**66**) and between said first and second locking surfaces (**72,74**) and forming an obtuse angle with respect to said outermost surface (**70**);
said locking means (**64**) further including a flange (**78**) disposed on said end wall (**20,22**) along a substantial portion of the length thereof and extending perpendicular to said end wall (**20,22**) and means (**80**) disposed on said end wall flange (**78**) for receiving said at least one locking tab (**68**) in a snug fashion and thereby locking said walls (**16,18,20,22**) from said relative movement with, respect to each other;
said end wall (**20,22**) including a guide surface (**82**) disposed on said end wall (**20,22**) directly adjacent said end wall (**20,22**) flange (**66**), said contact surface (**76**) on said at least one locking tab (**68**) adapted for sliding frictional engagement with said guide surface (**82**) on said end wall (**20,22**) as said side wall (**16,18**) is moved from said collapsed position to said upright position to guide said tab (**68**) into locking engagement with said means (**80**) for receiving said locking tab (**68**) and for preventing relative movement of said walls with respect to each other when in said upright position.

6. A collapsible container assembly (**10**) comprising;
a base (**12**) having a plurality of sides (**14**);
a pair of side walls (**16, 18**) and a pair of end walls (**20, 22**), each of said walls adapted to be extended vertically upward from a side (**14**) of said base (**12**) to define an interior portion (**24**) of said container (**10**) and including wall hinge means (**26**) interconnecting each of said side and end walls (**16, 18, 20 22**) to said base (**12**);
at least one of said side walls (**16, 18**) including an opening (**114**) therein, and including a door (**116**) disposed in said opening (**114**) of said side wall (**16, 18**) for opening and closing said opening (**114**) to allow access to the inside **24**) of the container assembly (**10**) through said side wall when said side wall (**16, 18**) is in the vertical position, said door (**116**) including at least one locking tab (**118**) disposed along the periphery thereof and extending outwardly from said door (**116**);
means (**120**) disposed on said opening (**114**) in said side wall (**16, 18**) for receiving said locking tabs (**118**) in a snug fashion and thereby locking said door (**116**) from relative movement with respect to said opening (**114**) in said side wall (**16, 18**);
said assembly characterized by said at least one locking tab substantially defining at least one delta-shaped tab (**118**);
said means (**120**) disposed in said opening (**114**) in said side wall (**16, 18**) for receiving said delta-shaped tab (**118**) being at least one substantially delta-shaped interruption (**122**) disposed at a predetermined position along said opening (**114**) of said side wall (**16, 18**).

9. A collapsible container assembly (**10**) comprising;
a base (**12**) having a plurality of sides (**14**);
a pair of side walls (**16, 18**) and a pair of end walls (**20, 22**), each wall adapted to be extended vertically upward from a side (**14**) of said base (**12**) to define an interior portion (**24**) of said container (**10**) and including wall hinge means (**26**) interconnecting each of said side and end walls (**16, 18, 20, 22**) to said base (**12**) and movably supporting said walls (**16, 18, 20, 22**) as said walls are moved between a collapsed position to an upright position;
wall latching means (**90**) for releasably latching adjacent side and end walls (**16, 18, 20,22**) together when said side and end walls (**16, 18, 20, 22**) are in the upright position;
said wall latching means (**90**) including a latch member (92) moveable between latched and unlatched positions;
said assembly characterized by said wall latching means (90) including an exterior latch actuator (**102**) disposed on the exterior of said container (**10**) and means (**96**) disposed on the interior (**24**) of said container (**10**), said means (**96**) including an interior latch actuator (**100**) disposed on the interior (**24**) of said container (**10**), said interior latch actuator (**100**) and said exterior latch actuator (**102**) operatively connected to said latch member (**92**) for moving said latch member (**92**) to said unlatched position.

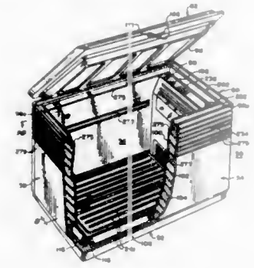
4,917,256

INTERLOCKING AND SEALING ARRANGEMENT FOR MODULAR DOMESTIC APPLIANCES

Richard W. Kruck, Sodus Township, Berrien County; Kevin S. Laundroche, Detroit, both of Mich., and Ralph R. Burin, Milton Township, DuPage County, Ill., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 12, 1988, Ser. No. 217,990
Int. Cl.[4] B65D *6/24*
U.S. Cl. 220—4 F 40 Claims

1. A knockdown domestic appliance unit comprising a plurality of side panels and a base panel, said base panel and said side panels having in the edges thereof cooperating integral means for interlocking said panels together, whereby said side panels may be readily assembled to said base panel and to each other by simple engagement of said interlocking means in said panel edges without the use of tools or separate fastening means, said interlocking means including elongated slots in said base panel which extend inwardly and downwardly therein at an angle to the vertical, and projecting tongues on the bottom edges of said side panels which extend into said slots, and cooperating interlocking shoulders on said side panels and said base panel which are engaged as said tongues are inserted into said slots, said interlocking shoulders being positioned between said slots on said base member and between said tongues on said side panels.

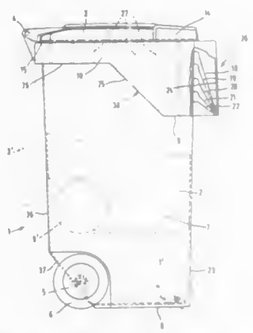


4,917,257

GARBAGE CAN

Gustav D. Edelhoff, Iserlohn, Fed. Rep. of Germany, assignor to Edelhoff M.S.T.S., Dusseldorf, Fed. Rep. of Germany

Filed Apr. 22, 1988, Ser. No. 184,884
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1987, 3713513
Int. Cl.[4] B65F *1/12*
U.S. Cl. 220—1 T 19 Claims



1. A garbage can comprising a barrellike can body which is provided with front, rear and side walls, and which is substantially rectangular in cross-section and tapers downwardly to its bottom and is provided with top front, rear and side edges, a cover, which is hinged to the top rear edge of the can body, a receptacle forming a receiving pocket, which is provided adjacent to the front edge of the top opening of the can body and is adapted to receive a grab claw of a lifting and tilting mechanism, and a pair of axially aligned casters, which are eccentrically mounted adjacent to the bottom of the can body, characterized in that the bottom of the can body is connected by an inclined wall portion to the rear wall of the can body, said inclined wall portion and the bottom of the can body are formed with laterally disposed re-entrant portions, which constitute recesses, and the casters are rotatably mounted on a common axle or an aligned stub axles fitted in holders and are disposed inside the imaginary envelope of the can body which surrounds the inclined wall portion and the recesses, said can body integrally formed below its top opening with an annular peripheral jacket, which is connected by stiffening ribs to the upper wall portions of the can body, and the receiving pocket for receiving the grab claw is provided in the space between the front wall of the can body and the front portion of the jacket and said stiffening ribs are approximately parallel to each other and to the longitudinal edges of the can body, whereby said garbage can can be nested with another garbage can without interference from said casters.

4,917,258

SNAP-ON LID FOR OPENED SOFT DRINK CANS

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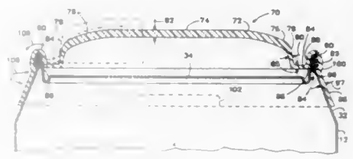
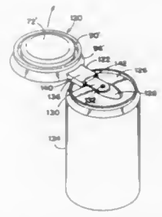
Filed Dec. 1, 1988, Ser. No. 279,344
Int. Cl.[4] B65D *53/00*
U.S. Cl. 220—240 20 Claims





1. A lid for closing the top of a beverage container having an upper portion which is surmounted by a bead protruding radially outwardly and extending circumferentially thereabout, comprising:
(a) a dome;
(b) collar means, surrounding said dome and having respective outer and inner sides thereof defining a downwardly open circumferential groove, for receiving and elastically gripping said bead;
(c) annular ring means of flexible resilient material, for interconnecting said dome movably with said inner side of said collar means and providing for progressive upward movement of said dome relative to said collar means in response to increased pressure within a container closed by said lid;
(d) radially inwardly directed lip means associated with said outer side of said collar means, for elastically gripping said upper portion of said container downwardly adjacent said bead with radially inwardly directed sealing force, wherein said sealing force increases in response to increased upward movement of said dome relative to said collar means;
(e) a frusto-conical skirt of resilient material depending downwardly and outwardly from said collar means; and
(f) an opener extending radially outwardly away from said frusto-conical skirt, said opener being tubular and defining mouth means for receiving and manipulating an opener lever of an easy-opening beverage can.

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4,917,259

END CLOSURE FOR A PACKAGING CONTAINER

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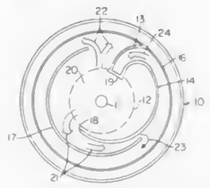
Filed Feb. 10, 1989, Ser. No. 210,608
Claims priority, application Sweden, Feb. 16, 1988, 8800515
Int. Cl.[4] B65D *41/50*
U.S. Cl. 220—270 4 Claims



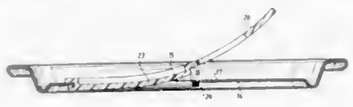
1. An end closure for a packaging container comprising: at least an outer layer formed by injection molded material having an easy opening device arranged therein including a grip, a circumferential tearing denotation inwardly adjacent a periphery of said outer layer, a first tearing denotation extending from said grip to said circumferential tearing denotation, a second tearing denotation spaced from said first tearing denotation and spaced inwardly of said circumferential tearing denotation and extending in a generally spiral shaped path, and a blind groove inwardly spaced from said circumferential tearing denotatio and extending generally circumferentially about a material flow region defined thereby and by said first, second, and circumferential tearing denotations, said blind groove and said first tearing denotation and said blind groove and said second tearing denotation further defining a plurality of material flow passages through which injected material will flow when exiting said material flow region, whereby an outer layer is formed including sharp and well defined tearing denotations.

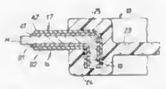
4,917,260

METAL CAN ENDS WITH PLASTICS CLOSURES

Peter J. Heyes, Wantage, and Nicholas J. Middleton, Highworth, both of England, assignors to CMB Packaging (UK) Limited, Woodside, England

PCT No. PCT/GB88/00847, § 371 Date Jun. 9, 1989, § 102(e) Date Jun. 9, 1989, PCT Pub. No. WO89/03349, PCT Pub. Date Apr. 20, 1989
PCT Filed Oct. 12, 1988, Ser. No. 378,211
Claims priority, application United Kingdom, Oct. 15, 1987, 8724245
Int. Cl.[4] B65D *17/34*
U.S. Cl. 220—270 18 Claims





1. A metal can end having a central panel with an aperture therein and a one-piece tear-open closure of a polymeric material moulded on to the central panel, the closure comprising a plug part filling the aperture, a rim surrounding the aperture at least on the under side of the central panel and a pull tab joined laterally to the plug part and lying against the upper side of the central panel, the can end being provided on its under side with a coating of a polymeric material bonded to the polymeric material of the rim of the closure, characterised in that the can end is provided on its upper side with a coating whose outer surface is of a polymeric material different from the polymeric material of the under side coating and chosen so as not to bond with the polymeric material of the closure but to be capable of being laminated in film form to the metal simultaneously with the polymeric material of the coating on the under side, and to protect the metal of the can end from corrosion and from the effects of double seaming the can end to a can body.

4,917,261

VACUUM-FORMED CONTAINER WITH U-SHAPED LOCK

Rodney D. Borst, Oregon, Wis., assignor to Placon Corporation, Madison, Wis.

Filed Mar. 18, 1988, Ser. No. 169,989
Int. Cl.[4] B65D *45/18*
U.S. Cl. 220—324 14 Claims

1. A reclosable thermoplastic container comprising:
(a) a base having a plurality of upright side walls with a peripheral edge extending outwardly from a side wall;
(b) a cover having a peripheral edge and adapted to close upon and cover the base;
(c) a positive locking tab attached to the peripheral edge of the cover by a first hinge having a first flexible line of weakness, the locking tab including downwardly depending straps joined together by a bridging member, wherein the straps and bridging member together define a U-shaped grasping handle and the bridging member defines a first camming surface; and
(d) a locking catch extending from a base side wall in corresponding alignment with the locking tab wherein the locking catch is provided with a second camming surface located substantially below and inwardly toward the base side wall from the peripheral edge which is adapted to positively engage the first camming surface of the locking tab such that when the cover is in closed position on the base, the first camming surface of the locking tab engages the second camming surface of the locking catch to prevent the locking tab from returning to an unlocked position without assistance; and wherein a section of the hinge closely underlies the base peripheral edge, when the first and second camming surfaces are engaged, to resist upward forces transmitted from the cover.

9. A one-piece reclosable thermoplastic container comprising:
(a) a base having a bottom wall and side walls extending upwardly therefrom, and peripheral edges extending outwardly from the base side walls;
(b) a cover having peripheral edges wherein one edge of the cover is connected to one edge of the base by a flexible line of weakness forming a cover hinge such that the cover may close upon and cover the base; and
(c) a closure mechanism for positively engaging the cover to the base, the closure mechanism comprising a locking tab attached to a peripheral edge of the cover by a locking hinge having a flexible line of weakness, wherein the locking tab includes a U-shaped grasping handle containing two downwardly depending parallel straps joined together at the end opposite the peripheral edge of the cover by a bridging member, the bridging member including a first camming surface; the closure mechanism further comprising a locking catch extending from a base side wall in corresponding alignment with the locking tab, wherein the locking catch is provided with a second camming surface located substantially below and inwardly toward the base side wall from a base peripheral edge which is adapted to positively engage the first camming surface of the locking tab, such that when the cover is in closed position on the base, the first camming surface of the locking tab engages the second camming surface of the locking catch to prevent the locking tab from disengaging from the locking catch without user assistance because of the engagement of the locking tab onto the locking catch, the locking tab further comprising a spring-like flap which presses against the locking catch to effect a snug-fit relationship between the first camming surface and the second camming surface.

4,917,262

COOKING VESSEL WITH ADJUSTABLE VENT SPACES

Masamichi Mita, Ashikaga, Japan, assignor to Mita Alumi Ind. Co., Ltd., Tochigi, Japan

Filed Dec. 29, 1988, Ser. No. 291,783
Claims priority, application Japan, Nov. 8, 1988, 63-144991
Int. Cl.[4] B65D *51/00*
U.S. Cl. 220—366 6 Claims

1. A cooking vessel, comprising in combination:
a pot having a generally concave shape defining an interior and a substantially circular opening, said opening having an upper edge, said upper edge having at least one circumferential portion forming a first stepped part having an upper end and a lower end, and at least one circumferential portion forming a first guide part extending in a circumferential direction from said lower end to said upper end of said first stepped part; and
a lid adapted to close said opening, said lid having a lower edge adapted to mate with said upper edge of said pot, said lower edge having at least one circumferential portion forming a second stepped part having an upper end and a lower end, and at least one circumferential portion forming a second guide part extending in said circumferential direction from said lower end to said upper end of said second stepped part;
whereby said lid rests upon said pot with said edges in substantially abutting relation to substantially close said opening of said pot, and upon rotation of said lid in said circumferential direction said lid rests upon said pot with portions of said first and second guide parts in substantially abutting relation and said first and second stepped parts and remaining portions of said first and second guide parts in spaced opposed relation to thereby define at least one space providing unrestricted access to said interior, the area of said space being a function of the angle of rotation of said lid.

4,917,263

HOUSEHOLD CONTAINER ASSEMBLY WITH ADAPTABLE LID FOR A PLURALITY OF BAGS

Yaakov Korb, 23945 Mercantile Rd., Beachwood, Ohio 44122

Filed Dec. 9, 1988, Ser. No. 281,659
Int. Cl.[4] B65D *7/12*
U.S. Cl. 220—404 12 Claims

1. A household container assembly which comprises:
a container having a top rim defining an opening at the top of the container;
a first bag located within the container, the first bag having an open end supported by attachment to the top rim of the container;
an adapter partially covering the container opening; the adapter being removably attached to the top rim of the container, the adapter having an inner rim defining an opening which is smaller than the container opening, the adapter helping to secure the open end of the first bag to the top rim of the container when the adapter is attached to the top rim of the container;
a second bag located within the container, the second bag having an open end supported by attachment to the inner rim of the adapter; and
a lid removably attached to the inner rim of the adapter and covering the adapter opening, the lid helping to secure the open end of the second bag to the inner rim of the adapter when the lid is attached to the inner rim of the adapter;
whereby the first bag may be released by removing the adapter from the container without releasing the second bag, and the second bag may be released by removing the lid from the adapter without releasing the first bag.

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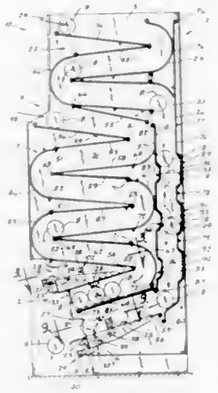
4,917,264
DOUBLE-DEPTH MODIFIED SERPENTINE CAN VENDER

Joseph F. Gasiel, Peru; Paul L. Hawkins, and Jeffery J. Wilson, both of Guthrie Center, all of Iowa, assignors to Fawn Engineering Corp., Des Moines, Iowa

Filed Dec. 27, 1988, Ser. No. 291,005
Int. Cl.[4] B65H *3/44*
U.S. Cl. 221—124 7 Claims



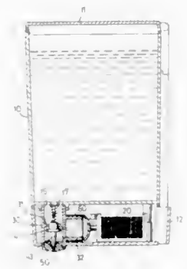
1. In an article dispensing machine:
a cabinet including one or more vertically disposed columns;
each column including a first serpentine track unit having an upper article receiving end and a lower article dispensing end, each column including further a second track unit having an upper serpentine section disposed above said first serpentine track unit and having an upper article receiving end, and having further a rear track section connected to said upper serpentine section and disposed behind said first serpentine track unit and having a lower article dispensing end, said rear track section substantially straight and normally vertically disposed, and disposed normally behind substantially the entire vertical extent of said first serpentine track unit; and
article release units secured to said cabinet means at said lower ends of said first serpentine track unit and said second track unit for controlling the dispensing of articles therefrom.

4,917,265
AUTOMATIC LIQUID DISPENSER

Meng C. Chiang, 4Fl., No. 19, Lane 60, Chung Hua Rd., Hsin-Tien City, Taipei Hsien, Taiwan

Filed May 4, 1988, Ser. No. 190,115
Int. Cl.[4] B67D *5/08*
U.S. Cl. 222—52 4 Claims

1. A liquid dispenser comprising:
an openable housing for retaining a quantity of a dispensing liquid, including an outlet at a lower face thereof which is composed of a plurality of holes, and a downwardly extending prong on the lower face of the outlet, said prong being encompassed by a spring member;
a base tray mounted to a lower face of said housing defining a chamber for installation of a sensor means and a valve control means, said base tray incorporating an outlet port disposed on a lower face thereof;
said sensor means substantially sensing a need for dispensing liquid, including a relay and a circuit board, the relay including an axle rod for actuating the valve control means;
said valve control means which is responsive to said sensor means comprising:
a cylinder for transferring liquid from the housing to an external part of the housing;
a plurality of horizontal panels extending from the inner wall of the cylinder toward the central portion of the cylinder;
a horizontally extending branch sleeve integrally connected with said cylinder, the branch sleeve being functionally connected to the axle rod of said sensor means through a rubber sleeve for operation in response to said sensor means;
a vertically located hollow sleeve-like movable plug having a circumferential flange on a central face and a downwardly extending protrusion on a lower part thereof within said cylinder, said movable plug being connectable to a rubber plug having a vent therein, said rubber plug being engageable with a bushing when said movable plug is urged downward and disengageable with the bushing when said movable plug is urged upward;



said spring member urging the rubber plug to engage with the bushing such that the opening of the bushing is sealed to close the dispenser, and liquid is allowed to flow through the sector-shaped holes of the outlet and the opening defined by said plurality of horizontal panels to fill the internal cavity of the cylinder and the branch sleeve;
said sensor means sensing an infra-red signal to actuate the relay, and the axle rod thereof pressing the rubber sleeve, thereby urging the movable plug upward until the flange thereof contacts with the sector-shaped panels of the cylinder opening the dispenser; the flange of the movable plug sealing the central opening defined by the panels of the cylinder such that the liquid retained in the upper part of the cylinder cannot flow down any further, and the dispenser is opened and dispenses a predetermined amount of dispensing liquid.

4,917,266
DISCHARGE SPOUT CONSTRUCTION FOR COLLAPSIBLE RECEPTACLE

David Kellenberger, Sherman; Nancy Cline, Bells, and Craig Nickell, Sherman, all of Tex., assignors to Super Sack Manufacturing Corporation, Dallas, Tex.

Filed Feb. 3, 1989, Ser. No. 305,624
Int. Cl.[4] B65D *33/38*
U.S. Cl. 222—105 9 Claims

1. An improved discharge spout in the bottom panel of a collapsible receptacle for flowable products comprising:
a substantially cylindrical spout of flexible material;
at least three triangular flaps formed in the bottom panel with intersecting cuts of predetermined length, the outer ends of said cuts forming potential tear locations;
an opening formed in the bottom panel when the triangular flaps are folded into the interior of the receptacle;

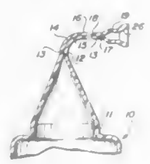
a substantially circularly shaped flap for covering the opening;
means for securing one end of each of the folded flaps to the inner side of the receptacle bottom panel beyond the outer ends of said cuts of predetermined length to form drawstring passageways, said securing means creating a tear resistant buffer zone of predetermined width between a potential tear location and the product to minimize loss of product if said intersecting cuts tend to tear; said securing means simultaneously securing a portion of the circularly shaped cover flap on only one side of the opening and one

end of the cylindrical spout to the bottom panel entirely surrounding the opening on the interior of the receptacle such that the cover flap covers the opening with the spout on the interior of the receptacle; and
a drawstring in the drawstring passageways formed by the secured, folded flaps such that when the drawstring is untied, the cover flap and pouring spout can be withdrawn through the opening and when the receptacle is closed, the spout is inside the receptacle, the opening is closed by the cover panel from the inside of the receptacle and the drawstring is drawn and tied to keep the opening securely closed.

4,917,267
SELF-CLOSING VALVE WITH TAMPER EVIDENT LIP SEAL TAB FOR LIQUIDS, PASTES OR SOLIDS

Roland J. A. Laverdure, 17027 N. 95th Dr., Sun City, Ariz. 85373

Continuation-in-part of Ser. No. 929,613, Nov. 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 816,238, Jan. 6, 1986, abandoned. This application Jul. 8, 1988, Ser. No. 216,856
Int. Cl.[4] B65D *35/08, 35/48*
U.S. Cl. 222—107 8 Claims



1. A sealed container having a squeezable thermoplastic self-closing valve portion capable of discharging liquids, pastes and solids, such as powder, pills, capsules and the like, including a separable shipping lip seal tab having a built-in compression clip lip seal housing portion comprising:
(A) said sealed container having a flexible thermoplastic elongated generally cylindrical outlet nozzle originally molded as part of the container body, said originally molded outlet nozzle includes an enlarged diametrical portion having outer rib reinforcing elements at its extreme outlet end for shaping the built-in compression clip lip seal portion during the thermoforming of the flexible thermoplastic self-closing valve portion:
(B) said squeezable thermoplastic self-closing valve portion is thermoformed and shaped by clamping, heating and compressing the container's elongated discharge outlet nozzle until it outwardly tapers to an adjoining widened, flattened, smooth curved quadrant discharge slot, said discharge slot having opposed nested walls substantially in face to face contact when said self-closing valve is in its normal closed position, said curved quadrant discharge slot retains its structural shape and self-closing integrity by cooling prior to release from the clamping means used for thermoforming, said opposed walls of the curved quadrant discharge slot have a thickness to ensure self-closing snap-back stress said snap-back stress, upon application of digital force at the exterior of the broadened outwardly tapering sides adjoining the widened, flattened curved discharge slot portion of the self-closing valve, is temporarily relieved causing the flattened curved quadrant discharge slot to tend to straighten out and return to its original elongated generally cylindrical outlet nozzle shape for dispensing product, when container is in an upended position:
(C) said separable shipping lip seal tab having a built-in compression clip lip seal housing portion includes:
1. a separable shipping lip seal tab portion integrally extending from the flattened curved quadrant discharge slot,
2. said separable shipping lip seal tab portion heat sealed, gas tight, for prevention of product discharge prior to consumer usage,
3. said separable shipping lip seal tab scored for tear-away separation for exposing the flattened curved self-closed discharge slot outlet for dispensing of product by the consumer,
4. said separable shipping lip seal tab extending into a pocketed built-in compression clip lip seal housing portion,
5. said built-in compression clip lip seal housing portion being formed of a size and shape to permit hand pressing for further compressing said portion over the exposed self-closed flattened curved quadrant discharge slot outer lip, whereby said scored section of said shipping lip seal tab being partly severed at said scored section, prior to purchase, indicates possible tampering for rejection by the consumer.

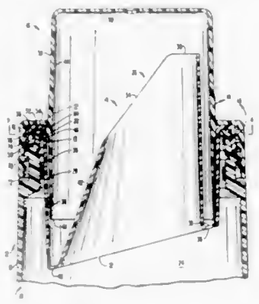
4,917,268
LIQUID DISPENSING PACKAGE WITH DRAINBACK SPOUT

G. Edward Campbell, Pleasanton, Calif.; Vincent R. Lomax, Mesa, Ariz.; Jack Buelow, Danville, and Mark T. Hanses, San Ramon, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Jan. 20, 1988, Ser. No. 209,221
Int. Cl.[4] B67D *1/16*
U.S. Cl. 222—109 19 Claims

1. A package for containing and dispensing liquids comprising:
(a) a container for containing liquids having a hollow body defining a liquid chamber therein and an upwardly directed finish having an opening therein;
(b) a fitment fitted in said opening, said fitment including thereon a frustoconical spout for dispensing liquids therethrough; and
(c) interlock and centering means on said finish and fitment for preventing rotation of said fitment with respect to said finish as well as centering said fitment with respect to said finish on a common central axis, said interlock and centering means comprising a plurality of teeth spaced around said fitment projecting readially inwardly interengaging with cooperating ramp projections on said finish projecting radially outwardly substantially entirely around said fitment and finish,
wherein said ramp projections have at least one shape, the first shape being a one-sided ramp on said finish and hav-

ing a leading edge wall making an obtuse angle to a tangent to the side wall of said finish and a trailing edge wall which is radially directed from a tangent to the side wall of said finish, said teeth and one-sided ramps being so dimensioned and positioned such that the teeth will pass over said ramps when said fitment is rotated with respect to said finish in one direction and will be stopped by said trailing edge wall to prevent rotation when rotated in the opposite direction,



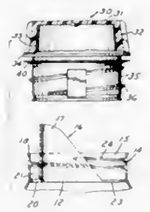
said ramps further comprising a second shape, said ramps of the second shape being two-sided and having leading and trailing edge walls which join together at an apex each making an acute angle to the radial direction through the apex, said teeth and said two-sided ramps being dimensioned and positioned so that said teeth are adapted to contact said leading and trailing edge walls or said apex of said ramps and thereby to center said finish with respect to said fitment.

4,917,269

LIQUID CONTAINING AND DISPENSING PACKAGE

Timothy J. Fuchs, Perrysburg; William E. Fillmore, Toledo, and Eugene F. Haffner, Maumee, all of Ohio, assignors to Owens-Illinois Closure Inc., Toledo, Ohio

Filed May 10, 1989, Ser. No. 349,676
Int. Cl.[4] B67D *1/16*
U.S. Cl. 222—109 5 Claims



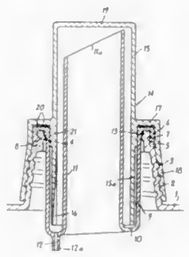
1. A liquid containing and dispensing package comprising:
a plastic container having a neck defining an inner spout and an outer annular wall surrounding the spout and spaced radially outwardly for said spout,
said outer wall having an internal thread on the inner surface thereof,
a plastic closure including a base wall,
a peripheral wall having a free edge and external threads on the outer surface of the peripheral wall, and a radial flange intermediate the base wall and the free edge above the threads,
said internal threads on said outer wall of said container engaging said external threads on said container and said radial flange on said container engaging said outer wall of said container,
said closure including and integral flexible radially outwardly extending sealing lip positioned on the outer surface of the peripheral wall above the external threads and extending radially lineal and closely adjacent said flange such that upon threading of the closure on the container the sealing lip flexes upwardly upon engagement with the inner surface of the outer wall of the container to seal the container adjacent said flange and above said threads.

4,917,270

CLOSURE DEVICE WITH POURING NOZZLE AND POURING SPOUT METERING STOPPER

Patrick Simon, Gautier, France, assignor to Societe de Conseils et D'Etudes des Emballages S.C.E.E., Seine et Marne, France

Filed Jun. 29, 1988, Ser. No. 214,552
Claims priority, application France, Jun. 29, 1987, 87 09145
Int. Cl.[4] B67D *1/16*
U.S. Cl. 222—111 13 Claims



1. In a closure device with a pouring nozzle and metering stopper for a container, the pouring nozzle being formed of a pouring spout (**11**) of closed periphery having a beveled open end (**11*a***), extending partly inside a sheath (**9**) having an upper end, the sheath (**9**) being extended at its upper end by a rotating ring (**6**) provided for fixation and orientation of the sheath on an upper end of a neck (**2**) of the container (**1**) and having an outer wall serving for retaining a skirt (**18**) formed about a lower portion of a body (**15**) of the metering stopper (**14**) with a pouring spout (**16**) forming a cover and covering he pouring spout (**11**) of the pouring nozzle, said beveled open end (**11*a***) having a periphery extending entirely above said ring (**6**), and wherein the sheath (**9**) of the pouring nozzle is extended by a slanting bottom part (**10**) leading to the pouring spout (**11**), said slanting bottom part (**10**) being formed with a small opening (**12**), calibrated as a function of a product contained, in its lowermost portion in order to obtain an inflow of air for pouring-out the product and a reintroduction of the product inside the container when the metering stopper is screwed again on the pouring nozzle closure device, wherein said ring (**6**) forms teeth (**8**) cooperating with a serrated crown (**5**) of the neck (**2**).

4,917,271

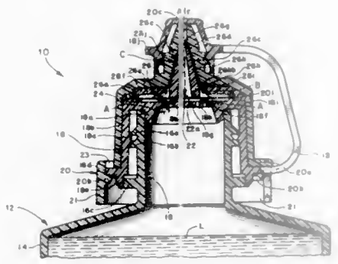
LIQUID DISPENSING NOZZLE ASSEMBLY WITH FILTER

Rowland W. Kanner; Joseph V. Ranalletta, both of Guntersville, Ala.; Gregory P. Kracher, and Alan D. Parker, both of Baltimore, Md., assignors to Ryder International Corporation, Arab, Ala. and pK Scientific, Inc., Frederick, Md., a part interest

Filed Oct. 7, 1988, Ser. No. 258,208
Int. Cl.[4] B67D *5/58*
U.S. Cl. 222—189 18 Claims

1. A liquid dispensing nozzle assembly for mounting on a liquid container and dispenser having a flexible wall and liquid

storage cavity for manually squeezed dispensing of liquid from the cavity through the nozzle assembly and for maintaining the liquid, such as contact lens saline sterile condition during storage and repeated dispensing of the liquid from the container cavity, said nozzle assembly comprising:
at least first and second conduit means for providing separate fluid flow paths, said first and second conduit means including common passageway means formed in said nozzle assembly, said first conduit means enabling flow of said liquid therethrough in order to discharge said liquid



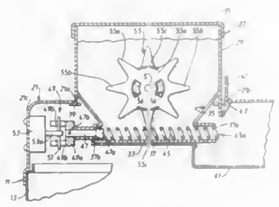
from said nozzle assembly during said manual liquid dispensing; and a barrier means formed within said second conduit means providing an obstruction to flow of said liquid therethrough, said obstruction being permeable to air and impermeable to bacteria thereby enabling only aspiration of air through said second conduit into said cavity to replace liquid dispensed therefrom, and said common passageway means comprising a terminal orifice in said nozzle assembly which forms both a liquid discharge orifice from said first conduit means and an air aspiration intake orifice in said second conduit means.

4,917,272

DETERGENT SUPPLY APPARATUS FOR WASHING MACHINE AND THE LIKE AND WASHING MACHINE USING THE SAME

Yoshio Ikeda, Aichi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 11,217, Feb. 5, 1987, abandoned. This application Sep. 26, 1988, Ser. No. 249,270
Claims priority, application Japan, Feb. 6, 1986, 61-24524; Feb. 12, 1986, 61-28235
Int. Cl.[4] G01F *11/00*
U.S. Cl. 222—231 4 Claims



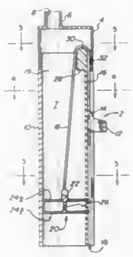
1. A washing apparatus having a washing tube, comprising:
a casing having an upper wall including an opening through which the washing tub is accessible, the upper wall also having a rectangular aperture having a circumferential edge;
a detergent supply device detachably mounted on the upper wall for communicating nwith an aintenrior of the casing through the rectangular aperture, including:
a storage casing having side walls arranged opposite to one another for defininging a storage space in which a powdery detergent is stored;
discharge opening means for discharging the detergent from the storage space;
conveying means for conveying the detergent received from the storage space to the discharge opening emans, the conveying means having a first coupling element;
a fixed pawl outwardly and substantially perpendicularly projecting from one side wall of the storage casing at which the first coupling element is positioned for engaging with the circumferential edge of the rectangular aperture of the upper wall; and
a movable pawl formed to another side wall of the storage casing for engaging with the circumferential edge of the rectangular aperture of the upper wall, the movable pawl having a sloped portion which is gradually reduced toward the discharge opening emans, the sloped portion being associated with the circumferential eldge of the rectangular aperture of the upper wall for forcibly moving the movable pawl and for engaging the movable pawl with the circumferential edge of the rectangular aperture only by mounting the detergent supply device on the upper wall of the casing of the apparatus;
means for driving the conveying means, the driving means includling a second coupling element associated with the first coupling element for transmitting a driving force of the driving means to the conveying means;
means for receiving the detergent from the discharge opening means; and
means for supplying the detergent on the receiving means to the washing tub.

4,917,273

STRAP DISPENSER

Richard H. Seager, Mystic, Conn., assignor to Risdon Corporation, Naugatuck, Conn.

Filed Oct. 6, 1988, Ser. No. 254,443
Int. Cl.[4] B67D *5/42*
U.S. Cl. 222—392 14 Claims



1. A strap dispenser comprising:
a longitudinal container defining a chamber for storing material to be dispensed;
an outlet to discharge the material from the chamber;
a piston within the chamber and movable in a dispensing direction toward said outlet to discharge the material;
a longitudinal strap connected to said piston and extending within the chamber substantially in the dispensing direction;
an opening in said container between said piston and said outlet through which said longitudinal strap passes from within the chamber to the outside of it, said strap extend-

ing outside the chamber in a direction substantially opposite the dispensing direction, wherein movement of the portion of said strap outside the chamber away from said outlet pulls said piston toward said outlet, thereby pushing the material in the chamber toward said outlet; and

a guide within the chamber for supporting said strap as it turns within the chamber from the dispensing direction to the opposite direction toward said opening.

4,917,274

MINISCULE DROPLET DISPENSER TIP

Maurice Asa, 3046 Telegraph, Berkeley, Calif. 94705, and David T. Asa, 2437 Piedmont #302, Berkeley, Calif. 94704

Continuation-in-part of Ser. No. 536,946, Sep. 27, 1983, abandoned. This application Sep. 19, 1984, Ser. No. 652,750

Int. Cl.[4] B65D *47/18*

U.S. Cl. 222—420 6 Claims

1. An improved fluid volume dispenser tip comprising an elongated tube, the discharge end of said tube having a constant diameter small bore between 0.3 and 1.0 mm which extends for approximately one-fourth the length of the tube, the outside diameter of the tip of the discharge end of the tube being of a constant diameter to where it is tapered at a sharp acute angle to the discharge opening to reduce the material disposed therearound, and

the opposite end of said tube having an increased diameter tapered internal bore for storage of fluid and an internal diameter substantially greater than said constant bore internal diameter.

4,917,275

DISPENSING CLOSURE

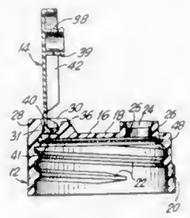
Robert J. Bolen, Jr., 10 Gwynn Ct., Closter, N.J. 07624, and Thomas R. Bolen, 64 Wheeler Ave., Westwood, N.J. 07675

Filed Jul. 1, 1988, Ser. No. 214,676

Int. Cl.[4] B65D *47/08*

U.S. Cl. 222—546 27 Claims

1. In a dispensing closure for a container, the closure comprising (A) a generally circular base having an upper surface with a front section, a dispensing orifice in the front section of the upper surface and an annular skirt depending downwardly from the upper surface and adapted to engage and secure the base to the container, and (B) a separate lid adapted to be pivotally assembled to the base and having a plug on its underside for sealing the dispensing orifice, the improvement which comprises: an elevated rear land disposed above and extending across the upper surface of the base opposite the dispensing orifice and joined to the front section of the base by an abutting wall transecting the upper surface of the base, a pivot recess defining an opening in the surface of the elevated rear land and disposed within the elevated rear land which is adapted to pivotally receive the lid, and said lid having a generally circular front section and a rearwardly extending, downwardly



depending pivot post adapted to frictionally engage the pivot recess in the elevated rear land.

4,917,276

SLIDING GATE NOZZLE FOR SPECIAL STEEL

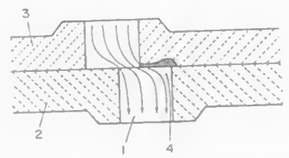
Hiroshi Shikano, Kitakyushu, and Toshihiro Suruga, Kitakyu, both of Japan, assignors to Kurosaki Refractories Co., Ltd., Fukuoka, Japan

Filed Jul. 11, 1988, Ser. No. 217,500

Claims priority, application Japan, Jul. 15, 1987, 62-177823

Int. Cl.[4] B22D *41/08*

U.S. Cl. 222—600 5 Claims



1. A sliding gate nozzle for special steel comprising an upper plate, a lower plate, and a nozzle hole extending through said upper and lower plates, said nozzle hole having an inner peripheral surface formed of a zirconia base refractory material composed of more than 53% by weight of partially stabilized zirconia having less than 10 mesh grain size, 1 to 7% by weight of metallic silicon powder having less than 100 mesh grain size, and 3 to 10% by weight carbon powder having less than 100 mesh grain size, wherein said zirconia base refractory material does not contain any Al_2O_3 or SiO_2.

4,917,277

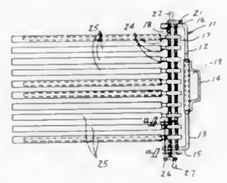
PLEAT FORMING APPARATUS

Retta J. Hibbard, 140 Regier Springs, Sparks, Nev. 89436

Filed Mar. 10, 1989, Ser. No. 321,716

Int. Cl.[4] D06J *1/06*

U.S. Cl. 223—34 7 Claims



1. A pleat forming apparatus comprising,

a framework including first and second spaced adjustment means mounted through said framework for spacedly adjusting a predetermined spacing between a plurality of parallel first pleat arms, said first pleat arms receiving the first and second adjustment means therethrough, and

wherein the first and second adjustment means are threaded rods including a first and second threaded rod rotatably mounted through the framework, and wherein the threaded rods are of equal pitch, diameter, and thread orientation.

4,917,278

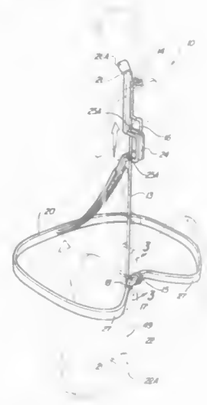
PORTABLE MANNEQUIN

Peter G. Ventimiglia, 19000 Lister, East Detroit, Mich. 48021

Filed Aug. 29, 1988, Ser. No. 238,331

Int. Cl.[4] A47F *8/02*

U.S. Cl. 223—68 24 Claims



1. A portable mannequin including:

(a) a frame member having a hook means at one end thereof, and an eye at the other end thereof,

(b) a hoop pivotally mounted to said eye; and

(c) a hoop extension member for manual movement in relation to said frame member, said hoop extension member connected at one end to said hoop and slidably connected at the other end to said frame member, to open and close said hoop.

4,917,279

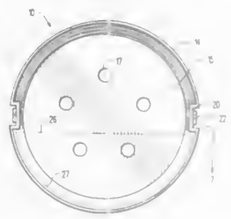
UNDERHOOD TOOL BOX

Rebecca L. Brow, and Philip R. Brow, P.O. Box 13, McMillan, Mich. 49853

Filed Feb. 10, 1989, Ser. No. 308,669

Int. Cl.[4] B62D *43/00*

U.S. Cl. 224—42.14 4 Claims



1. An underhood tool box adapted to be received within the wheel portion of a horizontally disposed spare tire mounted under the hood of a vehicle, comprising:

a cylindrical receptacle dimensioned to be received within a central recessed wheel portion of a spare tire, and having an open top end;

a circular cover for said open top of said receptacle;

a pair of diametrically opposed recesses formed in said receptacle;

a pair of latches located in said recesses for selectively securing said cover on said receptacle;

at least one semi-circular storage tray dimensioned for receipt in said receptacle;

and

said tray having a planar side wall portion retained in proper orientation within said receptacle by abutment with interior side wall portions of said recesses.

4,917,280

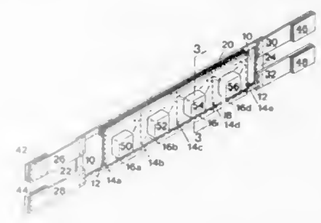
AQUATIC ATTACH PROTECTION BELT AND CHEMICAL PELLETS THEREFOR

David P. Schneider, 4 Woodside Dr. East, Apalachin, N.Y. 13732

Filed May 27, 1988, Ser. No. 199,468

Int. Cl.[4] B65D *83/00*; A45F *3/00*; B63C *11/02*

U.S. Cl. 224—223 10 Claims



1. A belt comprising strips of opposite layers and means for fixing the ends of the strips together so as to form an endless belt, means for forming a series of discrete pockets in said belt formed by said opposite layers and means providing a releasable closure on an end of each of said pockets, a body of chemical inserted into each of said pockets, at least one of said layers being pervious to water so that the chemical can dissolve in the water to produce an aura of chemically treated water in the vicinity of the belt, the chemicals in each of said pockets constituting pellets basically of sodium lauryl sulfate which when dissolved provides an aura of water about the belt flavored by said sulfate for repelling sharks away from the belt.

4,917,281

DRILL HOLSTER

John S. Ostermiller, 4910 S. Gera Rd., Frankenmuth, Mich. 48734

Filed Mar. 29, 1989, Ser. No. 329,967

Int. Cl.[4] A45F *5/00*

U.S. Cl. 224—253 1 Claim

1. A drill bolster, comprising:

a contoured tapering back panel terminating at an upper end in an elongated strap including first fastening means for securement around a wearer's belt;

a convexly contoured tapering front panel secured to said back panel, forming a receptacle dimensioned to removably retain an electric drill;

said receptacle having an open lower end including a closure flap for selectively closing said open lower end;

said closure flap formed by a continuation of said back panel;

second fastening means for retaining said closure flap in a

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closed position in which said closure flap extends in spaced parallel overlying relation with respect to said back panel, and allowing opening of said closure flap to a position in which said closure flap extends in a common plane with said back panel, and allowing insertion of an electric drill including a chuck mounting an elongated drill bit;

a plurality of pockets provided on an outer surface of said front panel and dimensioned to retain a plurality of drill bits;

a loop on said front panel for retaining a drill chuck key; and

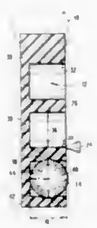
a safety strip for securement around a handle portion of a drill received in a said receptacle, said safety strap having a first end removably secured to said front panel and a second end provided with a hook for engagement with a wearer's belt loop.

4,917,282

HOLDER FOR GOLF BALLS AND THE LIKE

Lynn Hufford, 807 S. Center St., Flora, Ind.

Filed Feb. 10, 1988, Ser. No. 154,222
Int. Cl.[4] B60R *11/00*
U.S. Cl. 224—274 **18 Claims**



1. A device for holding golf balls, comprising:

a substantially solid block of resilient material having a thickness, a first surface, an oppositely facing second surface and a retention aperture extending into said substantially solid block from said first surface, said retention aperture having a dimension measured parallel to said first surface which is slightly smaller than the diameter of a golf ball to be held therein; and,

radial compression retention means for securing a golf ball within said retention aperture by oppositely directed radial compression forces being exerted by the retention aperture on diametrically opposed points on the ball.

4,917,283

STRIP FEED ROLLER

Franklin L. Weatherhead, and Harold E. Boyer, both of P.O. Box 419, 107 N. Main St., Botkins, Ohio 45306

Filed Feb. 27, 1989, Ser. No. 315,740
Int. Cl.[4] B65H *20/02*
U.S. Cl. 226—190 **20 Claims**

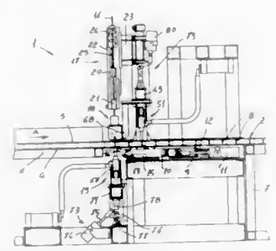
1. A strip feed roller for movement of paperlike material which comprises an elongate cylindrical member provided with a peripheral surface region, the peripheral surface region including sections of rigid material and alternately positioned sections of resilient material, the diameter of the peripheral surface region in which the sections of rigid material are located being the same diameter as the diameter of the peripheral surface region in which the sections of resilient material are located, the sections of rigid material and the sections of resilient material thus providing a smooth cylindrical surface by which the elongate cylindrical member has a constant diameter, whereby the strip feed roller is capable of extreme accuracy in feeding strips of material of various compositions, without cutting the strip and without fracturing capsules which may be present as a part of the strip.

4,917,284

APPARATUS FOR MANUFACTURING BUILDING PANELS

Angelo Candiracci, Fano, Italy, assignor to Monolite S.R.L., Fano, Italy

Filed Sep. 8, 1988, Ser. No. 241,725
Claims priority, application Italy, Sep. 22, 1987, 3613 A/87
Int. Cl.[4] B23K *11/32*
U.S. Cl. 228—5.1 **10 Claims**



1. Apparatus for manufacturing building panels, comprising

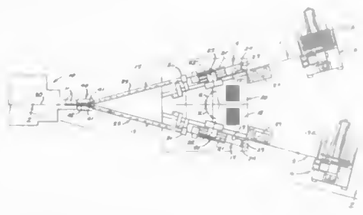
a horizontal table for assembling a panel formed by at least one layer of insulating material and by a pair of metal grids associated with the opposite faces of said insulating layer, means for advancing said panel step by step to a station for inserting, cutting and welding elements for connecting said metal grids, said inserting, cutting and welding station comprising means adapted to insert said connecting elements transversely to said insulating layer, lower welding means adapted to weld said connecting elements, which pass through said insulating layer, to the lower metal grid of the panel, means for cutting said connecting elements at the upper metal grid of the panel, and upper welding means adpted to weld said cut connecting elements to the upper metal grid of the panel, said advancement of the panel being actuated by a reciprocating device located below said panel and comprising a frame which is actuated by a jack and has a hook pivoted thereto which is actuated by a further jack to engage the lower grid during the active stroke and to disengage therefrom during the return stroke of said frame.

4,917,285

DUAL CAPSTAN IN-LINE WIRE DRAWING MACHINE

Wayne A. Shosie, Rockford, Ill., assignor to Rockford Manufacturing Group, Inc., Roscoe, Ill.

Filed Jul. 3, 1989, Ser. No. 375,127
Int. Cl.[4] B21C *1/12*
U.S. Cl. 228—5.7 **11 Claims**



1. Apparatus for drawing a length of wire through a die and for supplying the wire to a production machine, said apparatus comprising a support, a capstan rotatably mounted on said support, said capstan having an entrance end for receiving wire from said die and having an exit end from which wire is supplied to said production machine, feeding means on said support and located downstream of the exit end of said capstan for feeding wire from said capstan toward said production machine, cutting means located on said support between said feeding means and said production machine and selectively operable to cut said wire, and means for preventing said wire from being pulled reversely past said feeding means after the wire has been cut by said cutting means.

4,917,286

BONDING METHOD FOR BUMPLESS BEAM LEAD TAPE

James Pollacek, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

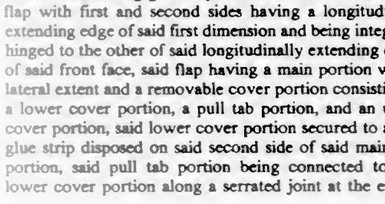
Division of Ser. No. 52,666, May 20, 1987, abandoned. This application Dec. 1, 1988, Ser. No. 280,065
Int. Cl.[4] H01L *21/88*
U.S. Cl. 228—110 **5 Claims**

1. A tape automated bonding method for a thin film structure, having a substrate, a contact region in a surface of said substrate, and at least one passivation layer superposing said surface, comprising:

forming a via in said passivation layer to an area of said contact region;

superposing a conductive tape beam across said via in said passivation layer, said conductive tape beam including a conductive layer and a support layer, said support layer having a support layer via corresponding in position to said via in said passivation layer;

applying first force to said beam to deform said beam into said via and into contact with said contact region; and,



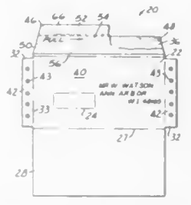
maintaining said first force to hold said beam in contact with said contact region while applying a second force to said beam to bond said beam to said contact region.

4,917,287

REVERSIBLE ENVELOPE

William W. Watson, 3585 Greenbrier, Apt. 75A, Ann Arbor, Mich. 48105

Filed Apr. 27, 1989, Ser. No. 343,629
Int. Cl.[4] B65D *27/06*
U.S. Cl. 229—73 **3 Claims**



1. A reversible envelope comprising a rectangular front face with a first and second side having two longitudinally extending edges of a first dimension and two laterally extending edges of a second dimension;

a rectangular rear face with a first and second side having two longitudinally extending edges of said first dimension and two laterally extending edges of a third dimension shorter than said second dimension, one of said rear face longitudinally extending edges being integrally hinged to one of said front face longitudinally extending edges;

side tabs having first and second sides and having two longitudinally extending edges extending for a fourth dimension, shorter than said first dimension, and two laterally extending sides of a dimension approximately equal to but slightly shorter than said second dimension, both of said tabs having one of said laterally extending edges being integrally hinged to one of said front face laterally extending edges, such that each of said two laterally extending edges of said front face has an integrally attached tab, both of said tabs having glue disposed on both of said sides;

a flap with first and second sides having a longitudinally extending edge of said first dimension and being integrally hinged to the other of said longitudinally extending edges of said front face, said flap having a main portion with a lateral extent and a removable cover portion consisting of a lower cover portion, a pull tab portion, and an upper cover portion, said lower cover portion secured to a first glue strip disposed on said second side of said main flap portion, said pull tab portion being connected to said lower cover portion along a serrated joint at the end of

said lower cover portion remote from said front face, said pull tab portion overlying a second glue strip, said upper cover portion being connected to said pull tab portion along a serrated joint at the end of said pull tab remote from said front face, said upper cover portion extending laterally away from said front face beyond said lateral extent of said flap main portion, said upper cover portion having a third glue strip formed thereon on said flap first side; and

said hinges between said front face and said rear face, said side tabs, and said flap all allowing pivotal movement in both directions, said first side of said front face, said rear face, said side tabs and said flap all facing in a first direction when all of these said members are pivoted outwardly away from said second side of said front face, thus resulting in a reversible envelope such that said side tabs can be pivoted longitudinally inwardly to overlie a portion of said first side of said front face, said second side of said side tabs now facing said first direction, said rear face being pivoted laterally inwardly such that said rear face first side overlies said side tabs second side, said glue on said side tab second side securing said rear face first side at this pivoted position, an envelope container now being defined for receiving documents, said flap being pivoted laterally inwardly such that said flap second face faces said first direction and said flap first side overlies said rear face second side, said third glue strip securing said rear face, thus resulting in a closed first-use envelope, said pull tab being removable from both of said upper and lower covers to separate said pull tab, exposing said second glue strip upon removal, said third glue strip and said upper cover portion remaining secured to said rear face, said rear face being separable from said side tabs, the reversible envelope being such that said side tabs can be pivoted longitudinally inwardly over said second side of said front face, said second side of said rear face can be pivoted laterally inwardly to overlie said side tabs and can be secured thereto, said first side of said flap can be pivoted laterally inwardly to overlie said rear face and said second glue strip can secure said flap to said first side of said rear face, to provide a closed second-use envelope.

4,917,288

TAMPER PROOF FOLDING BOX

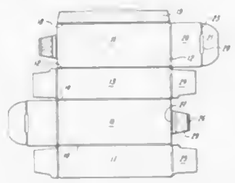
Jurgen Heitele, and Klaus Mohrhauser, both of Waldkirch, Fed. Rep. of Germany, assignors to August Faller KG, Waldkirch, Fed. Rep. of Germany

Filed Oct. 27, 1987, Ser. No. 113,866

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, 3636666

Int. Cl.[4] B65D 5/54

U.S. Cl. 229—102 4 Claims



1. A box having a tubular body with a first and second side,
an insertion flap extending from a first side of the body at a first fold line and said body carrying a second added flap for mating with said insertion flap and extending from said second side of the body,
said insertion flap having an extension portion and a slot with said slot between said extension portion and said first fold line,
said insertion flap being foldable at said first fold line to close said tube and receive said added flap through said slot,
means for locking said added flap to said insertion flap whereby said tube can only be opened by breaking said added flap so that said extension portion is foldable to act as a reusable closing means for fully closing said box,
said box being a folding box having plural substantially planar panels,
said box being folded to a set up form and said means for locking comprises an ultrasonic weld.

4,917,289

BULK CONTAINER BASE CONSTRUCTION

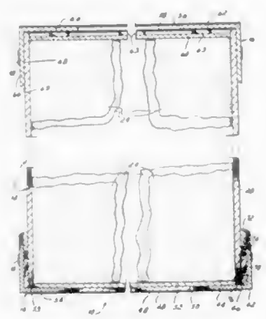
Kent A. Linnemann, Cincinnati, and Richard H. McKinzie, Bethel, both of Ohio, assignors to Shippers Paper Products Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 148,928, Jan. 27, 1988, Pat. No. 4,881,683. This application Mar. 21, 1989, Ser. No. 326,511

The portion of the term of this patent subsequent to Nov. 21, 2006, has been disclaimed.

Int. Cl.[4] B65D 90/02, 88/52

U.S. Cl. 229—109 2 Claims



1. A bulk container comprising:
a base including an annular base rim and a circular center portion having a circumferential edge, said annular base rim being formed of multiple layers of paperboard laminated together and formed into a rigid right angle to provide a first upstanding leg forming an annulus about the base of the container, and a second leg at right angles thereto underlying said center portion, and
a generally cylindrical side wall having a top and a base and being comprised of a foldable paperboard sheet and a plurality of vertically aligned paperboard slats secured thereto in substantially edge abutting relation, each said slat comprising a plurality of layers of paperboard laminated together and folded upon itself and laminated to itself to provide a slat of predetermined width and length having at least one rounded edge and being substantially flat,
said base of said side wall having a plurality of first blocks attached thereto and being insertable in said annular base rim and wedged in between said first upstanding leg of said annular base rim and said circumferential edge of said center portion of said circular base,
said annular base rim including a plurality of second blocks mounted to the inside surface of said first upstanding leg at the top thereof such that when said side wall is inserted in said annular base rim said first and second blocks interlock to prevent unintentional removal of said base of said side wall from said annular base rim.

4,917,290

SHOE TOTE BAG

Shinzo Saiki, 10 Crystal Dr., Great Neck, N.Y. 11021, and Kuniaki Nomura, 61 Jones St., New York, N.Y. 10014

Filed Jul. 26, 1989, Ser. No. 385,181

Int. Cl.[4] B65D 5/48

U.S. Cl. 229—112 4 Claims

1. A shoe tote bag for carrying a pair of shoes comprising a single blank that is die-cut and scored with fold lines to define when the blank is folded on the fold lines interhinged twin shoe boxes in back-to-back relation, each box having a back panel, a first side panel, a front panel and a second side panel, each box having an extension flap which is joined to the back panel to form a box having the form of a truncated, four-sided wedge adapted to accommodate one shoe of said pair thereof, said side panels and the front panel of each box having closure flaps at either end to enclose the box, the back panel of each box being provided with a slotted upper section which extends above the box to form a handle when the back panels of the twin boxes are superposed, and releasable means to retain said boxes in back-to-back relation.

4,917,291

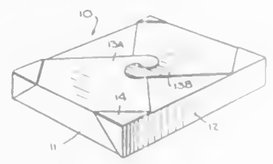
UNITARY GIFT BOX

Shinzo Saiki, 10 Crystal Dr., Great Neck, N.Y. 11021, and Kuniaki Nomura, 61 Jones St., New York, N.Y. 10014

Filed Jul. 26, 1989, Ser. No. 385,182

Int. Cl.[4] B65D 5/24

U.S. Cl. 229—155 4 Claims



1. A single flat blank formable into a unitary box, said blank being die-cut and scored to define bottom, side and end walls as well as a pair of generally triangular side flaps hinged to the side walls and a pair of generally triangular end flaps hinged to the end walls, each pair of said flaps having interlocking apexes, said blank including a main rectangular section from whose ends the triangular end flaps extend and from whose sides the triangular side flaps extend, a first transverse fold line being scored between each end flap and the main section and a second transverse fold line being scored in the main section in parallel to the first transverse line, the first and second transverse lines bordering the end walls, a first longitudinal fold line being scored between each side flap and the main section and a second longitudinal fold line being scored in the main section in parallel to the first longitudinal fold line, the first and second longitudinal lines bordering the side walls, said second longitudinal fold line extending into the end flaps to intersect the first and second transverse lines to define trapezoidal zones interconnecting the end and side walls, each zone having a diagonal fold line scored therein extending between an end of the first transverse line and the intersection of the second transverse line and the second longitudinal line, whereby when the blank is erected and the trapezoidal zones are each folded out on the diagonal fold line, the resultant box is provided with gussets which reinforce its corners.

4,917,292

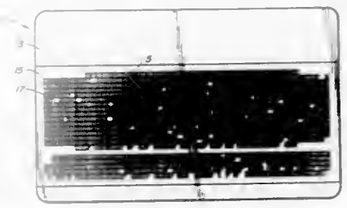
BOOK ON A POCKET CARD

Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Filed Apr. 21, 1988, Ser. No. 179,011

Int. Cl.[4] G11B 7/007, 7/24

U.S. Cl. 235—488 2 Claims



1. A microtext card and jacket comprising,
an opaque card the size of a credit card having a planar surface,
a reflective, metal-containing optically recorded material disposed over the surface of the card, the optically recorded material including unrecorded areas having a distinctive metallic-like reflectance, said optically recorded material further having an array of pages thereon, said pages having lines of microscopic text, with the pages of text reduced from normal book size by 5 to 200 times, the text having optical contrast relative to surrounding areas under light illumination sufficient for reading with magnification, whereby the contents of a book may be recorded on the card,
a transparent protective plastic material bonded to the optically recorded material, and
a foldable card jacket having a pocket containing said microtext card, the pocket having an outside opaque surface through which the card is not visible and an inside transparent surface where the card is visible.

4,917,293

HEATING AND/OR AIR CONDITIONING APPARATUS FOR MOTOR VEHICLES

Horst Fedter, Bühlertal; Werner Grünwald, Gerlingen, and Peter Nolting, Bühlertal, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE87/00255, § 371 Date Nov. 14, 1988, § 102(e) Date Nov. 14, 1988, PCT Pub. No. WO88/00536, PCT Pub. Date Jan. 28, 1988

PCT Filed Jun. 4, 1987, Ser. No. 276,053

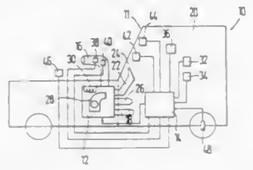
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1986, 3624171

Int. Cl.[4] F25B 29/00; F24F 7/00

U.S. Cl. 236—49.3 9 Claims

1. A climate control apparatus for a motor vehicle having an interior and a window, said apparatus comprising a first temperature sensor to be located in the vehicle interior for sensing a temperature therein; a first humidity sensor to be located in the vehicle interior for sening humidity therein; a second temperature sensor to be located outside of the vehicle interior for sening a temperature outside the vehicle, a second humidity

sensor to be located outside of the vehicle interior for sensing humidity of air outside the vehicle; a heat radiation sensor; intake duct means for supplying the outside air into the vehicle interior; at least two discharge ducts for discharging air into the vehicle interior, at least one of said ducts opening in a vicinity of a vehicle window, a blower for directing air through said discharge ducts; and control means for controlling air flow through said intake duct means and said discharge ducts and for controlling operation of said blower in accordance with readings of said first and second temperature and humidity sensors, and said heat radiation sensor, said first and second temperature and humidity sensors and said heat radiation sensor providing for determination of a temperature in a vicinity of the vehicle window.



4,917,294

SHUT-OFF VALVE FOR SCALD PREVENTION

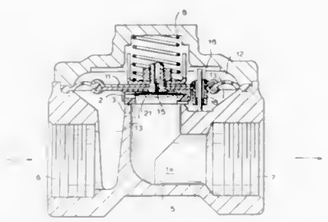
Konrad Bergmann; Josef Ems, both of Wittlich, and Hans Nikolayczik, Minbeim, all of Fed. Rep. of Germany, assignors to American Standard, Inc., New York, N.Y.

Division of Ser. No. 253,859, Oct. 4, 1988. This application Sep. 12, 1989, Ser. No. 406,043

Claims priority, application Austria, Oct. 8, 1987, 2661/87

Int. Cl.[4] G05D *23/10*

U.S. Cl. 236—93 B 4 Claims



1. An assembly for preventing water exceeding a preselected temperature form exiting a supply line, comprising:

a supply line including a housing, said housing defining a chamber therein;

an inlet connected to said housing and in fluid communication with said chamber;

an outlet connected to said housing and in fluid communication with said chamber;

a deformable, temperature-sensitive element mounted to said housing;

a valve assembly inlcuding a diaphragm positioned within said chamber;

a valve member secured to said diaphragm;

a valve seat defined by said housing;

an entrance chamber defined by said housing and a first side of said diaphragm, said entrance chamber being in fluid communication with said inlet;

a control chamber defined by said housing and a second side of said diaphragm;

an exit chamber defined by said housing and said valve assembly, said exit chamber being in fluid communication with said outlet, said valve assembly separating said entrance chamber from said exit chamber and controlling fluid communication between said entrance and exit chambers;

a first passage for establishing fluid communication between said entrance chamber and said control chamber, said first passage extending through said diaphragm;

a second passage for establishing fluid communication between said control chamber and said exit chamber, said second passage extending through said valve member;

means responsive to the deformation of said temperature-sensitive element for closing said second passage, said diaphragm urging said valve member towards said valve seat when said second passage is closed.

4,917,295

TIE PLATE RAIL FASTENING SYSTEM

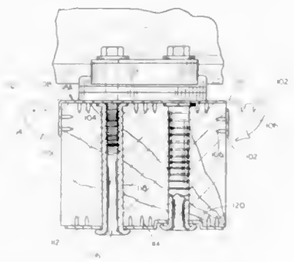
Gordon E. Matlock, 554 Sappington Bridge Rd., Sullivan, Mo. 63080

Continuation of Ser. No. 98,688, Sep. 21, 1987, Pat. No. 4,828,172, which is a continuation-in-part of Ser. No. 22,113, Mar. 5, 1987, Pat. No. 4,819,869. This application May 5, 1989, Ser. No. 347,664

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.[4] E01B *13/02*

U.S. Cl. 238—298 2 Claims



1. In combination,

an elongated, substantially horizontally disposed wood cross tie having an upper surface, opposite sides and opposite ends,

a wear barrier plate mounted on the upper surface of said cross tie adjacent each end thereof, each of said wear plates being bonded to the tie by means of a plurality of teeth extending therefrom which are embedded in the tie,

said wear barrier plate comprising a horizontally disposed portion which is positioned on the upper surface of the cross tie and a vertically disposed portion at each end thereof which extends downwardly therefrom outwardly of and adjacent to the associated side of the cross tie, each of said vertically disposed portions having inner and outer sides,

said horizontally disposed portion having a plurality of teeth extending downwardly therefrom which are embedded in the tie,

each of said vertically disposed portions having a plurality of teeth extending inwardly therefrom which are embedded in the side of the tie,

means securing the tie plates to the wear plates,

and means for securing the rails to said tie plates.

4,917,296

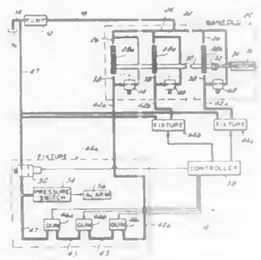
SPRAYING APPARATUS WITH FLOW ALARM

Ronald D. Konieczynski, North Royalton, Ohio, assignor to Nordson Corporation, Westlake, Ohio

Filed Mar. 24, 1989, Ser. No. 328,164

Int. Cl.[4] G08B *21/00*; **B05B** *17/00*

U.S. Cl. 239—1 9 Claims



9. The method of applying a coating material to a surface, comprising:

transmitting coating material through a line which is connected to at least one spray device and to a valve;

simultaneously opening said spray device and closing said valve so that coating material is discharged from said spray device onto a surface and is prevented from flowing through said valve;

sensing the fluid pressure within said line at a location upstream relative to said valve;

activating an alarm in the event said fluid pressure within said line reaches a predetermined level.

4,917,297

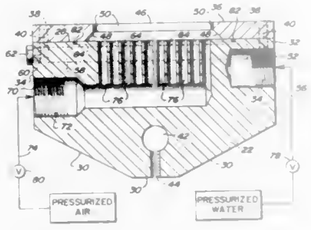
SNOW GUN

Mike Terhume, 4572 Excalibur Ct., Colorado Springs, Colo. 80917

Filed Apr. 10, 1989, Ser. No. 335,859

Int. Cl.[4] F25C *3/04*

U.S. Cl. 239—14.2 7 Claims



1. A gun assembly for making snow by atomizing water and projecting the atomized water by compressed air into an atmosphere having an ambient temperature below about 32 degrees F. to form snow, said gun assembly comprising: p1 (a) a unitary body member having a top surface, a bottom surface opposite said top surface, a first side surface, a second side surface opposite said first side surface, a front surface and a rear surface,

(b) a first water opening in said first side surface extending towards said second side surface and terminating within said body member,

(c) a pair of second water openings in said second side surface extending substantially parallel to each other towards said first side surface and terminating within said first water opening,

(d) a plurality of spaced water outlet ports extending from each of said pair of second water openings through and at an angle to said front surface with the spaced water outlet ports of one of said pair of second water openings extending toward the spaced water outlet ports of the other of said pair of second water openings,

(e) an air opening in one of said first and second side surfaces extending towards the other of said first and second side surfaces and terminating within said body member,

(f) a plurality of spaced air outlet ports extending from said air opening substantially perpendicular to and through said front surface immediately adjacent to and between said plurality of spaced water outlet ports,

(g) a pattern plate removably secured to said front surface and having a slot extending therethrough and in communication with said air outlet ports and said water outlet ports, and

(h) removable means to close said pair of second water openings at said second side surface.

4,917,298

METHOD FOR SPRAYING A FIBER-CONTAINING FLUID MIXTURE USING AN AIR ATOMIZING SPRAY GUN

David N. Henry, Harvest, Ala., assignor to USBI Company, Huntsville, Ala.

Filed Dec. 5, 1988, Ser. No. 280,456

Int. Cl.[4] B05B *7/08*

U.S. Cl. 239—8 1 Claim

1. A method of spraying a fiber-containing fluid comprising:

displacing a fiber-containing fluid through a nozzle assembly at pressures of about 69 KPa to about 386 KPa, said fibers having a length of about 1 mm to about 6 mm, said nozzle assembly comprising:

a) a nozzle extension, an elbow joint, and a nozzle in series communication through at least two hollow fluid passages;

b) said first fluid passage existing at a first nozzle outlet, said outlet having a diameter of about 2.5 mm to about 3.5 mm;

c) said fluid passage exiting at a second nozzle outlet for directing a gas at the fiber-containing fluid to atomize the fluid;

d) first control means for controlling the fiber-containing fluid flow disposed upstream of said nozzle assembly, said first control means comprising a pneumatic ball valve; and

e) second control means for controlling the gas flow disposed upstream of said nozzle assembly.

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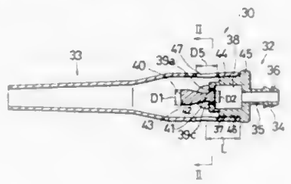
4,917,299

METHOD FOR SPRAYING ANTI-TERMITE AGENT AND THE APPARATUS THEREFOR

Osamu Kondo, Otokuni; Makoto Sakurai, Muko; Yoshihiro Toyonaga, Takatsuki, and Kazuhito Hokada, Hirakata, all of Japan, assignors to Shinto Paint Co., Ltd., Hyogo, Japan

Filed Mar. 16, 1988, Ser. No. 167,154
Claims priority, application Japan, Mar. 19, 1987, 62-66862
Int. Cl.[4] B05B *17/04*
U.S. Cl. 239—8 2 Claims



1. A method of spraying anti-termite agent, said method comprising:

providing a nozzle having a longitudinal axis, jetting ports defined therein and radially spaced a predetermined distance from the longitudinal axis, suction holes defined therethrough open to the exterior of the nozzle and to the jetting ports, a fluid guide member extending in a downstream direction from a location disposed radially inward of the jetting ports and having a tapered guide portion that flares radially outwardly as taken along the longitudinal axis in said downstream direction, and a horn portion disposed in said downstream direction from the guide portion of the guide member and having an inner frustum-shaped guide surface that tapers uniformly as taken along the longitudinal axis in said downstream direction toward a discharge end of the nozzle;

jetting anti-termite agent through the jetting ports to form jet streams which pass over the guide portion of the guide member and toward the horn portion;

causing gas to be sucked into the nozzle through the suction holes by the jetting of the anti-termite agent through the jetting ports so as to flow with the jet streams;

smoothly changing the direction in which the jet streams flow, when formed, by the passing of the jet streams over the guide portion of the guide member to create foam comprising the anti-termite agent and the gas sucked into the nozzle; and

smoothly directing the foam radially inwardly as it is expelled from the nozzle by smoothly changing the direction in which the foam flows in the nozzle when formed, by the passing of the foam through the horn portion under the force of the jetting of the anti-termite agent through the jetting ports.

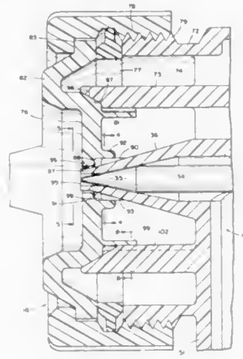
4,917,300

PAINT SPRAY GUN

John A. Gloviak, Chicago, and Tom G. Sprandel, Park Ridge, both of Ill., assignors to Stewart Warner Alemite Corporation, Charlotte, N.C.

Filed Apr. 25, 1985, Ser. No. 727,065
Int. Cl.[4] B05B *5/02*
U.S. Cl. 239—290 12 Claims

1. A paint spray gun, comprising; a valve body having an air passage therethrough adapted to be connected to a source of compressed air, a control valve in the passage for controlling the flow of air, a unitary plastic nozzle unit including an air inlet passage, a paint inlet passage and an elongated nozzle tip portion connected to receive paint from the paint inlet passage, said nozzle tip portion having a sufficiently thin axially extending generally annular wall so that the nozzle tip portion is radially flexible, and a forward end, an air cap covering the nozzle unit and adapted to receive air from the nozzle unit air inlet, said air cap having a central orifice into which the nozzle tip portion projects, and interengaging means on the air cap and the forward end of the flexible nozzle tip portion directly



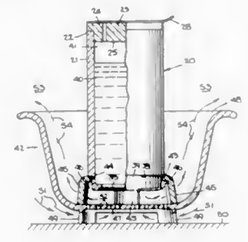
adjacent to the air cap central orifice for aligning the plastic nozzle tip portion in the air cap orifice even though the end of the nozzle tip portion is not perfectly concentric with the orifice.

4,917,301

CONTAINER WITH MICROPOROUS MEMBRANE FOR DISPENSING VAPOR FROM VOLATILE LIQUID

Marina A. Munteanu, New York, N.Y., assignor to International Flavors & Fragrances, Inc., New York, N.Y.

Filed Nov. 15, 1988, Ser. No. 271,623
Int. Cl.[4] A61L *9/04*
U.S. Cl. 239—43 32 Claims



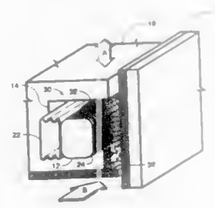
1. Apparatus for packaging and dispensing a volatile substance stored in a liquid phase and dispensed in a vapor phase, said apparatus comprising a container for confining at atmospheric pressure and room temperature a quantity of a volatile substance that is liquid at atmospheric pressure and room temperature and has a surface tension in its liquid phase that is above a predetermined value, said container being formed by first and second wall portions, said first wall portion being essentially impervious to said substance and including means for establishing communication between the interior of the container and the atmosphere when it is desired to dispense said substance, said second wall portion including a microporous membrane having interior and exterior surfaces with the exterior surface exposable to the atmosphere surrounding said container, said membrane having an active structure formed from a material that lacks affinity for said substance and has a critical surface tension that is below said predetermined value, said membrane having an air flow permeance such that when said exterior surface is exposed to the atmosphere and said interior surface is in contact with the liquid, said substance is transported through said second portion and discharged into the atmosphere as a vapor while said exterior surface of said second portion remains dry to the touch.

4,917,302

HIGH TEMPERATURE FLEXIBLE SEAL

Bruce M. Steinetz, Broadview Heights, and Paul J. Sirocky, Middleburg Heights, both of Ohio, assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 30, 1988, Ser. No. 292,146
Int. Cl.[4] B64D *33/04*; **F16J** *15/46*
U.S. Cl. 239—265.11 20 Claims



1. Apparatus for sealing a gap between a moveable panel and an adjacent sidewall spaced therefrom to inhibit leakage of gases from a high pressure side to a low pressure side, said apparatus comprising

a plurality of contiguous members in said gap having opposite major surfaces in sliding engagement with major surfaces of adjacent members, said surfaces being substantially parallel to the direction of potential leakage from said high pressure side to said low pressure side, and

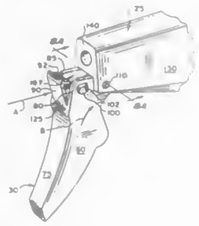
means for applying a pressure toward said sidewall to a portion of the outer peripheral edge of said of said members to form a seal between said sidewall and another portion of said outer peripheral edge which faces said sidewall.

4,917,303

SNAP-IN TRIGGER

Wilhelmus J. J. Maas, and Petrus L. W. Hurkmans, both of Someren, Netherlands, assignors to AFA Products, Inc., Forest City, N.C.

Filed Sep. 26, 1988, Ser. No. 249,374
Int. Cl.[4] B05B *9/04*
U.S. Cl. 239—333 27 Claims



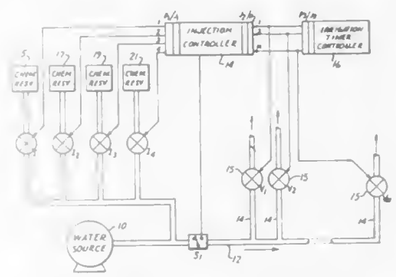
1. A pivot assembly comprising a base and a pivot arm and including pivot means for pivotally attaching said pivot arm to said base; said pivot means including respective mating elements on said base and said pivot arm, said mating elements comprising individual elements of opposing respective mating pairs of bearing sockets and pivot pins; said pivot arm comprising parallel spaced-apart flexible members each carrying one of said respective mating elements, said flexible members being adapted to flex sufficiently to allow said mating elements to enter into mating relationship with their pivot means counterparts on said base without substantial deformation of said mating elements; said pivot arm also comprising an integral hinged member having first locking means, said hinged member being adapted to hinge into a plurality of positions, a first of said positions being in an open configuration in which said first locking element is positioned away from the position of said mating elements, and a second of said positions being in a configuration in which a portion of said first locking means is positioned between said flexible members; said first locking means in said second position being adapted to maintain said mating elements in a mating configuration by restricting said flexible members against relative movement with respect to each other in the vicinity of said mating elements; said pivot arm including second locking means for securing the hinged member in said second position.

4,917,304

AUTOMATIC CONTROLLER FOR INJECTION OF ADDITIVES INTO IRRIGATION WATER

Angelo L. Mazzei, Bakersfield; Jim Wearin, and Joseph E. Figgs, both of Fresno, all of Calif., assignors to Avanti Manufacturing Co., Bakersfield, Calif.

Continuation of Ser. No. 948,369, Dec. 31, 1986, abandoned. This application Dec. 21, 1988, Ser. No. 290,879
Int. Cl.[4] A01C *23/04*
U.S. Cl. 239—64 12 Claims



1. An injection control system for selectively activating circuitry to control additive chemical injection into an existing automatically timed irrigation system having an irrigation timer comprising;

a plurality of storage means for storing one or more additives;

conduit means for delivering an additive from said plurality of storage means to conduit in said existing irrigation system;

a plurality of electrically activated valve means in said conduit means for delivering one or more of said additives selectively to said existing irrigation system;

injection control means for selectively controlling simultaneous injection one or more of said one or more additives from said plurality of storage means into said conduit means for mixing with water flowing through said existing irrigation system;

sensing means in said injection control means for sensing the opening and closing of valves in an existing irrigation system;

said injection control means including programmable central processing means programmed to read, count, and store in memory valve opening signals of said existing irrigation system; said programmable central processing means pro-

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grammed to control operation of said electrically activated valve means and said injection control means to control activation, duration and cessation of additive injected into said existing irrigation during its operation;

whereby said injection control system controls the amount and duration of additive supplied to one or more fields during operation of an existing irrigation system.

4,917,305

SPRINKLER

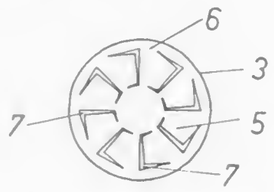
Dietrich Böhlen, Puidoux, and Gérard Ney, Chavornay, both of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 923,667, Oct. 27, 1986, abandoned. This application Sep. 6, 1988, Ser. No. 240,479

Claims priority, application Switzerland, Nov. 26, 1985, 5035/85

Int. Cl.[4] A47G *19/24*

U.S. Cl. 239—374 13 Claims



1. A sprinkler for dispensing powdered and granular products comprising:

a container body having walls and a top defining an open end for containing powdered and granular products;

a closure which surmounts and has a first portion which is fastened to the container body about the top open end of the container body and which extends from the top open end of the container body to a second closure portion which has surfaces displaced from and above and in a plane parallel with a plane defined by the top open end of the container body and which has holes therethrough for dispensing the products; and

a plate which surmounts the top open end of the container body displaced from and below and in a plane parallel with the second closure portion and held firmly in place between the closure and container thereby defining a chamber between the plate and closure, the plate having openings abutted by flanges which protrude into the container body for providing distribution of powdered and granular products from the container body into the chamber to the closure for avoiding blocking of the holes of the second closure portion during dispensing of the products from the container body via the openings in the plate and the holes through the second closure portion.

4,917,306

FUEL INJECTION NOZZLE

David J. Gaskell, Sudbury, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

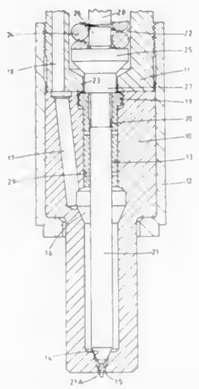
Filed Feb. 5, 1988, Ser. No. 152,655

Claims priority, application United Kingdom, Feb. 6, 1987, 8702711

Int. Cl.[4] F02M *47/00*

U.S. Cl. 239—533.9 4 Claims

1. A fuel injection nozzle for supplying fuel to an internal combustion engine, comprising a nozzle holder having an end face, a nozzle body, means for securing said nozzle body to said end face, a bore formed in said nozzle body, a seat located at one end of said bore, a sleeve slidable axially in the bore, a valve member having a first end and a second end and being slidable axially within said sleeve and shaped at said first end for cooperation with said seat, a chamber located in said holder, a spring located within said chamber, an abutment which engages said spring at one end, and extends through a reduced opening in said nozzle holder to engage said valve member at said second end, a surface defined on said valve member, passage means for conveying pressurized fuel from an inlet to said surface, a first end surface of said sleeve, a second end surface of said sleeve located opposite said first end surface, said second end surface being engageable with said abutment, said valve member surface being acted upon by fuel pressure which also acts on said first end surface of said sleeve to oppose the action of said spring, whereas at a sufficient fuel pressure level said sleeve and valve member move together



away from said seating thereby permitting fuel flow from said inlet to an outlet, engagement of said second end surface of said sleeve with said end face of said holder serving to arrest sleeve movement, and an adjustable stop member located in said chamber for engaging said abutment thereby limiting further valve member movement after arrestment of sleeve movement, and

wherein said valve member has a reduced outside diameter at said second end, said reduced diameter having an extended relationship with said sleeve member to thereby minimize risk of jamming of said sleeve member and said valve member.

4,917,307

FUEL INJECTOR

Randy C. Baxter; John W. Kiracofe,Jr., both of Taylors; Stephen L. Ballenger, Easley, all of S.C.; Paul S. Renowden, Hounslow, England; John Southwood, Watford, England, and Richard McGivney, Northolt, England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Feb. 6, 1989, Ser. No. 306,708

Claims priority, application United Kingdom, Feb. 5, 1988, 8802597; Oct. 11, 1988, 8823845

Int. Cl.[4] F02M *51/06*

U.S. Cl. 239—585 12 Claims

1. A fuel injector for supplying liquid fuel to an air inlet duct of a spark ignition engine comprising:

a valve seat member having at least one face thereon;

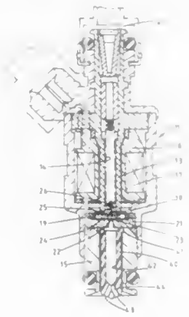
an annular seating element formed on said at least one face of said valve seat member;

a solenoid actuated plate valve member member engageable with said annular seating member;

an orifice in said seat member for the flow of fuel under pressure therethrough when said valve member is lifted from said seating element;

a tubular outlet for the flow of fuel therethrough from said orifice to the air inlet duct, said orifice producing a fuel spray within said tubular outlet;

an outlet end on said tubular outlet remote from said orifice; and



at least two diverging bores at said outlet end for emitting at least two diverging fuel sprays therethrough.

4,917,308

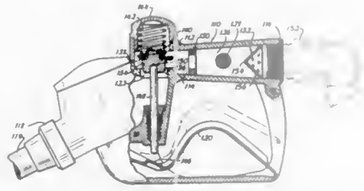
FLOW RATE LIMITING DEVICE FOR FUEL DISPENSING NOZZLES

Paul D. Manhardt, 1008 Tokaloa Dr., Knoxville, Tenn. 37922, and Leonard R. Nitzberg, P.O. Drawer 107, Knoxville, Tenn. 37919

Continuation-in-part of Ser. No. 165,756, Mar. 9, 1988, Pat. No. 4,844,344. This application May 9, 1989, Ser. No. 349,057

Int. Cl.[4] B05B *1/30*; B67D *5/377*

U.S. Cl. 239—590 8 Claims



1. A fuel dispensing nozzle having an inlet through which liquid fuel is supplied within a range of supply inlet pressures, an outlet from which liquid fuel is discharged, an internal flow passage through which fuel may flow from the inlet to the outlet, valve means disposed within said fuel passage intermediate said inlet and said outlet for selectively opening communication between said inlet and said outlet to permit fuel to flow from said inlet to said outlet, and a flow rate limiting means, said flow rate limiting means including turbulence damping means in the fuel passage for inducing substantially laminar flow within a portion of the fuel passage, and a turbulence generating body member disposed in said portion of said passage for limiting the volumetric rate of fuel flowing through said nozzle to a predetermined maximum rate independent of the fuel inlet pressure within said range and independent of the amount of communication provided between said inlet and said outlet by said valve means.

4,917,309

PROCESS FOR MICRONIZING SOLID MATTER IN JET MILLS

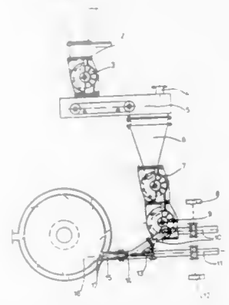
Hans-Günter Zander; Horst Bornefeld, and Bernd-Michael Holle, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 144,350, Jan. 15, 1988, Pat. No. 4,880,169. This application Mar. 30, 1989, Ser. No. 330,554

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1987, 3702787

Int. Cl.[4] B02C *19/06*

U.S. Cl. 241—5 5 Claims



1 A process for micronizing solid matters in a jet mill comprising introducing the solid matters in a jet mill across an injector, wherein the solid matters forcibly, pressure sluiced and pneumatically supplied so as to have only one degree of freedom of movement by a pneumatic delivery device to the injector.

4,917,310

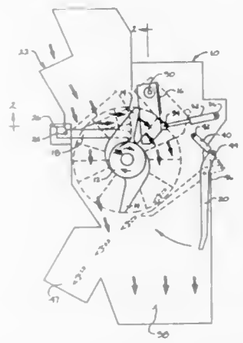
PROCESSING APPARATUS FOR SOLID REFUSE

Pietro Carrera, Rocca di Papa, Italy, assignor to Sorain Cecchini Recovery, Incorporated, Fairfax, Va.

Filed Feb. 27, 1989, Ser. No. 315,849

Int. Cl.[4] B02C *18/22*

U.S. Cl. 241—32 17 Claims



1. An apparatus for processing solid refuse by breaking up refuse containers, reducing volume of oversized items and removing relatively nonshreddable items such as appliances, carpeting, tires and the like, which comprises:

a housing having an inlet for solid refuse, an outlet for shredded refuse, and an outlet for nonshreddable items;

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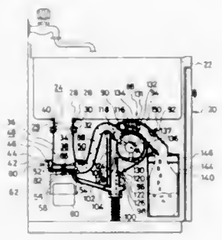
a rotor rotatably mounted in said housing intermediate said inlet and said outlet;
a plurality of blades mounted to said rotor;
a plurality of counterblade elements mounted to said housing adjacent to said rotor and disposed for meshing with said blades for shredding solid refuse therebetween;
pre-screening means for screening relatively small, abrasive materials in solid refuse fed through said inlet prior to shredding of the solid refuse between said blades and said counterblade elements; and
diverting means for diverting nonshreddable items towards said outlet for nonshreddable items in the solid refuse, said diverting means intercepting a fall path of nonshreddable items after their passage between said blades and said counterblades.

4,917,311
GARBAGE DISPOSER
Masataka Yoshino; Takao Morisaki; Hiromi Odegawa, and Masaharu Oohori, all of Nakatsugawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Gifu, Japan
Filed Sep. 20, 1989, Ser. No. 409,728
Claims priority, application Japan, Sep. 27, 1988, 63-241383; Oct. 14, 1988, 63-258756; Oct. 14, 1988, 63-258758; Oct. 14, 1938, 63-258759; Oct. 18, 1988, 63-262254
Int. Cl.[4] B02C *18/40*
U.S. Cl. 241—36 **9 Claims**

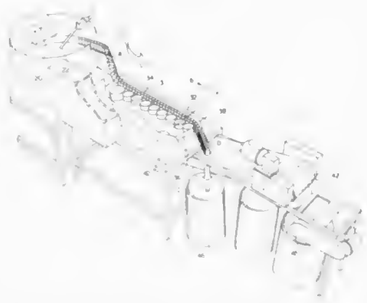


1. A garbage disposer comprising:
(a) pulverizing means, adapted to communicate to a basin of a sink through a drain hole of the basin for pulverizing the garbage charged through the drain hole thereinto together with water;
(b) straining means, connected to the pulverizing means, the straining means including a straining casing, a straining drum supported within the straining casing for rotation about a horizontal axis and a motor for rotating the straining drum, the straining drum having a circumferential face with a multiplicity of perforations formed therethrough for straining out the garbage pulverized in the pulverizing means;
(c) transporting means for transporting the garbage pulverized in the pulverizing means together with the water onto the circumferential face of the straining drum; and
(d) discharging means, connected to the straining means, for discharging the strained, pulverized garbage from the straining means.

4,917,312
BALL TUBE MILL
Vasily S. Bogdanov, ulitsa Kostjukova, 36, kv. 103; Ivan I. Miroshnichenko, ulitsa Kostjukova, 36, kv. 63; Nikolai S. Bogdanov, bulvar Pervogo Saljuta, 4, kv. 84; Nikolai D. Vorobiev, ulitsa Kostjukova, 36, kv. 3, all of Belgorod; Vladimir Z. Pirotsky, ulitsa Staroslobodskaya, 14, kv. 71, Moscow, and Ivan N. Shevchenko, ulitsa Dovatora, 62, kv. 68, Cherkessk, all of U.S.S.R.
Filed Jul. 18, 1988, Ser. No. 220,554
Int. Cl.[4] B02C *17/06*
U.S. Cl. 241—72 **4 Claims**

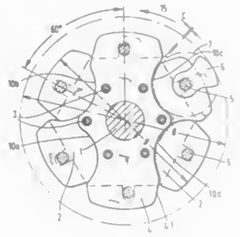
1. A ball tube mill comprising:
a cylindrical housing having a diameter (D) mounted for rotation about its longitudinal axis and having two ends, one of said ends being provided with inlet means for supplying a material to be comminuted and the other of said ends being provided with outlet means for discharging the comminuted material;
milling bodies arranged in said housing; and
annular wall plates having the shape of an ellipse and arranged in succession in said housing at an angle (α) to the longitudinal axis thereof at a spacing (l) which is greater than a projection D tan α of the major axis of the ellipse of each of the annular wall plates on the longitudial axis of the housing, the inside diameter of each of said annular wall plates increasing along the flow of the material being comminuted.

4,917,313
CRUSHER FOR BATTERY CATHODES
Drew W. Morris, P.O. Box 10111, Greenville, S.C. 29603
Filed Jan. 3, 1989, Ser. No. 292,817
Int. Cl.[4] B02C *19/14*
U.S. Cl. 241—99 **1 Claim**



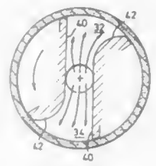
1. A crusher apparatus for continuously transporting and crushing cathode material of rejected battery cathodes comprising:
a wall;
a plurality of crusher heads opposite said wall at a distance less than a diameter of a single battery cathode from said wall;
a belt carried by said crusher heads rotating thereabout for transporting said battery cathodes past each head;
an opening defined between a first floor extending from the base of said wall and said a second floor extending below the crusher heads to permit therethrough discharge from crushed battery cathodes to fall; and
a top guide holding said cathode above said opening;
a troughed conveyor beneath said crusher for receiving the discharge from said crushed battery cathodes; and
an inverter for inverting said cathodes prior to transport to said crusher heads.

4,917,314
ROTOR FOR A HAMMER MILL
Helmut Manschwetus, Fuldabrück, Fed. Rep. of Germany, assignor to Thyssen Industrie AG, Essen, Fed. Rep. of Germany
Filed Mar. 25, 1988, Ser. No. 173,443
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1987, 3709800
Int. Cl.[4] B02C *13/04*
U.S. Cl. 241—194 **4 Claims**



1. A rotor for a hammer mill for breaking-up, shredding as well as otherwise reducing the size of scrap, household and industrial refuse, said rotor having an axis of rotation extending over the entire rotor length and comprising:
a plurality of plate-shaped support elements that rest against one another in such a way that they are staggered relative to one another in a circumferential direction and the support elements are wedged in place against one another in an axial direction; each support element is secured relative to said axis of rotation and has at least one radially outwardly disposed end, with each such end having side faces, and with said ends of support elements that are successively arranged in the direction of said axis of rotation of said rotor being staggered as to other ends of support elements in the circumferential direction while maintaining a uniform parallel spacing of the ends per se from one another for the radially outwardly disposed ends relative to each other which, due to being staggered, are not located directly against each other and the spacing between parallel ends in the axial direction of the hammer axis amounts to at least a thickness of two support elements so that all support elements per se are clamped against each other and all scrap, household and industrial refuse is accessible without any thereof being missed;
a respective cap for each radially outwardly disposed end of said support elements, with said caps also extending over said side faces of its respective support element end;
hammer shafts that are mounted in said support element ends, extend parallel to said axis of rotation of said rotor, and extend over the entire axial length of said rotor; and
pivotable hammers that are selectively disposed on said hammer shafts, with a given one of said hammers being disposed between two axially adjacent support element ends that extend parallel to one another, with said hammers being disposed on said hammer shafts in such a way as to be pivotable entirely all the way around a pivot axis thereof; both the caps that immediately follow one another in the circumferential direction, as well as the hammers that immediately follow one another in the circumferential direction, are staggered in the direction of the axis of rotation of said rotor, whereby said caps form parallel, spaced-apart, stepped, helical coverings of the periphery of said rotor, and the thus-formed free spaces that are successively disposed in the circumferential direction between each two axially adjacent caps form stepped, helical hammer lanes permitting full access of said pivotable hammers everywhere as to all scrap, household and industrial refuse without any omission of access thereto.

4,917,315
FLARED POCKETS FOR CENTRIFUGAL GRINDERS
Allan J. Wildey, Brantford, Canada, assignor to Amca International Limited, Brantford, Canada
Filed Sep. 17, 1986, Ser. No. 908,166
Int. Cl.[4] B02C *19/00*
U.S. Cl. 241—275 **13 Claims**



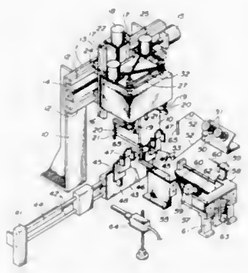
1. In a centrifugal grinder having an internal grinding surface shaped as a surface of revolution, and a rotor mounted within said surface for rotation about the axis thereof, the rotor defining a generally axial inlet passageway for material to be ground, and at least one pocket extending generally outwardly from the axis of the rotor toward the grinding surface, the improvement which comprises:
the provision of a configuration for said at least one pocket, wherein the cross-section of said at least one pocket increases at an increasing rate away from the rotor axis, the differential of the expansion rate of the cross-section of said at least one pocket at its outer limit adjacent the internal grinding surface being at least 8 times as great as the differential of the expansion rate of the cross-section of said at least one pocket at the level corresponding to the surface of the said generally axial inlet passageway.

4,917,316
METHOD AND APPARATUS FOR WINDING WIRE TO FORM COIL USING HOOK
Yasuyuki Suzuki, Saitama, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jul. 31, 1989, Ser. No. 387,154
Claims priority, application Japan, Aug. 15, 1988, 63-203020
Int. Cl.[4] B65H *81/102*
U.S. Cl. 242—4 R **13 Claims**

1. A method for winding a wire on a work using a hook, comprising the steps of:
(a) hooking a wire whose end is grasped by a clamp;
(b) inserting the hooked wire into a hole provided on the work;
(c) moving the clamp to a position opposite the position of the hook with respect to the hole of the work when drawing the wire with the hook; and
(d) turning the clamp grasping the end of the wire with respect to the work so as to wind the wire on the work.

2. An apparatus for winding a wire on a work, comprising:
(a) first means having a hook used for hooking the wire and for inserting the wire into a space defined in the work, the first means drawing the wire with the hook in a direction away from the space; and
(b) second means having a clamp for clamping an end of the

wire when the wire is inserted into the space, the second means moving the clamp to a position opposite the position of the hook with respect to the space defined in the



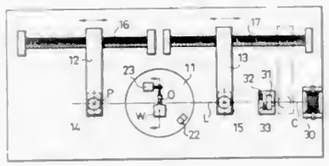
work when the first means draws the wire by means of the hook in the direction away from said space and turning the clamp grasping the end of wire with respect to the work to wind the wire on the work.

4,917,317

TOROIDAL COIL WINDING MACHINE

Takao Iihama, and Hidekazu Wada, both of Niigata, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 20,468, Mar. 2, 1987, abandoned. This application Oct. 31, 1988, Ser. No. 266,312
Claims priority, application Japan, Jul. 16, 1987, 61-167557
Int. Cl.[4] H01F *41/08*
U.S. Cl. 242—4 R 4 Claims



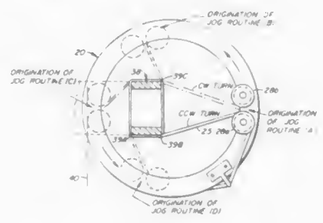
1. A coil winding machine comprising:
a rotatable table for supporting a workpiece having an opening;
wire clamping means for supporting one end of a wire to be inserted through said opening and being mounted on the table;
a first and a second arm arranged at two sides of the table movable relative to said table;
at least two hands for holding and releasing the wire which can be rotated around an axis parallel with an axis of said table and each respectively supported by one of said arms;
centering means mounted on the table for positioning a free end of the wire toward a central part of the opening when the wire is to be inserted into the opening by the hands;
guide means for guiding the free end to the central part of the opening;
wire delivery means arranged on the table at a side opposite to the guide means with said workpiece held therebetween, being movable relative to the opening for holding the free end of the wire inserted into the opening at one of said hands and delivering the free end towards the other of said hands while positioning the free end at a specified location; and
moving means for raising or lowering said table by an amount corresponding to a diameter of the wire and winding the wire around the opening;
wherein said hands each comprise a fixed position pawl member which can be opened or closed around a guide shaft and a movable pawl member, said movable pawl member being movable relative to the fixed position pawl member by said guide shaft, a holding force on said wire of said movable pawl member being weaker than a holding force on said wire of said fixed position pawl member, and with a center line of said movable pawl member and the fixed position pawl member passing through a rotational center of the table.

4,917,318

APPARATUS FOR FABRICATING A LOW VOLTAGE WINDING FOR A TOROIDAL TRANSFORMER

Randall L. Schlake, Lexington, Ky.; Clark J. Hamkins, Jackson, Mich., and James D. Richerson, Versailles, Ky., assignors to Kuhlman Corporation, Birmingham, Mich.

Division of Ser. No. 48,523, May 6, 1987, Pat. No. 4,771,957, which is a continuation of Ser. No. 698,981, Feb. 6, 1985, abandoned. This application May 20, 1988, Ser. No. 197,061
Int. Cl.[4] H01F *41/06*
U.S. Cl. 242—7.09 7 Claims



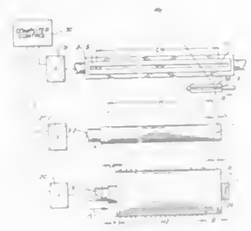
1. An apparatus for producing a multifilar winding having a toroidal shape, said apparatus comprising:
an arcuately shaped winding mandrel;
rotary support means for supporting and positioning said winding mandrel and operable for rotating said winding mandrel in both directions about its axis of revolution;
a magazine rotatable in both directions about a winding axis substantially orthogonal to said mandrel axis and operable for carrying a supply of wire to be wound onto said winding mandrel;
a shuttle rotatable in both directions about said winding axis and positioned coaxial to said magazine and encircling said winding mandrel;
means for rotating the magazine and the shuttle in both directions while winding wire onto the winding mandrel in both directions; and
guide means coupled to said shuttle and operable for guiding the wire from said magazine to said winding mandrel;
wherein said winding mandrel includes said wire wound thereon to form the multifilar winding by rotating said magazine and shuttle in one direction about said winding axis while rotating said winding mandrel in one direction about said mandrel axis, and then rotating said magazine and shuttle in the other direction about said winding axis while rotating said winding mandrel in the other direction about said mandrel axis.

4,917,319

METHOD OF WINDING YARN PACKAGES

Erich Lenk, Remscheid, Fed. Rep. of Germany, assignor to Barmag AG, Remscheid, Fed. Rep. of Germany

Filed Jun. 30, 1989, Ser. No. 374,963
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1988, 3822862; Jul. 14, 1988, 3823774; Feb. 21, 1989, 3905205
Int. Cl.[4] B65H *67/048*
U.S. Cl. 242—18 A 14 Claims



1. A method for continuously winding a high speed running yarn or the like onto bobbins serially delivered to a winding position, and without yarn stoppage between bobbin changes, and comprising the steps of,
(a) winding the running yarn onto a rotating first bobbin positioned at the winding position while gradually reducing the rotational speed of the bobbin, and including traversing the yarn at a location upstream of the winding position to thereby form a cross-wound package on the first bobbin,
(b) laterally separating the rotating first bobbin from said winding position upon the bobbin becoming full, and such that the length of the running yarn between the traversing location and the full bobbin increases, and while continuing to wind the yarn onto the rotating full bobbin,
(c) bringing an empty rotating second bobbin into circumferential contact with the yarn running from said traversing location to the laterally separated full bobbin,
(d) terminating the traverse of the running yarn and then
(e) transferring the running yarn from the rotating full bobbin to the rotating second bobbin, and
(f) decreasing the traversing speed during a period beginning shortly prior to the traverse being terminated in accordance with step (d), and with the rate of change of the decreasing traverse speed being greater than the rate of change of the decreasing rotational speed of the bobbin during the end portion of step (a).

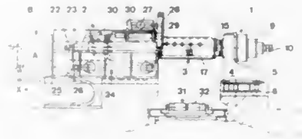
4,917,320

APPARATUS AND METHOD FOR REELING UP STRIPS

Wilhelm F. Lanener, Geriafingen, and Rolf Würgler, Esslingen, both of Switzerland, assignors to Lanener Engineering AG, Thun, Switzerland

Filed Aug. 29, 1983, Ser. No. 527,227
Claims priority, application Switzerland, Sep. 16, 1982, 5478/82
The portion of the term of this patent subsequent to Jul. 25, 2089, has been disclaimed.
Int. Cl.[4] B65H *19/30*; B21C *47/24*
U.S. Cl. 242—79 11 Claims

1. Apparatus for reeling up strips wherein said strips are movable in a strip path including a reel rotatable about its axis, drive means disengageably connected to said reel for driving said reel and in the reel engaging position arranged on one side of the strip path to form a coil of strip on said reel, a carriage frame fixedly connected to said reel arranged on the other side of the strip path, a housing for mounting said carriage frame, means associated with said frame for conducting the reel out of the strip path and into said housing, a coil stripper mounted on said housing on the side of the strip path opposed to said drive means for holding said coil of strip in said strip path between said stripper and drive means free from said reel when said reel is conducted out of the strip path, stripper drive means associated with said coil stripper, and means located between said drive means and housing for transporting said coil of strip away from said apparatus wherein said drive means and reel



include engaging means on the end faces thereof for selectively engaging and disengaging said drive means with said reel as said reel is conducted into and out of the strip path by said means associated with said frame so as to allow the coil of strip to be transported from said strip path away from said apparatus.

4,917,321

CENTRIFUGAL BRAKE ARM AND RETAINER

Dennis E. Roberts, Owasso, Okla., assignor to Zebco Corporation, Tulsa, Okla.

Filed Apr. 22, 1988, Ser. No. 184,820
Int. Cl.[4] A01K *89/02*
U.S. Cl. 242—289 14 Claims

1. A centrifugal brake system for a line-carrying spool on a fishing reel of the type having a housing and means for supporting the spool on the housing for rotation relative to the housing about an axis, said brake system comprising:
a brake surface on said housing;
a brake arm having a brake pad;
press fit means for retaining the brake arm in operative position on the spool for rotation therewith;
a brake surface on the brake pad; and
means mounting the brake pad on the brake arm for movement of the brake surface on the brake pad biasably against the housing brake surface under a predetermined centrifugal force developed through rotation of the spool,
wherein said spool has a shaft and said retaining means comprises a ring with a bore to closely frictionally accept the spool shaft,
wherein said spool has an axially facing surface, the ring is mounted for translatory axial movement relative to the spool shaft between a release position wherein the brake arm can be placed in and removed from operative position on the spool and a retention position, said ring has a first surface and with the ring in the retention position the brake arm is captively retained between the first ring surface and spool surface.

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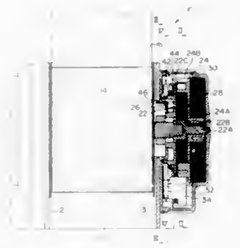
4,917,322
BARBED WIRE CADDY
Linsey L. Combs, Rte. 4, Box 185, Holdenville, Okla. 74848
Filed Apr. 3, 1989, Ser. No. 331,740
Int. Cl.[4] B65H *75/40*
U.S. Cl. 242—86.5 R 7 Claims

1. A cart for transporting spools of wire and for dispensing same comprising a "U"-shaped handle, having two legs with the free ends, said free ends are spaced apart and are each provided with a bearing axially aligned with the other, an axle extending through both said bearings, said axle having a stop member fixed to one end thereof, a pair of wheels on said axle between said bearings, retaining means for detachably retaining said bearings and wheels on said axle, and a lockable hinge on one of said legs enabling the selective swinging of said free end of one of said legs in a plane transverse to said axle, said hinge being located a distance from the bearing on the free end of one of said legs wherein said distance is greater than the radius of said wheels.

4,917,323
CHRISTMAS LIGHT STORAGE DEVICE
Don Wing, 11765 General Giraud, Montreal, Quebec, Canada (H4S 2H7)
Filed Nov. 10, 1988, Ser. No. 269,614
Int. Cl.[4] B65H *75/40*; B65D *85/42*
U.S. Cl. 242—96 13 Claims

1. A storage assembly for electric light sockets carried by a cable, the assembly comprising:
(a) cylinder means; and,
(b) at least first and second discs mounted about said cylinder means in longitudinally spaced relation and extending generally transverse to the axis of rotation of said cylinder means, each of said discs having a plurality of radially extending slots opening on the periphery thereof for receiving therein a length of cable, wherein each disc includes: an integral collar mounted to and extending longitudinally along said cylinder means; and, a plurality of integral supports, each support extending between said collar and that portion of the disc extending between an associated two of said slots.

4,917,324
WEBBING RETRACTOR
Shinji Mori, Aichi, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan
Filed Nov. 1, 1988, Ser. No. 265,823
Claims priority, application Japan, Nov. 6, 1987, 62-169897
Int. Cl.[4] B60R *22/44*
U.S. Cl. 242—107 20 Claims

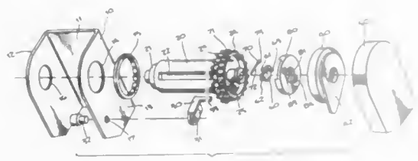


1. A webbing retractor comprising a frame; a retracting shaft supported in said frame for winding up an occupant restraining webbing; a connection wheel connected to said retracting shaft; a first resilient member engaged with said connection wheel at one end; a ratchet wheel engaged with the other end of said first resilient member; a second resilient member engaged with said ratchet wheel at one end and engaged with said frame at the other end; a pawl engaged with said ratchet wheel so as to prevent an urging force of said second resilient member from being transmitted to said retracting shaft; a frictional rotating means being rotatable to a desired angle under a transmittance of a rotation of said retracting shaft through a frictional force and enabling said pawl to be engaged with said ratchet wheel under an intermediate state of rotation; cam means provided with a plurality of projections, said cam means being rotatable under a rotational force of said connection wheel to move said pawl away from said ratchet wheel when rotated in a webbing retracting direction; and cam driving means defined by a groove formed helically at an outer circumference of said connection wheel for receiving a first projection projected from said cam means, whereby a rotation of said connection wheel is transmitted to said cam means when said first projection contacts a longitudinal end of said groove.

4,917,325
WEBBING SENSOR
George Strnad, Windsor, Canada, assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Dec. 23, 1987, Ser. No. 137,962
Int. Cl.[4] B60R *22/38*
U.S. Cl. 242—107.4 B 2 Claims

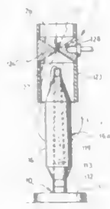
1. A method for the easy assembly of an inertial pawl, inertial mass and pawl biasing means of a seat belt retraction mechanism comprising the steps of:
mounting a straight wire spring by a looped portion on a post protruding laterally from a spool associated member, positioning a programming pawl having first and second entraining members laterally protruding therefrom on one side and an inertial mass engaging pin laterally protruding from an opposite side, adjacent said spool associated member, with said straight wire spring entrained by a slip fit between said first and second members and mounting an inertial mass of disc configuration on a spool stub shaft to rotate freely thereon; and

engaging said inertial mass engaging pin in a lost motion connection to said programming pawl by a slip fit of a slot



in a disc portion thereof, over said pin by said step of mounting said disc on said spool stub shaft.

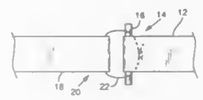
4,917,326
FLUFF SCATTERING PREVENTING DEVICE IN WINDER
Toshiaki Kojima, Kyoto; Hiroshi Uchida, Oumihachiman, and Yasuhiko Kubota, Nagaokakyo, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan
Filed Apr. 13, 1988, Ser. No. 180,909
Claims priority, application Japan, Apr. 15, 1987, 62-92897; Jul. 22, 1987, 62-112481
Int. Cl.[4] B65H *49/00, 57/22*
U.S. Cl. 242—128 9 Claims



1. A device for guiding the ballooning of yarn drawn from a yarn feed bobbin in a winding unit, the device comprising
a cylindrical body defining an upper end, a lower end and an interior surface, and
a throttle disposed in the cylindrical body between the upper end and the lower end for expanding the ballooning of the yarn,
the lower end of the cylindrical body being configured to surround at least a portion of the bobbin for transmitting the expanded ballooning of yarn downward as the yarn layer of the bobbin decreases.

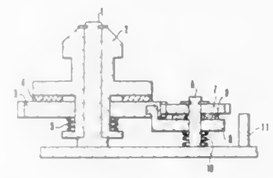
4,917,327
TAPE DISPENSER
Charles E. Asbury, Jr., Vancouver, Wash.; Boris Boltak, Portland, Oreg., and Victor H. Clausen, Vancouver, Wash., assignors to H. B. Fuller Company, Vancouver, Wash.
Filed Sep. 7, 1988, Ser. No. 241,418
Int. Cl.[4] B65H *59/38, 19/29*
U.S. Cl. 242—156 21 Claims

1. In an apparatus for dispensing elongated material from a roll, a system for regulating the tension in the material, comprising:
guide means for defining the path the elongated material is to follow, said guide means including at least one guide member movable in response to increased tension in the material to shorten the path thereof and movable in response to decreased tension in the material to lengthen the path thereof and movable in response to decreased tension in the material to lengthen the path thereof;
active brake means for applying a braking force to the roll;
a pivoted lever coupling the movable guide member to the active brake means;
said pivoted lever and active brake means cooperating to reduce the braking force when the movable guide member



moves to shorten the aforesaid path length and to increase the braking force when the movable guide member moves to lengthen the aforesaid path length;
a second roll, the first and second rolls being mounted on first and second spindles, respectively; and
mechanical, non-adhesive linkage means for linking the elongated material on the first roll to the elongated material on the second roll so that when the first roll is depleted of material, the second roll can immediately begin supplying material in its stead.

4,917,328
REEL DRIVING MECHANISM
Junji Kobayashi; Makoto Fujiki, both of Tokyo; Takashi Kimura; Masahiro Ando, both of Kanagawa, and Hidetoshi Matsuoka, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 1, 1988, Ser. No. 265,544
Claims priority, application Japan, Nov. 5, 1987, 62-278264
Int. Cl.[4] B65H *16/00, 18/08*
U.S. Cl. 242—204 11 Claims



1. A reel driving mechanism comprising:
(a) a reel table;
(b) a torque limiting member;
(c) a rotary member for driving said reel table via said torque limiting member; and
(d) a braking member for braking said rotary member, said braking member acting only when the direction of rotation of said reel table is a predetermined direction, and said braking member including a movable member driven by the rotating force of said rotary member.

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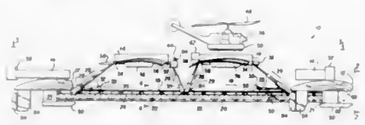
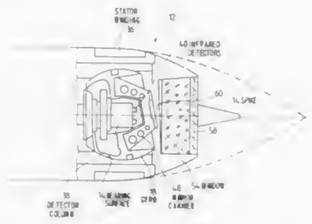
4,917,329
AERIAL AIRCRAFT CARRIER
Robert H. Vollmerhausen, 1809 Anderson Rd., Falls Church, Va. 22043
Continuation-in-part of Ser. No. 59,602, Jun. 8, 1987. This application Jun. 9, 1988, Ser. No. 204,264
Int. Cl.[4] B64D *5/00*; C64C *39/08, 37/02*
U.S. Cl. 244—2 6 Claims



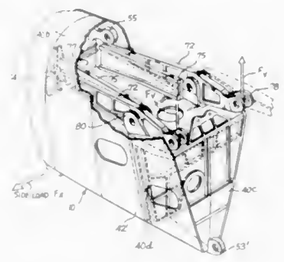
1. A modular aircraft, comprising, a first and a second shuttle craft, said first and said second shuttle craft having a cantilever fuseledge extending therebetween, said cantilever fuseledge being pivotably attached to said first and to said second shuttle craft, said cantilever fuseledge having elevating means disposed thereon, said elevational means having means for securing a said securing means having disposed therewith at least one means for stabilizing said secondary aircraft, whereby said secondary aircraft is secured to said modular aircraft, said secondary aircraft being retrieved in flight.

4,917,330
TARGET SEEKING PROJECTILE
Bernd Dulat, Primelweg 5, 7770 Uberlingen, and Hellmuth Moebes, Im Betzen 12, 7771 Frickingen, both of Fed. Rep. of Germany
Filed Mar. 3, 1989, Ser. No. 319,323
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1988, 3807725
Int. Cl.[4] F41G *7/26*
U.S. Cl. 244—3.16 6 Claims



1. A projectile with steering means for steering the projectile onto a target during the end phase of its trajectory, characterized by the combination of the following features:
(a) An optical seeker (**12**) comprises a gyro (**18**) with a gyro rotor supported, in operation, by compressed air supplied to a gap between a rotor surface and a bearing surface surrounding said rotor surface;
(b) An imaging optical system (**42**) comprising a Cassegrain system, and a detector (**40**) are provided on said air supported gyro, said imaging optical system being arranged to focus target radiation on said detector (**40**) and to scan a field of view with a first gyrating scanning motion;
(c) The projectile (**10**), at its front tip, is closed by an optically transparent, planar window (**54**);
(d) The optically transparent window (**54**) carries a central spike (**14**);
(e) The projectile is provided with tail stabilizing fins (**30**) and wings (**32**) in its mid-portion, said wings (**32**) being controlled by signals from said detector (**40**) and said gyro (**18**) through signal processing means (**24**) and servomotor means (**22**); and,
(f) The projectile (**10**) is shaped to be driven aerodynamically to make a continuous roll movement and, thereby, to provide a second gyrating scanning motion of said seeker (**12**).

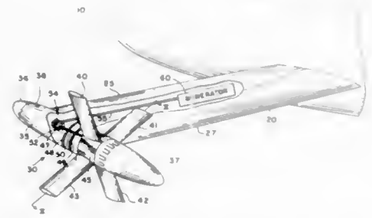
4,917,331
APPARATUS AND METHODS FOR REDUCING AIRCRAFT LIFTING SURFACE FLUTTER
Thomas R. Hager, Bothell; Gerald C. Lakin, Bellevue, and John T. Rogers, Snohomish, all of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Nov. 10, 1988, Ser. No. 269,839
Int. Cl.[4] B64D *27/00*
U.S. Cl. 244—54 11 Claims



1. An aircraft having a fuselage, the aircraft comprising:
a. a first wing and a second wing which are attached to opposite sides of the fuselage;
b. a first engine and a second engine; and
c. a first strut for attaching the first engine to the first wing and a second strut for attaching the second engine to the second wing in a manner that when the first engine and the second engine are subjected to a force, the first engine is caused to oscillate at a different frequency than the second engine, the first strut further including means for transmitting the oscillations of the first engine to the first wing, and means for transmitting the oscillations of the second engine to the second wing in a manner that the first wing oscillates at a different frequency than the second wing so as to reduce flutter.

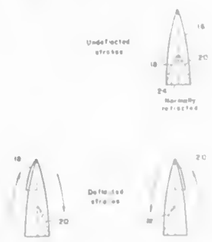
4,917,332
WINGTIP VORTEX TURBINE
James C. Patterson, Jr., Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Continuation-in-part of Ser. No. 4,304, Jan. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 243,685, Mar. 16, 1981, abandoned. This application Oct. 28, 1988, Ser. No. 264,993
Int. Cl.[4] B64D *33/00*
U.S. Cl. 244—58 9 Claims

1. An apparatus for reducing induced drag on an aircraft by attenuating a lift-induced vortex and for extracting energy from the vortex, the apparatus comprising:
a moving vehicle;
lift-producing surface means on said vehicle inducing a naturally-occurring wingtip vortex having a crossflow, said lift producing surface means having a leading edge, a trailing edge and a wingtip chord;
turbine means, positioned on the lift-producing surface means so that it is driven solely by said wingtip vortex crossflow with no power being derived from freestream airflow, for reducing induced drag on the moving vehicle by attenuating the lift-induced vortex and extracting rotational energy from said vortex, said turbine means further having a position adjacent to and aft of said wingtip chord, said turbine means having turbine blades with a blade diameter greater than 60% and less than 160% of



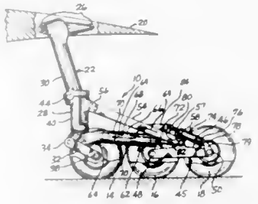
said wingtip chord, said turbine blades positioned in the crossflow of the wingtip vortex occurring outside the vortex core, providing energy for utilization within the aircraft without any thrust penalty to the vehicle propulsion system, and
means for utilizing said rotational energy within said moving vehicle.

4,917,333
ACTUATED FOREBODY STRAKES
Daniel G. Murri, Grafton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed May 11, 1988, Ser. No. 192,563
Int. Cl.[4] B64C *9/02, 9/08*
U.S. Cl. 244—75 R 10 Claims



1. An apparatus for controlling yawing moment of an aircraft having a forebody, the apparatus comprising:
a first strake mounted for movement in and out of the forebody;
a second strake mounted for movement in and out of the forebody;
the first and second strakes being symmetrically disposed and movable between alternative positions including a position where both strakes are simultaneously fully projectable radially outwardly from the forebody, a position where both strakes are simultaneously fully retractable inside the forebody, and a plurality of positions where the strakes are differentially projectable where one strake is projectable outwardly to varying widths and the other is fully retractable;
the first and second strakes being slidably connected to the forebody for sliding axially in a nd out of the forebody in a fore and aft direction.
7. An apparatus for controlling yawing moment of an aircraft, comprising:
a forebody rotatably connected to a forward portion of the aircraft;
at least one strake connected to the forebody and extending radially outwardly therefrom, and having a normal symmetric radial location which is variable to effect yaw control by rotating the forward portion of the forebody.

4,917,334
MULTIWHEELED TRAILING TYPE LANDING GEAR ASSEMBLY
Harry C. Ralph, Kirkland, and Gerhard E. Seidel, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Sep. 30, 1988, Ser. No. 251,428
Int. Cl.[4] B64C *25/10*
U.S. Cl. 244—102 R 7 Claims



1. A landing gear assembly for an aircraft comprising:
a. a main support member which is connected to the aircraft;
b. a first wheel assembly for supporting the aircraft on the ground;
c. means for connecting the first wheel assembly to the main support member;
d. a second wheel assembly for supporting the aircraft on the ground, the second wheel assembly including (1) a middle wheel which is located adjacent to the forward wheel, (2) a rear wheel which is located adjacent to the middle wheel, and (3) truck means for connecting the middle wheel with the rear wheel; and
e. means for connecting the second wheel assembly to the main support member in a member that the first and second wheel assemblies are in tandem, the second wheel connecting means including
(1) radius means for permitting movement of the second wheel assembly along a path which is a selected radius from a first location on the main support member, and
(2) absorbing means for resisting movement of the second wheel means in a first direction along the path when the second wheel assembly is subjected to a force in the first direction resulting from contact of the second wheel assembly with the ground.

4,917,335
APPARATUS AND METHOD FOR FACILITATING SUPERSONIC MOTION OF BODIES THROUGH THE ATMOSPHERE
Derek A. Tidman, Falls Church, Va., assignor to GT-Devices, Alexandria, Va.
Filed Mar. 31, 1988, Ser. No. 177,916
Int. Cl.[4] B64C *30/00, 1/38*
U.S. Cl. 244—130 44 Claims

28. A method of facilitating supersonic travel of a body through the atmosphere, comprising the step of:
reducing atmospheric mass density in front of a body travelling through the atmosphere at supersonic speed by ejecting a flow of a chemically interactive material from the body forwardly thereof at a high velocity relative to the body and atmosphere such that the ejected material is

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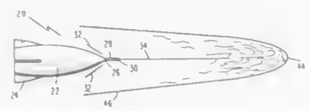
heated solely thereby and interacts chemically to release thermal energy in the atmosphere in a region located a



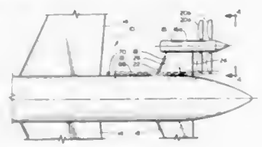
predetermined distance forwardly of the body to thereby provide said reduced atmospheric mass density.

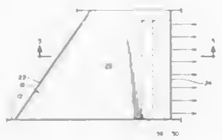
4,917,336

MOUNTING ASSEMBLY FOR UNDUCTED PROP ENGINE AND METHOD

Loyd D. Jacobs, and Belur N. Shivashankara, both of Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 19, 1988, Ser. No. 157,911
Int. Cl.[4] B64C *21/04*
U.S. Cl. 244—207 **10 Claims**





1. An engine mounting assembly comprising:
a. an aircraft structure having a fuselage;
b. an engine having an unducted propeller means, said engine being mounted in said assembly in a pusher configuration, said propeller means being adapted to rotate through a propeller path;
c. a strut being mounted in said assembly at a location forwardly and upstream of said propeller means;
d. said strut having a leading edge portion and a trailing edge portion, and being aerodynamically contoured so as to have first and second side surfaces over which air flows, said trailing edge portion having a rearwardly directed slot means positioned to discharge air in a downstream direction between airflow passing over said side surfaces of the strut, with the air discharged from the slot means traveling downstream to an affected path region of the propeller path;
e. air supply means to discharge pressurized air through said slot means at a velocity adequate to diminish discontinuity of airflow moving from said strut rearwardly to the affected path region of the propeller path;
f. said strut having an inner end portion connecting to said fuselage and an outer end portion connected to said engine, said slot means extending toward said first end of the strut and adjacent to said fuselage in a manner that at least some of the air discharged from the slot means passes adjacent said fuselage at a location radially outward of said propeller path, said slot means and said air supply means being arranged so that for each unit of length along said slot means, a relatively greater amount of air is discharged from said slot means at a location more closely adjacent to the inner end portion of the strut, in comparison with an amount of air discharged at a location directly forward of said propeller path;
whereby load variations on the propeller means passing through the affected region of the propeller path are diminished, and boundary layer air at a junction of the strut and the fuselage is activated.

4,917,337

ARTICLE SUPPORT FOR PEGBOARDS OF ALTERNATE THICKNESS

John W. Gridley, 5901 Laurel Ave., Golden Valley, Minn. 55416

Filed Aug. 2, 1985, Ser. No. 762,064
Int. Cl.[4] A47F *5/00*
U.S. Cl. 248—221.2 **5 Claims**

1. An article support for use with perforated boards of different thicknesses having a plurality of equally spaced holes, said article support comprising:
(a) an upper hook element having a reverse curve end member adapted to extend substantially directly to the rear through an opening in a perforated board and terminating in a tip lying adjacent said perforated board;
(b) a base member extending normally from said upper hook element and terminating generally in an article support portion;
(c) an upper boss forming a portion of said upper hook and extending normally from said base member, said boss extending outwardly on three sides from said upper hook element;
(d) a lower locking element having a rearwardly extending abutment member adapted for engagement with at least one portion of a hole in the perforated board;
(e) a lower boss forming a portion of said lower locking element and extending normally from said base member, said boss extending outwardly on three sides from said lower locking element, said upper and lower bosses forming a steadying means for holding said article support member in place; and
(f) upon said upper hook element, and said abutment member of said lower locking element being adapted for engagement with the perforated board, said base member is disposed to either lie against the perforated board or spatially disposed therefrom an amount equal to the normal dimensions of said upper and lower bosses.

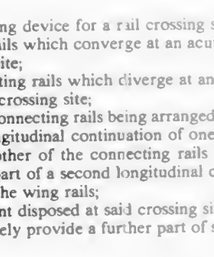
4,917,338

BRACKET ASSEMBLY FOR SUPPORTING A TRAFFIC SIGN

Raylin J. Olson, Loves Park; Lawrence L. Prunty, and Wendell W. Whitehead, both of Rockford, all of Ill., assignors to Olson Pattern and Foundry Works, Inc., Rockford, Ill.

Continuation of Ser. No. 244,020, Sep. 14, 1988, Pat. No. 4,860,985. This application Jun. 16, 1989, Ser. No. 369,827
The portion of the term of this patent subsequent to Aug. 29, 2006, has been disclaimed.
Int. Cl.[4] A47B *96/06*
U.S. Cl. 248—229 **2 Claims**

1. A bracket assembly adapted to support an electrical traffic sign and adapted to be fastened to a tubular mast having electrical leads therein, said bracket assembly comprising an elongated tube having front and rear side , means for attaching said traffic sign to the front side of said tube, a bracket for attaching said tube to said mast, said bracket having an opening therein permitting said electrical leads to extend from said mast to said tube, said tube defining a passage for said leads, an elongated slot formed through and extending along the rear side of said



tube to permit said leads to enter said passage, an arcuate seat within said tube and located between said passage and said slot, said seat extending longitudinally of said tube, and a pair of elongated cylindrical rods made of elastomeric material and received within said seat with a snug fit, said rods being disposed in end-to-end relation on opposite sides of said leads and serving to seal said slot.

4,917,339

REVERSING DEVICE FOR SWIVELABLE RAILS OR MOVABLE FROGS WITHIN THE CROSSING AREA OF A RAILWAY SWITCH

Gerald Durchschlag, Zeltweg; Alfred Lang, Weisen; Franz Rotter, Zeltweg; Dieter Fritz, Fohnsdorf, and Heinz Kopilovitsch, Hetzendorf, all of Austria, assignors to Voest-Alpine Maschinenbau Gesellschaft m.b.h., Linz, Austria

Filed Nov. 7, 1988, Ser. No. 267,875
Claims priority, application Austria, Nov. 5, 1987, 2931/87; Sep. 16, 1988, 2275/88
Int. Cl.[4] E01B *7/00, 7/16*
U.S. Cl. 246—382 **9 Claims**

1. A reversing device for a rail crossing site, comprising
two wing rails which converge at an acute angle towards a crossing site;
two connecting rails which diverge at an acute angle away from the crossing site;
one of the connecting rails being arranged to provide part of a first longitudinal continuation of one of the wing rails, and the other of the connecting rails being arranged to provide part of a second longitudinal continuation of the other of the wing rails;
a rail element disposed at said crossing site and arranged to alternatively provide a further part of said first longitudinal continuation which includes said one wing rail and one connecting rail or a further part of said second longitudinal continuation which includes said other wing rail and said other connecting rail;
means for shifting a structure comprising one of:
(a) said rail element; and
(b) said two wing rails and said two connecting rails,
between a first position and a second position, for alternatively establishing said first longitudinal continuation while disrupting said second longitudinal continuation, and establishing said second longitudinal continuation while disrupting said first longitudinal continuation;
said means for shifting said structure between said first position and said second position, comprising:
at least one supporting rod extending generally longitudinally of said wing rails and connecting rails beside said rail element;
guide means supporting each said supporting rod for reversible longitudinal movement;
drive means for reversibly longitudinally moving each said supporting rod in the respective said guide means between a first position and a second position;
each said structure having secured thereon and projecting generally transversally therefrom for interaction with a respective said supporting rod at least one structure-based thrust support having support surface means;
each support rod having secured thereon and projecting generally transversally therefrom for interaction with said structure at least one support rod-based thrust support having a wedge surface leading to a support surface, each said support surface being disposed in a substantially vertical plane as seen in plan view, which plane is substantially parallel to the longitudinal axis of the respective said support rod;
each support rod-based thrust support being so located on a respective said support rod, in relation to a respective said structure-based thrust support, that, in sequence as said structure is being shifted by longitudinally moving each said support rod, to provide as a new position either said longitudinal continuation from providing as an existing position the respective other said longitudinal continuation:
(a) a said support surface of a said support rod-based thrust support which is in engagement with a said support surface means of a said structure-based thrust support is moved out of engagement therewith so as to free said structure from being fixed in said existing position and able to be shifted towards said new position; and
(b) a said wedge surface of a said support rod-based thrust support is progressively moved along a said support surface means of a said structure-based thrust support so as to cam said structure away from said existing position and into said new position, until the said support surface into which such wedge surface leads becomes engaged with said support surface means of the last-mentioned structure based thrust support thereby fixing said structure in said new position.

4,917,340

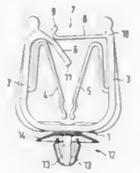
RETAINING BRACKET FOR FASTENING CABLES OR GROUPS OF CABLES

Dietrich Jüemann, Lörrach; Mathias Hänsel, and Wolfgang Schneider, both of Kandern, all of Fed. Rep. of Germany, assignors to A. Raymond, Lorrach, Fed. Rep. of Germany

Filed Oct. 31, 1988, Ser. No. 264,728
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1987, 3737113
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—74.2 **3 Claims**

1. A retaining bracket of elastic plastic material for holding elongated components of different diameters to a carrier plate comprising a base plate including first and second opposite

edges and having means for fastening the bracket to a carrier plate, a first integral side wall that extends upwardly from said first edge of said base plate and terminating in a first free end, a second integral side wall that extends upwardly from said second edge of said base plate and terminating in a second free end, said first and second integral side walls forming a U-shaped retention space having an upwardly directed opening for insertion of said components, a first cover arm being integrallly connected to said first free end of said first side wall and further including a first cooperating locking edge on a free end thereof, a second cover arm being integrally connected to said second free end of said second side wall and further including a second cooperating locking edge on a free end thereof, said



first cover arm being relatively rigid and extending obliquely downward into the retention space from said first free end of said first side wall, said first cover arm covers approximately one-half of said opening, said second cover arm being relatively flexible and extending across the opening from said second free end of said second side wall and partially overlapping an upper side thereof of said first cover arm, whereby, upon insertion of said components said second cover arm deflects downwardly beyond said first cooperating locking edge of said first cover arm thereby permitting said components to enter the retention space and allowing said second cover arm to snap back and engage its said second cooperating locking edge with said first cooperating locking edge of said first cover arm thus securing said components therein.

4,917,341

TRESTLE WITH CROSSED LEGS FOR SUPPORTING MUSICAL KEYBOARDS

Paolo Pirchio, Castelfidardo, Italy, assignor to MPM Music - S.r.l., Castelfidardo, Italy

Filed Dec. 16, 1988, Ser. No. 285,060
Claims priority, application Italy, Dec. 22, 1987, 19449/87[U]
Int. Cl.[4] F16M *11/32*
U.S. Cl. 248—164 **9 Claims**

1. A support for musical keyboards comprising in combination:

a trestle having a first end resting on the floor and a second end supporting a first musical keyboard, the second end of the trestle having at least one pair of spaced-apart transverse bars attached thereto, each transverse bar having a respective back end and a center line, the trestle being adjustble in height such that the musical keyboard may be adjusted to a desired height from the floor;

a pair of upright shafts each having a first end and a second end, means for connecting the first end of each shaft to each respective back end of each transverse bar such that the upright shaft may pivot about the center line of the respective transverse bar and further such that rotation thereabout may be prevented; the second end of each shaft extending upwardly from each respective transverse bar;

a pair of brackets, one bracket mounted perpendicularly to the second end of each respective shaft for support of a second musical keyboard and further such that when the shafts are pivoted about the center lines of the respective transverse bars, the brackets are moved together and apart with respect to one another such that keyboards of varying widths may be supported thereon; and

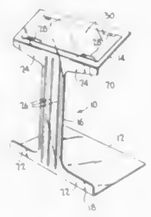
a pair of additional brackets each having an upper arm and a lower arm, means for connecting the lower arm of each additional bracket near the second end of each respective upright shaft such that each additional bracket may pivot forwardly and backwardly about an axis which is perpendicular to the center line ofthe respective transverse bar and further such that rotation thereabout may be prevented, such that the upper arm of the additional brackets may support a third musical keyboard and when the additional brackets are pivoted about the connecting means, the third musical keyboard may be inclined.

4,917,342

STAND-UP SIGN HOLDER

Jacob Fast, 7561 NW. 9th St., Plantation, Fla. 33317

Filed Mar. 24, 1989, Ser. No. 328,499
Int. Cl.[4] F16M *11/00*
U.S. Cl. 248—174 **12 Claims**



1. A holder for labels, signs and the like comprising a sheet of foldable material having a base panel at one of the sheet, a label or sign holding panel at an opposite end of the sheet, an elongate stem connecting said panels, a transverse fold line between the base panel and the stem whereby, when the base panel is folded about said fold line substantially perpendicularly to the stem, the holder can stand on the base panel with the stem extending upwardly toward the label or sign holding panel and a further transverse fold line between the label or sign holding panel for bending the panel back toward the base panel.

4,917,343

ADJUSTABLE SUPPORT

Ross B. Wainscott, Feilding, New Zealand, assignor to READ-EZE Systems Limited, Lower Hitt, New Zealand

Continuation of Ser. No. 907,820, Sep. 16, 1986, abandoned. This application Oct. 14, 1987, Ser. No. 110,037
Claims priority, application New Zealand, Sep. 16, 1985, 213481; Oct. 25, 1985, 213967
Int. Cl.[4] A47B *65/00*
U.S. Cl. 248—447.2 **4 Claims**

1. An adjustable support comprising:

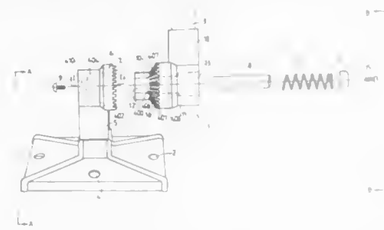
a first support means;

a second support means operatively disposed adjacent to said first support means;

a spring under compression biasing said second support means into abutting relationship with said first support means;

engagement means positioned between the first and second support means in the form of a first set of teeth provided radially about an inner peripheral edge of a frusto-conical recess portion of said first support means and a second set of teeth engageable with said first set and provided radially about an inner peripheral edge of a frusto-conical projection of said second support means, said first and second sets of teeth locking said first and second support means together when in said abutting relationship and said frusto-conical recess of said first support means including an inner bore and said frusto-conical projection of said second support means including a projecting portion which when in said abutting relationship fits within said inner bore of the first support means;

mounting and operating means being provided which enable



said first and second support means to be disengaged from said abutting relationship against the bias of said spring, the mounting and operating; means having a pin one end extending through a bore in said second support means to contact said first support means, the pin within the bore having thereon said spring one end of which contacts a flange portion within said bore in said second support means, the other end of said spring contacting a cover knob on the other end of the pin, the cover knob substantially filling an open end of the bore for concealing said spring within said bore, the mounting and operating means being fixed relative to the first support means wherein manual pressure applied axially to the second support means causes the second support means to laterally move relative to the first support member to thereby release the first and second sets of teeth from engagement thus allowing rotational movement of the first and second support means relative to each other to a new position in which release of the axial pressure allows said spring to return said second support means to said abutting relationship.

4,917,344

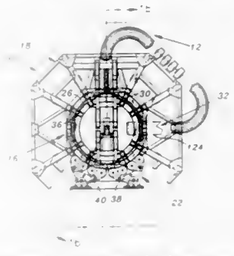
ROLLER-SUPPORTED, MODULAR, ISOCENTRIC GANTRY AND METHOD OF ASSEMBLY

Rudolf E. Prechter, Cranbury, and Benjamin A. Prichard, Jr., East Windsor, both of N.J., assignors to Loma Linda University Medical Center, Loma Linda, Calif.

Filed Apr. 7, 1988, Ser. No. 178,471
Int. Cl.[4] G01N *21/00*
U.S. Cl. 248—664 **13 Claims**

1. An earthquake resistant, roller-supported, modular, isocentric gantry for supporting and rotating a radiation beam transport and delivery system on an axis of rotation around a stationary patient so as to precisely deliver a treatment beam to a predetermined target isocenter within the patient and on the axis of rotation from several different angles during patient treatment, the gantry comprising:

an inner support structure including vertically extending, parallel and concentric front and rear circular rings separated by axially extending brace members and supported by rollers for rotation on an axis of rotation, the rear ring carrying an entry element of the beam transport and delivery system for turning on the axis of rotation and the front ring or an axially extending brace member carrying means supporting an exit element of the beam transport and delivery system to precisely deliver the treatment beam at the target isocenter on the axis of rotation independent of the rotational position of the inner support structure;



motor drive means for rotating the inner support structure on the axis of rotation;

an outer annular segmented truss secured to and circumscribing the inner support structure and carrying intermediate elements of the beam transport and delivery system for turning on the axis of rotation with the inner support structure; and

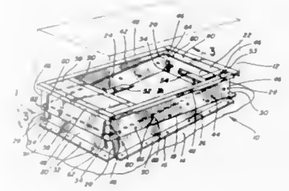
means extending between the rear ring and the truss for supporting other intermediate elements of the beam transport and delivery system between the rear ring and the truss.

4,917,345

ADJUSTABLE ROOF CURB

John R. Czech, Lemont, Ill., assignor to Midwest Mechanical, Inc., Willowbrook, Ill.

Continuation of Ser. No. 201,955, Jun. 3, 1988, abandoned. This application Sep. 29, 1989, Ser. No. 415,424
Int. Cl.[4] F16M *11/00*
U.S. Cl. 248—678 **10 Claims**



10. An adjustable roof curb structure for mounting apparatus on an inclined or flat roof surface in which said apparatus is mounted horizontally relative to ground comprising:

a base member having interconnected, upstanding planar walls defining a hollow, rectangular frame;

a support member having interconnected upstanding planar walls defining a hollow rectangular frame and having said base member nested therein with the walls of said members arranged in opposing relationship, said support member constructed and arranged to mount the apparatus thereon;

said base member having flange means for mounting the base member to said roof surface;

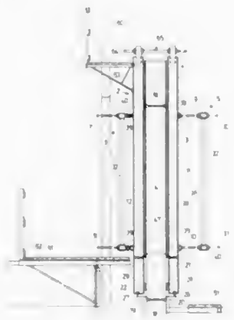
said base member and support member having cooperating slot and fastener means in both ends of each opposing walls for adjustably coupling the support member relative to the base member in both a lateral and a longitudinal direction whereby said apparatus mounted thereon can be oriented in a horizontal plane relative to ground, said means including linear slots in opposing planar walls of said members and extending in a direction transverse to the roof surface adapted to receive said fasteners therethrough for such adjustable coupling of said members, said means being located adjacent opposite ends of the curb structure so that said members can be adjustably coupled selective at each such end thereof.

4,917,346

CONCRETE FORM SHUTTERING

Hugo Mathis, Bregenz, Austria, assignor to Rund-Stahl-Bau Gesellschaft m.b.H.

PCT No. PCT/EP87/00309, § 371 Date Feb. 17, 1988, § 102(e) Date Feb. 17, 1988, PCT Pub. No. WO87/07922, PCT Pub. Date Dec. 30, 1987
PCT Filed Jun. 12, 1987, Ser. No. 163,821
Claims priority, application Austria, Jun. 17, 1986, A1653/86
Int. Cl.[4] E04G *11/20*
U.S. Cl. 249—20 27 Claims



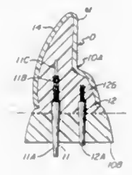
1. An adjustable form for forming a structure, the form comprising an inner form and an outer form, a space being defined between the inner form and the outer form for forming the structure therein, the inner and the outer forms each having a plurality of spaced-apart form plates, each form plate having form plate edges and a rear side, web members being provided between adjacent form plates of the inner form and between adjacent form plates of the outer form, a first circumferentially closed, force-transmitting support ring being arranged horizontally spaced from and inside the inner form, a second circumferentially closed, force-transmitting support ring being arranged horizontally spaced from and outside the outer form, threaded spindles being mounted in the support rings, the threaded spindles being slidable in approximately horizontal direction, means for fixing the threaded spindles, each threaded spindle having an end engaging a form carrier, wherein a form carrier is mounted to each form plate and each web member, the web members engaging over the form plate edges at the rear sides of the form plates, wherein each web member has on a surface facing the space between the inner and outer forms a support which corresponds in thickness approximately to the thickness of the form plates, the supports extending between the form plate edges of adjacent spaced-apart form plates.

4,917,347

REFRACTORY DIE FOR MAKING PORCELAIN DENTAL PROSTHESIS AND A THERMAL CONDUCTING PIN FOR USE THEREIN

Thomas J. Fenick, Garwood Rd., Trumbull, Conn. 06611

Filed Nov. 14, 1988, Ser. No. 270,346
Int. Cl.[4] A61C *13/34*
U.S. Cl. 249—54 2 Claims



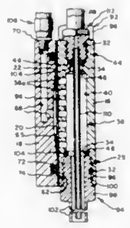
1. A refractory die for making a porcelain dental prosthetic restoration comprising
a die simulating the shape of a prepared tooth which is adapted to receive a porcelain restoration,
said die being made of an ammonia phosphate bonded investment,
a solid high temperature pin imbedded in said refractory die for withstanding temperatures in the range of 1600° F. to 2200° F., with a minimum of oxidation,
said pin having opposed end portions, one end portion of said pin projecting out of said refractory die material, and the other end portion being imbedded in said die whereby said pin during vitrification functions as a heat sink for conducting heat to and from the interior of the refractory die so that the internal area of the die is being heated and cooled at substantially the same rate as a layer of procelain adapted to be formed thereon.

4,917,348

FILLING NOZZLE CUT-OFF VALVE

Iver J. Phallen, Youngstown; Richard J. Jezuit, Lancaster, and Patrick J. Lynch, North Tonawanda, all of N.Y., assignors to Oden Corporation, Buffalo, N.Y.

Filed Nov. 14, 1988, Ser. No. 270,644
Int. Cl.[4] F16K *31/365*
U.S. Cl. 251—61.1 17 Claims



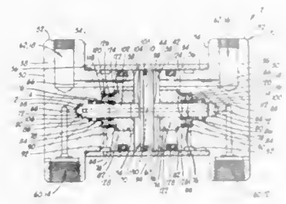
1. A filling nozzle cut-off valve comprising:
a valve head having an operational surface provided with a centrally located shallow recessed portion and an air hole extending to the recessed portion;
a valve body having a smooth surface disposed in alignment with the operational surface of the valve head, inlet and outlet ports, spaced apart inlet and outlet passageways extending respectively from the inlet and outlet ports to inlet and outlet passageway openings in an area of the smooth surface opposite the recessed portion of the valve head, the inlet and outlet passageway openings being arranged in two columns symmetrical with the center of the smooth surface;
a diaphragm disposed between the valve head and the valve body and extending across both the recessed portion of the valve head and the passageway openings in the smooth surface; and
holding means which holds the parts together with the diaphragm sandwiched between the operational surface of the valve head and the smooth surface of the valve body.

4,917,349

VALVE, AND SET POINT PRESSURE CONTROLLER UTILIZING THE SAME

Jim B. Surjaatmadja, and Mark C. Ehlert, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Mar. 29, 1989, Ser. No. 329,930
Int. Cl.[4] F16K *31/122*
U.S. Cl. 251—63 8 Claims



1. A valve comprising:
a housing having a high pressure port and a low pressure port defined therein, said housing including:
a sleeve;
a first end piece having said high pressure port defined therein; and
a second end piece having said low pressure port defined therein; and
wherein said first end piece and said second end piece are disposed in opposite ends of said sleeve for permitting either of said end pieces to be rotated relative to said sleeve so that said high pressure and low pressure ports are positionable at different angles to each other;
a valve member disposed in said housing so that said valve member is movable between a closed position, wherein said high pressure port does not communicate with said low pressure port, and an open position, wherein said high pressure port communicates with said low pressure port;
seal means for providing a seal between said valve member and said housing; and
communicating means, disposed in said valve member, for continuously communicating said high pressure port across said seal means regardless of the position of said valve member.

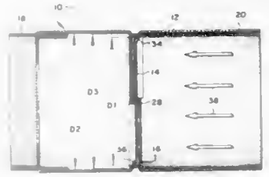
4,917,350

GASKETLESS AIR DAMPER

Barry C. Beyer, Greenfield, and Thomas M. Pendergrass, Rushville, both of Ind., assignors to American Standard Inc., New York, N.Y.

Filed Jul. 18, 1989, Ser. No. 381,607
Int. Cl.[4] F16K *31/04, 1/22*
U.S. Cl. 251—129.11 6 Claims

1. An air damper comprising:
a cylindrical sleeve, said sleeve having an integrally formed inwardly protruding circumferential seal ridge which defines a generally circular air flow path through said damper;
a rod penetrating said sleeve through the plane defined by said seal ridge;
a plurality of gears operatively connected to said rod;
a motor operatively connected to said gears; and
a generally circular damper blade mounted for rotation on said rod within said sleeve and having a generally flat face portion, said blade having an overall diameter greater than the diameter of the air flow pat defined by said seal ridge and said blade having first and second edge seals, said edge seals being integrally formed portions of said blade which extend away from the plane of said face portion of said blade in opposite directions to aerodynamically interact with air flowing through said damper so that essentially constant torque is transmitted through said rod irrespective of the position of said blade relative to air flow through said damper and so that when said damper is closed, one of said edge seals is disposed generally upstream of said face portion of said blade and abuts directly against a first side of said seal ridge and the other of said edge seals is disposed generally downstream of said face portion of said blade and abuts directly against the other side of said seal ridge, said downstream one of said edge seals being at least partially shielded from air flowing into said damper by said seal ridge.

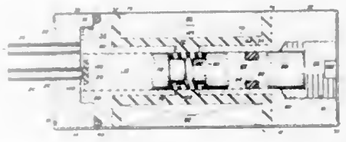


4,917,351

METERING VALVE

George R. Lindbloom, Mesa, and Anton J. Matics, Scottsdale, both of Ariz., assignors to Micro-Flo Technologies, Inc., Tempe, Ariz.

Filed Mar. 15, 1989, Ser. No. 323,675
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.18 11 Claims



1. A fast-acting metering valve comprising:
(a) a casing with opposite first and second ends defining an interior chamber with inlet and outlet ports extending through said first end into said chamber;
(b) an electrical coil extending annularly within said casing;
(c) first and second retainers located respectively at said first and second ends of said casing being of a ferrous material;
(d) an armature slidable within said first retainer and extending generally axially therein, said armature having opposite first and second ends, said first end defining a valve seat member engageable with one of said ports in a closed position and in an open position permitting fluid communication between said ports;
(e) stop means axially aligned with said armature and slidable within said second retainer and defining an air gap between the stop means and the second end of said armature in the valve closed position;
(f) means at the second end of said casing for axially selectively adjusting the position of said stop means relative to said armature to set the air gap therebetween; and

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(g) biasing means normally urging said armature toward said closed position.

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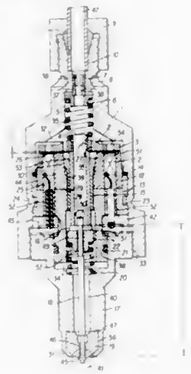
INJECTOR FOR ENGINE WITH SPARK IGNITION AND DIRECT INJECTION

Bertrand Hauet, Issy Les Moulineaux; Jean-Pierre Jourde, Croissy Sur Seine; Christian Ozenfant, Les Clayes Sous Bois, and Claude Dabert, Vilette De Vienne, all of France, assignors to Regie Nationale Des Usines Renault, Boulogne Billancourt, France

Filed May 6, 1988, Ser. No. 191,137
Claims priority, application France, May 12, 1987, 87 06632
Int. Cl.[4] F02M *51/06*; F16K *31/02*
U.S. Cl. 251—129.19 6 Claims



1. An electromagnetic injector for an engine with spark ignition and direct injection, said injector comprising:

a body having a support defining a valve seat;

a needle in said housing and cooperating with said valve seat to form a reverse clack;

means for suspending said needle such that it closes said clack, said suspending means including a return spring;

mobile means movable for releasing suspension of said needle, said mobile means comprising a plane plate and a liner fixed thereto;

means connected to said body for delivering a pressurized fuel to said clack; and

an electromagnetic coil in said body and comprising means for moving said mobile means to a position for releasing suspension of said needle so that said clack may be opened by fluid pressure of said fuel,

wherein said suspending means further comprise:

a headed end of said needle support opposite said clack; and

means biased by said return spring for engaging said headed end to close said clack;

wherein an end of said liner opposite said flat plate contacts said engaging means, said end of said liner moving said engaging means away from said headed end when said electromagnetic coil is energized so that said needle is movable independently of said return spring,

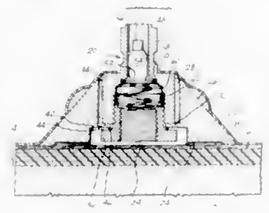
whereby upon actuation of said electromagnetic coil the suspension of said needle is released so that said clack is slowly opened and whereby said clack is rapidly closed by said return spring when said electromagnetic coil is not actuated.

4,917,353

VACUUM PROBE AND METHOD

A. Douglass Riley, Winnipeg, Canada, assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 15, 1988, Ser. No. 272,112
Int. Cl.[4] F16L *37/28*
U.S. Cl. 251—148 19 Claims



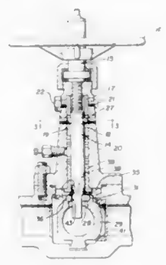
1. A vacuum probe comprising a bottom portion having a bottom surface with a recess formed therein for developing a vacuum between the probe and a workpiece, a top portion, outer sidewall means sloping upwardly and laterally inwardly from said bottom portion to said top portion, a vacuum line connector projecting upwardly from said top portion for attaching the probe to a vacuum line, and an axial passageway extending through the connector and communicating with the recess; said sidewall means forming an outer annular sealing surface for receiving sealing material to sealingly engage a vacuum pressure bag when the probe is positioned between the bag and workpiece with the connector projecting through an opening in the bag and a vacuum is applied through the axial passageway.

4,917,354

DUAL ACTION BALL VALVE

James F. Chambers, 17 Woodberry Rd., Little Rock, Ark. 72212

Filed Jan. 10, 1989, Ser. No. 295,452
Int. Cl.[4] F16K *5/06*
U.S. Cl. 251—163 3 Claims



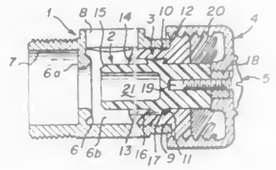
1. In a dual-action ball valve of the type wherein a valve stem is mounted in a valve bonnet and a bonnet bushing and threadably connected at its upper end to a drive nut connected to a hand wheel and its lower end slidably received in the ball valve, whereby initial rotation of the hand wheel to open the valve causes the ball valve to move away from the valve seat and continued rotation causes the ball valve to rotate 90° to the open position, the improvement comprising a sleeve fixedly mounted within the valve bonnet and surrounding the valve stem, a pair of spiral slots provided in the side wall of said sleeve, a transverse guide pin mounted in the valve stem and having its opposite end portions extending into the sleeve slots, an insert member mounted on the upper wall of the ball valve, said insert member comprising a disc having an aperture, the lower end of said valve stem extending through said aperture, said aperture having tapered bearing wall surfaces cooperating with sloping cam surfaces on the lower end portion of the valve stem, and arcuate members integrally formed on the upper surface of the insert adjacent each end of the aperture and engaging the lower end of the valve bonnet bushing to thereby provide a trunnion, whereby the ball valve is tilted relative to the valve seat during the sliding movement of the stem cam surfaces relative to the tapered bearing surfaces in the insert.

4,917,355

STOP VALVE

Richard C. G. Dark, Rancho Cucamonga, and William L. Wright, Ontario, both of Calif., assignors to Robert Manufacturing Company, Rancho Cucamonga, Calif.

Filed May 22, 1989, Ser. No. 355,282
Int. Cl.[4] F16K *41/00*, *31/50*
U.S. Cl. 251—214 33 Claims



32. A stop valve comprising:

a valve body;

said valve body containing an inlet bore, an outlet bore and a chamber intermediate said inlet and outlet bores, said chamber including:

a chamber wall separating said chamber from said inlet bore with said chamber wall containing a passage and a seal seat, with said seal seat being located peripheral of said passage;

a valve sleeve receiving passage spaced from said inlet and outlet bores with said valve sleeve receiving passage containing internal threads;

sleeve means;

said sleeve means being formed of a relatively rigid non water absorptive slippery plastic material and including:

a circular shaped end wall having a circular opening of a first predetermined diameter, DW, defining an axially extending passage with said circular opening being centrally located in said end wall;

said end wall including a seal seat bordering said opening, said seal seat being of a right circular conical surface shape;

an axially extending hollow cylindrical cavity of a second predetermined diameter DC, and of a length, LC; said second diameter DC being greater than the diameter DW of said circular opening; and

a cylindrical shaped peripheral outer surface portion with said cylindrical shaped outer surface peripheral portion containing a first thread for matingly engaging said internal threads of said valve sleeve receiving opening in said housing and forming an interference fit therebetween;

valve stem means, comprising:

an elongate one-piece molded member of a resilient compressible plastic material, said elongate member including:

first and second ends and being of a predetermined length, LS;

first and second generally cylindrically shaped portions of diameter DS1 and DS2, respectively; and

a third band portion, located between and adjacent said first and second cylindrical portions, said third portion including a cylindrical section being of a diameter, DS3, where DS3 is slightly larger than said diameter DS2, to define a raised band portion, and said third band portion being of a predetermined length LB, where LB is less than LS;

said third band portion defining first and second annular edges bridging the top and bottom ends, respectively, of the outer surface thereof to said respective adjacent first and second cylindrical portions;

said first annular edge facing toward said second end and having an inverted frusto conical shape to define a seal surface for engagement with said seal seat of said sleeve means;

said second annular edge including a lip, with said lip outwardly projecting from and peripherally extending about said first cylindrical portion, said lip having a right circular conical shaped outer surface and an inverted right circular shaped inner surface with the cone angle of said inner surface being greater than the cone angle of said outer surface and with the outer diameter of said lip, LL, being greater slightly than DS3 and being slightly greater than said DS, the inner diameter of said sleeve bore, whereby a compressive force is produced between said lip and said sleeve bore cavity responsive to said stem being located within said sleeve cavity;

said first cylindrical portion including an annular edge at said first end of said member; said annular edge having a tapered shape to form a seal for engaging said seal seat in said chamber wall; and

said second end of said member including coupling means for coupling a torque thereto;

hand grippable handle means for turning said stem means, said handle means having coupling means for coupling to said valve stem torque coupling means and preventing relative rotational movement therebetween; said handle means including a top surface and a annular rim portion depending from said top surface; said handle means rim portion containing a multi-lead thread on an inner surface thereof;

said multi-lead thread on said handle means rim portion being in operative mating engagement with said multi-lead thread on said sleeve means, whereby rotation of said handle means causes said handle means to move axially of said sleeve means;

said stem means being responsive to rotation of said handle means in one rotational direction for axially moving within said hollow cavity in a first direction to move said annular edge of said first cylindrical portion into sealing engagement with said seal seat in said chamber wall and close a fluid path between said inlet and outlet bores and being responsive to rotation of said handle means in an opposite rotational direction for axially moving said stem means in the opposite direction to withdraw said first seal means from contact with said seal seat in said chamber wall to open a fluid path between said inlet and outlet bores and for moving first annular edge of said third cylindrical portion of said stem means into engagement with said seal seat in said sleeve means wall to produce a sealing engagement therebetween and with said lip of said third cylindrical portion maintaining sealing engagement with the walls of said sleeve means hollow cylindrical cavity; and

screw means for fastening said handle means to said stem means.

4,917,356

LOW PROFILE, REMOTELY OPERABLE VALVE

Hossain A. Shirdavani, 14425 NE. 37th Pl., Unit G-6, Bellevue, Wash. 98007

Filed Oct. 10, 1989, Ser. No. 419,545
Int. Cl.[4] F16K *31/46*
U.S. Cl. 251—294 1 Claim

1. A poppet valve comprising:

a fitting having a first longitudinal axis, an inner end, an outer end, an outer surface, an inner surface, a valve seat at said inner end, a shoulder in said inner surface adjacent to said valve seat, a skirt at said outer end, said skirt having a plurality of diametrically oppositely positioned slots,

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said slots having first slot ends and being parallel to said first longitudinal axis, and a snap ring groove in said outer surface,

a poppet having a head, a valve seat portion of said head and a stem portion of said head and a stem having a surface and a snap ring groove in said surface, and an end, said end having a slot, said slot having a second slot end and bifurcating said end of said stem,

a poppet stem snap ring,

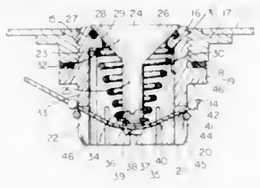
a fitting snap ring,

a spring, surrounding said stem, seated on said shoulder and retained on said stem by said poppet stem snap ring in said snap ring groove in said surface of said stem,

a cable having first and second ends,

a first ferrule fastened at said first end of said cable,

a second ferrule fastened on said cable a distance from said first ferrule, said distance being such that when (1) said poppet is installed in said fitting with said valve seat por-



tion on said valve seat and retained in said fitting by said spring positioned between said shoulder and said poppet stem snap ring and (2) said cable is positioned in two diametrically oppositely located slots of said plurality of slots and through said slot bifurcating said end of said stem and (3) said cable is retained in said two of said plurality of slots at said second slot ends by said fitting snap ring in said snap ring groove in said outer surface, said ferrules keep said cable in said bifurcating slot in said stem,

said slots being such that with said cable so retained there is slack between said first and second ferrules and said second slot end is nearer to said outer end of said fitting than said first slot ends,

whereby when tension is applied to said cable said slack is taken up, moving said poppet to compress said spring and move said valve seat portion off said valve seat, thus opening said valve and whereby when said tension is relieved, said spring closes said valve.

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DIAPHRAGM VALVE

Oliver L. Danko, Chesterland, Ohio, assignor to Nupro Company, Willoughby, Ohio

Continuation-in-part of Ser. No. 249,386, Sep. 26, 1988. This application Aug. 8, 1989, Ser. No. 391,188

Int. Cl.[4] F16K *7/16, 31/50, 43/00*

U.S. Cl. 251—331 14 Claims

10. A diaphragm valve comprising:

a body having a recess, and inlet and an outlet selectively communicating across a valve seat disposed in a recess;

a composite diaphragm received in the recess for selective movement toward and away from the valve seat;

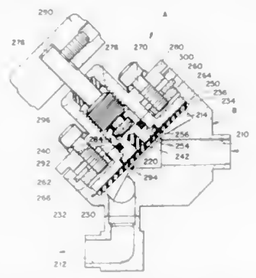
a first annular member disposed along a rear face of the diaphragm sealingly clamping a peripheral portion of the diaphragm to the body;

a closing cap at least partially received in the recess and engaging the first annular member for defining a cavity therebetween;

an actuating stem extending through the closing cap, the stem having a first end secured to the diaphragm without extending therethrough and a second end cooperating with the closing cap to advance and retract the stem relative thereto;

a ring secured to the body within said cavity between the first annular member and the closing cap;

a second annular member axially interposed between the ring and first annular member, the second annular member



abuttingly engaging the ring for transferring clamping forces from the body through the ring to the second annular member; and

means for transferring clamping forces from the second annular member to the closing cap which transfers desired clamping forces to the first annular member and the peripheral portion of the diaphragm to the body.

4,917,358

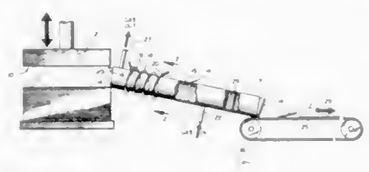
APPARATUS FOR PRODUCING ELECTRICAL STEEL CORE LAMINATIONS

Gregory Ludkovsky, Munster, Ind., assignor to Inland Steel Company, Chicago, Ill.

Division of Ser. No. 223,807, Jul. 25, 1988, Pat. No. 4,871,403. This application Jun. 19, 1989, Ser. No. 367,981

Int. Cl.[4] C21D *1/42*

U.S. Cl. 266—104 5 Claims



1. In combination:

a stamping press comprising means for stamping laminations from steel strip;

a downwardly inclined, tubular, chute having an upper entry end located adjacent said stamping press and comprising means for receiving laminations stamped at said press;

said tubular chute comprising means for conducting laminations away from said stamping press;

said tubular chute comprising means for totally enclosing said laminations along at least a portion of the length of said chute;

and induction heating coil means, located around said enclosed chute portion, for annealing laminations conducted away from said stamping press by said chute.

4,917,359

APPARATUS FOR MAKING HYPEREUTECTIC AL-SI ALLOY COMPOSITE MATERIALS

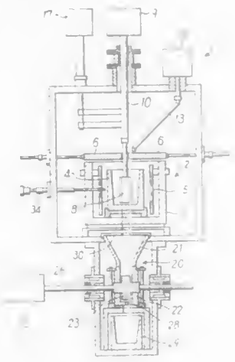
Kiyoshi Ichikawa, Tsukuba; Satoshi Ishizuka, and Shinji Yamamoto, both of Hamamatsu, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo and Suzuki Motor Co., Ltd., Shizuoka, both of, Japan

Division of Ser. No. 175,217, Mar. 30, 1988. This application May 17, 1989, Ser. No. 352,878

Claims priority, application Japan, Mar. 30, 1987, 62-79425; Oct. 8, 1987, 62-254345

Int. Cl.[4] C21C *7/10*

U.S. Cl. 266—208 6 Claims



1. An apparatus for making a composite material of a hypereutectic Al-Si alloy which comprises an alloy melting furnace contained

in a vacuum vessel, said melting furnace having a stirring blade rotated at low speed by a drive unit,

an addition hopper to feed a strengthening material of nonmetallic particles or fibers to a molten alloy, in said furnace,

a taphole through which the mixed molten composite material is poured down,

a taphole open-close device to open and close said taphole from outside of said vacuum vessel,

a stirrer to receive the molten composite material poured down through said taphole including

a rotor having a polygonal cross section that rotates at high speed to stir and spatter the received molten composite material,

and a heat-resistant vessel containing said rotor, receiving the molten composite material spattered therefrom, and pouring the collected material down into a mold through a small-diameter hole provided therein.

4,917,360

OPERATING DEVICE FOR ELECTRIC CHAIN BLOCK

Yasuhiro Kojima, Kawasaki, Japan, assignor to Kabushiki Kaisha Kito, Japan

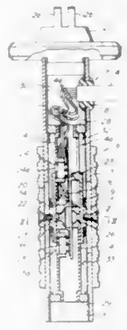
Filed Aug. 28, 1987, Ser. No. 90,627

Claims priority, application Japan, Aug. 29, 1986, 61-203512

Int. Cl.[4] B66D *1/12;* **H02P** *5/06*

U.S. Cl. 254—362 3 Claims

1. An operating device for an electric chain block having an electric motor for raising and lowering operations, said operating device comprising; a cylinder body interposed between one end of a chain for raising and lowering an object and a hook for hanging the object, a cylindrical grip fitted on said cylinder body and slidable upwardly and downwardly over predetermined distances relative to said cylinder body, movement detecting means provided in the cylinder body for detecting upward and downward movements of said cylindrical grip, moved distance detecting means provided in the cylinder body for detecting distances of said upward and downward movements of the cylindrical grip, and control means for energizing said electric motor to rotate it in normal and reverse directions in response to output of said movement detecting means according to the upward and downward movements of said cylindrical grip, respectively, and controlling rotating speeds



of said electric motor in response to output of said moved distance detecting means, wherein said moved distance detecting means comprises a light emission element, a light reception element and light changing means interposed between the light emission element and the light reception element for changing amount of light received by said light reception element in response to distances of the upward and downward movements of the cylindrical grip.

4,917,361

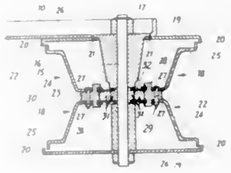
SNATCH BLOCKS

Richard B. Maxcy, Rte. 131, Warren, Me. 04864

Filed Mar. 1, 1989, Ser. No. 317,570

Int. Cl.[4] B66D *3/04*

U.S. Cl. 254—411 5 Claims



1 A snatch block for use when a line of a selected diameter, such as a line to which a lobster trap is attached, is to be pulled, said snatch block including a hanger having an arm extending laterally of one end, a supporting hook having a shank rotatably connected to the arm, a sheave, and means rotatably supporting the sheave and connecting the sheave to the hanger in a position underlying but spaced a substantial distance below the arm to enable the line to be passed laterally onto the sheave, said sheave including a central portion establishing a minimum sheave diameter and end portions increasing in diameter towards the respective ends of the sheave, each end portion including an end wall normal to the sheave axis and extending outwardly a distance greater than the line diameter to provide a line stop, each end wall including an annular lip extending substantially parallel with the sheave axis away from the sheave with the junction between each lip and wall so curved as to ensure that the line, when running across and

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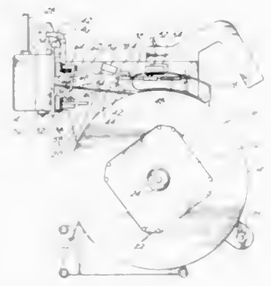
against it, will not become chafed, and water shields, one for each end of the sheave and connected to and held by the hanger, each shield including a rim in the form of an annular flange within which the edge of the appropriate one of the lips is a close but free fit, the axial extent of the lips and the outside diameter of the rim flanges such that the line running across either lip does not engage the free edge of the associated flange.

4,917,362

AUTOMATIC WIRE PULLER

Bruce Wilson, 3912 Mohawk St., Pasadena, Calif. 91107, assignor to Bruce Wilson, Pasadena, Calif.

Filed Mar. 9, 1989, Ser. No. 320,972
Int. Cl.[4] B65H *57/28*
U.S. Cl. 254—139.3 FT 11 Claims



1. An automatic wire puller for use with standard fish tape reels having a play-out and take up handle, the wire puller comprising:
a frame;
a fish tape reel holder rotatably mounted to the frame;
a bidirectional drive means for selectively rotating the reel holder in a play-out direction and a take up direction, the drive means having an arm pivotally mounted about the axis of rotation of the reel holder, a reversible electric motor mounted to the arm distal the pivot point, a sprocket driven by the motor, mating pins circumferentially mounted to the reel holder engaging the sprocket, and, means for constraining the arm;
means for remotely selecting the direction of operation and engaging the drive means;
means for constraining the handle of the fish tape reel;
a first torque sensing means for sensing torque on the reel holder in the take up direction, the first torque sensing means disabling the drive means if the fish tape becomes snagged during take up;
a second torque sensing means for sensing torque in the reel holder in the play-out direction, the second torque sensing means disabling the drive means if the fish tape becomes snagged during play-out;
a means for determining that take up of the fish tape is complete to disable the drive means; and
means for attaching the frame to a standard electrical outlet box.

4,917,363

THERAPEUTIC HEADREST

Sherry J. Evans, and Mary J. Jones, both of 8524 S. Wallace Ave., Chicago, Ill. 60620

Filed Jul. 11, 1988, Ser. No. 217,487
Int. Cl.[4] A61G *13/00*
U.S. Cl. 269—328 3 Claims

1. A therapeutic headrest for supporting a person's head so that the gravitational forces acting on the person's facial muscles and tissues are substantially directed toward the crown of the person's head and thus are reversed from the direction that they normally act, the therapeutic headrest comprising, in combination:
means for supporting the person's body in a supine position at a first predetermined elevation, the body support means having a first edge;
means for supporting the person's head at a second predetermined elevation below said first predetermined elevation such that the person's head is extended beyond the first edge of the body support means and is supported in a position 180 degrees from the position it occupies when the person is in his or her normal upright, vertical position, with the head support means including four vertically adjustable legs each having a top end and a lengthwise adjustable bottom end, with two of the legs defining a first set of legs and with the other two of the legs defining a second set of legs, two horizontal frame members, with one of the frame members being perpendicularly attached to said top ends of the two of said adjustable legs of the first set of legs and with the other of the frame members being perpendicularly attached to said top ends of the two of the said adjustable legs of the second set of legs, and a plate interposed between two of said adjustable legs of second set of legs and parallel to said frame members, said plate including a plurality of connectors, and with the head support means being conformable to the shape of the crown of the person's head;

a connector bar interposed with two of said adjustable legs and aligned perpendicular to said horizontal frame members, said connector bar having a mount projecting horizontally for attachment to said body support, and
alignment means for aligning the head support means with the body support means so as to accommodate the person.

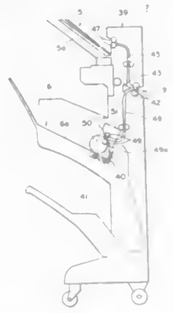
4,917,364

SHEET PROCESSING APPARATUS

Noriyoshi Iida, Ichikawa; Nobutaka Uto, Yokohama; Masakazu Hiroi, Tokyo, and Akimitsu Hoshi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 839,607, Mar. 14, 1986, abandoned.
This application Oct. 13, 1988, Ser. No. 258,128
Claims priority, application Japan, Mar. 15, 1985, 60-052055; Apr. 19, 1985, 60-085088
Int. Cl.[4] B41L *43/12*
U.S. Cl. 270—37 36 Claims

1. A sheet processing apparatus, comprising:
an inlet adapted to receive sheets;
stacking means for stacking sheets received through said inlet;
a tray, disposed below said stacking means, for stacking sheets received through said inlet, said tray being inclined downwardly toward an upstream side with respect to movement of the sheets to said tray;
a stopper for stopping upstream edges of the sheets on said tray;
means for urging the sheets to said stopper to align the sheets;
a stapler for stapling the sheets aligned on said tray by said urging means;
releasing means for moving said stopper away from its operative position to allow the sheets to fall;
an accommodating means, disposed below said tray, for receiving and accommodating the sheets allowed to fall by said releasing means;



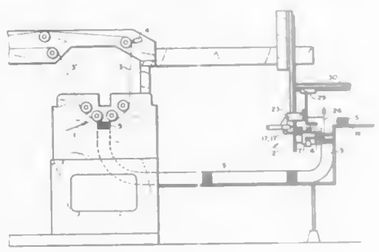
a first passage for guiding the sheets from said inlet to said stacking means;
a second passage for guiding the sheets from said inlet to said tray; and
selector means for selectively directing the sheets to said first or second passage.

4,917,365

METHOD AND APPARATUS FOR DIVIDING A MOVING STACK OF FLEXIBLE WORKPIECES INTO PARTIAL STACKS COMPRISING A PREDETERMINED NUMBER OF WORKPIECES

Kurt Stemmler, and Egon Marth, both of Neuwied, Fed. Rep. of Germany, assignors to Winkler & Dunnebier Maschinenfabrik & Eisengiesserei KG, Neuwied, Fed. Rep. of Germany

Filed Jul. 12, 1988, Ser. No. 218,313
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1987, 3723866
Int. Cl.[4] B65H *41/00*
U.S. Cl. 270—52.5 5 Claims



1. Apparatus for dividing a moving stack of flexible workpieces, having detectable markings thereon, into partial stacks comprised of a predetermined number of workpieces, in particular in the manufacture of towels, such as face towels, paper hand towels and the like, such towels being interfolded with one another in a zigzag manner, said apparatus comprising means for detecting the markings provided on the stack, means for separating a partial stack from the total stack comprising a separating blade wherein the front part of the separating blade includes a nozzle adapted to be operated with blowing air, and means for discharging and depositing a partial stack.

4,917,366

SHEET HANDLING APPARATUS

Koichi Murakami, Yokohama; Hideki Adachi, Kawasaki; Masanori Miyata, Yokohama, and Takeshi Honjo, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 20, 1987, Ser. No. 16,867
Claims priority, application Japan, Feb. 25, 1986, 61-38322; Feb. 25, 1986, 61-38323; Feb. 25, 1986, 61-38324; Feb. 25, 1986, 61-38325; Feb. 25, 1986, 61-38326; Feb. 25, 1986, 61-38327; Apr. 11, 1986, 61-82303; Apr. 11, 1986, 61-82304; Apr. 11, 1986, 61-82305; Apr. 11, 1986, 61-82306; Apr. 11, 1986, 61-82307; Apr. 11, 1986, 61-82310; Jun. 9, 1986, 61-133566; Jun. 9, 1986, 61-133568; Jun. 9, 1986, 61-133576; Jun. 9, 1986, 61-133577; Jun. 9, 1986, 61-133578; Jun. 9, 1986, 61-133579
Int. Cl.[4] B42B *1/02*
U.S. Cl. 270—53 45 Claims

8 A sheet handling apparatus comprising:
folding means for folding transported sheets;
detection means for detecting defective folding in said sheets;
binding means positioned downstream of said folding means and adapted to bind the sheets transported from said folding means; and
control means for controlling the binding operation for a sheet when said detection means detects a defective folding on said sheet.

4,917,367

ON-LINE TIPPING APPARATUS FOR A SIGNATURE INSERTING MACHINE

Harold E. Sterne, 5815 Cherokee Dr., Cincinnati, Ohio 45243, and Anthony V. Macke, 1879 U.S. Rte. 52, Moscow, Ohio 45153

Filed Aug. 29, 1988, Ser. No. 237,542
Int. Cl.[4] B65H *5/30*
U.S. Cl. 270—57 19 Claims

1 A portable on-line tipping apparatus intended for use with a signature inserting machine wherein the apparatus has an auxiliary chain drive system run by a main conveyor chain drive system of the signature inserting machine, said on-line tipping apparatus comprising:
(a) a frame assembly capable of being readily moved from a place of storage to operable association with the signature inserting machine;
(b) a drive system base mounted on the frame assembly for accommodating an auxiliary chain drive system, said base

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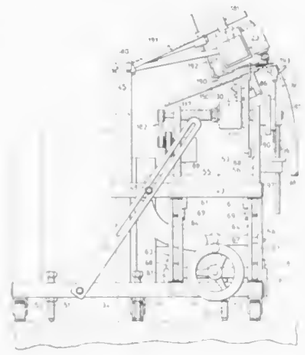
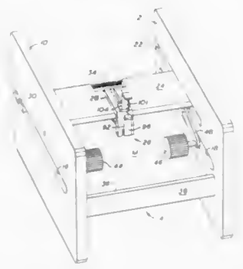
having a vertical movement means for approximate positioning of the auxiliary chain drive system;
(c) an auxiliary chain drive system mounted on the drive system base said auxiliary chain drive system having an endless auxiliary conveyor chain with pusher means thereon for moving an insert along its length, said system having means to operably engage it with the main conveyor chain whereby power from said main conveyor chain is transferred to the auxiliary conveyor chain so as to directly control its speed and timing;
(d) a raceway operably associated with the frame assembly above the auxiliary chain drive system for receiving a signature from the signature inserting machine;



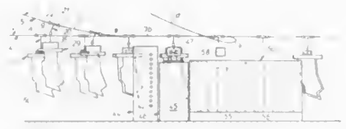
(e) an adhesive applying mechanism operably associated with the frame assembly for directing a bead of adhesive to an outwardly facing surface of the signature while being moved by the pusher means of the endless auxiliary conveyor chain; and
(f) an elongated catch saddle operably associated with the frame assembly and above the raceway for receiving an insert from a hopper of the signature inserting machine, said elongated catch saddle adjustably positioned to receive the insert so as to overlie the adhesive bead on the signature.

4,917,368
SHEET FEEDING METHOD AND APPARATUS
Theodore J. LaBelle, Dorchester; Kenneth A. McAuley, Boston, and George P. Ward, Jr., Danvers, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Mar. 16, 1989, Ser. No. 324,036
Int. Cl.[4] B65H *3/30*
U.S. Cl. 271—21 23 Claims



1. A sheet handling mechanism for separating and feeding the uppermost sheet from a stack of superposed sheets influenced by forces causing the sheets to be attracted to one another, each sheet having top and bottom surfaces and forward and rear edges, said mechanism comprising:
mechanical pick means including hook means for insertion under and lifting of the rear edge of the uppermost sheet from the remainder of the stack;
translatable lifting roller means for engaging the bottom surface of the uppermost sheet and for progressively peeling the uppermost sheet away from the remainder of the stack; and
drive roller means positioned in the translating path of said lifting roller means for contacting the top surface of the uppermost sheet as it is sandwiched between said roller means to feed the uppermost sheet away from the remaining stack of superposed sheets.

4,917,369
METHOD AND APPARATUS FOR POSITIONING LIMP WORKPIECES FOR TREATMENT THEREOF
Philipp Moll, Aachen, and Albrecht Kaiser, Vlotho, both of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Kaiserslautern, Fed. Rep. of Germany
Filed May 7, 1987, Ser. No. 47,976
Claims priority, application European Pat. Off., Sep. 15, 1986, 86112725
Int. Cl.[4] B65H *7/02*
U.S. Cl. 271—228 3 Claims

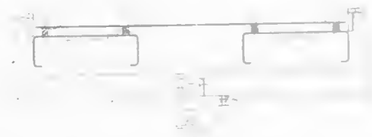


1. A method for positioning at least two limp workpiece layers together, comprising the steps of:
suspending a first workpiece layer in a first vertical plane and suspending a second workpiece layer in a second vertical plane, the vertical planes being separate with regard to one another;
moving the first workpiece layer and the second workpiece layer along paths, the paths converging such that the workpiece layers are moved toward one another in the suspended position allowing the workpiece layers to be moved into relative contact after the workpiece layers are moved toward one another;
determining the relative two-dimensional position of the first and second workpieces to determine if the first and second workpieces are in two-dimensional alignment;
shifting the position of one of the workpieces upon determination that the first and second workpieces are not in two-dimensional alignment, to fix the position of the first and second workpieces in two-dimensional alignment with regard to one another; and
moving the first and second workpieces, fixed in two-dimensional alignment.

4,917,370
SHEET LAUNCHER FOR ROLL FORMING MACHINE
Graham W. Batts, Dunedin, New Zealand, assignor to White Consolidated Industries, Inc., Cleveland, Ohio
Filed Aug. 28, 1987, Ser. No. 90,449
Int. Cl.[4] B65H *9/14*
U.S. Cl. 271—229 9 Claims

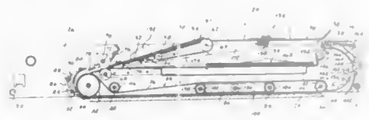
1. A sheet launcher, for feeding elongated pieces of sheet material to processing equipment, comprising first transfer means for transporting individual elongated, substantially rectangular pieces of sheet material to a launch position, centering

means operating to laterally move said sheets at said launch position to locate said sheets at a centered location in said launch position in which said sheets are laterally and longitudinally aligned with respect to said processing equipment, and guide means operating to grip and guide said sheets at longitudinally spaced locations as said sheets move to said processing equipment, said guide means operating to maintain gripping engagement with said sheets and operating to guide said sheets



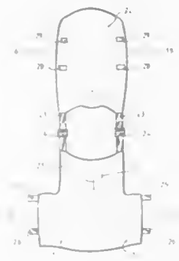
into said processing equipment until a substantial portion thereof enters said processing equipment, said centering means including first pushers along one side of said sheets which are located in a fixed position for positioning the adjacent edge of said sheets in a predetermined lateral location, said centering means also including second pushers along the opposite edge of said sheets which resiliently engage said sheets and maintain said sheets against said first pushers.

4,917,371
AUTOMATIC DOCUMENT FEEDER AND REGISTRATION SYSTEM THEREFOR
Francis M. Bastow, Newark Valley, and William C. Hoffman, Apalachin, both of N.Y., assignors to Savin Corporation, Stamford, Conn.
Continuation of Ser. No. 919,872, Oct. 16, 1986, abandoned, which is a division of Ser. No. 449,132, Dec. 13, 1982, Pat. No. 4,621,799. This application Jul. 13, 1988, Ser. No. 220,434
Int. Cl.[4] B65H *9/04*
U.S. Cl. 271—245 3 Claims



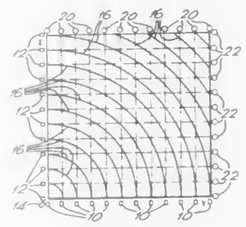
1. An apparatus for advancing a sheet to a predetermined location on an exposure platen and for removing said sheet from said exposure platen including in combination a flat belt; means including a rotatable member for supporting a portion of said belt adjacent said predetermined location, said belt portion engaging a sheet and extending substantially across the width of said exposure platen, means for rotating said member to move said sheet in a single direction toward said location, said rotatable member being formed with a reentrant portion adapted to form a corrugation in said belt portion; means for stopping said sheet adapted to extend into said corrugation to intercept said sheet at said location, wherein said stopping means comprises a substantially vertical registration surface; means for removing said sheet from said exposure platen; and means for guiding said sheet from said exposure platen to a desired location wherein said guiding means comprise a curved guide surface, having a recessed portion, for directing said sheet from said exposure platen.

4,917,372
LIQUID-CONTAINING ILLUSORY DEVICE
Eric S. Zeitlin, 3059 Grand Ave., Baldwin, N.Y. 11510
Filed Jan. 3, 1989, Ser. No. 293,079
Int. Cl.[4] A41D *1/00*
U.S. Cl. 272—8 N 8 Claims



1. An illusion device for use with a protective garment; said device comprising a first sheet of fluid impervious material and a second sheet of fluid impervious material; and wherein at least on of said sheets of material is shaped to resemble the outer contour of a human body part; and said first and second sheets are joined at their marginal edges, thereby forming at least one central fluid chamber; and said device further comprises a fluid contained within said central fluid chamber.

4,917,373
INTERACTIVE SYSTEM FOR SELF-ACCOMPANIMENT BY MOBILE PERFORMERS
Nicholas H. Bourne, Coombe House Cottages, Coombe Fishacre, Newton Abbot, Devon, and Alan J. Smith, 7 Francis Close, Lee-on-Solent, Gosport, Hampshire, both of United Kingdom
PCT No. PCT/GB87/00927, § 371 Date Aug. 29, 1988, § 102(e) Date Aug. 29, 1988, PCT Pub. No. WO88/04948, PCT Pub. Date Jul. 14, 1988
PCT Filed Dec. 31, 1987, Ser. No. 240,129
Claims priority, application United Kingdom, Jan. 3, 1987, 8700043
Int. Cl.[4] A63G *5/00*
U.S. Cl. 272—9 12 Claims



7. An apparatus for controlling an audio and/or visual output signal channel by interacting a mobile performer in a performance zone with preselected externally generated radiation, comprising:
a performance zone;
means for emitting into said performance zone a preselected electromagnetic radiation at a substantially constant frequency outside the limits of human audibility or visibility;
means for detecting interference between said preselected radiation and the performer including means for sensing

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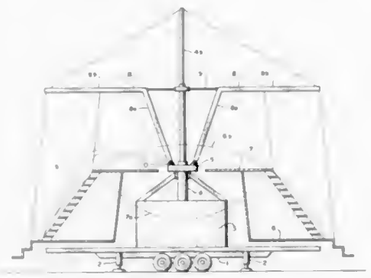
the doppler effect and means for providing a first output related thereto;
an array of transmitters and receivers arranged on mutually perpendicular axes including means for forming a lattice of invisible rays in at least two dimensions across said performance zone;
means for detecting interference with said rays and the performer and means for providing a second output related thereto; and
means for using said first and second outputs to set off individual or pre-programmed sequences of audio and/or visual effects.

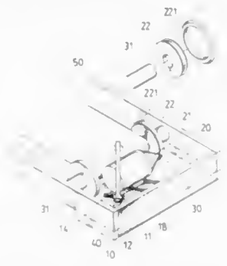
4,917,374
TRANSPORTABLE POWER DRIVEN CAROUSEL
Peter Petz, Sredlungsstra Be 44, 8891 Sulzbach-Aichach, Fed. Rep. of Germany
Filed Feb. 13, 1989, Ser. No. 309,594
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1988, 8801883[U]; Aug. 6, 1988, 8810076[U]
Int. Cl.[4] A63G *1/00*
U.S. Cl. 272—29 **10 Claims**



1. An improved transportable poweroperated carousel comprising a minimum of two concentric rotating tier-like platforms, a central mast with a rotating hub and radially oriented support arms arranged in a spoke-like manner from the hub for suspending the rotating platforms; wherein said support arms are L-shaped angled support arms including a first leg extending upwardly from the hub in an operating position, and a second leg adjacent thereto which, in an operating position, assumes a substantially horizontal orientation the arms being pivotally connected with the hub.

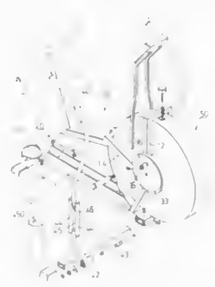
4,917,375
MOTORIZED TREADMILL SPEED CHANGER
Paul Lin, 212-1, Lin 37, Ping Chen Village, Ping Chen, Tao Yuau, Taiwan
Filed Aug. 22, 1989, Ser. No. 396,706
Int. Cl.[4] A63B *23/06*
U.S. Cl. 272—69 **2 Claims**

1. An improved motorized treadmill speed changer comprising an adjusting unit and a driving unit; said adjusting unit consisting of a handle bar, a pinion connected to the handle bar and pivotally mounted on the frame of the treadmill, a U support having two slot ways in both sides and being diagonally fixed to the frame of the treadmill, a rack having two slide bars slidably fitted in the slot ways and a motor base slide having two holes to be fitted on the slide bars; said driving unit consisting of a motor mounted on the base slide, a friction cone fixed to the shaft of the motor, and a friction wheel fixed to the roller of the endless belt of the treadmill and covered with a layer of colloid material to act as buffer to prevent from slipping; said two units being so constructed that the line between the circumference of the base and the apex of the friction cone is in alignment with the inner rim of the friction wheel and parallel to the side of the U support so as to attain best friction and eliminate the stress resulted from friction and that the slide and the motor with the friction cone can be pushed back and



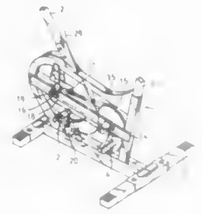
forth by turning the handle bar and the speed of the revolving belt increases with the advancing of the friction cone and decreases with the retreating of the same so that the speed of the revolving belt can be changed steplessly and controlled by turning the handle bar.

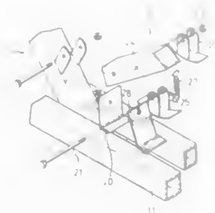
4,917,376
EXERCISE BICYCLE FOR EXERCISING ARMS AND LEGS
Peter K. Lo, P.O. Box 13-124, Taipei, Taiwan
Continuation-in-part of Ser. No. 298,692, Jan. 19, 1989, which is a continuation-in-part of Ser. No. 192,166, May 10, 1988, Pat. No. 4,824,102. This application Apr. 26, 1989, Ser. No. 343,593
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—73 **1 Claim**



1. An exercise bicycle comprising:
a frame assembly including a base frame, a wheel frame fixed on a front portion of said base frame, and a seat frame fixed on a rear portion of said base frame;
a crank assembly including a crank shaft journalled on said seat frame, two crank arms respectively secured to two ends of said crank shaft, two pedals secured to said crank arms respectively, a sleeve mounted rotatably on said crank shaft, and clutch means for locking said sleeve on said crank shaft when said crank shaft rotates in a predetermined direction, said sleeve including a rear driving pulley sleeved rigidly thereon, and a rear driven pulley sleeved rigidly on said sleeve;
a wheel axle assembly including a wheel axle journalled on said wheel frame, a front driving pulley sleeved rigidly on said wheel axle, two swing wheels **20**, secured to two ends of said wheel axle at their centers, two crank pins secured eccentrically to outer surfaces of said swing wheels respectively, and two sheaves sleeved rotatably on said crank pins respectively;
a pair of hand operated swing levers mounted pivotally at their lower ends on said base frame, each of said levers having a lengthwise extending slide slot formed therethrough in which said sheave is received slidably in such a manner that said sleeve cannot disengage from said slide slot when said swing lever is swung, swinging movement of said swing levers causing the corresponding said swing wheel to rotate in said predetermined direction;
a wheel assembly including a wheel hub sleeved rotatably on said wheel axle, a wheel sleeved rigidly on said wheel hub, and a front driven pulley sleeved rigidly on said wheel hub; and
a belt assembly including a first endless belt trained on said front driving pulley and said rear driven pulley, and a second endless belt trained on said rear driving pulley and said front driven pulley;
whereby, when said pedals are rotated in said predetermined direction, said crank shaft, sleeve, rear driving pulley, second endless belt, front driven pulley, hub and wheel are in turn rotated in said predetermined direction;
when said levers are swung, said swing wheels, front driving pulley, first endless belt, rear driven pulley, sleeve, rear driving pulley, second endless belt, front driven pulley, hub and wheel are in turn rotated in said predetermined direction; and
when a first torque is applied to said sleeve by rotating said pedals in said predetermined direction, and when a second torque is applied to said sleeve by swinging said levers, the sum of said first and second torques is output from said rear driving pulley.

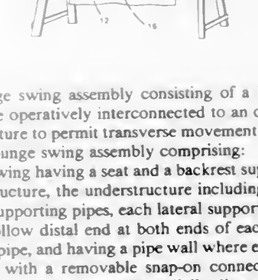
4,917,377
EXERCISE BICYCLE
Chih S. Chen, No. 30, Lane 229, Pu Tsai Keng Rd., Tai Ping Hsiang, Taichung Hsien, Taiwan
Filed Jun. 28, 1989, Ser. No. 372,549
Int. Cl.[4] A63B *23/04*
U.S. Cl. 272—73 **2 Claims**





1. An exercise bicycle comprising generally a frame body with a seat and a pair of handles; a chain transmission being provided on a lower part of said frame body, said chain transmission including two chair wheels and a chain; a pair of foot pedals being pivoted on an axle of a rear chain wheel; a pair of discs being attached to an axle of a front chain wheel and driven by said pedals via said chain transmission; a pair of casings being fixed on both sides of said lower part of said frame body for encompassing said chain transmission; and a brake unit being fixed relative to said frame body at a position substantially between said discs and being actuated by a controller via a cable so as to brake said discs; said controller being provided on one of said handles; said brake unit including a rod with one end relatively pivoted on said frame body, and a free end connected to said cable; a pair of brake shoes being pivoted on both sides of said rod at a longitudinally intermediate position thereof; a lower end of each said brake shoe having a curved shape related to a rim of said disc; a guide being fixed below said brake unit for passing and guiding said cable such that said free end of said rod can be pulled downward by said cable and such that each said brake shoe pressing an inner circular surface of said rim of each said disc; and said frame body having a base with two pairs of extendible shafts for providing a larger base area of said exercise bicycle.

4,917,378
PORTABLE INDOOR/OUTDOOR LOUNGE SWING
Janet L. Girecky, and Frank D. Girecky, both of 202 E. Oak St., Kent, Ohio 44240
Filed May 9, 1989, Ser. No. 349,415
Int. Cl.[4] A63G *9/16, 9/00*
U.S. Cl. 272—85 **30 Claims**



1 A lounge swing assembly consisting of a lounge swing adapted to be operatively interconnected to an overhead supporting structure to permit transverse movement of the lounge swing, the lounge swing assembly comprising:
a lounge swing having a seat and a backrest supported by an understructure, the understructure including at least two lateral supporting pipes, each lateral supporting pipe having a hollow distal end at both ends of each lateral supporting pipe, and having a pipe wall where each distal end is fitted with a removable snap-on connector and each hollow distal end contains a radially directed opening in the pipe wall adapted to engage said snap-on connector;
each snap-on connector comprising a ferrule member slip fitted around the respective exterior distal end of the supporting pipe and a corresponding interior spring steel member adapted to compressively engage the interior of the respective hollow distal end of each supporting pipe, where the spring steel member interacts with the respective ferrule member to provide snap-on connection to said supporting pipe;
where each said ferrule member includes a lower ferrule wall and contains a radial opening in the lower ferrule wall radially aligned with the radial opening in said respective hollow end of said supporting pipe, where each said respective interior spring steel member comprises a V-shaped spring steel member having an upper member and a lower member compressively engaging the upper interior surface and the lower interior surface of the respective hollow distal end of the lateral supporting pipe, the lower member of the spring steel member being se-

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cured thereto a downwardly depending button adapted to be radially aligned within the radially aligned opening in the lower pipe wall and the radially aligned opening in the lower ferrule wall whereby said button aligned within said openings securely locks said snap-on connector to the respective distal end of said lateral pipe, said button adapted to be compressed radially inwardly substantially free of the radially aligned opening in said respective ferrule whereby the respective ferrule can be laterally removed from or slipped onto the respective distal end of the lateral pipe;

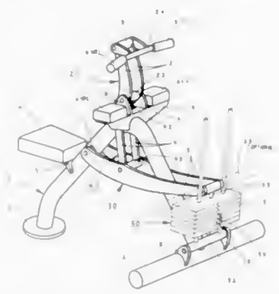
each said ferrule containing an upright member adapted to interconnect with a supporting chain, and a plurality of supporting chains where each chain connects with a respective upright member on respective snap-on connectors, and said supporting chains are adapted to operatively interconnect overhead to a support structure to permit transverse swinging movement of the lounge swing.

4,917,379

FOUR-BAR VARIABLE RESISTANCE ARM EXTENSION MACHINE

Henry H. Maag, 5332 Clark Cir., Westminster, Calif. 92683

Filed Jun. 19, 1989, Ser. No. 368,408
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 **3 Claims**



1. An exercise machine which develops an operator's arm extending muscles, comprising:

a rigid frame which includes means for fixing the positions of said operator's upper arms and elbow joints;

a rigid rotating effort arm which is journaled in said frame on a generally horizontal axis which is approximately common with the axes of rotation of said operator's elbow joints while said operator's upper arms and elbow joints are supported by said fixing means;

said rigid rotating effort arm includes hand-engaging surfaces which, through body-machine contact, transmit resistive forces to the operator's forearms through circular paths about the operator's elbow joints;

wherein, in its resting position, said rigid rotating effort arm extends radially from said fixing means, such that when the operator's upper arms and elbow joints are supported by said fixing means resistive force is applied in the direction of arm flexion;

a rigid rotating weight arm which is journaled in said frame on an axis which is both parallel with and separated by a specific distance from the axis of rotation of said rigid rotating effort arm;

said rigid rotating weight arm includes means for loading weights onto at a point offset from its axis of rotation;

said rigid rotating effort arm and said rigid rotating weight arm are mechanically linked to each other at axes which are both parallel with and offset by specific distances from their respective axes of rotation by a rigid connecting link which has a specific length between its centers of connection;

said rigid rotating effort arm, said rigid rotating weight arm, said link mechanically joining said rigid rotating effort arm and said rigid rotating weight arm, and said frame of said arm extension exercise machine join together to form a four-bar linkage which, when acting in conjunction with the sinusoidally changing values of force applied by the machine's rotating weight arm as the applied weight swings through a circular path through the gravitational field, applies a predetermined variably resistive force which varies as a function of the degrees of rotation of the operator's elbow joints and which is characteristic of the relationships in length and orientation of the four rigid members forming the four-bar linkage and the orientation of the rotating weight arm to the gravitational field throughout the range of the exercise movement;

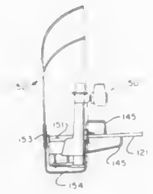
said specific distance between the axis of rotation of said rigid rotating effort arm and the axis of rotation of said rigid rotating weight arm, said specific distance between the axis of rotation of said rigid rotating effort arm and the axis of connection of said connecting link on said rigid rotating effort arm, said specific distance between the axis of rotation of said rigid rotating weight arm and the axis of connection of said connecting link on said rigid rotating weight arm, and said specific distance between the centers of connection on said connecting link all have a definite non-changing relationship to each other, which relationship, along with their orientations to each other, is determined through kinematic analysis of the moving parts of the four-bar linkage/rotating weight arm force-varying mechanism and is dependent on said predetermined variably resistive force which said four-bar linkage/rotating weight arm force-varying mechanism is designed to put out throughout the exercise movement.

4,917,380

TABLE TENNIS BALL SERVING DEVICE

Gary Gatchel, Rockford, Ill.; Joseph E. Newgarden, Biscayne Park, and Gordon E. Lynn, Carol City, both of Fla., assignors to Joseph E. Newgarden, Gallatin, Tenn.

Division of Ser. No. 719,872, Apr. 3, 1985. This application Jan. 13, 1988, Ser. No. 143,565
Int. Cl.[4] A63B *39/00*
U.S. Cl. 273—30 **6 Claims**



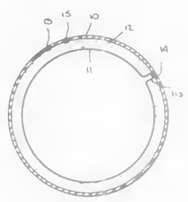
1. A robot serving assembly comprising a net, said net including a central portion having a plurality of pivoting arms attached at one end to said central portion in close proximity to one another and extending radially outwardly from said central portion in different angular positions so as to be foldable into a collapsed position adjacent one another for storage and carrying purposes, netting extending between said arms when said arms are moved to a predetermined extended position for maintaining said netting in an extended position, said netting also being attached to a trough device for receiving balls, said trough device being pivotally attached to opposite sides of said central portion and also being foldable adjacent said pivoting arms when collapsed, a robot server operatively mounted relative to the trough device in order to feed balls to said robot when said trough device is opened to an extended position, and means for attaching said robot to a table, said attachment means including a plurality of supporting arms mounted between said robot and respective upper and lower surfaces of said table, the length of the supporting arms engaging the upper side of the table being sufficiently shorter than the length of the supporting arms engaging the underside of said table so as to provide offset supporting arms engagement with the upper side and underside of the table for locking said supporting arms to said table by the weight of said robot.

4,917,381

VARIABLE WEIGHT PLAY BALL

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Continuation-in-part of Ser. No. 205,477, Jun. 18, 1988, Pat. No. 4,834,382. This application May 9, 1989, Ser. No. 349,414
Int. Cl.[4] A63B *41/00*
U.S. Cl. 273—58 H **7 Claims**



1. A variable-weight spherical play ball comprising.

A. a non-stretchable outer casing formed of flexible, liquid-impervious material and having a predetermined diameter;

B. an inflatable inner bladder disposed within said casing formed of elastomeric material to define with the casing a spherical region therebetween whose volume depends on the extent to which the inner bladder is stretched by inflation;

C. a valved liquid inlet mounted on said casing to permit the introduction of liquid into said region in an amount imparting a desired weight to the ball; and

D. a valved air inlet mounted on said bladder, the air inlet projecting through said casing and being peripherally sealed thereto to provide access to said inner bladder from the exterior of the ball, thereby by inflating the inner bladder with air, the liquid introduced to said region is then caused to become uniformly distributed throughout the region to create a spherical layer that is pressed by the inner bladder against the interior surface of the casing said layer having an outer diameter determined by the diameter of the casing and a thickness determined by the amount of liquid therein.

4,917,382

INFLATABLE TOY ARTICLE

Philip A. Hendershott, Rt. 5, Box 19, Emporia, Kans. 66801

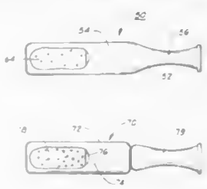
Filed Jan. 25, 1988, Ser. No. 147,521
Int. Cl.[4] A63B *59/06*; A63H *27/10*
U.S. Cl. 273—72 R **4 Claims**

1. An inflatable toy comprising:

an outer protective cover having a selected shape and defining an interior balloon cavity, the selected shape of the protective cover being in the form of a softball bat and having the shape of an elongated cylinder with a handle portion having a diameter of convenient size for grasping and a ball striking portion with a somewhat larger diameter, the protective cover fabricated of a plurality of pliable members constructed to have appropriate contours, the pliable members being joined together along the edges thereof to produce the selected shape of the inflatable toy and to define an entry slot which openly communicates with the balloon cavity;

plug means disposed in a portion of the balloon cavity defining the ball striking portion for imparting greater mass to the ball striking portion;

a toy balloon fabricated of a thin, air tight, inflatable membrane having a body portion and a nozzle portion such that in a deflated state the body portion is disposable within the balloon cavity and the nozzle portion is extendable from the entry slot so that the body portion is inflatable to selectively fill the balloon cavity and support the outer protective cover in the selected shape; and



cover means for covering the entry slot after insertion and inflation of the body portion, sealing of the nozzle portion and positioning the sealed nozzle portion into the entry slot, the cover means comprising:

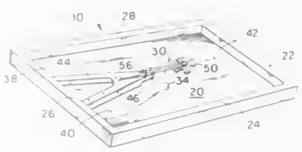
a first fastener member having a loop bearing area and a second fastener member having a pile bearing area, the first fastener member affixed to the protective cover around the entry slot, the second fastener member having a suitable size to cover the entry slot when supported by the first fastener member.

4,917,383

ACTION TARGET

Robert L. Brown, Lakeview; Robert D. Shilen, Tonawanda, and Robert F. Rosnak, Depew, all of N.Y., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Oct. 16, 1989, Ser. No. 421,776
Int. Cl.[4] A63F *7/00, 9/16*
U.S. Cl. 273—118 R **12 Claims**



1 An action target for a marble game comprising:

base means supportable on a playing surface for at least partially dividing the playing surface into two playing areas;

movable arm means pivotally mounted to the base means and swingable between positions in each of said two playing areas;

target means on said arm extending laterally therefrom into each of said two playing areas when the arm is aligned with the base means;

indicator means responsive to movement of said arm means past a preselected point in each of said two playing areas for signaling a victory by one player.

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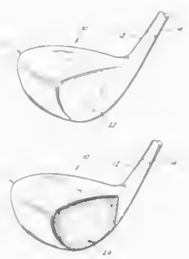
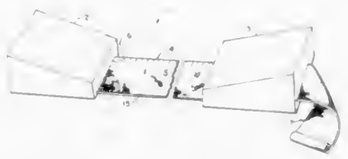
4,917,384
GOLF CLUB
Michael Caiati, P.O. Box 933, Evanston, Ill. 60204
Filed Jun. 29, 1989, Ser. No. 372,794
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—175 6 Claims



1. In a golf club having a head portion and having a golf ball contacting smooth planar face surface, the improvement comprising:
a layer of closely spaced granular material bonded to said smooth surface for retarding sliding movement of a golf ball relative to said surface and inducing angular rotation of the ball when struck by said head.

4,917,385
GOLF TRAINING DEVICE
Russell M. Brown, 57 Washington St., Natick, Mass. 01760
Filed Oct. 24, 1988, Ser. No. 261,065
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—187 B 1 Claim



1. A golf training device comprising:
a platform member adapted to rest on a supporting surface and having an upper surface adapted for supporting one foot of a golfer, said upper surface comprising an inner surface portion for engaging an inner portion of the foot and an outer surface portion for engaging an outer portion of the foot and said upper surface sloping downwardly from said outer surface portion to said inner surface portion; and
a resilient snap disc member having one end fixed to said platform member and a cantileved opposite end disposed below said upper surface and adapted to produce a sound in response to deflection produced by downward movement of said inner surface portion relative said outer surface portion.

4,917,386
APPARATUS AND METHOD OF PLAYING A BOARD GAME SIMULATING A RACE
W. James Tozer, 777 E. South Temple - 12F, Salt Lake City, Utah 84102
Continuation of Ser. No. 189,114, May 2, 1988, abandoned. This application Jun. 22, 1989, Ser. No. 370,026
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—246 18 Claims

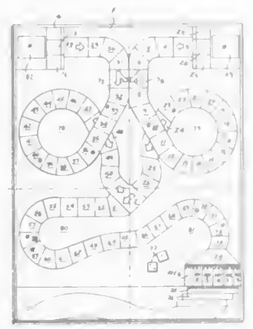
1. A game for simulating a race of equal moves comprising:
a playing surface having a plurality of racing lanes each being subdivided into an equal number of advancement spaces including a starting space and a finishing space;
a plurality of playing pieces corresponding to said number of racing lanes; and
means for determining the advancement of said playing pieces, said means having indicia such that the probability of at least one playing piece being advanced and reaching the finishing space first is different from that of said other playing pieces.

13. A method for simulating a race comprising the steps of:
designating a plurality of racing lanes on a playing surface;
subdividing each of said lanes into an equal number of advancement spaces along the length of said racing lanes, including a starting space and a finishing space;
assigning to each of a plurality of playing pieces indicia wherein said indicia correspond to a possible roll of a set of dice;
assigning a set of odds to said playing pieces such that the probability, determined empirically, of the roll from the set of dice that corresponds to one of said playing pieces relates to the odds assigned to said playing piece and the odds of at least one playing piece being different from that of the other playing pieces;
placing said playing pieces on said starting spaces;
rolling the set of dice;
advancing the playing piece corresponding to the roll with the set of dice by an advancement of at least one space; and
repeating the steps of rolling and advancing, wherein the advancement of any of said playing pieces being the same until one playing piece has advanced to the finishing space.

4,917,387
BOARD GAME SIMULATING CHILDHOOD CONFLICTS
James F. Roggero, 81 William St., Portsmouth, R.I. 02871
Filed Dec. 5, 1988, Ser. No. 279,514
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—249 3 Claims

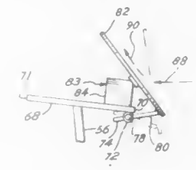
1. A method of playing a board game simulating childhood conflicts in attempting to reach an outdoor goal from interiorly of a house, said method comprising,
providing a playing board and defining on said board a plurality of circuitous paths including a first circuitous "Dad" path, and
providing a second circuitous "Mom" path on said playing board independent of said first path, and

providing a third path on said playing board associated with a termination of said first and second paths, and
further providing a plurality of first starting bedroom positions spaced adjacent and associated with the origin of the first circuitous path, and
providing a plurality of second starting positions spaced adjacent to and associated with an origin of the second circuitous path, and
providing said first circuitous path with a plurality of first spaces and said second circuitous path with a plurality of second spaces wherein said first and second spaces are of an equal number, and
providing a union space wherein said first and second spaces intersect, and
providing said third circuitous path to originate at said union space, and
providing a plurality of waiting spaces adjoining a terminal end space of said third circuitous path when said plurality of waiting spaces are of equal number to a total of the first and second starting position spaces, and
providing an outdoor space positioned adjacent said waiting space removed from said terminal end space to define an outdoor goal, and
providing at leas tone chance device to determine a number of spaces to be traveled by a player, and



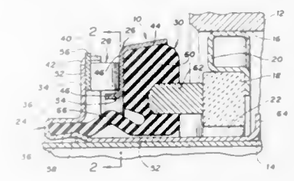
further providing at least a first and second token initially positionable in selective first and second starting position spaces representing individual players, and
providing each of said first and second circuitous paths with a cross-over space wherein an individual player may cross from the first circuitous path to the second circuitous path or conversely from the second circuitous path to the first circuitous path prior to the union space, and
providing a plurality of benefit spaces and a plurality of punishment spaces and a plurality of blank spaces defined within each of the spaces of the respective first, second, and third circuitous paths, and
providing a plurality of "Mom" cards and a plurality of "Dad" cards, and further designating a plurality of spaces in said first, second, and third circuitous paths as respective "Mom" and "Dad" spaces to require a player to draw a respective "Mom" or "Dad" card upon landing on a "Mom" or "Dad" space, and
said third circuitous path is provided with a number of spaces equal to the number of spaces in said first or second circuitous path, and
wherein said waiting spaces are formed to include six spaces, each waiting space having a distinguishing indicia and each of the first and second starting spaces also having a distinguishing indicia wherein each starting space having a corresponding waiting space and wherein said chance device includes six digital designations from one to six to correspond to a respective waiting space, and a player to reach the outdoor goal must attain a digit on said chance device to equal the digit designation of a waiting space the player is positioned in, and
placing the first and second tokens on respective first and second starting positions, sequentially utilizing the chance device by each player to advance the first and second tokens a predetermined number of spaces along the respective first and second circuitous paths in conforming with numbers appearing on the chance device.

4,917,388
RESETTING GUN TARGET
Wayne Marquardt, 1902 W. 6th St., Mishawaka, Ind. 46544
Filed Apr. 3, 1989, Ser. No. 332,586
Int. Cl.[4] F41J *7/00*
U.S. Cl. 273—392 10 Claims



1. A target for practicing marksmanship, said target including a frame, a plate defining an impaction surface to be contacted by a projectile, said plate connected to said frame by a pivotal connector, said plate pivotal about said pivotal connector between a ready position and an impacted position, said plate shifted from said ready position to said impacted position when struck by a projectile, said pivotal connector including means for shifting said plate drom its impacted position to its ready position, said pivotal connector includes a hinge, said shifting means includes an over-center orientation between said frame and said plate wherein said plate shifts by its own weight from its impacted position to its ready position under force of gravity.

4,917,389
WATER PUMP FACE SEAL ASSEMBLY
Steven F. Baker, Bellevue, and Joseph L. Tengowski, Norwalk, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Oct. 31, 1988, Ser. No. 278,523
Int. Cl.[4] F16J *5/36*
U.S. Cl. 277—42 2 Claims



1. A face seal assembly for sealing a generally annular space formed between a primary seal face fixed to a fluid filled housing and the outer surface of a rotatable cylindrical shaft that extends through a central opening in said primary seal face, comprising,
a first casing having a cylindrical sleeve sized to fit non-turnably and fluid tight to said shafl outer surface and also having a wall extending radially out from said sleeve via a

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connecting structure thereto and being generally normal to the axis of said sleeve and terminating in a cylindrical flange extending from said wall in one axial direction, said cylindrical flange further having a plurality of slots therethrough,

a second casing surrounding said first casing sleeve having a generally cylindrical skirt and a wall extending radially inwardly from said skirt generally normal to the axis of said skirt and terminating in a cylindrical flange of lesser diameter than said first casing cylindrical flange and extending in the opposite axial direction, said cylindrical flange also having a plurality of slots therethrough,

an axially resilient, generally annular wave spring that is formed of flat stock with a width substantially equal to half the difference in diameters between said casing cylindrical flanges, and which therefore will fit closely between said cylindrical flanges when it is compressed between said casing walls to bias them apart, said wave spring further being torsionally stiff by virtue of its width and also having a plurality of inner and outer tabs receivable through said first and second casing slots so as to mechanically interlock said casing cylindrical flanges to efficiently transmit torque from said first to said second casing with substantially no lost motion, and,

an elastomer sealing member having a radially inner portion joined fluid tight to said first casing and a radially outer portion that is non turnably held inside said second casing and which holds a secondary seal face resiliently against said primary seal face under the bias of said wave spring,

whereby, said annular space is completely sealed relative to said fluid filled housing, and the sealing juncture of said elastomer sealing member and said first casing is substantially isolated from stress by virtue of the efficient transmission of torque by said wave spring and by virtue of the close fit of said wave spring between said casing flanges, which maintains said casings substantially coaxial to one another.

2. A cartridge face seal assembly for sealing a generally annular space formed between a primary seal face fixed to a fluid filled housing and the outer surface of a rotatable cylindrical shaft that extends through a central opening in said primary seal face, comprising,

a first casing having a cylindrical sleeve that is adapted to be installed fluid tight and non-turnably to said shaft outer surface and also having an integral wall extending radially out from said sleeve via a connecting structure and being generally normal to the axis of said sleeve, said connecting structure comprising a fold of generally U shaped cross section deformed so as to be spaced radially outwardly from the shaft, said integral wall further being substantially axially aligned with said fold so as to be capable of providing stiffening for said fold,

a second casing surrounding said first casing sleeve having a generally cylindrical skirt and a wall extending radially inwardly from said skirt generally normal to the axis of said skirt,

an axially resilient wave spring that is torsionally stiff and which is compressed between said first and second casing walls so as to bias them axially apart, said wave spring further being mechanically interlocked between said first and second walls so as to efficiently transmit torque from said first to said second casing with substantially no lost motion by virtue of said spring's torsional stiffness, and,

an elastomer sealing member having a radially inner sleeve portion that is crimped tightly into said first casing fold as it is deformed radially outwardly so as to provide a fluid tight juncture and so as to retain said seal to said first casing, said seal also having a radially outer portion that is non-turnably held inside said second casing skirt and wall and which holds a secondary seal face,

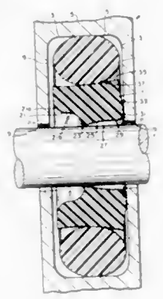
whereby, prior to installation of said first casing, said second casing is retained to said first casing by said seal sleeve portion, while after installation, the fluid tight juncture of said seal sleeve portion and said first casing is substantially isolated from stress by virtue of the efficient transmission of torque by said wave spring.

4,917,390

HYDRAULIC SEAL ASSEMBLY

John Lee, Palos Verdes Peninsula; Richard J. Vernon, Long Beach; Robert Janian, Encino; David A. Rossi, Newport Beach, and Stanley E. Charles, La Canada, all of Calif., assignors to Tetrafluor, Inc., El Segundo, Calif.

Filed Nov. 25, 1988, Ser. No. 275,896
Int. Cl.[4] F16J *15/24, 15/32*
U.S. Cl. 277—165 9 Claims



1. An annular compressive seal for use in a hydraulic system, said seal having a first, second, third and fourth side;

(a) the first side being toroidal in shape along a substantial portion of its length, comprising a convex upper portion running axially and radially and extending radially inwardly to merge into a concave portion running axially and radially;

(b) the second side running substantially axially from the end of the concave portion of the first side but having a shallow concavity along substantially its entire length;

(c) an arc running axially and radially from the second side at its end remote from the first side, the second side and the arc together being toroidal in shape;

(d) a third side running in substantially a straight line and radially from the arc; and

(e) a fourth side axially connecting the first and third side and having a slight curve inward;

the intersection of the first and second sides forming a point contact, and a portion of the arc adjoining the second side forming a contact area.

4,917,391

SEALING RING ASSEMBLY

Roy E. Shelinbarger, Jr., Wichita, and John T. Cherryholmes, Potwin, both of Kans., assignors to Aerospace Systems and Components, Inc., Wichita, Kans.

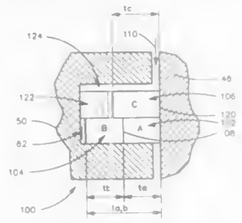
Filed Jul. 12, 1988, Ser. No. 218,814
Int. Cl.[4] F16J *9/16*
U.S. Cl. 277—193 14 Claims

1. A sealing ring assembly supported by a piston in a piston groove and extensive therefrom for sealing contact with a cylinder wall confining the piston, the sealing ring assembly comprising:

an inner ring member disposed in the piston groove;

a seal ring member disposed in the piston groove in external juxtaposition to the inner ring member; and

a backer ring member disposed in the piston groove in side juxtaposition to the inner ring member and the seal ring member, the backer ring member coextensive with the seal ring member to form a common sealing surface against the cylinder wall, the thickness of the backer ring member being determined to be greater than the thickness of the seal ring member and less than the combined thicknesses of the seal member and the inner ring member so



that the ring land contact area is maximized and so that a substantial residue deposit groove void is formed between the backer ring member and the piston.

4,917,392

COLLAPSIBLE LUGGAGE CARRIER

Emilio Ambasz, 295 Central Park West, New York, N.Y. 10024

Filed May 22, 1989, Ser. No. 355,552
Int. Cl.[4] B62B *3/04*
U.S. Cl. 280—40 9 Claims

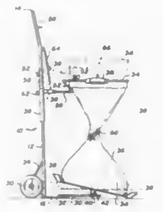
1. A collapsible luggage carrier comprising a handle having portions adjacent its lower end adapted to provide support for an article in a first plane; a base having a pair of leg members joined to the handle for pivotal movement between an extended position in which portions of the base provide support for an article in a second plane disposed substantially orthogonally to the first plane and a collapsed position in which said base is substantially parallel with the first plane; a pair of transversely spaced-apart wheeled carriages attached to the lower end of the handle portion for pivotal movement between an extended position in which the axes of rotation of the wheels are in parallel relation to the first plane and a collapsed position in which the wheeled carriages are retraced and the axes of rotation of the wheels are disposed orthogonally to the first plane, and cam means including an S-shaped cam slot located in each wheeled carriage through which a respective leg member of said base extends, said cam means moving the wheeled carriages between their extended and collapsed positions in response to movement of the base between its extended and collapsed positions respectively.

4,917,393

TWO WHEEL TROLLEY FOR CARRYING BAGS

Ralph J. Rogers, 46280 - 3rd Ave., Chilliwack, B.C., Canada (V2P 1R8)

Filed Feb. 27, 1989, Ser. No. 316,361
Int. Cl.[4] B62B *1/04*
U.S. Cl. 280—47.28 5 Claims



1. A two wheel trolley for holding a flexible container comprising:

two upright members, each member extending down from a handle portion to a short platform between bottom ends of the two upright members, the upright members spaced apart and joined as a rigid frame;

a pair of wheels, each wheel located adjacent to the lower ends of the upright members, positioned to support and transport the trolley when the upright members are tipped back;

a rotatable table to hold he container, the table supported on a leg pivotally attached to the short platform, the table having a stored position when the leg is pivoted up against the upright members;

opposing skirt protector strips on the rotatable table to prevent corners of the bag overlapping the table;

flexible support arms extending out from the two upright members with external ends to hold open the container resting on the table, the support arms having means to move down in line with the two upright members to take into account different sized containers, and to allow the top of the container to be lowered when twisted on the table, and

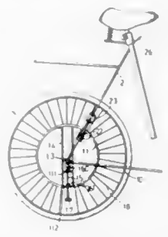
grip means to hold the open edges of the container and support the container from the support arms.

4,917,394

BICYCLE WITH AN ECCENTRIC REAR WHEEL

Fuh T. Lin, No. 6, Alley 10, Lane 73, Sec. 2, Chung Hsing Rd., 19 Lin, Tieh Shan Li, Ho Mei Chen, Chang Hwa Hsien, Taiwan

Filed Apr. 28, 1989, Ser. No. 344,694
Int. Cl.[4] B62M *1/00*
U.S. Cl. 280—229 1 Claim



1. A bicycle having a frame, a seat, a front wheel, a couple of seat stays and a rear wheel, characterized in that:

said rear wheel has an inner rim with two plates set in parallel with each other across a diameter of said inner rim and an outer rim, a plurality of spokes being radially oriented between said inner rim and outer rim;

a sleeve with a seat formed thereon is provided around a hub of said eccentric wheel; said sleeve receiving a shaft head extending from one end of a threaded shaft, said threaded shaft being threadably positioned between said two plates by two nuts which are fixed between said two plates and against respective supporting means which are positioned between said two plates in appropriate position, said threaded shaft having a pinion on an end thereof opposite to said shaft head; and

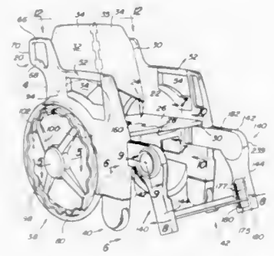
respective toothed blocks are slidably mounted on each seat stay to be engageable with said toothed pinion; said toothed blocks being slidable to adjust a relative position of said hub with respect to said plates by engaging with and rotating said pinion so as to cause said wheel to rotate more or less eccentrically about said hub.

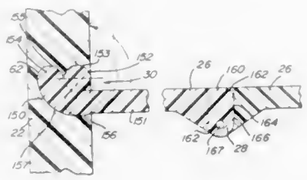
4,917,395

WHEELCHAIR AND METHOD OF MAKING SAME

Joseph M. Gabriele, 8416 Carole La., Fenton, Mich. 48430

Filed Dec. 23, 1988, Ser. No. 289,167
Int. Cl.[4] B62B *11/00*
U.S. Cl. 280—250.1 **17 Claims**





1. A foldable chair, comprising:

a pair of normally spaced generally vertically oriented side panels, each of said side panels having an elongated generally horizontal slot therein;

a pair of seat panels, said seat panels each having a hinge portion extending along one edge thereof located within said horizontal slot of one of said side panels and an opposite edge;

said hinge portions of said seat panels each including a generally circular convex hinge surface and a locking surface means adjacent a free edge thereof located within said slot; and

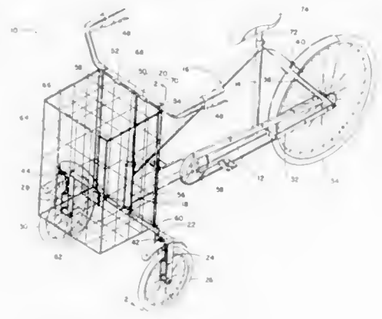
said side panel slots each having a circular concave socket receiving said generally circular convex hinge surface in pivotal relation and a locking socket receiving said hinge portion locking surface when said seat panels are pivoted about said hinge surface to a generally horizontal orientation, said locking surface means limiting further pivotal movement of said seat panels and supporting said seat panels in said generally horizontal orientation without requiring support for said seat panel at said opposite edges.

4,917,396

TRICYCLE

Sabino Meneses, and Irene Meneses, both of 267 Congressional La., Rockville, Md. 20852

Filed Mar. 22, 1989, Ser. No. 327,241
Int. Cl.[4] B62K *5/08*
U.S. Cl. 280—267 **1 Claim**



1. A tricycle, comprising:

an elongated main frame member;

a head tube perpendicularly attached at a front end of said main frame member;

a seat support member secured at an intermediate portion of said main frame member, said seat support member extending in spaced parallel relation with said head tube;

a diagonal frame member extending from a top portion of said seat support member to a top portion of said head tube;

a lower rear fork attached to a rear end of said main frame member and extending parallel therewith;

an upper rear fork extending from an upper rear end of said seat support member to a rear end portion of said lower rear fork;

a large diameter rear wheel rotatably supported by said upper and lower rear forks;

a steering rod received for rotation within said head tube;

a transverse steering bar perpendicularly secured at a lower end of said steering rod;

a pair of front forks secured at opposite ends of said transverse steering bar;

a pair of small diameter wheels mounted for rotation by said front forks;

a handle bar secured at an upper end of said steering rod, said handle bar having a central portion extending in parallel relation with said transverse steering bar;

a pedal crank mechanism mounted for rotation on said main frame member:

a chain and sprocket drive systematically connected between said pedal crank mechanism and said large diameter rear wheel; and

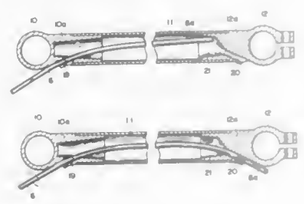
a generally rectangular basket disposed forwardly of said steering rod, said basket having a pair of spaced parallel vertically extending corner frame members secured between said central handle bar portion and said transverse steering bar; said basket corner frame members each having a lower end received through said transverse steering bar.

4,917,397

STRUCTURE FOR THREADING A CABLE THROUGH A BICYCLE FRAME

Yoshiya Chonan, Souka, Japan, assignor to Sakae Ringyo Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1988, Ser. No. 169,063
Claims priority, application Japan, Jul. 20, 1987, 62-111155
Int. Cl.[4] B62K *19/30*
U.S. Cl. 280—281.1 **7 Claims**



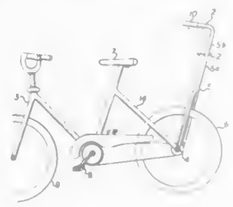
1. In a bicycle frame having connecting members and tubes, at least one of the tubes having opposite ends respectively connected to a pair of said connecting members which opposite ends and connecting members define end portions at said opposite ends of said at least one tube to which end portions others of said tubes are connected to establish the frame, and at least one cable threaded through an interior region of said at least one tube defined by a wall of said at least one tube, the improvement comprising a cable inlet opening formed in one of said end portions in communication with said interior region and a cable outlet formed in the other of said end portions, and means for defining a cable threading exit opening in said other end portion adjacent the cable outlet and in communication with said interior region, said cable threading exit opening means having tapered side walls communicating with said interior region and establishing a gradually decreasing diameter in the direction of said cable outlet and communicating with said cable outlet to enable the cable to be guided by said tapered side walls and thereby threaded through the cable threading exit opening means into said outlet, wherein said tapered side walls of the cable threading exit opening means has a largest diameter located furthest from the cable outlet and which largest diameter is approximately equal to the inner diameter of the interior region located immediately adjacent thereto.

4,917,398

BICYCLE TRAINING HANDLE

Paulo S. de Miranda Pinto, San Diego, Calif., assignor to Adele L. Bell Lee, San Diego, Calif., a part interest

Filed May 8, 1989, Ser. No. 348,900
Int. Cl.[4] B62H *7/00*
U.S. Cl. 280—293 **6 Claims**



1. In combination with a bicycle having a frame including two wheel axles, a training handle device for a rider to be supported by a non-riding person exerting a force upon said device when required to prevent an unacceptable motion of said rider, said device comprising:

a handle;

a first extension element attached at one end to said handle;

a means for pivotally attaching the other end of said first extension element to one of said axles;

a means for limiting the pivotal motion of said first element to a specific range of positions, wherein the handle is proximate to the rider in at least one of said positions;

wherein said extension element comprises at least two telescopically connected extension members; and

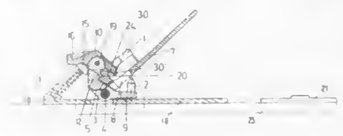
wherein said means for limiting motion comprises a fixture attached to said bicycle proximate to said axle, said fixture having a protrusion abutting said extension element when said extension element is at one of the limits of pivotal motion.

4,917,399

LONG DISTANCE SKI BINDING

Klaus Hölzl, Vienna, Austria, assignor to TMC Corporation, Switzerland

PCT No. PCT/EP87/00288, § 371 Date Dec. 18, 1987, § 102(e) Date Dec. 18, 1987, PCT Pub. No. WO87/07845, PCT Pub. Date Dec. 30, 1987
PCT Filed Jun. 4, 1987, Ser. No. 150,644
Claims priority, application Austria, Jun. 23, 1986, 1706/86
Int. Cl.[4] A63C *9/18*
U.S. Cl. 280—615 **8 Claims**



1. A cross-country ski binding comprising:

a main body adapted to be attached to a ski;

a ball plate mounted on the main body for supporting the ball of a ski boot;

a heel plate mounted on the main body for supporting the heel of the ski boot;

holding means mounted on the ball plate for holding said ski boot on said main body;

transducer means for detecting the pressure applied to the ski and for generating electrical signals in response to the pressure;

an evaluation circuit, coupled to said transducer means, for evaluating said electrical signals generated by said transducer means;

a display device, coupled to said evaluation circuit, for displaying one of a first operating mode indicative of the number of steps traveled by the ski, and a second operating mode indicative of the force applied to the ski during a push-off phase of each of said steps; and

a selector switch, coupled to said display means, for selectively switching said display device between said first operating mode and said second operating mode.

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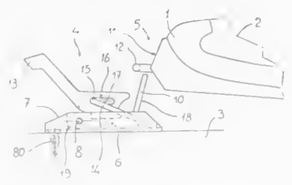
4,917,400
SKI BINDING FOR USE IN CROSS-COUNTRY OR MOUNTAINEER SKIING
Georges P. J. Salomon, Quintal, 74000 Annecy, and Jacques Quellais, Epagny, 74410 Saint Jorioz, both of France
Continuation of Ser. No. 577,484, Feb. 6, 1984, Pat. No. 4,647,064. This application Aug. 29, 1986, Ser. No. 901,641
Claims priority, application France, Feb. 9, 1983, 83 02436
The portion of the term of this patent subsequent to Mar. 3, 2004, has been disclaimed.
Int. Cl.[4] A63C *9/085*
U.S. Cl. 280—615 40 Claims

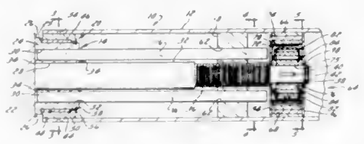


40. A ski binding comprising:
a flexion element adapted to extend forwardly of a shoe or boot and to be connected to a shoe or boot and said ski, wherein said flexion element comprises:
means for permitting the heel of said shoe or boot to be lifted away from said ski; and
means for sequentially pivoting said then only flexing said flexion element after a predetermined extent of pivoting in response to lifting of said heel of said shoe or boot away from said ski.

4,917,401
PARCEL CART
Osamu Iwaki, Nagoya, Japan, assignor to Kobayashi Hansokiki Co., Ltd., Nagoya, Japan
Filed Aug. 9, 1988, Ser. No. 230,341
Claims priority, application Japan, Dec. 25, 1987, 62-198688[U]
Int. Cl.[4] B62B *1//12*
U.S. Cl. 280—655 1 Claim

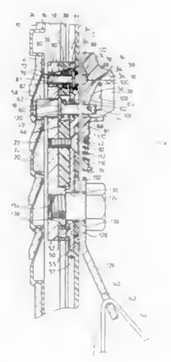
1. A parcel cart convertible between a folded storage position and an unfolded operating position, comprising:
a main bed body having a rectangular box shape and provided with a pair of wheels on both sides of the rear edge portion thereof, respectively, parcel support portions, each having a predetermined width and being parallel to the other, on both side edges thereof, respectively, a cavity at the center thereof, and a flange portion which extends inwardly from the upper front edge thereof;
a lower frame member having a size such that it can be stored in said cavity when the parcel cart is in the folded storage position, the lower end thereof being pivotally connected with the rear edge portion of said main bed body;
an upper frame member connected with the back of the end of said lower frame member by a hinge;
an upper slide member provided with a handle formed at the upper end thereof and a lower slide member connected to the lower end of said upper slide member by a flexible member, said upper and lower slide members being fitted slidably into said upper and lower frame members, respectively; and
releasable retaining means for releasably retaining the parcel cart in the folded storage position, the releasable retaining means including a spring biased hook provided on said main bed body and an aperture formed in said upper frame member, said hook being spring biased in a locking position in said aperture when the parcel cart is in the folded storage position, and the releasable retaining means further including projections extending from said lower slide member and adapted to engage the flange portion which extends inwardly from the upper front edge of the main bed body to retain the lower frame member and the lower slide member within said cavity when the parcel cart is in the folded storage position.

4,917,402
TORSION SPRING CARTRIDGE ASSEMBLY
Norm Reynolds, Franklin; Wilbur C. Reynolds, Muskego, both of Wis., and Charles F. Wharton, Lake Bluff, Ill., assignors to Reynolds Torsion System, Inc., Muskego, Wis.
Continuation of Ser. No. 781,149, Aug. 14, 1985, abandoned.
This application Mar. 26, 1987, Ser. No. 31,224
Int. Cl.[4] B60G *3/00*
U.S. Cl. 280—700 4 Claims



1. A T-frame trailer comprising a tubular tongue,
a square axle tube removably mounted on one end of said tongue,
a torsion spring cartridge assembly removably mounted in each end of said axle tube,
said cartridge assemblies each including a bearing assembly having an outer configuration corresponding to the square configuration of said axle tube to prevent rotation of said bearing assembly in said axle tube, a torque assembly mounted for rotary motion in said bearing assembly and a counter torque hub having an outer configuration corresponding to the inner configuration of said square axle tube to prevent rotation of said counter torque hub in said axle tube,
a set of torsion bars operatively connecting said torque assembly to said counter-torque hub, one of said cartridge assemblies being removably mounted as a single unit at each end of said axle tube,
and a wheel mounted on each torque assembly.

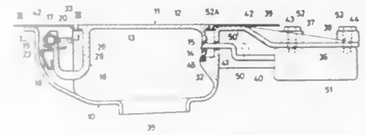
4,917,403
WEBBING SUPPORT APPARATUS
Toshio Gyoda; Mitsuaki Katsuno, both of Niwa, and Motonobu Sugiura, Okazaki, all of Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan
Filed Apr. 21, 1989, Ser. No. 341,558
Claims priority, application Japan, Apr. 25, 1988, 63-101539
Int. Cl.[4] B60R *22/20*
U.S. Cl. 280—808 19 Claims



1. A webbing support apparatus capable of varying a support height of a webbing to be installed in a vehicle comprising:
a guide rail supported on a body of the vehicle;
a moving member supporting said webbing, guided by said guide rail and capable of being moved in a vertical direction;
restricting means displaceably arranged in the moving member, engaged with the guide rail at each of a plurality of vertical positions of said guide rail and restricting the moving member against the guide rail so as to prevent a downward movement of the moving member;
operating means displaceably arranged in said moving member, operated to be displaced and releasing the restricted condition of said moving member through said restricting means; and
stopping means displaceably arranged in said moving member, displaced by said displacing operation of said operating means and stopping said moving member from being moved further downwardly either at a restricting position adjoining to a position below the restricting position before its movement or at a position above the restricting position.

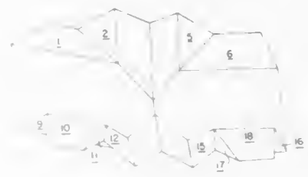
4,917,404
DEVICE FOR SUPPORTING THE FUEL CHARGING FILLER FOR MOTOR VEHICLES
Renato Pasquali, Garbagnate Milanese, and Luigi Verga, Vertemate con Minoprio, both of Italy, assignors to Alfa Lancia Industriale S.p.A., Arese, Italy
Filed Dec. 16, 1987, Ser. No. 133,878
Claims priority, application Italy, Dec. 30, 1986, 24264B/86
Int. Cl.[4] B60R *25/00*
U.S. Cl. 280—853 2 Claims

1. A device for supporting the fuel charging filler of a motor vehicle, comprising a filler support part defining a housing for the filler and shaped to be fastened to the sheet metal of the bodywork of the vehicle in a corresponding opening provided on the same bodywork, said device being constituted by an integrated unit comprising a container element having a first opening for receiving the filler and a second opening with a door hinged thereto, elastic means for biasing the door to an open position, and electrically actuatable locking means for securing the door in a closed position, said container element with said door and said locking means mounted thereon being suitable for being fastened to the sheet metal of the bodywork, said container element being made as a single, integral cup-shaped body with said first and said second openings formed therein, said container element having a bracket integrally formed with the cup-shaped body to permit said locking means to be attached thereto, said container element having opposed



cylindrical seats each of which is suitable for receiving and supporting a respective pivot pin linking the door to said container element, a cylindrical spring located between said pivot pins and coaxial therewith for biasing said pivot pins into their respective cylindrical seats, and invitation guide means for facilitating the assemblage of said door to said container element, said invitation guide means comprising recessed passages located on opposed walls of said container element for receiving and guiding said pivot pins into said cylindrical seats.

4,917,405
SHEET FOLDING METHOD AND APPARATUS
Stephan R. W. Muth, New York, and Guenther Vollath, Tarrytown, both of N.Y., assignors to VanDam, Inc., New York, N.Y.
Division of Ser. No. 95,175, Sep. 10, 1987, Pat. No. 4,826,212.
This application Apr. 28, 1989, Ser. No. 345,127
Int. Cl.[4] B42D *19/00;* B31F *1/00*
U.S. Cl. 281—5 9 Claims



1. An improved folded sheet product, of the type wherein a sheet of a given rectangular area is folded toward its center so as to define opposing pairs of upper and lower outer pleats, and has outer cross fold means defining inverse folds in the opposing pairs of outer pleats so that each pair folds inwardly toward the other,
wherein the improvement comprises:
a plurality of complementary inverse fold lines formed on outer parts of one of said pair of opposing outer pleats which define a pair of tuck folds into which the inverse folds of the other pair of outer pleats fold in interleaved fashion when the sheet is folded to a closed position,
whereby said complementary inverse fold lines form the pair of tuck folds which more readily receive the inverse folds of the other pair of outer pleats in interleaved fashion so that the sheet can be smoothly folded to the closed position.

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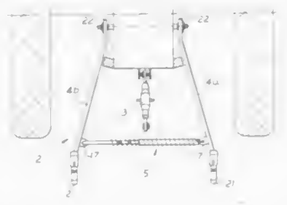
4,917,406

LENGTH-ADJUSTABLE HOLDING DEVICE FOR THE LOWER STEERING ARM OF A THREE-POINT COUPLING DEVICE

Paul Herchenbach, Ruppichteroth; Alfred Frackenpohl, Lohmar, and Hermann Rugen, Meppen-Rühle, all of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Mar. 21, 1989, Ser. No. 326,320
Int. Cl.[4] A01B *59/043*
U.S. Cl. 280—455.1 10 Claims



1. A length-adjustable holding device with a resilient support for the lower steering arm of a three-point coupling device for an agricultural tractor, having a helical spring comprising a first connecting element, and an adjusting member adjustable received in the helical spring and comprising a second connecting member, with a pin being provided to secure the position of the adjusting member relative to the helical spring, which pin passes through the space between two spring coils and engages a bore of the adjusting member, wherein the adjusting member is designed with at least two through-apertures for a pin, the axis of each through-aperture extends at an angle relative to a plane transverse to the longitudinal axis of the helical spring, which angle substantially corresponds in size to the helical angle of the helical spring, the distance between the through-apertures differs from that between the coils of the helical spring, and the adjusting member is guided in a guiding bore of a guiding sleeve accommodated within the helical spring.

4,917,407

PLASTIC PART PROVIDED WITH A METAL THREADED ELEMENT

Heiner Gassmann, Jakobstr. 3, 7300 Esslingen 1; Siegfried Beck, Stöfflerweg 8, 7000 Stuttgart 80, and Werner Heinlein, Arnaudweg 7, 7135 Wiernsheim 2, all of Fed. Rep. of Germany

Division of Ser. No. 852,385, Apr. 15, 1986, Pat. No. 4,714,278, which is a continuation of Ser. No. 170,225, Jul. 18, 1980, abandoned. This application Sep. 16, 1987, Ser. No. 97,008
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1979, 2937443
Int. Cl.[4] F16L *55/00*
U.S. Cl. 285—169 12 Claims

1. A plastic housing cover for a valve, said cover including an open upper end and an open base of larger diameter than said upper end which open base set as upon said valve to cover said valve, said cover further including an integral cylindrical connector sleeve formed as a unitary part of said cover extending outwardly therefrom and including a cylindrical bore therein, said connector sleeve having a connector end with a radially extending shoulder, said connector sleeve further includes an annular channel, a seal means in said annular channel exterior surface of said connector sleeve, a metal nipple having a passage therethrough with threads on an inner surface of one end of said passage, said passage in said metal nipple being substantially the same diameter as said cylindrical bore in said connector sleeve, said metal nipple having a first nonthreaded outer cylindrical end portion radially outwardly of said threaded end of said passage, said first nonthreaded outer cylindrical end portion having a diameter which is greater than the diameter of said radially extending shoulder of said connector end of said connector sleeve, said metal nipple including an outer connector means having an outer diameter greater than said connector sleeve which covers an exterior surface of said connector sleeve and said seal means for securing said metal nipple to said connector sleeve and for connecting a fluid pressure line connected to said threaded end of said nipple to said connector end of said connector sleeve.

4,917,408

ADJUSTABLE BALL FITTING FOR FLUID LINES

Matthew Vidrine, 920 N. 1st St., and Robert Lucero, 351 W. Gum, both of Eunice, La. 70535

Continuation of Ser. No. 103,669, Oct. 2, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 314,225
Int. Cl.[4] F16L *27/04, 47/00*
U.S. Cl. 285—261 5 Claims

1. An adjustable PVC ball fitting apparatus for connecting two straight, cylindrical sections of PVC pipe, the apparatus being positionable in a fluid line for providing angulated flow of fluid through the line, the apparatus comprising:

(a) a first, unitary body portion having first and second ends, an annular wall, and having a beveled edge adjacent the first end of the first, unitary body portion, the bevel being formed by increasing the inner diameter of the first, unitary body portion from a point intermediate the first and second ends to a point adjacent the first end, a portion of the annular wall adjacent the second end of the first, unitary body portion having means for slidingly receiving a straight, cylindrical section of PVC pipe;

(b) a second, unitary body portion including an annular wall and first and second ends, a portion of the annular wall adjacent the first end of the second, unitary body portion having means for slidingly receiving a straight, cylindrical section of PVC pipe and having a substantially ball-shaped portion adjacent the second end thereof;

(c) a unitary resilient ring member, made of an elastomeric material, disposed within the substantially ball-shaped portion of the second, unitary body portion, the ring member having a substantially ball-shaped exterior travelling surface having a size and shape substantially equal to the inner surface of the substantially ball-shaped portion of the second, unitary body portion for slidingly engaging the interior surface of the substantially ball-shaped portion of the second, unitary body portion, the ring member also having a substantially cylindrical inner surface having a diameter substantially equal to the outside diameter of the first, unitary body portion adjacent the first end of the first, unitary body portion, the first end of the first, unitary body portion being disposed in the ring member; and

(d) a bonding compound fixedly engaging the interior surface of the ring member to the exterior surface of the first, unitary body portion, wherein the elastomeric ring member is insertable into and removable from the substantially ball-shaped portion of the second, unitary body portion before the ring member is fixedly engaged to the first, unitary body portion, but after the elastomeric ring member is fixedly engaged to the first, unitary body portion, the ring member is not removable from the substantially ball-shaped portion of the second, unitary body portion, the resilient ring member being slidably movable in relation to the second, unitary body portion, so that the angle of flow within the line can be adjusted, yet preventing leakage between the first and the second body portions.

4,917,409

TUBULAR CONNECTION

Doyle E. Reeves, Houston, Tex., assignor to Hydril Company, Houston, Tex.

Continuation of Ser. No. 868,887, May 27, 1986, which is a continuation of Ser. No. 489,739, Apr. 29, 1983, abandoned. This applicatioo Sep. 6, 1938, Ser. No. 240,679
Int. Cl.[4] F16L *15/00*
U.S. Cl. 285—334 7 Claims

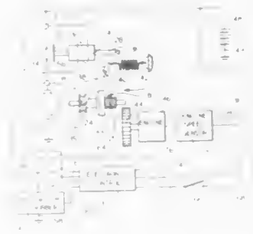
1. A threaded pipe connection comprising a box having tapered, internal, generally dovetail-shaped threads with stab flanks and load flanks and flat roots and crests that are parallel to the longitudinal axis of the pipe and a pin having tapered, exteranl, generally dovetail-shaped threads with stab flanks and load flanks and flat roots and crests that are parallel to the longitudinal axis of the pipe for mating with the internal threads of the box to make up a pipe connection, a pipe thread lubricant coating the threads, said threads increasing in width in one direction on the box and in the other direction on the pin so the roots, crests, and flanks of the threads move together and form seals that resist the flow of fluids between the threads with the stab flanks and the roots and crests being designed to move into sealing engagement before both the load flanks and the stab flanks move into sealing engagement after which the flanks will move together and form seals to complete the sealing of the connection as the connection is fully made up.

4,917,410

ELECTRONIC STARTING MOTOR CONTROL

Donald L. Cummins, and Stephen P. Santichen, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1988, Ser. No. 283,096
Int. Cl.[4] F02N *11/08*
U.S. Cl. 290—38 R 8 Claims



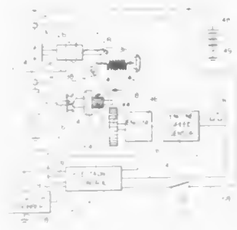
1 An electric starting system for an electric cranking motor comprising, a source of direct voltage, an electric cranking motor connected to rotatably drive a pinion, a solenoid having a coil and a shiftable plunger, said plunger coupled to said pinion for shifting said pinion into mesh with the ring gear of an engine to be cranked, solenoid contact means operated by said plunger to a closed condition when said coil is energized, means connecting said solenoid contact means and said cranking motor in series and across said source of direct voltage, whereby said cranking motor is energized when said solenoid contact means is closed, a switching means, a circuit connected across said source of direct voltage and in parallel with said solenoid contact means and cranking motor, said circuit comprising said coil and said switching means with the coil and switching means connected in series, a start switch, means responsive to closure of said start switch for causing said switching means to close to thereby energize said coil to cause said pinion to move into mesh with said ring gear and to cause said solenoid contact means to close, and means responsive to the closure of said solenoid contact means for causing said switching means to repeatedly switch on and off to supply pulses of current to said coil that is sufficient to maintain said pinion meshed with said ring gear and to maintain said solenoid contact means closed without overheating said coil.

4,917,411

ELECTRONIC STARTING MOTOR CONTROL WITH LOW VOLTAGE PROTECTION

Donald L. Cummins, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1988, Ser. No. 282,765
Int. Cl.[4] F02N *11/08;* H02H *7/08*
U.S. Cl. 290—38 R 4 Claims



1 An electronic control system for an electric cranking

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motor comprising, a source of direct voltage, an electric cranking motor connected to drive a pinion that is adapted to be meshed with the ring gear of an engine to be cranked, a solenoid having a plunger and a coil, said coil when energized causing said plunger to be moved, said plunger connected to said pinion for moving said pinion into mesh with said ring gear, solenoid contact means operated by movement of said plunger, said contact means being closed when said coil is energized to connect said source of direct voltage and said cranking motor, means for connecting and disconnecting said solenoid coil to and from said source of direct voltage comprising a plurality of parallel connected field effect transistors, a start switch, means for causing said field effect transistors to be turned on when said start switch is closed, a voltage sensing means connected to sense the magnitude of the voltage of said source of direct voltage, said voltage sensing means including means for developing a signal when the magnitude of the voltage of said source of direct voltage is below a predetermined value, and means coupled to the gates of said field effect transistors and responsive to the development of said signal for turning off said field effect transistors.

4,917,412

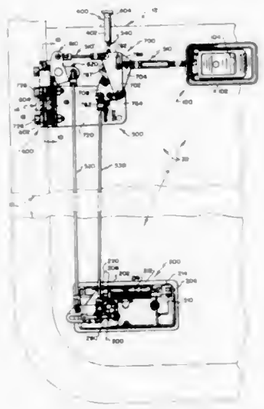
VEHICLE DOOR LOCK SYSTEM PROVIDING A PLURALITY OF SPACED ROTARY LATCHES

Jye P. Swan, Brunswick Hills; Lee S. Weinerman, Medina, and Joel T. Vargus, Middleburg Hts., all of Ohio, assignors to The Eastern Company, Cleveland, Ohio

Continuation of Ser. No. 191,817, May 3, 1988, abandoned, which is a continuation of Ser. No. 54,687, May 27, 1987, abandoned, which is a continuation-in-part of Ser. No. 830,709, Feb. 18, 1986, abandoned. This application Jan. 30, 1989, Ser. No. 303,972

Int. Cl.[4] E05C *9/00*

U.S. Cl. 292—48 33 Claims



1. A door lock system for a vehicle door that closes an access opening of a vehicle body, for securely latching the door in a closed position, and for locking the closed latched door, the system comprising:

(a) striker means including a plurality of striker members for attachment to a vehicle body at a plurality of spaced striker locations near an access opening of the vehicle body that is closable by a door of the vehicle;

(b) rotary latch means including a plurality of rotary latch units for attachment to the vehicle door at a plurality of spaced latch locations for rendering the door "latched" as by latchingly engaging the striker means for securely latching the vehicle door in a closed position, with the latch locations each being adjacent a separate one of the striker locations when the vehicle door is closed, and with each of the rotary latch units latchingly engaging a separate one of the striker members when the door is closed;

(c) latch operator means for attachment to the vehicle door, including:

(i) first operator means connected to the vehicle door at a first operator location which is spaced from each of the latch locations, with the first operator means being movable at the first operator location between a first normal position and a first latch operating position; and,

(ii) second operator means connected to the vehicle door at a second operator location which is spaced from each of the latch locations, with the second operator means being movable at the second operator location between a second normal position and a second latch operating position;

(d) latch unit interconnection means for drivingly interconnecting the rotary latch units to effect concurrent unlatching of the rotary latch units from latching engagement with their associated striker members;

(e) connection means for establishing a driving connection between the latch operator means and a selected one of the rotary latch units to normally enable the latch operator means to "unlatch" the door as by releasing the selected rotary latch unit from latchingly engaging its associated striker member and, through concurrent operation of the latch unit interconnection means, to release the other of the rotary latch units from latching engagement with their associated striker members to thereby enable the vehicle door to be moved from its closed position, the connection means including:

(i) first linkage means that extends along a first path from the first operator location to the laten location of the selected rotary latch unit, and with the first linkage means being drivingly connected to the first operator means at the first operator location and to the selected rotary latch unit at its latch location for normally establishing a driving connection that extends along the first path for enabling the first operator means to unlatch the door as by causing the rotary latch means to withdraw latching engagement of the rotary latch means with the striker means and to thereby unlatch the door in response to movement of the first operator means between the first normal position and the first latch operation position; and,

(ii) second linkage means that extends along a second path from the second operator location to the latch location of the selected rotary latch unit, and with the second linkage means being drivingly connected to the second operator means at the second operator location and to the selected rotary latch unit at its latch location for normally establishing a driving connection that extends along the second path for enabling the second operator means to unlatch the door as by causing the rotary latch means to withdraw latching engagement of the rotary latch means with the striker means and to thereby unlatch the door in response to the movement of the second operator means between the second normal position and the second latch operator position;

(f) lock control means for selectively disabling the normal driving connection that is provided by the connection means between the first operator means and the selected rotary latch unit means when the door is latched and to thereby "lock" the closed latched door against being unlatched, including first control means for selectively preventing the first linkage means from enabling the first operator means to unlatch the rotary latch means from latching engagement with the striker means;

(g) the first linkage means including a first release lever pivotally connected to the selected rotary latch unit for pivotal movement about a common axis between a first non-actuated position and a first release position for effecting unlatching of the selected rotary latch unit when the first release lever is pivoted to the first release position;

(h) the second linkage means including a second release lever pivotally connected to the selected rotary latch unit for pivotal movement about said common axis between a second non-actuated position and a second release position for effecting unlatching of the selected rotary latch unit when the second release lever is pivoted to the second release position;

(i) the rotary latch units other than the selected rotary latch unit each having a pawl that is pivotally movable to an unlatching position for effecting unlatching;

(j) the latch unit interconnection means including drive link means including separate drive links drivingly connected to the pawls of each of said other rotary latch units for pivoting the pawls thereof to their unlatching positions in response to unlatching of their associated separate drive links; and,

(k) the latch unit interconnection means additionally including an operating arm that is pivotally connected to the selected rotary latch means and to the drive link means for moving the drive link means to unlatch the other rotary latch means in response to pivotal movement of either of the first ad second release lever means into releasing engagement with the release means of the selected rotary latch.

4,917,413

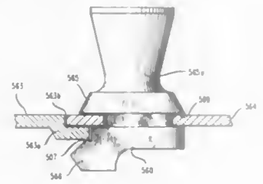
RESILIENT LATCHING DEVICE

Donald M. Jason, and James A. Jason, both of Asbury, N.J., assignors to Donald M. Jason, Asburg, N.J.

Continuation-in-part of Ser. No. 852,086, Apr. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 764,111, Aug. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 480,832, Mar. 31, 1983, abandoned. This application Jun. 9, 1987, Ser. No. 60,933

Int. Cl.[4] E05C *19/06*

U.S. Cl. 292—76 45 Claims



1. A one-piece door or panel retention device for latching against a striker bar or surface comprising a solid body of elastomeric material having a durometer hardness on the Shore A scale of between 20 and 90, a tensile strength between 550 and 2000 pounds per square inch (3.65 and 146.14 Kg/cm^2), and a tear strength of between 75 and 300 pounds per linear inch (0.89 and 53.57 Kg/cm.), having along one edge thereof an outwardly-projecting lip forming a catch on an undercut surface of said lip, an outwardly-directed surface of said lip comprising a cam, at least a portion of which is constructed in closed relation of said latch to form a positive cross-sectional angle of between 15 degrees and 90 degrees with a plane parallel to a striker bar or surface of a panel wherein said door or panel retention device is installed.

4,917,414

INTERLOCK ARRANGEMENT FOR AN APPLIANCE DOOR AND AN INTERLOCK UNIT THEREFOR

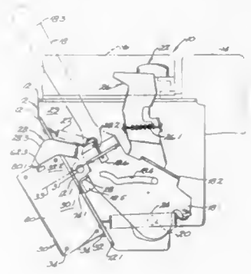
Henry J. Boulanger, Nicholasville, Ky., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 23, 1988, Ser. No. 289,342

Int. Cl.[4] E05C *5/02*

U.S. Cl. 292—98 7 Claims

1. An interlock arrangement for an appliance door comprising a support, a bolt pivotally mounted on the support for movement between a latching position securing an appliance door closed and an unlatching position permitting opening of the door, a lever pivotally mounted on the support for manual movement between latching and unlatching positions thereof to move the bolt between corresponding positions, the lever having a cam and having a radial slot circumferentially disposed thereon for movement with the lever between said latching and unlatching positions of the lever, a lock pivotally mounted on the support for movement in a plane between latching and unlatching positions of the lock, the lock having a detent to be received in lever slot and having a follower to be engaged by the lever cam to pivot the lock from its unlatching position to its latching position to move the detent into the lever slot when the lever is moved to its latching position so that the detent locks the lever in its latching position when the lock is in its latching position, and an interlocking unit mounted on the support, the unit having a member normally disposed under the plane of lock movement normally permitting the lock to move between its latching and unlatching positions, having first movable and complementary electrical contacts engageable for operating an appliance, having an electrical resistance heater connectable in an appliance circuit to be selectively energized when appliance operation is to be initiated, and having means thermally responsive to the heater and to a temperature in a selected appliance zone to move the member into said plane only when the lock is in its latching position in the plane, to intercept and prevent movement of the lock in the plane from its latching position to its unlatching position, and to engage the first contacts to operate the appliance only when the lock is in its latching position, said means being thermally responsive to release the lock to move form its latching position to its unlatching position only after the heater is deenergized when appliance operation is discontinued and after the selected appliance zone is cooled so that the thermally responsive means has cooled to a predetermined reset temperature.



4,917,415

LATCHING MECHANISM FOR A TOP OF A VEHICLE, ESPECIALLY PASSENGER MOTOR VEHICLE

Willi Wurl, Niefern-Oeschelbronn, Fed. Rep. of Germany, assignor to Porsche Aktiengesellschaft, Weissach, Fed. Rep. of Germany

Filed Aug. 1, 1988, Ser. No. 226,746

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1987, 3725431

Int. Cl.[4] B60J *7/12;* **F05C** *5/00*

U.S. Cl. 292—113 22 Claims

1. A latching mechanism for a top of a vehicle, which is tightened against a fixed body, comprising;

support bracket means arranged on a side of the top;

operating lever means supported about a first transverse shaft;

a pivotal latching member cooperating with a receiving means on a side of the body;

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the operating lever means being operatively connected with the latching member by at least one guide lever means, which guide lever means is rotatably connected with the operating lever means by way of a second transverse shaft and with the latching member by way of a third transverse shaft;
guide track means provided at the support bracket means which cooperates with a roller means seated on the third transverse shaft;
a bolt extending in the transverse direction to connect the

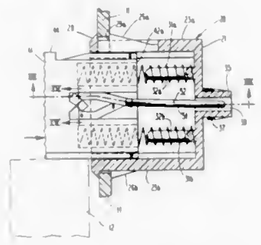
latching member and the support bracket means to each other;
the bolt extending through longitudinal slots of the support bracket means and of the latching member and being displaced within the longitudinal slots by actuation of the operating lever means; and
the latching member, during the pivoting of the operating lever means into a raised closing position, follows a defined upward movement into the receiving means and a subsequent rearward longitudinal tightening movement inside of the receiving means.

4,917,416

WINDOW LATCHING DEVICE

Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.

Filed Sep. 21, 1988, Ser. No. 247,157
Int. Cl.[4] E05C *1/10*
U.S. Cl. 292—175 **7 Claims**



1. A window latching device for use in double-hung windows to allow variable latched open spaces between individual sashes thereof comprising:
an insert shell fixedly set into an aperture in the inner face of a vertical member of a first window sash, said shell being hollow with an outwardly facing opening therein for receiving a latching plug;
a latching plug with an inner edge and an oppositelydisposed outer edge slidably mounted for movement therein in said shell; and
control means connected between said shell and said plug to bias movement of said plug between a flush-mounted window opening position and a protruding partial opening position, said control means including at least one spring mounted between the inside of said shell and said plug and a catch pin fixed to the interior of said shell in a cantilever manner at one end and having hooking means at the opposite end thereof, and guiding means in said plug for leading said hooking means to predetermined hooks.

4,917,417

HOOD LATCH ASSEMBLY HAVING UNITARY LATCHING LEVER WHICH FUNCTIONS BOTH AS A PRIMARY AND SECONDARY LATCH

Michael E. Aubry, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 24, 1989, Ser. No. 315,081
Int. Cl.[4] E05C *19/10*
U.S. Cl. 292—117 **7 Claims**

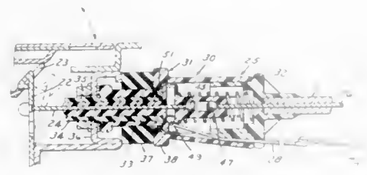
1. A hood latch assembly for use in an automotive vehicle having a hood pivotally supported for movement between open, partially open and closed positions, a striker having a horizontally disposed latch engaging portion carried by said hood, and with said striker being movable through a given path of movement by said hood when the latter is moved between its open and closed positions and a generally horizontally disposed vehicle support structure for engaging said hood when in its closed position,
said hood latch assembly comprising:
a stationary housing which is adapted to be mounted to said support structure and which receives said striker when the hood is moved to its partially open and closed positions,
primary latch means pivotally supported by said housing for movement toward and from the path of movement of said striker between a latched position in which it engages said latch engaging portion on said striker to hold the hood in its closed position and an unlatched position in which it permits movement of the hood to a partially open position,
manually manipulatable secondary latch means pivotally supported by said housing for movement toward and from said path of movement of said striker between a latched position in which it overlies and engages said latch engaging portion of said striker when the hood is moved to a partially open position and an unlatched position in which it permits movement of said hood from its partially open position to its fully open position,
first spring means for biasing said primary and secondary latch means toward their latched positions,
second pop-up spring means carried by said housing and engageable with said striker when the hood is moved to its closed position, the pop-up spring means being compressed by said striker when the hood is moved to its closed position,
and a release means operatively connected with said primary latch means for effecting movement of the latter to its unlatched position to allow the pop-up spring means to move the hood to its partially open position in which the striker engages the secondary latch means,
the improvement being that said primary and secondary latch means comprises a unitary latch lever pivotally supported by said housing via a pivot means and having first and second vertically spaced, transversely extending latching projections lying in the path of movement of said striker, said first latching projection serving as said primary latching means and said second latching projection serving as said secondary latching means and extending transversely of and projecting into the path of movement of said striker a greater extent than said first latching projection,
and wherein said first and second latching projections of said latch lever have tapered upper end surfaces to enable the striker to cam the unitary latch lever toward their unlatched position in opposition to said first spring means when the hood is being moved from its open position to its partially open and closed positions, respectively, said first spring means returning said unitary latch lever to its latched position when the striker clears the first and second latching positions of said latching lever as the hood is being moved toward its closed position.

4,917,418

FUEL FILLER DOOR RELEASE SYSTEM

Donald J. Gokee, Bowling Green, Ohio, assignor to Babcock Industries Inc., Fairfield, Conn.

Filed Dec. 12, 1988, Ser. No. 283,462
Int. Cl.[4] F05C *1/12*
U.S. Cl. 292—125 **5 Claims**



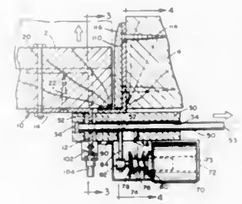
1. A fuel filler door release system for a vehicle for use in connection with a fuel filler door covering a fuel opening and having a latch holding the door in closed position, comprising
a release device adapted to be mounted within the vehicle,
said release device comprising a housing including a housing part adapted to be fixed within the vehicle,
said housing including a conduit part,
means releasably connecting said conduit part to said housing part,
a sleeve,
said housing including a tubular portion through which said sleeve extends,
a fastener engaging said sleeve for holding said housing part in position on the vehicle,
a plunger having one end extending through an opening in the sleeve, a flange, and another portion extending within the housing part,
a first strand,
means for releasably connecting the first strand to the plunger,
a second strand,
said second strand extending through the conduit part of the housing,
means releasably connecting said second strand to said plunger,
means yieldingly urging said plunger axially of said housing toward said housing part,
a third strand, means releasably connecting said third strand to said plunger,
said housing including an opening through which said third strand extends,
such that the release device is mounted in the vehicle and the first strand connected to the latch, the second strand is connected to an operating handle in the vehicle and the third strand extends to another portion of the vehicle remote from the operating handle, such as the trunk of the vehicle.

4,917,419

ELECTROMECHANICAL DOOR LOCK SYSTEM

Saturnino F. Mora, Jr., 401 Hidden Vista Dr., and Godofredo A. Jimenez, 448 Windrose Way, both of Chula Vista, Calif. 92010

Filed Aug. 22, 1988, Ser. No. 234,553
Int. Cl.[4] F05C *1/04*
U.S. Cl. 292—144 **13 Claims**



1 A garage door lock system for locking a garage door to a door frame comprising:
a latch mountable on a garage door, said latch having a tongue with a bolt aperture opening through said tongue;
a block of solid material fastenable to said door frame, said block having an elongate bolt bore extending into said solid material and a tongue slot, said bolt bore opening into said slot;
a bolt slidably mounted within said bore, said bolt being movable to a first portion extending into said slot and a second position retracted from said bolt aperture and into said bolt bore;
a solenoid mounted on said block, said solenoid including a plunger, said plunger being movable by said solenoid between a first extended position and a second energized position, said plunger being non-colinear with said bolt; and
a coupling mechanism connected between said plunger and said bolt for causing said bolt to move between said first and second positions.

4,917,420

LOW EFFORT CABLE RELEASE HOOD LATCH ASSEMBLY

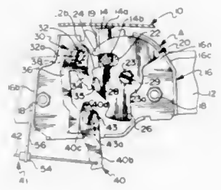
Lloyd W. Rogers, Jr., Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 21, 1989, Ser. No. 312,269
Int. Cl.[4] F05C *3/26*
U.S. Cl. 292—198 **4 Claims**

1. A latch assembly for latching and unlatching a pivotally movable closure panel of an automotive vehicle comprising
a housing which is adapted to be mounted to vehicle body structure of the vehicle adjacent a striker on the closure panel,
a locking lever pivotally supported by said housing for

movement between a latched position in which an upper end portion thereof is latched to the striker on said closure panel to hold the latter in its closed position and an unlatched position in which said upper end portion releases the striker to allow the closure panel to be moved toward an open position, said locking lever being biased toward said unlatched position and having a lower end portion remote from its upper end portion,

a detent lever pivotally supported by said housing for movement between a first position in which a first portion thereof engages said locking lever to retain the latter in its latched position and a second position in which said first portion thereof releases said locking lever to allow the latter to be moved to its unlatched position, said detent lever having a second portion and being spring biased toward its first position, and manually manipulatable release means operatively associated with said second portion of said detent lever for moving the latter in opposition to its spring biasing force from its first position toward its second position to release said locking lever for movement toward its unlatched position, the improvement being that said latch assembly includes a third lever pivotally supported by said housing and at least partially located between said lower end portion of said locking lever and said second portion of said detent lever, said third lever having an upper end disposed within the path of move-



ment of said lower end portion of said locking lever, a lower end which is connected with said manually manipulatable release means and an intermediate portion adjacent its pivot which engages said second portion of said detent lever, said third lever in response to being rotated in one direction by manual movement of said manually manipulatable release means in a first direction exerting a high mechanical advantage to said detent lever and causing the latter to be rotated from its first position toward its second position to release said locking lever for movement from its latched position toward its unlatched position to release the striker, said lower portion of said locking lever engaging said upper end of said third lever as it moves towards its unlatched position to cam and return said third lever and release means back toward its original position and then blocking said third lever against movement in said one direction while the closure panel is open,

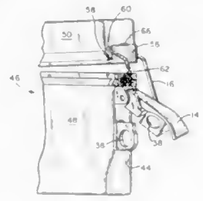
said locking lever being adapted to be engaged by said striker and cammed from its unlatched position toward its latched position when the closure is being moved toward its closed position, said locking lever during this movement also camming said detent lever against its spring bias toward its second position until the first portion thereof is aligned with a detent portion on said locking lever whereupon said spring biased detent lever returns to its first position to detentably engage and hold said locking lever in its latched position.

4,917,421

DETACHABLE FASTENER FOR ELECTRICAL ENCLOSURES

David B. Wightman, White Bear Lake; Steven J. Hammond, Coon Rapid, and Robert A. Knoss, St. Francis, all of Minn., assignors to Federal-Huffman, Inc., Anoka, Minn.

Filed Nov. 1, 1988, Ser. No. 265,696
Int. Cl.[4] E05C *5/02*
U.S. Cl. 292—247 14 Claims



1. A readily detachable fastener for securing adjacent structures together, at least one of which has a pin receiving hole therein, comprising:

(a) a base pivot member having channeled side portions and being constructed and arranged to detachably engage one of the adjacent structures in a positive readily releasable relationship;

(b) a latch member pivotally mounted to said base pivot member so as to be movable between an open and closed position;

(c) a bail member carried by said latch member, said bail member being constructed so as to catch on the adjacent structure opposite the structure engaged by said base pivot member when said latch is in its open position, and tightly securing the adjacent structures together when said latch member is moved to its closed position; and

(d) a resilient connector pin connected to said base pivot member and extending outwardly therefrom, one end of said connector pin being connected to said base pivot member and the other free end of said connector pin having a central slit therein, said connector pin further having locking ribs extending outwardly from the outer surface thereof, and said connector pin being constructed and arranged to releasably interlock with the pin receiving hole in one of the adjacent structures.

4,917,422

PORTABLE LATCH DOOR LOCK

Hugh Rose, 5320 N. Camino Sumo, Tucson, Ariz. 85718

Filed Nov. 24, 1987, Ser. No. 124,606
Int. Cl.[4] E05C *19/18*
U.S. Cl. 292—293 10 Claims

1. A portable latch door lock for a door which swings toward the area to be secured, said door having a frame, a striker plate having a latch bolt hole, a recess in said door frame comprising a bolt receiving hole which is surrounded by said striker plate latch bolt hole, a knob, and a latch bolt which is actuated by said knob and which moves from said door into said recess comprising in combination:

a means for engaging said recess in said door frame and said striker plate latch bolt hole;

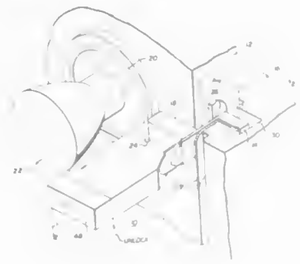
a means for engaging the inward face of said door;

a means for forcing said means for engaging said recess toward said means for engaging the inward face of said door;

adjustable means for engaging said door knob comprising a cable which has a first end fixed to said means for engaging said inward face and which end fixed to said means for engaging said inward face and which has a second end

which is adjustably fixed to said means for engaging said inward face;

a means for adjusting said means for forcing said means for engaging said recess toward said means for engaging said inward face of said door; and



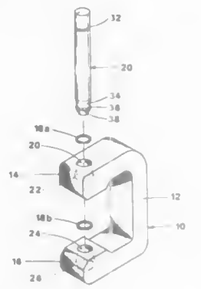
wherein said means for adjusting also tightens said adjustably fixed end of said cable means for engaging said door knob.

4,917,423

ONE-PIECE DOUBLE ENGAGEMENT SEAL LOCK

Raymond F. Kohn, P.O. Box 448, Magnolia, Tex. 77355

Filed Aug. 21, 1989, Ser. No. 396,475
Int. Cl.[4] B65D *33/34*
U.S. Cl. 292—324 10 Claims



1. A permanently secured double engagement seal lock comprising:

(a) a C shaped locking body comprised of a vertical member having a horizontal upper leg member and a horizontal lower leg member,

(b) said upper leg is parallel to said lower leg member and horizontal to said vertical member,

(c) a vertical upper hole passing through said upper leg member having a locking means within,

(d) a vertical lower hole in said lower leg member having a locking means within,

(e) said upper hole and said lower hole are vertically aligned on their respective center lines,

(f) a locking pin so dimensioned as to fit and slide snugly within said upper hole of said upper leg member and through to said lower hole of said lower leg member,

(g) said locking pin having its first end shaped and arranged to effect a temporary locking engagement with said cooperating locking means located within said upper leg member,

(h) said locking pin having its first end shaped and arranged to effect a permanent locking engagement with said cooperating locking means located within said lower leg member,

(i) said locking pin having an opposite end shaped and arranged to effect a permanent locking engagement with said cooperating locking means located within said upper leg member,

(j) said locking pin and said cooperating locking means within each of said upper leg member and said lower leg members are dimensioned to have the first end of said locking pin effect a permanent locking engagement with said cooperating locking means located within said lower leg member, and the opposite end of said locking pin effect a permanent locking engagement with said cooperating locking means within said upper leg member simultaneously,

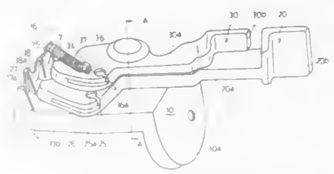
(k) with said locking body positioned around an aperture of a device to be sealed, with said upper leg member positioned on one side of said aperture and said lower leg member positioned on the opposite side of said aperture and said locking pin positioned over said aperture, said locking pin is pushed through said upper hole of said upper leg member with sufficient pressure to overcome the temporary locking engagement means contained therein, thus the first end of said locking pin passes through said aperture of the device to be sealed and into said lower hole of said lower leg member, at which time the first end of said locking pin permanently engages with said cooperating locking means located within said lower leg member while simultaneously the opposite end of said locking pin permanently engages said cooperating locking means within said upper leg member, thereby permanently securing said locking pin in place utilizing a double engagement locking means.

4,917,424

HANDLE DEVICE OF LID OPENER MECHANISM

Hiroshi Ishihara, Kariya, and Kimiharu Hirose, Obu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Mar. 10, 1988, Ser. No. 166,423
Claims priority, application Japan, Mar. 11, 1987, 62-035273[U]; Mar. 23, 1987, 62-042302[U]; Mar. 26, 1987, 62-044557[U]; Mar. 27, 1987, 62-046143[U]; Mar. 30, 1987, 62-047026[U]; Mar. 30, 1987, 62-047022[U]
Int. Cl.[4] E05C *21/00*
U.S. Cl. 292—336.3 8 Claims



1. An opener for opening individually two lids of a vehicle comprising:

(1) a base member including a connecting portion extending in a lateral direction, a supporting portion formed at one end portion thereof integrally with said connecting portion and extending in a longitudinal direction, an annular projection formed on said supporting portion and extending outwardly in a lateral direction, a bore formed in said annular projection and oriented in the axial direction thereof, a shoulder portion formed integrally with the other end portion of said supporting portion and extending outwardly in a lateral direction, and a pair of laterally spaced hooks formed on an upper side of said supporting portion;

(2) a first lever including a first main member adjoined to

said supporting portion of said base member in parallel relationship thereto and having a hole through which said annular projection of said base member is rotatably passed, a first knob formed at one end portion of said first main member, and a first pawl corresponding to one of said hooks and provided at the other end portion of said first main member;

(3) a second lever including a second main member adjoined to said first main member of said first lever in parallel relationship thereto and having an annular groove into which the distal end portion of said annular projection is rotatably received, a second knob formed at one end portion of said second main member, and a second pawl corresponding to the other of said hooks;

(4) means for preventing extraction of said second lever from said annular projection of said base member;

(5) a first spring interposed between said first pawl of said first lever and one of said hooks; and

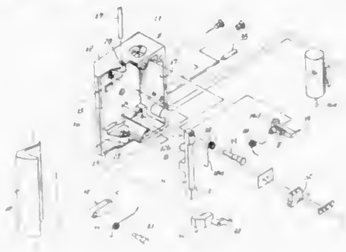
(6) a second spring interposed between said second pawl of said second lever and the other of said hooks.

4,917,425

ELECTRICAL STRIKE RELEASE

Duane K. Logas, San Bernardino, Calif., assignor to Adams Rite Manufacturing Company, City of Industry, Calif.

Filed Dec. 22, 1988, Ser. No. 288,774
Int. Cl.[4] E05B *15/02*; E05C *19/16*
U.S. Cl. 292—341.16 **11 Claims**



1. In an electrical release door strike, the combination comprising:

(a) a carrier frame,

(b) a strike bolt carried by the frame for pivoting when released, allowing door opening, the bolt adapted to receive and resist door opening force prior to said pivoting,

(c) means carried by the frame to release the strike bolt for such pivoting, including first, second and third arms,

(d) the first arm movable from a first position blocking bolt pivoting to a second position allowing bolt pivoting to in turn allow said door opening, the second arm movable from a primary position in which it holds the first arm in said first position to a secondary position in which it allows first arm movement to said second position, and the third arm movable from an initial position in which it holds the second arm in said primary position to a subsequent position in which it allows movement of the second arm to said secondary position,

(e) there being a solenoid carried by the frame to be operatively connected with the third arm, and wherein said third arm has a pivot axis about which it is pivotable from its initial position to its subsequent position in response to operation of the solenoid,

(f) there being a force exerting means yieldably urging the third arm into its said initial position, said force exerting means comprising a torsion spring,

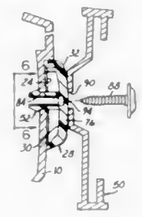
(g) and there being a counterweighted arm carried by the frame to pivot when the solenoid is operated, the counterweight arm operable independently of the solenoid and torsion spring to urge the third arm toward its said initial position in the event of failure of the torsion spring.

4,917,426

BUMPER ATTACHMENT MEANS FOR A NERF STRIP AND LICENSE PLATE HOLDER

David F. Copp, Dryden, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 17, 1989, Ser. No. 338,666
Int. Cl.[4] B60R *19/44*
U.S. Cl. 293—142 **2 Claims**



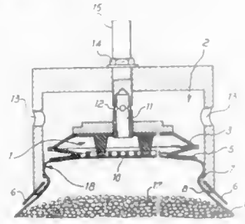
1. Vehicle bumper nerf strip and license plate holder attachment means for securing the nerf strip and holder to a vehicle bumper having an exterior face and an inner face, the bumper including a plurality of spaced apart openings therein for receiving nerf strip fasteners, comprising a nerf strip formed as an elongated strip of plastic material securable to the exterior face of the bumper across the length thereof, the nerf strip having an inner face and an outer face, a plurality of spaced apart first fasteners on the inner face of the nerf strip, the first fasteners being receivable in said spaced apart openings in the vehicle bumper by the application of a pushing force on the outer face of the nerf strip and removable by the application of a pulling force on the nerf strip, at least one second fastener on the inner face of the nerf strip, the second fastener comprising a pair of spaced apart flexible legs extending outwardly from said inner face and terminating in outer ends, each leg having an enlarged portion on the outer end thereof, the second fastener being receivable in one of said openings in the vehicle bumper by the application of a pushing force on the outer face of the nerf strip, a self threading screw threadable through the nerf strip after the second fastener has been received in said opening in the vehicle bumper, a dimple provided in the outer face of the nerf strip aligned with the second fastener at the center of the space between said legs to function as a location point for the tip of the screw prior to threading of the screw into the nerf strip, a boss on the inner face of the nerf strip in the space between said legs, the boss having a cylindrical opening therein to function as a guide for the screw, each leg having a trough therein extending from said cylindrical opening to the outer end of the leg to function as guide means for the screw, the screw being of sufficient length so that a portion thereof will extend between the legs of the second fastener upon complete threading of the screw into the nerf strip to thereby prevent flexing of the legs towards each other upon application of a pulling force on the nerf strip, said enlarged portions on the outer ends of the legs engagable with the inner face of the vehicle bumper to thereby positively retain the second fastener in place, and a license plate holder, the license plate holder having at least one opening therein, the screw being insertable through the opening in the holder prior to threading through the nerf strip to thereby secure both the nerf strip and holder in place.

4,917,427

AIR-SUCTION LIFTER

Enzo Scaglia, 21, V.le Monterosa, Milan, Italy (20100)

Filed Jul. 11, 1988, Ser. No. 217,416
Claims priority, application Italy, Aug. 6, 1987, 21601 A/87
Int. Cl.[4] B66C *1/02*
U.S. Cl. 294—64.1 **20 Claims**



1. An air suction device for lifting packages of goods having non-rigid walls, said air suction device comprising,

a. a suction chamber having substantially rigid walls to define a chamber interior and a chamber opening, said suction chamber having chamber seal means about said chamber opening for sealing in a substantially air-tight manner the suction chamber on a non-rigid wall of a package, said chamber interior being connectible to a vacuum source such that there is a first suction force at said chamber opening, whereby said suction chamber is capable of pulling the non-rigid wall of the package away from the packaged goods; and

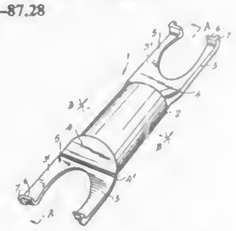
b. a suction cup disposed within said suction chamber, said suction cup having a cup interior and a cup opening, said cup opening being in the region of said chamber opening, said suction cup having cup seal means about said cup opening for sealing in a substantially air-tight manner the suction cup on the non-rigid wall of the package, said cup interior being connectible to a vacuum source such that there is a second suction force at said cup opening, whereby said suction cup is capable of pulling the non-rigid wall of the package further away from the packaged goods than said suction chamber alone, said first and second suction forces being present simultaneously throughout the lifting of the packaged goods.

4,917,428

BOTTLE CARRYING HANDLE

Manuel M. Sola, 885 Carlos Pellegrini St., (1338) Buenos Aires, Argentina

Filed Nov. 3, 1986, Ser. No. 926,105
Int. Cl.[4] B65D *71/00*
U.S. Cl. 294—87.28 **5 Claims**



1. A bottle carrying handle comprising:

an elongated body made of a rigid plastic material and having a central tubular portion and two planar ends connected to said central tubular portion by sloped portions, each of said planar ends having a pair of supporting arms for supporting an annular flange of a neck of a bottle, said supporting arms extending from said sloped portions and terminating in free ends, said supporting arms at each planar end being spaced apart from each other to define an opening therebetween for receipt of the neck of the bottle supported by said supporting arms and the spacing between said supporting arms at each planar end being sufficient for free movement of the neck of the bottle therebetween, and each supporting arm including neck retaining means for preventing the bottle supported by said supporting arms from slipping off of said supporting arms,

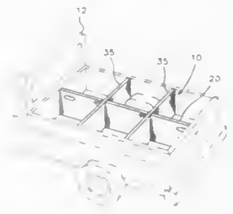
each of said supporting arms also including a reinforcing rim extending along a length of said supporting arms on a side opposite to that which supports the annular flange of the bottle.

4,917,429

TRUCK BED DIVIDER ASSEMBLY

John D. Giger, 9083 Calle Lucia, Lakeside, Calif. 92040

Filed Jan. 23, 1989, Ser. No. 300,319
Int. Cl.[4] B60R *11/00*
U.S. Cl. 296—37.6 **3 Claims**



1. A pickup truck having a truck bed having a flat floor, a front wall, laterally spaced side walls, and a rear gate, in combination with a portable divider assembly for dividing said truck bed into at least four smaller compartments without use of tools or modification of the truck bed and without attachment to the truck bed so that the divider assembly may be freely applied to compartmentalize the truck bed or removed to restore the truck bed to a noncompartmentalized condition thereof comprising:

said truck bed having a predetermined length and a predetermined width, said side walls and rear gate having a predetermined height;

a vertically oriented elongated center divider panel having a predetermined length and a predetermined height substantially equal to the respective length and height of said truck bed, said center divider panel having a front edge, a rear edge, a top edge, and a bottom edge, and a plurality of longitudinally spaced vertically oriented notches extending downwardly from the top edge of said center divider panel for matingly receiving cross member panels, wherein some of said notches are sometimes open and not always used by cross member panels;

a plurality of vertically oriented cross member panels each having a predetermined length and a predetermined height substantially equal to the respective width and height of said truck bed, said cross member panels having a top edge, a bottom edge, and laterally spaced side edges, and a vertically oriented notch extending upwardly from the bottom edge of each of said cross member panels for matingly receiving said center divider panel;

said notches in said center divider panel being formed therein by prescoring the walls of the panel to define a knockout member; and

notch plugs inserted into the open notches in said center divider panel, each of said notch plugs having spaced opposing lateral sides having grooves therein that form flanges for interlocking with said center divider panel

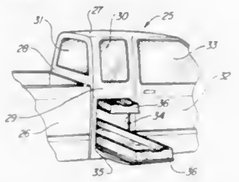
notches when the notches of said center divider panel are not used by said cross member panels.

4,917,430

PICKUP TRUCK CONVERSION

Michael A. Lawrence, 47889 Mt. Vesuvius, Utica, Mich. 48087

Filed Jun. 14, 1988, Ser. No. 206,594
Int. Cl.[4] B60R *11/06*
U.S. Cl. 296—376 19 Claims



1. In combination, in a pickup truck of the type having an extended cab with a cab side wall extending between a cab rear wall and a cab door, a side window in the side wall, a seat, and a storage area extending from the behind said seat to the rear wall of said cab, a truck conversion including:

(a) a frame assembly having its longitudinal axis mounted transverse to the longitudinal axis of said truck between said seat and said rear wall, said frame assembly defining a storage area therewithin,

(b) an access-opening provided in at least one of said side walls spaced below said side window, said access opening adjacent to, and in axial alignment with, said frame assembly,

(c) closure means for said access opening; and

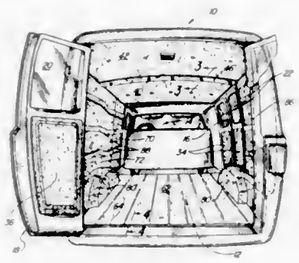
(d) storage means storable within said storage area defined by said frame assembly and extendable through said access opening.

4,917,431

LINER FOR VAN CARGO COMPARTMENT

Dean McDonald, Grand Blanc, Mich., assignor to Durakon Industries, Inc., Lapeer, Mich.

Filed Sep. 16, 1988, Ser. No. 245,085
Int. Cl.[4] B62D *33/00*
U.S. Cl. 296—39.1 5 Claims



1. A protective liner assembly for an automotive van that includes a cab portion and a cargo compartment defined by a ceiling, a floor, right and left side walls having wheel wells, rear doors and at least one side door, said liner assembly comprising:

a floor panel substantially covering the floor of the cargo compartment and said floor panel including portions for accommodating the wheel wells of the van;

a left side panel assembly substantially covering the left side wall of the van cargo compartment and extending from the floor of the van to the ceiling of the van;

a right side panel assembly substantially covering the right side wall of the van cargo compartment and extending from the floor of the van to the ceiling of the van;

said right and left side panel assemblies including wheel well covers which conform with the wheel wells of the van; and

said right and left side panel assemblies including a plurality of vertically spaced apart ribs;

a ceiling panel assembly which is secured to the ceiling of the cargo compartment, said ceiling assembly comprising a forward ceiling panel, a rear ceiling panel and an intermediate spacer bar member, wherein said spacer bar member permitting longitudinal adjustments of the forward and rear ceiling panels relative to each other; and

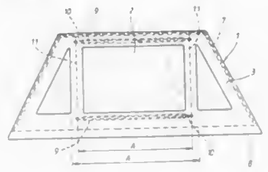
wherein said spacer bar member includes forward and rear slots that receive end portions of the forward and rear ceiling panels such that the forward and rear ceiling panels may be adjusted within the slots to a desired location.

4,917,432

STIFFENING OF A SURFACE PORTION OF A FLEXIBLE ROOF SKIN OF A VEHICLE

Jürgen Schrader, Stuttgart, and Klaus Claar, Sindelfingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Aug. 17, 1988, Ser. No. 233,005
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1987, 3727338
Int. Cl.[4] B06J *7/08*
U.S. Cl. 296—118 10 Claims



1. Stiffening arrangement for a surface portion of a flexible roof skin of a vehicle, which comprises a reinforcing section arranged at the roof skin and flexurally elastically fitted to a curve of the roof skin at the surface portion, wherein the reinforcing section includes tensioning device means for subjecting the reinforcing section to stress in such a way that the reinforcing section is changed from a bent configuration thereof to a tensioning configuration which is more sharply curved than the bent configuration when the roof skin is in a closed position.

4,917,433

MOTOR VEHICLE DOOR WITH A MULTI-SHELL DOOR BODY

Johann Tomforde, Sindelfingen, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 237,321
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1987, 3728778
Int. Cl.[4] B60J *5/04*
U.S. Cl. 296—146 18 Claims

1. Motor vehicle door with a multi-shell door body, into which a door pane running on pane guides can be lowered, comprising:

an inner wall extending essentially with a closed surface over a height of the door body and connected to a bottom of the door body;

an outer wall divided along a horizontal joining line into a upper wall portion and a lower wall portion, a removable anti-ram trim forming the lower wall portion of the outer wall;

in a region near the joining line, a transverse reinforcement which starts from the upper wall portion of the outer wall and extends in a direction of a depth of the motor vehicle door, the transverse reinforcement having a pane shaft

which is matched to a passage width of the pane guides for receiving the door pane, the transverse reinforcement being formed by a transverse wall; and

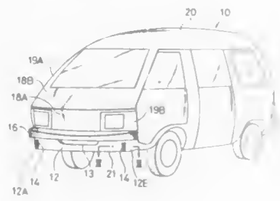
an intermediate wall extending downwards relative to the door between the inner wall and a plane of the pane guides, the intermediate wall connecting the transverse wall to the bottom of the door body.

4,917,434

CONSTRUCTION OF SIDE CORNER PORTION OF MOTOR VEHICLE

Keiji Sumitani, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

PCT No. PCT/JP87/00014, § 371 Date Oct. 28, 1987, § 102(e) Date Oct. 28, 1987, PCT Pub. No. WO88/01585, PCT Pub. Date Mar. 10, 1988
PCT Filed Jan. 9, 1987, Ser. No. 124,105
Claims priority, application Japan, Aug. 29, 1986, 61-203294
Int. Cl.[4] B62D *35/02, 32/00*
U.S. Cl. 296—180.1 31 Claims



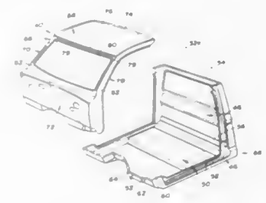
1. A construction of side corner portions of a motor vehicle, wherein curved surfaces are located between longitudinal side surfaces and a lateral surface of the vehicle and right and left air blow-out openings are formed into a vertically elongated slit shape on each curved surface to provide an air jet in a direction normal to said curved surface.

4,917,435

TRUCK CAB CONSTRUCTION

Roy E. Bonnett, Birmingham; Ronald A. Carpenter, Dearborn, and Stephen W. Gallagher, Birmingham, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 23, 1989, Ser. No. 355,955
Int. Cl.[4] B62D *25/00*
U.S. Cl. 296—190 17 Claims



1. A truck cab comprising:

a lower cab component including a unitary, lower member having a rear wall, a floor, and a toe panel; said rear wall having an upper end and also having a lower end from which the floor extends forwardly from a rear end thereof to a front end thereof; and said toe panel having a lower end connected to the front end of the floor and having an upper end to which the toe panel extends upwardly and forwardly from its lower end;

an upper cab component including a unitary, upper member having a roof, a pair of windshield pillars, and a cowl; said roof having a rear end from which the roof extends forwardly to a front end thereof where the roof is connected at laterally spaced locations to upper ends of the windshield pillars; and said windshield pillars extending downwardly from the laterally spaced upper ends thereof to laterally spaced lower ends thereof which are connected to the cowl;

an upper connection that connects the upper end of the rear wall of the lower cab component to the rear end of the roof of the upper cab component; and

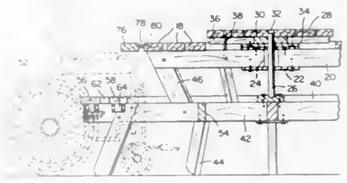
a lower connection that connects the upper end of the toe panel of the lower cab component to the cowl of the upper cab component.

4,917,436

PICNIC TABLE WITH WHEELCHAIR AND CHAIR ACCESS

Howard L. Thom, Laurel, Mont., assignor to Thom's Inc., Laurel, Mont.

Filed Apr. 13, 1989, Ser. No. 337,748
Int. Cl.[4] A47B *39/00*
U.S. Cl. 297—157 8 Claims



1 A table comprising a table top having a continuous periphery, a bench seat extending around the periphery of the table with the table and bench seat being interconnected and supported from a support surface, said bench seat being continuous and including at least one removable segment, means detachably supporting the removable segment from the bench

seat to enable removal of the removable bench segment to provide access to the periphery of the table top by a wheelchair or a straightback or similar chair, said bench seat being supported by a plurality of radial frame members with the removable bench seat segment being connected to the outer end portions of two adjacent radial frame members.

4,917,437

PIECE OF SEATING FURNITURE

Rainer Machate, Biebertal; Robert Vonhausen, Giessen, and E. Hansen, St. Margrethen, all of Fed. Rep. of Germany, assignors to Voko Franz Vogt & Co., Pohlheim, Fed. Rep. of Germany

Filed Jan. 7, 1988, Ser. No. 142,041

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1987, 3700447

Int. Cl.[4] A47C *3/00*

U.S. Cl. 297—300 21 Claims

1. A piece of seating furniture having a seat carrier, a seat part articulated to the seat carrier, and a back part supported on a back carrier to provide a supporting force, the supporting force provided by the back part being adjusted in response to a weight applied to the seat part, characterized in that the seat part is mounted on the seat carrier for vertical adjustment by means of a parallelogram linkage against the force of a spring element, in that the force of the spring element is adjusted in response to the vertical adjustment of the seat part, and in that the back carrier is mounted for pivotal motion with respect to the seat carrier, a pivoting motion of the back carrier taking place against the force of the spring element, the vertical adjustment of the seat part adjusting the supporting force provided by the back part.

4,917,438

ADJUSTABLE-WIDTH SEATING FOR PASSENGER-CARRYING VEHICLES

Arthur Morgan, St. Albans, England, assignor to Flight Equipment & Engineering Limited, Buckinghamshire, United Kingdom

Filed May 24, 1988, Ser. No. 197,954

Claims priority, application United Kingdom, Jun. 1, 1987, 8712844

Int. Cl.[4] A47C *7/54*

U.S. Cl. 297—411 14 Claims

1. An adjustable-width seating unit for use in a passenger-carrying vehicle, said adjustable-width seating unit comprising

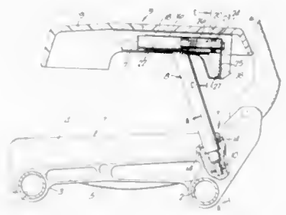
a support frame which is mountable in a vehicle,

a back support part and a bottom part, mounted substantially at right angles on said support frame,

a pillar having a pivotal connection to said support frame to swing about a first axis substantially longitudinally disposed with respect to the seating unit,

an armrest mounted on said pillar remove from said pivotal connection and rotatable relative to said pillar about a second axis which is fixed relative to the pillar and substantially longitudinally disposed with respect to the seating unit,

first releasable detent means adjacent to said pivotal connection for locating said pillar in pre-determined positions angularly spaced about said first axis and second releas-



able detent means adjacent to the mounting of said armrest on said pillar for locating said armrest in pre-determined positions angularly spaced about said second axis,

the angular spacings of said pre-determined positions about said first and second axes being substantially equal,

whereby on swinging said pillar about said first axis between its said pre-determined positions said armrest may be moved between laterally-spaced positions and by rotating said armrest about said second axis between its said pre-determined positions its angular disposition relative to the seating unit will substantially be maintained.

4,917,439

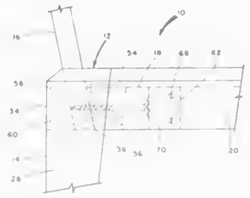
CHAIR INCORPORATING IMPROVED CHAIRBACK SUPPORT STRUCTURE

John A. Hutton, New York, N.Y., assignor to Donghia Furniture Co., Ltd., New York, N.Y.

Filed May 31, 1988, Ser. No. 200,648

Int. Cl.[4] A47C *7/40*

U.S. Cl. 297—443 4 Claims



1. A chair of a type having four legs, a seat and a back, comprising:

(a) a pair of rear support legs having upper and lower portions;

(b) a rear outer support rail secured between the upper portions of said legs;

(c) an inner support rail extending between said rear support legs and in facing spaced relationship to said rear outer support rail;

(d) a chair back sandwiched between said inner support rail and said rear outer support rail and secured therebetween, said outer support rail extending in a first direction between said rear support legs and being secured by pegs

which extend in substantially said first direction and into holes defined in said rear support legs and said rear outer support rail;

(e) screws for securing said inner support rail to said back, said inner support rail bearing against and supporting said back and bearing against said pair of rear support legs; and

(f) a recess support surface being formed in a pair of side rails each of which is secured to a respective one of said rear legs, said side rails defining right and left edges of the chair and a recess being further defined in that portion of said rear legs adjacent the recesses in adjacent side rails, said recess on said rear legs and said recesses on said side rails together providing substantially level support surfaces with a top facing surface of said inner support rail to support a seat cushion.

4,917,440

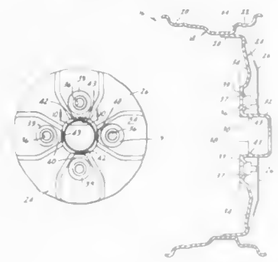
METHOD OF WHEEL MANUFACTURE FOR CORRECTING ROTATIONAL NON-UNIFORMITY OF A PNEUMATIC TIRE AND WHEEL ASSEMBLY, APPARATUS FOR PERFORMING SUCH METHOD, AND THE RESULTING WHEEL

Anwar R. Daudi, E. Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Division of Ser. No. 132,269, Dec. 14, 1987, Pat. No. 4,819,472, which is a division of Ser. No. 846,365, Mar. 31, 1986, Pat. No. 4,736,611, which is a continuation-in-part of Ser. No. 667,338, Nov. 1, 1984, abandoned. This application Feb. 3, 1989, Ser. No. 305,644

Int. Cl.[4] B60B *3/00*

U.S. Cl. 301—9 DN 11 Claims



1. A vehicle wheel (16) comprising a wheel rim (18) having a bead seat region (20, 22) and a wheel-mounting disc (24) affixed internally of said rim,

characterized in that said disc (24) comprises a center opening (30) surrounded by a circular flange (40 and 114) oriented axially of said disc and having an angularly spaced array of indentations (115 or 296) extending radially inwardly of said flange and axially therealong, said indentations having radially inwardly oriented and axially extending wheel-mounting surfaces formed one on each of said indentations on a common cylinder of revolution defining the axis of said center opening.

4,917,441

PLASTIC WHEEL COVER WITH FASTENING DEVICE

Issao Iida, Saitama Prefecture, Japan, assignor to Kanto Seiki Co., Ltd., Omiya, Japan

Filed Jul. 6, 1988, Ser. No. 215,769

Claims priority, application Japan, Jul. 13, 1987, 62-174553; Aug. 7, 1987, 62-120990[U]; Sep. 30, 1987, 62-149769[U]

Int. Cl.[4] B60B *7/04*

U.S. Cl. 301—37 PB 42 Claims

1. A plastic wheel cover comprising:

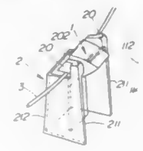
a cover proper constructed of a molded plastic;

a plurality of latching units integrally and circularly arranged on one surface of said cover proper, each unit including a catching pawl extending perpendicularly away from said cover proper and a spring holder extending perpendicularly away from said cover proper at a position near the catching pawl; and

a ring spring held by the spring holders in a manner to resiliently bias the catching pawls radially outwardly with respect to said cover proper;

wherein each of said spring holders comprises:

(a) a wall portion raised from said cover proper and extend-



ing in a radial direction with respect to said cover proper; and

(b) a head portion located above said wall portion and integrally connected to said wall portion through a neck portion in a manner to define an inwardly facing slit between said head portion and said wall portion, said slit extending radially inwardly from a terminating point at said neck portion;

said wall portion and said head portion being positioned away from each other in a circumferential direction with respect to said cover proper.

4,917,442

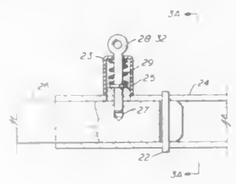
DEMOUNTABLE TRAILER WHEEL

James H. Johnson, 1020 Pinecrest St., Vidor, Tex. 77662

Filed Dec. 14, 1988, Ser. No. 284,402

Int. Cl.[4] B60B *37/06*

U.S. Cl. 301—113 1 Claim



1. A connection for mounting a wheel on a trailer comprising a non-rotating journal on which the wheel is mounted, a sleeve rigidly secured to the trailer and horizontally disposed for forward motion, said sleeve having an opening or bore snugly receiving said journal, and a pair of connection means to prevent relative rotation and relative axial movement between journal and sleeve, the first of said connection means being a pin received in aligned transverse openings in the sleeve and journal and the second connecting means being a spiking pin extending transversely through the sleeve only to divide its bore into two portions and a slot formed in the end of said journal member to divide the forward end of the journal into two like portions, the spiking pin of the sleeve being received in the slot of the journal member to halt linear progress of the journal during assembly and also preventing relative rotation, said second connection means being disposed so that proper seating of the spiking pin in the journal slot also brings the aligned transverse openings of the first connecting means into proper alignment to receive the pin member

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thereof, and also being disposed for disassembly, after withdrawal of the pin of the first connecting means, by a simple axial withdrawal (non-rotating) motion of the journal member relative to the sleeve,

said forward end of the journal member terminating in a flat transverse surface interrupted only by said slot which receives the spiking pin.

4,917,443

ANTILOCK BRAKE CONTROLLER WITH FAIL-SAFE MICROPROCESSOR

Dennis A. Kramer, Troy; Alan E. Tousignant, Mt. Clemens, and Robert S. Turner, Royal Oak, all of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 1, 1989, Ser. No. 345,252
Int. Cl.[4] B60T *8/88*
U.S. Cl. 303—92 4 Claims

1. In an anti-lock brake system for a motor vehicle, said system including means for sensing the rate of rotation of a member whose rate of rotation is indicative of the speed of a wheel of said vehicle; means for generating a wheel speed signal indicative of said rate of rotation; a main control circuit having means for determining an incipient wheel-lock condition based on said wheel speed signal and means for generating a brake release signal upon determining said incipient wheel-lock condition; and means for releasing a brake in response to said brake-force release signal, the improvement comprising:

a main microprocessor;

a fail-safe microprocessor of a different type;

means for connecting said main microprocessor to said brake-release means such that the main microprocessor monitors whether said brake-releasing means has released said brake in response to said brake-force release signal; and

means for electrically connecting said fail-safe microprocessor and main microprocessor such that the fail-safe microprocessor monitors said main microprocessor;

said fail-safe microprocessor including means for preventing release of said brake by said brake-release means upon either a determination that said brake-release means is functioning improperly or a determination that said main microprocessor is functioning improperly;

whereby said fail-safe microprocessor is capable of disabling said brake-release system independently of said main microprocessor.

4,917,444

ANTILOCK BRAKE CONTROL METHOD AND SYSTEM FOR MOTOR VEHICLES

Hideki Ishido; Takayuki Ushijima; Katsumasa Igarashi, and Seiichi Ishizeki, all of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1989, Ser. No. 309,369
Claims priority, application Japan, Feb. 16, 1988, 63-33038
Int. Cl.[4] B60T *8/74*
U.S. Cl. 303—100 7 Claims

1. In an antilock brake control method for a motor vehicle with an antilock brake responsive to braking hydraulic pressure and a wheel speed sensor provided to detect wheel speed, comprising the steps of:

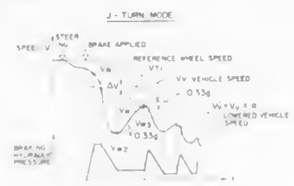
detecting an actual wheel speed responsive to output signal of said wheel speed sensor;

setting a first reference vehicle speed responsive to said actual wheel speed;

determining a first reference wheel speed responsive to said first reference vehicle speed;

decreasing said braking hydraulic pressure when the actual wheel speed falls below said first reference wheel speed;

reincreasing said decreased braking hydraulic pressure when the actual wheel speed exceeds said first reference wheel speed; and



detecting a lateral acceleration responsive to lateral movement of the vehicle;

the improvement comprising:

determining a J-turn state of the vehicle when said lateral acceleration is in excess of a predetermined value;

determining a second reference wheel speed representing a value lower than said first reference wheel speed at said J-turn state; and

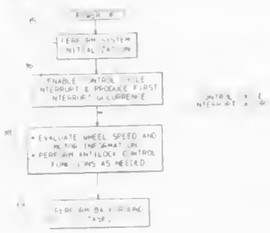
controlling the braking hydraulic pressure in dependency on the second reference wheel speed at said J-turn state, so as to delay timing of decreasing the braking hydraulic pressure and to advance timing of reincreasing the braking hydraulic pressure.

4,917,445

ABS VARIANT NOMINAL HOLD PRESSURE

Kevin G. Leppek, W. Bloomfield; Alex Kade, Grosse Pointe Woods, and Allen J. Walenty, Utica, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 13, 1989, Ser. No. 322,138
Int. Cl.[4] B60T *8/58, 8/60*
U.S. Cl. 303—100 4 Claims



1. A wheel lock control system for limiting a pressure applied to a brake of a vehicle wheel traveling over a road surface, the system comprising:

means for detecting an incipient wheel lock condition;

means for storing a value of brake pressure at which the incipient wheel lock condition occurred;

means for relieving wheel brake pressure to alleviate the incipient wheel lock condition;

means for measuring an elapsed time while wheel brake pressure is being relieved;

means for detecting a first condition in which the wheel is approaching recovery from the lock condition;

means responsive to a detected first condition for calculating a value of wheel brake pressure corresponding to an amount of pressure remaining at the wheel brake after having relieved wheel brake pressure for the measured elapsed time by (a) multiplying the stored value of brake pressure by the elapsed time to approximate an amount of pressure having been relieved from the wheel brake during the measured elapsed time, (b) multiplying the stored pressure value by a calibrated amount to arrive at a value representative of all pressure having been relieved from the wheel brake, and (c) subtracting (1) the approximated amount of pressure relieved from (2) the value representative of all pressure having been relieved to arrive at a calculated value of pressure remaining at the wheel brake;

means for controlling the wheel brake pressure constant at the calculated value of pressure remaining at the wheel brake while the wheel is approaching recovery;

means for detecting a second condition in which the wheel has recovered from the incipient lock condition;

means for increasing wheel brake pressure in response to the detected recovery to a value which is a substantial fraction of the stored pressure value; and

means for increasing wheel brake pressure gradually from the significant fraction of the stored pressure value until an incipient wheel lock condition is again detected.

4,917,446

SYSTEM FOR MOVING THE DOOR OF A CABINET FROM AN OPEN TO A CLOSED POSITION

Roberto Mariani, Cesano Maderno, Italy, assignor to Ditta Mariani Enrico, Desio, Italy

Filed Mar. 27, 1989, Ser. No. 329,164
Claims priority, application Italy, Mar. 29, 1988, 20012 A/88
Int. Cl.[4] A47B *48/00*
U.S. Cl. 312—325 5 Claims

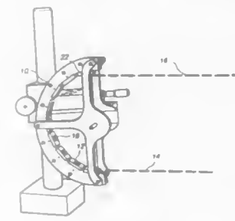
1. A system for moving a door of a cabinet from a closed to an open position, said cabinet comprising at least one door and one fixed frame comprised of at least one first and one second vertical upright as well as by at least one upper and one lower horizontal shelf, in which said door can be moved in relation to said fixed frame so that the vertical edge of the door next to said first vertical upright when said door is open will then be next to said second vertical upright when said door is closed, said door being moreover connected to said fixed frame by means of two elbow-shaped horizontal arms, each of which is comprised of two branches, by an elbow and by two extremities rotatable round respective pivots, and being the first extremity of one and the other elbow-shaped horizontal arms mounted rotatably on the upper and lower part, respectively, of said fixed frame while the said extremity of one and the other elbow-shaped horizontal arms is mounted rotatably on said door on an upper and a lower point, respectively, arranged on the vertical line which passes through the center of gravity of said door, characterized in the in each elbow-shaped horizontal arm the second branch, which lies between said second extremity and the elbow, is longer than the first branch, which lies between said elbow and said first extremity, that the length of said first branch of each elbow-shaped horizontal arm is equal to or greater than the distance between the pivot on which rotates said first extremity of each elbow-shaped horizontal arm and the closest point of the door in the closed position, and that said elbow-shaped horizontal arms co-operate with a guide which maintains the door substantially parallel to the fixed frame; wherein said guide comprises a housing and a rigid bar, a first extremity of which is rotatably connected of the door while the other extremity is connected to said housing by means of a first pin which is integral with said rigid bar and by a second pin which is integral with said housing; wherein said housing has a slot in which said first pin is forced to move for determining the displacement of said rigid bar and of the door in relation to said second pin; wherein the extremity of said rigid bar which is connected to said housing has a slot and is mounted in a rotatable and slidable way in relation to said second pin; wherein a compressed spring is mounted between said first and said second pin; wherein said first extremity of said rigid bar is rotatably connected to a pin which is integral with a support fastened to the door; and wherein said support is integral with a bracket which is superimposed on a small plate fastened to the second vertical upright of the fixed frame thus causing the connection of said door with said fixed frame.

4,917,447

EXTREME ULTRAVIOLET REFLECTOR

Brian E. Newnam, Los Alamos, N. Mex., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Feb. 6, 1989, Ser. No. 306,358
Int. Cl.[4] G02B *17/00, 1/10*; H01S *3/081*
U.S. Cl. 350—1.1 3 Claims



1. A retroreflector for use in a resonator loop of a free electron laser beam having operating wavelengths in the range of 10–100 nm, comprising:

a number of facets having planar reflective surfaces, each facet arranged to receive light at an angle of incidence effective for total external reflectance from said reflective surface, said number being selected to reflect said incident light through an angle completing said resonator loop while providing a total reflectance of at least 40% for said number of facets within said wavelength range of 10–100 nm, each said reflective surface being a vacuum-deposited metal and one of said facets defines an off-axis conic section effective to collimate said laser beam.

4,917,448

LIGHTED DISPLAY DEVICE

M. David Oppenheimer, 8433 Edwin Dr., Los Angeles, Calif. 90046

Filed Oct. 27, 1988, Ser. No. 263,086
Int. Cl.[4] C02B *6/00*
U.S. Cl. 350—96.1 21 Claims

1. In a lighted display device comprising:

display means having a plurality of lighting elements arranged in a pattern;

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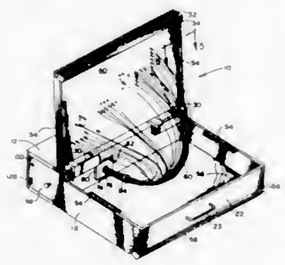
a plurality of elongated light conducting fiber optic means, one end of each of the fiber optic means being removably received in, and extending from, one of the lighting element locations on the display means;

support means receiving the other ends of each of the fiber optic means and retaining the other ends of the fiber optic means;

light source means for illuminating the other ends of the fiber optic means, light from the light source means being received by the other ends of the fiber optic means and being conducted to the one ends of the fiber optic means for illumination thereof; and



movable means interposed between the light source means and the other ends of the fiber optic means for periodically altering the light received by the other ends of the fiber optic means to alter the light conducted to the one ends of the fiber optic means;

wherein the improvement comprises:

means engaging each of the fiber optic means for establishing a predetermined relationship between the portions of the fiber optic means extending between the ends thereof to facilitate untangling of fiber optic means which become tangled and to prevent tangling of fiber optic means.

4,917,449

METHOD OF DISPOSING A POLARIZATION DIRECTING OPTOELECTRONIC COUPLER AND A COUPLER FOR CARRYING OUT THE METHOD

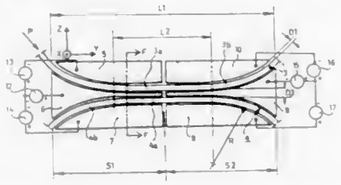
Per O. Granestrad, Tyresö , Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Nov. 14, 1988, Ser. No. 270,264

Claims priority, application Sweden, Nov. 20, 1987, 8704606; May 27, 1988, 8801991; May 27, 1988, 8801992

Int. Cl.[4] G02B *6/10, 6/00*

U.S. Cl. 350—96.14 **19 Claims**



1. A method of operating a polarization directing optoelectronic coupler, including a single crystal wafer of doubly refracting material with an optical axis, an elongate interaction region at the upper surface of the wafer divided into at least two transverse sections, two optical waveguides extending in the interaction region at mutual spacing in the longitudinal direction thereof, and an electrode means arranged in the interaction region, the electrode means in each of the sections having at least three electrodes extending along the waveguides over substantially the entire length of their respective section and having connections for electrical voltage sources, the optical axis being directed in the transverse direction of the waveguides, with the latter extending in the Y direction of the crystal for switching lightwaves, the orthogonal polarization directions of which have arbitrary mutual strengths, said method comprising the steps of:

generating a first electrical field in said waveguides between said at least three electrodes, said first field being substantially parallel to the optical axis and having the same direction in each of the at least two sections and in both of said two waveguides for changing the coupling length of the coupler;

generating a second electrical field in said waveguides between said at least three electrodes, said second field being substantially parallel to the optical axis and having a direction in one of said waveguides which is counter to the direction of the second electrical field in a second of said waveguides in the same section, for changing the difference between the propagation constants ($\Delta\beta$) of the waveguides; and

wherein the field strengths of the first and the second electrical fields are selected such that both orthogonal polarization directions TE, TM of the light are individually switched over to a desired amount between said waveguides.

9. A polarization directing optoelectronic coupler comprising:

a single crystal wafer of doubly refracting material with an optical axis;

an elongate interaction region at the upper surface of the wafer divided into at least two transverse sections;

two optical waveguides extending in the interaction region at mutual spacing in the longitudinal direction thereof;

an electrode means arranged in the interaction region, the electrode means in each of the sections having at least three electrodes extending along said waveguides over substantially the entire length of their respective section and having connections for electrical voltage sources, the optical axis being directed in the transverse direction of said waveguides and said waveguides extending in the Y direction of the crystal, for switching lightwaves, the orthogonal polarization directions of which have arbitrary mutual strengths;

said voltage sources being operable to generate a first electrical field between said electrodes, said first field in said waveguides being substantially parallel to the optical axis and having the same direction in all of the sections and in both said waveguides, for changing the crossover length of the coupler, and being operable to generate a second electrical field between said electrodes, which in said waveguides is substantially parallel to the optical axis and has a direction in one of the waveguides which is counter to the direction of the second electrical field in the other waveguide in one and the same section for changing the difference between the propagation constants ($\Delta\beta$) of the waveguides; and

wherein the field strength of said first and said second electrical fields have a magnitude such that both polarization directions (TE, TM) of the light are individually crossed over to a desired extent between said waveguides.

4,917,450

DYNAMIC OPTICAL INTERCONNECTION DEVICE FOR INTEGRATED CIRCUITS

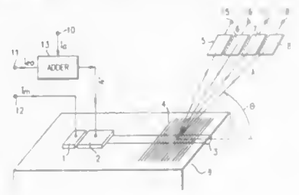
Jean P. Pocholle, Arpajon; Bourbin Yannic, Antony; Michel Papuchou, Massy; Pierre J. Huignard, Paris, and Claude Puech, Longjumeau, all of France, assignors to Thomson-CSF, Paris, France

Filed Oct. 31, 1988, Ser. No. 264,396

Claims priority, application France, Nov. 3, 1987, 87 15200

Int. Cl.[4] G02B *6/12;* **G02F** *1/29*

U.S. Cl. 350—96.11 **9 Claims**



1. A dynamic optical interconnection device for integrated circuits, comprising:

at least one device for emitting coherent light, frequency modulated by a first electrical signal selecting one of several interconnections and amplitude modulated by a second electrical signal representing a sequence of data;

at least one optical guide coupled to the emitting device;

at least one diffraction grafting coupled to the guide to diffract the light emitted by the emitting device in a direction depending on the frequency of this light;

each emitting device, each optical guide and each diffraction grating being integrated in one and the same integrated circuit semiconductor substrate;

and comprising:

a plurality of photoelectrical receivers coupled to the diffraction grating so as to receive the light diffracted respectively in several pre-defined directions correspond to several interconnections, each receiver given an electrical signal indication according to the amplitude of the light diffracted in the corresponding direction, when this interconnection is selected.

4,917,451

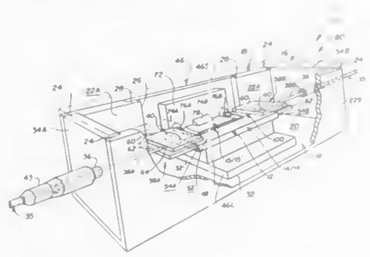
WAVEGUIDE STRUCTURE USING POTASSIUM TITANYL PHOSPHATE

Michael P. Chouinard; Edward P. Gargiulo; James L. Hohman, Jr.; Daniel B. Laubacher; Jiunn-Yau Liou, and Moshe Oren, all of Wilmington, Del., assignors to E. I. DuPont De Nemours and Company, Wilmington, Del.

Filed Jan. 19, 1988, Ser. No. 145,852

Int. Cl.[4] G02B *6/10*

U.S. Cl. 350—96.14 **46 Claims**



1. In an electro-optic component having a housing with a dielectric waveguide structure disposed therein, the improvement comprising a mounting pedestal disposed between the housing and the dielectric waveguide structure, the pedestal being fabricated of a dielectric material, wherein the housing has a floor and a sidewall each of which is provided with a registered opening therein, wherein the pedestal is mounted on an L-shaped insert member having a first and a second leg, the leg of the insert having the pedestal thereon being received in the housing to close the opening in the floor thereon, with the other leg of the insert closing the opening in the sidewall of the housing.

4,917,452

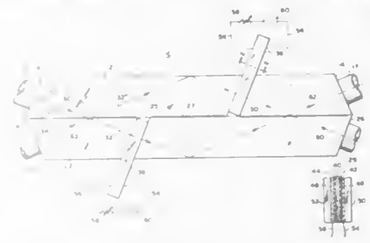
LIQUID CRYSTAL OPTICAL SWITCHING DEVICE

Marshall Liebowitz, Ridgefield, Conn., assignor to UCE, Inc., Norwalk, Conn.

Filed Apr. 21, 1989, Ser. No. 341,434

Int. Cl.[4] G02B *6/26, 6/10;* **G02F** *1/13*

U.S. Cl. 350—96.15 **10 Claims**



1 In a liquid crystal optical switching device having first and second transparent trapezoidal prisms each having angled end faces and having the larger of the bases in juxtaposition with respect to each other forming an interface therebetween, at least one optical radiation input and output coupled to said angled end faces of said prisms, the improvement comprising:

means for applying optical radiation to said input normal to said angled end face and at an angle greater than the critical angle with respect to said interface;

a liquid crystal optical shutter means positioned in lateral spaced relationship along said interface in each of said prisms;

means for bonding said prisms centrally along said interface between said liquid crystal optical shutter means;

liquid crystal beam splitter means positioned in said interface and extending from said means for bonding said prisms between said optical shutters and said angled end faces of said prisms whereby optical radiation applied to said angled end faces of said prisms which is transmitted or reflected by said beam splitters is applied to said shutter means at an angle normal to said optical shutter means; and

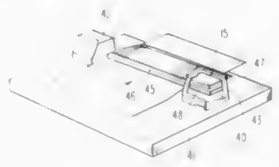
variable biasing means coupled to said optical shutter means for applying a continuous bias on said optical shutter means which bias is selectively variable for controlling the optical radiation switched by said switching device.

4,917,453

OPTICAL COMMUNICATION SIGNAL SOURCE

Timothy R. Block, Rochester; Gerald M. Heiling, Pine Island; Dennis L. Karst, Rochester; David C. Kubliska, Rochester; Tong Lu, Rochester, and Ronald L. Soderstrom, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 8,699, Jan. 29, 1987, abandoned. This application Sep. 29, 1988, Ser. No. 251,975
Int. Cl.[4] G02B 6/32
U.S. Cl. 350—96.20 3 Claims



1. An optical communication signal source package for coupling optical signals to an end of an optical fiber, said package comprising in combination:

a support;

first and second short wavelength semiconductor laser diodes each having a mounting flange and means for emitting a beam of polarized light;

said laser diodes being mounted on said support with said flanges in a common plane and being oriented to provide parallel beams of polarized light having different orthogonal planes of polarization;

a first connector carried by said support at a location spaced from said laser diodes, said first connector having an aperture and a second connector, the optical fiber mounted in said second connector, said first and second connectors cooperating for positioning the end of the optical fiber at said first connector aperture, and said second connector being releasably engageable with said first connector;

first and second predefined light paths extending respectively from said first and second laser diodes to said first connector aperture;

first and second lens means located in said first and second light paths for receiving said parallel beams of polarized light from said laser diodes and for directing said light beams toward said first connector aperture; and

a polarization responsive optical coupling device carried by said support between said first and second lens means and said first connector aperture and disposed in both of said light paths and responsive to said orthogonal polarization planes to direct substantially the entire amplitudes of both light beams toward said first connector aperture, said coupling device comprising a holographic beam separator.

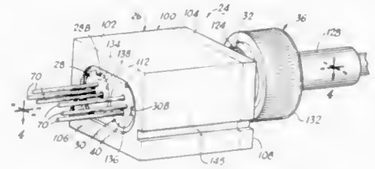
4,917,454

IMAGE SCANNER EMPLOYING LIGHT PIPES AND AN IMAGING SENSOR ARRAY

Peretz Feder, Englewood, N.J., assignor to Photon Imaging Corp., Edison, N.J.

Filed Mar. 9, 1989, Ser. No. 322,627
Int. Cl.[4] G02B 6/06
U.S. Cl. 250—227.23 12 Claims

1. A scanner comprising a plurality of light pipes arranged in a bundle having first and second ends organized in first and second geometries respectively, said scanner also including an array of photosensors organized on a random access basis, means for coupling said second ends to said array optically, means for exposing said array to light through said light pipes for a sequence of preselected time periods, means for reading selected sensors of said array during a first of said time periods according to an address string for organizing pixel data at said second ends to match pixel positions at said first ends, means for resetting all sensors in the array, means for rereading said selected sensors in accordance with said address string in the



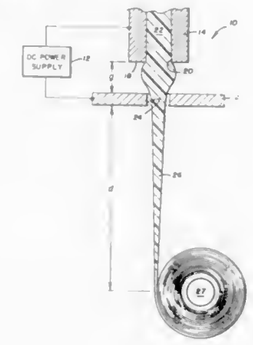
reverse order during a second of said time periods, and means for processing the output of each of said sensors obtained during said first and second time periods in a manner to produce like exposure times for all sensors of said array which are so read and for eliminating smearing.

4,917,455

FIELD-ASSISTED FIBER SPINNING FOR THE PREPARATION OF OPTICAL FIBERS HAVING NON-LINEAR OPTICAL ACTIVITY

David S. Soane, 22 Arbor Dr., Piedmont, Calif. 94610

Filed Sep. 18, 1987, Ser. No. 98,533
Int. Cl.[4] G02B 6/00, 6/10
U.S. Cl. 350—96.34 21 Claims



1. An elongated optical fiber defining an axis comprising a polymer and a dipolar dopant wherein a predominance of the dipoles of the dopant are electromagnetically and mechanically oriented in essentially the same direction along the axis of the fiber, wherein the ratio of dopant to polymer is between about 0.1/99.9 and 80/20 percent by weight.

4,917,456

OPTICAL CROSSOVER NETWORK

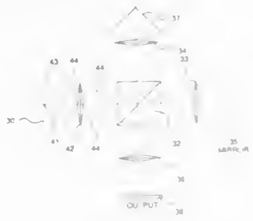
Jurgen Jahns, Sbrewsbury, and Miles J. Murdocca, Jackson, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 15, 1988, Ser. No. 219,623
Int. Cl.[4] G02B 27/14; H04B 9/00
U.S. Cl. 350—169 14 Claims

1. An arrangement for developing two output images from one input image, with a specified spatial relationship between the two output images comprising:

a beam splitter situated to receive said input image for developing a first beam and a second beam;

means for partitioning the image contained in the second beam and reversing the spatial relationship of the image of said second beam about an axis substantially centered in



said image to develop a third beam containing a crossover image; and

means for combining the first beam and the third beam to form a composite image including said input image and said crossover image.

4,917,457

BEAM SEPARATING PRISM

Takashi Iizuka, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 201,815
Claims priority, application Japan, Jun. 8, 1987, 62-142440[U]; Jun. 11, 1987, 62-90024[U]
Int. Cl.[4] G02B 27/14, 5/04
U.S. Cl. 350—173 9 Claims

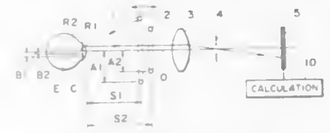
1. In an optical attachment having an optical system for viewing with the naked eye having a first optical axis coinciding with an optical axis of an endoscope, an imaging optical system having a second optical axis at a first non-zero angle relative to said first optical axis, and a beam separating prism that splits rays of light coming from the endoscope into two beams that are respectively launched into the two optical systems, the improvement wherein said beam separating prism has an entrance end face and a first exit end face which are both oriented perpendicular to said first optical axis, a first reflecting plane disposed between said entrance end face and said first exit end face, a second exit end face oriented at a second predetermined angle relative to said second optical axis, and a second reflecting plane disposed physically between said first optical axis and said second exit end face, said faces and planes being arranged in such a way that the rays of light reflected by said first reflecting plane are reflected successively by said entrance end face, said second exit end face and said second reflecting plane before they emerge from said second exit end face, and with a point of intersection between said first optical axis and said first reflecting plane being positioned closer to said entrance end face than a point of intersection between said first and second optical axes.

4,917,458

CORNEA SHAPE MEASURING APPARATUS

Isao Matsumura, Yokosuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 53,483, May 26, 1997, abandoned. This application Aug. 1, 1989, Ser. No. 390,506
Claims priority, application Japan, Jun. 9, 1986, 61-133287
Int. Cl.[4] A61B 3/10
U.S. Cl. 354—212 13 Claims



1 A cornea shape measuring apparatus, comprising:

first and second substantially ring-like index marks adapted to be positioned a finite distance opposite an eye to be examined, said first index mark being adapted to be spaced from said second index mark in a direction of an optic axis;

an imaging optical system for receiving corneal reflection images of said first and second index marks;

a light position detector adapted to be provided on an image surface of said imaging optical system; and

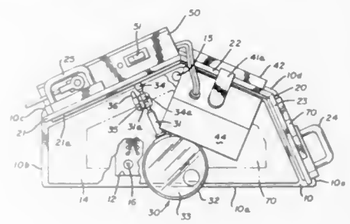
calculating means for calculating the radius of curvature of the cornea on the basis of: (i) distance between said first index mark and said second index mark in the direction of the optic axis; (ii) radii of the images of said first and second index marks; and (iii) radii of said first and second index marks.

4,917,459

JEWELRY DISPLAY DEVICE

Samuel G. Solitt, 2121 Brookshire Rd., and Jerry Shaw, 50 W. Fairlawn Blvd., both of Akron, Ohio 44313

Filed Aug. 29, 1988, Ser. No. 237,066
Int. Cl.[4] B65D 1/36; G02B 7/02
U.S. Cl. 350—235 9 Claims



1. A viewing and display device, comprising:

(a) a base having at least some edge surfaces:

(b) an upright frame projecting from at least some edge surfaces of said base;

(c) light means mounted on said frame in overlying relationship with said base;

(d) magnifying means mounted on said frame;

(e) reflective means carried on one surface of said frame;

(f) carrying means mounted on the opposed surface of said frame;

(g) power supply means carried on the same surface of said frame as said carrying means and operatively connected to said light means;

(h) said base having a recessed storage area;

(i) activating means for said light means disposed in said recessed storage area;

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(j) a first display cushion releasably mounted on said base in normally covering relationship with said storage area; and
(k) said light means being activated by pressure on said first display means.

4,917,460

METHOD AND APPARATUS FOR CONTROLLING LENS OF IMAGE FORMING APPARATUS

Shuji Yamada, Hyogo, and Hironori Ando, Osaka, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jul. 25, 1988, Ser. No. 223,479
Claims priority, application Japan, Jul. 30, 1987, 62-193102; Jul. 30, 1987, 62-193103
Int. Cl.⁴ G02B *7/02*
U.S. Cl. 350—255 **50 Claims**

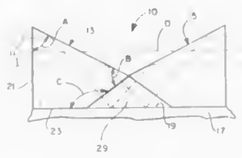
1. A method for controlling a lens of an image forming apparatus comprising the steps of moving said lens at a first speed in one direction from an initial position until passing a home position, and moving said lens at a second speed lower than said first speed in a direction opposite to said one direction to stop at said home position.

4,917,461

ACHROMATIC INFRARED RETARDER

Dennis H. Goldstein, 2410 Edgewater Dr., Niceville, Fla. 32578

Filed Jan. 11, 1989, Ser. No. 298,072
Int. Cl.⁴ G02B *5/04, 7/18*
U.S. Cl. 350—286 **4 Claims**



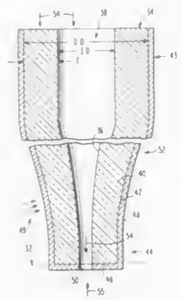
1. An achromatic infrared retarder device, comprising:
(a) a substrate supporting an optically reflective surface;
(b) two identical prisms of preselected optical material disposed in confronting relationship on said reflecting surface, said prisms defining an optical axis through said prisms;
(c) each of said prisms being defined by a first optical surface perpendicular to said optical axis, a second optical surface intersecting said optical axis and oriented at a preselected angle to said first optical surface, and a third optical surface disposed at said preselected angle to said second optical surface, said preselected angle selected in size corresponding to said optical material comprising said prisms whereby a total internal reflection of a light beam directed along said optical axis results at said second optical surface; and
(d) said prisms in said confronting relationship defining a region bounded by respective third optical surfaces of said prisms and said optically reflective surface.

4,917,462

NEAR FIELD SCANNING OPTICAL MICROSCOPY

Aaron Lewis; Michael Isaacson, both of Ithaca, N.Y.; R. Eric Betzig, Ann Arbor, Mich., and Alec Harootunian, Syracuse, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation of Ser. No. 207,927, Jun. 15, 1988, abandoned, which is a continuation of Ser. No. 90,408, Aug. 27, 1987, abandoned, which is a continuation of Ser. No. 796,356, Nov. 8, 1985, abandoned. This application Aug. 16, 1989, Ser. No. 394,304
Int. Cl.⁴ G02B *5/18, 21/00;* H01J *3/14, 5/16*
U.S. Cl. 350—319 **26 Claims**



1. Apparatus for near-field microscopy, comprising:
a tapered, generally tubular pipette having an axial central opening, an upper body portion and a lower tip portion, a tapered glass wall coated with an opaque, metallic layer, and a submicron aperture at the end of said tip portion;
means for mounting said pipette for controlled axial motion, in a z direction;
stage means for receiving a sample to be observed;
means for moving said stage means in an x-y plane with respect to said aperture; and
means for determining the proximity of said aperture to the surface of a sample, and for activating said means for mounting said pipette to move said aperture with respect to a sample to position the surface of the sample within the near-field region of said aperture.

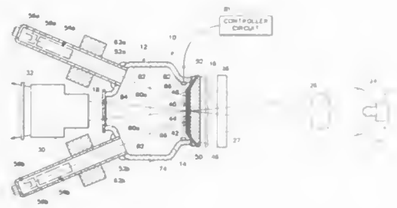
4,917,463

CHARGE MODULATION COMPENSATED LIQUID CRYSTAL LIGHT VALVE HAVING THE FIRST AND SECOND ELECTRIC FIELDS COOPERATING TO PROVIDE A DIVERGENT ELECTRON LENS EFFECT

Thomas S. Buzak, Beaverton; Rolf S. Vatne, Portland, and Dana E. Whitlow, Aloha, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 5, 1987, Ser. No. 46,806
Int. Cl.⁴ G02F *1/13;* G09G *1/06*
U.S. Cl. 350—331 R **15 Claims**

1. In an electron beam-addressed liquid crystal light modulator having writing means positioned within an evacuated envelope for emitting a writing beam of primary electrons that propagate along beam paths and strike a target surface of a liquid crystal cell to cause the emission of secondary electrons from the target surface and thereby address selected regions on the target surface, the improvement comprising:
an optically semi-transparent electrode structure spaced apart from and positioned over a substantial portion of the target surface, the electrode structure defining within the evacuated envelope a boundary between first and second electric field regions, the first electric field region being located between the electrode structure and the target surface and the second electric field region being located between the electrode structure and the writing means; and
compensation means generating first and second electric fields in the respective first and second electric field regions for eliminating shadow effects produced on the target surface by interception of the writing beam primary electrons by the electrode structure, the first and second electric fields cooperating to provide a lens effect that deflects the beam paths of the writing beam primary electrons propagating through the electrode structure to landing positions on the target surface that distribute the electrons substantially uniformly over the target surface and thereby eliminate the shadow effects.

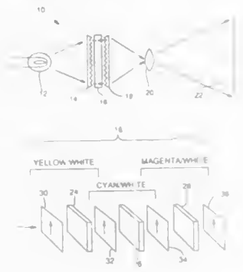


4,917,464

HIGH BRIGHTNESS/CONTRAST COLOR DISPLAY SYSTEM

Arlie R. Conner, Portland, Oreg., assignor to In Focus Systems, Inc., Tualatin, Oreg.

Filed Mar. 28, 1989, Ser. No. 329,938
Int. Cl.⁴ G02F *1/13;* G03B *21/00*
U.S. Cl. 350—335 **8 Claims**



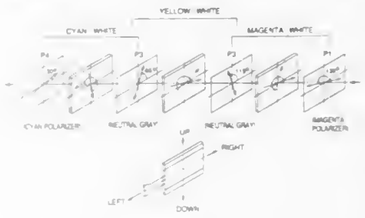
1. An accessory for use with a conventional overhead projector to project electronically generated color images therefrom, the projector having a bulb, a projection lens, and a projection surface having a Fresnel lens thereunder, the Fresnel lens focusing light from the bulb into the projection lens, the accessory being adapted to rest on the projection surface and comprising:
first lens means for receiving converging white light form the projection surface of the projector and collimating said light;
second lens means or receiving collimated light and focusing said light into the projection lens;
a display subassembly positioned between the first and second lens means and illuminated by the collimated light, said subassembly including first, second, third and fourth polarizers and further including first, second and third transmissive liquid crystal birefringent display panels, the birefringence of said panels being tuned, respectively, to first, second and third subtractive complementary colors, each of said panels having a plurality of electronically operable pixels, said panels being stacked so that corresponding pixel in each of said panels are aligned with the direction of the collimated light, the first panel being positioned between the first and second polarizers, the second panel being positioned between the second and third polarizers and the third panel being positioned between the third and fourth polarizers.

4,917,465

COLOR LISPLAY SYSTEM

Arlie R. Conner, Portland, and Paul E. Gulick, Tualatin, both of Oreg., assignors to In Focus Systems, Inc., Tualatin, Oreg.

Continuation-in-part of Ser. No. 378,997, Jul. 12, 1989, and a continuation-in-part of Ser. No. 363,099, Jun. 7, 1989, and a continuation-in-part of Ser. No. 329,938, Mar. 28, 1989. This application Sep. 1, 1989, Ser. No. 402,134
Int. Cl.⁴ G02F *1/13*
U.S. Cl. 350—335 **23 Claims**



1. A display apparatus including a display subassembly, the display subassembly comprising:
first, second and third supertwisted nematic birefringent liquid crystal display panels, each of said panels exhibiting the characteristic wherein they switch rapidly between a deselected state and a selected state when an excitation voltage applied thereto exceeds a threshold value;
first, second, third and fourth polarizers;
the first panel being positioned between the first and second polarizers, the second panel being positioned between the second and third polarizers and the third panel being positioned between the third and fourth polarizers;
the birefringence of the first, second and third panels being selected, in cooperation with operation of the polarizers adjacent thereto, to pass light of first, second and third subtractive primary colors, respectively, when the panels are in first states, and to pass substantially all colors of light when the panels are in second states;
each of said panels having a plurality of electronically operable pixels, said panels being stacked so that corresponding pixels in each of said panels are aligned along an axis orthogonal thereto;
the apparatus further including:

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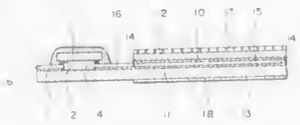
illumination means for illuminating the display subassembly with substantially collimated light; and
light processing means for processing the collimated light exiting the display subassembly to permit wide angle viewing.

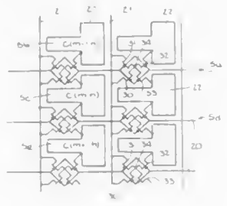
4,917,466
METHOD FOR ELECTRICALLY CONNECTING IC CHIPS, A RESINOUS BUMP-FORMING COMPOSITION USED THEREIN AND A LIQUID-CRYSTAL DISPLAY UNIT ELECTRICALLY CONNECTED THEREBY
Akio Nakamura; Naoki Kodama; Osami Hayashi, all of Saitama, and Hirofumi Saita, Kanagawa, all of Japan, assignors to Shin-Etsu Polymer Co., Ltd., Kanagawa, Japan
Filed Aug. 2, 1988, Ser. No. 227,253
Claims priority, application Japan, Aug. 13, 1987, 62-202225
Int. Cl.[4] G02F *1/133*
U.S. Cl. 350—336 5 Claims



5. In a liquid-crystal display unit comprising two circuit board substrates disposed in parallel with a space therebetween filled with a liquid crystal, at least one of the substrates being electrically connected to an IC chip for driving the liquid-crystal display, an improvement that the electrodes of the substrate and the respective electrodes of the IC chip are electrically connected by the steps of:
(a) forming a coating layer of an electroconductive thermoplastic adhesive resinous composition on the electrodes of the IC chip;
(b) putting the IC chip on the substrate in such a position that the electrodes of the IC chip coated with the electroconductive thermoplastic resinous composition are each contacted with the respective electrodes of the substrate;
(c) pressing the IC chip and the substrate together with a pressure;
(d) heating the coating layer of the electroconductive thermoplastic adhesive resinous composition to cause melting thereof; and
(e) cooling the molten electroconductive thermoplastic adhesive resinous composition to effect solidification of the same while maintaining the pressure.

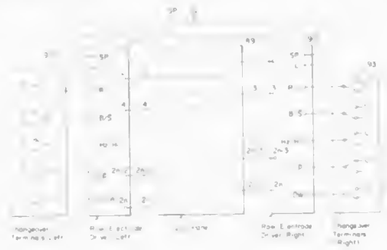
4,917,467
ACTIVE MATRIX ADDRESSING ARRANGEMENT FOR LIQUID CRYSTAL DISPLAY
Hsiung-Ku Chen, Taipei; Ting-Sing Wang, Hsin-Chu, and Chia-Wei Hao, Taipei, all of Taiwan, assignors to Iodustrial Technology Research Institute, Taiwan
Filed Jun. 16, 1988, Ser. No. 207,753
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—332 17 Claims

1. A device for providing redundant matrix addressing of a liquid crystal material, comprising:
first, second, third and fourth thin film transistors, each of said transistors having a source and a drain, one of said source and drain from each of said transistors being electrically directly connected together, said connection being physically a commonly shared portion of thin film material, and each of said transistors having a gate positioned to act between the respective transistor source and drain;
a gate line connected to each said gate, a first portion of said gate line being physically split into two electrically parallel branches, said branches separating and coming together in said first portion of said gate line leaving an open space between said branches, said commonly shared portion of thin film material being positioned in said open space;
a first load electrode and a second load electrode and a data bus line being associated with said device, the other side of said source and drain which is not connected to said commonly shared portion of thin film material of said first



transistor and said fourth transistor connects to said data bus line, the other of said source and drain not connected to said commonly shared portion of thin film material of said second transistor being connected to said first load electrode, the other of said source and drain not connected to said commonly shared portion of thin film material of said third transistor being connected to said second load electrode.

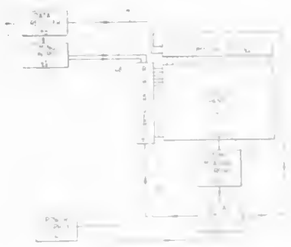
4,917,468
DRIVE CIRCUIT FOR USE IN SINGLE-SIDED OR OPPOSITE-SIDED TYPE LIQUID CRYSTAL DISPLAY UNIT
Nobuaki Matsuhashi, Teuri; Makoto Takeda, Nara, and Hiroshi Take, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan
Filed Dec. 9, 1986, Ser. No. 939,720
Claims priority, application Japan, Dec. 9, 1985, 60-277258; Dec. 10, 1985, 61-278796
Int. Cl.[4] G09G *3/18, 3/36;* G02F *1/133*
U.S. Cl. 350—332 6 Claims



1. A drive circuit for use in a matrix type liquid crystal display unit including a liquid crystal display panel having a plurality of picture elements connected to row and column electrodes and switching elements for addressing said picture elements, the switching elements being provided at said picture elements, comprising:
row electrode driver means, for driving the row electrodes of the matrix type liquid crystal display panel, said row electrodes applying signals to the switching elements;
said row electrode driver means being connectable to either terminals of said row electrodes provided for a single-sided liquid crystal display panel or to terminals of said

row electrodes provided for an opposite-sided liquid crystal display panel;
said row electrode driver means including,
changeover terminal means for enabling said row electrode driver means to drive said terminals of said row electrodes provided for said single-sided liquid crystal display panel or to drive said terminals of said row electrodes provided for said opposite-sided liquid crystal display panel;
said row electrode driver means producing an initial output signal when said changeover terminal means has been set to indicate that said terminals of said row electrodes provided for said single-sided liquid crystal display panel are being used which is identical to the initial output signal produced when said changeover terminal means has been set to indicate said terminals of said row electrodes provided for said opposite-sided liquid crystal display panel are being used.

4,917,469
ADDRESSING LIQUID CRYSTAL CELLS
Peter W. Ross, Stansted, Great Britain, assignor to STC PLC, London, England
Filed Jul. 1, 1988, Ser. No. 214,532
Claims priority, application United Kingdom, Jul. 18, 1987, 8716992
Int. Cl.[4] G02F *1/13;* G09G *3/02*
U.S. Cl. 350—332 21 Claims

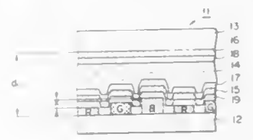


1. A method of operating a co-ordinate addressed liquid crystal cell having first and second sets of electrodes which define pixels of the cell that are selectively switchable between a first range of states and a second range of states, each said range extending from a fully switched state to a relaxed state, wherein said selective switching is effected by addressing the pixels on a line-by-line basis by applying unipolar strobe pulses serially to members of said first set of electrodes while charge balanced bipolar data pulses are applied in parallel to members of the second set of electrodes, which method of operating includes sensing the temperature of the liquid crystal cell to derive a signal representative of its temperature, employing the sensed temperature signal to control the amplitudes of the strobe and data pulses, and additionally employing the sensed temperature signal to apply, only when the sensed temperature exceeds a predetermined value, to each of the pixels between each of its consecutive addressings with strobe and data pulses, a stabilization voltage that is an alternating voltage whose frequency of alternation is higher than the fundamental frequency that is defined by the waveform of a single one of said bipolar data pulses.

4,917,470
DRIVING METHOD FOR LIQUID CRYSTAL CELL AND LIQUID CRYSTAL APPARATUS
Shinjiro Okada, Kawasaki, and Junichiro Kanbe, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 818,702, Jan. 14, 1986, abandoned. This application Nov. 16, 1988, Ser. No. 273,745
Claims priority, application Japan, Jan. 14, 1985, 60-003231
Int. Cl.[4] G02F *1/133*
U.S. Cl. 350—333 11 Claims

1. A driving method for a liquid crystal cell of the type constructed without a photoconductive layer comprising a pair of oppositely spaced electrodes forming a matrix electrode structure, a dielectric layer disposed on either one or both sides of the pair of electrodes, and a memory type ferroelectric liquid crystal disposed between the oppositely spaced electrodes, said driving method comprising the step of:
applying to the liquid crystal cell a driving voltage having a rectangular waveform of a duration provided with an attenuation slope at the falling part thereof.

4,917,471
LIQUID CRYSTAL DEVICE
Hideaki Takao, Sagamihara; Tatsuo Murata, Atsugi; Junichiro Kanbe; Miki Tamura, both of Yokohama; Masaru Kamio, Atsugi; Nobuyuki Sekimura, Kawasaki, and Yoshiki Kikuchi, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 28, 1987, Ser. No. 90,703
Claims priority, application Japan, Aug. 30, 1986, 61-202746; Aug. 30, 1986, 61-202747; Aug. 30, 1986, 61-202748; Aug. 30, 1986, 61-202749; Nov. 20, 1986, 61-275352; Jan. 23, 1987, 62-014923
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—339 F 9 Claims



1. A liquid crystal device comprising:
(a) a pair of transparent electrodes having a plurality of confronting portions formed therebetween;
(b) a pair of substrates supporting each of said pair of transparent electrodes;
(c) an alignment control film on each of the pair of substrates, said alignment control film having been subjected to monoaxial alignment treatment;
(d) a group of color filters comprising a plurality of color filters arranged on the innerside of at least one of the pair of substrates and arranged at positions corresponding to

each of said plurality of confronting positions, provided that a color filter with a maximum thickness is adjacent to another color filter with a minimum thickness and the relationship of X is $\leqq(1/10)\text{-}d_0$ is satisfied where d_0 is the distance (μm) between the pair of substrates and X (μm) is the maximum film thickness difference between the color filter with the maximum thickness and the color filter with the minimum thickness wherein d_o is $\leqq 5$ μm; and

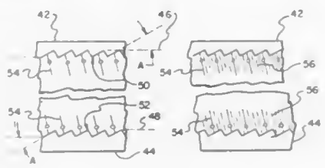
(e) a chiral smectic liquid crystal arranged between said pair of substrates, the film thickness of the chiral smectic liquid crystal being such that the formation of a spiral structure in a chiral smectic phase is inhibited and the chiral smectic liquid crystal is aligned in one of two different, stable alignment states upon the application of no voltage.

4,917,472

LIGHT VALVES WITH POSITIVE DIELECTRIC ANISOTROPY LIQUID CRYSTAL AND HIGHLY TILTED OFF-PERPENDICULAR SURFACE ALIGNMENT, AND ASSOCIATED OPERATING METHOD

John D. Margerum, Woodland Hills, and Anna M. Lackner, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 14, 1988, Ser. No. 168,061
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—340 **11 Claims**



1. A liquid crystal light valve system, comprising:

a liquid crystal light valve including a liquid crystal cell operable in a tuneable birefringent mode having a pair of walls with opposed inner surfaces, and means for establishing a spatial voltage pattern across said cell in response to the spatial pattern of an input radiation beam, said cell containing a positive dielectric anisotropy liquid crystal medium at a tilt angle off-perpendicular to said opposed cell surfaces within the approximate range of 6°–45°, said liquid crystal being characterized by a peak transmissivity at a corresponding first bias voltage, and by a progressively decreasing transmissivity at bias voltages greater and lesser than said first bias voltage, and

means for applying a bias voltage across said cell which is approximately equal to said first bias voltage which corresponds to said peak transmissivity, and

first and second polarizers, said liquid crystal light valve being positioned between said polarizers.

8. A method of operating a liquid crystal light valve to modulate a readout beam in accordance with an input signal, said light valve including a liquid crystal cell having a pair of walls with opposed inner surfaces, said cell containing a positive dielectric anisotropy liquid crystal medium at a tilt angle off-perpendicular to said opposed cell surfaces within the approximate range of 6°–45°, said liquid crystal being characterized by a peak transmissivity at a corresponding first bias voltage, and by a progressively decreasing transmissivity at bias voltages greater and lesser than said first bias voltage, comprising:

applying a bias voltage across said cell which is approximately equal to the voltage level corresponding to said peak transmissivity,

applying an input signal to the light valve,

superimposing a signal voltage corresponding to said input signal upon the second bias voltage across said cell to control the liquid crystal tilt angle,

directing a readout beam through said cell, and

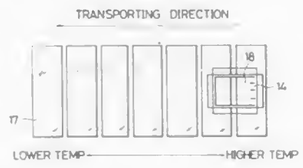
modulating said readout beam in accordance with the signal voltage and liquid crystal tilt angle.

4,917,473

METHOD OF MANUFACTURING LIQUID CRYSTAL DEVICES

Toshio Watanabe, Atsugi, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Filed Oct. 6, 1988, Ser. No. 254,096
Claims priority, application Japan, Oct. 13, 1987, 62-257899; Oct. 13, 1987, 62-257900
Int. Cl.[4] G02F *1/13*; C09K *19/52, 19/56*
U.S. Cl. 350—341 **5 Claims**



1. A method of disposing a liquid crystal material between a pair of substrate comprising:

forming an electrode arrangement on the inside surfaces of a pair of substrates;

coating an orientation control film on the inside surface of at least one of said substrates;

giving orientation treatment to said orientation control film;

mating said pair of substrates with an inner space therebetween;

sealing the periphery of the mated substrates except for at least one inlet port, said inlet port being aligned so that a fluid can flow into said inner space in the direction approximately perpendicular to the direction of said orientation treatment;

placing the sealed substrates in a vacuum chamber;

descending the pressure in said vacuum chamber;

pouring said liquid crystal material into said inlet port at an elevated temperature at which said liquid crystal material exhibits a low viscosity;

elevating the pressure in said vacuum chamber in order to introduce said liquid crystal material onto said inner space;

descending the temperature of said liquid crystal material between said substrates to the operable level at which said liquid crystal material exhibits a high viscosity, with the liquid crystal material being present in the vicinity, said temperature descending including descending the liquid crystal temperature to approximately 0° C. or below;

sealing off said inlet port in order to avoid loss of said liquid crystal material contained in the inner space, said sealing occurring while said liquid crystal is substantially at the descended temperature; and

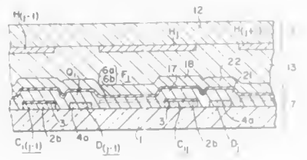
removing the remaining portion of said liquid crystal material from the vicinity of said inlet port.

4,917,474

OPTOELECTRONIC PANEL AND METHOD OF MAKING THE SAME

Shunpei Yamazaki; Akira Mase, and Toshimitsu Konuma, all of Tokyo, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Continuation of Ser. No. 774,500, Sep. 10, 1985, abandoned. This application May 23, 1988, Ser. No. 198,699
Claims priority, application Japan, Sep. 10, 1984, 59-189183; Sep. 10, 1984, 59-189184
Int. Cl.[4] G02F *1/35*; G06F *3/02*
U.S. Cl. 350—333 **15 Claims**



8. A photoelectric panel with a plurality of pixels, such pixel comprising:

a liquid crystal layer;

a triple-layered semiconductor incorporating at least a first N-layer, a substantially I-layer, and a second N-layer in the foregoing order;

a common electrode;

a first electrode for a first portion of said triple-layered semiconductor which constitutes, in cooperation with said common electrode, a photosensitive element forming a photodetector;

a second electrode electrically isolated from the first electrode, said second electrode being for a second portion of said triple-layered semiconductor and the liquid crystal layer to constitute, in cooperation with said common electrode, a display pixel adjacent to said photodetector where the second portion of the triple-layered semiconductor corresponds to an active, non-linear element electrically coupled to the liquid crystal layer;

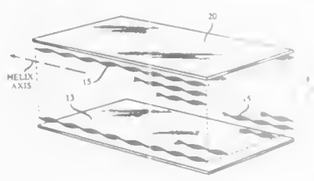
wherein said electrode arrangements are composed of a plurality of column strips and a plurality of row strips and the pixels along a column share said triple-layered semiconductor.

4,917,475

FLEXOELECTRIC LIQUID CRYSTAL DEVICE

Robert B. Meyer, Wellesley, Mass., and Jayantilal S. Patel, Scotch Plains, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 6, 1987, Ser. No. 22,736
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—350 R **9 Claims**



1. A liquid crystal device comprising

a cell containing a liquid crystal material (30) and including a pair of essentially parallel plates (13, 20), at least one of which is transparent to light made incident thereon, electrode means (12, 22) on said plates for applying an electric field (E) across said plates in a direction essentially parallel to the direction of said light, and means (80, 90) for aligning the molecules (15) of the material along a predetermined direction,

characterized in that:

the directors (n) of said molecules form a helix in which the helix axis is essentially parallel to said plates and perpendicular to the direction of said field, and

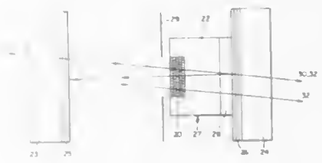
said applying means generates an electric field which does not unwind said helix but which causes the planes of said directors to change their orientation relative to said helix axis.

4,917,476

THERMAL IMAGERS USING LIQUID CRYSTAL SENSING ELEMENTS

Surinder S. Makh; Alan D. Hart, and David L. Tunnicliffe, all of Bristol, United Kingdom, assignors to British Aerospace Public Limited Company, Bristol, England

Continuation of Ser. No. 876,483, Jun. 20, 1986, abandoned. This application Mar. 4, 1988, Ser. No. 168,557
Claims priority, application United Kingdom, Jan. 21, 1985, 8515789; Aug. 21, 1985, 8520913
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—351 **21 Claims**



1. A thermal imaging system comprising:

support means made of heat-retaining material;

a liquid crystal film element mounted within said support means but having a surface exposed, said liquid crystal film element being sensitive to infra-red radiation incident on said surface from a remote source; and

detector means arranged to detect changes in said liquid crystal film element due to said incident infra-red radiation from said remote source, said support means being operable for retaining at least a part of said incident infra-red radiation from said remote source for a given period of time.

4,917,477

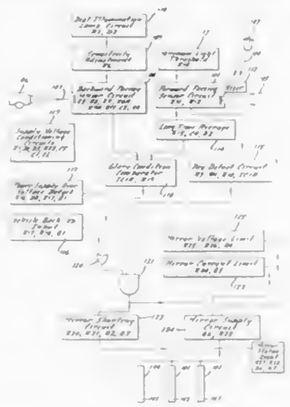
AUTOMATIC REARVIEW MIRROR SYSTEM FOR AUTOMOTIVE VEHICLES

Jon H. Bechtel, and Harlan J. Byker, both of Holland, Mich., assignors to Gentex Corporation, Zeeland, Mich.

Filed Apr. 6, 1987, Ser. No. 34,913
Int. Cl.[4] G02F *1/17*
U.S. Cl. 350—357 **44 Claims**

1 In an automatic rearview mirror system for automotive vehicles, the combination including an electrochromic variable reflectance member the reflectivity of which varies continuously over a range as a function of at least two electrical signal levels applied thereto, ambient light sensing means effective to sense ambient light and generate a corresponding electrical signal indicative of the ambient light level, glare sensing means effective to sense glare causing light and generate a corresponding electrical signal indicative of the glare causing light level, and means operable to apply an electrical control signal to said variable reflectance member to vary the reflectivity of said reflectance member while maintaining a high quality image during reflectance transition as a function of the sensed

ambient light signal and the sensed glare causing light level signal, the total response time of said control signal to changes



in the electrical indicative of the glare causing light level being faster than the total response time of said electrochromic reflectance member to said control signal.

4,917,478

ARRANGEMENT FOR ILLUMINATION AND SCANNING OF AN OBJECT BY MEANS OF A SCANNING DISK SIMILAR TO A NIPKOW DISK

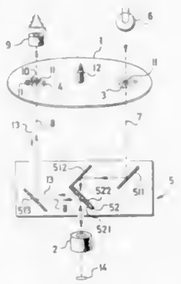
Mojmír Petrán, Plzen; Milan Hadravsky, Plzen, and Miroslav Maly, Prague, all of Czechoslovakia, assignors to Jednotne Zemedelske Druzstvo "Vitezny Unor" Se Sidlem V Komorne, Blovice, Czechoslovakia

Filed Jun. 27, 1988, Ser. No. 211,559

Claims priority, application Czechoslovakia, Jun. 29, 1987, 4816-87

Int. Cl.[4] **G02B** *21/06, 26/04*

U.S. Cl. 350—527 **2 Claims**



1. In a device for tandem scanning of an object having an arrangement for illumination and scanning of an object by means of a rotating scanning disk having diametrically opposed, spirally arranged elementary openings, and further having a light splitting system including a semitransparent mirror with a partially reflective coating on one side and no coating on the other side, and wherein an illuminating light ray is passed through a first elementary opening on said rotating disk and passed into said light splitting system whereby a portion of said light ray is passed through said semitransparent mirror to the object, and an image light ray is reflected from said object back to said semitransparent mirror, and a portion thereof reflected from said surface having the reflective coating such that said light splitting system will thereafter reflect said partial image light ray through a second elementary opening on said disk, and then passed to where an image of said object can be viewed;

the improvement comprising said semitransparent mirror having a thickness sufficient to space apart said partial image light ray reflected from said surface having said reflective coating from any partial light ray reflected from said uncoated surface such that only the partial light ray reflected from said coated surface will pass through said second elementary opening, and any partial image light ray reflected from said uncoated surface is blocked by said disk.

4,917,479

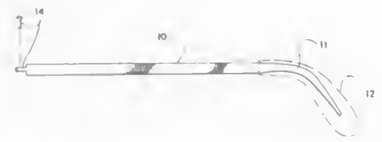
ADJUSTABLE COUNTERWEIGHTED TEMPLE PIECES FOR EYEGLASSES

William T. Bidgood, Rte. 4, Box 4189, Cleveland, Ga. 30528

Filed Oct. 3, 1988, Ser. No. 252,116

Int. Cl.[4] **G02C** *5/14*

U.S. Cl. 351—123 **3 Claims**



1. In a temple piece for a pair of glasses, said temple piece terminating in a hook receivable over the ear of the wearer, the improvement wherein the said temple piece is substantially rigid and terminates in a thin, tapering hook member for receiving a weighted semi-solid sleeve, said weighted sleeve comprising a semi-solid sleeve-like envelope of tapered design, said envelope containing a mixture of rubbery material and heavy, inert powdered material, said weighted envelope defining a tapered narrow inside space for snugly receiving said tapering hook member, the arrangement being that the top of the ear of the glasses wearer serves as the fulcrum for the glasses, the said weighted sleeve being of sufficient weight to move the balance of the glasses to a point along the temple piece nearer to the ears of the wearer than to the opposite end of said temple piece, said weighted sleeve fitting snugly on said tapering hook member, the arrangement being such that said weighted sleeve is movable as a means of longitudinal adjustment of said temple piece by a wedging action behind the ear of the wearer, the wedging action being due to the tapered hook member received within said narrow inside space of said weighted envelope, said sleeve serving as both counterweight and cushion.

4,917,480

EYE REFRACTIVE POWER MEASURING APPARATUS

Yasuo Kato; Kiwami Horiguchi; Ikuo Kitao, and Yoshihiro Takahashi, all of Tokyo, Japan, assignors to Kabushiki Kaisha TOPCON, Tokyo, Japan

Continuation of Ser. No. 153,506, Feb. 3, 1988, abandoned, which is a continuation of Ser. No. 819,607, Jan. 17, 1986, abandoned. This application Nov. 28, 1988, Ser. No. 277,439

Claims priority, application Japan, Jan. 18, 1985, 60-5782; Jun. 22, 1985, 60-136517

Int. Cl.[4] **A61B** *3/02, 3/10*

U.S. Cl. 351—211 **5 Claims**

1. An eye refractive power measuring apparatus, comprising:

chart projection means for projecting a chart image for test use to a retina of an eye under test by using visible light, said chart projection means including a chart plate disk having at least one first fixation chart for objective test use and a plurality of second fixation charts for subjective test use, said chart plate disk being manipulatable to selectively position one of said first and second fixation charts in an optical axis of said chart projection means;

measuring target projection means for projecting a measuring target image to the retina of the eye under test by using invisible light;

display device means for displaying said measuring target image as a visible image; and

means for simultaneously changing a focusing state of said measuring target image and a focusing state of said chart image with respect to the eye under test.

4,917,481

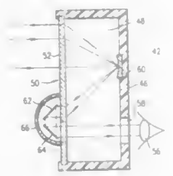
HIGH INTENSITY LASER RADIATION PROTECTION

Walter Koechner, Great Falls, Va., assignor to Fibertek, Inc., Herndon, Va.

Filed Jun. 6, 1988, Ser. No. 202,819

Int. Cl.[4] **G02F** *1/01*

U.S. Cl. 350—363 **11 Claims**



1. A pair of goggles for protecting the eyes of the wearer from laser radiation while affording transmission of other optical signals to the wearer's eyes, comprising

(a) a frame defining a chamber open at one end;

(b) a generally planar lens connected with said frame for closing the open end of said chamber, said lens including means for transmitting optical signals to the interior of said chamber and containing at least one opening;

(c) optical switch means connected with said frame within said chamber, said switch means normally transmitting said optical signal as an output signal through said lens means, said switch means being operable upon receipt of laser radiation having a predetermined intensity to terminate transmission of the optical signals; and

(d) reflector means arranged adjacent said lens opening for reflecting said optical switch output signal through said lens opening to the eyes of the wearer, whereby the wearer's eyes receive only output optical signals from said optical switch corresponding with optical signals transmitted into said chamber by said lens means, and further whereby upon receipt of laser radiation above a predetermined intensity threshold, said optical switch means terminates optical transmission to protect the wearer's eyes from the laser radiation.

4,917,482

COMPACT ZOOM LENS SYSTEM CAPABLE OF HIGH ZOOM RATIO AND HAVING COVERAGE OF A WIDE VISUAL FIELD

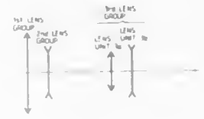
Takayuki Ito, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1988, Ser. No. 291,828

Claims priority, application Japan, Dec. 29, 1987, 62-336460; May 27, 1988, 63-129532

Int. Cl.[4] **G02B** *15/00*

U.S. Cl. 350—423 **11 Claims**



1. In a compact zoom lens system capable of high zoom ratio and having coverage of a wide visual field which consists, in order from the object side, of a first lens group having a positive focal length, a second lens group having a negative focal length and a third lens group having a positive focal length, and which effects zooming from the wide-angle end to the telephoto end by moving either all of the three lens groups or the first and third lens groups, with the image plane held at a constant position, the improvement wherein the third lens group is composed of a lens unit 3*a* having a positive focal length and a lens unit 3*b* having a negative focal length, and the two lens units 3*a* and 3*b* are moved independently of each other in such a way that the distance between the lens units 3*a* and 3*b* is increased to satisfy the following condition (1) when zooming is effected from the wide-angle end to the middle focal length, and is decreased to satisfy the following condition (2) when zooming is effected from the middle focal length to the telephoto end:

$$(1)\ 0.05<(D_M-D_T)/(f_T-f_M)<0.6\ (D_M-D_T>0)$$

$$(2)\ 0.35<(D_M-D_W)/(D_M-D_T)<5.0(D_M-D_T,\ D_M-D_w>0)$$

where

D_M: the distance between lens units 3*a* and 3*b* at the middle focal length which corresponds to K=0.6–0.9 of the range of focal lengths;

D_T: the distance between lends units 3*a* and 3*b* at the telephoto end;

f_T: the focal length of the overall system at the telephoto end;

f_M: the focal length of the overall system at the middle focal length (K=0.6–0.9); the distance between lens units 3*a* and 3*b* at the wide-angle end;

K: $(\log f_M-\log f_W)/(\log f_T-\log f_W)=\log Z_M/\log Z$;

f_W: the focal length of the overall system at the wide-angle end;

$Z_M=f_m/f_W$: zoom ration for the middle focal length (k=0.6–0.9); and

$Z=f_T/f_W$: zoom ratio.

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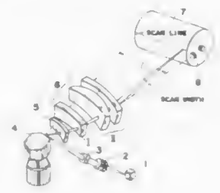
4,917,483

F.THETA LENS SYSTEM WITH VARIABLE FOCAL LENGTH

Sachiko Nakao, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 12, 1988, Ser. No. 282,738
Claims priority, application Japan, Dec. 11, 1987, 62-314983
Int. Cl.[4] G02B *15/14, 26/10*
U.S. Cl. 350—423 **21 Claims**



1. An f.θ lens system for use in a laser beam scanning device including a deflector by which laser beam is deflected so as to scan an image plane, the f.θ lens system comprising from the deflector side:
a first lens unit of negative refractive power;
a second lens unit of positive refractive power;
said first and second lens units being relatively movable to vary a focal length of the f.θ lens system.

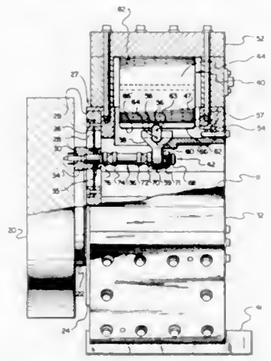
4,917,484

HIGH-PERFORMANCE DYNAMIC MOUNT FOR LASER-BEAM STEERING MIRROR AND ACTUATING MOTOR THEREFOR

Theodore A. Heinz, Simi Valley, Calif., assignor to Rockwell International Corporation

Filed May 15, 1984, Ser. No. 610,379
Int. Cl.[4] G02B *27/7, 5/08;* **H01L** *41/04*
U.S. Cl. 350—487 **8 Claims**

1. In combination an apparatus for dynamically mounting and actuating an object such as a laser mirror with great precision of motion comprising:
at least one piezoelectric shear motor for providing actuating movement along one axis, said shear motor further comprising:
(i) a plurality of polarized piezoelectric shear elements arranged in a vertical stack of horizontal layers to provide movement along a horizontal axis in response to applied electrical signals,
(ii) each shear element comprising a polarized piezoelectric strip having a first electrode in contact with the top and one end face of the strip and a second electrode in contact with the bottom and other end face of the strip,
(iii) adjacent horizontal layers being bonded together so that the bottom surface of the upper layer moves to the same extent as the top surface of the lower layer, the movement of each horizontal layer being a shear movement along a shear plane; and
(iv) a base plate for said plurality of piezoelectric shear elements;
object-support means to which said object is attached;
a motor-mount member for supporting the motor;
a suspension plate attached to the motor-mount member and containing at least one suspension assembly formed from a suspension ring holder having a recess and a suspension ring fitting within the recess but spaced from the ring holder;
a flexure assembly located within the space separating the suspension ring from the suspension ring holder, the flexure assembly permitting axial, tip and tilt movement of the suspension ring;
a support member for affixing the suspension assembly to the object-support means; and
a flexible linkage assembly for transmitting movement along a single axis further comprising:
(i) shaft means comprising a front, center and rear section each formed with a central axial bore therein;



(ii) a flexible joint for providing at least two degrees of rotational freedom between two shafts including a pair of arcuate longitudinal bearings, a trunion block in the shape of a double wedge having a long, arcuate narrow edge at each opposite side thereof, the longitudinal axis of each edge being orthogonal to that of the other edge, the flexible joint being located between the rear end of the first and the front end of the center shaft sections, and between the rear end of the center and front end of the rear sections, the flexible joint formed with a central bore therethrough;
(iii) tensioning means running through the bores and attached to the front and rear shaft sections for placing a predetermined amount of tension on the flexible-joint; and
(iv) means for stabilizing the flexible linkage in the lateral direction in the area of the flexible-joint.

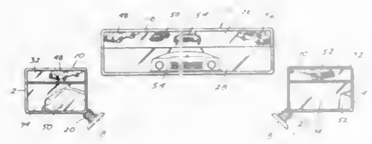
4,917,485

SAFETY MIRROR SYSTEM FOR VEHICLES

William K. Baldwin, Sr., 14219 Decatur Dr., Magalia, Calif. 95954

Filed Jun. 5, 1989, Ser. No. 361,634
Int. Cl.[4] G02B *5/10;* **B60R** *1/08*
U.S. Cl. 350—627 **3 Claims**

1. A safety mirror system for a vehicle, comprising at least one elongated mirror having distinctly different upper and lower viewing divisions and adapted for attachment inside said vehicle in a location providing rear surveillance for a vehicle driver cooperative with at least two small mirrors being longitudinal right half and left half duplicates of said elongated mirror, said small mirrors adapted for external attachment to said vehicle with one on each side of said vehicle for side viewing; wherein said upper division of said elongated mirror is comprised of a convex mirror mounted in protruding frames which arch centrally and curve back to reduce protrusions adjacent outer ends of said elongated mirror; wherein said upper divisions of said small mirrors are formed in essentially the same manner as the upper division of the elongated mirror with the exception that the convex mirrors are truncated at the



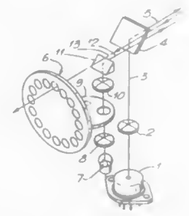
apex of the arch defined by the convex mirror of the upper division of the elongated mirror; and wherein said convex mirrors of said upper divisions of both said elongated mirror and said small mirrors are angled with the upper edge out and the lower edge in relative to planar surfaces of said mirrors in said lower divisions.

4,917,486

PHOTOCOAGULATION APPARATUS

Anthony Raven, Royston, and John Marshall, Farnborough, both of England, assignors to Scientific Generics Ltd., Cambridge, England

Filed May 20, 1988, Ser. No. 196,320
Claims priority, application United Kingdom, May 20, 1987, 8711888; Aug. 12, 1987, 8719131; Mar. 16, 1988, 8806254
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—221 **26 Claims**



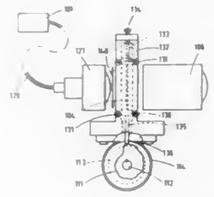
1. A laser photocoagulator including a laser system and a viewing system, characterized in that the laser system includes a first solid state laser diode and at least one further solid state laser diode, said laser diodes operating in the infrared range, said laser system further including means for combining the infrared light produced by said laser diodes, and wherein said viewing system and said laser system have in common a dichroic beam splitter which, in use, separates infrared light from visible light, said viewing system and said laser system sharing a substantially common light path between said dichroic beam splitter and the eye of a patient, whereby the clinician may view a patient's eye through the beam splitter substantially without risk of exposure to the infrared light used for treatment, the photocoagulator further including an alignment system incorporating a visible light source, the visible light source comprising a solid state laser diode which provides coherent light having a wavelength in the visible range.

4,917,487

PROJECTION APPARATUS

John S. Cruickshank, Inchture, United Kingdom, assignor to L.B.P. Partnership, St. Louis, Mo.

Filed Aug. 19, 1988, Ser. No. 234,275
Claims priority, application United Kingdom, Oct. 20, 1987, 8724527
Int. Cl.[4] G03B *21/26*
U.S. Cl. 353—28 **14 Claims**



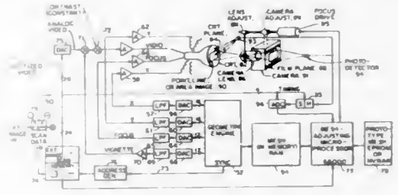
1. A projection apparatus for illuminating a plurality of profiles of an object including radiant energy means adapted to project a beam of radiation through means defining a slit aperture, a holder for supporting said means defining said slit aperture and a cam means having a plurality of different dwell positions thereon arranged to drive the means defining the slit aperture across the path of the radiant energy means whereby differing portions of an object may be successively illuminated.

4,917,488

PHOTOCELL DISTANCE MEASUREMENT

William H. Glass, Edina, Minn., assignor to Management Graphics, Inc., Bloomington, Minn.

Continuation of Ser. No. 1,205, Jan. 7, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,784
Int. Cl.[4] G01C *3/08*
U.S. Cl. 356—4 **9 Claims**



1. Distance measurement apparatus comprising:
means for alternately providing a first and a second source of radiation, wherein
said first source and said second source each provide distinct geometric patterns of radiation having different number of dimensions, said geometric patterns being selected from two different one of a zero-, one- and two-dimensional image comprising a point, a line and a solid planar image, respectively, and
said first and said second source of radiation sharing a common plane;
a detector providing two intensity signals in response to received incident radiation from each of said means for providing a first and second source of radiation; and
means for calculating the distance according to the intensity signals provided according to said first and second sources of radiation and providing a corresponding distance related signal.

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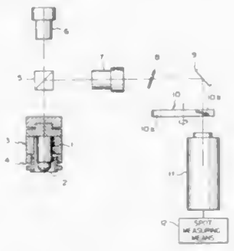
4,917,489

DEVICE FOR MEASURING SIZE OF LIGHT SPOT

Takashi Nishio, Koufu; Tomoyoshi Ikeya, and Chiharu Koshio, both of Yamanashi, all of Japan, assignors to Pioneer Electronic Corporation and Pioneer Video Corporation, both of Yamanashi, Japan

Filed Dec. 2, 1988, Ser. No. 278,713
Claims priority, application Japan, May 19, 1988, 63-66096[U]
Int. Cl.[4] G01J *1/00*
U.S. Cl. 356—121 5 Claims



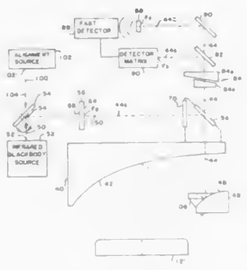
1. A device for measuring a size of a light spot formed on a reference surface comprising: an optical magnifying system having a receiving surface to be aligned with said reference surface and for magnifying an image of a light spot formed on said receiving surface; attenuating means for attenuating an intensity of the magnified image; a photo-electric converter for receiving the magnified and attenuated image so as to produce an electric signal representing the image; and means for measuring the size of the image on the basis of said electric signal.

4,917,490

BORESIGHT ALIGNMENT MEASURING APPARATUS AND METHOD FOR ELECTRO-OPTIC SYSTEMS

James R. Schaffer, Jr., Madison; Stephen K. Pitalo, and Henry P. Lay, both of Huntsville, all of Ala., assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 4, 1988, Ser. No. 152,401
Int. Cl.[4] G01B *11/26*
U.S. Cl. 356—152 23 Claims



1. An apparatus for static and dynamic testing of the boresight alignment of an electro-optic system having a line-of-sight sensor responsive to first radiation from a target for sensing the location of the target and setting the direction of a target vector to correspond to the location of the target, and a line-of-sight illuminator for directing an illumination beam of second radiation at the located target, the boresight alignment being the extent to which the target vector and the illumination beam have achieved a predetermined angular relationship, said apparatus comprising:

a main optic optically coupled to the electro-optic system and aligned with a principal radiation path for receiving the second radiation from the electro-optic system and focusing the second radiation about a focal point in a focal plane substantially perpendicular to said principal radiation path, said main optic including a primary reflector for reflecting the first and the second radiations between the electro-optic system and a subreflector zone, and a secondary reflector positioned in said subreflector zone and spaced from said primary reflector for reflecting the first and second radiations between said primary reflector and said focal plane along said principal radiation path;

first radiation source means positioned effectively in said principal radiation path for generating a target beam of the first radiation and for directing said target beam along said principal radiation path sequentially to said secondary reflector, to said primary reflector, and to the sensor of the electro-optic system, said target beam causing the sensor to set the direction of tbe target vector in substantial correspondence with said target beam; and

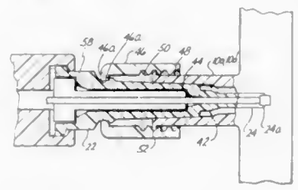
detecting means positioned effectively in said focal plane and in said principal radiation path and responsive to the second radiation for detecting the location of the illumination beam relative to the location of the target vector.

4,917,491

SPECTROMETRY DETECTOR HEAD AND FIBER OPTIC CONNECTOR

Lawrence S. Ring, 898 Hillcrest Dr., Laguna Beach, Calif. 92651, and Wayne E. Rodgers, 3217 Overbland Ave., Los Angeles, Calif. 90024

Filed Jul. 15, 1988, Ser. No. 219,765
Int. Cl.[4] G01N *1/20;* G01J *3/00*
U.S. Cl. 356—300 10 Claims



1. For use in fiber optic spectrophotometry and/or spectrofluorimetry systems in which a sensing head is inserted in a branch of a tube containing a fluid for exposure to said fluid, and color characteristics of the fluid or a dye in contact with the fluid are sensed by the head and conveyed through an elongated fiber optic cable to a chemical analyzer, a connector device including a sensing head and disposing an end of the fiber optic cable in light transmitting proximity to, but insulated from the fluid, said device comprising:

(A) a tubular member, said member having an outside diameter less than the inside diameter of the tube branch into which the member is to be inserted, said tubular member being open at its outer end and closed at its inner insertable end by an optically transparent tranverse wall, said tubular member having an inside diameter greater than the outside diameter of the end of the elongated fiber optic cable to receive and removably secure the last said end for disposition in facing engagement with said transverse wall;

(B) means to retain the closed end of said tubular member upon its insertion within the tube branch to effect contact with the fluid therein and to prevent fluid from passing by the tubular member and out of the said tube branch;

(C) an orificed cap defining an open chamber; and

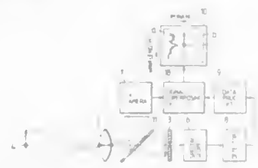
(D) means to attach said cap onto the periphery of the transparent transverse wall so that said chamber is closed by the last said wall thereby exposing the color of the chamber contents and its changes to the end of the fiber optic cable through said transparent wall.

4,917,492

SPECTRUM MEASURING APPARATUS

Musubu Koishi, Shizuoka, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Dec. 6, 1988, Ser. No. 280,763
Claims priority, application Japan, Jun. 21, 1988, 63-153317
Int. Cl.[4] G01J *3/02*
U.S. Cl. 356—300 7 Claims



1. A spectrum measuring apparatus, comprising:

lens means for forming an image of an object on measuring spot extraction means and on camera means;

said measuring spot extraction means for extracting a light beam originating from a measuring spot of said object;

spectroscope means for dispersing said extracted light beam into a spectrum;

said camera means for picking-up a total image of said object;

signal superposing means for superposing signals corresponding to said spectrum and said total image on each other and generating superposed video signal; and

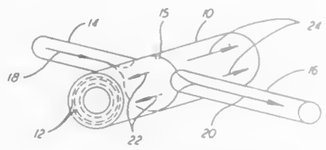
display means for displaying said spectrum and said total image on the basis of said superposed video signal.

4,917,493

FURNACE FOR ELECTROTHERMAL ATOMIZATION OF SAMPLES FOR ANALYSIS BY ATOMIC ABSORPTION SPECTROPHOTOMETRY

Margaretha T. C. de Loos-Vollebregt, Pynacker, Netherlands, assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 13, 1988, Ser. No. 205,888
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1987, 3720376
Int. Cl.[4] G01N *21/74*
U.S. Cl. 356—312 2 Claims



1. An electrothermal graphite furnace for atomization of samples for analysis by means of atomic absorption spectrophotometry comprising:

a tubular body fabricated entirely of pyrolytic graphite formed in coaxial cylindrical lamellas; and

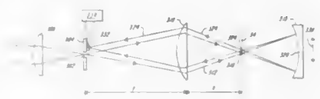
electrode means extending radially from said body for passing electric heating current transversely therethrough.

4,917,494

BEAM FORMING APPARATUS FOR AERODYNAMIC PARTICLE SIZING SYSTEM

Trent A. Poole, South Amherst; Norman C. Ford, Amherst, both of Mass., and Barton E. Dahneke, Palmyra, N.Y., assignors to Amherst Process Instruments, Inc., Amherst, Mass.

Continuation-in-part of Ser. No. 78,857, Jul. 28, 1987. This application Sep. 9, 1988, Ser. No. 243,333
Int. Cl.[4] G01N *15/14, 21/85*
U.S. Cl. 356—335 22 Claims



1. Apparatus for generating closely-spaced first and second light beams in an image plane, each light beam having a thin, elongated cross-sectional shape, comprising:

source means for generating an incident light beam;

means defining an aperture slit;

first lens means for focusing the incident light beam on said slit defining means;

second lens means positioned for focusing an image of said aperture slit in said image plane to form said first light beam; and

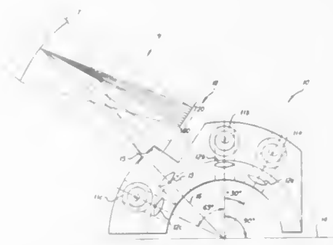
optical means for reflecting said first light beam after passing through said image plane to form a reflected first light beam and for focusing said reflected first light beam in said image plane to form said second light beam spaced from said first light beam.

4,917,495

PORTABLE COLORIMETER AND METHOD FOR CHARACTERIZATION OF A COLORED SURFACE

Larry E. Steenhoek, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 20, 1988, Ser. No. 286,785
Int. Cl.[4] G01J *3/18, 3/50*
U.S. Cl. 356—328 21 Claims



1 A portable colorimeter for determining the optical properties of a color film sample comprising:

(a) an integrated unit housing irradiation means, detection means, control means, analysis means, and display means;

(b) said irradiation means including a plurality of illumination means for sequentially illuminating the sample from a plurality of corresponding illuminating angles;

(c) said detection means including an optical detector means for sequentially detecting the light reflected from the sample at a detection angle different from any of said illuminating angles;

(d) whereby the light detected by said detector means is analyzed by said analysis means and converted into a signal displayed by said display means; and

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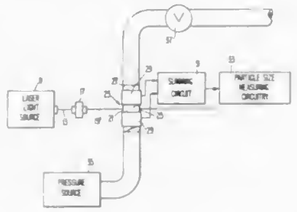
(e) said control means controlling said irradiation means, said detection means, said analysis means and said display means.

4,917,496

PARTICLE SIZE MEASURING INSTRUMENT WITH DIRECT SCATTERED LIGHT DETECTION

Holger T. Sommer, Greenbelt, Md., assignor to Pacific Scientific Company, Anaheim, Calif.

Filed Jul. 11, 1988, Ser. No. 217,337
Int. Cl.[4] G01N *15/02*
U.S. Cl. 356—336 12 Claims



1. A particle measuring system comprising a tube, means to cause fluid entraining particles to be measured to pass through said tube in a fluid stream, said tube having an interior wall surface shaping the flow of said stream, means to direct a shaped beam of light through said stream in said tube perpendicular to the direction of flow of said stream, and at least one photodetector having a photosensitive surface mounted on the wall of said tube with said photosensitive surface positioned adjacent to said interior wall surface and arranged to detect the light scattered from said beam of light by particles in said stream passing through said beam of light.

4,917,497

METHOD OF AND APPARATUS FOR THE POSITIONAL DETECTION OF OBJECTS

Donald W. Tomkins, Loughborough, and Laurence Holden, Ylewsley, both of England, assignors to Holtronic Technologies Limited, London, England

Filed Jul. 31, 1987, Ser. No. 80,458
Claims priority, application United Kingdom, Aug. 4, 1986, 8619006
Int. Cl.[4] G01B *9/021*
U.S. Cl. 356—347 14 Claims

1. A method of positional detection of objects including the steps of:

A. preparing a hologram which records the three dimensional image of an object by means of a single exposure;

b. positioning the prepared hologram in parallel reference beams of coherent light to allow reconstruction of a real focused image of the object;

c. positioning the object to coincide with the real image formed by the hologram which has been excited by the coherent light so as to re-illuminate the object;

d. optically detecting the coincidence of the object and its holographic image by visually observing a maximum signal;

e. with the object and the image of the object having specific contours, carrying out the positioning and detecting steps to cause the object to detect the coincidence of the object and the real image substantially entirely on the basis of coincidence of the contours; and

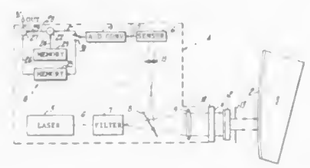
f. ascertaining the coincidence of the object and its holographic image by detecting a substantially zero signal from a position behind the object with respect to the hologram, simultaneously with observing the maximum signal, as a double check.

4,917,498

ARRANGEMENT FOR TESTING GRAZING HYPERBOLOIDS AND SIMILAR REFLECTIVE SOLID BODIES FOR SHAPE DEVIATIONS

Joseph M. Geary, 10660 Pinewood Trail, Jupiter, Fla. 33478

Continuation of Ser. No. 61,637, Jun. 15, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 313,288
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—357 10 Claims



1. An arrangement for testing an aspheric convex grazing reflecting surface of a solid body, which is to be impinged upon during its use by a light beam at a grazing angle of incidence deviating from normal to the reflecting surface, for deviations of its actual shape from its ideal shape, comprising:

means for emitting a laser beam;

optical means including an optically active surface with a shape dissimilar from that of the reflecting surface to be tested interposed between said emitting means and the reflecting surface to be tested and operative for so optically modifying said laser beam as to propagate between said optical means and the reflecting surface along a predetermined path that is substantially normal to the reflecting surface and to be reflected from the reflecting surface for propagation substantially along said predetermined path and through said optical means back toward the generating means as a return laser beam having a wave front indicative of the actual shape of the reflecting surface and any optical aberrations of said optical means;

means for forming an interference pattern between said laser beams; and

means for evaluating said interference pattern, including

means for generating an initial signal representative of said interference pattern,

means for providing a reference signal representative of the ideal shape of the reflecting surface,

means for storing an additional signal representative of the influence of the aberrations of said optical means on the interference pattern, and

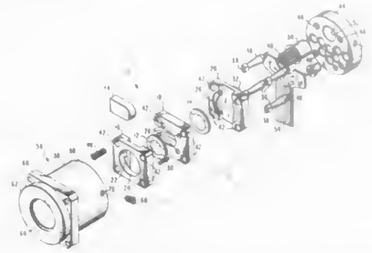
means for correlatedly subtracting said reference signal and said additional reference signal from said initial signal to obtain a final signal representative only of the difference between the actual and ideal shapes of the reflecting surface.

4,917,499

APPARATUS FOR ANALYZING CONTAMINATION

Robert J. Champetier, Torrance, and Richard L. Graff, Ventura, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 3, 1986. Ser. No. 914,900
Int. Cl.[4] G01N *25/00*
U.S. Cl. 374—14 13 Claims



1. Apparatus for identifying molecular contamination in an environment comprising a unitary package including:

a sensing crystal for collecting the contamination;

means for causing the contamination to change from one of its solid-liquid-vapor states to another of its solid-liquid-vapor states;

means including a reference crystal spaced from said sensing crystal for providing a reference comparison therfor, for conducting a thermo-gravimetric analysis on said sensing crystal and the contamination thereon and for vibrating said sensing crystal and detecting its frequency of vibration and any changes therein, thereby for detecting the change of state to identify the contamination; and

an enclosure having means for supporting said sensing crystal and for exposing said sensing crystal to the environment, and comprising

a base;

means for supporting said reference crystal, and

means for spacing said sensing and reference crystals and said supporting means therefor in substantial thermal isolation from said base, and in which

said supporting means comprise a first support supporting said sensing crystal, a second support secured to said first support, a third support secured to said second support and supporting said reference crystal, and resilient means extending through said second support in contact with both said crystals and biasing said crystals respectively into contact with their respective supports.

4,917,500

COLOR SENSOR SYSTEM FOR THE RECOGNITION OF OBJECTS WITH COLORED SURFACES

Attila Lugos, Haguenau, France, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 30, 1988, Ser. No. 278,092
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1987, 3740998
Int. Cl.[4] G01J *3/50*
U.S. Cl. 356—406 13 Claims

1. A color sensor system for the recognition of objects having at least a partially colored surface, comprising:

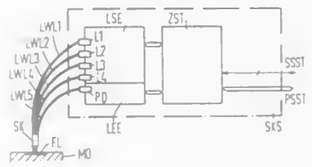
at least three electronic light transmitters, each emitting light pulses in a predetermined narrow-band range of wavelengths;

a transmitter control device coupled to said electronic light transmitters for establishing at least one control cycle during which said light pulses successively illuminate said colored surface of an object;

an electronic light receiver for receiving light reflected from said colored surface in response to the arrival of each of said light pulses and converting them into individual electrical signals having an intensity corresponding to that of said reflected light;

an evaluation device coupled to said electronic light receiver for making a color recognition determination based on the intensity of said received individual electrical signals in the course of said control cycle;

at least one temperature sensor for supplying temperature data with regard to an ambient temperature to said transmitting control device and said evaluation device, wherein said transmitting control device supplies in the



course of said control cycle to said electronic light transmitters current pulses which are individually determined in accordance with said temperature data and stored data relating to temperature-dependent emission curves of said light transmitters for successively illuminating said colored surface with light pulses of predetermined intensity, and wherein said evaluation device makes a compensation for said received individual signals based upon said temperature data and stored data relating to temperature-dependent conversion curves of said light receiver; and

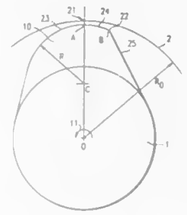
means for comparing said received individual electrical signals with stored values for said color recognition determination.

4,917,501

INTERNAL MIXER WITH IMPROVED ROTORS

Dominique Simonet, Nohanent, and Michel Garmy, Le Cendre, both of France, assignors to Compagnie Generale Des Etablissements Michelin- Michelin & Cie, Clermont-Ferrand, France

Filed Jun. 5, 1989, Ser. No. 361,353
Claims priority, application France, Jun. 16, 1988, 88/08205
Int. Cl.[4] B29B *1/06*; B01F *7/04*
U.S. Cl. 366—99 5 Claims



1. An internal mixer comprising:

a mixing tank including at least one cylindrical chamber; and

a rotor rototably mounted in said chamber, said rotor comprising at least two inclined blades, each of said blades having a profile which defines a convergent surface and a first divergent surface with the wall of said chamber, said convergent surface and first divergent surface being connected by a surface at a fine passage with respect to the wall of said chamber, wherein the center and radius of

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curvature of said profile are substantially constant on both sides of said fine passage, wherein said profile comprises a setback which is separated from the fine passage in a direction opposite to the direction of rotation of the blade and is always followed, in said direction opposite to the direction of rotation of the blade, by a second divergent surface which has a steeper profile than said first divergent surface.

4,917,502

NOZZLE FOR THE MIXING OF AT LEAST TWO FLOWABLE REACTION COMPONENTS AND PROCESS FOR OPERATING SUCH NOZZLE

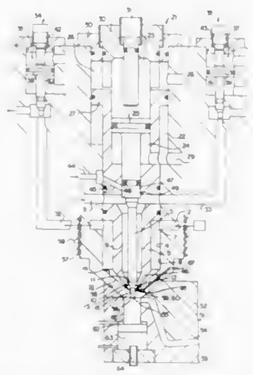
Ferdinand Proksa, Leverkusen; Hans-Michael Sulzbach, Koenigswinter; Reiner Raffel, Siegburg, and Ferinand Althausen, Neunkirchen, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Hennecke GmbH, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 643,508, Aug. 23, 1984, Pat. No. 4,749,554. This application Mar. 1, 1988, Ser. No. 162,772

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1983, 3331840; Oct. 1, 1983, 3335786; Oct. 1, 1983, 3335787; Jun. 1, 1984, 3420517

Int. Cl.[4] **B01F** *13/00*; **B29F** *7/74*

U.S. Cl. 366—159 1 Claim



1. A process for mixing at least two flowable reaction components comprising mixing the components in metered quantities by passing a first reaction component through a first nozzle to form a first stream, passing a second component through a second nozzle to form a second stream, the location of said second nozzle being such that said second stream concentrically surrounds and comes into contact with said first stream at an interface as the streams pass through each of said nozzles, and maintaining a high relative speed between said streams at said contact outside the nozzles such that turbulence is produced at the interface of said streams.

4,917,503

PHOTOACTIVATABLE LEUCO BASE TIME-TEMPERATURE INDICATOR

Himangshu R. Bhattacharjee, Randolph, N.J., assignor to Life-Lines Technology, Inc., Morris Plains, N.J.

Continuation of Ser. No. 803,750, Dec. 2, 1985, abandoned. This application Sep. 30, 1987, Ser. No. 103,418

Int. Cl.[4] **G01K** *3/04, 11/12*

U.S. Cl. 374—102 17 Claims

17. A method of measuring an incremental time-temperature exposure of a perishable article by

(a) applying to the article an indicator comprising a mixture of a thermally inactive compound that includes essentially a leuco base and a photosensitive compound which on exposure to actinic radiation forms an acid that converts the leuco base to a thermally active product,

(b) exposing the indicator to actinic radiation to render it thermally active,

(c) measuring the reflectivity of the indicator at a specified wavelength,

(d) measuring the reflectivity of the indicator at the specified wavelength after incremental time-temperature exposure, and

(e) calculating the incremental time-temperature exposure by using a pre-established relationship between a change in reflectivity of the indicator and time-temperature exposure.

4,917,504

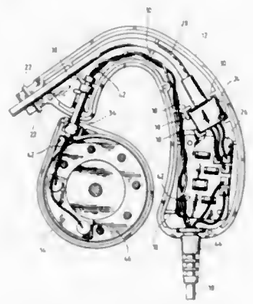
COMMUNICATIONS HEADSET

Charles G. Scott, Aptos, and Robert J. Bernardi, Scotts Valley, both of Calif., assignors to Plantronics, Inc., Santa Cruz, Calif.

Filed May 5, 1989, Ser. No. 348,052

Int. Cl.[4] **H04R** *1/04, 1/10, 25/02*

U.S. Cl. 381—187 4 Claims



1. A communications headset comprising:

a first housing containing a microphone transducer and electronic circuitry, the first housing being symmetrical about a central plane and having a substantially hook-shaped outline in its central plane, such that said housing can be lowered into a secure, post-auricular position, the interior curve of said hook shape engaging the wearer's ear and securing said housing behind the auricle, around the rear and top of the ear, with a forwardly-directed portion of the first housing extending partially in front of the ear, said forwardly-directed portion having a cylindrical protrusion extending therefrom;

a second housing, symmetrical about a central plane and having a substantially teardrop-shaped outline in its central plane, containing an acoustical receiver having wires coupled thereto, the second housing having acoustical port holes on both of its substantially planar and teardrop-shaped outer surfaces and being coupled near its apex to said forwardly-directed portion of the first housing with a ball-and-socket joint which allows limited angular and rotary movement of the second housing with respect to the first housing such that the second housing may be folded inwardly to a position substantially parallel with the external surfaces of the wearer's ear, the ball-and-socket joint also permitting rotation of the second housing about the axis of the ball-and-socket joint, the extent of said rotation being limited by the cylindrical protrusion on said forwardly-extending portion of the first housing, the ball-and-socket joint further defining a hollow channel between the first and second housings through which said receiver wires pass; and

a flexible, telescoping voice tube having proximal and distal ends, the proximal end detachably coupled to said cylindrical protrusion on the forwardly-directed portion of the first housing, said voice tube extending forward and down from the first housing such that the distal end can be positioned generally in front of the wearer's mouth.

4,917,505

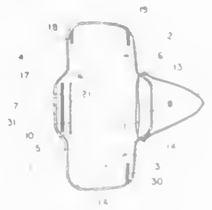
COMBINATION MAT, CARRYING BAG AND VISOR

Cheryl F. Bullard, and Roger D. Bullard, both of Rte. 1, Box 32A, Billingsley, Ala. 36006

Filed Jan. 19, 1989, Ser. No. 299,052

Int. Cl.[4] **A45C** *3/10*

U.S. Cl. 383—4 4 Claims



1. A combination mat, bag and visor comprising, in combination:

a shaped pad of liquid-impervious material, said pad having a plurality of integrally formed sections defined by intermediate fold lines,

said sections including a middle section and a pair of oppositely disposed end sections,

said middle section including an adjacent top section and bottom section,

first means on said pad for detachably interconnecting said end sections in overlying relationship with each other and said central section,

second means for detachably interconnecting said top section in overlying relationship with said end sections in said overlying relationship,

third means for detachably interconnecting said bottom section in overlying relationship with said end sections in said overlying relationship,

a pocket in said middle section and manipulable closing means for said pocket,

an insect barrier netting having a portion attached to the interior of said pocket.

a plurality of VELCRO strips, and

means for attaching said VELCRO strips to an associated baby carrier or the like at selected locations, said pad being adapted to be attached by said VELCRO strips to said carrier in a U-shaped configuration to form a sun visor for a body occupying said carrier.

4,917,506

INTERLOCKING CLOSURE DEVICE HAVING CONTROLLED SEPARATION AND IMPROVED EASE OF OCCLUSION

Gerald H. Scheibner, Liberty Lake, Wash., assignor to First Brands Corporation, Danbury, Conn.

Continuation of Ser. No. 132,785, Dec. 14, 1987, abandoned, which is a division of Ser. No. 27,081, Mar. 17, 1987, Pat. No.

Int. Cl.[4] **B65D** *33/24*

U.S. Cl. 383—63 52 Claims

1. An interlocking closure fastening device comprising a male closure element and a female closure element formed such that said male closure element and said female closure element engage in interlocking relationship; said male closure element comprising a substantially linear U-shaped channel element including a profile portion comprising a base portion having a pair of spaced-apart, parallelly disposed webs integrally attached to said base portion and extending therefrom, said webs terminating in hooks, said hooks comprising hook portions facing away from each other and hook projections facing toward each other; said female closure element comprising a substantially linear U-shaped channel element including a profile portion comprising a base portion having a pair of spaced-apart, parallelly disposed webs extending from said base portion, said webs terminating in hooks extending nonlinearly from said webs and facing toward each other, said hooks each including a projection extending nonlinearly in a direction outwardly and downwardly with respect to said base portion and facing away from each other; each of said projections being characterized as providing guidance for occlusion of said female closure element with said male closure element; and wherein said female closure element further provides controlled separation characteristics to said interlocking closure fastening device when said interlocking closure fastening device is partially deoccluded.

4,917,507

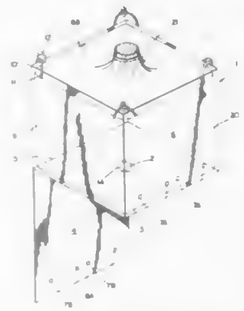
BAG

James I. Davidson, Latterworth, England, assignor to Sidian Trading Ltd., Latterworth, England

Continuation of Ser. No. 178,521, Apr. 7, 1988, abandoned. This application Feb. 17, 1989, Ser. No. 312,440

Int. Cl.[4] **B65D** *33/16*

U.S. Cl. 383—67 12 Claims



1. A bag comprising at least one sidewall, a bottom panel provided with an aperture therein, the periphery of said aperture being substantially coplanar with the bottom panel, said aperture also defining the discharge outlet for said bag such that once material within the bag passes through the aperture the material is completely unconfined by any part of the bag and is freely in the external environment, a liner within the bag covering at least part of the bottom panel and having a continuous rupturable portion in registry with the aperture, an exterior flap attached at one of its edges to the exterior of the bag and adapted in one position to overlie the aperture and the rupturable portion of the liner to protect the aperture and the rupturable portion during handling of the bag, said rupturable portion of said liner comprising the sole means for completely

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closing said aperture against discharge of the bag contents therethrough, said flap in said one position thereof having the sole purpose of covering and protecting said aperture and said rupturable portion of said liner during handling of the bag, and a fastener for releasaby fastening the flap in said one position, the flap and the fastener being attached to the bag at positions spaced from the aperture, whereby the flap may be released away from the area of the aperture and will hang clear of the aperture when released.

4,917,508

THIN LINEAR MOTION ROLLING GUIDE UNIT

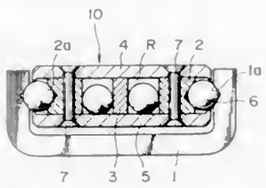
Tatsuo Mottate, Tokyo, Japan, assignor to Nippon Thompson Co. Ltd., Tokyo, Japan

Filed Sep. 19, 1988, Ser. No. 245,671

Claims priority, application Japan, Dec. 23, 1987, 62-195367[U]

Int. Cl.[4] F16C *29/06*

U.S. Cl. 384—45 6 Claims



1. A thin linear motion rolling guide unit comprising:

a rail (**1**) made of a long member having a U-shaped cross section in which first track grooves (**1***a*) are respectively formed on inside surfaces of both side walls in the longitudinal direction of said long member;

a table (**10**) which is slidably combined with said rail (**1**) and has a pair of track members (**2**), second track grooves (**2***a*) being formed on the outside surfaces of said track members (**2**) at the positions which face said first track grooves (**1***a*) of the rail (**1**) and endless circulating passages for a number of rolling members (**6**) being also formed by the track members (**2**),

the rolling members (**6**) which are inserted between the first track groove (**1***a*) of the rail (**1**) and the second track groove (**2***a*) of the table (**10**) which faces the rail;

flat plate shaped upper and lower lids (**4** and **5**) which are attached in the upper and lower portions of the table (**10**) so as to sandwich the track members (**2**) which are symmetrically arranged with respect to an axial direction of the table;

said track members (**2**) forming loop inside wall surfaces (**2***c*) of the endless circulating passages for the rolling members (**6**) which are formed in said table (**10**); and

a circulator (**3**) provided between the track members (**2**) which are symmetrically arranged, said circulator (**3**) forming outside wall surfaces (**3***c*) of the endless circulating passages,

wherein said circulator (**3**) is combined with said upper and lower lids (**4** and **5**) and fixed, thereby constructing an endless circulating passage complete loop for the rolling members (**6**).

4,917,509

FLANGED BEARING AND PROCESS FOR PRODUCING SAME

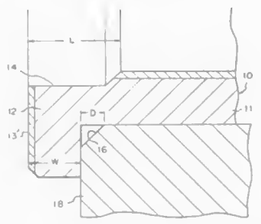
Hiroshi Takano, Saitama, Japan, assignor to Senju Metal Industry Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1989, Ser. No. 314,174

Claims priority, application Japan, Mar. 4, 1988, 63-28119[U]

Int. Cl.[4] F16C *33/04*

U.S. Cl. 384—275 2 Claims



1. A flanged bearing provided with a chamfer and adapted to be fitted in an opening formed in a housing and to receive a shaft, said bearing comprising a cylindrical body and a radially outwardly extending flange formed integrally with one end of said cylindrical body, the inner periphery of said cylindrical body being formed with a clearance means adjacent to said flanged end.

4,917,510

BEARING ASSEMBLY FOR A WHEEL OF A MOTOR VEHICLE

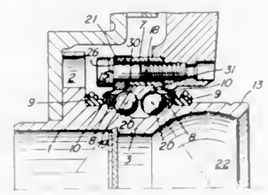
Werner Jacob, Briandring 29, D-6000 Frankfurt/Main 70, Fed. Rep. of Germany

Filed Dec. 14, 1987, Ser. No. 220,481

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1986, 36434841

Int. Cl.[4] F16C *33/58*

U.S. Cl. 384—503 4 Claims



1. A bearing assembly or a drivable wheel hub at an associated wheel carrier of a motor vehicle, comprising:

a double-row rolling element bearing having an outer divided bearing ring provided so as to be fixable to the wheel carrier, and an inner single-part bearing ring arranged so as to form one unit with a wheel flange or attaching the vehicle wheel, the outer bearing ring (**4**) being divided by being broken apart in an area (**24**) of its circumferential extension essentially in a plane (E - E) which extends radially relative to its axis (X - X), the inner bearing ring (**3**) being integral with a component (**13**) of a driving joint (**22**) provided for driving the vehicle wheel or connected to the component (**13**) via teeth (**23**);

a holding ring 7 arranged so as to receive the outer bearing ring **4**; and wherein the holding ring (**7**) has a radially extending stop face (**17**) arranged so as to contact a corresponding radial face (**31**) of the outer bearing ring (**4**), and an inner face (**18**) arranged so as to receive and outer face (**19**) of the outer bearing ring (**4**).

4,917,511

INTERMITTENTLY MOVING DEVICE

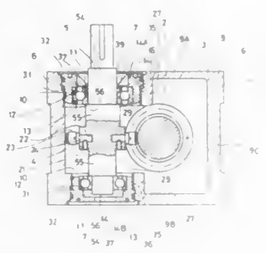
Shinji Katsube, Outsu, Japan, assignor to Tsubakimoto Chain Co., Osaka, Japan

Filed Jul. 22, 1988, Ser. No. 222,768

Claims priority, application Japan, Jul. 24, 1987, 62-185750

Int. Cl.[4] F16C *43/04, 25/06*

U.S. Cl. 384—540 3 Claims



1. An intermittently moving device comprising a case, an input shaft to which a cam is attached, an output shaft which crosses orthogonally with said input shaft and is provided with a cam follower to be engaged with said cam;

said case has inner screw holes which are formed on a first pair of confronting walls of the case, an opening end of each of said holes is provided with circumferential notched grooves having an engaging surface, a second set of inner holes are formed on a second pair of confronting walls which are at right angles to said first pair of confronting walls;

said output shaft has bearings mounted on both sides of said cam follower so as to prevent inward movement toward said cam follower and, is supported in said case by adjusting wheels;

each of said adjusting wheels has a bearing hole provided with a step difference in order to insert said bearing thereinto and to hold the outward end face of said bearing with said step difference, and is screwed in said respective inner screw holes; and each of said adjusting wheels is held in place by a locking piece which is mounted on the outward end face of said adjusting wheel and engaged with said engaging surface of said notched grooves.

4,917,512

APPARATUS FOR AUTOMATICALLY ADJUSTING A GAP BETWEEN A PLATEN AND A PRINT HEAD

Takao Mimura; Atsushi Nishikawa, and Masayuki Kumazaki, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Jan. 27, 1989, Ser. No. 303,501

Claims priority, application Japan, Jan. 28, 1988, 63-18115; Jan. 29, 1988, 63-18797

Int. Cl.[4] B41J *11/20*

U.S. Cl. 400—56 17 Claims

1. A mechanism for automatically adjusting a gap between a platen and a print head in a printer for printing on a print medium comprising:

a frame having side walls and a base;

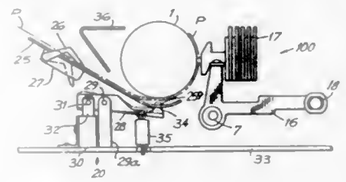
a carriage guide means for carrying a print head mounted between said frame walls and for adjusting the relative position between the carriage and the platen;

a carriage mounted for reciprocal displacement on said carriage guide means, the print head being mounted on the carriage;

a print medium thickness detecting lever pivotably mounted on said base adjacent to the platen with one end of the lever selectively contacting one of said platen and said print medium;

a print medium detecting lever;

print medium presence detecting means for detecting whether the print medium is within said printer in response to the position of the print medium detecting lever and providing a print medium presence detecting signal corresponding to the presence of the print medium;



print medium thickness detecting means for detecting the distance between said platen and said print medium thickness detecting lever in response to the position of said lever and providing a print medium thickness detecting signal corresponding thereto in response to said paper presence signal; and

carriage control means for controlling said carriage guide means in response to said print medium detecting signal whereby said carriage guide adjusts the relative position between the carriage and platen to a suitable distance for printing base on the thickness of the print medium.

4,917,513

THERMAL IMPRINT RECORDING APPARATUS

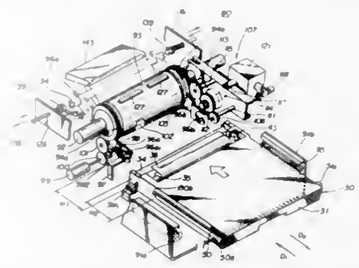
Itsuo Takanashi, Kamakure; Hideshi Tanaka, Yokohama; Shigeru Kato, Yokohama; Naomi Osada, Yokohama, and Toshikatsu Ichito, Kawasaki, all of Japan, assignors to Victor Company of Japan, Kanagawa, Japan

Filed Nov. 4, 1988, Ser. No. 267,534

Claims priority, application Japan, Nov. 6, 1987, 62-280794; Mar. 9, 1988, 63-31345[U]

Int. Cl.[4] B41J *3/02*

U.S. Cl. 400—120 6 Claims



1. A thermal imprint recording apparatus adapted to be mounted with a paper cartridge accommodating a paper for recording an image on the paper fed from a first side of the paper cartridge by a thermal head via an ink film supplied from a first roll of ink film held on the paper cartridge after the ink film is drawn out through a second side of the cartridge opposite to said first side, said cartridge carrying a second roll of the ink film on which the ink film is taken up adjacent to the first roll, comprising:

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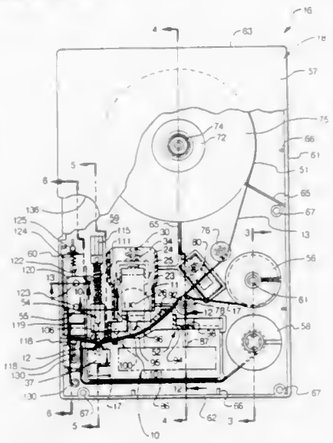
a platen roller on which the paper is fed from the cartridge;
thermal head means including the thermal head disposed so as to be pressed on a surface of the platen roller for recording the image on the paper fed on the platen roller;
an insertion opening formed on a front panel of the apparatus for accepting the cartridge when the cartridge is mounted on the apparatus;
a discharge opening provided on the front panel of the apparatus for discharging the paper after the image is recorded by the thermal head;
a cartridge accommodating space defined in the printer for accepting the cartridge when the cartridge is inserted into the printer;
ink film loading means comprising an arm driven by a driving means and movable between a first state for engaging with one of said first and second ink film rolls held on the cartridge and a second state for drawing out the ink film from the other of the ink film rolls held on the cartridge so as to draw out the ink film and load the ink film at a predetermined position between the platen roller and the thermal head means;
paper feed means disposed in the cartridge accommodating space so as to be located at a side of the cartridge opposite from the side from which the ink film is drawn out when the cartridge is inserted into the printer for feeding a sheet of paper in the cartridge one by one; and
discharge means disposed on a same side as the paper feed means relative to the cartridge in the cartridge accommodating space in a state generally parallel to the cartridge when the cartridge is inserted in the printer, for transporting the paper subjected to the recording from the platen roller to said discharge opening.

4,917,514

THERMAL PRINTING DEVICE AND TAPE SUPPLY CARTRIDGE EMBODYING A TAPE CUT-OFF MECHANISM

Michael M. Richardson, and Frank A. Borgeson, both of Scottsdale, Ariz., assignors to Kroy Inc., Scottsdale, Ariz.

Continuation-in-part of Ser. No. 151,109, Feb. 1, 1988, Pat. No. 4,815,874. This application Jan. 19, 1989, Ser. No. 299,798
Int. Cl.[4] B41J *3/20*
U.S. Cl. 400—120 11 Claims



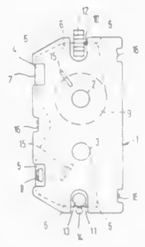
1. A tape supply cartridge for operative insertion into and use with a thermal printing device or the like having a print station for forming a selected image onto a tape and a tape cut-off actuator arm, said cartridge comprising:
a cartridge housing having top and bottom walls and an edge wall joining said top and bottom walls;
a tape opening in a portion of said edge wall;
a supply of tape;
tape alignment means for guiding said tape past said print station and for guiding said tape through said tape opening;
a tape cut-off means disposed within said cartridge and between said alignment means and said tape opening, said tape cut-off means including a first cut-off edge and a second cut-off edge connected with a portion of said cartridge, said first and second cut-off edges adapted for limited movement relative to one another and cooperating with one another to sever said tape as a result of the limited relative movement of said first and second cut-off edges; and
means connected with at least one of said first and second edges for receiving a cut-off force from said cut-off actuator arm of said device.

4,917,515

INKING RIBBON CASSETTE

Gerhard Piller, Allensbach, and Michael Schwarzbauer, Constance, both of Fed. Rep. of Germany, assignors to Computer Gesellschaft Konstanz mbH, Bundesrepublik, Fed. Rep. of Germany

Filed Sep. 27, 1988, Ser. No. 249,837
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1987, 8713034[U]
Int. Cl.[4] B41J *32/00*
U.S. Cl. 400—249 4 Claims



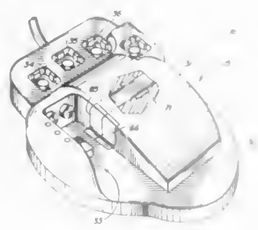
1. In a printing device including a printer head, a capstan-type ink-ribbon drive, and a ribbon-end monitor, an ink ribbon cassette reversible between a first position and a second position, said cassette comprising the following:
a substantially rectangular housing composed of two halves, each having two relatively long longitudinal edges and two shorter lateral edges;
two ribbon winding hubs between which said ink-ribbon is conveyable along a conveying path;
a pair of printer-head openings extending through one of said longitudinal edges into said conveying path and symmetrically disposed about a centerline of said cassette, so that said printer head is disposed inside of said conveying path when said cassette is mounted in said printing device;
two capstan/monitor opening means for receiving said capstan drive when said cassette is mounted in one of said positions, and for receiving said ribbon-end monitor when said cassette is mounted in the other of said positions, and disposed symmetrically opposite one another, one at each of said two shorter lateral edges; and
said capstan/monitor opening means extending into said conveying path.

4,917,516

COMBINATION COMPUTER KEYBOARD AND MOUSE DATA ENTRY SYSTEM

Dale J. Retter, 7350 Via Paseo Del Sur, E #206, Scottsdale, Ariz. 85258

Continuation-in-part of Ser. No. 16,018, Feb. 18, 1987, abandoned. This application Aug. 15, 1988, Ser. No. 231,952
Int. Cl.[4] B41J *5/08*
U.S. Cl. 400—489 17 Claims



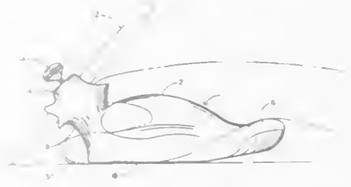
1. A computer data input control system including in combination:
a first housing member having a graspable raised, substantially convex, central portion adapted to underlie and support the palm of at least one hand of an operator in a natural relaxed concave position, with the fingers freely dangling so that the fingertips of each finger extend substantially vertically downwardly, said housing member having an upper surface and a lower surface;
a plurality of data input keys arranged adjacent said raised central portion in groups of predetermined three dimensional patterns at each of the thumb and fingertip positions of the hand of such operator on the upper surface of said housing member, each group operated by different fingertips of an operator from a constant home position, wherein each finger is capable of activating all of the keys of the associated group through finger movement alone, said finger positions comprising individual fingertip wells, each having a bottom and vertical sides with discrete key surfaces thereon for freely receiving the fingertips of an operator to permit multiple direction movement of the fingertips to contact different discrete ones of said key surfaces corresponding to the direction of movement of the fingertips, and wherein said data input keys are located in various positions in said wells so that said data input keys may be operated by the fingertips in said constant home position;
at least a first mouse means mounted within said housing member having a push button switch and having a movement detection input means extending from the lower surface of said housing member for contacting a support surface;
first control means on said housing member comprising a push button switch actuator located at said thumb position for engagement by the thumb and coupled with said first mouse means for operating said push button switch of said first mouse means, said entire first housing member being movable by said hand of such operator without removal of said fingertips from said constant home position to operate said movement detector input means of said first mouse means as said first housing member is moved on a support surface; and
means for coupling said mouse means and said data input keys with a processing device.

4,917,517

COMBINED HAND SUPPORT AND WRITING INSTRUMENT HOLDER

Paula Ertz, Newport Beach, Calif., assignor to Smith & Nephew Rolyan, Inc., Menomonee Falls, Wis.

Filed Aug. 11, 1988, Ser. No. 230,896
Int. Cl.[4] B43K *23/00, 29/00*
U.S. Cl. 401—6 4 Claims



1. A writing aid comprising a combination hand support and writing instrument holder and including:
a movable body portion having a surface to receive and support the palm of a user, said body portion having a pair of laterally extending side panels projecting outwardly and in opposite directions therefrom, some of the user's fingers engaging one of said side panels so that the movement of said body portion may be accurately controlled;
a head portion projecting outwardly from one end of said body portion and having means for retaining a writing instrument, such that a movement of said body portion along the plane of a writing paper causes a corresponding movement of the writing instrument over the paper;
a neck portion by which to connect said head portion to said body portion, said neck portion being narrower than said head portion to receive other fingers of the user thereagainst to further control the movement of said body portion;
a tail portion projecting outwardly from an end of said body portion opposite the end to which said head portion is connected, said tail portion receiving a downward pressure that is applied thereto by the user; and
pivot means around which said body portion is adapted to rotate when a downward pressure is applied to said tail portion so that the writing instrument is either moved into contact with the writing paper when said body portion is rotated around said pivot means in a first direction or the writing instrument is moved out of contact with the writing paper when said body portion is rotated around said pivot means in a direction opposite to said first direction.

4,917,518

AUTOMATIC PENCIL

Haan-Tzong Chern, No. 84, Song-Po St., Panchiao City, Taipei Hsien, Taiwan

Filed Dec. 27, 1988, Ser. No. 289,912
Int. Cl.[4] B43K *21/16*
U.S. Cl. 401—65 3 Claims

1. An automatic pencil including:
a housing unit consisting of a lower housing and an upper housing;
a sleeve disposed coaxially in said lower housing and having a ribbed outer surface and a splined inner surface, said ribbed outer surface enabling said sleeve to fit into said lower housing;
an inner tubular member extending coaxially through said sleeve;
an externally splined upper ring sleeved rigidly on an intermediate portion of said inner tubular member so as to engage with said splined inner surface of said sleeve,

thereby preventing rotation of said inner tubular member relative to said sleeve;
a tubular first engagement element of a diameter greater than that of said inner tubular member, secured coaxially to an upper end of said inner tubular member, extending out of said lower housing, including several sprocket teeth provided annularly on an upper end surface of said first engagement element;
an upper compression spring sleeved on said inner tubular member between said first engagement element and said sleeve for biasing said first engagement element to move upward away from said sleeve;
a connecting tube having a diameter smaller than that of said inner tubular member and secured coaxially to a lower end of said inner tubular member;
a chuck connect coaxially to a lower end of said connecting tube;
a lower ring sleeved moveably on said connecting tube;
a lower compression spring sleeved on said connecting tube between said lower ring and said upper ring for biasing said lower ring to sleeve on said chuck so as to hold a lead rod within said chuck;
an outer tubular member disposed coaxially in said upper housing and having a ribbed outer surface enabling said outer tubular member to fit into said upper housing, and an internally threaded upper end portion;

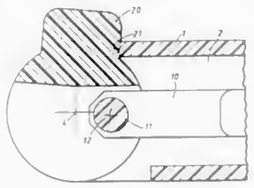
means for coupling said sleeve with said outer tubular member in such a manner that said outer tubular member can rotate but not move axially relative to said sleeve;
a tubular bolt member having an enlarged upper end for receiving lead rods, and an externally threaded lower portion engaged with said internally threaded upper end portion of said outer tubular member thereby enabling said bolt member to move axially in said upper housing;
a second engagement element secured to a lower end of said bolt member and including several sprocket teeth provided annularly on a lower end surface thereof so as to engage with said sprocket teeth of said first engagement element;
a cap sealing said enlarged upper end of said bolt member;
characterized in that each of said sprocket teeth of said first and second engagement elements has a barbed free end;
whereby, when said upper housing and hence said outer tubular member are rotated relative to said lower housing in a certain direction, said lead rod registered within said chuck moves downward; and when said upper housing and hence said outer tubular member are rotated relative to said lower housing in the opposite direction, said upper spring urges said first engagement element upward and said barbed ends of said sprocket teeth of said second engagement element pull said barbed ends of said sprocket teeth of said first engagement element upward so as to move said lead rod upward.

4,917,519

WRITING INSTRUMENTS WITH ROTATABLE WHEEL ACTUATOR

Robert White, Cholsey, and Michael B. Seal, Henley-on-Thames, both of England, assignors to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 150,479, Feb. 8, 1988, abandoned, which is a continuation of Ser. No. 875,812, Jun. 18, 1986, abandoned. This application Feb. 22, 1989, Ser. No. 314,243
Claims priority, application United Kingdom, Jun. 21, 1985, 8515830
Int. Cl.[4] B43K *7/12, 24/02, 24/06*
U.S. Cl. 401—99 **11 Claims**



1. A writing instrument comprising a barrrel with an axial bore and having an end wall, a writing tip carried by a single reservoir received in the bore and a rotatable wheel member including a transverse slot extending inwardly from the periphery of the wheel to a depth exceeding the radius of the wheel member and including opposed side walls and a bottom wall, said wheel member being supported by the barrel about an axis transverse to the bore, the trailing end of the reservoir being positioned in said slot in engagement with each of the opposed side walls of the slot to provide a pivot having an axis spaced apart from but parallel to said axis transverse to the bore and which is movable through a forwardmost position so that rotation of said wheel member in one direction moves the pivot axis through the forwardmost position to longitudinally displace the reservoir in the barrel to thereby advance the writing tip relative to the forward end of the barrel to a writing position and rotation of said wheel member in an opposite direction longitudinally displaces the reservoir in the barrel to retract the writing tip from the writing position to a retracted position and where said wheel member includes a radial projection providing means for abutment of said wheel member against a stop defined by the end wall of the barrel on movement of the pivot axis through the forwardmost position so that when the tip is advanced to the writing position, pressure on the advanced writing tip urges the abutment means into firmer engagement with the stop.

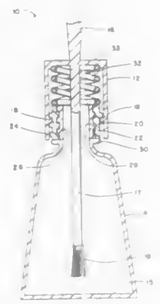
4,917,520

APPLICATOR BRUSH

Ginny Reid, 10443 N. May, Ste. 747, Oklahoma City, Okla. 73120

Filed Jan. 4, 1989, Ser. No. 293,427
Int. Cl.[4] A46B *11/00;* **A45D** *34/00*
U.S. Cl. 401—127 **2 Claims**

1. An applicator brush for attachment to a bottle having an externally threaded bottle neck portion, comprising:
a tubular member having internal threads dimensioned for engagement with the external threads on the bottle neck portion;
said tubular member having external threads;
circumferentially spaced axial gaps formed in said external threads on said tubular member;
a hollow cap member having a first end wall and a second opposite open end;
a plurality of radially inwardly extending lugs in axial alignment within said cap member;
said lugs dimensioned for engagement with said external threads of said tubular member and for axial sliding engagement in said axial gaps,
an elongated applicator shaft extending through said cap member and secured thereto;
said applicator shaft having a distal end terminating in an applicator tip;
a coil spring surrounding said applicator shaft in coaxial relation therewith; and



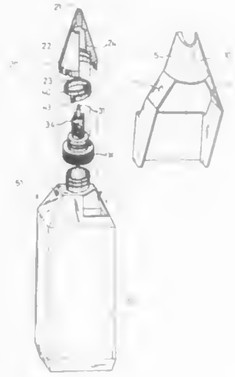
a first end of said spring secured to said first end wall of said cap member and a second end of said spring disposed within said cap member for abutment with an upper end surface of said tubular member, whereby said cap member may be selectively secured against axial movement to said tubular member or disposed for axial sliding movement of said cap member with respect to said bottle upon not more than 90 degree rotation of said cap member with respect to said tubular member.

4,917,521

PEN TYPE CONTAINER FOR CORRECTION FLUID WITH DAUBING FUNCTION

Kung-Chung Lai, No. 100-1 Sec. 2, Ho Pin West Rd., Taipei, Taiwan

Filed Feb. 15, 1989, Ser. No. 310,868
Int. Cl.[4] B43K *8/00, 1/06*
U.S. Cl. 401—260 **1 Claim**



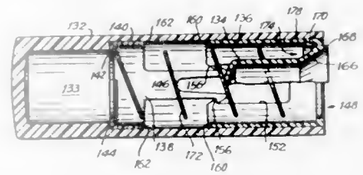
1. In association with a container (50) for ink correction liquid, the improvement comprising a liquid dispenser mechanism that includes:
a hollow liner element (30) having a relatively large diameter end thereof adapted to immovably fit onto the discharge end of the container so that liquid can flow from the container through the space circumscribed by the liner element, said liner element including a hollow spiral wall having a frusto-conical configuration extending away from the aforementioned large diameter end to form a small diameter free end; said frusto-conical spiral wall being formed of an elastic material capable of resilient deformation in the axial direction;
an axial shaft (31) extending from the small diameter end of the hollow liner element away from the space circumscribed by the liner element;
a hollow frusto-conical cover (20) fitting onto the hollow liner element, said cover having a large diameter end section rotatably fitting around the large diameter end of the liner element whereby the cover can be manually rotated without changing its axial position relative to the large diameter end of the liner element; said cover including a frusto-conical wall extending along and beyond the liner element to form a liquid-discharge opening (21) surrounding the tip of said axial shaft (31); mating helical wedge surfaces (34,24) formed on the small diameter end of the liner element frusto-conical wall and the inner surface of the frusto-conical cover; the mating wedge surfaces being configured so that rotation of the cover in a first direction causes the wedge surface on the cover to exert an axial cam force on the wedge surface of the liner element, such that the elastic wall contracts toward the large diameter end of the liner element, thereby pulling said axial shaft from a closed position wherein its tip is engaged with the discharge opening (21) to an open position wherein said tip is spaced from the discharge opening;
manual means (10) for applying a rotary operating force to the cover, said manual means comprising a lever element pivotably attached to the associated container (at 51) for swinging motion around an axis extending transversely across the container axis;
said cover (20) having an external groove (22) in its outer surface, said lever element having an inturned end wall 915) extending into said external groove, whereby swinging motion of said lever element toward the container causes the cover to rotate in the aforementioned first direction;
and a torsion spring (40) extending around the hollow liner element with its opposite ends connected, respectively, to the cover and to the large diameter end of the liner element, said spring being oriented to rotate the cover in a second direction when manual pressure is removed from the lever element.

4,917,522

MANUALLY-OPERATED FLUID DISPENSER AND ASSOCIATED CLOSURE CAP

Nathan Kay, Encino; Donald W. McNab, Long Beach, and Edward J. Moya, San Gabriel, all of Calif., assignors to Photofinish Cosmetics, Inc., Encino, Calif.

Division of Ser. No. 194,840, May 17, 1988, Pat. No. 4,874,117. This application Jul. 24, 1989, Ser. No. 384,745
Int. Cl.[4] A46B *17/04*
U.S. Cl. 401—269 **1 Claim**



1 A cap for releasable securement about an applicator car-

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ried on an end of a body which includes a secondary abutment surface on the body proximate the body end, said cap comprising:

a shell having an open end;

a positionally fixed member in said shell remote from said open end;

shuttle means in said shell for protectively receiving the applicator when said cap is secured on the body and for movement longitudinally along said shell, said shuttle means comprising a first shuttle member movable along said shell between a first position of releasably captured engagement with said fixed member and a second position in limit stop abutment with said fixed member, and a second shuttle member movable along said shell between a first position of releasably captured engagement with said first shuttle member and a second position in limit stop abutment with said fixed member; and

spring means between said fixed member and said second shuttle member for normally urging said second shuttle member toward said first position in which an open end of said second shuttle member is disposed proximate said shell open end and for normally urging, through said releasable engagement between said second shuttle member and said first shuttle member said first shuttle member toward said first position proximate said shell open end;

said second shuttle member including a contact portion at its open end configured for engagement with the body proximate the body end which carries the applicator such that, as the cap is relatively moved into securement about the applicator, the body engages said contact portion and drives said second shuttle member from its first to its second position in limit stop abutment with said fixed member, and the secondary abutment surface on the body engages said first shuttle member and drives said first shuttle member from its first to its second position in limit stop abutment with said fixed member.

4,917,523

CARD FILE MOUNTING MEMBER

Robert G. Merrick, and John P. Merrick, both of Cupertino, Calif., assignors to Merrick Industries, Inc., Sunnyvale, Calif.

Division of Ser. No. 225,638, Jul. 27, 1988, abandoned, which is a continuation-in-part of Ser. No. 623,799, Jun. 22, 1984, abandoned. This application Aug. 19, 1988, Ser. No. 234,454

Int. Cl.[4] B42F *13/00*

U.S. Cl. 402—79 6 Claims

1. Structure for producing a plurality of mounting members for application to an object to be mounted on a pair of rails of a card file index, said structure comprising:

a sheet of rigid stock material, said sheet being pre-cut into a plurality of separable ones of said mounting members which are disposed adjacent each other on said sheet, pairs of adjacent ones of said mounting members having openings preformed therein along their facing edges,

a backing sheet;

an adhesive material applied to selected portions of one side of said mounting members to adhere said members to said backing sheet until use, said adhesive material serving to attach said mounting member to an object after removal of said mounting member from said backing sheet.

4,917,524

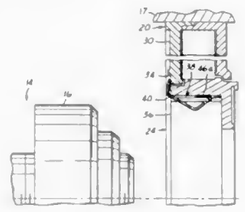
LOCKING CLIP

Harry E. Wilcox, Plymouth, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Feb. 6, 1989, Ser. No. 306,723

Int. Cl.[4] F16B *1/00*

U.S. Cl. 403—12 6 Claims



1. A coupled electromechanical mechanism easily uncoupled for relative rotation when in an assembly comprising a first member mounted for rotation relative to a second member, comprising

a rotor mounted in a stator, said stator being adapted to be nonrotatably secured to said second member and said rotor adapted to receive and rotate with said first member, and

lock means forming pat of the electromechanical mechanism carried by said mechanism for resisting said stator from rotating relative to said rotor but permitting rotation when receiving said first member, said stator and rotor being generally cylindrical and each including an end face, the end faces being generally coplanar and perpendicular to the cylinder axis, and said lock means including a detent and a spring clip which has a resiliently deflectable leg adapted to releasably engage the detent and resist said stator rotating relative to said rotor, said spring clip and detent being received in one of said stator and rotor and associated with the end face on the other of said stator and rotor.

4,917,525

BAYONET COUPLING CONNECTOR

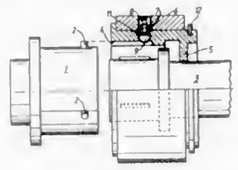
William C. W. Duncan, Northampton, Great Britain, assignor to AB Electronic Components Limited, Great Britain

Filed Mar. 7, 1989, Ser. No. 319,974

Claims priority, application United Kingdom, Mar. 12, 1988, 8805912

Int. Cl.[4] B25G *3/00*

U.S. Cl. 403—27 3 Claims



1. A bayonet coupling connector comprising:

a first coupling member having radially protruding pins;

a second member further comprising:

a rotatable coupling nut having internal tracks for receiving said pins when said first and second members are mated, said members being rotatable relative to each other to move said pins around and to the ends of their respective tracks to fully lock said members together;

a coupling ring which slidingly surrounds said coupling nut;

a spring biased plunger supported by said coupling ring and extending radially to rotationally lock said ring to said nut; and

an operative part of said plunger which extends into a respective track, said operative part radially displacable by said respective pin whenever said first and second members are fully locked together, said respective pin bearing against and urging said plunger radially outward to rotationally disengage said nut from said coupling ring and allow said coupling ring to rotate freely around said nut in a first direction whenever said first and second members are fully locked together.

4,917,526

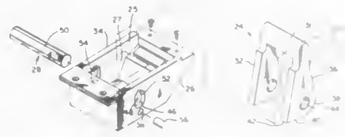
CLEVIS ASSEMBLY FOR HANGING AIRBORNE STORES

Peter S. Paterson, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1986, Ser. No. 913,033

Int. Cl.[4] F16C *11/10*

U.S. Cl. 403—79 25 Claims



1. A clevis assembly for an airborne store, comprising:

a clevis block having means therein defining a recess, and having an exterior surface adapted to be mounted flush with an exterior surface of the airborne store;

a clevis movable between an extended position in which the store can be supported from an ejector shackle carried by an aircraft, and a vertically retracted position translated partially into said recess, and a stowed position in which it is rotated fully into said recess flush with said exterior surface of said clevis block after the store is dropped from the aircraft, said clevis having two parallel legs, each having an inner end pivotally connected to said clevis block, and each having an outer end connected to the other of said legs by a cross bar, said clevis presenting a generally U-shaped outline for reception of said ejector shackle for selectively supporting said clevis and for releasing said clevis to allow the airborne store to be released from said shackle at the desired moment;

a horizontally disposed pivot pin having a non-round profile along at least a load bearing portion of the length of said pivot pin on a vertical extremity thereof when said clevis is in its extended position, said pivot pin extending through said inner end of each of said clevis legs and into said clevis block;

means in one of said clevis block and said leg inner ends defining, when said clevis is in its extended position, a hole into which said pivot pin extends, said hole being vertically elongated and having a non-round vertical extremity similar in shape to the shape of the non-round vertical extremity of said non-round portion of said pivot pin;

whereby said non-round vertical extremity of said pin fits into said non-round vertical extremity of said hole when said clevis is in its extended position so that said clevis is restrained from rotating until it retracts to its vertically retracted position.

4,917,527

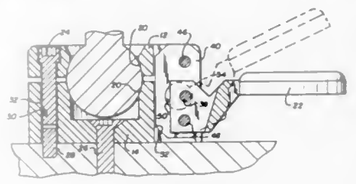
SNAP-LOC COUPLING DEVICE

William A. Bollinger, Rte. 2, Box 219, Manning, S.C. 29102

Filed Nov. 21, 1988, Ser. No. 273,813

Int. Cl.[4] F16C *11/06*

U.S. Cl. 403—90 16 Claims



1. A clamping device comprising:

a first clamping plate;

a second clamping plate;

means for coupling said first clamping plate to said second clamping plate;

said first clamping plate and said second clamping plate defining therebetween a ball seat for receiving a ball-shaped element provided on an object to be clamped thereby;

a clamping lever pivotally mounted to one of said first and second clamping plates and having an unlocked position and a locked position; and

a plate element pivotally mounted to the other of said first and second clamping plates, said plate element further being pivotally mounted to said clamping lever,

whereby movement of said clamping lever from said unlocked position to said locked position pivots said plate element relative to the other of said first and second clamping plates and pulls said plate element so as to urge said other of said first and second clamping plates against a ball disposed within said ball socket to thereby clamp and lock the ball relative to said first and second clamping plates.

4,917,528

PANEL JOINT

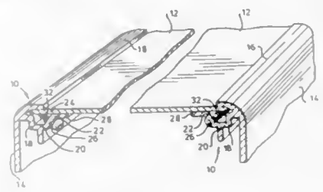
Peter Shewchuk, 940 Meyerside Drive, Mississauga, Canada (L5T 1R9)

Filed Apr. 11, 1988, Ser. No. 180,090

Claims priority, application Canada, Apr. 13, 1987, 534547

Int. Cl.[4] F16B *12/00*

U.S. Cl. 403—231 15 Claims



1. A panel joint comprising:

an elongated member having a first transverse flange;

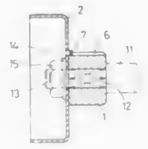
a second transverse flange spaced from said first flange, the second flange having a base portion and an outer portion extending toward the first flange to a define a generally C-shaped slot between said flanges;

a planar panel having a peripheral edge portion adapted to be located in said C-shaped slot to bear against one of said flanges; and

a releasable retaining element attached to the other of said

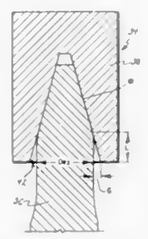
flanges which engages and urges said panel edge portion against said one flange.

4,917,529
ARRANGEMENT FOR COUPLING ROTARY SHAFT WITH ROTARY MEMBER
Tadashi Hishida, Sakai, Japan, assignor to VIV Engineering Inc., Osaka, Japan
Filed May 16, 1989, Ser. No. 353,332
Int. Cl.[4] B25G *3/00*
U.S. Cl. 403—259 4 Claims



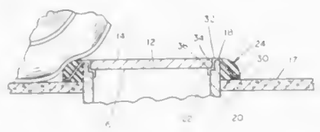
1. An arrangement for coupling together a rotary shaft and a rotary member having a center hole therethrough, comprising:
a polygonal cross-section part adjacent one end of said shaft and a protruding portion at said end of said shafl and having a threaded portion thereon;
a boss having a polygonal cross section-hole extending axially therethrough with a cross-sectional shape complementary to the cross-sectional shape of said part of said shaft, said boss being fixedly mounted on said polygonal cross-section part of said rotary shaft with said protruding end of said rotary shaft extending through said center hole in said rotary member;
recess means in said boss;
engaging means on said rotary member constituted by a portion of the thickness of said rotary member deformed in a direction toward said boss and having a shape complementary to said recess means and fitting into said recess means; and
threaded means engaged on said threaded portion and clamping said rotary member against said boss.

4,917,530
STRUCTURAL JOINT
John A. Engelhardt, Warsaw, and David C. Kelman, Winona Lake, both of Ind., assignors to Boehringer Mannheim Corporation, Indianapolis, Ind.
Filed Aug. 31, 1989, Ser. No. 401,178
Int. Cl.[4] B25G *3/00*
U.S. Cl. 403—334 6 Claims



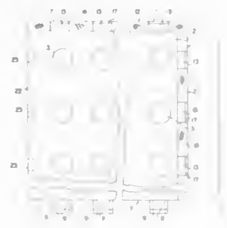
1. A structural joint comprising:
a female member having an elongated generally right circular cone shaped bore therein with a mouth defining entry into the bore; and
an elongated male member matingly engageable with said female member having a contoured outer surface extending between a terminal end and an inboard region, said male member including:
a generally right circular cone shaped coupling element adjacent said terminal end congruently sized and shaped relative to the bore in said female member for mating engagement with the bore and, when joined with said female member, extends to a location within the bore spaced from the mouth thereof;
a transitional element having a transverse dimension substantially smaller than the mouth of the bore extending longitudinally of said male member from a location within the bore spaced from the mouth thereof to a location beyond the mouth of the bore when said male member is joined with said female member; and
an intermediate element having a smooth convex shaped outer surface of continuous curvature interconnecting said coupling element and said transitional element such that upon the application of bending stresses on said male member, said convex shaped outer surface of said intermediate element is caused to rollingly engage the bore of said female member.

4,917,531
TEMPORARY DEVICE FOR USE WITH A MANHOLE SUPPORT DURING STREET REPAIRS
Robert E. McGinnis, 5712 N. 33rd St., Omaha, Nebr. 68111
Filed Jun. 8, 1989, Ser. No. 363,637
Int. Cl.[4] E02D *29/14*
U.S. Cl. 404—26 15 Claims



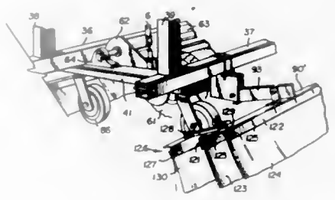
13. A temporary device for use with a cylindrical support positioned in a roadway which has been partially ground down for resurfacing with the grinding of the roadway causing the upper end of the cylindrical support to be elevated above the ground surface of the roadway, comprising,
a flat, resilient temporary ramp member having a thickness approximately equal to the vertical distance between the upper end of the cylindrical support and the ground surface of the roadway,
said ramp member having a central opening formed therein adapted to receive the cylindrical support therein whereby said ramp member may be temporarily positioned on the ground roadway around the cylindrical support to cushion contact between a vehicle wheel and the cylindrical support prior to the roadway being resurfaced,
and means operatively securing said ramp member to said cylindrical support.

4,917,532
GRID PLATE
Karl Haberhauer, Gruenstadt; Wolfgang Schibalski, Lampertheim-Rosengarten; Walter Bircky, Bolanden, and Theo Rydman, Hettenleidelheim, all of Fed. Rep. of Germany, assignors to Dr. Spiess Kunstoff-Recycling GmbH Co., Kleinkarlbach, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 115,979, Nov. 2, 1987, Pat. No. 4,826,351, which is a continuation-in-part of Ser. No. 934,097, Nov. 24, 1986, abandoned. This application Nov. 15, 1988, Ser. No. 271,576
Claims priority, application Austria, Nov. 16, 1987, 3021/87
Int. Cl.[4] E01C *5/22*
U.S. Cl. 404—35 15 Claims



1. A grid plate of plastic material having a rough slippage-preventing top side and a rib-reinforced bottom side, the grid plate being adapted to be emplaced as a securing element for at least parking places, road embankments, and ramps comprising:
a three-dimensional grid plate having a substantially square shape and including an upper face, a lower section opposite the upper face, at least four sides around the perimeter extending from the upper face to lower section, the lower section of the grid plate having ring-shaped reinforcement members which extend from the upper face and are connected with one another by reinforcing webs and to the sides of the grid plate;
plug-in connecting means adapted to be locked together and again disconnectable for connecting together emplaced grid plates including at least one insertable first connecting web means projecting out of a first side wall of the grid plate at given positions and extending substantially parallel to the upper face, said first connecting web means each having a free-end angularly bent hook-shaped into a half-hinge such that the free ends of the first connecting web means points in the direction towards the upper face of the grid plate, at least one insertable, second connecting web means projecting out of a side wall which abuts the first side wall of the grid plate at given positions and extending substantially parallel to the upper face, said second connecting web means each having a free-end angularly bent hook-shaped into a half-hinge such that the free ends of the second connecting web points in the direction towards the lower section of the grid plate and at least one horizontal wall aperture means being provided in each of the at least two side walls which do not include first and second web connecting means in positions on each of the side walls for engaging first and second connecting web means of adjacently arranged grid plates, each side wall having horizontal wall aperture means also having an offset step-shaped portion in downward direction starting from the upper face of the grid plate and an additional offset, step-shaped portion in upward direction starting from the lower section.

4,917,533
RESURFACING APPARATUS AND PROCESS
Jack H. Wilson, Jackson, Miss., assignor to Sport Koter U.S.A., Inc., Jackson, Miss.
Continuation-in-part of Ser. No. 309,963, Feb. 13, 1989, which is a continuation of Ser. No. 117,495, Nov. 6, 1987, abandoned, which is a continuation-in-part of Ser. No. 10,936, Feb. 5, 1987, Pat. No. 4,789,265. This application Aug. 9, 1988, Ser. No. 230,029
Int. Cl.[4] E01C *19/16*
U.S. Cl. 404—75 25 Claims



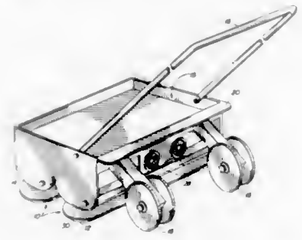
1. A method of resurfacing a surface comprising the steps of:
(a) providing a self-propelled resurfacing device including at least a pair of drive wheels, said device having front and rear faces, and provided with free-floating, spreading and smoothing means on said front and rear faces, the device further including end brush means mounted on said frame in laterally spaced relationship, said end brush means laterally adjustable along at least said front face;
(b) aligning said device along one end portion of the surface;
(c) adjusting said end brush means along the frame to establish a desired lateral space therebetween;
(d) depositing a mass of resurfacing material on said surface along the said front face of the device; and
(e) moving said device across said surface so that said spreading and smoothing means spreads and smooths said resurfacing material uniformly across at least the entire surface between said end brushes, and wherein said spreading and smoothing means erases tracks in said resurfacing material caused by said drive wheels.
6. Resurfacing apparatus comprising:
frame means provided with front and rear faces;
a plurality of wheel means mounted on the underside of said frame means between said front and rear faces;
free floating flexible blade means mounted on, and extending along said front face of said frame, and free floating brush means mounted on, and extending along said rear face of said frame, and end brush means mounted along, and extending forwardly and substantially perpendicularly to each of said front and rear faces;
said flexible blade, brush and one portion of said end brush means adapted to engage a mass of resurfacing material applied to a surface at an angle of about 45° relative to vertical during forward movement of the apparatus.

4,917,534
EPOXY FLOOR FINISHING MACHINE
Teddie G. Baugh, P.O. Box 616, Carthage, Mo. 64836
Filed Jul. 19, 1988, Ser. No. 221,058
Int. Cl.[4] E01C *19/16*
U.S. Cl. 404—97 1 Claim

1. An epoxy floor finishing machine, comprising:
a chassis accommodated to receive weights thereon;
a plurality of laterally spaced, elongated rigid blades mounted to the underside of the chassis and having flat undersurfaces for smoothing epoxy flooring material and rounded ends for avoidance of edge lines in the flooring;
means for pivoting the blades about their axes and for establishing fixed positions of the blades relative to the chassis

for selecting the angling of the blades for smoothing the flooring material;

wheels mounted on the chassis in normally raised position above the blades when the blades are in a flooring contacting position;



handle means freely pivotable relative to the chassis for dragging the blades of the weighted chassis across the flooring during smoothing; and

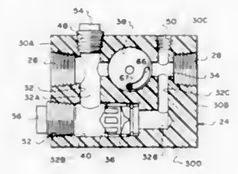
stop means located on the chassis, establishing a selectively encounterable limit to the pivoting of the handle means about the chassis, for lowering the wheels for transportation of the chassis in a blade floor noncontacting position.

4,917,535

PRESSURE COMPENSATING FLOW RATE CONTROL DEVICE WITH DUAL OPERATING MODES

Thomas N. Prassas, Phoenix, Ariz., assignor to Aquapore Moisture Systems, Phoenix, Ariz.

Filed Apr. 19, 1989, Ser. No. 340,324
Int. Cl.[4] A01G *25/06*
U.S. Cl. 405—36 **28 Claims**



1. A pressure compensating flow rate control device, comprising:

(a) a body having an external surface with an inlet port recessed therein for receiving a fluid and an outlet port recessed therein for discharging a fluid;

(b) means defining a first passage internally of said body and extending between and interconnecting said inlet and outlet ports for providing a first internal fluid flow path through said body from said inlet port to said outlet port;

(c) means defining a first chamber internally of said body in said first passage thereof and being spaced from said inlet and outlet ports and closed at said external surface of said body;

(d) a flow regulating mechanism disposed in said first chamber and hidden from view at said external surface of said body for regulating fluid flow through said first flow path to provide a preset constant rate of fluid flow from said body at said outlet port and thereby define a controlled mode of operation of said device;

(e) means defining a second passage internally of said body extending between and interconnecting said inlet and outlet ports for providing a second internal flow path through said body from said inlet port to said outlet port;

(f) means defining a second chamber internally of said body in said second passage thereof spaced from said inlet and outlet ports and having an opening defined in the external surface of said body and spaced from said first and second external surface portions; and

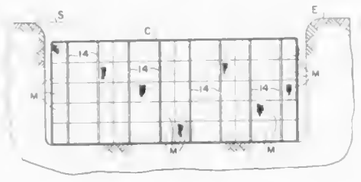
(g) a flow diverting mechanism disposed in said second chamber and having an actuating element exposed through said opening of said second chamber for adjusting said flow diverting mechanism between a first condition for blocking fluid flow through said second flow path and a second condition for permitting fluid flow through said second flow path and thereby for correspondingly operating said de.ice in said controlled mode to discharge fluid from said outlet port at said constant flow rate and in a by-pass mode to discharge flu.d from said outlet port at an augmented flow rate which combines fluid flow through said second flow path with fluid flow through said first flow path and is thereby higher than said constant flow rate alone.

4,917,536

FLUID STORAGE SYSTEM

Joseph Glasser, Storrs, Conn., assignor to Eljen Corporation, Storrs, Conn.

Filed Jan. 31, 1989, Ser. No. 304,663
Int. Cl.[4] E02B *11/00*
U.S. Cl. 405—45 **2 Claims**



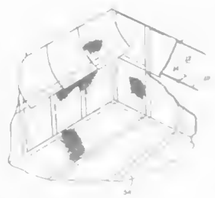
1. A subterranean fluid storage system comprising a plurality of rectangularly shaped modules of uniform geometry, each module having a height (h) and a width (w) and a length (l), each module including at least two straps encircling said module lengthwise, said straps being spaced from but parallel to one another, each module further including a plurality (N) of rigid core sheets, each core sheet formed from an initially flat rigid thermoplastic material having a thickness (t), each core sheet further characterized by a rectangular height (h) and width (w), each core sheet further including opposed faces with alternate raised land portions and with surrounding valleys of corresponding configuration to provide an overall thickness (T) for each core sheet that is approximately twenty-five times the thickness (t) of the initially flat sheet material, fluid pervious non-woven flexible fabric segments interposed between adjacent core sheets in each module, said core sheets in said fabric segments cooperating to define a laminated stack of length at least N×T, wherein N equals the number of core sheets and T equals the overall thickness of one such core sheet, said fabric segments being relatively thin in comparison to the overall thickness of the core sheets, and said modules being arranged adjacent to one another in a ground excavation, said modules being stacked one on top of another to a height which is in even multiple of the height of each module and wherein additional modules are arranged in side-by-side relationship with said vertically stacked modules, and a fluid pervious fabric material covering said stacked adjacent modules.

4,917,537

FLUID IMPERVIOUS, MULTIPLE PANEL LINING SYSTEM

Carl C. Jacobson, 1355 E. Calle de Caballo, Tempe, Ariz. 85284

Filed Apr. 12, 1989, Ser. No. 336,897
Int. Cl.[4] B09B *1/00*
U.S. Cl. 405—52 **44 Claims**



6. A fluid impervious, multiple panel lining system positioned adjacent to and supported by a support surface, comprising:

a. a first generally rectangular foldable panel with an open mesh network, first and second vertical edges, an inner layer contacting the support surface and an outer layer placed above and overlapping the inner layer;

b. a second generally rectangular foldable panel with an open mesh network having first and second vertical edges, an inner layer contacting the inclined surface and an outer layer placed above and overlapping the inner layer, the second panel being laterally aligned with respect to the first panel such that the adjacent vertical edges of each panel overlap to create a vertical overlap zone;

c. a first sealant layer sealed to and supported by the mesh network of the inner layers of the first and second panels, the first sealant layer extending into the vertical overlap zone and sealing the inner layer of the first panel to the inner layer of the second panel; and

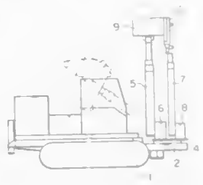
d. a second sealant layer for covering the outer layers of the first and second panels and for sealing together the adjacent vertical edges of the outer layers of the first and second panels within the vertical overlap zone.

4,917,538

TUNNEL LINING PROCESS AND APPARATUS THEREFOR

Shigetoshi Koga; Yoshio Hosokawa; Hideo Sueki; Mikio Okano; Ryota Fujiwara, all c/o Fujita Kogyo Kabushiki Kaisha, 6-15, Sendagaya 4-chome, Shibuya-ku, Tokyo; Yukihisa Inagawa, 7-313, Hayashi-cho, Ogaki-shi, Gifu-ken, and Ken Fukui, 3-31, Shibata-cho, Minami-ku, Nagoya-shi, Aichi-ken, all of Japan

Filed Apr. 5, 1989, Ser. No. 333,583
Claims priority, application Japan, Apr. 26, 1988, 63-101349
Int. Cl.[4] E21D *11/00*
U.S. Cl. 405—150 **6 Claims**



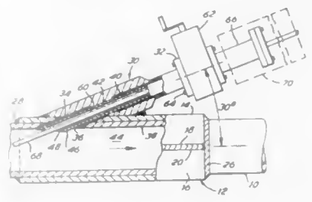
1. A tunnel lining process consisting of the steps of disposing a pressing form for pressing a tunnel concrete lining and a side form constructed separately from said pressing form and positioned on the side of said pressing form opposite to an already placed concrete lining along an excavated surface of a tunnel, placing lining concrete in a space delimited by said both forms, the excavated surface and the already placed concrete lining so as to press the lining concrete onto the excavated surface to be lined, thereafter displacing said pressing form along said side form and in parallel to said surface to be lined, then replacing the steps of placing lining concrete and displacing said pressing form until placing of concrete over the entire length of the side form is completed, displacing said side form to the next lining region after the finally placed concrete has revealed its mechanical strength, and repeating the above-described steps.

4,917,539

PIPELINE SYSTEMS

Brian E. de la Salle, Tring, United Kingdom, assignor to Saunders & Dolleymore, Watford, England

Filed Jun. 2, 1988, Ser. No. 201,692
Claims priority, application United Kingdom, Jun. 4, 1987, 8713069
Int. Cl.[4] F16L *1/00*
U.S. Cl. 405—154 **9 Claims**



1. A method of forming a cable entry or exit pipe on a fluid transportation pipeline while in normal operation full of and transporting a fluid under a positive pressure, which method comprises the following steps:

(a) producing a branch pipe having an end thereof shaped to fit closely around a section of the pipeline when disposed at a predetermined acute angle thereto, the branch pipe having a bore which is substantially less than that of the pipeline;

(b) securing in a fluid tight manner said end of the branch pipe to the pipeline section thereby to provide an oblique branch pipe lying at an acute angle to the pipeline section, which angle is suitable for the entry into or exit from the pipeline of a cable or other line;

(c) securing an isolating valve in a fluid tight manner to the free end of the oblique branch pipe;

(d) securing a fluid tight drilling apparatus in a fluid tight manner to the free side of the isolating valve, which fluid tight drilling apparatus is equipped with a removable drill bit;

(e) opening the valve and introducing the drill bit through the opened valve into the oblique branch pipe;

(f) rotating and progressively advancing the drill bit into oblique contact with and through the wall of the pipeline section while simultaneously supporting and guiding the drill bit against transverse displacement thereof by the pipeline wall being drilled obliquely, thereby to form in the pipeline wall an aperture, which aperture has a jagged edge to the bore of the pipeline section;

(g) withdrawing the drill bit and closing the valve;

(h) producing a tubular branch pipe liner for lodgment in the oblique branch pipe to serve there as a cable guide tube covering said jagged edge of the aperture, the liner having one end shaped and smoothed so as to minimize damage to a cable being fed into or withdrawn from the pipeline through the liner;

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(i) replacing the drill bit by a driving tool carrying temporarily thereon said branch pipe liner;
(j) opening the isolating valve and advancing the driving tool and branch pipe liner through the isolating valve into the oblique branch pipe thereby to engage the branch pipe liner in the branch pipe in a predetermined disposition in which said shaped one end just projects into the pipeline section, covers said jagged edge, and is properly oriented for the passage therethrough of a said cable;
(k) securing the liner in the branch pipe in said disposition;
(l) withstanding the driving tool through the isolating valve;
(m) closing the isolating valve; and
(n) removing the drilling apparatus from the isolating valve.

4,917,540

PIPELINE LAYING SYSTEM AND VESSEL WITH PIPELINE STRAIGHTENING AND TENSIONING DEVICE

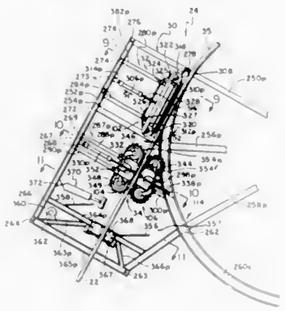
Carlos E. Recalde, Irvine, Calif., assignor to Santa Fe International Corporation, Alhambra, Calif.

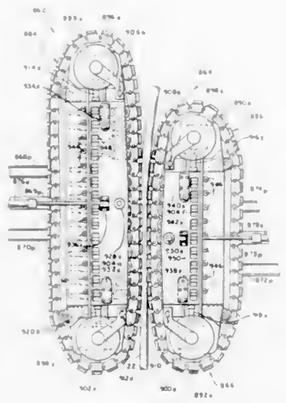
Division of Ser. No. 48,454, May 11, 1987, Pat. No. 4,820,082, which is a continuation of Ser. No. 757,790, Jul. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 646,112, Aug. 31, 1984, Pat. No. 4,687,376. This application Nov. 7, 1988, Ser. No. 268,237

The portion of the term of this patent subsequent to Feb. 9, 2005, has been disclaimed.

Int. Cl.[4] F16L *1/04;* B63B *35/04*

U.S. Cl. 405—168 10 Claims





1. A straightening device for use on a reel pipelaying vessel adapted to laying out a single pipeline in a body of water comprising:
a pair of straightening assemblies adapted for being positioned in opposite facing directions on either side of said pipeline, each of said assemblies adapted for being supported for reciprocal movement toward and away from said pipeline;
adjustment means mounted within said assemblies and adapted for individual adjustability to enable the establishment of predetermined curvatures in the facing directions of said assemblies;
said adjustment means adapted for enabling independent serial adjustment of pipeline curvature;
each of said straightening assemblies comprising a carriage base, an endless chain track positioned therearound, and a series of adjustable guide rollers mounted within said carriage base to enable the establishment of different curvatures in the facing directions of said chain track, with said adjustment means mounted within said carriage base and adapted for enabling independent adjustment of said guide rollers in a direction substantially perpendicular to said pipeline.

4,917,541

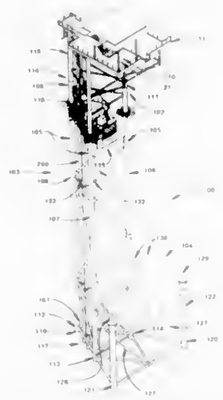
OFFSHORE SUPPORT STRUCTURE METHOD AND APPARATUS

Samuel C. Carruba, Houston, Tex., assignor to CBS Engineering, Inc., Houston, Tex.

Filed Aug. 9, 1989, Ser. No. 391,436

Int. Cl.[4] E02B *17/02*

U.S. Cl. 405—227 9 Claims



1. An offshore support structure for use with at least one well located in a body of water, comprising:
a central support structure having three tubular legs, each leg having upper and lower ends, the legs all having a length greater than the depth of the body of water, and the upper ends of each of the legs adapted to be disposed above the surface of the body of water;
a single hollow pile disposed in at least one of the legs of the central support structure and adapted to be driven into the ground below the body of water, the at least one hollow pile having an upper and a lower end, and extending outwardly and upwardly from the leg in which it is disposed and fixedly secured thereto;
a first set of bracing members disposed between and interconnecting the three tubular legs of the central support structure;
an outrigger support structure having at least two tubular legs, each leg having upper and lower ends, the legs each having substantially the same length, which length is substantially less than the depth of the body of water and a plurality of bracing members disposed between and interconnecting the at least two tubular legs;
at least one pile disposed in each of the legs of the outrigger support structure and adapted to be driven into the ground below the body of water and fixedly secured to the leg;
a second set of bracing members disposed between and interconnecting the outrigger support structure to the central support structure; and
the at least one well is disposed within the at least one hollow pile disposed in a leg of the central support structure, whereby the only portion of the support structure subject to wave action on the surface of the body of water is the upper end of the legs of the central support structure and each hollow pile disposed in a leg becomes part of the support structure and is capable of withstanding lateral and axial loads exerted upon the support structure.

4,917,542

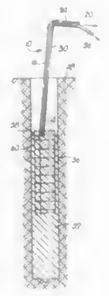
PNEUMATIC GROUT REMOVAL METHOD FOR FORMING FOUNDATION STRUCTURES

Edwin W. Hickey, 3202 Shipping Ave., Coconut Grove, Fla. 33133

Filed Jun. 17, 1988, Ser. No. 209,079

Int. Cl.[4] E02D *5/56, 7/22*

U.S. Cl. 405—241 7 Claims



1. A portable pump for removing a pumpable substance such as grout or the like from a contained volume of said substance and for allowing a person to operate said pump which supporting the weight thereof, said pump comprising:
an elongated pumping unit including
an elongated, tubular, substance-conveying member,
said tubular member having a substance-entry end for insertion into said pumpable substance and a discharge end for discharge of said substance;
rigid support means for engaging the shoulder of a person for allowing the person to support said pump during operation thereof, and
means for injecting a gas under pressure from a source thereof into said tubular member in the vicinity of said entry end, whereby injection of said gas into said tubular member while said member is generally upright and while said entry end is inserted in said substance allows said gas to rise in said tubular member to thereby convey said substance through said entry end and said tubular member for discharge from said discharge end,
said pumping unit being composed of lightweight material such that the total weight of said pump is light enough to be supported by a person while operating said pump.

4,917,543

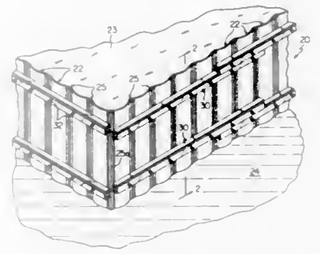
WALL SYSTEM EMPLOYING EXTRUDED PANEL SECTIONS

Richard W. Cole, Nixa; Richard L. Marsh, Springfield, both of Mo., and Joseph V. Tassone, Kettering, Ohio, assignors to Dayco Products, Inc., Dayton, Ohio

Filed Oct. 11, 1988, Ser. No. 255,810

Int. Cl.[4] E02D *29/02, 5/00*

U.S. Cl. 405—262 18 Claims



1 In a retainer wall for use in retaining soil or as a sea wall, in which a plurality of individual panels formed of extruded plastic material are positioned in lateral side-by-side relation and in which generally vertical adjacent marginal edges of said panels are interconnected to form a wall, the improvement comprising a plurality of wale members formed of extruded plastic material and positioned along one side of said wall laterally of said panels, said wale members having overlapping and mutually interlocking end portions for laterally transferring loads and bending moments between adjacent said wale members, and having mutually interengageable laterally extending interlocking flanges for transmitting bending moments between interlocked said members.

4,917,544

METHODS AND APPARATUS FOR PNEUMATICALLY TRANSFERRING A FLOWABLE PRODUCT

Douglas Crahan; Steve Bendig, both of Birmingham, Ala., and Keith Toon, Wichita, Kans., assignors to Vulcan Materials Company, Birmingham, Ala.

Filed Feb. 11, 1987, Ser. No. 13,532

Int. Cl.[4] B65G *53/66, 53/40, 53/12, 53/36*

U.S. Cl. 406—14 8 Claims

4. A method of transferring caustic soda beads from a railcar having an outlet opening, to a receiving zone, said method comprising the steps of:
providing an open-loop air circuit which communicates said outlet opening with said receiving zone by means of a transfer conduit,
pressurizing ambient air to at least 75 psig in a compressor while condensing moisture from the air as it is being pressurized,
conducting pressurized, partially demoisturized air from said compressor through a dryer to further demoisturize the air,
reducing the pressure of said pressurized, demoisturized air to below 25 psig,
conducting a first portion of said demoisturized reduced-pressure air into said railcar to pressurize said railcar,
conducting a second portion of said demoisturized, reduced-pressure air through an automatic control valve and into said transfer conduit and past said discharge opening to cause caustic soda beads to become entrained in said air,
continually sensing the pressure in said railcar and generating a signal indicative of the sensed pressure,
supplying said signal to a pneumatic control system connected to said control valve for automatically opening and closing said control valve in accordance with said signal

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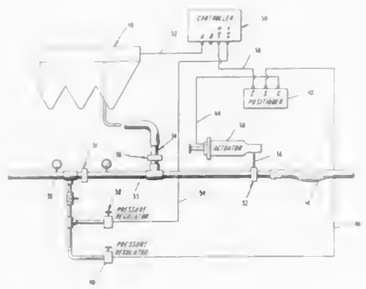
to vary the amount of said first air portion delivered to said railcar to maintain a predetermined pressure therein, said pneumatic control system operated by pressurized air withdrawn from said circuit ahead of said step of reducing said air pressure,

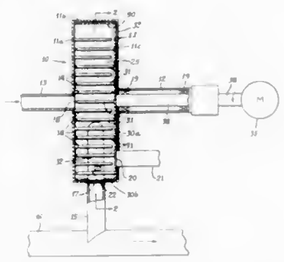


conducting the pressurized air and entrained caustic soda beads in said transfer conduit to said receiving zone, and thereafter
discharging said pressurized air to atmosphere.

4,917,545
APPARATUS FOR CONTROLLING MATERIAL FLOW
Jean H. Lagneau, 1 Grande Rue, Tremblay les Villages, 28170 Chateauneuf en Thymerais, France
Filed Mar. 27, 1987, Ser. No. 30,841
Claims priority, application France, Apr. 4, 1986, 86 04847
Int. Cl.[4] B65G *53/02*
U.S. Cl. 406—86 7 Claims

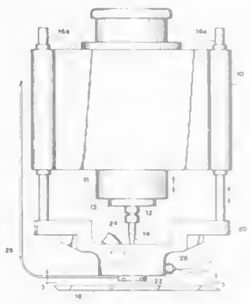
1. An apparatus for directing the flow of particulate material, comprising:
(a) at least one hopper providing a path for flowing particulate material, said at least one hopper comprising two opposed undulating sheets defining said path therebetween, each undulating sheet:
(1) forming a boundary between said path and an air channel; and
(2) having openings therein for allowing air to enter said path; and
(b) a supporting surface corresponding to each of said undulating sheets, each supporting surface:
(1) abutting its corresponding undulating sheet on the interior of the air channel bounded by said undulating sheet; and
(2) rising above the openings in its corresponding undulating sheet, thereby preventing particulate material flowing in said path from entering said air channel.

4,917,546
SOLIDS FLUIDIZER-INJECTOR
Tytus R. Bulicz, Hickory Hills, Ill., assignor to Institute of Gas Technology, Chicago, Ill.
Filed Mar. 26, 1986, Ser. No. 844,118
Int. Cl.[4] F04B *1/08*
U.S. Cl. 406—123 29 Claims



1. A process for fluidizing solid particles for feeding to a solid particle utilization means, comprising: supplying a feed selected from the group consisting of solid particles, agglomerates of said solid particles, and at least one of said solid particles and said agglomerates in carrier gas, said solid particles having an average particle diameter of about 1 to about 500 microns through one end wall of a fixed casing to a fluidizing chamber defined by said one end wall of said fixed casing and the enclosing side wall and opposite end wall of a rotatable cylinder having one open end and rotatable within an enclosing side wall of said fixed casing; rotating said rotatable cylinder causing rotary motion of said solid particles by a plurality of rotating projections extending from said rotatable cylinder end wall for a substantial portion of the length of said fluidizing chamber toward said fixed casing one end wall and causing reduction of size of agglomerates of said solid particles by said rotating projections coacting with stationary projections extending from said fixed casing one end wall for a substantial portion of the length of said solids fluidizing chamber toward said rotatable cylinder end wall, having spacings between said stationary projections of about 0.25 to about 0.75 inch and arranged with respect to said rotating projections to permit rotation of said rotatable cylinder; passing said solid particles through a solids feed means comprising an orifice open to said solids fluidizing chamber for feeding solid particles to a solid particle utilization means.

4,917,547
APPARATUS AND METHOD FOR DISPENSING SOLUTION TO PREVENT SMEAR IN THE MANUFACTURE OF PRINTED CIRCUIT BOARDS
Jeffrey W. Frederickson, 2107 SW. Edgewood Rd., Portland, Oreg. 97201, and Douglas R. Kocher, 10961 SE. Sunnyside, Clackamas, Oreg. 97045
Filed Feb. 9, 1989, Ser. No. 307,996
Int. Cl.[4] B23Q *11/12*
U.S. Cl. 408—1 R 11 Claims

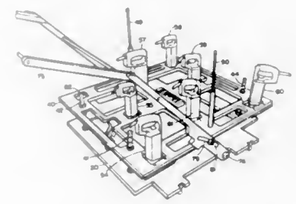


1. A method of preventing smear in the manufacture of multi-layer printed circuit boards comprising the steps of:
(a) placing a multi-layer printed circuit board in a drilling jig;
(b) bringing a drill into proximity with the multi-layer printed circuit board;
(c) sensing the proximity of the drill to the multi-layer printed circuit board; and
(d) at a predetermined proximity of the drill to the circuit board, dispensing an aqueous smear preventing solution said solution including at least one active amine, a fatty acid, and a surface tension reducing agent onto the drill as it engages the multi-layer printed circuit board.

8. The delivery system for applying a smear preventing solution to the walls of holes in a printed circuit board as the holes are being drilled comprising:
(a) A drilling jig including a reciprocally vertically movable drill;
(b) a housing enclosing the drill and movable in a vertical direction;
(c) a pressure foot comprising a plastic ring connected to a bottom opening of the housing for contacting the surface of the printed circuit board while drilling takes place, said pressure foot having a radial bore therethrough; and
(d) a source of smear preventing solution coupled to said radial bore in said ring by a conduit for spraying said solution across the surface of said printed circuit board onto said drill at the point of contact between said drill and said printed circuit board.

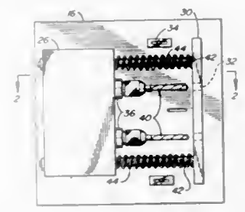
4,917,548
PATTERN DRILLING MACHINE FOR SECURING ROOFING INSULATION
Robert W. Ruff, 5210 Park St., Hudsonville, Mich. 49426
Filed Apr. 4, 1988, Ser. No. 177,095
Int. Cl.[4] B23B *41/00, 47/00*
U.S. Cl. 408—1 R 3 Claims

1. A machine for drilling a pattern of holes in a substantially horizontal panel, including a template having openings, and a plurality of drilling devices mounted on said template at said openings, and having drilling axes traversing said template, wherein the improvement comprises:
means forming a frame establishing a platform and having an opening;
guideway means disposed perpendicularly to said platform on one of said frame and said template, and guideway follower means on the other thereof;
actuating means operative to position said template along said guideway means, and thereby cause portions of said drilling devices to move through said frame opening into said panel; and



panel-engaging means adapted to support said frame on said panel, said panel-engaging means including a plurality of rollers each having an axial length exceeding the diameter thereof, said drilling devices being pistol drill units, and said template including clamping means securing said drill units in position at said openings in said template.

4,917,549
BORING MACHINE
Richard W. Geernaert, 350 Morris St., Sebastopol, Calif. 95472
Filed Dec. 5, 1988, Ser. No. 280,011
Int. Cl.[4] B23B *41/00, 49/00*
U.S. Cl. 408—42 6 Claims



1. A boring machine for drilling a pair of holes in an article having an outside surface and an inside surface to be drilled, said inside surface to be drilled generally perpendicular to said outside surface, said boring machine comprising:
a template member for placement against said article outside surface;
motor means connected to said template member;
switch means for activating said motor means;
a pair of drill members connected to said motor means and mounted in a housing beneath said template member in parallel, side-by-side arrangement, said drill members oriented generally parallel to said template member and said article outside surface, and perpendicular to said article inside surface to be drilled;
a guide mechanism including a front plate, said front plate connected to said template member by at least one guide rod member conditioned to retract relative to said housing, said front plate including a pair of guide holes conditioned to permit penetration of said front plate by said drill members; and
stop means for limiting the retraction of said guide rod member, wherein when said boring machine is placed adjacent said article so that said template member is against said article outside surface and said front plate is against said article inside surface to be drilled, and said

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switch means activates said motor means, said boring machine may be moved so that said front plate and said guide rod member retract relative to said housing, and said drill members drill a pair of holes in said article inside surface.

4,917,550

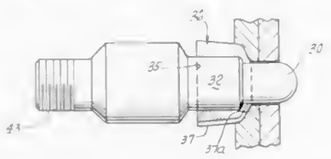
COUNTERSINK FORMING TOOLING

John A. Aurentz, Fallbrook, Calif., assignor to Briles Rivet Corporation, Oceanside, Calif.

Continuation of Ser. No. 239,708, Sep. 2, 1988, which is a continuation-in-part of Ser. No. 5,101, Jan. 20, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 312,229

Int. Cl.[4] B23B *51/10*

U.S. Cl. 408—225 6 Claims



1. In tooling to form a countersink and counterbore in a workpiece, the countersink axially intersecting a bore hole in the workpiece, the combination comprising:

(a) a first part defining an axis and that extends axially forwardly in the bore hole,

(b) a rotatable carrier connected with said first part,

(c) and a cutter blade on the carrier, the blade projecting radially relative to said first part and forming at least one cutting edge spaced outwardly of a cylinder defined by said first part, said cutting edge shaped to form said countersink and counterbore at one end of said bore hole,

(d) said first part having shoulder means for defining a rectangular hole in which said blade is removably received and held and said first part also having a forward portion projecting forwardly of the blade and defining surfaces to engage the previously drilled bore hole,

(e) and including a retainer adjustably received in said first part and positioned to effect holding of the blade in engagement with a location edge defined by one of said first part and carrier,

(f) said blade and said location edge having tongue and groove interfit to radially center the blade relative to said first part, and said first part having a forwardly facing convex nose and defining a pilot to guidedly interfit the bore hole.

4,917,551

PROGRESSIVE BLIND SPLINE BROACH MACHINE AND METHOD

Robert E. Roseliep, 6 Elmsleigh La., Grosse Pointe, Mich. 48230

Filed Sep. 14, 1988, Ser. No. 244,010

Int. Cl.[4] B23D *37/08*

U.S. Cl. 409—244 6 Claims

1. A method of progressively broaching blind splines or similar shapes such as cams or irregular profiles or multiple workpieces which comprises:

(a) providing an indexable work table having a plurality of work holding stations arranged in predetermined spacing along an indexing path,

(b) providing a work loading station and a work unloading station in the indexing path at adjacent locations between said work holding stations,

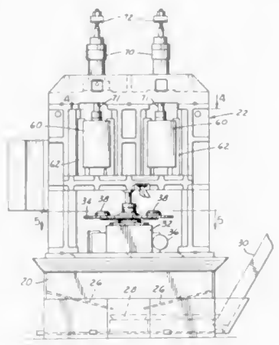
(c) providing a plurality of axially movable, non-rotating, reversible tool rams in stationary positions above the indexing path, each tool ram spaced to register with respective work holding stations,

(d) providing a plurality of individual reversible, piston-cylinder, non-rotating drives each coupled to a tool ram and connected to a fluid pressure source,

(e) indexing the work table in a step-by-step motion,

(f) loading a workpiece at a work loading station in each work holding station as the table is indexed,

(g) unloading a workpiece at the work unloading station as the table is indexed,



(h) mounting a cutting tool on each tool ram, and

(i) actuating each piston-cylinder drive to move each ram and cutting tool toward a workpiece in a work station to accomplish metal removal between indexing steps,

whereby a metal removal cut is performed on each workpiece at each work holding station between indexes and a plurality of metal removing cuts are performed by each tool ram between indexes.

4,917,552

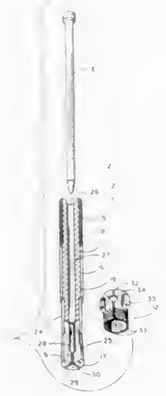
PIN DRIVE ANCHOR WITH LOCKING SLEEVE

Danny E. Crawford, Charles City, Iowa, assignor to Diversified Fastening Systems, Inc., Charles City, Iowa

Filed Sep. 5, 1989, Ser. No. 402,646

Int. Cl.[4] F16B *13/06*

U.S. Cl. 411—32 6 Claims



1. An improved pin drive anchor for securing various types of articles to a masonry or concrete wall, said anchor comprising:

(a) an elongated body having:

(1) an outer generally cylindrical end portion having threads for attaching said articles to said wall;

(2) a generally cylindrical center portion;

(3) an inner generally cylindrical end portion that is approximately equally divided into a reduced section extending from said center portion and an inclined section that extends from said reduced portion to the free terminus of said inner end portion; and

(4) a longitudinal axially aligned bore that includes a first section with a generally uniform diameter extending from the free terminus of said outer end portion to a point proximate with said inclined section and a second section that has a diameter smaller than that of said first section and extends inwardly from said first section;

(b) a sleeve member secured on said reduced section of said inner end body portion;

(c) said sleeve member and said body inner end portion being slotted to permit expansion of said sleeve member and said inner end portion of said body when a pin is driven through the entire length of said bore.

4,917,553

SLIDING NUT OR SCREW FOR INSERTION INTO C-BARS

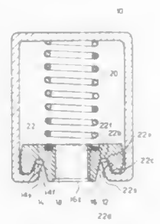
Franz Muller, Eichelhaher Str. 1, 6200 Wiesbaden, Fed. Rep. of Germany

Filed Apr. 7, 1989, Ser. No. 334,433

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1988, 3811974

Int. Cl.[4] F16B *27/00, 37/00, 35/06*

U.S. Cl. 411—85 15 Claims



1. A locking member which is one of a nut and screw head of a nut and screw assembly such that said locking member is received into a C-bar having inwardly pointing marginal webs, said locking member comprising:

a bottom engaging side in which a pair of longitudinal grooves is provided with each said groove receiving in an open top thereof a respective web of the C-bar, each said groove defining a bottom wall and opposed side walls which said side walls are inclined inwardly toward one another from said open top to said bottom wall, and each said groove also having a projection from one of said side walls of each said groove and a corresponding indentation on the other said side wall of each said groove laterally opposite said projection, such that as the nut and screw assembly is tightened said projection causes the marginal web adjacent thereto to laterally bend in an arcuate manner towards said indentation.

4,917,554

SCREW UNIT TO JOIN SEMI-RIGID MATS TOGETHER

Walter Broan, Arpke, Fed. Rep. of Germany, assignor to Cryotherm Limited, Leeds, England

Filed Mar. 29, 1989, Ser. No. 330,119

Claims priority, application United Kingdom, Apr. 9, 1988, 8808369

Int. Cl.[4] F16B *35/00*

U.S. Cl. 411—392 17 Claims

1. A screw unit for joining together semi-rigid mats, consisting for example of mineral fibers or foam material, comprising a shaft and an enlargement at one end of said shaft, with said shaft consisting of a wire helix wound in corkscrew fashion, having a longitudinal axis, and continuing at said one end into said enlargement as a spiral winding forming a headpiece, with the helix angle of said wire helix adjacent said headpiece and with respect to said longitudinal axis being smaller than the helix angle of said wire helix in the region of the other end of said shaft, and with at least a portion of said enlargement extending orthogonally with respect to said longitudinal axis and having a relatively short axial length such that said enlargement is prevented from projecting beyond an adjacent surface of one of said mats.

4,917,555

JOINING ELEMENT FOR TWO MACHINE PARTS OF COMPONENTS, SUCH AS A FIT-STRETCH FASTENER AND FIT-STRETCH BOLT

Hubert Taubert, Neuwied, Fed. Rep. of Germany, assignor to Friedr. Boesner GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 70,907, Jul. 8, 1987, abandoned, which is a continuation of Ser. No. 632,448, Jul. 19, 1984, abandoned. This application Jul. 21, 1989, Ser. No. 384,864

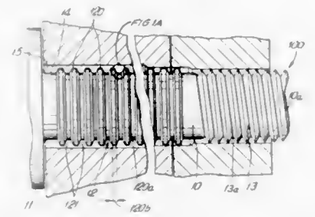
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1983, 8325206[U]

Int. Cl.[4] F16B *35/04*

U.S. Cl. 411—411 5 Claims

1. An axially extending fastening element for interconnecting two machine parts or components, said fastening element comprising a fit-stretch fastener having an axially elongated shank with a head at one end thereof, wherein the improvement comprises that said shank includes an axially extending section with a plurality of parallel concentric fitting rings having an outer diameter and extending around said shank with a concentric fitting groove located between and spacing each pair of adjacent said fitting rings, an axially extending fastening thread extending from at least one end of said section with the fitting rings, said fastening thread having a core forming a stressing cross-section, said fitting rings having a root diameter with a stressing cross-section defined by the root diameter within the fitting grooves and the stressing cross-section of said fitting rings equal to the stressing cross-section of

the core of the fastening thread, the fitting grooves having a surface extending in the axial direction at the root thereof with at least one radius two to three times an axially extending radius defined by the fastening thread, and each said fitting ring having a crest at the outer diameter thereof with a width



approximately corresponding to a width at the pitch diameter of a preliminary shape of the fitting rings of the fastening element, said fastening thread has an outside diameter and the outer diameter of the fitting rings is in the range of 0.1 to 0.5 mm larger than the outside diameter of said fastening thread.

4,917,556

MODULAR WAFER TRANSPORT AND PROCESSING SYSTEM

Lawrence R. Stark, San Jose, and Frederick Turner, Sunnyvale, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 243,110, Sep. 2, 1988, abandoned, which is a continuation of Ser. No. 856,738, Apr. 28, 1986, abandoned. This application May 26, 1989, Ser. No. 358,461

Int. Cl.[4] B65G *1/06*

U.S. Cl. 414—217 9 Claims

1. A wafer transport and processing system comprising:

a transport vacuum chamber having a first plurality of ports and a second plurality of ports, each of said ports of said first and said second pluralities communicating the interior of said chamber to the exterior of said chamber;

valve means for opening and closing each of said ports of said first and said second pluralities;

a wafer processing chamber connected to one of said ports on an exterior side of said valve means for said one port, and a wafer processing chamber connected to another of said ports of said first and said second pluralities on an exterior side of said valve means for said another port; and

transfer means in said transport vacuum chamber comprising:

first transport means in said transport vacuum chamber for transferring a wafer from any first selected one of said ports of said first plurality into said transport vacuum chamber and thence to any selected port in said first plurality of ports; and

second transport means in said transport vacuum chamber for transferring a wafer from any first selected one of said ports of said second plurality into said transport vacuum chamber and thence to any second selected port in said second plurality of ports, said first transport means not being capable of transferring a wafer into said transport vacuum chamber from at least two ports in said second plurality, said second transport means not being capable of transferring a wafer into said transport vacuum chamber from at least two ports in said first plurality;

said transport vacuum chamber not being sectionalizable so as to comprise a vacuum chamber intermediate said first transport means and said second transport means with said first and said second transport means being exterior to said intermediate vacuum chamber, said transfer means being capable of transferring a wafer from said first transport means to said second transport means so that a wafer is transferable from any first selected port in said first plurality of ports to any second selected port in said second plurality of ports.

4,917,557

DOUBLE-DECKED, AUTOMOBILE LOADING APPARATUS, AND METHOD OF USING THE SAME

Fusao Kato, Kurashiki, and Yoshio Umezu, Tokyo, both of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo and Kabushiki Kaisha Marubun, Okayama, both of, Japan

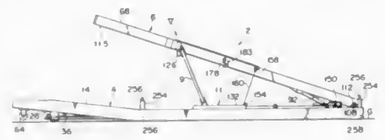
PCT No. PCT/JP87/00279, § 371 Date Sep. 22, 1987, § 102(e) Date Sep. 22, 1987, PCT Pub. No. WO87/06895, PCT Pub. Date Nov. 19, 1987

PCT Filed May 7, 1987, Ser. No. 110,692

Claims priority, application Japan, May 7, 1986, 61-104530; Dec. 4, 1986, 61-289655

Int. Cl.[4] E04H *6/06*

U.S. Cl. 414—229 15 Claims



1. A double-decked apparatus for loading motor vehicles into a container, said apparatus comprising: a base placed within the container, and on which a motor vehicle can be placed in a substantially horizontal position; a movable deck adapted to have a motor vehicle releasably secured thereon and rotatably connected at one end to one end of said base, and able to be positioned in a first position, wherein said movable deck substantially overlaps said base, and rotatable upwardly by external force means from the first position to a second position, where said movable deck is located above the motor vehicle positioned on said base; and at least one support rod interposed between said base and said movable deck for holding said movable deck in the second position,

said base having a contact surface for contacting a surface on which it is placed, and wheels at both end portions of said base, said wheels being designed so as not to bear said base on said surface when said base is placed on a flat surface, to thereby maintain a sufficient reaction applied from said surface to said contact surface, and

said base having first engagement sections formed on both end portions of said base, for engagement by a lifting device when the lifting device is used to lift one end portion of said base, when one end portion of said base is raised slightly above said surface to thereby move said

contact surface away from said surface, and said wheels at the other end portion of the base contact with said surface.

4,917,558

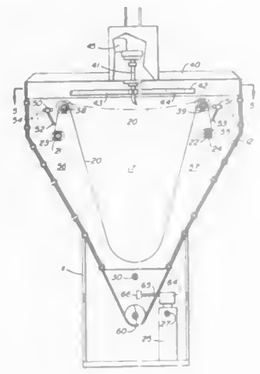
VARIABLE-VOLUME BIN FOR STORING AND DISPENSING PARTICULATE MATERIALS

Bryan M. Jenkins, Davis, Calif., assignor to Regents of the University of California, Alameda, Calif.

Filed Jan. 10, 1989, Ser. No. 295,486

Int. Cl.[4] B65G *65/36*

U.S. Cl. 414—288 14 Claims



1. A device for holding and delivering a load of particulate material such as wood blocks, wood chips—dry or moist—, and briquettes, comprising:

a main bin having an open upper end, closed side walls, and a closed bottom wall,

a pair of drive shafts journaled across and in the side walls of said main bin,

driving means secured to said main bin for driving said drive shafts,

a flexible belt having one end secured to a first said drive shaft on one side of the bin and another end secured to a second said drive shaft on the opposite side of the bin,

transmission means driven by said driving means for driving said drive shafts,

reversing means associated with said transmission means and one of the said drive shafts for reversing the direction of rotation of one said drive shaft, so that rotation of said first and second drive shafts in one direction slackens said belt, for loading said load thereon and rotation of said first and second drive shafts in the opposite direction tighten and raise said belt and drops said load into said main bin, and

delivery means for delivering said particulate material from said main bin.

4,917,559

METHOD AND APPARATUS OF LOADING OR UNLOADING A PLURALITY OF STACKS OF TRAYS FROM A CONTAINER

Jelle van der Schoot, Aalten, Netherlands, assignor to Staalkat B.V., Netherlands

Filed Nov. 14, 1988, Ser. No. 270,590

Int. Cl.[4] B65G *59/02, 67/24*

U.S. Cl. 414—331 24 Claims

14. Apparatus for unloading stacks of trays from a movable storage container, comprising

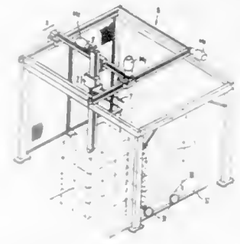
(1) a storage container having vertically disposed supports and a plurality of horizontally disposed sections connecting said supports and forming a plurality of horizontally disposed shelves that are positioned at different vertical levels of said container for holding on each shelf at least three laterally adjacent stacks of trays;

(2) unloading means for unloading a stack of trays from said container and having a configuration such that the unloading means is capable of being inserted under a lowermost tray of the middle stack of said trays of said three adjacent stacks of trays and supporting that middle stack of trays;

(3) unloading moving means for moving said unloading means; and

(4) control means for controlling the movement of the unloading means such that the unloading means is movable;

(a) vertically adjacent said container such as to place said



unloading means at the top of a first shelf to be unloaded;

(b) horizontally forward such as to insert said unloading means under said lowermost tray of said middle stack of trays;

(c) laterally such as to loosen said middle stack of trays from said adjacent stacks so that the middle stack of trays is removable without interference from the other stacks of trays of the said three adjacent stacks of trays;

(d) vertically to slightly elevate the stack of trays from the shelf; and

(e) horizontally backwards such as to remove said middle stack of trays from said container.

4,917,560

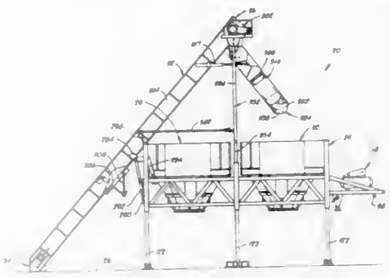
TWIN BIN SELF ERECT SILO

Stuart W. Murray, Edmond; Ronald G. Hankins, and Thomas E. Bowman, both of Oklahoma City, all of Okla., assignors to CMI Corporation, Oklahoma City, Okla.

Filed Jan. 19, 1989, Ser. No. 298,741

Int. Cl.[4] B65G *65/32, 67/08, 69/00*

U.S. Cl. 414—332 19 Claims



1. A silo for storing and dispensing hot mix asphaltic concrete, comprising:

a silo main frame disposed at a selected height above the earth's surface;

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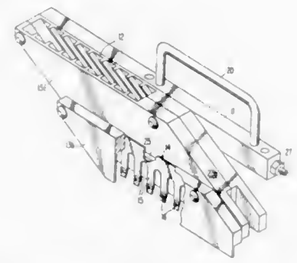
a plurality of bins supported on the silo main frame for storing and dispensing the hot mix asphaltic concrete;
a conveyor extending in an operating position thereof along an angle from a lower end thereof at the earth's surface to an upper end thereof above the bins for receiving hot mix asphaltic concrete at the lower end thereof and discharging the hot mix asphaltic concrete at the upper end thereof; and
slug feeder means, mounted on the upper end of the conveyor to receive the hot mix asphaltic concrete discharged from the conveyor, for forming slugs of hot mix asphaltic concrete and discharging the slugs into selected bins at selected times.

4,917,561

FEEDER CASSETTE FOR A COMPONENT PROCESSING UNIT

Douglas A. Biesecker, Clarks Summit, Pa., and Daniel J. Horton, Conklin, N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Sep. 26, 1988, Ser. No. 249,181
Int. Cl.[4] B65G *59/06*
U.S. Cl. 414—414 **3 Claims**



1. A snap-in feeder cassette device for feeding a plurality of components into a component processing unit, said device comprising:
a component holder body having a plurality of channels formed therein, each channel accommodating a plurality of components;
an outlet for discharging each of the components from the channels; and
a means for activating each of said channels sequentially as said tube holder body is indexed forwardly, so as to discharge components from an activated channel prior to activating the next channel, and continuing until all of the components are discharged, said activating means maintaining the components within said channels anytime that said device is removed from the component processing unit prior to emptying all of said channels, wherein said activating means comprises a leaf spring, said leaf spring having one finger for each of said channels, and wherein each of said fingers has a button fixed at the distal end thereof.

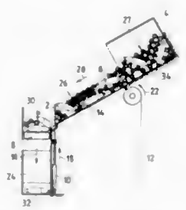
4,917,562

BARRIER-WALL DEVICE FOR SUBDIVIDING AMOUNTS OF PIRNS ACCUMULATED IN BULK

Luigi Colli; Roberto Badiali, and Claudio Pasut, all of Pordenone, Italy, assignors to Savio, S.p.A., Pordenone, Italy

Filed Dec. 16, 1987, Ser. No. 133,639
Claims priority, application Italy, Dec. 23, 1986, 22811 A/86
Int. Cl.[4] B65H *67/06*
U.S. Cl. 414—420 **4 Claims**

1. An apparatus for feeding pirns in a controlled manner from a source to a transfer means, comprising:
(a) a container for pirns adapted to be spaced from and above the transfer means and adapted to be tilted downwardly for discharging pirns therefrom, toward the transfer means;
(b) means for tilting said container downwardly for introducing and discharging pirns therefrom towards the transfer means;
(c) a downwardly sloped substantially linear chute extending from said downwardly tilted container to the transfer means for conveying pirns in a descending manner from said container to the transfer means therebetween;



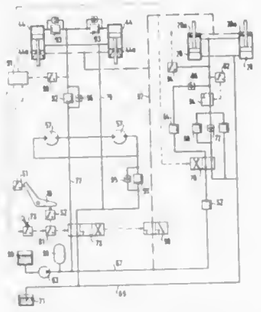
(d) a substantially vertical moveable barrier wall adjacent to the transfer means, wherein said barrier wall is adapted to be lowered or raised to control the number of pirns at the transfer means;
(e) drive means connected to said barrier wall for controlling the height of said wall; and
(f) sensing means operatively connected to said drive means for sensing the height of pirns at the transfer means, wherein said sensing means is adapted to activate said drive means to lower and raise said barrier wall and thereby control the number of pirns at the transfer means.

4,917,563

AIRCRAFT TOWING VEHICLE HAVING A MECHANISM FOR SUBSTANTIALLY PREVENTING RELATIVE AIRCRAFT WHEEL MOVEMENTS

Juergen Pollner, Munich; Gregor Trummer, Aschering, and Peter Moelzer, Schawbhausen, all of Fed. Rep. of Germany, assignors to Krauss Maffei AG, Munich, Fed. Rep. of Germany

Filed Sep. 28, 1988, Ser. No. 250,286
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1987, 3732644
Int. Cl.[4] B64F *1/22*; B62D *49/02*
U.S. Cl. 414—428 **21 Claims**



1. An aircraft towing vehicle comprising a vehicle frame constructed to be maneuvered about a surface in forward and aft directions, the frame including a generally U-shaped, rearwardly opening recess formed to receive an aircraft nose wheel therein:
a ramp carried by the frame, disposed within the recess and adapted to receive thereon the nose wheel;
means disposed forward of the ramp and defining a stop surface adapted to engage the nose wheel on the ramp and limit its relative forward movements:
a nose wheel lifting and securing device carried by the frame, operatively disposed within the U-shaped recess, and including a lifter adapted to be moved into engagement with an aft portion of the nose wheel for moving the nose wheel during a nose wheel engaging operation onto the ramp and against the stop surface defining means: a holder movably carried by the frame, disposed relatively above the ramp and movable in a generally downward direction against a nose wheel supported on the ramp: and power drive means for applying a predetermined nose wheel holding force to at least one of the lifter and the holder when the nose wheel is on the ramp: and
actuating means operatively coupled with the power drive means for automatically activating the power drive means and thereby automatically applying the predetermined force in response to the completion of the nose wheel engaging operation.

4,917,564

HOLD-DOWN SYSTEM FOR AN AIRCRAFT TOWING VEHICLE

Juergen Pollner, Munich; Gregor Trummer, Aschering, and Peter Moelzer, Schawbhausen, all of Fed. Rep. of Germany, assignors to Krauss-Maffei AG, Munich, Fed. Rep. of Germany

Filed Sep. 28, 1988, Ser. No. 72,502
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1987, 3732645
Int. Cl.[4] B64F *1/22*; B62D *49/02*
U.S. Cl. 414—428 **13 Claims**

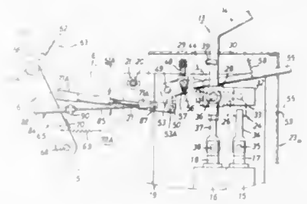
1. An aircraft towing vehicle comprising a vehicle frame constructed to be maneuvered about a surface in forward and aft directions the frame including a generally U-shaped. rearwardly open recess formed to receive an aircraft nose wheel therein;
a ramp carried by the frame and positioned at a forward end of the recess for receiving; and supporting the nose wheel;
means carried by the frame defining a stop surface against which the nose wheel abuts when carried on the ramp to limit relative forward movements of the nose wheel on the ramp;
a lifter carried by the frame and operatively disposed within the recess for engaging an aft portion of the nose wheel and pushing the nose wheel onto the ramp and against the stop surface during a nose wheel engaging operation;
a nose wheel holder including guide means operatively coupled with the frame, permitting relative movements of the holder from a lowermost position along a generally upwardly and forwardly oriented, predetermined path, and positioning the holder so that it engages a wheel being pushed up the ramp by the lifter at a point located substantially in an upper, forward quadrant of the nose wheel periphery;
power drive means operatively coupled with the holder for applying a clamping force of a predetermined magnitude to the nose wheel; and
sequencing means operatively coupled with the power drive means for energizing the power drive means and applying the clamping force to the nose wheel in response to the arrival of the nose wheel at a predetermined location on the ramp.

4,917,565

APPARATUS FOR CONTROLLING POSTURE OF FRONT LOADER

Isao Kourogi, Osaka, Japan, assignor to Kubota Ltd., Osaka, Japan

Filed Sep. 8, 1988, Ser. No. 242,165
Claims priority, application Japan, Sep. 10, 1987, 62-226995; Sep. 10, 1987, 62-226996
Int. Cl.[4] F15B *13/00*; E02F *3/00*
U.S. Cl. 414—701 **16 Claims**



1. An apparatus for controlling the posture of a front loader having a mast secured to a vehicle body, a boom supported by the mast and liftable by a boom cylinder, a work implement rotatably supported by the forward end of the boom and movable by an implement cylinder for scooping and dumping, a boom control valve for operating the boom cylinder, an implement control valve for operating the implement cylinder, and a single control lever for operating the two control valves independently of each other and also at the same time, the apparatus being characterized in that it comprises an engaging portion provided on the control lever, an engagable member provided on a fixed member on the vehicle body and releasably engagable with the engaging portion when the control lever is positioned for lowering the boom and moving the work implement for scooping, implement sensor means for detecting whether an angle between the work implement and boom is an angle which would make the work implement bottom surface parallel with the horizontal ground when the boom is lowered to a height where the work implement would contact the ground, and release interlocking means operatively connected to the implement sensor means and to the engagable member for moving the engagable member to a released position where the engagable member is not engagable with the engaging portion upon the implement sensor means detecting said angle.

4,917,566

CRANE ATTACHMENT FOR BACKHOE

J. Raymond Chauvin, Hyde Park, Vt., assignor to Contractors Crane Service, Inc., Morrisville, Vt.

Filed Nov. 17, 1988, Ser. No. 272,628
Int. Cl.[4] E02F *3/00*
U.S. Cl. 414—722 **2 Claims**

1. Am improved backhoe of the type having a boom, adapted such that a dipperstick may be attached to the end of the boom to be moved vertically by an hydraulic piston, having a rod end and a cylinder end, mounted on said boom, and adapted such that a working member, typically a bucket, may be attached to the dipperstick, so as to be rotatably, or pivotally, movable, wherein the improvement comprises:

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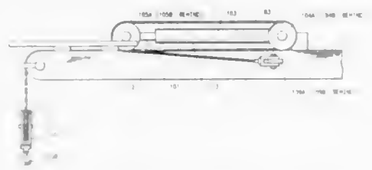
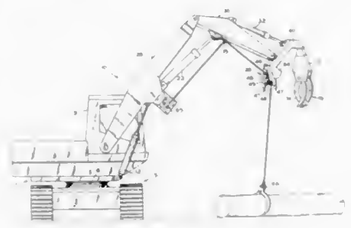
(a) one or more front sheaves mounted on said rod end of said hydraulic piston;
(b) one or more back sheaves mounted on said cylinder end of said hydraulic piston;
(c) one or more boom sheaves mounted on said boom; and



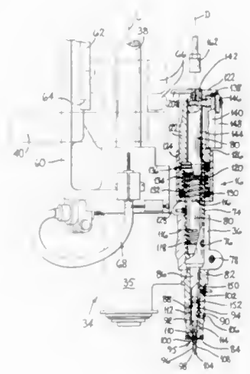
(d) a load suspending means engaging and running over said one or more front sheaves, said one or more back sheaves, and said one or more boom sheaves, and having a suspended load engaging means after engaging and running over said one or more boom sheaves.

4,917,567
LOG YARDER
Gerald E. Renfro, 10735 Horseshoe Bend Rd., Boise, Id. 83703, and Kenneth W. Renfro, Third St. Clr., Horseshoe Bend, Id. 83629
Filed Oct. 14, 1988, Ser. No. 257,884
Int. Cl.[4] B66C *1/44*
U.S. Cl. 414—731 6 Claims



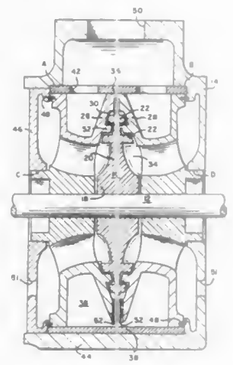
1. A log yarder comprising:
a support vehicle;
a framework mounted for horizontal rotation upon said support vehicle;
boom means pivotally engaging said framework for vertical movement relative thereto;
an elongated heeling rack pivotally mounted upon said boom means;
a slack kicker secured to said yarder, said kicker including a cable threaded through said heeling rack for attachment to a log; and
grapple means pivotally secured to said heeling rack; said slack kicker operable to skid logs to said heeling rack and said grapple means operable to grasp the logs for loading and placement.

4,917,568
SUCTION PICK-UP APPARATUS FOR ELECTRICAL OR ELECTRONIC COMPONENTS
Victor T. Hawkswell, Witham, England, assignor to Emhart Industries, Inc., Hartford, Conn.
Filed Jan. 29, 1988, Ser. No. 150,128
Claims priority, application United Kingdom, Feb. 5, 1987, 8702618
Int. Cl.[4] B25J *15/06*
U.S. Cl. 414—737 2 Claims



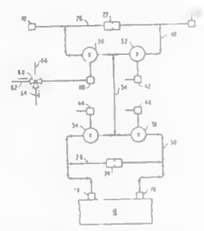
1. A pick-up head for surface mount electronic components which are to be picked up by the use of suction comprising
a pick-up tool including
a first pick-up surface at the bottom thereof,
a vertically extending cylindrical chamber, and
a vertical bore extending vertically from said pick-up surface to the bottom of said chamber,
a piston member including a cylindrical top portion and a cylindrical tip portion at the other end having a second pick-up surface at the bottom thereof, said vertical bore slideably receiving said cylindrical tip portion,
cylindrical sleeve means secured within said chamber for slideably receiving said cylindrical top portion of said piston member,
said piston member being displaceable between an elevated inoperative position and a lowered operative position,
said chamber having a vertical length selected so that a portion thereof will be located above said elevated piston member,
said sleeve means being selectively spaced from the bottom of said chamber to define an annular gap around said piston member,
conduit means defined in said tip portion extending between said second pick-up surface and said gap,
first and second conduits defined in said pick-up tool communicating, respectively with said chamber portion above said elevated piston element and with said gap so that piston element from said inoperative position to said operation position and so that vacuum can be applied to said second conduit to attach a component engaged by either of said first or second pick-up surfaces.

4,917,569
TURBINE CONTAINMENT SYSTEM
Robert R. Kimberlin, Athens, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Nov. 3, 1988, Ser. No. 266,656
Int. Cl.[4] F01D *5/06, 9/02*
U.S. Cl. 415—84 7 Claims



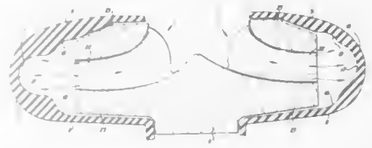
1. A containment system for a radial-flow turbine assembly comprising:
a housing assembly;
a turbine rotor journalled for rotation about an axis and having a hub portion and a generally tapering disk portion extending radially outward from the hub portion;
an annular nozzle assembly adapted for rotation within said housing assembly and normally secured in the housing assembly against rotation and forming a tapered rotor chamber within which the rotor rotates with minimum axial and radial clearance between rotor and chamber;
a plurality of support struts extending axially inward from the nozzle assembly to a minimal axial and radial clearance with the hub portion of the rotor; and
a containment ring having an inner diameter surface securing the outer annular surface of the nozzle assembly so that the nozzle assembly can be rotated relative to the containment ring in preselected situations.

4,917,570
TURBINE SHAFT AXIAL LOAD PROTECTION SYSTEM
Joseph Pankowiecki, Casselberry; Andrew S. Braytenbah, and Gilbert F. Hyde, both of Winter Springs, all of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed May 13, 1988, Ser. No. 193,697
Int. Cl.[4] F01D *3/00*
U.S. Cl. 415—104 11 Claims



1. In a system composed of a steam turbine including a rotor having a shaft, the turbine containing a plurality of chambers each defining a pressure zone containing a fluid which, during operation of the turbine, is at a pressure which influences the axial thrust load on the shaft, the turbine being constructed such that at least during rapid shut down a pressure differential can develop between two of the chambers to create an excessive axial thrust load on the shaft, the improvement comprising controllable valve means connected in a fluid flow path between the two chambers, and valve operating means connected for operating said valve means during rapid shut down of the turbine in order to reduce the pressure differential between the two chambers, wherein said valve means comprise: two valve units each connected between the two chambers and each composed of two controllable valves connected together in series; and a pressure balance line connected between said two valve units and connected to each said valve unit at a location between said two controllable valves of said unit, for establishing a low resistance fluid flow path among said controllable valves of said two units.

4,917,571
FLOW-STABILIZING VOLUTE PUMP AND LINER
John Hyll, 8349 Summer Meadow Dr., and Harold Basmadjian, 11258 S. Brandon Park Dr., both of Sandy, Utah 84092
Continuation-in-part of Ser. No. 154,434, Feb. 9, 1988, abandoned, which is a continuation of Ser. No. 592,289, Mar. 20, 1984, abandoned. This application Jul. 5, 1988, Ser. No. 215,352
Int. Cl.[4] F04D *7/04, 29/40, 29/44, 29/66*
U.S. Cl. 415—197 22 Claims



10. A removable volute liner for a centrifugal pump of the volute type adapted to pump slurries of abrasive material, said pump including a pump casing which surrounds an impeller having a relatively thick shroud at each side thereof defining therebetween at least one impeller discharge opening in the outer periphery of the impeller and a drive shaft for rotating said impeller, said casing comprising a pair of wall portions disposed opposite and spaced apart from one another, one of the pair having an opening for receiving an impeller drive shaft having a longitudinal axis, the other of the pair having a fluid inlet opening, and said pair lying in planes which extend generally perpendicularly to the longitudinal axis of the shaft; a volute wall portion which connects together the pair of wall portions and has a fluid outlet opening; and a casing interior comprised of the interior surfaces of said pair of wall portions and said volute wall portion including said fluid outlet opening, said casing being split into two halves, said halves sealingly engaging one another and cooperating to form a complete volute passage around said pump impeller when the pump is assembled, said removable volute liner for said pump casing comprising:
a. a pair of liner side wall portions disposed opposite and spaced apart from one another, one of the pair having an opening for receiving said impeller drive shaft, the other of the pair having a fluid inlet opening, said wall portions lying in planes which extend generally perpendicularly to the longitudinal axis of the shaft, and each wall portion having an exterior surface which matingly engages a corresponding portion of the casing interior surface; and
b. a linear volute wall portion which connects together the pair of side wall portions when the liner is assembled within the casing and which has a fluid outlet discharge nozzle tangentially leading therefrom, the wall portion and the discharge nozzle each having an exterior surface

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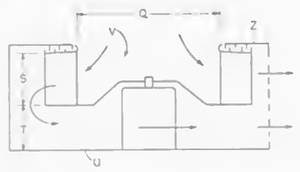
which matingly engages a corresponding portion of the casing interior surface, and said liner volute wall portion including said fluid outlet discharge nozzle when assembled within the casing forming a complete volute liner passage around said pump impeller, which passage has an arcuately contoured interior surface having a volute region extending from a cutwater to a throat portion and a discharge nozzle region extending outwardly from the throat portion, the arcuately contoured interior surface in the volute wall portion of the volute region adjacent the throat portion comprising in axial cross-section a recirculation region having a trio of concave portions interconnected by a pair of convex portions which cooperate to provide a flowingly contoured surface of changing axial cross-section in the volute wall portion of the volute region, said concave portions comprising a central concave portion with a variable radius R flanked on each side by one of a pair of side concave portions having fixed radii r_1 and r_2, wherein R may vary from R greater than one of r_1 and r_2 near the cutwater to R less than or equal to one of r_1 and r_2 near the throat portion, said flowingly contoured surface extending past the throat portion into the discharge nozzle region wherein said surface gradually becomes circular in axial cross-section, the combined thicknesses of the impeller shrouds at the outer periphery of the impeller being a significant proportion of the width of the recirculation zone at the outer periphery of the impeller, said contoured interior surface in the volute wall portion of the volute region adjacent the cutwater portion being free of convex portions and thus presenting only a single concave portion, with said contoured interior surface having a smooth, generally uniform surface transition along the length of the volute passage from the cutwater portion to the throat portion in the direction of rotation of the impeller.

4,917,572

CENTRIFUGAL BLOWER WITH AXIAL CLEARANCE

Robert Van Houten, Winchester, Mass., assignor to Airflow Research and Manufacturing Corporation, Watertown, Mass.

Filed May 23, 1988, Ser. No. 197,226
Int. Cl.[4] F04D *1/00*
U.S. Cl. 415—206 **12 Claims**



1. A centrifugal blower comprising an impeller mounted to rotate on an axis in a predetermined direction, and a housing having two housing faces spaced apart along that axis, the impeller having blades that are curved rearwardly away from that rotational direction, the blades being positioned within the housing between the housing faces, one of the housing faces defining an inlet, the bousing being substantially closed except for said inlet and an outlet, the blower being characterized in that the:

(a) clearance between the impeller blades and at least one of the housing faces is greater than 30% of the impeller blade depth, whereby an air channel is established by said clearance;

(b) the impeller diameter is at least 70% of the housing dimension along that diameter;

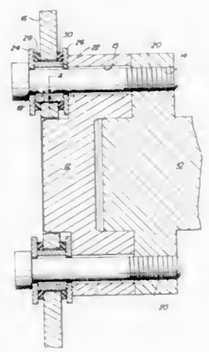
(c) the cross-sectional area of the blower outlet is greater than 70% of the area of the cross-sectioned area of the housing taken in a plane that is perpendicular to the direction of airflow and along the impeller axis.

4,917,573

COOLING FAN ISOLATION MOUNT

William J. Sikula, Jr., Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 31, 1989, Ser. No. 359,256
Int. Cl.[4] F04D *29/34*
U.S. Cl. 416—134 R **6 Claims**



1. A fan mount comprising:

a drive shaft having a plurality of tapped bores formed therein spaced circumferentially around the axis of the drive shaft;

a fan positioned at the end of said drive shaft and having a fan hub with a plurality of through bores formed therein, each said through bore corresponding in position to one of said tapped bores;

drive means positioned in said through bores and connected to said tapped bores for providing a direct piloting and drive to said fan, said fan being axially movable along said means and able to pitch and yaw slightly relative to the axis of said drive means, said drive means including:

a plurality of bolts, each bolt extending through one of said through bores and threadedly engaging the corresponding one of said tapped bores;

a plurality of stiff spacers, each spacer being positioned about one of said bolts and an inside diameter of each said through bore and an outside diameter of each said spacer being sized to provide a small clear space therebetween, thereby permitting said fan to pitch and yaw relative to said drive means axis; and

a plurality of stiff washers, each stiff washer being positioned about one of said bolts, with one stiff washer at each end of said spacer on opposite sides of said fan.

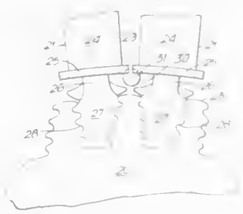
4,917,574

AEROFOIL BLADE DAMPING

Alec G. Dodd, and Edwin Pateman, both of Derby, England, assignors to Rolls-Royce plc, London, England

Filed Jul. 19, 1989, Ser. No. 381,971
Claims priority, application United Kingdom, Sep. 30, 1988, 8823024
Int. Cl.[4] F01D *5/22*
U.S. Cl. 416—193 A **9 Claims**

1. An aerofoil blade rotor assembly comprising a rotatable disc member having a plurality of radially extending aerofoil blades located on its periphery, each of said aerofoil blades having circumferentially extending portions which are radially spaced apart from said disc member and circumferentially spaced apart from but aligned with the circumferentially extending portions of adjacent aerofoil blades, and a plurality of spherical damping members, at least one spherical damping member being located in each space defined between said rotatable disc and adjacent circumferentially extending blade portions so that each spherical damping member is centrifugally urged into simultaneous engagement with said adjacent circumferentially extending portions associated therewith upon the rotation of said assembly, each of said circumferentially extending portions being provided with circumferentially extending tracks to receive said spherical damping member in frictional engagement therewith, each space having dimensions such that said spherical damping member in each space is free to move from a first position out of contact with said tracks to a second position in which the spherical damping member is in contact with said tracks which tracks are so configured that each of said spherical damping members is maintained in simultaneous engagement with said adjacent circumferentially extending portions upon rotation of the disc.

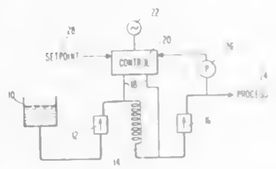


4,917,575

LIQUID CHROMATOGRAPHIC PUMP

Theodore E. Miller, Jr., and Charles M. Davis, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 859,175, May 2, 1986, abandoned. This application Oct. 27, 1988, Ser. No. 261,056
Int. Cl.[4] F04B *19/24*
U.S. Cl. 417—52 **9 Claims**



6. A method of operation of a liquid chromatographic system, said system comprising: a pump, a reservoir adapted to contain liquid eluent, a liquid chromatographic column, and detector means, said elements being arranged such that said pump pumps eluent from said reservoir through said liquid chromatographic column to said detector means,

said pump comprising:

a chamber of essentially fixed volume connected in series with first and second check valves, and means for heating said fluid within said chamber such that fluid is forced out of an exit check valve upon heating, and fluid is drawn from said reservoir through said inlet check valve upon subsequent cooling of the liquid in said chamber, said method comprising the steps of:

monitoring the flow rate of eluent exiting said chromatographic column to generate a flow rate signal; and

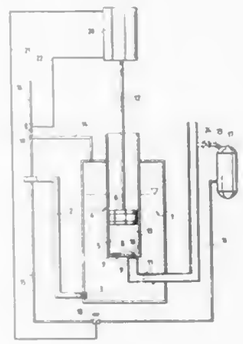
using said signal to control the amount of heating applied to the liquid in said chamber for controlling the rate of pumping of said fluid.

4,917,576

METHOD AND APPARATUS FOR CONVEYING A LIQUID

Walter Peschka, Sindelfingen, and Gottfried Schneider, Stuttgart, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft und Raumfahrt e.V., Bonn, Fed. Rep. of Germany

Filed Mar. 15, 1988, Ser. No. 168,429
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1987, 3710363
Int. Cl.[4] F17D *1/14*
U.S. Cl. 417—53 **8 Claims**



1. A method for conveying a liquid at or in the proximity of its boiling temperature, in particular, liquid hydrogen, by means of a pump which draws the liquid from a storage container through a suction entrance port, characterized in that the pressure in said storage container is increased for a short time during the suction phase of said pump above the equilibrium pressure of the liquid in said storage container.

4,917,577

HIGH SPEED CENTRIFUGAL OXYGENATOR

Thomas E. Stirling, Sugarloaf, Pa., assignor to Barrett, Haentjens & Co., Hazelton, Pa.

Filed Jan. 25, 1989, Ser. No. 301,443
Int. Cl.[4] F04F *11/00*
U.S. Cl. 417—66 **3 Claims**

1. A high specific speed centrifugal pump for mixing a first and second fluid, comprising:

an inlet into said pump through which said first fluid is drawn;

means for injecting said second fluid into a flow of said first fluid being drawn into said inlet;

a pump chamber of a frusto-conical shape formed by a conical wall and a cylindrical wall, said inlet being at a frustrum of said pump chamber;

an outlet of said pump chamber at a base of said frusto-conical pump chamber; and

an impeller having blades of an effective fluid moving width mounted for rotation in said pump chamber, said impeller being mismatched to said pump chamber with said blades spaced from said conical wall of said pump chamber by a distance in the range of between approximately one and a

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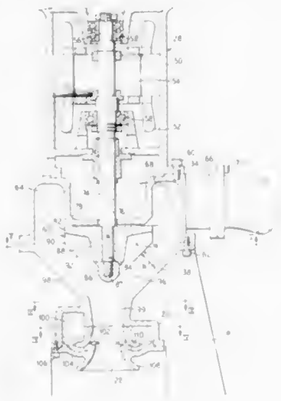
third and four times said effective width of said blades; and



a motor connected to said impeller for rotating said impeller in said chamber at a specific speed of at least about 3,500 r.p.m.

4,917,578

VARIABLE CAPACITY COMPRESSOR

Nobuyuki Nakajima, and Toshio Yamaguchi, both of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1989, Ser. No. 325,922
Claims priority, application Japan, Apr. 15, 1988, 63-92889
Int. Cl.[4] F04B *49/00*; F04C *29/08*
U.S. Cl. 417—295 4 Claims

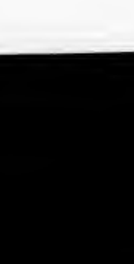
1. In a variable capacity compressor having a cylinder, two compression spaces defined within the cylinder, a control element rotatably arranged within said cylinder and having two pressure-receiving portions formed thereon at substantially diametrically opposite locations, first and second pressure working chambers formed in said cylinder, said two pressure-receiving portions being slidably received, respectively, in said first and second pressure working chambers such that said first pressure working chamber is divided into a first lower-pressure chamber and a first higher-pressure chamber, and said second pressure working chamber is divided into a second lower-pressure chamber and a second higher-pressure chamber, said first and second lower-pressure chambers being supplied with low pressure, first passage means (27) communicating between said first and second higher-pressure chambers, second passage means (31, 30*f*) extending between one of said first and second higher-pressure chambers and a low-pressure side, control valve means operable in response to suction pressure in said compressor for opening and closing said second passage means to control pressure within said first and second higher-pressure chambers, wherein said control element is rotated in opposite directions in response to change in the difference between pressure within said first and second lower-pressure chambers and pressure within said first and second higher-pressure chambers for varying the capacity of said compressor, the improvement comprising third passage means (28,29) opening into said one of said first second higher-pressure chambers and communicating said one of said first and second higher-pressure chambers with at least one of said compression spaces for supplying the former with discharge pressure from the latter.

4,917,579

TRANSPORTER PUMP

Mikael Torma, Olten, Switzerland, assignor to KAILEG AB, Malmo, Sweden

PCT No. PCT/SE88/00354, § 371 Date Feb. 22, 1989, § 102(e) Date Feb. 22, 1989, PCT Pub. No. WO88/10371, PCT Pub. Date Dec. 29, 1988
PCT Filed Jun. 23, 1988, Ser. No. 319,081
Claims priority, application Sweden, Jun. 24, 1987, 8702613
Int. Cl.[4] F04B *43/12*
U.S. Cl. 417—322 5 Claims



1. A transporter which includes at least one elongated transporting element (1) which is made of a material capable of changing its volume in response to the application of voltage or magnetic fields thereacross, wherewith a transporting element, optionally together with a further transporting element or some other part of the transporter, defines an elongated transporting channel (7), and which transporter further includes means for generating such fields in predetermined regions along the transporting element and in a given order of sequence such as to generate substantially peristaltic motion in said element, said means including at least three conductors (3, 4, 5) which are arranged peripherally in relation to the transporting element and to which different phases of a multi-phase alternating voltage or alternating current are applied, characterized in that the conductors (3, 4, 5) comprise conductors which extend in mutually adjacent relationship substantially helically in relation to the transporting element (1).

4,917,580

PUMP MECHANISM FOR SIMULTANEOUS DELIVERY OF TWO ATOMIZER LIQUIDS TO A SPRAYER DEVICE

Georg Schnetzer, Mader, Austria, assignor to Wagner International AG, Switzerland

Filed Oct. 14, 1988, Ser. No. 258,012
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1987, 3734980
Int. Cl.[4] B05B *12/14*; F01B *1/00*; F15B *1/00*
U.S. Cl. 417—345 21 Claims

1. A drive control system for a multiple pump apparatus producing the simultaneous delivery of multiple atomizer liquids in a selectable ratio comprising:

a first piston-cylinder drive, said first piston-cylinder drive having fluid entry means for allowing entry of a pressurized fluid into the cylinder region above the piston of said first piston-cylinder drive, said pressurized fluid providing means for driving said piston into the lower cylinder region of said first piston-cylinder drive;

a second piston-cylinder drive, said second piston-cylinder drive having fluid entry means for allowing entry of a pressurized fluid into the cylinder region below the piston of said first piston-cylinder drive, said pressurized fluid providing means for driving said piston into the upper cylinder region of said first piston-cylinder drive;

stroke adjustment means attached to the pistons of said piston-cylinder drives for adjusting the respective stroke lengths of said pistons so that an increase in the piston stroke length in one of said piston-cylinder drives produces a corresponding shortening of the piston stroke length in the other of said piston-cylinder drives;

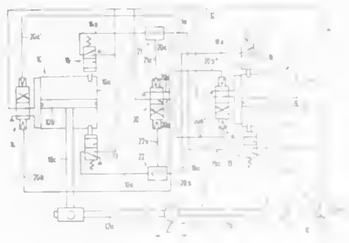
a first pneumatic drive means for actuating said first piston-cylinder drive, said first pneumatic drive means providing a controlled flow of a pressurized fluid into the cylinder region above the piston of said first piston-cylinder drive;

a second pneumatic drive means for actuating said second piston-cylinder drive, said second pneumatic drive means providing a controlled flow of a pressurized fluid into the cylinder region below the piston of said first piston-cylinder drive;

multiple pilot control means respectively connected to each of said piston-cylinder drives, said multiple pilot control means disposed at the dead points of the pistons of said pneumatic drive devices for providing control signals for said pneumatic drive means, said control signals being actuated by contact between the pistons of said piston-cylinder drives and the respective pilot control means;

transfer control means for selecting between the control signal outputs of said multiple pilot means, said transfer control means having inputs connected to the control signal outputs of said multiple pilot means and outputs connected to said pneumatic drive means, said transfer control means providing control signals to said pneumatic drive means, said control signals to said pneumatic drive means corresponding to the output control signals provided by the pilot control means disposed on the piston-cylinder drive having the longer piston stroke;

a compressor means for maintaining a supply of liquid at a constant pressure to said multiple pilot means, said pneumatic drive means, and said transfer control means.

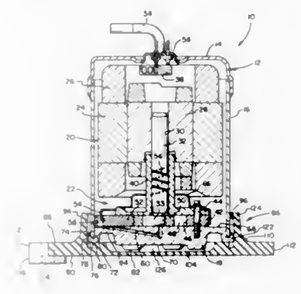


4,917,581

MOUNTING BOOT FOR A HERMETIC COMPRESSOR

Hubert Richardson, Jr., Brooklyn; Phillip A. Tomell, and Michael J. Maertens, both of Adrian, all of Mich., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed Sep. 12, 1988, Ser. No. 243,316
Int. Cl.[4] F04B *39/00*
U.S. Cl. 417—363 31 Claims



1. A vertically upright hermetic compressor for mounting to a horizontal support surface, comprising:

a housing including a top end, a bottom end, and a generally cylindrical central portion therebetween;

a motor compressor unit operably disposed within said housing; and

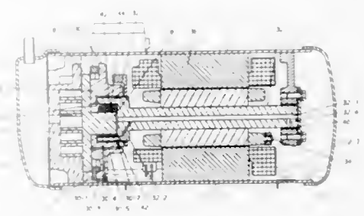
mounting means, removably attached to said housing bottom end, for mounting said compressor to the horizontal support surface, said mounting means comprising a resilient body member, including a generally horizontal bottom portion overlying said housing bottom end and an upstanding sidewall portion circumferentially engaged with said housing central portion adjacent said housing bottom end, to substantially cover said housing bottom end.

4,917,582

HORIZONTAL SCROLL COMPRESSOR WITH OIL PUMP

Howard H. Fraser, Jr., Lafayette, and Thomas L. Kassouf, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 27, 1989, Ser. No. 315,982
Int. Cl.[4] F04C *18/04, 29/02*
U.S. Cl. 418—55 6 Claims



1. In a hermetic horizontal scroll compressor including a shell containing a fixed and an orbiting scroll, a crankcase, a crankshaft extending substantially in the horizontal direction, bearings for supporting said crankshaft, means for driving said crankshaft, an anti-rotation means for limiting said orbiting

scroll to orbiting motion and an oil sump, a lubrication system comprising:

means forming a piston bore in fluid communication with sid oil sump;

piston means integral with said anti-rotation means and reciprocatably located in said piston bore;

a lubrication distribution means in fluid communication with said piston bore for delivering oil to lubricate said orbiting scroll, said crankshaft and said bearings whereby when said anti-rotation means is caused to move said piston means reciprocates in said piston bore and thereby pumps oil from said sump to said lubrication distribution means.

4,917,583

BEARING SUPPORT FOR A TWIN-SHAFT PUMP

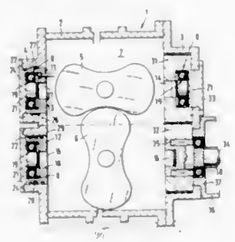
Heinz Frings, Cologne; Karl-Heinz Ronthaler, Zülpich, and Ralf Steffens, Cologne, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed May 16, 1988, Ser. No. 194,252

Claims priority, application European Pat. Off., May 15, 1987, 87107091.8

Int. Cl.⁴ F04C *2/18*

U.S. Cl. 418—206 **24 Claims**



1. In a twin-shaft pump including

means defining a working chamber; said means including a first side plate and an opposite, second side plate;

two impellers accommodated in said working chamber and each having a first end face and an opposite, second end face; each said first end face being adjacent and oriented toward said first side plate and each said second end face being adjacent and oriented towards said second side plate;

a separate impeller bearing adjacent the first and second end faces of each said impeller; and

a pump drive situated adjacent the first end faces and being operatively connected to the impellers;

the improvement comprising

a dish-shaped component situated adjacent at least one of the end faces of at least one of said impellers; said dish-shaped component having a wall defining a dish-shaped cavity accommodating one of said impeller bearings and being situated externally of said at least one impeller; said impeller bearing being in a supporting contact with said wall; and

a stationarily held stub shaft being in alignment with said one impeller bearing and projecting into said cavity and the impeller bearing received therein for supporting said impeller bearing.

4,917,584

VANE PUMP WITH ANNULAR AETAINER LIMITING OUTWARD RADIAL VANE MOVEMENT

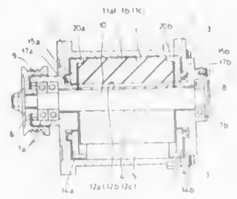
Hiroshi Sakamaki; Yukio Horikoshi, and Takeshi Jinnouchi, all of Sakado, Japan, assignors to Eagle Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 118,142, Nov. 6, 1987, abandoned. This application Dec. 20, 1988, Ser. No. 289,445

Claims priority, application Japan, Dec. 3, 1986, 61-185570[U]

Int. Cl.⁴ F04C *2/344*

U.S. Cl. 418—256 **6 Claims**



1. A vane pump comprising a housing means having a rotor chamber, said rotor chamber having an inner peripheral surface, a rotor means rotatably mounted in said rotor chamber, said inner peripheral surface having a central axis which is eccentrically disposed relative to the axis of rotation of said rotor means, said rotor means having a plurality of generally radially disposed vane slots, a plurality of vane means slidably mounted in said vane slots and operable to define variable volume chambers for effecting a pumping action as said rotor means rotates and said vane means move generally radially in and out of said vane slots, said vane means having longitudinal ends, recess means in said longitudinal ends, retainer plate means disposed between said housing means and said longitudinal ends of said vane means, rotatable support means for rotatably supporting said retainer plate means in said housing means, said retainer plate means having stopper means extending axially into said recess means in said vane means, said stopper means having an annular surface, said annular surface being engaged by said recess means to limit the extent of outward radial movement of said vane means to preclude sliding contact between said vane means and said inner peripheral surface of said rotor chamber, said inner peripheral surface of said rotor chamber having a non-circular configuration corresponding to the configuration of the path of travel of the outer radial ends of said vane means to thereby provide a uniform clearance between said inner peripheral surface of said rotor chamber and said path of travel of said outer radial ends of said vane means.

4,917,585

GEROTOR MOTOR OR PUMP HAVING SEALING RINGS IN COMMUTATOR MEMBERS

Albin J. Niemiec, Sterling Heights, and John F. Walrad, Southfield, both of Mich., assignors to Vickers, Incorporated, Troy, Mich.

Filed Mar. 14, 1989, Ser. No. 323,500

Int. Cl.⁴ F04C *2/10, 15/02;* F03C *2/08*

U.S. Cl. 418—61.3 **11 Claims**

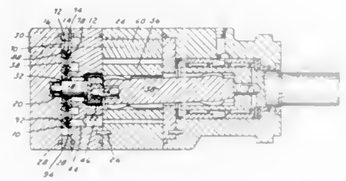
1. In a Gerotor type hydraulic motor or pump wherein a rotary valve selectively provides communications to ports, the improvement wherein said rotary valve comprises

a commutator adapted to be positioned between spaced surfaces of the unit and moved in an orbital path with respect to said surfaces,

said commutator comprising spaced commutator members,

means extending between said members such that they are moved in unison,

said members having contacting faces for engaging the respective surfaces, one member engaging one surface and the other engaging the other surface,



said members having radially spaced pairs of annular grooves facing one another, each groove of each pair being radially spaced from the other, and an annular sealing ring in each said groove.

4,917,586

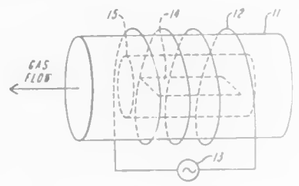
PROCESS FOR DRY STERILIZATION OF MEDICAL DEVICES AND MATERIALS

Adir Jacob, 23 Juniper La., Framingham, Mass. 01701

Continuation of Ser. No. 72,899, Jul. 14, 1987, Pat. No. 4,818,488, which is a continuation-in-part of Ser. No. 19,134, Feb. 25, 1987, Pat. No. 4,801,427. This application Nov. 22, 1988, Ser. No. 275,202

Int. Cl.⁴ A61L *2/00;* G01N *23/00*

U.S. Cl. 422—21 **17 Claims**



1. A method for sterilization of medical devices and materials comprising the steps of:

placing said devices and materials within a gas-tight confining chamber, at least a portion of said chamber being formed from non-metallic material,

evacuating said chamber to a substantially low pressure and introducing a gas into said chamber,

initiating a microwave discharge in said gas to create a gas plasma within said chamber by application of microwave energy to a microwave cavity located at one end of said chamber remote from and not encompassing said devices and materials, thereby creating a substantially field-free zone away from said cavity, said field-free zone containing said devices and materials whereby said devices and materials are contacted by a substantially electrically neutral active species at a temperature below that which would be detrimental to said devices and materials,

maintaining said gas plasma for a controlled period of time,

maintaining a flow of said gas through said chamber and

withdrawing the said devices and materials from said chamber.

4,917,587

APPARATUS FOR THE PRODUCTION OF BUILDING UNITS FROM AFTERHARDENING MATERIALS

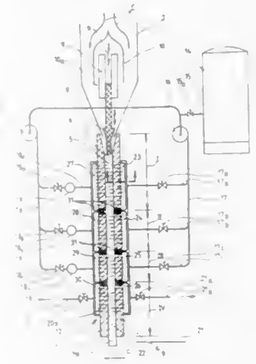
Tibor Alpár; János Györvári, and Ernö Schmidt, all of Szombathely, Hungary, assignors to Fakombinat, Szombathey, Hungary

Filed Apr. 26, 1988, Ser. No. 186,426

Claims priority, application Hungary, Mar. 5, 1987, 2251-2004/87

Int. Cl.⁴ B28B *17/00;* E04G *21/06*

U.S. Cl. 425—64 **10 Claims**



1. Apparatus for the production of building units from an afterhardening mixture containing cement and water as binding material wherein said binding material is hardened by carbonation, said apparatus comprising a die comprising a die space, a CO_2 gas-source being capable of fluid communication with said die space, and holes in at least one wall of the die, said holes being suitable for injection of CO_2 gas into the die space at pressure which exceeds the atmospheric pressure, the die having an inlet port for admitting the raw afterhardening mixture, and an outlet port for discharging the building units hardened by carbonation; a press mechanism being situated in front of the inlet port for pressing the raw afterhardening mixture into the die space and moving the afterhardening mixture as well as the building units hardened therefrom by carbonation through the die space; and the holes leading into the die space serving as inlets for the CO_2 gas, said holes being divided into separate zones of hole groups and communicating with gas injection devices which include control means for separately controlling the amount of CO_2 gas to be injected at each of said zones.

4,917,588

PRESS FOR MOLDING ARTICLES FROM POWDERED MATERIALS AND DRIVE MEANS THEREFOR

Thomas Gräbener, Siegen, and Theodor Gräbener, Netphen, both of Fed. Rep. of Germany, assignors to Theodor Grabener Pressensysteme GmbH & Co. KG, Netphen, Fed. Rep. of Germany

Filed May 6, 1988, Ser. No. 191,289

Claims priority, application European Pat. Off., May 7, 1987, 87106634.6

Int. Cl.⁴ B30B *15/14, 15/16*

U.S. Cl. 425—150 **13 Claims**

1. In a press for the production of precision moldings from pulverized materials comprising a base frame having thereon a platen, a draft frame guided in ways on the base frame for movement relative to the platen, and a mechanical drive connected between the base frame and the draft frame for cyclically moving the draft frame in its ways to constitute the

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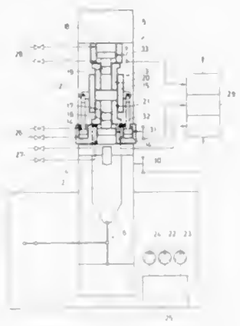
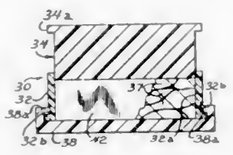
principal ram and to provide the principal axis of press movement,
the improvement comprising
a hydraulic subpress interposed between the draft frame and the platen and providing at least one additional axis of press movement,
means supplying fluid under pressure to said hydraulic subpress, and



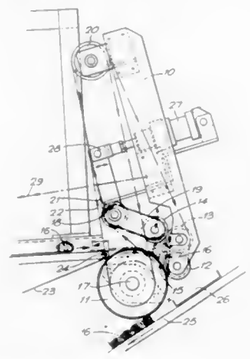
a control mechanical including
remotely operated hydraulic valves to govern the flow of pressure fluid to and from said hydraulic subpress, and
means for operating said valves to power the subpress in response to the position of the draft frame during its cyclical movement relative to the platen.

4,917,589
SOAP BAR FORMING APPARATUS
David A. Manderson, 6300 Fransean Dr., Hodgkins, Ill. 60525
Filed Apr. 4, 1988, Ser. No. 177,455
Int. Cl.[4] B29C *43/36*
U.S. Cl. 425—318 3 Claims



1. Apparatus for forming a plurality of pliable soap particles into a soap bar, said apparatus comprising:
a housing having a generally rectangular aperture with first and second open ends and extending through said housing;
a removable base coupled to said housing over the first open end of said aperture, wherein said base is generally flat and rectangular in shape and is positioned to receive and support soap particles deposited into the aperture via the second open end thereof;
coupling means for removably connecting said base and said housing in a linear sliding manner, said coupling means including a pair of elongated, linear slots on facing, outer portions of said housing and a pair of elongated, linear flanges on facing portions of said base, with each of said slots positioned to receive a respective one of said flanges in linear sliding engagement; and
manually operated, generally rectangular compressing means comprised of a unitary body and positioned for sliding insertion into the second open end of the aperture and compression of the soap particles into a generally rectangular soap bar when linearly displaced toward said base, whereupon the soap bar may be removed from said housing by further displacement of said compressing means following removal of said base from said housing.

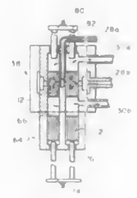
4,917,590
APPARATUS FOR PREPARING ROLLED PASTRY PRODUCTS
Anders G. Svengren, Hjaernarp, and Lars G. A. Wadell, Aastorp, both of Sweden, assignors to Nestec S.A., Vevey, Switzerland
Division of Ser. No. 15,933, Feb. 18, 1987, Pat. No. 4,828,862.
This application Feb. 15, 1989, Ser. No. 311,622
Claims priority, application European Pat. Off., Mar. 24, 1986, 86104045
Int. Cl.[4] B29C *53/00*; A21C *3/06*
U.S. Cl. 425—321 8 Claims



1. An apparatus for preparing rolled pieces of pastry material comprising:
at least four rollers rotatable in a same direction at a same peripheral speed positioned for having parallel longitudinal axes and for defining a substantially cylindrical cavity enclosed by the rollers;
a conveyor belt having a leading edge positioned adjacent the rollers and a surface for transporting pieces of pastry to be rolled to the rollers in a direction transverse to the longitudinal axes of the rollers;
means for forming an admitting gap between two of the rollers for admitting pieces of pastry material to be rolled from the conveyor belt through the admitting gap into the cavity and then for closing the admitting gap between the two admitting rollers for then rolling the pieces in the cavity with each roller; and
means for forming a releasing gap between two of the rollers for releasing rolled pieces from the cavity from between the two releasing rollers forming the releasing gap and for closing the releasing gap.

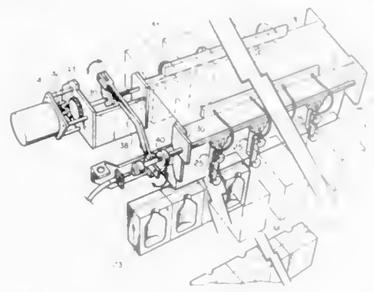
4,917,591
APPARATUS FOR CURING RESIN IMPREGNATED IN FILTER ELEMENT
Atsushi Sakaida, Nagoya, and Masanori Suzuki, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Feb. 4, 1987, Ser. No. 10,856
Claims priority, application Japan, Feb. 7, 1986, 61-24179
Int. Cl.[4] A01J *21/00*
U.S. Cl. 425—392 18 Claims

1. An apparatus for curing an uncured resin impregnated in a filter element having a uniform cross-section throughout the length thereof to harden and strengthen the filter element, comprising:
a curing pot formed of an outer tube and an inner tube secured integrally and coaxially with each other to form an annular space between the outer and inner tubes having a cross-section corresponding to a profile of a filter element to be treated, the annular space being adapted to receive the filter element during the curing operation in a compact and easily removable manner; and



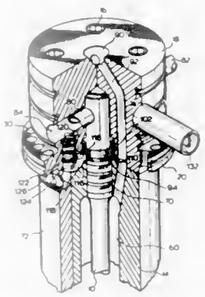
means for circulating hot air through the annular space including inlets defined through a side wall of the inner tube at a midportion thereof and defined through a side wall of the outer tube at a midportion thereof, respectively, for blowing the hot air into the annular space, and outlets at upper and lower regions of the side wall of the outer tube, respectively, for sucking the hot air from the annular space,
whereby the filter element accommodated in the annular space is forcibly penetrated by the hot air and the resin contained therein is cured.

4,917,592
APPARATUS FOR APPLYING LABELS TO BLOW MOLDED ARTICLES
John A. Plenzler, Toledo, Ohio, and Gerald L. Ames, Temperance, Mich., assignors to Owens-Illinois Plastic Products, Inc., Toledo, Ohio
Filed Mar. 31, 1988, Ser. No. 175,803
Int. Cl.[4] B29C *49/24*, *49/04*; B65C *9/14*
U.S. Cl. 425—503 10 Claims



1. In an apparatus for forming hollow articles by blow molding parisons into conformity with cavities of an array of mold sections wherein parisons in the form of tubes are extruded from an extruder into an array of neck molds on a head and the head is moved axially away from the extruder to define the parisons and the mold sections are closed about the parisons and the parisons are blown outwardly, and an apparatus for applying labels to the hollow blow plastic articles, the improvement comprising
an array of vacuum devices,
means for supporting said array of vacuum devices on said head for movement toward sources of plastic labels when the head is in position adjacent the sources and for movement toward the cavities of the mold sections when the head is adjacent the mold cavities, and
means for moving said array of vacuum devices into engagement with sources of plastic labels, slowly removing the vacuum devices away from the sources, and thereafter moving the array of vacuum devices between the mold sections, and rapidly moving the devices into the cavities to deliver an array of labels to the cavities,
said means for moving said vacuum devices comprising a stepping motor,
said means for supporting said vacuum devices comprising a shaft having a longitudinal axis, means for mounting said shaft on said head for rotation along said axis, each vacuum device comprises a yoke pivoted on said shaft, and a vacuum block pivoted intermediate its ends on said yoke.

4,917,593
INJECTION MOLDING SYSTEM HAVING VALVE MEMBER SPLIT RING
Jobst U. Gellert, 7A Prince Street, Georgetown, Ontario, Canada (L7G 2X1)
Filed Jun. 6, 1989, Ser. No. 362,067
Claims priority, application Canada, Jun. 2, 1989, 601623
Int. Cl.[4] B29C *45/23*
U.S. Cl. 425—549 9 Claims



1. In a valve gated hot runner injection molding apparatus having a heated nozzle with a rear face which is secured against a heated manifold, the heated nozzle being received in a well in a cavity plate, the nozzle having a central bore extending therethrough to receive an elongated valve member and to provide a melt passage which extends in the central bore around at least a forward portion of the valve member to convey melt to a gate extending to a cavity, the elongated valve member having a forward end and rear end, the valve member having a rearwardly projecting portion which extends into a central opening in the manifold, the central opening in the manifold being in alignment with the central bore through the nozzle, the valve member being longitudinally reciprocable between a retracted position and a forward position, and pivotal lever means to apply a force to the valve member in a direction towards a closed position in which the forward end of the elongated valve member is seated in the gate, the improvement comprising:
a split ring which is mountable when the valve member is in the retracted position in the central opening in the manifold around the rearwardly projecting portion of the valve member, the split ring and the rearwardly projecting portion of the valve member being received in the central opening in the manifold to retain the split ring in longitudinal engagement with the valve member while the split ring and the valve member reciprocate, the split ring

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being engaged by the lever means to transmit the force towards the closed position to the valve member.

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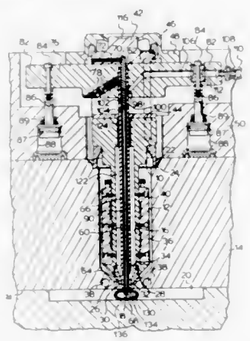
INJECTION MOLDING SYSTEM WITH GAS FLOW THROUGH VALVE GATE

Jobst U. Gellert, and Harald H. Schmidt, both of Georgetown, Canada, assignors to Mold-Masters Limited, Georgetown, Canada

Continuation-in-part of Ser. No. 331,166, Mar. 31, 1989, abandoned. This application Aug. 28, 1989, Ser. No. 398,990
Claims priority, application Canada, Feb. 28, 1989, 592345; Jul. 19, 1989, 606079
Int. Cl.[4] B29C *45/23*
U.S. Cl. 425—549 9 Claims



1. In a valve gated hot runner injection molding apparatus having a heated nozzle seated in a well in a cavity plate, the nozzle having a central bore extending therethrough to receive an elongated valve member with a forward end and a rear end and to provide a melt passage which extends in the central bore around at least a forward portion of the valve member to convey melt to a gate extending through the cavity plate to a cavity, and valve member actuating means to reciprocate the valve member longitudinally between a retracted open position and a forward closed position in which the forward end of the valve member is seated in the gate, the improvement wherein;

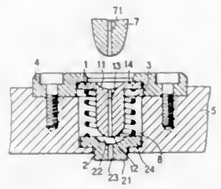
the elongated valve member is hollow and receives centrally therein an elongated pin having a forward end and a rear end, the pin being securely mounted in a fixed position wherein the forward end of the pin is centrally received in the gate with a space therearound which provides a stream of melt with a hollow center flowing through the space around the forward end of the pin into the cavity when the valve member is retracted to the open position, the pin having a hollow central portion extending from an inlet near the rear end of the pin to an outlet at the forward end of the pin, whereby pressurized gas received at the inlet to the hollow pin flows through the outlet into the hollow center of the stream of melt flowing into the cavity.

4,917,595

NOZZLE TOUCH SPRUE BUSHING DEVICE

Susumu Nakamura; Koichi Yokoi, and Hajime Nakamura, all of Yamanashi, Japan, assignors to Sankyo Engineering Co., Ltd., Yamanashi, Japan

Filed Dec. 2, 1988, Ser. No. 278,845
Claims priority, application Japan, Jun. 1, 1988, 63-71682[U]; Jun. 6, 1988, 63-74296[U]; Jun. 6, 1988, 63-74297[U]
Int. Cl.[4] B29C *45/22*
U.S. Cl. 425—567 14 Claims



1. A nozzle touch sprue bushing device, comprising:

an outer frame having an interposed portion;

an inner mold element having a material admitting portion;

a sprue bush located in said interposed portion, said sprue bush having a rear end with a nozzle touch portion for engagement by an injection nozzle of an injection machine for receiving material injected by the injection machine, said sprue bush having a front end with a shaped fitting portion for engagement with said material admitting portion, said material admitting portion having a shaped engagement portion, one of said shaped fitting and engagement portions being concave and the other of said shaped fitting and engagement portions being convex, said shaped fitting and engagement portions being complimentary in shape for close engagement therebetween for establishing a leak resistant path between said sprue bush and said inner mold element; and

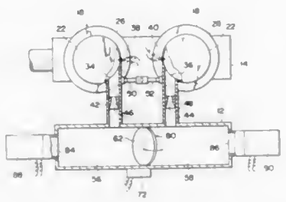
biasing means operatively engaged between said sprue bush and said material admitting portion for biasing said shaped fitting and engagement portions apart from each other, said biasing means being counteracted by engagement of an injection nozzle against said sprue bush and engagement of said interposed portion against said inner mold element for engaging said shaped fitting and engagement portions against each other.

4,917,596

PULSATING COMBUSTION SYSTEM AND METHOD OF STARTING THE SYSTEM

Kazuo Saito, Fujisawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 27, 1989, Ser. No. 385,590
Claims priority, application Japan, Jul. 29, 1988, 63-188224
Int. Cl.[4] F23C *11/04*
U.S. Cl. 431—1 7 Claims



1. A pulsating combustion system comprising:

a pair of pulsating combustors identical in structure, each comprising a combustion chamber having an air-intake port and an exhaust port, and further comprising at least two air-intake pipes each connected at one end to one of the air-intake ports, at least two tail pipes each connected at one end to one of the exhaust ports, at least two aerodynamic valves each fitted within one of said air-intake pipes and having a forward flow coefficient and a backward flow coefficient smaller then the forward flow coefficient, fuel-injecting means for injecting fuel into each of the combustion chambers, and ignition means located within each of the combustion chambers;

an air-intake chamber to which the air-intake pipes of said pulsating conductors are connected at the other end;

an exhaust chamber to which the tail pipes of said pulsating combustors are connected at the other end;

air-supplying means for causing air to flow from said air-intake chamber to said exhaust chamber through said pulsating combustors;

separation valve means located within said air-intake chamber, for partitioning said air-intake chamber into a first sub-chamber communicating with said air supply means and with the air-intake pipe of one of said pulsating combustors and a second subchamber communicating with said air supply means and with the air-intake pipe of the other pulsating combustor; and

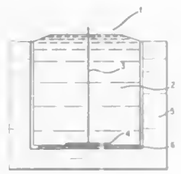
means for opening said separation valve means, thereby connecting said pulsating combustors, after said pulsating combustors have operated independently of each other for some time, with said air-intake chamber separated into said two sub-chambers by means of said separation valve means.

4,917,597

WAX CANDLE

Jurgen Henze, Peiting, Fed. Rep. of Germany, assignor to Schongauer Wachswarenfabrik W. Ewald & Sohn GmbH, Fed. Rep. of Germany

Filed Feb. 27, 1989, Ser. No. 315,995
Int. Cl.[4] F23D *3/16*
U.S. Cl. 431—289 4 Claims



1. A wax candle comprising:

(a) a combustible wax insert containing a wick;

(b) a wax jacket surrounding said wax insert, wherein said wax jacket has a melting point sufficiently higher than said wax insert so that said wax jacket does not melt when said candle burns; and

(c) an insulating layer contacting said wax jacket at a position beneath the attachment point of said wick.

4,917,598

FUEL OIL LAMP AND METHOD OF CONSTRUCTION

Daniel P. Stoner, 11914 Hartland Pl., Moreno Valley, Calif. 92388

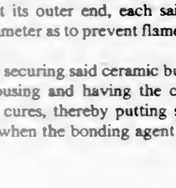
Filed Aug. 23, 1989, Ser. No. 397,183
Int. Cl.[4] F23D *3/24*
U.S. Cl. 431—320 14 Claims

1. A fuel oil lamp comprising, in combination:

containing means for storing a volume of fuel oil to be burned by said lamp;

a sleeve mounted over said containing means, said sleeve having an open bottom for receiving said containing means;

an interference ring formed on an exterior surface of said containing means, said interference ring being resilient and being compressed between said containing means and said sleeve for providing a force for securing said containing means to said sleeve;



delivering means extending from the interior of said containing means for drawing said volume of fuel oil out of said containing means; and

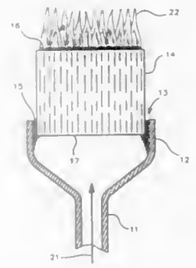
illuminating means mounted on a top portion of said containing means for reflecting light provided by the burning of said fuel oil.

4,917,599

BURNER FOR COMBUSTIBLE GASES

Detley E. M. Hasselmann, 519 S. Nardo Ave., Solana Beach, Calif. 92075

Filed Dec. 29, 1988, Ser. No. 292,477
Int. Cl.[4] F23D *14/12*
U.S. Cl. 431—328 14 Claims



1. A burner for combustible gases, said burner comprising:

means constituting a gas inlet, said means being adapted to be coupled to a source of combustible gas;

a hollow metal housing connected to said gas inlet means and having an outer opening;

a thin walled ceramic burner head means having an inner end and an outer end and a multiplicity of passages therethrough extending directly and uninterruptedly from said inner end to said outer end, said burner head means being mounted in said metal housing opening and projecting outwardly therefrom, the combustible gases passing through said burner head means and being ignited at said outer end thereof, each said passage functioning as a separate burner at its outer end, each said passage being of such small diameter as to prevent flame propagation therethrough, and

a bonding agent securing said ceramic burner head means to said metal housing and having the characteristic of expanding as it cures, thereby putting said burner head in compression when the bonding agent is fully dry.

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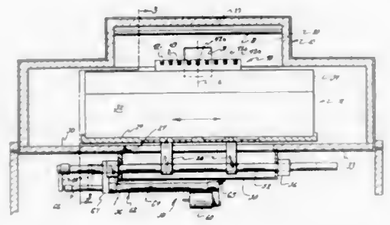
4,917,600

RECIPROCAL FURNACE FOR HEATING METAL PARTS

Raymond E. White, East Longmeadow, Mass., assignor to American Saw & Mfg. Company, East Longmeadow, Mass.

Filed Sep. 14, 1989, Ser. No. 407,230
Int. Cl.[4] F27B *9/14*; F24J *3/00*
U.S. Cl. 432—121 5 Claims



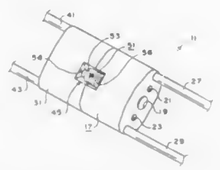
1. Furnace for heating to a predetermined temperature metallic parts including hole saws and the like comprising a furnace having a high temperature heating chamber, a reciprocal movable hearth disposed entirely within said chamber, a ceramic holder for said parts carried by the reciprocal hearth and including a plurality of parallel slots, spaced longitudinally with respect to the direction of reciprocal movement of said hearth, a first opening into said chamber on one side thereof for receiving said metallic parts to be fitted into each of said spaced slots, a second opening disposed on the side of said chamber opposite the first opening for removal of each of said parts from said slots, said hearth having a predetermined starting position in which the slot disposed adjacent one end of the holder is aligned with said first and second openings, means for reciprocally driving said hearth within said chamber in one direction from said starting position in incremental strokes equal to the spacing between adjacent said slots and in the opposite direction to return said hearth to its starting position, the numbers of said slots, the spacing therebetween and the speed of the incremental and return movement of said hearth being selected to provide a heating cycle for each of said parts approximately equal to the time required to heat each of said parts to said predetermined temperature.

4,917,601

ORTHODONTIC EXPANSION SCREW APPLIANCE

Jeff I. Williams, Memphis, Tenn., assignor to Professional Learning Programs, Inc., Memphis, Tenn.

Filed Feb. 2, 1989, Ser. No. 305,284
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—7 6 Claims



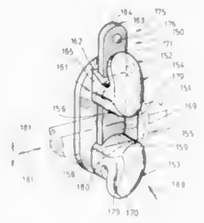
1. An orthodontic expansion screw appliance for being secured to first and second areas of a patient's teeth; said appliance comprising:
(a) a first screw body having an internally threaded bore;
(b) first retention means attached to said first screw body for securing said first screw body relative to the first area of the patient's teeth;
(c) a second screw body having an internally threaded bore;
(d) second retention means attached to said second screw body for securing said second screw body relative to the second are of the patient's teeth;
(e) a screw spindle having an externally threaded first end for being screwed into said internally threaded bore of said first screw body and having an externally threaded second end for being screwed into said internally threaded bore of said second screw body: rotation of said screw spindle causing said first and second screw bodies to move relative to one another; and
(f) fill means coating said externally threaded first and second ends of said screw spindle for preventing said externally threaded first and second ends of said screw spindle from inadvertently rotating within said internally threaded bores of said screw bodies.

4,917,602

ADJUSTABLE ORTHODONTIC BRACKET ASSEMBLY

Garfford J. Broussard, 203 Chimney Rock, Houston, Tex. 77024

Filed Sep. 12, 1988, Ser No. 242,717
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—8 20 Claims



1. An adjustable orthodontic bracket assembly adapted for use with an arch wire comprising:
a base member having at least one arch wire contact surface, the base member adapted to be associated with the surface of a tooth, the tooth having a longitudinal axis;
an attachment member having at least one arch wire contact surface; and
means for movably associating the base member and the attachment member with respect to one another, along an axis substantially parallel to the longitudinal axis of the tooth, to provide an arch wire receiving channel formed by the at least one arch wire contact surfaces of the base member and the attachment member, whereby the size of the arch wire receiving channel may be varied to accommodate different sizes of arch wire by relative movement between the base member and the attachment member.

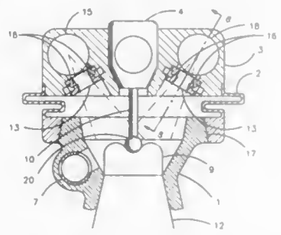
4,917,603

DENTAL ISOLATION SYSTEM

August F. Haack, 3813 Don Juan Ct, NW, Albuquerque, N. Mex. 87107

Filed Jan. 30, 1989, Ser. No. 302,774
Int. Cl.[4] A61C *1/00*
U.S. Cl. 433—29 1 Claim

1. In combination, a means for isolating both a patient and a dentist from breakdown products of tooth drilling operations comprising:
a. a cap portion which fits over and seals with a tooth and its associated gum portion;
b. a manifold portion attached to and positioned adjacent to said cap portion;
c. a flexible bellows portion positioned between and interconnecting and sealing to said cap portion and said manifold portion to provide a space therebetween, said bellows allowing free motion of said manifold portion relative to said cap portion;
d. a dental handpiece and drill attached and sealed to said manifold;
e. a fiber optic viewing and illumination system attached and sealed to said manifold and arranged to afford a view of the tip of said drill and a portion of said tooth;



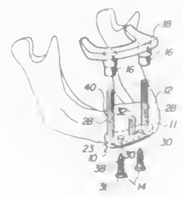
f. a suction pump for removing said breakdown products and water associated with drilling through a tube attached to said manifold, said breakdown products and said water replaced with fresh air supplied through a separate tube connected to said manifold;
g. one or more air jets supplied from a compressed air source for removing water and debris from said fiber optic viewing and illumination system optical surfaces.

4,917,604

COMPRESSION STAPLE, METHOD AND APPARATUS FOR INSERTION OF SAME

Irwin A. Small, 6861 Orinoco Cir., Birmingham, Mich. 48010

Filed Apr. 20, 1988, Ser. No. 184,088
Int. Cl.[4] A61C *8/00*
U.S. Cl. 433—174 15 Claims



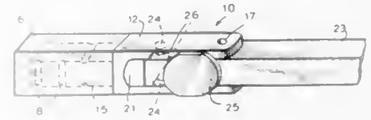
1. A staple assembly for implantation in a mandibular jaw for supporting a dental prosthesis; said staple assembly comprising:
a staple having a base plate and a plurality of parallel threaded transosteal pins; said base plate having a flat upper surface and a lower surface adapted to flatly mate with a flat surface on the inferior border of said mandibular jaw, said base plate having at least two circular openings extending through said base plate, each of said plurality of transosteal pins of a length to extend through said mandibular jaw and having one end affixed to said base along a predetermined arc ascribed on said upper surface and having a free end extending through said mandibular jaw whereby said free ends are positioned in a predetermined parallel spaced apart relationship, and
at least two self-tapping lag screw members having head portions, each of said at least two lag screw members adapted to extend through a respective one of said at least two openings in said base plate to threadably engage a bone portion of said mandibular jaw whereby said flat upper surface of said base plate is compressively mated with said flat surface of said inferior border of said mandibular jaw when said screw members are tightened and said head portions engage said lower surface of said base plate.

4,917,605

DENTAL LOCKING CLASP MEMBER

Ralph Hallmark, 80 S. Howell Ave., Centerreach, N.Y. 11720

Filed Dec. 9, 1988, Ser. No. 281,666
Int. Cl.[4] A61C *13/225*
U.S. Cl. 433—178 9 Claims



1. A dental locking clasp member used as part of a locking clasp in a partial casting appliance comprising:
a U-shaped piece having twin arms attached to an anchor portion having a plurality of anchor grooves, each of said arms having a locking recess adjacent a free end of said arm, said locking recesses being substantially circular and having a depth sufficient to permit flexing of said arms of said U-shaped piece in any of two directions to permit locking engagement;
a bar end portion surrounding said anchor portion and engaged in said anchor grooves, which is provided with a curved spur whose tip is directed substantially parallel to the adjacent outer surface of said bar end portion; and
a receptacle portion having two locking projections positioned to engage in said locking recesses of said arms to hold said U-shaped piece fixed in said receptacle portion.

4,917,606

THREADED DENTAL ANCHOR

Alan N. Miller, New City, N.Y., assignor to IPCO Corporation, White Plains, N.Y.

Filed May 9, 1988, Ser. No. 191,347
Int. Cl.[4] A61K *5/04*
U.S. Cl. 433—225 33 Claims

1. A dental anchor for insertion into a blind channel extending from an excavated surface of a tooth, the channel having a tapered seat portion of predetermined degrees, said dental anchor comprising:
an upper retention section to provide retention of a superstructure formed on the tooth;
a lower anchoring section connected to said upper retention section;

said anchoring section including a helical buttress-type thread thereon along its entire length for self-threading engagement in the tooth channel to anchor said dental anchor to the tooth; and

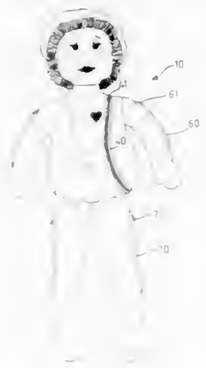
said buttress-type thread having a substantially planar lower surface facing towards a distal insertion end of said anchoring section, an angled upper surface tapering inwardly towards said upper retention section, and a crest disposed between said planar lower surface and said angled upper surface.

4,917,607

DOLL FOR FACILITATING THERAPEUTIC COMMUNICATION AND ATTITUDINAL HEALING

Sandra S. Van Hoose, Rt. 2 Box 313-C, Federalsburg, Md. 21632

Filed Sep. 29, 1988, Ser. No. 250,698
Int. Cl.[4] G09B *19/00*; A63H *3/02*
U.S. Cl. 434—236 29 Claims



1. A doll for therapeutic communication of feelings and emotions comprising:

a body having a head, torso, arms and legs;

at least one of said head, torso, arms, and legs having at least one cavity with a corresponding opening allowing access to said cavity and means for closing said opening;

means, insertable into said cavities, for expressing human emotions, said means comprising a plurality of forms, each form having an emotional connotation; and

fabric bandages, said bandages being stored in a cavity in said head.

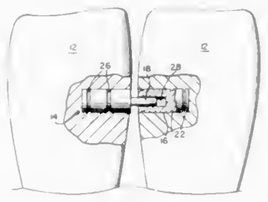
4,917,608

CRANIAL MOTION DENTAL ATTACHMENT

Gerald H. Smith, 3569 Cranberry Dr., Huntingdon Valley, Pa. 19006

Filed May 17, 1985, Ser. No. 735,141
Int. Cl.[4] A61C *5/08*
U.S. Cl. 433—219 3 Claims

1. A cranial motion dental attachment for linking interproximal wall of adjacent molded crowns while permitting relative movement therebetween, comprising; a first member adapted to be mounted within a first dental crown having a cylindrical piston integrally connected to and extending from one end thereof; and a second member adapted to be mounted in a second dental crown adjacent said first dental crown; said second member including a cylindrical bore formed therein



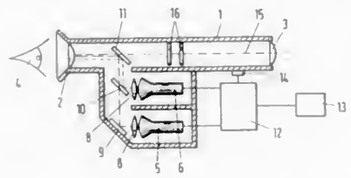
and adapted to receive said piston, in use, permitting relative movement between said first and second members.

4,917,609

ARRANGEMENT FOR FIRING SIMULATION AND BATTLE SIMULATION

Kurt Eichweber, Hamburg, Fed. Rep. of Germany, assignor to Precitronic Gesellschaft fur Feinmechanik und Electronic mbH, Fed. Rep. of Germany

Filed Oct. 31, 1988, Ser. No. 265,046
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1988, 3825326
Int. Cl.[4] F41G *3/26*
U.S. Cl. 434—20 20 Claims



1. Arrangement for firing simulation and battle simulation, for reflecting images generated by means of a computer into the beam path of a sighting device which has at least one cathode-ray tube for producing said images, wherein said cathode-ray tube emits essentially monochromatic light, said arrangement further comprising at least one narrow-band absorption filter for the wavelength of the light emitted from said cathode-ray tube located in said beam path of the sight outside the beam path of the generated images.

4,917,610

TRAINING APPARATUS FOR REMOTE CONTROL MODEL HELICOPTERS

Rock Whiteman, 12432 Gladstone Ave., Sylmar, Calif. 91342

Filed Dec. 20, 1988, Ser. No. 287,446
Int. Cl.[4] G09B *9/08*
U.S. Cl. 434—33 11 Claims

1. A training apparatus for use in learning to fly remote control model helicopters, comprising:

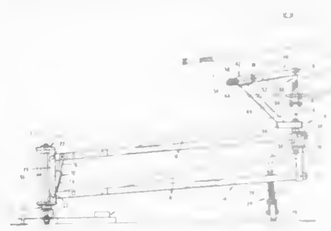
(a) a generally horizontal base;

(b) a first support assembly rotatably mounted on said base for rotation about a first axis;

(c) a second support assembly rotatably mounted on said first support assembly for rotation about a second axis spaced apart from said first axis, said second support assembly comprising:

(i) an upwardly extending member;

(ii) a first frame rotatably supported by said upwardly extending member for rotation about a third axis spaced apart from said first and second axes; and



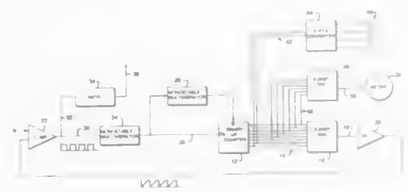
(iv) a second frame mounted on said first frame for rotation about a fourth axis, said second frame including mounting means for carrying the model helicopter.

4,917,611

ION CHAMBER TRAINER

R. William Whalen, and David P. Bacom, both of San Luis Obispo, Calif., assignors to SPEC Consultants, Inc., Trafford, Pa.

Filed Mar. 16, 1989, Ser. No. 324,090
Int. Cl.[4] G09B *9/00*
U.S. Cl. 434—218 4 Claims



1. A transmitter for use in training persons in the use of a radioactivity measuring instrument of the type in which an instructor sets a simulated level of radioactivity to be measured into a radio transmitter, characterized in that the simulated level of radioactivity transmitted by the instructor can be read by the instructor for comparison against the simulated level of radioactivity measured by the trainee, and further characterized in that both low levels and high levels of radioactivity can be simulate with equal percentage accuracy, said transmitter comprising in combination:

first means responsive to a simulated level of radioactivity set in by the instructor to generate and transmit a train of pulses in which the width of each pulse is related to the simulated level of radioactivity and the spacing between successive pulses is constant;

second means connected to said first means and responsive to said train of pulses for producing a multi-digit digital representation of the simulated level of radioactivity;

a meter having various scales;

third means connected to said second means and responsive to the first N most significant digits of the digital representation for indicating which scale of the meter the simulated level of radioactivity should be read on; and,

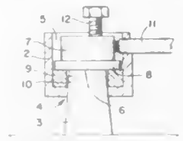
fourth means connected to said second means and responsive to the remaining digits of said digital representation for producing an analog signal from those digits and applying the analog signal to said meter, so as to provide the instructor with a quantitative indication of the magnitude of the transmitted simulated level of radioactivity.

4,917,612

MAGNETIC ELECTRIC POWER CONNECTOR

Arthur Priest, C/- Dunalley Post Office, Dunalley, Tasmania 7177, Australia

Filed Jan. 26, 1989, Ser. No. 301,584
Int. Cl.[4] H01R *11/30*
U.S. Cl. 439—39 21 Claims



1. A connector for electrically connecting an electrical lead to a terminal of a battery, said connector comprising:

a mounting member and a contact member;

said mounting member being connectable to a terminal post of a battery and including a mounting magnetic section and means for conducting electricity between said battery terminal and said contact member;

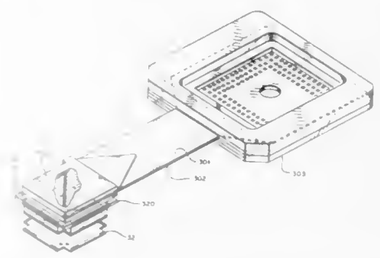
said contact member including means to connect an electric lead thereto, an electrical conductive section to conduct electricity to said electric lead, a contact magnetic section to couple with the mounting magnetic section to connect the contact member to the mounting member such that electricity may be conducted from the battery terminal to said electric lead via said electrical conductive section and wherein the magnetic sections are outside the major electrical conductive route and wherein the magnetic sections at least partially insulate said electrical conductive sections.

4,917,613

HIGH DENSITY CONNECTION SYSTEM

Ashok N. Kabadi, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Nov. 4, 1988, Ser. No. 267,028
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—67 11 Claims



1. A high density flexible circuit connector system for electrical coupling of high density flexible circuits with an electrical apparatus comprising:

a first rectangular stiffener plate having a slot disposed diagonally from one corner to an opposite corner of said plate;

a first flexible circuit having a substantially triangular neck area disposed at a 45 degree angle from the remaining first flexible circuit, said first neck area coupled with said stiffener plate through said slot;

a second flexible circuit having a substantially triangular

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neck area disposed at a 45 degree angle from the remaining second cable, said second neck area coupled with said first stiffener plate through said slot;

fastening means for fastening said first neck area and said second neck area to a surface of said first stiffener plate.

4,917,614

ELECTRICAL CONNECTOR FOR SURFACE MOUNTING ONTO CIRCUIT BOARDS

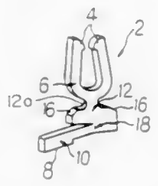
Shoji Kikuchi, Hiratsuka; Nobuaki Onoue, Sagamihara, and Junichi Tanigawa, Kawasaki, all of Japan, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 26, 1988, Ser. No. 186,497

Claims priority, application Japan, May 12, 1987, 62-115684; Aug. 14, 1987, 62-202993

Int. Cl.[4] H01R *9/09*

U.S. Cl. 439—83 **9 Claims**



1. An electrical contact comprising:

an elongate termination section to be terminated at the outer end thereof to an electrically conductive area on an insulation board;

an intermediate section having a relatively large base portion linked to the inner end of said termination section at substantially a bottom center of said base portion and having a relatively narrow neck portion; and

a contact section having substantially symmetrical opposing contact members coupled to said neck portion of said intermediate section for resiliently receiving a contact pin between said opposing contact members;

wherein said termination section is long enough so that the outer end thereof extends from the side of said base portion of said intermediate section and is bent from the base portion at an acute angle with respect to the plane of said intermediate section and said contact section.

4,917,615

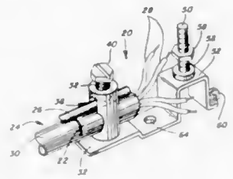
GROUND BRACKET

George J. Franks, Jr., 664 Thompson Cir., Inverness, Ill. 60067

Filed Nov. 18, 1988, Ser. No. 273,257

Int. Cl.[4] H01R *4/36*

U.S. Cl. 439—98 **12 Claims**



1. A bracket for mechanical and electrical connection between a conductive sheath of a shielded cable and a ground wire, comprising:

a lug having a first, generally keyhole-shaped bore formed therein, the keyhole-shaped bore including an enlarged portion only slightly larger than the diameter of an exposed portion of the conductive sheath of the shielded cable and a reduced portion only slightly larger than the diameter of the ground wire, a second bore formed to extend into the first bore; and

means in said second bore which forces the ground wire into engagement with the exposed portion of the conductive sheath of the shielded cable with the keyhole-shaped bore snugly holding the ground wire and shielded cable during engagement to thereby form an electrical connection between the conductive sheath and the ground wire.

4,917,616

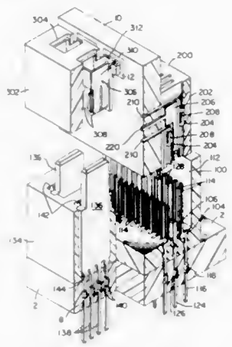
BACKPLANE SIGNAL CONNECTOR WITH CONTROLLED IMPEDANCE

Henry W. Demler, Jr., Lebanon, Pa.; Frank P. Dola, Hudson, Fla.; David J. Kimmel, Clearwater, Fla., and Thomas J. Sotolongo, Clearwater Beach, Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 15, 1988, Ser. No. 220,045

Int. Cl.[4] H01R *13/652*

U.S. Cl. 439—101 **41 Claims**



1. An electrical connector assembly for use in impedance controlled interconnections between a motherboard and daughterboard, the assembly comprising:

a first connector containing a plurality of first signal contacts;

a second connector containing a like plurality of mating second signal contacts, the first and second connectors and the first and second signal contacts being configured to form a right angle interconnection of the motherboard and daughterboard; and

ground means including a planar ground bus in the first connector extending between rows of first signal contacts and a plurality of separate ground contacts in the second connector, extending between second signal contacts, each ground contact comprising a planar member with a resilient contact section and means for interconnection to a printed circuit board, the ground contacts being disposed in spaced parallel relationship, the planar members, between the resilient contact section and the means for interconnection to a printed circuit board extending at right angles to the planar ground bus in the first connector.

4,917,617

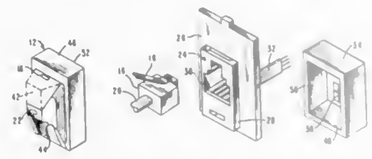
WEATHERPROOFING APPARATUS FOR TELEPHONE CONNECTORS

Thomas J. Smith, Bay Shore, N.Y., assignor to TII Industries, Inc., Copiague

Filed Jal. 3, 1989, Ser. No. 375,132

Int. Cl.[4] H01R *13/44*

U.S. Cl. 439—135 **7 Claims**



1. A weatherproofing apparatus for a telephone connector having a lockinq lever disposed thereon comprising:

resilient plug shroud means having;

(i) a first opening adapted to receive a telephone cable therethrough,

(ii) a second opening adapted to receive said locking lever,

(iii) a third opening distal to said first opening adapted to receive said telephone plug therethrough, and

(iv) lip means disposed about the perimeter of said third opening for frictionally receiving a mating telepbone jack.

4,917,618

MOUNTING SYSTEM FOR PLUG-IN MODULES

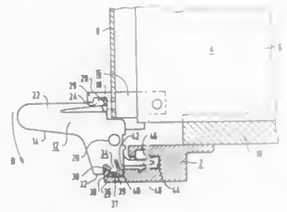
Ralf Behrens, Nuremberg; Kurt-Michael Schaffer, Eckental, and Helmut Schierreich, Veitsbronn, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 26, 1989, Ser. No. 302,825

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1988, 8802800[U]

Int. Cl.[4] H01R *13/62*

U.S. Cl. 439—157 **6 Claims**



1. A mounting system for a plurality of mounting plug-in modules in a module carrier, the module carrier comprising a metal framework having at least one horizontal transverse bar that defines a transverse bar slot, a projection and a plurality of racks arranged perpendicular to the metal bar for receiving the plug-in modules, the plug-in modules comprising a circuit card that is insertable into the racks of the carrier along an insertion plane, the system comprising:

a fixture having:

an end piece coupled to at least one of the plug-in modules, the end piece having an end piece slot with a projection;

a front plate connected to the end piece in a form-locking manner, forming a front face to the plug-in modules; and

a lever having a fulcrum, the lever defining a lever slot, inner and outer projections and a resilient detent hook, the lever being coupled to the end piece so that the fulcrum of the lever is supported in the end piece perpendicular to the insertion plane, the inner and outer projections of the lever engaging with the projection of the transverse bar when the lever is in a locking position and the resilient detent hook engaging with the projection of the end piece when the lever is in a locking position, the inner projection of the lever defining a slit formed in such a manner that the inner projection faces away from the lever and forms a resilient leg.

4,917,619

TOOL CHANGER FOR WELDING ROBOT

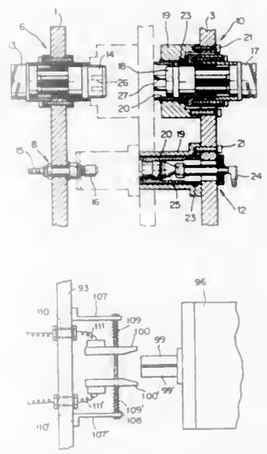
Toshihiro Nishiwaki, Kanagawa, Japan, assignor to Obara Corporation, Tokyo, Japan

Filed Dec. 9, 1988, Ser. No. 282,626

Claims priority, application Japan, Dec. 26, 1987, 62-328399; Feb. 16, 1988, 63-31823; Oct. 25, 1988, 63-267051

Int. Cl.[4] H01R *4/64*

U.S. Cl. 439—191 **11 Claims**



1. A tool changer for a welding robot, comprising:

a first base plate associated with a robot arm and a second base plate associated with tool member, a plurality of first connector parts supported on said first base plate and extending therethrough, said first connector parts being adapted to supply at least one of electricity, gas and water to the tool member from the robot arm, a plurality of second connector parts supported on said second base plate and extending therethrough, said second connector parts being adapted to receive at least one of electricity, gas and water from said first connector parts, each said first connector part being adapted to slidably mate with and form a connection with a respective said second connector part, said connector parts being respectively arranged on said base plates such that respective pairs of said connector parts mate when said base plates are disposed in a predetermined relationship adjacent one another; and

an electrical transformer mounted on said first base plate associated with the robot arm, said electrical transformer being located centrally of said first connector parts, said electrical transformer having a pair of secondary terminals extending therefrom, said second base plate having a pair of electrical terminals supported thereon centrally of said second connector parts, said secondary terminals of said electrical transformer being electrically connected to

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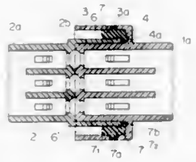
said electrical terminals of said second base plate when said first connector parts mate with said second connector parts.

4,917,620

WATERPROOF ELECTRICAL CONNECTOR

Masakuni Samejima; Kiyohito Fukuda, and Mitsuru Matsumoto, all of Haibara, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Oct. 26, 1988, Ser. No. 262,631
Claims priority, application Japan, Oct. 28, 1987, 62-163616[U]; Oct. 28, 1987, 62-163617[U]
Int. Cl.⁴ H01R *13/52*
U.S. Cl. 439—272 **2 Claims**



1. A waterproof electrical connector comprising
a first connector housing having an annular enclosure formed around an outer periphery thereof, said annular enclosure including an annular wall surrounding said outer periphery of the first connector housing and an end wall extending radially to connect said annular wall and said outer periphery to define a cavity;
a groove formed in said end wall of said annular enclosure and facing said cavity;
a seal ring inserted in said cavity, said seal ring being formed of a resilient material and having a first section of smaller wall thickness to provide a forwardly open space in said cavity and a second section of larger wall thickness extending rearwardly of said first section and including an inwardly extending rib, said second section abutting said end wall and being compressed between said annular enclosure and said outer periphery of said first connector housing; and
a second connector housing having a sleeve projecting forwardly of an outer periphery thereof and adapted to be inserted into said open space to contact the outer periphery of the first connector housing and radially compress said first section of said seal ring in said cavity with said groove providing space for axial displacement of said inwardly extending rib.

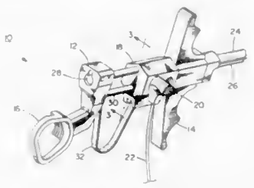
4,917,621

RESECTOSCOPE WITH IMPROVED GUIDE BLOCK AND ELECTRICAL PLUG CONNECTION

Benedetto Grossi, Stamford, and Thomas W. Bracci, Norwalk, both of Conn., assignors to Circon Corporation, Santa Barbara, Calif.

Division of Ser. No. 202,154, Jun. 2, 1988. This application Mar. 2, 1989, Ser. No. 318,120
Int. Cl.⁴ H01R *13/00*; **A61B** *17/39*
U.S. Cl. 439—224 **11 Claims**

1. A disconnectable electrical plug for use with a urological endoscope, the plug comprising:
housing means comprised of a dielectric material and intended for grasping by an operator;
conductor means extending into said housing means for providing an electrical current into said housing means;
keying means for limiting insertion of the plug into a guide block of an endoscope to at least two orientations, said keying means comprising an extension block insertable into the guide block of the endoscope, said extension block extending from said housing means at a substantially right angle to an entry of said conductor means into said housing means, said extension block being insertable into the guide block in a first orientation with said conductor means being in a substantially downwardly extending position or a second orientation with said conductor means being in a substantially upwardly extending position, said extension block having a receptacle means; and



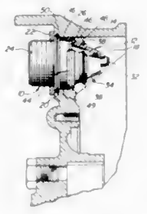
connector means at least partially located in said extension block for electrically connecting said conductor means with a proximal end of an electrode located within the guide block, said connector means being located at said receptacle means such that said connector means can contact the electrode at said receptacle means.

4,917,622

STRAIN RELIEF DEVICE FOR ELECTRICAL CABLES

Randall D. Davis, Machesney Park, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 10, 1989, Ser. No. 377,163
Int. Cl.⁴ H01R *13/58, 13/52*
U.S. Cl. 439—271 **24 Claims**



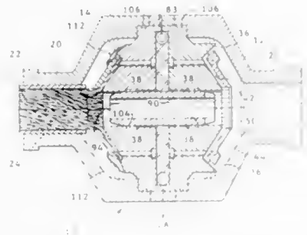
1. A strain relief device adapted for use with an electrical connector for terminating an electrical cable, comprising:
at least a pair of shell members adapted for assembly to a terminating end of the electrical connector and for embracing the electrical cable;
first receptacle means in the form of a groove extending substantially entirely about the periphery of the sheel members;
retaining means positionable in the first receptacle means for holding the shell members in assembly on the electrical connector;
second receptacle means on the inside of the shell members; and
strain relief means positionable in the second receptacle means for clamping about the electrical cable when the shell members are held in assembly by the retaining means.

4,917,623

TERMINATOR OF A MULTI-STRAND ELECTRICAL CONDUCTOR

Dimitry G. Grabbe, Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 8, 1988, Ser. No. 242,018
Int. Cl.⁴ H01R *13/28*
U.S. Cl. 439—284 **20 Claims**



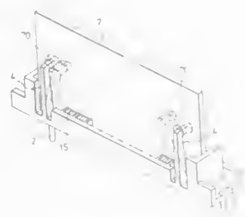
1. A terminator of a multi-strand electrical conductor for conducting high current levels at high frequency and high temperature, said conductor having a longitudinal axis and an outer periphery substantially concentric thereto, said terminator comprising:
(a) a plurality of groups of strands of said multi-strand conductor wherein each of said strands includes a layer of insulating material insulating it from adjacent strands;
(b) a terminal having a wire terminating surface;
(c) receiver means for receiving and directing some of said plurality of groups of strands outwardly from said axis and distributing ends of some of said strands along portions of said wire terminating surface which are further from said longitudinal axis than is said outer periphery; and
(d) a fusion of metal along said ends of said strands and a portion of said wire terminating surface into a monolithic fused structure.

4,917,624

SOCKET FOR PRINTED CIRCUIT BOARD

Mu-Gen Yu, 17-1, Alley 24, Lane 51, Shin-Sheng Rd., Tansui Chen, Taipei Hsien, Taiwan

Filed Mar. 28, 1989, Ser. No. 329,548
Int. Cl.⁴ H01R *9/09*
U.S. Cl. 439—328 **4 Claims**



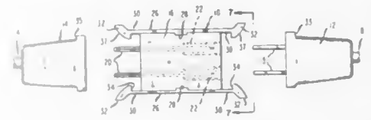
1. A socket for a printed circuit board comprising:
a socket body defining an elongated channel having two opposite ends, said body having a base with a row of cavities for receiving one side of the circuit board which bears conductors for electrical connection; and
two immobilizing pins which are provided at one side of the row of cavities adjacent to said ends of said socket body and are arranged in positions substantially parallel to the printed circuit board, each of said pins having both a bent end to be inserted into a hole provided in the printed circuit board, and a hooking element formed on said bent end, said pins having a substantial degree of resiliency so as to be movable along a line substantially parallel to the channel in said body to facilitate engagement and disengagement with the printed circuit board said bent ends extending along lines substantially normal to the printed circuit board, and said hooking elements projecting from one side of said bent ends in opposite directions relative to one another, said booking elements extending along a line substantially parallel to the channel in said base of said socket body.

4,917,625

SNAP-ON ELECTRICAL CONNECTOR FOR ELECTRICAL CORD HAVING MATING PLUGS

Ernest Haile, 30 Cadwalader Ter., Trenton, N.J. 08618

Continuation-in-part of Ser. No. 223,330, Jul. 25, 1988, abandoned. This application Oct. 18, 1988, Ser. No. 259,549
Int. Cl.⁴ H01R *13/627*
U.S. Cl. 439—358 **8 Claims**



1. A device for mechanically and electrically connecting a pair of electrical cords, said cords having a mating male plug and female connector each of which is formed with shoulder means, said device comprising a retainer having:
(a) at least two opposed retainer members each of which is in the form of an elongated strip of springable material;
(b) locking heads on the strips adapted to interengage with the shoulder means of the mating plug and female connector responsive to insertion of the plug and connector between the strips; and
(c) means providing a connection between the strips and spacing the strips apart a distance sufficient to permit insertion of the plug and connector into engagement with the locking heads thereof, said plug and connector being interengageable directly with each other in mating, electrical contact and wherein the shoulder means of the plug and connector are spaced apart a distance sufficient to engage said locked heads when the plug and connector are so interengaged with each other, said device further including a third strip having a locking head thereon, said plug and connector having shoulder means engaging the locking heads of all three strips when the plugs are in electrical contact.

4,917,626

CORD PLUG COUPLING

Paul S. Barton, R.F.D. 1, Box 2337, Liberty, Me. 04949

Filed Sep. 7, 1989, Ser. No. 404,273
Int. Cl.⁴ H01R *13/639*
U.S. Cl. 439—369 **13 Claims**

1. Device for holding together a pair of mating electrical plugs which comprises
at least one strap of fabric carrying a multiplicity of hooks on one face, the strap being devoid of hooks along a base area at one end,
said strap being affixed by such base area to one side of a first one of said plugs with its hooked end extending beyond its end the hooks facing inwardly toward the plug to which it is fastened,
a corresponding pad of fabric carrying a multiplicity of loops on only one side,

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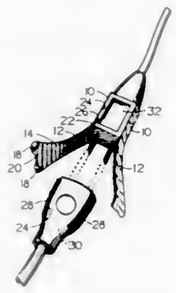
said pad being affixed by its loopless side to the side of the second one of said plugs with its looped side facing outwardly toward the hooks of the strap,



whereby when said plugs are mutually engaged said strap and said pad may be manually pressed together to lock said hooks and loops to each other.

4,917,627

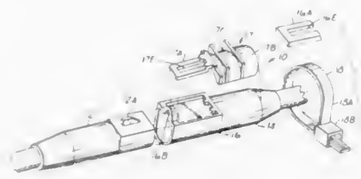
LATCH REPLACEMENT KIT

Charles E. Hendricks, St. Clair Shores, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 28, 1989, Ser. No. 344,924

Int. Cl.[4] H01R *13/627*

U.S. Cl. 439—371 **1 Claim**



1. A kit for repairing a damaged latch of a connector assembly lock wherein a barrel-type plug of one connector which contains a catch of the lock inserts into a socket of another barrel-type connector containing a latch of the lock, the lock includes a key hole having the profile of the catch for receiving the catch and a latch fixedly attached to the rear portion of the lock, the latch having a front structure and a slot, the front structure rising sufficiently to allow a front wedge surface of the catch being urged through the key hole to enter the slot, the slot encompassing the catch such that a rear flat face of the catch abuts against the front structure locking the plug connector in the socket connector wherein a damaged latch occurring if the latch is raised excessively such that the latch severed from the rear portion of the lock leaving a damaged lock housing, said kit comprising:

a replacement latch assembly comprised of:

(1) a mounting bracket that encompasses the socket connector near a rear location of the damaged lock, said mounting bracket having a grooved track extending over the surface of the bracket;

(2) a resilient replacement latch fixedly attached to a front edge of said mounting bracket such that said latch extends over the housing of the lock and in the lock housing so as to be in a position to replace the detached latch of the damaged latch, said replacement latch having slot for receiving the catch; and

(3) a tie strap comprised of a strap and a strap lock, the strap routing in the track and about the socket connector and through the strap lock, locking said bracket in place against the socket connector such that the replacement latch confluences with the catch and the damaged lock housing.

4,917,628

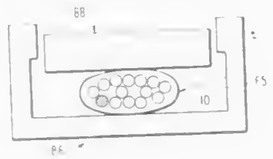
MODULAR PLUG FOR VARIABLY DEFORMING CABLE TERMINATED THEREIN

Stephen B. Bogese, II, Salem, Va., assignor to Virginia Patent Development Corp., Roanoke, Va.

Continuation of Ser. No. 170,636, Mar. 16, 1988, abandoned, which is a continuation of Ser. No. 65,674, Jun. 22, 1987, abandoned, which is a continuation of Ser. No. 912,179, Sep. 26, 1986, abandoned, which is a continuation of Ser. No. 815,193, Dec. 26, 1985, abandoned, which is a continuation of Ser. No. 604,229, Apr. 26, 1984, abandoned, which is a division of Ser. No. 246,165, Mar. 23, 1981, Pat. No. 4,461,923. This application Jan. 17, 1989, Ser. No. 298,871

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—391 **16 Claims**



1. In a modular plug characterized by a unipartite rigid dielectric housing having a free end for insertion into a mating modular jack, a movable locking tab extending angularly rearwardly from the free end of the housing and adapted to mate with a tab-receiving latch in the modular jack, a cable input end having a cable-receiving opening for receiving a multiconductor cable having an outer jacket, and a terminal receiving side having a plurality of slots for receiving substantially planar contact terminals having insulation-piercing tangs at the lower portion thereof for terminating the conductors of the cable in the opening and an upper portion for making electrical contact with the spring contact members of the mating modular jack,

the improvement which comprises cable locking means formed in said housing adapted to compressibly hold the cable in said opening and to cause deformation of a portion of the cable, said cable locking means including means for producing a variable pressure for compressibly holding the cable in said opening thereby producing controllable deformation of the cable, said means for producing a variable pressure including a first level of pressurization on said cable during which said cable locking means is in a first position on said cable, and a second level of pressurization on said cable during which said cable locking means is in a second position on said cable.

4,917,629

ELECTRICAL CONNECTOR AND TERMINATION METHOD THERETO

Shuichi Matsuzaki, and Shigeru Kikuta, both of Tokyo, Japan, assignors to Hirose Electric Co, Ltd., Tokyo, Japan

Filed Feb. 21, 1989, Ser. No. 312,213

Claims priority, application Japan, Mar. 7, 1988, 63-53287; May 19, 1988, 63-122596

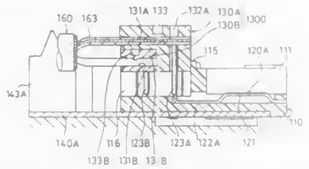
Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—405 **3 Claims**

1. An electrical connector to which insulated conductors of a multiconductor cable are connected by insulation piercing, which comprises:

an insulation housing having a front recess and a rear recess;

a plurality of contacts arranged in said insulation housing such that contacting sections of said contacts are exposed in said front recess and piercing sections of said contacts project upwardly in said rear recess; and



a guide block disposed in said rear recess and having a lateral slot extending in a horizontal plane in which said insulated conductors are arranged side by side at regular intervals, a plurality of vertical slots into which said piercing sections are inserted, and a deformation groove extending along said horizontal plane and at right angles to said insulated conductors and provided behind said vertical slots for securing said insulated conductors to said guide block when it is deformed

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4,917,630

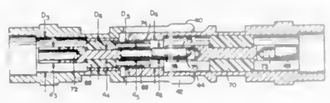
CONSTANT IMPEDANCE HIGH FREQUENCY COAXIAL CONNECTOR

George M. Hubbard, Hamden, Conn., assignor to The Phoenix Company of Chicago, Inc., Wood Dale, Ill.

Continuation of Ser. No. 108,783, Oct. 15, 1987, abandoned. This application Nov. 21, 1988, Ser. No. 273,693

Int. Cl.[4] H01R *17/18*

U.S. Cl. 439—578 **26 Claims**



12. A coaxial electrical connector comprising:

a first plug including:

a first inner conductor having a free end for connection to a second inner conductor;

a first outer conductor having a free end for connection to a second outer conductor; and

a first dielectric spacer between the first inner conductor and the first outer conductor, the free end of the first inner conductor projecting beyond the free end of the first outer conductor, the region between the first inner conductor and the first outer conductor having a substantially constant impedance;

a second plug for connection to the first plug including:

the second inner conductor having a free end for connection to the first inner conductor;

the second outer conductor having a free end for connection to the first outer conductor; and

a second dielectric spacer between the second inner conductor and the second outer conductor, the free end of the second outer conductor projecting beyond the free end of the second inner conductor, the region between the second inner conductor and the second outer conductor having a substantially constant impedance;

the projecting portion of the first inner conductor and the projecting portion of the second outer conductor overlapping each other when the connector is partially engaged thereby defining an overlap region which forms part of the signal pathway; and

the ratio of the inner diameter of the projecting portion of the second outer conductor to the outer diameter of the projecting portion of the first inner conductor and the dielectric constant within the overlap region being such that the impedance is substantially constant within the overlap region and is the same as the impedance of the connector in the first and second plugs.

4,917,631

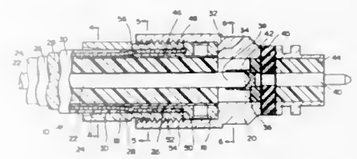
MICROWAVE CONNECTOR

Ronald A. Souders, Reading, and Jorge L. Cabrera, Jeffersonville, both of Pa., assignors to UTI Corporation, Collegeville, Pa.

Filed Dec. 2, 1988, Ser. No. 279,381

Int. Cl.[4] H01R *17/18*

U.S. Cl. 439—583 **9 Claims**



1. A connector for microwave transmission lines having an inner conductor, a low-density PTFE dielectric layer surrounding the inner conductor, a thin outer conductor surrounding the dielectric layer, a woven wire braid shield surrounding the thin outer conductor and an exterior insulating covering surrounding the shield, comprising:

(a) a contact ring surrounding and in physical and electrical contact on an interior surface thereof with the outer conductor, a first end of the contact ring, the outer conductor and the dielectric layer all terminating in a common plane, the contact ring having a second end spaced from the first end, and having a shouldered portion between the first and second ends thereof for contacting the shield and causing the shield to terminate in a plane parallel to and spaced from the common plane of the first end of the contact ring, the outer conductor and the dielectric layer,

(b) a clamp nut movably surrounding the shield and contact ring along at least a portion thereof,

(c) a connector shell removably engageable with the clamp nut and surrounding at least the shouldered portion of the contact ring, and

(d) captivating means adapted to prevent axial movement of said inner conductor, and

(e) the outer conductor, the contact ring, the shield, the clamp nut and the connector shell all being in physical contact to provide an electrical path from the thin outer conductor to the connector shell while keeping constant characteristic cable impedance.

4,917,632

SEISMIC TAKEOUT CONNECTOR

J. David Smith, Richmond, Tex., assignor to Shaw Industries Ltd., Rexdale, Canada

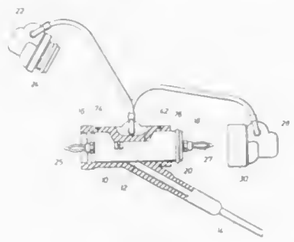
Filed May 15, 1989, Ser. No. 351,787

Int. Cl.[4] H01R *9/03*

U.S. Cl. 439—624 **12 Claims**

1. An electrical connector comprising an elongated housing of non-conducting material, two electrical connector conductors extending lengthwise of the housing, each connector conductor having a socket at one end and a pin at the other, a sleeve of elastic material positioned on the housing so that a portion of the housing extends beyond the sleeve to serve as a male plug and a portion of the sleeve extends beyond the other

end of the housing to combine with the housing to form a female plug, said sleeve having an elongated leader cable entry boot in its side surface for forming a watertight seal with a



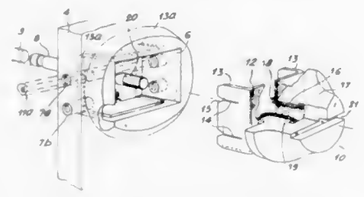
geophone cable, a geophone cable extending through the cable entry boot, and means connecting the conductors in the geophone cable to the connector conductors extending lengthwise of the housing.

4,917,633

SEPARABLE CONNECTION DEVICE BETWEEN A CONDUCTING LUG AND AT LEAST ONE CONNECTION WIRE

Albert Lacoste, Aulnat, France, assignor to Centre National D'Etudes des Telecommunications, Issy Les Moulineaux, France

Filed Sep. 15, 1988, Ser. No. 244,884
Claims priority, application France, Sep. 18, 1987, 87 12977
Int. Cl.[4] H01R *9/22*
U.S. Cl. 439—722 7 Claims



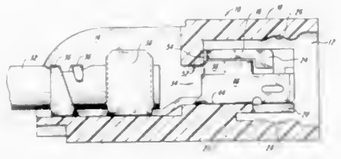
1. A separable connection device comprising:
a casing open at one end to receive a wire clamp, said casing including an aperture for receiving at least one sheathed wire, extending into the casing parallel to said open end;
a lug threaded at one end supported by said casing perpendicular to a plane of said one end;
a wire clamp having first and second spaced apart wings connected by a central portion, each wing bearing on an edge a cutting slit, for engaging a sheathed wire, said central portion including an opening for receiving said lug; and,
an actuation member axially fixed to said wire clamp, including a plurality of inside threads disposed over said opening engaging said lug threads, said member engaging said lug threads forcing said cutting slit into engagement with said sheathed wire, whereby an electrical connection is made between said wire, clamp and lug.

4,917,634

ELECTRICAL CONNECTOR

Lawrence E. Geib, Carol Stream, and Herbert C. Naylor, West Dundee, both of Ill., assignors to Reed Devices, Inc., Carol Stream, Ill.

Filed Jun. 24, 1987, Ser. No. 65,922
Int. Cl.[4] H01R *13/432*
U.S. Cl. 439—746 8 Claims



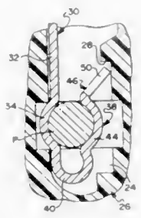
1. An electrical connector comprising:
a housing of electrically insulative material having:
top and bottom members spaced from respective top and bottom housing walls,
side members integral with the top and bottom members,
one or more parallel passageways each having a forward end and a rearward end; defined by the top and bottom members and side members,
the top member having an inwardly extending first abutment in each passageway to act as an insertion stop,
a second abutment centrally of each passageway having a forwardly facing V-groove,
a terminal insertable in each passageway and having a forward end portion engageable with the first abutment, a pair of yieldable tines cooperative with the V-groove, a forward contact portion mateable with a terminal of a mating connector housing, and a rearward portion having means for contacting an attached wire.

4,917,635

PIN GRIP TERMINAL

Richard V. Landries, and Bradley A. Shattuck, both of Warren, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 24, 1989, Ser. No. 383,486
Int. Cl.[4] H01R *13/432*
U.S. Cl. 439—746 2 Claims



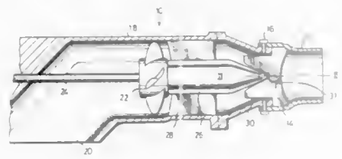
1. A pin grip terminal for use in a connector body of electrical insulation material which has a terminal cavity which includes a latch shoulder, the pin grip terminal comprising:
a base having a forward end, a contact area at the forward end for engaging a side of pin contact and a rearward end, and
a cantilever spring arm which is integrally attached to the forward end of the base by a reverse bend so that the cantilever spring arm confronts the contact area at the forward end of the base,
the cantilever spring arm having a slit which divides the cantilever spring arm into a contact grip for engaging an opposite side of the pin contact and biasing it against the contact area at the forward end of the base and an elongated lock tang for retaining the pin grip terminal in a connector body,
the elongated lock tang slanting away from the base in the rearward direction and extending past the contact grip.

4,917,637

WATERJET PROPULSION SYSTEM FOR WATERCRAFT

Katsumasa Soga, and Jiro Kitao, both of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed May 25, 1988, Ser. No. 198,752
Claims priority, application Japan, May 28, 1987, 62-81503
Int. Cl.[4] B63H *11/113*
U.S. Cl. 440—42 4 Claims



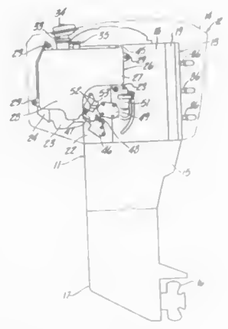
1. A waterjet propulsion system for a watercraft comprising a duct disposed on the bottom of the watercraft and having an opening facing backward, means for producing a waterjet in said duct, a steerable nozzle supported rotatably around a vertical axis at said duct opening,
a rear part of said duct being gradually reduced in its cross-sectional area to form a restriction, a fore end of said nozzle surrounding said rear part of said duct, and
a flow guide mounted inside of and integrally with said nozzle and extending forward beyond said vertical axis into said restriction.

4,917,638

ENGINE COVERED BY A COWLING FOR A MARINE PROPULSION DEVICE

Akinori Kojima, Shizuoka, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jul. 16, 1984, Ser. No. 630,979
Claims priority, application Japan, Jul. 27, 1983, 58-135732; Jul. 27, 1983, 58-135733; Jul. 27, 1983, 58-135734
Int. Cl.[4] F02B *33/04*
U.S. Cl. 440—77 22 Claims



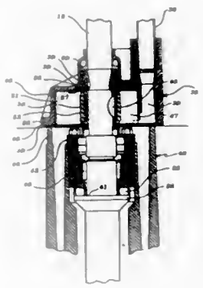
1. An outboard motor comprising an internal combustion engine having a lubricating system and disposed with the rotational axis of its output shaft extending substantially in a vertical direction, a protective cowling enclosing said engine, a liquid tank containing lubricant for the engine lubricating system contained within said protective cowling and disposed below the top of and on one side of said engine, and an electric starter motor contained within said protective cowling and disposed on the opposite side of said engine from said liquid tank.

4,917,639

DEVICE FOR SUPPORTING DRIVE SHAFT OF MARINE PROPULSION UNIT

Akihiro Onoue, Hamamatsu, Japan, assignor to SanshinKogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 19, 1988, Ser. No. 158,218
Claims priority, application Japan, Feb. 24, 1987, 62-39255
Int. Cl.[4] B63H *21/38*
U.S. Cl. 440—88 6 Claims



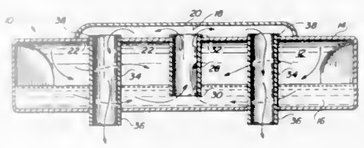
1. In a marine outboard drive comprised of an outer housing, a drive shaft journaled within said outer housing for driving a marine propulsion device, a thrust bearing interposed between said outer housing and said drive shaft for supporting said drive shaft against thrust forces in at least one direction, a pump housing affixed within said outer housing and defining a pumping cavity, said pumping cavity being defined by a surface facing in a direction extending axially of said drive shaft, a pumping element drivingly connected to said drive shaft and contained within said pumping cavity, said driving connection comprising a resilient element connecting said pumping element to said drive shaft and permitting relative axial movement therebetween when not axially loaded, said resilient element exerting an axial force on said drive shaft relative to said pumping element for maintaining the thrust forces on the drive shaft in the one direction when installed and under load.

4,917,640

MARINE ENGINE EXHAUST SYSTEM AND METHOD

Charles C. Miles, Jr., Longwood, Fla., assignor to Marine Muffler Corporation, Apopka, Fla.

Filed Mar. 13, 1989, Ser. No. 322,408
Int. Cl.[4] B63H *21/10*
U.S. Cl. 440—89 21 Claims



1. An exhaust muffler for marine engines, comprising:
a first enclosed chamber defined by a first chamber wall and a bottom portion;

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inlet means extending through said first chamber wall for passing exhaust gases from a marine engine into said first chamber and so that cooling liquids entrained with said exhaust gases collect in the bottom portion of said first chamber;

an oblong second enclosed chamber having a second chamber wall a portion of which is common with said first chamber;

at least one intermediate exhaust passageway extending from near the bottom portion of said first chamber, through said common portion of said second chamber wall and into said second chamber; and

at least one outlet exhaust passageway spaced from said one intermediate exhaust passageway along the lengthwise dimension of said second chamber and extending from said second chamber and through said first chamber wall for venting of the muffled exhaust gases.

4,917,641

LIFE JACKET

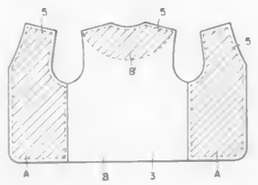
Shoji Katoh, 90, Hakuraku, Kanagawa-ku, Yokohama, and Minoru Arai, 146-3, Isezakicho 6-chome, Naka-ku, Yokohama, both of Japan

Continuation of Ser. No. 179,103, Apr. 8, 1988, abandoned. This application Jul. 18, 1989, Ser. No. 383,307

Claims priority, application Japan, Mar. 8, 1988, 63-30667[U]

Int. Cl.[4] B63C *9/08*

U.S. Cl. 441—115 **3 Claims**



1. A life-jacket comprising an outer cloth and an inner lining, said outer cloth and said inner lining being joined to one another to define therebetween a back part enclosure and two front part enclosures with each of said front part enclosures being joined to said back part enclosure, said back part enclosure having an upper portion adapted to be juxtaposed to a wearer's neck and shoulders when the life-jacket is placed on a wearer's body ready for use, air-inflatable bag means disposed within each of said front part enclosures and in said upper portion of said back part enclosure, feathers in each of said front part enclosures and in said upper portion of said back part enclosure between said air-inflatable bag means and said inner lining, said outer cloth having a pocket, compressed air means on said life-jacket disposed in said pocket, actuating means connected to said compressed air means and actuated by said wearer to admit compressed air from said compressed air means to said air-inflatable bag means to inflate the latter, an inflation tube means mounted on said life-jacket and receivable in said wearer's mouth for the wearer to blow air into said air-inflatable bag means to inflate the latter, said actuating means being disposed on said life-jacket so as to be readily actuated by said wearer when the life-jacket is placed on a wearer's body ready for use, said inflation tube means being disposed on said life-jacket so as to be readily receivable in said wearer's mouth when the life-jacket is placed on a wearer's body ready for use, each of said two front part enclosures and said back part enclosure having a lower edge portion, two belt means, securing means securing one end of each of said two belt means to each lower edge portion of said two front part enclosures, said two belt means each passing between said wearer's legs and being secured to said lower edge portion of said back part enclosure, and loop means on said lower portion of each of said front part enclosures and on said lower portion of said back part enclosure for holding said two belt means when said two belt means are not being used to secure the life-jacket to a wearer's body.

4,917,642

AIR-TIGHT CERAMIC CONTAINER

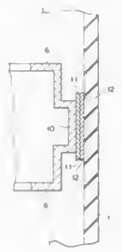
Masako Nakahashi; Makoto Shirokane; Hiromitsu Takeda; Tatsuo Yamazaki, all of Tokyo; Tsutomu Okutomi, Yokohama; Shozi Niwa, Sagamihara; Mikio Okawa, Tokyo, and Mitsutaka Homma, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 1, 1988, Ser. No. 176,752

Claims priority, application Japan, Apr. 2, 1987, 62-79618; Jul. 13, 1987, 62-172843; Jul. 13, 1987, 62-172845; Mar. 4, 1988, 63-49758

Int. Cl.[4] H01J *9/26*

U.S. Cl. 445—44 **13 Claims**



1. A method of manufacturing an air-tight ceramic container, comprising the steps of: coating an active metal consisting of Li and/or Zr on an opening end face of a ceramic tubular member in tight contact therewith by means of an organic adhesive in an amount of 0.1 to 10 mg/cm^2, thereby forming an active metal layer which is not reacted with the ceramic member; placing a brazing filler metal on said active metal layer; placing a metal cover member for shielding an opening portion of said ceramic tubular member so that a peripheral portion end face of said metal cover is in contact with said brazing filler metal; melting said brazing filler metal by heating, thereby simultaneously reacting the active metal layer with the ceramic base to form a metal-ceramic bond and brazing said metal cover thereto.

4,917,643

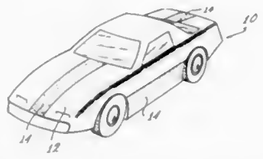
TOY VEHICLE WITH THERMOCHROMIC MATERIAL

Keith Hippely, Manhattan Beach, and Larry R. Wood, Redondo Beach, both of Calif., assignors to Mattel, Inc.

Filed Jun. 26, 1987, Ser. No. 67,519

Int. Cl.[4] A63H *17/00*

U.S. Cl. 446—14 **19 Claims**



1. A toy vehicle comprising a vehicle body having an initial appearance resulting from at least a portion of said vehicle body being coated with thermochromic paint means having an initial color, said thermochromic paint means for changing said initial appearance by changing said initial color in response to temperature variation of said vehicle body, said thermochromic paint means including thermochromic material capable of changing color due to said temperature variation in order to vary said initial appearance of said vehicle body to a substantially different appearance.

4,917,644

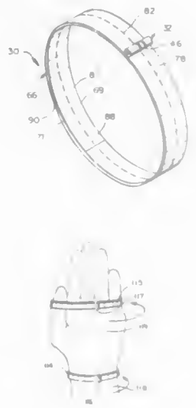
MAGNETIC TOY AND APPAREL

Philip Sunshine, 1997 Millboro Dr., Potomac, Md. 20854

Filed Aug. 18, 1989, Ser. No. 395,682

Int. Cl.[4] A63H *33/00, 33/26, 1/24;* **A63F** *9/00*

U.S. Cl. 446—26 **24 Claims**



1. A magnetic toy comprising:

a figure having an outside surface which permits the figure to roll in an angular direction, at least part of the figure having two opposite magnetic poles running parallel to each other along the figure surface in the angular direction and forming a magnetic force line between the two opposite magnetic poles in the figure;

a magnetic belt having an outside surface which permits the figure to roll, at least part of the belt having two opposite magnetic poles running parallel to each other along the belt surface and forming a magnetic force line along the belt surface between the two opposite magnetic poles in the belt, said magnetic force line in the belt constituting means for attracting and holding the figure to the belt, permitting the figure to roll along the belt, orienting the figure relative to the belt by aligning the magnetic force line of the figure with the magnetic force line of the belt, and guiding the figure along a path on the belt defined by the magnetic force line of the belt by keeping the magnetic force line of the figure aligned with the magnetic force line of the belt while the figure rolls along the belt.

4,917,645

DOLL WITH SOUND GENERATING MECHANISM

Francis R. Amici, Northford, Conn.; Brian Fontaine, Southbridge, Mass., and Craig Dubois, Granby, Conn., assignors to Hasbro, Inc., Pawtucket, R.I.

Filed Jul. 26, 1989, Ser. No. 385,191

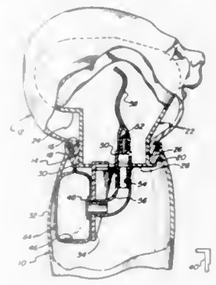
Int. Cl.[4] A63H *3/28*

U.S. Cl. 446—184 **19 Claims**

1. A sound producing doll comprising:

(a) a doll having a torso, head, arms and legs; and

(b) a sound producing mechanism in said doll comprising (i) a compressible pillow in said torso providing a volume of air therewithin, (ii) a closed cavity-defining member in said head and having a base wall extending transversely of said head and torso, said pillow being supported on said base wall, (iii) a bladder within said member, and (iv) a conduit from said pillow to said bladder, said bladder being expansible and vibrating upon passage of air therethrough from said conduit and producing a sound simulating that of an infant burping, the sound being amplified by said cavity-defining member.



4,917,646

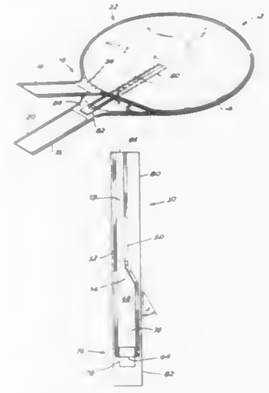
SELF-SEALING VALVE, A SELF-SEALING, NON-LATEX BALLOON, AND A METHOD FOR PRODUCING SUCH A BALLOON

Garry Kieves, 3517 W. 38th St., Minneapolis, Minn. 55410

Filed Aug. 17, 1988, Ser. No. 233,156

Int. Cl.[4] A63H *27/10;* **F16K** *15/16;* **B32B** *31/00*

U.S. Cl. 446—224 **14 Claims**



14. A self-sealing, non-latex balloon having a body and a stem comprising, in combination:

a first balloon sheet having an interior surface;

a second balloon sheet bonded to said first balloon sheet so as to define said body and said stem; and

a self-sealing valve having a first floating portion within said body and a second portion heat-fused to said first and second balloon sheets within said stem, said self-sealing valve including a first flexible plastic valve sheet, having a thickness in the range of one (1.0) to two (2.0) mil, bonded to a second flexible plastic valve sheet, having a thickness

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in the range of one (1.0) to two (2.0) mils, so as to provide a positioning tab and a valve inlet defining said second portion, said positioning tab being initially bonded to said interior surface of said first balloon sheet at a predetermined position and a predetermined orientation with respect thereto;

said valve inlet being bonded to said first and second balloon sheets within said stem;

said self-sealing valve further including a bonding barrier of heat-resistant ink applied to at least one of said first and second flexible plastic valve sheets at said valve inlet;

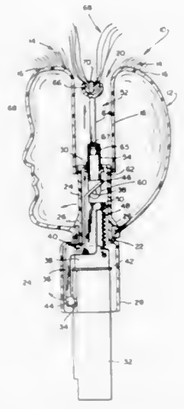
said self-sealing valve further defining a valve passageway having an inlet section, an outlet section and an offset section, such that said inlet section has a width greater than said outlet section.

4,917,647

COMB AND TALK DOLL

Joseph J. Wetherell, 20 Woodsbridge Rd., Katonah, N.Y. 10536, and Larry Reiner, 1 Horizon Rd., Fort Lee, N.J. 07024

Filed Feb. 27, 1989, Ser. No. 315,594
Int. Cl.[4] A63H *3/44*
U.S. Cl. 446—297 17 Claims



1. A comb and talk doll comprising a doll head including a plurality of extensible hair strands, hair securement means within the doll head for attaching the hair strands to the doll head, said hair securement means being yieldably displaceable in response to the application of a tensile force upon the hair strands, sound generating means within the doll, linkage means engageable by the hair securement means for displacement, said linkage means further being in communication with the sound generating means for actuating the sound generating means upon the application of a tensile force to the hair strands.

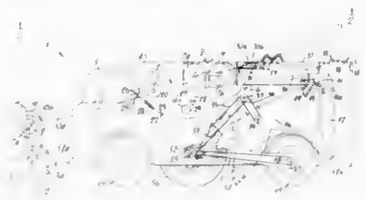
4,917,648

TOY SANITATION TRUCK

Robert A. Hartje, 359 Mountainview Ter., Dunellen, N.J. 08812

Filed Aug. 9, 1988, Ser. No. 230,045
Int. Cl.[4] A63H *33/30, 17/12, 17/14*
U.S. Cl. 446—424 21 Claims

1. A toy sanitation truck comprising in combination: a truck structure of a shape symbolic of a municipal utility sanitation truck having an integral housing means with left and right side faces thereof with forward axle and wheels and with a rearward axle and wheels as an integral part thereof, said integral housing means including a cab, an aft housing structure forming a space having an upper portion thereto and located substantially between said forward and rearward axles, a water-storage vessel, at-least one lid-portion for gaining access to said upper portion of said space, the lid-portion being adapted to be alternately opened and closed for gaining access to said upper interior portion, and an aft-cleaning means for effecting a cleaning function of treating or cleaning a substrate surface, the cab having a cab-rear, and a water absorbing sponge; two pin-structures, different ones thereof located on each of opposite ones of said left and right side faces, and two spaced-apart lever arms, each having an elongated longitudinal axis with a proximal end and with a distal end, the lever arms extending in



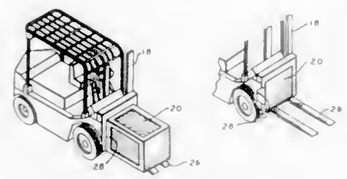
parallel relationship to one-another and said proximal ends thereof being mounted respectively at said pin-structures pivotally adapted for pivoting the lever arms forwardly and aftwardly overhead toward the cab-rear, toward the aft-cleaning means and toward the housing structure, to an aftward pivoted position rearward of said pin-structures, and when said lever arms are pivoted rearwardly, excess water within the sponge being drainable directly into said water-storage vessel; said aft-cleaning means being constructed and shaped to be symbolic of at-least one structure having an actual cleaning function, mounted on said distal ends.

4,917,649

TOY VEHICLE WITH SIMULATED LOADING

Robert F. Tammera, 56 Gilbert Pl., W. Orange, N.J. 07052

Filed Aug. 10, 1989, Ser. No. 392,106
Int. Cl.[4] A63H *17/00, 17/14, 17/40*
U.S. Cl. 446—427 11 Claims



1. A toy load carrying vehicle comprising:

a body having a cavity therein for receiving a load; means secured to said body for enabling movement of said body along a surface;

support means on one end of said body for holding a load;

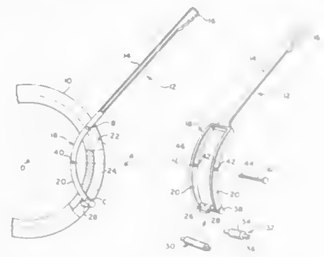
a load slidable on said support means and being movable into and out of said body cavity; and means extending downwardly from said load and engageable with means extending from said surface, movement of said body and load in one direction causing said downwardly extending means to engage said surface extending means and move said load into said cavity and movement in an opposite direction causing said load to be moved out of said cavity.

4,917,650

HOOP TYPE TOY

Eddy Paultre, 1011 Owasco Rd., West Hempstead, N.Y. 11552

Filed Sep. 7, 1988, Ser. No. 241,337
Int. Cl.[4] A63H *33/02*
U.S. Cl. 446—453 7 Claims



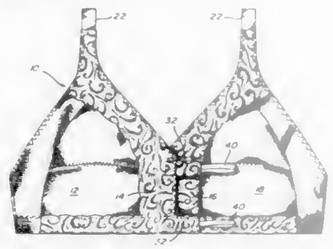
1. A hoop style toy comprising in combination a hoop, the perimeter of which is formed with a continuous groove, and a guide control member comprising an elongated handle having an outwardly arcuately curved bifurcated lower portion formed by a pair of legs joined at one end to said handle by a first transverse member and at their other end by a second transverse member having a projection adapted to ride within said groove, a brake pin secured across said legs at a point substantially midway therealong, said outwardly curved bifurcated lower portion being disposed in use over said hoop so that said brake pin is located in the interior of said hoop, said transverse members ride on the perimeter of said hoop and said legs straddle the hoop crossing the perimeter thereof at two spaced points, said brake pin being disposed on said legs at a point that, when in use on the hoop, said brake pin lies on the line substantially joining the center of the hoop and the center of the curvature of the legs, and the distance between the center of curvature of said legs and the points at which said legs cross the perimeter of said hoop are equal to the distance between the center of curvature and the brake pin so that said transverse members and said brake pin cooperate to provide effective guidance and directional control of said hoop and control of the speed of said hoop when said handle is manipulated to bring said brake pin into control with the inner peripheral rim of said hoop.

4,917,651

FRONT OPENING BRASSIERE FOR EASY ACCESS AND REMOVAL BY A HANDICAPPED PERSON

Francine J. Rainville, 303 Fleet Dr., Beaconsfield, Quebec, Canada (H9W 5X8)

Filed Sep. 6, 1988, Ser. No. 240,207
Int. Cl.[4] A41C *3/02*
U.S. Cl. 450—58 5 Claims



1. A front opening brassiere for easy access and removal by a handicapped person, said brassiere comprising:

brassiere cups having at least one joining piece extending around the back of a wearer;

one brassiere cup having a center underlapping portion, the other cup having a center overlapping portion which extends over the underlapping portion between the brassiere cups;

adjustable top and bottom fabric fastening pads, said pads being disposed in a spaced apart relationship on the underside of the overlapping portion to engage with corresponding support pads located on the top side of the brassiere cup with the underlying portion;

positive attachment means between the underside of the overlapping portion and a top side of the underlapping portion, said positive attachment means being located between said top and bottom fabric fastening pads;

at least one fabric loop extending from the edge of the overlapping portion to assist in gripping the overlapping portion of the brassiere cup for access or removal;

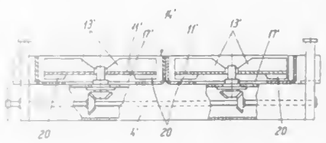
whereby said top and bottom fabric fastening pads and corresponding support pads, in conjunction with said fabric loop, are adapted to position said overlapping portion with respect to said underlapping portion to thereby facilitate the engagement and disengagement of said positive attachment means.

4,917,652

HARVESTER THRESHER WITH MEANS FOR DISTRIBUTING GRAIN-CHAFF MIXTURE

Franz Glaubitz, and Horst Harig, both of Harsewinkel, Fed. Rep. of Germany, assignors to Claas Ohg, Harsewinkel, Fed. Rep. of Germany

Filed Feb. 17, 1988, Ser. No. 157,736
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1987, 3704755
Int. Cl.[4] A01F *29/12*
U.S. Cl. 460—111 11 Claims



1 A harvester thresher comprising grain cleaning means having a discharge end; and means for distributing a grain-chaff mixture arranged in the region of said discharge end of said grain cleaning means, said distributing means having two oppositely rotatable discs and a cup-shaped housing which surrounds said discs and has at least one throwing out opening and a bottom, said bottom of said cup-shaped housing having a central air supply opening, each of said discs of said distributing means being provided with a distributing strip attached to said disc, said bottom of said housing is formed as a cover provided with said central air supply opening, said cup-shaped cover also having an open end facing towards said grain cleaning means, said discs having one side facing toward said grain cleaning means and being provided at said one side with said distributing strips, said disc also having another side facing towards said cover of said cup-shaped housing and being provided at said another side with a plurality of air vanes.

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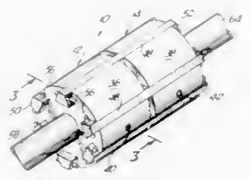
4,917,653
ELASTOMERIC COUPLING
Charles N. Collucci, 83 Spruce St., Bloomfield, N.J. 07003
Filed Jul. 28, 1988, Ser. No. 225,251
Int. Cl.[4] F16D *3/58*
U.S. Cl. 464—85 23 Claims

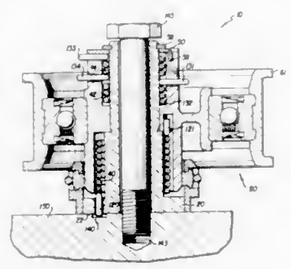


1. An elastomeric coupling for rotatably connecting the ends of a pair of substantially inline rotatable shafts, said coupling comprising:
a pair of hubs adapted for rotation and located in tandem with one end of each of said hubs located adjacent to one another, the opposite end of each of said hubs having a bore configured to receive an end of one of said respective shafts;
means for connecting the associated hub to the portion of the shaft received therein for rotation therewith;
each of said hubs having a plurality of radially oriented and longitudinally extending passageways communicating with said one end of said hub, wherein selected passageways in one of said hubs are substantially aligned with corresponding passageways in the other one of said hubs to form a plurality of pairs of substantially aligned passageways in said adjacently located hubs;
a plurality of elongated, flexible elastomeric members, each of said elastomeric members having a longitudinal extent greater than the combined length of the pair of adjacently aligned hubs, wherein separate ones of said members are configured to be received within selected pairs of adjacently aligned hub passageways in a close fitting relationship to operatively and drivingly connect said hubs to one another;
each of said elastomeric members being positioned within the associated aligned passageways of said hubs with the opposite ends of said members projecting beyond the opposite ends of said hubs, each of said projecting ends of said members having a hole therein; and
a plurality of pins disposed such that a separate pin is removably received within each of the holes of said elastomeric members, each of said pins having a portion projecting beyond an edge of the associated elastomeric member to overlie an end edge of the associated hub passageway, the projecting portions of said pins adapted to abut against an end surface of the adjacent hub upon axial displacement of said elastomeric members to limit axial movement of said members within said aligned passageways during rotation of said hubs;
whereby said elastomeric members transmit the rotation of one of said hubs, imparted by the rotation of its associated shaft, to the other one of said hubs and, thereby, to the shaft associated with said other hub.

4,917,654
BELT TENSIONING ARRANGEMENT
Derek J. Edwards, Crewe, England, assignor to Rolls-Royce Motor Cars Limited, Crewe, England
Filed May 6, 1988, Ser. No. 191,217
Claims priority, applicatioo United Kingdom, May 15, 1987, 8711522
Int. Cl.[4] F16H *7/08*
U.S. Cl. 474—133 4 Claims

1. A belt tensioning arrangement for an endless belt adapted for disposition around a plurality of pulleys to define an envelope in which one of the pulleys is mounted for movement with respect to the remaining pulleys to accommodate changes in length of the belt comprising means for moving the said one pulley in response to changes in belt length whereby to maintain the tension in the belt substantially constant, resilient means forming part of the means for moving and having an axis and an end remote from a lever which is mounted for pivotal movement about a fixed point and which is connected to the said one pulley and a damper connected to the lever, the resilient means and the lever being disposed within the envelope of the belt, and the end of the resilient means one from the lever being spaced away from a line drawn substantially at right angles to the axis of the resilient means and passing through the pivot of the lever.

4,917,655
SELF ADJUSTING TIMING BELT TENSIONER
Kelly D. Martin, Lawndale, N.C., assignor to Ina Bearing Co., Inc., Fort Mill, S.C.
Filed Mar. 1, 1989, Ser. No. 317,516
Int. Cl.[4] F16H *7/08*
U.S. Cl. 474—112 39 Claims



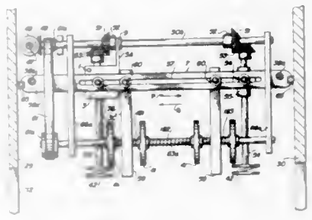
1. A belt tensioner for applying a tension force to an endless drive belt disposed along a path, comprising
(a) a pivot shaft for mounting adjacent the belt path, defining a pivot axis;
(b) a belt contacting tire;

(c) a rotatable pulley having a central axis and an eccentric hub coaxial with an eccentric axis, said pulley hub being coaxial with said pivot axis and said eccentric axis, said pulley being capable of urging said belt contacting tire to tension said belt, said hub including a plurality of spring stop faces defining at least one arc radially disposed from said eccentric axis;
(d) a torsional drive force means having a fixed first end radially disposed from said pivot axis and a second end fixed within said hub for biasing said pulley and said belt contacting tire into the belt path to tension said belt; and
(e) a helical countertorsion force means having a first end moveably coupled to said hub within said arc to provide a step-displaced counterrotation torque, and a second end unidirectionally coupled around said pivot shaft, for permitting essentially unidirectional overrunning movement around said pivot shaft;
whereby said torsional drive force means is adapted to apply a tension to said belt in a first direction and said countertorsion force means permits only increments of counterrotation defined by said arc.

4,917,656
REAR BELT GUARD IN A SEWING MACHINE
Shuichi Sato, Utsunomiya, and Takashi Sakai, Imaichi, both of Japan, assignors to SSMC Inc., Fairfield, N.J.
Filed Jul. 17, 1989, Ser. No. 380,952
Claims priority, application Japan, Aug. 16, 1988, 63-107430[U]
Int. Cl.[4] F16H *57/02*
U.S. Cl. 474—144 6 Claims

1. A rear belt guard in a sewing machine comprisig:
a head of a sewing machine mounted o a table of the sewing machine and capable of turning in the rear portion thereof;
a driving unit disposed under the table;
a belt device positioned between the side of the head and the driving device and having a belt entrained around a driving pulley mounted on the driving unit and a driven unit mounted on the head for transmitting a rotary motion of the driving unit to the head via the driving and driven pulleys; and
a belt guard for covering the belt exposed over the table and composed of a front belt guard for covering the front portion of the belt and a rear belt guard for covering the rear portion of the belt;
characterized in that the rear belt guard is composed of a guard member having an inclined wall inclined downwardly toward the rear portion thereof provided with a notched recess at the upper surface thereof, a cover member slidable on the notched recess and capable of covering the notched recess for receiving the belt when the head is turned, and a spring for urging the cover member in the direction to close the notched recess.

4,917,657
CONTINUOUS FORM STATIONERY FOLDING MACHINE WITH SYSTEM FOR SIMULTANEOUSLY LOCATING STATIONERY AND LATERALLY ADJUSTING FOLDING MECHANISMS
Earnest B. Busch, Jr., 9619 N. 21st Dr., Phoenix, Ariz. 85021
Filed Jan. 30, 1989, Ser. No. 304,775
Int. Cl.[4] B65H *45/20*
U.S. Cl. 493—8 7 Claims



1. In combination with apparatus for producing continuous form stationery by folding a strip of paper along transverse line of weakening formed therein, said apparatus including
a frame
oscillating guide means mounted on said frame for alternately distributing said successive lines of weakening in said paper in substantially opposite direction,
means for feeding said paper into said guide means at a predetermined speed, said paper having first and second spaced apart elongate edges and having front and back faces,
folding means carried on said frame and operatively associated with said oscillating guide means for urging said paper distributed by said guide means into a folded condition, said folding means including first and second spaced apart sets of spirals shaped and dimensioned and rotatably driven to receive paper from said oscillating guide means to fold the paper along the transverse lines of weakening, one of said spirals in each of said first and second sets normally engaging said first elongate edge during urging of said paper into a folded condition,
the improvements comprising means for positioning, with respect to said first elongate edge, said one of said spirals in said first set and said one of said spirals in said second set, said positioning means including
(a) means for laterally simultaneously adjusting the position of said one of said spirals in said first set and said one of said spirals in said second set with respect to said first elongate edge to engage said first elongate edge to urge said paper distributed by said guide means into a folded condition, said lateral adjustment means including
(i) a first rotatable elongate shaft which is above, is at an angle with respect to said faces of, and is laterally spaced away from said first edge and from said faces of said paper moving through said guide means for distribution thereby,
(ii) at least one track generally parallel to paper moving through said guide means,
(iii) first gear box means carrying said one of said spirals in said first set and said elongate shaft, said one of said spirals in said first set downwardly extending from said first gear box means,
(iv) second gear box means carrying said set and said elongate shaft, said one of said spirals in said second set downwardly extending from said second gear box means,
(v) means for rotating said elongate shaft,
(vi) means carried on said elongate shaft for engaging said track such that when said shaft is rotated by said rotat-

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ing means, said engaging means moves along said track such that said elongate shaft, said one of said spirals in said first set, and said one of said spirals in said second set simultaneously each move n a lateral direction of travel which is parallel to said paper moving through said guide means and is toward the other of said spirals in said first and second sets;

(b) sensor means mounted on said apparatus for determining when said one of said first set of spirals and said one of said second set of spirals are each aligned with said first elongate edge of said paper; and,

(c) at least one beater for periodically tamping said paper distributed by said chute, said beater

(i) assisting in the folding and positioning of said paper,

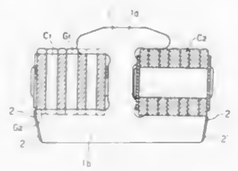
(ii) being movably mounted on a second rotatable shaft for rotation therewith and for sliding movement which is along the shaft intermediate said spirals in said first set and is in a direction parallel to paper moving through said guide means, said first gear box means being shaped and dimensioned to contact and slidably move said beater along said second rotatable shaft when said first rotatable elongate shaft is rotated with said rotating means to move said first gear box means toward said other of said spirals in said first set.

4,917,658

FRICTION PLATE FOR CVT CHAIN

Yoshiaki Sugimoto; Toshihiro Hosokawa; Yutaka Uchiumi, all of Saitama; Shuji Sasamoto, Osaka, and Nobuyuki Fujimoto, Saitama, all of Japan, assignors to Tsubakimoto Chain Co., Japan

Filed Jul. 5, 1989, Ser. No. 375,606
Claims priority, application Japan, Jul. 5, 1988, 63-88463
Int. Cl.[4] F16G *1/22*
U.S. Cl. 474—242 **11 Claims**



1. A friction drive chain comprising:

a plurality of friction plates arranged adjacent one another, the friction plates being substantially I-shaped in lateral section and having upper and lower beam members;

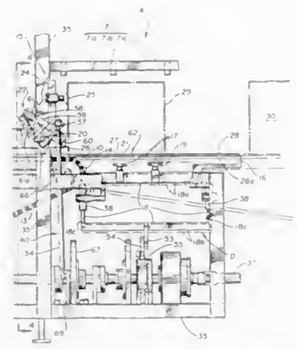
connecting elements for the friction plates, said connecting elements being received in recesses defined between the upper and lower beam members, on both lateral sides of said friction plates, to form an endless chain, the upper and lower beam members of said friction plates being engaged with the connecting links partly by means of grooves along the upper and lower portions of the link plates of said connecting elements, laterally outer surfaces of the lower beam member of each of said friction plates forming friction drive surfaces for contact with a pulley, and wherein the friction plates are heat treated to increase structural strength, and said friction drive surfaces are surface hardened to form abrasion resistant layers by means of a surface hardening treatment.

4,917,659

PACKAGING CONTAINER EJECTION APPARATUS

John M. Mohaupt, Minneapolis, and Mark R. Riemenschneider, St. Paul, both of Minn., assignors to R. A. Jones & Co., Inc., Covington, Ky.

Filed Apr. 21, 1987, Ser. No. 40,906
Int. Cl.[4] B31B *1/78, 1/04*
U.S. Cl. 493—12 **3 Claims**



1. Apparatus for ejecting defective carton blanks from a carton erecting machine, comprising:

conveyor means for transporting knocked down carton blanks to a carton erecting station and for transporting erected cartons from the carton erecting station along a transfer path;

erecting means for erecting knocked down carton blanks at a carton erecting station;

sensing means for determining whether a carton blank at the carton erecting station fails to be properly erected by the erecting means and is therefore defective;

ejecting means constructed and arranged when activated, for engaging defective carton blanks and ejecting them from the carton erecting machine, the ejecting means comprising:

upper means;

lower means;

the upper and lower means comprising first and second tractors at least one of which is pivotable from an open, non-contacting position to a closed, contacting position, at least one of which has a driven continuous belt for tractively contacting opposite sides of said carton blank;

actuator means for introducing relative movement between the upper means and the lower means when the ejecting means is actuated thereby to engage the top and bottom surfaces of a defective carton blank in the nip formed between the upper means and the lower means;

the actuator means comprises pivot means for pivoting at least one of said tractors from said open position to said closed position;

driving means for causing the upper means and the lower means to cooperate to eject the defective carton blank transversely to the carbon transfer path of the machine;

the driving means includes means for driving said continuous belt;

control means actuated by said sensing means for actuating said ejecting means and for engaging defective carton blanks and ejecting them transversely to the transfer path of the erecting machine;

the control means includes means for actuating the pivot means to pivot at least one of the tractors to a closed position and for activating the driving means to eject the defective knocked down carton blank from said erecting machine;

at least one of said tractors comprising:

a tractor body;

a driven roller mounted on an inner end of said tractor body and driven by a tractor drive shaft;

an idler roller rotatively mounted on an outer end of said tractor body;

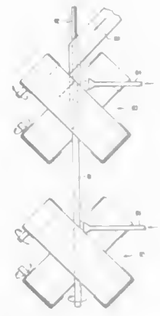
said driven continuous belt of said tractor being mounted on said driven and idler rollers of the tractor, to travel thereon in response to said driven roller, wherein said tractor is pivotable about said tractor drive means;

4,917,660

APPARATUS FOR PRODUCING CYLINDRICAL FILTERS

Albert E. Spaller, Jr., Johnson City, and Jack S. Moore, Jr., Blountville, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 25, 1988, Ser. No. 275,835
Int. Cl.[4] B31C *13/00*
U.S. Cl. 493—42 **14 Claims**



1. Apparatus for making cylindrical filters from tows of fibers, said apparatus comprising:

(a) a mandrel;

(b) at least one first belt located adjacent to said mandrel and in position to make essentially linear contact with a tube formed from at least one tow of fibers twisted around said mandrel;

(c) first means for driving said at least one first belt so as to draw said at least one tow of fibers onto said mandrel and so as to move the tube axially relative to said mandrel;

(d) at least one second belt located downstream of said mandrel in position to contact the tube and

(e) second means for driving said at least one second belt so as to collapse the tube and close the hole in the tube formed by said mandrel.

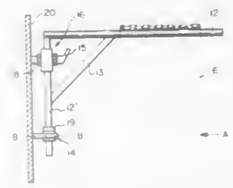
4,917,661

DEVICE FOR COLLECTING BAGS OR SACKS

Erwin Tirp, Lengerich, and Heinz Peters, Lienen, both of Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Jun. 23, 1988, Ser. No. 210,338
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725335; Feb. 29, 1988, 3806445
Int. Cl.[4] B65H *29/00*
U.S. Cl. 493—194 **3 Claims**

1. A device for collecting bags or sacks in a machine for making the bags or sacks, wherein the collecting device comprises a collecting rod, which is mounted in a frame of the machine and which extends transversely to a direction in which the bags or sacks are advanced through the machine, wherein the collecting rod is connected at one end to a carrier extending at right angles to the rod, said carrier being pivoted in the machine frame about a pivot axis parallel to the collecting rod, and the device including means for fixing the carrier in selected positions, characterized in that the carrier is longitudinally slidably mounted in a slide means, which is spaced above



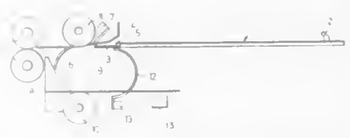
the pivot axis of the carrier, the carrier being adapted to be fixed in position relative to said slide means, the slide means being mounted for movement along a transversely extending track and having means for fixing same in position on the track.

4,917,662

METHOD AND AN APPARATUS FOR FOLDING PLIABLE MATERIAL, SUCH AS DOCUMENTS, WHICH MAY DIFFER IN QUALITY AND LENGTH AND WHICH ARE CONVEYED IN ASSEMBLED FORM OR SUCCESSIVELY

Jacobus F. Gombault, Drachten, Netherlands, assignor to Hadewe B.V., Drachten, Netherlands

Filed Oct. 14, 1988, Ser. No. 257,923
Claims priority, application Netherlands, Oct. 14, 1987, 8702457
Int. Cl.[4] B65H *9/10, 45/12*
U.S. Cl. 493—416 **21 Claims**



1. A method of folding pliable, paperlike material, such as documents, which may differ in quality and length and which are conveyed in assembled condition or successively in a transport track, said material being provided with a fold in a location at some distance before a trailing edge by bending a leading edge and a contiguous portion of the material out of the plane of transport and creating a folding area by guide means, in which area subsequently a desired sharp folding edge is made by a folding means, characterized by bending the leading edge and the contiguous portion of the material out of the plane of transport during a feeding of the material, brining the material into a hollow tubular shape by displacing said leading edge and contiguous portion along a stationary means that forms a hollow body with an inner tubular guiding face, which shape, depending upon the length of the material, is completely or partly circumferentially closed, flattening the tubular shape to form at least one folding area, and feeding the material to the folding means in flattened form.

4,917,663

PACKAGING MACHINE WITH DIRECT BLANK SETUP

Irvan L. Pazdernik, Alexandria, Minn., assignor to APV Douglas Machine Corporation, Alexandria, Minn.

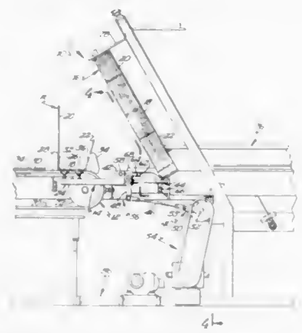
Filed May 24, 1988, Ser. No. 198,053
Int. Cl.[4] B31B *3/02, 1/06*
U.S. Cl. 493—416 **4 Claims**

1. Method of retaining control of a container blank along a conveyor assembly in a packaging machine, with the blank including a major panel having side edge portions, with the

conveyor assembly including an upper flight moving in a first direction, with the upper flight including a leading lug having an edge and a trailing lug having an edge with the edges of the lugs being spaced to engage the blank, with the conveyor assembly including longitudinally extending continuous guide flanges alongside the conveyor assembly to overlie the side edge portions of the major panel, with the longitudinally extending guide flanges having terminal ends, comprising the steps of:

(a) attaching the major panel of the blank to an arm assembly in a first position;

(b) moving the arm assembly with the attached blank in an arcuate path from the first position to a second position, with the major panel of the blank attached to the arm assembly and being positioned thereby between the leading and trailing lugs on the upper flight of the conveyor assembly and spaced from the terminal ends of the longitudinally extending guide flanges in the second position,



with the blank being held on the upper flight by the leading and trailing lugs;

(c) moving the arm assembly with the attached blank in the first direction from the second position to a third position simultaneously as the blank located between the leading and trailing lugs moves on the upper flight in the first direction, with the side edge portions of the major panel of the blank attached to the arm assembly being inserted in the first direction under the longitudinally extending guide flanges by the arm assembly and the conveyor assembly as the arm assembly moves from the second position to the third position and as the blank moves on the upper flight in the first direction; and

(d) releasing the major panel of the blank from the arm assembly when the arm assembly is in its third position and after the side edge portions of the major panel of the blank have been inserted under the guide flanges for movement with the conveyor assembly in the first direction.

4,917,664

FLUTED ROLL FOR A CORRUGATED BOARD MANUFACTURING MACHINE

Hervé Lacaux, Condat Sur Vienne, France, assignor to Papeteries et Cartonneries Lacaux Freres, Limoges, France

Filed Oct. 24, 1988, Ser. No. 261,974

Claims priority, application France, Oct. 23, 1987, 87 14712

Int. Cl.[4] B31B *1/64*

U.S. Cl. 493—470 **12 Claims**

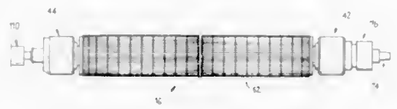
1. A roll for a machine for manufacturing corrugated board, said roll comprising:

a hollow roll shell comprising a roll body, said shell having a peripheral surface and an internal cylindrical suction chamber for permanent connection to a source of low pressure;

a series of radial suction apertures in said shell opening onto said peripheral surface of said shell and connecting said peripheral surface of said shell with said suction chamber; and

a series of axial ducts in a peripheral portion of said body of said shell for permanently circulating a heat carrying fluid for heating said shell;

wherein said series of axial ducts comprises an even number of said axial ducts evenly spaced apart and connected in



pairs, each said pair constituting a heating circuit, and each said axial duct having opposite open ends;

the ends of each said pair of axial ducts at a first end of said shell are interconnected; and

the opposite ends of each said pair of axial ducts at a second end of said shell are an inlet and an outlet, respectively, for the heat carrying fluid.

4,917,665

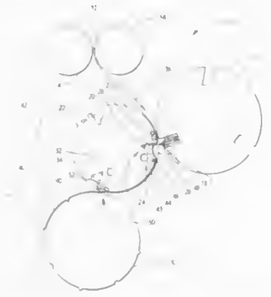
BEDROLL INTERFOLDING MACHINERY IMPROVEMENT

Dennis Couturier, Washburn, Wis., assignor to C. G. Bretting Manufacturing Co. Inc., Ashland, Wis.

Continuation of Ser. No. 195,195, May 18, 1988, abandoned, which is a division of Ser. No. 62,858, Jun. 16, 1987, Pat. No. 4,778,441. This application May 26, 1989, Ser. No. 358,530

Int. Cl.[4] B31D *1/04*

U.S. Cl. 493—472 **3 Claims**



1. An improved cutoff bedroll and cutoff roll system for use in machinery having a cutoff bedroll, a cutoff roll and a folding roll for interfolding porous cut sheets from an adjacent web of material, the improved cutoff bedroll and cutoff roll system comprising:

(a) a cutoff roll;

(b) a cutoff bedroll adjacent the cutoff roll and having:

(i) a cutoff station located on the periphery of the cutoff bedroll,

(ii) a notch selectively porting vacuum on the cutoff bedroll and located a predetermined distance downstream of the cutoff station, and

(iii) an air pressure station for selectively exhausting air from the cutoff bedroll ahead of the cutoff station;

(c) a cutoff position located at a nip between the cutoff bedroll and the cutoff roll; and

(d) vacuum means for porting vacuum to the notch from the cutoff position to a nip between the cutoff bedroll and a folding roll;

(e) means for rotating the bedroll at a surface speed differential with respect to the linear speed of an adjacent web of material such that the web slides along the periphery of the bedroll until the leading edge of the web is positioned at the notch as the cutoff station reaches the cutoff position;

wherein the air pressure station exhausts positive air pressure generally radially from the bedroll for separating the trailing edge of the cut sheet from the bedroll prior to the bedroll-folding roll nip.

4,917,666

STEERABLE THRU-LUMEN CATHETER

Ronald J. Solar, and Leo Roucher, both of San Diego, Calif., assignors to Medtronic Versaflex, Inc., San Diego, Calif.

Filed Nov. 14, 1988, Ser. No. 270,557

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—95 **22 Claims**

1. A dilatation catheter means comprising:

a first flexible tubular member having proximal and distal ends comprising a spring coil body defining a lumen, said spring coil body having proximal and distal ends, and a flexible covering positioned over said spring coil body,

a second, smaller tubular member having distal and proximal ends and having at last one lumen, wherein at least one of said at least one lumen is open at its distal end, said second tubular member extending through said first tubular member such that the distal end of said second tubular member extends distally beyond the distal end of said first tubular member,

dilatation balloon means attached concentric to the distal ends of said first and second tubular members, and

control means attached to the proximal end of said dilatation catheter, the control means having at least one passageway in fluid connection with the interior of said first tubular member and/or one more lumens of said second tubular member, the control means and the dilatation catheter being so configured that when the control means is rotated, the dilatation catheter itself rotates to cause the distal end of the dilatation catheter to rotate.

4,917,667

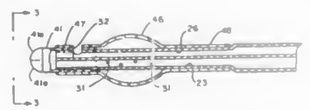
RETROPERFUSION BALLOON CATHETER AND METHOD

Jerome Jackson, Los Angeles, Calif., assignor to Retroperfusion Systems, Inc., Costa Mesa, Calif.

Continuation-in-part of Ser. No. 154,921, Feb. 11, 1988, Pat. No. 4,850,969, which is a continuation-in-part of Ser. No. 103,495, Oct. 1, 1987, abandoned. This application Jan. 9, 1989, Ser. No. 294,867

Int. Cl.[4] A61M *29/00*

U.S. Cl. 604—96 **15 Claims**



1. In a retroperfusion catheter, a flexible elongate element formed of plastic having proximal and distal extremities and having at least first and second lumens extending therethrough, a flexible tip formed of a material which is substantially softer than that of the flexible elongate element secured to the distal extremity of the flexible elongate element, a balloon having proximal and distal portions carried by the distal extremity of the flexible elongate element, means bonding the distal extremity of the balloon to said portion of the flexible tip to secure the flexible tip to the distal extremity of the flexible elongate member to ensure that the flexible tip will not become separated from the distal extremity of the flexible elongate element.

4,917,668

VALVE FOR PERMANENT VENOUS CANNULAE OR FOR CATHETER INSERTION MEANS

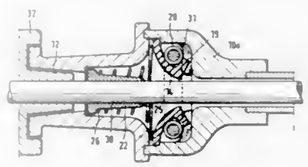
Hans-Guenter Haindl, Melsungen, Fed. Rep. of Germany, assignor to B.. Braun Melsungen AG, Melsungen, Fed. Rep. of Germany

Filed Feb. 2, 1989, Ser. No. 305,850

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1988, 3809127

Int. Cl.[4] A61M *5/18*

U.S. Cl. 604—167 **7 Claims**



1. A valve for permanent venous cannulas or catheter insertion means, comprising:

a housing having a longitudinally extending channel,

an elastomeric valve body disposed in the channel and having a plurality of slots dividing the valve body into a plurality of segments, the valve body being alterable between a closed position in which the spacing between the segments is substantially minimized and an open position in which the spacing between the segments is relatively increased,

insertion means for pushing the valve body into the open position, and

a spring for biasing the valve body in the closed position.

4,917,669

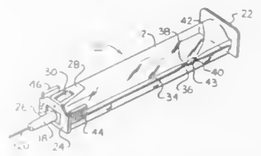
CATHETER INSERTER

Jean M. Bonaldo, Upland, Calif., assignor to Safetyject, Costa Mesa, Calif.

Filed Feb. 8, 1989, Ser. No. 308,137

Int. Cl.[4] A01M *5/00*

U.S. Cl. 604—164 **6 Claims**



1. A catheter inserter comprising:

an inserter housing of parti-cylindrical configuration having a flat base which is generally parallel to the longitudinal axis of the inserter housing;

a cannula;

a cannula housing disposed within the inserter housing and longitudinally slidable therewithin, said cannula housing having a main body portion of a cross-sectional configura-

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tion which is generally complementary with the inserter housing cross-sectional configuration;

said cannula housing including hub means for fixing said cannula to said cannula housing main body so as to extend generally parallel to the inserter housing longitudinal axis;

first stop means disposed at said first end of said inserter housing;

locking means formed on said cannula housing so as to be selectively engageable with said first stop means to lock said cannula housing in a first disposition in which the cannula extends outwardly from the inserter housing at a first end of said inserter housing; and

second stop means formed on said inserter housing remote from said first stop means and selectively engageable with said locking means to lock said cannula housing in a second disposition in which said cannula is retracted within said inserter housing.

4,917,670

CONTINUOUS SPINAL ANESTHESIA ADMINISTERING APPARATUS AND METHOD

Ronald J. Hurley, 83 Pine St., Norwell, Mass. 02061, and Kenneth W. Larson, 57 Liberty La., Keene, N.H. 03431

Filed Mar. 22, 1988, Ser. No. 171,895
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—51 **10 Claims**

1. A method for the continuous administration of spinal anesthesia to a patient comprising

inserting a hollow surgical needle of about 24 gauge (0.508 mm O.D.) to about 26 gauge, (0.403 mm O.D.) partially into the desired spinal site;

inserting a polymeric microcatheter which is sized to fit within the needle into said needle and advancing it until one end of said microcatheter has projected beyond the needle opening and into the desired spinal site, said microcatheter being reinforced with a reinforcing member which extends substantially the length of the microcatheter;

withdrawing said needle from said patient while maintaining said microcatheter within said spinal site; and

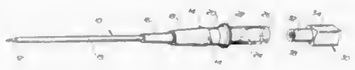
administering anesthetic to said patient through said microcatheter without withdrawing the reinforcing member from the microcatheter.

4,917,671

FLASH PLUG FOR I.V. CATHETERS

Joseph J. Chang, Tampa, Fla., assignor to Critikon, Inc., Tampa, Fla.

Filed Jul. 20, 1988, Ser. No. 221,579
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—168 **11 Claims**



1. A flash plug for an I.V. catheter comprising:

a flash plug body formed of a polymeric material, and including a relatively narrow outside diameter distal end for engaging a catheter flash chamber and a relatively larger outside diameter proximal end for extending from said flash chamber, said narrow and larger outside diameter portions being separated by a shoulder for engaging the proximal end of said flash chamber, said flash plug body including an aperture extending through said distal end proximal portions of said body, said aperture exhibiting a relatively smaller interior diameter within said distal end than the interior diameter of said aperture within said proximal end; and

an insert formed of a porous material and located within said aperture intermediate the terminal ends of said aperture to retain blood within said flash chamber and within said aperture distal said insert, said insert being sized so as to be insertable through said proximal end of said aperture and incapable of passage through said relatively smaller diameter distal portion of said aperture.

4,917,672

SHIELD FOR AN HYPODERMIC SYRINGE INJECTION NEEDLE

Thomas E. Terndrup, 1752 Berwyn Rd., LaFayette, N.Y. 13084, and Brian R. Terndrup, R.D. 1 Box 142, Ebensburg, Pa. 15931

Filed Mar. 17, 1989, Ser. No. 324,701
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—192 **16 Claims**

1. A shield for the injection needle of an hypodermic syringe, comprising:

(a) a movable shield sleeve having top, bottom and sides;

(b) said sleeve including a channel extending therethrough from said top to said bottom and having upper and lower portions for normally positioning the sharpened end of the injection needle in said upper portion;

(c) said sleeve including an opening extending from one side of said sleeve and intersecting said channel and stopping short of the other side of said sleeve and positioned between said upper and lower portions;

(d) said sleeve opening having a plunger positioned therein;

(e) said plunger having an opening therein alignable with said channel;

(f) said plunger being movable between a normal blocking position in which said plunger opening is misaligned with respect to said channel, and an aligned position in which said plunger opening is aligned with respect to said channel;

(g) means for shifting said plunger in said sleeve opening so as to move said plunger opening from said normal blocking position to said aligned position to permit said needle to move through said plunger opening, thereby permitting said needle to be exposed a substantial distance below said bottom of said sleeve for purposes of injection;

(h) automatic means associated with said syringe and said sleeve on said top and movable therewith for permitting said sleeve to move relative to said needle to permit said needle to be automatically retracted into said sleeve upper portion after said needle has been exposed a substantial distance below said bottom of said sleeve for injection; and

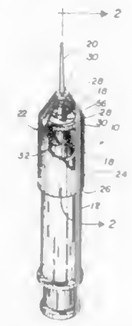
(i) automatic means for automatically bringing said plunger to said normal blocking position subsequent to retraction of said needle in said sleeve and from said plunger opening.

4,917,673

ASSEMBLY FOR THE PROTECTION AGAINST INADVERTENT PUNCTURE BY MEDICAL NEEDLES

Allan J. Coplin, 3340 SW. 59th St., Ft. Lauderdale, Fla. 33312

Filed Oct. 31, 1988, Ser. No. 264,971
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—198 **17 Claims**



1. A protection assembly for a needle including a needle mount designed to be used in connection with a syringe, catheter or like medical instrument, said assembly comprising:

(a) shield means movable relative to said needle and the medical instrument and positionable between a covering and a non-covering position for selective protection of a pointed end of the needle,

(b) said shield means including an elongated configuration and a hollow interior portion and disposed in surrounding, concentric relation to the needle,

(c) said shield means having a sufficient longitudinal dimension to extend along the length of he needle from at least the needle mount to overlying and covering relation to the pointed end thereof when in said covering position,

(d) said shield means comprising a sleeve structure including one end being substantially open and transversely dimensioned to concentrically surround and move relatively to an outer surface of the medical instrument when said sleeve is moved from said non-covering position to said covering position,

(e) said sleeve comprising an opposite end being substantially closed and including a central aperture formed in said opposite end and being of sufficient transverse dimension to allow passage therethrough of the needle,

(f) biasing means mounted adjacent the needle mount within said hollow interior portion in biasing engagement with said shield means for biasing thereof to move outwardly, coaxially along the length of the needle from said non-covering position to said covering position,

(g) locking means mounted adjacent the needle mount and extending laterally outward therefrom into locking engagement with an interior surface of said shield means at at least two spaced apart locations along the length of said shield means,

(h) said locking means and said interior surface cooperatively structured and disposed to removably lock said shield means selectively in either said covering or said non-covering position, and

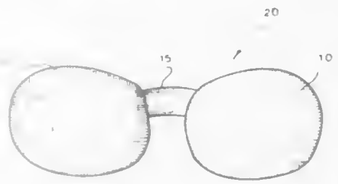
(i) said locking means comprising a plurality of fingers at least two of which are each disposed radially outward from the needle mount in opposed relation to one another and adjacent to and in substantially parallel relation with said inner surface of said sleeve, each of said fingers flexibly structured and movable relative to a remainder of said locking means into engaging relation with said inner surface of said sleeve at a distal end of each finger.

4,917,674

MOUTH MOISTURIZING DEVICE

Henry C. Molinoff, 234 Edgewood Ave., Smithtown, N.Y. 11787

Continuation-in-part of Ser. No. 148,087, Apr. 4, 1988, Pat. No. 4,838,882. This application Nov. 21, 1988, Ser. No. 273,839
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—286 **4 Claims**



1. A medical device for safe treatment of an individual suffering from xerostomia comprising two mouth moisturizing pads, each of which bold at least one sponge section and have a covering made of cloth in which said sponge section is held, said pad having dimensions which are approximately equal to but not significantly less than those of a cheek pouch of said individual, and further comprising a connecting strap attached to each of said mouth moisturizing pads of a length such that each of said mouth moisturizing pads can comfortably reside in one of said cheek pouches of said individual while said strap is supported at least partially by the teeth of said individual, said sponge section being saturable with water for gradual dispensing of said water in the mouth and containing a portion of said water

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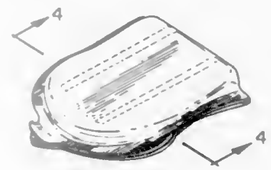
4,917,675

FOLDED FLANGE SEALED SANITARY NAPKIN

Martha K. Taylor, Mercerville; Wassim Seidy, Somerset, and Subramani Srinivasan, East Brunswick, all of N.J., assignors to McNeil-PPC, Inc., Milltown, N.J.

Filed Jul. 14, 1988, Ser. No. 219,430
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385.1 **4 Claims**



1. A sanitary napkin with sealing means for individually wrapping said napkin prior to use comprising:

(a) an absorbent element having a body-facing side, an adhesive-bearing side, longitudinally extending edges and transverse edges, said element being folded along a transverse axis to overlap portions of said body-facing side;

(b) an elongated wrapping member having an interior surface disposed over said adhesive-bearing side of said absorbent element, said wrapping member having portions that extend over portions of said edges of said absorbent element to form opposing outwardly extending flange portions;

(c) pressure-sensitive adhesive means disposed at a location on said interior surface of said flange portions for adhering one flange portion of said wrapping member to a correspondingly disposed region on the interior surface of an

opposing flange portion to retain said napkin in its folded position prior to use; and

(d) wherein said flange portions each comprise a tab for enabling the use to grip said wrapping member to separate said adhesive means adhering said flange portions prior to suing said napkin, and said flange portions extend over the edges of said napkin to form a continuous, outwardly extending flange around the perimeter of said absorbent element, said wrapping member serving also as release paper for the adhesive bearing side of said absorbent element.

4,917,676

USER-ACTIVATED TRANSDERMAL THERAPEUTIC SYSTEM

Werner Heiber, Bedford Hills; Robert Andriola, Putnam Valley, both of N.Y.; Paul Williams, Fairlawn, N.J., and Charles Ebert, Redwood City, Calif., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 933,000, Nov. 20, 1986, abandoned. This application Sep. 27, 1988, Ser. No. 251,016

The portion of the term of this patent subsequent to Mar. 27, 2007, has been disclaimed.

Int. Cl.[5] A61F *13/00*

U.S. Cl. 424—449 **20 Claims**

1. A therapeutic substance non-releasing drug delivery system having a removable protective layer thereon, said system comprising

(a) a therapeutic substance reservoir containing a therapeutic agent or precursor of said therapeutic agent in a first form which cannot permeate from said therapeutic reservoir through said system to the surface of said system which is or was in contact with said removable protective layer;

(b) an activating agent reservoir containing a system activating agent;

(c) a burstable seal or membrane between (a) and (b) which is impermeable to said system activating agent and said therapeutic agent or precursor of said therapeutic agent; and

(d) an occlusive backing layer; wherein upon bursting of said burstable seal or said burstable membrane, said system activating agent activates said system by contacting and converting said therapeutic agent or precursor of said therapeutic agent from said first form into a therapeutic agent second form which second form which migrates from said therapeutic agent or precursor of said therapeutic reservoir to said surface of said system which is or was in contact with said removable protective layer whereby said system becomes a therapeutic substance releasing delivery system.

4,917,677

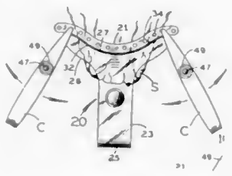
SURGICAL CLAMP ASSEMBLY AND METHOD

John A. McCarthy, 1800 N. Federal Hwy., #107, Pompano Beach, Fla. 33062

Filed Mar. 29, 1989, Ser. No. 330,264

Int. Cl.[4] A61B *17/08*

U.S. Cl. 606—151 **15 Claims**



1. A surgical clamp assembly comprising:

a first clamp having a pair of opposed arms with laterally elongated segments at one end facing each other, each of said segments having an exposed laterally elongated end edge, said end edges of the arms being aligned with each other, and means for selectivley adjusting said arms of the first clamp toward each other to clamp between said laterally elongated segments a fold of skin that is to be surgically removed along a cut line located substantially along said end edges of said arms;

and a pair of additional clamp elements for clamping engagement respectively with proximate segments of the skin immediately adjoining said fold of skin in immediate proximity to said end edges of said laterally elongated segments of said arms, each of said clamp elements having a narrow dimension lengthwise of the corresponding arm and being elongated laterally of the corresponding arm, each of said clamp elements having an end edge which mates with said end edge of said laterally elongated segment on the corresponding arm, at least one of said clamp elements having projections facing the other clamp element.

4,917,678

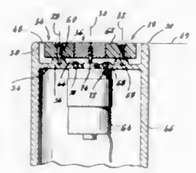
DEPILATORY DEVICE

David R. Locke, Bridgeport, Conn., and Pieter L. Lochner, Surrey, England, assignors to Remington Products, Inc., Bridgeport, Conn.

Filed Sep. 1, 1988, Ser. No. 239,456

Int. Cl.[4] A61B *17/50*

U.S. Cl. 606—133 **25 Claims**



1. A depilatory device comprising:

a. a plurality of hair removal member each comprising a generally cylindrically-shaped body having a peripheral surface, a longitudinal axis and an end surface thereof;

b. said axes aligned substantially parallel and spaced apart a distance for establishing juxtaposed engagement between said peripheral surfaces;

c. a housing for said device having an aperture therein for entry of body hairs to be removed;

d. said aperture extending in a direction generally transverse to said longitudinal axes; and,

e. an electrically energized motor means for imparting rotary motion to said hair removal members whereby manually orientating said axes substantially perpendicular to the surface of a subject's skin at a body site from which hair is to removed and positioning said end surfaces is juxtaposed relation with the subject's skin at said site provides an uprooting engagement of the subject's body hair between rotating peripheral surfaces of said hair removal members.

4,917,679

SYRINGE WITH PROTECTIVE SLEEVE

Richard F. Kronner, 1443 Upper Cleveland Rapids Rd., Roseburg, Oreg. 97479

Filed Sep. 12, 1988, Ser. No. 243,291

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—198 **10 Claims**

1. In combination with a syringe including a barrel and an elongate needle projecting from one end of the barrel, the needle terminating in a tip:

a needle protector having an end portion slidably mounted on the barrel and an opposite end portion, said opposite end portion having a passage extending therethrough and said protector having one position on the barrel where the needle extends through said passage with the needle exposed beyond said opposite end portion, said protector with movement thereof along the barrel in a direction extending away from the end of the barrel having the

needle being shiftable to a needle guard position where the tip of the needle is located inwardly of said opposite end portion of the protector, and

guide structure interposed between the protector and said syringe defining said one and said guard positions, said protector further including a flexible sealing member adjacent said passage constructed to seal the tip of a needle with the protector in said guard position.

4,917,680

FOLDED INTRAOCULAR LENS WITH ENDLESS BAND RETAINER

Brooks J. Poley, 2 Greenway Gables, Minneapolis, Minn. 55403

Continuation-in-part of Ser. No. 213,325, Jun. 30, 1988, which is a continuation-in-part of Ser. No. 31,250, Mar. 26, 1987, Pat. No. 4,769,034. This application May 1, 1989, Ser. No. 345,837

Int. Cl.[4] A61F *2/16*

U.S. Cl. 623—6 **11 Claims**

1. A resilient intraocular lens which is folded on itself along an axis of folding so as to reduce its transverse dimension and thereby enable it to be implanted in an eye through a smaller incision than would otherwise be required, and

a releasable retainer which extends circumferentially around the lens to retain it so folded while being inserted in the eye,

said retainer comprising a band of pliant severable material, said band having opposite circumferential edges,

said retainer surrounding the lens with said edges transverse to said axis of folding,

said retainer having means forming a line of weakness extending from one said circumferential edge of the band, across the band to the other of said circumferential edges,

said retainer being severable along said line of weakness thereby to permit the lens to be unfolded within the eye.

4,917,681

INTRAOCULAR MULTIFOCAL LENS

Lee T. Nordan, 9834 Genesee Ave., Ste. 209, La Jolla, Calif. 92037

Continuation of Ser. No. 88,227, Aug. 24, 1987, Pat. No. 4,769,033. This application Aug. 15, 1988, Ser. No. 232,140

The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.

Int. Cl.[4] A61F *2/16*

U.S. Cl. 623—6 **6 Claims**

1. An intraocular implant to replace the crystalline lens of a patient's eye, in particular after a cataract extraction, comprising

a generally discoidal biconvex lens shaped to exhibit light converging properties over its entirety;

said lens having a distal side and a proximal side to be placed against the vitreous humor of said patient's eye;

the face of one of said sides comprising:

a substantially aspherical, convex surface whereof the radius of curvature deceases from a value at points of said surface nearest to the center of the lens, to a lower value at points of said surface farther away from the center of the lens;

said decreases occurring along both the vertical axis and the horizontal axis of the plane of said lens.

4,917,682

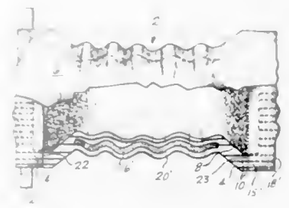
LEAK RESISTANT ELASTIC WAIST DIAPER

Eugene P. Lancaster, Gig Harbor, and Andrew Urban, III, Sumner, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 850,183, Apr. 10, 1986, Pat. No. 726,807. This application Nov. 9, 1987, Ser. No. 118,831

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—385.2 **5 Claims**



1. In a disposable diaper of the type having a coextensive moisture permeable skin contacting cover sheet and a moisture impermeable backing sheet with a moisture absorbing filler pad disposed therebetween, said pad being of smaller longitudinal and transverse dimensions than said cover and backing sheets to form pad free zones around the margins of the diaper, said diaper having longitudinal leg contacting edges and transverse waist contacting ends, the improvement which comprises:

an insert piece located transversely across at least one of the waist contacting ends of the diaper between the backing and cover sheets,

said insert piece overlapping the filler pad between said pad

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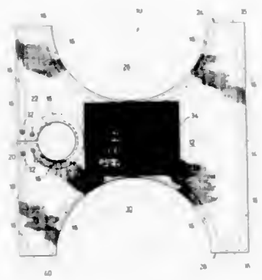
and the skin contacting cover sheet and serving to prevent liquid leakage from the pad to the waist contacting end,
said insert piece being made from a heat shrinkable elastomeric material of the type that is heat unstable and relatively inelastic in its unshrunk form and stable and relatively elastic in its heat shrunk form,
said insert piece being bonded to at least one of the cover or backing sheets in the waist zone and heat shrunk to its relatively elasticized state in said zone to provide a leak resistant diaper with at least one elasticized waist portion.

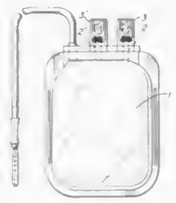
4,917,683
CANINE SEASONAL PANTIES
Kathaleen H. Thompson, 4389 Misty Morning Dr., Memphis, Tenn. 38115
Filed Jan. 17, 1989, Ser. No. 297,026
Int. Cl.[4] A61F *13/16*; A01K *23/00*
U.S. Cl. 604—387 6 Claims



1. A garment for canine bitches comprising:
an hourglass shaped portion having a generally rectangular top section having opposite side edges, a narrower middle portion forming a crotch section, and a generally retangular bottom section having opposite side edges;
said top section and bottom section being connected to each other at their side edges to form a panty-like garment;
said top section having a circular tail opening adapted to receive an animal's tail;
an absorbent pad positioned in the crotch area adjacent to said circular tail opening;
said top section being provided with a slit extended to said circular opening and bifurcating said top section; and
snaps positioned on both sides of said slit for fastening said garment at the animal's back.

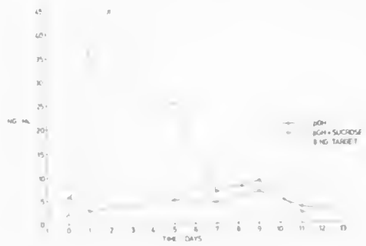
4,917,684
PROTECTIVE COVER FOR INLET/OUTLET PORTS OF THE PLASTIC BAG USED FOR MEDICAL PURPOSE
Isao Yasumura, Hiroshima, Japan, assignor to Japan Medical Supply Co., Ltd., Hiroshima, Japan
Continuation of Ser. No. 88,861, Aug. 24, 1987, abandoned. This application Aug. 1, 1989, Ser. No. 388,759
Claims priority, application Japan, Sep. 1, 1986, 61-134760; Dec. 4, 1986, 61-187266
Int. Cl.[4] A61B *19/00*
U.S. Cl. 604—468 11 Claims

1. A bag adapted for medical use, comprising:
a plastic bag having one or more projecting ports;
plastic cover means attached to said bag for covering said one or more projecting ports; and
plastic tab means affixed to said cover means for tearing an opening area in said plastic cover means to expose said one or more projecting ports, said tab means having a welded portion with a weld area welded to said cover means, the



weld area of said welded portion corresponding in area to the opening area in the plastic cover means.

4,917,685
DELIVERY DEVICE FOR THE ADMINISTRATION OF STABILIZED GROWTH PROMOTING HORMONES
Ravi Viswanathan, and Randolph B. DePrince, both of Terre Haute, Ind., assignors to International Minerals & Chem. Corp.
Filed May 16, 1986, Ser. No. 863,885
Int. Cl.[4] A61K *9/22*
U.S. Cl. 604—891.1 20 Claims



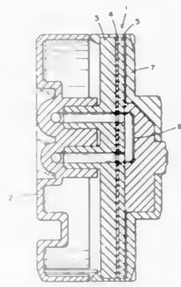
1. A delivery device designed to be implanted in an animal and for the administration of a stabilized growth promoting formulation, said device comprising a wall, formed at least in part by a porous membrane, which surrounds and defines a reservoir containing a growth hormone and a stabilizing amount of a stabilizer which inhibits aggregation and bioinactivation of the growth hormone selected from one or more of the following:
(a) a polyol selected from the group consisting of non-reducing sugars, sugar alcohols, sugar acids, lactose, pentaerythritol, water-soluble dextrans, and Ficoll;
(b) an amino acid selected from the group consisting of glycine, sarcosine, lysine or salts thereof, serine, arginine or salts thereof, betaine, N,N-dimethylglycine, aspartic acid or salts thereof, glutamic acid or salts thereof;
and
(c) a choline derivative selected from the group consisting of choline chloride, choline dihydrogen citrate, choline bitartrate, choline bicarbonate, tricholine citrate, choline ascorbate, choline borate, choline gluconate, choline phosphate, di(choline) sulfate and dicholine mucate.

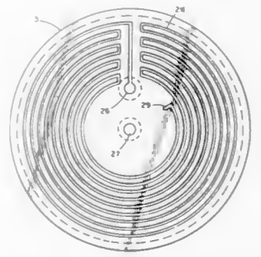
4,917,686
ANTIMICROBIAL DEVICE AND METHOD
Roger Bayston, London, England, and Nancy J. Grove, Conifer, Colo., assignors to Colorado Biomedical, Inc., Evergreen, Colo.
Continuation-in-part of Ser. No. 809,235, Dec. 16, 1985, abandoned. This application Nov. 23, 1987, Ser. No. 123,922
Int. Cl.[4] A61M *5/325*
U.S. Cl. 604—265 14 Claims

1. A medical device made from a material capable of being implanted in living tissue and of long indwelling therein, which exhibits persistent antimicrobial activity in use, and comprises:
a body of a polymeric material which is capable of being swelled by a swelling agent and which has been subject to such a swelling agent which contains completely dissolved therein one or more antimicrobial agents as a solute, said body being contacted by such swelling agent for a sufficient period of time to promote swelling of the body of material to enlarge the normal size and intermolecular spaces therewithin thereby causing diffusion and migration of the solution containing the selected antimicrobial agent(s) into the enlarged intermolecular spaces of the body of material by the action of the swelling agent within the body of material and said solvent being removed from said solute in the matrix of the body of material by evaporation with said solute remaining in the intermolecular spaces of the body of material and after removal of said solvent said body of material returning substantially to its original size and shape and having substantially normal intermolecular spaces with said antimicrobial agent substantially uniformly deposited therein for subsequent continuous molecular migration to and molecular diffusion through the surfaces to provide persistent antimicrobial activity at the surfaces of during use in the human body, said medical device subject to autoclaving prior to use; and said polymeric material and said antimicrobial agent(s) selected so that the rate of continuous molecular migration and molecular diffusion remains the same or is retarded by the effects of autoclaving.

4,917,687
APPARATUS FOR CONTROLLING FLUID FLOW RATE
Matthew O'Boyle, Houston, Tex., assignor to Sta-Set Corporation, Houston, Tex.
Continuation of Ser. No. 939,620, Dec. 5, 1986, Pat. No. 4,822,344. This application Feb. 1, 1989, Ser. No. 305,190
The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—248 8 Claims

1. Apparatus for controlling a flow rate of a liquid to be administered parenterally to a patent, said apparatus comprising:
a housing having spaced inlet and outlet channels for said liquid;
a first metering plate held against movement with respect to said housing, said plate having a front surface facing away from said housing and a rear surface facing said housing with a plurality of apertures extending between said front and rear surfaces, a first of said apertures being aligned with said inlet channel and a second of said apertures being aligned with said outlet channel;
plate means held against movement with respect to said housing and engaging the rear surface of said metering plate, said plate means having a first hole aligned with said inlet channel and said first aperture and a second hole aligned with said outlet channel and said second aperture, said rear surface of said metering plate and said plate means defining a first metering passage, one end of said passage communicating with one of said first and second apertures, the other end of said passage communicating with a third of said apertures, said plurality of apertures further comprising a series of apertures each of which communicates with said metering passage at spaced locations intermediate said ends; and
cover means supported by said housing and movable relative thereto, said cover means having an interior surface engaging the front surface of said metering plate, said interior surface having a groove one end of which is continually in alignment with the other of said first and said second apertures, said cover means being movable with





respect to said housing selectively to bring the other end of said groove into alignment with any predetermined one of said series of apertures and said third aperture whereby movement of said cover means with respect to said housing incrementally changes the flow rate of said liquid between said channels by adding or bypassing portions of said metering passage through which said liquid must travel in flowing from said inlet channel to said outlet channel.

4,917,688
BANDAGE FOR TRANSDERMAL DELIVERY OF SYSTEMICALLY-ACTIVE DRUG
Eric L. Nelson, Newport Beach, and Rajaram Vaidyanathan, Laguna Niguel, both of Calif., assignors to Nelson Research & Development Co., Irvine, Calif.
Continuation of Ser. No. 3,400, Jan. 14, 1987, abandoned. This application Jun. 27, 1988, Ser. No. 211,833
Int. Cl.[4] A61F *13/00*; A01N *17/00*
U.S. Cl. 604—306 28 Claims

1. A bandage for transdermal delivery of an active agent, said bandage comprising:
a fixed supply of an active agent; a
control means, separate from said fixed supply of active agent, for adjustably and incrementally controlling surface contact area between the fixed supply of active agent

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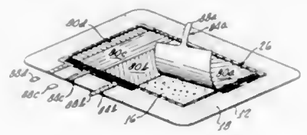
and the dermal surface when the bandage is held thereagainst in order to select one of a plurality of available



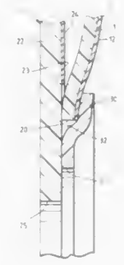
doses greater than zero that can be delivered by the bandage without altering the fixed supply of active agent.

4,917,689

OSTOMY BAG WITH SUPPORT RING

Glyn J. A. Coombes, Kemptown, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Dec. 2, 1988, Ser. No. 278,981
Claims priority, application United Kingdom, Dec. 19, 1987, 8729637
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—338 7 Claims



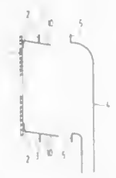
1. A body discharge collection bag comprising: a first wall of flexible material; a second wall of flexible material joined with the first wall around its edge, the second wall having a opening therein for location in register with a body discharge opening so that body discharge material can enter the bag through the opening; a first flexible sheet member having an aperture therein smaller than said opening; means securing the first sheet member to the inner surface of the second wall with the aperture in alignment with and overlapping the opening; a second flexible sheet member having an aperture therein smaller than said opening, said second sheet member being adapted to secure the bag to the patient around the body discharge opening; and means securing the second sheet member to the first sheet member where said first sheet member overlaps the opening, with the aperture in the second sheet member in alignment with the aperture in the first sheet member and with the second sheet member being located on the outer surface of the second wall so that body discharge material enters the bag through the apertures in the first and second sheet members without contacting the second wall around its opening.

4,917,690

APPARATUS FOR TENDING A STOMA

Gerd Hunger, München, Fed. Rep. of Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 863,106, May 15, 1986, abandoned, and a continuation of Ser. No. 494,039, May 12, 1983, abandoned. This application Oct. 20, 1987, Ser. No. 112,230
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—338 17 Claims



1. An ostomy device for detachably securing a bag to a stoma comprising:

(a) an apertured base plate, said base plate defining first and second circumferences, said first circumference being smaller than the second with a diameter enlargeable to a diameter of the stoma to be tended and a second larger circumference the diameter of which is about 4 to about 20 mm smaller than the edge of the base plate for transmitting traction forces to the skin of the user at a maximum distance from said stoma,

(b) a ring means substantially parallel to the base plate made of a flexible but self-sustaining plastic material having a thickness of about 0.3 to about 2.0 mm and a breadth of about 5 to about 20 mm, the dimension of the aperture of the ring being determined by the diameter of the said second circumference, said ring means adapted to be adhesively and detachably contacted by a surface of a bag that receives the excreta from said stoma, and

(c) a connector means made of a flexible but non resilient plastic film material having a thickness of about 0.05 to about 0.3 mm connecting said base plate and said ring means, said connector means being cylindrical or having the form of a steep truncated cone and extending substantially perpendicular to said base plate, said connector means being attached to said base plate along said second circumference whereby forces transmitted to said base plate upon attachment of a bag to said ring or by the movements of the user or by said bag are absorbed by said base plate at said larger circumference to dissipate said forces at a maximum distance from said stoma.

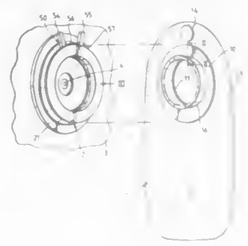
4,917,691

MEDICO-SURGICAL COLLECTION BAG HAVING A RATCHET LOCKING RING

Peter J. Briggs, Lancing, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Jan. 31, 1989, Ser. No. 304,071
Claims priority, application United Kingdom, Feb. 2, 1988, 8802265
Int. Cl.[4] H61F *5/44*
U.S. Cl. 604—339 11 Claims

1. A two-part medico-surgical collection bag assembly comprising: a first part comprising a collection bag and a second part comprising a patient fitment, said patient fitment including means for securing the fitment around a discharge outlet of the patient, wherein one of said parts includes a deformable collar and a ring, said ring embracing said collar and said ring being displaceable from an open state to a tightened state, and wherein the other of said parts has a neck, said neck having an external dimension substantially the same as the internal dimension of the collar such that the neck is freely insertable in the collar when the ring is in an open state, and the said collar



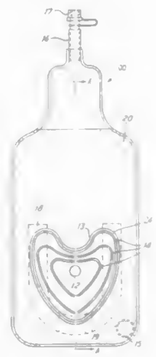
being deformed about the said neck when the ring is tightened such as firmly to retain the two parts together.

4,917,692

FAECAL INCONTINENCE BAG

Peter L. Steer, and Ronald A. Plass, both of Reigate, England, assignors to E. R. Squibb and Sons, Inc., Princeton, N.J.

Filed May 4, 1987, Ser. No. 45,654
Claims priority, application United Kingdom, May 9, 1986, 8611296
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—355 10 Claims



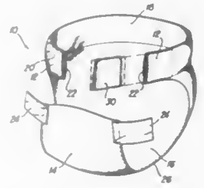
1. A faecal incontinence bag; having flexible front and rear walls secured together around their periphery, the front wall having a hole therein for entry of matter discharged by the wearer, the hole being surrounded by an adhesive pad of skin-compatible water-resistant material secured to the external surface of the front wall surrounding the hole, and the pad being generally of heart-shape which is symmetric about a longitudinal axis and comprises a concave portion substantially bisected at one end of said axis having holes forming said concave portion and a generally convex portion bisected at the opposite end of said axis so that when in position on the wearer the holes of the concave portion of the heart-shaped pad is towards the front of the wearer.

4,917,693

COMPACT DISPOSABLE DIAPER

Barbara S. Terry, P.O. Box 40, Red Oak, Ga. 30272

Filed Nov. 23, 1988, Ser. No. 275,264
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385.1 8 Claims



1. A compact disposable diaper adapted for use with a child, comprising:

a diaper assembly having a front portion, a seat portion, and a rear portion connected together and with each of said portions having opposed side walls and opposed edges, said diaper assembly being adapted to be worn around the crotch region of the child;

there being provided a pair of open-ended compartments in the opposed edges of said rear portion and respectively adjacent to the top corners of said diaper assembly;

a baby maintenance item disposed within each of said compartments;

closure means on the edges of the side walls at the top of said rear portion for closing said compartments, for removeably retaining said baby maintenance items within said compartments; and

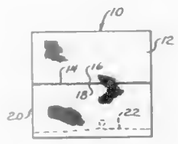
fastening means on the opposed side walls of said front portion for attaching said front portion to said rear portion so that a part of said front portion overlies said compartments and for retaining the diaper assembly in place on the child.

4,917,694

SURGICAL SPONGE

James L. Jessup, Elk Grove Village, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 379,683, May 19, 1982, abandoned. This application May 20, 1986, Ser. No. 867,000
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—362 13 Claims



1. A surgical sponge, comprising:

a sheet of absorbent material; and

an elongated visually detectable element at a visible location on the sheet comprising a pair of elongated strands twisted about each other, one of said strands having a color which contrasts with the color of said sheet to facilitate visual inspection of the element prior to the use of the sponge, and the other of said strands having a color which in the presence of blood contrasts with the color of blood to significantly increase the visibility of the sponge in a pa-

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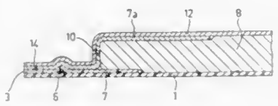
tient's body when saturated by body fluids with the color of the two strands being different from each other.

4,917,695

DIAPER WITH LENGTHWISE ELASTICS AND METHOD FOR CONTINUOUS MANUFACTURE OF SUCH DIAPERS

Yves Villez, Linselles, France, assignor to Boussac Saint Freres B.S.F., La Madeleine, France

Filed Dec. 2, 1987, Ser. No. 127,465
Claims priority, application France, Dec. 2, 1986, 86 16844
Int. Cl.[4] A61F *13/16*; A41B *13/02*
U.S. Cl. 604—370 **4 Claims**



1. A diaper comprising
liquid-impervious supple outer sheet whose inner face is provided with lengthwise lines of adhesive,
an absorbent pad arranged on the inner face of said outer sheet so that its two opposed lengthwise edges are set back relative to the two opposed lengthwise edges of the outer sheet and so that its two opposed transverse edges are set back relative to the two opposed transverse edges of the outer sheet,
a liquid-pervious supple inner sheet covering the inner face of the outer sheet and the absorbent pad arranged on said face,
at least one lengthwise-extending elastic member secured by adhesive bonding in the stretched state onto the inner face of the outer sheet, along the median part of each of the two opposed lengthwise edges of said sheet, and
fastening means for closing the diaper around the user's body,
wherein a strip of liquid-impervious supple sheet material is placed on the inner face of the outer sheet, below the absorbent pad, over each of the at least one elastic member, over the entire length of the outer sheet, each strip being secured to the outer sheet by at least one of said lengthwise lines of adhesive on both sides of each corresponding elastic member, thus forming with the outer-sheet, around the corresponding elastic member, a tunnel extending about the entire length of the diaper, and having over its entire length a portion extending laterally beyond the corresponding lengthwise edge of the pad, the said portion being folded onto the top face of the pad so as to envelop said lengthwise edge of the pad, the outer face of inner sheet being coated with adhesive over the entire periphery so as to adhere, all around the pad, onto the outer sheet and onto the strips where the said strips extend beyond the absorbent pad.

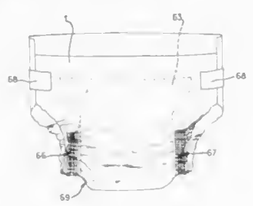
3. A method for continuous manufacture of diapers comprising:
unwinding and longitudinally feeding a continuous band of liquid-impervious sheet,
continuously applying transversely spaced lengthwise lines of adhesive onto the upper face of the said impervious band,
unwinding and longitudinally feeding continuous elastic members, coating the said elastic members with adhesive at intervals to form adhesive-coated sections separated by sections which are not coated with adhesive and applying the elastic members in the stretched state onto the upper face of the impervious band, in the vicinity of the two opposed lengthwise edges of the latter, between said lengthwise lines of adhesive, so as to make the elastic members adhere thereto along successive longitudinally spaced sections,
continuously unwinding and longitudinally applying onto the upper face of the impervious band, over each of the elastic members, a continuous strip of sheet material, each strip having a width greater than the width of the corresponding elastic member, so that each strip adheres to the impervious band along at least one of said lengthwise lines of adhesive on both sides of the corresponding elastic member, and having over the entire length of each strip a portion extending laterally beyond the corresponding edge of said band,
successively depositing onto the upper face of the impervious band, over the two strips, individual absorbent pads of a width smaller than the width of the band, so that the successive pads are arranged on the impervious band in the regions where the elastic members adhere to the band, and are longitudinally spaced from each other,
folding the extending portion of each strip over the corresponding edge and onto the top face of each pad so as to envelop the edge of the pad,
unwinding and longitudinally feeding a continuous liquid-pervious band having substantially the same width as the impervious band, coating the said pervious band with adhesive on one face and applying it with said adhesive-coated face onto the upper face of the impervious band, over the strips and the absorbent pads so that the pervious band adheres all around the absorbent pads, to the impervious band and to the strips where the said strips extend beyond and over the edge of the absorbent pads, and
successively cutting off, in the transverse direction, the two bands, the stretched elastic members, and the two strips, between the successive pads, across the sections of the elastic members which are not coated with adhesive.

4,917,696

DISPOSABLE DIAPER PANTIE

Raphael De Jonckheere, Bondues, France, assignor to Peaudouce, Societe Anonyme, Linselles, France

Continuation of Ser. No. 910,083, Sep. 22, 1986, abandoned, which is a division of Ser. No. 572,071, Jan. 19, 1984, Pat. No. 4,666,542. This application Jul. 28, 1988, Ser. No. 225,563
Claims priority, application France, Jan. 19, 1983, 83 00780
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385.2 **3 Claims**



1. A disposable diaper, comprising:
an absorbent pad located between an impervious backing sheet and a permeable inner liner sheet,
a plurality of longitudinal coatings of adhesive material distributed over at least side marginal portions of the inside face of said backing sheet and extending over its entire length,
both said backing sheet and said liner being provided with lateral cutouts enabling the passage of the legs, and the delineation of a crotch zone,
said absorbent pad being smaller in width than said backing sheet and said inner liner, at least in said crotch zone, so that said side marginal portions extend outwardly beyond the side edges of said absorbent pad,

the inside face of said backing sheet being provided with two arrays, each of at least two rectilinear individual elastic strands positioned parallel to each other, said arrays being unconnected to each other and spaced transversely apart from one another, said strands of each array being provided on each side of said side marginal portions of said backing sheet,
said strands of each array being located in channels between two of said longitudinal coatings of adhesive,
each said individual elastic strand being affixed in stretched condition to said inside face of said backing sheet in the crotch zone of the diaper by an adhesive material coated on said elastic strand, both end portions of each individual strand being free from adhesive material and from transverse joining members and being unaffixed to said backing sheet, and said liner in said channels,
so that said end portions are retracted in said channels within the diaper, between two of said longitudinal coatings of adhesive,
the elastic strands which are situated closest to the absorbent pad being positioned close to the lateral edge of the pad so that both arrays of elastic strands act upon the lateral edges of the pad to form the crotch zone of the diaper into a trough-like shape of outwardly convex surface, providing differentiated traction forces, due to each individual elastic strand.

4,917,697

SANITARY NAPKINS HAVING FLAPS AND STRESS RELIEF MEANS

Thomas W. Osborn, III, Cincinnati, and Letha M. Hines, Wyoming, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 31, 1989, Ser. No. 175,814
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—387 **9 Claims**

1. A sanitary napkin, comprising:
an absorbent means;
a flap associated with said absorbent means along a line of juncture and extending laterally outward from said absorbent means to a distal edge; and
a first stress relief means for relief of stresses, said first stress relief means comprising a slit or a notch and being located along said line of juncture.

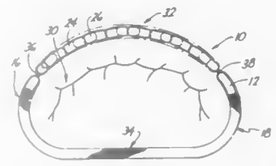
4,917,698

MULTI-SEGMENTED ANNULOPLASTY RING PROSTHESIS

Alain Carpentier, Paris, France; Hung L. Lam, Norco, and Than Nguyen, Huntington Beach, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Filed Dec. 22, 1988, Ser. No. 290,001
Int. Cl.[4] A61F *2/24*
U.S. Cl. 623—2 **17 Claims**

1. An annuloplasty ring prosthesis comprising:
a body which defines a substantially circular shaped ring proportioned to fit about the annulus of a heart valve, said body being formed from two or more segments, each of which is formed with opposing ends;
a flexible covering fitted about said segments to position each of said segments ends adjacent to an end of another



of said segments, with said ends remaining unconnected; and
means associated with said covering for snugly holding said covering about said adjacently positioned ends.

4,917,699

PROSTHETIC LIGAMENT

Alan Chervitz, Palm Harbor, Fla., assignor to Zimmer, Inc., Warsaw, Ind.

Filed May 16, 1988, Ser. No. 194,323
Int. Cl.[4] A61F *2/08*
U.S. Cl. 623—13 **2 Claims**

1. A prosthetic device for repair or replacement of tissue connected to a bone, the prosthetic device including a first end with an eyelet to receive fixation means for securing the first end to the bone, a second end of reduced outer diameter for insertion into a tunnel formed in the bone, and an intermediate section connecting the first end and the second end, the second end and intermediate section defines a canal extending from an opening at the second end to an opening at the eyelet at the first end, the first end and the intermediate section being formed with a first uniform braid of a plurality of fibers and the second end being formed with a second uniform braid from a portion of the plurality of fibers, the second uniform braid being different from the first uniform braid wherein said first uniform braid is defined by a three dimensional braid for the plurality of fibers, the second end serving as a guide for insertion of the second end through the bone channel so that the intermediate section adjacent the second end is adapted for fixation to another bone and the second end is cut off after the first end and intermediate section are secured to bone.

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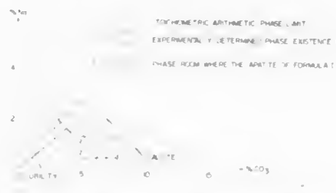
4,917,700
PROSTHETIC LIGAMENT
Jerry L. Aikins, Warsaw, Ind., assignor to Zimmer, Inc., Warsaw, Ind.
Filed Aug. 1, 1988, Ser. No. 226,600
Int. Cl.[4] A61F *2/08*; D04C *1/00*
U.S. Cl. 623—13 4 Claims

1. A prosthetic ligament comprising a plurality of fibers extending between opposite ends, the plurality of fibers forming a braided jacket and an unbraided core, the braided jacket extending over a majority of the length of the prosthetic ligament to surround all of the unbraided core, and the plurality of fibers defining the unbraided core also defining a portion of the braided jacket near at least one end.

4,917,701
TEMPOROMANDIBULAR JOINT PROSTHESES
Douglas H. Morgan, 3043 Foothill Blvd., La Crescenta, Calif. 91214
Filed Sep. 12, 1988, Ser. No. 242,524
Int. Cl.[4] A61F *2/28*
U.S. Cl. 623—16 19 Claims

1. A temporomandibular surgical implant, comprising:
a thin, rigid plate of biologically inert metal contoured to generally conform to and overlay at least the articular eminence and about half of the mandibular fossa portions of the glenoid fossa, but not the petro-tympanic fissure, said plate having a superior surface for disposition facing toward the articular eminence and mandibular fossa, and a smooth, hard, non-wearing, condyle-bearing inferior surface facing away therefrom;
a layer of resilient, biologically inert, non-metallic material securely attached to, and contacting only, said superior surface of said plate and disposed thereon to reside between said plate and the floor of the mandibular fossa such that minute spaces between said plate and said floor are occupied by said layer, said layer having a thickness which can be quickly reduced by manual trimming or shaving of said layer such that the position of said plate relative to said floor can be finely adjusted contemporaneously with implantation; and
attachment means for attaching said plate to the skull such that said plate is held in a desired position relative to said mandibular fossa and articular eminence, with said resilient layer sandwiched therebetween.

4,917,702
BONE REPLACEMENT MATERIAL ON THE BASIS OF CARBONATE AND ALKALI CONTAINING CALCIUMPHOSPHATE APATITES
Hans Scheicher, Rondell Neuwittelsbach 4, 8000 München 19, and Eberhard Wendler, Sedelhofstr. 3, 8000 München 60, both of Fed. Rep. of Germany
Continuation-in-part of Ser. No. 866,199, May 9, 1986, abandoned. This application Feb. 9, 1988, Ser. No. 153,885
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1984, 3433210
Int. Cl.[4] A61F *2/28*; C04B *35/00*; A61C *13/08*
U.S. Cl. 623—16 25 Claims



1. An agent for filling bone defects, for building up bone, for forming bone-contact layers on the replacements of bones and roots of teeth and for making independent smaller bone replacement parts or implant articles, comprising a calcium phosphate apatite having carbonate and alkali portions, all ions being definedly integrated in the crystal lattice, of the following formula:

$$Ca_{10-a-b-x}Me^{II}_aMe^{I}_b(PO_4)_{6-x}(CO_3)_x(OH)_{2-b-x}(H_2O)_w$$

wherein
Me^{I} is a singly charged metal ion,
Me^{II} is a doubly charged metal ion,
a represents the number of double charged metal ions with the exception of Ca and is a value from 0 to 1.0,
b represents the number of singly charged metal ions and is a value from 0.05 to 1.2,
x represents the number of carbonate ions and is a value from 0.02 to 1.2, the sum b+x being a maximum of 2.0, and
w represents the number of water molecules integrated in the crystal lattice and is a value from 0 to b+x
wherein at least a portion of the Me^{I} ions are alkali ions and the CO_3 ions are positioned at the PO_4 positions within the apatite lattice.

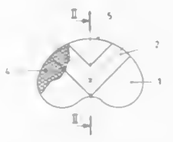
4,917,703
BONE INGROWTH CHAMBER
Tomas Albrektsson, Mölndal, Sweden, assignor to Nobel Pharma AB., Sweden
Filed Nov. 23, 1987, Ser. No. 124,148
Claims priority, application Sweden, Nov. 21, 1986, 8604974
Int. Cl.[4] A61F *5/00, 2/28*
U.S. Cl. 623—66 5 Claims

1. An apparatus of a bio-compatible material for implantation in a living bone tissue and for studying bone tissue formation growth in an implant under different experimental conditions, said apparatus comprising:
an outer portion with a central recess extending therethrough and a removable inner portion insertable in said central recess;
means provided in at least a bottom wall of said outer portion cooperating with a bottom wall of said inner portion to form a plurality of bone tissue ingrowth channels when said inner portion is fully inserted into said central recess, said channels being exposable for access thereto when said inner portion is removed upwardly;

wherein at least one of said channels, a test channel, is provided with a test substance, thereby allowing comparative

examination of said bone tissue ingrowth in said cannels to determine promoting/retarding properties of said test substance on said bone tissue ingrowth.

4,917,704
INTERVERTEBRAL PROSTHESIS
Otto Frey, Winterthur, and Rudolf Koch, Berlingen, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland
Filed Jun. 8, 1988, Ser. No. 204,020
Claims priority, application Switzerland, Jul. 9, 1987, 2606/87-1
Int. Cl.[4] A61F *2/44*
U.S. Cl. 623—17 14 Claims



1. An intervertebral prosthesis for an arthrodesis comprising a disk-like body for fitting between a pair of vertebrae, said body having weld-like raised parts disposed on opposite surfaces thereof dimensioned to enhance lateral stability of said body in situ, each said raised part on said body having a cross-section of cylindrical segment shape and forming an acute angle with a second raised part on a respective surface of said body.

258-452 O.G.-90-12

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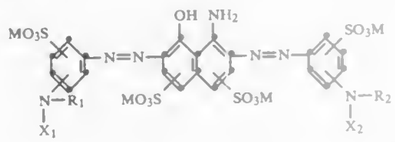
4,917,705

PROCESS FOR DYEING OR PRINTING OF FIBRE MATERIAL FROM NATURAL OR SYNTHETIC POLYAMIDES WITH REACTIVE DISAZO DYES

Dieter Mäusezahl, Biel-Benken, and Peter Loew, Münchenstein, both of Switzerland, assignors to Ciba-Geigy Corp., Ardsley, N.Y.

Filed Sep. 21, 1988, Ser. No. 247,208
Claims priority, application Switzerland, Sep. 21, 1987, 3625/87-0
Int. Cl.[4] C09B *62/01*, D06P *1/38*, *3/10*
U.S. Cl. 8—549 15 Claims

1. A process for dyeing or printing wool or synthetic polyamide fibre materials with sulfo-containing reactive dyes, which comprises dyeing or printing these fibre materials with reactive dyes of the formula



(1)

where each M is a cation, R_1 and R_2 are independently of each other hydrogen or C_1–C_4alkyl, and X_1 and X_2 are independently of each other α,β-dibromopropionyl, α-bromoacryloyl, chloroacetyl or a mono-, di- or trihalopyrimidinyl radical wherein said dyeing process is carried out at a pH between 4 and 6 and at a temperature between 80° and 110° C., and subsequently the pH of the dyebath is made alkaline.

4,917,706

LIQUID COMPOSITIONS OF PREREDUCED SULFUR DYES AND PRODUCTION THEREOF

Laszlo A. Meszaros, Charlotte, N.C., assignor to Sandoz Ltd., Basel, Switzerland

Filed Feb. 1, 1988, Ser. No. 145,545
Int. Cl.[4] C09B *49/00*, *67/28*
U.S. Cl. 8—652 42 Claims

1. A process for producing a liquid composition of a sulfur dye in pre-reduced leuco form which comprises washing a sulfur dye which has been obtained by precipitation from a thionation reaction product with water to remove inorganic salts therefrom and reducing the washed sulfur dye by heating it in an aqueous alkaline medium which contains, as the reducing agent for the sulfur dye, a reducing sugar or a sulfide which is formed in situ and to which no sulfide reducing agent has been added, the heating being continued until at least 90%, by weight, of the dye becomes dissolved.

4,917,707

PROCESS, CELL AND DEVICE FOR CRYSTAL GROWTH, PARTICULARLY FOR SPACE VESSEL

Manuel P. Claramonte, Chaville; Guy M. Bonnet, Poissy, and Jean-Claude Auffret, Chapet, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

PCT No. PCT/FR87/00386, § 371 Date Mar. 30, 1988, § 102(e) Date Mar. 30, 1988, PCT Pub. No. WO88/02794, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 8, 1987, Ser. No. 193,650
Claims priority, application France, Oct. 9, 1986, 86 14056
Int. Cl.[4] B01D *9/02*
U.S. Cl. 23—300 10 Claims

1. Process for growing a crystal by diffusion, comprising the following steps:

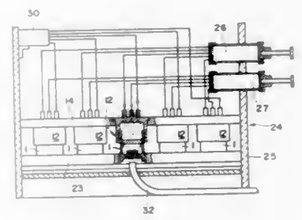
placing a substance to be crystallized into a crucible and closing said crucible by a diffusion wall;

placing said crucible with said substance and said diffusion wall into a first recipient;

obturating said first recipient by a stopper of porous material;

arranging a porous body in a second recipient;

bringing together said first and second recipients so that said



porous body and said stopper of porous material are in contact with each other;

injecting a precipitating agent into said porous body of said second recipient; and

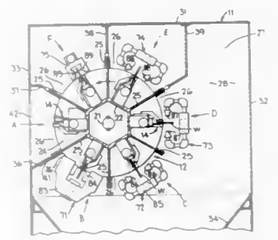
growing said crystal of said substance.

4,917,708

DEBURRING AND CLEANING APPARATUS WITH MULTI-STATION ROTARY DRUM AND RECIPROCATING BLASTING GUNS

Tomio Yamaguchi; Shoichi Harada; Akira Suzuki, and Ikuei Takamura, all of Shizuoka, Japan, assignors to Fuji Seiki Machine Works, Ltd., Shizuoka, Japan

Continuation of Ser. No. 145,080, Jan. 19, 1988, abandoned. This application Mar. 15, 1988, Ser. No. 168,186
Claims priority, application Japan, Jan. 19, 1987, 62-008177; Jan. 19, 1987, 62-8176; Mar. 26, 1987, 62-070185
Int. Cl.[4] B24C *3/04*
U.S. Cl. 51—419 15 Claims



1. A blasting apparatus for cleaning and deburring workpieces, such as electronic devices encapsulated by synthetic resin, comprising:

housing means defining ga substantially closed blasting chamber therein;

rotary drum means disposed within said blasting chamber and supported for rotation about a substantially horizontal rotational axis;

drive means connected to said drum means for effecting rotational movement of said drum means about said rotational axis in an intermittent step-like manner so that the drum means is rotated through a plurality of equal angular steps during each revolution thereof;

said drum means defining therein a plurality of axially elongated compartments which open radially outwardly, said plurality of compartments being uniformly circumferentially spaced around the rotational axis of said drum means

and being circumferentially separated from one another by intermediate divider walls;

a plurality of workpiece holding means mounted don said drum means, one of said workpiece holding means being positioned within each of said compartments, said workpiece holding means having clamping means for holding a said workpiece so that the workpiece is oriented so as to extend generally axially of the drum;

said housing means including means cooperating with said drum means with the drum means is stationary and defining a station for permitting access to one of the compartments to permit loading and unloading of workpieces with respect to the workpiece holding means associated with said one compartment; and

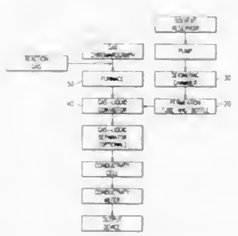
a gun arrangement for deburring and cleaning workpieces mounted on said drum means within the remaining compartments, said gun arrangement including head means mounted don said housing for reciprocating back-and-forth movement in a cyclic manner through a predetermined stroke along a direction which is parallel to said rotational axis, said gun arrangement including a plurality of nozzle assemblies mounted don said head means in circumferentially spaced relationship with one another so that each said nozzle assembly cooperates with a selected one of said remaining compartments and axially traverses forwardly and backwardly along the compartment during each reciprocating cycle of the head means for directing a treating fluid against the workpiece held within the respective compartment, each said nozzle assembly including a generally U-shaped head having a pair of arms which effectively straddle the workpiece in the respective compartment and which mount thereon a pair of generally opposed discharge nozzles for permitting substantially simultaneous treating of opposite sides of the respective workpiece.

4,917,709

PERMEATION PH CONTROL SYSTEM

Randall C. Hall, College Station, and Karl M. Williams, Bryan, both of Tex., assignors to O. I. Corporation, College Station, Tex.

Filed Aug. 27, 1987, Ser. No. 89,981
Int. Cl.[4] B01D *15/08*
U.S. Cl. 55—18 **16 Claims**



1. A method of solvent pH control in an electrolytic conductivity detector, the method comprising:

passing solvent from a source thereof through a deionizing chamber;

passing the solvent from the deionizing chamber through a permeation system; and

introducing the solvent from the permeation system into a gas-liquid contactor, wherein sample gas is contacted with solvent that has passed through the permeation system.

9. In an electrolyte detector apparatus having a supply of solvent which is delivered to a solvent input of a gas-liquid contactor, a solvent pH controlling device comprising:

an ion exchange column adapted to receive the solvent prior to its delivery to said solvent input of the gas-liquid contactor, said ion exchange column having an output;

a permeation bottle;

a tube which is permeable to a soluble gas dissolved in a permeation liquid, the tube leading from said output of the ion exchange column to said permeation bottle;

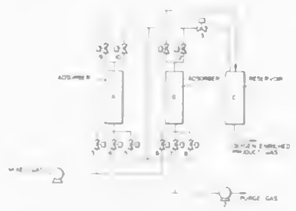
the permeation bottle being adapted to contain the permeation liquid, the liquid having in equilibrium the soluble gas and an ion of the soluble gas, the tube passing through the permeation liquid and then attaching to said solvent input of the gas-liquid contactor.

4,917,710

PROCESS FOR RECOVERING OXYGEN ENRICHED GAS

Kazuo Haruna, Hyogo; Kanji Ueda, Osaka; Masahiro Inoue, Hyogo, and Hitosi Someda, Yachiyo, all of Japan, assignors to Sumitomo Seika Chemicals Co., Ltd., Hyogo, Japan

Filed Feb. 23, 1989, Ser. No. 313,887
Claims priority, application Japan, Mar. 17, 1988, 63-65197
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—26 **8 Claims**



1. A process for recovering an oxygen enriched gs from a mixed gas mainly composed of nitrogen gas and oxygen gas by means of PSA which comprises:

providing two adsorbers A and B packed with zeolite molecular sieve as the adsorbant and a gas reservoir for accumulating the recovered oxygen enriched gas which is connected to the outlet of each adsorber and used in common, introducing the mixed gas into adsorber A at a pressure of atmospheric pressure to less than 2 kg/cm^{2}G to adsorb nitrogen gas, and desorbing nitrogen gas previously adsorbed in adsorber B therefrom under a pressure of between 100 mmHG to 400 mmHg,

introduction, adsorption and desorption being carried out according to the following six steps:

(1) introducing the mixed gas through the inlet of adsorber A and selectively adsorbing nitrogen gas, while accumulating the resulting oxygen enriched gas in the reservoir through the outlet of adsorber A;

(2) desorbing nitrogen gas through the inlet of adsorber B with a vacuum pump;

(3) flowing a part of the oxygen enriched gas in the reservoir for rinsing backward to the outlet of adsorber B wherein desorption of nitrogen gas is being continued;

(4) stopping introduction of the mixed gas into adsorber A, and thereafter introducing a part of the residual oxygen enriched gas in adsorber A into the outlet of adsorber B through the outlet of adsorber A to recover the oxygen enriched gas;

(5) introducing another part of the residual oxygen enriched gas in adsorber A into the inlet of adsorber B wherein desorption has been completed through the outlet of adsorber A to recover the oxygen enriched gas, while flowing a part of the oxygen enriched gas backward to the outlet of adsorber B to accumulate pressure; and

(6) flowing a part of the oxygen enriched gas backward to the outlet of adsorber B, while introducing the mixed gas into the inlet of adsorber B to effect pressurization, and repeating the above six steps in turn with alternation of adsorbers A and B.

4,917,711

ADSORBENTS FOR USE IN THE SEPARATION OF CARBON MONOXIDE AND/OR UNSATURATED HYDROCARBONS FROM MIXED GASES

Youchang Xie; Naiyu Bu; Jun Liu; Ge Yang; Jiangno Qiu; Naifang Yang, and Youchi Tang, all of Beijing, China, assignors to Peking University, Beijing, China

Filed Dec. 1, 1987, Ser. No. 127,196
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—68 **62 Claims**

1. An adsorbent for use in selective adsorption of CO, unsaturated hydrocarbons, or mixtures thereof, from a mixed gas, comprising: (i) a suitable support having a sufficiently high surface area, and (ii) a cuprous compound on said support prepared by heating a solid mixture of said support and copper compound selected from the group consisting of a cuprous compound, a cupric compound and combinations thereof at a temperature and for a time period sufficient to disperse an adsorbent effective amount of said copper compound onto the surface of said support.

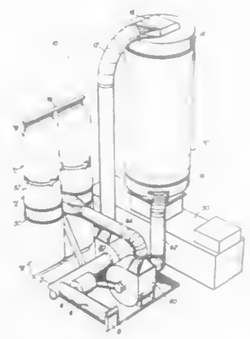
20. A process for separating CO from a mixed gas containing CO together with a component selected from the group consisting of H_2, N_2, Ar, He, CH_4, C_2H_6, C_3H_8, CO_2, and mixtures thereof, which process comprises passing a stream of said gas through a mass of an adsorbent as claimed in claim 1 at a temperature in the range from 0° C. to 100° C. and a pressure from 1 to 100 atmosphere, and releasing the adsorbed CO by heating the adsorbent or lowering the pressure.

4,917,712

METHOD AND APPARATUS FOR FILTERING CONDITIONED AIR AND SEPARATING DUST FROM REUSABLE WASTE

Benjamin R. Crigler, Atlanta, Ga., assignor to Crigler Enterprises, Atlanta, Ga.

Filed Nov. 22, 1988, Ser. No. 275,007
Int. Cl.[4] B01D *46/04*
U.S. Cl. 55—96 **21 Claims**



1. An apparatus for filtering air containing reusable debris and dust and collecting the reusable debris for recycling separately from dust collected for disposal comprising:

(a) an initial filter system for collecting unfiltered air and segregating reusable debris from dust and air having an inner filter tube, an outer filter tube, and an annular space between said tubes such that said inner filter tube is concentrically contained within said outer tube, said inner tube having pores such that large debris is retained within said tube and air and dust escape to said annular space, said outer tube having smaller pores than said inner tubes such that dust is retained within said annular space, but air may escape from said outer tube to the environment and including upper and lower support means for said inner and outer tubes for maintaining concentricity;

(b) a first conduit for receiving unfiltered air and delivering said air downwardly into said inner tube;

(c) a first fan means for drawing unfiltered air through said first conduit and forcefully depositing unfiltered air within said inner tube means, thereby creating a positive air flow within said initial filter system;

(d) a baler disposed beneath said inner tube for receiving reusable waste from said inner tube for compacting and storing said reusable waste therein;

(e) a secondary filter system having a plurality of filter bags for receiving dust laden air, said filter bags having pores such that air escapes through said pores to said work environment but dust is retained within said bags;

(f) a second conduit connected to said outer tube for receiving partially filtered air from said initial filter system, said second conduit communicating with said secondary filter system; and

(g) a second fan means connected to said second conduit for drawing said air and dust out of said outer tube by creating suction within said initial filter system for positively forcing said dust and air into said secondary filter system through said second conduit.

4,917,713

LOW-PROFILE AIR FILTRATION MODULE

Martin C. Helmus, Wyoming, Mich., assignor to Comp-Aire Systems, Inc., Grand Rapids, Mich.

Filed May 23, 1989, Ser. No. 355,633
Int. Cl.[4] B01D *46/02*
U.S. Cl. 55—385.2 **10 Claims**

1. An air filtration module including a housing having an intake opening in the top of thereof, means in said housing adapted to support at least one filter unit, and blower means mounted in said housing and disposed to draw incoming air downward through said intake opening, and discharge said air into said housing through an exhaust opening, wherein the improvement comprises:

a horizontal central panel secured in said housing, and separating the space defined by said housing into a conversion chamber above said panel and a distribution chamber below said panel and above the position of a filter unit established by said filter support means, said panel having a central opening providing communication between said chambers, said blower means being mounted in said conversion chamber beside said central opening; and

a duct plate mounted in said conversion chamber, and disposed to conduct exhaust from said blower means past said central opening to a position of discharge into said conversion chamber.

4,917,714

FILTER ELEMENT COMPRISING GLASS FIBERS

Homan B. Kinsley, Jr., Powhatan, Va., assignor to James River Corporation, Richmond, Va.

Filed Dec. 8, 1988, Ser. No. 281,384
Int. Cl.[4] B01D *46/02*
U.S. Cl. 55—524 19 Claims

1. A filter element of high strength and good flex and permeability comprising a non-woven mat of (i) glass fibers, (ii) synthetic short fibers and (iii) polymer fibrids having a softening point below the softening point of said short fibers, said short fibers being bound to said glass fibers by the polymer fibrids.

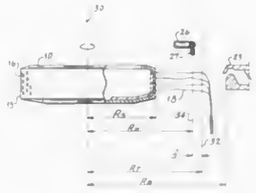
18. A system for removing particulates from a gas comprising a filtration housing having an inlet and an outlet, said inlet being operatively connected to receive said gas, a passage within said housing from said inlet to said outlet and a filter element of claim 1 completely across said passage whereby said gas passing from said inlet to said outlet passes through said filter element.

4,917,715

METHOD FOR PRODUCING ROTARY TEXTILE FIBERS

Farrokh Kaveh, Worthington, and David C. K. Lin, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 27, 1988, Ser. No. 290,117
Int. Cl.[4] C03B *37/04, 27/02*
U.S. Cl. 65—6 11 Claims



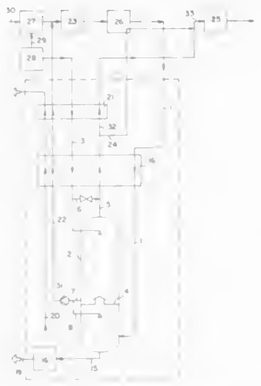
1. A method of making glass fibers in a rotary centrifuge having a peripheral wall, a plurality of orifices in such wall and an axis of rotation, comprising the steps of discharging and attenuating streams of molten glass fibers from the rotary centrifuge along paths generally perpendicular to such axis of rotation, turning the glass fibers down in a direction generally parallel to such axis of rotation and prior to such turning down quenching said fibers at a location exterior of the centrifuge, at a position to temper the fibers into high strength textile fibers, by the application of a quenching liquid while such fibers are in paths generally perpendicular to such axis of rotation, wherein such quenching liquid is applied in the range of 0.2 lb. to 1.2 lb. (0.09 kg. to 0.54 kg. of liquid) to 1 lb. of glass (0.45 kg of glass).

4,917,716

PROCESS FOR PURIFYING A GASEOUS MIXTURE

Wolfgang Schmid, Gruenwald; Hans Becker, Munich; Herwig Landes, Weilheim, and Hans Jungfer, Planegg, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jan. 27, 1989, Ser. No. 302,283
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1988, 3802552
Int. Cl.[4] F25J *3/00*
U.S. Cl. 62—20 22 Claims



1. A process for purifying a gaseous mixture consisting essentially of hydrogen and containing carbon monoxide and methane as impurities, comprising:

scrubbing said gaseous mixture with liquid nitrogen in a scrubbing column having an upper section and a lower section, the scrubbing liquid nitrogen being introduced into the upper section of the scrubbing column and in a quantity sufficient to substantially completely remove carbon monoxide from said gaseous mixture; and

withdrawing a partial amount of said scrubbing liquid nitrogen, enriched with carbon monoxide, between said upper and lower sections, said partial amount withdrawn being dimensioned so that the remaining scrubbing liquid nitrogen, which is introduced into the lower section of the scrubbing column, is sufficient to substantially completely scrub out methane from said gaseous mixture in said lower section while leaving a substantial portion of carbon monoxide in said gaseous mixture.

4,917,717

APPARATUS FOR AND PROCESS OF COATING GLASS

Jean-Francois Thomas, Ottignies; Robert Terneu, Thiméon; Albert Van Cauter, Charleroi, and Robert Van Laethem, Loverval-Gerpinnes, all of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed Nov. 14, 1986, Ser. No. 930,757
Claims priority, application United Kingdom, Dec. 20, 1985, 8531423
The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.
Int. Cl.[4] C03C *17/00*
U.S. Cl. 65—60.1 58 Claims

1. Apparatus for use in pyrolytically forming a metal oxide coating on an upper face of a hot glass substrate in sheet or ribbon form, the apparatus comprising:

conveyor means for conveying the hot glass substrate in a downstream direction along a coating path with an extended coating path length of at least 2m;

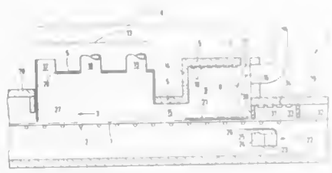
a roof structure defining a coating chamber opening downwardly onto the coating path and a passageway, wherein the coating chamber is positioned within or adjacent to the upstream end of the passageway and has a spraying zone and a coating chamber atmosphere;

means for spraying a solution of coating precursor material in the form of a volatilizable solution comprised of solvent and a metallic compound, which metallic compound is soluble in the solvent and is pyrolyzable by the hot glass substrate to form a metal oxide coating thereon, downwardly towards the upper face of the hot glass substrate positioned within the coating chamber from a height of at least 75cm above the upper face of the hot glass substrate;

means for supplying heat energy to the coating chamber to vaporize at least a portion of the solution of coating precursor material before it reaches the upper face of the hot glass substrate and to thereby charge the coating chamber atmosphere with vaporized coating precursor material, the coating chamber being in communication with the passageway to permit a stream of the coating chamber atmosphere charged with vaporized coating precursor material to flow along the passageway from the coating chamber; and

pressure lowering means for causing the coating chamber atmosphere to flow continuously from the coating chamber along the coating path and in contact with the upper face of the substrate for a contact time of at least 10 seconds.

33. A process for pyrolytically forming a metal oxide coating on an upper face of a hot glass substrate in sheet or ribbon form, comprising:



a. conveying the hot glass substrate in a downstream direction along an apparatus having a coating path with an extended coating path length of at least 2m and including a coating chamber having a spraying zone and a coating chamber atmosphere, and a passageway defined within the apparatus, the coating path leading beneath the coating chamber and the coating chamber opening downwardly onto the upper face of the hot glass substrate;

b. spraying downwardly towards the upper face of the hot glass substrate positioned within the coating chamber a solution of coating precursor material, which solution of coating precursor material is in the form of a volatilizable solution comprised of solvent and a metallic compound, which metallic compound is soluble in the solvent and is pyrolyzable by the hot glass substrate to form a metal oxide coating thereon, and which coating chamber is positioned within or adjacent to the upstream end of said passageway;

c. supplying heat energy to the coating chamber to vaporize at least a portion of the coating precursor material before it reaches the upper face of the hot glass substrate and to thereby charge the coating chamber atmosphere with vaporized coating precursor material; and

d. causing the coating chamber atmosphere charged with vaporized coating precursor material to flow continuously from the coating chamber along the coating path in a downstream direction and in contact with the upper face of the hot glass substrate for a contact time of at least 10 seconds by pressure lowering means,

wherein spraying in step b is from a height of at least 75cm above the upper face of the hot glass substrate and with sufficient energy to ensure a positive impact of any non-vaporized solution of coating precursor material.

4,917,718

METHOD OF MAKING CAPILLARY TUBE

George E. Berkey, Pine City, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Division of Ser. No. 82,680, Aug. 7, 1987, Pat. No. 4,822,389.
This application Nov. 14, 1988, Ser. No. 270,620
Int. Cl.[4] C03B *37/022, 37/018, 23/04*
U.S. Cl. 65—108 10 Claims

1. A method of making a thick walled glass capillary tube having a small inside diameter comprising the steps of

providing a glass tube having an inside diameter greater than the desired inside diameter,

applying particulate glass material to the outside peripheral surface of said tube to form an adherent porous coating,

sintering said porous coating to consolidate said glass particles,

heating the structure so formed to the drawing temperature of the material thereof, and

drawing said structure to a predetermined desired inside diameter.

4,917,719

HERBICIDAL ISOTHIAZOLE DERIVATIVES

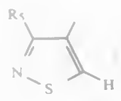
Rafael Shapiro, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 639,942, Aug. 13, 1984, Pat. No. 4,604,130, which is a continuation-in-part of Ser. No. 478,146, Mar. 30, 1983, abandoned. This application Apr. 17, 1986, Ser. No. 853,227
Int. Cl.[4] C07D *417/12;* A01N *43/66*
U.S. Cl. 71—90 6 Claims

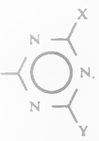
1 A compound of the formula:

$QSO_2NHCONHA$

where
Q is



R_5 is Cl, C_1–C_3 alkoxycarbonyl or C_1–C_3 alkyl;
A is



X is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, or cyclopropyl; and
Y is CH_3, OCH_3, or
and agriculturally suitable salts thereof.

5. A method for controlling the growth of undesired vegetation comprising applying to the locus of such vegetation an agriculturally effective amount of a compound of claim 1.

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4,917,720

FUNGICIDAL AND PLANT-GROWTH REGULATING AZOLYL ETHER KETONES AND ALCOHOLS

Gerhard Jäger, Leverkusen; Manfred Jautelat, Burscheid; Wolfgang Krimer, Burscheid; Karl H. Büchel, Burscheid; Paul Reinecke, Leverkusen; Wilhelm Brandes, Leichlingen; Gerd Hänssler, Leverkusen, and Klaus Lürssen, Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

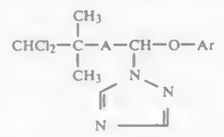
Division of Ser. No. 930,634, Nov. 13, 1986, abandoned. This application Oct. 12, 1988, Ser. No. 256,808

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1985, 3540523

Int. Cl.[4] A01N *43/653*; C07D *249/08*

U.S. Cl. 71—92 8 Claims

1. An azolyl ether ketone or alcohol of the formula



in which

A represents the keto group or a CH(OH) grouping, and

Ar represents phenyl which is optionally mono- or di-substituted by identical or different substituents selected from the group consisting of fluorine, chlorine and phenyl,

or an addition product thereof with an acid or metal salt.

4,917,721

HERBICIDAL ESTERS, COMPOSITIONS AND USE

Georg Pissiotas, Lörrach, Fed. Rep. of Germany; Hans Moser, Magden, and Beat Böhner, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

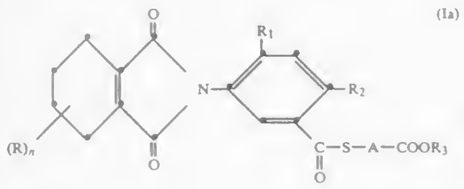
Filed Feb. 5, 1987, Ser. No. 10,927

Claims priority, application Switzerland, Feb. 11, 1986, 535/86; Sep. 10, 1986, 3637/86

Int. Cl.[4] A01N *43/38*; C07D *209/48*

U.S. Cl. 71—96 4 Claims

1. A 5-(N-3,4,5,6-tetrahydrophthalimido)benzoic acid ester of formula Ia



(Ia)

wherein

n is 0, 1 or 2,

R is C_1–C_3alkyl,

R_1 is halogen,

R_2 is halogen,

A is a straight chain or branched chain C_1–C_4alkylene bridge,

R_3 is C_1 to C_4alkyl, C_3–C_6alkenyl, C_3–C_6alkynyl or C_3–C_7-cycloalkyl each of which may be unsubstituted or substituted by halogen or C_1–C_4alkoxy.

4. A method of selectively controlling weeds pre- or post-emergence in crops of useful plants, which method comprises treating said useful plants or the crop area thereof with an effective amount of a compound according to claim 1, or of a composition containing such a compound.

4,917,722

SINGLE CRYSTALS OF CHROMIUM AND METHOD FOR PRODUCING THE SAME

Tsutomu Kuniya; Koichi Hanawa, and Tomoyuki Oikawa, all of Kanagawa, Japan, assignors to Tosoh Corporation, Yamaguchi, Japan

Filed May 18, 1989, Ser. No. 353,415

Claims priority, application Japan, May 18, 1988, 63-119303; May 20, 1988, 63-122143; May 23, 1988, 63-123930; May 24, 1988, 63-124951; May 27, 1988, 63-128253; May 27, 1988, 63-128254; May 31, 1988, 63-131690; May 31, 1988, 63-131691

Int. Cl.[4] C22C *29/12*

U.S. Cl. 75—232 17 Claims

17. Single crystals of chromium comprising chromium having incorporated thereinto silicon in the form of SiO_2 in a total amount of from 0.002% to 0.1% by weight based on chromium and/or cobalt in an amount of from 0.01% to 3% by weight based on chromium.

4,917,723

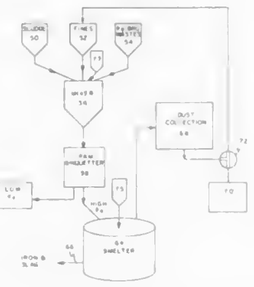
METHOD FOR AGGLOMERATION OF IRON BEARING MATERIALS

Thomas J. Coyne, Jr., Clover, S.C., assignor to T.C., Inc., Clover, S.C.

Filed Jan. 26, 1989, Ser. No. 301,872

Int. Cl.[4] C22B *1/08*

U.S. Cl. 75—433 5 Claims



1. A method for recovering non ferrous metals from steel plant waste comprising:

agglomerating said steel plant waste;

charging said agglomerated waste to a smelter;

smelting said agglomerated waste to form molten iron and slag;

volatilizing the non ferrous metals and removing said volatilized non-ferrous metals with the smelter off-gases;

recovering the smelter dust from the off-gas;

agglomerating the recovered dust by ram briquetting to form a cold compact material;

charging said cold compact material into said smelter to volatilize the non-ferrous metals contained therein;

recovering the volatilized non-ferrous metal;

determining the percentage of each non-ferrous metal in the recovered dust; and

when the percentage of dust is sufficiently high that the hazardous component is economically recoverable, the agglomerate said high value dust to a high value agglomerate and remove it from the process for separate recovery of the non-ferrous metals contained therein.

4,917,724

METHOD OF DECALCIFYING RARE EARTH METALS FORMED BY THE REDUCTION-DIFFUSION PROCESS

Ram A. Sharma, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 11, 1988, Ser. No. 255,700

Int. Cl.[4] B22F *1/00*

U.S. Cl. 75—350 11 Claims

1. A method for preparing a mixture of a rare earth and an intermetallic compound comprising said rare earth and a ferromagnetic metal selected from the group consisting of iron and cobalt comprising the steps of:

(a) reducing a compound of said rare earth with calcium in the presence of said metal at an elevated temperature;

(b) heating the product of the reducing step for a time and at an elevated temperature sufficient to diffuse most of said rare earth into said metal and produce a cake of said mixture containing CaO and unreacted Ca;

(c) hydrating said cake with water in a substantially CO_2-free environment to alkalize said CaO and Ca into $Ca(OH)_2$ and crumble said cake into a mass of particles having a first fraction comprising principally $Ca(OH)_2$ having a portion of said mixture entrained therein and a second fraction comprising principally said mixture;

(d) treating said first fraction with an aqueous alkaline solution containing a reagent capable of forming a calcium salt soluble in said solution;

(e) maintaining said solution at a pH sufficiently greater than 9.0 during said treating step to substantially prevent dissolution of said rare earth while forming said; and

(f) removing said solution from said mixture; whereby said $Ca(OH)_2$ is separated from said mass with substantially no loss of said rare earth therfrom.

4,917,725

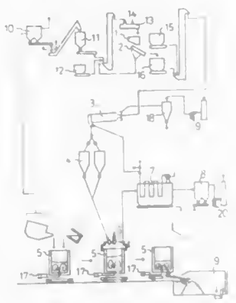
PROCESS FOR TREATING ELECTRIC FURNACE DUST

Nobuyuki Hara; Yukitaka Anabuki; Katsutoshi Murakami, all of Tokyo, and Mitsuhiko Harada, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo and Nippon Magnetic Dressing Co., Ltd., Kitakyushu, both of, Japan

Filed Sep. 19, 1988, Ser. No. 246,562

Int. Cl.[4] C22B *1/08*

U.S. Cl. 75—752 8 Claims



1. A process for treating electric furnace dust comprising mixing agglomerated electric furnace dust and an agglomerated reducing agent with a material for reducing the melting point of slag to form a mixture; preheating the mixture; bubbling an oxygen-containing gas into molten steelmaking slag in a reaction furnace; mixing said preheated mixture with said molten steelmaking slag in said reaction furnace while continuing said bubbling to form a reaction furnace contents; heating the reaction furnace contents to produce waste gases containing volatilized materials and a molten remainder material; recovering the volatilized materials from said waste gases, and cooling the molten remainder material to solidify the remainder material.

4,917,726

CHROMIUM RECOVERY PROCESS

Eddie C. J. Choe; Leo W. Beckstead; Charles J. Kucera, Jr., all of Arvada, Colo., and Pandelis Papafingos, Riverside, Calif., assignors to Amax Inc., Greenwich, Conn.

Continuation of Ser. No. 43,673, Apr. 16, 1987, abandoned. This application Oct. 26, 1988, Ser. No. 263,966

Int. Cl.[4] C22B *34/32*

U.S. Cl. 75—623 7 Claims

1. A method for treating sludge material containing at last about 10% chromium in an environmentally leachable form while avoiding detrimentally affecting the environment which comprises:

heating said sludge material to a temperature within the range of about 300° C. to 600° C. for a time sufficient to form an activated product thereof,

subjecting said activated product to reduction and smelting at an elevated temperature in excess of 1,000° C. to produce a metallic product comprising chromium and a slag,

and then separating said metallic product from said slag,

whereby both the slag and the metallic product are in a form non-detrimental to the environment.

4,917,727

METHOD OF OPERATING A BLAST FURNACE

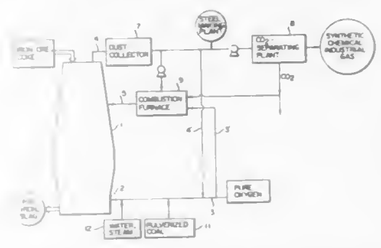
Hiroshi Saito; Yotaro Ono, both of Tokyo; Hirohisa Hotta, and Masahiro Matsuura, both of Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 884,979, Jul. 14, 1986, abandoned. This application Nov. 22, 1988, Ser. No. 279,252

Claims priority, application Japan, Jul. 26, 1985, 60-165383

Int. Cl.[4] C21B *5/06*

U.S. Cl. 75—460 8 Claims



1 A method of operating a blast furnace having a furnace top, a shaft and a hearth fitted with tuyeres opening to said hearth at a tuyeres nose, comprising the steps of:

charging a charge including iron ore and coke as major constituents from said furnace top into said blast furnace;

blowing pure oxygen, pulverized coal, and a temperature control gas from said tuyeres, said temperature control gas being adapted to prevent a temperature rise at the nose of said tuyere;

blowing an oxidizing preheating gas which is substantially devoid of nitrogen from an intermediate level of said shaft to increase the volume of gas upward from said intermediate level of said shaft and to preheat the charge in said blast furnace to a temperature of from 500° to 1,200° C. such that reduction of said charged iron ore can take place at a satisfactory reaction rate; and

combusting coke with said pure oxygen to melt said iron ore and to generate a blast furnace gas which is substantially devoid of nitrogen.

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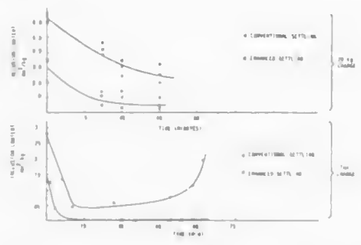
4,917,728

ALUMINIUM ALLOY TREATMENT

Philip G. Enright, Hook Norton, England, assignor to Alcan International Limited, Quebec, Canada

Filed Apr. 29, 1988, Ser. No. 188,520
Claims priority, application United Kingdom, Apr. 29, 1987, 8710200
Int. Cl.[4] C22B 9/10
U.S. Cl. 75—68 R 19 Claims



1. A method of removing unwanted inclusion particles from a body of liquid aluminum or aluminum alloy by deposition thereof comprising

A. 1. adding to the liquid metal an excess of at least one alloying constituent and

2. raising to metal temperature higher than a selected casting temperature and above that liquidus of the alloy below which some intermetallic particles can form,

B. causing the temperature of the liquid metal to fall below the said liquidus so that intermetallic phase particles nucleate and cause the residual liquid metal to alter its composition and temperature according to the liquidus line of the phase diagram until it achieves a selected temperature and composition,

wherein

the alloying constituent is chosen so as to form a peritectic system with aluminum and the intermetallic is chosen to nucleate preferentially on or in the vicinity of inclusion particles of oxide, boride, spinel or mixtures thereof and grow to form complex bodies which have an enhanced settling rate and which grow to a size and with a morphology whereby during setting the liquid metal is scavenged of titanium diboride particles.

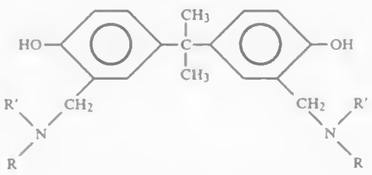
4,917,729

CORROSION INHIBITING AQUEOUS, ACIDIC COMPOSITIONS COMPRISING METAL-CHELATING O-HYDROXYBENZYLAMINE COMPOUND

Walter O. Siegl, Dearborn, and Mohinder S. Chattha, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 5,181, Jan. 20, 1987, Pat. No. 4,792,355.
This application Sep. 21, 1988, Ser. No. 247,227
Int. Cl.[4] C04B 9/02
U.S. Cl. 106—14.15 9 Claims

1. An aqueous, acidic composition useful to deposit a corrosion inhibiting coating on a metal substrate, said composition (1) having a pH of between about 2 and about 4.5 and (2) consisting essentially of at least about 0.01 weight percent of a water-soluble or water-dispersible metal-chelating compound selected from compounds having the general chemical formula:



wherein R is selected from hydroxy ethyl and hydroxy propyl moieties which may be substituted with non-interfering functionality and R′ is H, alkyl, aryl or hydroxy alkyl.

4,917,730

PREVENTION OF SPOTTING IN THERMAL IMAGING COMPOSITIONS

Alan G. Miller, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 600,474, Apr. 16, 1984. This application Oct. 16, 1985, Ser. No. 788,162
Int. Cl.[4] C09D 11/00
U.S. Cl. 106—21 13 Claims

1. A thermally imageable composition comprising at least one leuco dye in reactive proximity to an inorganic nitrate salt, whereby imagewise application of heat causes said nitrate salt to oxidize said at least one leuco dye to produce a change in color, and an effective amount of at least one base characterized as having a conjugate acid having a pKa greater than or equal to zero and an oxidation potential such that it cannot be oxidized by silver.

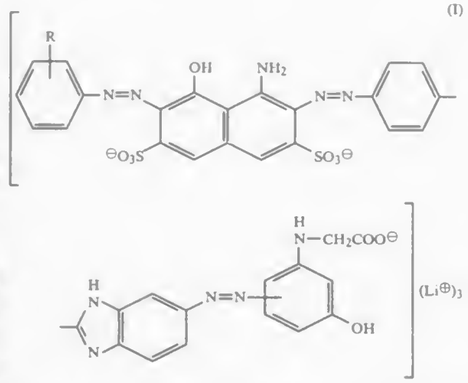
4,917,731

WATER-SOLUBLE BLACK TRISAZO DYESTUFFS

Wolfgang Bauer, 6, Masurenstrasse; Konstantin Morgenroth, 4, Büchertalstrasse, both of 6457 Maintal 3; Kuno Reh, 14, Lauterbacher Strasse, 6000 Frankfurt 61, and Josef Ritter, 12, Berliner Strasse, 6238 Hofheim/Ts., all of Fed. Rep. of Germany

Filed Dec. 12, 1988, Ser. No. 283,469
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3743527
Int. Cl.[4] C09D 11/02
U.S. Cl. 106—22 6 Claims

1. Water soluble black trisazo dyestuffs of the general formula I



(I)

wherein R denotes hydrogen, alkyl having 1 or 2 carbon atoms, alkoxy having 1 or 2 carbon atoms, acylamino having 2 or 3 carbon atoms or carboxamide.

4,917,732

FLYASH TREATMENT

Daniel C. Baker, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 944,908, Dec. 22, 1986, abandoned.
This application Oct. 25, 1988, Ser. No. 263,962
Int. Cl.[4] C04B 7/14
U.S. Cl. 106—85 6 Claims

1. A process for producing a flyash-slag composite comprising discrete particles of slag dispersed in a solid mixture comprising

(a) tumbling slag particles with an aqueous suspension of finely divided clay, under conditions effective to provide aggregation, the ratio of slag to said clay, by weight, being from about 15 parts to about 40 parts slag per part of clay, and forming a mixture comprising aggregates of slag and clay in said suspension;

(b) adding flyash derived from the gasification of coal to said mixture while tumbling said mixture under said conditions, said flyash particles being added in a ratio of from about one part to about 5 parts flyash per part of slag, by weight, and forming a flyash-aggregate mixture;

(c) adding a finely divided cementitious material to said flyash-aggregate mixture while tumbling said flyash aggregate mixture, the ratio of cementitious material to flyash being from about 0.1 part to about 0.3 part cementitious material per part of flyash, by weight, and producing a flyash composite, the amount of water present in the suspension or added during tumbling, by weight, being sufficient to produce a ratio of water to the total solids tumbled of from about 0.1 to about 0.5.

4,917,733

POZZOLANIC MIXTURE FOR STABILIZING LANDFILL LEACHATE

David L. Hansen, P.O. Box 290, West Sand Lake, N.Y. 12196

Filed Nov. 14, 1988, Ser. No. 272,134
Int. Cl.[4] C05F 3/00
U.S. Cl. 106—85 20 Claims

11. A method for the disposal of landfill leachate comprising the steps of: combining fly ash, kiln dust and landfill leachate to form a pozzolanic mixture, and curing the mixture to form a solid leach-resistant body.

4,917,734

GRAFTED ETHYLENE POLYMERS AND COPOLYMERS AND THEIR APPLICATIONS AS BINDERS FOR COATING

Henri Demay, Senlis; Remi Hauschild, Paris, and Adrien Nicco, Bethune, all of France, assignors to Norsolor (Orkem Group), Paris, France

Filed Oct. 24, 1988, Ser. No. 261,379
Claims priority, application France, Oct. 22, 1987, 87 14599
Int. Cl.[4] C08L 91/06; C08F 265/02; C08C 19/00
U.S. Cl. 106—270 13 Claims

1. Graft copolymers of ethylene polymers and copolymers, characterized in that they are thermoplastic and are prepared by polymerization of (in % by weight relative the resin obtained):

0.5 to 30% of a backbone polymer of at least one unoxidized polyethylene and/or an unoxidized ethylene copolymer based on at least 70% by weight of ethylene and a comonomer optionally containing ester, a hydride of acid functional group, said polyethylene or ethylene copolymer being defined by the following properties: a weight average molecular weight (Mw) of between 900 and 60,000, a Brookfield viscosity at 190° C. of between 0.1 and 500 poises and/or a Brookfield viscosity at 140° C. of between 0.1 and 2,000 poises, a crystallinity, measured by X-ray, of between 10% and 80%,

70 to 99.5% of styrene-based, vinyl, acrylic and/or methacrylic grafting monomers,

in the presence of at least one free radical initiator and of at least one organic solvent, said graft copolymer being soluble at ambient temperature in alcohols, esters, ethers, or ketones.

4,917,735

PROCESS FOR THE PRODUCTION OF RUTILE MIXED-PHASE PIGMENTS

Jakob Rademachers, and Hans-Peter Heisse, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 18, 1989, Ser. No. 298,602
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1988, 3802468
Int. Cl.[4] C09C 1/36
U.S. Cl. 106—428 9 Claims

1. A process for the production of rutile mixed-phase pigments comprising calcinating a solid mixture of titanium dioxide or titanium dioxide hydrate or titanium dioxide and titanium dioxide hydrate with a dye-producing metal compound in an indirectly heated rotary kiln supplied with air, wherein the titanium dioxide comprises an uncalcined, salt-free titanium dioxide having a specific BET surface of 50 to 500 m^2/g.

4,917,736

METHOD OF TRANSFORMING A PASSIVE FERROMAGNETIC MATERIAL INTO A PERMANENT MAGNET

Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 20, 1989, Ser. No. 326,777
Int. Cl.[4] C21D 1/04
U.S. Cl. 148—108 10 Claims

1. Method of transforming a passive ferromagnetic material into a permanent magnet with more than double the existing energy product or, said method including the steps of:

(A) encasing a bar of the passive ferromagnetic material in an annular shell of superconductive material at a temperature above the transition temperature of the superconductive material,

(B) placing the encased ferromagnetic material into an axial magnetic field providing sufficient oersteds to magnetize the passive ferromagnetic material, thereby enclosing a large amount of flux in the superconducting shell,

(C) lowering the temperature to below the transition temperature of the superconductive material whereupon all of the enclosed flux is permanently trapped, and

(D) removing the axial magnetic field.

4,917,737

SEALING COMPOSITION AND METHOD FOR IRON AND ZINC PHOSPHATING PROCESS

William S. Carey, Ridley Park, and David W. Reichgott, Richboro, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Mar. 13, 1989, Ser. No. 322,447
Int. Cl.[4] C23C 22/84
U.S. Cl. 148—250 7 Claims

1 A method of sealing a phosphatized metal component which comprises contacting a phosphatized metal component with a heavy metal and chromium free aqueous acidic solution consisting essentially of a substituted iminodimethylene diphosphonic acid having the formula R1—N—$(CH_2—PO_3H_2)_2$ wherein R1 is a Z, alkyl or aryl moiety having a carbon chain length up to a length where solubility in an acidic aqueous solution is lost; where Z is

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$$[Cn-N\overset{R2}{\underset{}{\overset{|}{\underset{}{}}}}\underset{m}{\overset{}{\underset{}{}}}R3$$

R2 and R3 are hydrogen, alkyl, aryl or phosphono alkyl moieties, m is 1 to 3, and Cn is a methylene carbon chain up to the length where solubility in an acidic aqueous solution is lost, and water soluble salts thereof.

4,917,738

STEAM TURBINE ROTOR FOR HIGH TEMPERATURE

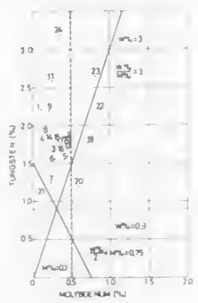
Yusaku Takano, Nagasaki; Akio Hizume, Tokyo; Yorimasa Takeda, Nagasaki; Toshio Fujita, Tokyo; Shushi Kinoshita, Akashi; Kikoo Morita, Kakogawa, and Masahiro Ikuta, Kakogawa, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Kabushiki Kaisha Kobe Seikosho, Kobe, both of, Japan

Continuation of Ser. No. 880,880, Jul. 1, 1986, abandoned. This application May 31, 1988, Ser. No. 201,294

Claims priority, application Japan, Jul. 9, 1985, 60-149185

Int. Cl.[4] C22C *38/22, 38/24*

U.S. Cl. 148—325 4 Claims



1. A steam turbine rotor which comprises an iron base alloy containing 0.05 to 0.2 wt % of carbon, 0.1 wt % or less of silicon, 0.05 to 1.5 wt % of manganese, more than 8.0 wt % to less than 13 wt % of chromium, less than 1.5 wt % of nickel, 0.1 to 0.21 wt % of vanadium, 0.01 to 0.1 wt % of niobium, 0.01 to 0.1 wt % of nitrogen, 0.02 wt % or less of aluminum, 0.10–0.38 wt % of molybdenum and 0.9 to 3.0 wt % of tungsten; contents of molybdenum Mo and tungsten W satisfying the following formulae

$$0.75 \leqq \tfrac{1}{2}W + Mo \text{ and}$$

$$3 \leqq W/Mo$$

a δ-ferrite phase and a large grain boundary carbide being scarcely contained basically in the metallic structure; a matrix of martensite being formed therein.

4,917,739

RAPIDLY SOLIDIFIED ALUMINUM-TRANSITION METAL-SILICON ALLOYS

Colin M. Adam, Morristown, N.J.; Kenji Okazaki, Lexington, Ky.; David J. Skinner, Flanders, N.J., and Robert G. Corey, Murrells Inlet, S.C., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 29, 1988, Ser. No. 111,958

The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.

Int. Cl.[4] C22C *21/00*

U.S. Cl. 148—437 11 Claims

1. An aluminum alloy consisting essentially of the formula $Al_{bal}TM_dSi_e$ wherein "TM" is at least one element selected from the group consisting of Fe, Co, Ti, V, Ni, Zr, Cu, Mg, and Mn, "d" ranges from about 2–20 wt %, "e" ranges from about 2.1–20 wt %, and the balance is aluminum plus incidental impurities, said alloy having been rapidly solidified at a quench rate of at least about 10^6 K./sec from a carbothermically reduced aluminous material containing oxides of Al, Si and transition metals, and having a microstructure which is at least about 50% composed of a microeutectic and/or microcellular structure.

4,917,740

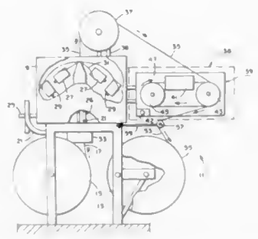
BRAIDING MACHINE

Myron Waldman, Pawtucket, R.I., assignor to WST Power Electronics, Inc., Providence, R.I.

Filed Mar. 11, 1988, Ser. No. 166,569

Int. Cl.[4] B29C *53/84*

U.S. Cl. 156—51 9 Claims



1. In a braiding machine wherein a product over which a metal braid is to be applied is drawn up from a supply spool, passed through a braiding mechanism and then wound onto a take-up spool, the improvement comprising a closed loop type induction heater disposed along the path of travel of the product from the braiding mechanism to the take-up spool for applying heat, when desired, to the product before it is wound on the take-up reel.

4,917,741

PROCESS AND APPARATUS FOR MAKING AN ENDLESS CONVEYOR BELT, FOR JOINING ENDS OF A BELT AND FOR REPAIRING A BELT

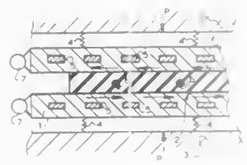
Peter Thies, Ennepetal, and Harald Fudickar, Solingen-Grafrath, both of Fed. Rep. of Germany, assignors to C. S. Fudickar KG, Wuppertal, Fed. Rep. of Germany

Filed Nov. 29, 1988, Ser. No. 277,338

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1987, 3742651

Int. Cl.[4] B32B *31/16*

U.S. Cl. 156—73.1 9 Claims



1. In a process for forming, rendering endless or repairing a conveyor belt made of rubber and equipped with a plurality of stress bearing inserts, in which a conveyor belt section provided with rubber material and prepared for vulcanization is brought between a plurality of heatable press platens and is vulcanized using heat and pressure, said rubber material provided to said conveyor belt section having Newtonian flow properties and undergoing a hot pressing, the improvement wherein in said vulcanization said conveyor belt section is vibrated over a vibrational time period smaller than a time required for vulcanization, vibrational motion generated therefrom accelerating filling of all hollow spaces in said section, and said conveyor belt section is only vibrated substantially in the vicinity of said Newtonian flow.

8. The improvement defined in claim 1 wherein said process operates with ultrasonic vibration frequencies.

4,917,742

METHOD OF MAKING LIGHTWEIGHT PANELS AND THEIR CORE MATERIALS

Yasuhiko Watanabe; Nobuyoshi Nakamura; Yoshinori Kuriyama, and Takuji Motegi, all of Kitakyushu, Japan, assignors to Nippon Steel Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1989, Ser. No. 311,565

Claims priority, application Japan, Feb. 17, 1988, 63-32792

Int. Cl.[4] B32B *3/12*

U.S. Cl. 156—79 3 Claims

1. A method of making a core for a lightweight panel which comprises applying a resol resin having a viscosity of about 500 to 10,000 centipoises and a water content of about 20% or less containing about 15 to 90 parts by weight of a blowing agent to 100 parts by weight of said resin, about 0.5 to 10 parts by weight of a foam stabilizer to 100 parts by weight of said resins and about 5 to 40 parts by weight of an acidic substance to 100 parts by weight of said resin on an interior surface of a substantially non-adhesive flat container in a substantially uniform thickness, positioning a honeycomb open at top and bottom on said resin, allowing said resin to foam freely and cure at a temperature of about 50° to 100° C. so as to obtain phenolic foam having a density of 7 to 20 kg/m^3, and cutting off any overflow of the phenolic foam.

4,917,743

METHOD FOR MANUFACTURING A FRICTION RING HAVING A CONICAL OR CYLINDRICAL FRICTION SURFACE

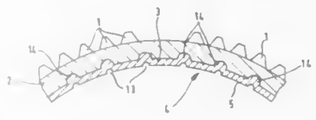
Johann Gramberger, Hauptschulstrasse 26, A-4902 Wolfsegg, and Ferdinand Mairhofer, Moosbergweg 41, A-4810 Gmunden, both of Austria

Filed Feb. 18, 1988, Ser. No. 157,652

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1987, 3705658

Int. Cl.[4] B32B *18/00*

U.S. Cl. 156—89 9 Claims



1. A method for manufacturing a frictional ring having a circumferential frictional surface, the method comprising the steps of:

manufacturing a ring-shaped supporting member having a first circumferential supporting surface;

molding and compressing a sintering powder to provide a strip-shaped sinter powder member having a second circumferential supporting surface complementary to said first circumferential supporting surface;

pre-sintering said sinter powder member to provide a self-supporting mechanically stable friction member;

pressing said friction member into said supporting member with said first and second circumferential supporting surfaces adjoining each other;

sintering said friction member with said second circumferential supporting surface onto said first circumferential supporting surface of said supporting member.

4,917,744

METHOD OF MAKING A TIRE REINFORCED WITH SHEATH CORD THREADS

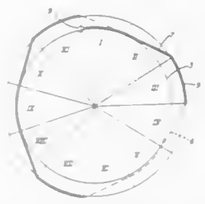
Ulrich Knipp, Bergisch-Gladbach, and Otto Ganster, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 851,854, Apr. 14, 1986, abandoned, and a continuation-in-part of Ser. No. 789,676, Oct. 21, 1985, abandoned, which is a continuation of Ser. No. 532,412, Sep. 15, 1983, abandoned. This application Jun. 30, 1988, Ser. No. 213,666

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1983, 3322266

Int. Cl.[4] B29D *30/00, 30/08;* B60C *9/07*

U.S. Cl. 156—117 2 Claims



1. In the process for the production of a cast tire reinforced with sheathed core threads and having at least one tire foot, the improvement comprising prefabricating tire reinforcement by winding a continuous cord thread in an alternating manner on

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to a core, the alternation being controlled in such a manner that at each turning point of said alternation, said continuous cord thread is guided for a predetermined length in a rotationally, symmetric manner in the region of the tire foot, said prefabricating being characterized by the following:

(a) the continuous cord thread is wound onto a rotating core with non-narrowing flanks; and either

(b1) the wound core is used to form the core's internal contour of the cast tire; or

(b2) the tire reinforcement is removed from the core after a fixing operation and is introduced into a tire casting mold; and

(c) the alternation is controlled in such a manner that at said turning points the continuous cord thread is pressed at least once on each side for the duration of at least one rotation against a bead provided in a rotationally symmetric manner on the core, in the region of the tire foot.

4,917,745

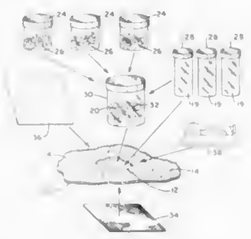
FABRIC REPAIR PROCESS

Lawrence L. Speer, 16678 Chibiabos Trail, Doylestown, Ohio

Filed Sep. 22, 1988, Ser. No. 247,684

Int. Cl.[4] B32B *35/00*

U.S. Cl. 156—94 2 Claims



1. A process for repairing damaged fabric comprising preparing a repair assembly by the sequential steps of:

covering the underneath surface of the damaged fabric's damaged area with a backing fabric;

placing a first layer of a thermoplastic resin in the damaged area, on said backing cloth;

placing at least one additional layer of a mixture comprising flockfibers and a thermoplastic resin on top of said first layer, and thereafter heating the repair assembly thus formed thereby securing said backing fabric and the flockfibers to said damaged fabric; and

wherein said mixture of flockfibers in said resin is prepared by placing the mixture components in a closed container with an agitator ball and shaking the container.

4,917,746

APPARATUS AND METHOD FOR CONTOURING ELASTIC RIBBON ON DISPOSABLE GARMENTS

Hugo L. Kons, 719 W. Summer, Appleton, Wis. 54911, and Richard H. Frick, 1417 Winneconne, Neenah, Wis. 54956

Continuation-in-part of Ser. No. 390,153, Jun. 21, 1982, abandoned. This application Jun. 18, 1984, Ser. No. 621,900

Int. Cl.[4] B23B *31/12*

U.S. Cl. 156—164 50 Claims

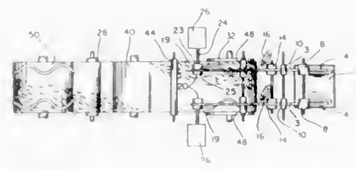
1. A method for applying a continuous, moving ribbon of elastic material to a moving web of material, comprising the steps of:

rotatably mounting at least one receiving roll about an axis essentially perpendicular to the surface of the web;

continuously moving the web in a direction coinciding with its length;

simultaneously moving and applying tension to the elastic ribbon in the direction of its length around a circumferential surface of the receiving roll;

oscillating said receiving roll in a direction essentially transverse to the direction of movement of the web while the ribbon is contacting said circumferential surface, imparting a coefficient of friction such that the friction of said surface with the ribbon and the tension of the ribbon



together provide sufficient force on the ribbon to move the ribbon around said surface and slidingly along said rotational axis of said receiving roll in an oscillatory manner with the oscillatory motion of said receiving roll, said receiving roll being of a sufficient length to contain the axial travel of the ribbon thereacross; feeding the oscillating ribbon into engagement with the web in an undulating pattern and adhering the ribbon thereto.

4,917,747

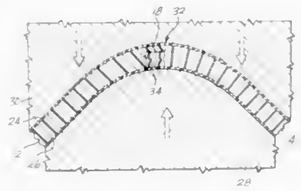
METHOD OF MAKING CRUSHED CORE MOLDED PANELS

Victor C. Chin, Issaquah; Paul Y. Jone, Seattle, and Robert J. Marshall, Marysville, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 24, 1989, Ser. No. 315,725

Int. Cl.[4] B32B *31/12, 31/20*

U.S. Cl. 156—198 15 Claims



1. A method of making panels of the type having a low density core sandwiched between outer skins and an interface between two different core materials along a radius of the panel, said method comprising:

providing a substantially flat section of each said core material.

forming a flange that extends integrally outwardly from an upper portion of one of said sections and forms a reduced thickness edge on said one section;

positioning said one section to abut an edge of the other of said sections with said flange extending over the upper surface of said other section;

assembling the abutting sections and two skins, including positioning the abutting sections between the skins;

compression molding the assembled sections and skins to form a panel with a bend substantially along the abutting edges of said sections, said bend increasing in radius of curvature from the lower to the upper surfaces of said sections; and

while so molding said sections and skins, crushing at least one of said flange and the radially adjacent portion of said other section to form an essentially voidless interface between said sections sandwiched between essentially smooth portions of said skins.

4,917,748

METHOD OF MAKING MICROWAVE HEATABLE MATERIALS

Peter Harrison, West Yorkshire, England, assignor to Waddingtons Cartons Limited, Leeds, United Kingdom

Filed Jan. 19, 1988, Ser. No. 145,359

Claims priority, application United Kingdom, Jan. 17, 1987, 8700966

Int. Cl.[4] B32B *31/20*

U.S. Cl. 156—230 31 Claims

1. A method of producing a microwave interactive sheet material for use in microwave cooking comprising the steps of:

(a) providing a receiving sheet;

(b) applying to a surface of the receiving sheet a composition comprising a liquid component in which are mixed in suspension microwave interactive particles in an amount not greater than 50% of said composition so as to distribute the composition over the surface; and

(c) drying the liquid component of the composition to leave the particles so distributed so as to fix the particles in such distribution and so as to ensure that the particles form a layer to be subjected to microwave radiation, whereby upon drying of the liquid component, the amount of particles is sufficient to provide cooking of foodstuff placed in close proximity thereto,

4,917,749

PROCESS FOR THE CONTINUOUS PRODUCTION OF MANUFACTURED ARTICLES REINFORCED WITH MIXTURES OF HYDRAULIC BINDERS

Andrea Vittone, Milan; Giuseppe Chiappini, Albiano Magra, and Massimo Di Paola, Rapallo, all of Italy, assignors to Mopfelan S.p.A., Milan, Italy

Division of Ser. No. 829,101, Feb. 14, 1986, Pat. No. 4,767,491. This application Jan. 29, 1988, Ser. No. 150,046

Claims priority, application Italy, Feb. 15, 1985, 19535 A/85

Int. Cl.[4] B32B *31/08*

U.S. Cl. 156—242 4 Claims

1. A process for the continuous production of reinforced manufactured articles consisting of a succession of layers of hydraulic binder mixes and open nets made of fibrilled synthetic films, said process comprising the following phases:

feeding to a single conveyor belt, made of porous material, a hydraulic binder mix in the form of a thin uniform layer;

feeding to the single conveyor belt a net-like structure with a reinforcing function;

immersion and impregnation of the reinforcing net into the thin mix layer, and compacting thereof with the hydraulic binder all on the single conveyor belt;

initial extraction of excess water during the compacting phase, until the content of water is between 15% and 40% with respect to dry product on the single conveyor belt;

successive feeding of further layers of hydraulic binder mix alternated with nets of fibrilled polyolefinic films to form a plate, with a subsequent compacting and extraction of the water all on the single conveyor belt;

levelling-sizing of the surface of the plate consisting of a plurality of hydraulic binder/net layers on the single conveyor belt;

final extraction under vacuum of the excess water on the single conveyor belt;

pressing of the plate and extraction of the outflowing water;

cutting the plate to the desired size.

4,917,750

METHOD OF AND APPARATUS FOR MANUFACTURING A MINERAL FIBER INSULATING WEB

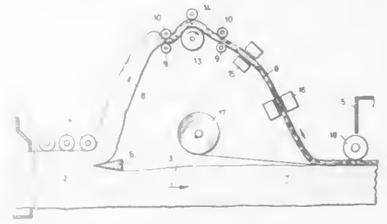
Gerd R. Klose, Dorsten, Fed. Rep. of Germany, assignor to Deutsche Rockwool Mineralwoll - GmbH, Fed. Rep. of Germany

Filed Jan. 20, 1988, Ser. No. 146,005

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1987, 3701592

Int. Cl.[4] B32B *31/18*

U.S. Cl. 156—254 21 Claims



1. A method of manufacturing a laminated cured multi-ply mineral fiber web comprising the steps of providing an uncured primary nonwoven mineral fiber web treated with a binding agent, conveying the primary nonwoven mineral fiber web along a predetermined path of travel, compacting the primary nonwoven mineral fiber web, severing the primary nonwoven mineral fiber web into at least two secondary nonwoven mineral fiber webs, compressing at least one of the secondary nonwoven mineral fiber webs substantially beyond the initial compaction of the primary nonwoven mineral fiber web, subjecting the at least one compressed web to at least one subsequent treatment step, thereafter positioning the at least one compressed and remaining secondary nonwoven mineral fiber webs into contiguous relationship to each other, curing the binding agent to adhere the secondary nonwoven mineral fiber webs to each other thereby forming a laminated cured multi-ply mineral fiber web, and aligning the mineral fibers of the at least one secondary nonwoven mineral fiber web during the performance of the compressing step.

4,917,751

METHOD OF PRODUCING DOUBLE SIDED OPTICAL MEMORY DISKS

Kenji Obta, Yao; Hiroyuki Katayama; Akira Takahashi, both of Nara; Yoshiteru Murakami, Nishinomiya, and Junji Hirokane, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 222,357, Jul. 20, 1988, abandoned, which is a continuation of Ser. No. 120,227, Nov. 10, 1987, abandoned, which is a continuation of Ser. No. 727,414, Apr. 25, 1985, abandoned. This application Mar. 20, 1989, Ser. No. 328,743

Claims priority, application Japan, May 11, 1984, 59-95436; May 12, 1984, 59-95423

Int. Cl.[4] B32B *31/28*

U.S. Cl. 156—272.2 5 Claims

1. A method of producing double sided optical memory disks comprising the steps of

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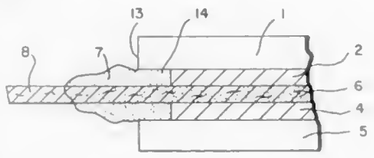
dropping a viscous adhesive material hardenable by ultraviolet radiation at predetermined longitudinal intervals onto an elongated cloth material of uniform thickness so as to cause said adhesive material to become absorbed by and contained in said cloth material,

thereafter placing said cloth material sandwichedly between a first optical disk piece and a second optical disk piece, each of said optical disk pieces containing a recording layer,



thereafter applying pressure between said first and second optical disk pieces with said cloth material sandwiched therebetween such that said first and second optical disk pieces remain separated uniformly by a predetermined separation distance, and

thereafter applying ultraviolet radiation to and thereby hardening said adhesive material while said first and second optical disk pieces are maintained at said uniform separation distance.

4,917,752

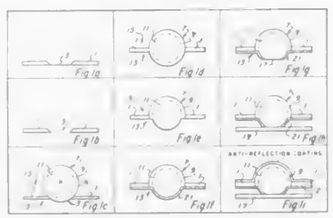
METHOD OF FORMING CONTACTS ON SEMICONDUCTOR MEMBERS

Millard J. Jensen, Balch Springs, and Jules D. Levine, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 647,605, Sep. 4, 1984, abandoned. This application Sep. 11, 1986, Ser. No. 906,646

Int. Cl.[4] H01L *31/04*

U.S. Cl. 156—292 **3 Claims**



1. A method of forming aluminum foil contacts on silicon members, comprising the steps of:

(a) providing a silicon member having an oxide layer thereon,

(b) mechanically removing a portion of said oxide and an adjacent portion of said silicon member,

(c) providing a roughened surface on the silicon member in the region whereat the silicon member portion was removed, and

(d) bonding a contact on said roughened surface by impact pressing aluminum foil at temperatures in the range of 500 to 577 degrees C. to said roughened surface.

4,917,753

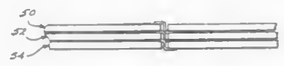
TWO-SIDED ADHESIVE TAPE

Gary D. Torgerson, and Joyce E. Ferm, Both of Seattle, Wash., assignors to Ferm & Torgerson, Seattle, Wash.

Division of Ser. No. 928,802, Nov. 7, 1986, Pat. No. 4,770,914. This application Jul. 11, 1988, Ser. No. 217,556

Int. Cl.[4] B32B *3/00*

U.S. Cl. 156—324 **3 Claims**



1. A method for making two-sided adhesive tape, comprising:

mounting first and second input spools of single-sided adhesive tape and a third input spool of a bridge member for rotation about respective input axes, each single-sided adhesive tape comprising an elongated strip of flexible material having lengthwise extending lateral edges, an adhesive side surface with adhesive, and a back side not surfaced with adhesive, the bridge member comprising an elongated strip of flexible material having lengthwise extending lateral edges;

pulling first and second strips of single-sided adhesive tape and a third strip of the bridge member from the respective first, second and third input spools, and joining said strips to form two-sided adhesive tape comprising a pair of single-sided adhesive tapes positioned in edge-to-edge relationship to one another such that an inner lateral edge of the first single-sided adhesive tape is adjacent to an inner lateral edge of the second single-sided adhesive tape, such that the adhesive sides of the first and second single-sided adhesive tapes face in opposite directions from one another, such that one lateral edge of the bridge member is adhesively joined to the first single-sided adhesive tape, and such that the opposite lateral edge of the bridge member is adhesively joined to the second single-sided adhesive tape, each strip being pulled by a force that is sufficient to pull the strip from its respective input spool and that is substantially uniform across the width of the strip; and

taking up the two-sided adhesive tape onto an output device.

4,917,754

METHOD FOR COATING A SOLID CLOSED SURFACE

Heinz Vetter; Walter Hellmann, and Otmar Krajec, all of Rossdorf, Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 270,525, Nov. 14, 1988, abandoned. This application Apr. 20, 1989, Ser. No. 341,154

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1987, 3740080

Int. Cl.[4] B32B *31/18*

U.S. Cl. 156—344 **7 Claims**

1. A method for coating a firm, closed surface having a peelable adhesive masking film thereon with a low viscosity coating composition, which method comprises lifting off the masking film from the surface at one end thereof and pouring the low viscosity coating composition into the wedge defined between the exposed surface and the lifted masking film, said surface being generally vertical, said wedge extending horizontally across said surface and being upwardly open, and then pulling off the masking film from the surface such that said horizontally extending wedge moves along the surface to be coated while replenishing the low viscosity coating composition at the rate at which it is consumed.

4,917,755

BELT JOIN APPARATUS FOR TIRE BUILDING DRUMS

Yuichiro Ogawa, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 839,625, Mar. 14, 1986, abandoned. This application Jun. 30, 1988, Ser. No. 214,925

Claims priority, application Japan, Mar. 19, 1985, 60-57385

Int. Cl.[4] B29D *30/08, 30/16;* **B32B** *31/04*

U.S. Cl. 156—405.1 **3 Claims**

1. A belt join apparatus for tire building drums comprising:

a first belt conveyor assembly for conveying a first belt component having a plurality of steel cords;

a second belt conveyor assembly for conveying a second belt component having a plurality of steel cords, the second belt conveyor assembly being arranged at a predetermined angle with respect to said first belt conveyor assembly, the first and second belt components being conveyed so that the steel cords of said first and second belt components become substantially equal in cord direction and cord angle in relation to one another;

centering means comprising an upper centering assembly arranged above said second belt conveyor assembly for centering said second belt component, a lower centering assembly arranged below said first belt conveyor assembly for centering said first belt component, an upper drive assembly for driving said upper centering assembly, and a lower drive assembly for driving said lower centering assembly;

press means for pressing and joining one upon the other of said first and second belt components with said steel cords of said first and second belt components disposed in the same cord direction and same cord angle and with said first and second belt components centered by said upper and lower centering assemblies;

feeding means for feeding the joined belt components, wherein the steel cords of said first and second belt components are equal in cord direction and cord angle in relation to one another, as a unit to a tire building drum; and

cutting means for cutting the joined first and second belt components whereby the joined belt components can be applied simultaneously in one step to a tire building drum and then cut simultaneously to a predetermined length along the same cord directions of said first and second belt components.

4,917,756

MACHINE FOR MANUFACTURING COMPOSITE REINFORCEMENT ELEMENTS WOVEN IN THREE DIMENSIONS

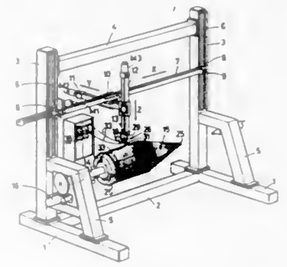
Georges J. J. Cahuzac, Saint Jean D'Illac, and Francois Monget, Merignac, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Mar. 23, 1987, Ser. No. 173,754

Int. Cl.[4] B65H *81/00;* **D05B** *93/00*

U.S. Cl. 156—429 **5 Claims**

1. A machine for manufacturing composite reinforcement elements woven in three dimensions from textile, mineral, synthetic or other fibers comprising: a frame; mounting means for mounting a disposable mandrel of foam or the like having externally the internal shape of the reinforcement element to be produced; rotation means for rotating said mounting means; a vertical arm carried by said frame above said mounting means and adjustable along three orthogonal axes; fixing means attached to said arm for detachably mounting work devices said fixing means including a foot member extending in the direction of said vertical arm, a motor fixed on said foot and a horizontal shaft supported by said foot and driven in rotation by said motor; implanting means for implanting rigid members in the mandrel, said implanting means being attachable to said fixing means; application means for applying on the surface of the mandrel successive layers of threads or fibers, the layers being superimposed and crossed in at least two directions; and interconnection means for interconnecting said layers by



means of threads or fibers which extend perpendicularly through the layers.

4,917,757

METHOD OF PERFORMING SOLUTION GROWTH OF ZNSE CRYSTALS

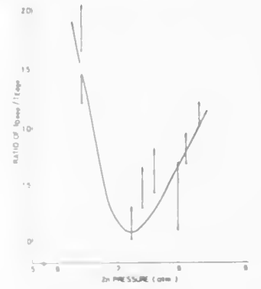
Jun-ichi Nishizawa, Sendai, Japan, assignor to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Continuation of Ser. No. 783,805, Oct. 4, 1985, abandoned, which is a continuation of Ser. No. 509,053, Jun. 29, 1983, abandoned. This application Feb. 3, 1988, Ser. No. 153,567

Claims priority, application Japan, Jul. 2, 1982, 57-115893

Int. Cl.[4] C30B *29/46, 29/48, 7/10, 35/00*

U.S. Cl. 156—624 **4 Claims**



1. A method of fabricating a p-type ZnSe crystal minimizing deviation from stoichiometry relying on a temperature difference between a crystal source region and a crystal growth region using Se as the sole solvent material, using a IA group element as a p-type impurity, applying a constant Zn vapor pressure having a value which is larger than 6.5 atm. and smaller than 8 atm. to the surface of the Se solvent in the crystal growth region during the crystal growth period, and keeping said crystal growth region at a constant temperature of 1050° C.

4,917,758

METHOD FOR PREPARING THIN COPPER FOIL-CLAD SUBSTRATE FOR CIRCUIT BOARDS

Koichi Ishizuka; Morio Gaku; Kenzi Ishii; Hidenori Kinbara, and Masakazu Motegi, all of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed May 19, 1989, Ser. No. 354,954

Claims priority, application Japan, May 20, 1988, 63-122050; Jul. 12, 1988, 63-171734; Jul. 12, 1988, 63-171735; Jul. 14, 1988, 63-173743; Jul. 14, 1988, 63-173744; Aug. 26, 1988, 63-210490; Dec. 21, 1988, 63-320453

Int. Cl.[4] C23F *1/00*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—630 16 Claims

1. A method for preparing a thin copper foil-clad substrate for the manufacture therefrom of circuit boards, which comprises subjecting a copper foil-clad circuit board substrate comprising an electrically insulating support having provided on one or both sides thereof a copper foil having an average thickness of 12 μm or more to etching with an etching solution for copper, said etching being performed such that the whole surface of the copper foil is etched at a predetermined etching rate selected from the range of from 0.01 to 0.3 μm/sec, thereby to reduce the thickness of the copper foil on at least one side of the insulating support to 10 to 80% of its original thickness, and the variation of the thickness of the copper foil remaining after the etching is within ±2.0 μm on the basis of a desired thickness.

4,917,759

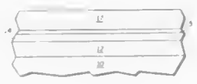
METHOD FOR FORMING SELF-ALIGNED VIAS IN MULTI-LEVEL METAL INTEGRATED CIRCUITS

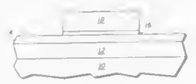
Duncan M. Fisher, and Jeffrey L. Klein, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

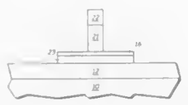
Filed Apr. 17, 1989, Ser. No. 339,451

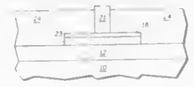
Int. Cl.[4] C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

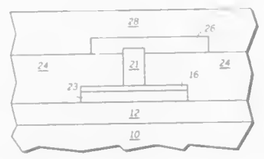
U.S. Cl. 156—643 10 Claims











1. A method for forming a via in a semiconductor device comprising the steps of:

providing a semiconductor substrate;

forming a first conducting layer overlying said substrate;

forming a second conducting layer of a material different from said first conducting layer overlying said first conducting layer;

etching a portion of said second conducting layer using said first conducting layer as an etch stop to form a patterned portion of said second conducting layer;

forming a third conducting layer of material different from said second conducting layer overlying said patterned portion of said second conducting layer; and

etching a portion of said third conducting layer using said patterned portion of said second conducting layer as an etch stop to form a pillar wherein said etching selectively etches said third connecting layer substantially more than said patterned portion of said second conducting layer.

4,917,760

METHOD FOR MAKING AN IMPLANTABLE ELECTRODE

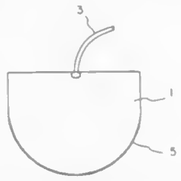
Gerhard Richter, Erlangen; Erhard Weidlich, Spardorf; Konrad Mund, Erlangen, and Horst Böder, Biberach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Division of Ser. No. 364,268, Apr. 1, 1982, Pat. No. 4,773,433, which is a continuation of Ser. No. 178,601, Aug. 18, 1980, abandoned, which is a continuation of Ser. No. 778,213, Mar. 16, 1977, abandoned. This application Aug. 18, 1988, Ser. No. 233,565

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2613072

Int. Cl.[4] B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—655 9 Claims



1. A method of making the electrode head of a tissue-implantable electrode, particularly a stimulating electrode which comprises an electrode head and an electrical lead attached thereto, comprising forming the electrode head of a carbon body and superficially activating a thin surface layer of said body by an oxidizing treatment so as to impart a microporous structure to said layer, whereby the surface of said body remains macroscopically smooth.

4,917,761

METHOD OF RENDERING POLYMERIC MATERIALS HYDROPHILIC FOR ETCHING

Gerald T. Keep, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 14, 1989, Ser. No. 393,424

Int. Cl.[4] B44C *1/22*; B29C *37/00*; C03C *15/00, 25/06*

U.S. Cl. 156—668 9 Claims

1. The method of rendering a polymeric material hydrophilic before etching comprising the steps of contacting said material with a primary solvent to swell the material, and then contacting the material with a secondary solvent which has substantial solubility in both the primary solvent and water.

4,917,762

PROCESS FOR MANUFACTURING A LIQUID ABSORBING PAD

Peter Dalki r, Kyhnsvej 4, DK-2930 Klampenborg, Denmark

Continuation of Ser. No. 829,641, Jan. 30, 1986, abandoned. This application Jun. 23, 1988, Ser. No. 220,940

Claims priority, application Denmark, Oct. 1, 1984, 4700/84

Int. Cl.[4] D21B *1/32*

U.S. Cl. 162—5 8 Claims

1. A process for manufacturing a defibrated material for use as a liquid absorbing pad in soft hygiene articles and sanitary products, comprising the steps of:

providing coated or uncoated wet-strength container board or packaging paper as cellulose pulp;

cutting said cellulose pulp in suitable sizes for defibration;

defibrating said cellulose pulp by a dry process; and

adding a mixture of water and a surfactant to the cut cellulose pulp during or just before the defibration step to reestablish the absorption capacity of the cellulose pulp fibres, said mixture of water and surfactant comprising a maximum of 20% by volume of the resultant cellulose pulp, water and surfactant mixture, thereby producing an absorbent defibrated material.

4,917,763

METHOD OF RECOVERING CHEMICAL FROM SPENT PULP LIQUORS

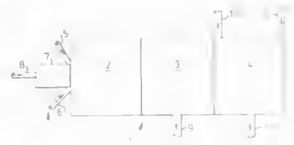
Sven Santén, Hofors; Ragnar Bernhard, Falun, and Jarl Martensson, Sandviken, all of Sweden, assignors to SKF Steel Engineering AB, Hofors, Sweden

Continuation of Ser. No. 784,007, Oct. 4, 1985, abandoned. This application Jun. 10, 1988, Ser. No. 205,604

Claims priority, application Sweden, Oct. 19, 1984, 8405231

Int. Cl.[4] D21C *11/14*

U.S. Cl. 162—30.1 5 Claims



I. A method of recovering chemicals from spent pulp liquors, comprising:

(a) gasifying and partially disintegrating a spent pulp liquor containing organic and inorganic constituents in a raction zone of a reactor into which external thermal energy from a plasma generator has been introduced such that the spent pulp liquor is substantially converted to a product mixture consisting essentially of a melt containing mainly sodium sulfide and a gaseous stream containing mainly hydrogen, carbon monoxide, and alkali compounds;

(b) separating, in a separation zone and at substantially the temperature of gasification, the melt from the gaseous stream to recover sodium sulfide;

(c) cooling the gaseous stream from step (b) in a quenching and cooling zone to a temperature below 950° C. such that the alkali compounds are converted to liquid form and hydrogen and carbon monoxide resin as a product substantially free of sulphur compounds; and

(d) withdrawing the alkali compounds in liquid form and withdrawing the product gas substantially free of sulphur compounds.

4,917,764

BINDER FOR IMPROVED GLASS FIBER MATS

Steven S. Lalwani, Upper Montclair, N.J., and Philip J. Halpin, Rock Hill, S.C., assignors to GAF Building Materials Corporation, Wayne, N.J.

Filed Dec. 12, 1988, Ser. No. 282,818

Int. Cl.[4] B32B *17/02*; D04H *1/64*; D21H *3/40, 3/52*

U.S. Cl. 162—156 17 Claims

1. A glass fiber mat having improved strength and wettability properties comprising a plurality of glass fibers disposed as a mat and a binder to hold said fibers in position, said binder consisting essentially of between about 94% and about 99% by weight of urea-formaldehyde resin and from 1% to not more than 6% by weight of a styrene-butadiene latex copolymer.

4,917,765

VESICULATED POLYMER GRANULES

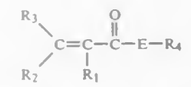
Loreen D. Ferguson, Mississauga; Peter C. Hayes, and Tadas S. Macas, both of Toronto, all of Canada, assignors to C-I-L Inc., North York, Canada

Division of Ser. No. 95,419, Sep. 8, 1987, Pat. No. 4,808,633. This application Feb. 2, 1989, Ser. No. 305,094

Int. Cl.[4] D21H *3/60*

U.S. Cl. 162—168.2 4 Claims

1. Paper containing dispersed therein vesiculated granules of cross-linked carboxylated polyester resin prepared by the free radical polymerization of a dispersion comprising (a) an ethylenically unsaturated monomer; (b) a carboxylated unsaturated polyester resin having an acid value of from 5-50 mg KOH/g; (c) water; and (d) a base; characterized in that said dispersion further comprises an alkyl acryloyl derivative of the formula:



where R_1, R_2 and R_3 are selected from H and CH_3; E is NH or O; R_4 is C_{1-6} alkyl substituted with Z; wherein Z is NR_5R_6; wherein R_5 is C_{1-4} alkyl and R_6 is H; or R_5 and R_6 are independently C_{1-3} alkyl; and quaternary C_{1-3} alkyl salts of said alkyl acryloyl derivative.

4,917,766

HYBRID FORMER FOR A PAPER MACHINE

Mauri Kolvuranta, Petäjävesi, Finland, and Michael Odell, New Zealand, assignors to Valmet Paper Machinery Inc., Finland

Filed Jun. 20, 1988, Ser. No. 209,493

Claims priority, application Finland, Jun. 18, 1987, 872726

Int. Cl.[4] D21F *1/00*

U.S. Cl. 162—301 21 Claims

1. Hybrid former for a paper machine, said former comprising

a lower wire loop operative jointly with a head box of the paper machine and forming a first single-wire dewatering zone in which water is removed through the lower wire from a web being formed by at least one dewatering member situated inside the lower wire loop, and

an upper wire unit including an upper wire loop guided by

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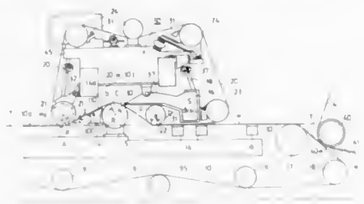
guide rolls and a web-forming roll, said upper wire loop forming, after the first dewatering zone, a second twin-wire dewatering zone together with a run of the lower wire,

the web-forming roll being fitted inside the upper wire loop at a location where the second twin-wire dewatering zone begins and the second twin-wire dewatering zone is curved upwardly over a sector of the forming roll,

a forming shoe being fitted inside the lower wire loop and being provided with a curved deck guiding the lower wire and having a center of curvature inside the lower wire loop,

wherein deflector units are fitted both inside the lower wire loop and inside the upper wire loop between the forming roll and forming shoe along a continuously upwardly directed run of the twin-wire dewatering zone from the forming roll to an inlet edge of the deck of the forming shoe, to produce impulses which act on the web being



formed from both sides and are sufficiently strong to improve web formation,

wherein the first single-wire dewatering zone is substantially horizontal,

the forming roll is hollow-faced, and

the second twin-wire dewatering zone run is substantially straight and upwardly inclined between the forming roll and forming shoe along which said deflector units are fitted, additionally comprising

a second forming roll situated inside the lower wire loop and after the forming shoe in a direction of travel, and positioned to curve the twin wire zone downwardly over a sector thereof,

a downwardly inclined run of the second twin-wire zone after the second forming roll, and

the twin-wire zone being curved upwardly after the downwardly inclined run about a forming or guide roll to a plane substantially equal to the first substantially horizontal, single wire portion.

4,917,767

PRESS WITH EXTENDED NIP

Antti I. Ilmarinen, Skoghall, and Kjell S. E. Jansson, Forshaga, both of Sweden, assignors to Valmet Paper Machinery, Inc., Helsinki, Finland

Filed May 2, 1989, Ser. No. 346,168

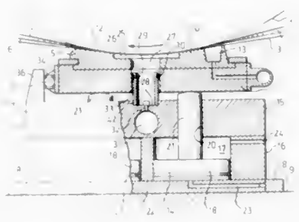
Claims priority, application Sweden, May 25, 1988, 88019336

The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.

Int. Cl.[4] D21F *3/02*

U.S. Cl. 162—358 8 Claims

1. An extended nip press for paper and board machines, comprising a support means acting as a counter member; pressure means disposed opposite said support means, designed to be secured to a stand, and comprising a press shoe which, together with said support means, forms an extended nip pressing zone; at east one endless movable fluid-impervious belt arranged to pass through said pressing zone together with a fiber web to be dewatered; said pressure means further comprising an elongate jack unit disposed transversely across the belt and including a plurality of jacks disposed in at least one row across the belt and having pistons with piston rods acting on said press shoe to force it against said support means, said press shoe being freely supported by the piston rods without rigid mechanical connection therebetween, a block with cavities for the pistons of the jacks, a top element closing said cavities and being provided with apertures for the piston rods of the jacks, and a plurality of hydrostatic pressure pockets disposed in at least one row, the bottom of each pressure



pocket being located in said top element and communicating with a channel via narrow holes in said top element for the supply of pressure fluid to said pressure pockets, the transition between said top element and said press shoe at each pressure pocket being formed by a sleeve, said sleeves being so disposed in the pressure pockets that the press shoe can be moved in relation to the top element.

4,917,768

PRESS WITH EXTENDED NIP

Antti I. Ilmarinen, Skoghall, Sweden, assignor to Valmet Paper Machinery, Inc., Helsinki, Finland

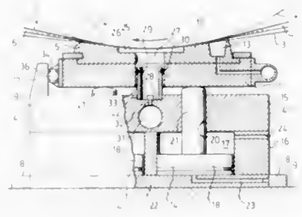
Filed May 2, 1989, Ser. No. 346,169

Claims priority, application Sweden, May 25, 1988, 88019344

The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.

Int. Cl.[4] D21F *3/02*

U.S. Cl. 162—358 6 Claims



1. An extended nip press for paper and board machines, comprising a support means acting as a counter member; pressure means disposed opposite said support means and comprising a press shoe and a carrying element carrying the press shoe and designed to be secured to a stand, said press shoe, together with said support means, forming an extended nip pressing zone; at least one endless movable fluid-impervious belt arranged to pass through said pressing zone in sliding contact with said press shoe; and at least one endless, liquid-absorbing felt, arranged to pass through said pressing zone together with a fiber web to be dewatered; said pressure means further comprising a plurality of jacks disposed in at least one row across the belt and having pistons with piston rods acting on said press shoe to force it against said support means, said press shoe being freely supported by the piston rods without rigid mechanical connection therebetween, and said pressure means being provided with a support bearing disposed downstream of the press shoe and positioned for engaging the press shoe to absorb horizontal forces acting on the press shoe during operation, said support bearing comprising a stationary support element mounted on said carrying element, and rolling bodies rotatably journaled between and in contact with the press shoe and a support surface of said stationary support element.

4,917,769

DISTILLATION APPARATUS FOR REMOVAL OF VOLATILE ACIDS FROM AQUEOUS SOLUTIONS

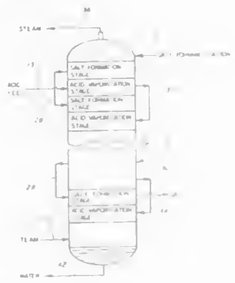
Wendell E. Van Horn, Chicago, Ill., assignor to OO Chemicals, Inc., West Lafayette, Ind.

Division of Ser. No. 189,228, May 2, 1988, Pat. No. 4,898,644.

This application May 24, 1989, Ser. No. 356,549

Int. Cl.[4] B01D *3/32*

U.S. Cl. 202—158 4 Claims



1. Apparatus for removing a volatile component from an aqueous solution comprising:

an elongated distillation column having therein separate vertically and alternately disposed liquid-vapor contact zones through which a first and second liquid flow,

one or more distillation plates within each of said liquid-vapor contact zones,

means for introducing steam at the lower end of said column for upward flow therein into contact with all of the liquid-vapor contact zones,

inlet means for introducing a first liquid into the upper part of said column,

inlet means for introducing a second liquid into said column,

means for flowing said first liquid downwardly within said column and countercurrently to the upward flow of steam in a liquid-vapor contact zone,

means for flowing said second liquid downwardly within said column and countercurrently to the upward flow of steam in a liquid-vapor contact zone separate from the liquid-vapor zone in which said first liquid flows,

steam outlet means in the upper portion of said column, and

outlet means in the lower portion of said column for recovering a liquid stream.

4,917,770

DISTILLATION APPARATUS

Charles T. Asbury, and Genevieve J. Asbury, both of 4710 61st Avenue Dr. West, Bradenton, Fla. 34210

Filed Aug. 7, 1989, Ser. No. 390,611

Int. Cl.[4] C02F *1/04, 1/20*

U.S. Cl. 202—176 7 Claims

1. Distillation apparatus comprising:

a vertically extending distillation cylinder having a closed top and an open bottom;

a heating element disposed in said distillation cylinder and having a base closing said bottom of said distillation cylinder;

a condensing tube connected to said distillation cylinder adjacent to said top, whereby water vapor formed within said distillation cylinder will enter said condensing tube;

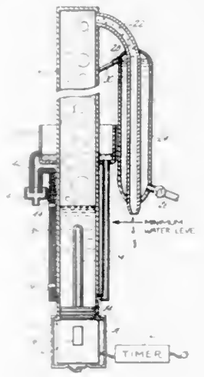
a condenser having a top and a bottom enclosing a portion of said condensing tube;

said condenser having a cooling water inlet adjacent to said bottom of said condenser;

said condenser having a cooling water discharge aperture adjacent to said top of said condenser;

a trough connected to said discharge aperture and extending downwardly and outwardly to a point where water in said trough will impinge on said distillation cylinder;

a basin having a bottom and a side wall surrounding said distillation cylinder and secured thereto for collecting water which impinges on said distillation cylinder;



an over flow tube having a first end above said bottom of said basin;

said over flow tube extending downwardly to a second end;

a feed tube having a first end connected to said basin and a second end connected to said distillation cylinder adjacent to said bottom of said distillation cylinder;

an upwardly extending discharge tube having a first end connected to said distillation cylinder adjacent to said bottom of said distillation cylinder;

said discharge tube having a U-turn and extending downwardly to a second end;

a funnel disposed below said second end of said discharge tube and said second end of said over flow tube.

4,917,771

DISTILLING APPARATUS

Lauri Santasalo, Helsinki; Esko Huhta-Koivisto, Espoo, and Jouko Ruokonen, Helsinki, all of Finland, assignors to Oy Santasalo-Sohlberg Oy, Finland

Filed Feb. 25, 1988, Ser. No. 160,314

Claims priority, application Finland, Feb. 26, 1987, 870846

Int. Cl.[4] B01D *1/10*

U.S. Cl. 202—177 12 Claims

1. Distilling apparatus, comprising

a structure defining a space therein,

a plurality of heat exchange tubes extending through said space and being joined to said structure at junctures thereof,

a first input connector for introducing impure liquid to be distilled communicating with said space,

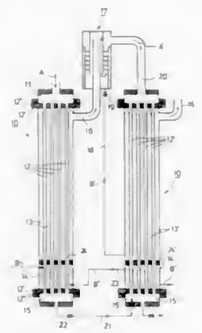
a second input connector for introducing heating vapor communicating with one end of said tubes,

a first output connector communicating with said space for removing a mixture of vapor generated in said structure

and remaining liquid which has not vaporized in said structure, and

a second output connector communicating with an opposite end of said tubes for removing condensate and any remaining heating vapor,

said structure, space, tubes, and connectors being arranged to conduct said heating vapor through said tubes extending through said space, and to conduct said impure liquid to be distilled through said space itself and around said tubes, without formation of any microcrevices at said tube junctures,



additionally comprising

flanges joined to both said ends of said heat exchange tubes at said junctions thereof,

a condensate collecting chamber situated underneath said flange joined to a bottom end of said tubes and through which said tubes and said second output connector communicate, and

a distribution chamber situated above said flange joined to a top end of said tubes and through which said tubes and said second input connector communicate.

4,917,772

OVEN DOOR ASSEMBLY

Hans-Joachim Koschlig, and Lothar Brandau, both of Bochum, Fed. Rep. of Germany, assignors to Dr. C. Otto Feuerfest GmbH, Bochum, Fed. Rep. of Germany

Filed Nov. 16, 1988, Ser. No. 272,560

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1987, 3739452

Int. Cl.[4] C10B *25/02, 25/06*

U.S. Cl. 202—242 9 Claims

1. An oven door assembly including a door body and a vertical arrangement of barrier plates spaced apart from an inner side of said door body to form a gas channel, which assembly comprises:

a plurality of ceramic barrier plates,

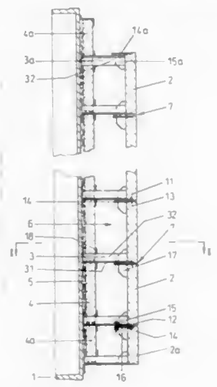
a plurality of supporting means,

a plurality of clamping devices, and

a plurality of mounting elements

in which each of said ceramic barrier plates has a planar front side directed to an interior of an oven, a planar backside directed to the gas channel, planar vertical side faces, and upper and lower side faces having a profile running continuously over the length of said upper and lower side faces, in which said supporting means are fixed to said door body and extend through the gas channel to the barrier plates,

and in which each of said clamping devices includes a lower and upper clamping device joined to and extending from a respective one of said supporting means into a gap between two vertically adjacent ceramic barrier plates of said plurality of ceramic barrier plates arranged above each other, said lower clamping device engaging the profile of the lower side face of a first barrier plate of said two ceramic barrier plates which is thereby supported by said lower clamping device and said one supporting means, and said upper clamping device being releasably pressed against the upper side face of a second barrier plate of said two ceramic barrier plates by a respective one of said mounting elements which is disposed in a first



position of at least two positions for causing said upper clamping device to thereby removably engage the profile of said upper side face, so that each of the ceramic barrier plates can be replaced by releasing the upper clamping device of each of said clamping devices when each of said mounting elements is disposed in a second position of said at least two positions.

4,917,773

PROCESS FOR INTRODUCING ZIRCONIUM TETRACHLORIDE, HAFNIUM TETRACHLORIDE AND MIXTURES THEREOF INTO A COLUMN FOR THE CONTINUOUS EXTRACTIVE DISTILLATION UNDER PRESSURE OF SAID CHLORIDES

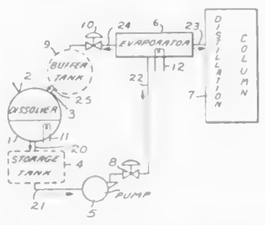
Pierre Brun, Grenoble, and Jean Guerin, Frejus, both of France, assignors to Compagnie Europeenne Du Zirconium Cezus, Courbevoie, France

Filed Mar. 6, 1989, Ser. No. 319,054

Claims priority, application France, Mar. 31, 1988, 88 04731

Int. Cl.[4] B01D *3/40;* C01G *25/04, 27/04*

U.S. Cl. 203—50 13 Claims



1. Process for introducing zirconium tetrachloride, hafnium tetrachloride or mixtures thereof into a column for continuous extractive distillation under pressure, comprising the steps of:

(a) dissolving said zirconium tetrachloride, hafnium tetrachloride or mixtures thereof in a liquid solvent in which the vapor pressure and solubility of said tetrachlorides vary significantly with temperature and pressure, at atmospheric pressure and at a predetermined temperature θ_1 to yield a solution of predetermined concentration;

(b) transferring said solution, with compression and at constant and predetermined flow rate, to an evaporator connected to a column for extractive distillation, said evaporator and column being at the same pressure;

(c) reheating the solution in the evaporator to a predetermined temperature θ_2 higher than θ_1, and sufficient to cause sublimation of the majority of the tetrachlorides in the solution; and

(b) introducing the sublimed tetrachlorides into the column for continuous extractive distillation at a predetermined flow rate.

4,917,774

METHOD FOR ANALYZING ADDITIVE CONCENTRATION

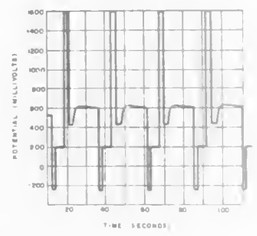
Gordon Fisher, Sudbury, Mass., assignor to Shipley Company Inc., Newton, Mass.

Filed Apr. 24, 1986, Ser. No. 855,360

The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—153.1 12 Claims



1. A method for determining the effective quantity of organic additive in an electroplating bath comprising the steps of:

a. obtaining a plurality of plating baths, each having a known and different quantity of organic additive;

b. for each bath, repeatedly cycling an inert electrode through a predetermined sequence of voltammetric steps where for each cycle, a first step is within a metal plating range, a next step is within a metal stripping range, a next step of cleaning the inert electrode and a final step is without applied potential whereby the electrode is prepared for the next subsequent cycle initiated upon completion of the prior cycle;

c. correlating the effective quantity of additive with the coulombs utilized during the metal stripping step;

d. obtaining a plating bath having an unknown quantity of organic additive, repeatedly cycling a working electrode through said bath using the aforesaid predetermined sequence of voltammetric steps until a steady state condition is obtained for said bath;

e. measuring the coulombs utilized during the metal stripping step of said cycle for said bath having an unknown quantity of organic additive; and

f. choosing from said correlation a quantity of organic additive which corresponds to said coulombs utilized for said bath with said unknown quantity of organic additive.

4,917,775

METHOD FOR MEASURING AND ADJUSTING ELECTROCHEMICAL POTENTIAL AND/OR COMPONENT CONTENT IN THE PROCESS OF TREATING VALUABLE MATERIALS

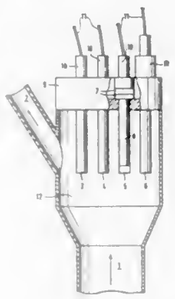
Seppo V. Rantapuska, Espoo, and Seppo O. Heimala, Pori, both of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Continuation of Ser. No. 787,735, Oct. 15, 1985, abandoned. This application May 7, 1987, Ser. No. 47,498

Claims priority, application Finland, Oct. 30, 1984, 844246

Int. Cl.[4] G01N *27/30*

U.S. Cl. 204—153.1 8 Claims



1 A method for measuring and adjusting electrochemical potential and/or component content in a slurry in the process of treating valuable materials in slurry form when the valuable materials are recovered either together or separately in response to recovery range values defined on the basis of electrochemical potential and component content in said slurry, comprising measuring of electrochemical potential and/or component content by means of at least one electrode made of a mineral material similar to or the same as a main component of the slurry to be controlled and, in order to keep the electrode similar to the slurry component and in order to protect the electrode, switching onto the electrode a supply voltage differing from a previously measured electrochemical potential and switching off the supply voltage before starting the measuring operation.

4,917,776

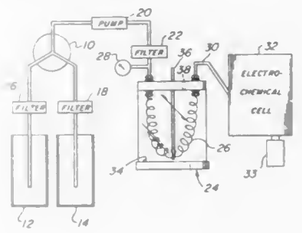
FLOW THROUGH VOLTAMMETRIC ANALYZER AND METHOD USING DEOXYGENATOR

Larry Taylor, P.O. Box 104, Westtown, Pa. 19395

Filed Feb. 9, 1989, Ser. No. 308,847

Int. Cl.[4] G01N *27/28*

U.S. Cl. 204—153.1 19 Claims



1 A flow through voltammetric analyzer, comprising:

an electrochemical flow cell;

a selector valve for selecting an analyte or electrolyte into a flow path;

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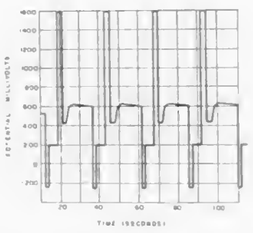
a pump for pumping fluid in the flow path;
a deoxygenator in the flow path comprised of a length of convoluted oxygen permeable tubing contained in a container which is sealed except for an inlet and an outlet connection for said tubing and an inlet and an outlet for an inert gas substantially free of oxygen; and
means for connecting said outlet connection for said tubing to said electrochemical flow cell.

13. Apparatus for deoxygenation of samples to be analyzed in a flow through voltammetric analyzer, comprising:
a length of convoluted oxygen permeable tubing through which the sample to be analyzed passes; and
a container in which said oxygen permeable tubing is mounted, said container including an inert gas inlet adapted to be connected to a source of inert gas and an outlet for said inert gas, said inert gas flow through said container flushing oxygen out of said container as oxygen diffuses through said tubing.

4,917,777
METHOD FOR ANALYZING ADDITIVE CONCENTRATION
Gordon Fisher, Sudbury, Mass., assignor to Shipley Company Inc., Newton, Mass.
Continuation-in-part of Ser. No. 855,360, Apr. 24, 1986. This application Jan. 25, 1988, Ser. No. 147,864
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—153.1 **8 Claims**



1. A method for determining the effective quantity of organic additive in an electroplating bath comprising the steps of:
a. obtaining a plurality of plating baths, each having a known and different quantity of organic additive;
b. for each bath, repeatedly cycling an inert electrode through a predetermined sequence of voltammetric steps where for each cycle, a first step is within a metal plating range, a next step of cleaning the inert electrode, a next step is within a metal stripping range, and a final step is at a potential approximating that of a potential that would be generated by an oxidation reduction reaction in an open circuit condition at the surface of the inert electrode, whereby the electrode is prepared for the next subsequent cycle initiated upon completion of the prior cycle;
c. correlating the effective quantity of additive with the coulombs utilized during the metal stripping step;
d. obtaining a plating bath having an unknown quantity of organic additive, repeatedly cycling a working electrode through said bath using the aforesaid predetermined sequence of voltammetric steps until a steady state condition is obtained for said bath;
e. measuring the coulombs utilized during the metal stripping step of said cycle for said bath having an unknown quantity of organic additive; and
f. choosing from said correlation a quantity of organic additive which corresponds to said coulombs utilized for said bath with said unknown quantity of organic additive.

4,917,778
PROCESS FOR THE CORROSION PROTECTION OF NEODYMIUM-IRON-BORON GROUP SINTERED MAGNETS
Koji Takada, Nagoya, and Yutaro Etizen, Kawaguchi, both of Japan, assignors to Yugen Kaisha Johoku Riken Kogyo, Japan
Filed Oct. 19, 1989, Ser. No. 423,974
Claims priority, application Japan, May 26, 1989, 1-131580
Int. Cl.[4] C25D *5/34, 13/04*
U.S. Cl. 204—32.1 **1 Claim**

1. A process for the corrosion protection of a neodymium-iron-boron group sintered magnet, which comprises the steps of:
immersing the neodymium-iron-boron group sintered magnet in oxidizing acid to activate the surface thereof; plating the magnet with nickel having internal stress of not more than 1000 kgf/cm^2; and applying cationic electrodeposition coating thereto.

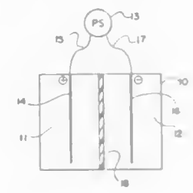
4,917,779
PROCESS FOR THE FORMATION OF FLUOROPLASTIC COATING ON SURFACE OF ZINC, ZINC ALLOY OR ZINC PLATING
Kunio Katsuma, Chiba, Japan, assignor to Usui Kokusai Sangyo Kabushiki Kaisha, Japan
Filed May 23, 1989, Ser. No. 355,525
Int. Cl.[4] C23C *28/00*
U.S. Cl. 204—37.1 **8 Claims**

1. A process for the formation of a fluoroplastic coating on the surface of a substrate selected from the group consisting of zinc, zinc alloys and zinc platings, which comprises:
(i) conducting alternating current electrolysis in an electrolytic solution, which contains a phosphoric salt at a concentration of 0.1–3 moles/l in terms of PO_4 and a chromic salt at a concentration of 0.1–3 moles/l in terms of CrO_4 and has been adjusted to pH 6–11 with at least one of sodium hydroxide and potassium hydroxide, while using the substrate as an anode, whereby an anodic oxide film is formed on the surface of the substrate;
(ii) dipping the substrate with the anodic oxide film formed therein in a dispersion of a fluoroplastic to coat the anodic oxide film with the fluoroplastic; and
(iii) subjecting the thus-coated substrate to a heat treatment at a temperature of at least 170° C.

4,917,780
PROCESS FOR COLORING ANODIZED ALUMINUM BY AC ELECTROLYSIS
Dieter Brodalla; Loert de Riese-Meyer, and Juergen Lindener, all of Duesseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany
Filed Jul. 19, 1989, Ser. No. 382,611
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1988, 3824402
Int. Cl.[4] C25D *11/22*
U.S. Cl. 204—37.6 **20 Claims**

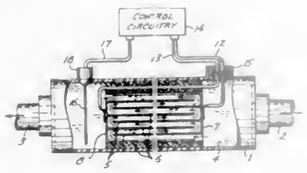
1. In a process for coloring anodized surfaces of aluminum or aluminum alloys by electrolysis using an alternating current or an alternating current superimposed on a direct current and a counter electrode, while the anodized surfaces are immersed and are functioning as an electrode in an aqueous electrolyte solution comprising silver cations, the improvement wherein said aqueous electrolyte solution also comprises at least one material selected from the group consisting of p-toluene-sulfonic acid, a water soluble alkali metal, ammonium, and alkaline earth metal salt of p-toluene-sulfonic acid, and mixtures of two or more of these constituents.

4,917,781
PROCESS FOR PREPARING QUATERNARY AMMONIUM HYDROXIDES
Hossein Sharifian, and Alan R. Tanner, both of Austin, Tex., assignors to Southwestern Analytical Chemicals, Inc., Austin, Tex.
Filed Jul. 20, 1988, Ser. No. 221,720
Int. Cl.[4] C25B *3/00*
U.S. Cl. 204—72 **26 Claims**



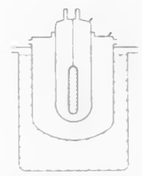
1. A process of preparing quaternary ammonium hydroxides from quaternary ammonium salts in an electrolytic cell which comprises an anolyte compartment containing an anode and a catholyte compartment containing a cathode and water, said anolyte and catholyte compartments being separated from each other by a cation-exchange membrane, said process comprising the steps of
(a) providing the catholyte compartment with a cathode of zinc, cadmium, tin, lead, or alloys thereof, mercury, or mercury amalgam,
(b) charging an aqueous solution containing a quaternary ammonium salt to the anolyte compartment,
(c) passing a current through the electrolytic cell to produce quaternary ammonium hydroxide in the catholyte compartment, and
(d) recovering the quaternary ammonium hydroxide from the catholyte compartment.

4,917,782
ELECTROLYTIC LIQUID PURIFICATION PROCESS AND APPARATUS
Bruce Davies, Kenmore, Wash., assignor to Advanced Water Systems, Inc., Woodinville and Water Regeneration Systems, Inc., Kirkland, both of, Wash.
Filed Mar. 2, 1988, Ser. No. 163,501
Int. Cl.[4] C02F *1/46*; C25B *15/08, 9/00*; B01D *13/02*
U.S. Cl. 204—152 **4 Claims**



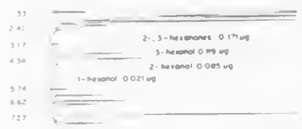
3. A process for clarifying liquid which comprises arranging two sets of plates of inert electrically conductive material in interleaved closely-spaced relationship to form an electrolytic cell, flowing liquid containing impurities between the plates of the cell, passing direct current electricity from the plates of one set to the plates of the other set for a period of time sufficient to effect deposit on the plate surfaces a substantial amount of impurities attracted to such plate surfaces, periodically reversing the direction of direct current flow between the plates for a period of time sufficient to purge from plate surfaces impurities adhering thereto, trapping in a filter impurities sloughed from the plate surfaces and carried by liquid discharged from the electrolytic cell, and terminating the flow of electricity between the plates of the cell if the velocity of the flow of liquid through the cell decreases below a predetermined value.

4,917,783
METHOD FOR PURIFYING MACROCYCLIC KETONES
Tadafumi Yokota, and Hiroshi Okino, both of Saitama, Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan
Filed Mar. 31, 1988, Ser. No. 176,054
Claims priority, application Japan, Mar. 31, 1987, 62-75914
Int. Cl.[4] C07C *45/00*
U.S. Cl. 204—157.15 **6 Claims**



1. A method for purifying a macrocyclic ketone which comprises light-irradiating a macrocyclic ketone containing a macrocyclic diketone as an impurity, wherein said ketone is obtained by the cyclization of a diester of a straight alkanedicarboxylic acid having from 9 to 18 carbon atoms by acyloin condensation, followed by reduction of the resulting intermediate, whereby purified macrocyclic ketone is obtained therefrom.

4,917,784
PROCESS FOR LIGHT-DRIVEN HYDROCARBON OXIDATION AT AMBIENT TEMPERATURES
John A. Shelnutt, Tijeras, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Sep. 26, 1989, Ser. No. 412,736
Int. Cl.[4] B01J *19/08*
U.S. Cl. 204—157.6 **20 Claims**



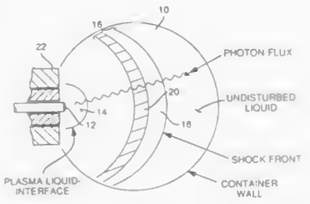
1. A method for oxidizing hydrocarbons in a catalytic cycle that is driven by a photo-redox cycle that mimics photosynthesis which comprises the steps of:
providing a solution comprising a metalloporphyrin photosensitizer that generates reducing equivalents for activating oxygen, a biomimetic hydrocarbon-oxidation catalyst, molecular oxygen as the oxidant, a hydrocarbon substrate molecule, a sacrificial electron donor, an acylating agent, and a solvent; and
irradiating said solution with light in the presence of molecular oxygen.

4,917,785

LIQUID PROCESSING SYSTEM INVOLVING HIGH-ENERGY DISCHARGE

Christian H. A. Juvan, 10053 Judy Ave., Cupertino, Calif. 95014

Filed Jul. 28, 1987, Ser. No. 78,655
Int. Cl.[4] B01D *13/02*; H05B *31/06*
U.S. Cl. 204—164 42 Claims



1. An electro-hydraulic system for ionizing and separating materials contained in a liquid, utilizing an intense electrical discharge into the liquid for permeating the liquid with electromagnetic radiation as well as a shock wave, comprising,

firing chamber means for containing a volume of the liquid and for containing the electrical discharge applied to the liquid,

liquid circulating means for directing the liquid into and out of the firing chamber means in a substantially continuous flow, including means associated with the liquid circulating means for introducing a vortex into the flow of the liquid through and out of the chamber, tending to cause the liquid to retain precipitated solids as it flows out of the firing chamber means, rather than depositing them in the firing chamber means,

a pair of electrodes in the firing chamber means, and electrical current conducting means connected to the electrodes for delivering a high intensity charge of electrical current to and across the electrodes in the firing chamber means,

the current conducting means including switching means for handling the large pulses of current delivered to the electrodes,

a high voltage power supply means for supplying consecutive pulses of high voltage/high current to the electrodes in the firing chamber means, and electrode replacement means associated with the firing chamber means and the current conducting means, for enabling replacement of the electrodes as they are eroded from the electrical discharge.

4,917,786

METHOD AND APPARATUS FOR EVAPORATING MATERIAL IN VACUUM

Horst Ehrich, Buchenhöfe 71, 4270 Dorsten, Fed. Rep. of Germany

Continuation of Ser. No. 89,904, Aug. 24, 1987, abandoned, which is a continuation of Ser. No. 722,185, Apr. 10, 1985, abandoned. This application Nov. 1, 1988, Ser. No. 266,380
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1984, 3413891
Int. Cl.[4] C23C *14/22*; B05D *3/14*
U.S. Cl. 204—192.38 23 Claims

1. A method of coating comprising exposing a substrate to be coated in a vacuum chamber to vapors produced with an electric arc discharge, the steps of said method including:

(1) arranging in a single vacuum chamber the substrate to be coated, a cold cathode and an anode spaced from said substrate;

(2) employing as the anode, a main anode body of refractory material and a vaporizable anode material supported at the end of the main anode body facing said cathode;

(3) maintaining a vacuum in said chamber to the degree that only a vacuum arc discharge from the cathode to the anode can be maintained;

(4) initiating an arc discharge between said cathode and said vaporizable anode material to produce cathode spots from which electrons travel to the anode to produce an arc current;

(5) with space maintained between said cathode and anode, and in the absence of a discharge-sustaining gas in the path between said cathode and anode, maintaining a stable DC arc discharge between said cathode and anode for an extended duration by:

(5*a*) continuously applying an arc-producing DC voltage between said cathode and anode for an extended duration, and

(5*b*) maintaining the arc current low, but at a level sufficient to maintain a fixed region of anode material in a continuous evaporating state such that vapors of anode material from said fixed region continuously sustain said arc discharge,

whereby ionized vapors of anode material from the resulting fixed anode region are continuously provided over a prolonged period; and

(6) exposing said substrate to be coated to said ionized vapors during said prolonged period to produce a homogeneous, adherent coating on said substrate.

14. An apparatus for coating a substrate in a vacuum chamber by exposure to vapors produced with an electric arc discharge, comprising:

(1) a single vacuum chamber having therein a support for a substrate to be coated, a cold cathode and an anode spaced from said substrate and said cathode;

(2) said anode comprising a main anode body of refractory material and a vaporizable anode material supported at the end of the main anode body facing said cathode;

(3) means for maintaining a vacuum in said chamber to the degree that only a vacuum arc discharge from the cathode to the anode can be maintained;

(4) means for initiating an arc discharge between said cathode and said vaporizable anode material to produce cathode spots from which electrons travel to the anode to produce an arc current;

(5) means including a DC voltage source for maintaining a stable DC arc discharge between said spaced cathode and anode in the absence of a discharge-sustaining gas in the path between said cathode and anode, said means constructed and arranged to:

(5*a*) continuously apply said arc-producing DC voltage between said cathode and anode for an extended duration, and

(5*b*) maintain the arc current low, but at a level sufficient to maintain a fixed region of anode material in a continuous evaporating state such that vapors of anode material from said fixed region continuously sustain said arc discharge, whereby ionized vapors of anode material from the resulting fixed anode region can be continuously provided over a prolonged period; and

said apparatus arranged to expose said substrate to be coated to said ionized vapors during said prolonged period to produce a homogeneous, adherent coating on said substrate.

4,917,787

METHOD FOR ON-LINE DECOKING OF FLAME CRACKING REACTORS

Akinobu Fukuhara, Sagamihara, Japan, and Gerard R. Kamm, Charleston, W. Va., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Continuation of Ser. No. 547,016, Oct. 31, 1983, abandoned.
This application Apr. 16, 1987, Ser. No. 39,756
Int. Cl.[4] C10G *9/12*
U.S. Cl. 208—48 R 6 Claims

1. In a continuous process for cracking hydrocarbon feeds in a flame-cracking reactor wherein carbonaceous or hydrogen-containing fuel and oxygen are combusted to form a combustion product which is admixed with superheated steam to produce a heat carrier, and the heat carrier is contacted with converging hydrocarbon feedstock stream and passed to a reactor wherein cracking of the feedstock takes place and carbon deposits on walls defining the reactor, the improvement which comprises periodically stopping the hydrocarbon feedstock stream, providing the heat carrier at a temperature of from about 1250° C. to 1600° C. said heat carrier comprising at least about 10 weight percent steam, and introducing the heat carrier into the reactor for a period of time sufficient to reduce the carbon deposited.

4,917,788

MANUFACTURE OF LUBE BASE STOCKS

Lillian A. Rankel, Princeton, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 48,864, Jul. 12, 1987, abandoned. This application Nov. 10, 1988, Ser. No. 269,345
Int. Cl.[4] C10G *53/04, 55/04, 57/00*
U.S. Cl. 208—73 22 Claims

1. In a process for manufacturing a lube bright stock, said process comprising deasphalting a vacuum resid, solvent extracting said deasphalted resid, and catalytically dewaxing said deasphalted, solvent-extracted resid, the improvement whereby the cycle life of the dewaxing catalyst is extended by thermally treating said vacuum resid for about 0.1 to about 2.0 hours at a temperature of about 450° F. to about 950° F. and at a pressure of 0 to 3000 psig prior to said deasphalting step.

4,917,789

CATALYTIC DEWAXING PROCESS

James R. Butler, and William P. Licht, both of Big Spring, Tex., assignors to Fina Technology, Inc., Dallas, Tex.

Filed Feb. 3, 1987, Ser. No. 10,224
Int. Cl.[4] C10G *47/16, 11/05*
U.S. Cl. 208—89 17 Claims

1. A process for catalytic dewaxing a hydrocarbon feed having an initial boiling point of less than 500° F. and a final boiling point of less than 900° F., comprising passing the hydrocarbon feed through a reaction zone containing a crystalline silica polymorph silicalite catalyst at mild dewaxing conditions under which the C_3 and lower hydrocarbon gas make from said reaction zone is not greater than 2 wt. % based on the feed.

4,917,790

HEAVY OIL CATALYTIC CRACKING PROCESS AND APPARATUS

Hartley Owen, Belle Mead, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 10, 1989, Ser. No. 335,643
Int. Cl.[4] C10G *11/18*
U.S. Cl. 208—113 12 Claims

1. A fluidized catalytic cracking process wherein a heavy hydrocarbon feed comprising hydrocarbons having a boiling point above about 650 F. is catalytically cracked to lighter products comprising the steps of:

a. catalytically cracking said feed in a catalytic cracking zone operating at catalytic cracking conditions by contacting said feed with a source of hot regenerated catalyst to produce a cracking zone effluent mixture having an effluent temperature and comprising cracked products and spent cracking catalyst containing coke and strippable hydrocarbons;

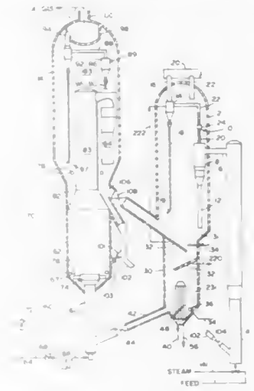
b. separating said cracking zone effluent mixture into a cracked product rich vapor phase and a solids rich phase comprising said spent catalyst and strippable hydrocarbons, said solids rich phase having a temperature;

c. heating said solids rich phase by mixing it with a source of hot regenerated catalyst having a higher temperature than said solids rich phase to produce a catalyst mixture comprising spent and regenerated catalyst having a catalyst mixture temperature intermediate said solids rich phase temperature and the temperature of the regenerated catalyst;

d. stripping in a primary stripping stage said catalyst mixture with a stripping gas to remove strippable compounds from spent catalyst;

e. passing said catalyst mixture from said primary stripping stage to a secondary stripping stage;

f. stripping and cooling said catalyst mixture in said secondary stripping stage by fluidizing said catalyst mixture with a stripping gas and removing heat from said catalyst mixture by indirect heat exchange with a heat exchange means having a heat transfer coefficient and wherein the heat transfer coefficient for indirect heat exchange from



said catalyst mixture across said heat exchange means is higher than a heat transfer coefficient across said indirect heat exchange means obtainable without the presence of stripping gas to produce a cooled, stripped catalyst mixture with a reduced content of strippable hydrocarbons;

g. regenerating said cooled, stripped catalyst mixture by contact with oxygen or an oxygen containing gas in a regenerating means to produce regenerated catalyst having a higher temperature than said catalyst mixture temperature as a result of combustion of coke on said spent catalyst;

h. recycling to the cracking reaction zone a portion of the regenerated catalyst to crack more hydrocarbon feed; and

i recycling to the primary stripping stage a portion of the regenerated catalyst to heat spent catalyst.

4,917,791

PROCESS AND CATALYSTS FOR HYDROCONVERSION OF COAL OR PETROLEUM ASPHALTENE TO DISTILLATE LIQUIDS

Chia-chen Chu Kang, 301 Gallup Rd., Princeton, N.J. 08540

Continuation of Ser. No. 616,546, Jun. 1, 1984, abandoned, which is a continuation-in-part of Ser. No. 411,699, Aug. 24, 1982, abandoned. This applicatioo Mar. 10, 1988, Ser. No. 169,166
Int. Cl.[4] C10G *45/04*
U.S. Cl. 208—419 22 Claims

1. A two-stage catalytic process for hydroconversion of coal to produce hydrocarbon liquid products and fuel gas, which comprises:

passing a preheated feed material containing solid coal particles and dissolved coal with hydrogen through a first stage catalytic reactor containing a large-pore catalyst and

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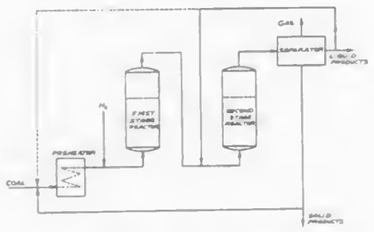
converting the coal to preasphaltene, coal asphaltene, distillate liquid and gas effluent material over the catalyst, said catalyst having macropores larger than 1000A occupying a major portion of the total pore volume;

passing the first-stage reactor effluent containing mainly preasphaltene, coal asphaltene and distillate through a second stage catalytic reactor containing a small-pore catalyst, and converting the preasphaltene and coal as-



phaltene to effluent material containing lower-boiling distillate liquid, said small pore catalyst having pores smaller than 1000A occupying a major portion of the catalyst total pore volume; and

separating the second stage reactor effluent material into hydrocarbon gaseous and liquid products and a solids-containing insoluble material, and withdrawing a hydrocarbon liquid product from the process.

4,917,792

AUTOMATIC TRANSACTION TERMINAL HAVING MEANS FOR PRESETTING THE DENOMINATIONS OF NOTES STORED IN A PLURALITY OF NOTE CARTRIDGES

Hiroyoshi Murakami, Moriyama, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Feb. 9, 1987, Ser. No. 12,155
Claims priority, application Japan, Feb. 10, 1986, 61-27298
Int. Cl.[4] B07C *5/36*; G06F *15/30*
U.S. Cl. 209—534 3 Claims

1. An automatic transaction terminal comprising:

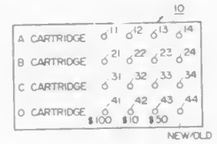
a plurality of cartridges for each storing bank notes of at least one denomination,

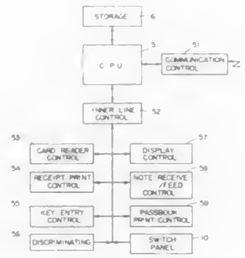
note distributing means for performing at least one of storing notes in the respective cartridges and feeding out stored notes from respective cartridges,

control means for controlling operation of said note distributing means; and

note presetting means, commonly associated with all of said cartridges, for selectively presetting a pattern representing the denominations of the notes to be stored in each of the respective cartridges, said presetting means containing a plurality of individual signal storage elements which are grouped into sets such that each set is dedicated to a respective single one of said cartridges, said storage elements comprising mechanical on/off switch elements wherein on or off positions of said switch elements define said preset pattern representing said denominations of the notes to be stored in respective ones of said cartridges, each switch element defining a preset electrical state, the electrical states of said grouped storage elements defining said preset pattern by said on or off positions of said switch elements,

said control means including means for reading said preset pattern defined by the preset electrical states of said grouped storage elements from said note presetting means, storing said preset pattern, and utilizing said stored preset pattern to control operation of said note distributing means so that each of said cartridges may store or feed out





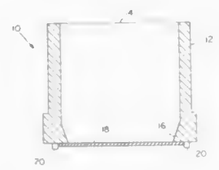
the note having the denomination preset by said presetting means through said note distributing means.

4,917,793

TRANSPARENT POROUS MEMBRANE HAVING HYDROPHILIC SURFACE AND PROCESS

Aldo M. Pitt, 18 Partridge La., Sudbury, Mass. 01776, and Michael J. Steuck, 89 Central St., N. Reading, Mass. 01864

Filed Dec. 4, 1986, Ser. No. 937,755
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—94 14 Claims



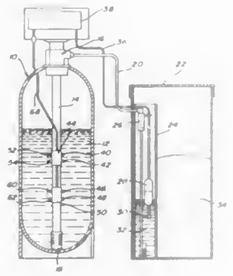
1. A composite porous thermoplastic membrane which is microscopically transparent having an optical density in aqueous solution of between 0 and 0.5 when measured at 410 nanometers visible light which comprises a porous, hydrophilic polytetrafluoroethylene membrane substrate having an average pore size between 0.001 and 10 microns, said membrane substrate being directly coated on its entire surface with a cross-linked polymer having a thickness between 10 and 200 Angstroms, said cross-linked polymer formed from a monomer polymerized in situ on said substrate, in a solvent comprising a mixture of water and a water miscible organic solvent, said composite porous membrane having essentially the same porous configuration as said porous membrane substrate.

4,917,794

REGENERATION SENSING DEVICE

Don G. Fettes; Myles P. Marusiak, both of Regina, and Gerald R. Mushka, White City, all of Canada, assignors to Water Conditioning Canada Ltd., Regina, Canada

Filed Mar. 27, 1989, Ser. No. 329,367
Int. Cl.[4] B01J *49/00*
U.S. Cl. 210—96.1 11 Claims



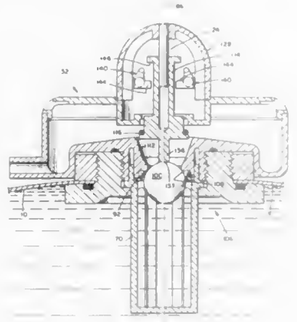
1. In a tank containing water softening material, a tube for distributing in said tank water to be softened; top and bottom primary sets of electrically conductive probes spaced at a predetermined distance above one another within the water softening material, said probes facing into the water softening material and water to measure the electrical resistance of the material at their respective locations; top and bottom secondary sets of electrically conductive probes spaced at a predetermined distance above one another within the softening material, the probes of said secondary sets being exposed to water only to measure the electrical resistance of the water at their respective locations; the probes of the top primary set being disposed adjacent the probes of the top secondary set; the probes of the bottom primary set being disposed adjacent the probes of the bottom secondary set.

4,917,795

AUTOMATIC VALVE ASSEMBLY

Chester A. Sable, Rancho California; Lawrence V. Maidarelli, Tustin, and Henry Church, Whittier, all of Calif., assignors to Anthony Industries, Inc., City of Commerce, Calif.

Continuation-in-part of Ser. No. 919,890, Oct. 15, 1986, Pat. No. 4,778,595. This application May 18, 1988, Ser. No. 195,603
Int. Cl.[4] B01D *23/20*
U.S. Cl. 210—120 32 Claims



1. A valve assembly connected to the upper portion of a tank for being filled with and drained of liquid, the valve assembly comprising:

first valve means communicating with the inside of the tank, said first valve means responsive for being closed by the tank's being full of pressurized liquid;

second valve means communicating with said first valve means and the outside of the tank, said second valve means responsive for being opened by gas being expelled from the tank through said first valve means when liquid is filling the tank for permitting the gas being expelled to exit through said second valve means;

means cooperating with said first valve means and said second valve means for preventing both of said first and second valve means from being simultaneously maintained in their closed conditions; and

selectively actuable means associated with said second valve means for permitting an external force to be applied to said second valve means, for opening and maintaining open said second valve means while said force is applied during selected times when liquid in the tank is not pressurized for permitting gas outside the tank to enter the tank and liquid to drain from the tank.

4,917,796

LIFT WITH AUTOMATED DUMP

Stanley Rudzinski, Chicago, Ill., assignor to Rudz Enterprises, Inc., Chicago, Ill.

Filed Sep. 1, 1988, Ser. No. 239,539
Int. Cl.[4] B01D *35/02*; B65G *47/40*
U.S. Cl. 210—159 23 Claims

1. A material lift apparatus comprising:

a container,

means for moving said container between a filling station in which material may be introduced into said container and a discharge station,

means for supporting said container in a material containing upright condition while at said filling station and during movement from said filling station toward said discharge station,

means responsive to movement of said container to said discharge station for pivoting said container to discharge material contained therein at said discharge station,

said container pivoting means including a shaft fixed to said container, a sprocket fixed to said shaft, and a link chain mounted apart from said container in fixed relation adjacent to the path of movement of said container to said discharge station whereby as said container approaches

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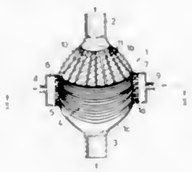
said discharge station said sprocket engages said chain, causing rotation of said sprocket, shaft, and container, and said container moving means including a ball screw, a ball nut fixed to said container supporting means and operatively engaging said ball screw, and a drive motor for rotating said ball screw to move said ball nut, container supporting means, and container relative to said ball screw.

4,917,797

APPARATUS FOR EXCHANGING IONS, MOLECULES, GAS, LIQUID AND/OR HEAT BETWEEN FLUIDS

Jorge Inacio, Solna, and Erling Nilsson, Upplands Väsby, both of Sweden, assignors to Data Promeditech I.N.C. AB, Solna, Sweden

PCT No. PCT/SE87/00166, § 371 Date Sep. 21, 1988, § 102(e) Date Sep. 21, 1988, PCT Pub. No. WO87/06151, PCT Pub. Date Oct. 22, 1987
PCT Filed Apr. 1, 1987, Ser. No. 249,931
Claims priority, application Sweden, Apr. 10, 1986, 8601612
Int. Cl.[4] B01D *35/18, 13/00*
U.S. Cl. 210—184 13 Claims



1. An apparatus for exchanging ions, molecules, gas, liquid, and/or heat between a blood fluid and at least one other fluid comprising a rigid vessel having a tubular inlet and a tubular outlet for said blood fluid;

said tubular inlet and outlet being mutually axially aligned and located at opposite ends of the vessel;

and comprising a substantially cylindrical center portion and an inlet portion adjoining said center portion and said tubular inlet and tapering gradually from the center portion to the tubular inlet;

and an outer portion adjoining said center portion and said tubular outlet and tapering gradually from said center portion to said tubular outlet;

at least one bundle of substantially parallel hollow fibers extending through said center portion of said vessel so as to be substantially uniformly distributed over the whole of a crosssectional area of the flow path of said blood fluid between said inlet and said outlet and having its opposite ends passed sealingly through the wall of said vessel and open respectively into an inlet chamber means and an outlet chamber means for said other fluid;

said inlet chamber means and said outlet chamber means being located externally of and adjoining the vessel wall, and a rigid body arranged within said inlet portion of the vessel and covering the whole cross-sectional area of said inlet portion and occupying a substantial part of the internal volume of said inlet portion;

said rigid body comprising a plurality of flow channel means for said blood fluid extending through the rigid body for distributing said blood fluid substantially uniformly over the cross-sectional area of the center portion of the vessel and forming a communication between said tubular inlet and said center portion of said vessel;

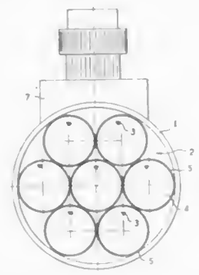
the surface of said rigid body facing said center portion of the vessel being convex, and the fibers of said fiber bundle being substantially uniformly distributed over said convex surface of said body and extending in planes substantially parallel with said surface.

4,917,798

METHOD OF FABRICATING A PERFORATED PLATE FOR A HOLLOW FIBER SEPARATOR APPARATUS, AND DEVICES OBTAINED THEREBY

Jun K. Liou, Beynost, and Philippe Aptel, Toulouse, both of France, assignors to Lyonnaise Des Eaux, Paris, France

Filed Mar. 21, 1989, Ser. No. 326,533
Claims priority, application France, Mar. 29, 1988, 88 04067
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—321.89 11 Claims



4. A tube plate for a hollow fiber separator apparatus formed by gluing the end of a bundle of hollow fibers by means of a curable resin, wherein the plate includes reinforcing elements embedded in the resin and surrounding respective ends of a plurality of elementary bundles which together make up the bundle of hollow fibers.

4,917,799

FILTERING DEVICE FOR BLOOD PLATELETS

Kazuhiko Masuda, Takatsuki, and Masami Ohnishi, Osaka, both of Japan, assignors to Nissho Corporation, Osaka, Japan

Filed Oct. 28, 1988, Ser. No. 263,757
Claims priority, application Japan, Nov. 5, 1987, 62-279985
Int. Cl.[4] B01D *39/04*
U.S. Cl. 210—435 3 Claims

1. A filtering device for blood platelets comprising a column packed with polyester fibers having an average cross-sectional diameter of 0.1～5 μm, a bulk density of from 0.1～0.6 g/cm^3, and wherein the surface of said fibers have roughness of about 0.1 to 1.0 μm which is detectable by an electro-microscope which roughness has been formed by treating the fibers with solvent having a solubility parameter of 8.0～12.5 cal/ml$^{0.5}$.

4,917,800

FUNCTIONAL, PHOTOCHEMICALLY ACTIVE, AND CHEMICALLY ASYMMETRIC MEMBRANES BY INTERFACIAL POLYMERIZATION OF DERIVATIZED MULTIFUNCTIONAL PREPOLYMERS

Harold K. Lonsdale, Bend, and Carl C. Wamser, West Linn, both of Oreg., assignors to Bend Research, Inc., Bend, Oreg.

Division of Ser. No. 883,043, Jul. 7, 1986, Pat. No. 4,784,736.
This application Jul. 19, 1988, Ser. No. 221,307
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—490 18 Claims

1. A thin film composite membrane comprising a microporous polymeric membrane support and an ultrathin membrane comprising the interfacial polymerization reaction product made from at least one prepolymer of the type M_FX_m, $M_F'Y_n$ and N_FY_n wherein

M_F and M_F' are monomeric or oligomeric moieties that can initiate photochemical redox reactions,

N_F is a linkable or crosslinkable monomeric or ologiomeric moiety that cannot initiate photochemical redox reactions,

X and Y are groups which render said prepolymers reactive in an interfacial polymerization reaction,

m and n are integers ≧2, and wherein said interfacial polymerization reaction product possesses substantially the same selective photochemical redox reactivity as M_F and M_F'.

4,917,801

LYMPHOCYTE COLLECTION TUBE

Albert A. Luderer, Marshfield, Mass., and Ward C. Smith, Corning, N.Y., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 864,443, May 16, 1986, abandoned, which is a continuation of Ser. No. 678,100, Dec. 4, 1984, abandoned, which is a continuation-in-part of Ser. No. 544,125, Oct. 21, 1983, abandoned. This application Nov. 2, 1987, Ser. No. 117,396
Int. Cl.[4] B01D *21/26*
U.S. Cl. 210—516 17 Claims

1. An assembly for centrifugally separating lymphocytes and monocytes from heavier phases of a sample of whole blood or a pretreated cell fraction thereof which comprises:

(a) a container having an open end and a closed end;

(b) a liquid density gradient medium initially positioned adjacent said closed end;

(c) means for preventing mixing of the liquid density gradient medium with a blood sample prior to centrifugation of the container, the preventing means including a non-movable partition means positioned above the surface of said medium which seals said medium therebeneath prior to centrifugation and which remains stationary during centrifugations; and

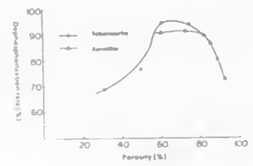
(d) a free space initially adjacent said partition means of sufficient volume to contain said sample and an added reagent where desired.

4,917,802

METHOD FOR TREATING WASTE WATER

Yukio Fukaya, Kanagawa; Kazuyuki Hatano, and Kazuhiro Sainohira, both of Aichi, all of Japan, assignors to Onoda Autoclaved Light Weight Concrete Co., Ltd, Aichi, Japan

PCT No. PCT/JP87/00080, § 371 Date Oct. 6, 1987, § 102(e) Date Oct. 6, 1987, PCT Pub. No. WO87/04695, PCT Pub. Date Aug. 13, 1987
PCT Filed Feb. 9, 1987, Ser. No. 130,875
Claims priority, application Japan, Feb. 10, 1986, 61-25948; Jul. 18, 1986, 61-168031
Int. Cl.[4] B01D *15/00*
U.S. Cl. 210—605 10 Claims



6. A method of treating water containing phosphorus compounds comprising

passing said water through a treatment zone containing a porous contact material, said porous material comprising tobermorite, xonotlite or a mixture thereof and having a porosity of 50% to 90%, said porous material being produced by foaming and hardening an aqueous slurry which comprises silica-based material, lime-based material and water in the presence of a foaming agent to form a porous product, and then subjecting said porous product to hydrothermal synthesis.

4,917,803

WATER CLARIFICATION PROCESS

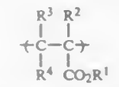
Stephan J. Allenson, Richmond, Tex., assignor to Nalco Chemical Company, Naperville, Ill.

Division of Ser. No. 317,763, Mar. 2, 1989, Pat. No. 4,873,280.
This application Aug. 14, 1989, Ser. No. 393,139
Int. Cl.[4] C02F *1/56*
U.S. Cl. 210—728 10 Claims

1. A process of clarifying water comprising:

adding to water to be clarified an effective amount of a composition comprised of an alkali metal aluminate;

an anionic vinyl polymer which is comprised of at least 90 weight percent of units having the Formula I of



wherein R^1 is hydrogen, alkali metal cation, ammonia cation, or alkyl of 1 to 16 carbon atoms, and R^2, R^3, and R^4 are each independently hydrogen, alkyl of 1 to 16 carbon atoms, or a carboxylic acid moiety or water soluble salt thereof, provided said polymer contains no more than 70 weight percent of units of said Formula I comprised of a carboxylic acid or water soluble salt thereof moiety and which contains less than 10 total carbon atoms;

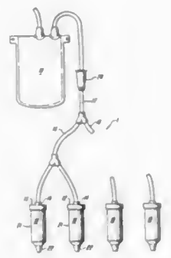
wherein said anionic vinyl polymer has an average molecular weight of at least 500,000,

wherein the weight ratio of said alkali metal aluminate and said anionic vinyl polymer is from 5 to 175 alkali metal aluminate per part anionic vinyl polymer,

and water;

and wherein said composition is an ungelled aqueous solution having a pH of at least 10;
agitating said water to form a floc; and separating the floc from a clarified supernatent.

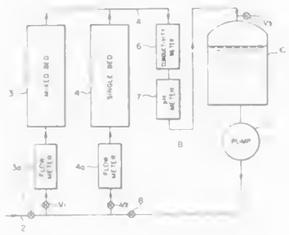
4,917,804
METHOD AND VESSEL FOR SEPARATION OF CRYOGLOBIN
Stephen H. Franks, Hopkioton; David M. Dillon, Dover, and Read S. McCarty, Hingham, all of Mass., assignors to Baxter International Inc., Deerfield, Ill.
Filed Oct. 31, 1986, Ser. No. 925,318
Int. Cl.[4] B01D *21/26*
U.S. Cl. 210—737 9 Claims



1. A method of isolating cryoprecipitate including the steps of freezing and thawing plasma and subsequently centrifuging the thawed plasma to separate precipitated material therefrom, further comprising the steps of
(A) transferring said plasma to at least one separation vessel having
(i) a hollow body portion having first and second closed ends and a longitudinal axis
(ii) a port for said transferring plasma to said vessel, and
(iii) an elongate nipple extending from and closing the second end, said nipple defining an interior volume in the range of two to five percent of the volume of the hollow body portion, and
(B) orienting a said separation vessel in a fixture during centrifuging such that the nipple end of the vessel assumes a position of greatest g force so as to isolate cryoprecipitate in said nipple,
(C) decanting cryoprecipitate—depleted plasma from said separation vessel via said port,
(D) closing off said port, and
(E) opening said nipple to allow delivery of said cryoprecipitate therefrom without re-mixing or cross contamination.

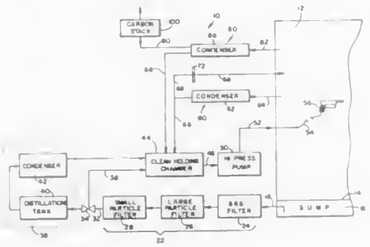
4,917,805
CYCLICAL COMPLETE MIX ACTIVATED SLUDGE PROCESS
John H. Reid, 6 River Oak Pl., Fredericksburg, Va. 22401
Filed Dec. 20, 1988, Ser. No. 286,805
Int. Cl.[4] C02F *3/30*
U.S. Cl. 210—605 3 Claims

1. A process for nitrification and denitrification of ammonia-contaminated wastewater, comprising:
A. continuously feeding said wastewater to a single flow-through complete mix activated sludge basin with a hydraulic retention time of a minimum of 12 hours, wherein an aeration means is cyclically operated and which contains mixed liquor having a mean cell residence time of at least 15 days;
B. agitating said mixed liquor while cyclically aerating said mixed liquor for approximately 3–9 minutes to form an oxic stage and withholding aeration for approximately 3–9 minutes to form an anoxic stage, to treat said mixed liquor for discharge from said basin;
C. continuously withdrawing said treated mixed liquor from said basin; and



D. clarifying said treated mixed liquor to obtain activated sludge and treated and clarified liquor, as effluent which has ammonia contents no higher than 2.0 mg/l, nitrite contents no higher than 1.0 mg/l, and nitrate contents no higher than 2.0 mg/l.

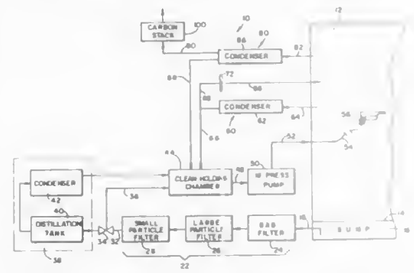
4,917,806
METHOD OF AND APPARATUS FOR CONTROLLING PH AND ELECTRICAL CONDUCTIVITY OF WATER USING ION EXCHANGE RESIN
Yoshihiro Matsunaga; Tadao Nishimori, and Hiromasa Matsuoka, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Dec. 20, 1988, Ser. No. 286,715
Claims priority, application Japan, Dec. 21, 1987, 62-321341
Int. Cl.[4] C02F *1/42*
U.S. Cl. 210—662 7 Claims



1. A method of controlling the pH and electrical conductivity of water by means of ion exchange resins comprising:
dividing a flow of inlet water into first and second streams, respectively;
directing the first stream to flow into a mixed bed containing a mixture of an anion exchange resin and a cation exchange resin;
directing the second stream into a single bed containing one of an anion exchange resin and a cation exchange resin;
combining the first and second streams after their respective flows through the mixed and single beds into a flow of outlet water;
supplying some of the outlet water as at least part of the inlet water; and

adjusting the proportion of the flow of the inlet water between the first and second streams to control the pH and electrical conductivity of the outlet water.

4,917,807
METHOD FOR RECOVERING SOLVENT
Anthony J. Prisco, Jr., Beverly; Bruce R. Sewter, Pemberton Twp., Burlington County; William E. Briggs, Beverly, and Gary L. Archer, Mount Holly, all of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Division of Ser. No. 832,491, Feb. 21, 1986, Pat. No. 4,770,197.
This application May 9, 1988, Ser. No. 191,507
Int. Cl.[4] B01D *3/00, 5/00*
U.S. Cl. 210—774 10 Claims



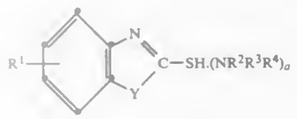
1. A method comprising cleaning a solvent which is being recirculated in a closed system where said solvent comprises a liquid portion and a vapor portion in which ambient gases may be entrained, and wherein said solvent may contain hazardous particulate material, including the steps of
removing said particulate material from said liquid portion,
condensing at least a portion of said solvent vapor to a liquid,
recirculating an uncondensed portion of said solvent vapor through at least a portion of said system,
venting said ambient gases from said system while removing said solvent vapor and said particulate material therefrom, and
selectively storing or recirculating said filtered liquid solvent and said condensed solvent vapor.

4,917,808
COMPOSITION FOR RECOVERY OF OIL BY SURFACTANT FLOODING WITH A MIXTURE OF CARBOXYMETHYLATED OXETHYLATE AND A SORBITAN ESTER
Dieter Balzer, Haltern, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany
Division of Ser. No. 137,205, Dec. 23, 1987, Pat. No. 4,825,951.
This application Feb. 14, 1989, Ser. No. 310,135
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644386
Int. Cl.[4] E21B *43/22*
U.S. Cl. 252—8.554 13 Claims

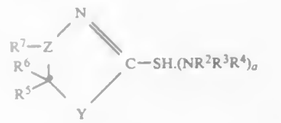
1. A composition comprising effective amounts of
(a) 10–100% of a carboxymethylated oxethylate of the formula $R\text{-}(OC_3H_6)_m(OC_2H_4)_nOCH_2COOM$ and 90–0% of an oxethylate of the formula $R\text{-}(OC_3H_6)_m(OC_2H_4)_nOH$
wherein R is an aliphatic radical of 6 to 20 carbon atoms, an alkyl-$C_{6\text{-}10}$-aromatic radical of 3 to 18 carbon atoms in the alkyl group or a di- or oligo-alkyl-$C_{6\text{-}10}$-aromatic radical of 1 to 18 carbon atoms per alkyl group, the total number of carbon atoms in the alkyl chains being 5 to 40, m is 0 to 20, n is 3 to 100, M is an alkali or alkaline-earth metal ion or ammonium, and
(b) a fatty acid ester of a polyglucosyl sorbitol.

4,917,809
HIGH-TEMPERATURE LUBRICANTS
Horst Zinke, Ernsthofen, Fed. Rep. of Germany, and Rolf Schmacher, Marly, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Nov. 2, 1987, Ser. No. 115,287
Claims priority, application Switzerland, Nov. 11, 1986, 4497/86
Int. Cl.[4] C10M *135/36*
U.S. Cl. 252—32.7 E 18 Claims

1. A composition consisting essentially of
(a) one or more lubricants or hydraulic oils based on mineral oil or synthetic oils and
(b) 0.05 to 5% by weight, relative to the total weight of the lubricant composition or hydraulic oil composition, of a mixture of
(1) at least one compound of the formula I or II

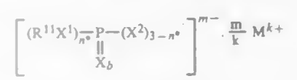


I

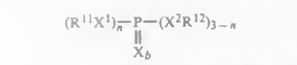


II

in which Y is —O—, —S—, —NH— or —NR^9—, with R^9 being C_1–C_{12}-alkyl, Z is —CR^8— or —N— and R^1 is hydrogen, C_1–C_{12}-alkyl, C_1–C_4-alkoxy, C_2–C_{24}-alkoxycarbonyl or nitro, R^2 is hydrogen or unsubstituted or OH-substituted C_1–C_{24}-alkyl, R^3 is hydrogen, C_1–C_{24}-alkyl or C_2–C_{24}-alkenyl, R^4 is C_1–C_{24}-alkyl or C_2–C_{24}-alkenyl, or R^3 and R^4 together are a —$C(R^{10})$=N—CH$_2$–CH$_2$- radical, with R^{10} being hydrogen, C_1–C_{17}-alkyl or C_2–C_{17}-alkenyl, and R^5 is hydrogen, —SH or C_1–C_{22}-alkyl, R^6 is hydrogen, R^7 is hydrogen or R^6 and R^7 together are a direct bond, R^8 is hydrogen or C_1–C_{22}-alkyl or phenyl, or R^7 and R^8 together are carbonyl and a has the value 0 or 1 to 2, and
(2) at least one compound of the formulae III or IV



III



IV

in which X, X^1 and X^2 independently of one another are oxygen or sulfur, R^{11} and R^{12} are identical or different and are each C_1–C_{12}-alkyl which may be interrupted by —O—, —S— or —C(O)O —, unsubstituted or C_1–C_{12}-alkyl-substituted phenyl or naphthyl, unsubstituted or C_1–C_4-alkyl-substituted C_5–C_{12}-cycloalkyl or C_7–C_{13}-aralkyl, and n is the number 1, 2 or 3, $n^\bullet$ is the number 1 or 2, m is the number 1 or 2, k is the number 1 or 2 and b is the number 0 or 1, and, in the case of n or $n^\bullet$ being 2 or also n being 3, the radicals R^{11} are identical or different or two radicals R^{11} can, together with the two heteroatoms X^1 and the P atom to which they are linked, form a 5-membered or 6-membered ring, and in which M is a k-valent metal cation, a proton or a compound $HN^+R^{13}R^{14}R^{15}$, R^{13} being hydrogen or unsubstituted or OH-substituted C_1–C_{30}-alkyl, R^{14} being hydrogen or C_1–C_{30}-alkyl and R^{15} being C_1–C_{30}-alkyl or C_{18}-alkenyl,

or R^{14} and R^{15} together forming a $-C(R^{16})=N-CH_2-CH_2-$ radical and R^{16} being hydrogen, C_1–C_{17}-alkyl or C_2–C_{17}-alkenyl, with the proviso that, if m is 2 and k is 1, two different radicals M are possible.

4,917,810

PIEZOELECTRIC COMPOSITE MATERIAL

Tsutomu Tsunooka; Shigeo Saito; Takashi Yamamoto, and Hiroshi Ito, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Continuation of Ser. No. 827,028, Feb. 5, 1986, abandoned, which is a continuation of Ser. No. 527,631, Aug. 29, 1983, abandoned, which is a continuation of Ser. No. 295,208, Aug. 24, 1981, abandoned, which is a continuation of Ser. No. 44,741, Jun. 1, 1979, abandoned. This application Oct. 25, 1988, Ser. No. 264,000

Claims priority, application Japan, Jun. 1, 1978, 53-64890

The portion of the term of this patent subsequent to Jul. 23, 2004, has been disclaimed.

Int. Cl.[4] C04B *35/49, 35/78*

U.S. Cl. 252—62.9 **17 Claims**

1. A piezoelectric composite material comprising a mixture of one or more polymers and ferroelectric ceramic microcrystals, which contain 90% or more grains in a particle size range of about 1 to 400μ, at a ceramic microcrystals: one or more polymers mixing ratio of about 1:9 to 9:1 by volume, said ferroelectric ceramic microcrystals having virtually single domains.

4,917,811

BLEACH COMPOSITIONS AND PROCESS FOR MAKING SAME

Jeffrey N. Foster, Rutherford, N.J.; William M. Karpusiewicz, Floral Park, N.Y.; Charles F. Irwin, Randolph; Hien T. Pham, Fort Lee, both of N.J., and Michael P. Aronson, West Nyack, N.Y., assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 246,836, Sep. 20, 1988, abandoned. This application Jan. 3, 1989, Ser. No. 292,692

Int. Cl.[4] C11D *3/395, 3/39;* **D06L** *3/02*

U.S. Cl. 252—95 **6 Claims**

1. A cogranulate comprising 1–45% by weight of an aliphatic organic peroxyacid and 99–35% by weight of an alkaline, hydratable alkalimetal inorganic or organic salt, said salt having a pH of at least 8.5 at a concentration of 1% in distilled water at 25° C., and said cogranulate being formed in a process wherein all water employed therein is taken up by said hydratable salt as water of hydration.

4,917,812

GRANULAR AUTOMATIC DISHWASHER DETERGENT COMPOSITION PROVIDING GLASSWARE PROTECTION CONTAINING INSOLUBLE ZINC COMPOUND

William A. Cilley, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 13, 1989, Ser. No. 310,817

Int. Cl.[4] C11D *3/12, 3/395*

U.S. Cl. 252—99 **18 Claims**

1. A granular automatic dishwashing detergent composition comprising:

(a) from about 0.1% to about 8.0% of a detergent surfactant;

(b) an amount of a chlorine bleach ingredient sufficient to provide the composition with from 0% to about 5.0% of available chlorine based on the weight of the detergent composition;

(c) from about 10% to about 80% of a detergency builder material;

(d) an amount of an insoluble inorganic zinc compound having a maximum particle size of less than about 1.7 millimeters that will provide the composition with from about 0.02% to about 10.0% zinc.

4,917,813

BLEACHING COMPOSITION

Muneo Aoyagi, Utsunomiya, and Atsuo Nakae, Minamisaitama, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Mar. 17, 1987, Ser. No. 27,288

Claims priority, application Japan, Apr. 2, 1986, 75983

Int. Cl.[4] C11D *3/395, 7/56*

U.S. Cl. 252—99 **5 Claims**

1. A bleaching composition consisting essentially of

(a) 80 to 95 wt.% of an inorganic peroxide bleaching agent selected from the group consisting of percarbonates and perborates;

(b) 0.1 to 10 wt.% of an nonionic surfactant;

(c) 0.05 to 10 wt.% of a polymer of acrylic acid and water-soluble salts of said polymer, said polymer having a molecular weight of 500 to 50,000;

(d) 0.05 to 5 wt.% of a protease; and

(e) one or more members of inorganic and organic builder components selected from the group consisting of sodium tripolyphosphate, sodium carbonate, sodium pyrophosphate, sodium sulfate, sodium borate, sodium hydrogen carbonate, sodium silicate, sodium nitrilotriacetate and sodium ethylenediaminetetraacetate.

4,917,814

PIGMENTED HYPOCHLORITE COMPOSITIONS

Debra MacIntyre, Hamilton, and Carl Triplett, Milford, both of Ohio, assignors to The Drackett Company, Cincinnati, Ohio

Filed Aug. 11, 1988, Ser. No. 230,937

Int. Cl.[4] D06L *3/08;* **C11D** *3/395;* **C01B** *11/06*

U.S. Cl. 252—102 **21 Claims**

1. A composition comprising an aqueous vehicle having incorporated therein an effective oxidizing amount of a hypochlorite ion and a colorant system containing one or more pigments selected from the group consisting of cobalt aluminate and cobalt chromite, said pigments not having a coating and being present in sufficient concentration to impart color to said composition.

4,917,815

STABLE AQUEOUS AROMATIC PERCARBOXYLIC ACID SOLUTION

Wolfgang Beilfuss, Hamburg, and Karl-Heinz Diehl, Norderstedt, both of Fed. Rep. of Germany, assignors to Sterling Drug Inc., New York, N.Y.

Filed Jun. 10, 1988, Ser. No. 205,133

Int. Cl.[4] C07C *179/133;* **D06L** *3/02;* **A01N** *37/10, 43/40*

U.S. Cl. 252—186.23 **7 Claims**

1. A stabilized aqueous disinfecting and bleaching solution comprising an aromatic percarboxylic acid, a stabilizer for the aromatic percarboxylic acid and water, in which the stabilizer comprises:

an aromatic carboxylic acid corresponding to the aromatic percarboxylic acid and in an amount at least about equal in parts by weight to the aromatic percarboxylic acid; and at least one of

(i) an aqueous solution of perglutaric acid stabilized with an excess of hydrogen peroxide; or

(ii) a 10% to 60% aqueous solution of hydrogen peroxide.

4,917,816

STABILIZED PEROXIDE COMPOSITIONS AND PROCESS FOR PRODUCING SAME

James M. Self, Taylors, S.C., assignor to ABCO Industries, Inc., Roebuck, S.C.

Filed Jan. 3, 1984, Ser. No. 567,664

Int. Cl.[4] A62D *3/00, 9/00;* **C01B** *15/00;* **C09K** *3/00*

U.S. Cl. 252—186.26 **4 Claims**

1. An organic peroxide aqueous dispersion comprising:

(a) from about 35 to about 70 weight percent of solid benzoyl peroxide particles, said particles having a size of about 10 microns or less;

(b) water;

(c) a compound that produces an ionic region about the peroxide particles in the dispersion, is inert as to the peroxide, and is at least water dispersible wherein said compound is selected from the group consisting of finely divided fumed silica, a sodium salt of a condensed naphthalene sulfonic acid and a sodium salt of a polymerized carboxylic acid:

(d) a defoamer; and

(e) a water soluble acidic inorganic salt which is inert as to the peroxide, increases the viscosity of the dispersion, retains water of hydration upon dry down of the dispersion and possesses fire retardant properties.

4,917,817

OPTICAL ACTIVE COMPOUND, PROCESS FOR PRODUCING SAME AND LIQUID CRYSTAL COMPOSITION CONTAINING SAME

Hiroyuki Nohira, Urawa; Masanao Kamei, Asaoka; Hideki Kanazawa, Yotsukaichi; Tetsuya Abe, Kitaibaraki; Yoko Yamada, Atsugi, and Yuko Etoh, Tokorozawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

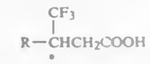
Filed Jul. 21, 1988, Ser. No. 222,426

Claims priority, application Japan, Jul. 24, 1987, 62-183485; Jul. 24, 1987, 62-183486; Feb. 22, 1988, 63-037624

Int. Cl.[4] C09K *19/52;* **G02F** *1/13;* **C07B** *53/21*

U.S. Cl. 252—299.01 **4 Claims**

1. An optically active 3-trifluoromethyl alkanoic acid represented by the following formula (2):



(2)

wherein R denotes an alkyl group having 1–14 carbon atoms, and C* denotes an asymmetric carbon atom.

4,917,818

NEMATIC LIQUID CRYSTAL COMPOSITION

Shinichi Sawada; Toyoshiro Isoyama, both of Ichihara; Tetsuya Matsushita, Sodegzura, and Kenji Furukawa, Yokosuka, all of Japan, assignors to Chisso Corporation, Japan

Filed Aug. 31, 1988, Ser. No. 238,509

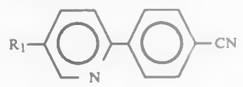
Claims priority, application Japan, Sep. 8, 1987, 62-224737

Int. Cl.[4] C09K *19/34;* **G02F** *1/13*

U.S. Cl. 252—299.61 **12 Claims**

1. A nematic liquid crystal composition for multiplex drive display elements, which composition comprises

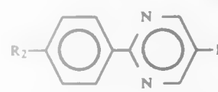
(1) 10 to 50% by weight of a first component selected from the group consisting of at least one member of compounds expressed by the formula



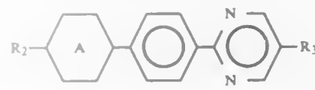
(1)

where R_1 represents an alkyl group of 1 to 8 carbon atoms, and

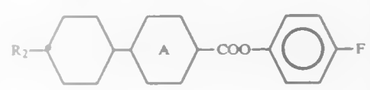
(2) 20 to 90% by weight of a second component comprising at least one member of compounds selected from the group consisting of formulas (II)–(VI), the range for each being 0 to 40% by weight of at least one member of compounds expressed by the following formula (II), 0 to 50% by weight of at least one member of compounds expressed by the following formula (III), 0 to 40% by weight of at least one member of compounds expressed by the following formula (IV), 0 to 40% by weight of at least one member of compounds expressed by the following formula (V), and 0 to 40% by weight of at least one member of compounds expressed by the following formula (VI), the total weight of said first component and said second component being 60% by weight or more:



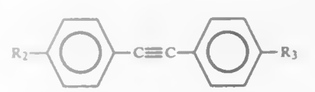
(II)



(III)



(IV)

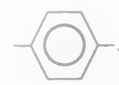


(V)

wherein R_2 represents an alkyl group of 1 to 10 carbon atoms, R_3 represents an alkyl group of an alkoxy group each of 1 to 10 carbon atoms and

represents

or



and the respective %s by weight based on the total weight of said composition.

4,917,819

CYCLOHEXANE DERIVATIVE AND LIQUID CRYSTAL COMPOSITION CONTAINING SAME

Yasuyuki Goto, Yokohamashi; Shigeru Sugimori, Fujisawashi, and Tetsuya Ogawa, Yokohamashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

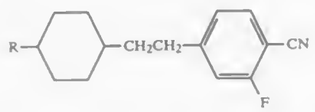
Division of Ser. No. 867,680, May 28, 1986, Pat. No. 4,797,228. This application Jun. 16, 1988, Ser. No. 207,615

Claims priority, application Japan, Jun. 10, 1985, 60-125489

Int. Cl.[4] G02F *1/13;* **C09K** *19/30;* **C07C** *19/08, 21/24, 25/13*

U.S. Cl. 252—299.63 **5 Claims**

1. A cyclohexane derivative expressed by the formula



wherein R is an alkyl group of 1 to 10 carbon atoms.

4,917,820

ETHYLENE REMOVAL AGENT, POSTHARVEST PRESERVATION AGENT AND DEODORANT

Mutsumi Matsumoto, and Masanobu Ogawa, both of Gunma, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 86,287, Aug. 17, 1987, abandoned. This application Mar. 1, 1989, Ser. No. 317,140

Claims priority, application Japan, Aug. 26, 1986, 61-198136; Sep. 3, 1986, 61-205849; Sep. 18, 1986, 61-217916; Sep. 18, 1986, 61-217917; Nov. 18, 1986, 61-272825; Dec. 2, 1986, 61-285913

Int. Cl.[4] C09K *15/00*

U.S. Cl. 252—397 18 Claims

1. A method for removing ethylene from an ethylene-generating source, which method comprises placing in proximity to said source a composition which comprises (A) at least one compound selected from the group consisting of phosphoric acid, phosphorous acid, hypophosphorous acid, hypochlorous acid an salts of said acids and (B) at least one compound selected from the group consisting of oxides, carbonates, sulfates and peroxides of cobalt, nickel, titanium, zirconium, vanadium, chromium, molybdenum, tungsten, manganese, copper, silver, zinc, germanium, tin, lead, platinum, palladium, magnesium, calcium, strontium, and barium, Fe_2O_3, peroxides of alkali metals, and alkali metal salts or alkaline earth metal salts of peroxocarbonic acid or peroxoboric acid.

4,917,821

OPTICALLY ACTIVE MESOMORPHIC COMPOUND AND LIQUID CRYSTAL COMPOSITION CONTAINING SAME

Shosei Mori; Kenji Shinjo, both of Atsugi, and Takashi Iwaki, Isehara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

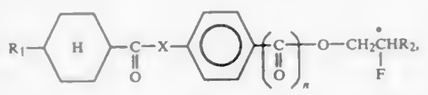
Filed Nov. 7, 1988, Ser. No. 268,265

Claims priority, application Japan, Nov. 9, 1987, 62-281038

Int. Cl.[4] G02F *1/13;* C09K *19/30;* C07C *69/76, 69/74*

U.S. Cl. 252—299.63 41 Claims

1. An optically active mesomorphic compound represented by the formula:



(I)

wherein R_1 denotes an alkyl group having 1–16 carbon atoms; R_2 denotes an alkyl group having 1–18 carbon atoms; C* is an asymmetric carbon atom; X is an oxygen atom or sulfur atom; and n is 0 or 1.

4,917,822

GRAPHITE-CONTAINING CONDUCTIVE SUSPENSION FOR PICTURE TUBES

Norbert Thiel, Bad Säckingen, and Rolf Zondler, Straubing-Ittling, both of Fed. Rep. of Germany, assignors to Nokia Graetz, Pforzheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 108,066, Oct. 13, 1987, abandoned. This application May 12, 1988, Ser. No. 193,372

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1986, 3636186

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—511 15 Claims

1. A graphite-containing conductive suspension disposed on an inside surface of a picture tube and making electrical contact therewith, comprising:

5 to 20 percent graphite by weight;

5 to 15 percent lead oxide containing sealing glass-frit powder by weight;

0.1 to 5 percent binder, for said sealing glass-frit powder, by weight; and

60 to 90 percent solvent, for said binder, by weight.

14. A graphite-containing conductive suspension disposed on an inside surface of a picture tube and making electrical contact therewith, comprising:

5 to 20 percent graphite by weight.

5 to 15 percent lead oxide containing sealing glass-frit by weight; and

a binder solution mixture of a binder and a solvent, said mixture being selected from a group of mixtures consisting of: nitrocellulose with amyl acetate, nitrocellulose with isoamyl acetate, nitrocellulose with butyl acetate, methyl hydroxyl butyl cellulose with amyl acetate, methyl hydroxyl butyl cellulose with isoamyl acetate, methyl hydroxyl butyl cellulose with butyl acetate, water-soluble cellulose with water, methyl cellulose with water, and polyvinyl alcohol with water, in each mixture the binder being provided in an amount of 0.1 to 5 percent by weight of the conductive suspension and the solvent being provided in an amount of 60 to 90 percent by weight of the suspension.

4,917,823

STABLE AND EASILY RINSEABLE LIQUID CLEANSING COMPOSITIONS CONTAINING CELLULOSIC POLYMERS

Robert J. Maile, Jr., Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 921,905, Oct. 24, 1986, abandoned, which is a continuation of Ser. No. 625,407, Jun. 28, 1984, abandoned. This application Nov. 23, 1988, Ser. No. 277,463

Int. Cl.[4] C11D *1/12, 3/37, 17/08*

U.S. Cl. 252—548 11 Claims

1. A liquid personal cleanser product consisting essentially of:

A. a thickener consisting essentially of from about 0.1% to about 1.5% of a water-soluble hydroxyethyl cellulose polymer and mixtures thereof;

B. from about 3% to about 20% of a phase stabilizing solvent selected from the group consisting of ethylene glycol, propylene glycol, and mixtures thereof;

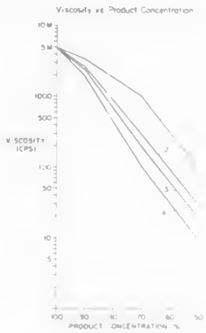
C. from about 10% to about 50% of a synthetic surfactant;

D. from about 0.001% to about 1.0% of electrolyte in addition to ingredients A–C;

E. from about 50% to about 80% water; and

wherein said solvents of B. have a molecular weight of from about 200 to about 10,000; and wherein said product has a neat

product viscosity (100%) of from about 2,000 cps to about 12,000 cps, and a dilute product viscosity (50%) of from about



15 cps to about 95 cps and wherein said liquid cleansing product is substantially a single phase product.

4,917,824

FLUID LIGHT CONTROLLING MEDIUM FOR A VEHICLE REARVIEW MIRROR

Niall Lynam, Holland, Mich., and Keith W. Molyneux, Willow Glen, Ireland, assignors to Donnelly Mirrors Limited, Naas, Ireland

Filed Jan. 22, 1988, Ser. No. 146,838

Int. Cl.[4] G02B *5/24*

U.S. Cl. 252—582 6 Claims

1. A fluid composition for use as a light attenuating medium in a rearview mirror consisting essentially of:

(a) a carrier fluid, the major component of which is propylene carbonate, such that said carrier fluid has a freezing point $\leqq -30°$ C., a boiling point $\geqq 80°$ C., and a viscosity within 5° C. of the freezing point thereof of up to 50 centipoise;

(b) a light absorbing dye in solution, rather than in dispersion, in said carrier fluid consisting of an azo, anthraquinoid, phthalocyanine or 1,2-chrome dye or a mixture of two or more thereof, said dye or mixture of dyes remaining in solution at a temperature below −30° C. and having an absorbance characteristic when combined with the other fluid components according to Beer-Lambert's Law:

$$Ix = Ioe^{-\alpha cx}$$

wherein

Ix = intensity of illumination after-traveling through the fluid;

Io = initial intensity of illumination;

α = average absorbance coefficient of the dye or dye mixture in the visible range of radiation;

c = concentration of the dye or dye mixture; and

x = light pathlength through the light absorbing medium such that

$\alpha cx = A$

where A has a value in the range 0.05 to 11.0 and where the maximum value of A for the day position of the mirror is 0.28 and where the minimum value of A for the night position of the mirror is 2.00; and

(c) a U.V. stabilizing agent in solution in said carrier fluid which is a benzophenone, benzotriazole or organo-nickel complex.

4,917,825

SOLVENT COMPOSITION AND PROCESS FOR THE ISOLATION OF RADIUM

William J. McDowell, Knoxville, and Gerald N. Case, Oak Ridge, both of Tenn., assignors to The United States of America, as represented by the Department of Energy, Washington, D.C.

Filed Oct. 5, 1988, Ser. No. 253,634

Int. Cl.[4] G21F *7/08;* C09K *3/00*

U.S. Cl. 252—631 9 Claims

1. A solvent composition for extracting radium which comprises a high molecular weight organophilic carboxylic acid and an organophilic macrocycle.

9. A solvent extraction process for the selective separation and isolation of radium which comprises, providing a solvent phase extraction composition comprised of an organophilic carboxylic acid and an organophilic macrocycle component, mixing said composition with an aqueous phase containing said radium, said aqueous phase having a pH of greater than 7 until a state of equilibration is reached between the two said phases and separating said organic solvent phase containing said radium from said basic aqueous phase.

4,917,826

CYCLIC HYDROCARBONS WITH AN AMINOALKYL SIDECHAIN

Roy A. Johnson, Kalamazoo; Gordon L. Bundy, Portage; Gilbert A. Youngdale, Portage; Douglas R. Morton, Portage, and Donald P. Wallach, deceased, late of Kalamazoo, all of Mich. (by Vera M. Wallach, Legal Representative), assignors to The Upjohn Company, Kalamazoo, Mich.

PCT No. PCT/US86/02116, § 371 Date Jun. 16, 1987, § 102(e) Date Jun. 16, 1987, PCT Pub. No. WO87/02367, PCT Pub. Date Apr. 23, 1987

PCT Filed Oct. 7, 1986, Ser. No. 117,851

Int. Cl.[4] C07J *9/00;* C07D *265/30, 295/00, 213/62, 213/78;* A61K *31/13, 31/395, 31/495*

U.S. Cl. 552—522 3 Claims

1. A compound selected from the group consisting of N-(5-fluoro-2,4-dinitropheny)-N'-(17β)-3-methoxyestra-1,3,5(10)-trien-17-yl)-1,6-hexanediamine, N-(2,4-dinitrophenyl)-N'-(17β)-3-methoxyestra-1,3,5(10)-trien-17-yl)-1,6-hexanediamine and pharmacologically acceptable acceptable salts thereof.

4,917,827

PROCESS FOR THE PREPARATION OF 9(11)-DEHYDRO STEROIDS

Jacobus N. M. Batist, Kwintsheul; Nicolaas C. M. E. Barendse, Den Hoorn, and Arthur F. Marx, Delft, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed Jun. 10, 1988, Ser. No. 204,720

Claims priority, application Netherlands, Jun. 12, 1987, 87201122

Int. Cl.[4] C07J *1/00*

U.S. Cl. 552—602 5 Claims

1. Process for preparing a 9(11)-dehydro steroid selected from the group consisting of androstane and pregnane series steroids, comprising

providing a 9-alpha-hydroxy steroid selected from the group consisting of androstane and pregnane series steroids, said

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9-alpha-hydroxy steroid having at least one hydrogen atom at the C-11 position; and

dehydrating said 9-alpha-hydroxy steroid in an inert organic solvent in the presence of a Lewis acid thereby removing the 9-alpha-hydroxy group and the hydroxy atom at the C-11 position and producing the corresponding 9(11)-dehydro steroid.

4,917,828

PROCESS FOR PREPARING KETOCHOLANATES

Naohiro Kubota, Urawa, Japan, assignor to Adeka Argus Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1988, Ser. No. 170,684

Claims priority, application Japan, Mar. 31, 1987, 62-78105

Int. Cl.[4] C07J *1/100;* A61K *31/56*

U.S. Cl. 260—397.3 8 Claims

1. A process for preparing ketocholanates, comprising oxidizing at least one starting compound selected from the group consisting of a C_{1-8} alkyl 3α-alkoxycarbonyloxy7α,12α-dihydroxycholanate, a C_{1-8} alkyl 3α-acyloxy-7α,12α-dihydroxycholanate, a C_{1-8} alkyl 3α-alkoxycarbonyloxy-12α-hydroxycholanate and a C_{1-8} alkyl 3α-acyloxy-12α-hydroxycholanate with an alkali metal salt of an oxo acid of halogen in the presence of a cerium compound, thereby to produce at least one compound selected from the group consisting of a C_{1-8} alkyl 3α-alkoxycarbonyloxy-7,12-dioxochalanate, a C_{1-8} alkyl 3α-alkoxy-carbonyloxy-7-oxo-12α-hydroxycholanate, a C_{1-8} alkyl 3α-acyloxy-7,12-dioxocholanate, aC_{1-8} alkyl 3α-acyloxy-7-oxo-12α-hydroxycholanate, a C_{1-8} alkyl 3α-alkoxycarbonyloxy-12-oxocholanate, and a C_{1-8} alkyl 3α-acyloxy-12-oxocholanate.

4,917,829

3,7,11,15-TETRAMETHYL-2,4,6,10,14,-HEXADECAPENTAENDIC ACID

Isao Yamatsu, Kawaguchi; Yuichi Inai, Tokyo; Shinya Abe, Kawagoe; Takeshi Suzuki, Abiko; Yoshikazu Suzuki, Ichinomiya; Osamu Tagaya, Gifu; Kouichi Suzuki, Kakamigahara; Koichi Abe, Fuchu, and Kouji Yamada, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 535,480, Sep. 26, 1983, abandoned, which is a division of Ser. No. 249,245, Mar. 30, 1981, abandoned. This application May 16, 1986, Ser. No. 865,934

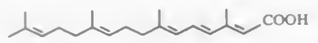
Claims priority, application Japan, Apr. 7, 1980, 55-44558

The portion of the term of this patent subsequent to Apr. 7, 2004, has been disclaimed.

Int. Cl.[4] C07C *57/03;* A61K *31/20*

U.S. Cl. 260—413 3 Claims

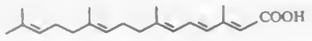
1. 3,7,11,15-Tetramethyl-2,4,6,10,14-hexadecapentaenoic acid of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof.

2. A method of treating precancerous skin conditions which comprises administering to a subject requiring such treatment a therapeutically effective amount of a pharmaceutical composition comprising 3,7,11,15-tetramethyl-2,4,6,10,14-hexadecapentaenoic acid of the formula (I):



(I)

or a pharmaceutically acceptable salt theeof, and a pharmaceutical carrier.

4,917,830

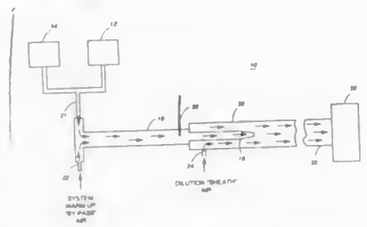
MONODISPERSE AEROSOL GENERATOR

Lawrence W. Ortiz, Los Alamos, N. Mex., and Sidney C. Soderholm, Pittsford, N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 19, 1988, Ser. No. 246,062

Int. Cl.[4] B01F *5/02;* C09K *3/30*

U.S. Cl. 261—18.1 10 Claims



1. A monodisperse aerosol generator comprising:

means for nebulizing an organic liquid having a low vapor pressure and an aqueous solution having a high population of seed nuclei;

vaporization means receiving said nebulized organic liquid and said nebulized solution for flash vaporizing said nebulized organic liquid and said nebulized solution;

condensation means receiving said vaporized nebulized organic liquid and said nebulized solution for condensing vapors of said vaporized nebulized organic liquid onto particles of said vaporized nebulized solution in an atmosphere of slow moving cool air to promote uniform growth of said condensed vapors on said particles; and

means for outputting a monodisperse aerosol comprising said condensed vapors on said particles.

4,917,831

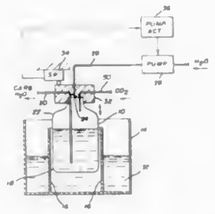
BUOYANT TANK CARBONATOR PUMP CONTROL FOR POST-MIX BEVERAGE APPARATUS

Lawrence B. Ziesel, Marietta, and Robert D. Hughes, Atlanta, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Mar. 29, 1989, Ser. No. 330,175

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—27 20 Claims



1. Carbonator apparatus, comprising:

a first container for holding a predetermined volume of liquid therein;

a second container holding a variable volume of carbonated water resulting from mixing a quantity of water and carbon dioxide, said second container being constrained to move in a vertical direction and floatable in said volume of liquid in said first container;

means for feeding carbon dioxide from an external source into said second container;

control means for feeding water from an external source into said second container to vary said volume of carbonated water and thus the flotation level of said second container in said first container;

means for feeding carbonated water out of said second container; and

means responsive to the flotation level of said second container for causing said control means to maintain the volume of carbonated water at a predetermined quantity.

4,917,832

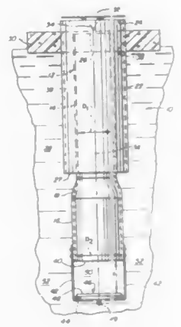
AIR LIFT DIFFUSER

Thomas J. Marcum, Englewood; Troy W. Fieselman, Littleton, and Richard B. Weber, Denver, all of Colo., assignors to Wilfley Weber, Inc., Englewood, Colo.

Filed Feb. 10, 1989, Ser. No. 310,061

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—77 9 Claims



1. An air lift diffuser for aerating a body of water which comprises:

(a) an air lift tube open at its top and bottom ends, said tube being adapted to be supported in a vertical position in said body of water and having a circular transverse cross section and having a predetermined internal diameter at its open bottom end, the interior of said tube being substantially open and substantially free of any obstruction throughout its length;

(b) means for supporting said air lift tube in said vertical position in said body of water;

(c) a gas diffuser adapted to be positioned below said air lift tube, said gas diffuser having a circular, horizontally oriented, fixed non-rotating bubble emitting surface the diameter of which is approximately equal to the internal diameter of the open bottom end of said air lift tube; and

(d) means for supporting said gas diffuser with the bubble emitting surface of the gas diffuser spaced from the open bottom end of the air lift tube a distance equal to approximately ½ to approximately 1½ times the internal diameter of the open bottom end of said air lift tube,

the space between the bubble emitting surface of the gas diffuser and the bottom end of the air lift tube being substantially open and substantially free of any obstruction to the passage of bubbles from the gas diffuser into the open bottom end of the air lift tube, and the space immediately surrounding the space between said air lift tube and said gas diffuser being substantially open and substantially free of any obstruction to the passage of water from said surrounding space into the space between said two members.

4,917,833

METHOD OF MANUFACTURING INFORMATION DISCS FROM A SYNTHETIC MATERIAL BY AN INJECTION MOLDING DEVICE

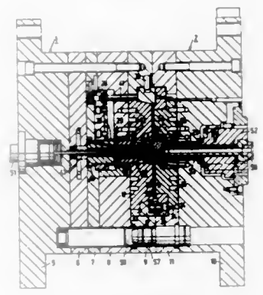
Johannes H. J. Cools, Waalre, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 27, 1988, Ser. No. 211,635

Claims priority, application Netherlands, Jun. 26, 1987, 8701499

Int. Cl.[4] B29C *33/30, 45/26*

U.S. Cl. 264—1.3 5 Claims



1. In a method of manufacturing discs, with an information structure on one side, from a synthetic material by an injection molding device, the injection molding device comprising:

a mold having a first mold section (1) and a second mold section (2) which are movable relative to one another between an open and a closed position, a mold cavity (3) is defined between the mold sections in the closed position, and the synthetic material is injected into the cavity to form said discs,

a flat mirror plate (12) located on the first mold section,

a disc-shaped stamper (16) bounds a first side of the mold cavity and the disc-shaped stamper is detachably secured to the mirror plate (12),

a guard ring (17), detachable from the first mold section, covering the periphery of the stamper (16) in an operating position,

a quick-fastening device (18–20) cooperating with the guard ring (17) for rapidly securing the guard ring to the first mold section in the operating position,

a coupling device (33, 37) coupling the guard ring (17) to the second mold section (2) in the closed position of the mold, and

said stamper (16) being detachably secured to a stamper support (21), the stamper support cooperates with a stamper changer (26–32) provided on the first mold half (1) for changing the stamper when the mold is in the open position and the guard ring (17) is coupled to the second mold section (2),

the method comprising a number of production runs comprising a plurality of production cycles, each production cycle, comprising the following steps: closing the mold, injecting and cooling the synthetic material, opening the mold, and removing the disc, the stamper being changed after every production run, after the stamper is changed a starting run is performed, said starting run comprising a plurality of starting cycles comprising the same steps as the production cycles but yielding a reject product, after the starting run, a next production run commences, the improvement comprising

the automatically controlling of a sequence of successive production runs, stamper changes and starting runs,

each stamper change is carried out within a fixed time interval and comprises the following steps: coupling the guard ring (17) to the second mold section (2) towards the end of

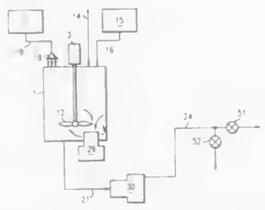
the last production cycle of a production run by actuating the quick-fastening device (18–20) and the coupling device (33, 37), opening the mold releasing the stamper support (21) from the first mold section (1) by actuating the quick-fastening device after removal of the last disc of the production run from the open mold, removing the stamper support with the stamper from the first mold section by a stamper manipulator, positioning a next stamper support with a next stamper on the first mold section by the stamper manipulator, securing said next stamper support to the first mold section by actuating the quick-fastening device, and securing the guard ring to the first mold section by actuating the coupling device and quick-fastening device prior to the beginning of the starting cycle of the next starting run.

4,917,834

METHOD FOR FORMING HOMOGENEOUS BLENDS OF PARTICULATE MATERIALS

Albert F. Hadermann, Ijamsville, Md., and Jerry C. Trippe, Fairfax Station, Va., assignors to General Technology Applications, Inc., Manassas, Va.

Filed Nov. 16, 1988, Ser. No. 271,705
Int. Cl.[4] B29B *9/02*
U.S. Cl. 264—8 27 Claims



1. A method for preparing a homogeneous mixture of finely divided particles of at least two unlike materials, at least one of said materials including fine particle agglomerates, comprising:

forming a slurry of said particulate unlike materials in liquid nitrogen;

subjecting said slurry to agitation and shear forces to break up agglomerates and to maintain individual particles of said materials in a randomly mixed, homogeneous suspension; and stabilizing said homogeneous suspension by removing liquid nitrogen therefrom while maintaining the homogeneity of said suspension.

12. A batch-to-continuous process for compounding mixtures of unlike particulate materials comprising:

preparing a batch of said unlike materials by mixing a predetermined quantity of each of said materials together and suspending said materials as a slurry in liquid nitrogen to form a slurry batch;

subjecting said slurry batch to agitation and shear forces to break up agglomerates and to maintain individual particles of said materials in a randomly mixed, homogeneous suspension;

transferring said homogenized slurry batch to a holding means, said holding means arranged to maintain the homogeneity of said suspension and to prevent settling of particulates;

continuously withdrawing a slurry stream from said holding means and stabilizing said withdrawn slurry stream by removing liquid nitrogen therefrom to form a powder;

preparing a second slurry batch having the same composition as said first slurry batch and subjecting said second batch to agitation and shear forces to break up agglomerates and to maintain individual particles of said materials in a randomly mixed, homogeneous suspension to obtain a second homogenized slurry batch;

transferring said second homogenized slurry batch to said holding means at a time before said first slurry batch has been exhausted by withdrawal of said slurry stream therefrom, and

continuing the preparation of slurry batches at a rate sufficient to provide a continuous slurry stream for stabilization by removal of liquid nitrogen therefrom to form a powder.

4,917,835

PROCESS FOR THE PRODUCTION OF POROUS SHAPED ARTICLES

Anthony M. Lear, Addlestone; Stephen R. Tennison, Weybridge, and Paul W. Satchell, Cardiff, all of United Kingdom, assignors to The British Petroleum Company p.l.c., London, United Kingdom

PCT No. PCT/GB87/00524, § 371 Date Feb. 4, 1988, § 102(e) Date Feb. 4, 1988, PCT Pub. No. WO88/00601, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 22, 1987, Ser. No. 158,270
Claims priority, application United Kingdom, Jul. 22, 1986, 8617831
Int. Cl.[4] B29C *43/00, 67/20*; C01B *31/02*
U.S. Cl. 264—29.1 17 Claims

2. A process for the production of a shaped porous carbon article comprising:

(a) partially curing a phenolic resin mixture to a solid form,

(b) comminuting the partially cured solid to form particles,

(c) forming the resulting ground solid into a pre-determined shape,

(d) sintering the shaped solid so as to produce a form-stable sintered product, and

(e) carbonizing the shaped article, the temperature and duration of the partial curing step (a) being so selected as to give a degree of partial cure sufficient to give a sinterable product in step (d).

4,917,836

PROCESS FOR PRODUCING HIGH-STRENGTH, HIGH-MODULUS CARBON FIBERS

Shoji Yamane; Tomitake Higuchi, and Katsumi Yamasaka, all of Ehime, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 929,466, Nov. 12, 1986, abandoned. This application Oct. 27, 1988, Ser. No. 265,341
Claims priority, application Japan, Nov. 18, 1985, 60-256730; Nov. 18, 1985, 60-256731
Int. Cl.[4] D01F *6/18, 9/22*
U.S. Cl. 264—29.2 5 Claims

1. A process for producing carbon fibers, comprising the steps of first extruding a solution of an acrylonitrile polymer comprising 99 wt. % or more of acrylonitrile units through a spinneret provided over the liquid surface of a coagulating bath into an inert atmosphere; then introducing the resultant filaments into said coagulating bath to effect coagulation for formation of swollen filaments having therein voids; then drawing said swollen filaments in at least two drawing baths which have successively elevated temperatures to provide a mean void size in filaments of 100 Å or smaller; applying an oil to the multistep drawn filaments; drying the oil-applied filaments to collapse the same; further drawing the collapsed filaments at a temperature of 100° C. or higher to provide an overall draw ratio, including a draw ratio in said multistep drawing, of at least 7 for formation of drawn filaments having a tensile strength at 240° C. of 0.3 g/d or higher and a tensile modulus at 240° C. of 2.0 g/d or higher; heating said drawn filaments in an oxidizing atmosphere of 200° to 300° C. under tension of 0.2 g/d or higher to convert the same into oxidized filaments; heating said oxidized filaments in an inert atmosphere of 300° to 900° C. under a tension to effect preliminary carbonization thereof; and further heating the preliminary carbonized filaments in an inert atmosphere of 1,000° to 1,500° C. to complete carbonization thereof.

4,917,837

GYPSUM-BASED INSECTICIDE PELLETS AND METHOD OF MANUFACTURE

John L. Clarke, Jr., 402 Fairbank Rd., Riverside, Ill. 60546

Continuation-in-part of Ser. No. 904,905, Sep. 8, 1986, abandoned. This application Nov. 25, 1987, Ser. No. 125,150
Int. Cl.[4] B29B *9/08*
U.S. Cl. 264—37 11 Claims

1. A method for forming a gypsum-based pesticide pellet of a size and weight to be machine distributable and having a release time for the pesticide which is determined at least in part by the size of the pellet, and which will release a pesticide generally uniformly over the life of the pellet, and in which the gypsum is a solid formed by the bonding of plaster of Paris and water, comprising the steps of:

(a) thoroughly mixing a pesticide, plaster of Paris and water with the amount of water being no greater than a minimum required to completely set the plaster of Paris into gypsum so that substantially all water is absorbed in the chemical reaction between the plaster of Paris and water and with a mixing time of no greater than about five seconds,

(b) using high pressure to introduce the mixture into a pellet mill or briquet-making machine which forms the mixture into a pellet having a size and shape to be machine distributable prior to setting of the mixture, and

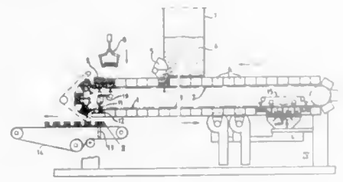
(c) screening the pellet for size and drying.

4,917,838

METHOD OF MANUFACTURING GREEN BRICKS WITH SMOOTH SIDE SURFACES

Henricus G. R. Rensen, Bemmel, Netherlands, assignor to Machinefabriek De Boer B.V., Nijmegen, Netherlands

Continuation of Ser. No. 147,496, Jan. 25, 1988, abandoned, which is a division of Ser. No. 59,009, Jun. 8, 1987, Pat. No. 4,832,587. This application Sep. 19, 1989, Ser. No. 409,286
Claims priority, application Netherlands, Jun. 25, 1986, 8601671
Int. Cl.[4] B28B *3/05, 5/00, 7/10, 7/36*
U.S. Cl. 264—39 1 Claim



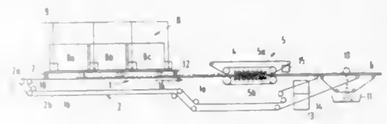
1. Method for manufacturing green bricks with smooth side surfaces, using a mould container with side walls and a movable bottom, comprising washing said mould container with excess water such that said side walls of said mould container are moistened, and while keeping said side walls moist placing a releasing material layer of sand or sawdust only on said movable bottom and then filling said mould container with clay, then trimming excess clay from said mould container, and moving said bottom so that it is virtually outside said mould container while said side walls are kept moist to form a green brick with smooth side surfaces due to the absence of said releasing material layer on said moist side walls.

4,917,839

METHOD FOR CONTINUOUSLY PRODUCING MOLDED MEMBERS

Jörg Bold, Kaiserslautern, Fed. Rep. of Germany, assignor to "Wurtex" Maschinenbau Hofmann GmbH & Co., Uhingen, Fed. Rep. of Germany

Filed Jun. 6, 1988, Ser. No. 203,475
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1987, 3719128
Int. Cl.[4] B29C *43/48*
U.S. Cl. 264—39 3 Claims



1. A method of continuously producing molded members from a mixture of binder and fibrous material, including the steps of:

providing a molding belt that has lateral edges for supporting the edges of said molded member that is to be formed;

covering each of said lateral edges of said molding belt by loosely placing thereon a horizontal respective cover belt;

then dispersing said binder and fibrous material mixture on said molding belt and its cover belts;

moving said cover belts along with said molding belt in the direction of travel of, and at the same speed as, said molding belt to avoid any relative shifting between the cover belts and the molding belt;

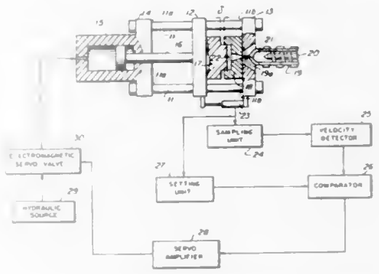
then, while said mixture rests on said molding belt and its cover belts, compacting said mixture to form said molded member; removing said cover belts from said molding belt after said compacting of said molded member, subsequently cleaning said cover belts, and then again placing said cover belts on said molding belt prior to a zone where said dispersing occurs.

4,917,840

MOLD COMPRESSION CONTROL PROCESS FOR AN INJECTION MOLDING MACHINE AND APPARATUS THEREOF

Susumu Harada, and Hideo Tanaka, both of Mishima, Japan, assignors to Toshiba Machine Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 79,425, Jul. 30, 1987, abandoned. This application Jan. 25, 1989, Ser. No. 300,720
Claims priority, application Japan, Jul. 30, 1986, 61-179575; Aug. 13, 1986, 61-189849
Int. Cl.[4] B29C *45/80*
U.S. Cl. 264—40.5 4 Claims



1. A method for controlling the compression of molten resin

in a cavity in an injection molding machine, said injection molding machine having a moving die plate and a fixed die plate, said moving die plate having a first mold die half mounted thereon and said fixed die plate having a second mold die half mounted thereon, said method comprising the steps of:

moving said moving die plate to a predetermined position to form a compression gap between said first mold die half and said second mold die half;

then injecting said molten resin into said cavity; and

then moving said moving die plate at velocities controlled to predetermined values with respect to a plurality of positions of said moving die plate in a range of said compression gap.

4,917,841

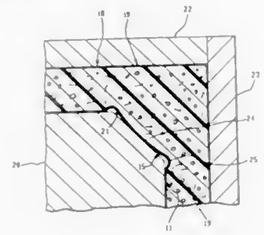
METHOD OF MAKING A REFRIGERATOR CABINET LINER HAVING NON-CRINKLED CORNERS

Thomas E. Jenkins, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 7, 1988, Ser. No. 254,732

Int. Cl.[4] B29C *67/22*

U.S. Cl. 264—46.5 **12 Claims**



1. A method of forming each corner of intersecting walls of a very thin structure of a vacuum formed plastic to avoid crinkling of each corner because of movement of the structure due to its thinness when pressure is applied to the outer structure of the structure during foaming of a liquid foam including:

forming each corner of the intersecting walls of the structure with a flat surface during vacuum forming of the structure;

disposing the vacuum formed structure with its inner structure in spaced relation to a foam plug having a flat surface at each corner corresponding to the flat surface at each corner of the vacuum formed structure so as to have a predetermined clearance therebetween;

disposing the vacuum formed structure with its outer surface in spaced relation to a casing to form a space therebetween;

and supplying a liquid foam into the space between the vacuum formed structure and the casing so that the liquid foam converts into plastic foam during foaming to adhere the plastic foam to the outer surface of the vacuum formed structure and the inner surface of the casing with the foaming pressure on the outer surface of the vacuum formed structure causing movement of the inner surface of the vacuum formed structure against the foam plug including the flat surface of each corner of the vacuum formed structure engaging the corresponding flat surface of the foam plug so that the flat surface of each corner of the vacuum formed structure is placed in tension to avoid crinkling of each corner of the vacuum formed structure.

4,917,842

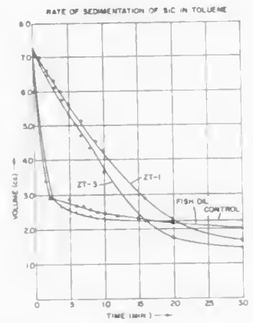
PROCESS OF MAKING CERAMICS

Janie K. Currie, Russell; Roman Loza, Solon, and Eleanor J. Fendler, Hudson, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Feb. 12, 1988, Ser. No. 155,659

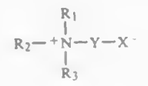
Int. Cl.[4] C04B *33/28*

U.S. Cl. 264—56 **3 Claims**



1. A process for preparing a finished ceramic article comprising:

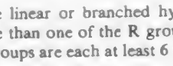
(a) apply a slip composition comprising a mixture of inorganic particulate material, an organic solvent and a dispersant for said particulate material having the structure set forth below:



where

R_1, R_2, R_3 are linear or branched hydrocarbon chains, where no more than one of the R groups is CH_3 and the remaining R groups are each at least 6 to 30 carbon atoms long;

Y is selected from the group consisting of $(CH_2)_n$ where n=1 to 10 and



where m=1 to 5; and X is selected from the group consisting of COO^{31}, SO_3^-, $PO_3^=$to a substrate;

(b) drying said slip composition to remove said organic solvent to produce a dried unfired ceramic film on said substate;

(c) removing said dried film from said substrate; and

(d) firing said dried film at an elevated temperature to produce the finished ceramic article.

4,917,843

PROCESS FOR JOINING MOLDED SILICON NITRIDE PARTS

Ernö Gyarmati, Jülich, Fed. Rep. of Germany, and Xiliang Qiu, Beijing, China, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Julich, Fed. Rep. of Germany

Filed Oct. 30, 1987, Ser. No. 115,775

Int. Cl.[4] C04B *35/58*

U.S. Cl. 264—60 **22 Claims**

1. Process for joining together, by hot pressing, first and second molded parts each having a silicon nitride surface at least in the portion of each said part which is intended to be joined to the other said part, comprising the steps of:

polishing at least said portions of said molded silicon nitride surfaces which are to be joined together, for reducing surface roughness;

applying sputtering a silicon nitride layer having a nitrogen content exceeding the Si_3N_4 stoichiometric ratio on at least one of said surface portions which are to be joined together, and

hot pressing together said surface portions which are to be joined with provision between said surface portions of a complementary nitrogen deficiency relative to silicon for establishment of an at least approximate stoichiometric ratio of nitrogen to silicon in a and cross a resulting joint by diffusive migration during hot pressing.

4,917,844

METHOD OF MANUFACTURING LAMINATE PRODUCT

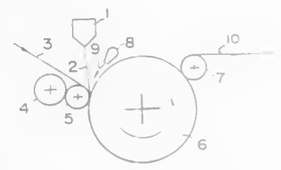
Toshiya Komai; Sei Kawahara, and Mitsuhiro Ikeda, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 31, 1988, Ser. No. 176,053

Claims priority, application Japan, Apr. 1, 1987, 62-77552

Int. Cl.[4] B129C *47/88*

U.S. Cl. 264—85 **10 Claims**



1. A method of manufacturing laminate products wherein when a laminate product is manufactured by extruding a thermoplastic resin on a substrate for coating, a space enclosed between a member for cooling the thermoplastic resin and a non-cooled thermoplastic resin film is kept within an atmosphere containing a gas having a high permeability with respect to the thermoplastic resin film.

4,917,845

PREPARATION OF ULTRA-HIGH MOLECLAR WEIGHT POLYESTER

Gerald Cohn, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 176,554, Apr. 1, 1988, Pat. No. 4,792,573. This application Dec. 19, 1988, Ser. No. 285,928

The portion of the term of this patent subsequent to Dec. 20, 2005, has been disclaimed.

Int. Cl.[4] B29C *43/00*; C08J *9/28*

U.S. Cl. 264—109 **19 Claims**

1. A process for preparing porous pills which can be solid state polymerized at a very rapid rate into high molecular weight polyester resin which comprises: (1) dissolving a polyester prepolymer in a suitable organic solvent: (2) recovering the polyester prepolymer from the organic solvent to produce a porous, fibrous mass of the polyester prepolymer; and (3) compacting the porous, fibrous mass into the porous pills.

4,917,846

METHOD OF MANUFACTURING A PLURALITY OF ROTATIONAL MEMBERS

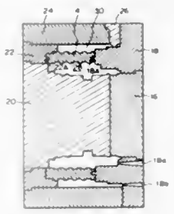
Hiromori Takase, Kawasaki, and Shigeru Kamata, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 862,660, May 13, 1986, abandoned. This application Apr. 18, 1988, Ser. No. 185,266

Claims priority, application Japan, May 21, 1985, 60-109056; May 22, 1985, 60-109637; May 7, 1986, 61-104315

Int. Cl.[4] B29C *45/44*

U.S. Cl. 264—130 **5 Claims**



1. A method of manufacturing a rotational cylinder unit, which comprises a first rotational member having rotationally engaging portions in outer and inner peripheral portions, a second rotational member for rotationally engaging the outer peripheral portion of the first rotational member, and a third rotational member for rotationally engaging the inner peripheral portion of the first rotational member, and which is constructed by engaging the first, second and third rotational member, comprising the steps of:

fixing a clearance generating member made of soluble material on the outer periphery of the first rotational member;

forming a mold to generate the second and third rotational members, wherein the mold cooperates with the first rotational member fixed with the clearance generating member and has a formation member for forming outer and inner cavities separated by the first rotational member to mold the second and third rotational members, respectively;

injecting resin into the cavities to form the second and third rotational members;

generating a clearance between the rotationally engaging portions of the first rotational member and the second rotational member by eliminating the clearance generating member therebetween to enable rotational movement between the first and secor ¹ rotational members, and

wherein a clearance between the rotationally engaging portions of the first rotational member and the third rotational member is formed by shrinkage to enable rotational movement therebetween.

4,917,847

METHOD OF MAKING A REVERSE OSMOSIS ELEMENT

Donald F. Solomon, Hemet, Calif., assignor to Wetco of Delaware, Inc., Decatur, Ga.

Division of Ser. No. 74,570, Jul. 17, 1987, Pat. No. 4,844,805. This application Apr. 14, 1989, Ser. No. 338,880

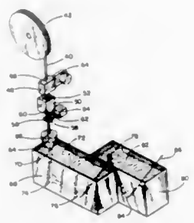
Int. Cl.[4] B29C *47/02, 53/04*; B32B *31/30*

U.S. Cl. 264—134 **4 Claims**

1. A method of manufacturing a reverse osmosis element comprising an elongate backing member having three dimensional porosity and coated with a semipermeable membrane comprising passing a continuous length of backing material comprising a thin flexible strip of thermoplastic material having three dimensional porosity through a heating element,

forming the heated material to a desired curved cross-section, continuously extruding a film of fluid semi-permea-

ble membrane forming material onto the backing material, passing coated backing material sequentially through a



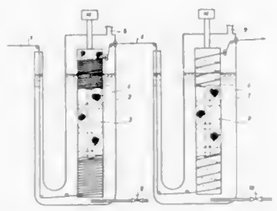
cooling bath and a heating bath, and cutting the continuous material into a plurality of elements.

4,917,848

PROCESS FOR PRODUCING POLYESTER FIBERS

Kazuo Kurita; Youichi Watanabe, and Susumu Tate, all of Ootsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Jan. 10, 1989, Ser. No. 295,524
Claims priority, application Japan, Jan. 13, 1988, 63-6566
Int. Cl.[4] D01F *11/08*
U.S. Cl. 264—184 3 Claims



1. A process for producing polyester fibers of high tenacity and high modulus, which comprises

melt-spinning a polyester having an intrinsic viscosity, measured in a mixed solvent of p-chlorophenol/tetrachlorethane=3/1 at 30° C., of not lower than 0.3, to obtain extruded filaments of low orientation having a birefringence not higher than 10.0×10^{-3},

post-polymerizing the filaments in a heating medium at a temperature of 100° to 250° C., and

subjecting the post-polymerized filaments to multi-stage drawing at a total draw ratio of more than 6 times in at least two stages, wherein the first stage drawing is at a temperature below the melt-down temperature of the filaments in a swollen state by the heating medium and above 0° C., and the second stage drawing is at a temperature above the drawing temperature of the first stage drawing +20° C. and below the melting point of the polyester.

4,917,849

PROCESS FOR PREPARING IONOMERS

Jeffrey A. Jones, and Manfred Heimberg, both of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Oct. 26, 1987, Ser. No. 112,586
Int. Cl.[4] D01F *6/34, 6/36*
U.S. Cl. 264—211.24 22 Claims

1. A process for preparing an ionomer comprising:

(a) contacting a vinyl acetate polymer with a metal hydroxide at a temperature in the range of between about 160° C. and about 200° C. under shear, said metal of said hydroxide selected from the group consisting of alkali metals and alkaline earth metals; and

(b) reacting the product of step (a) with a polymer having carboxylic acid or diacid anhydride functionality.

4,917,850

POLYURETHANE ELASTIC GLOVE HAVING IMPROVED PUNCTURE AND TEAR RESISTANCE

Norman Gray, Cary, N.C., assignor to Aukland Group (USA), Inc., Cary, N.C.

Filed Oct. 13, 1988, Ser. No. 257,450
Int. Cl.[4] C08G *18/66*
U.S. Cl. 264—301 8 Claims

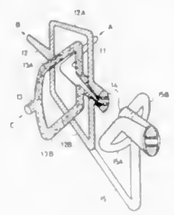
1. A method for the manufacture of a polyurethane glove and the like having improved tear and puncture resistance which comprises preparing a solution in an organic solvent of a polyurethane composition which is the thermoplastic reaction product of an aliphatic diisocyanate, a high molecular weight aliphatic polyether diol having a molecular weight in the range of about 1,000 to about 5,000, and a low molecular weight aliphatic diol containing about 2 to about 6 carbon atoms, immersing a glove form in the solution of the polyurethane composition to form a coating of the polyurethane on the form, withdrawing the form from the solution, evaporating the solvent from the coating to form a solid film of the polyurethane composition on the form and then removing the film from the form to provide a glove having superior tear and puncture resistance properties.

4,917,851

METHOD OF MANUFACTURING MULTI-LAYER RESIN MATERIAL

Toyokazu Yamada, Chiba; Masao Miyama, Ichihara; Hideo Sugimura, Kisarazu, and Takeshi Shinohara, Chiba, all of Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed May 22, 1986, Ser. No. 866,187
Claims priority, application Japan, Jun. 10, 1985, 60-125930
Int. Cl.[4] B29C *47/06, 47/12, 47/92;* B32B *31/30*
U.S. Cl. 264—40.7 10 Claims



1. A method of manufacturing a multi-layer resin material having at least one inner layer and two outer layers, said method comprising the steps of:

extruding at least two different kinds of thermoplastic resins from coextrusion apparatus and feeding the resins to a feed block, to form said multi-layer resin material, and thence to a T-die;

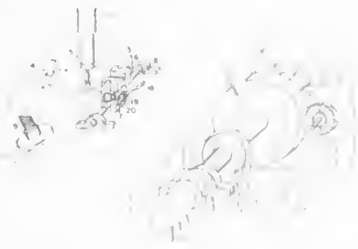
joining through the same flow path as the resin for said outer layers an auxiliary resin, which is substantially the same as a resin for said outer layers, to both lateral edges of multi-layer resins within the feed block of said coextrusion apparatus, said feed block having an input end section defined on the end thereof to which the resins are supplied and a terminating end section defined on the end thereof from which the resins are supplied to said T-die, said joining of said auxiliary resin occurring at the terminating end section of said feed block after said inner and outer layers have been laid up one on the other so that said lateral edges of the multi-layer resin material are defined before entering the T-die and are made substantially of a single resin.

4,917,852

METHOD AND APPARATUS FOR RAPID SOLIDIFICATION

John W. Poole, Bow, N.H.; Merton C. Flemings, Cambridge, Mass.; Thomas A. Gaspar, Columbus, Ohio, and Matthew A. Simpson, Manchester, N.H., assignors to Norton Company, Worcester, Mass.

Filed Apr. 29, 1988, Ser. No. 188,584
Int. Cl.[4] B29B *9/10*
U.S. Cl. 264—500 2 Claims



1. A process for rapid solidification of a melted ceramic multi-phase solidifying composition (MPSC), comprising steps of:

(a) providing a solid moving chilling surface maintained at a temperature sufficiently low to cause solidification of any liquid MPSC in direct contact with said chilling surface; wherein said chilling surface is in the form of a surface of rotation having a heat conductivity of less than 2 joules per second per square centimeter of area per centimeter of thickness per degree Celsius,

(b) providing a propelling gas outlet comprising a reservoir having in part of its defining wall an exit zone at least five times wider than its own local height;

(c) supplying to said reservoir a sufficiently rapid flow of a propelling gas to maintain a continuous flow of said propelling gas through said exit zone at a propelling velocity of at least 200 meters per second as measured along the direction line providing the shortest distance between any part of said exit zone and said moving chilling surfaces;

(d) introducing into the flow of propelling gas between said exit zone and said chilling surface a quantity of liquid MPSC, having a width no more than four-fifths of the width of said exit zone, that will be atomized to a plurality of fine liquid MPSC droplets by the flow of propelling gas between said exit zone and said chilling surface;

(e) conveying said fine liquid MPSC droplets in said flow of propelling gas at a velocity that causes them to impinge, while still at least partially liquid, against said chilling surface, and after at least partial solidification thereon, to be detached from said chilling surface as small discrete bodies, and

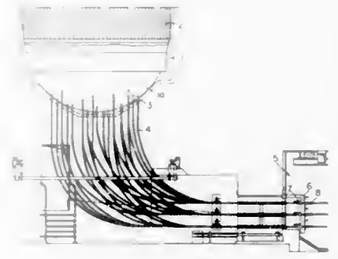
(f) collecting the small discrete bodies.

4,917,853

PIPE FOR SUPPORTING AND POSITIONING MEASURING DEVICES IN THE CORE OF A NUCLEAR REACTOR

René Feurgard, La Celle Saint-Cloud, France, assignor to Framatome, Courbevoie, France

Filed Nov. 25, 1987, Ser. No. 125,509
Claims priority, application France, Nov. 26, 1986, 86 16505
Int. Cl.[4] G21C *17/00, 19/22*
U.S. Cl. 376—255 5 Claims



1. In a pressurized water nuclear reactor comprising a reactor vessel, a core placed in the reactor vessel, a measuring room, a plurality of guide tubes connecting the reactor vessel to the measuring room, a plurality of measuring pipes, each measuring pipe being mounted in a guide tube to be displaceable longitudinally inside the guide tube and comprising a tubular outer shroud, a central sheath arranged coaxially inside the shroud as a guiding element of a movable probe for measuring neutron flux, measuring devices placed in the tubular shroud around the central sheath, in fixed positions distributed along the length of the measuring pipe, and conductors connected to the measuring devices and placed longitudinally along the measuring pipe, the improvement consisting of measuring pipes in which the tubular shroud comprises a plurality of components of tubular shape, called spacers, each of said spacers being machined internally to receive a set of measuring devices placed in a predetermined position along the length of the measuring pipe and successive sections of flexible tubing, an initial section of said tubing having a first end inside the measuring room and a second end connected to a first spacer, intermediate sections each connecting two successive spacers and a final section placed beyond a final spacer which is furthest away from the initial section and open at its free end, and in which the tubular shroud comprises additionally openings in its side wall, in locations distributed at intervals along the length of the measuring pipe.

4,917,854

METHOD AND ARRANGEMENT FOR CONSOLIDATING AND STORING NOZZLES REMOVED FROM NUCLEAR FUEL ASSEMBLIES

William G. Cole, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 26, 1988, Ser. No. 236,719
Int. Cl.[4] G21C *19/00*
U.S. Cl. 376—272 13 Claims

13. A consolidated stack of nozzles from nuclear reactor fuel assemblies comprising:

a. a plurality of like nozzles removed from nuclear reactor fuel assemblies, each of which has a planar side, an oppositely facing nonplanar side and a plurality of apertures extending from said planar side to said nonplanar side;

b. spacer plates having at least two holes at positions matched to corresponding apertures in the nozzles;

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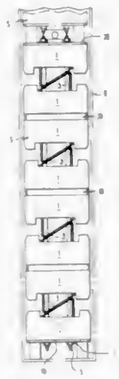
c. end plates having at least two holes at positions matched to corresponding apertures in the nozzles; and

d. tie rods;

wherein said nozzles are arranged in pairs of nozzles having nonplanar sides directed toward each other; wherein said pairs of nozzles are stacked one upon another with a respective one of the spacer plates being disposed between facing planar sides



of adjoining pairs and with at least two apertures of the stacked nozzles being in alignment with each other and with the holes in the spacer plates; wherein an end plate is disposed on the top and on the bottom of the stacked nozzles with the holes of the end plates aligned with the apertures of the nozzles; and wherein said tie rods are inserted through the aligned holes and apertures and clamp the stacked nozzles between said end plates.

4,917,855

APPARATUS FOR THE SHUTDOWN OF A HIGH TEMPERATURE NUCLEAR REACTOR

Ralf Faber, Juelich; Hubert Handel, Rimbach; Reinhard Mauersberger, Juelich; Josef Schoening, Hambruecken, and Hermann Schmitt, Winnweiler, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Dortmund, Fed. Rep. of Germany

Filed Feb. 11, 1988, Ser. No. 155,130

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1987, 3704746

Int. Cl.[4] G21C *7/12*

U.S. Cl. 376—338 **20 Claims**

1. An apparatus for the shutdown of a high temperature nuclear reactor having a cylindrical core filled with a bed of fuel elements and surrounded by a side reflector and a pressure vessel, said apparatus comprising:

a plurality of horizontal, nose-shaped projections extending from said side reflector into said core and having a vertical passage through each of said projections, whereby the vertical passages of vertically adjacent projections are aligned to form a vertical channel having a top end and a bottom end, said channel having a predetermined volume;

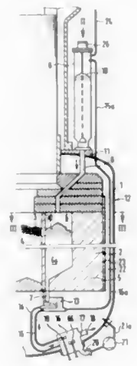
a plurality of elevated reservoirs of absorber material elements located above said plurality of horizontal, nose-shaped projections and

communicating with said vertical passages through a feed line between said reservoir and said passage;

a redundantly controlled release device located between said reservoir and said feed line;

element removal tubes connected to said bottom ends of said vertical passages;

means for controlling absorber material element removal from said vertical channel and transporting removed absorber material elements to said reservoir connected to said element removal tubes; and



wherein said predetermined volume of said vertical channel is sufficient to hold enough absorber material elements to shut down said nuclear reactor.

4,917,856

SELF-LATCHING REACTIVITY-REDUCING DEVICE FOR USE IN ON-SITE SPENT FUEL ASSEMBLY STORAGE

Donald E. Mueller, Plum Boro, and William A. Boyd, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 8, 1988, Ser. No. 281,148

Int. Cl.[4] G21C *3/32, 7/06*

U.S. Cl. 376—447 **7 Claims**

1. In combination with a fuel assembly having top and bottom nozzles, an array of fuel rods extending between said nozzles, and a plurality of guide thimbles extending between and attached at their opposite upper and lower end portions to said nozzles, a reactivity-reducing device comprising:

(a) an elongated rod having leading and trailing ends and containing neutron absorbing material and a central passage extending between and open at said ends, and said rod being inserted fully in one of said guide thimbles to place its trailing end adjacent said top nozzle and said guide thimble upper end portion and its leading end adjacent said bottom nozzle and said guide thimble lower end portion, said rod being insertable into said guide thimble solely through said top nozzle;

(b) means mounted at said leading end of said rod for self-latching with said lower end portion of said guide thimble upon full insertion of said rod in said guide thimble so as to render said self-latching means unlatchable from said guide thimble without the use of an independent tool inserted solely through said passage of said rod from said trailing end thereof, said lower end portion of said guide thimble having means for permitting engagement of said lower end portion of said guide thimble with said self-latching means, said self-latching means and said means for permitting being so constructed as to prevent unlatching of said self-latching means upon rotation or axial movement of said rod; and

(c) means removably attached to said trailing end of said rod for closing said passage therethrough and rendering said self-latching means at said opposite leading end of said rod inaccessible by the independent tool from said trailing end of said rod such that said rod is non-removably installed in said guide thimble.

4,917,857

PROCESS FOR PRODUCING METALLIC OR CERAMIC HOLLOW-SPHERE BODIES

Manfred Jaeckel, Loxstedt, and Hartmuth Smigilski, Hamburg, both of Fed. Rep. of Germany, assignors to Norddeutsche Affinerie Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Jul. 12, 1988, Ser. No. 218,239

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1987, 3724156

Int. Cl.[4] B22F *7/02*

U.S. Cl. 419—9 **10 Claims**

1. A process for producing metallic or ceramic hollow spheres which comprises the steps of:

(a) agitating, in a fluidized bed reactor, particles of expanded polystyrene with an aqueous suspension which contains dissolved or suspended or organic binder and metallic and/or ceramic powder particles, whereby a coating is formed on said expanded polystyrene particles;

(b) drying said coating;

(c) pyrolyzing the expanded polystyrene of said particles and at least part of the binder at a temperature from 400° to 500° C. form hollow spheres; and

(d) sintering the metallic or ceramic hollow spheres at a temperature from 1000° to 1500° C.

4,917,858

METHOD FOR PRODUCING TITANIUM ALUMINIDE FOIL

Daniel Eylon, Dayton, and Francis H. Froes, Xenia, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 1, 1989, Ser. No. 387,925

Int. Cl.[4] B22F *3/24*

U.S. Cl. 419—28 **11 Claims**

1. A method for producing a titanium aluminide alloy foil comprising the steps of:

(a) providing a preselected quantity of blended elemental powder including substantially chloride free unalloyed titanium and aluminum in preselected proportions;

(b) rolling said powder to predetermined thickness to form a foil of a titanium-aluminum alloy in said preselected proportions of elemental powder;

(c) sintering said foil; and

hot pressing said foil to densify said foil to substantially 100% theoretical density of said alloy.

4,917,859

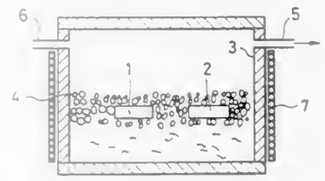
DEWAXING PROCESS FOR METAL POWDER COMPACTS MADE BY INJECTION MOLDING

Kazunori Hamo, Chiba, Japan, assignor to Mitsubishi Steel Mfg. Co., Ltd., Tokyo, Japan

Filed Sep. 6, 1989, Ser. No. 403,458

Int. Cl.[4] B22F *1/00*

U.S. Cl. 419—36 **1 Claim**



1. A dewaxing process for a metal powder compact made by injection molding, the process comprising the steps of:

embedding in alumina powder a compact made by injection molding a mixed molding material consisting of metal powder and an organic binder including low melting point substances;

heating said embedded compact to a temperature of 200° C. in a chemically inert atmosphere in a dewaxing furnace, thereby removing said low melting point substances incorporated into said organic binder from said compact without causing deformation of said compact;

placing said compact in a closed sintering vessel so as to keep the surrounding temperature of said compact constant and disposing said vessel in a vacuum furnace;

evacuating said vacuum furnace; and

removing said organic binder by heating to a temperature of 550° to 650° C. at a heating rate of 300° to 600° C./hr while supplying an inert gas into said vacuum furnace.

4,917,860

CORROSION RESISTANT ALLOY

John H. Culling, St. Louis, Mo., assignor to Carondelet Foundry Company, St. Louis, Mo.

Filed Jan. 10, 1989, Ser. No: 295,275

Int. Cl.[4] C22C *38/42, 38/44*

U.S. Cl. 420—49 **12 Claims**

1. An alloy which is hardenable and castable and has good corrosion resistance to hot concentrated sulfuric acid consisting essentially of:

Nickel	4–18.5% by weight
Chromium	24–30%
Molybdenum	0.3–1%
Copper	2.7–4.5%
Silicon	2.7–4.5%
Manganese	up to about 1.5%
Nitrogen	up to about 0.25%
Carbon	up to about 0.08%
Vanadium	up to about 0.35%
Columbium	up to about 0.8%
Tantalum	yp to about 1.0%
Titanium	up to about 0.6%
Tungsten	up to about 0.8%
Boron	up to about 0.007%
Iron	essentially balance

provided, however, that when carbon exceeds about 0.03%, the minimum proportion of one or more of vanadium, columbium, tantalum and titanium contained in said alloy, up to the percentages set forth above, is determined according to the equation:

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$$\%C - 0.03\% = \frac{\%\ V}{5.5} + \frac{\%\ Cb}{10} + \frac{\%\ Ta}{20} + \frac{\%\ Ti}{5}$$

4,917,861

PALLADIUM ALLOY CONTAINING GERMANIUM AND/OR LITHIUM AND DENTAL RESTORATIONS UTILIZING SAME

Stephen P. Schaffer, Hamburg, and Patrick J. McCabe, Tonawanda, both of N.Y., assignors to Pierce & Stevens Corporation, Buffalo, N.Y.

Filed Nov. 15, 1988, Ser. No. 271,578
Int. Cl.[4] C22C *5/04*
U.S. Cl. 420—463 7 Claims

1. A dental alloy having exceptional high temperature strength consisting essentially of:
a. 50–85 percent by weight palladium;
b. 5–40 percent by weight of at least one metal selected from the group of cobalt and copper;
c. 1–15 percent by weight gallium;
d. up to 5 percent by weight of a modifier selected from the group consisting of nickel, gold, indium, ruthenium, tin and mixtures thereof;
e. from about 0.01 up to about 0.05 percent by weight of an oxygen scavenging component which is a member selected from the group consisting of germanium, lithium, and mixtures thereof; and
f. up to 0.5 percent by weight of a grain refiner selected from the group consisting of rhenium, iridium, and mixtures thereof, said alloy having an exceptional high temperature strength characterized by a sag test value of less than 1 mm at a firing temperature of 950–1000° C., and further having a coefficient of thermal expansion of about $13.8–15\times10^{-6}$in/in/°C., a solidus temperature of at least 1100° C., a liquidus temperature of not more than 1400° C., Vickers hardness greater than 150, offset yield strength at 0.1 percent offset of greater than 40,000 p.s.i., and tensile elongation greater than 6 percent.

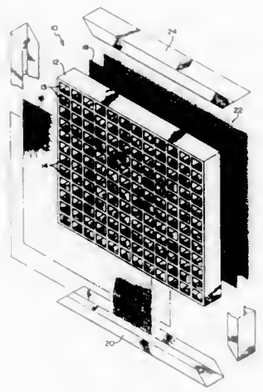
4,917,862

FILTER AND METHOD FOR REMOVING MERCURY, BACTERIA, PATHOGENS AND OTHER VAPORS FROM GAS

Allan Kraw, and Carol A. Kraw, both of 10238 Gelfand Pl., Albuquerque, N. Mex. 87114

Filed Apr. 15, 1988, Ser. No. 182,244
Int. Cl.[4] A61L *9/00*
U.S. Cl. 422—4 12 Claims

12. A method of collecting contaminants including particulates, bacteria, pathogens, mercury and other vapors from contaminated gas, said method comprising:
attaching a filter assembly to a heating, ventilating and air conditioning system so that air being recirculated through the system flows through the assembly, said filter assembly having at least one container including a plurality of cells partially filled with activated carbon pellets adapted to swirl when gas flows therethrough and at least one germicidal lamp; and
flowing contaminated gas from an upstream position to a downstream position though the filter, thereby swirling the pellets contained therein, and eventually exposing substantially all of the surface of the pellets to the contaminated gas to effect removal of the contaminants by the filter.



4,917,863

COLORIMETRIC GAS MEASURING DEVICE FOR CHLOROSILANES

Wolfgang Bäther, Lübeck, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck

Filed Sep. 1, 1988, Ser. No. 239,382
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1987, 3729078
Int. Cl.[4] G01T *1/48*
U.S. Cl. 422—58 18 Claims

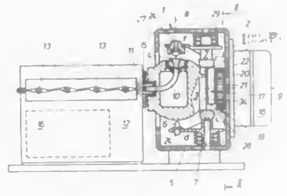
1. A colorimetric gas measuring device for detecting chlorosilanes in an air sample, the device comprising:
a housing having an openable inlet end and an openable outlet end so as to permit a flow of the air sample therethrough;
a porous substrate disposed in said housing and accessible to the air sample entering the housing at said inlet end to be investigated as to the presence of chlorosilanes;
said substrate being a conversion zone defined by unimpregnated silica gel for reacting directly with the chlorosilanes to form a detectable substance; and,
a carrier impregnated with an acid indicator disposed downstream of said substrate to define a detection zone wherein said detectable substance reacts with said acid indicator to provide a colorimetric indication of the presence of the chlorosilanes.

4,917,864

DEVICE FOR FEEDING AN ANALYZING APPARATUS

Hermann Marsoner, Steinberg, and Erich Kleinhappl, Graz, both of Austria, assignors to AVL AG, Austria

Filed May 11, 1988, Ser. No. 192,615
Claims priority, application Austria, May 12, 1987, A1204/87
Int. Cl.[4] G01N *35/00*
U.S. Cl. 422—63 10 Claims



1. A device for alternatively feeding an analyzing apparatus with liquid or gaseous sample, reference or cleansing media, comprising a sample receiving means defining a sample input opening on a circumferential surface of a supporting piece, a feeder unit disposed about said sample receiving means with fittings for said liquid or gaseous sample, reference or cleansing media to be introduced, wherein said feeder unit has an inner circumference which is provided with guide elements carrying insertable input elements and wherein said sample input opening located on said supporting piece is rotationally symmetric with said feeder unit, and a control unit rotating said supporting piece to position one of said input elements in alignment with and radially outward from said sample input opening wherein said control unit during alignment inserts said input element sealingly into said sample input opening by an axial displacement of said guide element parallel to said sample input opening.

4,917,865

ANALYSIS DEVICE

William A. Romanauskas, Southbury, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 908,046, Sep. 16, 1986, Pat. No. 4,762,683. This application Dec. 28, 1987, Ser. No. 138,037
Int. Cl.[4] G01N *9/30*
U.S. Cl. 422—72 4 Claims

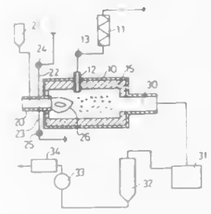
1. A centrifugal device for analyzing liquid samples comprising a rotor having an axis of rotation, said rotor comprising:
means for receiving a first fluid sample in the rotor,
means for holding a plurality of reagents in interiors of a plurality of separate cells, and
means for inletting fluid from the receiving means through hydrophilic capillaries to the cell interiors, wherein the inletting means further comprises inlet hydrophobic capillaries between the hydrophilic capillaries and the cell interiors.

4,917,866

PRODUCTION PROCESS OF SILICON CARBIDE SHORT FIBERS

Susumu Abe; Tadayoshi Ikai, both of Toyota, and Masahiro Ogawa, Toyoake, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Nov. 10, 1988, Ser. No. 269,339
Claims priority, application Japan, Nov. 12, 1987, 62-286261
The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.
Int. Cl.[4] C01B *31/36*
U.S. Cl. 423—345 11 Claims



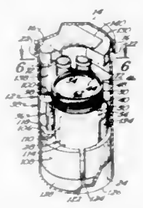
1. A process for producing silicon carbide fibers, which comprises:
(a) oxidizing metallic silicon powder in an oxidizing gas atmosphere into silicon monoxide in the form of ultrafine particles or gas; and
(b) carbonizing said silicon monoxide in a reducing gas atmosphere containing carbon at a temperature falling in the range of 1300° to 1800° C. for causing a heterogeneous core information of silicon carbide, thereby producing silicon carbide short fibers.

4,917,867

APPARATUS FOR THE COLLECTION AND TRANSPORTATION OF DUAL BIOLOGICAL SAMPLES

Richard E. Jensen, St. Peter; Donald H. Nichols, Roseville, and D. Gary Hemphill, Wayzata, all of Minn., assignors to Forensic Applications Corporation, Minneapolis, Minn.

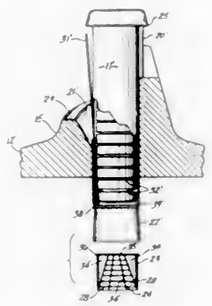
Continuation-in-part of Ser. No. 89,586, Aug. 26, 1987, Pat. No. 4,873,193. This application Jun. 27, 1988, Ser. No. 212,016
Int. Cl.[4] B01L *3/00*
U.S. Cl. 422—102 15 Claims



1. An apparatus for collecting and transporting a first sample and a second sample of biological materials for evidentiary purposes, said apparatus comprising:
an outer container defining a receptacle region, said outer container having a bottom portion and a lid member mountable on said outer container opposing the bottom portion thereof;

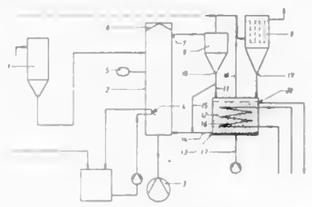
a specimen vial for removably receiving and containing a first sample;
at least one sample tube for removably receiving and containing a second sample;
a protective collar, said protective collar being received within the receptacle region of the outer container, said protective collar further defining a first bore extending at least partially through said protective collar and being sized to snugly and engagingly receive said specimen vial and at least one second bore extending at least partially through said protective coliar and being sized to snugly and engagingly receive said sample tube;
lower cushioning means disposed between said bottom portion of said outer container and both said specimen vial and said sample tube; and
upper cushioning means disposed between said lid member of said outer container and both said specimen vial and said sample tube.

4,917,868
POOL CHEMICAL DISPENSER
Roy P. Alexander, 23 Rt. 81, Killingworth, Conn., and Alan H. Milford, 120 Wakefield St., Hamden, Conn. 06517
Continuation of Ser. No. 881,532, Jul. 2, 1986, abandoned. This application Oct. 30, 1987, Ser. No. 117,388
Int. Cl.[4] B01F *1/00*
U.S. Cl. 422—119 20 Claims



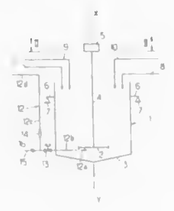
1. A free-floating dispenser for dispensing a fast dissolving solid calcium hypochlorite chemical into a surrounding body of water comprising in combination:
(a) a floater having an opening therethrough;
(b) an elongated chemical-containing cartridge having a top and a bottom interconnected by a sidewall, the cartridge being insertable in the opening of the floater and extending below the floater holding a stack of fast dissolving calcium hypochlorite solid chemical tablets to be dispensed out through the bottom by dissolving into the surrounding body of water, the cartridge further being open-bottomed and having a sidewall skirt around the bottom connected to the sidewall and extending below the level of the solid chemical in the cartridge to permit water to enter through the bottom;
(c) chemical support means insertable within the sidewall skirt and secureable therewithin to support the stack of fast dissolving calcium hypochlorite chemical tablets within the cartridge and control the passage of the solid chemical through the bottom of the cartridge and the passage of water around and beneath the solid chemical tablets; and
(d) cartridge retaining means in the opening in the floater and on the sidewall of the cartridge cooperative with each other to hold the cartridge at selected elevations within the floater and thereby control the depth of immersion of the fast dissolving solid calcium hypchlorite chemical tablets directly in the water that has entered through the bottom of the open-bottomed cartridge from the surrounding body of water to obtain a uniform dissolving rate of the solid chemical.

4,917,869
LIME HYDRATING PLANT AND PROCESS OF LIME HYDRATING AS WELL AS FLUE GAS DESULFURIZATION PLANT WITH SUCH A LIME HYDRATING PLANT AND PROCESS OF FLUE GAS DESULFURIZATION
Rolf Graf, Am Felsenkeller 43, 6382 Friedrichsdorf, Fed. Rep. of Germany
Filed Jun. 30, 1988, Ser. No. 213,797
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1987, 3721773
Int. Cl.[4] C01B *6/00;* C04B *2/04, 2/08*
U.S. Cl. 422—162 10 Claims



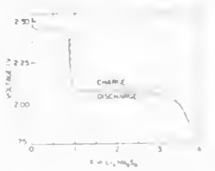
1. A lime hydrating plant, comprising:
a hydrator
means for injecting air and water into said hydrator to form a hydrated lime product,
means for precipitating solids from said product,
means for collecting said solids from said precipitating means, and
means for cooling said solids within said collecting means, wherein a line is positioned between said collecting means and said hydrator for returning cooled solids to said hydrator.

4,917,870
INSTALLATION FOR PREPARATION OF STARCH GLUES
Michael Roetynck, Estaires, and Michel Clabaux, Lestrem, both of France, assignors to Roquette Freres, France
Continuation of Ser. No. 925,514, Oct. 27, 1986, abandoned, which is a continuation of Ser. No. 769,072, Aug. 26, 1985, abandoned. This application Apr. 29, 1988, Ser. No. 188,622
Claims priority, application France, Aug. 24, 1984, 84 12306
Int. Cl.[4] B01F *3/12*
U.S. Cl. 422—226 1 Claim



1. An apparatus for the preparation of starch glues, particularly used in the manufacture of corrugated cardboard comprising an installation consisting essentially of a vessel having a lower part and a higher part and a substantially vertical axis equipped with stirring means acting at a level situated in the lower part of the vessel, as well as means for supplying the vessel with all constituents of the glue to be manufactured and essentially with starch employed in the dry state in the form of powder introduced by pneumatic means, the supply means of the vessel comprising piping through which the starch travels and which comprises a portion substantially parallel with the vertical axis of the vessel and situated outside the vessel, said portion which comprises an elastic element which permits vertical movements of limited amplitude of the vessel, extending from a level situated above the highest level that the glue can reach in the vessel to a lower, substantially horizontal terminal portion, which passes through the wall of the vessel from the outside to the inside and which opens at a level close to the stirring means, said horizontal terminal portion comprising, as close as possible to the vessel but outside with respect to the vessel, means for opening and closing the passage for the starch.

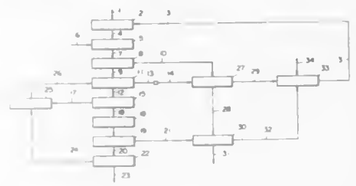
4,917,871
CHEVREL-PHASE SYNTHESES AND ELECTROCHEMICAL CELLS
Jeffrey R. Dahn, Surrey, and Harith J. Al-Janaby, North Delta, both of Canada, assignors to Moli Energy Limited, Canada
Continuation-in-part of Ser. No. 36,287, Apr. 9, 1987. This application Aug. 1, 1988, Ser. No. 227,073
Int. Cl.[4] C01G *37/14*
U.S. Cl. 423—61 18 Claims



1. A method of making a chevrel-phase material comprising the steps of heating a precursor composition including one or more heat-labile compounds of one or more non-molybdenum metals capable of forming a chevrel-phase material to thereby decompose said one or more heat-labile compounds and volatilize decomposition products from said precursor composition, removing said volatilized decomposition products, forming a reaction mixture including said one or more non-molybdenum metals initially present in said one or more heat-labile compounds together with molybdenum and a chalcogen, further heating said reaction mixture at an elevated temperature and cooling said reaction mixture.

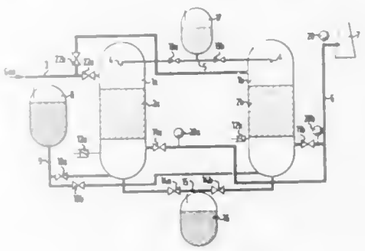
4,917,872
METHOD FOR PRODUCING TITANIUM FLUORIDE
Keisuke Nakahara; Hideyuki Yoshikoshi; Toshio Hinami, and Takaho Kawawa, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan
Filed Nov. 25, 1988, Ser. No. 276,311
Claims priority, application Japan, Dec. 4, 1987, 62-306921
Int. Cl.[4] C01G *23/02, 49/10*
U.S. Cl. 423—76 18 Claims

1. A method for producing titanium fluoride, comprising the sequential steps of:
(1) dissolving iron-containing titanium material in a hydrofluoric acid solution to produce a fluoride solution;
(2) crystallizing ferric fluoride in the fluoride solution followed by separation from the fluoride solution of the ferric fluoride crystals thus obtained by cooling the fluoride solution to produce a crude titanium fluoride solution;
(3) crystallizing and separating a mixed salt of $(NH_4)_2TiF_6$ and $(NH_4)_3FeF_6$ by mixing an ammonium fluoride solution with the crude titanium fluoride solution followed by concentrating said mixture;



(4) drying said mixed salt and pyrolyzing said mixed salt at a temperature of from 300° to 800° C. in a stream of dry gas to produce solid ferric fluoride (FeF_3) and gaseous mixture of TF_4, HF and NH_3; and
(5) condensing the gaseous TiF_4, HF and NH_3 at a temperature of from 20° to 280° C. to produce solid TiF_4 which is separated from gaseous HF and NH_3.

4,917,873
PROCESS AND APPARATUS FOR CLEANING HOT GASES
Peter Filus, Jülich, and Wolfgang Heidrich, Düren, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany
Continuation of Ser. No. 75,285, Jul. 20, 1987, abandoned, which is a continuation of Ser. No. 870,776, Jun. 4, 1986, abandoned. This application Jul. 6, 1988, Ser. No. 218,471
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1985, 3520671
Int. Cl.[4] B01J *8/00, 20/00;* C01B *7/00;* B05D *3/02*
U.S. Cl. 423—239 9 Claims



1. Method of cleaning gas containing noxious matter by contact of said gas with a solid reagent-containing material layer adhering on carrier bodies, in which said layer requires formation thereof on said bodies by wetting said bodies with a solution of said material followed by drying of said solution on said bodies and also requires removal and replacement when reagents in said layer become spent, said method being composed of steps performed in the same reactor vessel and including the steps of:
providing carrier bodies in stationary operating positions in a gas-cleaning reactor vesssel, said carrier bodies being bodies selected from the group which consists of tubes, pipes, trickle film columns, Raschig rings, Berl saddles, Intalox saddles, and wire spirals, and being made, of

chemically inert material selected from the group which consists of glass, ceramic, metal and plastic, and said operating positions being disposed in said vessel so as to require said gas to pass by and adjacent to said stationary-positioned bodies when said gas is caused to pass through said vessel;

irrigating said carrier bodies, from above, in their said stationary positions with a said solution containing a reagent for reacting with at least one noxious substance contained in said gas, continuing irrigation until said carrier bodies are wetted by said solution;

drying said reagent-containing solution on said carrier bodies and thereby producing a solid material layer thereon;

passing said gas through said vessel for cleaning noxious matter therefrom by reaction with said reagent of said solid material layer;

irrigating and wetting said carrier bodies anew with said solution after reaction of said noxious matter with said reagent weakens, followed by repetition of the above-stated drying and gas cleaning steps;

repeating the above-stated sequence of an irrigation step followed by drying of said solution and gas cleaning as above set forth;

after at least one repetition of said sequence of steps, washing out spent residues of said layers on said carrier bodies by contact with a washing solution while said carrier bodies remain in said stationary operating positions in said reactor vessel, and then

repeating at least once, in the same reactor vessel, the above-stated sequence of irrigation, solution drying, gas cleaning and spent residue washing-out steps.

4,917,874

DESULFURIZATION PROCESS

Atul C. Sheth, Tullahoma, Tenn., and William A. Butler, Raleigh, N.C., assignors to The University of Tennessee Research Corporation, Knoxville, Tenn.

Filed Jun. 24, 1988, Ser. No. 211,493

Int. Cl.[4] C01B *17/00;* **B01J** *8/00*

U.S. Cl. 423—244 **27 Claims**

1. A process for desulferizing an alkali metal sulfate comprising providing the alkali metal sulfate in dissolved form in an aqueous solution having a pH of less than about 8 so that sulfate ions and alkali metal ions are present in the solution, and contacting the aqueous solution with a weak base anion exchange resin having bicarbonate groups associated therewith that exchange with the sulfate ions in the solution so that the sulfate ions become associated with resin and the bicarbonate groups become associated with the alkali metal ions in the solution.

4,917,875

GAS/SOLID CONTACT METHOD FOR REMOVING SULFUR OXIDES FROM GASES

Andrew S. Moore, North Brunswick; David B. Bartholic, Watchung; Dwight F. Barger, High Bridge, and William J. Reagan, Englishtown, all of N.J., assignors to Englehard Corporation, Edison, N.J.

Continuation of Ser. No. 866,670, May 27, 1986, abandoned. This application Jun. 29, 1988, Ser. No. 214,915

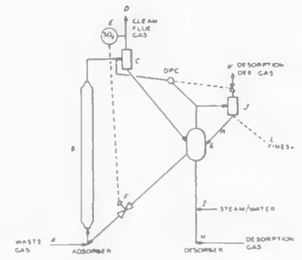
Int. Cl.[4] B01J *8/00;* **C01B** *17/00;* **B01D** *53/02*

U.S. Cl. 423—244 **20 Claims**

1. A process for removing oxides of sulfur from a waste gas which comprises one or more oxides of sulfur and substantially all of the carbon is as carbon dioxide, said process comprising:

a. continuously passing a stream of said waste gas into concurrent contact with fluidizable particles of a regenerable sulfur oxide adsorbent in a riser at a gas flow rate sufficiently high to assure fast fluid transport of said particles by said gas through said riser in a solely dilute phase entrained solids contacting zone for a period of time less than 30 seconds, at a superficial gas velocity of between 40 to 80 ft. per second and at a temperature between 250° F. to in excess of 1700° F., employing sufficient of said fluidizable particle to adsorb a desired amount of the oxides of sulfur in said gas, said adsorbent consisting essentially of particles having a particle size distribution suitabl for fluidization and being in the size range of about 20 to 150 microns with an average particle size in the range of 50 to 80 microns.

b. immediately separatiing the gas from adsorbent particles now laden with oxides of sulfur at the outlet of said riser in a high efficiency separator to recover the majority of the adsorbent particles, whereby the adsorbent particles and gas containing oxides of sulfur are in contact with each other under conditions such that a bed of adsorbent particles is present,



c. continuously passing the separated fluidizable particles of adsorbent into a regeneration zone, which is in flow communication with said adsorption zone, and containing said particles of adsorbent in said regeneration zone with a stream of reducing gas containing an effective amount of water vapor for a time and at a temperature sufficient to release substantially all adsorbed sulfur oxides and form a gas comprising hydrogen sulfide,

d. continuously separating said gas comprising hydrogen sulfide from the hot fluidizable particles of absorbent now depleted of sulfur; and

e. continuously circulating the fluidizable particles of adsorbent from step (d) to the riser in step (a) for contact with an incoding stream of gas containng one or more oxides of sulfur.

4,917,876

IRON-TITANIUM-ALUMINUM-PHOSPHORUS-OXIDE MOLECULAR SIEVE COMPOSITIONS

Brent M. T. Lok, New City; Bonita K. Marcus, Rye; Celeste A. Messina, Ossining, and Edith M. Flanigen, White Plains, all of N.Y., assignors to UOP, Des Plaines, Ill.

Continuation of Ser. No. 902,129, Sep. 2, 1986, abandoned, which is a continuation of Ser. No. 599,824, Apr. 13, 1984, abandoned. This application May 17, 1988, Ser. No. 195,474

Int. Cl.[4] C01B *25/36*

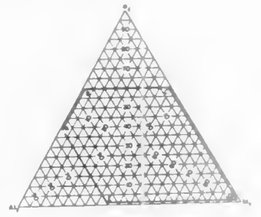
U.S. Cl. 423—306 **11 Claims**

1. A crystalline molecular sieve having a three-dimensional microporous framework structure of FeO_2, TiO_2, AlO_2 tetrahedral oxide units having an empirical chemical composition on an anhydrous basis expressed by the formula:

$$mR:(M_xAl_yP_z)O_2$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "M" represents iron and titanium; "m" represents the molar amount of "R" present per mole of $(M_xAl_yP_z)O_2$ and has a value of zero (O) to about 0.3; and "x", "y" and "z" represent the mole fractions of "M", aluminum and phosphorus, respectively, present as tetrahedral oxides, said mole fractions being such that they are within the

pentagonal compositional area defined by points A, B, C, D and E of FIG. 1, said crystalline molecular sieves having a



characteristic X-ray powder diffraction pattern which contains at least the d-spacings set forth in one of the following Tables C and N-V.

TABLE C

	(FeTiAPO-14)	
2θ	D (Å)	Relative Intensity
8.6–8.9	10.3–9.93	vs
13.0	6.81	w
21.9–22.2	4.06–4.00	w
25.4	3.51	w
27.5	3.24	w
29.7	3.01	w

TABLE N

	(FeTiAFO-36)	
2θ	D (Å)	Relative Intensity
7.7–7.9	11.5–11.2	vs
16.2–16.6	5.47–5.34	w–m
18.9–19.3	4.70–4.60	m–s
20.6–20.8	4.31–4.27	w–s
21.8–22.0	4.08–4.04	m
22.2–22.5	4.00–3.95	w–m

TABLE O

	(FeTiAPO-37)	
2θ	D (Å)	Relative Intensity
6.1–6.3	14.49–14.03	vs
15.5–15.7	5.72–5.64	w–m
18.5–18.8	4.80–4.72	w–m
23.5–23.7	3.79–3.75	w–m
26.9–27.1	3.31–3.29	w–m

TABLE P

	(FeTiAPO-39)	
2θ	D (Å)	Relative Intensity
9.4–9.6	9.41–9.21	w–m
13.3–13.6	6.66–6.51	m–vs
18.0–18.4	4.93–4.82	m
21.2–21.5	4.19–4.13	m–s
22.5–23.0	3.95–3.87	s–vs
30.2–30.5	2.96–2.93	w–m

TABLE Q

	(FeTiAPO-40)	
2θ	D (Å)	Relative Intensity
7.5–7.7	11.79–11.48	vw–m
8.0–8.1	11.05–10.94	s–vs
12.4–12.5	7.14–7.08	w–vs
13.6–13.8	6.51–6.42	m–s
14.0–14.1	6.33–6.28	w–m

TABLE Q-continued

	(FeTiAPO-40)	
2θ	D (Å)	Relative Intensity
27.8–28.0	3.209–3.187	w–m

TABLE R

	(FeTiAPO-41)	
2θ	D (Å)	Relative Intensity
13.6–13.8	6.51–6.42	w–m
20.5–20.6	4.33–4.31	w–m
21.1–21.3	4.21–4.17	vs
22.1–22.3	4.02–3.99	m–s
22.8–23.0	3.90–3.86	m
23.1–23.4	3.82–3.80	w–m
25.5–25.9	3.493–3.440	w–m

TABLE S

	(FeTiAPO-42)	
2θ	D (Å)	Relative Intensity
7.15–7.4	12.36–11.95	m–vs
12.5–12.7	7.08–6.97	m–s
21.75–21.9	4.09–4.06	m–s
24.1–24.25	3.69–3.67	vs
27.25–27.4	3.273–3.255	s
30.5–30.25	2.974–2.955	m–s

TABLE T

	(FeTiAPO-44)	
2θ	D (Å)	Relative Intensity
9.4–9.55	9.41–9.26	vs
13.0–13.1	6.81–6.76	w–m
16.0–16.2	5.54–5.47	w–m
20.6–20.85	4.31–4.26	s–vs
24.3–24.4	3.66–3.65	w–vs
30.7–30.95	2.912–2.889	w–s

TABLE U

	(FeTiAPO-46)	
2θ	D (Å)	Relative Intensity
7.2–8.1	12.3–10.9	vs
21.2–21.8	4.19–4.08	w–m
22.5–23.0	3.95–3.87	vw–m
26.6–27.2	3.351–3.278	vw–w
28.5–29.0	3.132–3.079	vw–w

TABLE V

	(FeTiAPO-47)	
2θ	D (Å)	Relative Intensity
9.4	9.41	vs
15.9–16.0	5.57–5.54	w–m
20.5–20.6	4.33–4.31	s
24.5–24.7	3.63–3.60	w
25.8–25.9	3.45–3.44	w
30.4–30.5	2.940–2.931	w

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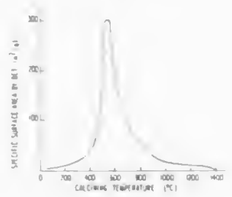
4,917,877

PROCESS FOR PRODUCING ALUMINUM NITRIDE POWDER

Masanory Oguni; Hachiro Ichikawa; Akira Murase; Hiroo Ozawa, all of Shizuoka, and Akihiko Tsuge, Kanagawa, all of Japan, assignors to Nippon Light Metal Co., Ltd., Tokyo, Japan

Filed Oct. 14, 1988, Ser. No. 258,256
Claims priority, application Japan, Oct. 14, 1987, 62-257358; Dec. 16, 1987, 62-316329
Int. Cl.[4] C01B *21/072*
U.S. Cl. 423—412 7 Claims



1. A process for producing aluminum nitride powder by reacting nitrogen gas with a mixture of alumina powder and carbon powder, wherein a solid organic compound is added to said mixture and the resulting material consisting of the alumina powder, carbon powder and solid organic compound is directly heated in the nitrogen gas, wherein said solid organic compound is directly vaporized upon being heated to yield ultra-fine carbon without melting into the liquid phase upon heating in the nitrogen gas and wherein the addition amount of the solid organic compound is from 5 parts by weight to 25 parts by weight for 100 parts by weight of alumina, wherein the solid organic compound is one or more selected from the group consisting of phenol-formaldehyde resin, polyvinylidene chloride, polyphenylene, and cellulose.

4,917,878

NOVEL USE OF A RADIOLABELLED ANTIBODY AGAINST STAGE SPECIFIC EMBRYONIC ANTIGEN FOR THE DETECTION OF OCCULT ABSCESSES IN MAMMALS

Madhukar L. Thakur, Cherry Hill, N.J., assignor to Thomas Jefferson University, Philadelphia, Pa.

Filed May 2, 1988, Ser. No. 189,141
Int. Cl.[4] A61K *49/02, 39/395*
U.S. Cl. 424—1.1 10 Claims

1. A method of detecting occult abscess and inflammation in a mammal, comprising the steps:
- administering to the mammal an effective amount of a reagent comprising an antibody against stage specific embryonic antigen-1, a radiolabel and a bifunctional chelating agent which links said antibody and said radiolabel under conditions which allow the reagent to accumulate at sites of occult abscess; and
- detecting said occult abscess by radioscintigraphic method.

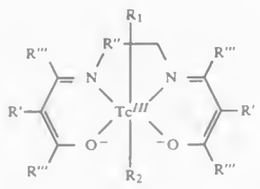
4,917,879

99MTC(III) MYOCARDIAL IMAGING AGENTS THAT ARE EFFECTIVE IN HUMANS

Edward A. Deutsch, and Karen F. Libson, both of Cincinnati, Ohio, assignors to University of Cincinnati, Cincinnati, Ohio

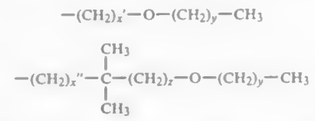
Filed May 19, 1989, Ser. No. 354,491
Int. Cl.[4] A61K *49/02;* C07F *13/00*
U.S. Cl. 424—1.1 8 Claims

1. A myocardial imaging agent having the following general formula:



wherein
- R′ and R‴ represents H, hydroxyl, C_1–C_5 alkyl, C_1–C_5 alkyl substituted by hydroxyl, ether, amide, ketone, aldehyde or nitrile groups and
- R″ represents C_1–C_4 alkylene, C_1–C_4 alkylene which may be substituted with hydroxyl, ether, amide, ketone, aldehyde or nitrile groups; and
- wherein R_1 and R_2 represent the same or different phosphine ligand wherein said ligand has the following general formula:

wherein R_4 and R_5 represent a moiety selected from the following



wherein X=3 or 4, X=1-4, Y=0-4 and Z=0-4 and wherein R_3 is a moiety selected from the moieties represented by R_4 or R_5 and —OCH_3, C_1–C_5 alkyl.

4,917,880

IODINE-CONTAINING EMULSION

Karl A. J. Wretlind, Stockholm, and Bengt M. Ajaxon, Upsala, both of Sweden, assignors to Kabivitrum AB, Stockholm, Sweden

Filed Jun. 10, 1988, Ser. No. 204,718
Claims priority, application European Pat. Off., Jun. 11, 1987, 87850192.3
Int. Cl.[4] A61K *49/04*
U.S. Cl. 424—5 11 Claims

1. Emulsion for use as an x-ray contrast agent which is stable to heat sterilization and during long-term storage and which contains at least one iodinated lipid selected from the group consisting of iodine-containing triglycerides and iodine-containing alkyl esters of fatty acids, which are emulsified in an aqueous phase by means of at least one emulsifier selected from the group consisting of egg yolk phospholipids and soybean phospholipids and wherein said emulsion further contains, as a stability-increasing agent, at least one member selected from the group consisting of amino acids and urea, and further, optionally, also one or more pharmacologically acceptable oils or fats, and wherein the lipid particles of the emulsion have a size of below 0.5 μm.

4,917,881

DEHYDRATED GARLIC PREPARATIONS AND BUFFER COMPOUNDS TO ALLEVIATE DIGESTIVELY INDUCED AFTEREFFECTS

Daniel S. Gray, 37 Albourne St., South River, N.J. 08882

Filed Mar. 4, 1988, Ser. No. 164,191
Int. Cl.[4] A61K *35/78, 33/32*
U.S. Cl. 424—10 8 Claims

1. A garlic product comprising a granule of garlic including an effective amount of zinc oxide which amount is between 7–15 milligrams per 5 grams of garlic granules operative to alleviate the unpleasant aftereffects caused by the consumption of garlic.

4,917,882

GEL-TYPE SUNSCREEN COMPOSITION

John R. Strobridge, Comstock Park, Mich., assignor to Amway Corporation, Ada, Mich.

Filed Mar. 16, 1989, Ser. No. 324,564
Int. Cl.[4] A61K *7/42, 7/44*
U.S. Cl. 424—59 28 Claims

1. A method of producing a gel-type sunscreen composition comprising the steps of:
- combining between about 1 and about 30 percent of sunscreen agent, between about 5 and about 25 percent polyethylene to between about 20 and about 95 percent of a benzoic ester;
- agitating and heating the mixture to a temperature and for a time sufficient to dissolve the polyethylene in the benzoate ester;
- after the polyethylene is dissolved in the benzoate ester, cooling the mixture while agitating to thereby produce a gelled sunscreen composition.

4,917,883

OIL IN WATER EMULSION SUNSCREEN COMPOSITION

John R. Strobridge, Comstock Park, Mich., assignor to Amway Corporation, Ada, Mich.

Filed Mar. 16, 1989, Ser. No. 324,306
Int. Cl.[4] A61K *7/42, 7/44*
U.S. Cl. 424—59 17 Claims

1. A method of producing an oil in water emulsion sunscreen composition comprising the steps of:
- mixing a pre-blend including
  - between about 0.5 and about 20 percent of a copolymer of ethylene and vinyl acetate,
  - between about 0.5 and 10 percent of a second polymeric film forming agent which increases the substantivity of the film forming composition,
  - between about 0.5 and about 10 percent of a fatty acid component of an emulsifier,
  - between about 1 and about 30 percent of sunscreen agent;
- adding the pre-blend to water with agitation sufficient to form a dispersion of droplets of the pre-blend within the water; and
- adding an alklaine saponifying agent to the dispersion with continued agitation to complete the oil in water emulsion.

4,917,884

SHAVING COMPOSITIONS

David Roberts, 7242 Mission Hill Dr., Las Vegas, Nev. 89113

Filed Jan. 27, 1988, Ser. No. 149,122
Int. Cl.[4] A61K *7/15*
U.S. Cl. 424—73 19 Claims

1. An improved shaving composition consisting essentially of aged diethyleneglycol monoethyl ether, glyoxal, urea, fatty acid and alkanolamine, wherein the ratio by weight of alkanolamine to fatty acid is between about 1:2 and about 1:3.

4,917,885

HARD MEDICINAL CAPSULE

Toru Chiba; Hiroaki Muto; Soji Tanioka; Yuichi Nishiyama, all of Niigata; Noboru Hoshi, and Yoshiro Onda, both of Tokyo, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 734,289, May 15, 1985. This application Dec. 23, 1986, Ser. No. 946,119
Claims priority, application Japan, Oct. 23, 1984, 59-222676
Int. Cl.[4] A61K *31/74*
U.S. Cl. 424—78 10 Claims

1. A hard capsule for medicinal use shaped from a mixture comprising from 70 to 98 parts by weight of a cellulose ether, of which the ether-forming substituent groups are selected from the group consisting of methyl, ethyl, hydroxyethyl and hydroxypropyl, and from 30 to 2 parts by weight of a polyvinyl alcohol.

4,917,886

NOVEL TOPICALLY ADMINISTRABLE PHARMACEUTICAL COMPOSITIONS

Henning Asche, Bettingen, and Heidi Affolter, Birsfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 193,188, May 10, 1988, abandoned, which is a continuation of Ser. No. 766,669, Aug. 15, 1985, abandoned, which is a continuation of Ser. No. 536,584, Sep. 28, 1983, abandoned. This application Aug. 21, 1989, Ser. No. 396,781
Claims priority, application Switzerland, Oct. 7, 1982, 5898/82
Int. Cl.[4] A61K *31/78*
U.S. Cl. 424—81 21 Claims

1. A topically administrable pharmaceutical composition in the form of an oil/water emulsion and containing, as active ingredient, a non-steroidal, anti-inflammatorially active compound having at least one acidic group, characterized in that said composition has a pH of from approximately 5 to approximately 7.5 and containing:
- (a) from approximately 10 to approximately 50% by weight of a water-soluble, volatile lower alkanol having from 2 up to and including 4carbon atoms,
- (b) from approximately 1 to approximately 20% by weight of a polyhydric alcohol or a poly-lower alkylene glycol having a chain length of from approximately 200 to approximately 6000 units as co-solvent,
- (c) from approximately 40 to approximately 80% by weight of water,
- (d) from approximately 3 to approximately 15% by weight of a liquid, semi-solid or solid hydrocarbon; a fatty alcohol having 1 or 2 hydroxy functions and approximately from 6 to 34 carbon atoms; a fatty acid ester with glycerine, the fatty acid having from 6 to 24 carbon atoms; a fatty acid ester of a lower alcohol, having from 1 up to and including 12 carbon atoms or of a higher even-numbered aliphatic alcohol having from 16 to 36 carbon atoms, the fatty acid having from 6 to 34 carbon atoms; or a fatty alcohol of approximately from 6 to 34 carbon atoms etherified by a lower alkanol or a lower alkoxy-lower alkanol; as a lipid, or a mixture thereof,
- (e) in the presence or absence of from approximately 0.5 to approximately 5% by weight of a readily or sparingly soluble fatty acid salt; a salt of a fluorinated fatty acid, of an alkoxy-carboxylic acid, of a sulphonamido carboxylic acid, of a fatty acid lactate, or of an alkylmalonic or alkylsuccinic acid; a sparingly soluble alkyl sulphonate; a sulphonated fatty acid alkyl ester; a fatty acid sulphonate; a fatty acid ester sulphonate; a perfluorinated alkyl sulphonate; a readily or sparingly soluble alkylbenzene sulphonate; a sulphated primary or secondary fatty alcohol; a soap, sulphated ester, amide, alkanolamide, mono- or polyglyceride or polyglycol ether, of a fatty alcohol or alkylphenol; a fatty acid ester with a mono- or poly-hydric

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alcohol; a fatty acid ester with an oligo-hydroxy compound or with a polyhydroxy compound; a polyethylene or polypropylene glycol ether having approximately from 2 to 23 ethylene glycol or ethylene oxide units of a fatty alcohol, of a fatty acid ester or of fatty amines derived from fatty alcohols; ethylene oxide or propylene oxide block copolymers having hydrophilic polyhydroxyethylene groups or hydrophobic polyhydroxypropylene groups having a molecular weight of from approximately 1000 to approximately 11000, the fatty acid each having from 6 to 34 carbon atoms and the fatty alcohol having approximately from 6 to 34 carbon atoms; as emulsifier, and present if the lipid phase is not self-emulsifying,

(f) from approximately 0.5 to approximately 2% by weight of a synthetic gel-forming macromolecule, the units of which are vinyl alcohol, vinyl pyrrolidine, acrylic or methacrylic acid as gel structure former, and

(g) from approximately 0.1 to approximately 10% by weight of a non-steroidal, anti-inflammatorially active compound having at least one acidic group.

4,917,887

HYBRID INTERFERONS, THEIR USE AS PHARMACEUTICAL COMPOSITIONS AND AS INTERMEDIATE PRODUCTS FOR THE PREPARATION OF ANTIBODIES AND THE USE THEREOF AND PROCESSES FOR PREPARING THEM

Rudolf Hauptmann, Ebreichsdorf; Peter Swetly, Vienna; Peter Meindl, Vienna; Gunther Adolf, Vienna; Edgar Falkner, Vienna; Gerhard Bodo, Vienna, and Ingrid Maurer-Fogy, Vienna, all of Austria, assignors to Boehringer Ingelheim International GmbH, Fed. Rep. of Germany

Filed Mar. 9, 1987, Ser. No. 23,634

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1986, 3607835

Int. Cl.[4] A61K *45/02;* **C07K** *13/00, 15/26;* **C12P** *21/00*

U.S. Cl. 424—85.7 **8 Claims**

1. A hybriod interferon the formula

$$R^1\text{—Gln Ile Phe—}R_2$$

(I)

wherein R_1 is a polypeptide fragment encoded by a DNA sequence upstream of the BglII restriction site common to alpha 1-, alpha 2-, and omega-interferons, wherein said polypeptide fragment is selected from the group consisting of the corresponding fragments of

an alpha-1 interferon,

the N-terminal Met derivative of an alpha-1 interferon,

the N-formyl-Met derivative of an alpha-1-interferon,

an alpha-2 interferon,

the N-terminal Met derivative of an alpha-2 interferon,

the N-formyl-Met derivative of an alpha-2 interferon,

an omega interferon,

the N-terminal Met derivative of an omega interferon, or

the N-terminal formyl-Met derivative of an omega interferon, and

R_2 is a polypeptide fragment encoded by a DNA sequence downstream of said BglII restriction site wherein said polypeptide fragment is selected from the group consisting of the corresponding fragments of

an alpha-1 interferon,

an alpha-2 interferon, or

an omega interferon,

with the proviso only one of R_1 and R_2 is derived from an omega interferon.

7. A pharmaceutical composition, comprising an artiviral effective amount of the hybrid interferon of claim 1 and a pharmaceutically acceptable carrier.

4,917,888

SOLUBILIZATION OF IMMUNOTOXINS FOR PHARMACEUTICAL COMPOSITIONS USING POLYMER CONJUGATION

Nandini Katre, El Cerrito, and Michael J. Knauf, Oakland, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Division of Ser. No. 866,459, May 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 749,955, Jun. 26, 1985, abandoned. This application Dec. 11, 1987, Ser. No. 131,901

Int. Cl.[4] A61K *39/44, 31/745*

U.S. Cl. 424—85.91 **11 Claims**

1. A pharmaceutical preparation comprising a non-toxic, inert, pharmaceutically acceptable aqueous carrier medium in which is dissolved an immunotherapeutically effective amount of a biologically active, selectively conjugated immunotoxin protein, wherein the protein is covalently conjugated to a water-soluble polymer selected from the group consisting of polyethylene glycol homopolymers and polyoxyethylated polyols, wherein said homopolymer is unsubstituted or substituted at one end with an alkyl group and said polyol is unsubstituted, and wherein said protein in its unconjugated form is normally hydrophobic and insoluble or not readily soluble in water or in said aqueous carrier medium under ambient conditions of room temperature and atmospheric pressure at a pH of between about 6 and 8 in the absence of a solubilizing agent.

4,917,889

TOPICAL COMPOSITION AND TREATMENT

Barbara A. Carty, Bronx; Anna Grealish, Yonkers, both of N.Y., and Mary Murtagh, Saddle Brook, N.J., assignors to Thomas W. Clarke, Midland, N.J., a part interest

Filed Jul. 14, 1988, Ser. No. 218,897

Int. Cl.[4] A61K *33/08*

U.S. Cl. 424—693.1 **4 Claims**

1. A composition suitable for the topical treatment of burns and sores consisting essentially of about equal parts of an aqueous solution of calcium hydroxide containing not less than about 0.14 grams of $Ca(OH)_2$ per 100 cc. of water at 25° C. and raw linseed oil.

4,917,890

PROCESSES FOR PREPARATION OF ALOE PRODUCTS, PRODUCTS PRODUCED THEREBY AND COMPOSITIONS THEREOF

Bill H. McAnalley, Grand Prairie, Tex., assignor to Carrington Laboratories, Inc., Irving, Tex.

Division of Ser. No. 869,261, Jun. 5, 1986, Pat. No. 4,735,935, which is a continuation-in-part of Ser. No. 810,025, Dec. 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 754,859, Jul. 12, 1985, abandoned, which is a continuation-in-part of Ser. No. 750,321, Jun. 28, 1985, abandoned, which is a continuation-in-part of Ser. No. 649,967, Sep. 12, 1984, abandoned, which is a continuation of Ser. No. 375,720, May 7, 1982, abandoned. This application Dec. 21, 1987, Ser. No. 136,193

Int. Cl.[4] A61K *35/78, 31/70*

U.S. Cl. 424—195.1 **63 Claims**

1. A process for producing a substantially anthraquinone-free aloe gel from a leaf of the aloe plant, comprising:

(a) washing an aloe leaf in a bacteriacidal solution to remove substantially all surface dirt and bacteria;

(b) removing at least a first end portion from said washed leaf;

(c) draining, preserving and collecting anthraquinone rich sap from said cut and washed leaf; and

(d) removing rind from said leaf to produce a substantially anthraquinone free gel.

4,917,891

COMPOSITION HAVING EVAPORATIVE OIL-LIKE MATERIAL

Peter J. Kaufmann, Raleigh, and Charles G. Friedman, Pittsboro, both of N.C., assignors to Revlon, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 684,635, Dec. 21, 1984, abandoned. This application Apr. 1, 1987, Ser. No. 33,583

Int. Cl.[4] A61K *7/02, 31/695, 9/10, 47/00*

U.S. Cl. 424—401 **23 Claims**

1. A noncomedogenic, oil-in-water emulsion composition free of animal, vegetable and mineral oils, the composition including:

an emulsifier system in an amount between about 0.30% and about 17% by weight of the total composition;

at least one oil absorber in an amount up to about 10% by weight of the total composition;

a volatile silicone fluid in an amount between about 0.5% to about 20% by weight of the total composition, said silicone fluid being able to impart an essentially oil-free composition on a wearer after evaporation thereof so that the potential for developing undesirable acne skin conditions is significantly reduced; and

water in an amount between about 48% to about 67%,

wherein the noncomedogenic emulsion composition is viscous with a viscosity between about 45,000 to about 150,000 centipoise so that the composition is a cream, lotion or ointment.

4,917,892

ENCAPSULATED TOPICAL DELIVERY SYSTEM

Tully J. Speaker, Philadelphia; Frank N. Chang, Dresher, and Stephen C. Hsu, Ambler, all of Pa., assignors to Temple University, Philadelphia, Pa.

Filed Jun. 28, 1988, Ser. No. 212,492

Int. Cl.[4] A61K *6/00*

U.S. Cl. 424—401 **20 Claims**

1. A delivery system for the immediate and sustained topical application of at least one topically-active agent to a localized area of the body comprising a viscous carrier containing a dissolved or dispersed topically-active agent and a topically-active agent microencapsulated within a semipermeable anistropic salt film which is the emulsion reaction product of a) a partially lipophilic, partially hydrophilic, polyfunctional Lewis acid or salt thereof in aqueous medium with b) a Lewis base or salt thereof in a water-immiscible, slightly polar organic solvent for the base.

4,917,893

PROLONGED RELEASE MICROCAPSULES

Hiroaki Okada; Yasuaki Ogawa, both of Osaka, and Takatsuka Yashiki, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 940,614, Dec. 11, 1986, which is a division of Ser. No. 667,096, Nov. 1, 1984, Pat. No. 4,652,441. This application Sep. 30, 1987, Ser. No. 103,117

Claims priority, application Japan, Nov. 4, 1983, 58-207760

The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.

Int. Cl.[4] A61K *9/52;* **B01J** *13/02;* **A61F** *2/00*

U.S. Cl. 424—423 **8 Claims**

1. A spherical microcapsule for an injectable preparation, having an average diameter of 2–200 μm, the spherical microcapsule comprising particles of a mixture of a biologically active polypeptide and a drug-retaining substance selected from the group consisting of gelatin, albumin, pectin and agar, the weight ratio of the drug-retaining substance to the biologically active polypeptide being in the range of about 2.5/1 through about 1/1, the particles being dispersed in a spherical microcapsule matrix composed of a lactic acid-glycolic acid polymer having a monomer ratio within the range of about 78/22 to 50/50 and an average molecular weight within the range of about 5,000–100,000

4,917,894

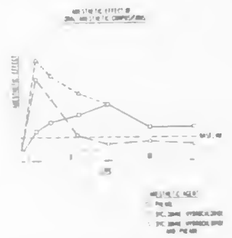
RAPID-ONSET LONG-DURATION ORAL ANESTHETIC COMPOSITION

Joseph A. Matthias, Lake Mohawk, and Kim L. Bildstein, Chester, both of N.J., assignors to Beecham Inc., Clifton, N.J.

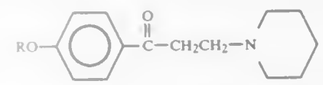
Filed Jun. 29, 1988, Ser. No. 212,900

Int. Cl.[4] A61K *9/68*

U.S. Cl. 424—440 **7 Claims**



1 An oral anesthetic composition comprising an anesthetically effective amount of a compound of formula (I)



(I)

wherein R is alkyl of 2 to 8 carbon atoms or a pharmaceutically acceptable salt thereof and an anesthetically effective amount of a rapid-onset anesthetic selected from the group consisting of hexylresorcinol, and benzocaine in combination with a pharmaceutically acceptable carrier, said carrier being in orally administrable form.

4,917,895

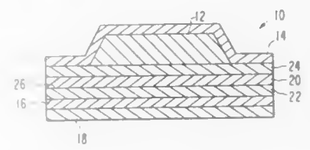
TRANSDERMAL DRUG DELIVERY DEVICE

Eun S. Lee, Redwood City; David Edgren, El Granada, and Su I. Yum, Los Altos, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 115,949, Nov. 2, 1987, abandoned. This application Jul. 14, 1988, Ser. No. 219,115

Int. Cl.[4] A61F *13/02*

U.S. Cl. 424—448 **16 Claims**



1. A controlled release medical device for delivery of a drug in a pre-determined delivery rate pattern to a biological environment comprising, in combination:

reservoir means containing said drug having a surface through which the drug is released to the biological environment;

a metal layer disposed between said reservoir means and the biological environment, wherein said metal layer in a first state is uneroded and, is substantially impermeable to the passage of said drug, and in a second stat is eroded and permeable to said drug;

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whereby substantially all of said drug must pass through said metal layer to reach the biological environment, and whereby the passage of drug to the biological environment by diffusion is impeded until the metal layer changes state.

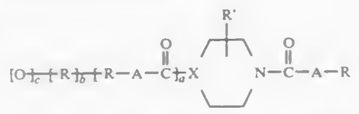
4,917,896

PENETRATION ENHANCERS FOR TRANSDERMAL DELIVERY OF SYSTEMIC AGENTS

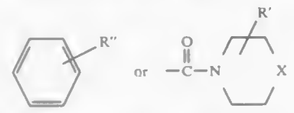
James V. Peck, Costa Mesa, and Gevork Minaskanian, Irvine, both of Calif., assignors to Nelson Research & Development Co., Irvine, Calif.

Continuation-in-part of Ser. No. 897,043, Aug. 15, 1986, abandoned. This application Nov. 19, 1986, Ser. No. 932,709
Int. Cl.[4] A61F *13/00*
U.S. Cl. 424—449 9 Claims

1. A method for enhancing penetration of systemically active agents through the skin or mucosal membranes and into the bloodstream of humans and animals, said method comprising the topical administration of effective amounts of a systemically active agent and of a membrane penetration enhancer having the structural formula



wherein X may represent sulfur, oxygen or nitrogen; a and b may be 0 or 1, c may be 0, 1 or 2, except that when X is oxygen, a, b and c are 0, when X is nitrogen c is 0 and only one of a or b is 1, and when X is sulfur a and b are 0; A is a branched or a straight chain, divalent aliphatic radical having from 0 to 2 double bonds; R' is selected from the group consisting of H, a lower alkyl group having from 1 to 4 carbon atoms, phenyl, lower alkyl or halogen substituted phenyl, acetamido, halogen, piperidinyl, lower alkyl or halogen substituted piperidinyl, carbalkoxy, carboxamide, and alkanoyl; and R is hydrogen or a lower alkyl group having from 1 to 4 carbon atoms,



wherein R'' is H or halogen, and salts thereof.

4,917,897

PHARMACEUTICAL COMPOSITIONS

Joachim Augstein, Woodhouse Eaves, and Maqbool Ahmed, Loughborough, Leicestershire, both of England, assignors to Fisons plc, Leicestershire, England

Division of Ser. No. 105,508, Oct. 5, 1987, Pat. No. 4,804,678, which is a continuation of Ser. No. 783,330, Oct. 5, 1987, abandoned, which is a continuation of Ser. No. 456,510, Jan. 7, 1983, abandoned. This application Feb. 8, 1989, Ser. No. 308,196
Claims priority, application United Kingdom, Jan. 22, 1982, 8201833; Jul. 17, 1982, 8220762
Int. Cl.[4] A61R *37/22*
U.S. Cl. 424—450 7 Claims

1. A pharmaceutical composition comprising an aqueous suspension in which sodium cromoglycate is partitioned between a free aqueous phase and a liposome phase, wherein the liposomes comprise one or more natural or synthetic lecithins and the ratio by weight of sodium cromoglycate to lipid in the liposomes is in the range from 0.01 to 100.

4,917,898

PHARMACEUTICAL COMPOSITIONS FOR THE PROPHYLAXIS AND THERAPY OF CALCULOSIS OF BILIARY TRACT AND OF BILIARY DYSPEPSIA

Mario Angelico, and Simos Contos, both of Florence, Italy, assignors to Pharmaricerche Di Allesandra Tonozzi e C. s.a.s., Milan, Italy

Filed Jun. 1, 1988, Ser. No. 200,945
Claims priority, application Italy, Jun. 3, 1987, 20771 A/87
Int. Cl.[4] A61K *9/48*
U.S. Cl. 424—452 4 Claims

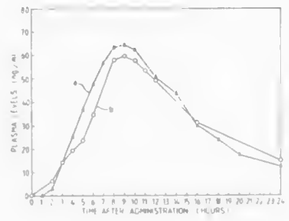
1. Pharmaceutical composition for the prevention and therapy of calculosis of the biliary tract and of biliary dyspepsia, containing as the active principle taurohyodeoxycholic acid in admixture with suitable carriers or excipients.

4,917,899

CONTROLLED ABSORPTION DILTIAZEM FORMULATION

Edward J. Geoghegan; Seamus Mulligan, both of Athlone, Ireland, and Donald E. Panoz, Tuckerstown, Bermuda, assignors to Elan Corporation plc, Athlone, Ireland

Continuation-in-part of Ser. No. 684,661, Dec. 20, 1984, Pat. No. 4,721,619. This application Nov. 16, 1987, Ser. No. 121,224
Claims priority, application Ireland, Oct. 16, 1987, 2789/87
The portion of the term of this patent subsequent to Jan. 2, 2007, has been disclaimed.
Int. Cl.[4] A61K *9/12, 9/16, 9/26*
U.S. Cl. 424—461 20 Claims



1. A diltiazem pellet formulation for oral administration, said pellet comprising a core of diltiazem or a pharmaceutically acceptable salt thereof in association with an organic acid and a lubricant, the diltiazem component and the organic acid being present in a ratio of from 50:1 to 1:1, and a membrane surrounding said core comprising a multiplicity of sequentially applied and dried layers, each layer containing a major proportion of a pharmaceutically acceptable film-forming, water insoluble, naturally occurring polymer and a minor proportion of a pharmaceutically acceptable film-forming, water soluble polymer, the number of layers in said membrane and the ratio of said water soluble to water insoluble polymer being effective to permit release of said diltiazem from said pellet at a rate allowing controlled absorption thereof over a twelve hour period following oral administration.

4,917,900

CONTROLLED RELEASE FORMULATIONS CONTAINING ZIDOVUDINE

Harry P. Jones; Robert J. Mackey, and Michael J. D. Gamlen, all of Dartford, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Mar. 25, 1988, Ser. No. 173,261
Claims priority, application United Kingdom, Mar. 27, 1987, 8707421
Int. Cl.[4] A61K *9/16*
U.S. Cl. 424—493 10 Claims

1. Pharmaceutical formulations adapted for oral administration in which discrete units comprising zidouvdine are each provided with a controlled release coating comprising a mixture of (a) a non-ionic polymer of at least one monomer selected from alkyl esters of acrylic and methacrylic acids, and (b) ethyl cellulose; components (a) and (b) being present in the coating in a weight ratio of 1:3 to 3:1.

4,917,901

METHODS AND COMPOSITIONS FOR INHIBITING OR DESTROYING SPERMATOZOA AND ORGANISMS WHICH CAUSES SEXUALLY TRANSMITTED DISEASES IN MAMMALIAN HOST

Pierre Bourbon, Toulouse, France; Pierre Lagny, Kildare, Ireland, and Pierre Billot, Neuilly sur Seine, France, assignors to Atlantic Pharmaceutical Products, Ltd., Kildare, Ireland

Filed May 22, 1987, Ser. No. 53,374
Claims priority, application France, May 22, 1986, 86 07310; European Pat. Off., Dec. 8, 1986, 86 402 716.4
Int. Cl.[4] A61K *33/14, 31/14*
U.S. Cl. 424—673 4 Claims

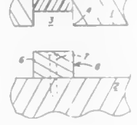
1. A method for inhibiting or destroying spermatozoa in a mammalian host in need thereof which comprises contacting the spermatozoa with a therapeutically effective amount of a composition which comprises a therapeutically effective amount of an active ingredient capable of inhibiting or destroying spermatozoa and a therapeutically-synergistically effective amount of an anti-enzymatic fluorinated compound capable of releasing 0.25% to 1% by weight of fluoride anions.

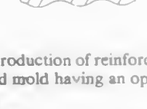
4,917,902

MOLD FOR THE PREPARATION OF REINFORCED REACTION INJECTION MOLDED PRODUCTS

Gregory H. Slocum, Pittsburgh; Michael F. Hurley, Oakdale; Wallace D. Templin, Coraopolis, and Donald W. Schumacher, Bethel Park, all of Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Mar. 28, 1989, Ser. No. 329,729
Int. Cl.[4] B29C *45/34*
U.S. Cl. 425—553 2 Claims





1. A mold for the production of reinforced reaction injection molded products, said mold having an open and a closed position and comprising:

(i) an upper mold part,

(ii) a lower mold part, said parts having surface portions defining the interior of a mold cavity when said mold is in the closed position,

(iii) a first channel in one of said parts completely surrounding said cavity, one upper edge of said channel forming at least a portion of the outer edge of said cavity, sand wherein said channel is at least partially filled with an elastomeric material, and

(iv) a first shear plate attached to the other of said parts in a location opposite said channel, wherein when said mold is in the closed position, said first shear plate:

(a) enters said first channel,

(b) presses against said elastomeric material, and

(c) presses against said outer edge,

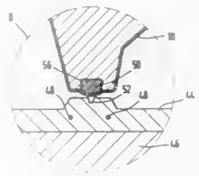
said first shear plate having one or more tapered slots therein, said slots; (1) tapering down from the surface of said first plate which presses against said elastomeric material, and (2) allowing gases to escape from said cavity when said mold is in the closed position.

4,917,903

APPARATUS FOR PRODUCING DECORATIVE SEAMS ON FILMS SHAPED USING A DRAWING METHOD

Kurt Meute, Jurgenweg 6, D-3000 Hannover 21, Fed. Rep. of Germany

Filed Jan. 11, 1988, Ser. No. 141,745
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1987, 3700960
Int. Cl.[4] B29C *59/02, 51/20*
U.S. Cl. 425—174.4 7 Claims



1. An apparatus for deep-drawing a film comprising:

a die box having a top opening;

means for heating said film disposed above said top opening;

means for holding said film between said top opening and said heating means;

means for deforming said film by a pressure differential to obtain a deformed film within said die box;

retractable molding means insertable into said die box through said top opening for molding said deformed film to obtain a molded film;

means for embossing an ornamental seam on said molded film before retraction of said molding tool from said molded film, said embossing means disposed in said die box and comprising:

a die holder, and

a heated, soft, embossing layer attached to said die holder having an embossing surface with a negative decorative seam for embossing said ornamental seam; and

means for pressing said embossing means against said molding tool to obtain said ornamental seam on said molded film.

4,917,904

PROCESS FOR THE PRODUCTION OF TRANSGLUTAMINASE-CONTAINING FOOD HAVING IMPROVED TEXTURE

Atsushi Wakameda; Nobuaki Yatsuka, and Yasuhiko Sasamoto, all of Tokyo, Japan, assignors to Taiyo Fishery Co., Ltd., Tokyo, Japan

PCT No. PCT/JP88/00657, § 371 Date Feb. 3, 1989, § 102(e) Date Feb. 3, 1989, PCT Pub. No. WO89/00011, PCT Pub. Date Jan. 12, 1989
PCT Filed Jun. 30, 1988, Ser. No. 310,720
Claims priority, application Japan, Jul. 2, 1987, 62-166021
Int. Cl.[4] A23L *1/313, 1/315, 1/325*
U.S. Cl. 426—7 13 Claims

1. A process for production of food having improved texture which consists of reacting 0.001 to 5 parts by weight of transglutaminase to 100 parts by weight of a food material containing one or more materials selected from the group consisting of fish meat, animal meat and fowl.

4,917,905
PROCESS FOR MANUFACTURING COOKED PRESSED CHEESES

Bussiere Guy, Ramonville, and Lablee Jean, Mamirolle, both of France, assignors to Roquette Freres, Lestrem, France

Continuation of Ser. No. 942,679, Dec. 17, 1986, abandoned.
This application Feb. 21, 1989, Ser. No. 313,309
Claims priority, application France, Dec. 17, 1985, 85 18686
The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.
Int. Cl.[4] A23C *19/05, 19/068*
U.S. Cl. 426—39 9 Claims

1. A process for manufacturing cooked pressed cheeses from milk wherein the milk is acidified in a reproducible and reliable manner for renneting, comprising the steps of:
providing a given volume of milk from which the cooked pressed cheese is to be prepared;
measuring the initial pH and the temperature of said milk;
selecting a period of time within which the pH of the milk will be brought from the initial pH to a renneting pH, said renneting pH being between 6.40 and 6.70 and said renneting pH being the required renneting pH for the type of cooked pressed cheese being manufactured;
acidifying the milk for renneting solely by adding an acidogen to the milk, said acidogen being selected from the group consisting of gluconolactones and glucoheptonolactones and said acidogen being added to the milk in an amount which is the minimum amount required to bring the initial pH of the milk to the renneting pH within the selected period of time, said minimum amount of acidogen being determined based on the kinetics of transformation of the acidogen at said temperature of the milk and as a function of the volume of the milk and the selected period of time, whereby the milk is acidified for renneting and brought from the initial pH to the renneting pH solely by the acidogen;
renneting the prepared milk by adding coagulating enzymes to the prepared milk; and then
coagulating;
dividing the coagulum;
cooking;
grinding;
molding;
pressing;
removing from the mold; and
ripening.

4,917,906
PROCESS FOR PRESERVING RAW MEAT WITH A BACTERIA-LYSING ENZYME FROM STREPTOMYCETES

Andreas Lotz, Frankfurt am Main; Gerhard Wöhner, Flörsheim am Main; Christian Klug, Schwalbach am Taunus; Erich Löck, Bad Soden am Taunus, and Gert-Wolfhard von Rymon Lipinski, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

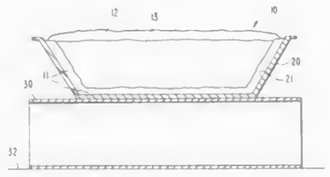
Filed Jan. 19, 1988, Ser. No. 145,304
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1987, 3701565
Int. Cl.[4] A23L *1/31, 1/315*
U.S. Cl. 426—56 6 Claims

1. A process for preserving a raw meat product, which comprises applying a bacteria-lysing enzyme from Streptomycetes to said meat product to provide at least about 10 units/mg of said enzyme in or on said meat product.

4,917,907
PIE HAVING A MICROWAVE BROWNABLE CRUST AND METHOD OF BAKING SAME

Stanley H. Kwis, Mt. Laurel; Robert H. Fleming, Collingswood; John P. O'Meara, Haddonfield, and Warren A. Widicus, Vincentown, all of N.J., assignors to Campbell Soup Company, Camden, N.J.

Filed Aug. 14, 1987, Ser. No. 85,373
Int. Cl.[4] H05B *6/80*
U.S. Cl. 426—90 25 Claims



1. A pie product having an uncooked bottom crust dough which is suitable for baking and browning in a microwave oven, the pie product comprising:
(a) a tray for supporting the pie, the tray being composed of a microwave-interactive material and being in heat-conductive contact with the bottom crust dough;
(b) a heat-conductive release coating interposed between an interior surface of the tray and the bottom crust dough;
(c) the bottom crust dough comprising a raw dough-base containing a reducing sugar and an amino acid source in amounts sufficient to promote chemical surface browning reactions, the browning reactions including both Maillard-type browning and caramelization browning, during the desired microwave exposure period; and
(d) a pie filling within the bottom crust dough, said filling comprising less than 90 wt. % water.

4,917,908
REDUCED OIL FRENCH FRIED POTATO PRODUCTS AND PROCESS FOR PREPARING

William E. Prosise, Ramsey, N.J., assignor to GAF Chemicals Corporation, Wayne, N.J.

Filed Jun. 26, 1989, Ser. No. 371,162
The portion of the term of this patent subsequent to Apr. 17, 1990, has been disclaimed.
Int. Cl.[4] A23L *1/217*
U.S. Cl. 426—102 17 Claims

1. A reduced oil French fried potato product comprising French fry potato pieces which are coated with polyvinylpyrrolidone (PVP).

4,917,909
LOW OIL POTATO CHIPS AND PROCESS FOR PREPARING

William E. Prosise, Ramsey, N.J., assignor to GAF Chemicals Corporation, Wayne, N.J.

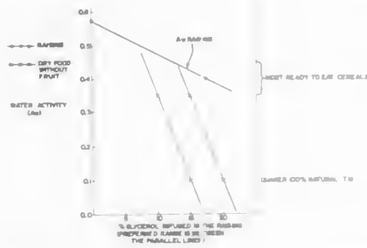
Filed Jun. 23, 1989, Ser. No. 370,479
The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.
Int. Cl.[4] A23L *1/217*
U.S. Cl. 426—102 16 Claims

1. A low oil potato chip product which is crisp and flavorful comprising potato slices which are coated with polyvinylpyrrolidone.

4,917,910
PROCESS FOR INFUSING HIGH LEVELS OF HUMECTANT INTO DRIED FRUITS, FOR USE IN DRY FOODS, SUCH AS IN MIXES AND READY TO EAT CEREALS

FuHung Hsieh, Columbus, Mo.; Lloyd S. Young, Barrington, Ill.; Linda D. Racicot, Hawthorn Woods, Ill., and Subodh K. Raniwala, Vernon Hills, Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Apr. 6, 1988, Ser. No. 178,137
Int. Cl.[4] A23B *7/14, 7/08*
U.S. Cl. 426—102 32 Claims



1. A process for unfusing liquid humectant into dried fruit, comprising: applying a predetermined amount of liquid humectant topically to a bed of dried fruit pieces, the amount of liquid humectant applied to be at least about 10% of the weight of the resulting admixture of dried fruit pieces and liquid humectant but less than the amount which would produce pools of free liquid in the bed; tumbling the dried fruit pieces together with the liquid humectant; and allowing the tumbled dried fruit and liquid humectant to stand until most of the liquid humectant has been infused into the dried fruit.

4,917,911
BACON ASSEMBLY AND METHOD OF MAKING SAME

Robert G. Bush, Green Bay, Wis., and Ciro J. Giammona, Mercer Island, Wash., assignors to Schreiber Foods, Inc., Green Bay, Wis.

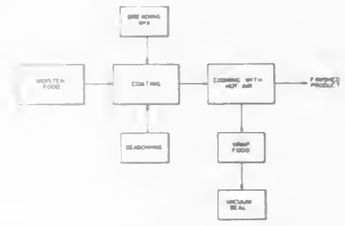
Filed Jul. 21, 1988, Ser. No. 222,559
Int. Cl.[4] A23L *1/01*
U.S. Cl. 426—243 20 Claims

14. A method of forming a bacon assembly comprising the steps of:
arranging a plurality of bacon strips on a single plane in a predetermined arrangement such that each of said bacon strips overlaps at least another one of said bacon strips at an overlapping section and such that at an overlapping section of two of said plurality of bacon strips a lean portion of one of said bacon strips engages a lean portion of the other of said bacon strips; and
at least partially cooking said bacon strips in said arrangement by subjecting said arranged bacon strips to microwave radiation, such that said bacon strips are microwave welded at said overlapping sections.

4,917,912
METHOD OF MAKING A LOW FAT FOOD ITEM HAVING THE TASTE AND FLAVOR OF A FRIED FOOD PRODUCT

Carolyn L. Duncan, 7490 E. 400 N., Kokomo, Ind. 46901

Continuation of Ser. No. 231,992, Jun. 27, 1988, abandoned, which is a continuation-in-part of Ser. No. 879,083, Jun. 26, 1987, abandoned. This application Apr. 18, 1989, Ser. No. 339,877
Int. Cl.[5] A23L *1/315*
U.S. Cl. 426—291 12 Claims



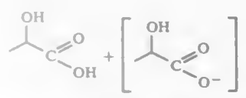
1. Method of cooking a food item having a low fat content and the taste and flavor of a fried food product, said method comprising the steps of:
(a) moistening the surface of the food item with water;
(b) thoroughly coating the wet surface with a breading composition including flour, milk, egg and seasoning, but excluding ay shortening or coloring agent;
(c) spraying the coated item with a mist of water until said breading composition appears sticky;
(d) placing the coated food item into a cooking chamber;
(e) directing hot gas jets against the coated food item for a period sufficient to cook and turn the food item brown;
(f) removing the cooked food item from said cooking chamber; and
(g) spraying the cooked food item with a mist of water to turn the item uniformly brown throughout the surface thereof.

4,917,913
USE OF SCLAREOLIDE IN AUGMENTING OR ENHANCING THE ORGANOLEPTIC PROPERTIES OF FOODSTUFFS

Lawrence Backholz, Jr., Middletown; Mohamad I. Farbood, Holmdel, both of N.J.; Nicolas Koosiakoff, Chambourcy, France, and Lewis G. Scharpf, Fair Haven, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

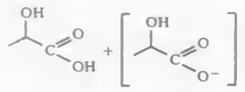
Filed Sep. 29, 1989, Ser. No. 418,171
Int. Cl.[4] A23L *1/226*
U.S. Cl. 426—536 1 Claim

1. A process for enhancing the taste of a cheddar cheese flavored foodstuff consisting essentially of the step of adding to said foodstuff a taste enhancing quantity, from about 0.5% up to to about 25% by weight of said foodstuff on a dry basis, of a mixed seasoning composition of matter consisting essentially of:
(a) from about 0.25 up to about 0.80 mole percent on a dry basis of a lactic acid/lactate species mixture having the structure:



(b) from 0 up to about 0.09 mole percent on a dry basis of

glycollic acid/glycollate ion species mixture having the structure:



(c) from about 0 up to about 10.0 mole percent on a dry basis of magnesium ion;

(d) from about 6 mole percent up to about 50 mole percent on a dry basis of a phosphate/monoacid phosphate/diacid phosphate/phosphoric acid species mixture having the formula:

$$[PO_4^{=}]+[HPO_4^{=}]+[H_2PO_4^{-}]+H_3PO_4$$

taken alone or taken further together with at least one of the species tripolyphosphate, pyrophosphate and/or polymetaphosphate;

(e) from 0 mole percent up to about 40 mole percent on a dry basis of sodium ion;

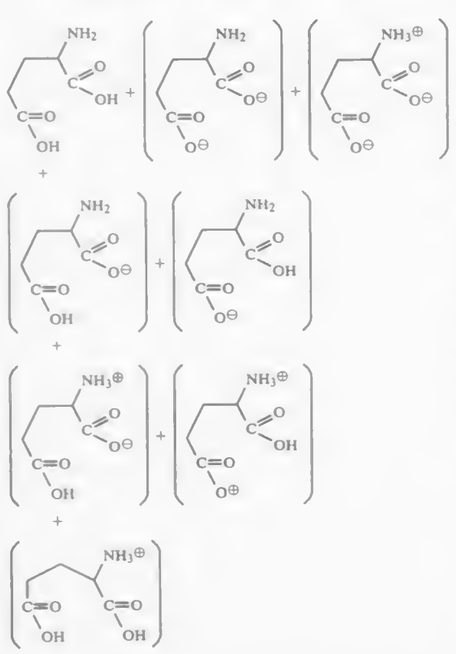
(f) from about 8 mole percent up to about 50 mole percent on a dry basis of potassium ion;

(g) from about 0.3 mole percent up to about 16 mole percent on a dry basis of chloride ion;

(h) from 0 mole percent up to 30 mole percent on a dry basis of carbonate/bicarbonate/carbonic acid species mixture having the formula:

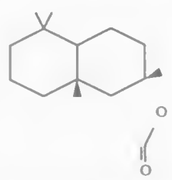
$$[CO_3^{=}]+[HCO_3^{-}]+H_2CO_3$$

(i) from 0 mole percent up to about 2.0 mole percent on a dry basis of monobasic glutamate/dibasic glutamate/gluamic acid species mixture having the formulae:



(j) from 0 up to about 0.6 mole percent on a dry basis of calcium ion; and

(k) from 0.1 up to about 0.6 moles percent on a dry basis of sclareolide having the structure:



with the proviso that the sum total of mole percent on a dry basis of sodium ion, potassium ion, magnesium ion and calcium ion is from about 48 mole percent up to about 60 mole percent; and with the proviso that the sum total of carbonate/bicarbonate/carbonic acid ion species mixture having the formula:

$$[CO_3^{=}]+[HCO_3^{-}]+H_2CO_3$$

taken together with the sum total mole percent on a basis of the phosphate/monobasic phosphate/dry basis of the phosphate/-monobasic phosphate/dibasic phosphate species mixture having the formula:

$$[PO_4^{=}]+[HPO_4^{=}]+[H_2PO_4^{-}]+H_3PO_4$$

taken alone or taken further together with at least one of the species tripolyphosphate, pyrophosphate and/or polymetaphosphate is from about 34 mole percent up to about 50 mole percent; the term "mole percent" being based upon the total moles of cations, anions and free organic acid which is substantially non-ionized in the composition.

4,917,914

ACCELERATED PROOFING OF REFRIGERATED DOUGHS

Edward Katz, St. Louis, and Douglas A. Edmonson, Ballwin, both of Mo., assignors to Anheuser-Busch Companies, Inc., St. Louis, Mo.

Division of Ser. No. 922,524, Oct. 24, 1986, Pat. No. 4,792,456. This application Nov. 30, 1988, Ser. No. 278,180

Int. Cl.[4] A21D *10/00*

U.S. Cl. 426—551 **12 Claims**

1. A method of accelerating the proofing of raw dough products containing a chemical leavening system which consists of a particulate acidulant element and a particulate CO_2 producing element, said system having one of the leavening elements encapsulated to minimize premature reaction between the elements, which raw dough products are to be stored in sealed containers and refrigerated comprising the steps of

(a) forming the dough product at a forming temperature of not more than about 70° F. at which temperature proofing of the dough is suppressed,

(b) artificially heating the formed dough product from the forming temperature to an average temperature of less than about 90° F.,

(c) sealing the heated dough product in a container,

(d) proofing the dough within the container at said average temperature until the container is internally sealed by the proofing of the dough product and the internal pressure reaches at least about 10 psi in the container, and

(e) refrigerating the heated dough product in the sealed container.

4,917,915

WATER-IN-OIL EMULSION SPREAD

Frederick W. Cain, Rushden; Malcolm G. Jones, Stevington, and Ian T. Nortan, Rushden, all of Great Britain, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 2, 1987, Ser. No. 20,423

Claims priority, application United Kingdom, Mar. 6, 1986, 8605559; Aug. 18, 1986, 8620066

Int. Cl.[4] A23D *3/00*

U.S. Cl. 426—573 **18 Claims**

1. A low fat spread containing less than 30 wt.% fat, comprising from 10 to 30 wt.% continuous fat phase and from 90 to 70 wt.% dispersed aqueous phase, wherein the aqueous phase is gel-forming and has a viscosity of at least 25 mPa.s at a shear rate of 17090 sec.$^{-1}$ and a temperature of 5° C.

4,917,916

FOOD CONTAINING ANHYDROUS CRYSTALS OF MALTITOL AND THE WHOLE CRYSTALLINE HYDROGENATED STARCH HYDROLISATE

Mamoru Hirao; Hiromi Hijiya, and Toshio Miyaka, all of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Continuation of Ser. No. 640,782, Aug. 14, 1984, abandoned, which is a division of Ser. No. 511,762, Jul. 7, 1983, abandoned, which is a division of Ser. No. 321,311, Nov. 13, 1981, Pat. No. 4,408,041. This application Mar. 21, 1986, Ser. No. 843,854

Claims priority, application Japan, Feb. 12, 1981, 19512

Int. Cl.[4] A23G *3/00*; A23L *2/00, 1/42, 1/40*

U.S. Cl. 426—658 **41 Claims**

1. In a process for producing a food-stuff which contains substantially non-hygroscopic, free-flowing sweetener comprising incorporating said sweetener into the foodstuff, the improvement wherein said substantially non-hygroscopic, free-flowing sweetener is selected from the group consisting of anhydrous crystals of maltitol and a whole crystalline hydrogenated starch hydrolysate mixture solid containing anhydrous crystals of maltitol.

4,917,917

ELECTROSTATIC POWDER COATING METHOD AND APPARATUS THEREFOR

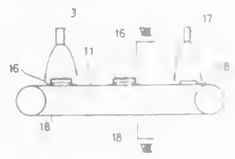
Masahiro Yamamoto, Sakura; Mituyosi Kumata, Toyonaka; Katutoshi Kozoe, and Tsutomu Itoh, both of Tokyo, all of Japan, assignors to Onoda Cement Company, Ltd., Yamaguchi, Japan

Continuation of Ser. No. 862,036, Jun. 12, 1986, Pat. No. 4,811,689. This application Nov. 28, 1988, Ser. No. 277,011

Claims priority, application Japan, May 16, 1985, 60-104800

Int. Cl.[4] B05D *1/06*; B05B *5/02*

U.S. Cl. 427—26 **20 Claims**



1. In an electrostatic powder coating method including the steps of directing a gun for performing electrostatic powder coating toward an object to be coated, forming a DC electric field between said gun and said object and jetting a powder coating material from said gun into said electric field to coat said object, the improvement comprising the steps of:

providing an auxiliary electrode, said auxiliary electrode being capable of retaining an electric charge;

electrically precharging said auxiliary electrode in the same polarity as said gun with a precharging means before jetting a powder coating material from said gun;

separating said auxiliary electrode from the influence of said precharing means; and

providing said separated precharged auxiliary electrode in a manner that allows the electric charge to be retained on said auxiliary electrode in the vicinity of a selected surface of said object on which it is desired to increase the quantity of powder coating material deposited in order to produce an auxiliary electric field between said auxiliary electrode and said selected surface so that a portion of said powder coating material is transferred onto said selected surface by said auxiliary electric field.

15. In an electrostatic powder coating apparatus having an electrostatic powder coating gun directed toward an object to be coated and a DC high voltage source connected between said gun and said object, said DC high voltage source forming a DC electric field between said gun and an object to be coated, the improvement comprising:

an auxiliary electrode that is capable of retaining an electric charge;

precharging means for precharging said auxiliary electrode in the same polarity as said gun, whereby said auxiliary electrode may be precharged by the precharging means before the coating operation; and

said auxiliary electrode provided in the vicinity of a selected surface of said object on which it is desired to increase the quantity of powder coating material deposited in order to produce an auxiliary field between said auxiliary electrode and said selected surface, said auxiliary electrode provided in a manner that allows an electric charge to be retained on said auxiliary electrode while separated from the influence of said precharging means.

4,917,919

PROCESS FOR PREVENTING CAKING OF AMMONIUM BIFLUORIDE AND/OR FLUORIDE PARTICLES

Klaus Geisler, Bergisch Gladbach; Dorde Jovcic, Burscheid; Bernd Krumbach, Leverkusen, and Heinz Heumüller, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 11, 1988, Ser. No. 217,501

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725285

Int. Cl.[4] B05D *7/00*

U.S. Cl. 427—220 **11 Claims**

1. A process for preventing the caking of particles of ammonium bifluoride and/or ammonium fluoride salt mixtures, the process comprising spraying a solution on said particles, said solution consisting essentially of (a) a solvent, said solvent being a fluorochlorohydrocarbon, and (b) a primary, secondary or tertiary amine carrying an alkyl group with 8 to 25 carbon atom, the amine being in a concentration of 0.005 to 0.2% by weight, based on the ammonium bifluoride and/or ammonium fluoride.

VOL 1113 ISS 3 AP 17 1990 UMI

4,917,920
FIBROUS STRUCTURES HAVING A DURABLE FRAGRANCE AND A PROCESS FOR PREPARING THE SAME

Akira Ono, Tokyo; Toshikazu Fuse, Nagahama; Osamu Miyamoto, Ketaka; Shoso Makino, Hikone; Yoshihisa Yamato, Shiki; Hiroshi Kametani, Kurayoshi; Susumu Tokura, Osaka; Hiromi Tanaka, Hikone; Toru Ito; Hitomi Nakao, both of Nagahama; Shuji Tokuoka, Takatsuki, and Toshihide Takeda, Hikone, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

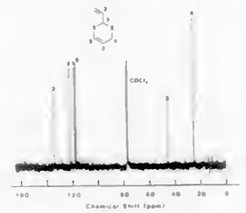
Division of Ser. No. 302,435, Jan. 26, 1989, Pat. No. 4,882,220.
This application Jul. 31, 1989, Ser. No. 387,958
Claims priority, application Japan, Feb. 2, 1988, 63-23444; Apr. 11, 1988, 63-88669; Apr. 27, 1988, 63-105766; May 12, 1988, 63-115617; May 18, 1988, 63-121140; May 19, 1988, 63-122299; Jun. 15, 1988, 63-145687
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—389.9 8 Claims

1. A process for preparing a durable, fragrant fibrous structure, which comprises applying a treating liquid comprising microcapsules composed of an external wall of a formaldehyde based resin enclosing a fragrant substance and a low temperature reactive organopolysiloxane prepolymer emulsion to at least a part of a fibrous structure and then drying the fibrous structure at a temperature of less than 150° C. to fix said microcapsules on fiber surfaces of the fibrous structure.

4,917,921
ANTITHROMBOGENIC AND ANTIBIOTIC COMPOSITION AND METHODS OF PREPARATION THEREOF

Robert E. Hermes, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 20, 1988, Ser. No. 184,545
Int. Cl.[4] B05D *1/18;* C08F *228/06*
U.S. Cl. 427—430.1 14 Claims



1. An antithrombogenic and antibiotic composition of matter consisting essentially of a copolymer of 2-vinyl-4H-1,3-dithiin and N-vinyl pyrrolidone.

4,917,922
FLAME RETARDANT PLANT

C. Jay Allison, Federal Way, and David W. Park, Puyallup, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Oct. 28, 1987, Ser. No. 113,312
Int. Cl.[4] A01G *5/06;* A01N *3/00*
U.S. Cl. 428—22 16 Claims

1. A flame retardant plant having foliage and structure which comprises a plant or a plant portion, not attached to a water source, having infused therein an effective amount of flame retardant material essentially uniformly distributed at least within the active xylem and the foliage.

4,917,923
CARBONACEOUS CYLINDRICAL BODY AND PROCESS FOR PRODUCING THE SAME

Akio Yoshida; Tsuneo Niinuma, and Ikuo Seo, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaishi, Tokyo, Japan

Filed Jun. 22, 1988, Ser. No. 209,720
Claims priority, application Japan, Jun. 22, 1987, 62-154800; Jun. 8, 1988, 63-140767
Int. Cl.[4] B29C *41/32, 53/56;* B32B *27/12;* C01B *31/02*
U.S. Cl. 428—34.1 18 Claims

1. A carbonaceous cylindrical body which comprises a composite body of a carbonized material of a thin paper-like supporting body having a strength ratio of lengthwise direction to widthwise direction of 2 to 10 obtained by manufacturing a paper-like body so that its carbonizable fibers are oriented and a carbonaceous matrix having an optically isotropic structure under a polarizing microscope and which shows a carbon content of at least 85% by weight, an oxygen gas permeation coefficient of from 10^{-2} to 10^{-7} cm^2/sec. under a partial pressure of oxygen of 1 atm. and a bulk density of from 1.4 to 1.9 g/cm^3.

5. A process for producing a carbonaceous cylindrical body of a carbon content of at least 85% by weight, an oxygen gas permeation coefficient of from 10^{-2} to 10^{-7} cm^2/sec. under a partial pressure of oxygen gas of 1 atm. and a bulk density of from 1.4 to 1.9 g/cm^3, which process comprises the steps of:

(I) providing a carbonizable precursor of carbon onto a thin paper-like supporting body which has been obtained by manufacturing a paper-like body so that its carbonizable fibers are oriented and shows a strength ratio of its lengthwise direction to its widthwise direction of from 2 to 10, thereby obtaining a carrying body;

(2) hardening said carrying body by heating thereof under pressure, thereby obtaining a sheet-like molded material;

(3) winding cylindrically said sheet-like molded material in a lengthwise direction in at least a single layer thereby forming a cylinder-form material; and

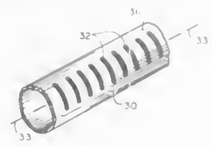
(4) carbonizing said cylinder-form material at a temperature of not lower than 800° C. in an inert atmosphere.

4,917,924
FOOD BODY WITH SURFACE COLOR IDICIA

Alvin S. Huang, Wheeling; Myron D. Nicholson, Lemont, and Rama Ramagopal, Bolling Brook, all of Ill., assignors to Viskase Corporation, Chicago, Ill.

Filed Dec. 16, 1988, Ser. No. 285,454
Int. Cl.[4] A22C *13/00;* D06P *3/60*
U.S. Cl. 428—34.8 31 Claims

1. An article comprising a substrate having thereon a desired indicia comprising an aluminum-organic dye lake and a binder-carrier, with said lake dispersed in said binder-carrier and bonded to the substrate by said binder-carrier in a moisture insensitive manner to form said indicia, with said indicia being

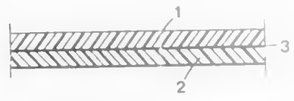


substantially completely transferable from said substrate to a contiguous edible surface in the presence of water.

4,917,925
MULTILAYER SHEET MATERIAL, PROCESS FOR ITS MANUFACTURE AND ITS USE

Maurice Loretti, Chatelaine/Geneva, and Pierre Vanat, Geneva, both of Switzerland, assignors to Vifor S.A., Carouge, Switzerland

Filed Jul. 26, 1989, Ser. No. 385,708
Claims priority, application Switzerland, Jul. 29, 1988, 2898/88
Int. Cl.[4] B32B *23/08, 27/08, 27/34*
U.S. Cl. 428—35.7 10 Claims



1. A multilayer sheet material comprising an 11-aminoundecanoic acid polyamide film (1) bonded by at least one of its faces to a polypropylene film (2).

4,917,926
SOLUBLE TAPE AND FILM

Lutz R. Weinhold, Fenor-Tramore, and John D. McDonough, Waterford, both of Ireland, assignors to Waterford Research & Development Limited, Waterford, Ireland

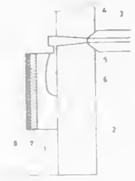
Continuation-in-part of Ser. No. 59,950, Jun. 9, 1987, abandoned. This application May 20, 1988, Ser. No. 196,510
Claims priority, application Ireland, May 21, 1987, 1336/87; Nov. 9, 1987, 3002/87
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—40 20 Claims

15. A self-supporting film of a plasticised polymethacrylate selected from the group consisting of polymers of butyl esters of methacrylic acid, and copolymers thereof with each other or with methyl methacrylate or with a compatible co-monomer.

4,917,927
SYNTHETIC RESIN MOLDINGS AND METHOD FOR THE MANUFACTURE THEREOF

Katsutoshi Sakaitani, No. 24-22, 6-chome, Shinjukucho; Hiroyuki Nakamura, No. 22-6, Wakitahoncho, both of Kawagoe-shi, Saitama-ken, and Kiyoshi Miyagi, No. 7-3, Kobushi-cho, Tokorozawa-shi, Saitama-ken, all of Japan

Filed Sep. 19, 1988, Ser. No. 245,679
Claims priority, application Japan, May 26, 1988, 63-129693
Int. Cl.[4] B05D *3/06*
U.S. Cl. 428—40 10 Claims

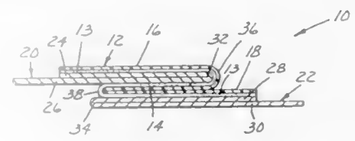


8. A method according to claim 7, wherein said printed synthetic resin sheet is charged into said molding die such that the side of the printed synthetic resin sheet having the ink film thereon is adjacent the inner surface of the molding die.

4,917,928
FOLDED ADHESIVE FILM DRESSING

Steven B. Heinecke, New Richmond, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 2, 1988, Ser. No. 279,365
Int. Cl.[4] B32B *7/06, 7/12*
U.S. Cl. 428—41 19 Claims



1. An adhesive composite comprising a backing having a coating of pressure-sensitive adhesive on one surface, said backing having a center region and two side regions adjacent said center region, and further comprising first and second liner pieces, wherein said first liner piece is releasably adhered to the adhesive coated surface of one of the side regions of the backing and said second liner piece is releasably adhered to the adhesive coated surface of the other side region of the backing, and wherein said backing is wrapped around the first liner piece, releasably adhering said adhesive coated surface of the center region of the backing to at least one of the liner pieces.

4,917,929
ONE PIECE ADHESIVE BANDAGE AND PACKAGE UNIT

Steven B. Heinecke, New Richmond, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 18, 1989, Ser. No. 298,628
Int. Cl.[4] B32B *7/06, 7/12*
U.S. Cl. 428—41 19 Claims

1. An adhesive composite comprising a backing having a central region bounded on opposing sides by side regions, said central region having a pressure-sensitive adhesive coated on at least a portion of one face of the backing, and wherein said

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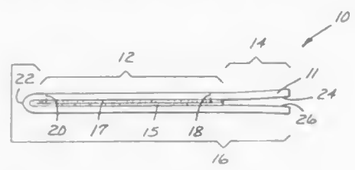
adhesive-coated face of said central region is releasably adhered to at least one of the side regions and wherein said



central region is separable from the side regions by separation means.

4,917,930

PERFLUORO COMPOUND DISPERSIONS CONTAINING REDUCED AMOUNTS OF SURFACTANT AND PROCESS OF PREPARATION

William McCormick, Carlisle, Mass., assignor to Adamantech, Inc., Linwood, Pa.

Continuation-in-part of Ser. No. 794,271, Nov. 4, 1985, abandoned, which is a continuation of Ser. No. 600,653, Apr. 16, 1984, abandoned. This application Oct. 3, 1986, Ser. No. 914,961

Int. Cl.[4] A61K *31/74, 31/025*

U.S. Cl. 424—78 **20 Claims**

1. A composition comprising a stable, uniform, aqueous dispersion of a perfluoro compound having gas transfer properties and a surfactant, wherein greater than about 75% by weight of the surfactant present in said dispersion is complexed with the perfluoro compound.

9. A process for preparing an aqueous dispersion of a perfluoro compound having gas transfer properties, which comprises:

(a) providing an initial dispersion comprising (i) a perfluoro compound phase containing a surfactant complexed with the perfluoro compound, and (ii) an aqueous phase containing uncomplexed surfactant;
(b) concentrating the perfluoro compound phase;
(c) recovering the concentrated perfluoro compound phase from the aqueous phase; and
(d) redispersing the concentrated perfluoro compound phase with an amount of an aqueous medium effective to redisperse the perfluoro compound phase and thereby to form a final dispersion.

4,917,931

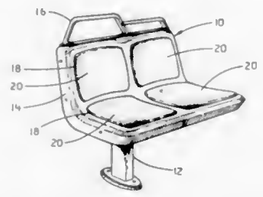
VANDAL RESISTANT UPHOLSTERED SEAT

Keith A. McDowell, Belmont, and Vaughn L. Clark, Martin, both of Mich., assignors to American Seating Company, Grand Rapids, Mich.

Filed Feb. 24, 1988, Ser. No. 159,829

Int. Cl.[4] A47C *27/00*

U.S. Cl. 428—88 **14 Claims**



1. A vandal resistant upholstered seat insert for a seat wherein the seat insert is shaped to fit in a seat insert portion of the seat and wherein the seat insert is attached to the seat by releasable fastening means, the seat insert comprising:

a hard substrate shaped to fit in the seat insert portion of the seat and including means for removably attaching the seat insert to the seat by means of the insert fastening means, the substrate having an outer surface that is engaged by a seated passenger;
a vertical pile fabric covering the outer surface of the substrate comprising a planar backing material with a plurality of generally upright fibers attached to the backing material and extending outwardly from an outer side of the backing material; and
a layer of high strength adhesive interposed between the vertical pile fabric and the substrate and affixing the vertical pile fabric to the substrate, the adhesive bonding the fabric to the substrate with a bond strength that is sufficient to resist peeling of the fabric from the substrate.

4,917,932

FLOOR MAT WITH A NON-SLIDABLE SURFACE

Scott D. McClung, 49 La Senda, South Laguna, Calif. 92677

Filed Oct. 5, 1987, Ser. No. 105,146

Int. Cl.[4] B32B *33/00*

U.S. Cl. 428—90 **1 Claim**

1. A floor mat which is for use on a floor carpet of an automobile, said floor mat comprising:

a. a base with a non-slidable bottom surface and a top surface, said base being formed from a mixture of crumb rubber and poly vinyl chloride which is heated in order to cure said poly vinyl chloride thereby setting said crumb rubber therein wherein said crumb rubber is 20 to 45 percent by volume of said mixture and said poly vinyl chloride is 55 to 80 percent by volume of said mixture;
b. an adhesive layer which is disposed on said top surface of said base; and
c. a plurality of bristles which are electrostatically flocked onto said adhesive layer and permanently bonded thereto wherein said bottom surface of said base is disposed on the floor of the automobile so that it grips the floor carpet of the automobile.

4,917,933

PLASTIC SHEET FOR LINING BUILDING SURFACES

Werner Schluter, Am Schierloh 6, 5860 Iserlohn, Fed. Rep. of Germany

Continuation of Ser. No. 143,622, Jan. 13, 1988. This application Jul. 31, 1989, Ser. No. 391,697

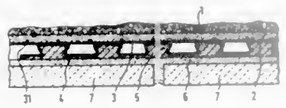
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1987, 3701414

Int. Cl.[4] B32B *3/06;* **E04B** *5/52*

U.S. Cl. 428—99 **2 Claims**

1. A plastic sheet for bonding to and lining the surface of a foundation or wall onto which a covering material is bonded, wherein unequal stresses are experienced by the foundation or wall and the covering material which is compensated for by the plastic sheet, said plastic sheet having dovetail-shaped parallel grooves on the inner and outer surfaces thereof and a lattice matting applied to the inner surface of the plastic sheet including anchoring protrusions adpated to be pressed into the

bonding material on the surface of the foundation or wall lined by the plastic sheet, whereby the lattice matting prevents bonding material from entering the grooves on the inner sur-



face of the plastic sheet which remain open so as to permit the plastic sheet to stretch or expand as a result of the unequal stresses in the foundation or wall and the covering material.

4,917,934

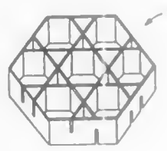
TELESCOPE MIRROR BLANK AND METHOD OF PRODUCTION

Daniel R. Sempolinski, Painted Post, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Apr. 27, 1989, Ser. No. 343,573

Int. Cl.[4] C03B *23/207;* **G02B** *5/08;* **E05F** *15/20*

U.S. Cl. 428—116 **26 Claims**



1. In a telescope mirror blank comprising a faceplate and a supporting network core, the supporting network core being composed of a plurality of thermally crystallized glass struts, the crystallized glass having a coefficient of thermal expansion between -10 and $+10\times10^{-7}$/° C. over the temperature range 0°-300° C., the struts being fused to the faceplate, the improvement wherein the network core structures are composed of sintered and crystallized glass powder and are frit sealed to one another to form a network which, in turn, is frit sealed to the faceplate.

14. In a method of producing a telescope mirror blank comprising a faceplate and a supporting network core, the supporting network core being composed of a plurality of glass-ceramic struts, the glass-ceramic having a coefficient of thermal expansion between -10 and $+10\times10^{-7}$/° C. over the temperature range 0°-300° C., the struts being fused to the faceplate, the improvement which comprises the steps of forming a slurry from a powdered thermally crystallizable glass capable of being converted to a glass-ceramic having a coefficient of thermal expansion between -10 and $+1\cdot\times10^{-7}$/° C. over the temperature range 0°-300° C., forming thin-walled struts from the slurry, sintering the struts, assembling and sealing the strauts together with a thermally crystallizable glass frit to form a rigid network core, and sealing the network core to the faceplate with a thermally crystallizable glass frit.

4,917,935

CERAMIC PACKING

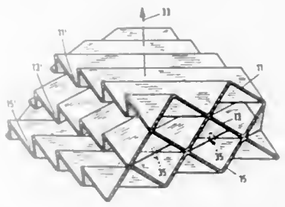
Vladimir Kubicek, Seuzach, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jul. 8, 1986, Ser. No. 883,061

Claims priority, application Switzerland, Jul. 18, 1985, 03 119/85

Int. Cl.[4] B32B *3/17*

U.S. Cl. 428—116 **11 Claims**



7. A one-piece homogeneous ceramic packing comprising

a plurality of corrugated layers disposed in spaced apart relation, each layer having parallel wave troughs disposed at an angle to said troughs of an adjacent layer; and
a plurality of joins integrally formed with and between said layers, each said join being located at a point of intersection of one layer with an adjacent layer and being formed solely of the same material as said layers.

4,917,936

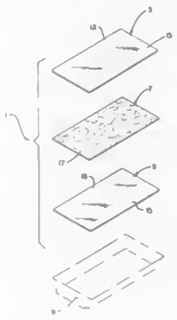
ABSORBENT PAD AND METHOD FOR CONSTRUCTING SAME

John C. Rhodes, Washington, Mo.; Ronald R. Aljoe, Lewisville, Tex., and Berne F. Ellers, Orkelljunga, Sweden, assignors to Clean-Pak, Inc., St. Louis, Mo. and Dry Forming Processes AB, Orkelljunga, Sweden

Filed Sep. 19, 1988, Ser. No. 246,155

Int. Cl.[4] B32B *3/10*

U.S. Cl. 428—137 **19 Claims**



1. An absorbent pad for meat and poultry products and the like including:

upper and lower plastic film layers, each having a series of through perforations of predetermined size extending throughout said layers;
a substantially uniform in thickness intermediate absorbent layer disposed between said upper and lower layers and having a plurality of juxtaposed and overlapping absorbent material fibers which are operatively secured to adjacent absorbent material fibers in structural supporting relationship and are also constructed to provide a plurality

of spaced interstices extending throughout said absorbent layer;

a plurality of superabsorbent granular particles dispersed throughout the absorbent layer and being physically retained in place against movement within the absorbent layer, said particles being physically retained in place at random and spaced locations in said absorbent layer by said absorbent material fibers, said superabsorbent granular particles being capable of absorbing and suspending liquids therein while continuing to be held and physically retained in place by the absorbent material fibers of said absorbent layer even after liquid is absorbed in said superabsorbent granular particles and absorbent material fibers; and

said upper and lower perforated plastic film layers being attached to one another at least partially along opposite marginal edge portions thereof to retain said absorbent layer between said upper and lower layers;

whereby said absorbent material fibers and said superabsorbent granular particles absorb and suspend substantial quantities of liquid throughout the absorbent layer without reverse migration of liquid past the through perforations in said layers so as to maintain the absorbed and suspended liquid out of contact with the meat product.

4,917,937

CLOTH FOR A PAPER MACHINE

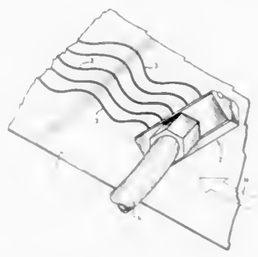
Lasse Lappänen, Lempäälä , and Seppo Taipale, Sillinjärvi, both of Finland, assignors to Tamfelt Oy Ab, Tampere, Finland

Filed Apr. 28, 1989, Ser. No. 344,933

Claims priority, application Finland, Dec. 8, 1988, 885693

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—196 **6 Claims**



1. A cloth for a paper machine, comprising a fabric formed by threads of a synthetic material, whereby reinforcements extending substantially longitudinally of the cloth are arranged at predetermined points in the cloth, the reinforcements being formed by feeding molten plastic material in a narrow stripe on to the surface of the cloth, and the directions of the stripes forming the reinforcement being arranged to deviate from the longitudinal direction of the cloth at least locally.

4,917,938

FIBER REINFORCED ARTICLE CAPABLE OF REVEALING DAMAGE DUE TO SURFACE IMPACTS AND METHOD OF MAKING SAME

Raja Mohan, Dublin, Ohio, assignor to Edo Corporation, Salt Lake City, Utah

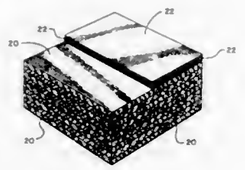
Filed Feb. 13, 1987, Ser. No. 14,391

Int. Cl.[4] B32B *7/02*

U.S. Cl. 428—215 **6 Claims**

1. A fiber reinforced composite article comprising a base structure composed of a first filamentary material which is saturated with polymeric resin, said base structure having a thickness of between about 0.25 centimeter and 1.3 centimeters, and

a layer of second filamentary material which is wound over the base structure and saturated with polymeric resin, said layer having a thickness of between about 4 mils and 20



mils, with said second filamentary material having a sufficiently different modules of elasticity from the modulus of elasticity of said first filamentary material so that the modulus of elasticity of one of the filamentary materials is at least about twice that of the other filamentary material.

4,917,939

RECORDING METHOD AND RECORDING MEDIUM

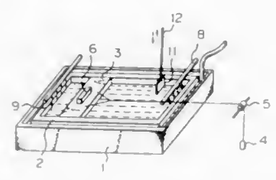
Hiroshi Matsuda, Yokohama; Kenji Saito; Kunibiro Sakai, both of Tokyo; Ken Eguchi, Yokohama; Yukuo Nishimura, Sagamihara, and Takashi Nakagiri, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Apr. 14, 1986, Ser. No. 851,083

Claims priority, application Japan, Apr. 16, 1985, 60-80853; Apr. 16, 1985, 60-80854

Int. Cl.[4] B32B *9/04*; G01D *9/00*

U.S. Cl. 428—216 **8 Claims**



1. A recording medium comprising a recording layer containing a diacetylene derivative compound and an ultraviolet radiation absorption layer capable of absorbing sufficient ultraviolet radiation causing color change in the recording layer to provide enhanced storage stability for said recording medium, said recording layer being capable of changing color at a portion irradiated with a beam having a wavelength of 420 nm to 800 nm in accordance with input information to effect recording.

4,917,940

METHOD OF FORMING A MULTIPLE LAYER DIELECTRIC AND A HOT FILM SENSOR THEREWITH

Hopsou, Jr. Purnell, Seaford, and Sang Q. Tran, Hampton, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 1, 1988, Ser. No. 176,547

Int. Cl.[4] B32B *7/02, 15/08*

U.S. Cl. 428—216 **4 Claims**

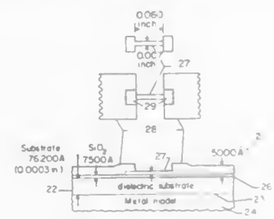
1. A hot-film sensor for use on an electrically conductive surface comprising:

a first layer of a thermoplastic polymer formed on an electrically conductive surface;

a second layer of fused silica formed on said first layer of thermoplastic polymer to form a multiple layer dielectric substrate;

an electrically resistive film of metal formed on selected areas of said dielectric substrate to form one or more multiple layer hot-film sensor elements and electrical circuits formed on said multiple layer dielectric substrate connecting one or more hot-film sensing elements.

2. The invention as defined in claim 1 wherein said first layer



of thermoplastic polymer is formed of a coating of poly-monochloro-para-xylyene up to 5.0 microns in thickness;

said second layer of fused silica is up to 1.0 microns in thickness;

said one or more hot-film sensor elements are formed of an electrically resistive nickel-chrome film up to 2200 Å in thickness; and

said electrical circuits are formed of aluminum up to 5000 Å in thickness.

4,917,941

FIBER- AND FILAMENT-CONTAINING CERAMIC PREFORM AND COMPOSITE

William B. Hillig, Ballston Lake, and Henry C. McGuigan, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 947,203, Dec. 29, 1986, Pat. No. 4,810,442.

This application Jan. 25, 1988, Ser. No. 147,961

The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.

Int. Cl.[4] B32B *5/02, 5/16*

U.S. Cl. 428—283 **10 Claims**

1. A preform consisting essentially of a layer of a plurality of continuous ceramic filaments surrounded by a mixture of fibers and particulates, each said filament being longer than about 1000 microns and having a diameter greater than about 10 microns, said fibers being discontinuous and having an aspect ratio ranging from about 10 to less than about 200, said particulates having an equivalent diameter ranging from greater than about 0.2 μ to less than about 3 μ, the ratio of the largest to the smallest dimension of said particulates being less than about 10 and the largest dimension of said particulates being less than about $\frac{1}{2}$ of the length of said fibers, the volume ratio of said fibers to said particulates ranging from about 1:5 to about 1:1, at least about 90% by volume of said particulates being filler particulates, said filaments being substantially parallel to each other extending at least substantially across a section of said preform and there being no significant contact between said filaments, said filaments having a melting or decomposition point higher than 1000° C., said fibers and filler particulates being selected from the group consisting of aluminum oxide, beryllium oxide, silicon carbide, silicon nitride, titanium carbide, titanium diboride, zirconium carbide, zirconium diboride and mixtures thereof, from 0 to about 10% by volume of said particulates being comprised of a ceramic meltable material which has a melting point ranging from a minimum of about 1000° C. to a maximum which is about 100° C. below the melting or decomposition point of said fibers, filler particulates and filaments, said preform having an open porosity ranging from 30% by volume to about 80% by volume of said preform, said preform being of simple, hollow and/or complex shape, said preform being useful for producing a ceramic composite which does not differ significantly in shape and size therefrom and which consists essentially of a continuous matrix phase and a filler phase, said preform being characterizable as being infiltratable with molten ceramic infiltrant to produce said composite wherein said infiltrant and said ceramic meltable material form said matrix phase.

4,917,942

NONWOVEN FILTER MATERIAL

John C. Winters, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 22, 1988, Ser. No. 288,294

Int. Cl.[4] B32B *27/00*

U.S. Cl. 428—286 **16 Claims**

1 A disposable microfibrous filter material especially suited for use as a dust and debris collection device for vacuum cleaning apparatus, said microfibrous filter material comprising a laminate structure of a porous layer of self-supporting, thermoplastic, nonwoven fabric having an air permeability of at least 300 $m^3/min/m^2$ and a layer of a randomly intertangled nonwoven mat of electretcontaining microfibers of synthetic polymer coextensively deposited directly on and adhering to said self-supporting nonwoven fabric, said laminate structure having an air permeability of from about 5 to 50 $m^3/min/m^2$

4,917,943

FIBER CONTAINING AGGREGATE AND PROCESS FOR ITS PREPARATION

Günter Tesch, Avenue Jean-Marie-Musy 15, CH-1700 Fribourg, Switzerland

Filed Jan. 12, 1988, Ser. No. 143,028

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1987, 3700680; Switzerland, Mar. 16, 1987, 00969/87; Aug. 17, 1987, 03157/87

Int. Cl.[4] D02G *3/00*

U.S. Cl. 428—288 **9 Claims**

1. A fiber aggregate, for a filler material for covers or pillows, a cushioning material, or filters, comprising a plurality of fiber balls bonded together by connecting binder fibers, wherein each fiber ball comprises fibers or filaments which are spherically entangled.

4,917,944

MULTI-PLY WEATHERABLE PLASTICIZER-FREE SHEET

Hans-Ulrich Breitscheidel, Siegburg; Rudolf Kautz, Hennef; Werner Kühnel, Neukirchen-Schönenhof; Manfred Simm, Troisdorf; Paul Spielau, Troisdorf-Sieglar, and Richard Weiss, Troisdorf, all of Fed. Rep. of Germany, assignors to Huels Troisdorf Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Division of Ser. No. 867,543, May 28, 1986, abandoned. This application Sep. 30, 1987, Ser. No. 102,667

Claims priority, application Fed. Rep. of Germany, May 28, 1985, 3519064; European Pat. Off., Apr. 29, 1986, 86105883.2

The portion of the term of this patent subsequent to Jun. 14, 2005, has been disclaimed.

Int. Cl.[4] B32B *27/08*

U.S. Cl. 428—308.4 **10 Claims**

1. A multi-ply, weatherable, plasticizer-free and deep-drawable sheet for the internal and external outfitting of automotive vehicles, comprising:

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a first layer comprised of an ethylene-propylene-diene terpolymer and a homopolymer and/or copolymer of propylene, produced by extrusion or calendering with a sheet thickness of 0.2 to 3 mm bonded to a second layer comprised of a crosslinked polyolefin resin-containing foam; said first layer containing

65–25% by weight of a partially crystalline ethylene-propylene-diene terpolymer comprising

65–82% by weight of ethylene;

18–35% by weight of propylene, and

3–8% by weight of a diene tercomponent,

with a melt index MFI (230/5) of 0.5–2.0 g/10 min., a tensile strength of at least 10 N/mm^2, and DSC maximum temperature of at least 40° C.;

35–75% by weight of at least one propylene polymer selected from the group consisting of homopolymer and a copolymer of propylene, with a melt index MFI (230/2.16) of 0.2–2 g/10 min.;

0–10% by weight of fillers, comprising at least one of chalk, kaolin, talc, carbon black, silica and silicic anhydride; as well as, per 100 parts of said polymers:

0.1–1.0 parts by weight of stabilizers comprising at least one of sterically hindered phenolic antioxidants, phenolic phosphites and thioesters of aliphatic carboxylic acids;

0.1–2 parts by weight of a lubricant comprising at least one of metallic salts of carboxylic acids, montanic acid esters and hydrogenated hydrocarbon resins;

0–5 parts by weight of colorants; and

0–4 parts by weight of an extender oil;

said second layer containing, in 100 parts by weight of the polyolefin-containing resin, at least 15% by weight of a polar, copolymerized monomer;

said first layer and said second layer being adhesively bonded directly to each other by thermal pressure bonding or flame laminating.

4,917,945

SHAPING OF SYNTACTIC FOAM

James B. Cattanach, Middlesbrough, England, assignor to Imperial Chemical Industries plc, London, England

Division of Ser. No. 151,283, Feb. 1, 1988. This application Jul. 12, 1989, Ser. No. 378,787

Claims priority, application United Kingdom, Feb. 9, 1987, 8702847

Int. Cl.[4] B32B *3/26*

U.S. Cl. 428—313.3 3 Claims

1. A shaped article comprising a core of syntactic foam material of hollow microspheres in a thermoplastic polymer matrix and at least one surface layer of reinforced thermoplastic material comprising a quasiisotropically reinforced lay up of layers of continuous, collimated fibres in a thermoplastic matrix, the surface layer being integral with the core material.

4,917,946

LOW MAGNETIC SIGNATURE PRODUCTS AND METHOD

Julius J. Grodski, Toronto, and H. Laurie Miller, Oakville, both of Canada, assignors to Her Majesty the Queen as represented by the Minister of National Defence in Her Majesty's Canadian Governmenmt, Ottawa, Canada

Filed Nov. 13, 1987, Ser. No. 120,383

Claims priority, application Canada, Feb. 27, 1987, 530863

Int. Cl.[4] B32B *5/16*; C08K *3/10*

U.S. Cl. 428—328 12 Claims

1. A solid composition having low magnetic signature for use in buoyancy compensating devices comprising a plurality of spherical unconnected particles of selected, degreased, low magnetic signature lead shot incorporated in a polymeric or other non-metallic matrix material, wherein the lead shot particles are physically and electrically separated from each other, being completely pre-coated with a suitable coating material.

4,917,947

MAGNETIC RECORDING MEDIUM

Kideaki Kosha; Kiyomi Ejiri; Toshihiko Miura; Koyotaka Fukino, and Kouichi Masaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 25, 1987, Ser. No. 125,277

Claims priority, application Japan, Nov. 28, 1986, 61-281866; Nov. 28, 1986, 61-281867; May 13, 1987, 62-114404

Int. Cl.[4] G11B *5/70, 5/708*

U.S. Cl. 428—329 10 Claims

1. A magnetic recording medium comprising a non-magnetic support having provided thereon a magnetic layer comprising a binder having dispersed therein a ferromagnetic powder, in which said magnetic layer contains surface-coated inorganic particles having a Mohs' hardness of 5 or more as an abrasive, said coated inorganic particles being present substantially at the surface of the magnetic layer in a larger proportion than in the interior of the magnetic layer, the inorganic particles being coated with a material which increases the acidity of the surface of the inorganic particles; and wherein the binder is an acidic group containing resin.

4,917,948

REVERSIBLE THERMOSENSITIVE RECORDING MATERIAL

Yoshihiko Hotta, Numazu, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 27, 1989, Ser. No. 302,247

Claims priority, application Japan, Jan. 27, 1988, 63-014754

Int. Cl.[4] B41M *5/18*

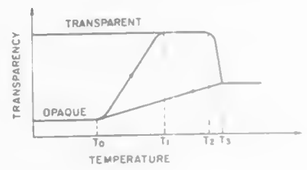
U.S. Cl. 428—335 12 Claims

1. A reversible thermosensitive recording material comprising:

(a) a support, and

(b) a reversible thermosensitive recording layer formed thereon, which comprises as the main components a matrix resin, at least one higher monocarboxylic fatty acid having 16 or more carbon atoms, and at least one aliphatic saturated dicarboxylic acid or derivative thereof, wherein said derivative is selected from the group consisting of p-nitrobenzyl esters, S-p-bromobenzylthiuronium salts, benzylammonium salts, diamides, anilides, phenacyl esters, monoamides, dihydrazides, p-bromophenacyl esters, dianilides, dibenzalhydrazides, S-p-chlorobenzylthiuronium salts, and p-phenylphenacyl esters, with the ratio

by weight of the amount of said higher monocarboxylic fatty acid to the amount of said aliphatic saturated dicarboxylic acid or derivative thereof being in the range of (95:5) to (20:80), wherein said higher monocarboxylic fatty acid and said aliphatic saturated dicarboxylic acid or derivative thereof are dispersed as particles in said matrix resin and wherein said higher monocarboxylic fatty acid



has a melting point ranging from about 30° C. to about 150° C., and said aliphatic saturated dicarboxylic acid or derivative thereof has a melting point ranging from about 80° C. to about 200° C., with the melting point of said higher monocarboxylic acid being higher than the melting point of said aliphatic saturated dicarboxylic acid or derivative thereof.

4,917,549

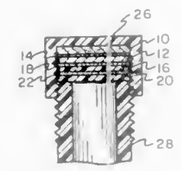
LEAKPROOFING CAP LINERS AND TAMPERPROOFING CONTAINERS BY INDUCTION HEATING

Bahjat Z. Yousif, 582 Washington St., Elmhurst, Ill. 60126

Continuation-in-part of Ser. No. 6,913, Jan. 27, 1987, abandoned. This application Apr. 14, 1988, Ser. No. 181,561

Int. Cl.[4] B32B *27/04*; C01J *7/02*; B65B *7/00*

U.S. Cl. 428—349 29 Claims



1. An improved laminated cap liner of the type formed of a layer of pulp, a layer of metal foil container sealing material adhesively affixed to one surface of said layer of pulp, and a layer of adhesive disposed between said layer of pulp and said layer of metal foil container sealing material, the improvement comprising:

the adhesive securing said layer of pulp to said layer of metal foil container sealing material is a water base emulsion including an essentially non-crosslinked, crosslinkable polymer, a crosslinking agent and a catalyst and/or an essentially non-crosslinkable settable polymer

such that upon heating of said layer of metal foil container sealing material to a temperature sufficient to crosslink said crosslinkable polymer with said crosslinking agent and/or to set said settable polymer to form a nonadhesive, chemically resistant film over said layer of pulp such that when the cap is removed from the metal foil container, the layer of pulp will separate from said layer of container sealing material.

4,917,950

LARGE DIAMETER ORIENTED MONOFILAMENTS

Teh-Chuan Wang, Parkersburg, W. Va., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 18,385, Feb. 25, 1987, Pat. No. 4,839,132. This application Jan. 26, 1989, Ser. No. 301,471

Int. Cl.[4] D02G *3/00*

U.S. Cl. 428—373 10 Claims

1. A monofilament prepared from at least one semi-crystalline linear polymer and having a diameter of at least about 60 mils, the monofilament being oriented at least about 3.5 times in the longitudinal direction, having a variation in ovality of less than about 5%, and having at least 2 substantially concentric layers.

4,917,951

LIPID VESICLES FORMED OF SURFACTANTS AND STEROIDS

Donald F. H. Wallach, Brookline, Mass., assignor to Micro-Pak, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 078,658, Jul. 28, 1987, Pat. No. 4,855,090. This application Nov. 24, 1987, Ser. No. 124,824

Int. Cl.[4] A61K *9/66, 37/22*; B01J *13/02*

U.S. Cl. 428—402.2 8 Claims

1. A multilamellar lipid vesicle formed of surfactant materials which do not form vesicles in the absence of a steroid, said multilamellar lipid vesicle consisting essentially of a single surfactant selected from the group consisting of:

polyoxyethylene (n) cetyl ethers where n ranges from 5–10; polyoxyethylene (x) stearyl ethers where x ranges from 2–10; polyoxyethylene (y) oleyl ethers where y ranges from 2–10; polyoxyethylene (z) linoleyl ethers where z ranges from 2–10; polyoxyethylene (s) eicosamonoenoyl ethers where s ranges from 2–10; polyoxyethylene (t) eicosadienoyl ethers where t ranges from 2–10; and

about 20–50% of a steroid.

5. A multilamellar lipid vesicle formed of surfactant materials which do not form these vesicles in the absence of a steroid, said multilamellar lipid vesicle consisting essentially of a single surfactant selected from the group consisting of:

polyoxyethylene (n') cetyl amines where n' ranges from 5–10; polyoxyethylene (x') stearyl amines where x' ranges from 5–10; polyoxyethylene (y') oleyl amines where y' ranges from 5–10; polyoxyethylene (z') linoleyl amines where z' ranges from 5–10; polyoxyethylene (s') eicosamonoenoyl amines where s' ranges from 5–10; polyoxyethylene (t') eicosadienoyl amines where t' ranges from 5–10; and

about 20–50% of a steroid.

4,917,952

ELECTROCONDUCTIVE IRON OXIDE PARTICLES

Tsutomu Katamoto; Tokihiro Kurata, and Nanao Horiishi, all of Hiroshima, Japan, assignors to Toda Kogyo Corp., Hiroshima, Japan

Filed Sep. 26, 1988, Ser. No. 248,986

Claims priority, application Japan, Sep. 29, 1987, 62-244594; Oct. 23, 1987, 62-269051; Aug. 25, 1988, 62-211436; Aug. 25, 1988, 62-211437

Int. Cl.[4] B32B *5/30*

U.S. Cl. 428—403 14 Claims

1. Electroconductive iron oxide particles having a volume resistivity less than 5×10^6 Ω-cm, and comprising iron oxide particles selected from hematite and maghemite, and SnO_2 particles containing Sb as a solid solution deposited on the surfaces of the iron oxide particles.

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4,917,953

METHOD OF FORMING SOLID LUBRICAITNG FILM ON CERAMIC MATERIAL AND PRODUCT PRODUCED BY THE SAME

Tatsumi Hioki, Nagoya; Shogo Hibi, and Jun-ichi Kawamoto, both of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Feb. 26, 1988, Ser. No. 161,184
Claims priority, application Japan, Feb. 28, 1987, 62-45987
Int. Cl.[4] B32B *9/00;* B05D *3/06*
U.S. Cl. 428—408 14 Claims

1. A method of forming an inorganic solid lubricating film on the surface of a ceramic material comprising the steps of:

(1) evaporating a liquid or solid organic material by heating the same in a vacuum atmosphere having a vacuum degree of not less than 10^{-4} Torr, said organic material having a vapor pressure of not more than 10^{-4} Torr at room temperature thereby decomposing the same into molecules or clusters;

(2) emitting and depositing said organic material, in the form of molecules or clusters, onto the surface of said ceramic material disposed in said vacuum atmosphere, and

(2) irradiating the ions of a gas element at a dosage of not less than 1×10^{15} ions/cm^2 on the surface of said ceramic material simultaneously with said emitting and depositing step, said gas element having an energy of not less than 1 kev, so as to carabonize said organic material into an inorganic material containing carbon at a high density.

6. A ceramic member comprising:

a ceramic material;

an inorganic solid lubricating film formed on the surface of said ceramic material, which is produced by the steps of:

(1) evaporating a liquid or solid organic material by heating the same in a vacuum atmosphere having a vacuum degree of not less than 10^{-4} Torr, said organic material having a vapor pressure of not more than 10^{-4} Torr at room temperature thereby decomposing he same into molecules or clutters;

(2) emitting and depositing said heated and evaporated organic material in the form of molecules or cluters onto the surface of said ceramic material in said vacuum atmosphere,

(3) irradiating the ions of a gas element at a dosage of not less than 1×10^{15} ions/cm^2 on the surface of said ceramic material simultaneously with said emitting and depositing step, said gas element having an energy of not less than 1 kev so as to carbonize said organic material into an inorganic material containing carbon at a high density.

4,917,954

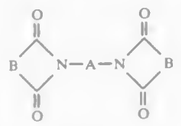
LAMINATED ARTICLE FROM CURABLE RESIN COMPOSITION COMPRISING BIS MALEIMIDE AND ALKENYL PHENYL HYDROXY ETHER

Horst Stenzenberger, and Peter Koenig, both of Schriesheim, Fed. Rep. of Germany, assignors to Technochemie GmbH, Fed. Rep. of Germany

Division of Ser. No. 942,696, Dec. 17, 1986, Pat. No. 789,704.
This application Nov. 30, 1988, Ser. No. 278,935
Claims priority, application United Kingdom, Jan. 18, 1986, 8601201; Sep. 12, 1986, 8622083
Int. Cl.[4] B05D *1/36*
U.S. Cl. 428—411.1 16 Claims

1. A laminated article, formed by heating under pressure an alternating stack of cast film and layers of reinforcing material, said cast film having been cast from a solution of 25 to 65% by weight of a curable resin in an inert organic solvent selected from the group consisting of dimethylformamide, dimethylacetamide, N-methyl pyrrolidone, tetramethyl urea, acetone, methylethyl ketone, methylisobutyl ketone, cyclohexanone, methylene chloride, ethyl chloride, 1, 2-dichloroethane, dioxane, tetrahydrofuran, ethyl glycol, ethyl acetate, ethyl glycol acetate, methyl glycol acetate, diethyleneglycol diethyl ether, diethyleneglycol monoethyl either acetate and mixtures thereof; said curable resin comprising a mixture of:

(a) at least one bisimide of the general formula I



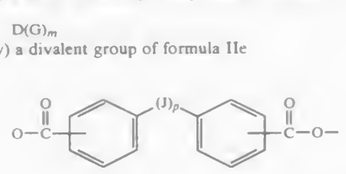
(I)

in which B represents a divalent radical containing a carbon-carbon double bond and A is a divalent radical containing at least two carbon atoms and

(b) at least one alkenyl compounds of formula II

$$D(G)_m \qquad II$$

or (v) a divalent group of formula IIe



IIe

in which J is a divalent group chosen from $-SO_2-$, $-SO-$, $-CMe_2-$, $-O-$, $-C(CF_3)_2-$, $-CH_2-$ or $-CO-$ and p is 0 or 1.

4,917,955

COLOR PLUS CLEAR COMPOSITE COATING HAVING A CATALYST-FREE BASE COAT COMPRISING POLYEPOXIDES AND POLYACID CURING AGENTS

Samuel Porter, Jr., Natrona Heights; Dennis A. Simpson, Koppel; William P. Blackburn, Evans City, and Mark E. Endlish, Chicora, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 13, 1987, Ser. No. 72,302
Int. Cl.[4] B05D *1/36, 7/00;* B32B *15/08*
U.S. Cl. 428—413 17 Claims

1. An improved composite coating comprising a colored basecoat over which is applied a clear top coat, the improvement comprising:

(a) the base coat which comprises a liquid crosslinkable composition containing a polyepoxide and a polyacid curing agent; wherein the base coat is substantially free of a cure catalyst; and

(b) the top coat comprises a cure catalyst system in an amount sufficient to effectively cure the composite coating.

4,917,956

METHOD OF PREPARING CYCLODEXTRIN-COATED SURFACES

Ronald P. Rohrbach, Forest Lake, Ill., assignor to UOP, Des Plaines, Ill.

Filed Jul. 11, 1988, Ser. No. 217,506
Int. Cl.[4] B32B *23/04, 23/06, 23/08*
U.S. Cl. 428—423.1 33 Claims

1. A method of coating a solid phase substrate with a polyisocyanate crosslinked cyclodextrin resin comprising contacting a solution of the polyisocyanate crosslinked cyclodextrin resin in a dipolar aprotic solvent with said substrate to afford a wetted substrate, removing the solvent from said wetted substrate to give the substrate coated with the polyisocyanate crosslinked cyclodextrin resin, and recovering the coated substrate, where the polyisocyanate crosslinked cyclodextrin resin is the reaction product of a cyclodextrin with a polyisocyanate in a molar proportion effective to afford said product with a water solubility less than about 200 ppm and with a solubility in at least one dipolar aprotic solvent of at least 0.1 weight percent.

4,917,957

WELD-CONTAINING POLYARYLENE SULFIDE RESIN MOLDED ARTICLE

Toshikatsu Nitoh, and Toshifumi Nonaka, both of Fuji, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Jul. 29, 1988, Ser. No. 226,160
Claims priority, application Japan, Aug. 3, 1987, 62-194022; Sep. 2, 1987, 62-219785; Sep. 30, 1987, 62-246361
Int. Cl.[4] B32B *9/04*
U.S. Cl. 428—447 10 Claims

1. An injection molded polyarylene sulfide article having at least one weld portion between at least first and second regions of said article, which weld portion is formed by opposing melt flows during injection molding of said article, said article consisting essentially of a polyarylene sulfide composition comprising (A) 100 parts by weight of a polyarylene sulfide resin, and (B) an amount between 0.01 to 5 parts by weight of an alkoxysilane sufficient to strengthen said weld portion, wherein said alkoxysilane is selected from the group consisting of aminoalkoxysilanes, epoxyalkoxysilanes, mercaptoalkoxysilanes and vinylalkoxysilanes.

4,917,958

METAL COATED CERAMIC COMPOSITION

Yoshito Akai, Wakayama; Nobuyuki Konaga, Osaka; Yasunori Arisato, Katano, and Yukikazu Moritsu, Nishinomiya, all of Japan, assignors to Okuno Chemical Industry Co., Ltd., Osaka, Japan

Continuation of Ser. No. 813,194, Dec. 24, 1985, abandoned.
This application Feb. 12, 1988, Ser. No. 158,051
Claims priority, application Japan, Dec. 12, 1984, 59-279028
Int. Cl.[4] B32B *15/04;* C03C *27/02*
U.S. Cl. 428—457 5 Claims

2. A process for forming an electroconductive metal plating layer on a ceramic article, the process consisting essentially of the steps of:

applying to the surface of the ceramic article a vitreous ceramic composition comprising:

(i) about 100 parts by weight of at least one compound selected from the group consisting of AlN, BN and Si_3N_4 powders,

(ii) about 40 to about 800 parts by weight of SiO_2 powder,

(iii) about 3 to about 200 parts by weight of B_2O_3 powder, and

(iv) about 10 to about 500 parts by weight of at lest one compound selected from the group consisting of CaO, and Al_2O_3,

heating the ceramic article at a temperature of about 500° to about 1500° C. to form a vitreous coating layer, and

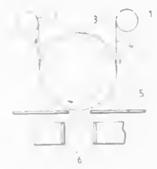
plating the vitreous coating layer with an electroconductive metal.

4,917,959

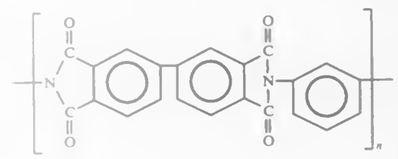
METHOD FOR PREPARING MAGNETIC RECORDING MEDIUM

Yuji Kasanuki, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1989, Ser. No. 321,396
Claims priority, application Japan, Mar. 16, 1988, 63-60322
Int. Cl.[4] B32B *15/08;* B05D *5/12*
U.S. Cl. 428—458 6 Claims



1 A method for prparing a magnetic recording medium, which comprises applying a thermal treatment at a temperature of 100° C. or higher on a polymeric substrate comprising a polybiphenyl type imide having a molecular structure shown below, and then forming a magnetic layer on said substrate.



4,917,960

POROUS COATED PRODUCT

Dennis A. Hornberger, Reading; Mark F. Mosser, Sellersville, and Bruce G. McMordie, Feasterville, all of Pa., assignors to Sermatech International, Inc., Limerick, Pa.

Continuation-in-part of Ser. No. 566,514, Dec. 29, 1983, Pat. No. 4,617,056, Ser. No. 820,021, Jan. 21, 1986, and Ser. No. 624,924, Jun. 27, 1984, Pat. No. 4,793,968, which is a continuation of Ser. No. 454,473, Dec. 29, 1982, abandoned, and Ser. No. 886,906, Jul. 16, 1986. This application Oct. 14, 1986, Ser. No. 918,531
Int. Cl.[4] B22F *3/10*
U.S. Cl. 428—550 73 Claims

1 An article of manufacture suited for heat exchange which includes a porous coating in which the pores have been created by the removal of a fugitive material, which article comprises a metal surface coated with a porous coating which comprises a cured inorganic binder which is resistant to the removal of

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the figitive material, the coating including interconnecting pores open to the surface of the coating and to the metal surface which pores have been created by the removal from the coating of particles of a fugitive material.

4,917,961

METHOD OF PRODUCING CORROSION-, HEAT- AND WEAR-RESISTANT MEMBER, AND THE MEMBER PRODUCED

Nobuhiro Tsujii; Genryu Abe; Akira Yamaguchi, all of Hyogo; Minoru Mishuku, and Nobujiro Tsuchiya, both of Kanagawa, all of Japan, assignors to Sanyo Special Steel Co., Ltd. and Fujl Die Co., Ltd., both of, Japan

Filed Aug. 14, 1989, Ser. No. 393,534
Claims priority, application Japan, Mar. 6, 1989, 64-52088
Int. Cl.[4] B22F *3/00*
U.S. Cl. 428—552 9 Claims

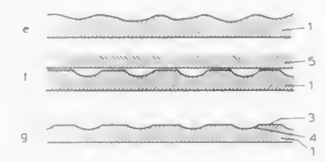
1. A method of producing a corrosion-, heat- and wear-resistant member which comprises packing an atomized powder of a high-carbon high-chromium steel containing, in % by weight, 0.8 to 2.0 of C, 0.05 to 1.00 of Si, 0.05 to 1.00 of Mn, 15 to 25 of Cr, optionally 0.05 to 4.0 of at least one selected from Mo, V, Nb, W and Co, the balance being iron, into a capsule, heating the capsule packed with the powder, then extruding the capsule packed with the powder to obtain a stock not containing carbide grains greater than 3 μm, working the stock, polishing a surface of the stock, and evaporating a film of TiC and/or TiN onto the polished surface.

4,917,962

METAL PRODUCT HAVING IMPROVED LUSTER AFTER PAINTING

Jean R. Crahay, Francorchamps, and Adolphe A. Bragard, Esneux, both of Belgium, assignors to Centre de Recherches Metallurgiques-Centrum VOOR Research In de Metallurgie, Brussels, Belgium

Filed Jul. 27, 1987, Ser. No. 77,812
Claims priority, application Luxembourg, Jul. 28, 1986, 86531
Int. Cl.[4] B21D *53/00*
U.S. Cl. 428—600 20 Claims



1. In a metal product exhibiting improved luster after painting including a metal member having a surface to be painted, said surface having a roughness formed by a plurality of flat and smooth facets separated by valleys, the improvement wherein:

said flat and smooth facets on said surface constitute at least 30% of the area of said surface;

said surface lies in a common plane; and

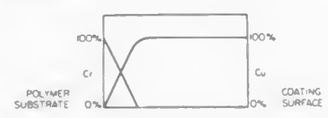
all of said flat and smooth facets lie in said common plane.

4,917,963

GRADED COMPOSITION PRIMER LAYER

Wilfred C. Kittler, Thousand Oaks, Calif., assignor to Andus Corporation, Canoga Park, Calif.

Filed Oct. 28, 1988, Ser. No. 264,287
Int. Cl.[4] B32B *15/04*; C23C *14/14*
U.S. Cl. 428—610 21 Claims



1. An assembly comprising a conductor supported by a substrate, comprising

(a) a substrate;

(b) a graded composition primer layer bonded to said substrate, comprising a first metal and a second metal different from said first metal and having a composition which continuously varies from a predominance of said first metal at the surface facing away from said substrate to a predominance of said second metal at the surface bonded to said substrate, said primer layer being between about 50 and about 500 Å thick; and

(c) a conductor made of said first metal and bonded to said primer layer at the surface predominant in said first metal.

4,917,964

POROUS METAL-SECOND PHASE COMPOSITES

William C. Moshier, Pasadena; John M. Brupbacher; Leontios Christodoulou, both of Baltimore, and Dennis C. Nagle, Ellicott City, all of Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Continuation of Ser. No. 132,844, Dec. 14, 1987, abandoned, which is a division of Ser. No. 927,014, Nov. 5, 1986, which is a continuation-in-part of Ser. No. 662,928, Oct. 19, 1984, abandoned. This application Aug. 30, 1989, Ser. No. 401,481
Int. Cl.[4] C22C *32/00*
U.S. Cl. 428—614 13 Claims

1. A porous mass comprising a substantially uniform dispersion of up to about 80 volume percent in-situ precipitated second phase particles in a solvent metal matrix, said mass produced by propagating at or below atmospheric pressure, a substantially isothermal reaction wave front of second phase-forming constituents in the presence of at least about 20 volume percent of solvent metal in which said constituents are more soluble than said second phase.

4,917,965

MULTIFILAMENT NB3AL SUPERCONDUCTING LINEAR COMPOSITE ARTICLES

Kiyoshi Inoue; Takao Takeuchi; Yasuo Iijima, and Michio Kosuge, all of Tsukuba, Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Continuation-in-part of Ser. No. 235,539, Aug. 24, 1988, abandoned. This application Feb. 24, 1989, Ser. No. 315,825
Claims priority, application Japan, Aug. 25, 1987, 62-209150; Mar. 14, 1988, 63-60080; Aug. 12, 1988, 63-200238
Int. Cl.[4] H01B *12/00*
U.S. Cl. 428—614 18 Claims

1. A long, linear composite article which is characterized in that a large number of composite filaments are present as spaced from one another in a continuous layer composed of copper, a copper alloy, niobium, tantalum or vanadium, each of said composite filaments having a structure that at least one strand of a linear body is surrounded by an aluminum alloy or niobium, said linear body being composed substantially of extremely fine, filamentary superconducting Nb_3Al compound

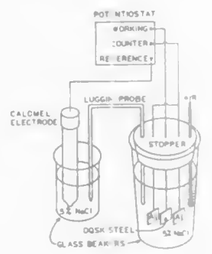
having an average diameter of from about 0.03 μm to about 1μm.

4,917,966

GALVANIC PROTECTION OF STEEL WITH ZINC ALLOYS

Bryan E. Wilde, Granville, Ohio, and Michael K. Budinski, Rochester, N.Y., assignors to The Ohio State University, Columbus, Ohio

Continuation of Ser. No. 017,810, Feb. 24, 1987, abandoned. This application Oct. 7, 1988, Ser. No. 256,187
Int. Cl.[4] B32B *15/00*
U.S. Cl. 428—659 7 Claims



1. A method of protecting steel, other than stainless steel from corrosion, which method comprises:

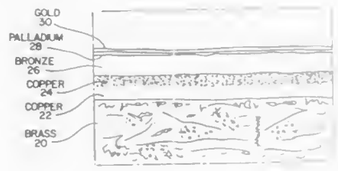
(a) coating the steel directly on with an alloy selected from the group of alloys which consist essentially of 8–18 %/wt of cobalt and a balance of zinc, and 20–50 %/wt of manganese and a balance of zinc.

4,917,967

MULTIPLE-LAYERED ARTICLE AND METHOD OF MAKING SAME

Dennis A. Cupolo, Suffern; Geoffrey P. Fonseca, Pomona, both of N.Y.; Fernando Fernandez, Raimey Base, P.R.; Jean Greenbaum, New York, and Jeffrey M. Brown, Suffern, both of N.Y., assignors to Avon Products, Inc., New York, N.Y.

Filed Jan. 13, 1989, Ser. No. 296,594
Int. Cl.[4] B32B *15/00*
U.S. Cl. 428—669 4 Claims



1. A multiple-layered metallic article comprising a first layer of base metal, an intermediate layer of bronze electroplated on said base metal layer, an outer layer of precious metal selected from gold, silver, palladium, rhodium or platinum electroplated on said intermediate layer, and a barrier layer selected from palladium, between said intermediate layer and said outer layer, said outer layer being relatively thin compared to the thickness of said intermediate layer and said first layer and having a thickness in the range of about 1 to about 5 microinches, wherein said metallic article is useful as an article of costume jewelry and is hypoallergenic with respect to people having skin sensitive to nickel.

4,917,968

HIGH TEMPERATURE CORROSION RESISTANT COMPOSITE STRUCTURE

Robert H. Tuffias, Los Angeles; John Harding, Van Nuys, and Richard Kaplan, Beverly Hills, all of Calif., assignors to ULTRAMET, Pacoima, Calif.

Filed Apr. 15, 1988, Ser. No. 182,127
Int. Cl.[4] B32B *15/0*
U.S. Cl. 428—621 6 Claims

1 A high temperature corrosion resistant metallic structure comprising:

A high temperature corrosion resistant first layer comprising platinum group metal having a melting point in excess of approximately 1500 degrees centigrade;

A second layer of refractory material having a tensile strength of greater than approximately 5,000 pounds per square inch at a temperature of approximately 1500 degrees centigrade; and

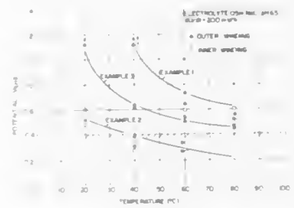
A transition layer forming a metallurgical bond between said first and second layers, said transition layer comprising a solid solution of the materials in said first and second layers.

4,917,969

PROCESS FOR THE PRODUCTION OF CLAD HOT ROLLED STRIP AND THE RESULTING PRODUCT

Hans Pircher, Mülheim; Rudolf Kawalla, Oberhausen; Gerd Sussek, Mülheim; Walter Wilms, Duisburg, and Waldemar Wolpert, Dinslaken, all of Fed. Rep. of Germany, assignors to Thyssen Stahl AG, Duisburg, Fed. Rep. of Germany

Filed Dec. 12, 1988, Ser. No. 283,407
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1987, 3742539
Int. Cl.[4] B32B *15/00*; B23H *20/00*
U.S. Cl. 428—685 18 Claims



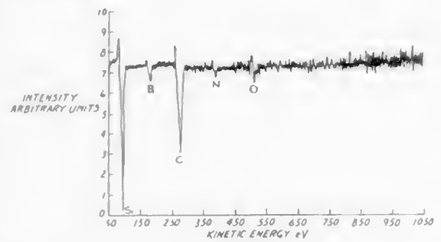
1 A process for the production of a clad hot rolled strip, comprising (a) cladding a steel slab as a base material with a corrosion-resistant cladding material as a layer material by explosive cladding, (b) heating the resulting composite body from (a) to a rolling temperature, (c) hot-rolling the composite body from (b) to a final thickness of the hot rolled strip with a high reduction of pass in one operation in a hot strip mill, (d) rapidly cooling the resulting hot rolled strip from a finish rolling temperature to a cooling temperature and (e) coiling the cooled strip.

4,917,970

MAGNETO OPTIC RECORDING MEDIUM WITH SILICON CARBIDE DIELECTRIC

Arnold W. Funkenbusch, White Bear Lake, Minn., assignor to Minnesota Mining & Manufacturing Company, Minn.

Filed Feb. 1, 1988, Ser. No. 150,921
Int. Cl.[4] G11B 5/64
U.S. Cl. 428—694 4 Claims



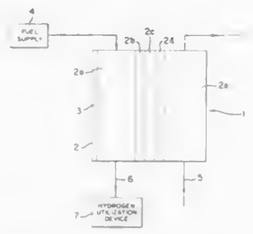
1. A magneto-optic recording medium comprising a substrate, an amorphous magnetizable rare earth-transition metal alloy layer having a transparent dielectric layer on at least one side, and a reflective surface located to reflect light through the magnetizable alloy layer, wherein the dielectric layer is comprised of silicon carbide of the formula SiC , wherein x, the molar ratio of carbon to silicon, is greater than 1.2.

4,917,971

INTERNAL REFORMING FUEL CELL SYSTEM REQUIRING NO RECIRCULATED COOLING AND PROVIDING A HIGH FUEL PROCESS GAS UTILIZATION

Mohammad Farooque, Huntington, Conn., assignor to Energy Research Corporatioo, Danbury, Conn.

Filed Mar. 3, 1989, Ser. No. 318,614
Int. Cl.[4] H01M 8/06
U.S. Cl. 429—19 20 Claims



1. A system comprising:

a high temperature fuel cell including: an anode passage comprising an anode electrode, said anode passage being adapted to receive fuel process gas; a cathode passage comprising a cathode electrode, said cathode passage being adapted to receive an oxidant process gas; an electrolyte in communication with said anode and cathode electrodes; catalyst means in said fuel cell for reforming hydrocarbon fuel from a fuel supply to produce fuel process gas including hydrogen for said anode passage;

the fuel process gas and the oxidant process gas at said anode and cathode electrodes in the presence of said electrolyte undergoing electrochemical conversion to produce electrical energy; and

the reforming of said hydrocarbon fuel being such as to absorb heat produced by said electrochemical conversion in an amount to maintain the temperature of said fuel cell substantially at a preselected temperature;

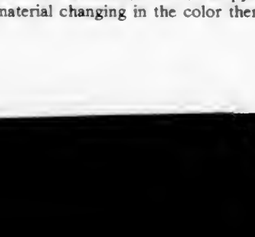
and means for receiving the gas exhausted from said anode passage and utilizing the fuel process gas in said exhausted gas such that the net utilization of fuel process gas by said fuel cell and said utilization device exceeds about 50%.

4,917,972

ELECTRODE FOR USE IN OXYGEN ELECTRODE REACTION

Reiko Notoya, Sapporo, and Tatsumi Nagayama, Yokosuka, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1988, Ser. No. 204,434
Claims priority, application Japan, Oct. 2, 1987, 62-249170
Int. Cl.[4] H01M 4/90
U.S. Cl. 429—44 3 Claims



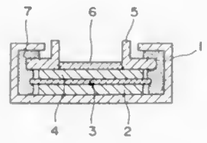
1. An electrode for use in oxygen electrode reaction wherein an electrode activation material layer made of IrO_2 is disposed to the surface of an electrode substrate made of platinum or platinum graphite.

4,917,973

SECONDARY BATTERY

Yoshikazu Yoshimoto; Hiroshi Wada; Tomonari Suzuki; Masaru Yoshida, and Shigeo Nakajima, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 254,029, Oct. 6, 1988, abandoned. This application Jul. 18, 1989, Ser. No. 381,262
Claims priority, application Japan, Oct. 6, 1987, 62-253365; Oct. 6, 1987, 62-253366
Int. Cl.[4] H01M 2/12
U.S. Cl. 429—91 2 Claims



1. A secondary battery which is composed of a positive electrode element, a negative electrode element, a separator containing an electrolyte therein which is inserted between the positive electrode element and the negative electrode element and a casing for packaging these elements therein, being characterized in that:

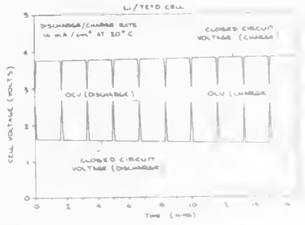
either one of the positive and negative electrode is made of a pyrolytic carbonaceous material which is obtained by thermal decomposition of a hydrocarbon compound selected from benzene, propane and their derivatives at a low temperature of about 1,000° C., said pyrolytic carbonaceous material changing in the color thereof due to a change in stage structure of a graphite intercalation compound formed between adjacent layers which is caused in response to a voltage generated between the positive and negative electrodes; wherein the casing has a transparent window for observing the color change of said pyrolytic carbonaceous material.

4,917,974

LITHIUM/ORGANOSULFUR REDOX CELL HAVING PROTECTIVE SOLID ELECTROLYTE BARRIER FORMED ON ANODE AND METHOD OF MAKING SAME

Lutgard C. De Jonghe; Steven J. Visco, both of Berkeley; Mellin Liu, Albany, and Catherine C. Mailhe, Berkeley, all of Calif., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Apr. 14, 1989, Ser. No. 337,978
Int. Cl.[4] H01M 4/60
U.S. Cl. 429—104 12 Claims



1. A solid lithium-organosulfur redox cell comprising:

(a) a solid lithium anode formed from a material selected from the class consisting of elemental lithium and one or more lithium base alloys comprising over 50 wt.% lithium or mixtures thereof;

(b) a liquid organosulfur cathode having the formula of $(R(S)_y)_N$ where y=1 to 6. n=2 to 20, and R is one or more different aliphatic or aromatic organic moieties having 1 to 20 carbon atoms, which may include one or more oxygen, sulfur, nitrogen, or fluorine atoms associated with the chain when R comprises an aliphatic chain, wherein the linear chain may be linear or branched, saturated or unsaturated, and wherein either the aliphatic chain or the aromatic ring may have substituted groups thereon; and

(c) a barrier layer formed adjacent a surface of said solid lithium anode consisting of a reaction product of said solid lithium anode with said liquid organosulfur cathode.

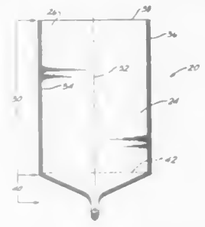
4,917,975

CONTAMINATION CONTROL MATS AND METHODS AND APPARATUS FOR REMOVING SHEETS THEREFROM

Joselito S. De Guzman, 3807 W. 119th Pl., Hawthorne, Calif. 90250

Filed Feb. 3, 1989, Ser. No. 306,333
Int. Cl.[4] B32B 3/02; F23J 0/00
U.S. Cl. 428—81 11 Claims

1. In a contamination control mat of adjacently adhered sheets of film, each sheet having an adhesive coated over a substantial portion of the upper surface of each sheet and a tab forming a non-adhering portion of the sheet that does not adhere to an adjacent sheet, wherein the mat has, when lying substantially flat, a perimeter defining a closed plane figure, the improvement wherein the closed plane figure has an axis extending in a given direction about which the closed plane figure is substantially symmetric, and at least one converging portion at an end of the closed plane figure converging toward



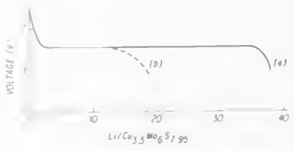
and terminating adjacent the tab wherein the tab extends away from the figure substantially in the same direction as the axis.

4,917,976

MATERIAL STRUCTURE HAVING POSITIVE POLARITY

Masataka Wakihara, Yokohama, and Takashi Uchida, Funabashi, both of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1989, Ser. No. 366,460
Claims priority, application Japan, Jun. 16, 1988, 63-148978
Int. Cl.[4] H01M 4/58, 4/04
U.S. Cl. 429—218 10 Claims



1 A material structure having positive polarity which is produced by providing a structure wherein a mixture comprising (i) a copper Chevrel phase compound represented by the general formula:

$$Cu_xMo_6S_{8-y} \quad (1$$

(wherein x=2 to 4 and y=0 to 0.25) and (ii) a high polymeric organic compound, filled in the open sections of a reticulate material sheet, at least the surface of which is formed of copper, and by heating said structure in a gas containing sulfur.

4,917,977

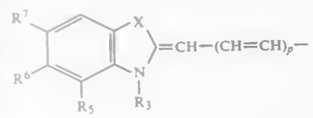
VISIBLE SENSITIZERS FOR PHOTOPOLYMERIZABLE COMPOSITIONS

William K. Smothers, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 23, 1988, Ser. No. 289,119
Int. Cl.[4] G03H 1/04; G03C 1/68
U.S. Cl. 430—1 16 Claims

9. A photosensitive composition comprising:

(a) a compound of the formula



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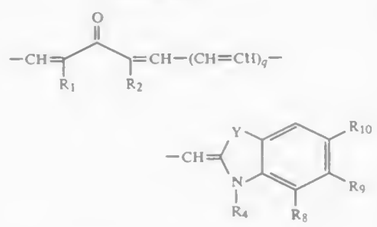
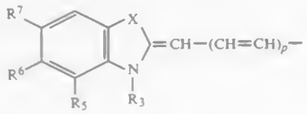
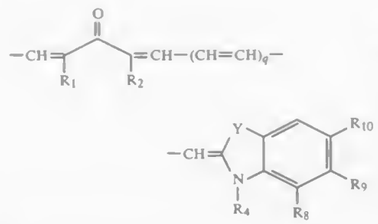


wherein:
p and q are each independently 0 or 1;
R_1 and R_2 are H, or R_1+R_2 is $-(CHR_{11}CHR_{12})-$ or $-(CH_2CHR_{13}CH_2)-$, where R_{11} and R_{12} are each either hydrogen or joined to form an aromatic ring and R_{13} is either H or an alkyl groups of about 1 to about 6 carbon atoms;
R_3 and R_4 are each independently alkyl groups of about 1 to about 6 carbon atoms or substituted or unsubstituted phenyl;
X and Y are each independently O, S, Se, NR_{14}, or $CR_{15}R_{16}$, where R_{14}, R_{15}, and R_{16} are each independently alkyl groups of about 1 to about 6 carbon atoms or substituted or unsubstituted phenyl; and
R_5, R_6, R_7, R_8, R_9, and R_{10} are each independently alkyl groups of about 1 to about 6 carbon atoms, alkoxy groups of about 1 to about 6 carbon atoms, substituted or unsubstituted phenyl, chlorine, or bromine, with the proviso that
R_5 and R_6 together or R_6 and R_7 together and that independently R_8 and R_9 together or R_9 and R_{10} together may be joined to form an aliphatic or aromatic ring;
(b) a polymeric binder;
(c) an ethylenically unsaturated compound capable of free radical initiated addition polymerization; and
(d) a free radical generating system activatible by actinic radiation said initiator system comprises a HABI and a chain transfer agent.

12. A single step process for forming a light-stable hologram which comprises exposing to modulated actinic radiation comprising an object beam and a reference beam bearing holographic information a photopolymerizable layer comprising:
(a) a compound of the formula





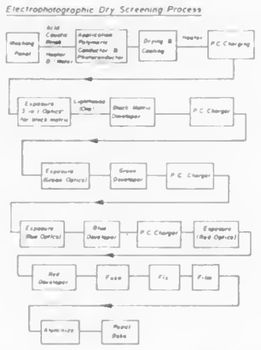
wherein:
p and q are each independently 0 or 1;
R_1 and R_2 are H, or R_1+R_2 is $-(CHR_{11}CHR_{12})-$ or $-(CH_2CHR_{13}CH_2)-$, where R_{11} and R_{12} are each either hydrogen or joined to form an aromatic ring and R_{13} is either H or an alkyl groups of about 1 to about 6 carbon atoms;
R_3 and R_4 are each independently alkyl groups of about 1 to about 6 carbon atoms or substituted or unsubstituted phenyl;
X and Y are each independently O, S, Se, NR_{14}, or $CR_{15}R_{16}$, where R_{14}, R_{15}, and R_{16} are each independently alkyl groups of about 1 to about 6 carbon atoms or substituted or unsubstituted phenyl; and
R_5, R_6, R_7, R_8, R_9, and R_{10} are each independently alkyl groups of about 1 to about 6 carbon atoms, alkoxy groups of about 1 to about 6 carbon atoms, substituted or unsubstituted phenyl, chlorine, or bromine, with the proviso that
R_5 and R_6 together or R_6 and R_7 together and that independently R_8 and R_9 together or R_9 and R_{10} together may be joined to form an aliphatic or aromatic ring;
(b) a solvent soluble, thermoplastic polymeric binder;
(c) at least one ethylenically unsaturated monomer capable of free radical initiated addition polymerization and having a boiling point above 100° C.; and
(d) a free radical generating system activatible by actinic radiation.

4,917,978

METHOD OF ELECTROPHOTOGRAPHICALLY MANUFACTURING A LUMINESCENT SCREEN ASSEMBLY HAVING INCREASED ADHERENCE FOR A CRT

Peter M. Ritt, West Lampeter Township, Lancaster County, and Harry R. Stork, Adamstown Borough, both of Pa., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Jan. 23, 1989, Ser. No. 299,507
Int. Cl.[4] G03C *5/00*; B05D *3/10, 5/06*
U.S. Cl. 430—23 **11 Claims**



1. In a method of electrophotographically manufacturing a luminescent screen assembly on a substrate of a color CRT comprising the steps of:
(a) coating said surface of said substrate with a volatilizable conductive layer;
(b) overcoating said conductive layer with a volatilizable photoconductive layer including a dye sensitive to visible light;
(c) establishing a substantially uniform electrostatic charge on said photoconductive layer;
(d) exposing selected areas of said photoconductive layer to visible light to affect the charge thereon;
(e) developing selected areas of said photoconductive layer with a triboelectrically charged, dry-powdered, surface-treated first color-emitting phosphor;
sequentially repeating steps c, d and e for triboelectrically charged, dry-powdered, surface-treated second and third color-emitting phosphors to form a luminescent screen comprising picture elements of triads of color-emitting phosphors;
the improvement wherein the adherence of said dry-powdered, surface-treated phosphor materials to said photoconductive layer is increased by contacting said surface-treated phosphor materials and the underlying photoconductive layer with a solvent for a sufficient period to time to render said layer and said materials tacky, and
fixing said surface-treated phosphor materials with at least one coating of a substantially dry spray of an aqueous alcohol mixture of a material selected from the group consisting of dichromated polyvinyl alcohol and potassium silicate to minimize the displacement of said phosphor materials.

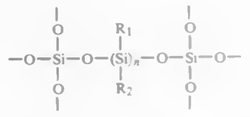
4,917,980

PHOTORESPONSIVE IMAGING MEMBERS WITH HOLE TRANSPORTING POLYSILYLENE CERAMERS

Santokh S. Badesha, Pittsford; Milan Stolka, Fairport, and Richard L. Schank, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 22, 1988, Ser. No. 288,197
Int. Cl.[4] G03G *5/14*
U.S. Cl. 430—58 **34 Claims**

1. A charge transporting polysilylene-ceramer in a layered imaging member comprised of



wherein R_1 and R_2 are independently selected from the group consisting of alkyl, aryl, substituted alkyl, substituted aryl, and alkoxy; and n represents the number of repeating units.

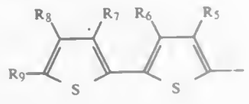
4,917,981

PHOTOSENSITIVE MEMBER FOR ELECTROPHOTOGRAPHY

Yoichi Nakamura; Masami Kuroda, and Nobora Furusho, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Dec. 28, 1987, Ser. No. 138,118
Claims priority, application Japan, Dec. 25, 1986, 61-313499; Jan. 19, 1987, 62-9245; Jan. 20, 1987, 62-10435; Jan. 26, 1987, 62-15437; Jan. 29, 1987, 62-18957
Int. Cl.[4] G03G *5/06*
U.S. Cl. 430—75 **13 Claims**

1. A photosensitive member for electrophotography which comprises an electroconductive substrate and a photosensitive layer containing at least one member of the group consisting of thiophene structure-containing azo compounds having one of the general formulae (I) to (X):



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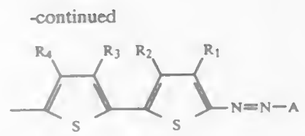
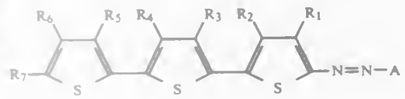
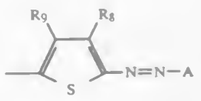


(II)



(III)



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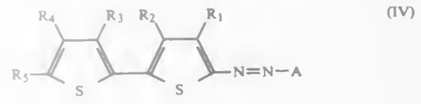

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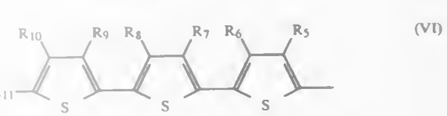
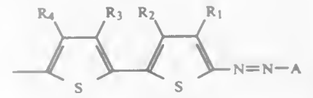
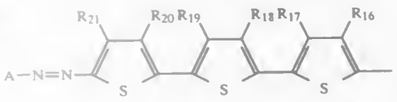
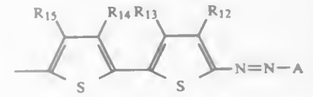


(VI)

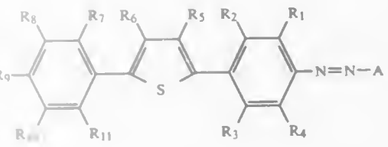




(VII)



(VIII)



(I)

VOL 1113 ISS 3 AP 17 1990 UMI

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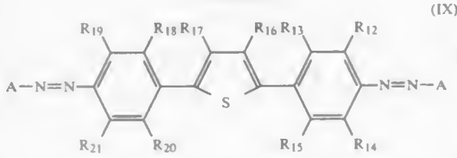
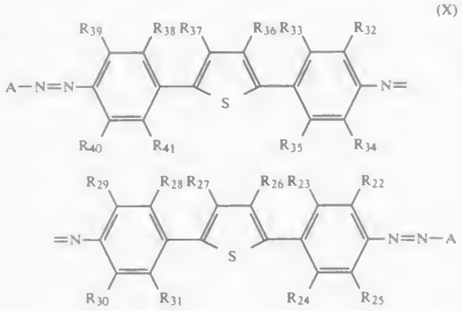
(IX)



(X)



wherein R_1 to R_{41} each represents a hydrogen atom, a halogen atom, a hydroxy group, an alkyl group, an alkoxy group, an allyl group, an aldehyde group, an acyl group, a carboxyl group, an ester group, a carbamoyl group, an amino group, an alkylamino group, an arylamino group, an aryl group, an aralkyl group, a nitro group, or a cyano group, and A represents a coupler residue.

4,917,982

TONER FOR USE IN DEVELOPING ELECTROSTATIC IMAGES CONTAINING POLYPROPYLENE

Makoto Tomono, Hino; Noriyoshi Tarumi, Tama, and Masayuki Sato, Ohtsuki, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 65,092, Jun. 18, 1987, abandoned, which is a continuatioo of Ser. No. 768,496, Aug. 22, 1985, abandooed, which is a division of Ser. No. 550,992, Nov. 14, 1983, abandoned, which is a continuation of Ser. No. 279,673, Jul. 1, 1981, abandoned, which is a continuation of Ser. No. 50,475, Jun. 20, 1979, abandoned, which is a continuation of Ser. No. 741,408, Nov. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 408,008, Oct. 19, 1973, abandoned. This application Jan. 19, 1988, Ser. No. 147,025

Claims priority, application Japan, Oct. 21, 1972, 47-104865

Int. Cl.[4] G03G *13/22*

U.S. Cl. 430—99 **11 Claims**

1. In a method of electrophotography comprising developing an electrostatic latent image with a toner composition, then fixing the toner image by passing a paper bearing said toner image between rollers, at least one of which is heated to a temperature of about 155° to about 210° C. and is coated with a fluorocarbon resin, the improvement wherein the toner composition comprises

(a) a coloring agent,

(b) a styrene homopolymer or copolymer of styrene with at least one acrylic comonomer, and

(c) polypropylene having a number average molecular weight of about 3,000 to about 4,000 in an amount of between about 1 to 10 parts by weight per 100 parts by weight of said styrene homopolymer or copolymer, and

(d) a charge control agent.

4,917,983

TONER FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE COMPRISING LINEAR POLYESTER POLYMER

Masafumi Uchida; Hiroyuki Takagiwa, and Satoru Ikeuchi, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 910,651, Sep. 23, 1986, abandoned. This application Apr. 7, 1988, Ser. No. 183,332

Claims priority, application Japan, Oct. 1, 1985, 60-216244; Oct. 2, 1985, 60-217995

Int. Cl.[4] G03G *9/08*

U.S. Cl. 430—109 **17 Claims**

1. A heat fixable toner for developing an electrostatic latent image comprising as a binder

a non-linear polyester obtained from polymerization of a monomer composition comprising

a polyhydric alcohol monomer containing at least 3 hydroxy groups and/or

a polycarboxylic acid monomer containing at least 3 carboxylic acid groups,

and wherein said non- linear polyester consists essentially of either

first monomer units constituting principal chains thereof and 1 to 60 mol % of the total of said first monomer units contain an aliphatic hydrocarbon unit having at least 3 carbon atoms, or

second monomer units constituting principal chains and a side chain thereof and 2 to 65 mol % of the total of said second monomer units contain an aliphatic hydrocarbon unit having at least 3 carbon atoms,

and wherein said toner further comprises a coloring agent.

4,917,984

ELECTROPHOTOGRAPHIC TONER COMPOSITION COMPRISING POLYMERS HAVING SPECIFIED MOLECULAR WEIGHTS

Jun Saito, Kawasaki, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1988, Ser. No. 230,530

Claims priority, application Japan, Mar. 10, 1987, 62-198181

Int. Cl.[4] G03G *9/08*

U.S. Cl. 430—109 **4 Claims**

1. An electrophotograhic toner composition consisting essentially of a binder resin and a dye or pigment, said binder resin being a polymer synthesized from a vinylic monomer and satisfying the conditions represented by the following expressions

$$10^3 \leqq Mp \leqq 2 \times 10^4,$$

and

$$S_1:S_2:S_3:S_4 = (0.3 \sim 0.8):1:(0.5 \sim 1):(0.7 \sim 1.2)$$

in which the symbols have the following meanings in the molecular weight distribution of the polymer measured by gel permeation chromatogrpahy,

Mp is a molecular weight of the polymer which shows a peak value in the chromatogram,

S_1 is a weight fraction of molecules having a molecular weight of from 0 to 3,000,

S_2 is a weight fraction of molecules having a molecular weight of from more than 3,000 to 13,000,

S_3 is a weight fraction of molecules having a molecular weight of from more than 13,000 to 50,000, and

S_4 is a weight fraction of molecules having a molecular weight of more than 50,000.

4,917,985

ORGANIC SULFUR-CONTAINING COMPOUNDS AS ADJUVANTS FOR POSITIVE ELECTROSTATIC LIQUID DEVELOPERS

Lyla M. El-Sayed, West Chester, Pa., and Torence J. Trout, Yorklyn, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 30, 1988, Ser. No. 292,291

Int. Cl.[4] G03G *9/12*

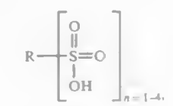
U.S. Cl. 430—114 **50 Claims**

1. A positive electrostatic liquid developer having improved charging and imaging characteristics consisting essentially of

(A) a nonpolar liquid having a Kauri-butanol value of less than 30, present in a major amount,

(B) thermoplastic resin particles having an average by area particle size of less than 10 μm having dispersed therein an adjuvant which is substantially insoluble in the nonpolar liquid at ambient temperatures and is an organic sulfur-containing compound selected from the group consisting of

(1)



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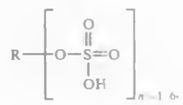
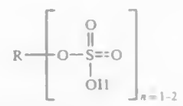


(3)



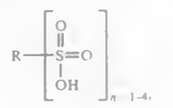
and (4) the salts of (1), (2) and (3), wherein R is alkyl of 1 to 30 carbon atoms, substituted alkyl of 1 to 30 carbon atoms, aryl of 6 to 30 carbon atoms, or substituted aryl of 6 to 30 carbon atoms, and

(C) a nonpolar liquid soluble ionic or zwitterionic charge director compound.

26. A process for preparing a positive electrostatic liquid developer for electrostatic imaging comprising

(A) dispersing at an elevated temperature in a vessel a thermoplastic resin, sulfur-containing compound of the formula selected from the group consisting of

(1)



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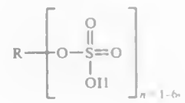
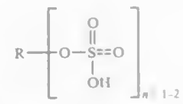


(3)



and (4) the salts of (1), (2) and (3), wherein R is alkyl of 1 to 30 carbon atoms, substituted alkyl of 1 to 30 carbon atoms, aryl of 6 to 30 carbon atoms, or substituted aryl of 6 to 30 carbon atoms; and a dispersant nonpolar liquid having a Kauri-butanol value of less than 30, while maintaining the temperature in the vessel at a temperature sufficient to plasticize and liquify the resin and below that at which the dispersant nonpolar liquid degrades and the resin decomposes,

(B) cooling the dispersion, either

(1) without stirring to form a gel or solid mass, followed by shredding the gel or solid mass and grinding by means of particulate media with or without presence of additional liquid;

(2) with stirring to form a viscous mixture and grinding by means of particulate media with or without the presence of additional liquid; or

(3) while grinding by means of particulate media to prevent the formulation of a gel or solid mass with or without the presence of additional liquid;

(C) separating the dispersion of toner particles having an average by area particle size of less than 10 μm from the particulate media, and

(D) adding to the dispersion during or subsequent to Step A a nonpolar liquid soluble ionic or zwitterionic change director compound.

4,917,986

PHOSPHOROUS-CONTAINING COMPOUNDS AS ADJUVANT FOR POSITIVE ELECTROSTATIC LIQUID DEVELOPERS

Dominic M. T. Chan, Wilmington, and Torence J. Trout, Yorklyn, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 30, 1988, Ser. No. 292,191

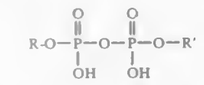
Int. Cl.[4] G03G *9/12*

U.S. Cl. 430—115 **53 Claims**

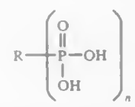
1. An improved positive electrostatic liquid developer having improved charging characteristics consisting essentially of

(A) a nonpolar liquid having a Kauributanol value of less than 30, present in a major amount,

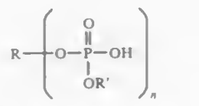
(B) thermoplastic resin particles having dispersed therein 0.1 to 10 percent by weight based on the total weight of developer solids of a phosphorous-containing compound which is substantially insoluble or immiscible in the nonpolar liquid at ambient temperatures and is selected from the group consisting of (1) polyphosphoric acids; (2) the +1 and +2 metal salts of said polyphospboric acids; (3) phosphorous pentoxide; (4) pyrophosphate compounds of the general formula:



wherein R and R', which can be the same or different are alkyl of 1 to 10 carbon atoms; (5) the +1 and +2 metal salts of said pyrophosphates; (6) phosphonic acids of the general formula:



wherein R is alkyl of 1 to 30 carbon atoms and aryl of 6 to 30 carbon atoms, n is a whole number of 1 to 6; (7) the +1 and +2 metal salts of said phosphonic acids; (8) phosphate compounds of the general formula:



wherein R and R', which can be the same or different, are H, alkyl of 1 to 30 carbon atoms and aryl of 6 to 30 carbon atoms, n is whole number of 1 to 6; and (9) the +1 and +2 metal salts of said phosphate compounds, the resin particles having an average by area particle size of less than 10 μm, and

(C) a nonpolar liquid soluble ionic or zwitterionic charge director compound.

4,917,987

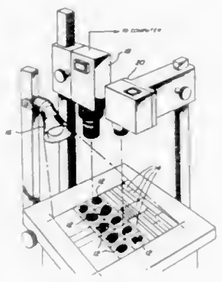
METHOD OF ENHANCING THE RESOLUTION OF A FINGERPRINT IMAGE IN A FINGERPRINT RECORDING SYSTEM

Douglas C. Arndt, Thousand Oaks, and Virgle L. Hedgcoth, Pomona, both of Calif., assignors to Identicator Corporation, San Bruno, Calif.

Filed Nov. 9, 1988, Ser. No. 269,430

Int. Cl.[4] G03C *5/16*; A61B *5/10*

U.S. Cl. 430—139 **22 Claims**



1. A method of enhancing the resolution of a fingerprint image in a fingerprint recording system comprising:

(a) applying a solution of a cheical fingerprint compound to the fingerprint pattern area of a least one finger of the person to be fingerprinted, the compound containing a first constituent which is arranged by itself or in conjunction with a developer compound to provide a visible image of the fingerprint when applied to a porous surface under light within the visible spectrum and a second constituent which is arranged to fluoresce within a predetermined wavelength range of 500 to 650 nm when subjected to ultraviolet radiation.

(b) depositing the solution from the ridges of tlie fingerprint pattern area onto a porous surface and forming a visible image therefrom representative of the ridge pattern of the finger,

(c) illuminating the porous surface with the fingerprint image deposited thereon with visible and ultraviolet light whereby the brightness of the image within said predetermined spectrum is increased due to the fluorescence of the second constituent.

(d) focusing the image onto a photosensitive surface having a maximum sensitivity to light within said predetermined range and

(e) converting the image focused onto the photosensitive surface into information representative of the ridge pattern of the finger.

4,917,988

PROCESS FOR PRODUCING PHOTOSENSITIVE NEGATIVE WORKING DIAZO RESIN LITHOGRAPHIC PLATE USING ADMIXTURE OF AT LEAST THREE SOLVENTS

Shigeo Koizumi; Nobuo Nishikawa, and Nobuyuki Kita, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 17, 1988, Ser. No. 156,801

Claims priority, application Japan, Apr. 16, 1987, 62-93498

Int. Cl.[4] G03C *1/74*; G03F *7/16, 7/08*

U.S. Cl. 430—169 **14 Claims**

1. A process for producing a photosensitive lithographic plate, which comprises coating onto a substrate having a hydrophilic surface a solution of a negative working photosensitive composition wherein the solid content thereof is from 1 to 50 wt.% based on the solution of the photosensitive composition containing 3 to 30 wt.% of a photosensitive diazo resin and 70 to 97 wt.% of a linear organic polymer based on total weight thereof dissolved in a solvent mixture comprising:

(a) 10 to 90 wt.% of 1-methoxy-2-propanol,

(b) 5 to 70 wt.% of an amino group-free polar solvent having a boiling point under 1 atm of 50 to 100° C. and a dielectric constant at 20° C. of at least 5.5, and

(c) 5 to 30 wt.% of methyl lactate, the amount of components (a), (b), and (c) being based on the total solvent mixture,

and drying the coated solution.

4,917,989

OPTICAL RECORDING MEDIUM WHICH HAS A REFLECTOR LAYER CONTAINING A SILICON-PHTHALOCYANINE DERIVATIVE

Bernhard Albert, Maxdorf; Peter Hauser, Limburgerhof; Michael Acker, Heppenheim; Wolfgang Schrott, Ludwigshafen, and Gerhard Wageoblast, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 17, 1988, Ser. No. 194,891

Claims priority, application Fed. Rep. of Germany, May 19, 1987, 3716734

Int. Cl.[4] G03C *5/16, 1/72*; G11B *7/24*; B41M *5/26*

U.S. Cl. 430—270 **10 Claims**

1. An optical recording medium capable of having information recorded thereon by a laser beam in the form of optically detectable marks, which comprises a transparent base, a dye-containing layer which is sensitive to laser light and a reflector layer which contains a silicon-phthalocyanine derivative of the formula:

wherein R^1 is bonded to the phthalocyanine radical and is hydrogen, C_1–C_{12} alkyl, C_1–C_{12}-alkoxy, halogen or a radical of the formula:

wherein R^2, R^3 and R^4 are identical or different and independently of one another are each C_1–C_5-alkyl, n is 1,2, 3 or 4 and A and B are identical or different and independently of one another are each C_1–C_{12}-alkyl, halogen or a radical of the formula —OR^5, in which R^5 is C_1–C_{12}-alkyl which is optionally interrupted by one or more oxygen atoms or C_1–C_4-alkylimino groups or substituted by a 5-membered or 6-membered saturated heterocyclic radical or a combination thereof, or is a radical of the formula:

wherein R^2, R^3 and R^4 are as defined above.

4,917,990

PHOTOSENSITIVE PRINTING PLATE FOR USE IN FLEXOGRAPHIC PRINTING

Heinz Herrmann, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 25, 1988, Ser. No. 276,392

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1987, 3740432

Int. Cl.[4] G03C *1/80, 1/76*

U.S. Cl. 430—286 **15 Claims**

1. A photosensitive printing plate for use in flexographic printing comprising:

(a) a transparent, flexible, dimensionally stable plastic film support;

(b) an adhesive layer comprising a chlorosulfonated polyethylene; and

(c) a light-hardenable layer comprising, an elastomer.

11. A printing plate as claimed in claim 1, wherein said elastomer is a block copolymer of a vinyl compound and a diene.

4,917,991

DIRECT POSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Yasuo Tosaka, Sagamihara; Keiji Ogi, Hachioji, and Atushi Kamitakahara, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 863,690, May 15, 1986, abandoned. This application Jun. 23, 1988, Ser. No. 210,397

Claims priority, application Japan, May 20, 1985, 60-106054

Int. Cl.[4] C03C *1/08, 5/26*

U.S. Cl. 430—378 **16 Claims**

1. A direct positive silver halide photographic material which has at least one silver halide emulsion layer containing internal image-type silver halide particles of which surface is not preliminarily fogged, and providing a positive image by surface developing during and/or after a fogging treatment after an imagewise exposure, said internal image-type silver halide particle consisting essentially of a core chemically sensitized or doped with a metal ion and a plurality of shells covering said core, among which the outermost shell of said plurality shells contains more silver chloride than that in a shell adjacent to said outermost shell.

4,917,992

DEVELOPING AGENTS

Malcolm D. Tirel, Alderley Edge, and William E. Long, Wilmslow, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 32,721, Apr. 1, 1987, Pat. No. 4,732,981, which is a division of Ser. No. 834,985, Feb. 28, 1986, Pat. No. 4,687,846. This application Oct. 23, 1987, Ser. No. 111,807

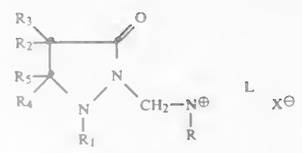
Claims priority, application United Kingdom, Mar. 15, 1985, 8506803

Int. Cl.[4] G03C *5/38*; C07D *403/14*

U.S. Cl. 430—465 **7 Claims**

1. A single bag powder developer composition, which comprises

(a) at least one pyrazolidinone salt of the formula



in which $X^{\ominus}$ is an anion, which may be organic or inorganic,

L represents the atoms necessary to complete a ring or ring system, which may be substituted,

R_1 is phenyl or substituted phenyl,

R_2 and R_3 are each hydrogen, lower alkyl or substituted lower alkyl,

R_4 and R_5 are each hydrogen, lower alkyl, substituted lower alkyl, phenyl or substituted phenyl,

(b) hydroquinone or substituted hydroquinone,

(c) a base or a buffer system, and

(d) a preservative.

4,917,993

SILVER HALIDE PHOTOGRAPHIC MATERIALS

Yasuo Mukunoki; Masakazu Yoneyama, and Sumito Yamada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 19, 1988, Ser. No. 286,030

Claims priority, application Japan, Dec. 18, 1987, 62-320702

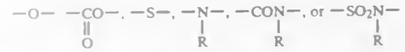
Int. Cl.[4] G03C *1/76*

U.S. Cl. 430—523 **6 Claims**

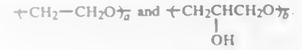
1. A silver halide photographic material comprising a support having thereon at least one light-sensitive silver halide emulsion layer and at least one other hydrophilic colloid layer, wherein at least one compound represented by formula (I) is contained in at least one layer of said silver halide photographic material and wherein an organic material selected from the group consisting of a natural or synthetic water-soluble polymer is contained in at least one of said light-sensitive silver halide emulsion layer and said other hydrophilic colloid layer such that at least 10% by weight of the organic material originally present in said layer of said silver halide photograpic material is washed out from said layer during development processing:

$$A-X-Y-B \qquad (I)$$

wherein A represents an alkyl group having from 8 to 25 carbon atoms, an alkenyl group having from 8 to 25 carbon atoms or an aryl group having from 8 to 25 carbon atoms; X represents



wherein R represents an alkyl group having from 1 to 10 carbon atoms or —Y—B; Y represents a group consisting of at least one of each of the units



wherein a represents from 5 to 50; and b represents from 2 to 20; and B represents hydrogen or an alkyl group having not more than 8 carbon atoms, an alkylcarbonyl group having not more than 8 carbon atoms, or a phenyl group having not more than 8 carbon atoms.

4,917,994

COLOR PHOTOGRAPHIC REFLECTION PRINT MATERIAL WITH IMPROVED KEEPING PROPERTIES

Alberto M. Martinez, Rochester; Ronald G. Olsen, Fairport, and Gary W. Visconte, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 1, 1988, Ser. No. 162,915
Int. Cl.[4] G03C *7/26, 1/30*
U.S. Cl. 430—543 6 Claims

1. A color photographic print material comprising a support, one or more gelatin silver halide emulsion layers having associated therewith one or more dye-forming couplers and optionally subbing layers, interlayers, and overcoat layers, wherein the silver halide emulsion side of the element has a surface pH of between 4.0 and 5.3.

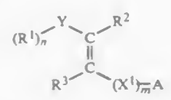
4,917,995

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Tetsuro Kojima; Tetsunori Matsushita; Ichizo Toya, and Kazuhiko Takeuchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 28, 1988, Ser. No. 212,746
Claims priority, application Japan, Jun. 30, 1987, 62-163622
Int. Cl.[4] G03C *1/02, 1/08*
U.S. Cl. 430—565 7 Claims

1. A silver halide photographic material for obtaining silver images comprising at least one silver halide emulsion layer on a support having a white reflection layer, wherein at least one compound represented by formula (I) is contained in at least one of the constituent layers:

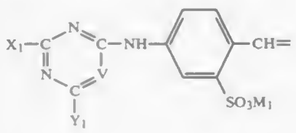


(I)

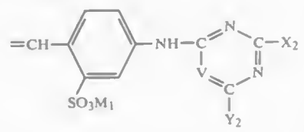
wherein X^1 represents a divalent bonding group bonded by way of a hetero atom to a carbon atom; A represents a group capable of controlling the tone of silver images, which is bonded to X^1 by way of the hetero atom of A; R^1, R^2 and R^3 each represents a hydrogen atom or a group which may be substituted, in which R^1 and R^2, or R^1 and R^3 may further be bonded together to form a carbocyclic ring or a heterocyclic ring; Y represents:

a cyano group or a nitro group, in which R^4, R^5, R^6, R^7 and R^8 each represent a hydrogen atom or a group which may be substituted; n and m represent 0 or 1, provided that if m is 0, the group represented by A is bonded to a carbon atom by way of the hetero atom of A; and further comprising a brightening agent represented by formula (VI):

(VI)



-continued



wherein X_1, X_2, Y_1 and Y_2 each represents a hydroxyl group, a halogen atom, a morpholino group, an alkoxy group, an aryloxy group, an alkyl group, an amino group, an alkylamino group, or an arylamino group; M_1 represents a hydrogen atom or a cation; and V represents =N— or =CH—.

4,917,996

SILVER HALIDE GRAINS, PREPARATION THEREOF AND LIGHT-SENSITIVE PHOTOGRAPHIC MATERIAL CONTAINING SAID GRAINS

Syoji Matsuzaka; Hideo Akamatsu; Shu Nishiwaki, and Yoshihiko Suda, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1988, Ser. No. 185,081
Claims priority, application Japan, Jul. 28, 1984, 59-158111; Oct. 1, 1984, 59-206765; Oct. 8, 1984, 59-211763; Oct. 8, 1984, 59-211764
Int. Cl.[4] G03C *1/02*
U.S. Cl. 430—567 7 Claims

1. Hybridized silver salt crystal grains, comprising crystals of developable silver salts formed by epitaxial junction on the host grains consisting substantially of silver iodobromide or silver bromide having (110) faces and/or semi-(110) faces.

2. A silver halide photographic emulsion, comprising hybridized silver salt crystal grains comprising crystals of developable silver salts formed by epitaxial junction on the host grains consisting substantially of silver iodobromide or silver bromide having (110) faces and/or semi-(110) faces.

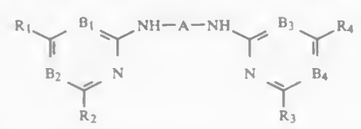
4,917,997

SILVER HALIDE PHOTOGRAPHIC EMULSION

Tadashi Ikeda, and Haruo Takei, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 12, 1988, Ser. No. 246,569
Claims priority, application Japan, Sep. 11, 1987, 62-227905
Int. Cl.[4] G03C *1/28*
U.S. Cl. 430—572 3 Claims

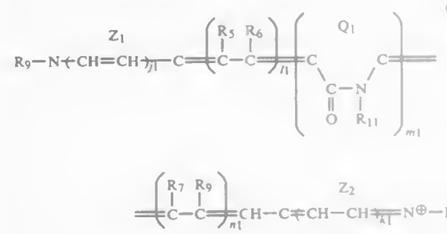
1. A silver halide photographic emulsion, which comprises a silver halide emulsion;
at least one ascorbic acid compound;
at least one compound represented by general formula (I):



(I)

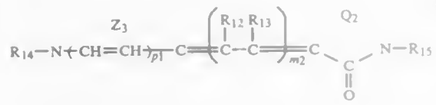
wherein
A represents a divalent aromatic residual group;
R_1, R_2, R_3 and R_4 each independently represents a hydrogen atom, a hydroxyl group, an alkyl group, an alkoxyl group, an aryloxyl group, a halogen atom, a heterocyclic nucleus, an allylthio group, a heterocyclylthio group, an arylthio group, an amine group, a substituted or unsubstituted alkylamino group, a substituted or unsubstituted arylamino group, a heterocyclylamino group, or a substituted or unsubstituted aralkylamino group, a substituted or unsubstituted aryl group or a mercapto group; and
B_1, B_2, B_3, and B_4 each independently represents —CH= or —N=, with the proviso that at least one of A, R_1, R_2, R_3 and R_4 contains a sulfonyl group, that one of B_1 and B_2 represents —CH= and the other represents —N=, and that one of B_3 and B_4 represents —CH= and the other represents —N=; and
at least one sensitizing dye of general formula (II) and general formula (III) at least one sensitizing dye of:

(II)



wherein
Z_1 and Z_2, which may be the same or different, each represents a 5- or 6-membered nitrogen-containing heterocycle-forming atomic group;
Q_1 represents a 5- or 6-membered nitrogen-containing ketomethylene ring-forming atomic group;
R_5, R_6, R_7 and R_8 each independently represents a hydrogen atom, a lower alkyl group, or a phenyl group or aralkyl group, either or both of which may be substituted;
R_9 and R_{10} each independently represents an alkyl group or alkenyl group, either of which may contain one or more oxygen atoms, sulfur atoms and/or nitrogen atoms in a carbon chain and which may be substituted;
R_{11} has the same meaning as R_9 or represents an aryl group or a 5- or 6-membered heterocyclic group;
l_1 represents 1;
n_1 represents 0;
R_5 and R_9 may be connected to each other to form, together with the adjacent atoms, a 5- or 6-membered ring;
j_1 and k_1 each independently represents an integer of 0 or 1;
m_1 represents 1;
X_1 represents an acid anion; and
r_1 represents 0 or 1;

(III)



wherein
Z_3 represents a 5- or 6-membered nitrogen-containing heterocycle-forming atomic group;
Q_2 represents a 5-or 6-membered nitrogen-containing ketomethylene ring-forming atomic group;
R_{12} represents a hydrogen atom or an alkyl group;
R_{13} represents a hydrogen atom or a phenyl group or an alkyl group, either or both of which may be substituted;
R_{14} represents an alkyl or alkenyl group, either of which may contain one or more oxygen atoms, sulfur atoms and/or nitrogen atoms in a carbon chain or may be substituted;
R_{15} has the same meaning as R_{14}, or represents a hydrogen atom or a monocyclic aryl group or a 5- or 6-membered monoheterocyclic group which may be substituted;
m_2 represents 2 or 3, with the proviso that two R_{13}'s may be connected to each other to form, together with the adjacent atoms, a 5- or 6-membered ring which may contain one or more oxygen atoms, sulfur atoms and/or nitrogen atoms; and
P_1 represents 0 or 1, with the proviso that R_{12} and R_{14} may be connected to each other to form, together with the adjacent atoms, a 5- or 6-membered ring.

4,917,998

METHOD OF DETECTING AIDS VIRUS INFECTION

Denis R. Burger, and Andrew S. Goldstein, both of Portland, Oreg., assignors to Epitope, Inc., Beaverton, Oreg.

Filed May 6, 1986, Ser. No. 860,169
The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.
Int. Cl.[4] G01N *33/569, 33/577*
U.S. Cl. 435—5 18 Claims

1. A method for detecting the presence of HTLV III infection, which comprises contacting a sample obtained from a mammalian subject suspected of being infected with HTLV III virus with monoclonal antibodies against an antigen produced as a result of said infection and detecting the binding of said antibodies to said antigen, said antigen being selected from the group consisting of a 28 kilodalton antigen, a 39 kilodalton antigen, a 49 kilodalton antigen, and a 52 kilodalton antigen, the binding thereof being related to the presence of HTLV III infection, said antigen being capable of binding to one of the antibodies secreted by a cell line having ATCC accession numbers HB9100, HB9101, HB9102, HB9114, or HB9115.

4,917,999

OLIGONUCLEOTIDE PROBES FOR DETECTION OF α-AMYLASE GENES

Graham Byng, Bristol, and Karen L. Wollweber, Elkhart, both of Ind., assignors to Miles Inc., Elkhart, Ind.

Filed Sep. 2, 1986, Ser. No. 902,905
Int. Cl.[4] C12Q *1/68;* C07H *19/073, 19/173*
U.S. Cl. 435—6 6 Claims

1. An oligonucleotide probe for use in the detection of a gene encoding α-amylase in an organism suspected of carrying the gene, comprising:
an oligonucleotide having a base sequence chosen from the sequences,
(a) GAI GGI TTI CGI ITT GAT GCC GIC AAI CAT ATT
wherein I is inosine; or
(b) GTT ACA TTT GTT GAA AAT CAT GAC ACA
which oligonucleotides are capable of hybridization, under hybridization conditions, with a second base sequence present in the organisms *Bacillus stearothermophilus, Bacillus subtilis* NA64, *Bacillus amuloliquefaciens* and *Bacillus licheniformis*, which second base sequence is capable of encoding the aminoacid sequence asp-gly-phe-arg-leu-asp-ala-val-lys-his-ile.

3. A method for detecting the presence of a gene encoding the enzyme α-amylase from an organism suspected of containing said gene comprising contacting the oligonucleotide probe of claim 1 with a DNA sample from said organism under conditions favorable to hybridization between said probe and said sample and determining the presence of hybridized probe.

4,918,000

MULTI-COLOR LABELING OF DIFFERENT ANTIGENS IN A BIOLOGICAL SYSTEM

Walter Schubert, Schiefener Weg 14, D-5208 Eitorf, Fed. Rep. of Germany

Filed Sep. 27, 1985, Ser. No. 780,958
Int. Cl.[4] G01N *33/53*
U.S. Cl. 435—7 37 Claims

1. A method for multicolor-labeling at least two different antigens simultaneously present in a common biological system, with the aid of a corresponding number of different antigen-specific antibodies, comprising

(a) adding to an animal tissue containing at least a first antigen and a second antigen, at least a first primary antibody, active against said first antigen and free from a moiety labeling any antigen in an optically detectable manner, in an amount effectively immunologically reacting with said first antigen;
(b) adding to the tissue resulting from step (a) at least a first secondary antibody immunologically reacting with said first primary antibody and containing free binding sites in excess of those occupied by said first primary antibody, said first secondary antibody being conjugated with a first detecting moiety selected from the group consisting of:
(i) a first labeling radical conjugated directly with said first secondary antibody, and
(ii) a first labeling radical conjugated with said first secondary antibody via a first labeling effect-enhancing bridge member; thereby labeling said first antigen in an optically detectable manner;
(c) adding to the treated tissue resulting from step (b) and still containing free binding sites capable of acting against any subsequently introduced antibodies or against subsequently introduced bridge members, at least one inactive immunoglobulin subclass of a non-immune normal serum from a given animal species, in an amount sufficient for blocking all free antibody-specific binding sites remaining from step (b) and,
(d) adding to the treated tissue resulting from step (c) a second primary antibody from the same animal species as said non-immune normal serum,
said second primary antibody being immunologically reactive with said second antigen, completely free from activity against any antibodies and any normal sera introduced previously into said treated tissue, and conjugated with a second detecting moiety free from cross reactivity with said first detecting moiety and being selected from the group consisting of:
(i) a second labeling radical conjugated directly with said second primary antibody, and
(ii) a second labeling radical conjugated with said second primary antibody via a second labeling effect-enhancing bridge member; thereby labeling said second antigen as optically distinguishable from said first antigen labeled with said first detecting moiety.

4,918,001

METHOD FOR THE DETERMINATION OF PROTEASE INHIBITORS

Hans-Jürgen Kolde, Marburg, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed Sep. 4, 1986, Ser. No. 903,458
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1985, 3531778
Int. Cl.[4] C12Q *1/36, 1/38*
U.S. Cl. 435—24 **21 Claims**

1. A method for determining the biological activity of a protease inhibitor using a protease which can be inhibited by this inhibitor and a substrate capable of producing a detectable response upon cleavage by the protease, which comprises first mixing a liquid containing the protease inhibitor and the substrate and then adding the protease to start the reaction, and determining the rate of hydrolysis of the substrate.

4,918,002

KERATINOCYTE MEGACOLONIES, AND ASSAYS FOR GROWTH FACTORS

Howard Green, Brookline, and Vann Barrandon, Boston, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Filed Aug. 21, 1986, Ser. No. 898,929
Int. Cl.[4] C12Q *1/02;* **G01N** *33/48*
U.S. Cl. 435—29 **19 Claims**

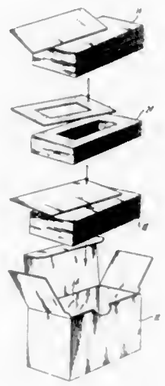
1. A method for qualitatively assaying a compound for ability to promote epidermal cell growth and migration, comprising the steps of:
including said compound in a medium which, without said compound, will allow colony formation from a keratinocyte cell but will not alone allow megacolony formation from said cell,
placing a said keratinocyte cell at a position in said medium,
incubating said keratinocyte cell and said medium,
and determining whether a megacolony is formed, said megacolony having a surface area of at least 1 cm^2 and containing at least 2×10^5 cells,
wherein formation of said megacolony indicates that said compound promotes cell growth and migration.

4,918,003

BIOLOGICAL TEST DEVICE FOR STEAM STERILIZERS

Louise Macaro, Mt. Vernon; John Dyckman, Monroe, both of N.Y.; Thomas A. Augurt, Stamford, Conn., and Andrew Zwarun, Roslyn Heights, N.Y., assignors to Propper Manufacturing Company, Inc., Long Island City, N.Y.

Continuation of Ser. No. 771,810, Aug. 30, 1985, abandoned. This application Sep. 29, 1988, Ser. No. 251,976
Int. Cl.[4] C12M *1/34*
U.S. Cl. 435—31 **11 Claims**



1. An enclosure constructed and arranged to receive a biological test device and adapted to be inserted in an autoclave for testing the proper functioning of the autoclave, the enclosure comprising: a first stack of layers of semiporous material; a second stack of layers of semiporous material; said first and second stacks each having selected height and porosity characteristics; said first and second stacks being spaced apart from one another and positioned one above the other; a layer of highly porous material positioned between and in contact with said first and second stacks; said first and second stacks and said layer of highly porous materials forming a disposable pack having top and bottom surfaces formed by the top of one of said first and second stacks and the bottom of the other of said first and second stacks, and side edges formed by the edges of said first and second stacks and the edges of said highly porous layer between said top and bottom surfaces; said highly porous layer having a cavity formed therein for receiving a biological test device; relatively steam impervious material positioned only around the side edges of said pack to inhibit the passage of air and steam through said side edges and neither above said pack top surface nor below said pack bottom surface; and means for retaining said relatively impervious material in position around said side edges.

5. A method for testing the proper function of an autoclave comprising the steps of: inserting in said autoclave a biological test device encased within a disposable enclosure comprising a first stack of layers of semiporous material, a second stack of

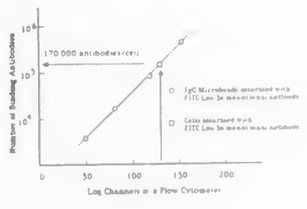
layers of semiporous material, said first and second stacks each having selected height and porosity characteristics, said first and second stacks being spaced apart from one another and positioned one above the other, a layer of highly porous material positioned between and in contact with said first and second stacks, said first and second stacks and said layer of highly porous materials forming a disposable pack having top and bottom surfaces formed by the top of one of said first and second stacks and the bottom of the other of said first and second stacks and side edges formed by the edges of said first and second stacks and the edges of said highly porous layer between said top and bottom surfaces, said highly porous layer having a cavity formed therein for receiving a biological test device, a sheet of relatively steam impervious material positioned around the side edges of said pack to inhibit the passage of air and steam through said side edges, and means for retaining said relatively impervious material in position around said side edges; operating said autoclave through its normal sterilization cycle with a normal sterilization load; and, removing the biological test device from said enclosure and determining whether biological material in said test device has been destroyed by sterilization.

4,918,004

METHOD OF CALIBRATING A FLOW CYTOMETER OR FLUORESCENCE MICROSCOPE FOR QUANTITATING BINDING ANTIBODIES ON A SELECTED SAMPLE, AND MICROBEAD CALIBRATION KIT THEREFOR

Abraham Schwartz, Durham, N.C., assignor to Caribbean Microparticles Corporation, Hato Rey, P.R.

Continuation-in-part of Ser. No. 128,786, Dec. 4, 1987, Pat. No. 4,857,451, and Ser. No. 850,746, Apr. 11, 1986, Pat. No. 4,828,984, said Ser. No. 128,786, is a continuation-in-part of Ser. No. 805,654, Dec. 11, 1985, Pat. No. 4,774,189, which is a continuation-in-part of Ser. No. 685,464, Dec. 24, 1984, Pat. No. 4,774,180. This application Dec. 10, 1987, Ser. No. 131,200
The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.
Int. Cl.[4] G01N *33/546, 33/547*
U.S. Cl. 435—7 **19 Claims**



7. A method for calibrating a flow cytometer or fluorescence microscope in terms of the number of binding antibodies per microbead as a function of fluorescence intensity value measured on the flow cytometer of fluorescence microscope, and subsequent measuring of a sample to which said antibodies are bindable, comprising the steps of:
(i) providing a microbead calibration kit comprising a set of populations of microbeads having a coefficient of variation of diameter of about 2 percent or less, with said diameter of said microbeadebeing substantially equivalent to the diameter of the sample to be measured, said populations being capable of binding, directly or via a linking group, a fluorescently labeled antibody, wherein the number of fluorescently labeled antibodies, binding to each microbead in said populations is the same within a said population, but different from population to population among the respective said populations in said set;
(ii) oontacting each of said populations of microbeads with a fluorescently labeled antibody to effect direct or indirect binding of said antibody to said microbeads for saturation of the binding sites associates with said microbeads, to produce antibody-bearing microbeads having directly or indirectly bound thereto antibodies of a known or determinable number per microbead;
(iii) determining the fluorescence intensity of each of said populations of antibody-bearing microbeads on said flow cytometer or fluorescence microscope;
(iv) constructing a calibration plot of the number of fluorescently labeled antibodies, as a function of fluorescence intensity measured on said cytometer of fluorescence microscope for said antibody-bearing microbeads;
(v) contacting said sample with a second portion of said fluorescently labeled antibody capable of binding to said sample, to yield a fluorescently labeled antibody-bearing sample;
(vi) determining the fluorescence intensity of said fluorescently labeled antibody-bearnng sample on said flow cytometer or fluorescence microscope; and
(vii) determining from said calibration plot the number of fluorescently labeled antibodies binding to the sample, based on the fluorescence intensity of the sample measured on said flow cytometer of fluorescence microscope.

4,918,005

METHOD OF QUANTITATIVE ASSAY FOR VITAMIN B_{12} AND REAGENT FOR ASSAYING VITAMIN B_{12}

Asao Murai, Kawasaki, and Masao Yamamoto, Tokyo, both of Japan, assignors to Sanraku Incorporated, Tokyo, Japan

Filed Jul. 17, 1987, Ser. No. 74,745
Claims priority, application Japan, Jul. 25, 1986, 61-175332
Int. Cl.[4] C12Q *1/04, 1/00;* **C12R** *1/89;* **G01N** *33/567*
U.S. Cl. 435—34 **6 Claims**

1. A method for the quantitative assay of vitamin B_{12} in a substance containing vitamin B_{12} comprising:
adding marine methanol-utilizing bacteria having vitamin B_{12} auxotrophy to a medium for quantitative assay of said bacteria containing pyrroloquinoline-quinone and a polyoxyethylene sorbitan fatty acid ester;
adding a standard dilution of vitamin B_{12} in a serial concentration to a first portion of said medium to culture said bacteria in said first portion;
measuring the absorbancy of said first portion as standard dilution OD values to determine the degree of growth of said bacteria as a function of vitamin B_{12} concentration;
preparing a standard linear curve of absorbancy versus B_{12} concentration based on said measurements;
adding a test substance to a second portion of said medium to culture said bacteria in said second portion;
measuring the absorbancy of said second portion as a test substance OD value to determine the degree of growth of said bacteria; and
comparing the test substance OD value with said standard linear curve to quantitatively determine the B_{12} concentration in said test substance.

4,918,006

GENE CODING FOR INSECTICIDAL CRYSTAL PROTEIN

David J. Ellar, Kingston, and Elizabeth S. Ward, Cambridge, both of England, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 750,211, Jul. 1, 1985, abandoned. This application Feb. 3, 1986, Ser. No. 824,912
Int. Cl.[4] C12P *21/00;* **C12N** *15/00;* **C07H** *15/12*
U.S. Cl. 435—69.1 **12 Claims**

1. A recombinant plasmid capable of replication in a bacterial host species and containing an expressible heterologous DNA composition having a nucleotide base sequence coding for a 27kdal protein toxin or an insecticidally effective segment thereof and including an expression mechanism for said heterologous DNA which is recognized by the host species system but does not exhibit substantial growth phase limitations in the

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bacterial host species, the heterologous DNA composition having substantial sequence homology to the gene or gene segment coding for a protein present in a crystal of B. thuringiensis var. israelensis.

4,918,007

PROMOTER ARRANGEMENT FOR STREPTOMYCETES VECTORS

Klaus-Peter Koller, Bad Soden am Taunus, and Günther J. Riess, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 8, 1986, Ser. No. 917,066

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1985, 3536182

Int. Cl.[4] C12P *21/00, 21/02;* C12N *15/00, 1/20;* C07H *15/12*

U.S. Cl. 435—69.2 14 Claims

1. A tandem arrangement of two promoters, each being active in Streptomyces, at least one of said promoters being selected from the group consisting of a promoter located in the 350 bp Pst I-Sph I fragment of plasmid pIJ 702 and a promoter located in the 650 bp Hinc II-Sst I fragment of plasmid pKA1 1, which fragment is located within the 0.94 kb Pst I-Bam HI fragment.

4,918,008

PROCESS FOR THE PREPARATION OF PROTEIN HYDROLYSATE AND MEDICAMENTS CONTAINING THESE HYDROLYSATES

Kailash K. Gauri, Zur Waldburg 13, D-2359 Lentfobrden, Fed. Rep. of Germany

PCT No. PCT/EP86/00016, § 371 Date Sep. 17, 1986, § 102(e) Date Sep. 17, 1986, PCT Pub. No. WO86/04217, PCT Pub. Date Jul. 31, 1986

PCT Filed Jan. 20, 1986, Ser. No. 918,253

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1985, 3501560; May 24, 1985, 3518828

Int. Cl.[4] C12P *21/06;* A23J *3/00*

U.S. Cl. 435—68.1 26 Claims

1. Protein hydrolysate prepared by a process comprising:

heating an approximately 1% to 10% by weight suspension of a member selected from the group consisting of whey protein, lactalbumin, α-lactalbumin, lactoferrin, β-lactoglobulin, lysozyme or serum albumin in water at 35° C. for about 1 to 4 hours under agitation with at least one protease,

continuing said heating at about 60° C. for about 2 to 3 hours,

heating the suspension to 80° C. to 90° C. and maintaining it at this temperature for a brief time period,

cooling the suspension and evaporating it under reduced pressure to produce a residue,

isolating the residue as product (A) and extracting it with a member selected from the group consisting of a polar solvent or a mixture selected from the group consisting of a polar solvent or a mixture of polar solvents at room temperature or at an elevated temperature up to 50° C. to produce an extract, and

filtering the extract to obtain a filtrate and obtaining from the filtrate product (AP) by evaporating the filtrate to dryness.

4,918,009

METHOD OF CONTROLLING THE REGIOSELECTIVITY OF GLYCOSIDIC BONDS

Kurt G. I. Nilsson, Lund, Sweden, assignor to Svenska Sockerfabriks AB, Malmo, Sweden

Filed Dec. 4, 1986, Ser. No. 938,703

Claims priority, application Sweden, Dec. 11, 1985, 8505842

Int. Cl.[4] C12P *19/64;* C12N *9/24*

U.S. Cl. 435—73 23 Claims

1. A method of controlling the regioselectivity of the glycosidic bond formed between glycosyl donor and glycosyl acceptor in the enzymatic production of an oligosaccharide compound which either consists of or is a fragment or an analog of the carbohydrate part in a glycoconjugate, synthesized by reverse hydrolysis or transglycosidation, comprising reacting a donor substance which is a monosaccharide or oligosaccharide or a glycoside of a monosaccharide or oligosaccharide, with an acceptor substance which is an O-, N-, C- or S-glycoside consisting of a monosaccharide, oligosaccharide or a saccharide analog and at least one aglycon which is O-, N-, C- or S-glycosidically bonded in 1-position, in the presence of an exo- or endoglycosidase of EC group 3.2, the α- or β-configuration being selected on the glycoside bond between the glycosyl group and the aglycon in the acceptor substance, and separating the oligosaccharide compound from the reaction mixture.

4,918,011

ENZYMATIC PREPARATION OF 3',4'-ANHYDROVINBLASTINE

Anne E. Goodbody, Toronto; Endo Tsuyoshi, Mississauga; John Vukovic, Malton, and Masanaru Misawa, Weston, all of Canada, assignors to Allelix Biopharmaceuticals Inc., Mississauga, Canada

Filed Aug. 4, 1986, Ser. No. 893,018

Int. Cl.[4] C12P *17/18, 17/00, 17/16*

U.S. Cl. 435—119 15 Claims

1. A process for preparing 3',4'-anhydrovinblastine which comprises forming a reaction mixture containing vindoline, catharanthine and a catalytically effective amount of a coupling agent selected from the group consisting of hemoglobin, hemin, microperoxidase and horseradish peroxidase.

4,918,012

METHOD FOR PRODUCING CARNITINE, L-CARNITINAMIDE HYDROLASE AND METHOD FOR PRODUCING SAME

Kiyoshi Nakayama; Haruo Honda; Yukie Ogawa; Tatsuya Ozawa, and Tetsuo Ohta, all of Kanagawa, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Aug. 26, 1987, Ser. No. 89,454

Claims priority, application Japan, Aug. 26, 1986, 61-198173; Apr. 16, 1987, 62-91938

Int. Cl.[4] C12P *13/00, 41/00;* C12N *9/80*

U.S. Cl. 435—128 14 Claims

1. A method for producing carnitine comprising hydrolyzing carnitinamide by contacting, in a reaction medium, carnitinamide with (A) a carnitinamide hydrolase capable of hydrolyzing carnitinamide to form carnitine or (B) a microorganism containing said carnitinamide hydrolase.

4,918,013

METHOD FOR PRODUCING PYRUVIC ACID BY FERMENTATION

Bernard Besnainou, Aix En Provence; Dominique Glani, Peronne, and Claire Sahut, Aix En Provence, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 17, 1988, Ser. No. 258,391

Claims priority, application France, Oct. 15, 1987, 87 14248

Int. Cl.[4] C12P *7/40;* C12R *1/72, 1/73*

U.S. Cl. 435—136 13 Claims

1. A method for producing pyruvic acid by means of fermentation, wherein it consists of:

1.—cultivating Candida cells in a culture medium comprising a source of carbon, a source of nitrogen, thiamine and mineral salts at a pH of 4.5 to 5.5 in aerobic conditions,

2.—separating the cells thus produced from the growing medium,

3.—cultivating said cells in a bioconversion medium containing a source of carbon and mineral elements at a pH of 3.5 to 4.5 in aerobic conditions, and

4.—extracting the pyruvic acid produced from the culture medium.

4,918,014

METHOD FOR PRODUCING MUCOID AND PHAGE RESISTANT GROUP N STREPTOCOCCUS STRAINS FROM NON-MUCOID AND PHAGE SENSITIVE PARENT STRAINS

Ebenezer R. Vedamuthu, Bradenton, Fla., assignor to Microlife Technics, Inc., Sarasota, Fla.

Filed Oct. 11, 1985, Ser. No. 786,631

Int. Cl.[4] C12N *15/00, 1/22;* C12R *1/46*

U.S. Cl. 435—172.1 14 Claims

1. A method for imparting phage resistance to a Streptococcus bacterium which comprises:

(a) providing a phage sensitive bacterium of the genus Streptococcus group N which is lysed by a homologous phage; and

(b) conjugatively transferring a plasmid from a donor bacterium to the phage-sensitive recipient bacterium, to thereby produce a phage resistant transconjugant bacterium which is resistant to the homologous phage, wherein the transferred plasmid contains DNA isolated from an 18.5 Mdal parental plasmid referred to as pSRQ2202 which encodes for production of a mucoid substance from *Streptococcus cremoris* (MS) NRRL-B-15995.

4,918,015

GENTAMICIN-RESISTANCE GENES AND THEIR USE AS MARKERS

Wolfgang Wohlleben; Günter Muth, and Alfred Pühler, all of Bielefeld, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 30, 1987, Ser. No. 44,325

Claims priority, application Fed. Rep. of Germany, May 2, 1986, 3614903

Int. Cl.[4] C12N *1/20, 7/00;* C12P *21/00;* C12R *1/465*

U.S. Cl. 435—172.3 31 Claims

1. A substantially pure DNA fragment comprising a nucleotide sequence that comprises a sequence of restriction sites wherein said sequence includes EcoRI-BamHI-ClaI, said DNA fragment is capable of conferring a gentamicin-resistance activity to a host and said host is gentamicin-sensitive.

15. A substantially pure DNA fragment comprising a nucleotide sequence that is capable of conferring a gentamicin-resistance activity upon a host, wherein said DNA fragment is produced by the process comprising the steps of

(a) substantially digesting DNA from *S. ghanaensis,* strain DSM 2932, with BglII to produce fragments of *S. ghanaensis* DNA,

(b) incorporating a fragment of the BbIII-digested *S. ghanaensis* DNA into a plasmid to produce a hybrid plasmid that is capable of being transferred to a host, of replicating in the host and of conferring gentamicin-resistance activity upon the host,

(c) selecting the hybrid plasmid that is capable of conferring the gentamicin-resistance activity upon the host and

(d) isolating the DNA fragment from the hybrid plasmid, wherein said host is gentamicin-sensitive.

4,918,016

ENZYME IMMOBILIZATION ON MINERAL PARTICLES COATED WITH CHITOSAN

Jean-Louis Leuba, Boussens; Albert Renken, Saint-Sulpice, and Erwin Flaschel, Chavannes, all of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Filed Oct. 25, 1982, Ser. No. 436,423

Claims priority, application Switzerland, Nov. 17, 1981, 7375/81

Int. Cl.[4] C12N *11/14, 11/02, 11/10, 11/06*

U.S. Cl. 435—176 12 Claims

1. A process for the production of an enzymatically active biocatalyst insoluble in aqueous medium and particularly suitable for use in fluidised-bed or fixed-bed reactors, which comprises coating particles of a rigid and dense mineral material which a layer of chitosan to form a support, treating the support with a bifunctional reagent to stabilise the chitosan and then fixing an enzyme to the support.

4,918,017

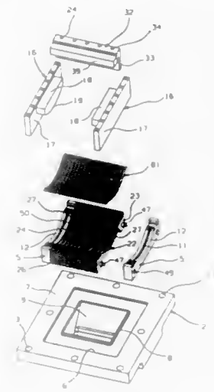
SCREEN ASSEMBLY FOR SCREENING ELASTOMERIC MATERIAL

Arthur W. Greenstreet, Clinton; Gerardo P. Elia, Akron, and Charles D. Spragg, Hudson, all of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Feb. 3, 1989, Ser. No. 305,688

Int. Cl.[4] B29B *13/10*

U.S. Cl. 425—197 17 Claims



1 A screen assembly including:

(a) a mesh screen adapted to be mounted adjacent a discharge outlet of an extruder for removing foreign particles from a material being discharged from the extruder;

(b) support means for supporting the mesh screen adjacent the discharge outlet of the extruder, said support means having a plurality of spaced elongated support ribs concavely-shaped in the flow direction of the material being discharged from the extruder forming a plurality of elongated slots therebetween for passage of the discharged material therethrough, with said screen being in juxtaposition to the ribs on the upstream side of the discharged material and being concavely-shaped complementary in curvature to the concavity of the support ribs; and

(c) means for mounting the support means and screen adjacent the discharge end of the extruder.

4,918,018

MICROORGANISM FOR USE IN INDUSTRIAL PROCESSES

James Waskovsky, Socorro, N. Mex., assignor to Chemolithotrophs, Inc, Socorro, N. Mex.

Filed Dec. 10, 1987, Ser. No. 131,425

Int. Cl.[4] C12N *1/20;* C12R *1/01*

U.S. Cl. 453—252.1 1 Claim

1. A substantially pure culture of *Ferroxifunis bagdadii,* having the identifying characteristics of ATCC 53601.

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4,918,019

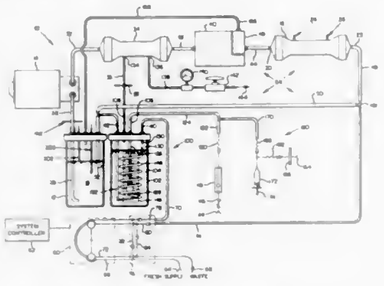
BIOREACTOR SYSTEM WITH PLASTICIZER REMOVAL

Perry W. Guinn, Oregon City, Oreg., assignor to C. D. Medical, Incorporated, Miami Lakes, Fla.

Continuation-in-part of Ser. No. 909,962, Sep. 22, 1986, which is a continuation-in-part of Ser. No. 862,014, May 12, 1986. This application Feb. 5, 1987, Ser. No. 11,913

Int. Cl.[4] C12M *1/12, 1/14*

U.S. Cl. 435—289 **11 Claims**



1. A bioreactor system comprising:

reservoir means for containing nutrient fluid, said reservoir means having first and second ports;

bioreactor means including a plurality of semipermeable fibers for containing cells to be nourished by the nutrient fluid, said bioreactor means having first and second nutrient flow ports;

fluid circuit means for allowing the circulation of nutrient fluid from the reservoir means through the bioreactor means, said fluid circuit means including a first portion coupling the first port of the reservoir means to the first nutrient fluid flow port of the bioreactor means, said fluid circuit means including a second portion coupling the second port of the reservoir means to the second nutrient fluid flow port of the bioreactor means;

recirculation means including a first pump for driving the nutrient fluid through the fluid circuit means; and

means for flushing manufacturing residue from the bioreactor means while maintaining system sterility, said means comprising:

a waste fluid outlet port;

a sterile fluid source;

a second pump means having an inlet coupled to the sterile fluid source and an outlet coupled to the second portion of the fluid circuit means, said second pump means being distinct from the first pump, for introducing sterile fluid from the sterile fluid source into the second portion of the fluid circuit means;

first valve means in the second portion of the fluid circuit means for isolating the sterile fluid source and the second nutrient fluid flow port of the bioreactor means from the second port of the reservoir means when in a first state, said valve means coupling the second nutrient fluid flow port of the bioreactor means to the second port of the reservoir means when in a second state;

second valve means for coupling the first nutrient fluid flow port of the bioreactor means to the waste fluid outlet port when in a first state, said second valve means isolating the first nutrient fluid flow port from the waste fluid outlet port when in a second state;

third valve means for isolating the first nutrient fluid flow port of the reservoir means from the first port of the reservoir means when in a first state, said third valve means coupling the first nutrient fluid flow port to the first port of the reservoir means when in a second state;

whereby when said valves are in their first state, sterile fluid introduced into the second portion of the fluid circuit means by the second pump means flows into the second nutrient fluid flow port of the bioreactor means and out the first nutrient fluid flow port of the bioreactor means to the waste fluid outlet port, thereby flushing manufacturing residue from the bioreactor means to the waste fluid outlet port, and when said valves are thereafter switched to their second states, the nutrient fluid is able to circulate from the reservoir means through the bioreactor means in an isolated loop free from manufacturing residue initially present in the bioreactor means.

4,918,020

ANALYZING MARKER DYES IN LIQUID HYDROCARBON FUELS

Anthony V. Nowak, Fullerton, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 21, 1989, Ser. No. 326,720

Int. Cl.[4] G01N *35/08*

U.S. Cl. 436—56 **9 Claims**

1. A method for determining the concentration of a marker dye in a liquid hydrocarbon fuel, said method comprising:

a. passing a sample of a liquid hydrocarbon fuel containing a marker dye through a bed of column packing to selectively retain the marker dye on the column packing and thereby substantially separate the marker dye from the liquid hydrocarbon fuel;

b. reacting the thus separated marker dye with a color forming reagent to form a colored complex; and

c. determining a color intensity for the colored complex, said color intensity being indicative of the concentration of the marker dye inserted after "complex".

4,918,021

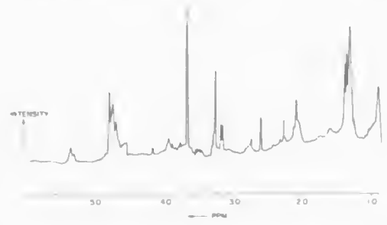
PROCESS FOR THE DETECTION OF CANCER

Eric T. Fossel, Chestnut Hill, Mass., assignor to The Beth Israel Hospital Association, Boston, Mass.

Continuation-in-part of Ser. No. 833,840, Feb. 26, 1986, abandoned. This application Jan. 10, 1989, Ser. No. 295,746

Int. Cl.[4] G01N *33/48*

U.S. Cl. 436—64 **41 Claims**



1. A method of diagnosing the presence of cancer in a living patient, comprising the following steps:

(a) subjecting a blood component sample from a patient to be tested to proton nuclear magnetic resonance spectroscopy to generate a NMR spectrum from which undesirable signals have been suppressed;

(b) selecting a lipoprotein resonance line for lipid peaks in said spectrum;

(c) measuring the full width at half-height of said resonance line;

(d) classifying the full width measured into either a category of normal full widths or into a category of abnormal full widths as compared to a predetermined standard for which abnormal full widths indicate the presence of cancer;

(e) for measured full width readings classified as abnormal in step (d), measuring the triglyceride level of the blood component sample;

(f) classifying the triglyceride level so measured into a category of normal levels or above normal levels;

(g) for component samples having above normal levels of triglycerides, subjecting the blood component sample to C-13 nuclear magnetic resonance spectroscopy to generate an NMR spectrum;

(h) classifying the NMR spectrum into a category of normal spectrum or into a category of abnormal spectrum as compared to a predetermined standard for which abnormal spectrum indicate the presence of cancer

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4,918,022

ANALYSIS OF BULK ASBESTOS SAMPLES

Clifford C. Houk, Athens, Ohio, assignor to Ohio State University, Athens, Ohio

Filed Mar. 13, 1989, Ser. No. 323,376

Int. Cl.[4] G01N *31/22*

U.S. Cl. 436—79 **6 Claims**

1. A process for detecting the presence of chrysotile in a product sample comprising the steps of:

(a) selecting a product sample suspected to contain chrysotile;

(b) mixing said sample along with a predetermined amount of basic buffered reagent solution containing a 2,2'-(1-triazene-1,3-diyldi-4,1-phenylene)bis[6-methyl-7-benzothiazolesulfonic acid) disodium salt dye concentration of between about 0.00005 and 0.00015% by weight; and

(c) placing said sample under ultraviolet light whereby fluorescence of said sample indicates the presence of chrysotile.

4,918,024

METHOD FOR DETERMINATION OF DICYANODIAMIDE IN PLANTS OR PARTS OF PLANTS

Ulrich Rust, Pechleraustrasse 6, D-8223 Trostberg, Fed. Rep. of Germany

Filed Nov. 3, 1988, Ser. No. 268,212

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1987, 3738675

Int. Cl.[4] G01N *33/00*

U.S. Cl. 436—106 **20 Claims**

1. A method for the determination of dicyanodiamide in a plant matrix comprising:

(a) extracting any dicyanodiamide from the plant matrix;

(b) purifying any dicyanodiamide obtained in step (a) of any interfering substances;

(c) reacting any dicyanodiamide obtained in step (b) with 3-hydroxy-2-butanone in a non-aqueous, alcoholic hydrochloric acid medium to form 2-guanidino-4,5-dimethyloxazole;

(d) isolating any 2-guanidino-4,5-dimethyloxazole formed in step (c) using liquid-liquid extraction;

(e) purifying any isolated 2-guanidino-4,5-dimethyloxazole of step (d) by reverse phase high pressure liquid chromatography; and,

(f) determining spectrophotometrically at a wavelength of 260 nm the amount of 2-guanidino-4,5-dimethyloxazole obtained in step (e).

4,918,025

SELF CONTAINED IMMUNOASSAY ELEMENT

Gerd Grenner, Lincoln, Mass., assignor to PB Diagnostic Systems, Inc., Westwood, Mass.

Filed Mar. 3, 1987, Ser. No. 21,136

Int. Cl.[4] C12Q *1/00;* **G01N** *31/22*

U.S. Cl. 436—165 **24 Claims**

1. A self-contained element for analysis of a liquid sample containing a component to be determined which comprises:

a housing containing a capillary tube having opposed interior top and bottom surfaces, a portion of at least one of said top and bottom surfaces having bound thereto a first reagent consisting of either said component to be determined or the binding partner of said component to be determined, said bound first reagent defining a reaction zone and interactive with said component to be determined to form a first nondiffusible species, and at least one of said top and bottom surfaces including a transparent area to permit measurement of radiation from at least a portion of said reaction zone;

a labelled second reagent, said second reagent consisting of said component to be determined or the binding partner of said component to be determined and being interactive with said first nondiffusible species or said first reagent to form a second labelled species;

means for introducing at least a portion of said sample and said labelled second reagent into said capillary tube by capillary forces;

at least one reactant reservoir containing a wash solution or a third reagent which is interactive with said second labelled species, said at least one reactant reservoir being in fluid communication with said capillary tube;

a waste reservoir in fluid communication with said capillary tube adapted to receive waste fluid from said capillary tube;

and said means for introducing said sample and said labelled second reagent, said at least one reactant reservoir and said waste reservoir being housed within said housing.

14. A process for analyzing for an analyte in a liquid sample within the confines of a self-contained element housing which comprises:

introducing a liquid sample into a porous layer within said element, said porous layer containing a labelled reagent which is interactive with said analyte;

passing said analyte and said labelled reagent by capillary force into a capillary having opposed top and bottom surfaces and a first reagent bound to at least one of said top and bottom surfaces, said first reagent being interactive with said analyte and said labelled reagent to form a first nondiffusible species comprising said labelled reagent, said analyte and said first reagent;

washing the interior of said capillary with a liquid composition positioned in a reservoir within said element and in fluid communication with said capillary to pass the portion of the sample noninteracted with said first reagent into a wastereservoir located within said element, and rendering said labelled reagent detectable.

4,918,026

PROCESS FOR FORMING VERTICAL BIPOLAR TRANSISTORS AND HIGH VOLTAGE CMOS IN A SINGLE INTEGRATED CIRCUIT CHIP

Walter K. Kosiak; Douglas R. Schnabel; Jonathan D. Mann; Jack D. Parrish, and Paul R. Rowlands, III, all of Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Mar. 17, 1989, Ser. No. 325,164

Int. Cl.[4] H01L *21/265*

U.S. Cl. 437—33 **11 Claims**

1. A process for forming in a common substrate a PMOS

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transistor of the lightly doped drain type, an NMOS transistor of the lightly doped drain type, and a vertical n-p-n bipolar transistor comprising the steps of:

forming simultaneously in a p-type semiconductive substrate a first set of at least three relatively lightly doped n-type wells;

forming simultaneously in a first and a second well of said first set of n-type wells a first and a second relatively lightly doped p-type well for serving as a lightly doped drain extension of the PMOS transistor and as the base of n-p-n transistor, respectively;

forming simultaneously a relatively heavily doped n-type surface region in a third well of said first set of n-type wells for serving as the drain of an NMOS transistor and a relatively heavily doped n-type surface region in the p-type substrate for serving as the source of said NMOS

transistor, a relatively heavily doped n-type surface region in the second p-type well for serving as the emitter of the n-p-n bipolar transistor and a relatively heavily doped n-type surface region in the second n-type well for serving as the collector contact region of the n-p-n bipolar transistor;

forming simultaneously a relatively heavily doped p-type region in the first p-type well for serving as the drain of the PMOS transistor, a relatively heavily doped p-type surface region in the first n-type well for serving as the source of the PMOS transistor, and a relatively heavily doped p-type surface region in the second p-type well for serving as the base contact region of the n-p-n bipolar transistor; and

providing polysilicon gate electrodes to the PMOS and NMOS transistors.

4,918,027

METHOD OF FABRICATING SEMICONDUCTOR DEVICE

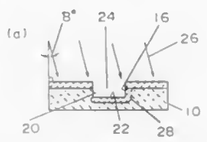
Genshu Fuse, Hirakata, and Takashi Ohzone, Yawata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 836,514, Mar. 5, 1986, abandoned. This application Apr. 27, 1988, Ser. No. 191,788

Claims priority, application Japan, Mar. 5, 1985, 60-43121

Int. Cl.[4] H01L *21/265*

U.S. Cl. 437—35 **1 Claim**



1. A method of fabricating a semiconductor device comprising:

a step of forming a trench in a semiconductor substrate having a principal surface, said trench having four side-walls which extend into said substrate in a direction substantially perpendicular to said principal surface of said semiconductor substrate and which are perpendicular to each other, and said trench having a bottom substantially parallel to said principal surface;

a step of positioning said semiconductor substrate in a first position;

a step of implanting ions into a first side-wall of said side-walls of said trench from a direction inclined to a normal to a plane containing said principal surface of said semiconductor substrate;

a step of positioning said semiconductor substrate in a second position which is different from said first position by rotating said semiconductor substrate by 90° about an axis of rotation which is perpendicular to said principal surface of said semiconductor substrate;

a step of implanting ions of the same type and to the same extent as implanted in the first side-wall into a second side-wall of said side-walls of said trench from said direction inclined to the normal to the plane containing said principal surface of said semiconductor substrate;

a step of positioning said semiconductor substrate in a third position which is different from said first and second positions by rotating said semiconductor substrate by 90° about said rotation axis;

a step of implanting ions of the same type and to the same extent as implanted in said first and second side-walls into a third side-wall of said side-walls of said trench from said direction inclined to the normal to the plane containing said principal surface of said semiconductor substrate;

a step of positioning said semiconductor substrate in a fourth position which is different from said first, second and third positions by rotating said semiconductor substrate by 90° about said rotation axis;

a step of implanting ions of the same type and to the same extent implanted in said first, second and third side-walls into a fourth side-wall of said side-walls of said trench from said direction inclined to the normal to the plane containing said principal surface of said semiconductor substrate; and

a step of implanting ions into the bottom of the trench by emitting ion beams of the same type as implanted in the side-walls in a direction perpendicular to said principal surface of said semiconductor substrate all of the steps of implanting being carried out such that the extent of implantation and the type of ion are such that an isolation trench is thereby formed.

4,918,028

PROCESS FOR PHOTO-ASSISTED EPITAXIAL GROWTH USING REMOTE PLASMA WITH IN-SITU ETCHING

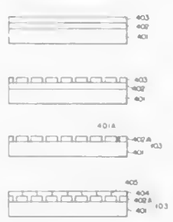
Shigeru Shirai, Nagahama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 38,325, Apr. 14, 1987, abandoned. This application Oct. 21, 1988, Ser. No. 262,233

Claims priority, application Japan, Apr. 14, 1986, 61-85509; Aug. 25, 1986, 61-198410

Int. Cl.[4] H01L *21/20, 21/306*

U.S. Cl. 437—81 **10 Claims**



1. A process for forming a crystalline deposited film on a substrate in a film forming space, said substrate having a surface, which comprises:

(a) preparing the surface on which spaced crystal nuclei are present for forming said crystalline deposited film;

(b) forming said crystalline deposited film on said surface of said substrate by separately introducing into said film forming space an activated species (A) formed by decomposition of a compound (SX) containing silicon and a halogen and an activated species (B) formed from a chemical substance for film formation (B) which is chemically mutually reactive with said activated species (A) to form a mixture and effect chemical reaction therebetween to thereby effect the formation of the crystalline deposited film, said crystalline deposited film having a surface;

(c) producing an etching action on the crystalline deposited film by exposing the crystalline deposited film surface to a gaseous substance (E) capable of effecting an etching action thereon, and thereby effecting crystal growth in a specific face direction;

(d) irradiating said gaseous substance (E) with light energy to thereby increase the etching activity thereof.

4,918,029

METHOD FOR LIQUID-PHASE THIN FILM EPITAXY

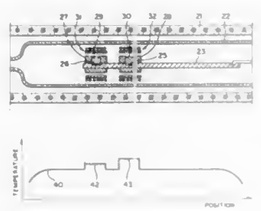
Ki-Joon Kim, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyoungsanj buk, Rep. of Korea

Filed Feb. 19, 1988, Ser. No. 157,981

Claims priority, application Rep. of Korea, Feb. 21, 1987, 1987-1489[U]

Int. Cl.[4] H01L *21/20, 21/208*

U.S. Cl. 437—119 **37 Claims**



1. A process of liquid-phase epitaxial growth of sliding boat type for forming a plurality of epitaxial layers on a plurality of substrates using a plurality of melting liquids in continuous fabrication steps, comprising the steps of:

heating an electric furnace to a first temperature level after inserting substrates mounted in boats and auxiliary heating devices each disposed around the boats and corresponding ones of a plurality of melting liquids, into a quartz reaction tube having a specified ambient temperature, and also heating both a first melting liquid and a second melting liquid to a second temperature level to make impurities melt by means of said auxiliary heating devices;

forming a first epitaxial layer on a first substrate by making said first substrate contact said first melting liquid by means of sliding said substrate holder and then cooling said first melting liquid to a third temperature level;

separating said first substrate from said first melting liquid by means of further sliding said substrate holder after forming a specified thickness of epitaxial growth on said first substrate, and again heating said first melting liquid to said second temperature level by said first auxiliary heating device;

making said first substrate contact the second melting liquid and said second substrate contact the first melting liquid by further sliding said substrate holder, and then cooling the first melting liquid to said third temperature level and the second melting liquid to a fourth temperature level, whereby a second expitaxial layer is formed on the first substrate and a first epitaxial layer is formed on the second substrate; and

separating all the substrates from the melting liquids by further sliding the substrate holder.

4,918,030

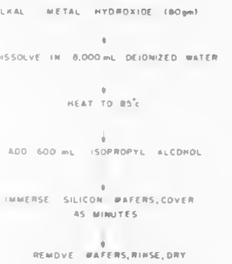
METHOD OF FORMING LIGHT-TRAPPING SURFACE FOR PHOTOVOLTAIC CELL AND RESULTING STRUCTURE

Walter R. Lamb, Sunnyvale, and John E. Lawrence, Capertino, both of Calif., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Mar. 31, 1989, Ser. No. 332,286

Int. Cl.[4] H01L *31/18*

U.S. Cl. 437—225 **11 Claims**



1. A method of fabricating a light-trapping textured surface of a photovoltaic cell comprising the steps of

(a) providing silicon wafers having surfaces with (100) crystallographic orientation,

(b) providing an aqueous solution of an alkali metal hydroxide,

(c) heating said aqueous solution to approximately 85° C.,

(d) adding isopropyl alcohol to the heated aqueous solution,

(e) immersing said silicon wafers in said heated aqueous solution for sufficient time to etch surfaces of said wafers and form pyramidal shapes on said surfaces, and

(f) removing and rinsing said silicon wafers in deionized water.

4,918,031

PROCESSES DEPENDING ON PLASMA GENERATION USING A HELICAL RESONATOR

Daniel L. Flamm, Chatham Township, Morris County; Dale E. Ibbotson, Westfield, both of N.J., and Wayne L. Johnson, Phoenix, Ariz., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 28, 1988, Ser. No. 290,740

Int. Cl.[4] H01L *21/00, 21/02;* **C23F** *1/00;* **C23C** *15/00*

U.S. Cl. 437—225 **38 Claims**

1. A process for fabricating a device comprising the steps of subjecting a substrate to a composition comprising entities that induce anisotropic removal of material from said substrate and

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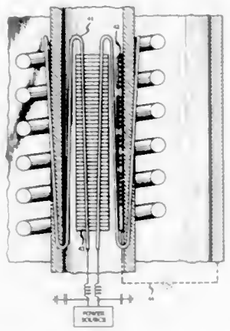
employing the resulting substrate for completion of said device, characterized in that said entity emanates from a species



generated in a helical resonator wherein said species is from a discharge in a gas at a pressure less than about 10 mTorr

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4,918,032

METHOD FOR FABRICATING THREE-DIMENSIONAL MICROSTRUCTURES AND A HIGH-SENSITIVITY INTEGRATED VIBRATION SENSOR USING SUCH MICROSTRUCTURES

Kailash C. Jain, Sterling Heights, Mich., and Jacob A. Abraham, Champaign, Ill., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 37,581, Apr. 13, 1988, abandoned. This application Jul. 8, 1988, Ser. No. 222,119
Int. Cl.[4] H01L 29/84
U.S. Cl. 437—228 7 Claims

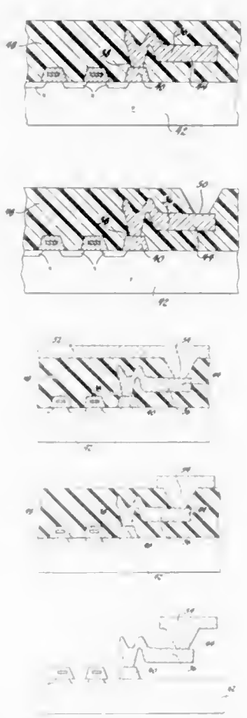
1. A method of attaching a mass to a micromechanical cantilever beam of the type having one end rigidly attached to a substrate, a free end having an end point, and which extends above said substrate, said method comprising the steps:

(a) forming a layer of photoresist overlying said cantilever beam and said substrate;

(b) hardening said photoresist layer;

(c) forming a via in said photoresist layer to expose a portion of said cantilever beam;

(d) transforming the surface of said photoresist layer from a hydrophobic state to a hydrophilic state;



(e) forming a mass overlying said photoresist layer, said mass extending through said via and adhering to said exposed portion of said cantilever beam; and,

(f) removing said photoresist layer.

4,918,033

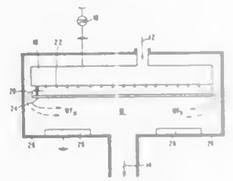
PECVD (PLASMA ENHANCED CHEMICAL VAPOR DEPOSITION) METHOD FOR DEPOSITING OF TUNGSTEN OR LAYERS CONTAINING TUNGSTEN BY IN SITU FORMATION OF TUNGSTEN FLUORIDES

Johann W. Bartha; Thomas Bayer, both of Sindelfingen; Johann Greschner, Pleizhausen; Georg Kraus, Wildberg, and Gerhard Schmid, Leinfelden-Echterdingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 1, 1988, Ser. No. 239,569
Claims priority, application European Pat. Off., Dec. 24, 1987, 87119192
Int. Cl.[4] H01L 21/00, 21/02, 21/285, 21/88
U.S. Cl. 437—245 6 Claims

1. A PECVD method for depositing a refractory metal layer on a semiconductor substrate in a plasma deposition chamber, which comprises a refractory metal cathode and an anode, comprising reacting a fluoro compound etch gas with the refractory metal cathode in said deposition chamber to convert said metal to gaseous refractory metal fluorides, wherein said cathode comprises a refractory metal sheet and an electrode and the gaseous refractory metal fluorides are generated by etching said sheet, and wherein the electrode and the refractory metal sheet are electrically connected to form a hollow

cathode region, a higher concentration of refractory metal fluoride radicals being generated in the region between said electrode and said refractory metal sheet owing to a higher



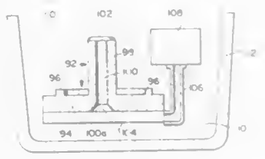
ionization level of discharge in said region, and depositing a layer of said refractory metal on a semiconductor substrate positioned on the anode of said chamber by exposing said substrate to said gaseous refractory metal fluorides.

4,913,034

RESERVOIR FEED METHOD OF MAKING CERAMIC COMPOSITE STRUCTURES AND STRUCTURES MADE THEREBY

Jerry G. Weinstein; Robert C. Kantner, and Marc S. Newkirk, all of Newark, Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation-in-part of Ser. No. 908,067, Sep. 16, 1986. This application Mar. 15, 1988, Ser. No. 168,358
Int. Cl.[4] C04B 35/10
U.S. Cl. 501—87 22 Claims



1. A method for producing a self-supporting ceramic composite structure comprising a ceramic matrix obtained by an oxidation reaction of at least a first parent metal with an oxidant to form a polycrystalline material which comprises an oxidation reaction product of said first parent metal and said oxidant and a filler infiltrated by said matrix, the method comprising:

(a) orienting a source comprising said first parent metal and a permeable mass of filler relative to each other so that formation of an oxidation reaction product will occur in a direction towards and into said mass of filler, wherein the quantity of said source of first parent metal provided is insufficient to embed substantially completely said permeable mass;

(b) communicating a reservoir comprising a second metal having a chemical composition which is different from said source of first parent metal with said source of first parent metal;

(c) heating said source of first parent metal to a temperature which is above the melting points of the first parent metal and the second metal, but below the melting point of said oxidation reaction product of said first parent metal to form a source comprising molten first parent metal and reacting said source of molten first parent metal with an oxidant to form said oxidation reaction product by maintaining at least a portion of said oxidation reaction product in contact with and extending between said source of molten first parent metal and said oxidant to progressively draw molten parent metal through the oxidation reaction product towards the oxidant and into said mass of filler so that fresh oxidation reaction product continues to form within said mass of filler at an interface between said oxidant and previously formed oxidation reaction product; and

(d) at said temperature, replenishing said source of first parent metal with said second metal in said reservoir as said oxidation reaction continues such that said permeable mass is substantially completely embedded, to permit the formation of said self-supporting ceramic composite structure.

4,918,035

PROCESS FOR THE PREPARATION OF COMPLEX PEROVSKITE TYPE COMPOUNDS

Osamu Inoue, Kadoma, and Syunichiro Kawashima, Nishinomiya, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 24,630, Mar. 11, 1987, abandoned. This application Jun. 30, 1989, Ser. No. 373,700
Claims priority, application Japan, Mar. 14, 1986, 61-57209; Jun. 2, 1986, 61-127559; Jun. 2, 1986, 61-127560
Int. Cl.[4] C04B 35/00
U.S. Cl. 501—135 9 Claims

1. A process for preparing a crystalline complex perovskite type compound, represented by the chemical formula $A(B_1C_1)O_3$, wherein A is a metal selected from the group consisting of Ba and Sr; B is a metal selected from the group consisting of Zn and Mg; and C is a metal selected from the group consisting of Nb and Ta; respectively, which comprises weighing out three types of metal alkoxides represented by the formulae $A(OR^1)_2$, $B(OR^2)_2$ and $C(OR^3)_5$, wherein R^1,, R^2 and R^3 are each an alkyl group, so that their amounts will be a moles, b moles and c moles, respectively, mixing them with an organic solvent containing z% by volume of a non-polar organic solvent and (100−z)% by volume of a polar solvent, wherein $0<z<100$, adding thereto water or a mixed solution of water and an organic solvent so that the amount of water will become $(8-0.065z)\times(2a+2b+5c)$ moles or greater to hydrolyze the metal alkoxides, heating the hydrolyzate in the presence of the water/organic solvent at a temperature of 85° C. or higher, at least in the course of or after the hydrolysis reaction, and then removing the solvent to obtain the crystalline compound

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4,918,036

CRACKING CATALYST/SULFUR OXIDE GETTERING AGENT COMPOSITIONS

Leo A. Rheaume, Hyattsville, and Ronald E. Ritter, Ellicott City, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation of Ser. No. 898,772, Aug. 15, 1986, abandoned, which is a division of Ser. No. 641,211, Aug. 16, 1984, abandoned. This application Jul. 7, 1988, Ser. No. 218,527
Int. Cl.[4] B01J 27/07, 29/06
U.S. Cl. 502—66 7 Claims

1. A method for preparing a sulfur oxide gettering agent which comprises reacting a Groupo IIA metal sulfate under reducing and hydrolyzing conditions at elevated temperature to remove original sulfur from said sulfate and to establish acceptor sites for sulfur oxide molecules.

3. The method of claim 1 wherein said Group IIA metal sulfate is combined with an oxidation catalyst.

5. The method of claim 1 wherein said gettering agent is mixed with a hydrocarbon cracking catalyst.

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4,918,037
CATALYST COMPONENTS FOR POLYMERIZATION CATALYST OF OLEFINS AND METHOD FOR THE PRODUCTION THEREOF

Hanneli Seppänen, Helsinki, Finland, assignor to Neste Oy, Finland

Continuation of Ser. No. 102,136, Sep. 29, 1987, abandoned. This application Mar. 8, 1989, Ser. No. 320,460
Claims priority, application Finland, Sep. 29, 1986, 863930
Int. Cl.[4] C08F *4/64*
U.S. Cl. 502—107 21 Claims

4. A method for producing a catalyst component for polymerizing α-olefines, comprising the steps of
(a) reacting a magnesium alkyl compound with chlorine gas,
(b) dissolving the thus-formed chlorinated magnesium alkyl compound in alcohol,
(c) adding magnesium silicate which has not been calcinated, to the thus-formed solution,
(d) adding the resulting mixture obtained in step (c) into a hydrocarbon medium at a temperature under about 0° C., thereby precipitating the chlorinated magnesium alkyl compound into and onto the magnesium silicate,
(e) separating the obtained solid catalyst component, and
(f) reacting the obtained solid catalyst component from step (e), with a titanium halogen compound in the presence of an internal electron donor,
whereby isotacticity of propylene polymerized in the presence of the thus-formed catalyst component is greater than isotacticity of propylene polymerized in the presence of a catalyst component formed with calcinated magnesium silicate.

11. The method of claim 4, wherein step (f) is performed in two stages, with the internal electron donor being added in the first stage thereof.

13. The method of claim 11, wherein starting temperature in the first stage of step (f) is under about 0° C., and temperature in the second stage of step (f) is about 90°-110° C.

4,918,038
PROCESS FOR THE PRODUCTION OF POLYETHYLENE WITH A BROAD AND/OR BIMODAL MOLECULAR WEIGHT DISTRIBUTION

Sari-Beth Samuels, Edison, and Frederick J. Karol, Belle Mead, both of N.J., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Oct. 29, 1987, Ser. No. 114,040
Int. Cl.[4] X08F *4/64, 4/68*
U.S. Cl. 502—112 4 Claims

1. A mixed catalyst system comprising
(a) the reaction product of (i) a vanadium halide having the formula VX_3 wherein X is chlorine, bromine, or iodine and each X is alike or different; (ii) a modifier having the formula BX_3 or $AlR_{(3-a)}X_a$ wherein X is as defined above; R is an alkyl radical having 1 to 14 carbon atoms; each R is alike or different; and a is 0, 1, or 2; and (iii) an electron donor, which is a liquid Lewis base in which the vanadium halide and modifier are soluble, said reaction product being supported;
(b) a complex having the formula $ZrMg_bX_c(ED)_d$ wherein X is as defined above; ED is an electron donor, which is a liquid Lewis base in which the precursors of the complex are soluble; b is a number from 1 to 3; c is a positive nubmer equal to or less than 4+2b; and d is a number from 4 to 10;
(c) a hydrocarbyl aluminum cocatalyst; and
(d) a halocarbon promoter having the formula $R_eCX_{(4-e)}$ wherein R is hydrogen or an unsubstituted or halo substituted alkyl radical having 1 to 6 carbon atoms; each R is alike or different; X is chlorine, bromine, iodine, or fluorine; each X is alike or different; and e is 0, 1, or 2 provided that, if no fluorine is present, e is 2.

4,918,039
BINUCLEAR METATHESIS POLYMERIZATION CATALYST SYSTEM

Andrea E. Martin, Avondale, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed Sep. 21, 1988, Ser. No. 247,231
Int. Cl.[4] C08F *4/52, 4/66*
U.S. Cl. 502—113 9 Claims

1. In a two-part metathesis polymerization catalyst system wherein part one of said system comprises $WOCl_4$ or a combination of $WOCl_4$ and WCl_6, a halide complex of a transition metal, said $WOCl_4$ or combination of $WOCl_4$ and WCl_6 first being dissolved in a solvent, solubilized with a phenolic compound and stabilized by a chelating agent or a Lewis base before being added to said halide complex of a transition metal; and wherein part two of said system comprises a catalyst activator, the improvement wherein a halide complex of a transition metal is added to part one of said system in a mole ratio of halide complex of transition metal to tungsten compound of from about 1:2 to about 2.5:1, wherein said transition metal is selected from the group consisting of Group IVB and Group VB of the Periodic Table.

4,918,040
POLYMERIZATION OF OLEFINS

Max P. McDaniel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 826,651, Feb. 6, 1986, which is a division of Ser. No. 652,250, Sep. 19, 1984, Pat. No. 4,663,403, which is a division of Ser. No. 464,095, Feb. 4, 1983, Pat. No. 4,477,586, which is a continuation-in-part of Ser. No. 412,059, Aug. 27, 1982, abandoned. This application Nov. 17, 1988, Ser. No. 273,290
The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.
Int. Cl.[4] C08F *4/64*
U.S. Cl. 502—125 2 Claims

1. A composition produced by contacting diphenylsilanol and titanium tetrachloride in a hydrocarbon solvent at a temperature of about 20° to about 40° C. wherein the molar ratio of the diphenylsilanol to the titanium tetrachloride is about 1/1 and wherein the diphenylsilanol and the titanium tetrachloride are each employed in an amount in the range of about 1 to about 10 weight percent based on the weight of the composition.

2. A composition produced by contacting triphenylsilanol with titanium tetrachloride in a hydrocarbon solvent at a temperature of about 20° to about 40° C. wherein the molar ratio of the triphenylsilanol to the titanium tetrachloride is about 1/1 and wherein the triphenylsilanol and the titanium tetrachloride are each employed in an amount in the range of from about 1 to about 20 weight percent based on the weight of the composition.

4,918,041
CATALYST FOR HYDROCARBON CONVERSION AND CONVERSION PROCESS UTILIZING THE SAME

Elmer J. Hollstein, Wilmington, Del.; James T. Wei, Ridgewood, N.J., and Chao-Yang Hsu, Media, Pa., assignors to Sun Refining and Marketing Company, Philadelphia, Pa.

Filed Sep. 21, 1988, Ser. No. 247,225
Int. Cl.[4] B01J *27/02*
U.S. Cl. 502—217 13 Claims

1. A catalyst comprising a sulfated and calcined solid mixture of (1) oxide or hydroxide of element from a first class consisting of Group III or Group IV elements, (2) oxide or hydroxide of metal from a second class consisting of Group V, Group VI or Group VII metals, and (3) oxide or hydroxide of Group VIII metal, the ratio of metal from said second class to Group VIII metal being in the range from 0.1:1 to 2.0:1.

4,918,042
EXHAUST GAS PURIFYING CATALYST

Toshihiro Takada, Toyota; Shinichi Matsumoto, Aichi; Hikaru Aoyagi, Toyota; Mikio Yamanaka, Yamato; Keiichi Ohmura, Sagamihara, and Toshiyuki Yashiro, Tokyo, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha; Nippon Steel Corporation and Nippon Kinzoku Co., Ltd., all of Tokyo, Japan

Filed Jul. 8, 1988, Ser. No. 216,687
Claims priority, application Japan, Jul. 9, 1987, 62-171725
Int. Cl.[4] B01J *21/04, 21/06, 23/86*
U.S. Cl. 502—314 24 Claims

1. An exhaust gas purifying catalyst comprising:
a heat resistant stainless steel catalyst support:
an oxide film containing aluminum oxide and zirconium oxide formed on said heat resistant stainless steel catalyst support:
an activated alumina catalyst carrier layer formed on said oxide film; and
at least one metal catalyst loaded in said activated alumina catalyst carrier layer.

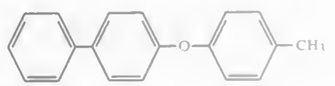
4,918,044
THERMOSENSITIVE RECORDING SHEET

Toshimi Satake; Toshiaki Minami; Fumio Fujimura, all of Tokyo; Satoshi Oda, Ikoma, and Masato Magami, Nakatsu, all of Japan, assignors to Jujo Paper Co., Ltd., Tokyo and Yoshitomi Pharmaceutical Industries, Ltd., Osaka, both of, Japan

Filed Apr. 29, 1988, Ser. No. 188,376
Claims priority, application Japan, Apr. 30, 1987, 62-107843
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—209 7 Claims

1. A thermosensitive recording sheet comprising a support and a thermosensitive color developer layer thereon containing a basic leuco dye and an organic color developer, said layer containing a compound of the formula

(I)



as a sensitizer.

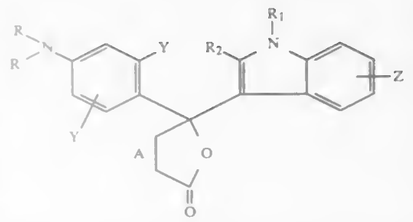
4,918,045
RECORDING MATERIAL

Katsumi Matsuoka; Masanobu Takashima; Ken Iwakura, and Keiso Saeki, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 15, 1988, Ser. No. 219,407
Claims priority, application Japan, Jul. 15, 1987, 62-176627
Int. Cl.[4] B41M *5/16, 5/22*
U.S. Cl. 503—213 13 Claims

1. A recording material comprising:
a support;
a microcapsule containing a substantially colorless electron-donating color former and a solvent; and
an electron accepting developer, wherein said color former is at least one selected from p-substituted aminophenylindolylphthalide derivatives, p-substituted aminophenylindolylazaphthalide derivatives and p-substituted aminophenylindoyldiazaphthalide derivatives, represented by

(I)



wherein
R and R' may be the same or different and are each an alkyl group, an aralkyl group, or an aryl group,
R_1 and R_2 may be the same or different and are each a hydrogen atom, an alkyl group or an aryl group,
ring A is a benzene ring, a pyridine ring, or a pyrazine ring, and,
Y, Y', and Z are each a hydrogen atom, an alkyl group, a halogen atom, a substituted amino group, or an alkoxy group, and said solvent is paraffin oil, and the amount of said solvent is at least 20% by weight based on the weight of the total contents of substances contained in said microcapsules.

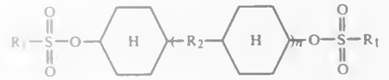
4,918,046
HEAT-SENSITIVE RECORDING MATERIAL

Mitsuo Akutsu, Tokyo; Syuji Iwakura, Saitama; Keiji Oya, Saitama, and Keiji Tabata, Saitama, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1988, Ser. No. 285,709
Claims priority, application Japan, Jan. 7, 1988, 63-1617; Feb. 23, 1988, 63-39882; Mar. 18, 1988, 63-66412
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—216 2 Claims

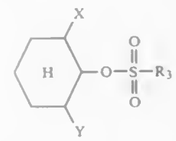
1. A heat-sensitive recording material which comprises a substrate carrying a usually colorless or light-colored coloring material and one or more color developers selected from the compounds represented by the following formulae (I), (II) and (III)
formula (I):

(I)



wherein
R_1 represents an alkyl group, an aryl group, an aralkyl group or an alkylaryl group each optionally substituted with a halogen atom, an alkoxy group, an acyl group, an alkoxycarbonyl group or a nitro group;
R_2 represents a direct bond, an alkylidene, —O—, —S— or —SO_2—; and
n is 0 or 1,
formula (II):

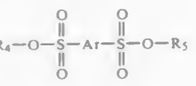
(II)



wherein
R_3 represents an alkyl group, an aryl group, a cycloalkl group, an arylalkyl group or an alkylaryl group; and

X and Y each independently represent a hydrogen atom, an alkyl group, a cycloalkyl group or an arylalkyl group, provided that X and Y do not simultaneously represent hydrogen atoms,

formula (III):



(III)

wherein

R_4 and R_5 each independently represent a cycloalkyl group or a substituted cycloalkyl group; and

Ar represents an aryl group.

4,918,047

HEAT-SENSITIVE RECORDING MATERIAL

Kensuke Ikeda; Ken Iwakura, and Masato Satomura, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

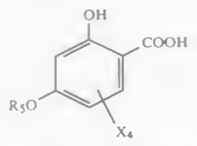
Continuation of Ser. No. 74,119, Jul. 16, 1987, abandoned. This application Jan. 6, 1989, Ser. No. 294,952

Claims priority, application Japan, Jul. 16, 1986, 61-167646; Jul. 23, 1986, 61-173171; Oct. 14, 1986, 61-243823; Oct. 14, 1986, 61-243824; Oct. 14, 1986, 61-243825

Int. Cl.[4] B41M *5/18*

U.S. Cl. 503—216 **8 Claims**

1. A heat-sensitive recording material comprising a support having thereon a recording layer containing an electron-donating colorless dye and an electron-accepting compound, wherein said electron-accepting compound is a salicylic acid derivative having an alkoxy group or an aryloxy group represented by formula (VII):



(VII)

wherein R_5 represents an alkyl group having from 6 to 20 carbon atoms or a group represented by formula $-(C_pH_{2p}-O)_q-Ar$ wherein Ar is a phenyl group, a phenyl group substituted with a 1-2 carbon alkoxy group or a phenyl group substituted with a 1-2 carbon alkyl group, p represents an integer of from 2 to 4 and q represents an integer of 1; and X_4 represents a hydrogen atom, said salicylic acid derivative containing at least 13 total carbon atoms and said recording layer further containing a zinc compound.

4,918,048

THERMOREACTIVE RECORDING MATERIAL

Hubertus Psaar, Leverkusen, and Siegfried Korte, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 26, 1988, Ser. No. 186,329

Claims priority, application Fed. Rep. of Germany, May 12, 1987, 3715724

Int. Cl.[4] B41M *5/18*

U.S. Cl. 503—216 **8 Claims**

1. A thermoreactive recording material which comprises a carrier material coated with a dyestuff precursor and, as an acceptor, an acid-modified polymer of acrylonitrile or methacrylonitrile and a benzyl 4-hydroxybenzoic acid ester.

4,918,049

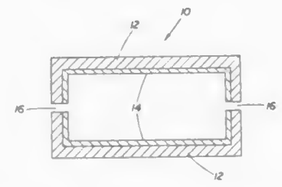
MICROWAVE/FAR INFRARED CAVITIES AND WAVEGUIDES USING HIGH TEMPERATURE SUPERCONDUCTORS

Daniel R. Cohn, Chestnut Hill; Leslie Bromberg, Sharon; Benjamin Lax, Chestnut Hill; Ward D. Halverson, Cambridge, and Paul P. Woskov, Charlestown, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 18, 1987, Ser. No. 121,923

Int. Cl.[4] H01P *1/16, 3/00, 7/00*; H01J *25/00*

U.S. Cl. 505—1 **22 Claims**



1. Structure for confining or guiding electromagnetic radiation having wavelengths in the range of approximately 10 μm to one centimeter, said structure having surfaces exposed to the radiation and said surface being covered with superconducting materials having critical temperatures greater than 35°K.

4,918,050

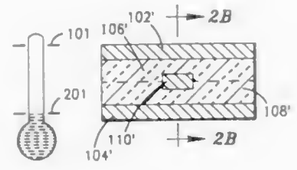
REDUCED SIZE SUPERCONDUCTING RESONATOR INCLUDING HIGH TEMPERATURE SUPERCONDUCTOR

Lawrence Dworsky, Northbrook, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 4, 1988, Ser. No. 177,296

Int. Cl.[4] H01P *1/203, 7/08*

U.S. Cl. 505—1 **17 Claims**



1. A resonator offering significantly smaller size in terms of length as well as in cross-sectional area for a given electrical signal, the resonator comprising:

a first superconducting means, for conducting an electrical signal thereon;

a second superconducting means for conducting an electrical signal thereon; and,

a first dielectric insulating means for electrically insulating said first superconducting means from said second superconducting means, said first dielectric having first and second surfaces, said first and second superconducting means respectively coupled to said first and second surfaces, said first dielect defining between said first and second surfaces a thickness which is less than or equal to five penetration depths of a signal carried in said superconductors, said first and second superconducting means each exhibiting a substantial amount of internal inductance with low loss such that an electrical signal propagated in said resonator has a velocity inversely proportional to the thickness of said dielectric.

4,918,051

METALORGANIC DEPOSITION OF SUPERCONDUCTING E_v-B_a-C_uO THIN FILMS BY RAPID THERMAL ANNEALING

Joseph V. Mantese, Washington; Adolph L. Micheli, Mt. Clemens, and Aboud H. Hamdi, Detroit, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 103,245, Sep. 30, 1987, abandoned. This application Dec. 22, 1987, Ser. No. 136,577

Int. Cl.[4] B05D *3/02*

U.S. Cl. 505—1 **3 Claims**

1. A method for producing films of superconductor materials comprising the steps of:

forming a solution from the neodecanoates of europium, barium, and copper metals, said metals form an oxide mixture exhibiting superconductive properties, said solution comprises a solvent having at least approximately 10 volume percent pyridine in xylene;

depositing a film of said solution onto a substrate, said substrate selected from the group consisting of strontium titanate, barium titanate, and sapphire;

pyrolyzing said film in an oxygen-containing environment at a first temperature of approximately 500° C. for up to approximately 5 minutes, so as to thermally decompose said neodecanoates of europium, barium and copper into a film containing oxides of europium, barium and copper, said pyrolyzing occurring substantially immediately after said depositing step; and

heating said oxide film at a second temperature ranging between about 850° C. and 1000° C. for a duration of up to approximately 2 minutes to promote grain growth of said metal oxides within said film and induce a change therein by which said film exhibits superconducting properties at a significantly increased temperature

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4,918,052

PERFUME BASE COMPOSITION

Junji Koshino; Yoshiaki Fujikura, both of Utsunomiya; Manabu Fujita, Kashiwa, and Nao Toi, Sakura, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jan. 26, 1989, Ser. No. 301,832

Claims priority, application Japan, Jan. 28, 1988, 63-18387

Int. Cl.[4] A61K *7/46*

U.S. Cl. 512—22 **1 Claim**

1. A perfume base composition comprising 2-cyclohexylpropanol in a mixture with conventional perfume base components.

4,918,054

ANTIBIOTICS CALLED 'CHLOROPOLYSPORINS B AND C', A PROCESS FOR THEIR PREPARATION, AND THEIR THERAPEUTIC AND VETERINARY USE

Tatsuo Haneishi; Takao Okazaki; Akio Torikata; Mutsuo Nakajima; Ryuzo Enokita; Toshiaki Katayama, and Seigo Iwado, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Continuation of Ser. No. 813,617, Dec. 26, 1985, abandoned. This application Jul. 11, 1989, Ser. No. 379,656

Claims priority, application Japan, Jan. 11, 1985, 60-2805

Int. Cl.[4] A61K *35/74, 37/02*; C07K *7/50, 9/00*

U.S. Cl. 514—8 **6 Claims**

1. An antibiotic substance named chloropolysporin C and pharmaceutically acceptable salts thereof, which, as its sulfate, is characterized by the following properties:

(a) it takes the form of an amphoteric white powder, soluble in water;

(b) specific rotation: $[\alpha]^{25}-64.4°$ (C=1.08, 0.1N aqueous hydrochloric acid, sodium D-line);

(c) elemental analysis: C, 50.53%; H, 4.69%; N, 6.14%; Cl, 5.62%; S, 1.12%;

(d) on acid hydrolysis it yields: neutral saccharides: glucose and mannose; amino acids: 3-chloro-4-hydroxyphenylglycine and N-methyl-p-hydroxyphenylglycine;

(e) ultraviolet absorption spectrum: as illustrated in FIG. 4 of the accompanying drawings, having an absorption maximum λ_{max} at 280 nm ($E_{1cm}=57$) in a 0.1N solution of hydrochloric acid, the absorbence, E, being measured at a concentration of 1% w/v;

(f) infrared absorption spectrum: the infrared absorption spectrum (νcm^{-1}) measured on a KBr disc is as shown in FIG. 5 of the accompanying drawings;

(g) nuclear magnetic resonance spectrum: the nuclear magnetic resonance spectrum (δ ppm), measured at 400 MHz in deuterated dimethyl sulfoxide using tetramethylsilane as the internal standard, is as illustrated in FIG. 6 of the accompanying drawings;

(h) solubility: soluble in water and methanol, sparingly soluble in acetone, and insoluble in ethyl acetate, chloroform and benzene;

(i) color reactions: positive in Ninhydrin and Rydon-Smith reactions;

(j) thin layer chromatography: Rf value=0.65, using a cellulose sheet (Eastman) as adsorbent and a 15:10:3:12 by volume mixture of butanol, pyridine, acetic acid and water as the developing solvent;

(k) molecular formula: $C_{77}H_{79}O_{30}N_8Cl_3.0.5H_2SO_4.5H_2O$;

(l) molecular weight: the molecular weight, measured by FAB-MS, was 1700 (MH^+, 1701).

4,918,055

METHOD OF STIMULATING MELANOCYTES BY TOPICAL APPLICATION OF ANALOGS OF ALPHA-MSH, AND COMPOSITIONS FOR USE IN SAME

Victor J. Hruby, 2802 E. Via Rotunda, Tucson, Ariz. 85716; Mac E. Hadley, 1911 W. Calle Campana DePlanta, Tucson, Ariz. 85745; Robert Dorr, 1130 S. Avenida Conalea, Tucson, Ariz. 85748, and Norman Levine, 6202 N. Camino Arco, Tucson, Ariz. 85718

Continuation of Ser. No. 825,162, Feb. 3, 1986, abandoned. This application Feb. 11, 1988, Ser. No. 154,823

Int. Cl.[4] A61K *37/24*

U.S. Cl. 514—14 **21 Claims**

1. A method for stimulating melanin production in a vertebrate which comprises administrating to said vertebrate in an amount sufficient to cause stimulation of melanocytes a compound of the group:

(1) alpha-MSH having the amino acid formula:

Ac-Ser-Tyr-Ser-Met-Glu-His-Phe-Arg-Trp-Gly-Lys-Pro-Val-NH_2;

(2) Alpha-MSH analogues having the formula:

Ac-Ser-Tyr-Ser-M-Glu-His-D-Phe-Arg-Trp-Gly-Lys-Pro-Val-NH_2

wherein M is selected from the group consisting of Met, Nle, and Cys;

(3) analogues of alpha-MSH having the formula

R_1-W-X-Y-Z-R_2

wherein R_1 is selected from the group consisting of Ac-Gly, Ac-Met-Glu, Ac-Nle-Glu and Ac-Tyr-Glu;

wherein W is selected from the group consisting of His, and D-His;

wherein X is selected from the group consisting of Phe, D-Phe, Tyr, D-Try, and (pNO_2)D-Phe;

wherein Y is selected from the group consisting of Arg and D-Arg;

wherein Z is selected from the group consisting of Trp and D-Trp; and

wherein R_2 is selected from the group consisting of NH_2, Gly-NH_2, and Gly-Lys-NH_2; and

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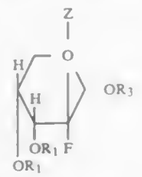
(4) alpha-MSH analogues selected from the group consisting of
[Nle^4, D-Phe^7]-alpha-MSH
[Nle^4, D-Phe^7]-alpha-MSH$_{4-10}$
[Nle^4, D-Phe^7]-alpha-MSH$_{4-11}$
[Nle^4, D-Phe^7, D-Trp^9]-alpha-MSH$_{4-11}$
[Nle^4, D-Phe^7]-alpha-MSH$_{4-9}$.

4,918,056
2-SUBSTITUTED ARABINOPYRANOSYL NUCLEOSIDES AND NUCLEOTIDES
Miroslav V. Bobek; Seung-Ho An, both of Williamsville, and Ralph J. Bernacki, Elma, all of N.Y., assignors to Health Research, Inc. (Roswell Park Division), Buffalo, N.Y.
Filed Oct. 14, 1986, Ser. No. 918,372
Int. Cl.^{4} A61K *31/70;* **C07H** *15/02*
U.S. Cl. 514—25 **7 Claims**

6. A pharmaceutical composition containing a pharmaceutically effective amount of a compound having the formula:



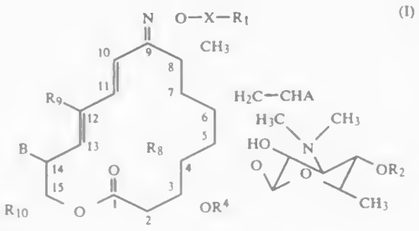
wherein Z is pyrimidinyl-1, purinyl-9, or 1,3-oxazinyl-3, each of R_1 and R_2 is selected from the group consisting of hydrogen, isopropylidene, C_{2-12} alkanoyl benzoyl, phenylacetyl, phenylpropionyl, o-, m-, and p-methylbenzoyl, β-cyclopentylpropionyl, and dihydrocinnamoyl, and R_3 is hydrogen, methyl, benzyl or a C_{2-12} alkyl group and pharmaceutically acceptable salts thereof in combination with a pharmaceutically acceptable carrier.

4,918,057
VETERINARY PREPARATIONS
Michael J. Kilpatrick, Horton Cum Studley, United Kingdom, assignor to Glaxo Group Limited, London, United Kingdom
Filed Jun. 30, 1987, Ser. No. 68,446
Claims priority, application United Kingdom, Jul. 1, 1986, 8615995
Int. Cl.^{4} A61K *31/70*
U.S. Cl. 514—30 **20 Claims**

1. A method for using veterinary preparations in domestic animals comprising the administration to said animals of salbutamol or an acid addition salt thereof in combination with an antimicrobial agent, thereby improving the growth rate, feed conversion efficiency or ratio of carcass lean to carcass fat of domestic animals.

4,918,058
MACROLIDE COMPOUNDS
Gabor Lukacs, and Catherine Duchatelle-Ruggeri, both of Paris, France, assignors to Adir Et Cie, Neuilly-sur-Seine, France
Filed May 6, 1988, Ser. No. 191,270
Claims priority, application France, May 6, 1987, 87 06361; Jan. 7, 1988, 88 00078; Jan. 29, 1988, 88 01031
Int. Cl.^{4} A61K *31/70;* **C07H** *17/08*
U.S. Cl. 514—30 **30 Claims**

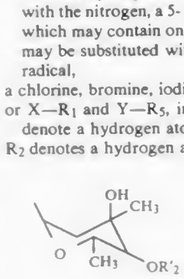
1. A compound selected from those of the formula:



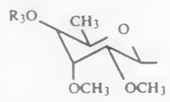
(I)

in which
A denotes: either an oxygen atom, or a group of formula N—O—Y—R_5, the sign present in the substituent of carbon^9 as well as in the definition of A meaning that one or other, independently, of the oxime or oxime ether groups can each be in the syn or anti form or in the form of a syn and anti mixture,
X and Y, which may be identical or different, denote either a linear or branched alkyl radical containing at most ten carbon atoms, or a linear or branched alkenyl radical containing at most ten carbon atoms,
R_1 and R_5, which may be identical or different, denote:
either a hydrogen atom,
or a linear or branched alkyloxy radical containing at most ten carbon atoms, or a linear or branched alkenyloxy radical containing at most ten carbon atoms, or a phenyl radical which radicals maybe optionally substituted with one or more radicals selected from, lower alkyl, lower alkyloxy, fluoro, chloro, bromo, iodo, nitro,
or a radical

in which R_6 and R_7, which may be identical or different, denote a hydrogen atom or a lower alkyl radical, or form, with the nitrogen, a 5- or 6-membered heterocyclic system which may contain one additional hetero atom and which may be substituted with a halogen atom or a lower alkyl radical,
a chlorine, bromine, iodine or fluorine atom,
or X—R_1 and Y—R_5, independently of one another, each denote a hydrogen atom,
R_2 denotes a hydrogen atom, or a radical of formula:



in which R'_2 denotes a hydrogen atom, an alkyl radical or a linear or branched lower acyl radical,
B denotes
a hydrogen atom,
or a radical of formula: —CH_2—O—B', where B' denotes:
either a hydrogen atom,
or a radical of formula:



in which R_3 denotes a hydrogen atom or a linear or branched lower alkyl radical,
R_4 denotes
a hydrogen atom,
or a linear or branched lower alkyl radical,
or a linear or branched lower acyl radical,
R_8 denotes
lower alkyl radical when B denotes a group —CH_2—O—B',
or a lower alkyloxy radical when B denotes a hydrogen atom,
R_9 denotes
a hydrogen atom when B denotes a hydrogen atom,
or a lower alkyl radical when B denotes a radical —CH_2—O—B',
R_{10} denotes a lower alkyl radical, the term lower, referring to the lower alkyl and lower alkyloxy radicals, denoting that the groups in question contain between 1 and 6 carbon atoms, and their addition salts with an acid.

27. A method for treating a living animal afflicted with a bacterial infection comprising the step of administering to the said living animal an amount of a compound of claim 1 which is suitable for alleviation of said condition.

4,918,059
LOW MOLECULAR WEIGHT ALKALI METAL HUMINATES, METHOD FOR THEIR PREPARATION AND APPLICATIONS THEREOF
Bernhard Seubert, Edingen-Neckarhausen; Helmut Beilharz, Schriesheim; Werner Fickert, Mannheim; Gunter Jeromin, Heidelberg, and Ulrich Spitzler, Freinsheim, all of Fed. Rep. of Germany, assignors to Rutgerswerke AG, Fed. Rep. of Germany
Filed Mar. 1, 1988, Ser. No. 162,741
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1987, 3707909
Int. Cl.^{4} A61K *31/70;* **C07H** *15/00*
U.S. Cl. 514—33 **7 Claims**

1. Alkali metal and ammonium salts of humic acids with an average molecular weight of 1,000, the molecular weights of said salts ranging between 300 and 1500.

6. A wound healing composition comprising an amount of a huminate of claim 1 sufficient to increase the healing rate and an inert pharmaceutical carrier.

4,918,060
METHOD OF TREATING MYASTHENIA GRAVIS AND RELATED DISEASES
Ralph W. Kuncl, and Daniel B. Drachman, both of Baltimore, Md., assignors to The Johns Hopkins University, Baltimore, Md.
Filed Sep. 4, 1987, Ser. No. 92,901
Int. Cl.^{4} A61K *31/70*
U.S. Cl. 514—46 **3 Claims**

1. A method of treating endocytosis of intrinsic membrane receptors in a warm-blooded animal in need of such treatment, which comprises administering to the warm-blooded animal an amount of 3-deazaadenosine which is effective to reduce the endocytosis of said membrane receptors.

4,918,061
METHOD OF PREVENTING DISEASES CAUSED BY GRAM-NEGATIVE ENDOTOXIN IN MAMMALS
Christian R. H. Raetz, Middleton; Richard A. Proctor, Madison, and James A. Will, Columbus, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.
Continuation of Ser. No. 719,328, Apr. 3, 1985, abandoned, which is a continuation-in-part of Ser. No. 492,378, May 6, 1983, abandoned. This application Jun. 8, 1988, Ser. No. 206,994
Int. Cl.^{4} A61K *31/70*
U.S. Cl. 514—62 **1 Claim**

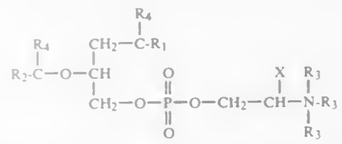
1. A method of protecting a mammal from the toxic effects of gram-negative endotoxin which comprises administering by injection to said mammal a safe amount of lipid X which is effective to protect said mammals from said toxic effects.

4,918,062
PHARMACEUTICAL COMPOSITIONS FOR THE TREATMENT OF CEREBRAL PSYCHO-ORGANIC SYNDROMES
Rosanna Lodi, Milan, Italy, assignor to Riace Establishment, Vaduz, Liechtenstein
PCT No. PCT/EP88/00276, § 371 Date Jan. 31, 1989, § 102(e) Date Jan. 31, 1989, PCT Pub. No. WO88/07860, PCT Pub. Date Oct. 20, 1988
PCT Filed Apr. 2, 1988, Ser. No. 294,515
Claims priority, application Italy, Apr. 8, 1987, 20034 A/87
Int. Cl.^{4} A61K *31/685*
U.S. Cl. 514—76 **1 Claim**

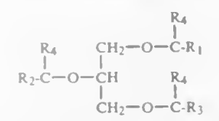
1. A method of treating a patient suffering from chronic cerebral psycho-organic syndromes of the involute kind or due to cerebrovascular insufficiency which comprises administering to said patient a pharmaceutical composition containing as the principal active ingredient an effective amount of L-α-glycerylphosphorylcolamine in admixture with a pharmaceutically acceptable carrier.

4,918,063
METHODS AND COMPOSITIONS EMPLOYING UNIQUE MIXTURES OF POLAR AND NEUTRAL LIPIDS FOR PROTECTING THE GASTROINTESTINAL TRACT
Lenard M. Lichtenberger, Houston, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.
Filed Feb. 17, 1987, Ser. No. 15,394
Int. Cl.^{4} A01K *31/685*
U.S. Cl. 514—78 **15 Claims**

1. A pharmaceutical composition comprising an ulcer protective amount of:
(a) a saturated phospholipid having the chemical structure



wherein R_1, R_2 and R_3 are either saturated or non-saturated aliphatic substitutions ranging from 4 to 32 carbon atoms; and R_4 is =0 or H_2; and
(b) a triglyceride having the chemical structure



wherein R1, R2 and R3 are either saturated or non-saturated or non-saturated aliphatic substitutions ranging from 4 to 32 carbon atoms; and R4 is =0 or H2; wherein the saturated phospholipid and triglycerides are together in a pharmaceutically acceptable diluent, and the triglyceride concentration therein is about equal to or greater than the phospholipid concentration.

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4,918,064

PHENYL GLYCINES FOR USE IN REDUCING NEUROTOXIC INJURY

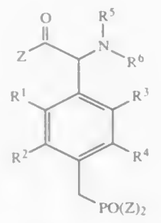
Alex A. Cordi, St. Louis, and Michael L. Vazquez, Ballwin, both of Mo., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Oct. 21, 1987, Ser. No. 111,749

Int. Cl.[4] C07F *9/38, 9/40;* **A01K** *31/66*

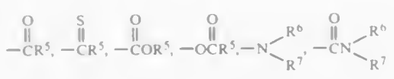
U.S. Cl. 514—114 **42 Claims**

1. A method to control neuropathological processes and the neurodegenerative consequences thereof in mammals, which method comprises treating a mammal susceptible to neurologic injury with an effective amount of a compound of the formula



(I)

wherein each of R^1 through R^4 is independently selected from hydrido, alkyl, cycloalkyl, aralkyl, aryl, haloalkyl, halo, cyano, nitro, and groups represented by $-OR^5$, $-SR^5$,



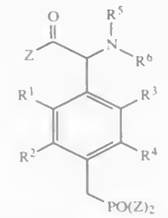
wherein each R^5 is independently selected from hydrido, alkyl, aryl, and aralkyl; and wherein each of R^6 and R^7 is independently selected from hydrido, alkyl, acyl, aryl, aralkyl and

and wherein Z is selected from $-OR^5$, $-SR^5$,

and

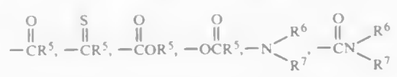
wherein each of R^5, R^6 and R^7 defined as before; with the proviso that R^6 and R^7 are not at the same time carbonyl-containing groups; and wherein R^8 is selected from hydrido and alkyl; or a pharmaceutically-acceptable salt thereof.

15. A compound of the formula



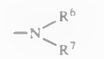
(I)

wherein each of R^1 through R^4 is independently selected from hydrido, alkyl, cycloalkyl, aralkyl, aryl, haloalkyl, halo, cyano, nitro, and groups represented by $-OR^5$, $-SR^5$



wherein each R^5 is independently selected from hydrido, alkyl, aryl, and aralkyl; and wherein each of R^6 and R^7 is independently selected from hydrido, alkyl, acyl, aryl, aralkyl and

and wherein Z is selected from $-OR^5$, $-SR^5$,



and

wherein each of R^5, R^6 and R^7 is defined as before; with the proviso that R^6 and R^7 are not at the same time carbonyl-containing groups; and wherein R^8 is selected from hydrido and alkyl; or a pharmaceutically-acceptable salt thereof.

4,918,065

CORTICOID-CONTAINING PREPARATION FOR TOPICAL APPLICATION

Wolfgang Stindl, Eisenstadt, Austria; Ingfried Zimmerman, Berlin; Renate Reckers, Berlin; Hans Wendt, and Rainold Arndt, both of Berlin, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation of Ser. No. 937,282, Dec. 3, 1986, which is a continuation of Ser. No. 835,490, Mar. 3, 1986, which is a continuation of Ser. No. 734,724, May 16, 1985, which is a continuation of Ser. No. 511,404, Jul. 7, 1983. This application Oct. 17, 1988, Ser. No. 258,055

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225848

Int. Cl.[4] A61K *31/56*

U.S. Cl. 514—179 **15 Claims**

1. In a corticoid-containing pharmaceutical preparation adapted for topical application, comprising 0.005–2% by weight of a corticoid having anti-inflammatory activity, a fatty phase, an aqueous phase, and at least one emulsifier, the improvement wherein:

the corticoid, the fatty acid, and the aqueous phase are present in the form of a stable dispersed mixture of (a) an oil/water emulsion containing an oil/water emulsifier, and (b) a water/oil emulsion containing a water/oil emulsifier, the particle size of the inner phase of the emulsions being 2–50 μm,

said oil/water emulsion and water/oil emulsion are present in said stable dispersed mixture in a side-by-side relationship, and

said preparation further contains jojoba oil

4,918,066

SUBSTITUTED 4-BENZYLPIPERAZINYL COMPOUNDS

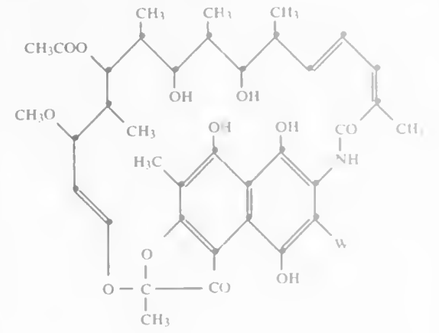
Wilhelm Kump, Biel-Benken, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 68,289, Jun. 12, 1987, abandoned. This application Jan. 11, 1989, Ser. No. 296,903

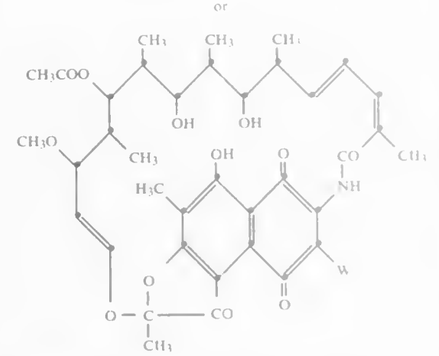
Int. Cl.[4] A61K *31/395;* **C07D** *521/00*

U.S. Cl. 514—183 **9 Claims**

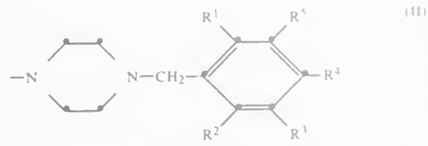
1. A compound of the formula



or



wherein W is a piperazin-1-yl radical of the formula



(II)

wherein R^1 and R^2 are C_1–C_4alkyl and R^3, R^4 and R^5 are hydrogen or C_1–C_4alkyl, or R^2 together with R^3 or R^3 together with R^4 are buta-1,3-dien-1,4-ylene, trimethylene or tetramethylene, each of which is unsubstituted or substituted by C_1–C_4alkyl, and R^1, R^4 and R^5 or R^1, R^2 and R^5 are hydrogen or C_1–C_4alkyl, or a pharmaceutically acceptable salt thereof

7. An antimicrobial composition containing at least one compound of formula IA or IB as claimed in claim 1, wherein W is as defined in claim 1, or a pharmaceutically acceptable salt thereof

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4,918,067

HETEROCYCLIC SUBSTITUTED PENICILLIN ANTIBIOTICS

Brian C. Gasson, and Michael J. Pearson, both of Brockham Park, England, assignors to Beecham Group p.l.c., United Kingdom

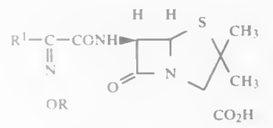
Filed Jul. 22, 1987, Ser. No. 76,360

Claims priority, application United Kingdom, Jul. 24, 1986, 8618094; Apr. 16, 1987, 8709258; Apr. 16, 1987, 8709259

Int. Cl.[4] A61K *31/43;* **C07D** *499/46, 239/02, 213/53, 285/08*

U.S. Cl. 514—196 **25 Claims**

1. A compound of formula (I) or a pharmaceutically acceptable salt or in-vivo hydrolysable ester thereof:



(I)

wherein R^1 is a 5 or 6 membered heterocycle containing 1 or 2 nitrogen atoms or 1 or 2 nitrogen atoms and 1 sulphur atom substituted by amino with the proviso, however, that R^1 is not 2-aminothiazol-4-yl; and R is hydrogen; alkenyl of 2 to 12 carbon atoms unsubstituted or substituted by carboxyl, esterified carboxyl, carbonyl, hydroxy, alkoxy, of 1 to 6 carbon atoms, cyano, carbamoyl, aryloxy, aralkoxy of 1 to 6 carbon atoms in the alkoxy moiety, mercapto, alkylthio of 1 to 6 carbon atoms, arylthio, amino, halo, nitro, azido, formyl, acyl, acyloxy, phthalimido, acylamino, alkoxycarbonylamino of 1 to 6 carbon atoms in the alkoxy moiety, aralkoxy-carbonylamino of 1 to 6 carbon atoms in the alkoxy moiety, heterocyclyl or carbocyclyl; alkynyl of 2 to 12 carbon atoms unsubstituted or substituted by carboxyl, esterified carboxyl, carbonyl, hydroxy, alkoxy of 1 to 6 carbon atoms, cyano carbamoyl, aryloxy, aralkoxy of 1 to 6 carbon atoms in the alkoxy moiety, mercapto, aklylthio of 1 to 6 carbon atoms, arylthio, amino, halo, nitro, azido, formyl, acyl, acyloxy, phthalimido, acylamino, alkoxycarbonylamino of 1 to 6 carbon atoms in the alkoxy moiety, aralkoxy-carbonylamino of 1 to 6 carbon atoms in the alkoxy moiety, heterocyclyl or carbocyclyl; carbocyclyl of 1 to 4 rings unsubstituted or substituted by alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkynyl of 2 to 6 carbon atoms, exo-methylene, carboxyl, alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety, oxo, hydroxy, alkoxyimino of 1 to 6 carbon atoms, oxyimino, alkoxy of 1 to 6 carbon atoms, cyano, carbamoyl, aryloxy, aralkoxy of 1 to 6 carbon atoms in the alkoxy moiety, mercapto, alkylthio, arylthio, amino, halo, nitro, azido, formyl, acyl, acyloxy, phthalimido, acylamino, alkoxycarbonylamino of 1 to 6 carbon atoms in the alkoxy moiety, aralkoxycarbonylamino of 1 to 6 carbon atoms in the alkoxy moiety, heterocyclyl or carbocyclyl, or heterocyclyl unsubstituted or substituted by halo, alkyl of 1 to 6 carbon atoms, carbocyclyl, alkylthio, acylamino, alkoxy of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, hydroxy, amino, carboxy, carbamoyl, acyl, alkoxycarbonyl of 1 to 6 carbon atoms, alkoxycarbonylalkyl of 1 to 6 carbon atoms in the alkoxy moiety and 1 to 6 carbon atoms in the alkyl moiety, aryl or oxo.

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4,918,068

CEPHEM COMPOUNDS

Yuichi Yamamoto, Yokohama; Kunio Atsumi; Kenji Sakagami, both of Kawasaki; Takashi Yoshida, Tokyo; Ken Nishihata, and Sinichi Kondo, both of Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Feb. 26, 1987, Ser. No. 19,172

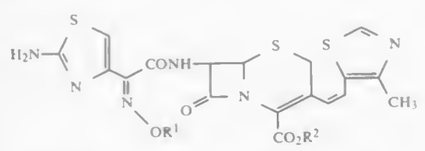
Claims priority, application Japan, Mar. 3, 1986, 61-44203

The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.

Int. Cl.[4] **C07D** *501/24;* **A61K** *31/545*

U.S. Cl. 514—206 **9 Claims**

1. The syn-isomer of a cephem compound represented by the following formula (I)



(I)

wherein R^1 means a lower alkyl group, R^2 denotes a lower alkanoyloxyalkyl group, a lower alkoxycarbonyloxyalkyl group, phthalidyl group or (5-methyl-2-oxo- 1,3-dioxolen-4-yl)methyl group of the carboxyl group, and the 4-methylthiazolyl group and the cephem moiety are cis to each other relative to the carbon-carbon double bond of the substituted vinyl group in the side chain at the 3-position of the cephem nucleus.

4,918,069

SPIRO[(PIPERIDINE- PYRROLIDINE- OR HEXAHYDROAZEPINYL SUBSTITUTED) PYRROLO[2,1-C][1,4]BENZOXAZEPINES]

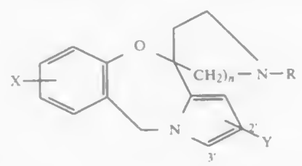
Richard C. Effland, Bridgewater; Larry Davis, Sergeantsville, and Kevin J. Kapples, Little York, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc.

Continuation of Ser. No. 79,557, Jul. 30, 1987, Pat. No. 4,812,450. This application Dec. 29, 1988, Ser. No. 290,343

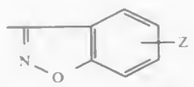
Int. Cl.[4] **C07D** *498/20, 403/04, 401/04;* **A61K** *31/55*

U.S. Cl. 514—211 **10 Claims**

1. A method of depressing blood pressure in a mammal which comprises administering to a mammal a blood pressure reducing effective amount of a compound of the formula



where R is hydrogen, loweralkyl, aryloweralkyl, acyl, loweralkenyl, loweralkynyl, and -(loweralkylene)



where Z is hydrogen, halogen, loweralkyl, loweralkoxy, CF_3, NO_2 and NH_2; X is hydrogen, halogen, loweralkoxy, CF_3, NO_2 and NH_2; X is hydrogen, halogen, loweralkyl, loweralkoxy and trifluoromethyl; Y is hydrogen, 2' or 3' acyl, formyl, carbinol of the formula

where R_1 and R_2 are the same or different and are independently hydrogen, loweralkyl, aryllowerlalkyl, aryl, loweralkenyl, loweralkynyl, and lower alkylbenzisoxazole; loweralkyl, loweralkenyl, and halogen; and n is an integer of from 1 to 3 and the pharmaceutically acceptable acid addition salts thereof and where applicable to the geometric and stereo isomers thereof.

4,918,070

CEPHALOSPORIN DERIVATIVES AND ANTIBACTERIAL AGENTS

Susumu Nakagawa, Okazaki; Hiroshi Fukatsu, Nagoya; Yoshiaki Katoh, Okazaki, and Satoshi Murase, Nagoya, all of Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan

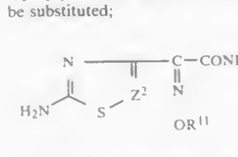
Filed Feb. 26, 1988, Ser. No. 161,100

Claims priority, application Japan, Feb. 27, 1987, 62-044166; Dec. 24, 1987, 62-327695

Int. Cl.[4] **C07D** *501/26;* **A61K** *31/545*

U.S. Cl. 514—206 **4 Claims**

1. A cephalosporin derivative having the formula:



(I)

wherein R^1 is a substituted amino group selected from the group consisting of:

(i) $R^4—C(=N\sim OR^5)—CONH—$ group, wherein R^4 is a phenyl, naphthyl, furanyl, thienyl, thiazolyl, 1,2,4-thiadiazolyl, pyridyl, isothiazolyl, oxazolyl, pyrimidyl group which may be substituted; R^5 is a hydrogen atom or a C_{1-6} alkyl, C_{3-6} cycloalkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, phenyl, naphthyl, benzyl, phenethyl, naphthylmethyl, pyridyl, furanyl, thienyl, imidazolyl, thiazolyl, isothiazolyl, isoquinolyl, quinolyl, oxazolyl, isoxazolyl, tetrazolyl group which may be substituted;

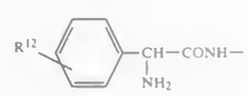
(ii) $R^4—C(=C(R^6)—R^7)—CONH—$ group, wherein R^4 is a phenyl, naphthyl, furanyl, thienyl, thiazolyl, 1,2,4-thiadiazolyl, pyridyl, isothiazolyl, oxazolyl, pyrimidyl group which may be substituted; each of R^6 and R^7, which may be the same or different, is a hydrogen atom, a halogen atom or a C_{1-6} alkyl, phenyl, naphthyl, benzyl, phenethyl, naphthylmethyl group which may be substituted;

(iii) $R^8—(Z^1)_n—CH(—R^9)—CONH—$ group, wherein R^8 is a C_{1-6} alkyl, C_{2-6} alkenyl, phenyl, naphthyl, furanyl, thienyl, benzothienyl, pyridyl, tetrazolyl, oxazolyl group which may be substituted and R^9 is a hydrogen atom, carboxyl group, an amino group, a sulfo group, a sulfamoyl group, a carbamoyl group, a hydroxyl group, a formyloxy group, a carbamoyloxy group, Z^1 is an oxygen atom or a sulfur atom and n is 0 or 1;

(iv) $R^{10}—CONH—$ group, wherein R^{10} is a pyridyl, imidazolyl, piperazinyl, thiazolyl or oxazolyl group which may be substituted;

(v)

wherein Z^2 is a carbon atom or a nitrogen atom and R^{11} is a hydrogen atom, a C_{1-6} alkyl, C_{3-6} cycloalkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, phenyl, naphthyl, benzyl, phenethyl, naphthylmethyl, pyridyl, furanyl, thienyl, imidazolyl, thiazolyl, isothiazolyl, isoquinolyl, quinolyl, oxazolyl, isoxazolyl, tetrazolyl, group which may be substituted; and



(vi)

wherein R^{12} represents one or two substituents selected from the group consisting of a hydrogen atom, a hydroxyl group, an acetoxy group and a halogen atom;

X is an alkenylene group R^2 is a 1,2,3-thiadiazolyl. 1.2 4-thiadiazolyl, 1,3,4-thiadiazolyl, tetrazolyl, thiazolyl, isothiazolyl, pyridyl, or benzothiazolyl, which may be substituted by one or more substituents selected from the group consisting of a halogen atom, a methyl group, an ethyl group, a propyl group, a hydroxymethyl group, an aminomethyl group, a sulfomethyl group, a carboxymethyl group, a cyanomethyl group, a fluoromethyl group, a chloromethyl group, a difluoromethyl group, a trifluoromethyl group, a carbamoylmethyl group, an N-methylcarbamoylmethyl group, a sulfamoylmethyl group, an oxo group, an N-methylaminomethyl group, an amino group, a methylamino group, a dimethylamino group, an ethylamino group, a methoxy group, an ethoxy group, a fluoromethyl group, a difluoroethoxy group, a trifluoroethyl group, a sulfamoyl group, a carboxyl group, a methoxycarbonyl group, a cyano group, a nitro group, a vinyl group, an allyl group, a propargyl group, an ethynyl group, an acetoxy group, a formyloxy group, a carbamoyloxy group, an N-methylcarbamoyloxy group, an acetamide group, a formamide group, an acetyl group, a fluoroacetyl group, a difluoroacetyl group, a trifluoroacetyl group, a hydroxyl group, a cyclopropyl group, a cyclobutyl group, a cyclopentyl group and a cyclohexyl group and R^3 is a hydrogen atom, a negative charge or a residue of an ester which can form a pharmaceutically acceptable ester hydrolyzable in a living body; or a pharmaceutically acceptable salt thereof.

4,918,072

PLATELET AGGREGATION INHIBITING COMPOSITION

Horst Koenig, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

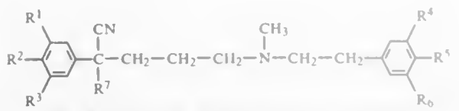
Continuation-in-part of Ser. No. 917,045, Oct. 9, 1986, abandoned. This application Feb. 20, 1987, Ser. No. 18,800

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1985, 3535949

Int. Cl.[4] **A61K** *31/50*

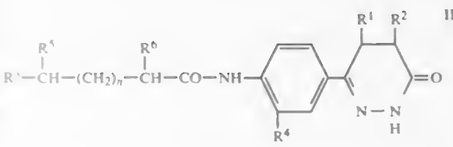
U.S. Cl. 514—247 **3 Claims**

1. A pharmaceutical composition which comprises: a pharmaceutical carrier and a combination of a compound of the formula I



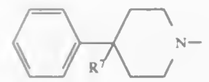
I

where R^1, R^2, R^3, R^4, R^5 and R^6 are identical or different and are each hydrogen or C_1–C_4-alkoxy, and R^7 is a C_1–C_4 alkyl, and a pyridazinone derivative of the formula II



II

where R^1 is hydrogen or methyl, R^2 is hydrogen or, together with R^1 forms a methylene of ethylene, R^3 is a group of the formula



where R^7 is hydrogen or C_1–C_4-acyl R^4 is hydrogen or, together with R^3, forms a direct bond or methylend, R^5 is hydrogen or methyl, R^6 is hydrogen or halogen and n is 0 or 1, compound I being present in an amount 50–450 parts by weight and compound II in an amount of 3–50 parts by weight.

4,918,073

DIARYLALKYL-SUBSTITUTED ALKYLAMINES AND MEDICAMENTS CONTAINING THEM

Wolfgang Rüger, Kelkheim; Hansjörg Urbach, Kronberg; Wilhelm Bartmann, Bad Soden am Taunus, and Joachim Kaiser, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

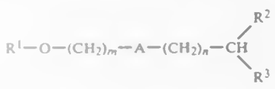
Filed Jan. 7, 1987, Ser. No. 1,204

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1986, 3600390

Int. Cl.[4] **A61K** *31/495;* **C07D** *241/04*

U.S. Cl. 514—255 **5 Claims**

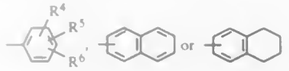
1. A compound of the formula I



(I)

in which:

R^1 is $(C_3$–$C_8)$-cycloalkyl, straight-chain or branched $(C_2$–$C_6)$-alkenyl, $(C_5$–$C_8)$-cycloalkenyl, or is



in which

R^4, R^5 and R^6 are identical or different and independently of one another are hydrogen, $(C_1$–$C_6)$-alkyl, $(C_3$–$C_8)$-cycloalkyl, hydroxyl, $(C_1$–$C_4)$-alkoxy, $(C_1$–$C_4)$-alkylthio, F, Cl, Br, I, nitro, cyano, trifluoromethyl, formyl, carboxyl, $(C_1$–$C_6)$-alkoxycarbonyl, $(C_1$–$C_6)$-acyl, carbamoyl, N-mono- or N,N-di-$(C_1$–$C_6)$-alkylcarbamoyl, sulfo, $(C_1$–$C_6)$-alkoxysulfonyl, sulfamoyl, N-mono- or N,N,-di-$(C_1$–$C_6)$-alkylsulfamoyl, $(C_1$–$C_6)$-alkylsulfinyl, $(C_1$–$C_6)$-alkylsulfonyl or amino, unsubstituted or substituted by one or two identical or different $(C_1$–$C_6)$-alkyl, $(C_1$–$C_6)$-acyl or phenyl groups,

R^2 and R^3 are identical or different and independently of one another are phenyl or phenyl-$(C_1$–$C_4)$-alkyl, the phenyl ring in each case being unsubstituted or substituted by one, two or three substituents selected from the group consisting of $(C_1$–$C_4)$-alkyl, $(C_1$–$C_4)$-alkoxy, F, Cl, Br, I, cyano, nitro and trifluoromethyl, and

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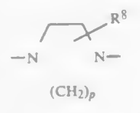
A is an amine of the formula:



$(CH_2)_p$

in which

R^8 is hydrogen, (C_1–C_6)-alkyl, formyl, (C_1–C_6)-acyl, carboxyl, (C_1–C_6)-alkoxycarbonyl, carbamoyl or N-mono- or N,N-di-(C_1–C_6)-alkylcarbamoyl, and

p is 2,

m is 2, 3 or 4 and

n is 1, 2, 3 or 4 or a salt of a compound of the formula I with a physiologically acceptable acid.

5. A pharmaceutical composition comprising an amount effective for use as a pharmaceutical in the therapy of a mammal of a compound of the formula I as claimed in claim 1 or a salt of said compound with a physiologically acceptable acid, together with a pharmaceutically acceptable carrier.

4,918,074

POLYAZAHETEROCYCLE COMPOUNDS

Yoshinao Tsuda, Tokorozawa; Tadashi Mishina, Iruma; Minoru Obata; Kazuhiko Araki, both of Nakatsu; Jun Inui, Iruma, and Tadao Nakamura, Nakatsu, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

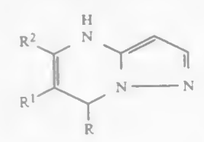
Continuation-in-part of Ser. No. 137,088, Dec. 23, 1987, abandoned, which is a division of Ser. No. 911,803, Sep. 25, 1986, abandoned, which is a continuation-in-part of Ser. No. 736,725, May 22, 1985, abandoned, and a continuation-in-part of Ser. No. 888,497, Jul. 23, 1986, abandoned, which is a continuation-in-part of Ser. No. 796,479, Oct. 16, 1985, abandoned. This application Feb. 10, 1988, Ser. No. 154,398

Claims priority, application Japan, Mar. 12, 1984, 59-47357; May 22, 1984, 59-104257; Sep. 30, 1985, 60-218306; Apr. 28, 1986, 61-98499

Int. Cl.[4] C07D *487/04;* A61K *31/505*

U.S. Cl. 514—258 **16 Claims**

1. A polyazaheterocycle compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein R is hydrogen, C_{1-4} alkyl, C_{3-6} cycloakyl, furyl, thienyl, pyridyl or phenyl which may be optionally substituted by one or two substituents selected from the group consisting of halogen, C_{1-4} alkyl, trifluoromethyl, C_{1-4} alkoxy, phenyl-C_{1-3} alkyloxy, C_{1-4} alkylthio, phenyl-C_{1-3} alkylthio, acyl, hydroxy, amino, nitro and cyano;

R^1 is hydrogen, cyano, carbamoyl, carboxyl, C_{1-4} alkoxycarbonyl which may be optionally substituted in the alkoxy moiety by one or two substituents selected from the group consisting of C_{1-4} alkoxy, cyano, a group represented by the formula: —N (Ra^1) (Rb^1) (wherein each of Ra^1 and Rb^1 is C_{1-4} alkyl or phenyl-C_{1-3} alkyl, or Ra^1 and Rb^1 together with the adjacent nitrogen atom form a 5- to 7-membered heterocycle selected from the group consisting of pyrrolidine, piperidine, morpholine, piperazine, N-methylpiperzine, N-(2-hydroxymethyl)-piperazine, azepine and diazepine), nitro, phenyl, thienyl, furyl and pyridyl, or alkanoyl;

R^2 is C_{1-4} alkyl, hydroxy-C_{1-4} alkyl, acetoxy-C_{1-4} alkyl, halo-C_{1-4} alkyl, dihalo-C_{1-4} alkyl, trifluoromethyl, C-$_{1-4}$ alkoxy-C_{1-4} alkyl, di-C_{1-4} alkoxy-methyl, C_{1-4} alkylcarbamoyloxy-C_{1-4} alkyl, C_{1-4} alkyl-thiocarbamoyloxy-C_{1-4} alkyl, formyl, hydroxyiminomethyl or cyano.

4,918,075

PURINYL AND PYRIMIDINYL CYCLOBUTANES AND THEIR USE AS ANTIVIRAL AGENTS

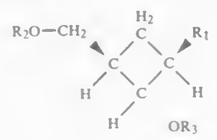
Robert Zahler, and Glenn A. Jacobs, both of Princeton, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 20, 1988, Ser. No. 286,914

Int. Cl.[4] **A61K** *31/395, 31/495;* C07D *473/00;* C07F *9/02*

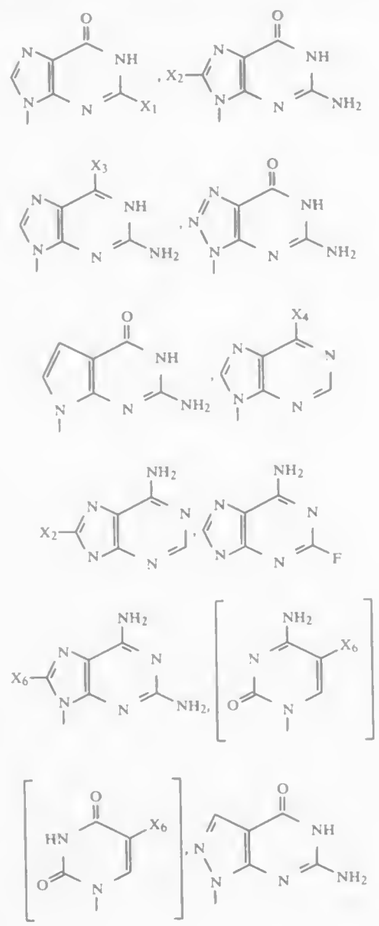
U.S. Cl. 514—262 **25 Claims**

1. A compound having the formula



I

or a pharmaceutically acceptable salt thereof, wherein R_1 is



wherein

X_1 is hydrogen, amino,

and —N=CHN(X_8)$_2$

X_2 is methyl, fluoro, chloro, bromo, iodo, hydroxy, or amino,

X_3 is hydrogen, chloro, or O—X_8,

X_4 is amino,

or —N=CHN(X_8)$_2$,

X_5 is hydrogen, methyl, fluoro, chloro, bromo, iodo, hydroxy, or amino,

X_6 is fluoro, chloro, bromo, iodo, hydrogen, methyl, trifluoromethyl, ethyl, 2-fluoroethyl, 2-chloroethyl, or

(trans)

X_7 is hydrogen, alkyl, substituted alkyl, or aryl,

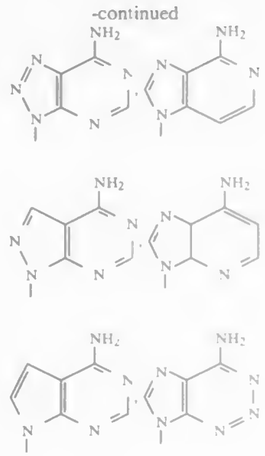
X_8 is alkyl,

X_9 is chloro, bromo, iodo, hydrogen, or methyl,

R_2 and R_3 are independently hydrogen, —PO_3H_2, or

25. A method of treating a viral infection in a mammalian or avian host in need thereof, which comprises administering to said host an effective amount of a compound as defined in claim 1.

-continued



4,918,076

TREATING ALCOHOL ADDICTION WITH 1,4-DIHYDROPYRIDINE DERIVATIVES

Klaus Opitz, Muenster, and Jörg Traber, Lohmar, both of Fed. Rep. of Germany, assignors to Troponwerke GmbH & Co. KG., Cologne, Fed. Rep. of Germany

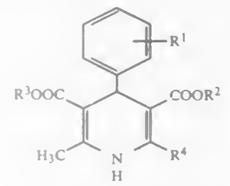
Filed Feb. 22, 1989, Ser. No. 314,345

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1988, 3806277

Int. Cl.[4] **A61K** *31/435*

U.S. Cl. 514—277 **10 Claims**

1. A method of treating the alcohol craving of a patient afflicted with alcohol addiction which comprises administering to such patient an amount effective therefor of a dihydropyridine of the formula



in which

R^1 is one or two substituents independently selected from the group consisting of nitro, halogen, trifluoromethyl and $OCHF_2$,

R^2 and R^3 each independently is alkyl with 1 to 12 carbon atoms optionally substituted by alkoxy with 1 to 4 C atoms, hydroxyl, halogen or N-methyl-N-benzylamino, and

R^4 is cyano or alkyl with 1 to 4 carbon atoms optionally substituted by hydroxyl or halogen.

4,918,077

3-PHEYL-5,6-DIHYDROBENZ(C)ACRIDINE-7-CARBOXYLIC ACIDS AND RELATED COMPOUNDS AS CANCER CHEMOTHERAPEUTIC AGENTS

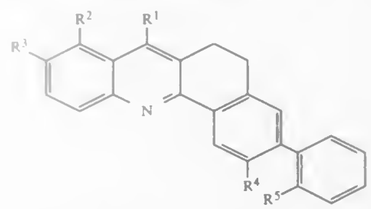
Carl H. Behrens, Wilmington, Del., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Filed Jan. 25, 1989, Ser. No. 301,379

Int. Cl.[4] **A61K** *31/435;* C07D *221/18*

U.S. Cl. 514—284 **30 Claims**

1 A compound having the formula:



or a pharmaceutically acceptable salt thereof, wherein:

R^1 is CO_2H, CO_2Na, CO_2K, or CO_2R^6;

R^2 and R^3 independently are H, F, Cl, Br, I, $CH_3CH_2CH_3$, CF_3, or S(O)mR^7;

R^4 and R^5 independently are H;

R^6 is $(CH_2)_nNR^8R^9$;

R^7 is alkyl of 1 to 5 carbon atoms optionally substituted with 1 or 2 of F, Cl and Br;

R^8 and R^9 independently are H or alkyl of 1 to 3 carbon atoms;

m is 0 to 2; and

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n is 2 to 4.

4,918,078

PHARMACEUTICAL COMPOSITIONS CONTAINING NEDOCROMIL SODIUM

Kenneth Brown; Andrew R. Clark, both of Loughborough, and Richard Salliss, Holmes Chapel, all of England, assignors to Fisons plc, Leicestershire, England

Division of Ser. No. 720,588, Apr. 8, 1985, Pat. No. 4,760,072.
This application Oct. 16, 1987, Ser. No. 109,049
Claims priority, application United Kingdom, Apr. 13, 1984, 8409705; Sep. 19, 1984, 8423634
The portion of the term of this patent subsequent to Jul. 26, 2005, has been disclaimed.
Int. Cl.[4] A61K *31/35*; C07D *491/052*
U.S. Cl. 514—291 8 Claims

1. An inhalation pharmaceutical formulation containing a therapeutically effective proportion of finely divided nedocromil sodium, which nedocromil sodium contains bound water, and a pharmaceutically acceptable liquefied gas aerosol propellant.

7. A process for the preparation of solid nedocromil sodium containing found water, which comprises mixing an aqueous solution of nedocromil sodium with a water miscible precipitating solvent for the nedocromil sodium the ratio of nedocromil sodium to water to precipitating solvent being in the range 1 part by weight of nedocromil sodium from 2 to 5 parts by volume of water: from 10 to 25 parts by volume of precipitating solvent.

8. A method of producing solid nedocromil sodium containing bound water which comprises subjecting nedocromil sodium of form B, as herein before defined, to a high humidity and subsequently removing any excess water.

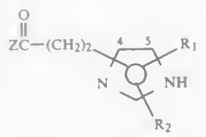
4,918,079

IMIDAZOLE DERIVATIVES AS 5-HT$_3$ RECEPTOR ANTAGONISTS

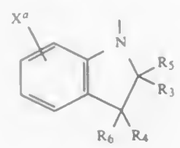
Francis D. King, Harlow, England, assignor to Beecham Group p.l.c., Brentford, England

Filed Sep. 30, 1988, Ser. No. 252,373
Claims priority, application United Kingdom, Oct. 2, 1987, 8723157
Int. Cl.[4] A61K *31/44, 31/415*; C07D *403/06, 471/04*
U.S. Cl. 514—299 8 Claims

1. A compound of formula (I), or a pharmaceutically acceptable salt thereof:

(I) 

wherein
R_1 and R_2 are independently hydrogen or C_{1-6} alkyl;
Z is a group of sub-formula (a), (b), (c), (d) or (e):

(a) 

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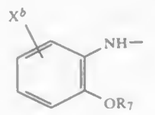
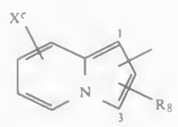
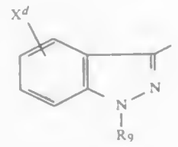
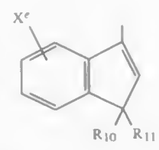
(b) 

(c) 

(d) 

(e) 

wherein
X^a to X^e are selected from hydrogen, halogen and hydroxy;
R_3 is hydrogen and R_4 is hydrogen or C_{1-6} alkyl;
R_5 to R_{11} are independently selected from hydrogen or C_{1-6} alkyl.

8. A method of treatment or prophylaxis of migraine, cluster headache, trigeminal neuralgia, visceral pain, gastrointestinal disorders and/or CNS disorders in mammals which comprises the administration of an effective amount of a compound according to claim 1.

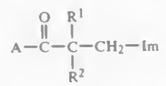
4,918,080

IMIDAZOLLYL CONTAINING KETONE DERIVATIVES

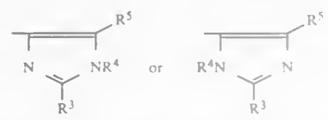
Alexander W. Oxford, Royston; David J. Cavalla, London, and Peter C. North, Royston, all of England, assignors to Glaxo Group Limited, London, England

Filed Apr. 13, 1988, Ser. No. 180,960
Claims priority, application United Kingdom, Apr. 14, 1987, 8708943; Jun. 5, 1987, 8713227; Jun. 5, 1987, 8713226; Jul. 15, 1987, 8716698; Sep. 3, 1987, 8720694
Int. Cl.[4] A61K *311/415, 31/44*; C07D *463/06, 471/04*
U.S. Cl. 514—300 8 Claims

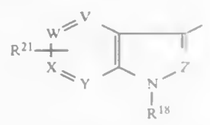
1. A compound of formula (I):

(I) 

or a physiologically acceptable salt or solvate thereof, wherein R^1 and R^2, which may be the same or different, each represents a hydrogen atom or a C_{1-6} alkyl group;
Im represents an imidazolyl group of formula:



wherein one of the groups represented by R^3, R^4 and R^5 is a hydrogen atom or a C_{1-6} alkyl, C_{3-7} cycloalkyl, C_{3-6} alkenyl, phenyl or phenyl C_{1-3} alkyl group, and each of the other two groups, which may be the same or different, represents a hydrogen atom or a C_{1-6} alkyl group; and
A is a group



R^{18} represents a hydrogen atom or a group C_{1-6} alkyl, C_{3-6} alkenyl, C_{3-10} alkynyl, C_{3-7} cycloalkyl, C_{3-7} cycloalkyl C_{1-4} alkyl, phenyl, phenyl C_{1-3} alkyl, $—CO_2R^{19}$, $—COR^{19}$, $—CONR^{19}R^{20}$ or $—SO_2R^{19}$ (wherein R^{19} and R^{20}, which may be the same or different, each represents a hydrogen atom, a C_{1-6} alkyl or C_{3-7} cycloalkyl group, or a phenyl phenyl C_{1-4} alkyl group, in which the phenyl group is optionally substituted by one or more C_{1-4} alkyl, C_{1-4} alkoxy or hydroxy groups or halogen atoms, with the proviso that R^{19} does not represent a hydrogen atom when R^{18} represents a group $—CO_2R^{19}$ or $—SO_2R^{19}$);
R^{21} represents a hydrogen atom or a halogen atom or a hydroxy, C_{1-4} alkoxy, phenyl C_{1-3} alkoxy or C_{1-6} alkyl group or a group $—NR^{22}R^{23}$ or $—CONR^{22}R^{23}$, (wherein R^{22} and R^{23}, which may be the same or different, each represents a hydrogen atom or a C_{1-4} alkyl or C_{3-4} alkenyl group, or together with the nitrogen atom to which they are attached form a saturated 5 to 7 membered ring); V, W, X and Y each independently represent a nitrogen atom or the group —CH—, and Z represents a nitrogen atom or the group $—CR^{24}$ (wherein R^{24} represents a hydrogen atom or a C_{1-6} alkyl, C_{3-6} alkenyl, C_{3-7} cycloalkyl, phenyl or phenyl C_{1-3} alkyl group), with the proviso that one and only one of V, W, X, Y and Z represents a nitrogen atom

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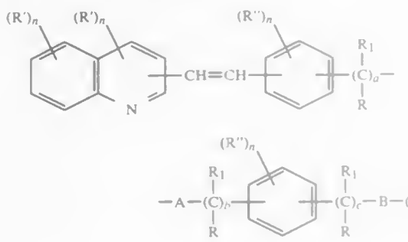
4,918,081

QUINOLINE DERIVATIVES AND USE THEREOF AS ANTAGONISTS OF LEUKOTRIENE D4

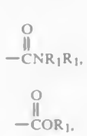
Fu-Chi Huang, Gwynedd; Robert A. Galemmo, Jr., Ambler, and Henry F. Campbell, North Wales, all of Pa., assignors to Rorer Pharmaceutical Corp., Ft. Washington, Pa.

Filed Jun. 20, 1988, Ser. No. 210,468
Int. Cl.[4] C07D *215/12, 215/14, 403/02*; A61K *31/47*
U.S. Cl. 514—311 16 Claims

1. A compound of the formula

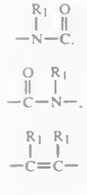


where
R' is independently hydrogen, alkyl having 1 to 6 carbon atoms, hydroxy, alkoxy having 1 to 6 carbon atoms, carboxy, carbalkoxy wherein alkoxy has 1 to 6 carbon atoms, halo, nitro, trifluoromethyl, cyano, acetyl, propionyl or benzoyl;
R_1 is independently hydrogen, alkyl having 1 to 6 carbon atoms, benzyl or phenethyl;
R is independently $—(CH_2)_x—X$; $—O(CH_2)_x—X$ (when not geminal to A or B when A or B when A or B is 0); $—S—(CH_2)_x—X$ or $—NR_1—(CH_2)_x—X$
where x is 0–3 and X is hydrogen, alkyl having 1 to 6 carbon atoms, phenyl, hydroxy, alkoxy having 1 to 6 carbon atoms, acetylamino, propionylamino, benzoylamino,



—CN or tetrazolyl;
R is hydrogen, hydroxy, alkoxy having 1 to 6 carbon atoms, halo, trifluoromethyl, $—CH_2R$, R or $—CH_2—O—(CH_2)_x—X$;
vicinal R groups together may be $(CH_2)_y$—where y is 1–4, thus forming a 3–6 membered ring;
geminal R_1 and R groups may together form a spiro substituent, $—(CH)_z—$, where z is 2 to 5;
geminal R_1 or R_1 and R groups may together form an alkylidenyl substituent,

A is —O—, —S—, —SO—, $—SO_2—$, $—NR_1—$,



or a chemical bond;
B is —O—, —S—, $—NR_1—$,

or a chemical bond;
a is 0–2; where a+b=1 or 2;
b is 0–2; where a+b=1 or 2;
c is 0–3;
d is 0–3;
n is 0–2;
Z is tetrazolyl, substituted tetrazolyl where the substituent may be
alkyl having 1 to 6 carbon atoms,
carboxyalkyl wherein alkyl has 1 to 6 carbon atoms,

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carbalkoxyalkyl wherein alkoxy has 1 to 6 carbon atoms and alkyl has 1 to 6 carbon atoms, or

where Y is $-COOR_1$, $-CN$,

or

and pharmaceutically acceptable salts thereof.

15. A method for the treatment of hypersensitive ailments in a patient requiring such treatment which comprises administering to such patient an effective amount of a compound of the formula according to claim 1.

4,918,082

ANTI-SPASMODIC AGENTS CONTAINING QUATERNARY NITROGEN

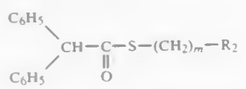
William M. Davis, Tucson, Ariz., assignor to United Pharmaceuticals, Inc., Tucson, Ariz.

Continuation of Ser. No. 068,636, Jun. 30, 1987, abandoned, which is a division of Ser. No. 754,815, Jul. 12, 1985, Pat. No. 4,721,722. This application Sep. 2, 1988, Ser. No. 243,108

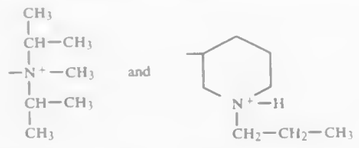
Int. Cl.[4] **A61K** *31/445;* **C07D** *211/18*

U.S. Cl. 514—317 **19 Claims**

1. A compound of the formula



where R_2 is a radical selected from the group consisting of



and m is an integer from 0 to 3.

5. A method of treating a patient suffering smooth muscle spasm comprising administering to the patient an effective amount of the compound defined in claim 1.

4,918,083

4,5 DIHYDROIMIDAZOLE COMPOUNDS WHICH HAVE USEFUL PHARMACEUTICAL UTILITY

John M. Berge, and Lee J. Beeley, both of Epsom, England, assignors to Beecham Group p.l.c., Brentford, United Kingdom

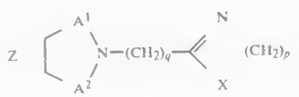
Filed Nov. 24, 1987, Ser. No. 124,902

Claims priority, application United Kingdom, Nov. 27, 1986, 8628415; Mar. 6, 1987, 8705238

Int. Cl.[4] **C07D** *401/12;* **A61K** *31/41*

U.S. Cl. 514—323 **30 Claims**

1. A compound of formula (I):



(I)

or a pharmaceutically acceptable salt, ester or amide thereof, or a pharmaceutically acceptable solvate thereof, wherein:

Z represents a residue of a substituted or unsubstituted phenyl or naphthyl group;

A^1 represents a substituted or unsubstituted methylene group;

A^2 represents a substituted or unsubstituted methylene group;

substituents for A^1 or A^2 including up to four groups selected from substituted or unsubsituted C_{1-12}-alkyl; substituted or unsubstituted C_{2-12}-alkenyl; substituted or unsubstituted C_{2-12}-alkynyl; substituted or unsubstituted phenyl, naphthyl, phenyl-C_{1-12}-alkyl or naphthyl-C_{1-12}-alkyl;

X represents NR^* wherein R^* represents a hydrogen atom, a substituted or unsubsituted C_{1-12}-alkyl group, a substituted or unsubstituted phenyl or naphthyl group, a C_{1-12}-alkanoyl group substituted or unsubstituted in the alkyl moiety, or a phenyl- or naphthyl -C_{1-12}-alkyl moiety substituted or unsubstituted in the aryl moiety;

p represents the integer 2

q represents an integer in the range of from 1 to 12; and wherein optional substituents for phenyl or naphthyl group or moiety; alkyl, alkenyl or alkynyl group or moiety include up to 5 groups selected from halogen, C_{1-12}-alkyl, C_{2-12}-alkenyl, C_{2-12}-alkynyl, phenyl, halo-C_{1-12}-alkyl, hydroxy, C_{1-12}-alkoxy, aryl-C_{1-12}-alkyloxy, amino, mono- and di-C_{1-12}-alkylamino, amino-C_{1-12}-alkyl, mono- and di-C_{1-12}-alkylaminio-C_{1-12}-alkyl, nitro, carboxy, C_{1-12}-alkoxycarbonyl, carboxy-C_{1-12}-alkyl, C_{1-12}alkyoxycarbonyl-C_{1-12}-alkyl, C_{1-12}-alkylcarbonyl or a moiety $SO_2NR^5R^f$ wherein R^5 and R^f each independently represent hydrogen or C_{1-12}-alkyl, or R^5 and R^f together with the nitrogen to which they are attached form a saturated 5- or 6- membered ring.

29. A method for the treatment or prophylaxis of hyperglycaemia or hypertension in a human or non-human mammal which comprises administering an effective, non-toxic, amount of a compound of formula (I) according to claim 1, or a pharmaceutically acceptable salt, ester or amide thereof, or a pharmaceutically acceptable solvate thereof, to a human or non-human mammal in need thereof.

4,918,084

PHARMACEUTICAL COMPOSITIONS AND MEDICAL USES OF DIOXOPIPERIDINE DERIVATIVES

Maurice W. Gittos, Plobsheim, France, assignor to National Research Development Corporation, London, England

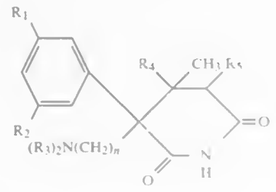
Division of Ser. No. 136,996, Dec. 23, 1987, Pat. No. 835,151, which is a division of Ser. No. 905,525, Sep. 10, 1986, Pat. No. 738,973. This application Mar. 14, 1989, Ser. No. 323,308

Claims priority, application United Kingdom, Sep. 11, 1985, 8522455; Feb. 17, 1986, 8603909; Feb. 17, 1986, 8603910

Int. Cl.[4] **A61K** *31/44*

U.S. Cl. 514—348 **8 Claims**

1. A method of antagonizing the anxiogenic effect of a benzodiazepine inverse agonist comprising administering to a patient being treated with a benzodiazepine inverse agonist, an anxiolytic amount of Formula 1



wherein:

R_1 represents methoxy, ethoxy or hydroxy,

R_2 represents methoxy, ethoxy, hydroxy or hydrogen

each R_3 independently represents methyl or ethyl.

R_4 represents hydrogen or methyl;

R_5 represents hydrogen or methyl; and

n represents 2 or 3,

or a pharmacologically acceptable acid addition salt thereof

4,918,085

PESTICIDAL 3-CYANO-5-ALKOXY-1-ARYLPYRAZOLES, COMPOSITIONS AND USE

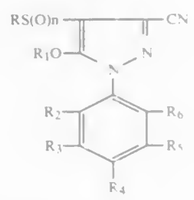
Themistocles D. J. D'Silva, Chapel Hill; Gail S. Powell, Raleigh; Philip R. Timmons, Durham, all of N.C., and Richard G. Pennicard, England, assignors to Rhone-Poulenc AG Company, Pa.

Filed Mar. 2, 1989, Ser. No. 317,722

Int. Cl.[4] **A01N** *43/56;* **C07D** *231/28*

U.S. Cl. 514—407 **28 Claims**

1. A compound of formula (I)



(I)

wherein:

R is selected from unsubstituted C_1 to C_4 alkyl or C_1 to C_4 alkyl substituted by one or more halogen atoms, which are the same or different, up to full substitution;

R_1 is selected from C_1 to C_4 alkyl, C_3 to C_6 alkenyl, C_3 to C_6 alkynyl, aralkyl or aryl, wherein R_1 is unsubstituted or substituted by one or more groups selected from halogen, alkyl, nitro, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, hydroxy, cyano, carboxy, alkoxycarbonyl, aminocarbonyl, alkylaminocarbonyl or dialkylaminocarbonyl, or R_1 is selected from aminocarbonyl, alkylaminocarbonyl or dialkylaminocarbonyl, wherein the defined alkyl and alkoxy moieties of the R_1 groups each contain one to four carbon atoms, or R_1 is $-P(=X)OR_7SR_8$ wherein X is an oxygen atom or a sulfur atom;

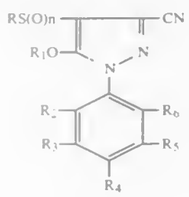
R_2,R_3,R_5 and R_6 are individually a hydrogen atom or a halogen atom;

R_4 is selected from a halogen atom or a C_1 to C_4 straight chain or branched chain alkyl, alkoxy, alkylthio, alkylsulfinyl or alkylsulfonyl group, which group is unsubstituted or substituted by one or more halogen atoms which are the same or different;

R_7 is methyl or ethyl;

R_8 is straight chain or branched chain C_3 to C_4 alkyl; and n is 0,1 or 2.

9. A method for the control of arthropods, nematodes, and helminth and protozoan pests at a locus which comprises the treatment of the locus with an effective amount of a compound of general formula(I)



(I)

wherein

R is selected from unsubstituted C_1 to C_4 alkyl or C_1 to C_4 alkyl substituted by one or more halogen atoms, which are the same or different, up to full substitution;

R_1 is selected from C_1 to C_4 alkyl, C_3 to C_6 alkenyl, C_3 to C_6 alkynyl, aralkyl or aryl, wherein R_1 is unsubstituted or substituted by one or more groups selected from halogen, alkyl, nitro, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, hydroxy, cyano, carboxy, alkoxycarbonyl, aminocarbonyl, alkylaminocarbonyl or dialkylaminocarbonyl, or R_1 is selected from aminocarbonyl, alkylaminocarbonyl or dialkylaminocarbonyl, wherein the defined alkyl and alkoxy moieties of said groups each contain one to four carbon atoms, or R_1 is $-P(=X)OR_7SR_8$ wherein X is an oxygen atom or a sulfur atom;

R_2,R_3,R_5, and R_6 are individually a hydrogen atom or a halogen atom;

R_4 is selected from a halogen atom or a C_1 to C_4 straight chain or branched chain alkyl, alkoxy, alkylthio, alkylsulfinyl or alkylsulfonyl group, which group is unsubstituted or substituted by one or more halogen atoms which are the same or different;

R_7 is methyl or ethyl;

R_8 is straight chain or branched chain C_3 to C_4 alkyl; and n is 0,1 or 2.

4,918,086

1-NITRO-2,2-DIAMINOETHYLENE DERIVATIVES

Laurenz Gsell, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

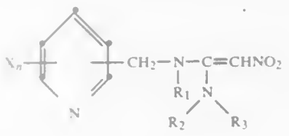
Filed Jul. 27, 1988, Ser. No. 224,623

Claims priority, application Switzerland, Aug. 7, 1987, 3051/87; Mar. 9, 1988, 888/88

Int. Cl.[4] **C07D** *213/26;* **A61K** *31/44*

U.S. Cl. 514—351 **21 Claims**

1. A 1-nitro-2,2-diaminoethylene derivative of formula I



(I)

wherein

X is chlorine, fluorine, unsubstituted or halogen-substituted C_1–C_5alkyl; unsubstituted or halogen-substituted C_1–C_4alkoxy, unsubstituted or halogen-substituted C_1–C_5alkylthio, unsubstituted or halogen-substituted alkylsulfinyl, unsubstituted or halogen-substituted alkylsulfonyl; or also nitro, cyano, thiocyanato, C_3–C_5haloalkenyl, C_3–C_5haloalkynyl, hydroxy, C_1–C_5alkoxycarbonyl, amino, C_1–C_4dialkylamino, C_1–C_5alkylcarbonyl, C_1–C_5alkylcarbamoyl or C_1–C_5alkylcarbonyloxy,

n is an integer from 0 to 4,

R_1 is hydrogen, C_1–C_5alkyl or C_3–C_7cycloalkyl,

R_2 is hydrogen, C_1–C_5alkyl, C_3–C_7cycloalkyl,

R_3 is hydrogen, C_1-C_5alkyl, C_3-C_7cycloalkyl, benzyl or pyridinylmethyl, or R_2 and R_3, together with the linking nitrogen atom, are the pyrrolidinyl or piperazinyl radical, with the proviso that not more than one of the substituents R_1, R_2 and R_3 is hydrogen, or a cis- or trans-isomer or a salt thereof.

4,918,087

2-THIOMETHYL-SUBSTITUTED-PYRIDINE AND -3,5-DICARBOXYLATES HAVING ANTI-HYPERTENSIVE ACTIVITY

Carmelo A. Gandolfi; Marco Frigerio; Odoardo Tofanetti, and Sergio Tognella, all of Milan, Italy, assignors to Boehringer Biochemia Robin S.P.A., Milan, Italy

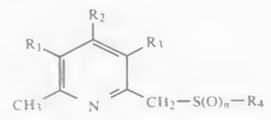
Filed Mar. 11, 1988, Ser. No. 167,164

Claims priority, application Italy, Mar. 13, 1987, 19800 A/87

Int. Cl.[4] C07D *213/55, 213/56;* **A61K** *31/44*

U.S. Cl. 514—356 5 Claims

1. A compound of formula I



(I)

wherein

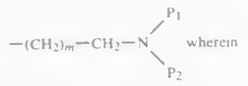
R_1 is COOR5;

R_2 is selected from the group consisting of m-nitrophenyl and m-cyanophenyl;

R_3 is $COOR_5$;

R_5 is a C_{1-6} alkyl group;

n is zero; and R_4 is a group of formula



wherein

m is an integer from 1 to 3, P_1 and P_2 are both hydrogen, or one of P_1 or P_2 is hydrogen and the other is selected from the group consisting of a C_{1-6} alkyl group and benzyl;

or a pharmaceutically acceptable salt thereof

5. A composition for the treatment of hypertension, comprising an inert carrier and an anti-hypertension effective amount of the compound of any one of claims 2, 1 or 3.

4,918,088

PEST CONTROL

Laurenz Gsell, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

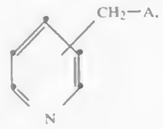
Filed Jul. 13, 1988, Ser. No. 218,190

Claims priority, application Switzerland, Jul. 20, 1987, 2747/87

Int. Cl.[4] A01N *43/40*

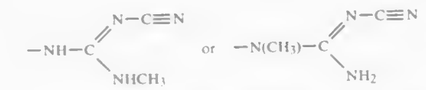
U.S. Cl. 514—357 17 Claims

1. A method of controlling insects and representatives of the order Acarina, which comprises contacting said pests, their different development stages or the locus thereof, with a pesticidally effective amount of a compound of formula I



(I)

wherein A is a radical



or a tautomer thereof, or with a composition containing such a compound.

4,918,089

AMIDE DERIVATIVES, AND THEIR PRODUCTION AND AGRICULTURAL FUNGICIDES CONTAINING THEM

Tomoyuki Kusaba, Toyonaka; Kazue Shinsugi, Kobe; Tsuguhiro Katoh; Naoto Meki, both of Toyonaka; Masayo Sugano, Osaka; Tomohiro Teramae, Takarazuka; Yukio Oguri, Toyonaka, and Tamon Uematsu, Kobe, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

Continuation of Ser. No. 198,283, May 25, 1988, abandoned. This application Aug. 22, 1989, Ser. No. 396,818

Claims priority, application Japan, May 26, 1987, 62-130392; Feb. 3, 1988, 63-024524; Mar. 23, 1988, 63-070191

Int. Cl.[4] C07D *417/12;* **A01N** *43/78*

U.S. Cl. 514—365 13 Claims

1 An amide compound of the formula:

wherein R^1 and R^2 are, the same or different, each a hydrogen atom or a C_1-C_3 alkyl group and R^3 is a 2-furyl group, a 3-furyl group, a 2-thienyl group or a 3-thienyl group.

4,918,090

SUBSTITUTED 2-AMINBENZOTHIAZOLES AND DERIVATIVES USEFUL AS CEREBROVASCULAR AGENTS

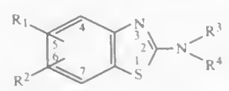
Graham Johnson, and Michael R. Pavia, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plain, N.J.

Division of Ser. No. 143,107, Jan. 25, 1988, Pat. No. 4,826,860, which is a continuation-in-part of Ser. No. 26,428, Mar. 16, 1987, abandoned. This application Dec. 9, 1988, Ser. No. 282,168

Int. Cl.[4] A61K *31/425*

U.S. Cl. 514—367 2 Claims

1. A method for treating cerebrovascular disorders which comprises administering to a patient in need thereof a therapeutically effective amount of a compound of the formula



(I)

or a pharmaceutically acceptable salt thereof in unit dosage form wherein

R^1 and R^2 are hydrogen

R_3 is hydrogen;

R_4 is lower alkyl substituted by a substituted or unsubstituted pyrrolidine, piperidine, pyridine or thiophene wherein the substituents are a straight or branched alkyl or alkenyl of from one to six carbon atoms.

4,918,091

NOVEL THIAZOLIDINEDIONES

Barrie C. C. Cantello, and Richard M. Hindley, both of Epsom, England, assignors to Beecham Group p.l.c., Brentford, United Kingdom

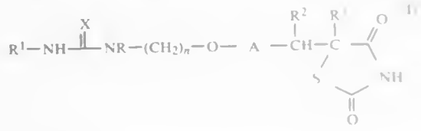
Filed Jun. 13, 1988, Ser. No. 206,219

Claims priority, application United Kingdom, Jun. 13, 1987, 8713863; Sep. 4, 1987, 8720824

Int. Cl.[4] C07D *277/34;* **A61K** *31/425*

U.S. Cl. 514—369 12 Claims

1. A compound of formula (I)



(I)

or a tautomeric form thereof, or a pharmaceutically acceptable salt thereof, wherein:

R represents hydrogen or C_{1-12} alkyl;

R^1 represents an C_{1-12} alkyl group or a substituted or unsubstituted phenyl or naphthyl group;

R^2 and R^3 each represent hydrogen, or R^2 and R^3 together represent a bond;

A represents a benzene ring having in total up to three substituents;

X represents oxygen, sulphur or a moiety NR^4 wherein R^4 represents hydrogen or C_{1-12} alkyl; and

n represents an integer in the range of from 2 to 6.

wherein optional substituents for any phenyl or naphthyl group includes up to five groups selected from halogen, alkyl, phenyl, alkoxy, haloalkyl, hydroxy, amino, nitro, carboxy, alkoxycarbonyl, alkoxycarbonylalkyl, alkylcarbonyloxy or alkylcarbonyl groups, wherein the alkyl or alkoxy groups have 1 to 12 carbon atoms.

4,918,092

LEUKOTRIENE ANTAGONISTS

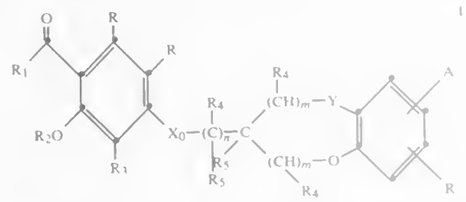
Richard Frenette, Laval; Robert N. Young, Senneville, and Masatoshi Kakushima, Dollard des Ormeaux, all of Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

Continuation of Ser. No. 563,728, Dec. 21, 1983, abandoned. This application Jan. 15, 1988, Ser. No. 144,343

Int. Cl.[4] A61K *31/35*

U.S. Cl. 514—382 7 Claims

1. Compounds having the formula I



(I)

wherein

each R is independently H, OH, alkyl of 1 to 6 carbon atoms which may be straight chain or branched; alkenyl of 2 to 6 carbon atoms which may be straight chain or branched, trifluoromethyl; alkoxy of 1 to 6 carbon atoms which may be straight chain or branched; SH; thioalkyl of 1 to 6 carbon atoms which may be straight chain or branched; phenyl; phenyl substituted by alkyl of 1 to 3 carbon atoms or by halogen; benzyl; phenethyl; halogen; amino; $N(R_4)_2$ wherein each R_4 is independently H or alkyl of 1 or 6 carbon atoms which may be straight chain or branched $COOR_4$; CH_2OR_4; formyl; CN; trifluoromethylthio; or nitro;

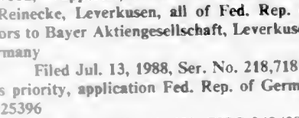
R_1 is alkyl of 1 to 6 carbon atoms which may be straight chain or branched; or alkoxy of 1 to 6 carbon atoms which may be straight chain or branched;

R_2 is H, alkyl of 1 to 6 carbon atoms which may be straight chain or branched; R_4CO; or R_4OCH_2;

R_3 is alkyl or 1 to 6 carbon atoms which may be straight chain or branched; or alkenyl of 3 to 6 carbon atoms which may be straight chain or branched;

Y is O or CHR_4;

A is



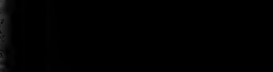
wherein

Z is O; S; CH_2; H/OH; alkenyl of 1-4 carbons; or N-R_8 wherein R_8 is OH, $N(R_4)_2$, alkyl or alkoxy of 1 to 6 carbon atoms, phenyl or phenyl substituted by alkyl or alkoxy groups of 1 to 3 carbon atoms, halogen, hydroxy, haloalkyl, COOH, CN, formyl or acyl of 1 to 6 carbon atoms;

each R_5 is independently H, OH, or alkyl of 1-4 carbons;

each R_6 is independently H, or alkyl of 1-4 carbons, and is absent when a triple bond is present;

R_7 is $COOR_4$; CH_2OH; CHO; tetrazole; $NHSO_2R_8$; hydroxymethylketone; CN; $CON(R_4)_2$; or



wherein each s is independently 0-3; R_9 is the radical W-R_{10} wherein W is O, S or NH and R_{10} is a hydrocarbon radical containing up to 21 carbon atoms;

r and q are each independently 0-20 provided that the total of r and q does not exceed 20; and

each m is independently 0, 1, or 2;

each n is independently 0, 1, 2 or 3;

p is 0 or 1;

and a pharmaceutically acceptable salt or acid addition salt thereof

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4,918,093

HYDROXYETHYL-AZOLYL OXIMES AND ETHERS THEREOF USEFUL AS FUNGICIDES

Wolfgang Krämer; Karl H. Büchel, both of Burscheid; Graham Holmwood, Wuppertal; Stefan Dutzmann, Duesseldorf, and Paul Reinecke, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

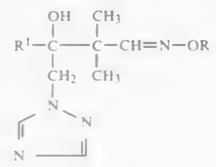
Filed Jul. 13, 1988, Ser. No. 218,718

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1987, 3725396

Int. Cl.[4] A01N *43/653;* **C07C** *249/08*

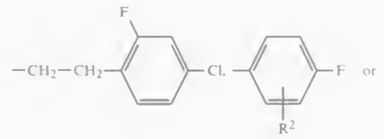
U.S. Cl. 514—383 7 Claims

1 A hydroxyethyl-azolyl oxime or ether of the formula

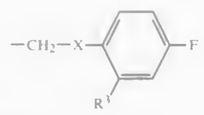


(I)

in which
R represents hydrogen, alkyl with 1 to 6 carbon atoms or alkenyl with 2 to 6 carbon atoms and
R^1 represents the radicals of the formula



or



wherein
R^2 represents hydrogen, fluorine or chlorine,
R^3 represents hydrogen, fluorine or chlorine and
X represents oxygen, sulphur or a CH_2 group,
and acid addition salts and metal salt complexes thereof.

6. A method of combating fungi comprising applying to fungi and/or to an environment thereof a fungicidally effective amount of a hydroxyethyl-azolyl oxime or ether of the formula (I) according to claim 1 or acid addition salts or metal salt complexes thereof.

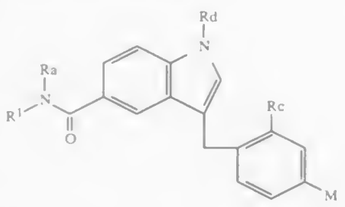
4,918,094

CARBOXAMIDE DERIVATIVES OF INDOLES AND LEUCOTRIENE ANTAGONIZING USE THEREOF

Peter R. Bernstein, Wallingford, Pa.; Frederick J. Brown, Newark; Victor G. Matassa, Wilmington, both of Del., and Ying K. Yee, Kennett Square, Pa., assignors to ICI Americas Inc., Wilmington, Del.

Filed Oct. 16, 1986, Ser. No. 919,845
Claims priority, application United Kingdom, Oct. 17, 1985, 8525658; Apr. 15, 1986, 8609176
Int. Cl.[4] C01D *209/22*; A61K *31/405*
U.S. Cl. 514—419 17 Claims

1. A compound of formula Ia



Ia

wherein
R^1 is selected from a group consisting of (2–10C)alkyl optionally containing 1 or more fluorine substituents; phenyl-(1–6C)alkyl in which the (1–6C)alkyl may optionally bear a fluoro or (1–4 C)alkoxy substituent and in which the phenyl moiety may optionally bear a substituent selected from a group consisting of halogeno, (1–4C)alkyl, (1–4C)alkoxy and trifluoromethyl; (3–8C)cycloalkyl-(1–6C)alkyl, the cyclic moiety of any of which optionally may contain one unsaturated linkage and may optionally bear 1 or 2 (1–4C)alkyl substituents;
Ra is hydrogen or methyl;
Rc is selected from a group consisting of hydrogen and (1–4C)alkoxy;
Rd is hydrogen, (3–8C)cycloalkyl, (3–8C)cycloalkyl-(1–4C)alkyl or (1–10C)alkyl optionally containing one or two double or triple bonds, said (1–10C)alkyl additionally optionally bearing a substituent P selected from a group consisting of cyano, carboxy, (1–4C)alkoxycarbonyl, carbamoyl of formula $CONR^2R^3$, ureido of formula $NR^4CONR^2R^3$, carbamoyloxy of formula $OCONR^2R^3$, a carbamate of formula NR^4COOR^5, acylamino of formula NR^4COR^5, acyloxy of formula $OCOR^5$, and an (optionally oxidized) thio group of formula $S(O)_nR^5$ in which
R^2 is selected from a group consisting of hydrogen, (1–6C)alkyl, and phenyl, the phenyl moiety of which may optionally bear 1 or 2 substituents selected from a group consisting of halogeno, (1–4C)alkyl, (1–4C)alkyoxy and trifluoromethyl, and
R^3 and R^4 are independently chosen from a group consisting of hydrogen and (1–6C)alkyl;
R^5 is selected from a group consisting of (1–4C)alkyl and phenyl wherein the phenyl moiety may optionally bear 1 to 2 substituents selected from a group consisting of halogen, (1–4C)alkyl, (1–4C)alkoxy and trifluoromethyl; and n is the integer 0, 1 or 2; and
M is an acidic group selected from a group consisting of carboxy and and acylsulphonamide residue of formula $-CO.NH.SO_2R^6$ in which
R^6 is selected from a group consisting of (1–6C)alkyl, (3–8C-)cycloalkyl, (6–12C)aryl, and (6–12C)aryl-(1–4C)alkyl, in which any of the aromatic moieties may bear 1 or 2 substituents selected from a group consisting of halogeno, amino, (1–4C)alkyl, (1–4C)alkoxy, and trifluoromethyl;
or a pharmaceutically acceptable salt thereof.

13. A method of antagonizing the action of at least one type of leukotriene in a mammal comprising administering to the mammal a pharmaceutically effective amount of a compound of claim 1

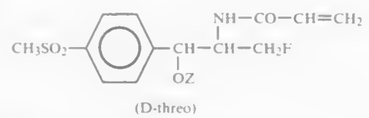
4,918,095

COMPOSITIONS WITH ANTIBIOTIC ACTIVITY AND THEIR USE

Davide Della Bella; Giancarlo Jommi; Mario Fantucci, all of Milan, and Dario Chiarino, Monza, all of Italy, assignors to Zambon S.p.A., Vicenza, Italy

Filed Dec. 18, 1987, Ser. No. 135,041
Claims priority, application Italy, Dec. 23, 1986, 22826 A/86
Int. Cl.[4] C07D *207/02*; C07C *103/58*
U.S. Cl. 514—423 4 Claims

1 A compound of formula



(II)

(D-threo)

wherein:
Z represents a hydrogen atom or represents an optionally substituted acyl group derived from a saturated or unsaturated aliphatic, aromatic or arylaliphatic acid having up to 16 carbon atoms, from an aliphatic or aromatic dicarboxylic acid having up to 12 carbon atoms, or from a natural aminoacid;
and, when Z is an acyl of a dicarboxylic acid or of an amino-

acid, the corresponding pharmaceutically acceptable salts with bases or with acids respectively

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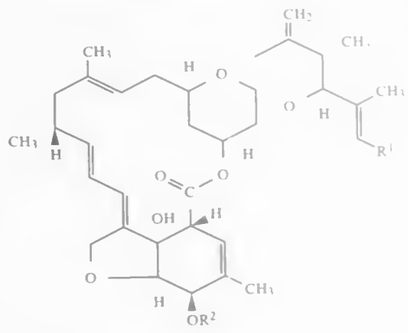
4,918,096

ANTIBIOTIC COMPOUNDS AND METHOD OF USE

Michael V. J. Ramsey, South Harrow; Brian M. Bain, Chalfont St. Peter; John B. Ward, Bushey; Hazel M. Noble, Burnham; Neil Porter, Pinner; Richard A. Fletton, Ruislip; David Noble, Burnham; Derek R. Sutherland, Chalfont St. Giles, and Peter D. Howes, Pinner, all of United Kingdom, assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 19, 1988, Ser. No. 168,102
Claims priority, application United Kingdom, Jan. 23, 1986, 8601595
Int. Cl.[4] A61K *31/365*; C07D *493/22*
U.S. Cl. 514—450 13 Claims

1. A compound of formula (I)



(I)

wherein
R^1 represents a methyl, ethyl or isopropyl group; and
OR^2 is a hydroxyl, acetoxy or methoxy group.

10. A method for treating endoparasitic, ectoparasitic or fungal conditions in animals and humans which comprises administering to the animal or patient an effective amount of one or more compounds according to claim 1

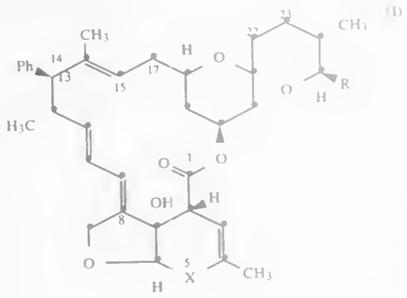
4,918,097

INSECTICIDES AND PARASITICIDES

Anthony C. O'Sullivan, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 1, 1989, Ser. No. 317,387
Claims priority, application Switzerland, Mar. 11, 1988, 934/88
Int. Cl.[4] A51K *31/365*
U.S. Cl. 514—450 18 Claims

1. Compounds of formula I



(I)

in which
X is one of the groups —CH(OR$_1$)—, —C(O)— or —C(=N—OR)—;
R_1 is hydrogen or an OH-protecting group;
R is hydrogen, an OH-protecting group, or an alkyl or cycloalkyl group;
R_2 is methyl, ethyl, isopropyl or sec.-butyl; and
Ph is a phenyl ring that is substituted by R_a, R_b, R_c and R_d, wherein each of R_a, R_b, R_c and R_d, independently of the others, is hydrogen, C_1–C_{10}alkyl, C_2–C_{10}alkoxyalkyl, C_2–C_{10}alkenyl, C_1–C_{10}alkoxy, C_2–C_{10}alkoxyalkoxy, or a phenyl or phenoxy radical that is unsubstituted or is substituted by at least one substituent from the group C_1–C_3alkyl and C_1–C_3alkoxy.

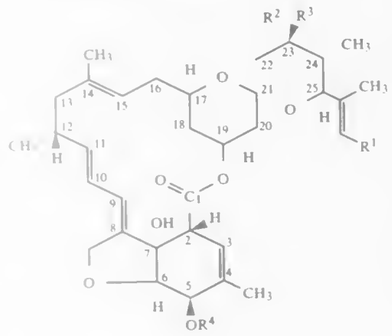
4,918,098

MACROLIDE COMPOUNDS

Michael V. J. Ramsay, South Harrow; Edward P. Tiley, Pinner; Oswy Z. Pereira, Hounslow; John B. Ward, Bushey; Neil Porter, Pinner; Hazel M. Noble, Slough; Richard A. Fletton, Ruislip; David Noble, Slough, and Derek R. Sutherland, Chalfont St Giles, all of England, assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 11, 1987, Ser. No. 24,763
Claims priority, application United Kingdom, Mar. 12, 1986, 8606122; Jun. 17, 1986, 8614689; Jul. 4, 1986, 8616346
Int. Cl.[4] A61K *31/365*
U.S. Cl. 514—450 12 Claims

1 A compound of formula (I)



(I)

wherein
R^1 is a methyl, ethyl or isopropyl group;
R^2 is a hydrogen atom or a group OR^5 as defined below and R^3 is a hydrogen atom, or R^2 and R^3 together with the carbon atom to which they are attached represent a >C=O group;
CR^5 is a hydroxyl group; an alkoxy group OR^7 in which R^7 is a C_{1-6} alkyl group substituted by a halogen atom or a C_{2-6} alkyl group interrupted by an oxygen or sulphur atom; a phosphate ester group of the formula —OP(O)-$(OH)_2$, —OP(O)(OH)(OZ), —OP(O)$(OZ)_2$, or —OP(O)-$(OCH_2CCl_3)_2$ where Z represents an alkali metal; or a group $OCONR^{10}R^{11}$ where R^{10} and R^{11} independently represent a hydrogen atom or a C_{1-4} alkyl group;
OR^4 is a hydroxyl or methoxy group, a group —$OCOR^6$ where R^6 is a C_{1-4} alkyl group; or a phosphate ester group or a group $OCONR^{10}R^{11}$ as defined for OR^5;
with the proviso that either R^2 is a group OR^7 as defined above or at least one of R^2 and OR^4 is a phosphate ester group or $OCONR^{10}R^{11}$ as defined above.

VOL 1113 ISS 3 AP 17 1990 UMI

4,918,099

DRUG, PREPARATION AND USE THEREOF

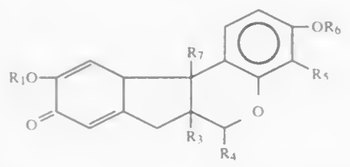
Chang-Kio Moon, Hyundae-villa 101 Ho, Daechi-Dong, Kungnam-Gu, Seoul, Rep. of Korea

Filed Mar. 26, 1986, Ser. No. 844,325
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3511609
Int. Cl.[4] A61K *31/35*
U.S. Cl. 514—453 5 Claims

1. A method of treating a patient suffering from diabetes mellitus,

which comprises administering to said patient an amount effective for treating said diabetes mellitus of a pharmaceutical composition comprising as active ingredient a benz(b)indeno(2.1-d)pyran derivative represented by the following structural formula (II)

(II)



wherein

R_1 and R_6 may be the same or different, and represent a hydrogen group, a lower alkyl group, an acetyl group, a benzyl group, or R_1 and R_6 together form a methylene group;

R_3 and R_7 may be the same or different, and represent a hydrogen group, hydroxyl group or acetyl group; R_4 represents a hydrogen group or an oxo group; R_5 represents a hydrogen group, a hydroxyl group, a lower alkyl group, an acetyl group or a benzyl group; and represents a single or a double bond.

4,918,100

CL-1957B ANTIBIOTIC COMPOUND AND ITS PRODUCTION

Gerard C. Hokanson, Ann Arbor; John P. Schaumberg, Ypsilanti; James C. French, Ann Arbor, and Josefino B. Tunac, Troy, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 531,128, Sep. 12, 1983, abandoned. This application Aug. 8, 1985, Ser. No. 763,577
Int. Cl.[4] A61K *31/35*
U.S. Cl. 514—451 2 Claims

1. An antimocrobial compound designated CL-1957B, or a pharmaceutically acceptable salt thereof;

compound CL-1957B having the name 19-(3,6-dihydro-3-methyl-6-oxo-2H-pyran-2-yl)-17-ethyl-6-hydroxy-9-(hydroxymethyl)-3,5,7,11,15-pentamethyl-8-oxo-2,10,12,16,18-nonadecapentaenoic acid and characterized by:

(a) a molecular weight of 556 atomic mass units;

(b) a melting point of 49°–52° C. (with prior softening);

(c) an optical rotation, ^{23}D of −156° (0.82% in chloroform);

(d) an ultraviolet absorption spectrum in methanol (free acid form) showing an absorption maximum at 289 nm (a=0.33) and end absorption below 260 nm:

(e) an ultraviolet absorption spectrum in methanol (carboxylate anion form) showing maxima at 240 nm (a=0.75), and 385 nm (a=0.24);

(f) an infrared spectrum in chloroform solution showing principal absorption peaks at 2970, 2940, 1715, 1700 (shoulder), 1640, 1455, 1375, 1250, 1100, and 965 reciprocal centimeters;

(g) a 360 MHz proton magnetic resonance spectrum in deuterochloroform solution showing signals at 0.76 (doublet, 3 protons), 0.95 (doublet, 3 protons), 1.03 (triplet, 3 protons), 1.05 (doublet, 3 protons), 1.17 (doublet, 3 protons), 1.74 (multiplet, 1 proton), 1.84 (singlet, 3 protons), 1.91 (doublet of doublets, 1 proton), 2.06 (multiplet, 2 protons), 2.11 (singlet, 3 protons), 2.15 (multiplet, 1 proton), 2.18 (quartet, 2 protons), 2.52 (multiplet, 1 proton), 2.65 (multiplet, 1 proton), 2.78 (multiplet, 1 proton), 3.60 (multiplet, 2 protons), 3.85 (multiplet, 2 protons), 4.96 (doublet of doublets, 1 proton), 5.02 (doublet, 1 proton), 5.20 (doublet, 1 proton), 5.61 (doublet of doublets, 1 proton), 5.66 (singlet, 1 proton), 5.69 (doublet of doublets, 1 proton), 5.98 (doublet, 1 proton), 5.99 (doublet, 1 proton), and 6.93 (doublet of doublets, 1 proton) parts per million downfield from tetramethylsilane; and

(h) a 90.5 MHz ^{13}C nuclear magnetic resonance spectrum in deuterochloroform solution showing principal signals at 214.97, 170.60, 164.40, 160.95, 151.97, 139.36, 135.62 134.90, 130.26 138.90, 122.69, 122.08, 120.03, 116.81, 81.55, 73.99, 62.61, 53.84, 47.96, 45.66, 40.82, 33.64, 33.56, 32.22, 26.61, 20.92, 18.67, 13.63, 13.58, 13.33, 12.39, and 12.32 parts per million downfield from tetramethylsilane.

4,918,101

TETRACYCLIC PHENANTHRO FURAN HETEROCYCLIC DERIVATIVES COMPOSITIONS AND USE

Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 128,638, Dec. 4, 1987, Pat. No. 4,797,495, which is a continuation-in-part of Ser. No. 673,356, Nov. 20, 1984, abandoned. This application Aug. 19, 1988, Ser. No. 234,252
Int. Cl.[4] A61K *31/34;* C07D *307/77*
U.S. Cl. 514—468 14 Claims

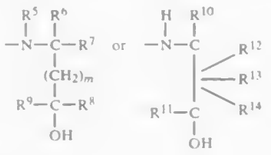
1. A compound of formula (I)

$$ArCH_2R^1 \quad (I)$$

and acid addition salts thereof; wherein

Ar is a fused tetrayclic aromatic phenanthro[9, 10-b] furan or phenanthro [9, 10-c] furan ring system optionally substituted by one or two substituents, the substituents will contain not more than four carbon atoms in total when taken together being the same or different and are selected from halogen; cyano; C_{1-4} alkyl or C_{1-4} alkoxy, each optionally substituted by hydroxy or C_{1-2} alkoxy; halogen substituted C_{1-2} alkyl or C_{1-2} alkoxy; a group $S(O)_nR^2$ wherein n is an integer 0, 1 or 2 and R^2 is C_{1-2} alkyl optionally substituted by hydroxy or C_{1-2} alkoxy; or the heterocyclic ring is optionally substituted by a group NR^3R^4 containing not more than carbon atoms wherein R^3 and R^4 are the same or different and each is a C_{1-3} alkyl group;

R^1 contains not more than eight carbon atoms and is a group



wherein

m is 0 or 1;

R^5 is hydrogen;

R^6 and R^7 are the same or different and each is hydrogen or C_{1-5} alkyl optionally substituted by hydroxy;

R^8 and R^9 are the same or different and each is hydrogen or C_{1-3} alkyl; —C—C— is a five- or six-membered saturated carbocyclic ring;

R^{10} is hydrogen, methyl or hydroxymethyl;

R^{11}, R^{12} and R^{13} are the same or different and each is hydrogen or methyl;

R^{14} is hydrogen, methyl, hydroxy, or hydroxymethyl.

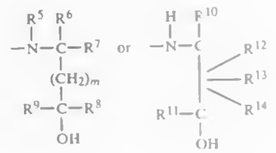
11. A pharmaceutical formulation containing a compound of formula (I)

$$ArCH_2R^1 \quad (I)$$

and acid addition salts thereof; wherein

Ar is a fused tetracyclic aromatic phenanthro [9, 10-b] furan or phenanthro [9,10-c] furan ring system optionally substituted by one or two substituents, the substituents will contain not more than four carbon atoms in total when taken together being the same or different and are selected from halogen; cyano; C_{1-4} alkyl or C_{1-4} alkoxy, each optionally substituted by hydroxy or C_{1-2} alkoxy; halogen substituted C_{1-2} alkyl or C_{1-2} alkoxy; a group $S(O)_nR^2$ wherein n is an integer 0, 1 or 2 and R^2 is C_{1-2} alkyl optionally substituted by hydroxy or C_{1-2} alkoxy; or the heterocyclic ring is optionally substituted by a group NR^3R^4 containing not more than 5 carbon atoms wherein R^3 and R^4 are the same or different and each is a C_{1-3} alkyl group;

R^1 contains not more than eight carbon atoms and is a group



wherein

m is 0 or 1;

R^5 is hydrogen;

R^6 and R^7 are the same or different and each is hydrogen or C_{1-5} alkyl optionally substituted by hydroxy;

R^8 and R^9 are the same or different and each is hydrogen or C_{1-3} alkyl; —C—C— is a five- or six-membered saturated carbocyclic ring;

R^{10} is hydrogen, methyl or hydroxymethyl;

R^{11}, R^{12} and R^{13} are the same or different and each is hydrogen or methyl;

R^{14} is hydrogen, methyl, hydroxy, or hydroxymethyl with a pharmaceutically acceptable carrier in the form of a tablet, capsule, syrup, or injection.

4,918,102

PREVENTION AND TREATMENT OF ALCOHOLISM BY THE USE OF DIETARY CHROMIUM

John P. Dobbins, 615 Allen Ave., San Marino, Calif. 91108

Filed Mar. 10, 1989, Ser. No. 321,780
Int. Cl.[4] A61K *33/24*
U.S. Cl. 514—505 6 Claims

1. The method of treating the disease of alcoholism which comprises the step of supplementing the diet with chromium in the form of chromium picolinate, by orally administering initially 1 milligram of chromium daily for at least 20 days in order to bring the blood glucose to normal or substantially normal level followed by administering a daily average amount between about 100 and 250 micrograms of said chromium in form of chromium picolinate.

4,918,103

LIQUID ORAL PHARMACEUTICAL COMPOSITIONS OF NON-STEROIDAL ANTI-INFLAMMATORY DRUGS

Moo K. Park, Fayetteville, N.Y., and Henry C. Caldwell, Wilmington, N.C., assignors to Formulations Development Labs, Wilmington, N.C.

Filed Jul. 25, 1988, Ser. No. 223,420
Int. Cl.[4] A61K *31/19, 31/255, 31/275, 47/00*
U.S. Cl. 514—520 14 Claims

1. A single phase, non-aqueous, liquid dosage unit pharmaceutical composition for oral administration comprising a therapeutic but nontoxic dose of a non-steroidal anti-inflammatory agent selected from the group consisting of a phenylacetic acid derivative, a indeneacetic acid derivative and a naphthaleneacetic acid derivative and an edible oil comprising an ester of glycerol or propylene glycol with 2 or 3 C_6–C_{12} fatty acids in the absence of ethanol.

4,918,104

METHOD AND COMPOSITION FOR INCREASING THE CONCENTRATION OF OMEGA-3 POLYUNSATURATED FATTY ACIDS IN POULTRY AND POULTRY EGGS AND POULTRY AND EGGS RESULTING THEREFROM

Howard S. Weiss, 45 Hillpark Ave., Great Neck, N.Y. 11021, and Carl S. Schwartz, R.D. 2192 Kirby La., Muttontown, N.Y. 11791

Filed Jun. 16, 1987, Ser. No. 62,890
Int. Cl.[4] A61K *31/20*
U.S. Cl. 514—560 7 Claims

1. A method of increasing the concentration of omega-3, polyunsaturated fatty acids in poultry which comprises administering to the poultry a poultry feed consisting essentially of a mixture of a conventional poultry feed and an amount of preformed omega-3, polyunsaturated fatty acid or a metabolic precursor thereof effective to increase the concentration of omega-3, polyunsaturated fatty acids in poultry which eat the feed, the metabolic precursor thereof being selected from the group consisting of linolenic acid, fish, menhaden oil, algae, and omega-3, polyunsaturated fatty acids having a carbon chain of less than about 18 carbons, so as to increase the concentration of omega-3, polyunsaturated fatty acids in the poultry

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4,918,105

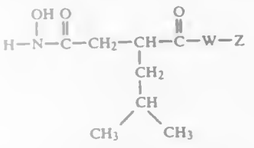
NOVEL COMPOUNDS WITH COLLAGENASE-INHIBITING ACTIVITY, A PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS IN WHICH THESE COMPOUNDS ARE PRESENT

Terence Cartwright, Saint Epain; Romaine Bouboutou-Tello, Arceuil; Yves Lelievre, Tours, and Marie-Claude Fournier-Zaluski, Paris, all of France, assignors to SA Laboratoire Roger Bellon, Neuilly-Sur-Seine, France

Filed Jan. 5, 1988, Ser. No. 141,072
Claims priority, application France, Jan. 6, 1987, 87 00053
Int. Cl.[4] C07C *93/10;* A61K *31/16, 31/185, 31/165*
U.S. Cl. 514—575 10 Claims

1. Compounds with collagenase-inhibiting activity, corresponding to the general formula:

(I)



in which:

W represents an amino acid residue selected from the group

consisting of valine, lysine, norleucine and methionine, and

Z represents an amino radical or an alkylamino radical of which the alkyl part, which contains 1 or 2 carbon atoms, is substituted by a phenyl or trifluorophenyl radical,

and also their diastereoisomers and their addition salts with pharmaceutically acceptable acids.

3. Compounds as claimed in claim 1, selected from the group comprising the following:

Nα-(N-hydroxy-2-isobutylsuccinamoyl)-L-valinamide,

N-benzyl-Nα-(N-hydroxy-2-isobutylsuccinamoyl)-L-valinamide

N-(4-trifluoromethylbenzyl)-Nα-(N-hydroxy-2-isobutylsuccinamoyl)-L-valinamide

N-phenethyl-Nα-(N-hydroxy-2-isobutylsuccinamoyl)-L-valinamide

N-benzyl-Nα-(N-hydroxy-2-isobutylsuccinamoyl)-L-norleucine and

N-benzyl-Nα-(N-hydroxy-2-isobutylsuccinamoyl)-L-lysinamide

N-benzyl-Nα-(N-hydroxy-2-isobutylsuccinamoyl)-L-methioninamide.

5. A pharmaceutical composition with collagenase-inhibiting activity, which contains at least a compound as claimed in one of claims 1 or 3 as the active ingredient, in association with a pharmaceutically acceptable, non-toxic vehicle or excipient.

6. A pharmaceutical composition according to claim 5, wherein the active ingredient is in the form of the most active isomer, as determined after separation of the distinct isomeric forms of the compound.

9. Method of treatment of diseases which involve excessive destruction of collagen by collagenase, wherein said method comprises administering a pharmaceutical composition according to claim 6.

4,918,106

N-(2-CHLORO-4-NITROPHENYL)-3-TRIFLUOROMETHYL-BENZENESULFONAMIDE DERIVATIVE AND AGRICULTURAL FUNGICIDE CONTAINING SAME

Takeo Yoshimoto, Yokohama; Mitsumasa Umemoto, Ohmuta; Keiichi Igarashi, Musashino; Yutaka Kubota, Yokobama; Hideo Yamazaki, Yokohama; Yuji Enomoto, Yokohama, and Hirobisa Yanagita, Chigasaki, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 831,543, Feb. 21, 1986, abandoned. This application Feb. 9, 1988, Ser. No. 154,010

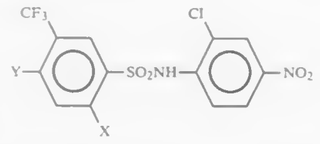
Claims priority, application Japan, Feb. 27, 1985, 60-36532; Mar. 1, 1985, 60-38793

The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.

Int. Cl.[4] A01N *41/04;* **C07C** *143/79*

U.S. Cl. 514—604 **8 Claims**

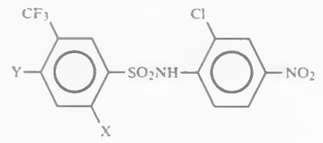
1. An N-(2-chloro-4-nitrophenyl)-3-trifluoromethyl-benzenesulfonamide derivative represented by the following formula (I):



(I)

wherein X is hydrogen or chlorine and Y is a hydrogen or chlorine.

5. An agricultural fungicide comprising (a), as an active ingredient, a fungicidally effective amount of an N-(2-chloro-4-nitrophenyl)-3-trifluoromethyl-benzenesulfonamide derivative represented by the following formula (I):



(I)

wherein X is hydrogen or chlorine and Y is hydrogen or chlorine, and (b) a carrier.

4,918,107

GLUTAMATE RECEPTOR INHIBITOR AND INSECTICIDAL COMPOSITION

Terumi Nakajima; Nobufumi Kawai; Koichi Shudo, all of Tokyo, and Tetsuo Shiba, Osaka, all of Japan, assignors to Tsumura & Co.; Tokyo Metropolitan Institute for Neurosciences, both of Tokyo and Takeda Chemical Industries, Ltd., Osaka, all of, Japan

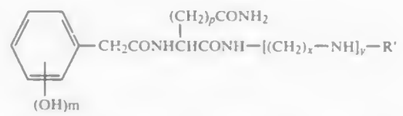
Filed Jun. 6, 1988, Ser. No. 202,491

Claims priority, application Japan, Jun. 10, 1987, 62-145666; Apr. 28, 1988, 63-107157

Int. Cl.[4] C07C *103/30;* **A01N** *37/18*

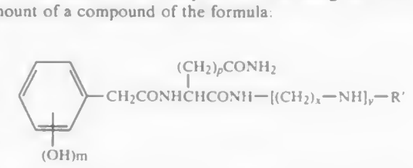
U.S. Cl. 514—616 **14 Claims**

1. A compound of the formula:



wherein R' is hydrogen atom of an alkyl containing 1 to 10 carbon atoms group, m is an integer of 1 to 3, p is an integer of 1 to 2, x is an integer of 2 to 6 and y is an integer of 1 to 3 or a salt thereof.

13. An insecticidal composition containing an effective amount of a compound of the formula:



wherein R' is hydrogen atom or an alkyl group containing 1to 10 carbon atoms, m is an integer of 1 to 3, p is 1 or 2, x is an integer of 2 to 6 and y is an integer of 1 to 3, or a salt thereof in the presence of a carrier.

4,918,108

METHOD OF IMPROVING THE ABSORPTION OF INJECTED ANTIBACTERIAL SUBSTANCES

Otto Kern; Franz Wilhelm, and Ernst Salamon, all of Ingelheim am Rhein, Fed. Rep. of Germany, assignors to Boehringer Ingelheim Vetmedica GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 825,785, Feb. 3, 1986, Pat. No. 4,705,803, which is a continuation of Ser. No. 471,299, Mar. 2, 1983, abandoned. This application Jun. 29, 1987, Ser. No. 68,036

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1982, 3209429

Int. Cl.[4] A61K *31/165, 31/135, 31/335*

U.S. Cl. 514—621 **1 Claim**

1. The method of increasing the absorption of a parenterally administered delayed-release oxytetracycline or delayed-release oxytetracycline hydrochloride in an animal host, which

comprises parenterally administering to said host (a) N-(2-amino-3,5-dibromo-benzyl)-N-methyl-cyclohexylamine or a non-toxic, pharmacologically acceptable acid addition salt thereof, and (b) an effective antibacterial amount of a delayed-release oxytetracycline or a delayed-release oxytetracycline hydrochloride.

4,918,110

COMPOSITIONS AND PROCESS FOR PRODUCING FOAM PLASTICS

Ching-Chi Kuo, Pleasanton; Mark Robertson, Fremont, and Kyu W. Lee, Danville, all of Calif., assignors to Hexcel Corporation, San Francisco, Calif.

Filed Sep. 12, 1988, Ser. No. 243,383

Int. Cl.[4] C08J *9/10, 9/12*

U.S. Cl. 521—82 **9 Claims**

1. A method for the formation of a foamable resin, said method consisting essentially of copolymerizing:

(a) a member selected from the group consisting of acrylic acid and methacrylic acid, and

(b) a member selected from the group consisting of acrylonitrile and methacrylonitrile,

with (c) acrylamide in an amount ranging from about 5 to about 20 parts by weight per 100 parts by weight of components (a) and (b) combined, in the presence of (d) at least one member selected from the group consisting of water, a urea and a formamide, in relative amounts such that said acrylamide combined with any water, urea and formamide used comprise at least about 24 parts by weight per 100 parts by weight of components (a) and (b) combined.

4,918,111

COMPOSITION FOR NON-CROSSLINKED FOAM

Haruhiko Tanaka, Ohtake; Fukashi Kagawa, Yamaguchi, and Kouji Nakashima, Hiroshima, all of Japan, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 158,487, Feb. 22, 1988, Pat. No. 4,791,143. This application Aug. 15, 1988, Ser. No. 232,736

Claims priority, application Japan, Feb. 28, 1987, 62-44056

Int. Cl.[4] C08J *9/6, 9/12*

U.S. Cl. 521—89 **16 Claims**

1. An expandable composition for non-crosslinked foam comprising:

(a) 80 to 99% by weight of a 1-butene copolymer,

(b) 20 to 1% by weight of an ethylene polymer containing at least 90 mole% of polymerized units of ethylene, and

(c) a blowing agent,

the percentages being based on the total weight of the 1-butene copolymer and the ethylene polymer wherein the 1-butene copolymer is composed of at least 70 mole% of polymerized units of 1-butene and not more than 30 mole% of polymerized units of an alpha-olefin having 2 to 20 carbon atoms other than 1-butene.

4,918,112

ADHESIVE FOAMS

Guillaume J. Roox, Antwerp, Belgium, assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Nov. 9, 1988, Ser. No. 269,214

Claims priority, application United Kingdom, Nov. 9, 1987, 8726201

Int. Cl.[4] C08J *9/00;* **B32B** *3/26*

U.S. Cl. 521—134 **7 Claims**

1. A polymeric foam comprising a foamed mixture of polymeric components (a) and (b) in a ratio by weight of from 5:95 to 95:5, (a) being a foamable olefinic substantially non-aromatic homo- or co-polymer devoid of polar units having a melt index of 0.1 to 250 g/10 minutes and (b) being a foamable olefin-unsaturated carboxylic acid copolymer, the said foamed mixture comprising at least 3 weight percent of polymer units derived from the unsaturated carboxylic acid.

4,918,113

PRODUCTION OF PLASTIC FOAM MATERIAL

Otello U. Titti; Patrick P. Cesta, both of Mississauga; Alan G. Wheeler, Oakville, and John C. Collins, Burlington, all of Canada, assignors to Valvoline Oil & Chemicals Ltd., Mississauga, Canada

Filed Jun. 28, 1988, Ser. No. 212,646

Int. Cl.[4] C08L *67/00*

U.S. Cl. 521—138 **10 Claims**

1. A process for producing an unsaturated polyester resin solution suitable for reaction with a catalyst, water, a gas releasing salt and a gas-release control agent to produce plastic foam material, the process comprising providing an initial unsaturated polyester resin solution with a predetermined relatively low acid value, and mixing said initial unsaturated resin solution with a half-ester to raise the acid value to a predetermined high value, said half-ester being the result of a reaction between a first compound selected from the group consisting of alcohols and glycols and a second compound selected from the group consisting of organic dibasic acids and anhydrides where only one replaceable hydrogen site of the second compound is reacted with the first compound, the other site being unreacted.

4,918,114

TELECHELIC VINYL RESIN OF LOW MOLECULAR WEIGHT HAVING ALKOXYSILYL GROUP AND PROCESS FOR PREPARATION THEREOF

Akira Kuriyama, Higashiosaka, and Hiromu Okamoto, Otsu, both of Japan, assignors to Sunstar Giken Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP88/00311, § 371 Date Nov. 30, 1988, § 102(e) Date Nov. 30, 1988, PCT Pub. No. WO88/07554, PCT Pub. Date Oct. 6, 1988

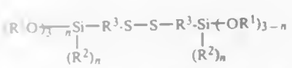
PCT Filed Mar. 29, 1988, Ser. No. 283,599

Claims priority, application Japan, Mar. 31, 1987, 62-80109

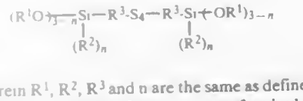
Int. Cl.[4] C08F *4/00, 2/46*

U.S. Cl. 522—27 **3 Claims**

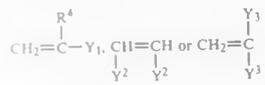
1. A process for preparing vinyl resin of a low molecular weight having alkoxysilylalkyl thioether groups at both terminal, which comprises subjecting (a) 1 to 20 parts by weight of one or more of a disulfide compound represented by the formula



wherein R^1 and R^2 are the same or different and are each an alkyl having 1 to 4 carbon atoms, R^3 is an alkylene having 1 to 4 carbon atoms, and n is an integer of 0 to 2, (b) 0.01 to 1 part by weight of one or more of a tetrasulfide compound represented by the formula:



wherein R^1, R^2, R^3 and n are the same as defined above, and (c) 100 parts by weight of one or more of a vinyl monomer represented by the formula:



wherein R^4 is hydrogen atom or methyl, Y^1 is a carboxyalkyl (or phenylalkyl or cycloalkyl) ester group, phenyl or a halogen atom, Y^2 is a carboxyalkyl ester group having 2 to 6 carbon

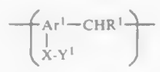
atoms or a halogen atom and Y^3 is fluorine atom or chlorine atom to photopolymerization reaction.

4,918,115
AROMATIC OLIGOMERS

Michael E. B. Jones, Chester, and John G. Carey, Warrington, both of England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 733,920, May 14, 1985, Pat. No. 4,743,663.
This application Feb. 5, 1988, Ser. No. 152,872
Claims priority, application United Kingdom, May 14, 1984, 8412264; Jan. 28, 1985, 8502040
Int. Cl.[4] A61K *5/01;* C09K *3/00;* C08K *6/08;* C08F *2/50*
U.S. Cl. 522—144 10 Claims

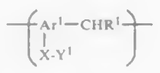
1. A composition which comprises:
(i) an oligomer which
(a) comprises on average at least one in-chain residue of the general formula



and;
(b) has one or more pendant and/or terminal acyloxymethyl groups,
wherein Ar^1 is an aromatic group or a substituted aromatic group,
R^1 is hydrogen or a hydrocarbyl group;
X is a group which activates Ar^1 to electrophilic attack,
Y^1 is an organic residue bearing a carboxyl substituent, and
the acyloxy group in the one or more pendant and/or terminal acyloxymethyl groups is derived from a polymerizable olefinically unsaturated carboxylic acid; and
(ii) a particulate filler.

5. The composition as claimed in claim 1 further comprising a photo-initiator system which is sensitive to visible light.

9 A method for treating a cavity in a tooth which method comprises at least the steps of:
(i) applying to the surface of a cavity in a tooth a layer of a dental adhesive comprising a photo-initiator system which is sensitive to visible light and an oligomer, which oligomer
(a) comprises on average at least one in-chain residue of the general formula



and;
(b) has one or more pendant and/or terminal acyloxymethyl groups;
wherein Ar^1 is an aromatic group or a substituted aromatic group;
R^1 is hydrogen or a hydrocarbyl group;
X is a group which activates Ar^1 to electrophilic attack;
Y^1 is an organic residue bearing a carboxyl substituent; and
the acyloxy group in the one or more pendant and/or terminal acyloxymethyl groups is derived from a polymerizable olefinically unsaturated carboxylic acid; and
(ii) exposing the layer to visible light of an appropriate wavelength under conditions and for a time such that curing of the oligomer is effected.

4,918,116
HIGH TEMPERATURE RESISTANT MOLDING MATERIALS

Arno Gardziella, Witten-Rudinghausen; Karl-Heinz Schwieger, Iserlohn; Peter Adolphs, Menden-Halingen, and Josef Suren, Wunnenberg-Haaren, all of Fed. Rep. of Germany, assignors to Rutgerswerke AG, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 054,605, May 27, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 312,884
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1986, 3619541; Feb. 20, 1987, 3705540
Int. Cl.[4] C08J *5/14;* C08L *61/00*
U.S. Cl. 523—149 9 Claims

1. In a high-temperature resistance molding material containing customary filler and additive materials and a carbon forming bonding agent, the improvement comprising using as the carbon forming bonding agent a phenol-novolac with a phenolformaldehyde molar ratio of 1:0.2 to 1:035.

4,918,117
POLYBUTADIYNE COATED CARBON FIBER REINFORCED POLYMER COMPOSITES

Arthur Snow, Alexandria, Va., and James P. Armistead, College Park, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 12, 1988, Ser. No. 256,433
Int. Cl.[4] C08K *9/00;* B32B *9/00;* D02G *3/00*
U.S. Cl. 523—215 10 Claims

1. A carbon fiber having a closely adherent coating of thermally polymerized polybutadiyne homopolymer.

4,918,118
PROCESS FOR IMPROVING PROPERTIES OF SYNTHETIC RESIN POWDER

Atsushi Kawakatsu, Takasago, and Ryuichi Takagi, Akashi, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 11, 1988, Ser. No. 179,782
Claims priority, application Japan, Apr. 13, 1987, 62-90077
Int. Cl.[4] C08J *3/20;* C08K *5/00;* C08L *51/04*
U.S. Cl. 523—334 6 Claims

1. A process for preparing a powdery synthetic resin which comprises: subjecting a latex of a graft-copolymer, having a rubber back bone, to coagulation,
heat treating the coagulated graft-copolymer,
adding a lubricant to the coagulated graft-copolymer in an amount of 0.01 to 10 parts by weight based on 100 parts by weight of said graft-copolymer before or after heat treatment, and then
removing water from the resulting mixture, thereby forming the mixture into a dried powder.

4,918,119
ADHESIVE CONTAINING ISOCYANATE-TERMINATED POLYURETHANE PREPOLYMER AND EPOXY RESIN

Hans-Guenter Seltmann, Duesseldorf; Hans-Josef Hoffmann, Kempen, and Hartmut Lippert, Monheim, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Filed Aug. 10, 1988, Ser. No. 230,639
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1987, 3726555
Int. Cl.[4] C08K *5/16;* C08L *63/02*
U.S. Cl. 523—461 17 Claims

1. An adhesive composition comprising:
(a) at least one isocyanate terminated polyurethane prepolymer, said prepolymer consisting essentially of the reaction product of a diisocyanate component selected from the group consisting of diphenylmethane diisocyanate, hydrogenated diphenylmethane diisocyanate, tolyene diisocyanate, hexamethylene diisocyanate, and mixtures thereof with a mixture of difunctional polyols, one of said polyols having a number average molecular weight of from about 400 up to 1000, and another of said polyols having a number average molecular weight of from more than 1000 up to about 4000;
(b) at least one aromatic dinitroso compound present in an amount sufficient to promote adhesion of the composition to an elastomeric substrate;
(c) at least one epoxy resin having an epoxide value of from about 0.45 to about 0.75 and a hydroxide value of less than about 0.01; and
(d) at least one alkyl benzene having the formula $C_6H_5—C_nH_{2n+1}$, where n is an integer having a value of 8 to 16,
said adhesive composition being essentially free of catalysts which catalyze the reaction of NCO groups with epoxy groups to form oxazolidone groups.

4,918,120
LOW STYRENE EMISSION UNSATURATED POLYESTER RESINS

Douglas G. Vanderlaan, and Wolfgang C. Forster, both of Jacksonville, Fla., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Filed Feb. 3, 1988, Ser. No. 151,836
Int. Cl.[4] C08K *5/01, 5/10;* C08L *67/06*
U.S. Cl. 523—465 14 Claims

1. A dicyclopentadiene resin composition having reduced styrene monomer emissions, while maintaining good interlaminate adhesion, comprising the following components in % by weight of the total resin composition:
(a) about 0.001 to 1.0% by weight of a paraffin having a melting point of about 40° to 80° C.;
(b) about 0.001 to 3.0% by weight of an interlaminate bonding promoter comprising the reaction product of
(i) a saturated or unsaturated fatty acid containing about 5 to 30 carbon atoms,
(ii) a mono- or diepoxy compound, wherein said reaction occurs at about 90° to 200° C., and wherein the relative amounts of fatty acid to epoxy vary in a molar ratio of fatty acid to epoxy functionality of about 0.5:1.0 to 2.0:1.0, respectively, and wherein the weight ratio of interlaminate bonding promoter to the paraffin is about 5:1 to 1:5;
(c) about 0.0 to 10% by weight of alpha-methyl styrene.
(d) about 0.0 to 1.0% by weight of a copper salt.
(e) the remainder comprising styrene and an unsaturated polyester resin made with dicyclopentadiene, and wherein said composition results in styrene emission rates of 60 grams/square meter or less measured one hour after gelation, and retains at least 80% to 90% of the interlaminate adhesion properties of an unmodified resin.

4,918,121
CURABLE ORGANOPOLYSILOXANE COMPOSITIONS COMPRISING A HYDROGEL HARDENING AGENT

Pierre-Michel Peccoux, Lyons, and Gilbert Schorsch, Colombes, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Oct. 20, 1988, Ser. No. 260,015
Claims priority, application France, Oct. 20, 1987, 87 14749
Int. Cl.[4] C08L *89/00*
U.S. Cl. 524—27 17 Claims

1. An organopolysiloxane composition curable into elastomeric state in a confined atmosphere, comprising.
(A) 100 parts of an α,ω-di(hydroxy)diorganopolysiloxane polymer having a viscosity of 700 to 1,000,000 mPa.s at 25° C., each comprising recurring diorganosiloxy units of the formula R_2SiO, in which the symbols R, which may be identical or different, are each a hydrocarbon radical containing from 1 to 8 carbon atoms, or a substituted such radical bearing one or more halogen atom or cyano substituents;
(B) 2 to 20 parts of a crosslinking agent having the general formula:

$$R_pSi(OCOR')_{4-p}$$

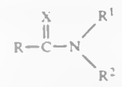
in which the symbol R is as defined above under (A), the symbol R' is a hydrocarbon radical devoid of aliphatic unsaturation, containing from 1 to 15 carbon atoms, and the symbol p represents 0 to 1;
(C) 0 to 150 parts of inorganic fillers; and
(D) 0.01 to 10 parts, per 100 parts of (A)+(B)+(C), of a hydrogel comprising one part of a colloid of natural or synthetic origin and at least five parts of water.

4,918,122
FLAME RETARDANT COMPOSITIONS

Richard J. Dellar, Timperley; Norman Richardson, deceased, late of Middleton (by Joyce Richardson, heir), and Brian G. Clubley, Wilmslow, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

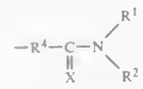
Filed Jul. 15, 1987, Ser. No. 73,787
Claims priority, application United Kingdom, Jul. 22, 1986, 8617861
Int. Cl.[4] C08K *5/34*
U.S. Cl. 524—95 12 Claims

1. A composition comprising an epoxy resin, phenol-formaldehyde resin, urea-formaldehyde resin, unsaturated-polyester resin or polyvinyl acetate latex having incorporated therein an effective flame retardant amount of a salt formed by the reaction between dimethyl methyl phosphonate, monomethyl methyl phosphonate or methyl phosphonic acid and a compound of the general formula (I)



(I)

in which X is O or S; R^1 is H, alkyl with 1 to 4 carbon atoms, alkenyl of up to 4 carbon atoms, CN, $CONH_2$ or NH_2, R^2 is H, alkyl with 1 to 4 carbon atoms or alkenyl of up to 4 carbon atoms or R^1 and R^2 together with the nitrogen atom to which they are attached form a heterocyclic ring of up to 6 carbon atoms which may optionally contain another nitrogen or an oxygen atom and R is H, an alkyl group with 1 to 8 carbon atoms, an aryl group with 6 to 10 carbon atoms, a cycloalkyl group with 5 to 12 carbon atoms or a heterocyclic group with up to 9 ring carbon atoms selected from the group consisting of pyridine, morpholine, piperidine, indole and quinoline, or, together with R^1 forms an alkylene chain of 3 to 10 carbon atoms, or R is a group NHR^3 wherein R^3 is H, alkyl with 1 to 4 carbon atoms, alkenyl of up to 4 carbon atoms, CN, $CONH_2$, or NH_2 together with R^1 forms an alkylene chain of 2 or 3 carbon atoms, or R is a group



where R^1, R^2 and X are as defined above and R^4 is a direct bond or an alkylene group having up to 8 carbon atoms or is an arylene group having 6 to 10 carbon atoms.

4,918,123

INVERSE EMULSION PROCESS FOR PREPARING HYDROPHOBE-CONTAINING POLYMERS

Henry W. Yang, Kingwood, and Thomas J. Pacansky, Houston, both of Tex., assignors to Exxon Chemical Patents, Inc., Linden, N.J.

Filed May 17, 1988, Ser. No. 194,800
Int. Cl.[4] C08L 5/10, 33/14, 39/00
U.S. Cl. 524—110 24 Claims

1 A process for preparing a polymeric water-in-oil emulsion of a copolymer of a water-soluble monomer and a water-insoluble oil-soluble monomer which comprises:

(i) forming a uniform aqueous solution of the water soluble monomer and the water-insoluble, oil-soluble monomer, said water-insoluble, oil-soluble monomer being solubilized by pre-dissolving it in a water-miscible, oil-immiscible organic solvent or by heating the water-insoluble, oil-soluble monomer in the presence of at least a portion of the water-soluble monomer and water,

(ii) forming an oil solution of an inert hydrophobic liquid oil, a surfactant having an HLB value of about 1 to about 5, and oil-soluble, water-insoluble linear ABA block copolymer perpared by reacting condensed 12-hydroxystearic acid with polyethylene oxide, said surfactant and block copolymer being present in sufficient amount to stabilize the emulsion during polymerization;

(iii) homogenizing the aqueous solution and the oil solution to form a water-in-oil emulsion;

(iv) deaerating the emulsion;

(v) incorporating a sufficient amount of a water-soluble, oil-insoluble free radical initiator to effect polymerization; and

(vi) polymerizing the monomers for a sufficient period of time and at a sufficient temperature to produce a high molecular weight copolymer in the aqueous phase of the water-in-oil emulsion.

6. The process of claim 1 wherein the surfactant is a sorbitan ester

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4,918,124

NOVEL COMPOSITION SUITABLE AS STABILIZERS FOR POLYMERS

Herbert Eichenauer, Dormagen; Alfred Pischtschan, Kuerten-Eichhof, and Karl-Heinz Ott, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 17, 1986, Ser. No. 931,429
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1985, 3542468
Int. Cl.[4] C08K 5/13
U.S. Cl. 524—151 7 Claims

1. Stabilizer composition comprising

(A) 20–80 parts by weight of a sulphur-containing polymer from styrene, a-methylstyrene, p-methylstyrene, vinyltoluene, acrylonitrile, methyl methacrlyate, or mixtures thereof, having a limiting viscosity of 2–15 ml/g (measured in demthylformamin at 25° C.) and a sulphur content o 1.15–3.95% by weight, at least 90% by weight of the incorporated sulphur being present as a component of terminal C_{1-18}thioalkyl groups,

(B) 80–20 parts by weight of a phenolic antioxidant.

4,918,125

FLAME RETARDANT CARBONATE POLYMER BLENDS

Omar M. Boutni, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 27, 1988, Ser. No. 289,935
Int. Cl.[4] C08K 5/42
U.S. Cl. 524—165 4 Claims

1. A flame retardant low-gloss thermoplastic blend, which, without the addition of polytetrafluoroethylene, exhibits no flaming drip in the UL-94 flammability test, which comprises:

(a) an aromatic polycarbonate, present in the range of about 70% to about 90%;

(b) an ABS copolymer having at least 34% rubber content and made by emulsion polymerization, said ABS copolymer being present in the range of about 10% to about 30%;

(c) a tetrabromobisphenol A polycarbonate in the range of about 5 phr to about 15 phr; and

(d) a perfluoroalkylsulfonate salt of an alkali metal in the range of about 0.2 phr to about 2 phr.

4,918,126

SILICONE RUBBER ADHESIVE FILMS WITH IMPROVED ADHESION

Takao Matsushita, and Kanzuo Hirai, both of Chiba Prefecture, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Jan. 23, 1989, Ser. No. 299,297
Claims priority, application Japan, Feb. 1, 1988, 63-21721
Int. Cl.[4] C08K 5/54
U.S. Cl. 524—188 14 Claims

1. A silicone rubber adhesive film prepared from a silicone rubber composition which has as its principal components

(A) 100 parts by weight organopolysiloxane gum having the average unit formula

$$R_nSiO_{(4-n)/2}$$

in the formula, R is a substituted or unsubstituted monovalent hydrocarbon group and n=1.9 to 2.1,

(B) 30 to 150 parts by weight wet-method hydrophobic reinforcing silica having a specific surface area of at least 200 m^2/g and composed of SiO_2 units and organosiloxane units selected from the group comprising $R_3SiO_{\frac{1}{2}}$ units, R_2SiO units, $RSiO_{3/2}$ units, and mixtures thereof, where each R in the formulas is defined as above, with the proviso that the organosiloxane unit to SiO_2 unit molar ration is 0.08 to 2.0,

(C) curing agent, in a quantity sufficient to cure the composition of the present invention, and

(D) 0.1 to 10 parts by weight organoalkoxysilane or the partial hydrolysis condensate of such an organoalkoxysilane having at least one functional group selected from the group consisting of mercapto group, amino group, alkenyl group, methacryloxy group, and acryloxy group,

wherein the tensile strength at break of said silicone rubber composition when uncured is in the range of 1.5 kg/cm^2 to 5.0 kg/cm^2 at 25 degrees Centigrade.

4,918,127

FILLED ELASTOMER BLENDS

Ashok M. Adur, Hackettstown, N.J., and Charles D. Shedd, Sugar Land, Tex., assignors to BP Performance Polymers, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 947,994, Dec. 31, 1986, abandoned. This application Feb. 23, 1989, Ser. No. 317,044
Int. Cl.[4] C08K 3/32, 3/10, 3/34, 3/00
U.S. Cl. 524—415 18 Claims

1. A halogen-free elastomer composition with thermoplastic processability, consisting essentially of:

(a) a flame retardant halogen-free inorganic filler greater than 50 weight % of the total composition,

(b) at least two elastomers selected from the group consisting of ethylene-propylene copolymers and terpolymers, polyamides, polyesters, polyisobutylene, polyurethanes, acrylic polymers, natural rubber, polybutadiene and polyisoprene, wherein the total elastomer content is less than 50 weight % of the total composition; and wherein said elastomer composition has the following properties:

(i) tensile strength greater than 1000 psi;

(ii) tear strength greater than 30 lbs/inch;

(iii) elastic modulus of about 10,000 psi at room temperature when measured in the uncrosslinked state;

(iv) smoke optical density less than 160;

(v) total hazardous gas content consisting essentially of HCN, oxides of nitrogen, H_2S, HCl, HBr, HF and total hydrocarbons less than 100 parts per million in the flaming mode and 30 parts per million in the non-flaming mode;

(vi) total carbon monoxide content less than 1000 parts per million in the flaming mode and 30 parts per million in the non-flaming mode;

(vii) processing temperature of about 320° to 420° F

4,918,128

PRESSURE-SENSITIVE ADHESIVE

Tsutomu Sakai, Hachioji, Japan, assignor to Toppan Moore Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 290,237
Claims priority, application Japan, Dec. 25, 1987, 62-328969
Int. Cl.[4] C08F 253/00; C08L 7/02
U.S. Cl. 524—450 5 Claims

1. A pressure-sensitive adhesive which comprises in admixture:

(a) natural rubber graft copolymerized with styrene and methyl methacrylate in the form of a latex; and

(b) a finely divided hard particulate matter having no thermoplasticity dispersed in the latex.

3. The pressure-sensitive adhesive as claimed in claim 1 wherein the finely divided particulate material having no thermoplasticity is a silica gel powder or a zeolite powder

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4,918,129

PROCESS FOR THE PRODUCTION OF AQUEOUS POLYMER DISPERSIONS, THE DISPERSIONS OBTAINABLE BY THIS PROCESS AND THEIR USE FOR THE PRODUCTION OF COATINGS

Joachim Probst, Leverkusen; Josef Pedain, Cologne; Bruno Bömer, Bergisch Gladbach; Adolf Schmidt, and Wolfhart Wieczorrek, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 13, 1989, Ser. No. 309,815
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1988, 3806066
Int. Cl.[4] C08L 75/00
U.S. Cl. 524—457 5 Claims

1. A process for the production of aqueous dispersions of polymers by polymerization of olefinically unsaturated monomers in aqueous medium in the presence of radical formers and hydrophilically modified, urethane-group-containing emulsifiers having an average molecular weight below 30,000

wherein the urethane-group-containing emulsifiers are oligourethanes having a branched molecular structure which

(i) are produced from the reaction of (a) organic polyisocyanates, (b) organic compounds containing isocyanate-reactive groups and (c) organic compounds containing hydrophilic groups or functional groups which are converted into hydrophilic groups by neutralization or quaternization after the isocyanate polyaddition reaction wherein the compounds (c) are monofunctional or a mixture of monofunctional are difunctional compounds relative to the isocyanate addition reaction, with the molar ratio in said mixture of monofunctional hydrophilic reactants to the corresponding difunctional reactants being at least 2:1, and which

(ii) have a content of chemically incorporated hydrophilic groups sufficient to impart to the oligourethane solubility or dispersibility in water, with the proviso that, on a statistical average at least 2.2 terminally incorporated hydrophilic groups are present per molecule

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4,918,130

ERASER

Yosimi Kano; Koji Seki, and Ryoichi Seki, all of Saitama, Japan, assignors to Buncho Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 55,853, Jun. 1, 1987, abandoned. This application Dec. 9, 1988, Ser. No. 282,062
Claims priority, application Japan, Feb. 10, 1987, 62-28746
Int. Cl.[4] C08K 3/00; C08L 23/06, 23/12, 53/02
U.S. Cl. 524—499 7 Claims

1 An eraser comprising 15 to 40% by weight of a styrene thermoplastic elastomer as a matrix with 1 to 30 % by weight of a hydrocarbon resin which is a thermoplastic resin polymerized from chain hydrocarbon components or cyclic hydrocarbon components contained in petroleum, natural gas, natural rubbers or terpene oils and a polyolefin selected from the group consisting of polyethylene and polypropylene in a weight ratio of polyolefin to hydrocarbon resin of from 3/1 to ⅓ and from 25 to 60% by weight of an inorganic filler, said hydrocarbon resin, polyolefin and inorganic filler being contained in the matrix.

4,918,131

AQUEOUS SILICONE DISPERSIONS

Norbert Gamon, Seevetal, and Karl Braunsperger, Burghausen, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 10, 1988, Ser. No. 230,543
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1987, 3727180
Int. Cl.[4] C08L 83/06
U.S. Cl. 524—500 10 Claims

1 Aqueous silicone dispersions consisting essentially of (a) polydiorganosiloxanes having the formula

$$HO-(SiR_2O)_n-H$$

where R is selected from the group consisting of hydrocarbon radicals having from 1 to 18 carbon atoms, hydrocarbon radicals substituted with radicals selected from the group consisting of halogen atoms, amino radicals, ether radicals, ester radicals, epoxy radicals, mercapto radicals and cyano radicals and (poly)glycol radicals and n is an integer having a value of at least 200, and wherein said polydiorganosiloxane has a vicosity greater than 1000 mPa.s at 25? C., (b) an organometallic condensation catalyst, (c) a high-molecular-weight, toluene-insoluble silicone resin having a mean particle size of at least 200 nm and having the formula

$$R_xSiO_{\frac{4-x}{2}}$$

where R is the same as above and x is a number having an average value of from 0.5 to 1.6 and (d) siliconates up to a maximum of 100 ppm by weight based upon the sum of the weights of polyorganosiloxanes (a), organometallic catalyst (b) and silicone resin (c).

4,918,132

THERMOPLASTIC POLYESTER RESIN COMPOSITION

Masafumi Hongo, Hatsukaichi; Hideyuki Shigemitsu, Otake; Naoki Yamamoto, Hiroshima, and Akira Yanagase, Otake, all of Japan, assignors to Mitsubishi Rayon Company Limited, Tokyo, Japan

Filed Sep. 20, 1988, Ser. No. 246,752
Claims priority, application Japan, Sep. 21, 1987, 62-236830
Int. Cl.[4] C08L 83/04, 67/02
U.S. Cl. 524—504 5 Claims

1. A thermoplastic polyester resin composition comprising:

(1) from 10 to 80% by weight of a thermoplastic polyester (A), composed mainly of an aromatic dicarboxylic acid having from 8 to 22 carbon atoms and alkylene glycol,

cycloalkylene glycol or aralykylene glycol having from 2 to 22 carbon atoms;

(2) from 5 to 55% by weight of a compound rubber graft copolymer (B) having at least one vinyl monomer graft-polymerized onto a compound rubber composed of from 10 to 90% by weight of a polyorganosiloxane rubber and from 10 to 90% by weight of a polyalkyl (meth)acrylate rubber in a total amount of 100% by weight in an inseparably interlocking fashion and having an average particle size of from 0.08 to 0.6 μm;

(3) from 5 to 70% by weight of a thermoplastic polyester elastomer (C), obtained from block copolymerization of an aromatic crystalline polyester as a hard segment component and an aliphatic polyester or polyether as a soft segment component; and

(4) from 0 to 60% by weight of a filler (D), with the total amount of components (A) to (D) being 100% by weight.

4,918,133

CYCLOOLEFIN TYPE RANDOM COPOLYMER COMPOSITIONS

Satoru Moriya; Akio Ishimoto; Yoshinori Akana; Yozo Yamamoto; Kotaro Kishimura, and Fumitoshi Ikejiri, all of Kuga, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP88/01027, § 371 Date Jun. 7, 1989, § 102(e) Date Jun. 7, 1989, PCT Pub. No. WO89/03413, PCT Pub. Date Apr. 20, 1989

PCT Filed Oct. 7, 1988, Ser. No. 363,884

Claims priority, application Japan, Oct. 8, 1987, 62-254007; Dec. 18, 1987, 62-322609; Dec. 18, 1987, 62-322610; Dec. 18, 1987, 62-322611; Apr. 6, 1988, 63-86049; Apr. 6, 1988, 63-86050; Jul. 20, 1988, 63-181401; Jul. 20, 1988, 63-181402; Jul. 20, 1988, 63-181403; Jul. 20, 1988, 63-181404; Jul. 20, 1988, 63-181405

Int. Cl.[4] C08L *23/16, 23/08, 53/02, 45/00*

U.S. Cl. 524—518 **10 Claims**

1. A cycloolefin type random copolymer composition characterized by comprising

(A) a cycloolefin type random copolymer containing an ethylene component and a cycloolefin component represented by the following general formula [I] or [II] and having an intrinsic viscosity [η] of 0.05–10 dl/g as measured at 135° C. in decalin and a softening temperature (TMA) of not lower than 70° C., and

(B) one or more non-rigid copolymers selected from the group consisting of:

(i) a cycloolefin type random copolymer containing an ethylene component, at least one other α-olefin component and a cycloolefin component represented by the following general formula [I] or [II] and having an intrinsic viscosity [η] of 0.01–10 dl/g as measured at 135° C. in decalin and a softening temperature (TMA) of below 70° C.,

(ii) a non-crystalline to low crystalline α-olefin type elastomeric copolymer formed from at least two α-olefins,

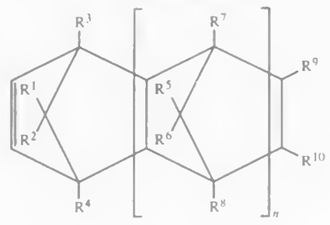
(iii) an α-olefin-diene type elastomeric copolymer formed from at least two α-olefins and at least one non-conjugated diene, and

(iv) an aromatic vinyl type hydrocarbon-conjugated diene copolymer or a hydrogenated product thereof,

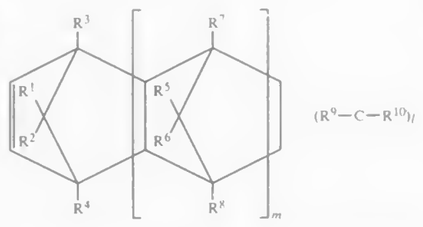
in such a proportion that the total amount of the component (B) is 5 to 100 parts by weight based on 100 parts by weight of the component (A).

General formula

[I]



[II]



wherein n and m are each 0 or a positive integer, l is an integer of at least 3, and R^1 to R^{10} each represents hydrogen atom, halogen atom or hydrocarbon group.

4,918,134

PROCESS FOR PARTIALLY CURING POLYARYLENE SULFIDES

Toshikazu Kato; Hiroshi Inoue, and Noriaki Emura, all of Yokkaichi, Japan, assignors to Tosoh Corporation, Yamguchi and Toso Susteel Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 125,417, Nov. 25, 1987, abandoned. This application Mar. 3, 1989, Ser. No. 318,797

Claims priority, application Japan, Nov. 27, 1986, 61-280894

Int. Cl.[4] C08K *3/36*

U.S. Cl. 524—609 **5 Claims**

1. A process for preparing a partially cured powdery polyarylene sulfide resin prior to molding said resin or applying said resin to a substrate, which comprises the steps of adding to a powdery, uncured virgin polyarylene sulfide resin at least one additive selected from the group consisting of non-hydrophobic silica and hydrophobic silica and mixtures thereof in a proportion of 0.05–0.6 parts by weight per 100 parts by weight of the resin and then heating and mixing the resin at temperatures in the range of a temperature just below the melting point of the resin down to a temperature lower by 80° C. than said melting point so as to partially cure the resin and increase the melt viscosity thereof to a level suitable for use in molding.

4,918,135

PROCESS FOR THE PREPARATION OF AQUEOUS POLYMER DISPERSIONS THE DISPERSIONS OBTAINED BY THE PROCESS AND THEIR USE FOR THE PRODUCTION OF COATINGS

Joachim Probst, Leverkusen; Walter Schäfer, Leichlingen; Klaus Schuster, Leverkusen; Heinrich Alberts, Odenthal; Hanns P. Müller, Bergisch-Gladbach; Adolf Schmidt, and Wolfhart Wieczorrek, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 10, 1989, Ser. No. 335,816

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1988, 3813840

Int. Cl.[4] C08K *5/16*

U.S. Cl. 524—714 **4 Claims**

1. In an improved process for the preparation of aqueous dispersions of polymers by polymerization of olefinically unsaturated monomers in an aqueous medium in the presence of radical formers and emulsifiers, the improvement comprises said emulsifiers being polyisocyanate addition products having a molecular weight below 20,000 and containing from 5 to 1000 milliequivalents of anionic structures corresponding to the following formula

incorporated therein per 100 g of solids content

4,918,136

ADHESIVE COMPOSITION

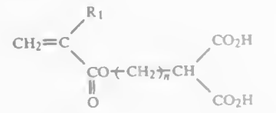
Toshio Kawaguchi, Fujisawa; Shigeri Shibuya, Sagamihara, and Koshi Kusumoto, Kamakura, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Filed Mar. 22, 1989, Ser. No. 327,021

Int. Cl.[4] C08K *5/15*

U.S. Cl. 524—751 **15 Claims**

1. An adhesive composition comprising (a) 100 parts by weight of a monomer mixture comprising a vinyl monomer having an acidic group in the molecule represented by the following formula:



wherein R_1 stands for a hydrogen atom or a methyl group, and n is a number of from 4 to 12,

and a vinyl monomer copolymerizable with said vinyl monomer, (b) 10 to 500 parts by weight of a filler, (c) 0.01 to 10 parts by weight of a polymerization initiator and (d) 0.01 to 100 parts by weight of ascorbic acid or a derivative thereof.

4,918,138

PROCESS FOR PRODUCING A COLORED MOLDED ARTICLE OF METATHESIS POLYMERIZED POLYMER

Shigeyoshi Hara; Zen-ichiro Endo, and Umewaka Nakatani, all of Yamaguchi, Japan, assignors to Hercules Incorporated, Wilmington, Del.

Filed Feb. 15, 1989, Ser. No. 310,578

Claims priority, application Japan, Feb. 15, 1988, 63-30946; Mar. 17, 1988, 63-61978; Apr. 26, 1988, 63-101296; Apr. 26, 1988, 63-101297

Int. Cl.[4] C08K *3/10*

U.S. Cl. 524—785 **8 Claims**

1 A process for producing a molded article comprising the steps of:

preparing a first reactive solution containing at least one metathesis polymerizable cycloolefin and a catalyst component of a metathesis polymerization catalyst system comprising a halide of tungsten, molybdenum, rhenium or tantalum;

preparing a second reactive solution containing at least one metathesis polymerizable cycloolefin ana an activator component for said metathesis polymerization catalyst system, wherein said activator component is selected from the group consisting of tetraalkyl tins, trialkyl tin hydrides, alkylaluminum compounds and alkylaluminum halide compounds;

adding at least one pigment selected from the group consisting of (a) a carbon black prepared by the incomplete combustion process, (b) a titanium oxide, (c) an iron oxide, and (d) a cobalt oxide to said second reactive solution;

adding, subsequent to the addition of said pigment, a supplementary amount of said activator component to said second reactive solution to compensate for said activator component consumed when said pigment is added to said second reactive solution;

combining a plurality of reactive solutions comprising at least said first reactive solution and said second reactive solution; and

introducing said combined reactive solutions into a mold and metathesis polymerizing in bulk in said mold to produce said molded article.

4,918,139

AQUEOUS DISPERSIONS OF THERMALLY CROSS-LINKABLE POLYMERS BASED ON ALKYL (METH)ACRYLATE, THE PROCESS FOR THEIR PREPARATION AND THEIR USE IN PARTICULAR AS BINDERS AND/OR IMPREGNATION AGENTS

Fernand Cuirassier, Saint Denis-Fr; Didier Wilhelm, Issy les Moulineaux, and Alain Blanc, Paris, all of France, assignors to Societe Francaise Hoechst of Tour Roussel-Hoechst, Puteaux, France

Filed Apr. 3, 1989, Ser. No. 332,136

Claims priority, application France, Apr. 13, 1988, 88 04883

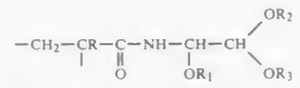
Int. Cl.[4] C08F *20/56, 24/00*

U.S. Cl. 524—813 **9 Claims**

1. Aqueous dispersions of thermally cross-linkable copolymers based on alkyl (meth)acrylate, characterized in that they contain a copolymerizate prepared in an aqueous emulsion containing:

90 to 99% by weight of repeating units resulting from the polymerization of a mixture of main monomers (a) consisting of 0.1 to 10% by weight of alpha,beta-ethylenic mono- and/or di-carboxylic C_3–C_5 acids, and/or their amides, of 0 to 10% by weight of styrene and/or acrylonitrile and the remainder up to 100% of esters of acrylic acid and/or methacrylic acid with C_1–C_{12} alkanols;

10 to 1% by weight of repeating units of general formula (I)



(I)

in which R represents a hydrogen atom or a methyl radical, R_1 represents a hydrogen or a C_1–C_4 alkyl radical, and R_2 and R_3 are either identical and then each represents a C_1–C_8 alkyl group, or together form a group $—CH_2—CR_4R_5—(CH_2)_n—$ in which n is 0 or 1 and R_4 and R_5, identical or different, represent a hydrogen atom or a methyl group.

4,918,140

CURABLE ORGANOPOLYSILOXANE COMPOSITIONS COMPRISING A HYDROGEL HARDENING AGENT

Pierre-Michel Peccoux, Lyons, and Gilbert Schorsch, Colombes, both of France, assignors to Rhone-Poulenc Chimie, Courbevole, France

Filed Oct. 20, 1988, Ser. No. 260,018
Claims priority, application France, Oct. 20, 1987, 87 14750
Int. Cl.[4] C08K *3/20*
U.S. Cl. 524—860 16 Claims

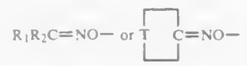
1. An organopolysiloxane composition curable into elastomeric state in a confined atmosphere, comprising:

(A) 100 parts of an α,ω-di(hydroxy)diorganopolysiloxane polymer, having a viscosity of 700 to 1,000,000 mPa.s at 25° C., each comprising recurring diorganosiloxy units of the formula R_2SiO, in which the symbols R, which may be identical or different, are each a hydrocarbon radical containing from 1 to 8 carbon atoms, or a substituted such radical bearing one or more halogen atom or cyano substituents;

(B) 2 to 20 parts of a crosslinking agent having the general formula:

$$R_pSiG_{4-p}$$

in which the symbol R is as defined above under (A), the symbols G, which may be identical or different, are each a radical of the formulae:



in which the symbols R_1 and R_2, which may be identical or different, are each a C_1–C_8 hydrocarbon radical, T is a C_4–C_8 alkylene radical and the symbol p represents 0 or 1;

(C) 0 to 150 parts of inorganic fillers; and

(D) 0.01 to 10 parts, per 100 parts of (A)+(B)+(C), of a hydrogel comprising one part of a coagulated colloid of natural or synthetic origin and at least five parts of water.

4,918,142

RUBBER COMPOSITION OF TIRE TREAD CONTAINING BLOCK COPOLYMER COUPLED WITH DICARBOXYLIC ACID ESTER

Yuichi Saito, Kobe; Takuzoh Yabuta, Minoo; Hiroyoshi Takao, Chiba; Akio Imai, and Mitsuji Tsuji, both of Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Sumitomo Rubber Industries, Ltd., Kobe, both of, Japan

Continuation of Ser. No. 125,045, Nov. 25, 1987, abandoned. This application Mar. 8, 1989, Ser. No. 320,836
Claims priority, application Japan, Nov. 29, 1986, 61-285578
Int. Cl.[4] C08F *297/04*; C08L *53/02*
U.S. Cl. 525—99 5 Claims

1. A rubber composition comprising a rubber component containing a block copolymer, said block copolymer being a branched block copolymer consisting essentially of a block A and a block B, obtained by copolymerization of an aromatic vinyl compound and a conjugated diene compound in the presence of an organolithium initiator in a hydrocarbon solvent and having the following conditions (A) to (E):

(A) the block A is a block of a copolymer wherein the content of the aromatic vinyl compound is from 5 to 20% by weight and the content of 1,2-bonds in the conjugated diene component is from 25 to 55% by weight;

(B) the block B is a block of a copolymer wherein the content of the aromatic vinyl compound is from 35 to 60% by weight and the content of 1,2-bonds in the conjugated diene component is from 20 to 70% by weight;

(C) the content of block A is from 20 to 80% by weight;

(D) the average content of the aromatic vinyl compound is from 20 to 40% by weight and the average content of 1,2-bonds in the conjugated diene component is from 20 to 60% by weight; and

(E) at least 40% by weight of the whole polymer chains are modified with at least one coupling agent selected from the group consisting of dimethyl adipate, diethyl adipate and di-n-butyl adipate.

4,918,143

POLYPHENYLENE ETHER RESIN COMPOSITION

Hisatake Sato, and Masaharu Makioo, both of Yokohama, Japan, assignors to Nippon Petrochemicals Co., Ltd., Japan

Filed May 25, 1989, Ser. No. 357,050
Claims priority, application Japan, May 26, 1988, 63-128773
Int. Cl.[4] C08L *71/04*
U.S. Cl. 525—132 9 Claims

1. A polyphenylene ether resin composition comprising as the major components:

(a) 100 parts by weight of polyphenylene ether resin, and

(b) 1–30 parts by weight of a hydrocarbon resin which has a softening point of 140°–180° C. and a ratio of weight-average molecular weight to number-average molecular weight M_w/M_n of 2.0 or less, and is prepared by polymerizing a raw material oil of hydrocarbon in which the total content of indene and methylindene is 80% by weight or more by the use of a Friedel-Crafts type catalyst.

4,918,144

VULCANIZABLE RUBBER COMPOSITION

Hideo Fukuda, Yokohama, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1988, Ser. No. 201,025
Int. Cl.[4] C08L *9/02*
U.S. Cl. 525—263 12 Claims

1. A vulcanizable composition comprising: a copolymer rubber derived at least from an ethylenically unsaturated nitrile and a conjugated diene and having a conjugated diene unit content in the polymer chain of not more than 30% by weight, 0.2 to 10 parts by weight per 100 parts by weight of said copolymer rubber of an organic peroxide and 5to 90 parts by weight per 100 parts by weight of said copolymer rubber of zinc dimethacrylate.

4,918,145

PROCESS FOR PRODUCING A BLOCK COPOLYMER RESIN AND PRODUCT THEREOF

David J. Dougherty, and Sunil B. Sarkar, both of Akron, Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Continuation of Ser. No. 944,110, Dec. 22, 1986, abandoned. This application Nov. 14, 1988, Ser. No. 273,136
Int. Cl.[4] C08F *297/04*
U.S. Cl. 525—271 15 Claims

1. A stable or semi-stable suspension in aliphatic diluent of clear, high impact multiblock copolymer comprised of block monomer units of vinyl aryl containing monomer units and conjugated diene containing monomer units wherein the block copolymer contains a vinyl aryl content in an amount exceeding about 75% and ranging to 85% percent of the total monomer content which is formed from substances consisting of vinyl aryl containing monomer, conjugated diene monomer, aliphatic hydrocarbon diluent and anionic polymerization catalyst with or without the use of inert pressurizing gas by the steps of preparing the block copolymer in a continuous stream comprising:

(1) alternately feeding into a highly agitated polymerization system a first monomer composition from the first monomer stream, differing in monomer composition from the first monomer stream, each monomer stream being interrupted while the other monomer stream is flowed, and repeating continually the feeding of said alternating streams, (2) adding to the polymerization system an anionic polymerization catalyst capable of polymerizing each of said monomers at a rate to cause polymerizing to form said copolymer at a desired molecular weight, said polymerizing being carried out in aliphatic hydrocarbon diluent to produce said copolymer in stable or semi-stable suspension in said diluent as a product, (3) withdrawing from said polymerization system a product stream at the same rate as the total of said feed streams whereby there is substantially continual flow through said polymerization system.

4,918,146

SURFACE MODIFICATION OF POLYCYCLIC CYCLOOLEFIN POLYMERS

Albert S. Matlack, Hockessin, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 20, 1989, Ser. No. 341,007
Int. Cl.[4] C08F *8/22*
U.S. Cl. 525—354 5 Claims

1. A method of treating surfaces of strained ring cycloolefin polymer articles comprising treating the surfaces of said articles with a reagent selected from the group consisting of halogens, pseudohalogen compounds and interhalogen compounds, wherein said strained ring cycloolefin polymer is selected from the group consisting of poly(dicyclopentadiene) and polymers made of polymerization of a mixture of dicyclopentadiene with a strained ring cycloolefin selected from the group consisting of higher cyclopentadiene oligomers, norbornene, norbornadiene, 4-alkylidene norbornenes, dimethanooctahydronaphthalene, and dimethanohexahydronaphthalene.

4,918,147

PREPARATION OF METAL CONTAINING RESIN COMPOSITION AND ANTIFOULING PAINT CONTAINING SAID COMPOSITION

Naoki Yamamori; Masayuki Matsuda, both of Osaka; Kiyoaki Higo, Nara, and Shinichi Ishikura, Kyoto, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed May 16, 1988, Ser. No. 194,286
Int. Cl.[4] C08C *19/00*; A61K *31/74*; C09D *5/16*
U.S. Cl. 525—386 11 Claims

1. A process for preparing a metal containing film-forming resin composition having a number average molecular weight of 4,000 to 40,000 which comprises reacting a mixture of

(A) an acid group containing base resin having an acid value in the range of 25~350 mg KOH/g selected from the group consisting of vinyl resin, polyester resin, alkyd resin and epoxy resin,

(B) a metallic salt of a low boiling organic basic acid having a boiling point in the range of 100°~240° C., the metal having a valence of 2 or more and a lesser ionization tendency than alkali metals, and

(C) a high boiling organic monobasic acid having a boiling point which is 20° C. or more higher than that of said low boiling organic basic acid,

at an elevated temperature which is lower than the decomposition temperature of said metallic salt of said low boiling organic basic acid, while removing the low boiling organic basic acid out of the system said resin composition having a lower viscosity and better crack resistance as compared to a resin composition containing either the component (B) or (C).

4,918,148

POLYAMIDE MODIFIED WITH MONOISOCYANATES

Rolf-Volker Meyer, Krefeld; Josef Merten, Korschenbroich; Rolf Dhein, and Harald Selbeck, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 854,086, Apr. 21, 1986, abandoned. This application Oct. 3, 1988, Ser. No. 252,763
Claims priority, application Fed. Rep. of Germany, May 4, 1985, 3516089
Int. Cl.[4] C08G *69/48*
U.S. Cl. 525—424 14 Claims

1. A thermoplastically processable polyamide molding composition obtained by melt blending 95.5 to 97% by weight of a polyamide with 0.5 to 3% by weight of at least one organic monoisocyanate of the formula where R is (i) a hydrocarbon radical containing at least six carbon atoms selected form an aliphatic radical, a cycloaliphatic radical, an araliphatic radical or an aromatic radical, (ii) a substituted hydrocarbon radical containing at least six carbon atoms selected from a substituted aliphatic radical, a substituted cycloaliphatic radical, a substituted araliphatic radical or a substituted aromatic radical or (iii) an organic radical comprised of a hydrocarbon radical (i), (ii) or a mixture thereof and bridging members selected from sulfur, oxygen or amide groups where the R does not include any additional NCO groups.

4,918,149

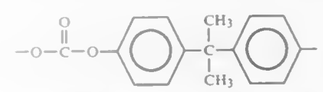
POLYPHTHALATECARBONATE/POLYCARBONATE RESIN BLENDS

Donald C. Clagett; Daniel W. Fox; Sheldon J. Shafer, and Paul D. Sybert, all of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

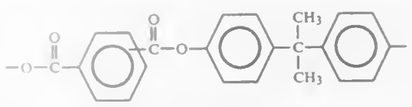
Filed Nov. 4, 1988, Ser. No. 266,978
Int. Cl.[4] C08F *20/00*; C08L *69/00*
U.S. Cl. 525—439 9 Claims

1. A blend comprising:

(a) a polyphthalatecarbonate resin present in said blend at a level of about 8 percent by weight based on the total weight of the blend, said polyphthalatecarbonate resin consisting essentially of carbonate units and phthalate units, wherein said carbonate units are represented by the formula:



and said phthalate units are represented by the formula:



said phthalate units being present at a level of at least 3.5 mole percent based on the combined total moles of carbonate units and phthalate units in said blend; and

(b) an aromatic polycaronate resin present in said blend at a level of about 92 percent by weight based on the total weight of the composition, said polycarbonate resin consisting essentially of carbonate units.

4,918,150

COMPOSITION COMPRISING VINYL ESTER, UNSATURATED URETHANE AND POLYBASIC ACID

Shigeru Sakakibara, Ichihara, and Shunji Arimoto, Narashino, both of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 278,236
Claims priority, application Japan, Nov. 30, 1987, 62-300038
Int. Cl.[4] C08L *63/04, 63/10*
U.S. Cl. 525—502 10 Claims

1. An activation energy-curable resin composition comprising as an essential ingredient a resin obtained by reacting (a) a reaction product of a novolak-epoxy compound and an unsaturated monocarboxylic acid, (b) a reaction product having one isocyanate group of a diisocyanate and a poly(meth)acrylate having a hydroxyl group per molecule and (c) at least one of an aromatic, aliphatic or alicyclic polybasic acid or an anhydride thereof.

4,918,151

AQUEOUS SUSPENSION PROCESS FOR PRODUCING LOW MOLECULAR WEIGHT VINYL COPOLYMERS

Zaev Sharaby, Cleveland Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 660,180, Oct. 12, 1984, abandoned. This application Apr. 21, 1986, Ser. No. 854,203
Int. Cl.[4] C08F *2/20*
U.S. Cl. 526—211 9 Claims

1. A process for the production of low molecular weight copolymers of vinyl or vinylidene halides and vinyl esters of fatty acids by aqueous polymerization, comprising (a) the use of up to about 20 parts by weight of vinyl esters of fatty acids per 100 parts by weight of vinyl or vinylidene halide monomer, said acids having from about 4 to about 26 carbons in the chain, as a comonomer, and (b) the use of from about 0.03 to about 5.00 parts by weight per 100 parts monomer of a water soluble or insoluble mercaptan as a chain transfer agent, wherein the mercaptan is admixed with said vinyl esters before adding said mercaptan to the polymerization medium, and wherein at least 0.5 parts by weight of said mercaptan is added in the form of a mixture with vinyl ester to the polymerization medium prior to the start of the polymerization reaction, and wherein less than about 2.0 parts by weight of dispersant is present per 100 parts by weight of monomer.

4,918,152

PROCESS FOR THE PRODUCTION OF FORMED ARTICLE OF AROMATIC VINYL RESIN

Masahiko Moritani; Takanori Fujita; Masahiro Niwano, and Kazuhiro Yokoo, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 8, 1988, Ser. No. 203,918
Claims priority, application Japan, Jun. 12, 1987, 62-147353; Apr. 8, 1988, 63-087548
Int. Cl.[4] C08F *22/40*
U.S. Cl. 526—262 21 Claims

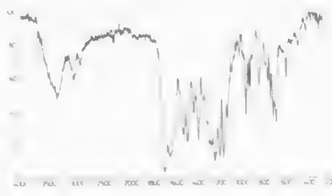
1. A process of producing optical elements from an aromatic vinyl resin, which comprises copolymerizing an aromatic vinyl monomer, a maleimide monomer in an amount of 0.1 to 1.5 mole per 1 mole of the aromatic vinyl monomer, and a polyfunctional monomer which is a member selected from the group consisting of phthalic acid (meth)acryloyloxyalkyl ester derivatives, aliphatic polyol (meth)acrylate derivatives, (meth-)acrylate derivatives having a (poly)ethylene glycol chain, bisphenol A (meth)acrylate derivatives, and iscyanuric acid-tris(2-hydroxyethyl methacrylate) in an amount of 1 to 30% by weight based on the weight of the whole monomer mixture in the presence of a radical polymerization initiator by a cast polymerization process.

4,918,153

COPOLY(IMIDINE-AMIDE)

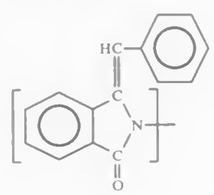
Patrick E. Cassidy, 6102 Bend O'River Dr., Austin, Tex. 78746; James M. Farley, 2795 Pinewood, League City, Tex. 77573, and Maryanne Mores, 235 May St., Manhattan, Ill. 60442

Filed Mar. 14, 1989, Ser. No. 323,594
Int. Cl.[4] C08G *8/02, 14/00*
U.S. Cl. 528—125 4 Claims



1. A copolymer containing an imidine unit of the general formula [I] and an amide unit of the general formula [II] in the basic chain structure of the polymer:

[I]



[II]

wherein R in the general formula [II] denotes hydrogen or a monovalent organic radical.

4,918,154

POLYESTER RESIN EXHIBITING OPTICAL ANISOTROPY IN MOLTEN STATE AND COMPOSITION THEREOF

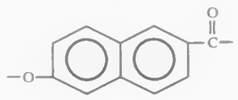
Noriyuki Hayashi, Fuji, and Kenji Hijikata, Mishima, both of Japan, assignors to Polyplastics Co., Ltd., Japan

Filed Apr. 10, 1989, Ser. No. 335,444
Claims priority, application Japan, Apr. 13, 1988, 63-90893
Int. Cl.[4] C08G *63/60, 63/06*
U.S. Cl. 528—190 6 Claims

1. A polyester resin which comprises 35 to 90 mole percent of the unit (I), 0.5 to 20 mole percent of the unit (II), 0.5 to 45 mole percent of the unit (III), 0.5 to 45 mole percent of the unit (IV), and 0.5 to 45 mole percent of the unit (V), exhibiting the anisotropy in its molten state:

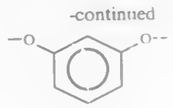
(I)

(II)

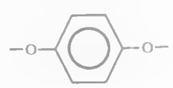


-continued

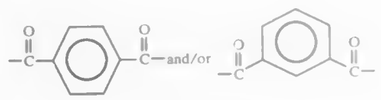
(III)



(IV)



(V)



4,918,155

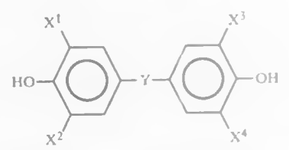
PROCESS FOR PRODUCTION OF POLYCARBONATE

Takashi Komatsu, and Eiichi Terada, both of Ichihara, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 198,232, May 25, 1988, abandoned. This application Apr. 5, 1989, Ser. No. 333,864
Claims priority, application Japan, Jun. 25, 1987, 62-156490
Int. Cl.[4] C08G *63/68*
U.S. Cl. 528—202 12 Claims

1. A process for producing polycarbonate which comprises reacting bisphenol A and a carbonate-forming derivative to produce a polycarbonate oligomer of bisphenol A, reacting said polycarbonate oligomer, halogenated bisphenol represented by the general formula:

(A)



wherein X^1, X^2, X^3 and X^4 are each a hydrogen atom or a halogen atom and Y is —O—, —S—, —SO—, —SO_2—, —CO—, an alkylene group having 1 to 4 carbon atoms, or an alkylidene group having 2 to 5 carbon atoms, provided that at least one of X^1 to X^4 is a halogen atom and pentahalogenophenol as a molecular weight modifier to produce a polycarbonate cooligomer, and then reacting said polycarbonate cooligomer and bisphenol A.

4,918,156

POLYESTER RESIN HAVING IMPROVED PROCESSABILITY

John H. Rogers, Greenville, S.C., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jun. 30, 1987, Ser. No. 68,484
Int. Cl.[4] C08G *63/02*
U.S. Cl. 528—272 19 Claims

1. A polyester resin containing a copolyesterether comprising:

(A) a dicarboxylic acid component consisting essentially of 1,4-cyclohexanedicarboxylic acid having a trans isomer content of at least 70%,

(B) a glycol component consisting essentially of

(1) 1,4-cyclohexanedimethanol, and

(2) from about 15 to about 5weight percent, based on the weight of the polyesterether, of polytetramethyleneether glycol having a molecular weight of about 500 to about 1100 and

(C) from about 0.1 to about 1.5 mole percent, based on the mole percentage of the acid or glycol component, of a branching agent having at least three carboxyl or hydroxyl functional groups and from 3 to 60 carbon atoms, said copolyesterether being present in said polyester resin in an amount effective to reduce the occurrence of film splitting during the production of biaxially oriented film from said resin but not exceeding 7 weight percent, based upon the total weigiit of the polyester resin and the copolyesterether.

4,918,157

THERMOSETTING COMPOSITION COMPRISING CYANATE ESTER, UREA COMPOUND AND EPOXY RESIN

Hugh C. Gardner, Hillsborough, and Richerd H. Newman-Evans, Somerville, both of N.J., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 71,215, Jol. 8, 1987, Pat. No. 4,804,740. This application Sep. 28, 1988, Ser. No. 250,838
Int. Cl.[4] C08G *83/00*
U.S. Cl. 528—322 7 Claims

1 A thermosetting composition comprising a cyanate ester; a urea compound selected from the group consisting of alkyl aryl ureas, aryl ureas and mixtures thereof; and an epoxy resin.

4,918,158

1,3-DIETHYNYLADAMANTANE AND METHODS OF POLYMERIZATION THEREOF

Kurt Baum, Pasadena, and Thomas G. Archibald, Los Angeles, both of Calif., assignors to Fluorochem Inc., Azusa, Calif.

Filed Jul. 21, 1986, Ser. No. 887,219
Int. Cl.[4] C08F *1/26*
U.S. Cl. 526—282 14 Claims

1 A method of polymerizing ethynyl-substituted adamantane monomers selected from the group consisting of 1,3-diethynyladamantane monomers and mixtures of 1-ethynyladamantane and 1,3-diethynyladamantane monomers which comprises heating the monomers under suitable temperature and time conditions for the purpose.

4,918,159

STYRENE-BASED/POLYMERCAPTAN POLYMER AND PROCESS FOR PRODUCTION THEREOF

Shinichi Nakamura; Hideo Teshima, and Eiichi Terada, all of Ichihara, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1988, Ser. No. 237,982
Claims priority, application Japan, Sep. 24, 1987, 62-237297; Jul. 1, 1988, 63-162428
Int. Cl.[4] C08G *75/04*
U.S. Cl. 528—376 25 Claims

1. A styrene-based polymer having a branching nucleus represented by the general formula:

$$R(S)_k \text{ or } R(A—S)_k$$

wherein R is an alkyl radical having 1 to 10 carbon atoms or an aryl radical having 6 to 10 carbon atoms, A is an organic radical, S is a sulfur atom, and k is 3 or 4, provided all of three or four of —S or —A—S are bonded to R, and having a sulfur content of 6 to 550 ppm, a weight average molecular weight of 450,000 to 1,300,000, and a weight average molecular weight-/number average molecular weight (Mw/Mn) ratio of 2 to 15.

4,918,160

METHOD FOR PRODUCING PURIFIED POLYCARBONATE RESIN WITH FLUID CONTAINING CO_2

Shigeo Kondoh, and Toshikazu Umemura, both of Osaka, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Mar. 23, 1989, Ser. No. 327,889
Claims priority, application Japan, Mar. 23, 1988, 63-67164
Int. Cl.[4] C08G *63/62*
U.S. Cl. 528—483 4 Claims

1. A method for producing a purified polycarbonate resin, which comprises contacting a solid polycarbonate resin selected from the group consisting of a polycarbonate resin, a resin composition comprising the polycarbonate resin in combination with a polyester resin selected from the group consisting of polyethylene terephthalate, polybutylene terephthalate, cyclohexanedimethanol/terephthalic acid/isophthalic acid copolymer or cyclohexanedimethanol/ethylene glycol/-terephthalic acid copolymer, a polystyrene, a styrene/maleic anhydride copolymer, a styrene/maleimide copolymer, a styrene/maleic anhydride/maleimide copolymer or a styrene/(meth)acrylic acid ester copolymer, and a polycarbonate copolymer selected from the group consisting of graft copolymers comprising the polycarbonate and a polystyrene, a styrene/maleic anhydride copolymer, a styrene/maleimide copolymer, a styrene/maleic anhydride/maleimide copolymer and a styrene/(meth)acrylic acid ester copolymer, with a fluid comprising at least 70% by weight of carbon dioxide and having a temperature of 30° to 120° C. and a pressure of at least 10 kg/cm^2.

4,918,161

LOW MOLECULAR WEIGHT PULMONARY SURFACTANT PROTEINS

D. Randall Steinbrink, Melrose, Mass., assignor to Genetics Institute, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 100,372, Sep. 24, 1987, Ser. No. 897,183, Aug. 15, 1986, abandoned, and Ser. No. 781,130, Sep. 26, 1985, abandoned, said Ser. No. 100,372, is a continuation-in-part of Ser. No. 897,183, , which is a continuation-in-part of Ser. No. 781,130,. This application May 4, 1988, Ser. No. 190,287
Int. Cl.[4] C07K *13/00;* A61K *37/02*
U.S. Cl. 530—300 4 Claims

1. A purified human protein, free or substantially free from other human proteins, which is characterized by:
(a) solubility in 1-butanol at 4° C.;
(b) insolubility in 1-butanol at −20C.;
(c) containing the peptide sequence FPIPLPY; and,
(d) a predominant band having an apparent molecular weight of ~6 kiloDaltons by SDS-PAGE analysis.

4,918,162

ASSAYS AND ANTIBODIES FOR N-MYC PROTEINS

Dennis J. Slamon, Woodland Hills, and Lawrence M. Souza, Thousand Oaks, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 5, 1988, Ser. No. 253,933
Int. Cl.[4] C07K *7/10*
U.S. Cl. 530—324 3 Claims

1. A polypeptide, consisting of an amino acid sequence selected from the group consisting of

(I)	AFGLGGLGGL LERAVSEKLQ	TPNPVILQDC HGRG;	MWSGFSAREK
(II)	ELAHPAAECV APASAPAAGP RPGGRQTSGG	DPAVVFPFPV AVASGAGIAA DHKALS;	NKREPAPVPA PAGAPGVAPP
(III)	ELAHPAAECV APASAPAAGP RPGGRQTSGG	DPAVVFPFPV AVASGAGIAA DHKALSTSGE	NKREPAPVPA PAGAPGVAPP DTLSDSDDED

-continued

	DEEEDEEEEI;		
(IV)	GEDTLSDSDD RSSSNTKAVT	EDDEEEDEEE TFTITVRPKN	EIDVVTVEKR AALGP; and
(V)	ELVKNEKAAK LLLEKEKLQA	VVILKKATEY RQQQLLKKIE	VHSLQAEEHQ HARTC.

4,918,163

MONOCLONAL ANTIBODIES SPECIFIC FOR LIPID-A DETERMINANTS OF GRAM NEGATIVE BACTERIA

Lowell S. Young, San Francisco, Calif., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 781,242, Sep. 27, 1985, Pat. No. 4,777,136. This application Apr. 24, 1986, Ser. No. 855,878
Int. Cl.[4] A01K *39/00;* C12N *00/00;* C01K *5/04*
U.S. Cl. 530—387 7 Claims

1. Hybridoma cell line XMMEN-OE5, having ATCC Accession No. HB9081.

4,918,164

TUMOR IMMUNOTHERAPY USING ANTI-IDIOTYPIC ANTIBODIES

Ingegerd Hellstrom; Kark E. Hellstrom, and Maria S. Kaho, all of Seattle, Wash., assignors to Oncogen, Seattle, Wash.

Continuation-in-part of Ser. No. 901,856, Aug. 28, 1986, and Ser. No. 96,095, Sep. 10, 1987. This application Nov. 4, 1987, Ser. No. 116,802
Int. Cl.[4] A61K *39/395;* C07K *15/04;* C12N *5/01*
U.S. Cl. 530—387 14 Claims

1. A monoclonal anti-idiotypic antibody, the antigen combining site of which immunospecifically binds to the idiotype of a second monoclonal antibody that defines the p97a epitope of the human melanoma associated p97 antigen.

4,918,165

MITOTIC INHIBITOR AND METHOD FOR PREVENTING POSTERIOR LENS CAPSULE OPACIFICATION AFTER EXTRACAPSULAR EXTRACTION

David B. Soll, Rydal; Thomsen J. Hansen, Havertown, and Ihab Kamel, Drexel Hill, all of Pa., assignors to Ophthalmic Research Corporation and Drexel University, both of Philadelphia, Pa.

Filed Jul. 16, 1987, Ser. No. 74,444
Int. Cl.[4] C07K *15/00;* A61K *39/395*
U.S. Cl. 530—391 9 Claims

1. A mitotic inhibitor for the prevention of posterior lens capsule opacification when instilled into the anterior or posterior chamber of the eye during or after extracapsular extraction comprising:
a conjugate of an anticollagen antibody and a cytotoxin to lens epithelial cells and fibroblasts.

4,918,166

PARTICULATE HYBRID HIV ANTIGENS

Alan J. Kingsman; Susan M. Kingsman, both of Islip, and Sally E. Adams, Kidlington, all of United Kingdom, assignors to Oxford Gene Systems Limited, Oxford, England

Continuation of Ser. No. 36,888, Apr. 10, 1987. This application Oct. 26, 1987, Ser. No. 112,083
Int. Cl.[4] C07K *15/04, 15/14, 17/00;* G01N *33/569*
U.S. Cl. 530—350 3 Claims

1. A particle comprising a plurality of fusion proteins, each fusion protein comprising a first amino acid sequence and a second amino acid sequence, wherein the first amino acid sequence is substantially homologous with a particle-forming protein encoded by a yeast TYA gene without TYP gene sequence and wherein the second amino acid sequence is substantially homologous to an HIV antigen.

4,918,167

METHOD OF PRODUCING PREPOLYMERS FROM HYDROXYALKYL LIGNIN DERIVATIVES

Wolfgang G. Glasser; Willer De Oliveira, both of Blacksburg, Va.; Stephen S. Kelley, Kingsport, Tenn., and Li S. Nieh, Mississippi State, Mich., assignors to Center for Innovative Technology, Herndon, Va.

Filed Apr. 19, 1988, Ser. No. 183,213
Int. Cl.[4] C07G *1/00*
U.S. Cl. 530—502 15 Claims

1. A method of preparing an epoxy resin prepolymer having multiple functionality comprising: treating a nonphenolic lignin derivative comprising an alkylene oxide modified lignin with epichlorohydrin reacting said lignin with said epichlorohydrin and isolating the prepolymer.

4,918,168

PROCESS FOR THE CONTINUOUS DIAZOTIZATION OF AMINES IN A MULTI-STAGE REACTOR

Nickolas J. Stepanink, Chesterfeld, and Bruce J. Lamb, St. Charles, both of Mo., assignors to Mallinckrodt Inc., St. Louis, Mo.

Filed Nov. 24, 1987, Ser. No. 124,500
Int. Cl.[4] C07C *113/04, 113/00*
U.S. Cl. 534—565 22 Claims

1. A process for the continuous production of an aromatic diazonium fluoride compound from the corresponding aromatic amine which comprises continuously introducing an aromatic amine into a multi-stage reactor comprising a plurality of sequential reaction zones; continuously introducing nitrosyl fluoride into each reaction zone and admixing it with aromatic amine therein, thereby reacting a portion of the aromatic amine with nitrosyl fluoride to form aromatic diazonium fluoride; and controlling the temperature in each reaction zone by means of a heat exchanger in each reaction zone such that the maximum temperature of the reaction mixture in each reaction zone is less than the autothermal decomposition temperature of the mixture and that the aromatic diazonium fluoride undergoes substantially no thermal decomposition.

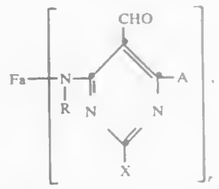
4,918,169

FIBER-REACTIVE DYESTUFFS COMPRISING A 5-FORMYLPYRIMIDINE MOIETY

Karl Hoegerle, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

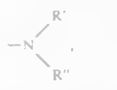
Filed Aug. 19, 1988, Ser. No. 233,781
Claims priority, application Switzerland, Aug. 27, 1987, 3288/87
Int. Cl.[4] C09B *62/04, 62/06, 62/08, 62/10, 62/24, 62/245, 62/25, 62/255;* D06P *3/10, 3/66, 1/384*
U.S. Cl. 534—618 15 Claims

1. A reactive dye of the formula



(1)

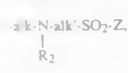
wherein Fa is a monoazo or polyazo, metal complex azo, anthraquinone, phthalocyanine, formazane, azomethine, dioxazine, phenazine, stilbene, triphenylmethane, xanthene, thioxanthone, nitroaryl, napthoquinone, pyrenequinone or perylenetetracarbimide dye radical, X is halogen, C_1–C_4-alkylsulfonyl, phenylsulfonyl, a sulfonic acid or phosphonic acid group or a quaternized ammonium group, r is 1 or 2, R is hydrogen or C_1–C_4 alkyl which is unsubstituted or substituted by halogen, hydroxyl, cyano, carboxyl, sulfo, sulfato, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkoxy or phenyl, and A is a radical of the formula



(2)

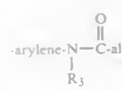
wherein R' is hydrogen, C_1–C_4alkyl which is unsubstituted or substituted by halogen, hydroxyl, cyano, carboxyl, sulfo, sulfato, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkoxy or phenyl, C_5–C_6-cycloalkyl, phenyl or naphthyl each of which is unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, carboxyl, sulfo or halogen, or a radical of the formula

(3)



(3a)

(3b)



(3c)

wherein alk and alk' are each independently of the other C_1–C_6alkylene, arylene is phenylene or naphthylene, each of which is unsubstituted or substituted by sulfo, carboxyl, C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen, R_1 is hydrogen, hydroxyl, sulfo, sulfato, carboxyl, cyano, halogen, C_1–C_4alkoxycarbonyl, C_1–C_4alkanoyloxy, carbamoyal or the group $—SO_2—Z$, R_2 is hydrogen or C_1–C_4alkyl, R_3 is hydrogen or C_1–C_4alkyl which is unsubstituted or substituted by hydroxyl, sulfo, sulfato, carboxyl or cyano, Z is $—CH=CH_2$ or $—CH_2—CH_2—Y$ and Y is —Cl, —Br, —F, $—OSO_3H$, $—SSO_3H$, —OCO—CH_3, —O-CO—C_6H_5, $—OPO_3H_2$, —OCO—CCl_3, —OCO—$CHCl_2$, —OCO—CH_2Cl, $OSO_2—R_4$, wherein R_4 is C_1–C_4alkyl or phenyl which is unsubstituted or substituted by C_1–C_4alkyl, or $—OSO_2—N(C_1\text{-alkyl})_2$; and R'' independently has the meaning of R or is a radical of formula (3) above; or R' and R'', together with the N atom, form a radical of the formula

(2a)

wherein alk and Z are as defined above.

4,918,170

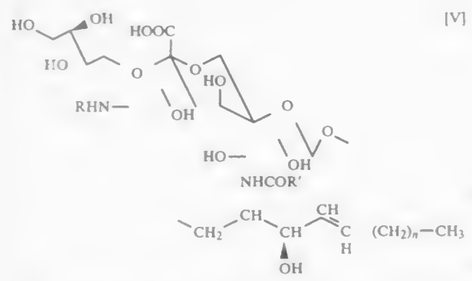
PROCESS FOR PRODUCING GANGLIOSIDES

Akira Hasegawa, and Makoto Kiso, both of Gifu, Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed May 16, 1989, Ser. No. 352,595
Claims priority, application Japan, Aug. 12, 1988, 63-201108
Int. Cl.[4] C07H *1/00;* C07G *37/00, 17/00;* A01N *43/04*
U.S. Cl. 536—1.1 4 Claims

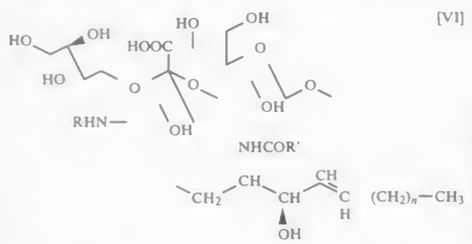
1 A process for producing a ganglioside represented by the following formula [V], [VI] or [VII]:

VOL
1113
ISS
3
AP
17
1990
UMI



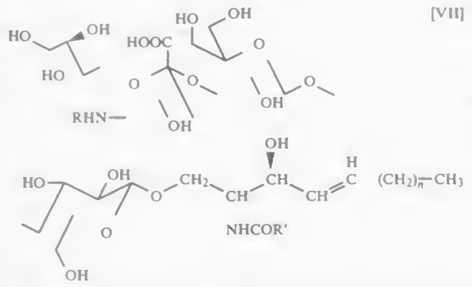
[V]

wherein R represents an aliphatic acyl group, R′ represents a saturated or unsaturated straight chain or branched chain alkyl group of 1–30 carbon atoms and n represents an integer of 0–20,



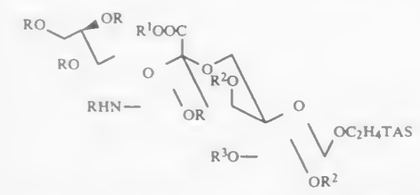
[VI]

wherein R, R′ and n are as defined above,



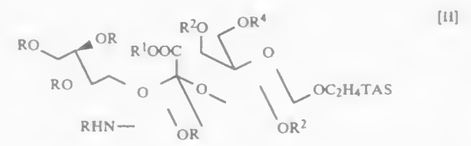
[VII]

wherein R, R′ and n are as defined above, which comprises eliminating the protecting group for hydroxyl group at 1-position of the reducing-end-glucose residue of 2-α-O-glycoside compound of sialic acid represented by the following formula [I], [II] or [III]:



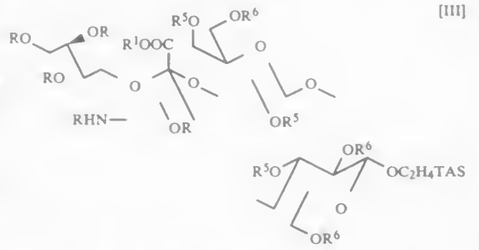
[I]

wherein R_1 represents a lower alkyl group, R^2 and R^3 each represents an acyl group and TAS denotes trialkylsilyl group, R is as defined above,



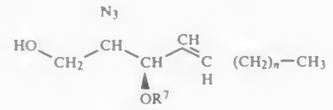
[II]

wherein R^2 and R^4 each represents an acyl group and R, R^1 and TAS are as defined above,

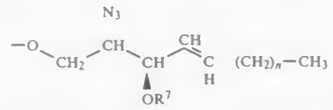


[III]

wherein R^5 and R^6 each represents an acyl group and R, R^1 and TAS are as defined above, reacting the thus treated compound with trichloroacetonitrile in the presene of a basic catalyst to convert the hydroxyl group at 1-position of the reducing-end-glucose residue to trichloroacetoimide $—OC(NH)CCl_3$, reacting the product with an azidosphingosine derivative represented by the formula [IV]:



wherein R^7 represents an acyl group and n is as defined above to replace the $—OC(NH)CCl_3$ group at 1-position of the reducing-end-glucose residue with the following group:



wherein R^7 and n are as defined above, then reducing the product, N-acylating the reduction product with a fatty acid and thereafter successively deprotecting the protecting group for hydroxyl group and protecting group for carboxyl group.

4,918,171

SAIKOSAPONIN DERIVATIVES, THEIR PRODUCTION AND USE

Haruji Oshio, Hyogo; Noriaki Kawamura, Osaka, and Taketoshi Saijo, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 21, 1988, Ser. No. 222,549

Claims priority, application Japan, Jul. 23, 1987, 62-186463

Int. Cl.[4] **C07G** *3/00;* **C07J** *15/24;* **A01N** *43/04, 45/00;* **A61K** *31/705*

U.S. Cl. 536—4.4 **10 Claims**

1. A phosphate ester of saikosaponin a, b_1, b_2, c, d or h or a pharmaceutically acceptable salt thereof.

4,918,172

ANTHRACYCLINE ANTIBIOTICS

Akihiro Yoshimoto, Fujisawa; Osamu Jodo, Yokohama; Yoshio Watanabe; Rokuro Okamoto, both of Fujisawa; Tomoyuki Ishikura, Chigasaki; Hiroshi Naganawa, Tokyo; Tsutomu Sawa, Ayase, and Tomio Takeuchi, Tokyo, all of Japan, assignors to Sanraku Incorporated, Tokyo, Japan

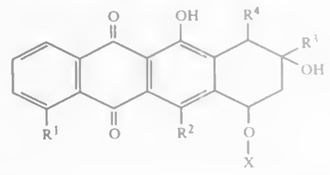
Filed Oct. 3, 1988, Ser. No. 252,636

Claims priority, application Japan, Oct. 6, 1987, 62-250712; Aug. 25, 1988, 63-211624

Int. Cl.[4] **C07H** *15/24;* **A61K** *31/71*

U.S. Cl. 536—6.4 **13 Claims**

1. Anthracycline antibiotics of a formula (I)



(I)

in which R^1 and R^2 are hydroxyl groups, R^3 is ethyl group, R^4 is methoxycarbonyl group and X represents daunosamine-rhodenose or daunosamine-dexyfucose; or

R^1 and R^2 are hydroxyl groups, R^3 is 1-hydroxyethyl group, R^4 is hydrogen atom and X represents daunosamine-rhodenose or daunosamine-deoxyfucose; or

R^1, R^2 and R^4 are hydroxyl groups, R^3 is ethyl group and X represents daunosamine-rhodenose, daunosamine-deoxyfucose, rhodosamine-rhodenose, N-monomethyldaunosamine-rhodenose or N-monomethyldaunosamine-deoxyfucose; or

R^1 is methoxy group, R^2 is hydroxyl group, R^3 is ethyl group, R^4 is methoxycarbonyl group and X represents daunosamine-rhodenose or daunosamine-deoxyfucose; or

R^1 and R^4 are hydroxy groups, R^2 is hydrogen atom, R^3 is ethyl group and X represents daunosamine-deoxyfucose, as well as pharmaceutically acceptable acid addition salts thereof.

4,918,173

2′,6′-DIDEOXY DERIVATIVES OF ANTHRACYCLINE GLYCOSIDES

Claude Monneret, Paris; Jean-Claude Florent, Les Ulis, and Agnès Genot, Villemomble, all of France, assignors to Laboratories Hoechst S.A., Puteaux, France

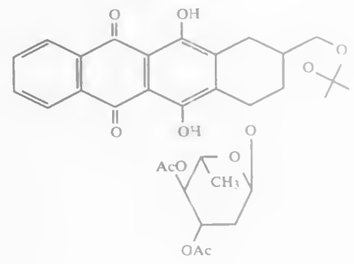
Filed Jun. 30, 1986, Ser. No. 880,075

Claims priority, application France, Jul. 2, 1985, 85 10063

Int. Cl.[4] **C07H** *15/24*

U.S. Cl. 536—6.4 **5 Claims**

1. An anthracyclin consisting of 1-O-(3′,4′-di-O-acetyl-2′,6′-dideoxy-α-L-arabinohexopyranosyl)-1,2,3,4,6,11-hexahydro-1S,3S,5,12-tetrahydroxy-3-hydroxymethyl-3,13-O-isopropylidenenaphthacene-6,11-dione of formula (XXIII) below.



4,918,174

TIACUMICIN COMPOUNDS

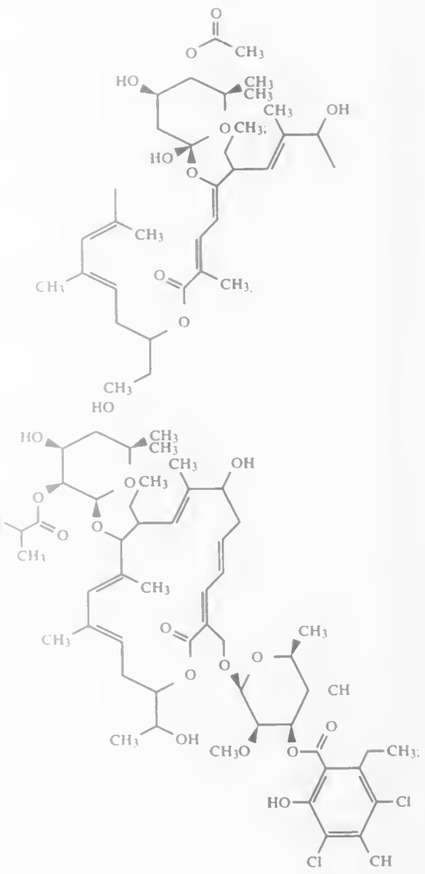
James B. McAlpine, Libertyville; Marianna Jackson, Waukegan, and James Karwowski, Mundelein, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Sep. 26, 1986, Ser. No. 912,438

Int. Cl.[4] **A61K** *31/70;* **C07D** *313/00, 407/00, 493/00*

U.S. Cl. 536—7.1 **12 Claims**

1 A compound of the formula:



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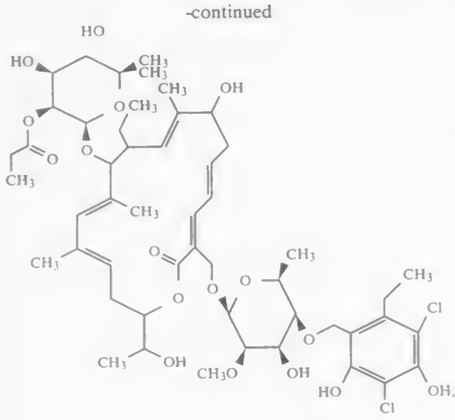
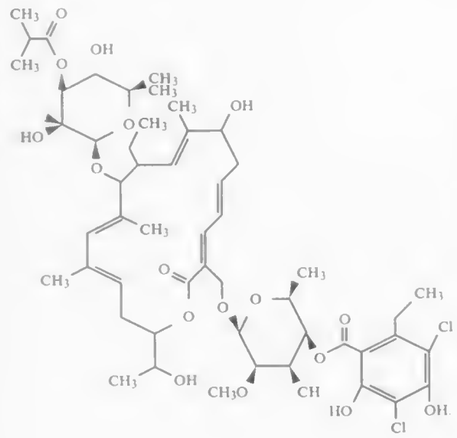


or



4,918,175

BISMUTH (PHOSPH/SULF)ATED SACCHARIDES

S. Marc Bowen, Independence; Richard S. Bodine, Kansas City, both of Mo., and James C. Coleman, Lenexa, Kans., assignors to Marion Laboratories, Inc., Kansas City, Mo.

Filed Jun. 21, 1988, Ser. No. 209,372

Int. Cl.[4] C07H *15/00, 23/00, 11/04;* A61K *31/715*

U.S. Cl. 536—171 25 Claims

10. A process for preparing a bismuth (phosph/sulf)ated saccharide comprising contacting a hydrogen (phosph/sulf-)ated saccharide and a bismuth substance under conditions such that the bismuth (phosph/sulf)ated saccharide is prepared.

4,918,176

UNSATURATED CYCLOALIPHATIC DERIVATIVES

Gerard Lang, Saint-Gratien; Serge Forestier, Claye-Souilly, and Alain Lagrange, Chatou, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

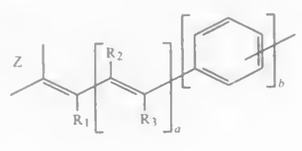
Filed Feb. 20, 1986, Ser. No. 831,552

Claims priority, application Luxembourg, Feb. 20, 1985, 85777

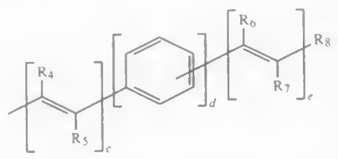
Int. Cl.[4] C07H *15/00;* C07D *265/30;* C07C *47/52*

U.S. Cl. 536—17.2 19 Claims

1. An unsaturated cycloaliphatic derivative having the formula:



(I)



wherein

R_1 to R_7, each independently, represent hydrogen or lower alkyl,

R_8 represents -C≡N, an oxazolinyl radical or a radical corresponding to one of the following formulas:

(i) $-CH_2OR_9$ and

(II)

wherein

R_9 represents hydrogen, lower alkyl, cyclopentyl, cyclohexyl, monohydroxyalkyl, polyhydroxalkyl, or a tetrahydropyrannyl radical and

R_{10} represents hydrogen, lower alkyl, $-OR_{11}$ or

wherein r' and r'', each independently, represent hydrogen, linear or branched alkyl, monohydroxyalkyl, polyhydroxyalkyl, alkenyl, cyclopentyl, cyclohexyl, phenyl, phenyl substituted by halogen, hydroxy or lower alkoxy, benzyl, phenthyl, benzyl substituted by hydroxy or alkoxy or phenethyl substituted by hydroxy or alkoxy, or r' and r'' taken together with the nitrogen atom to which they are attached form a heterocycle selected from the group consisting of piperidino, piperazino, morpholino, pyrrolidino and 4-(2-hydroxyethyl) piperazino, or r' represents hydrogen and r'' represents the residue of methionine or glucosamine,

R_{11} represents hydrogen, alkyl, monohyroxy lower alkyl, polyhydroxy lower alkyl, or the residue of a sugar selected from glucose, mannitol, erythritol or galactose,

Z represents a cycloaliphatic residue selected from the group consisting of norbornane, 2,2-dimethyl norborane, adamantane and cyclododecane,

a and e represent 0, 1 or 2, and b, c and d represent 0 or 1, it being understood that:

a+c+e≧1 and that b and d do not represent 0 simultaneously,

and the geometric and optical isomers of the said compounds of formula I, as well as their salts.

4,918,177

SIALIC ACID DERIVATIVES HAVING ACTIVE CARBONYL GROUP

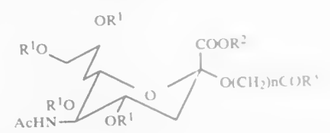
Shoji Yoshimura, Iruma; Shohei Shibayama, Tokorozawa; Masaaki Numata, Kawagoe; Masayoshi Ito, Kunitachi; Yoshiyasu Shitori, Tokyo, and Tomoya Ogawa, Musashino, all of Japan, assignors to Mect Corporation, Tokyo, Japan

Filed Dec. 21, 1987, Ser. No. 136,144

Int. Cl.[4] C07H *5/04, 15/00;* C07G *3/00;* A61K *31/715*

U.S. Cl. 536—18.7 36 Claims

1. A sialic acid derivative having an active carbonyl group represented by the formula [I]:



(I)

wherein R^1 represents hydrogen or acetyl group; R^2 represents hydrogen, a metal or a lower alkyl group; R^3 represents hydrogen, hydroxyl group, or a residue removed hydrogen from an alcohol portion of an active ester; Ac represents acetyl group; and n is 1 to 20, respectively.

4,918,178

TEST FOR JOHNE'S DISEASE

Sarah S. Hurley, Stoughton; Gary A. Splitter, Brooklyn, and Rodney A. Welch, Madison, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Oct. 22, 1987, Ser. No. 112,179

Int. Cl.[4] C07H *21/04;* C12N *15/00;* C12Q *1/68;* C12R *1/32*

U.S. Cl. 536—27 4 Claims

1. A polynucleotide fragment that will bind to *M. paratuberculosis*, but not *M. bovis*, *M. phlei*, or *M. scrofulaceum* in a hybridization test under stringent conditions.

4,918,179

2'-FLUORO-ARABINOFURANOSYL PURINE NUCLEOSIDES

Kyoichi A. Watanabe, Rye Brook, N.Y.; Chung K. Chu, Athens, Ga., and Jack J. Fox, White Plains, N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Division of Ser. No. 789,072, Oct. 18, 1985, Pat. No. 4,751,221.

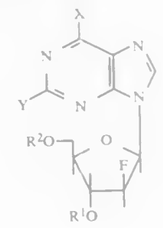
This application May 2, 1988, Ser. No. 189,148

The portion of the term of this patent subsequent to Jun. 14, 2005, has been disclaimed.

Int. Cl.[4] C07H *19/173, 19/06, 19/00;* A61K *31/70*

U.S. Cl. 536—24 2 Claims

1. A purine nucleoside having the structural formula



wherein

X and Y are the same or different and are hydrogen, halogen, OR^3, SR^3, NR^3R^4 or NHacyl;

R^3 and R^4 being the same or different and being hydrogen, a lower alkyl of 1 to 7 carbon atoms, an aralkyl compound selected from the group consisting of benzyl, benzhydryl or methoxybenzyl, or an aryl compound selected from the group consisting of phenyl, chlorophenyl, toluyl, methoxyphenyl and naphthyl; and

NHacyl being alkanoyl or aroyl amide, alkanoyl being an alkyl carbonyl radical in which alkyl is a straight or branched chain saturated or unsaturated hydrocarbon radical having from 1 to 20 carbon atoms and aroyl being a benzoyl or naphthoyl; and

wherein R^1 and R^2 are the same or different and are hydrogen, acyl or aroyl, acyl being an alkanoyl group of 1 to 20 carbon atoms and aroyl being a benzoyl or naphthoyl.

4,918,180

PREPARATION OF CELLULOSE ETHERS

Serge Huybrechts, Perthshire, Great Britain, assignor to Union Carbide Chemicals and Plastics Company, Inc., Danbury, Conn.

PCT No. PCT/GB87/00673, § 371 Date Nov. 23, 1988, § 102(e) Date Nov. 23, 1988, PCT Pub. No. WO88/02375, PCT Pub. Date Apr. 7, 1988

PCT Filed Sep. 24, 1987, Ser. No. 277,812

Claims priority, application United Kingdom, Sep. 24, 1986, 8622952

Int. Cl.[4] C08B *37/00, 3/06, 11/193, 11/08*

U.S. Cl. 536—56 6 Claims

1. A process for preparing a modified cellulose which comprises reacting a cellulose ether with an effective amount of an aggregating agent in order to reduce the dust content of the cellulose ether, said aggregating agent comprising (1) a polypropylene glycol or a propoxylated alcohol and (2) ethylene oxide/propylene oxide copolymer.

4,918,181

TERTIARYAMINOALKYL-HYDROXYALKYL ETHERS OF POLYGALACTOMANNANS

Dennis J. Karcher, 8907 Raintree Dr.; Michael E. Morgan, 7316 Six Mile La., Apt. #42, both of Louisville, Ky. 40220, and Martha A. Phelps, 302 Eline Ave., Louisville, Ky. 40207

Filed Mar. 2, 1988, Ser. No. 162,910

Int. Cl.[4] C07G *17/001;* C07H *15/04*

U.S. Cl. 536—114 9 Claims

1. As a composition to matter, the dialkylaminoalkyl ether-hydroxyalkyl ether of a polygalactomannan.

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4,918,182

SWEETENER

Graham Jackson, Reading, and Michael R. Jenner, Goring-on-Thames, both of Great Britain, assignors to Tate & Lyle Public Limited Company, United Kingdom

Filed Jul. 15, 1987, Ser. No. 73,454

Claims priority, application United Kingdom, Jul. 15, 1986, 8617222

Int. Cl.[4] C07H *1/00, 17/00, 5/06*

U.S. Cl. 536—124 **10 Claims**

1. Crystalline sucralose having enhanced thermal stability and a mean particle size of at most 10 microns, the maximum particle size being no more than twice the mean.

4,918,183

MONOAZO DYES, PROCESS FOR THEIR PREPARATION, AND THE USE THEREOF

Rudolf Hurter, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

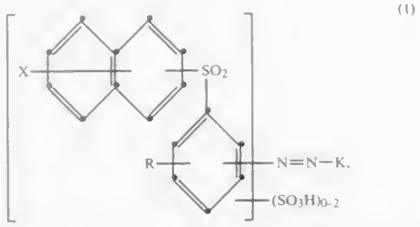
Continuation of Ser. No. 517,605, Jul. 27, 1983, abandoned. This application Oct. 24, 1985, Ser. No. 790,656

Claims priority, application Switzerland, Aug. 4, 1982, 4696/82

Int. Cl.[4] C09B *62/507, 62/527, 62/66, 62/82*

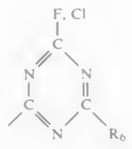
U.S. Cl. 534—617 **9 Claims**

1. A monoazo dye of the formula

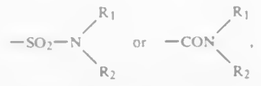


(I)

wherein K is an aminobenzene, alkoxybenzene, alkoxynaphthalene, phenol, naphthol, pyrazolone, pyrimidine, pyridone, indole, diphenylamine, acetoacetamide, naphthimidazole, tetrahydroquinoline or pyrazolo-[2,3-a] -pyrimidine radical or K is an aminonaphthalene radical which is unsubstituted or substituted by sulfo or an aminoaphthol radical which is substituted in the naphthalene nucleus by sulfo,and wherein the amino group is unsubstituted or substituted by methyl, ethyl, dimethyl, diethyl, cyanoethyl, hydroxyethyl, dihydroxyethyl, cyclohexyl, benzyl, pheynyl, acryloyl, mono-,di- or trichloroacryloyl or -metacryloyl, mono-, di-or tribromoacryloyl or -metacryloyl, —CO—CCl=CH—COOH, —CO—CH=C-Cl—COOH, 2-chloropropionyl, 3-phenylsulfonylpropionyl, 3-methylsulfonylpropionyl, β-sulfatoethylaminousulfonyl, vinylsulfonyl, β-chlorethylsulfonyl, βsulfatoethylsulfonyl, βmethylsulfonylethyl-sulfonyl, β-phenylsulfonylethylsulfonyl, 2-fluoro-2-chloro-3,3-difluorocyclobutane-1-carbonyl, 2,2,3,3-tetrafluorocyclobutanecarbon-1-or -sulfon-1-yl, β(2,2,3,3-tetrafluorocyclobut-1-yl)-acryloyl, α-or β-methylsulfonylacryloyl, chloroacetyl, bromoacetyl, α, β-di-chloropropionyl, αβ-dibromopropionyl, α-chloroacryloyl, α-bromoacryloyl, 2,4-difluoro-5-chloropyrimid-6-yl, 2,4,6-trifluoroyrimid-5-yl, 2,4-dichloro-5-methylsulfonylpyrimid-6-yl, 2,4-difluoro-5-methylsulfonylpyrimid-6-yl, 2,4-difluorotriazin-6-yl, chloro-or fluorotriazinyl radicals of the formula



wherein $R_6$is an unsubstituted or substituted amino group or a free or etherified oxy or thio group, or K is 1-phenyl-3-methyl -5-amino pyrazole, and R is hydrogen, halogen, carboxy, C_{1-6}-alkyl unsubstituted or substituted by halogen, hydroxy, sulfato, sulfo, carboxy, cyano, C_{1-4}-alkoxy, C_{1-6}-alkanoyl, benzoyl, phenyl, naphthyl or cycloalkyl; C_{1-6}-alkoxy unsubstituted or substituted by halogen, hydroxy, carboxy or sulfo; C_{2-6}-alkanoylamino unsubstituted or substituted by halogen; C_{1-6} -alkylsulfonylamino unsubsituted or substituted by halogen or C_{1-4}-alkoxy: C_{1-6}-alkylsulfonyl; phenyl-(C_{1-4}) -alkyl-sulfonyl or naphthyl-(C_{1-4})-alkylsulfonyl unsubstituted or substituted in the phenyl or naphthyl moiety by C_{1-4}-alkyl, C_{1-4}-alkoxy, halogen, C_{1-6}-alkanoylamino, hydroxy, carboxy or sulfo; or benzoyl unsubstituted or substituted by C_{1-4}-alkyl, C_{1-4}-alkoxy, halogen, C_{1-6}-alkanoylamino, hydroxy, carboxy or sulfo; or is



where each of R_1 and R_2 independently of the other is hydrogen or C_{1-6}-alkyl unsubstituted or substituted by halogen, hydroxy, sulfato, sulfo, carboxy, cyano, C_{1-4}-alkoxy, C_{1-6}-alkanoyl, benzoyl, phenyl, naphthyl or cycloalkyl; C_{5-7}-cycloalkyl unsubstituted or substituted by halogen, C_{1-4}-alkyl or C_{1-4}-alkoxy; phenyl or naphthyl unsubstituted or substituted in the phenyl or naphthyl moiety by C_{1-4} -alkyl, C_{1-4}-alkoxy, halogen, C_{1-6}-alkanoylamino, hydroxy, carboxy or sulfo; and wherein X is hydrogen, halogen, C_{1-6}-alkyl unsubstituted or substituted as given for R as substituted C_{1-6}-alkyl; C_{1-6}-alkoxy unsubstituted or substituted as given for R as substituted C_{1-6}-alkoxy; C_{2-6}-alkanoylamino unsubstituted or substituted by halogen; or C_{1-6}-alkylsulfonylamino unsubstituted or substituted by halogen or C_{1-4}-alkoxy; which dye contains 1 to 3 sulfo groups.

4,918,184

AZETIDIN-2-ONE DERIVATIVES, AND PROCESS FOR PRODUCTION THEREOF USING TIN ENOLATES

Yoshimitsu Nagao, Uji; Toshio Kumagai, Kawagoe; Satoshi Tamai, Komae; Yasuhiro Kuramoto, and Hisashi Shimidzu, both of Shiki, all of Japan, assignors to Lederle (Japan), Ltd., Tokyo, Japan

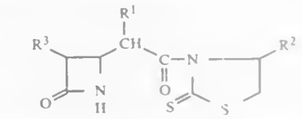
Division of Ser. No. 901,127, Aug. 28, 1986, abandoned. This application Dec. 23, 1987, Ser. No. 137,089

Claims priority, application Japan, Aug. 31, 1985, 60-192905; Oct. 1, 1985, 60-216127; Dec. 2, 1985, 60-269417

Int. Cl.[4] C07D *417/06, 277/12, 417/14;* **C07B** *37/04*

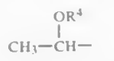
U.S. Cl. 540—200 **10 Claims**

1. A process for producing an azetidin-2-one derivative represented by the following formula (I)

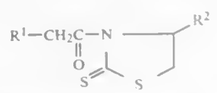


(I)

wherein R^1 represents a hydrogen atom, a lower alkyl group, an aralkyl group, a lower alkoxy group, aralkoxy group, a lower alkylthio group, an aralkylthio group, or a protected amino group, R^2 represents a lower alkyl group, an aryl group or an aralkyl group, and R^3 represents a hydrogen atom or a group of the formula

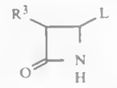


in which R^4 represents a hydrogen atom or a protective group for the hydroxyl group, which comprises reacting a compound represented by the following formula (II)



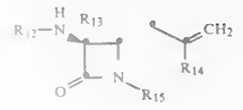
(II)

wherein R^1 and R^2 are as defined, with tin (II) triflate in the presence of a base, and then reacting the resulting compound with a compound represented by the following formula (III)



(III)

wherein R^3 is as defined, and L represents a lower alkanoyloxy group, a lower alkylsulfonyl group or an arylsulfonyl group.



wherein

R_{12} is an acyl group of the formula

wherein

R_k is

(a) C_1 to C_7 alkyl, cyanomethyl or 4-protected amino-4-protected carboxybutyl; or

(b) C_1 to C_6 alkoxy, allyloxy, phenoxy, benzyloxy or 4-methoxybenzyloxy; or

(c) the group R_1, wherein R_1 is phenyl or substituted phenyl, wherein the substituents are one or two halogens, protected hydroxy, cyano, trifluoromethyl, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, protected amino, protected carboxy, protected carboxymethyl, protected hydroxymethyl or protected aminomethyl; or

(d) an arylalkyl or aryloxyalkyl group of the formula

$$R_1—(O)_m—CH_2—$$

wherein R_1 is as defined above and m is 0 or 1; or

(e) a substituted arylalkyl or heteroarylalkyl group of the formula

wherein R_m is R_1 as defined above, thien-2-yl, thien-3-yl, fur-2-yl, or fur-3-yl; and W is protected hydroxy, protected carboxy, or protected amino; or

(f) a heteroarylmethyl group of the formula

$$R_n—CH_2—$$

wherein R_n is thien-2-yl, thien-3-yl, fur-2-yl, fur-3-yl, thiazol-2-yl, tetrazol-5-yl, or tetrazol-1-yl;

R_{13} is hydrogen or methoxy;

R_{14} is hydrogen, C_1 to C_6 alkyl or cycloalkyl, phenyl, phenyl (C_1 to C_4)alkyl or (protected carboxy)methyl; and

R_{15} is hydrogen or an amino protecting group.

4,918,185

PROCESS FOR CARBON-CARBON BOND FORMATION AT THE C-4 POSITION OF 3-ACYLAMINOAZETIDINONES AND PRODUCTS AND STARTING MATERIALS THEREFOR

Larry C. Blaszczak, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 99,803, Sep. 22, 1987, Pat. No. 4,771,135, which is a continuation of Ser. No. 613,111, May 22, 1984, abandoned. This application May 19, 1988, Ser. No. 195,552

Int. Cl.[4] C07D *205/08, 403/12, 417/12, 409/12*

U.S. Cl. 540—364 **6 Claims**

1. A compound of the formula

4,918,186

PROCESS FOR PRODUCING CYCLIC UREAS

Nobuyuki Kajimoto; Teruyuki Nagata, and Masaru Wada, all of Fukuoka, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 44,836, Apr. 30, 1987, abandoned. This application Mar. 7, 1989, Ser. No. 320,228

Claims priority, application Japan, May 6, 1986, 61-101935; May 6, 1986, 61-101937

Int. Cl.[4] C07D *233/34, 239/36, 243/04*

U.S. Cl. 540—492 **1 Claim**

1. In a process for producing a cyclic urea which comprises reacting a diamine expressed by the formula (II)

$$R\text{-}HN\text{-}R'\text{-}NH\text{-}R \qquad \text{(II)}$$

wherein R represents hydrogen atom or a lower alkyl group and R'represents dimethylene group, a lower alkyl group-sub-

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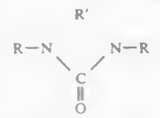
stituted dimethylene group, trimethylene group, a lower alkyl group-substituted trimethylene group, tetramethylene group, a lower alkyl group-substituted tetramethylene group, but a case where R represents hydrogen atom and R'represents dimethylene group, a case where R represents hydrogen atom and R'represents a lower alkyl group-substituted dimethylene group and a case where R represents methyl group and R'represents dimethylene group are excluded, with phosgene in the presence of a dehydrochlorinating agent, the improvement which comprises at first converting said diamine to its hydrochloride and thereafter, reacting the hydrochloride with phosgene in a molar ration of 1.0 to 1.5 of phosgene to diamine in water solvent while maintaining a pH of the reaction liquid in the range of 5.0 to 8.0 by said dehydrochlorinating agent to obtain a cyclic urea expressed in the formula (I)



(I)

wherein R and R'are each as defined above.

4,918,187

[2,5-DIHYDRO 5-PHENYL-2-OXO-3-FURANYL]AMINES

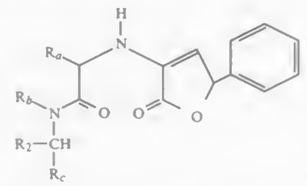
Stephen K. Boyer, Lebanon, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 868,227, May 28, 1986, abandoned. This application Sep. 27, 1988, Ser. No. 251,011

Int. Cl.[4] **C07D** *417/12;* **A61K** *31/395*

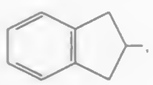
U.S. Cl. 540—523 **1 Claim**

1. A compound of the formula



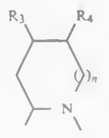
wherein R_c is carboxyl, lower alkoxycarbonyl, carbamoyl, N-mono lower alkyl carbamoyl, or N,N-di-lower alkyl carbamoyl; and

(a) R_a is methyl or omega amino lower alkyl; R_b is



and R_2 is H or lower alkyl; or

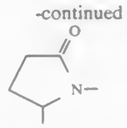
(b) R_a is methyl or omega amino lower alkyl; and R_2 and R_b together along with the carbon and nitrogen atoms to which they are attached form a group of the formula



[II]

or

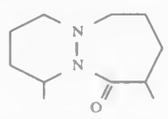
-continued



[IIa]

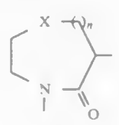
wherein n is 0 or 1; and R_3 and R_4 are each hydrogen, or together with the two carbon atoms to which they are attached form a cyclopentane, cyclohexane, or benzene ring; or

(c) R_2, R_b and R_a together with the atoms therebetween form a fused ring of the formula



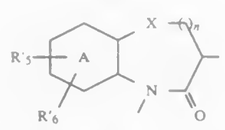
or

(d) R_2 is hydrogen or lower alkyl; and R_a and R_b, together with the atoms therebetween form a group selected from



[IV]

and



[IVa]

wherein R'_5 and R'_6 are each independently hydrogen, lower alkyl, lower alkoxy, lower alkanoyloxy, hydroxy, halogen, or trifluoromethyl, or R'_5 and R'_6 are together lower alkylenedioxy; X is O, S, CH_2, SO, SO_2; n=1 or 2; and ring A is phenyl or cyclohexyl.

4,918,188

OXADIAZINES

Michael B. Gravestock, Camberley, England, assignor to Imperial Chemical Industries plc, London, England

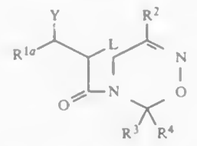
Division of Ser. No. 109,263, Oct. 14, 1987, Pat. No. 4,849,516. This application Nov. 10, 1988, Ser. No. 269,319

Claims priority, application United Kingdom, Oct. 17, 1986, 8624906

Int. Cl.[4] **C07D** *273/04*

U.S. Cl. 544—66 **2 Claims**

1. A compound of the formula (VIII):



wherein R^2 is hydrogen, C_{1-4} alkyl or phenyl optionally substituted by C_{1-4} alkoxy, C_{1-4} alkyl or halo; and R^3 and R^4 are

independently C_{1-4} alkyl, phenyl optionally substituted by C_{1-4} alkoxy, C_{1-4} alkyl or halo or together with the carbon atom to which they are attached form a C_{4-7} cycloalkyl ring optionally substituted by C_{1-4} alkyl, L is a leaving group and $R^{1a}C(Y)$— represents C_{1-4} alkyl or C_{1-4} alkyl substituted by at least one hydroxy group or protected hydroxy group or fluoro, or Y and L together represent oxygen.

4,918,189

SUBSTITUTED HYDROXYLAMINES AND COMPOSITIONS STABILIZED THEREWITH

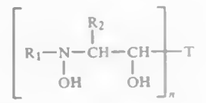
Ramanathan Ravichandran, Yonkers, and Raymond Seltzer, New City, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 940,834, Dec. 12, 1986, Pat. No. 4,749,733. This application Mar. 16, 1988, Ser. No. 168,808

Int. Cl.[4] **C07D** *403/06;* **C07C** *83/00*

U.S. Cl. 544—221 **7 Claims**

1. A compound of the formula



wherein

R_1 is alkyl having 1 to 36 carbon atoms, cycloalkyl having 5 to 12 carbon atoms, phenyl or naphthyl which is unsubstituted or substituted by alkyl having 1 to 36 carbon atoms, or aralkyl having 7 to 9 carbon atoms which is unsubstituted or substituted by alkyl having 1 to 36 carbon atoms,

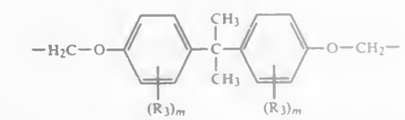
R_2 is hydrogen or R_1,

n is 1 to 4, and

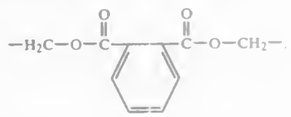
when n is 1, T is R_1 or T

and R_2 together with the carbon atoms to which they are attached form a ring containing 5 to 12 carbon atoms;

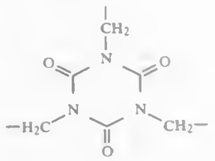
when n is 2, T is alkylene having 2 to 12 carbon atoms, or



wherein m is 1 or 2 and R_3 is hydrogen, alkyl or alkoxy each having 1 to 4 carbon atoms, hydroxyl, halogen, cyano or nitro, or



when n is 3, T is



or

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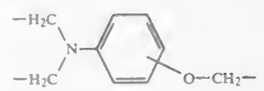
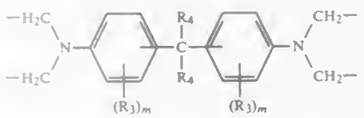


and when n is 4, T is



wherein R_4 is hydrogen or methyl and R_3 and m are as previously defined.

4,918,190

CRYSTALLINE COMPLEX COMPOUNDS OF PROPARGYL ALCOHOLS AND TERTIARY DIAMINES, AND PROCESS OF SEPARATION AND PURIFICATION OF PROPARGYL ALCOHOLS USING THE SAME

Fumio Toda, Ehime; Koichi Tanaka, Matsuyama, and Kikuo Ataka, Ube, all of Japan, assignors to Ube Industries, Ltd., Ube, Japan

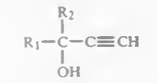
Filed Jul. 30, 1987, Ser. No. 79,821

Claims priority, application Japan, Aug. 6, 1986, 61-183347

Int. Cl.[4] **C07B** *57/00;* **C07D** *487/08, 487/14;* **C07C** *33/18*

U.S. Cl. 544—351 **10 Claims**

1. A crystalline complex compound of two molecules of a propargyl alcohol and one molecule of a diamine wherein the proparyl alcohol is represented by Formula (I):



(I)

wherein each of R_1 and R_2 represents a substituent which is different from each other and is selected from the group wherein each of R_1 and R_2 represents a substituent which is different from each other and is selected from the group consisting of a phenyl substituted one or two times by Cl, Br, F or 2,4 dimethyl;

a C_1–C_8 alkyl group; a benzyl group and a C_5–C_6 cycloalkyl; and

the tertiary diamine is selected from the group consisting of 1,4-diazabicyclo[2.2.2]-octane, 2-methyl-1,4-diazabicyclo[2.2.2]octane, 2,3-dimethyl-1,4-diazabicyclo[2.2.2.]octane, 2,6-dimethyl-1,4-diazabicyclo[2.2.2]octane, 2-phenyl-1,4-diazabicyclo-[2.2.2]octane, N,N'-dimethylpiperazine, N,N'-diethylpiperazine, N,N'-diisopropylpiperazine, 2-methyl-N,N'-dimethylpiperazine, N,N,N',N'-tetraethylethylenediamine, N,N,N',N'-tetramethyl-1,2-propanediamine, N,N,N',N'-tetraethyl-1,2-propanediamine, N,N,N',N'-tetramethyl-1,2-butanediamine, octrahydrodipyrrolo[1,2-a;1',2'-d]pyrazine and N-(N'-methyl-2-pyrrolidinyl)methylpiperidine excluding 1-(2,4-dimethylphenyl)-1-phenylpropargyl alcohol and triethylenediamine complex.

4,918,191

PREPARATION OF 2-N-PROPYL-4-AMINO-5-METHOXYMETHYL-PYRIMIDINE

Joachim Paust, Neuhofen, and Hansgeorg Ernst, Speyer, both of Fed. Rep. of Germany, assignors to BASF Aktinegesellschaft, Ludwigshafen, Fed. Rep. of Germany

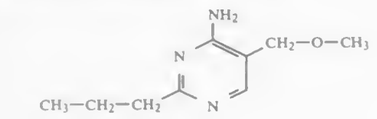
Filed Aug. 15, 1989, Ser. No. 393,976

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1988, 3829850

Int. Cl.[4] C07D *239/42*

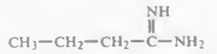
U.S. Cl. 544—326 **4 Claims**

1. A process for the preparation of 2-n-propyl-4-amino-5-methoxymethylpyrimidine of the formula I



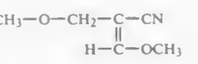
I

by reacting butyramidine II



II

with α-methoxymethyl-β-methoxyacrylonitrile III



III

wherein the butyramidine II is reacted with a 0.4–5 molar excess of α-methoxymethyl-β-methoxyacrylonitrile III at from −10° to +20° C.

4,918,192

POLYSUBSTITUTED ARYL ACRIDINIUM ESTERS

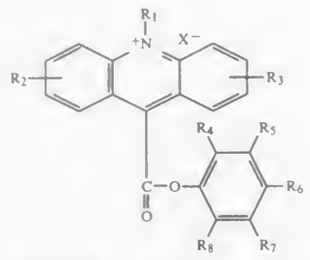
Say-Jong Law, Westwood; Steve C. S. Chang, Franklin; Stephen A. Palmacci, Walpole, and Roger S. Cubicciotti, Needham, all of Mass., assignors to Ciba Corning Diagnostics Corp., Medfield, Mass.

Division of Ser. No. 915,527, Oct. 6, 1986, Pat. No. 4,745,181. This application Dec. 14, 1987, Ser. No. 133,792

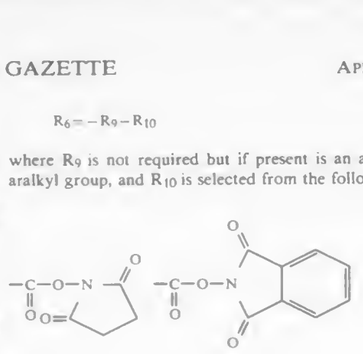
Int. Cl.[4] C07D *219/04, 401/12*

U.S. Cl. 546—104 **2 Claims**

1. A luminescent compound comprising a polysubstituted aryl acridinium ester selected from the group having the following structure:

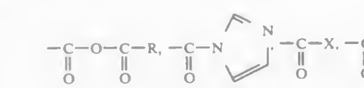


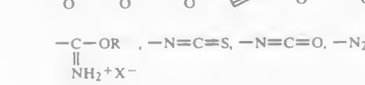
where R_1 is an alkyl, alkenyl, alkynyl, or aryl group; R_2, R_3, R_5, or R_7 are a hydrogen, amino, carboxyl, hydroxyl, alkoxyl, nitro, or halide group; R_4 or R_8 are an alkyl group; R_6 represents the following substituent:

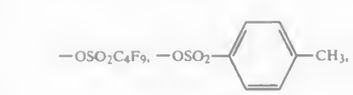


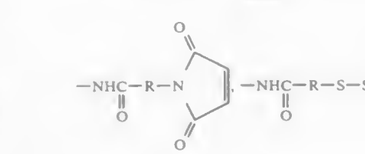
$R_6 = -R_9-R_{10}$

where R_9 is not required but if present is an alkyl, aryl, or aralkyl group, and R_{10} is selected from the following:









X is CH_3SO4^-, OSO_2F^-, a halide, $OSO_2CF_3^-$, $OSO_2C_4F_9^-$,

R is alkyl, aryl, aralkyl; and finally R_5, R_6, and R_7 substituent positions on the phenoxy ring are interchangeable.

2. A luminescent compound according to claim 1 wherein R_1 is a methyl group; R_2, R_3, R_5, and R_7 are hydrogen; R_4 and R_8 are a methyl group; R_{10} is an N-succinimidyl oxycarbonyl group attached directly to the para-position of the phenoxy ring; and X is $CH_3SO_4^-$

4,918,193

METHODS FOR PREPARING 3-[N-PHENYL-ACETYLAMINOPIPERIDINE]-2,6-DION

Stanislaw R. Burzynski, #5 Concord Cir., Houston, Tex. 77024

Filed Jan. 11, 1989, Ser. No. 295,372

Int. Cl.[4] C07D *211/40*

U.S. Cl. 546—220 **3 Claims**

1. A process for synthesizing the compound 3-[N-phenylacetylaminopiperidine]-2,6-dion, consisting essentially of the steps in sequence of:

providing a quantity of L-glutamine;

providing a quantity of phenylacetyl halide;

mixing together the L-glutamine and phenylacetyl halide in a weakly alkaline aqueous solution;

adjusting the weakly alkaline aqueous solution to a pH ranging from about 2 to about 3, to form an acidic reaction mixture;

heating the acidic reaction mixture to about 160° C. and thereafter allowing it to cool;

recovering from the acidic reaction mixture the product 3-[N-phenylacetylaminopiperidine]-2,6-dion, and when desired preparing the pharmaceutically acceptable salts thereof.

4,918,194

PROCESS FOR THE SYNTHESIS OF A N,N-DIALKYL-HYDROXYLAMINE

Paolo Roffia, Saronno; Sergio Tonti, Mestre; Alberto Cesana, Carate Brianza; Maria Angela Mantegazza, Cambiago, and Mario Padovan, Milan, all of Italy, assignors to Montedipe S.p.A., Milan, Italy

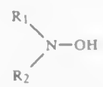
Filed Oct. 25, 1988, Ser. No. 262,354

Claims priority, application Italy, Oct. 29, 1987, 22452 A/87

Int. Cl.[4] C07D *295/22*; C07C *87/02*

U.S. Cl. 546—184 **6 Claims**

1. A process for the synthesis of N,N-dialkylhydroxylamine having the formula (I):



(I)

wherein R_1 and R_2, which may be the same or different, represent an alkyl, cycloalkyl, alkyl-cycloalkyl or cycloalkyl-alkyl group, having from 1 to 40 C atoms, or they are part of a cycloaliphatic ring, containing a hetero-atom N and having from 4 to 8 C atoms, by reaction with hydrogen peroxide of the corresponding (secondary) dialkyl-amine having formula (II):

(II)

wherein R_1 and R_2 are as defined above; comprising carrying out said reaction in the presence of a catalyst based on titanium-silicalite.

4,918,195

PROCESS FOR PREPARING TRIAZOLES FUSED WITH AROMATIC SYSTEMS BY REACTION OF O-ARYLENEDIAMINES WITH NITRITES

Ulrich Schnegg, Leverkusen, and Ulrich Bormann, Langerwehe, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 12, 1988, Ser. No. 243,384

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1987, 3732169

Int. Cl.[4] C07D *249/18*

U.S. Cl. 548—257 **23 Claims**

1. A process for preparing triazoles fused with aromatic systems comprising reacting o-arylenediamines with nitrites and subsequently conducting purification by distillation, wherein the distillation of the fused triazole is carried out in the presence of an alkaline substance consisting essentially of hydroxides, oxides, carbonates, bicarbonates of a compound selected from the group consisting of lithium, sodium, potassium, calcium, strontium, barium, rubidium, cesium or magnesium.

4,918,196

PROCESS FOR RECIMIZATION OF AN OPTICALLY ACTIVE ALPHA-AMINO ACID AMIDES AND PROCESS FOR PRODUCING OPTICALLY ACTIVE ALPHA-AMINO ACIDS

Masaharu Doya; Toshio Kondo; Hideo Igarashi, and Takako Uchiyama, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Feb. 21, 1986, Ser. No. 831,915

Claims priority, application Japan, Feb. 25, 1985, 60-36001; Jun. 21, 1985, 60-135462

Int. Cl.[4] C07D *233/90, 209/20*; C07C *103/183, 103/28*

U.S. Cl. 548—342 **11 Claims**

1. A process for racemization of an optically active alpha-amino amide, which comprises heating a D- or L- isomer of alpha-amino acid amide which is selected from the group consisting of alaninamide, valinamide, leucinamide, isoleucinamide, serinamide, threoninamide, cysteinamide, cystinamide, methioninamide, lysinamide, argininamide, aspartic amide, glutaminamide, phenylglycinamide, phenylalaninamide, tyrosinamide, tryptophanamide and histidinamide, at a temperature of 20° C. to 200° C. in the presence of a strongly basic compound and in the presence of an organic solvent or in the absence of any solvent to form a racemic mixture of the D- and L- alpha amino acid amides.

4,918,197

SILYLATION METHOD

Jonathan D. Rich, Rexford; Terry E. Krafft, Schenectady, and Philip J. McDermott, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 33,567, Apr. 3, 1987, abandoned. This application Aug. 15, 1988, Ser. No. 232,242

The portion of the term of this patent subsequent to Aug. 5, 2003, has been disclaimed.

Int. Cl.[4] C07F *7/08, 7/10, 7/18*

U.S. Cl. 548—406 **21 Claims**

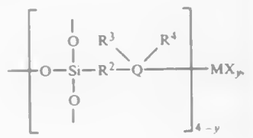
1. A method for making silylated aromatic organic material having at least one nuclear-bound silicon atom attached to an aromatic group by a carbon-silicon linkage comprising,

(A) effecting reaction between a halogenated polysilane of the formula,

and aromatic acylhalide of the formula,

in the presence of an effective amount of a supported transition metal complex having chemically combined groups selected from the class consisting of,

and



and

(B) recovering silylated aromatic organic material from the mixture of (A),

where X is halogen, M is a transition metal selected from palladium, platinum, or nickel, Q is a nitrogen or phosphorous radical, y is an integer having a value of from 1 to 3 inclusive, R is selected from X, hydrogen, $C_{(1-13)}$ monovalent hydrocarbon radicals, substituted $C_{(1-13)}$ monovalent hydrocarbon radicals, and divalent —O—, —S— radicals and mixtures thereof which can form ≡SiOSi≡ and ≡SiSSi≡ connecting groups, R^1 is a $C_{(6-20)}$ monovalent or polyvalent aromatic organic radical, R^2 is a divalent $C_{(2-14)}$ alkyl or aryl radical and R^3 and R^4 are monovalent $C_{(1-14)}$ alkyl or aryl radicals.

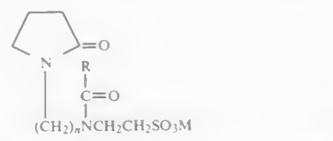
4,918,198

N-(PYRROLIDONYALKYL)-N-ACYL TAURINE SURFACTANTS

Lowell R. Anderson, Morristown; Mohamed M. Hashem, Wayne, and Robert B. Login, Oakland, all of N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.

Filed Aug. 28, 1989, Ser. No. 399,187
Int. Cl.[4] C07D *207/27*
U.S. Cl. 548—550 **12 Claims**

1. A surfactant having the formula:



where R is a alkyl group, saturated or unsaturated, having from 8–22 carbon atoms,
M is a metal ion, and
n is 1–6.

4,918,199

PROCESS FOR PRODUCING THIOTEPA

John Kazan, Martinsville, N.J., assignor to American Cyanamid Company, Wayne, N.J.

Filed Jan. 21, 1988, Ser. No. 146,511
Int. Cl.[4] C07D *205/02*
U.S. Cl. 548—956 **1 Claim**

1. In a process for producing THIOTEPA wherein thiophosphoryl halide is reacted with ethyleneimine, the improvement which comprises the steps of:

(a) adding aqueous solution of B-haloethylamine or salt thereof to an aqueous solution of NaOH or KOH with stirring within a temperature range of from about −10° C. to about +10° C.,

(b) adjusting the temperature of the resulting reaction mixture to from about 30° C. to about 60° C. and stirring for a sufficient period of time to complete the reaction,

(c) lowering the temperature of the reaction mixture to from about −10° C. to about +10° C. and neutralizing with a stoichiometric excess of an alkali metal carbonate or bicarbonate; providing in situ formation of ethylenimine.

4,918,200

CHROMOGENIC AND FLUOROGENIC SILANES AND USING THE SAME

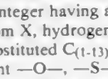
Barry C. Arkles, Ambler, Pa., assignor to Huls America Inc., Piscataway, N.J.

Continuation-in-part of Ser. No. 631,036, Jul. 16, 1984, abandoned. This application Jan. 20, 1987, Ser. No. 4,713
Int. Cl.[4] C07D *311/04*
U.S. Cl. 549—214 **7 Claims**

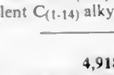
1. A chromogenic or fluorogenic silane having the formula:

$$X_yR_zSi(CH_2)_nL\text{-}Cou$$

wherein X is a hydrolyzable group selected from the group consisting of halogen, C_1–C_6 alkoxy, and dimethylamino; R′ is a C_1–C_6 alkyl or phenyl group; L is an ether (O), urethane



or urea



linkage; Cou is a bicyclo coumarin nucleus and L is linked to the coumarin nucleus at any unsubstituted position; n=1 to 8; y=1 to 3; and z=0 to 2, such that y plus z equals 3.

4,918,201

PROCESS FOR PREPARATION OF MALEIC ANHYDRIDE

Robert C. Edwards, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 150,223, Jan. 29, 1988, Pat. No. 4,861,738. This application Mar. 27, 1989, Ser. No. 328,575
Int. Cl.[4] C07D *307/60*
U.S. Cl. 549—259 **10 Claims**

1. A catalytic process for the oxidation of n-butane to maleic anhydride wherein n-butane is contacted with a catalytic amount of vanadium phosphorus oxide catalyst having an atomic ratio of phosphorus to vanadium in the range of about 0.5 to about 5 regenerated according to the following process comprising:

(A) contacting said catalyst at a temperature in the range of from about 300° C. to about 550° C. with an effective amount of a material selected from the group consisting of:

(1) molecular chlorine of fluorine or mixtures thereof;

(2) carbon halides of fluorine, chlorine, bromine or iodine being in the vapor state above about 250° C. at atmospheric pressure represented by the following formula:

$$C(X)_n$$

where each X is a selected halide and n is an integer from 1 to 4, any remaining radicals being hydrogen or mixtures thereof;

(3) organic halides of fluorine, chlorine, bromine or iodine being in the vapor state above about 250° F. at atmospheric pressure represented by the formula;

$$R(X_1)_m$$

where R is alkane, alkene or alkyne of straight or branched structure having at least two carbon atoms and X_1 is independently a primary, secondary or tertiary halide and m is an integer of from about 1 to about 20 consistent with the number of carbon atoms of said structure or mixtures;

(4) hydrogen halides or mixturs thereof at regeneration conditions including a temperature in the range of from about 300° C. to about 550° C.; and

(B) contacting the catalyst with an effective amount of an alkyl ester of other orthophosphoric acid and water.

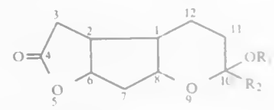
4,918,202

PRECURSOR OF PROSTAGLANDIN

Ryuzo Ueno; Ryuji Ueno, both of Nishinomiya, and Tomio Oda, Sanda, all of Japan, assignors to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo, Osaka, Japan

Filed Jul. 28, 1989, Ser. No. 386,074
Claims priority, application Japan, Jul. 29, 1988, 63-191190
Int. Cl.[4] C07D *493/04*
U.S. Cl. 549—299 **5 Claims**

1. 10-substituted-5,9-dioxatr cyclo[6.4.0.0^{2,6}]dodecane-4-one represented by following formula [II]:



(II)

wherein R_1 is a hydrocarbon protecting group, and R_2 is a saturated or unsaturated hydrocarbon group, which may contain one or more substituent(s) corresponding to the ω-chain of the objective PG's, which may contain one or more substituent(s) selected from the group consisting of halogen, hydroxyl, lower alkyl, alkoxy or phenoxy

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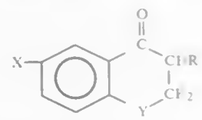
4,918,203

PREPARATION OF 6-SUBSTITUTED 4-CHROMANONES

Jerry R. Patton, and Narayanasamy Gurusamy, both of Ballwin, Mo., assignors to Mallinckrodt Inc.

Continuation of Ser. No. 813,195, Dec. 24, 1985, abandoned This application Feb. 3, 1988, Ser. No. 151,938
Int. Cl.[4] C07D *311/22, 311/38, 335/06*
U.S. Cl. 549—401 **9 Claims**

1. The process for preparing for preparing a 6-substituted-4-chromanone having the formula



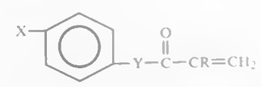
where

x is a member selected from the group consisting of halogen atoms, nitro, amino and alkyl having from 1 to about 20 carbon atoms;

Y is an oxygen or sulfur atom; and

R is a member selected from the group consisting of a hydrogen atom, halogen atom, alkyl having from 1 to about 20 carbon atoms and aryl having from 6 to about 12 carbons which comprises

(a) preparing a phenolic acrylate ester said ester having the formula



where X, Y and R are as defined above, by contacting a parasubstituted phenolic compound having the formula

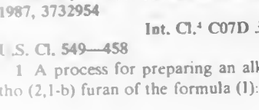
$$p\text{—}X\text{—}C_6H_4\text{—}Y\text{—}Z$$

where X and Y are as defined above and Z is a member selected from the group consisting of hydrogen atom, alkyl having from 1 to about 20 carbon atoms and aryl having from 6 to about 12 carbon atoms, with a β-unsubstituted acrylic acid compound having the formula

$$CH_2\text{=}CR\text{—}C(\text{=}O)OH$$

where R is as defined above, in the presence of a condensation-effecting amount of hydrogen fluoride under ester-forming condensation conditions to form said phenolic acrylate ester, said condensation conditions comprising a substantially anhydrous liquid reaction mixture of said parasubstituted phenolic compound, said β-unsubstituted acrylic acid compound and hydrogen fluoride;

(b) effecting rearrangement of the phenolic acrylate ester to a hydroxy- or mercapto-(vinyl ketone) having the formula



where X, Y and R are as defined above, in the presence of a Fries rearrangement-effecting amount of hydrogen fluoride under Fries rearrangement conditions comprising a substantially anhydrous liquid reaction mixture initially comprising said phenolic acrylate ester and hydrogen fluoride; and

(c) effecting cyclization of said ketone in the presence of a cyclizing amount of hydrogen fluoride under cyclization conditions to form the 6-substituted-4chromanone, said cyclization conditions comprising a substantially anhydrous liquid reaction mixture initially comprising said ketone and hydrogen fluoride.

4,918,204

TETRAHYDROFURAN PURIFICATION

T. Thomas Shih, Bryn Mawr, and Te Chang, West Chester, both of Pa., assignors to Arco Chemical Technology, Inc., Wilmington, Del.

Filed Jan. 30, 1989, Ser. No. 303,325
Int. Cl.[4] C07D *307/08*
U.S. Cl. 549—429 **3 Claims**

1. A process for recovering tetrahydrofuran in pure form from a water azeotrope formed during the dehydration of 1,4-butanediol in the presence of an acid catalyst consisting of contacting said azeotrope with an appropriate 1,2-glycol in an extractive distillation column.

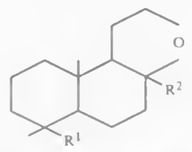
4,918,205

PREPARATION OF ALKYLATED DODECHYDRONAPHTO[2,1-B]FURANS

Walter Gramlich, Edingen-Neckarhausen; Eckhard Hickmann, Dannstadt-Schauernheim; Rainer Becker, Bad Durkheim, and Gerald Lauterbach, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

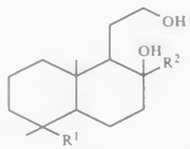
Filed Sep. 28, 1988, Ser. No. 250,077
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3732954
Int. Cl.[4] C07D *307/92*
U.S. Cl. 549—458 **9 Claims**

1 A process for preparing an alkylated dodecahydronaphtho (2,1-b) furan of the formula (I):



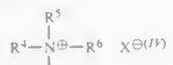
(I)

wherein R^1 and R^2 are identical and each is hydrogen or methyl, which comprises reacting an alkylated 2-hydroxydecahydronaphthalene-1-ethanol of the formula (II):



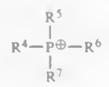
(II)

wherein R^1 and R^2 are each as defined above, with a sulfonyl chloride in the presence of a basic catalyst by performing the cyclization in the presence of a concentrated aqueous alkali metal hydroxide and a phase transfer catalyst, wherein said phase transfer catalyst is a tetraalkylammonium salt of the formula (IV):



(IV)

wherein R^4, R^5, R^6 and R^7 are identical to or different from each other and are independently alkyl of from 1 to 22 carbon atoms or alkyl of up to 25 carbon atoms, which carbon atoms are unsubstituted or substituted by hydroxyl, carboxamide or ether groups, or each of R^4, R^5, R^6 and R^7 are phenyl or phenyl substituted with alkyl groups of up to 20 carbon atoms, and wherein X^- is an anion of an acid; or said phase transfer catalyst is a tetraalkylphosphonium salt of the formula (V):



(V)

wherein R^4, R^5, R^6, R^7 and X^{31} are as defined above for the formula (IV).

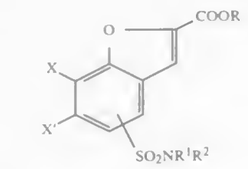
4,918,206

SULFAMOYL-2-BENZOFURANCARBOXYLIC ACID DERIVATIVE

Hiroshi Harada; Yoshihiro Matsushita; Masuhisa Nakamura, all of Osaka, and Yukio Yonetani, Nara, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Sep. 16, 1988, Ser. No. 245,294
Claims priority, application Japan, Oct. 12, 1987, 62-256890
Int. Cl.[4] C07D *307/85*
U.S. Cl. 549—468 7 Claims

1. A compound of the formula:



(I)

wherein R is hydrogen or a protecting group; R^1 and R^2 are the same or different and each is hydrogen, lower alkyl, 4- to 7-membered cycloalkyl, phenyl which is unsubstituted or substituted by a member selected from the group consisting of halo, methoxy and ethoxy, phenyl-lower alkyl, lower alkoxycarbonyl or morpholino-lower alkyl, or R^1 and R^2 taken together with the adjacent nitrogen atom may form pyrrolidino, piperidino or morpholino, each of which is unsubstituted or substituted by lower alkyl; and X and X' each is hydrogen or halogen,

or a pharmaceutically acceptable salt thereof.

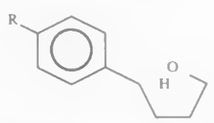
4,918,207

NOVEL OPTICALLY ACTIVE HALO-SUBSTITUTED TETRAHYDROFURANS

Herbert C. Brown, West Lafayette, Ind., assignor to Aldrich Chemical Co., Inc., Milwaukee, Wis.

Division of Ser. No. 175,178, Mar. 30, 1988. This application Jun. 12, 1989, Ser. No. 364,874
Int. Cl.[4] C07D *307/02, 307/06*
U.S. Cl. 549—504 9 Claims

1. A novel, optically active tetrahydrofuran of essentially 100% ee represented by the formula



wherein R is halo selected from the group consisting of chloro, fluoro, bromo and iodo.

4,918,208

PROCESS FOR PRODUCING 7-DIMETHYLAMINO-6-DEMETHYL-6-DEOXYTETRACYCLINE

Ryoichi Hasegawa, Yono; Hiroaki Ohno, Tokyo; Kazuaki Sano, Hoya, and Yoshinori Saito, Yono, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1988, Ser. No. 222,886
Claims priority, application Japan, Jul. 28, 1987, 62-186563; Aug. 18, 1987, 62-203540
Int. Cl.[4] C01D *99/29*
U.S. Cl. 552—205 4 Claims

1. A process for producing 7-dimethylamino-6-demethyl-6-deoxytetracycline (minocycline) which comprises treating the reaction liquid containing minocycline and formaldehyde with hydroxylamine or urea, the reaction liquid being obtained after reductive methylation of 7-amino-6-demethyl-6-deoxytetracycline by using aldehyde, then subjecting the reaction liquid to an adsorption treatment with a nonionic adsorption resin (adsorbent), and subsequently eluting the intended product adsorbed to the adsorbent.

4,918,209

PRODUCTION OF OXIMINOSILANES

Pierre Baule, Saint-Symphorien d'Ozon, and Francois Chizat, Bron, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Mar. 7, 1988, Ser. No. 164,897
Claims priority, application France, Mar. 5, 1987, 87 03206
Int. Cl.[4] C07F *7/10*
U.S. Cl. 556—422 15 Claims

1. A process for the continuous production of oximinosilanes of formula $(R'R''C{=}N{-}O)_n{-}SiR_{4-n}$ comprising the steps of:

(a) injecting continuously and simultaneously into a reactor equipped with a stirrer:

an organic solvent,

ammonia gas,

a halogenated silane of formula $R_{4-n}SiX_n$ in which X represents a halogen and R represents an alkyl radical containing from 1 to 15 carbon atoms, an alkenyl radical containing from 2 to 15 carbon atoms, an aryl, aralkyl or cycloalkyl radical containing from 5 to 15 carbon atoms, it being possible for these radicals to optionally contain hydrogen atoms substituted by halogen atoms which are inert in the reaction of the process, n being equal to 1, 2, 3 or 4, and

an oxime of formula $R'R''C{=}N{-}OH$, in which R' and R'' may represent a hydrogen atom, an alkyl radical containing from 1 to 15 carbon atoms, an alkenyl radical containing from 2 to 15 carbon atoms, an aryl, cycloalkyl, cycloalkenyl, aralkyl or alkylaryl radical containing from 5 to 15 carbon atoms, these radicals being optionally substituted by halogen, atoms which are inert in the reaction, it being possible for R' and R'' to together form an alkylene group such as $-(CH_2)_m-$, in which m represents 3 to 7, it being possible for the said methylene groups to contain hydrogen atoms substituted by halogen atoms which are inert in the reaction, the ratio

$$\frac{\text{number of moles of } NH_3}{\text{number of moles of } R_{4-n}SiX_n \text{ multiplied by } n}$$

being between 1.04 and 1.45, the ratio

$$\frac{\text{number of moles of oxime}}{\text{number of moles of } R_{4-n}SiX_n \text{ multiplied by } n}$$

being between 1 and 1.2;

(b) continuously collecting the reaction mass which leaves the reactor with an overflow device; and

(c) removing the precipitate of XNH_4 obtained from this reaction mass and distilling the organic liquid phase in order to recover therefrom the oximinosilane.

4,918,210

ZWITTERIONIC POLYSILOXANE COMPOSITIONS

William N. Fenton, 3831 N. Jefferson; Michael J. Owen, 2808 Lambros Dr., and Steven A. Snow, 1511 Sylvan La., all of Midland, Mich. 48640

Filed Jan. 20, 1987, Ser. No. 4,734
Int. Cl.[4] C07F *7/08, 7/10*
U.S. Cl. 556—425 20 Claims

1. A composition represented by the general formula

$$R'(CH_3)_2SiO[Si(CH_3)_2O]_w[S\,CH_3RO]_xSi(CH_3)_2R$$

where w is 0 to about 50, x is 0, 1, 2, 3, 4, or 5, the sum of x + w is less than or equal to about 50, R' denotes a methyl radical or an R radical, the molecule has at least one R radical, and R denotes a monovalent zwitterionic radical of the general formula

$$-(CH_2)_yN^+(R'')_2(CH_2)_zSO_3$$

where y is 1, 2, or 3, z is 3 or 4 and R'' denotes an alkyl radical with 1 to 5 carbon atoms.

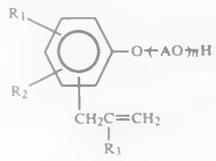
4,918,211

SURFACE ACTIVE COMPOUNDS HAVING A POLYMERIZABLE MOIETY

Kiaya Yokota, Shiga; Akinobu Ichihara, Kameoka, and Hitoshi Shinike, Kyoto, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Nov. 10, 1987, Ser. No. 119,460
Claims priority, application Japan, Dec. 12, 1986, 61-297229; Dec. 12, 1986, 61-297230; Dec. 12, 1986, 61-297231
Int. Cl.[4] C07C *143/11*
U.S. Cl. 558—31 14 Claims

1. A compound of the formula:



wherein

R_1 is alkyl, alkenyl or aralkyl of 4–18 carbon atoms,

R_2 is hydrogen or the same as R_1,

R_3 is hydrogen or methyl,

A is alkylene of 2–4 carbon atoms, and

n is 1–200, and

the moiety $(AO)_n$ contains an amount of oxyethylene groups effective to render the moiety hydrophilic, and the sulfate ester, phosphate ester, sulfosuccinate half ester or sulfosuccinate diester thereof and the base acid addition salt of one of said esters.

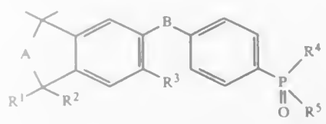
4,918,212

ARYLPHOSPHORUS DERIVATIVES

Hans-Heiner Wuest, Dossenheim, and Bernd Janssen, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 12, 1988, Ser. No. 231,475
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1987, 3726806
Int. Cl.[4] C07F *9/38, 9/40*
U.S. Cl. 558—214 7 Claims

1 An arylphosphorus derivative of the formula



wherein A is an ethylene radical, B is a $-CR^6{=}CH-$ or $-C{\equiv}C-$ group, R^1 and R^2 are each methyl, R^3 is hydrogen and R^4 and R^5 are each $-OR^7$, R^6 is hydrogen or methyl, and R^7 is hydrogen or a C_{1-4} alkyl group and physiologically tolerated salts thereof.

VOL 1113 ISS 3 AP 17 1990 UMI

4,918,213

OPTICALLY ACTIVE COMPOUND AND LIQUID CRYSTAL COMPOSITION CONTAINING SAME

Hiroyuki Nohira, Urawa; Masanao Kamei, Annaka; Hideki Kanazawa, Yotsukaichi; Yoko Yamada, Atsugi, and Yuko Etoh, Tokorozawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

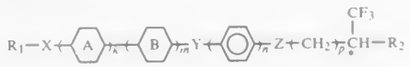
Filed Jul. 25, 1988, Ser. No. 223,363

Claims priority, application Japan, Jul. 28, 1987, 62-186575; Aug. 18, 1987, 62-204343; Feb. 24, 1988, 63-041456; Mar. 25, 1988, 63-071034

Int. Cl.[4] G02F *1/13;* **C09K** *19/34;* **C07D** *239/02;* **C07C** *69/76, 43/20, 43/02, 41/00*

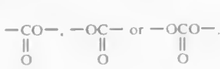
U.S. Cl. 558—271 **10 Claims**

1. An optically active compound represented by the following formula (I):

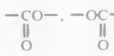


(I)

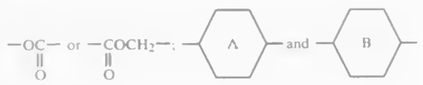
wherein R_1 denotes an alkyl group having 1–18 carbon atoms, R_2 denotes an alkyl group having 1–12 carbon atoms; X denotes a single bond, —O—,



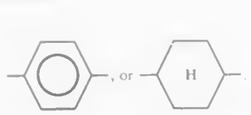
Y denotes a single bond,



—CH_2O— or —OCH_2—; Z denotes —OCH_2—,



independently denote



C* denotes an asymmetric carbon atom; k, m and n are independently 0, 1 or 2 with proviso that k+m+n is 2 or 3; and p is 1 or 2.

4,918,214

AMMOXIDATION OF PARAFFINS AND CATALYSTS THEREFROM

James F. Brazdil, Jr., Mayfield Village; Linda C. Glaeser, Lyndburst, and Mark A. Toft, Lakewood, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 242,236, Sep. 9, 1988, Pat. No. 4,874,738. This application Jul. 3, 1989, Ser. No. 374,804

The portion of the term of this patent subsequent to Nov. 8, 2006, has been disclaimed.

Int. Cl.[4] C07C *120/14*

U.S. Cl. 558—319 **8 Claims**

1. A process for making an α,β-unsaturated mononitrile by the catalytic reaction of a paraffin selected from propane and isobutane to oxygen and ammonia by catalytic contact of the foregoing reactants in a reaction zone with a complex metal oxide catalyst composition that has 0–99 weight percent of a diluent/support and 100–1 weight percent of a catalyst having the elements and the proportions indicated by the empirical formula:

$$VP_pW_wA_aD_dC_cT_tO_x \qquad \text{(formula 1)}$$

where

A is one or more of Sn, Mo, B and Ge;

D is one or more of Fe, Co, Ni, Cr, Pb, Mn, Zn, Se, Tc, Ga, Zr, In and As;

C is one or more of an alkali metal and Tl;

T is one or more of Ca, Sr, Mg and Ba; and

where a is 0–10; d is 0–10; c is 0–1; p is 0–10; p is 0.1–20; w is 0.2–10; the ratio (a+c+d+t+w):(1+p) is no more than 6; and no more than 2 atoms of Mo are present per atom of V; the reactants fed to the reaction zone containing a mole ratio of paraffin:NH_3 in the range from 2 to 16 and a mole ratio of paraffin to O_2 in the range from 1 to 10.

4,918,215

4-HALOGENOSTILBENE DERIVATIVES AND PROCESSES FOR THEIR PREPARATION

Dieter Reinehr, Kandern, Fed. Rep. of Germany, and Alwyn Spencer, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

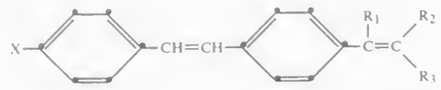
Continuation of Ser. No. 360,015, Mar. 19, 1982, abandoned. This application Oct. 3, 1984, Ser. No. 657,451

Claims priority, application Switzerland, Mar. 31, 1981, 2180/81

Int. Cl.[4] C07C *121/50, 69/76;* **C07D** *303/08*

U.S. Cl. 558—401 **8 Claims**

1 A compound of the formula



in which X represents bromine or iodine, R_1 represents hydrogen, alkyl or a non-chromophoric esterified carboxyl group, R_2 represents C_1–C_6-alkyl or C_2–C_4-alkenyl which is unsubstituted or substituted by a non-chromophoric group, or represents a non-chromophoric substituent of the second order and R_3 represents hydrogen or C_1–C_6-alkyl or C_2–C_4-alkenyl which is unsubstituted or substituted by a non-chromophoric group.

4,918,216

PREPARATION PROCESS OF α-L-ASPARTYL-L-PHENYL-ALANINE METHYL ESTER OR HYDROHALIDE THEREOF

Ryuichi Mita; Toshio Katob, both of Kawasaki; Chojiro Higuchi, Kamakura; Takeshi Oura, Zushi, and Akihiro Yamaguchi, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation of Ser. No. 126,729, Nov. 30, 1987, abandoned. This application May 25, 1989, Ser. No. 357,618

Claims priority, application Japan, Dec. 5, 1986, 61-288888; Dec. 5, 1986, 61-288889

Int. Cl.[4] C07C *101/02*

U.S. Cl. 560—41 **23 Claims**

1. A process for the preparation of the hydrohalide of α-L-aspartyl-L-phenylalanine methyl ester, comprising esterifying α-L-aspartyl-L-phenylalanine in the presence of an alkali metal halide or alkaline earth metal halide in a medium consisting of sulfuric acid, water and methanol, the amount of the alkali metal halide or alkaline earth metal halide being at least 1 equivalent relative to the α-L-aspartyl-L-phenylalanine, thereby allowing the resulting α-L-aspartyl-L-phenylalanine methyl ester to precipitae as its corresponding hydrohalide, and then isolating the hydrohalide.

11. A process for the preparation of α-L-aspartyl-L-phenylalanine methyl ester comprising esterifying α-L-aspartyl-L-phenylalanine in the presence of an alkali metal halide or alkaline earth metal halide in a medium composed of sulfuric acid, water and methanol, the amount of the alkali metal halide or alkaline earth metal halide being at least 1 equivalent relative to the α-L-aspartyl-L-phenylalanine, thereby to allow the resulting α-L-aspartyl-L-phenylalanine methyl ester to precipitate as its corresponding hydrohalide, then isolating the hydrohalide, and neutralizing the hydrohalide to provide the methyl ester.

4,918,217

MACROCYCLIC TETRAMERS HAVING COLUMNAR TRIDIMENSIONAL MESOPHASES

Enrico Dal Canale; Stefanio Borsignore, and Annick Du Vosel, all of Novara, Italy, assignors to Montedison S.p.A., Milan, Italy

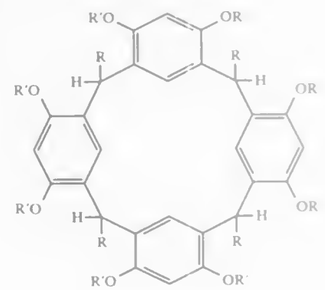
Filed Jul. 20, 1988, Ser. No. 221,609

Claims priority, application Italy, Jul. 21, 1987, 21370 A/87

Int. Cl.[4] C07C *69/76;* **C09F** *05/08*

U.S. Cl. 560—073 **7 Claims**

1. Macrocylic tetramers, having stable, columnar, tridimensional mesophases, having the formula:



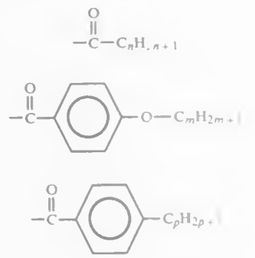
(I)

I

wherein:

R is an alkyl radical having from 1 to 3 carbon atoms, and

R', either equal to or different from one another, represents a radical selected from those having the formula:



(II)

(III)

(IV)

wherein:

n is an integer higher than or equal to 10, and

m and p are integers higher than or equal to 11.

4,918,218

PREPARATION OF ACETIC ACID AND METHYL ACETATE

Franz-Josef Mueller, Wachenheim, Fed. Rep. of Germany, and Dominique Matt, Strasbourg, France, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 25, 1984, Ser. No. 623,973

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1983, 3323654

Int. Cl.[4] C07C *51/12, 53/08, 67/36, 69/14*

U.S. Cl. 560—232 **10 Claims**

1. In a process for the preparation of acetic acid and methyl acetate by gas-phase carbonylation in the presence of a nickel-containing catalyst and in the presence of chlorine, bromine or iodine or a volatile compound of one of those halogens as a promoter, the improvement which comprises:

carrying out the reaction with a catalyst in which the active material consists essentially of not less than 40% by weight of nickel, and 0.001–1 part by weight of palladium per part by weight of nickel.

4,918,219

GLYCERINE DERIVATIVES

Jagadish C. Sircar, Ann Arbor, Mich.; Charles F. Schwender, Gladstone, N.J., and Mark J. Suto, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 22,467, Mar. 6, 1987, Pat. No. 4,806,642, which is a continuation of Ser. No. 657,211, Oct. 5, 1984, abandoned, which is a continuation-in-part of Ser. No. 547,297, Oct. 31, 1983, abandoned. This application Sep. 29, 1989, Ser. No. 250,892

Int. Cl.[4] C07C *69/157, 43/192, 43/174*

U.S. Cl. 560—254 **1 Claim**

1 A compound of the formula

wherein Y is acetyloxy or chloro and R_7 is alkyl of one to eight carbon atoms, cyclopentyl, cyclohexyl, cyclopentylmethyl, or cyclohexylmethyl.

4,918,220

SEPARATION OF TOLUENE DIISOCYANATE FROM THE RESIDUES OF THE PRODUCTION THEREOF

Gerard Collas, Calnire; Georges Gros, Bourg La Reine, and Ferenc Sagi, Lyons, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jan. 13, 1989, Ser. No. 296,810

Claims priority, application France, Jan. 13, 1988, 88 00466

Int. Cl.[4] C07C *137/00*

U.S. Cl. 560—352 **20 Claims**

1 A process for the separation of toluene diisocyantate from the residues of the production thereof, comprising extracting such residues with an extractant which comprises an inert gas in either the liquid or supercritical state wherein the inert gas comprises carbon dioxide, butane, ethane, propane, ethylene, nitrous oxide, SF_6, or a Freon.

4,918,221

PROCESS FOR PREPARING 2,5-DICHLOROPHENYLTHIOGLYCOLLIC ACID

Wolfgang Bauer, Maintal, and Willi Steckelberg, Hofheim, both of Fed. Rep. of Germany, assignors to Cassella AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 27, 1988, Ser. No. 186,638

Claims priority, application Fed. Rep. of Germany, May 9, 1987, 3715508

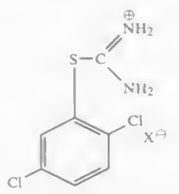
Int. Cl.[4] C07C *149/40*

U.S. Cl. 562—431 6 Claims

1. The process for preparing 2, 5-dichlorophenylthioglycollic acid which comprises:

(a) diazotizing 2,5-dichloroaniline with aqueous alkali metal nitrite at acidic pH to produce 2,5-dichlorophenyl-diazonium salt,

(b) reacting the 2,5-dichlorophenyl-diazonium salt from (a) with thiourea in an aqueous medium at acidic pH in the presence of a catalyst, and optionally in the presence of a finely dispersed non-metallic adsorbant, to produce 2,5-dichlorophenyl-isothuronium salt of the formula



wherein $X^{\ominus}$ is an anion of a mineral acid,

(c) hydroloyzing the 2,5-dichlorophenylisothiuronium salt from (b), without intermediate isolation, at alkaline pH to produce 2,5-dichlorothiophenol and

(d) condensing the 2,5-dichlorothiophenol with monochloroacetic acid to produce 2,5-dichlorophenylthioglycollic acid.

4,918,222

PROCESS FOR SYNTHESIS OF N-ACETYLGLYCINE

Jiang-Jen Lin, Round Rock; John F. Knifton, and Ernest L. Yeakey, both of Austin, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 635,077, Jul. 27, 1984, abandoned. This application Aug. 10, 1987, Ser. No. 83,397

Int. Cl.[4] C07C *102/00, 103/50, 103/48*

U.S. Cl. 562—518 1 Claim

1. A process for synthesizing N-acetylglycine exhibiting improved release of cobalt from the solid form of N-acetylglycine-metal complex and a higher yield of N-acetylglycine which comprises:

reacting paraformaldehyde, carbon monoxide, hydrogen and acetamide with a catalyst comprising a cobalt-containing compound in complex with a dinitrile promoter from the group consisting of adiponitrile, succinonitrile or glutaronitrile in an ethyl acetate solvent at a temperature of 80° C. to 150° C. and a pressure of 1000 psi to 4000 psi at a cobalt-containing compound to promoter molar ratio of 1.0:05 to 1:0:5.0.

4,918,223

METHOD OF PREPARING N-ACYLATED MERCAPTO-ALPHA-AMINO ACIDS

Hans-Peter Krimmer, Frankfurt, and Karlheinz Drauz, Freigericht, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

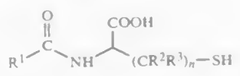
Filed Aug. 9, 1988, Ser. No. 230,028

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1987, 3727897

Int. Cl.[4] C07C *51/08, 67/00;* C07D *213/80, 333/22*

U.S. Cl. 562—556 10 Claims

1. A method of preparing N-acylated mercapto-α-amino acids of the formula



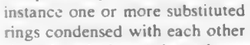
(I)

in which:

R_1 signifies hydrogen, (C_1-C_{18})-alkyl, linear or branched, unsubstituted or singly to triply substituted with aryl mercapto, (C_1-C_4)-alkoxy carbonyl; aryl-(C_1-C_8)-alkyl in which instance an unsubstituted or singly to triply substituted phenyl ring stands for aryl and the substituents can be (C_1-C_8)-alkyl, linear or branched, (C_1-C_4)-alkoxy-(C_1-C_4)-alkyl, aryl, pyridiyl, hydroxy, (C_1-C_4)-alkoxy, aryl oxy, halogen, amino, mono-or di-(C_1-C_5)-alkyl amino, (C_1-C_4)-acyl amino, (C_1-C_4)-alkoxy carbonyl amino, nitro, carboxy, (C_1-C_4)-alkoxy carbonyl, (C_1-C_4)-alkyl mercapto, and aryl mercapto in any position to each other independently of each other; thienylmethyl; aryl, in which instance one or more substituted or unsubstituted phenyl rings condensed with each other stand for aryl, in which rings the substituents have the same significance, independently of each other, as defined in the case of arylalkyl; or pyridinyl-2, pyridinyl-3, pyridinyl-4, thienyl-2, thienyl-3;

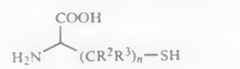
R_2 and R_3 independently of each other, represent hydrogen or (C_1-C_8)-alkyl; and

n signifies a whole number from 1 to 3 which comprises reacting a nitrile of the general formula:



(II)

in which R_1 has the meaning given above with a mercapto-60 -amino acid of the general formula:



(III)

in which R_2 and R_3 have the meanings given above, at a temperature between 0° C. and 100° C. in water or in a mixture of water and an organic solvent which is at least partially miscible with water, in the presence of an organic or inorgahic base.

4,918,224

METHOD OF PREPARING SALTS OF N-ACETYL CYSTEINE OR N-ACETYL HOMOCYSTEINE

Hans-Peter Krimmer, Frankfurt, and Karlheinz Drauz, Freigericht, both of Fed. Rep. of Germany, assignors to Degussa Akteingesellschaft, Frankfurt am Main, Fed. Rep. of Germany

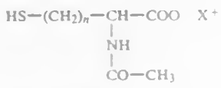
Filed Aug. 9, 1988, Ser. No. 230,026

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1987, 3727896

Int. Cl.[4] C07C *149/243, 149/247*

U.S. Cl. 562—557 5 Claims

1. A method of preparing salts of the general formula



in which n signifies the number 1 or 2 and X^+ is an alkali metal ion, an equivalent of an alkaline earth metal ion, an ammonium ion or a protonium salt of an organic base, said method comprising reacting acetonitrile with cysteine or homocysteine in an aqueous or aqueous-organic medium adjusted to a pH in the range of 8 to 10 by a base supplying the X^+ cation, at a temperature in the range of 0° C. to the boiling temperature of the reaction mixture and, after the reaction is over, removing the solvent.

4,918,225

PROCESS FOR THE PREPARATION OF PURE CROTONIC ACIDS

Siegbert Rittner, Mörfelden-Walldorf; Herbert Görtz, Frankfurt am Main, and Knut Riedel, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 558,112, Dec. 5, 1983, abandoned. This application Oct. 2, 1985, Ser. No. 783,319

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1982, 3245111

Int. Cl.[4] C07C *51/43, 57/08*

U.S. Cl. 562—600 2 Claims

1. A process for the preparation of pure trans-crotonic acid from a mixture of trans-crotonic acid and cis-crotonic acid containing at least 40% by weight of trans-crotonic acid, which comprises melting the mixture and crystallizing trans-crotonic acid from the melted mixture by cooling the melted mixture as long as the melted mixture contains at least 35% by weight of trans-crotonic acid.

4,918,226

PROCESS FOR CONVERTING FORMATE ESTERS TO CARBOXYLIC ACIDS

Roy L. Pruett, New Providence, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 174,824, Aug. 4, 1980, abandoned. This application Jun. 22, 1981, Ser. No. 275,806

Int. Cl.[4] C07C *51/353, 53/08, 55/14, 57/32*

U.S. Cl. 562—607 19 Claims

1. A process for the preparation of carboxylic acids of the formula $R(COOH)_n$ which comprises contacting a formic acid ester of the formula $(HCOO)_n$-R where R is aliphatic, cycloaliphatic or aralkyl and n is 1 or 2 with a catalytically effective amount of a soluble iridium salt and an iodide promoter at a temperature of from about 150° C. to about 250° C. in the presence of at least one carboxylic acid as solvent, at a pressure autogeneously present in the contacting step, and optionally in the presence of inert gas, but in the substantial absence of carbon monoxide.

4,918,227

PROCESS FOR THE PREPARATION OF BENZOYL UREAS

Heinz M. Becher, Bingen am Rhein; Rudolf Mengel, Gau-Algesheim, and Walter Ost, Bingen am Rhein, all of Fed. Rep. of Germany, assignors to Shell Internationale Research Maatschappy B.V., Netherlands

PCT No. PCT/EP86/00116, § 371 Date Feb. 9, 1987, § 102(e) Date Feb. 9, 1987, PCT Pub. No. WO86/05487, PCT Pub. Date Sep. 25, 1986

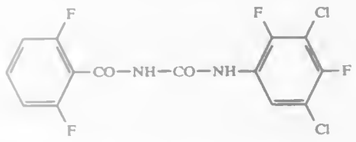
PCT Filed Mar. 6, 1986, Ser. No. 6,552

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509075

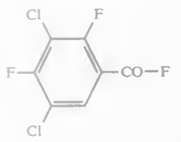
Int. Cl.[4] C07C *127/22*

U.S. Cl. 564—44 2 Claims

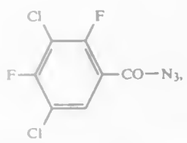
1 The method of preparing the compound of the formula



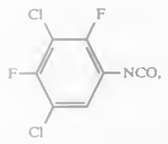
which comprises reacting a benzoyl derivative of the formula



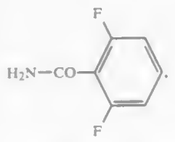
in an inert solvent said benzoyl derivative and inert solvent forming a reaction mixture, at elevated temperatures of between about 80° C. and the boiling point of the reaction mixture, with an alkali metal azide or an alkaline earth metal azide to form the azide intermediate of the formula



thermally degrading, at a temperature between about 80° C. and the boiling point of the reaction mixture, said azide intermediate in situ in the reaction mixture to form the isocyanate intermediate of the formula



reacting said isocyanate intermediate in situ in the reaction mixture at elevated temperatures with the benzamide of the formula



and recovering the reaction product.

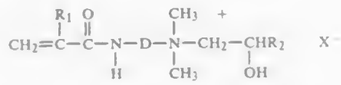
4,918,228

QUATERNARY AMMONIUM ACRYLIC MONOMERS AND ALCOHOL SOLUBLE POLYMERS MADE THEREFROM

Michael E. Morgan, and Martha A. Phelps, both of Louisville, Ky., assignors to Hi-Tek Polymers, Inc., Jeffersontown, Ky.

Filed Feb. 23, 1989, Ser. No. 313,908
Int. Cl.[4] C07C *103/60*
U.S. Cl. 564—208 7 Claims

1. A quaternary ammonium acrylic monomer having the structure



Wherein R_1 is H or methyl; wherein R_2 is an alkyl group containing 6 to 22 carbon atoms, D is an alkylene group containing 1 to 4 carbon atoms or a hydroxyalkylene group containing 2 to 4 carbon atoms, and X is an anion.

4,918,229

METHOD OF PRODUCING PRIMARY AMINES IN HIGH YIELDS AND NOVEL INTERMEDIATES THEREFOR

Herbert C. Brown, West Lafayette, Ind., assignor to Aldrich Chemical Company, Inc., Milwaukee, Wis.

Filed Jul. 29, 1988, Ser. No. 226,080
Int. Cl.[4] C07C *82/00*
U.S. Cl. 564—302 7 Claims

1. A process for obtaining an optically active primary amine of essentially 100% ee in high yields represented by the formula R^*NH_2 wherein R^* is a chiral alkyl group attached to the nitrogen comprising the steps of: heating an optically active dimethylorganoborane of the formula R^*BMe_2, wherein R^* is the same alkyl group but attached to boron, in a suitable solvent with an aminating agent selected from the group consisting of NH_2X wherein X is halo, NH_3+NaOCl or $CaOCl_2$, NH_3+Cl_2, chloroamine T, and O-hydroxylamine sulfonic acid, followed by hydrolysis with aqueous base to liberate the optically active primary amine, and isolation of same.

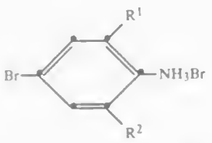
4,918,230

PROCESS FOR THE PREPARATION 4-BROMOANILINE HYDROBROMIDES

Robert Hässig, Gipf-Oberfrick, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

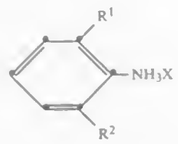
Filed Jun. 14, 1988, Ser. No. 206,551
Int. Cl.[4] C07C *87/452, 85/24*
U.S. Cl. 564—307 8 Claims

1. A process for the preparation of a 4-bromoaniline hydrobromide of formula I



(I)

in good yield and purity wherein R_1 and R_2 are each independently of the other C_1–C_{10}alkyl or C_3–C_7cycloalkyl, which process comprises brominating an aniline hydrohalide of formula II



(II)

wherein X is chlorine or bromine and R^1 and R^2 are as defined above, in the temperature range from −20° to +150° C., in the presence of an inert organic solvent.

4,918,231

PROCESS FOR THE PRODUCTION OF 1,2-AMINO ALCOHOLS

Larry R. Krepski; Steven M. Heilmann, and Jerald K. Rasmussen, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 635,452, Jul. 30, 1984, abandoned. This application Dec. 15, 1988, Ser. No. 284,595
Int. Cl.[4] C07C *91/23, 91/14, 85/12*
U.S. Cl. 564—363 17 Claims

1. Process for the preparation of 1,2-amino alcohol comprising the steps of

(a) reacting a silylated cyanohydrin with a Grignard reagent to produce a magnesium salt of the alpha-silyloxy imine,

(b) treating the reaction product of step (a) with either a reducing agent or an organolithium compound,

(c) hydrolyzing the reaction product of step (b), and

(d) isolating the 1,2-amino alcohol.

4,918,232

PROCESS FOR SEPARATING ANILINE DERIVATIVES

Hans-Josef Buysch, Krefeld; Michael Hüllmann, Heppenheim, and Lothar Puppe, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 29, 1988, Ser. No. 213,069
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1987, 3724018
Int. Cl.[4] C07C *85/26*
U.S. Cl. 564—437 19 Claims

1. In a process comprising separating from each other aniline derivatives having a different number of C atoms bound to the N atoms, the improvement comprising treating a mixture of the substances mentioned in liquid phase with zeolites of the faujasite type at a temperature from 0° C. to 190° C.

4,918,233

PRODUCTION OF ETHYLENEDIAMINE FROM MONOETHANOLAMINE AND AMMONIA

Michel Deeba, Allentown; Michael E. Ford, Center Valley, and Thomas A. Johnson, Orefield, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 8, 1986, Ser. No. 883,000
Int. Cl.[4] C07C *85/06, 87/16*
U.S. Cl. 564—479 5 Claims

1. In a continuous process for producing ethylenediamine by contacting monoethanolamine with ammonia under conditions sufficient to effect condensation therebetween, said contacting being carried out in the presence of a catalyst, the improvement which comprises:

carrying out the reaction in a fixed bed catalytic reactor at a pressure of from 25–1,000 psig; and

utilizing as said catalyst a mordenite exchanged with a rare earth metal or hydrogen ion and said mordenite being dealuminated mordenite.

4,918,234

SHAPE SELECTIVE CATALYSTS FOR C_2 TO C_4 ALKANOL AMINATION

Michel Deeba, North Brunswick, N.J., assignor to Air Products and Chemicals, Inc.

Filed Oct. 13, 1987, Ser. No. 108,256
Int. Cl.[4] C07C *85/06*
U.S. Cl. 564—480 7 Claims

1. In the catalytic preparation of C_{2-4} alkylamines by the reaction of a C_{2-4} alkanol with ammonia in the presence of hydrogen, the improvement which comprises: utilizing a crystalline alumino-silicate Y zeolite as the catalyst where such Y zeolite has a predominant proportion of the cations replaced with cobalt or nickel ions and utilizing ethanol as the alkanol

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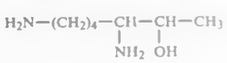
4,918,235

1,5-DIAMINOHEPTANOL-1,6,

Hans-Joachim Scholl, and Josef Pedain, both of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 2, 1988, Ser. No. 227,224
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1987, 3726049
Int. Cl.[4] C07C *91/04*
U.S. Cl. 564—503 1 Claim

1. 1,5-diaminoheptanol-6 corresponding to the formula



(I)

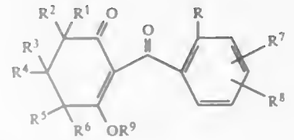
4,918,236

CERTAIN SUBSTITUTED 3-(SUBSTITUTED OXY)-2-BENZOYL-CYCLOHEX-2-ENONES

Christopher G. Knudsen, Berkeley, and William J. Michaely, Richmond, both of Calif., assignors to ICI Americas Inc., Wilmington, Del.

Filed Jun. 9, 1986, Ser. No. 871,989
Int. Cl.[4] C07C *49/225*
U.S. Cl. 568—306 7 Claims

1. A compound of the formula



wherein

R is halogen, C_1–C_2 alkyl, C_1–C_2 alkoxy, nitro; cyano; C_1–C_2 haloalkyl, or R^aSO_m— wherein m is 0 or 2 and R^a is C_1–C_2 alkyl;

R^1 is hydrogen or C_1–C_4 alkyl;

R^2 is hydrogen or C_1–C_4 alkyl; or

R^1 and R^2 together are alkylene having 2 to 5 carbon atoms;

R^3 is hydrogen or C_1–C_4 alkyl;

R^4 is hydrogen or C_1–C_4 alkyl; or

R^3 and R^4 together are oxo;

R^5 is hydrogen or C_1–C_4 alkyl;

R^6 is hydrogen or C_1–C_4 alkyl; or

R^5 and R^6 together are alkylene having 2 to 5 carbon atoms;

R^7 and R^8 independently are (1) hydrogen; (2) halogen; (3) C_1–C_4 alkyl; (4) C_1–C_4 alkoxy; (5) trifluoromethoxy; (6) cyano; (7) nitro; (8) C_1–C_4 haloalkyl; (9) R^bSO_n— wherein n is the integer 0, 1 or 2; and R^b is (a) C_1–C_4 alkyl; (b) C_1–C_4 alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10) —NR^cR^d wherein R^c and R^d independently are hydrogen or C_1–C_4 alkyl; (11) R^eC-(O)— wherein R^e is C_1–C_4 alkyl or C_1–C_4 alkoxy; (12) $SO_2NR^cR^d$ wherein R^c and R^d are as defined; or (13) —$N(R^c)C(O)R^d$ wherein R^c and R^d are as defined; and

R^9 is (a) C_1–C_6 alkyl; (b) C_4–C_6 cycloalkyl; (c) substituted C_1–C_6 alkyl; (d) phenyl—SO_2—; (e) substituted phenyl—SO_2—; (f) C_1–C_6-alkyl—SO_2—, optionally substituted; (g) C_1–C_6 alkyl—C(O)—, optionally substituted; (h) phenyl—C(O)—, optionally substituted; (i) benzyl; or (h) C_3–C_6 alkenyl.

4,918,237

PROCESS FOR THE MANUFACTURE OF 1,4-BIS(4-PHENOXYBENZOYL)BENZENE WITH CERTAIN METAL-CONTAINING CATALYSTS

David R. Corbin, West Chester, Pa., and Enio Kumpinsky, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 13, 1989, Ser. No. 322,622
Int. Cl.[4] C07C *45/46*
U.S. Cl. 568—322 10 Claims

1. A process for the manufacture of 1,4-bis(4-phenoxybenzoyl)benzene suitable for chain extension in the presence of aluminum chloride catalyst with a mixture of 1,4-benzenedicarbonyl chloride and 1,3-benzenedicarbonyl chloride, using either benzenecarbonyl chloride or 3,5-dichlorobenzenecarbonyl chloride as the capping agent, to a melt-stable poly(ether ketone ketone),

said process comprising contacting diphenyl ether for a period of about 60 to about 360 minutes, at a temperature of about 220°–258° C., with 1,4-benzenedicarbonyl chloride in respective mole ratios of about 5:1 to about 25:1 in the presence of at least one catalyst selected from the group consisting of unsupported iron (II) chloride (ferrous chloride), iron (II) sulfate (ferrous sulfate), gallium (III) sulfate, and indium (III) sulfate; and iron (II) chloride, iron (II) sulfate, gallium (III) sulfate, indium (III) sulfate, and iron (III) chloride (ferric chloride) on an inert support; the mole ratio of 1,4-benzenedicarbonyl chloride to the catalyst being about 10:1 to 1000:1; and recovering the 1,4-bis(4-phenoxybenzoyl)benzene product by separating it from both excess diphenyl ether and the catalyst.

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4,918,238

CATALYTIC OXIDATION OF ALKANES INTO ALCOHOL/KETONE MIXTURES

Michel Costantini, and Jean-Pierre Lecomte, both of Lyons, France, assignors to Rhone-Poulenc Chimie, Courbevole, France

Filed Mar. 3, 1989, Ser. No. 318,911
Claims priority, application France, Mar. 3, 1988, 88 02987
Int. Cl.[4] C07C *45/28*
U.S. Cl. 568—342 19 Claims

1. A process for the production of a mixture of alcohols and ketones, comprising catalytically oxidizing at least one hydrocarbon with an organic hydroperoxide, at a temperature above 20° C., in the presence of a catalytically effective amount of osmium or an osmium compound.

4,918,239

METHOD OF PRODUCING CYCLOHEXANONE FROM CYCLOHEXANOL THROUGH OXIDATIVE DEHYDROGENATION

Ikai Wang, and Yu-Ming Lin, both of Hsinchu, Taiwan, assignors to National Science Council, Taipei, Taiwan

Filed Dec. 27, 1988, Ser. No. 289,680
Int. Cl.[4] C07C *45/51*
U.S. Cl. 568—360 7 Claims

1. In a method for producing cyclohexanone by catalytic dehydrogenation of a cyclohexanol feed stream containing cyclohexanol and an oxygen containing gaseous oxidant; wherein the improvement comprises selecting a mole ratio of oxygen to cyclohexanol in the feed stream which is less than 0.2; and dehydrogenating the cyclohexanol feed stream in the presence of a CuO-ZnO-Al_2O_3 catalyst having a composition of Cu from 10–60 mole percent, Zn from 30–90 mole percent, and Al from 0–10 mole percent; and said dehydrogenation being conducted at a temperature of 180°–280° C.

4,918,240

PURIFICATION OF BETA ACIDS FOR HYDROGENOLYSIS AND SUCH PURIFIED BETA ACIDS

Paul H. Todd, Jr., and James A. Guzinski, both of Kalamazoo, Mich., assignors to Kalamazoo Holdings, Inc., Kalamazoo, Mich.

Filed Aug. 15, 1988, Ser. No. 232,289
Int. Cl.[4] C07C *45/78*
U.S. Cl. 568—366 37 Claims

1. A method for the removal of palladium or platinum catalyst poisons from a beta acid solution containing the same, consisting essentially of the step of agitating an aqueous alkaline solution of beta acids at a pH of at least about 10 in the presence of a metal oxide, hydroxide, or salt which provides polyvalent metal ions other than palladium and platinum, and separating insoluble materials containing catalyst poisons from the aqueous beta acid solution.

4,918,241

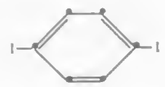
METHOD OF PREPARING AROMATIC ETHERS FROM IODOAROMATIC COMPOUNDS

Thomas H. Larkins, Jr., Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 188,990, May 2, 1988, abandoned. This application Aug. 7, 1989, Ser. No. 390,014
Int. Cl.[4] C07C *41/01, 43/20*
U.S. Cl. 568—648 1 Claim

1. A method of preparing the ether

comprising reacting the compound



with methanol in the presence of a basic compound, a copper catalyst and an amount of hydrogen which is effective to lower the oxidation state of the copper catalyst.

4,918,242

NOVEL OPTICALLY 1,3-PHENOXYPROPYLHALIDES

Herbert C. Brown, West Lafayette, Ind., assignor to Aldrich Chemical Company, Inc., Milwaukee, Wis.

Division of Ser. No. 175,178, Mar. 30, 1988. This application Jun. 12, 1989, Ser. No. 364,873
Int. Cl.[4] C07C *43/02, 43/20*
U.S. Cl. 568—658 7 Claims

1. A novel 1,3-phenoxyphenylhalide of essentially 100% ee represented by the formula: wherein R is phenoxy substituted by lower alkyl, halologeralkyl or loweralkoxy and X is chloro, fluoro, bromo or iodo.

4,918,243

HEAT INTEGRATION PROCESS

Lawrence A. Smith, Jr., Bellaire; Edward M. Jones, Jr., Friendswood, and Dennis Hearn, Houston, all of Tex., assignors to Chemical Research & Licensing Company, Houston, Tex.

Filed Oct. 28, 1988, Ser. No. 263,812
Int. Cl.[4] C07C *41/06*
U.S. Cl. 568—697 8 Claims

1. In the process for the preparation of methyl tertiary butyl ether comprising feeding an isobutene containing C_4 feed stream into a reactor, contacting said feed stream and methanol in the presence of an acidic catalyst to preferentially react at least a portion of the isobutene and methanol to form methyl tertiary butyl ether recovering a reactor effluent comprising said methyl tertiary butyl ether, feeding said reactor effluent to a distillation tower, separating said methyl tertiary butyl ether from unreacted C_4 hydrocarbons and methanol by distillation in said tower, recovering a raffinate containing unreacted C_4 hydrocarbons and methanol, contacting said raffinate with water to extract methanol into said water, separating said raffinate and water, recovering a methanol/water mixture and distilling said methanol/water mixture to remove methanol therefrom as an overhead; wherein the improvement comprises conducting the distillation of said methanol/water mixture at a pressure in the range of 40 to 60 psig, whereby the temperature of the methanol overhead is from about 104° to 114° C., said methanol overhead being condensed by indirect heat exchange between said methanol overhead and a stream withdrawn from said distillation tower, said withdrawn stream having a lower temperature than said methanol overhead prior to said indirect contact, thereby heating said withdrawn stream and cooling and condensing the methanol overhead, and returning said withdrawn stream to said distillation tower after said indirect heat exchange.

4,918,244

PREPARATION OF MTBE FROM TBA AND METHANOL

Edward C. Nelson, Lagrangeville, N.Y.; David A. Storm, Montvale, N.J., and Mahendra S. Patel, Croton on Hudson, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed May 4, 1987, Ser. No. 45,631
Int. Cl.[4] C07C *41/09*
U.S. Cl. 568—698 2 Claims

1. A one step continuous process for preparing MTBE comprising continuously feeding TBA and MeOH in a molar ratio of TBA to MeOH of between about 10:1 and about 1:10 into a packed solid-acid catalyst bed of Amberlyst 15 catalyst in a reactor-separator rectification column, said TBA being reacted with MeOH in the presence of said solid acid catalyst, wherein said TBA is fed to the top of said catalyst bed and said MeOH is fed into the bottom of said catalyst bed to provide a complete conversion of these components to substantially pure MTBE from the top of said rectification column.

4,918,245

PROCESS FOR PREPARING BISPHENOL A

Shigeru Iimuro; Takashi Kitamura, both of Nagoya, and Yoshio Morimoto, Tokai, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Nov. 28, 1988, Ser. No. 276,658
Claims priority, application Japan, Dec. 4, 1987, 62-305942
Int. Cl.[4] C07C *37/20, 39/16*
U.S. Cl. 568—727 7 Claims

1. A process for preparing bisphenol A by the reaction of acetone with phenol comprising:

(a) conducting the reaction of acetone with phenol in the presence of a sulfonic acid type cation exchange resin modified with a mercapto group-containing compound to convert 20 to 60% of the acetone in the reaction; and thereafter

(b) further reacting the resulting reaction mixture containing unreacted acetone in the presence of a hydrochloric acid catalyst.

4,918,246

PROCESS FOR PREPARING OPTICALLY ACTIVE HALOALCOHOLS

Herbert C. Brown, West Lafayette, Ind., assignor to Aldrich Chemical Company, Inc., Milwaukee, Wis.

Division of Ser. No. 175,178, Mar. 30, 1988. This application Jun. 12, 1989, Ser. No. 364,875
Int. Cl.[4] C07C *33/46*
U.S. Cl. 568—812 1 Claim

1. A process for obtaining an optically active alcohol represented by the formula wherein each R is the same or different members of the group consisting of hydrogen, fluoro, chloro, iodo and bromo with the limitation that at least one R must be other than hydrogen, and n is an integer of 1–10 in essentially 100% ee comprising the steps of reducing a prochiral haloketone with ether (+or (−) diisopinocampheylborane, followed by isolation of the optically active isomer.

4,918,247

PROCESS FOR THE PREPARATION OF 2,2-DIMETHYLPROPANEDIOL-1,3

Norbert Breitkopf; Wolfgang Hofs, both of Oberhausen; Heinz Kalbfell, Schermbeck; Franz Thonnessen, Oberhausen; Peter Lappe, Dinslaken, and Helmut Springer, Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Fed. Rep. of Germany

Filed May 26, 1989, Ser. No. 361,711
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1986, 3644675
Int. Cl.[4] C07C *29/14, 29/38, 31/20*
U.S. Cl. 568—854 13 Claims

1 A process for the preparation of 2,2-dimethyl-propanediol-1,3 comprising reacting isobutyraldehyde with an aqueous solution of formaldehyde in the presence of tri-n-propylamine to form a reaction mixture, hydrogenating said mixture to produce a hydrogenation product, and distilling said hydrogenation product in the presence of isobutanol to obtain highly pure 2,2-dimethyl-propanediol-1,3 wherein the weight ratio of said isobutanol to said hydrogenation product is from 1:40 to 1:200

4,918,248

PROCESS FOR PREPARATION OF ALCOHOLS

Yasuyuki Hattori; Noriaki Fukuoka; Shigeru Tamura; Kunizo Hashiba; Kiyoshi Tsukada, all of Wakayama, and Makoto Misono, Tokyo, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed May 22, 1989, Ser. No. 355,292
Claims priority, application Japan, Jun. 2, 1988, 63-136563
Int. Cl.[4] C07C *29/136, 31/125*
U.S. Cl. 568—885 4 Claims

1 A process for producing an alcohol, which comprises the step of catalytically reducing an organic carboxylic acid ester with hydrogen in the presence of a catalyst obtained by reducing a catalyst precursor comprising (A) copper oxide and (B) titanium oxide and/or titanium hydroxide at a weight ratio of (A) to (B) in the range between 15/85 and 65/35.

4,918,249

SILICOMETALLATE MOLECULAR SIEVES AND THEIR USE AS CATALYSTS IN OXIDATION OF ALKANES

Vincent A. Durante, West Chester; Darrell W. Walker, Media; Steven M. Gussow, and James E. Lyons, both of Wallingford, all of Pa., assignors to Sun Refining and Marketing Company, Philadelphia, Pa.

Filed Apr. 17, 1989, Ser. No. 338,916
Int. Cl.[4] C07C *29/50, 31/04, 2/00*
U.S. Cl. 568—910 13 Claims

1. An oxidation process comprising contacting a feedstock comprising a hydrocarbon or an oxygenated hydrocarbon having 1 to 10 carbon atoms at a temperature of about 350° to 550° C. with air or oxygen and in the presence of a catalytically

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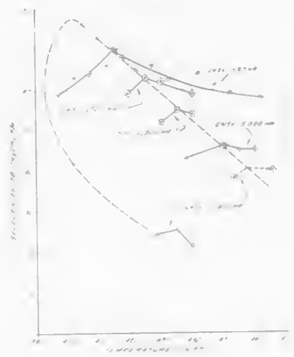
effective amount of a catalyst containing crystalline silicometallate having iron incorporated in the structural framework.



8. Process according to claim 1 wherein the feedstock is methane, the process is carried out in the vapor phase and the methane is converted to methanol.

4,918,250

PROCESS FOR THE PRODUCTION OF DINITROTOLUENE USING AN INORGANIC SALT AS A PHASE SEPARATION AGENT

Robert W. Mason, Lake Charles; Peter C. Imm, Sulphur, and Kent J. Bordelon, Lake Charles, all of La., assignors to Olin Corporation, Cheshire, Conn.

Filed Apr. 21, 1989, Ser. No. 341,447
Int. Cl.[4] C07C *76/00*
U.S. Cl. 568—934 10 Claims

1. A process for producing dinitrotoluene and causing phase separation of the dinitrotoluene so produced from the product mixture which comprises:

(a) reacting toluene with nitric acid having an acid concentration of between about 60 and about 75 percent by weight, based upon the total amount of acid plus water, at a reaction temperature of between about 60° C. and about 75° C., and employing between about 3 and about 5 moles of nitric acid per mole of toluene, to produce mononitrotoluene,

(b) reacting said mononitrotoluene with concentrated nitric acid having an acid concentration of between about 90 and about 100 percent by weight, based upon the total amount of acid plus water therein, at a reaction temperature of between about 40° C. and about 70° C., and employing between about 3 and about 4 moles of concentrated nitric acid per mole of mononitrotoluene, to produce a mixture containing dinitrotoluene and unreacted nitric acid, and

(c) incorporating an inorganic salt into said mixture to cause phase separation of said dinitrotoluene from said unreacted nitric acid in said mixture.

4,918,251

PREPARATION OF 2-HALOFLUOROBENZENE

Robert Halvachs, Belleville, Ill., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Apr. 4, 1989, Ser. No. 333,004
Int. Cl.[4] C07C *17/24, 21/24*
U.S. Cl. 570—143 16 Claims

1. A process for preparing a 2-halofluorobenzene which comprises:

treating with hydrogen gas an aqueous slurry of 2,4-dihalofluorobenzene;

said treatment being carried out in the presence of a transition metal catalyst, wherein said transition metal is selected from the group consisting of platinum and palladium, and at a temperature in the range of about 25° C. to about 75° C.

4,918,252

1-HALO-(Z,E)-7,10-DODECADIENE AND A METHOD FOR THE PREPARATION THEREOF

Takehiko Fukumoto, and Akira Yamamoto, both of Niigata, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 5, 1989, Ser. No. 333,462
Claims priority, application Japan, Apr. 12, 1988, 63-90129
Int. Cl.[4] C07C *21/19*
U.S. Cl. 570—189 3 Claims

1. 1-Halo-(Z,E)-7,10-dodecadiene represented by the general formula

$$CH_3CH_{(E)}CHCH_2CH_{(Z)}CH(CH_2)_6X.$$

in which X is a chlorine atom or a bromine atom.

4,918,253

PROCESS FOR THE PREPARATION OF 1,2,5,6,9,10-HEXABROMOCYCLODODECANE

Joshua Hermolin, Ramat Hasharon; Amiram Groweiss, Herzlia, and Aaron R. McMurray, Haifa, all of Israel, assignors to Bromine Compounds Limited, Israel

Filed Jun. 2, 1988, Ser. No. 201,547
Claims priority, application Israel, Jun. 11, 1987, 82858
Int. Cl.[4] C07C *17/02, 23/00*
U.S. Cl. 570—231 16 Claims

1. A process for the preparation of 1,2,5,6,9,10-Hexabromocyclododecane comprising reacting substantially to completion a reaction mixture comprising bromine and 1,5,9-cis, trans, trans-cyclododecatriene in a solvent,

contacting said reaction mixture with substantially anhydrous NH_3 after substantial completion of said reaction said HBr is deposited therefrom as NH_4Br; and

recovering said solvent substantially free of HBr.

4,918,254

NICKEL CATALYZED DISPLACEMENT REACTION

Steven P. Diefenbach, and Gene C. Robinson, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Feb. 6, 1989, Ser. No. 306,512
Int. Cl.[4] C07C *5/00, 6/00, 2/88*
U.S. Cl. 585—328 20 Claims

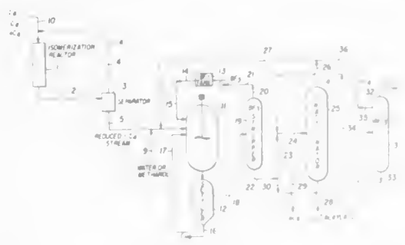
1. A process for displacing alkyl groups from a first trialkyl aluminum or mixture thereof, said process comprising contacting said first trialkyl aluminum or mixture thereof with an α-olefin or mixture thereof containing a different distribution of carbon atoms than the alkyl groups in said first trialkyl aluminum or mixture thereof, in the presence of a nickel catalyst at a temperature of about −10° to 150° C. whereby said α-olefins displace at least part of the alkyl groups in said first trialkyl aluminum or mixture thereof to form a second trialkyl aluminum or mixture thereof, further characterized by adding a deactivating amount of a catalyst poison selected from lead and compounds thereof which are capable of deactivating said nickel catalyst after the displacement reaction has proceeded to the desired extent but before any significant isomerization of the α-olefins to internal olefins has occurred.

4,918,255

HETEROGENEOUS ISOPARAFFIN/OLEFIN ALKYLATION WITH ISOMERIZATION

Tai-Sheng Chou, Pennington, N.J.; Albin Huss, Jr., Chadds Ford; Clinton R. Kennedy, West Chester, both of Pa., and Robert S. Kurtas, Sewell, N.J., assignors to Mobil Oil Corp., New York, N.Y.

Filed Jul. 15, 1988, Ser. No. 219,527
Int. Cl.[4] C07C *2/58*
U.S. Cl. 585—331 25 Claims



1. A continuous alkylation process for producing high octane gasoline comprising isomerizing the olefin feed to substantially reduce its alpha olefin content, effecting reaction of an isoparaffin containing from 4 to 20 carbon atoms with the isomerized olefin feed containing from 2 to 12 carbon atoms at from about −40° C. to about 500° C. and at a pressure in the range of subatmospheric to about 5000 psig using a hydrocarbon feed wherein a molar ratio of the isoparaffin to the olefin in the combined hydrocarbon feed is from about 1:1 to about 50:1 in contact with a composite catalyst comprising a Lewis acid with large pore zeolite and/or a nonzeolitic solid inorganic oxide in the presence of a controlled amount of water.

4,918,256

CO-PRODUCTION OF AROMATICS AND OLEFINS FROM PARAFFINIC FEEDSTOCKS

Margaret Nemet-Mavrodin, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 4, 1988, Ser. No. 140,360
Int. Cl.[4] C07C *2/00*
U.S. Cl. 585—415 18 Claims

1. A process for converting a hydrocarbon feedstock comprising at least 75 percent by weight of a mixture of at least two paraffins having from 5 to 10 carbon atoms, said process comprising contacting said hydrocarbon feedstock under sufficient condition with a catalyst comprising (1) a binder and (2) ZSM-5 or ZSM-11, said ZSM-5 or ZSM-11 being an aluminosilicate zeolite, said catalyst having an alpha value from about 5 to about 25, whereby at least 90 percent by weight of said paraffins are converted to different hydrocarbons comprising at least 90 percent by weight of the sum of C_6-C_8 aromatics, C_2-C_4 olefins, C_9^+ aromatics and C_1-C_3 paraffins, wherein the activated form of the fresh catalyst as initially prepared has an alpha value of at least 50 and the fresh catalyst is partially deactivated by subjecting the fresh catalyst to sufficient deactivating conditions to achieve an alpha value of from about 5 to about 25, and wherein said zeolite is in the hydrogen form and said zeolite is free of oxides impregnated thereon.

4,918,257

CATALYTIC CONVERSION OF METHANE TO HIGHER HYDROCARBONS

Jawad H. Murib, Cincinnati, Ohio, assignor to Quantum Chemical Corporation, New York, N.Y.

Filed Jul. 15, 1988, Ser. No. 219,417
Int. Cl.[4] C07C *2/00*
U.S. Cl. 585—500 28 Claims

1. A process for making higher hydrocarbons from methane comprising contacting methane with oxygen or an oxygen-containing gas in the presence of: a catalyst comprising

(a) at least one metal in the elemental state of Group IB of the Periodic Table of the Elements, with the proviso that if the metal is copper an additional Group IB metal must also be present;

(b) a metal-containing chloride or a metal-containing compound formed in-situ into a metal-containing chloride, said metal of said metal-containing chloride or said metal-containing compound formed in-situ into a metal-containing chloride selected from the group consisting of manganese, an alkali metal, an alkaline earth metal and a rear earth metal of the lanthanide series; and

(c) a volatile halide.

20. A process for making higher hydrocarbons from methane comprising contacting methane with oxygen or an oxygen-containing gas at a temperature in the range of between about 650° C. and about 1,000° C. and a pressure in the range of between about atmospheric and about 1,000 psi in the presence of a catalyst comprising:

(a) at least one metal in the elemental in the elemental state of Group 1B of the Periodic Table of the Elements, with the proviso that if the metal is copper an additional Group 1B metal must also be present;

(b) a metal-containing chloride or a metal-containing compound formed in-situ into a metal-containing chloride, said metal of said metal-containing chloride or said metal-containing compound formed in-situ into a metal-containing chloride selected from the group consisting of manganese, an alkali metal and an alkaline earth metal; and

(c) a volatile halide selected from the group consisting of hydrogen halides and halide substituted methanes.

26. A process for making higher hydrocarbons from methane comprising contacting methane with a gaseous stream of oxygen or an oxygen-containing gas and a volatile halide in the presence of a catalyst formed by the steps comprising:

(a) depositing silver nitrate and strontium nitrate on a carrier selected from the group consisting of alumina, silicon carbide and pumice; and

(b) hydrogenating said deposited silver nitrate and strontium nitrate.

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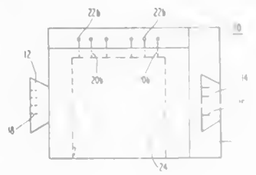
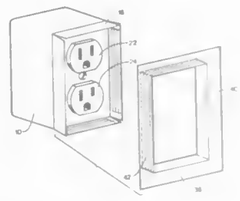
4,918,258
MODULAR ELECTRICAL WIRING SYSTEM
David L. Ayer, P.O. Box 42, No. Franklin, Conn. 06254
Filed Nov. 22, 1988, Ser. No. 275,100
Int. Cl.[4] H02G *3/08*
U.S. Cl. 174—53 17 Claims



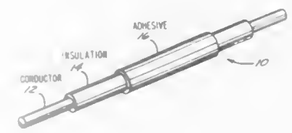
1. A modular electrical wiring system comprising:
first and second electrical boxes;
means for mounting the first box on a wall and supplying electrical energy to the first box;
the first and second boxes each including means for receiving and applying electrical energy to respective first and second function units;
connecting means disposed on exterior surfaces of the first and second boxes for supportedly connecting the first box to the second box; and,
the connecting means further including means for applying electrical energy from the first box to the second box wherein only energy from the first box is applied to the second function unit.

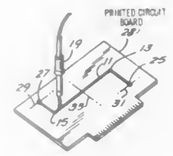
4,918,259
ELECTRICAL OUTLET BOX EXTENSION COVER
William L. Hanson, P.O. Box 7192, Tacoma, Wash. 98407
Filed Aug. 19, 1988, Ser. No. 235,030
Int. Cl.[4] H02G *3/14*
U.S. Cl. 174—66 2 Claims



1. An extension cover assembly for an electrical outlet box, comprising:
a cover capable of covering an electrical outlet box with cutouts corresponding to electrical receptacles of the electrical outlet box;
a frame capable of covering wallboard which surrounds the electrical outlet box;
first walls extending normal to the cover with serrations; and
second walls extending normal to the frame with serrations on the surfaces thereof that interlock with the serrations on the first walls extending from the cover, thus securing the frame to the cover.

4,918,260
ADHESIVE-COATED WIRE AND METHOD AND PRINTED CIRCUIT BOARD USING SAME
Louis E. Griffith, Hampstead, and Peter R. Ebner, Hollis, both of N.H., assignors to Preleg, Inc., Nashua, N.H.
Division of Ser. No. 196,877, May 19, 1988, Pat. No. 4,864,723, which is a continuation of Ser. No. 880,688, Jul. 1, 1986, abandoned, which is a continuation-in-part of Ser. No. 759,467, Jul. 26, 1985, abandoned. This application Sep. 12, 1988, Ser. No. 243,318
Int. Cl.[4] H01B *7/00, 13/16;* H05K *1/00*
U.S. Cl. 174—256 24 Claims





1. An electrically conductive wire, said wire comprising, in combination, an electrical conductor, a coating of relatively easily strippable insulation surrounding said conducter, and a coating of normally solid, inactive hot-melt adhesive surrounding said insulation, said adhesive being adapted to be activated by the application of heat thereto at each of a plurality of locations along its length so as to cause said wire to adhere to a substantially planar support surface at each of said locations in response to said application of heat.

22. A method of coating insulated electrical wire with a hot-melt adhesive, said method comprising: melting a hot-melt adhesive in heated chamber, passing uncoated insulated electrical wire through said melted adhesive in said chamber, withdrawing said electrical wire vertically from said heated chamber through a die to insure uniform coating, and cooling said coating to solidify it.

4,918,261
FLAT WIRE HARNESS ATTACHING UNIT
Mineo Takahashi; Susmum Nakayama; Satoshi Suzuki; Akio Mori; Hiroyuki Seo; Minoru Imamura; Hiroshi Tanaka, all of Shizuoka, and Norihiro Yoneyama, Aichi, all of Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Jun. 1, 1987, Ser. No. 55,934
Claims priority, application Japan, Jun. 4, 1986, 61-128157; Jun. 4, 1986, 61-128158; Jun. 4, 1986, 61-128519; Jun. 24, 1986, 61-95327[U]; Jun. 24, 1986, 61-95328[U]; Jun. 24, 1986, 61-95329[U]; Jun. 24, 1986, 61-95330[U]; Mar. 25, 1987, 62-069085
Int. Cl.[4] H02G *3/02, 3/26*
U.S. Cl. 174—135 8 Claims

1. A flat wire harness attaching unit for installing a flat wire harness formed of a plurality of wires covered with synthetic resin insulation, said plurality of wires being bundled and united into a flat integral structure having a first surface and a second surface by said synthetic resin insulation, said wire harness attaching unit comprising:
a clip section provided for association with a vehicle body side;

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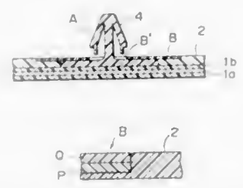
an attaching section formed integral with said clip section; and

a laminated sheet made of a material capable of being made integral with said synthetic resin insulation of the flat wire harness through fusion and having an area larger than the attaching section and adapted to extend beyond the attaching section over at least one of said first and second



surfaces of the flat wire harness, said laminated sheet being formed with a central opening through which the clip section extends, and said attaching section being adapted to be interposed between said laminated sheet and the wire harness such that said attaching section may be secured to the first surface of the wire harness through fusion of the synthetic resin insulation of the wire harness and the laminated sheet.

4,918,262

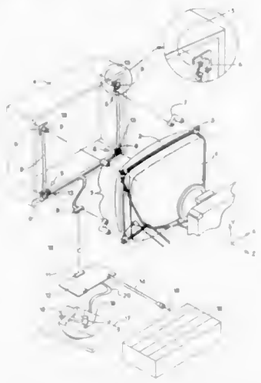
TOUCH SENSING DISPLAY SCREEN SIGNAL PROCESSING APPARATUS AND METHOD

Dale R. Flowers, Atlanta, Ga.; Kevin P. Goffinet, Cary, N.C.; Anthony W. Miles, Raleigh, N.C.; John T. Rowe, Jr., Raleigh, N.C., and Kevin H. Vorhees, Raleigh, N.C., assignors to IBM Corporation, Armonk, N.Y.

Filed Mar. 14, 1989, Ser. No. 324,778

Int. Cl.[4] G08C *21/00*

U.S. Cl. 178—18 **12 Claims**



1. In a touch sensing display apparatus having a display means, a frame, suspension means supporting said display means in said frame in a manner permitting uniaxial displacement of said display means relative to said frame, a plurality of electrical sensors connected with said suspension means and providing electrical signal outputs in response to displacement of said display means, and an electrical signal processing means connected to receive the electrical signal outputs from said sensors, the improvements comprising:

each of said electrical sensors comprises a plurality of strain sensors electrically connected together in a Wheatstone bridge configuration and supplying electrical signal outputs therefrom; and

differential amplifier means receiving as inputs the output from said Wheatstone bridge and an offset compensation signal, said differential amplifier providing as an output an amplified signal representative of the difference in voltage between its input; and

an analog to digital converter means connected to receive the output of said differential amplifier means, said analog to digital converter means supplying a digital output representative of the signal level received at its input; and

a digital microprocessor connected to receive said digital output representation from said analog to digital converter and for providing digital outputs representing the locus and magnitude of forces imposed on said display means and to provide digital offset compensation signals; and

a digital to analog conversion means connected to said microprocessor to receive said digital offset compensation signals therefrom for conversion into analog offset compensation signals supplied to said differential amplifier means.

4,918,263

CO-ORDINATE MEASURING SYSTEM

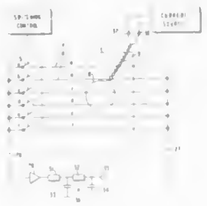
Wolfgang Jacob-Grinschgl, Munich, and Udo Müller, Unterschleissheim, both of Fed. Rep. of Germany, assignors to Kontron Holding AG, Zurich, Switzerland

Continuation of Ser. No. 193,228, May 11, 1988, abandoned, which is a continuation of Ser. No. 98,718, Sep. 21, 1987, abandoned, which is a continuation of Ser. No. 841,507, Mar. 19, 1986, abandoned. This application Jul. 21, 1989, Ser. No. 383,254

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1985, 3511864

Int. Cl.[4] G08C *21/00*

U.S. Cl. 178—19 **15 Claims**



I. In a co-ordinate measuring system for determining the position of a coil member relative to a grid member provided with a set of equidistant, parallel conductors associated with a coordinate axis of the system; a switching circuit for sequentially connecting each of said conductors to a common circuit for only a predetermined period of time during a sampling cycle, the time during which a conductor is connected to the common circuit being termed the activation time, and the time between sequential activation times of adjacent conductors being termed the switching interval, said switching circuit being constructed and arranged to produce a measuring signal in the form of a train of induced pulses in one of the members when a time variable current is applied to the other of the members; and an evaluation circuit for processing the measuring signal to provide a representation of a coordinate of the coil member relative to the grid member, the improvement comprising:

A low pass filter connected to the member in which said measuring signal is induced and to the front end of the evaluation circuit, said filter being responsive to the measuring signal for reducing frequency components therein due to operation of said switching circuit, and producing the first derivative of the envelope of the measuring signal.

4,918,264

ACTUATING MECHANISM AND MULTIPOSITION RUBBER OR MEMBRANE SWITCH DEVICE

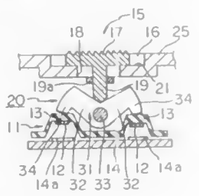
Masato Yamamoto, Kawagoe; Masahiro Nakajima, Oizumi; Toshimasa Yamanaka, Tokyo, and Kouji Satou, Shiki, all of Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Dec. 13, 1988, Ser. No. 283,961

Claims priority, application Japan, Dec. 26, 1987, 62-198050[U]; Jul. 29, 1988, 63-100695[U]

Int. Cl.[4] H01H *13/50, 21/00, 3/00*

U.S. Cl. 200—5 R **25 Claims**



1. A switching device comprising:

(a) a supporting structure;

(b) a substrate being spaced from said supporting structure and including at least one conductive element;

(c) a switch including a resilient member and at least one contact operatively connected to said resilient member, said at least one contact being normally held out of engagement with said at least one conductive element by the resilience of said resilient member;

(d) an operating member being slidably mounted with respect to said supporting structure for movement between at least one operative position and a neutral position; and

(e) a cooperating member being mounted for rotary movement with respect to said supporting structure between at least one cooperative position and a neutral position in response to the movement of said operating member;

wherein said operating member and said cooperating memeber are held in said neutral positions by the resilience of said resilient member, and at least one contact is brought into engagement with one of said at least one conductive element when said cooperating member is moved to said at least one cooperative position in response to the movement of said operating member to said at least one operative position against the resilience of said resilient member.

4,918,265

LEAF SPRING SWITCH AND SWITCH ASSEMBLY

Takashi Saito, Parkside Mansion 302, 29-4 Kumano-chyo, Itabashi-ku, Tokyo, Japan

Filed Feb. 7, 1989, Ser. No. 307,422

Int. Cl.[4] H01H *25/04, 1/26*

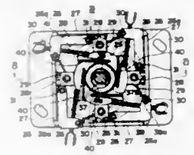
U.S. Cl. 200—6 A **2 Claims**

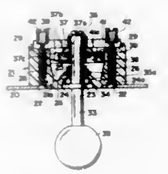
1. A leaf spring switch for replacing a microswitch having a long portion of a selected length, a short portion of a selected length and a selected width, comprising:

an L-shaped base member having a long portion and a short portion with the same respective lengths as those of the microswitch, said long portion being about one half the width of said short portion, said long portion and short portion of the base member having mounted holes in diagonal positions with respect to each other;

a first leaf spring contactor fixed to said short portion, said first leaf spring contactor extending along said long portion and having a contact on one longitudinal end thereof and a terminal on an opposite longitudinal end thereof;

a second leaf spring contactor fixed to said short portion locating at an outside position with respect to said first leaf spring contactor, said second leaf contactor extending along said long portion and having a contact on one longitudinal end thereof and a terminal on an opposite longitu-





dinal end thereof, said first leaf spring contactor and said second leaf spring contactor being opposed to each other in a spaced and parallel relationship; and

an actuator mounted on said second leaf spring contactor for moving at least a part of said second leaf spring contactor with respect to said first leaf spring contactor to engage said contacts with each other.

4,918,266

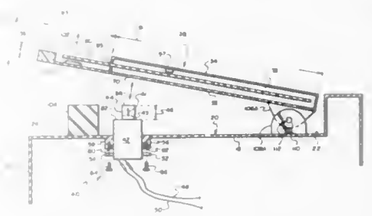
EXERCISE MACHINE SAFETY SWITCH

William T. Dalebout, and Ty Measom, both of Logan, Utah, assignors to Weslo, Inc., Logan, Utah

Filed Jan. 13, 1989, Ser. No. 297,075

Int. Cl.[4] H01H *35/00*

U.S. Cl. 200—52 R **11 Claims**



1. A safety switch comprising:

a base with first and second opposing ends;

a paddle with first and second opposing ends, said paddle comprising a partitioned member having a lower element connectedly spaced from an upper element a preselected height to form a void;

securing means for rotatably securing said first end of said paddle to proximate said first end of said base, said second end of said paddle positioned to rotatably move toward and away from said second end of said base;

switch means secured to said base, said switch means having a housing and an actuator extending from said housing and said base a distance less than said preselected height, said switch means being operable between a closed position and an open position upon operation of said actuator;

an aperture formed in said lower element positioned to

register with said actuator and sized to receive said actuator therethrough into said void; and

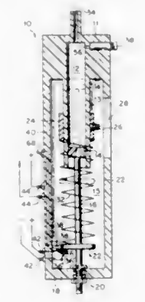
an enabling card removably positionable in said void to obstruct said aperture and reduce said preselected height to be less than said distance so that upon movement of said paddle toward said base, said switch is not operated with said enabling card removed and said switch is operated between said open and closed positions with said enabling card positioned in said void.

4,918,267

VACUUM OPERATED CIRCUIT BREAKER

Anthony Hum, 3185 Ellendale, Apt. 22, Montreal, Quebec, H3S-1W6, Canada

Filed Apr. 17, 1989, Ser. No. 339,608
Int. Cl.[4] H01H *35/38*
U.S. Cl. 200—82 R 8 Claims



1. A vacuum operated switch comprising:

(a) an enclosure open to ambient pressure and having a side wall and opposed end walls, with a conduit defining a cylindrical bore and having an axis located in said enclosure and extending from one said end wall of said enclosure and terminating short of the opposite end wall of said enclosure;

(b) a piston within said bore and movable along said axis;

(c) a shaft connected at one end to said piston and extending beyond the end of said conduit and through a bushing within the said opposite end wall;

(d) a flange member fixedly connected on said shaft between the end of said conduit and said opposite end wall and movable along the said axis in response to movement of said piston;

(e) a sleeve member mounted on said conduit;

(f) a compression spring surrounding said shaft and extending between said sleeve member and said flange member, said spring being adapted to force said piston and said flange member along said axis toward said opposite end wall;

(g) an inlet port in said one end wall connecting said cylindrical bore with said pressure source whereby a pressure substantially less than ambient will cause said piston and said flange member to move within said bore toward said one end wall;

(h) first and second electrical switch means connected with said enclosure and operable between on and off states; and,

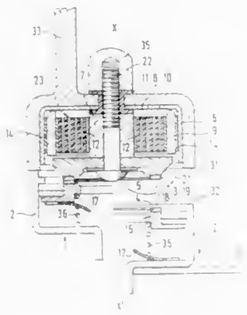
(i) movable lever means connected with said enclosure and having one end extending within the path of movement of said flange member, said lever means being operable in response to movement of said flange member, said lever means being operable in response to movement of said flange member so as to close said first electrical switch and open said second electrical switch when the pressure of said pressure source is substantially at ambient pressure and said flange member is moved by said compression spring toward said opposite end wall, and operable so as to open said first electrical switch and close said pressure source to substantially below ambient pressure and said flange member is moved away from said opposite end wall.

4,918,268

ARC-ROTATING MAGNETIC BLAST COIL FOR THE CONTACT ELEMENT OF AN ELECTRIC SWITCH

Daniel Pothieux, Grieges; Bernard Gallix, Decines Charpieu, and Julien Llorens, Le Murgeret, all of France, assignors to Societe Anonyme dite: Alsthom, Paris, France

Filed Sep. 22, 1988, Ser. No. 247,549
Claims priority, application France, Sep. 23, 1987, 87 13131
Int. Cl.[4] H01H *33/18*
U.S. Cl. 200—147 R 11 Claims



1. An arc-rotating magnetic blast coil for the contact element of an electric switch, the coil comprising, in particular, a conducting cup which is cylindrical in shape and which is connected to a current inlet, a winding disposed inside the cup to produce a magnetic field along the axis of the cup and having one end connected to the cup, a conducting core connected to the other end of the winding and situated in the center of the winding, and a fixed circuit-breaking contact disposed ahead of the coil relative to said cup within the magnetic field produced thereby and electrically connected to said core, wherein the winding is constituted by means of a flat conductor comprising a plurality of turns wound on the core together with an insulating sheet, and wherein means are provided for putting the winding under compression.

4,918,269

GAS-BLAST CIRCUIT BREAKER

Christoph Roehling, and Bernd Bruchmann, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 9, 1988, Ser. No. 282,153
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1988, 8804108[U]
Int. Cl.[4] H01H *33/88*
U.S. Cl. 200—148 A 17 Claims

1. A gas-blast circuit breaker with a blast arrangement associated to the contact system, comprising:

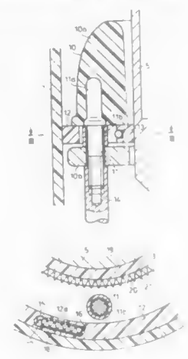
a movable tubular contact member;

a movable cylinder; and

a ring plunger including recesses, a first sealing ring adjacent to the cylinder for sealing and a second sealing ring adjacent to the movable tubular contact member for sealing;

the sealing rings being arranged with axial play in the recesses of ring plunger to function as a return valve, in the line of the flow paths for the compressed gas, closed during the pressure phase and open during the suction phase;

wherein the ring plunger comprises a first piece and a second piece arranged along an axis and rigidly coupled by spacers arranged parallel to the axis, the sealing rings being held between the pieces.

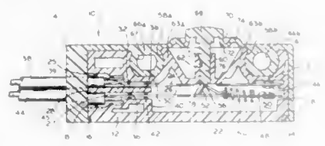


4,918,270

APPLIANCE SWITCH

Mario M. Orrico, Chicago, Ill., assignor to Illinois Tool Works, Inc., Glenview, Ill.

Filed Mar. 6, 1989, Ser. No. 319,536
Int. Cl.[4] H01H *13/06*
U.S. Cl. 200—302.2 17 Claims



1. An appliance switch comprising:

a base housing formed of an insulating material and having a top portion and a bottom portion;

said bottom portion of said housing having a fixed switch contact plate and a movable switch contact strip disposed in a cavity thereof;

said contact plate being formed with a fixed contact and said contact strip having an intermediate L-shaped movable portion and a movable contact;

a spring engaging said L-shaped portion so as to bias said movable contact to be spaced apart from said fixed contact in a first contact in a first position;

said L-shaped portion being movable from the first position to a second position where said movable contact is urged into contacting engagement with said fixed contact in a snap action;

said top portion of said housing having an upstanding collar which is axially aligned with a connecting tip of said L-shaped portion;

a pair of trough-like recesses being formed on opposite sides of said upstanding collar;

a cover member formed of an elastomeric material and having a pushbutton actuator member;

said actuator member being formed of a dome-shaped portion and an annular wall member joined integrally thereto;

a lower annular membrane having a radial inner end joined integrally to a lower part of said wall member and a radial outer end;

an inverted U-shaped flange being formed on an outer surface of said housing and being formed integrally with the outer end of said annular membrane to define a rolling-type seal between said housing and said cover member;

said cover member having a pair of cylindrically-shaped members being disposed on its interior, said cylindrically-shaped members being arranged so as to be received snugly within the respective pair of tough-like recesses in order to provide a stabilized engagement;

an actuating rod extending axially from said actuator member and being movably positioned within said collar of said housing, said actuating rod having a tip portion engaging the connecting tip of said L-shaped movable portion;

said dome-shaped portion being depressed under pressure to push said actuating rod downwardly causing peripheral bending and flexing of said annular membrane and causing said L-shaped portion to move from the first position to the second position; and

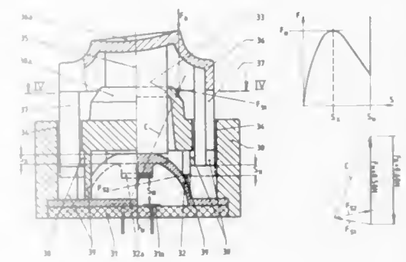
said L-shaped movable portion being restored to the first position under the bias force of said spring when the pressure is released.

4,918,271

PUSHBUTTON TYPE KEYBOARD SWITCH

Reinhard Deeg, Keltern, Fed. Rep. of Germany, assignor to Standard Elektric Lorenz AG, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 723,223, Apr. 15, 1985, abandoned. This application Jan. 24, 1989, Ser. No. 303,105
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3414909
Int. Cl.[4] H01H *3/12*
U.S. Cl. 200—344 4 Claims



1. A pushbutton-type switch comprising:

(a) a key having a downwardly projecting central plunger and at least two generally diametrically opposed downwardly projecting peripheral leg members, each of said leg members having a generally L-shaped horizontal cross section;

(b) an upwardly projecting guide member having a generally vertical outer surface and defining a generally horizontal central opening for slidingly receiving said plunger therein, the edge of said opening having a length in the direction of travel of said plunger which is small in relation to that of the plunger, said guide member having a generally square horizontal cross section with said leg members in proximate coacting relation to diagonally opposite corners thereof; and

(c) slide means on the ends of said leg members for slidingly engaging the corners of said guide member, the contact between the plunger and said opening and between said leg members and the engaged corners of said guide member serving to limit the degree to which the key can move in a direction which deviates from vertical.

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4,918,272

WIPER MOTOR DRIVING DEVICE FOR AUTOMOTIVE VEHICLES

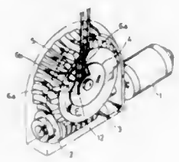
Itaru Nishikawa, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation-in-part of Ser. No. 94,758, Sep. 10, 1987. This application Mar. 9, 1989, Ser. No. 321,151

Claims priority, application Japan, Sep. 11, 1986, 61-139535

Int. Cl.[4] H01H *3/40*

U.S. Cl. 200—501 7 Claims



1. A wiper motor driving device for an automotive vehicle, comprising:

(a) a wiper motor having a worm shaft;

(b) a worm wheel having an autostop plate and a grounding plate which are disposed adjacent to each other on a surface of said worm wheel for conducting an electric current, said worm wheel meshing with worm shaft for rotation, said grounding plate having a cantilevered end at a height defining a space between the cantilevered end and a portion of worm wheel; and

(c) electrical contact means having a fixed contact movable in a slidable electrical contact relationship with said autostop plate and grounding plate to control the electric current, so that worm wheel and the wiper blade stop at a specified angular position of said worm wheel, said contact being separated from said grounding plate at said cantilevered end upon rotation of said worm wheel, said separated contact being of a height less than the cantilevered end of the grounding plate, whereby the worm wheel may be reversely rotated due to a reaction force of the wiper blade without further electrical contact between the grounding plate and the separated contact.

4,918,273

CONTACT FOR DUAL IN-LINE PACKAGE PACKAGED SLIDE SWITCH

Philip T. Stokoe, N. Attleboro, Mass., and Dennis R. Boulais, Danielson, Conn., assignors to Alco Electronic Products, Inc., North Andover, Mass.

Continuation of Ser. No. 219,041, Jul. 14, 1988, abandoned, which is a continuation of Ser. No. 948,310, Dec. 31, 1986, abandoned, which is a division of Ser. No. 817,006, Jan. 8, 1986, Pat. No. 4,687,887. This application Apr. 28, 1989, Ser. No. 344,766

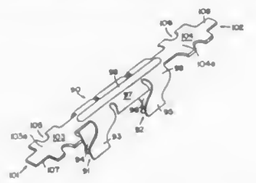
Int. Cl.[4] H01H *1/42*

U.S. Cl. 200—550 2 Claims

1. An inverted U-shaped contact for use in a dual in-line package slide switch having a base with contact pins arranged in a longitudinally extending row and a slider that is longitudinally slidable with respect to the base including at least one recess for receiving said contact thereby to move said contact relative to the contact pins, said contact having a longitudinal axis and comprising as integral elements thereof:

a generally transversely semicircular elongated connector member having an upper surface and an elongated supported rib on said upper surface,

two spaced pairs of teeth depending from said connector member, each tooth of each pair depending from said connector member in a curved shape and each said tooth in a pair having a convex clasping surface facing a like convex clasping surface of the other tooth of the same pair, each tooth in a said pair being supported in a spaced configuration for engaging the contact pins in the base,



A generally square, planar member extending along the longitudinal axis from each end of said connector member adjacent the pairs of teeth, each said planar member having at least one recess formed therein, each said recess facing outwardly and transversely of the longitudinal axis for engagement by portions of the slider adjacent the recess therein, said contact being affixed to said slider by deforming portions of the slider adjacent said planar members through said recess and in and about said planar members.

4,918,275

TURNTABLE FOR ELECTRONIC RANGE

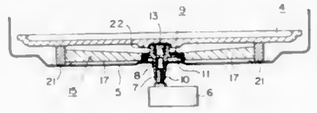
Kenzo Okamoto, Osaka, and Fumihiko Kitada, Neyagawa, both of Japan, assignors to Imanashi Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 66,499, Jun. 26, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 317,092

Claims priority, application Japan, Jun. 27, 1986, 61-149592

Int. Cl.[4] H05B *6/78*

U.S. Cl. 219—10.55 F 1 Claim



1. A turntable for an electronic range having an oven compartment comprising:

a circular tray member having top and bottom surfaces;

a tray supporting member having a disk-like base with a through hole centrally formed therein and a substantially triangular shaped concave portion formed on the backside thereof;

a plurality of arms joined to said base, each radially extending outward from said base and each provided with a roller at the outer end thereof for rotatably supporting said tray;

a driving motor for turning a drive shaft;

a coupling unit having a shaft sleeve for receiving said drive shaft at the lower end of said coupling unit;

said coupling unit further having an upper coaxial boss portion insertable into said through hole and an intermediate flange portion of substantially triangular shape for mating with said concave portion of said tray supporting member, said flange portion having downwardly tapered peripheral edges;

said tray member being provided centrally on the bottom surface thereof with an annular ridge portion whose inner diameter is slightly larger than outer diameter of said boss portion; and

said boss portion having such height that the upper end thereof penetrates inside of the annular ridge portion when said tray member is mounted on said tray supporting member.

4,918,276

AUTOMATIC COOKING CONTROL SYSTEM FOR A MICROWAVE OVEN

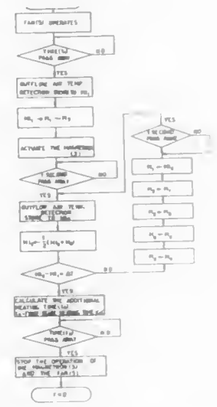
Ki T. Oh, Kyungsangnam, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 21, 1988, Ser. No. 287,025

Claims priority, application Rep. of Korea, Dec. 22, 1987, 14741/1987

Int. Cl.[4] H05B *6/68*

U.S. Cl. 219—10.55 M 6 Claims



1. A method of automatically cooking in a microwave oven having a heating chamber, a magnetron and a turntable comprising the steps of:

(a) measuring and storing a first temperature of air flowing out of the heating chamber;

(b) actuating the magnetron;

(c) measuring and storing a second temperature of the air flowing out of the heating chamber after a time delay of one second;

(d) calculating an arithmetic mean of the first and second temperature;

(e) determining if a difference between the first temperature and the arithmetic mean calculated in said step (d) is equal to a predetermined temperature increment, the amount of time between the actuation of the magnetron and the quality determined in said step (e) defining a first period of time;

(f) calculating an additional cooking time by multiplying the first period of time by a predetermined coefficient when said step (e) determines that the difference is equal to the predetermined temperature increment; and

(g) actuating the magnetron for the additional cooking time.

4,918,277

HEATED TOOL WITH NON-FLAT HEATING SURFACE FOR AVOIDING SOLDER-BRIDGING

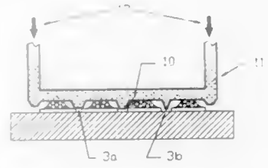
Gero Zimmer, Munich, Fed. Rep. of Germany, assignor to Productech Inc., Rolling Hills Estates, Calif.

Filed Jul. 6, 1988, Ser. No. 215,628

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1987, 3722725

Int. Cl.[4] H05B *1/00;* **B23K** *1/12*

U.S. Cl. 219—56.1 21 Claims



1. A heated tool for connecting objects to a plurality of pads which are spaced from each other by a certain distance, comprising a tool member having a heated bar with a heating surface for each pad and at least one spacer bar connected to said tool member and disposed between said heating surfaces for isolating an object on one pad from an object on another pad, said tool member having different cross-sectional areas at said heating surface and said spacer bar for providing different amounts of heat, each spacer bar having a width selected to be at least greater than the certain distance between the pads for directly contacting the pads to transfer heat to the pads for connecting the objects to the pads.

4,918,278

JOINABLE ARC GOUGING ELECTRODES WITH INDICATOR FOR INDICATING, DURING USE, WHEN ARC IS A PREDETERMINED DISTANCE FROM END OF ELECTRODE; AND METHOD OF USING SAME

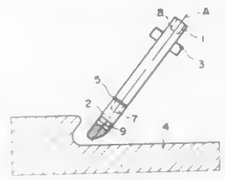
Naruo Kuwabara, Gifu; Toshio Kozima, Oogaki, and Takayuki Mizutani, Gifu, all of Japan, assignors to Ibiden Co., Ltd. and Ibiden Kosan Co., Ltd., Gifu, Japan

Filed Apr. 27, 1987, Ser. No. 42,958

Claims priority, application Japan, Apr. 30, 1986, 61-101662

Int. Cl.[4] B23K *9/24, 35/04*

U.S. Cl. 219—69.1 10 Claims



1. A successively joinable electrode for arc gouging and blasting of metallic articles comprising:

a consumable elongated electrode body comprising carbon, for striking an arc with a metallic article, having a longitudinal axis and a first end and a second end spaced apart along said longitudinal axis;

a projection, having an axis, formed at and integral with one of said ends of said electrode body and protruding coaxially therefrom;

a socket, having an axis, formed at and integral with the other of said ends of said electrode body and extending coaxially inward therefrom;

indicating means for indicating, during use, that said arc is a predetermined distance from one of said ends;

said projection of a successive carbon electrode of the same size and shape of said electrode body being sized to be connectably receivable within said socket of said electrode body with carbon-to-carbon contact between said projection of said successive electrode and said socket of said electrode body, whereby a successive electrode may be coaxially joined by insertion of a respective projection into a respective socket.

4,918,279

EDM CUTTING MACHINE INCLUDING DEVICE FOR PREVENTING TRANSMISSION OF SEALING PLATE MOVEMENT TO GUIDE HEAD ARM

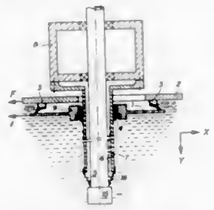
Bernard Babel, Petit-Lancy/Geneve, Switzerland; Joseph Josserand, Cruseilles, France; Hans Lehmann, Vessy, Switzerland, and Jean A. Ruffin, Boane, France, assignors to Charmilles Technologies, S.A., Switzerland

Filed Aug. 26, 1988, Ser. No. 237,311

Claims priority, application Switzerland, Aug. 28, 1987, 03307/87

Int. Cl.[4] B23H *1/00, 7/10*

U.S. Cl. 219—69.12 **14 Claims**



1. Machine for cutting by electrical discharge machining by means of an electrode wire tensioned between and running between two guide heads each of which is mounted on an arm, one at least of the arms passing through an opening in one of the walls of a tight tank containing a machining liquid, this tank and this passing arm being able to move with respect to each other, this machine having a sealing plate masking this opening in the tank and having a hole in it to allow the arm to pass through it, linked by at least one seal to the passing arm and along which can slide the moving wall through which the arm passes, characterized by a deflecting device arranged so as to prevent transmission to the passing arm of any movement of the sealing plate in a direction perpendicular to the axis of this arm, thereby preventing asymmetric action on this arm of frictional and pressure forces due to the frictions that take place between the sealing plate and the moving wall of the tight tank and between the seal connecting the sealing plate and this passing arm.

4,918,280

CLAMPING SLEEVE FOR BURNER ELECTRODES, ESPECIALLY FOR TIG BURNERS

Werner Jankus, Usterer Weg 6, D-4600 Dortmund 30, Fed. Rep. of Germany

Filed Mar. 1, 1989, Ser. No. 317,295

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1988, 8803019[U]

Int. Cl.[4] B23K *9/28*

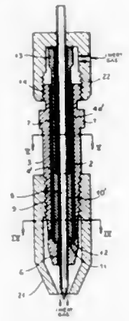
U.S. Cl. 219—75 **7 Claims**

1. A TIG burner, comprising:

an elongated tubular housing centered on a longitudinal axis and formed with a large-diameter bore open at one end of said housing and terminating at an opposite end of said housing in a small-diameter bore, a compression seat between said large-diameter bore and said small-diameter bore converging toward said axis in a direction toward said small-diameter bore, a first external thread on said housing proximal to said one end thereof, and a second external thread on said housing proximal to said opposite end thereof;

a compression cap threaded onto said first external thread, said tubular housing having generally radial passages opening outwardly from said large-diameter bore proximal to said seat;

a clamping sleeve received in said housing and having an elongated conductive body centered on said longitudinal axis and formed with an abutment at one end of said body engageable by said compression cap, said body being formed with a longitudinal throughgoing electrode-receiving bore having at least an eccentric portion thereof offset from said axis;



a tungsten electrode received in said electrode-receiving bore, closefittingly surrounded by said electrode-receiving bore and extending completely through said sleeve and out of said small-diameter bore, said body being further formed at another end thereof with a compression surface adapted to be pressed by the compression cap against said seat to compress said body against said electrode whereby the eccentric portion, upon compression of said body against said electrode, distributes thermal contact between the electrode, said body and said housing over a substantial length thereof; and

a nozzle threaded onto said second external thread, surrounding said electrode and discharging inert gas therearound.

4,918,281

METHOD OF MANUFACTURING LIGHTWEIGHT THERMO-BARRIER MATERIAL

Winford Blair, La Mesa, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Division of Ser. No. 314,667, Oct. 26, 1981, which is a continuation-in-part of Ser. No. 165,277, Jul. 2, 1980, abandoned. This application Sep. 29, 1986, Ser. No. 913,105

The portion of the term of this patent subsequent to Mar. 2, 1999, has been disclaimed.

Int. Cl.[4] B23K *20/00*

U.S. Cl. 219—78.02 **8 Claims**

1. A method of manufacturing a lightweight metallic structure comprising the steps of:

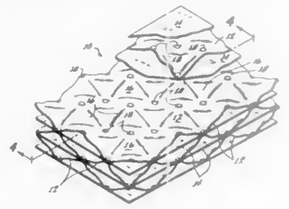
(a) providing stacked core structures with nodes, each structure having dimples with flat node surfaces projecting in opposite directions from a midplane and flat plate material sandwiched between each of the stacked dimpled core structures and on the outer surface of the outermost stacked dimpled core structure for forming an end surface thereto, said dimpled core structure and flat plate material comprising thin metallic foil material, with the foil thickness of some of the dimpled core structures and flat plate material being thinner than the others,

(b) providing a liquid interface diffusion bridge material between at least each node and flat plate surface in contact therewith;

(c) securing together the stacked component with the nodes of the dimpled core material in substantially vertical alignment during the securing together of the components;

(d) placing the secured together components on a reference surface;

(e) arranging the secured together components to a predetermined height and subjecting said components to a predetermined pressure against the reference surface;



(f) placing the secured together components and reference surface in a vacuum furnace;

(g) evacuating said furnace; and

(h) elevating the temperature within said furnace and maintaining that elevated temperature for a sufficient time to cause a eutectic melt of the bridge material and diffuse the bridge materials into the base of the adjacent components, creating a diffusion bond between the node flat surfaces and adjacent flat plate material while maintaining the predetermined height and predetermined pressure to prevent crushing of the dimpled core material during the eutectic melting and diffusion bonding sequence.

4,918,282

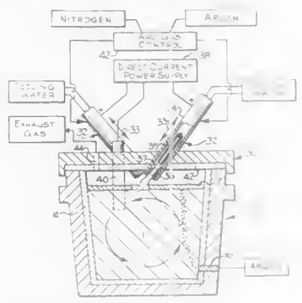
METHOD AND APPARATUS FOR HEATING MOLTEN STEEL UTILIZING A PLASMA ARC TORCH

David Cheek, Liberty, N.C., assignor to Plasma Energy Corporation, Raleigh, N.C.

Division of Ser. No. 817,907, Jan. 10, 1986, Pat. No. 4,734,551. This application Oct. 23, 1987, Ser. No. 112,688

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—121.37 **9 Claims**



1. An apparatus for heating a molten metal such as steel and comprising

a vessel adapted to support molten metal such as steel and including an open top,

at least two plasma arc torches mounted above said vessel, each said torch including a housing defining a forward end positioned adjacent the molten metal supported in said vessel, a rear electrode mounted within the housing, a tubular collimator mounted within said housing forwardly of and in coaxial alignment with said rear electrode, power supply means for generating an arc which extends from said rear electrode through said collimator and to the molten metal supported in said vessel, and vortex generating means for generating a vortical flow of gas at a location between said rear electrode and collimator and so that a vortical flow of gas exits forwardly through said collimator and substantially surrounds and collimates said arc, and with each of said at least two plasma torches being mounted approximately midway between the center and the inside periphery of the vessel and at circumferentially spaced locations with respect to the center of the vessel and also being mounted along a plane that is perpendicular to a radial line from the center of the vessel and at an angle of between about 30° to 70° with respect to the surface of the molten metal in the vessel, and with said torches being oriented in a common circumferential direction about the center of the vessel and such that the mass flow provided by said vortex generating means of said torches impinges at an angle upon the surface of the molten metal in said vessel and so as to impart a common circular movement to the molten metal in the vessel.

4,918,283

METHOD OF AND APPARATUS FOR CONDUCTING PLASMA WELDING

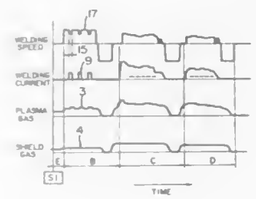
Takashi Yamade, Hitachi; Seishi Watakiki, Katsuta; Yasuzi Sakuma, Hitachi; Masayoshi Yamaguchi, Hitachi, and Shinichi Kurita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 84,555, Aug. 11, 1987, Pat. No. 4,788,409. This application Oct. 14, 1988, Ser. No. 257,889

Claims priority, application Japan, Aug. 13, 1986, 61-188481

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—121.46 **3 Claims**



1. A method of automatically conducting a plasma welding of sections of pipes, including the steps of:

clamping the pipe sections in a welding position;

preparing a welding torch movable around the surfaces of the pipe sections to be welded together;

moving said welding torch around the surfaces of the pipe sections to be welded together to successively conduct pre-heating, tack-welding, keyhole welding and finish padding by a plasma flame; and

during the successive welding operations, controlling the supplies of a welding current and a plasma gas such that the welding current and the flow of the plasma gas supplied during the tack-welding are greater than those in the pre-heating but smaller than those in the keyhole welding.

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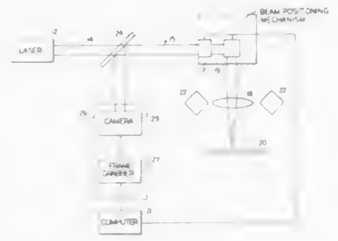
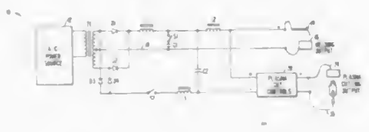
4,918,284
CALIBRATING LASER TRIMMING APPARATUS
John R. Weisz, Somerville, Mass., assignor to Teradyne Laser Systems, Inc., Somerville, Mass.
Filed Oct. 14, 1988, Ser. No. 258,152
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.78 20 Claims



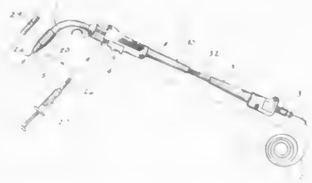
1. A method of calibrating laser trimming apparatus including a laser beam having a first wavelength, a laser beam positioning mechanism and a detection device using a second wavelength that is different from said wavelength, said detection device viewing a field and determining a mark position within said field, the method comprising,
controlling said laser beam positioning mechanism so as to move said laser beam to a desired nominal laser position in a workpiece region,
imprinting a mark on a medium with said laser to establish an actual laser position of said laser beam,
scanning said imprinted mark with said detection device to determine said actual laser position of said imprinted mark,
said scanning step involving using information indicating said mark position within said field,
said scanning step including generating a two-dimensional pixel array related to said field and assigning each pixel of said pixel array an intensity value, and
comparing said imprinted mark of said actual laser position with said desired nominal laser position and producing a result indicative of the difference between said actual laser position and said nominal laser position.

4,918,285
SYSTEM FOR SUPPLYING POWER
James M. Thommes, Escondido, Calif., assignor to Cyclomatic Industries, Inc., San Diego, Calif.
Filed Jun. 9, 1988, Ser. No. 204,640
Int. Cl.[4] B23K *9/10*
U.S. Cl. 219—130.1 7 Claims



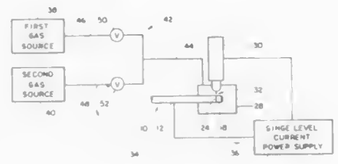
1. An apparatus for supplying power for arc welding and for plasma cutting, said apparatus comprising:
an A.C. power source;
a transformer having a primary winding connected to the A.C. power source and a secondary winding;
rectifier means for rectifying the A.C. current in the secondary winding to provide a first output and a second output; and
switch means connected to the rectifier means for selecting between the first and second outputs, the power supplied by said A.C. power source being controllable such that the first output is suitable for arc welding and the second output is suitable for plasma cutting.

4,918,286
METHOD AND APPARATUS FOR CLEANING AND LUBRICATING A METAL INERT GAS WELDING GUN
Robert W. Boyer, 436 Scenic Dr., Henderson, Nev. 89015
Filed May 1, 1989, Ser. No. 345,968
Int. Cl.[4] B23K *9/12*
U.S. Cl. 219—137.44 11 Claims



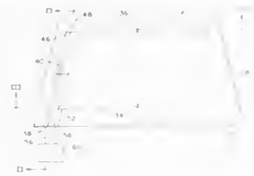
1. A method of cleaning an electric arc welder gun of a type including:
a housing;
a flexible conduit disposed in said housing, said flexible conduit having a first end for feeding a consumable welding wire therein, a second end adapted to engage with a tubular welding tip for selectively feeding said consumable welding wire through said other end of the flexible conduit and through said tubular welding tip;
said method comprising:
removing said consumable wire from a major portion of said flexible conduit;
injecting a liquid cleaner into said flexible conduit into the first or second end thereof at least until at least some of such liquid exits the other end thereof;
forcing the liquid cleaner from said flexible conduit;
forcing a liquid lubricant into said flexible conduit; and
moving said consumable wire back into the flexible conduit and tubular welding tip for use in a welding process.

4,918,287
APPARATUS AND METHOD FOR PRODUCING MULTI-LEVEL HEAT INPUT FOR WELD FORMATION USING A SINGLE CURRENT LEVEL POWER SUPPLY
Denis Yeo, Columbia, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Feb. 21, 1989, Ser. No. 312,283
Int. Cl.[4] B23K *9/16*
U.S. Cl. 219—137 PS 11 Claims



1. In combination with a welding chamber and a torch for welding a workpiece in said chamber by employing a lower heat input first welding pass and higher heat input second welding pass for weld information at a weld site in said chamber, a method for producing multi-level heat input, comprising the steps of:
(a) operating an electrical energy source connected between the welding torch and the workpiece to produce only a single level of electrical current;
(b) supplying first and second cover gases of different ionization energies; and
(c) regulating the flows of said first and second cover gases to the welding chamber to convert the single current level into a sequence of different power levels to achieve the sequence of the first welding pass at lower heat input and second welding pass at higher heat input.

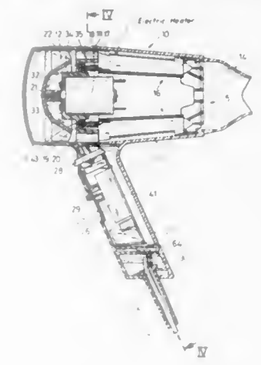
4,918,288
ELECTRICAL LEAD ARRANGEMENT FOR A HEATABLE TRANSPARENCY
Thomas M. Carter, Allison Park, and Harold S. Koontz, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Nov. 4, 1988, Ser. No. 267,403
Int. Cl.[4] H05B *3/26*
U.S. Cl. 219—203 20 Claims



1. An electrically heatable transparency comprising:
a nonelectrically conductive substrate;
a first bus bar on a surface of said substrate;
a second bus bar on said surface of said substrate spaced from said first bus bar;
an electroconductive heating member on said surface of said substrate interconnecting said first and second bus bars;
an electroconductive lead spaced from said surface of said substrate so as to electrically insulate said lead from said electroconductive member and said bus bars; and
means to electrically interconnect said lead with said first bus bar.

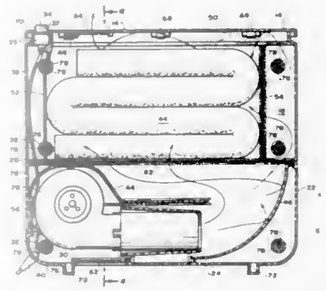
4,918,289
ELECTRIC HAIR DRYER
Heinz-Jürgen Ohlsen, Wuppertal, and Hans-Dieter Poweleit, Haan, both of Fed. Rep. of Germany, assignors to Robert Krups Stiftung & Co. Kg., Solingen, Fed. Rep. of Germany
Filed Feb. 23, 1989, Ser. No. 315,457
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1988, 3807287
Int. Cl.[4] H05B *1/02*; A45D *20/38*; F24H *3/04*
U.S. Cl. 219—370 24 Claims

1. An electric hair dryer, particularly a portable hair dryer, comprising a hollow housing having an air-admitting inlet and an air-discharging outlet spaced apart from said inlet; means for inducing a flow of air through said housing from said inlet to said outlet, including a rotor in said housing and an electric motor for said rotor; an electric heater for the flow of air in said housing; an insulating carrier at least partially surrounding



said motor; at least one first electric contact provided on said carrier; and at least one second electric contact provided on said heater and separably engaging said first contact.

4,918,290
PORTABLE TOWEL HEATING DEVICE
Robert A. DeMars, 7932 Maestro, Canoga Park, Calif. 91304
Continuation of Ser. No. 791,726, Oct. 28, 1985, abandoned. This application Sep. 14, 1987, Ser. No. 96,727
Int. Cl.[4] F27D *7/04*; F26B *9/06*
U.S. Cl. 219—400 8 Claims



1 An easily transportable towel heating device comprising
(a) a cabinet made of heat-resistant, lightweight material, said cabinet having a front, rear, two sides, bottom, and a hingedly mounted accessible top;
(b) an electrically operated blower-heater located in a bottom portion of said cabinet for providing a flow of heated air substantially parallel to the front of said cabinet;
(c) perforated means for supporting a towel in said cabinet above said blower-heater and for allowing intersecting air flows;
(d) a deflector located in the flow of heated air for directing said flow of heated air substantially perpendicular to the front of said cabinet around and through said towel; and
(e) means for exhausting said heated air from an upper end of said cabinet.

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4,918,291

ELECTRIC HEATER ASSEMBLIES

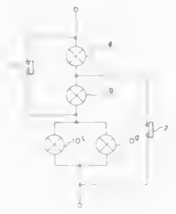
George A. Higgins, Hagley, and Richard C. Scott, Stourport on Severn, both of United Kingdom, assignors to Micropore International Limited, Worcestershire, United Kingdom

Filed Aug. 16, 1988, Ser. No. 232,786

Claims priority, application United Kingdom, Aug. 25, 1987, 8720056

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—464 9 Claims



1. An electric heater assembly for a glass ceramic top cooker comprising:

a plurality of electric heating elements;

a thermal cut-out device incorporating a first set of contacts for controlling the supply of electric current to at least one of the heating elements; and

means associated with the thermal cut-out device and incorporating a second set of contacts for controlling the supply of electric current to at least another of the heating elements,

wherein in the event of the thermal cut-out device detecting a first predetermined temperature the first set of contacts moves from a first position to a second position thereby causing the second set of contacts to move from a first position to a second position and in co-operation with the second set of contacts connects the heating elements in a lower power configuration or cuts off the supply of electric power to the heating elements and wherein when, as a result of the movement of the first and second sets of contacts from their first positions to their second positions, the thermal cut-out device subsequently detects a second predetermined temperature lower than the first predetermined temperature the first set of contacts moves from its second position to its first position thereby causing the second set of contacts to move from its second position to its first position and connecting the heating elements in their original configuration.

4,918,292

PROCESS AND MACHINE FOR THE WELDING TOGETHER OF PLASTIC PARTS PROCESSING A BUILT-IN WINDING

Max Nussbaum, Ermont, and Eric Federspiel, Saint Gratien, both of France, assignors to Gaz de France, Paris, France

Continuation-in-part of Ser. No. 210,457, Jun. 23, 1988, abandoned. This application Jul. 28, 1989, Ser. No. 387,424

Claims priority, application France, Jul. 15, 1987, 8709941

Int. Cl.[4] B29C *65/34*; B29L *31/24*; F16L *47/00*

U.S. Cl. 219—492 5 Claims

1. Method of welding together thermo-weldable plastic pipes by means of a thermo-weldable plastic fitting which receives respective ends of said pipes, comprising the steps of:

providing an electrical winding heating element around the fitting, said fitting having terminals for connection to a source of electrical current;

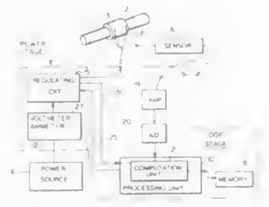
supplying the fitting with electrical current for heating by Joule effect, said current being adjusted for maintaining the temperature of the winding element between a minimum temperature (T1) below which the pipes and the fitting cannot be welded together, and a maximum temperature (T2) corresponding to the temperature which will cause damage to the pipes and the fitting, for a time interval having the relationship

$$\text{Log}(t) \geq A/T + B$$

where

t = time during which the temperature of the winding is between T1 and T2;

T = temperature reached by the winding within the above mentioned range of temperature;



$A = E_D/R$ and $B = \text{Log}(S^2/2D_o)$

where E_D = Activation Energy (Joule mole^{-1});

R = Perfect gas constant (R = 8.32 Joule, Kelvin^{-1}, mole^{-1});

D_o = constant depending on the structure of the plastic used;

$D_o = D/\exp(-E_D/RT)$

where D is the diffusion coefficient;

D and $D_o = m^2 \cdot S^{-1}$; and

s = molecular curvilinear displacement (m).

4,918,293

ELECTRICALLY OPERATED APPLIANCE CONTROLS AND METHODS OF MAKING THE SAME

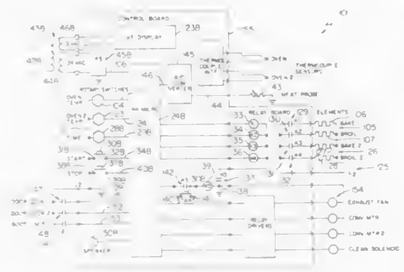
Gram J. McGeorge, Spring Lake, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 76,045, Jul. 21, 1987, Pat. No. 4,761,540, which is a division of Ser. No. 912,968, Sep. 29, 1986, Pat. No. 4,695,711, which is a division of Ser. No. 685,775, Dec. 24, 1984, Pat. No. 4,636,621. This application Jul. 27, 1988, Ser. No. 225,042

The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—506 22 Claims



1. In an electrically operated appliance control comprising an electrically operated device for providing two different functions of said device, an electrically operated visual display unit, and a manually operated selector means electrically interconnected to said device and said unit for selecting a desired function of said device and for setting said device to provide that selected function in a desired set manner thereof as being indicated on said display unit by such operation of said selector means, the improvement wherein said selector means comprises a manually operated movable selector member which when moved in one direction a certain amount from an off position thereof to a first position thereof selects one of said functions and then sets said device to provide that selected function in a desired manner as being indicated on said display unit as said selector member is being further moved in said one direction from said first position thereof and which when moved in the other direction a certain amount from said off position thereof to a second position thereof selects the other of said functions and then sets said device to provide that selected function in a desired manner as being indicated on said display unit as said selector member is being further moved in said other direction from said second position thereof.

4,918,294

ELECTRIC HEATING MEANS FOR A BREAD TOASTER

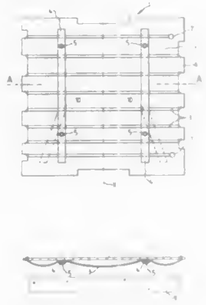
Andrea Hahnewald, Egelsbach, and Georg Möthrath, Hasselroth, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Nov. 17, 1988, Ser. No. 272,647

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1987, 3740298; Nov. 27, 1987, 3740299

Int. Cl.[4] H05B *3/16*, *3/26*

U.S. Cl. 219—521 10 Claims



1. A bread toaster having a housing with at least one air inlet opening at its bottom and at least one slot for accepting and ejecting the article to be toasted, an insulating body in said housing, said insulating body having a center axis (X), and being cooled by an air current that enters through said air inlet opening, flows subsequently mainly over the area of said center axis of said insulating body, and finally exits through said slot, heat conductor portions arranged on at least one side of said insulating body, and mounting means arranged on said insulating body spaced from said center axis (X) and thus substantially outside the range of action of said air current and securing said heat conductor portions on said insulating body, said heat conductor portions being secured on said insulating body with a sag profile such that said heat conductor portions are spaced a greater distance from said insulating body in the area of said center axis and said air current than in the area of said mounting means whereby—when viewed horizontally—a more even browning of the article to be toasted is accomplished.

4,918,295

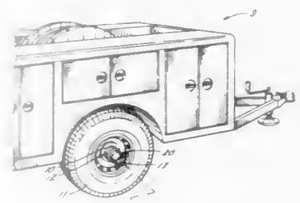
COMBINATION HUBODOMETER PROTECTIVE HOUSING AND STEP

Charles J. Sauber, 10 N. Sauber Rd., Virgil, Ill. 60182

Filed Apr. 12, 1989, Ser. No. 337,135

Int. Cl.[4] G01C *22/00*

U.S. Cl. 235—95 B 6 Claims



1. For use in connection with a vehicle axle having an internally threaded cylindrical hub end, a combination hubodometer protective housing and step comprising,

a cylindrical metal body having an open outward end for receiving the hubodometer internally and entirely recessed therein so that the cylindrical metal body protects the hubodometer against external impacts and forces, said body having an inward end with external threads for coupling with said axle hub threaded end to project outwardly therefrom as a step, and a circular wall located internally within the body, said wall defining an inner chamber for containing lubricant for said axle and an outer chamber for receiving the hubodometer, said wall having mounting means for connecting the hubodometer thereto for rotation with the body and axle hub.

4,918,296

ARTICLE IDENTIFYING SYSTEM

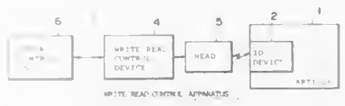
Hisato Fujisaka; Koichi Tsujino, both of Kyoto, and Tunetaka Shimada, Takatsuki, all of Japan, assignors to Omron Tateisi Electronics Company, Hanazono, Japan

Filed Mar. 1, 1988, Ser. No. 162,416

Claims priority, application Japan, Mar. 6, 1987, 62-52691; Mar. 6, 1987, 62-52692

Int. Cl.[4] G06K *5/00*

U.S. Cl. 235—380 14 Claims



1. An article identifying system having an ID device attachable to an article to be identified and a write/read control apparatus to write or read data into or from said ID device, wherein

said ID device comprises:

(a) a resonance circuit including a coil;

first data demodulating means for demodulating an output signal of said resonance circuit and obtaining data represented by a change in frequency of said output signal;

(b) an electrically erasable and programmable memory for storing identification data of the article to which said ID device is to be attached;

(c) memory control means for controlling a writing operation of said demodulated data into and reading operation of data from said memory;

(d) data modulating means for changing a resonant fre-

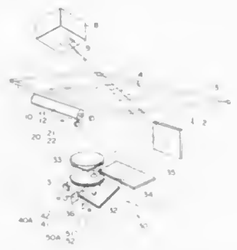
quency of said resonance circuit on the basis of the transmission data which is read out of said memory; and
(e) a rectifying/smoothing circuit for rectifying and smoothing an output from said resonance circuit thereby supplying DC power to each section of said ID device, and
said write/read control apparatus comprises:
(f) an oscillator which includes an oscillating coil and discontinuously changes an oscillating frequency in accordance with a data signal to be transmitted to said ID device;
(g) second data demodulating means for demodulating a data signal which is given by the ID device on the basis of a frequency change of a signal obtained from said oscillator; and
(h) data processing means for giving serial data to be transmitted to said oscillator and for converting data given from said second data demodulating means into a parallel signal.

4,918,297

OPTICAL IMAGE READING DEVICE

Yukuo Kurimoto, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1988, Ser. No. 291,740
Claims priority, application Japan, Jan. 8, 1988, 63-2067; Jan. 8, 1988, 63-2068
Int. Cl.[4] G06K *15/00*
U.S. Cl. 235—383 **8 Claims**



1. An optical image reading device comprising:
a reading window which an article is set facing;
a main light source for emitting a first light beam which is emitted via said reading window to a limited external space to scan the article;
symbol reading means for reading a symbol formed on the article from the first light beam which has been reflected by the article placed within the limited external space and has traveled via said reading window; and
light source control means for detecting that no article has been set within the limited external space, to thereby inhibit the activation of said main light source.

4,918,298

CHECKIN GATE APPARATUS

Haruo Tanabe, Kyoto; Masaji Ishida, Takatsuki; Tomoya Fujino, Ootsu, and Tadahiko Kurata, Nagaokakyo, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Nov. 30, 1987, Ser. No. 126,614
Claims priority, application Japan, Dec. 1, 1986, 61-287087; Jul. 8, 1987, 62-170478
Int. Cl.[4] G07B *15/02*
U.S. Cl. 235—384 **11 Claims**

1. A checkin gate apparatus comprising:
(a) carrying-in means for carrying in a ticket inserted into an insertion slot;
(b) reading means disposed in the course of a carry path of said carrying-in means, for reading information recorded on an inserted ticket;
(c) ticket cutting means for cutting off the ticket into two stubs after said reading means has read recorded information;
(d) distributing means for respectively distributing the two cut-off ticket stubs into a collection direction and a discharge direction;
(e) collecting means for collecting one of the cut-off stubs of the ticket; and

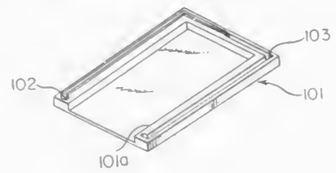
(f) carrying-out means for carrying-out the other of the cut-off stubs of the ticket to a discharge slot to discharge it;
said distributing means comprising a switchable carry path disposed on a discharge slot side of said reading means, for respectively feeding one cut-off half stub to a carry path of said collecting means and the other cut-off half stub to a carry path of said carrying-out means.

4,918,299

PLASTIC PACKAGE FOR CARD HAVING A BUILT-IN STORAGE MEDIUM

Makoto Ohmori, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 3, 1988, Ser. No. 151,983
Claims priority, application Japan, Sep. 7, 1987, 62-222058
Int. Cl.[4] G06K *19/02*
U.S. Cl. 235—488 **5 Claims**



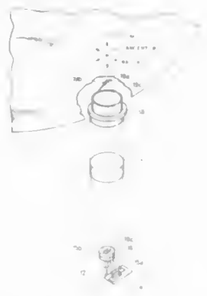
1. A plastic package for a card having a built-in storage medium such as a semiconductor device, for encasing and protecting said card body, comprising two plastic half case bodies having the same shape and each being provided with a convex portion and a concave portion which are disposed symmetrically with respect to a reference line on each of said half case bodies, the convex portion and the concave portion of one of said half case bodies being engageable with the corresponding concave portion and convex portion of the other half case body, respectively.

4,918,300

OPTICAL PICKUP SYSTEM HAVING MULTIPLE DIFFRACTION DEVICES AND LENS HOLDING MEANS

Shigeki Tsuji, and Hiroshi Ogata, both of Hiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 17, 1989, Ser. No. 324,653
Claims priority, application Japan, Mar. 17, 1988, 63-65512
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201.1 **5 Claims**



1. An optical pickup device for reading signal pits on a disk comprising:
a light source,
first diffraction means for splitting a light beam emitted along an axis from said light source into a zeroth order diffracted light beam for reading said signal pits and a plurality of first order diffracted light beams for detecting errors in tracking along the row of said signal bits,
an object lens for focusing each of said diffracted light beams on said disk and forming a corresponding plurality of light spots,
second diffraction means for separating from each other and deviating light beams reflected from said light spots and gathered by said object lens,
photosensor means for detecting a plurality of light beams having passed through said second diffraction means,
first holding means for holding said light source, said first and second diffraction means and said photosensor means, and
second holding means for holding said object lens,
said second holding means including a substantially cylindrical hollow section, said first holding means including a substantially cylindrical outer peripheral portion mating inside said hollow section, said first holding means being rotatable relative to said second holding means about the axis of said light beam emitted from said light source.

4,918,301

POSITION SENSOR HAVING DOUBLE FOCUSES AND UTILIZING A CHROMATIC ABERRATION

Tsutomu Miyatake, Ehime, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 179,566, Apr. 18, 1988, abandoned. This application Apr. 27, 1989, Ser. No. 344,247
Claims priority, application Japan, Jul. 8, 1987, 62-196174
Int. Cl.[4] G02B *5/22*, **H01J** *3/14, 5/16*
U.S. Cl. 250—216 **4 Claims**

1. In an apparatus having double focuses and utilizing a chromatic aberration for sensing the relative positions observed in the direction perpendicular to a common optical axis of first and second objects separated from each other by a small distance in the direction of the optical axis, the apparatus comprising:
a lens system for imaging a mark each of the first and second objects being accompanied by chromatic aberrations due to said small distance with first and second sets of lights having respective different wavelengths; a relative arrangement of the first and second objects and an objective lens in such a manner that the image plane of said first object occupied by the light of the first set of wavelengths is formed in a plane identical to the image plane of said second object occupied by the light of the second set of wavelengths; a filter means having first and second filter

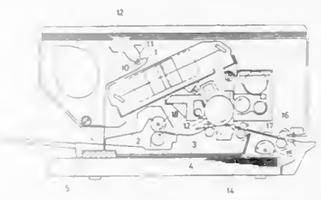
elements for cancelling the lights of the first and second sets of wavelengths respectively so as to cancel the image blur of the second object formed on the image plane of the second object due to the chromatic aberration caused by the light of the first set of wavelengths and the image blur of the first object formed on the image plane of the first object due to the chromatic aberration caused by the light of the second set of wavelengths.

4,918,302

ARRANGEMENT FOR DETECTING A STATE OF LIGHT OR BRIGHTNESS

Haruo Nishiyama, Kyoto, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 19, 1988, Ser. No. 195,948
Claims priority, application Japan, May 21, 1987, 62-124469; May 21, 1987, 62-124470
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227.11 **6 Claims**



1. A state detecting arrangement for detecting a light emitting state or the brightness of a plurality of predetermined locations, the arrangement comprising:
a plurality of optical fibers having respective first ends positioned at a plurality of locations to be detected so that levels of light output at respective second ends of said optical fibers may be different from one another;
at least one light receiving means for simultaneously receiving light emitted from the second ends of each said plurality of optical fibers; and
at least one means for judging said light emitting state of brightness of each of said plurality of locations on the basis of a detection level at said light receiving means.

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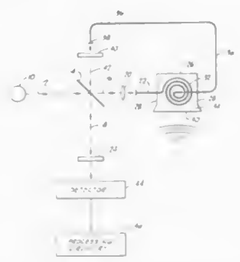
4,918,303

DETECTING DISTURBANCE WITH CROSS POLARIZED FIBER OPTIC SENSING

John S. Gergely, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed May 11, 1989, Ser. No. 351,237
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227.17 **11 Claims**



1. Apparatus for sensing a physical disturbance, comprising:
a source generating a light beam of single-frequency, coherent, linearly polarized light;
a sealed enclosure filled with coupling fluid, said enclosure having at least one flexible surface for sensing an external disturbance and inducing the disturbance into the coupling fluid;
a fiber optic-sensing coil of preselected diameter and number of turns disposed within said coupling fluid and responsive to any induced disturbance;
optic input means receiving said source light beam and directing same into said fiber optic coil;
optic output means receiving coil light from said fiber optic coil and directing said coil light through a half-wave plate to produce a phase-shifted coil light;
a beam splitter intersecting each of said source light beam and said phase-shifted coil light and directing a combined beam of reference source light and phase-shifted coil light;
polarizer means receiving said combined beam in the form of a Lissajous pattern of light and passing the E-field vector of the combined beam; and
a photoelectric detector receiving said combined beam to produce an A-C coupled current output proportional to the change in fiber length of said sensing coil which is proportionate to the amount of disturbance.

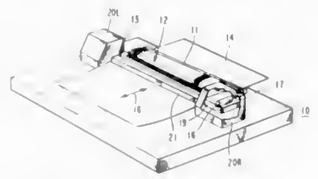
4,918,304

FLYING SPOT IMAGE SCANNER THAT UTILIZES A CRT COUPLED TO A NONCOHERENT FIBER OPTIC BUNDLE

Eugene I. Gordon, Summit, N.J., assignor to Photon Imaging Corp., Edison, N.J.

Filed Mar. 17, 1989, Ser. No. 325,455
Int. Cl.[4] H01J *5/16, 40/14*
U.S. Cl. 250—227.26 **23 Claims**

1. A scanner comprising a pluraity of light pipes extending from a first to a second face, said scanner including a CRT having a face plate and means for directing an electron beam at selected consecutive positions on said face plate determined by an address string, said first face being coupled to said face plate such that said electron beam causes pulses of light to be introduced at consecutive ones of said plurality of light pipes, said scanner also including a detector positioned opposing said second face to collect light constituting pixel data generated in



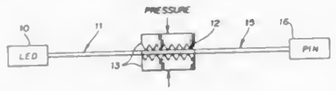
response to light exiting consecutive ones of said plurality of light pipes in said second face.

4,918,305

FIBER OPTIC PRESSURE SENSOR USING PRESSURE SENSITIVE FIBER DIFFERENT FROM INPUT AND OUTPUT FIBERS

Marek T. Wlodarczyk, Birmingham; Mark K. Krage, Royal Oak, both of Mich., and Deborah J. Vickers, Malibu, Calif., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 1, 1988, Ser. No. 227,041
Int. Cl.[4] H01J *5/16;* **G01D** *5/34*
U.S. Cl. 250—227.14 **5 Claims**



1. A fiber optic pressure sensor comprising, in combination:
a sensing fiber comprising a short length of single region transparent fiber of a dielectric material surrounded circumferentially by a layer of a metal for which the real part of the complex permittivity in a predetermined range of wavelengths is negative, the layer of metal hermetically sealing the fiber and defining a dielectric/metal boundary;
mechanical means for producing microbends in the sensing fiber at the dielectric/aluminum boundary in response to a pressure to be sensed;
a source of light at the predetermined range of wavelengths;
a first optic fiber coupling light from the source of light to one end of the transparent sensing fiber;
a light detector; and
a second optic fiber coupling light from the other end of the transparent sensing fiber to the light detector, whereby microbends at the dielectric/aluminum boundary in response to the pressure to be sensed cause increased light loss from the transparent medium to the aluminum within the sensing fiber and thus decrease the light detected by the light detector.

4,918,306

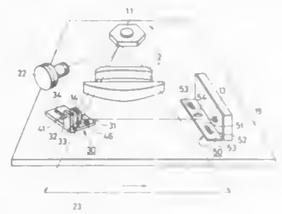
APPARATUS FOR ADJUSTING A BEAM POSITION DETECTING DEVICE

Taizo Saito, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 47,944, May 8, 1987, abandoned. This application Jul. 25, 1989, Ser. No. 384,381
Claims priority, application Japan, May 8, 1986, 61-69162[U]
Int. Cl.[4] G02B *26/10*
U.S. Cl. 250—235 **6 Claims**

1. A beam position detecting device for detecting a scanned light beam which moves in a first direction through a scanning range, comprising:

a mirror disposed to intercept an optical path of said scanned light beam;
a light beam sensor for detecting a light beam reflected from said mirror;
a base plate supporting said mirror and said light beam sensor;
a mirror holding member rotatably supported about an axis perpendicular to said base plate, for holding said mirror;
an adjusting member provided between said mirror holding



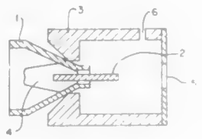
member and said mirror for adjusting an angle of said mirror with respect to said base plate; and
means for mounting said light beam sensor on said base plate to be displaceable along a direction transverse to a direction between said mirror and said light beam sensor,
wherein said mirror and said light beam sensor are disposed in a plane parallel to said first direction, said mirror being disposed immediately outside a start point of said scanning range and said light beam sensor being disposed outside an end point of said scanning range.

4,918,307

SAMPLE HOLDER FOR GLOW DISCHARGE MASS SPECTROMETER

Masahiro Shibata, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 29, 1988, Ser. No. 213,199
Claims priority, application Japan, Jun. 29, 1987, 62-101326[U]
Int. Cl.[4] H01J *49/04*
U.S. Cl. 250—288 **3 Claims**



1. A sample holder for a glow discharge mass spectrometer which comprises a sample holder body and a coating film of an insulating material of either i-carbon or crystalline diamond covering the surface of the sample holder body.

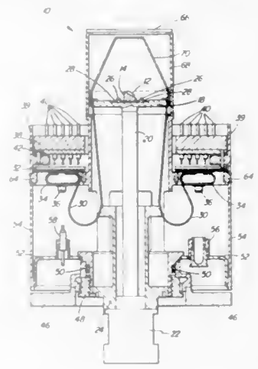
4,918,308

INTEGRATED DETECTOR DEWAR CRYOENGINE

Fred J. Neitzel, Santa Barbara; Leonard E. Peck, Jr., Goleta, and Richard M. Rall, Palos Verdes, all of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Continuation of Ser. No. 933,507, Nov. 21, 1986, abandoned. This application Mar. 20, 1989, Ser. No. 327,374
Int. Cl.[4] G01J *5/06*
U.S. Cl. 250—352 **7 Claims**

1. An apparatus for detecting electromagnetic radiation comprising:
detector means for detecting electromagnetic radiation;
means for removing thermal energy from said detector means by repeated compression and expansion of a fluid, said means for removing thermal energy comprising an expander operable to receive said fluid and having a cylindrical body with a disc-shaped projection at one end; and



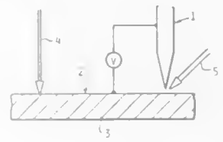
means for environmentally isolating said detector means and said means for removing thermal energy from said detector means so as to permit a vacuum to be formed in a region of said apparatus adjacent said detector means and said expander, said means for environmentally isolating further comprising an assembly housing and a bulkhead, said assembly housing mechanically communicating with said bulkhead.

4,918,309

METHOD FOR INVESTIGATING SURFACES AT NANOMETER AND PICOSECOND RESOLUTION AND LASER-SAMPLED SCANNING TUNNELING MICROSCOPE FOR PERFORMING SAID METHOD

Johannes G. Beha, Wädenswil; Armin U. Blacha, Thalwil; Rolf Claaberg, Gattikon, all of Switzerland; Rolf B. Moeller, Munich, Fed. Rep. of Germany, and Wolfgang D. Pohl, Adliswil, Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 20, 1988, Ser. No. 209,403
Claims priority, application European Pat. Off., Jun. 22, 1987, 87108907.4
Int. Cl.[4] H01J *37/00*
U.S. Cl. 250—306 **14 Claims**



3. An optical pulse sampled scanning tunneling microscope type device including:
a tunnel tip positioned at a tunneling distance over a surface region of a sample to be investigated,
means for producing an electrical potential between said tunnel tip and said surface region sufficient to permit a tunnel current to flow between said tunnel tip and said surface region,

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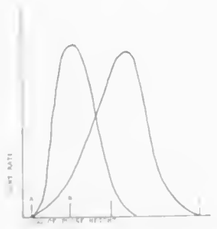
means for producing an optical pulse at or in the vicinity of said surface region or at said tunnel tip, and
a photoconductor on said tunnel tip, said optical pulse being incident on said photoconductor.

4,918,310

LIQUID SCINTILLATION COUNTER FOR MEASURING THE ACTIVITY OF RADIOACTIVE SAMPLES CONTAINING A MULTIPLE OF RADIOACTIVE ISOTOPES

Kenneth Rundt, Turku, and Heikki Kouru, Raisio, both of Finland, assignors to Wallac OY, Turku, Finland

Filed Nov. 22, 1988, Ser. No. 274,488
Claims priority, application Sweden, Dec. 18, 1987, 8705056
Int. Cl.[4] G01T *1/204*
U.S. Cl. 250—328 **4 Claims**



1. A liquid scintillation counter comprising
a detector for measuring the light output from a liquid scintillation sample containing radioactive isotopes of unknown activity, each isotope producing a characteristic analog spectrum in said detector,
a pulse height analyzer, having discriminators that are combined to define pulse height windows, said pulse height analyzer being connected to said detector for measuring and temporarily storing count rates for each of said windows, and
means for determining a value for the quench level of said scintillation sample characterized by,
the number of pulse height windows being at least N+1 when the number of isotopes is N, N being ≧2.
memory means for storing for each of said at least N+1 windows, representations of counting intensities determined by measuring calibration samples of each of said N isotopes at different levels of quench,
means for extracting from the stored representations a counting intensity for each of said at least N+1 windows and each of said N isotopes, on the basis of the determined quench level value, and
means for determining for each of said N isotopes a factor by which the at least N+1 extracted counting intensities is to be multiplied in order to fit the sum of the extracted counting intensities to count rates measured for said sample in each of said at least N+1 windows, each said factor being directly related to the amount of each isotope in the sample.

4,918,311

SET POINT CONTROL CIRCUIT FOR AN INFRARED GAS ANALYZER

Raymond E. Rogers, Oakland, Calif., assignor to Andros Analyzers Incorporated, Berkeley, Calif.

Filed Apr. 15, 1988, Ser. No. 181,929
Int. Cl.[4] G01N *21/61*
U.S. Cl. 250—343 **28 Claims**

1. A circuit for providing a stable set point for a gas analyzer comprising:
means for generating a reference signal;
a sensor for generating a sense signal, said sense signal being dependent on a parameter of said gas analyzer;
a set point circuit comprising:
switch means, having an input and an output, for switching between said reference signal generating means and said sensor; and
processor means coupled to said output of said switch means for selectively controlling said switch means to alternately

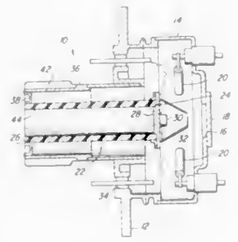
couple said input of said switch means between said reference signal generating means and said sensor, and for receiving said signals, said processor means also comparing said reference signal and said sense signal, wherein said processor means is responsive to the comparisons of said reference signal and said sense signal and controls said parameter until said sense signal corresponds to said reference signal to provide the stable set point for said gas analyzer.

4,918,312

DEWAR COLDFINGER

William H. Wellman, and Wallace Y. Kunimoto, both of Goleta, Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Nov. 23, 1988, Ser. No. 275,293
Int. Cl.[4] G01J *5/06*
U.S. Cl. 250—352 **11 Claims**



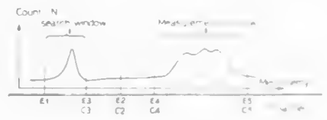
1. An infrared detector assembly comprising:
a dewar housing for providing an evacuated cavity,
an elongated hollow coldfinger tube within said dewar housing,
means for cooling one end of said tube thereby defining a cold end and a warm end of said tube,
an infrared detector mounted at said tube cold end, and
said tube having a layer of polymer material which is coated with a metal film, with said polymer layer providing strength for supporting said detector, and said metal film layer inhibiting gas permeation through said tube for preserving the integrity of said evacuated cavity.

4,918,313

DEVICE FOR COUNTING PARTICLES OF IONIZING RADIATION AND ITS APPLICATION TO IMPLEMENTING A METHOD OF MEASURING THE RATE OF LEAKAGE BETWEEN THE PRIMARY AND SECONDARY CIRCUITS OF A STEAM GENERATOR

Alain Dubail, Clamart; Alain Failbes, Lamanon Senas, and Francis Schulcz, Eyguieres, all of France, assignors to Electricite de France (Service National), France

Filed Jul. 8, 1987, Ser. No. 71,025
Claims priority, application France, Jul. 10, 1986, 86 10086
Int. Cl.[4] G01T *1/167*
U.S. Cl. 250—356.2 **2 Claims**



1. A method of measuring in real time the flowrate of fluid between a primary circuit and a secondary circuit of a steam generator, powered by a reactor of a nuclear power plant, said method comprising the following steps:
detecting at a specified point at the exterior of the secondary circuit a radioactive tracer such as isotope 16 of nitrogen (N^{16}) by using a device for counting particles of ionizing radiation of specified energy levels comprising means for detecting said radiation and delivering a detection signal in pulse form, on the input side of said detecting means a reference source for delivering reference ionizing radiation the energy spectrum of which is situated outside the energy spectrum of said ionizing radiation, on the output side of said detecting means means for discriminating the amplitude of said detection signal against a scale of amplitude levels and discriminating the energy spectrum of the received ionizing radiation which generated said pulses by counting the number of pulses of specified amplitude relative to the levels of the amplitude scale generated during a measurement time interval, and means of adjusting the relative position of the amplitude levels on the amplitude scale and the amplitude of the pulses generated by the reference ionizing radiation discriminated on the basis of the number of pulses of the same specified amplitude counted during the measurement time interval and
calculating the leakage flowrate q between the primary circuit and the secondary circuit from the following equation:

$$q = \frac{O \cdot \rho p}{\rho v} \quad k \cdot \frac{A}{Av}$$

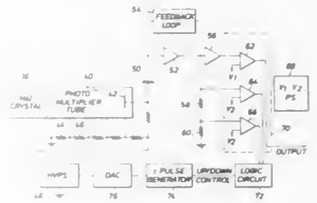
in which:
ρp represents the density of the primary fluid,
Ap represents the radioactive concentration of isotope 16 of nitrogen (N^{16}) in the primary fluid at the leak,
O represents the steam flowrate,
ρv represents the density of the steam,
Av represents the radio active concentration in isotope 16 of nitrogen (N^{16}) in the steam at the measurement point, and
k represents a coefficient characteristic of the decrease in the concentration of the tracer.

4,918,314

GAIN STABILIZATION CIRCUIT FOR PHOTOMULTIPLIER TUBES

Darrell S. Sonne, Katy, Tex., assignor to Halliburton Logging Services, Inc., Houston, Tex.

Filed Jan. 6, 1989, Ser. No. 293,916
Int. Cl.[4] G01T *1/28*
U.S. Cl. 250—369 **8 Claims**



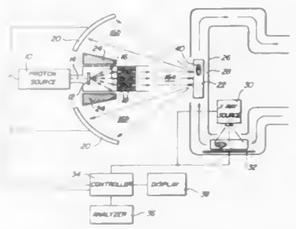
1 A control system for stabilization of a photomultiplier tube having an anode circuit and which is responsive to scintillation events detected in a scintillation detector wherein the photomultiplier tube forms an amplified output at the anode of such events, and wherein the stabilization circuit comprises:
(a) amplifier means connected to said photomultiplier tube output at the anode for forming a controllably sized output from said photomultiplier tube;
(b) first and second amplitude comparator means connected to the output of said amplifier means for converting the output thereof to logic levels dependent on amplitude of the signal from the photomultiplier tube, and wherein said logic levels comprise a control signal;
(c) a lockout circuit cooperative with said comparator means to limit operation of said comparator means to separate input pulses of specified amplitude in a given interval;
(d) means responsive to said control signal for forming a variable control voltage; and
(e) high voltage power supply means for said photomultiplier tube controllably operated to form a variable high voltage output for said photomultiplier tube in accordance with the control signal applied thereto.

4,918,315

NEUTRON SCATTER METHOD AND APPARATUS FOR THE NONINVASIVE INTERROGATION OF OBJECTS

Henry J. Gomberg, Ann Arbor, Mich., and Marcus McEllistrem, Lexington, Ky., assignors to Penetron, Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 142,810, Jan. 11, 1988, Pat. No. 4,864,142. This application May 31, 1988, Ser. No. 200,133
Int. Cl.[4] G01N *23/204*
U.S. Cl. 250—390.04 **26 Claims**



1 Apparatus for the noninvasive inspection of an object to

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determine the presence of at least one preselected element therein, said apparatus comprising:

a neutron beam source having a neutron beam controller operative in cooperation therewith to sequentially provide two monoenergetic neutron beams of different energies and to sequentially impinge the beams of neutrons upon the object whereby said object scatters the beams so as to provide a first and a second group of multienergetic, scattered neutrons;

a detector disposed to receive at least a portion of each of the groups of multienergetic scattered neutrons and operative to provide a signal corresponding thereto; and

an analyzer in communication with the detector and operative to: (1) receive the detector output signal, (2) analyze said signal to determine the intensity of the scattered neutrons as a function of their respective energies for each of the groups of scattered neutrons so as to provide an energy/intensity spectrum for each of the groups; (3) compare said spectra so as to determine the difference between the intensity of scattered neutrons of the first group at a first preselected energy indicative of the scattering of the first monoenergetic beam by a particular preselected element in said object and the intensity of scattered neutrons of the second group at a second preselected energy indicative of scattering of the second monoenergetic beam by said particular preselected element and (4) correlate said difference with the scattering contribution of said preselected element.

4,918,316

METHOD OF AND APPARATUS FOR IRRADIATING LARGE SURFACES WITH IONS

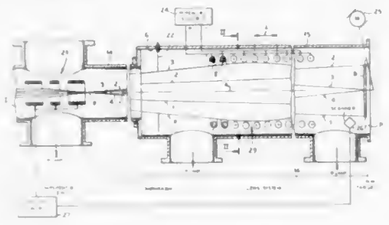
Jakob Schelten, Jülich, Fed. Rep. of Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Fed. Rep. of Germany

Filed Oct. 12, 1988, Ser. No. 257,108

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1987, 3734442

Int. Cl.[4] H01J *37/147*

U.S. Cl. 250—398 **16 Claims**



7. An apparatus for irradiating a large surface with ions, comprising:

means for generating a substantially monoenergetic beam of ions;

means traversed by said beam for focussing said beam at a focal point whereby said beam spreads along a path downstream from said focal point along a path having an axis and extending in a direction of movement of the ions of said beam;

a target provided with a large surface to be irradiated disposed along said path distal from said focal point in a plane perpendicular to the axis and such that straight-line paths of peripheral ions of said beam divergent from said focal point intersect said plane outwardly of said surface;

means for rotating said surface about said axis in said plane; and

means at a location along the path of said beam between said focal point and said surface for reflecting only said peripheral ions of said beam to converge said peripheral ions upon said surface while permitting ions of the beam traveling along straight-line paths from said focal point and intersecting said plane within said surface to travel substantially unreflected to said surface, and wherein said means for reflecting comprises:

an ion reflector surrounding said beam at said location and comprised of an electrode array extending along the path of said beam and consisting essentially of a multiplicity of electrode elements elongated transversely to said direction, closely spaced in said direction and provided with mutually parallel long sides transverse to said axis, the center-to-center spacing $\lambda/2$ of successive electrode elements, where λ is a periodicity of said electrode elements in said direction, being a minimum consistent with maintenance of electrical potentials on said elements, and

means for applying electrical potentials $\pm\Delta V$ of alternatingly opposite sign to the successive electrode elements and of a magnitude sufficient to effect reflection of peripheral ions of said beam incident upon a boundary region immediately adjacent said array as said peripheral ions approach respective electrode elements of said array.

4,918,317

RADIATION DOSIMETER

Todd M. Hess, Columbus, and Peter Gottschalk, Centerville, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 69,357, Jul. 2, 1987, abandoned. This application Dec. 14, 1988, Ser. No. 285,335

Int. Cl.[4] G01T *1/02*

U.S. Cl. 250—474.1 **15 Claims**

1. A radiation dosimeter comprising a support having a layer of microcapsules on the surface thereof, said microcapsules comprising a wall and an internal phase, said internal phase comprisinq a solution of a radiochromic dye, said radiochromic dye solution being capable of changing color or shade plus density upon exposure to gamma, ultraviolet or electron beam radiation.

4,918,318

ELECTRONIC OPTICS DEVICE WITH VARIABLE ILLUMINATION AND APERTURE LIMITATION, AND APPLICATION THEREOF TO AN ELECTRON BEAM LITHOGRAPHIC SYSTEM

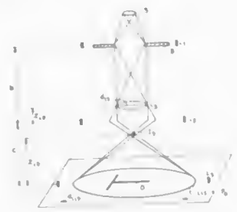
Emmanuel de Chambost, Molieres, and Michel Sonrier, Bois D'Arcy, both of France, assignors to Thomson-CSF, Paris, France

Filed Oct. 14, 1987, Ser. No. 112,671

Claims priority, application France, Oct. 14, 1986, 86 14261

Int. Cl.[4] H01J *37/302*

U.S. Cl. 250—492.2 **4 Claims**



1. An electronic optics device comprising a particle source and an object situated in an object plane, wherein an image of said object is to be projected onto an image plane located downstream from said object plane, and comprising a set of three electronic lenses with electronically controllable focal lengths between said source and said object plane, the first one being situated as close as possible to the source and associated with an aperture limitation diaphragm situated in the vicinity of its main plane, the focal lengths of these three lenses being controlled so as to give to the device three degrees of freedom required for electronically adjusting the section of the particle beam, in the object plane, thus determining the desired illumination and, the diameter and position of the image of the diaphragm, thus determining the desired aperture for the beam incident on the object.

4,918,319

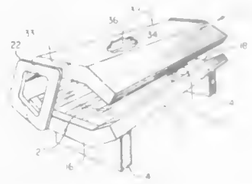
TANNING BED WITH CLOSURE CONTROL MECHANISM

Henk P. Kruitbof, Grez, Belgium, assignor to Puretan, Inc., Dallas, Tex.

Filed Nov. 3, 1987, Ser. No. 116,452

Int. Cl.[4] A61N *5/06*

U.S. Cl. 250—504 R **26 Claims**



1. In a tanning bed having an upper tanning element having a pair of oppositely facing end surfaces and a lower tanning element, a closure control mechanism comprising:

a pair of side arm braces, one said brace mounted at each end of said lower tanning element;

a first channel and a second channel defined on each said brace;

a pair of first rollers mounted on said upper tanning element and positioned for movement in said first channels; and

a pair of second rollers mounted on said upper tanning element and positioned for movement in said second channels, whereby said upper tanning element can be rotated and translated relative to said lower tanning element between a first, opened position and a second, closed position.

4,918,320

ALIGNMENT METHOD USABLE IN A STEP-AND-REPEAT TYFE EXPOSURE APPARATUS FOR EITHER GLOBAL OR DYE-BY-DYE ALIGNMENT

Bunei Hamasaki, Yokohama; Hajime Igarashi, Kawasaki; Akiya Nakai, Tokyo, and Naoki Ayata, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1988, Ser. No. 170,359

Claims priority, application Japan, Mar. 20, 1987, 62-064327; Mar. 20, 1987, 62-064328; Mar. 20, 1987, 62-064329; Mar. 20, 1987, 62-064330; Mar. 20, 1987, 62-064331; Mar. 20, 1987, 62-064332; Mar. 20, 1987, 62-064333; Mar. 20, 1987, 62-064334; Mar. 20, 1987, 62-064335

Int. Cl.[4] G01H *21/86*

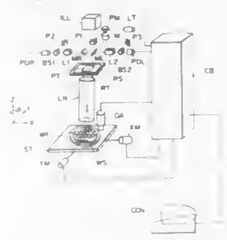
U.S. Cl. 250—548 **13 Claims**

1. An alignment method usable with a first object having a pattern, a second object having different shot areas, and a projection optical system effective to expose the shot areas of the second object to the pattern of the first object in a step-and-repeat manner, said method aligning in sequence the shot areas of the second object with respect to a projection region upon which the pattern of the first object is projected by the projection optical system, and comprising the steps of:

moving the second object in at least one of an X direction and a Y direction before start of the step-and-repeat exposures and making a first measurement, by use of the projection optical system, of a positional error of each of at least two shot areas of the second object with respect to said projection region;

rotationally moving the second object in a θ direction in accordance with the first measurement to determine the position of the second object with respect to the θ direction;

moving again the second object in at least one of the X direction and the Y direction after determination of the position of the second object with respect to the θ direction and making a second measurement, by use of the projection optical system, of a positional error of each of at least two shot areas of the second object with respect to said projection region;



generating and storing information concerning the correct layout position of the shot areas of the second object on the basis of the second measurement; and

controlling the movement of the second object in at least one of the X direction and the Y direction at the time of the step-and-repeat exposures, in accordance with the stored information, so as to align in sequence the shot areas of the second object with respect to said projection region.

4,918,321

REFLECTED LIGHT SCANNING METHOD AND APPARATUS FOR THE DETECTION OF SURFACE BLEMISHES

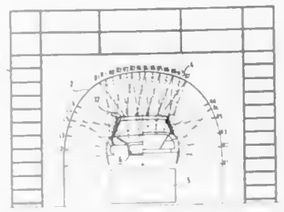
Jürgen Klenk, Alling; Horst Krasowski, Stuttgart, and Gerhard Jünemann, Leonberg, all of Fed. Rep. of Germany, assignors to Roth-Electric GmbH and Daimler-Benz AG, both of, Fed. Rep. of Germany

Filed Apr. 13, 1988, Ser. No. 180,936

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1987, 3712513

Int. Cl.[4] G01N *21/86*

U.S. Cl. 250—571 **15 Claims**



1. A method for monitoring a substantially smooth surface of an object for surface defects comprising:

providing relative movement between said object and lighting means;

illuminating a narrow strip on a surface of said object with diffused light from said lighting means with said strip

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being disposed transverse to the direction of relative movement;

directing light reflected from said surface into opto-electronic video camera means mounted adjacent said lighting means to produce images of said surface of the object being monitored;

said directing of said reflected light being carried out by means of movable reflecting means to provide a series of images of the surface of the object being monitored, whereby the increment of movement between adjacent images is smaller than the width of said narrow strip of light to provide overlapping of said images; and

evaluating video signals provided by said opto-electronic video camera means for intensity variations indicative of surface defects.

4,918,322

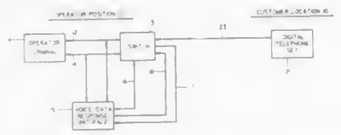
VOICE/DATA-FORMATTED TELEPHONE INFORMATION STORAGE AND RETRIEVAL SYSTEM

Walter W. Winter, Indian Harbour Beach; Jo Morris, Cocoa Beach, and Dale E. Cannon, Indian Harbour Beach, all of Fla., assignors to Golden Enterprises, Melbourne, Fla.

Filed Oct. 6, 1988, Ser. No. 254,305

Int. Cl.[4] H04M *3/50, 11/08*

U.S. Cl. 379—88 10 Claims



6. For use with an operator-assisted telephone service facility having an operator terminal through the operation of which an on-line operator services incoming calls that are coupled to said facility by way of a switch device to which a telephone link, over which an incoming caller communicates with said facility, is connected, said operator terminal being coupled to said switch device by way of a communications link therebetween, and wherein on-line participation by an on-line operator is required for effectively enabling an incoming caller to reach a called destination, a method for providing a response message to said incoming caller accessing said facility comprising the steps of:

(a) storing, in a storage device, a plurality of message components of which a response message may be comprised, in a form such that, when played back and transmitted to said incoming caller in a synthetically vocalized audio format, said response message effectively corresponds to the voice of the operator who is on-line with and services incoming calls; and

(a) accessing, from said storage device, in the course of the on-line operator's release of the servicing of said incoming call, selected ones of said plurality of message components and causing said selected message components to be assembled and transmitted over said telephone link as a synthetically vocalized audio response message to said incoming caller in the voice of said on-line operator who has released from the servicing of said incoming call, so that it appears to said incoming caller that the released operator is still on-line with and vocalizing said response message to said incoming caller.

4,918,323

ENGINE STARTING AND CHARGING DEVICE

Hiroaki Aso, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

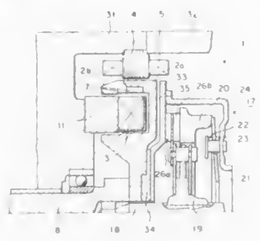
PCT No. PCT/JP88/00130, § 371 Date Oct. 6, 1988, § 102(e) Date Oct. 6, 1988, PCT Pub. No. WO88/06372, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 9, 1988, Ser. No. 265,864

Claims priority, application Japan, Feb. 12, 1987, 62-30025

Int. Cl.[4] F02N *11/00;* **F16D** *3/12*

U.S. Cl. 290—46 7 Claims



1. An engine starting and charging device, comprising: a starting and charging device body having revolving-field poles mounted on an engine crankshaft, a field winding wound around a field core, and an armature winding wound around an armature core; and a clutch plate mounted oppositely to said revolving-field poles through a cushioning material such that a space communicating to the outside air will be formed between a portion frictionally connected with a clutch disc and said revolving-field poles.

4,918,324

COAXIAL ENGINE STARTER

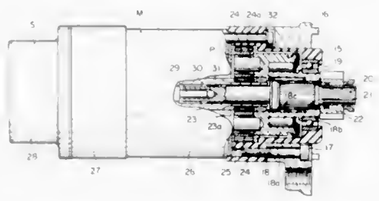
Shuzoo Isozumi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 12, 1989, Ser. No. 296,104

Claims priority, application Japan, Jan. 13, 1988, 63-6112

Int. Cl.[4] F02N *15/06*

U.S. Cl. 290—48 2 Claims



1. A coaxial engine starter in which a solenoid switch is disposed behind an electric motor, a planetary speed reduction gear is disposed in front of said electric motor, and an output rotary shaft is driven by said electric motor through said planetary speed reduction gear, wherein a housing to which a bearing for receiving radial loads from said output rotary shaft is secured and an inner gear of said planetary speed reduction gear are integrally formed by a resin, and wherein a flange for attaching the starter to an engine is mounted to said housing.

4,918,325

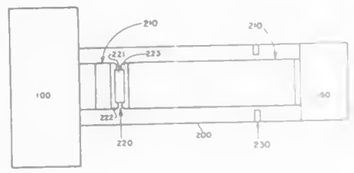
FAST RISETIME PULSE POWER SYSTEM

Kenneth O. Busby; Richard J. Adler, both of Albuquerque; Lynn M. Miner, Kirtland, and Gerald F. Kiuttu, Albuquerque, all of N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 8, 1983, Ser. No. 282,358

Int. Cl.[4] H03K *3/00;* **H01B** *7/00*

U.S. Cl. 307—106 5 Claims



1. A pulse enhancing system which electrically connects a pulse generator with a load, said pulse enhancing system receiving an electrical pulse which has a certain voltage and current risetime from said pulse generator and outputting an enhanced pulse in which the voltage and current risetime is decreased, said pulse enhancing system comprising:

an outer conductor which electrically connects said pulse generator with said load;

a first magnetically-insulated inner conductor which is electrically connected with said pulse generator and which receives said electrical pulse from said pulse generator, said first magnetically-insulated inner conductor being separated from said outer conductor by a first covering of magnetic insulation, said first covering enabling said first magnetically-insulated inner conductor to divert an initial radial electron flow of said electrical pulse into a first axial flow of current, said first magnetically-insulated inner conductor automatically producing a first improved electrical pulse with a first reduced voltage and current risetime, as said initial radial electron flow of the electrical pulse is diverted into said first axial flow of current;

a current diverter switch which receives and retransmits said first improved electrical pulse from said first magnetically-insulated conductor, said current diverter switch thereby producing a retransmitted pulse; and

a second magnetically-insulated inner conductor which electrically connects said current diverter switch to said load, said second magnetically-insulated inner conductor receiving said retransmitter pulse from said current diverter switch, and being separated from said outer conductor by a second covering of magnetic insulation, said second covering enabling said second magnetically-insulated inner conductor to divert initial radial electron flow of said retransmitted pulse into a second axial flow of current, said second magnetically-insulated inner conductor automatically producing said enhanced pulse to said load in which the voltage and current risetime is decreased, as said initial radial flow of said retransmitted pulse is diverted into said second axial flow of current.

4,918,326

ELECTRONIC SWITCHGEAR, PREFERABLY OPERATING CONTACT-FREE

Jean-Luc Lamarche, Langenargen, Fed. Rep. of Germany, assignor to I F M Electronic GmbH, Essen, Fed. Rep. of Germany

Filed Jul. 7, 1988, Ser. No. 216,172

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1987, 3722335

Int. Cl.[4] H01H *35/00*

U.S. Cl. 307—116 15 Claims

1. An electronic switchgear, preferably operating contact-free, comprising a presence indicator capable of being externally affected, a switching amplifier disposed downstream of the presence indicator, an electronic switch which can be controlled by the presence indicator via the switching amplifier, a supply circuit containing a voltage and/or current regulator for the provision of the supply voltage for the presence indicator and for the switching amplifier and a delay circuit interconnecting the switching amplifier or the electronic switch with the supply circuit and so inhibiting activation pulses, wherein the delay circuit becomes operational so as to start the delay time only after the voltage and/or current regulator has begun to operate and the supply circuit has made the correct supply voltage available for the presence indicator and the switching amplifier.

4,918,328

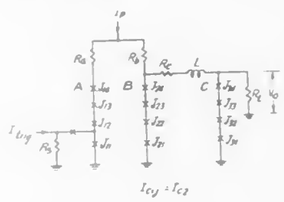
APPARATUS AND METHOD FOR GENERATING A STEP VOLTAGE WAVEFORM

Feng Kuo, Purdys, N.Y., assignor to Hypres Incorporated, Elmsford, N.Y.

Filed May 3, 1988, Ser. No. 190,955

Int. Cl.[4] H03K *4/02, 3/315, 3/38*

U.S. Cl. 307—227 7 Claims



1. An apparatus for generating a step voltage waveform, comprising:

first means for receiving a switching signal;

second means, responsive to said switching signal, for producing an intermediate signal switchable between at least a first voltage and a second voltage, said second means including a first path comprising a first plurality of switching devices in series, each of said switching devices being capable of switching between two stable states and said first plurality of switching devices being coupled to a second path comprising a second plurality of switching devices in series, each of said switching devices of said second plurality of switching devices being capable of switching between two stable states, said intermediate

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signal being at said second voltage when all of said switching devices of said first and second paths have switched from a first one of said stable states to a second one of said stable states; and

third means, responsive to the switching of the intermediate signal from the said first voltage to the said second voltage, for providing a fast step voltage waveform as an output signal, said third means including a third path of a third plurality of switching devices in series, said third means including means for inhibiting a switching of any of said third plurality of switching devices until said second means attains said second voltage state.

4,918,329

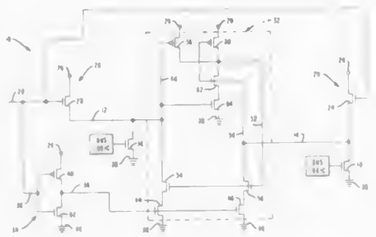
DATA TRANSMISSION SYSTEM

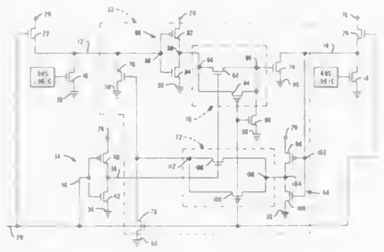
Gregory H. Milby, San Diego, and Ikuo J. Sanwo, San Marcos, both of Calif., assignors to NCR Corporation, Dayton, Ohio

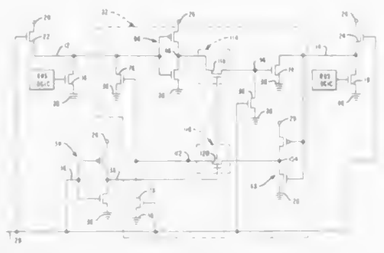
Filed Jul. 25, 1988, Ser. No. 224,023

Int. Cl.[4] H03K *19/17, 19/96;* G06F *13/00;* G11C *15/49*

U.S. Cl. 307—241 33 Claims







1. A data transmission system comprising:

first and second buses;

first and second means attached to said first and second buses, respectively, for the transfer of data signals to said buses;

supply means connected to said buses for precharging said buses to a first voltage level; and

circuit means connecting said buses and responsive to a data signal at a second voltage level on either of said buses for transferring said signal to the other bus.

4,918,331

LOGIC CIRCUITS WITH DATA RESYNCHRONIZATION

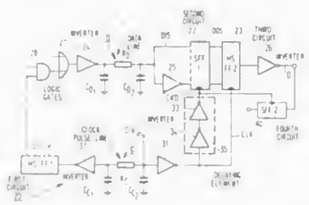
Adrianus T. Van Zanten; Hendrikus J. M. Veendrick, and Leonardus C. M. G. Pfennings, all of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 251,067, Sep. 27, 1988, abandoned, which is a continuation of Ser. No. 125,749, Nov. 20, 1987, abandoned, which is a continuation of Ser. No. 890,599, Jul. 30, 1986, abandoned. This application May 26, 1989, Ser. No. 358,478

Claims priority, application Netherlands, Oct. 21, 1985, 8502859

Int. Cl.[4] H03K *5/15, 19/003*

U.S. Cl. 307—269 5 Claims



1. A system of logic circuits comprising at least a first circuit and a second circuit, a data line for transferring a logic signal from said first circuit to said second circuit, and a clock line for providing a clock signal having clock pulses to said first circuit to control the transfer of the logic signal, said data line and said clock line each causing a delay in transmission of logic signals and clock pulses, respectively, and a delaying element for providing delayed clock pulses to said second circuit, wherein the total logic signal delay between said first circuit and said second circuit caused by at least one of geometrical distance and intervening circuit elements is less than the sum of the duration of a clock pulse period and the delay time of said delaying element and said first circuit and said second circuit each comprise a bistable circuit.

4,918,332

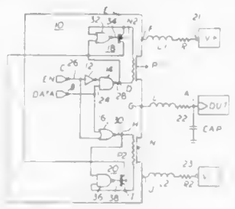
TTL OUTPUT DRIVER GATE CONFIGURATION

Michael A. Nix, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 15, 1988, Ser. No. 206,761

Int. Cl.[4] H03K *3/01, 17/16, 19/094*

U.S. Cl. 307—270 20 Claims



1. A TTL output driver gate configuration which has re-

duced voltage spikes on internal power supply potential and ground potential nodes comprising:

a P-channel pull-up transistor (P1) having a serpentine gate, a source and a drain, said pull-up transistor (P1) having a source coupled to a positive potential via the internal power supply potential node and its drain coupled to an output node, said serpentine gate of said pull-up transistor (P1) being formed of a first end and a second end;

an N-channel pull-down transistor (N1) having a serpentine gate, a source and a drain, said pull-down transistor (N1) having its source coupled to a negative potential via the internal ground potential node and its drain coupled to the output node, said serpentine gate of said pull-down transistor (N1) being formed of a first end and a second end;

first logic means (14) responsive to a data input signal making a low-to-high transition for generating a first control signal which is connected to the first gate end of said pull-up transistor;

second logic means (16) responsive to the data input signal making a high-to-low transition for generating a second control signal which is connected to the first gate end of said pull-down transistor (N1);

first positive feedback amplifier means (18) connected between the first and second gate ends of said pull-up transistor (N1) and being responsive to the first control signal for pulling down the second gate end of said pull-up transistor (P1) all the way to the negative potential so as to facilitate a low-to-high logic transition at the output node; and

second positive feedback amplifier means (20) connected between the first and second gate ends of said pull-down transistor (N1) and being responsive to the second control signal for pulling up the second end of said pull-down transistor all the way to the positive potential so as to facilitate a high-to-low logic transition at the output node,

whereby distributed R-C of the serpentine gates slow down the turn-on times of said pull-up and pull-down transistors (P1, N1) so as to reduce voltage spikes at the internal power supply potential and ground potential nodes during transitions at the output node.

4,913,333

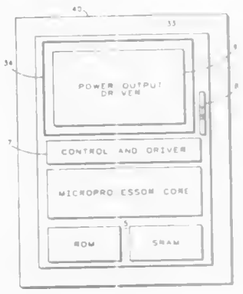
MICROPROCESSOR HAVING HIGH CURRENT DRIVE

Floyd E. Anderson, 15002 S. 40th Pl., Phoenix, Ariz. 85044; Stephen P. Robb, 211 W. Greentree Dr., Tempe, Ariz. 85284; Pern Shaw, 5209 Raincreek Pkwy., Austin, Tex. 78759, and Lewis E. Terry, 4812 E. Mitchell, Phoenix, Ariz. 85018

Filed Oct. 31, 1988, Ser. No. 264,733

Int. Cl.[4] H03K *17/12*

U.S. Cl. 307—270 6 Claims



1. An integrated circuit comprising:

a microprocessor core; and

at least one power output device coupled to said microprocessor core for providing a current drive capability of greater than 0.25 amps.

4,918,334

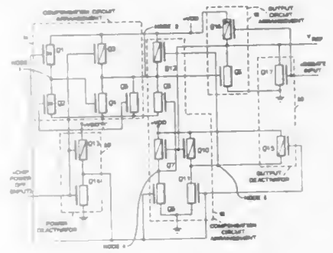
BIAS VOLTAGE GENERATOR FOR STATIC CMOS CIRCUITS

Anthony Correale, Jr., Raleigh, and Gary C. Lackett, Carey, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 15, 1988, Ser. No. 232,399

Int. Cl.[4] H03K *17/094, 3/01*

U.S. Cl. 307—296.8 11 Claims



1. A circuit arrangement for generating a voltage to bias static dc power dissipating circuits implemented in CMOS technology comprising:

at least one FET pull-up load device, said one FET pull-up device being coupled to at least one pull-down device; and

means coupled to a control gate of said pull-up load device, said means responsive to a plurality of process-dependent parameters including tolerances in device-channel lengths and widths and threshold voltages, to provide a variable biasing voltage to a control gate of the pull-up load device with said variable biasing voltage being at a level that causes the pull-up load device to provide a constant current unaffected by variations in process parameters or supply voltage tolerances.

4,918,335

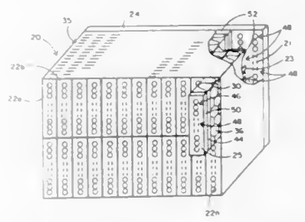
INTERCONNECTION SYSTEM FOR INTEGRATED CIRCUIT CHIPS

Louis E. Chall, Jr., Costa Mesa, Calif., assignor to Ford Aerospace Corporation, Newport Beach, Calif.

Division of Ser. No. 118,362, Nov. 6, 1987. This application Sep. 26, 1988, Ser. No. 248,674

Int. Cl.[4] H03K *3/26;* H01L *23/48;* H05K *5/00;* H01R *23/68*

U.S. Cl. 307—303.1 9 Claims



1. A leadless interconnection system for integrated circuits, comprising:

a substrate for supporting chip carriers; and

a plurality of chip carriers mounted on said substrate adjacent to each other, each of said carriers including a carrier body having a geometric shape such that said carriers are disposed on said substrate to form a mosaic; several connection pads respectively corresponding to several identi-

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cal interfaces, said pads so arranged on the periphery of the geometric shape of each said body that when said carriers are disposed in said mosaic, each connection pad is immediately adjacent to a corresponding connection pad of another carrier of the mosaic; and an integrated circuit chip mounted on each said carrier body; wherein:

said chips, carrier, and mosaic are so configured that each chip can selectively transmit and receive data to and from a chip on any adjacent carrier in said mosaic through said connection pads in a serial manner;

immediately adjacent ones of said connection pads are electrically connected to each other without the use of intervening wires or leads formed on said carrier; and

said chip includes a function circuit and interface means surrounding said function circuit for connecting said function circuit to said connection pads via leads having substantially equal lengths.

4,918,336

CAPACITOR COUPLED PUSH PULL LOGIC CIRCUIT

Andrew C. Graham, Sunnyvale, and Mark E. Fitzpatrick, San Jose, both of Calif., assignors to Gazelle Microcircuits, Inc., Santa Clara, Calif.

Continuation of Ser. No. 51,986, May 19, 1987, Pat. No. 4,810,905. This application Dec. 2, 1988, Ser. No. 279,183

The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.

Int. Cl.[4] H03K *19/094*

U.S. Cl. 307—448 4 Claims

1. A buffer circuit having an input signal lead for receiving an input signal, an outpnt signal lead for providing an output signal, a first voltage supply terminal, and a second voltage supply terminal, comprising:

first, second and third transistors;

said first transistor having a first current handling terminal, a control terminal, and a second current handling terminal connected to the second voltage supply terminal;

load means connecting the first voltage supply terminal and first current handling terminal of the first transistor;

said second transistor having a first current handling terminal connected to said first voltage supply terminal, a control terminal connected to the first current handling terminal of the first transistor, and a second current handling terminal;

said third transistor having a first current handling terminal connected to the second current handling terminal of the second transistor, a control terminal, and a second current handling terminal connected to the second voltage supply terminal;

the control terminals of the first and third transistors being connected to the input signal lead;

a capacitor having a pair of terminals, one terminal connected to the first current handling terminal of the third transistor, and the other terminal connected to the output signal lead; and

a load device coupled between the respective second current handling terminals of the first and third transistors and the second voltage supply terminal.

4,918,337

ACTIVE RC FILTER HAVING BAND-REJECTION AND ALL-PASS MODES

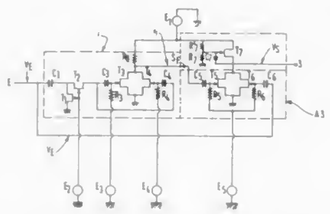
Yannick Deville, Ris-Orangis, France, assignor to U.S. Philips Corp., New York, N.Y.

Filed Oct. 12, 1988, Ser. No. 257,361

Claims priority, application France, Oct. 13, 1987, 87 14111

Int. Cl.[4] H03B *1/00;* **H03K** *5/00*

U.S. Cl. 307—520 13 Claims



1. An active filter circuit operable in a band-rejection mode and in an all-pass mode, comprising:

a filter and amplifier circuit comprising filtering means comprised of an RC filter circuit for filtering an input signal applied thereto, said filtering means having a transfer function which is of the first order in the numerator and of the second order in the denominator and amplifying means for amplifying the output of said filtering means;

an amplifier circuit for amplifying the input signal applied to said filter and amplifier circuit;

a second amplifier circuit for amplifying the output of said filter and amplifier circuit; and

summing means for summing the respective output signals of said first and second amplifier circuits; whereby

the active filter circuit has a transfer function which is of the second order in the numerator and second order in the denominator and the active filter mode can be changed between a band-rejection mode and an all-pass mode by changing the RC component values and amplifying means and amplifier gains.

4,918,338

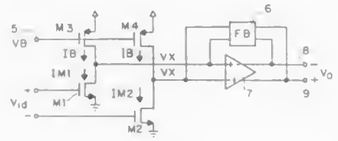
DRAIN-BIASSED TRANSRESISTANCE DEVICE FOR CONTINUOUS TIME FILTERS

Stephen L. Wong, Scarsdale, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Oct. 4, 1988, Ser. No. 253,794

Int. Cl.[4] H03B *1/00;* **H03K** *5/00*

U.S. Cl. 307—521 13 Claims



1. A variable resistance DBT device comprising:

first and second MOS transistors each having a drain electrode and a gate electrode,

first and second adjustable bias current sources,

means connecting said first current source and said first transistor in series circuit across terminals of a source of supply voltage and with the drain electrode of said first transistor connected to the first current source,

means connecting said second current source and said second transistor in series circuit across the terminals of the source of supply voltage and with the drain electrode of said second transistor connected to the second current source,

a differential amplifier having output means and first and second inputs coupled to the drain electrodes of the first and second transistors, respectively,

a feedback circuit coupling said output means of said differential amplifier to at least one of the inputs of the differential amplifier,

a pair of signal input terminals connected to respective gate electrodes of the first and second transistors, and

means for adjusting the value of bias currents supplied by the bias current sources to the drain electrodes of said first and second transistors thereby to bias the transistors into their triode regions, adjustment of said bias current sources being operative to vary the bias currents and thereby the drain voltages of the transistors so as to linearly vary the effective resistances of said transistors.

4,918,339

DATA OUTPUT CIRCUIT

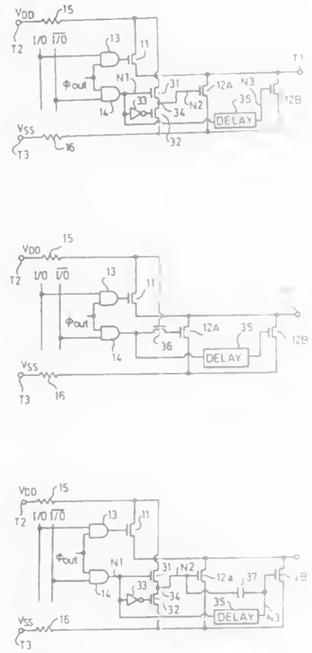
Ohshima Shigeo, Tokyo, and Toda Haruki, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 11, 1988, Ser. No. 167,081

Claims priority, application Japan, Mar. 23, 1987, 62-68242

Int. Cl.[4] H03K *17/06, 17/16, 19/003, 17/687*

U.S. Cl. 307—542 18 Claims



1. For a semiconductor integrated circuit, a buffer circuit having a power source voltage with first and second power source terminals, an input terminal for receiving an input signal from the integrated circuit, and an output terminal for outputting an output signal in response to the input signal comprising

a plurality of transistors having first and second states coupled in parallel between said output terminal and said second power source terminal;

transistor switch control means for switching each of said plurality of transistors in sequence during a switching cycle from its first state to its second state, said transistor switch control means including delay means for delaying the switching of at least one of said plurality of transistors to its second state; and

transistor voltage control means for at least initially supplying a voltage to the control gate of the first transistor switched during the switching cycle which is lower than the voltage supplied to the control gates of the remaining transistors in the switching cycle.

4,918,340

GTO THYRISTOR CONTROL CIRCUIT

Chao-Cheng Lu, 4-4, Alley 27, Lane 143, Chun Kung Rd., Taipei, Taiwan

Filed Oct. 11, 1988, Ser. No. 256,315

Int. Cl.[4] H03K *17/72*

U.S. Cl. 307—638 1 Claim

1. A GTO thyristor control circuit for controlling a gate turn-off (GTO) SCR thyristor having an anode, a cathode and a gate electrode and switching a load current, said control circuit comprising:

a thyristor trigger circuit consisting of the gate and cathode electrodes of the thyristor;

a turn-off voltage storage capacitor;

an input circuit means operably coupled to the thyristor trigger circuit, for receiving a thyristor gate input voltage and for applying said thyristor gate input voltage to said thyristor, said input circuit means including:

a first input circuit operably coupled in series with the gate electrode of said thyristor and in parallel with a load resistor and having a first zener diode in series with a first voltage divider and a first diode, said first input circuit receiving said thyristor gate input voltage and passing portions thereof exceeding the zener voltage of said first zener diode to said first voltage divider whereby the voltage from said first voltage divider is passed via said first diode and is applied as a turn-on voltage signal to the thyristor gate electrode for turning-on the thyristor;

a second input circuit operably connected to said voltage divider of said first input circuit and receiving the voltage therefrom, said second input circuit including a reference voltage storage capacitor, whereby said reference voltage storage capacitor is charged by the voltage from said voltage divider; and

a third input circuit operably connected with said first and second input circuits and receiving said thyristor gate input voltage, said third input circuit including a diode provided in series with said turn-off voltage storage capacitor, for charging said turn-off voltage storage capacitor;

input reference voltage circuit means operably connected with said third input circuit and including a diode and a voltage divider, for receiving the thyristor gate input voltage and providing therefrom an input reference voltage;

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limit reference voltage circuit means operably connected with said second input circuit reference voltage storage capacitor, for receiving voltage stored by said reference voltage capacitor and for providing therefrom an upper limit reference voltage and a lower limit reference voltage;

supply voltage storage circuit means including a supply voltage storage capacitor operably connected with said third input circuit and receiving said thyristor gate input voltage therefrom, for charging the supply voltage storage capacitor;

voltage comparator means operably connected with said reference voltage storage capacitor of said second input circuit and with said input reference voltage circuit means, for comparing the input reference voltage with the voltage on said reference voltage storage capacitor for thereby determining whether the thyristor is in an on state or an off state and providing a voltage comparator output signal in accordance therewith;

upper limit voltage comparator means operably connected with said input voltage reference circuit means and said limit reference voltage circuit means, for comparing the input reference voltage with the upper limit reference voltage for thereby determining whether the thyristor gate input voltage is above or below a predetermined upper working point voltage level and providing an upper limit voltage comparator output signal in accordance therewith;

lower limit voltage comparator means operably connected with said input voltage reference circuit means and said limit reference voltage means, for comparing the input reference voltage with the lower limit voltage for thereby determining whether the thyristor gate input voltage is above or below a predetermined lower working point voltage level and providing a lower limit voltage comparator output signal in accordance therewith;

AND gate circuit means having three inputs respectively operably connected to respective outputs of said voltage comparator means, upper limit voltage comparator means and lower limit voltage comparator means, for outputting an output signal having a first state when the respective states of said voltage comparator output signal, upper limit voltage comparator output signal and lower limit voltage comparator output signal are all coincident such as to indicate that the thyristor gate input voltage is falling and is between said predetermined upper and lower working point voltage levels, and for outputting an output signal having a second state when the respective states of said voltage comparator output signal, upper limit voltage comparator output signal and lower limit voltage comparator output signal are not coincident;

discharge circuit means operably connected to said input circuit means and said AND gate means and including a first saturation transistor circuit connected between said turn-off voltage storage capacitor and the anode and cathode of the thyristor, for operably connecting said turn-off voltage storage capacitor across the cathode and anode of said thyristor when the output signal of said AND gate circuit means attains said first state thereof, for discharging voltage stored in said turn-off voltage storage capacitor across the cathode and anode of said thyristor to thereby turn off said thyristor; and

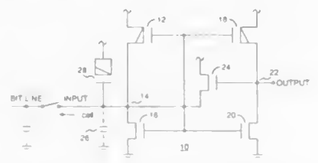
charge circuit means operably connected to said input circuit means and said AND gate means and including a second saturation transistor circuit connected between said turn-off voltage storage capacitor and the cathode of said thyristor, for operably connected the negative voltage terminal of said turn-off voltage capacitor with the cathode of said thyristor when the output signal of said AND gate attains said second state thereof, for thereby charging said turn-off voltage storage capacitor.

4,918,341

HIGH SPEED STATIC SINGLE-ENDED SENSE AMPLIFIER

Douglas C. Galbraith, Fremont, and Michael G. Ahrens, Sunnyvale, both of Calif., assignors to Actel Corporaton, Sunnyvale, Calif.

Filed Sep. 23, 1988, Ser. No. 230,764
Int. Cl.[4] H03F *3/45;* **H03K** *19/094*
U.S. Cl. 307—530 **3 Claims**



1. A high speed static single ended sense amplifier, including,

an input node,

an output node,

a first P-channel input transistor having its source connected to a source of positive voltage, its drain connected to said input node and its gate connected to a feedback node,

a first N-channel input transistor having its drain connected to said input node, its source connected to a source of negative voltage and its gate connected to said feedback node,

a first output P-channel transistor having its source connected to a source of positive voltage, its drain connected to said output node, and its gate connected to said feedback node,

a first N-channel output transistor having its drain connected to said output node, its source connected to a source of positive voltage and its gate connected to said feedback node,

an N-channel feedback transistor having its gate connected to said output node, its drain connected to a source of positive voltage and its source connected to said feedback node,

a capacitive voltage divider connected between said source of negative voltage, said source of positive voltage, and said input node, said capacitive voltage divider including a parasitic capacitance and a P-channel gate capacitor connected between said input node and one of said positive or negative voltage sources, the capacitance ratio of said capacitive voltage divider being such as to give the same voltage divider ratio as the voltage divider ratio resulting from first P-channel MOS input transistor and first N-channel MOS input transistor.

4,918,343

BRUSHLESS ALTERNATOR

Martin W. Heinrich, Cedar Grove, and James A. Ten Hoven, Sheboygan Falls, both of Wis., assignors to Kohler CO., Kohler, Wis.

Filed Oct. 13, 1988, Ser. No. 257,476
Int. Cl.[4] H02K *9/00, 9/06, 47/20*
U.S. Cl. 310—58 **10 Claims**

7. A brushless alternator, comprising:

a housing having an engine end and a free end opposite from the engine end;

housing mounting means at the engine end of the housing for mounting the housing to a prime mover;

a shaft coaxial with and extending through the housing;

means for mounting the shaft rotatably relative to the housing;

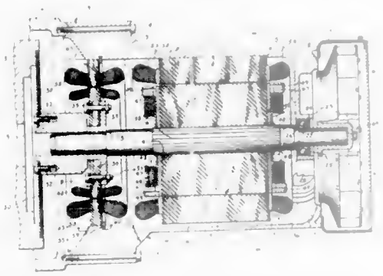
an exciter field assembly fixed to and inside of the housing, said exciter field assembly including a plurality of laminations which are stacked together;

an exciter armature which is mounted on the shaft to rotate with the shaft at an axial location in alignment with the exciter field assembly so that the exciter armature is radially inside of the exciter field assembly, said exciter armature including a plurality of laminations which are stacked together;

a rotor mounted on the shaft inside the housing, said rotor including a plurality of laminations which are stacked together;

a stator fixed to and inside of the housing at an axial location in alignment with the rotor so that the rotor is radially inside of the stator, said stator including a plurality of laminations which are stacked together;

cooling air intake means at the engine end of the housing;



exhaust vent means at the free end of the housing;

fan means outside of the housing at the free end of the housing to draw cooling air through the exhaust vent means;

means inside the housing for defining a cooling air flow path from the cooling air intake means to the exhaust vent means; and

wherein:

a drive hub is positioned on the shaft at the engine end of the housing to drivingly couple the shaft to a prime mover to which the housing is mounted;

the drive hub is bolted to the exciter armature;

the shaft has a flange which is integral with the shaft, and

the drive hub is slip fit onto the shaft and is also bolted to the flange.

4,918,344

ELECTRIC MOTOR WITH FRICTIONAL PLANETARY SPEED REDUCER

Akira Chikamori, and Kouichi Ueda, both of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

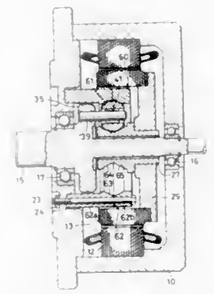
Filed Aug. 2, 1988, Ser. No. 227,387
Claims priority, application Japan, Aug. 4, 1987, 62-195032
Int. Cl.[4] H02K *5/167;* **F16H** *13/06*
U.S. Cl. 310—83 **6 Claims**

1. An electric motor with a frictional planetary speed reducer having a stator portion provided with a stator, an output shaft supported by said stator portion with a bearing therebetween, a rotor opposed to the stator and located between said output shaft and the stator, and the frictional planetary speed reducer located between said rotor and said output shaft, said frictional planetary speed reducer comprising:

a hollow cylindrical stationary wheel, one end of which is fixed to said stator portion and a free end of which is arranged in the vicinity of an inner periphery of said rotor,

a hollow cylindrical input shaft directly connected with an endplate extending radially inward from the end portion of said rotor at the free end side of the stationary wheel, said input shaft being arranged so as to form a determined space interposed between an inner periphery of said stationary wheel and an outer periphery of said input shaft as opposed to each other;

a plurality of planetary rollers being arranged circumferentially at regular intervals so as to be fitted in pressing contact into said space interposed between said stationary wheel and said input shaft;



a plurality of carrier pins each of which is arranged inside a planetary roller with a needle roller therebetween; and

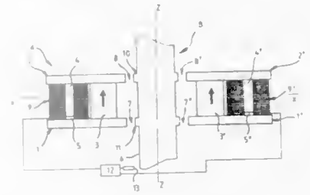
a carrier portion fixed to said output shaft and mounting each of said plurality of carrier pins.

4,918,345

MAGNETIC BEARING FOR ACTIVE CENTERING OF A BODY MOVABLE RELATIVE TO A STATIC BODY WITH RESPECT TO AT LEAST ONE AXIS

Hubert Vaillant de Guelis, Aubergenville; Jean-Pierre Roland, Vienne en Arthie, and Patrice Jamain, Maule, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Mar. 14, 1988, Ser. No. 167,685
Claims priority, application France, Mar. 13, 1987, 87 03489
Int. Cl.[4] F16C *39/06*
U.S. Cl. 310—90.5 **12 Claims**



1. Magnetic bearing for active magnetic centering of a body movable relative to a static body with respect to at least one centering axis, perpendicular to a reference axis, said bearing comprising on each side of a plane of symmetry perpendicular to said at least one centering axis and containing said reference axis:

at least one permanent magnet magnetized parallel to said reference axis;

at least one combination comprising a coil wound on a ferromagnetic core disposed to procure a magnetic flux parallel to said reference axis;

two ferromagnetic plates carried by said static body between which said at least one combination is clamped, said ferromagnetic plates adapted to provide a closed magnetic path for magnetic flux produced by said at least one combination via airgaps on said centering axis separating said movable body from said static body;

and further comprising:

a control circuit comprising a sensor responsive to relative movement between said movable body and said static

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body along said centering axis and adapted to feed to said at least one combination a current adapted to correct such relative movement;

a ferromagnetic pole piece in said movable body adapted to provide a closed magnetic path via said airgaps for magnetic flux circulating in said ferromagnetic plates.

4,918,346

LOW RIPPLE-TORQUE PERMANENT MAGNET BRUSHLESS MOTOR

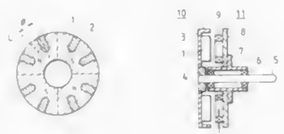
Fumio Tajima, Jyuou, Japan; Nicolas Samman, Eaubonne, France; Kunio Miyashita; Hiroshi Katayama, both of Hitachi; Motoya Ito, Katsuta; Seiichi Narushima, Tsuchiura, and Klyoshi Yamamuro, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

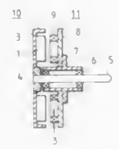
Filed Jun. 24, 1988, Ser. No. 211,042

Claims priority, application Japan, Jun. 26, 1987, 62-157687; Feb. 1, 1988, 63-19650

Int. Cl.[4] H02K *21/12, 29/00*

U.S. Cl. 310—156 5 Claims





1. A permanent magnet brushless motor comprising permanent magnets which are magnetized in N polarity and S polarity alternately in equal intervals, three phase driving coils facing the permanent magnets, electric commutators for controlling current to the driving coils, wherein a driving torque is generated corresponding to the current flowing through the driving coils and the permanent magnet,

characterized in that

two non-magnetizing regions are disposed on a surface of each permanent magnet having one polarity and facing said driving coils.

4,918,347

COIL WINDING CONSTRUCTION FOR AN ELECTRIC MOTOR

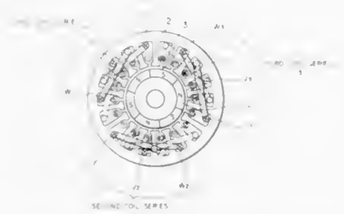
Yosuke Takaba, Iida, Japan, assignor to Tamagawa Seiki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1988, Ser. No. 248,424

Claims priority, application Japan, Jul. 21, 1988, 63-95675[U]

Int. Cl.[4] H02K *3/00, 1/00*

U.S. Cl. 310—179 3 Claims



3. A coil construction for an electric motor comprising a stator having a plurality of alternating slots and teeth surrounding a central rotor accommodating opening, a rotor mounted for rotation within said stator opening, and a plurality of windings disposed within a plurality of said stator slots and providing a plurality of phases, wherein the improvement resides in that said windings are incorporated in at least two independently wound coil series with each coil series containing three coils, one coil for each of three phases, each of said coil series occupying six adjacent stator slots with no two coil series occupying the same slot, and each of said coils occupies two of said slots which are separated by two intervening slots.

4,918,348

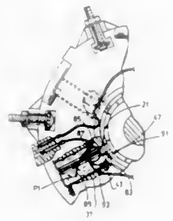
BRUSH WEAR INDICATOR

Alan H. Fitzsimmons, Toledo, and Joe K. Hammer, Bowling Green, both of Ohio, assignors to Prestolite Electric Incorporated, Toledo, Ohio

Filed Dec. 14, 1988, Ser. No. 284,312

Int. Cl.[4] H02K *13/00*

U.S. Cl. 310—242 30 Claims



1. Apparatus for indicating brush wear for an electrical appliance, by providing an electrical signal indicating that a brush is worn down to a point of extending brush wear, comprising:

a wearable brush moveable toward a contact point in the appliance, said brush deteriorating at said contact point during operation of the appliance;

spring means for biasing said brush toward said contact point, said spring means including a portion moveable along a path during at least some of the time said brush is moved during wear of said brush; and

electrical signal generator means having a member disposed in said path for making mechanical contact with said portion of said spring means when said brush is worn down to a point of extended brush wear, said electrical signal generator means for generating an electrical signal in response to the making of said mechanical contact.

4,918,349

SURFACE ACOUSTIC WAVE DEVICE HAVING APODIZED TRANSDUCER PROVIDED WITH IRREGULAR PITCH ELECTRODE GROUP

Takashi Shiba; Yuji Fujita, both of Yokohama; Toshimitsu Takahashi, Sagamihara, and Jun Yamada, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 4, 1988, Ser. No. 267,294

Claims priority, application Japan, Nov. 13, 1987, 62-285338; Dec. 23, 1987, 62-323960

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—313 C 8 Claims

1. A surface acoustic wave device comprising:

a piezoelectric substrate;

an input transducer comprised of interdigital electrodes and formed on said substrate; and

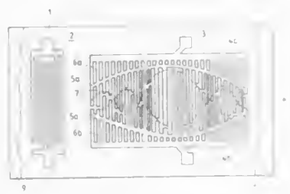
an output interdigital transducer comprised of interdigital electrodes and formed on said substrate;

at least one of said input transducer and said output transducer being comprised of:

first bus-bar electrodes which connect the edges of the same potential electrodes of said interdigital electrodes in alignment;

second bus-bar electrodes which connect the same potential electrodes of said interdigital electrodes in the vicinity of the overlapping portions;

a first electrode group comprised of a plurality of electrodes having the same width disposed between said first bus-bar electrodes and said second bus-bar electrodes at a regular



pitch having an interval equal to the width of said electrodes; and

a second electrode group comprised of electrodes arranged at irregular pitches with one end thereof connected to one of said second bus-bar electrodes, and the other ends of at least a part of said electrodes being overlapped with the different potential electrodes, thereby constituting sources of a surface acoustic wave.

4,918,350

ENERGY-TRAPPING-BY-FREQUENCY LOWERING-TYPE PIEZOELECTRIC RESONANCE DEVICE

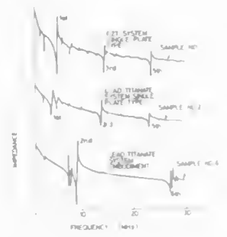
Akira Ando; Toshihiko Kittaka, and Yukio Sakabe, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co. Ltd., Japan

Filed Jun. 27, 1988, Ser. No. 211,777

Claims priority, application Japan, Jun. 26, 1987, 62-160665; Sep. 19, 1987, 62-235948

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—320 11 Claims



1. A piezoelectric resonance device of the energy-trapping-by-frequency-lowering type using a harmonic wave above the fundamental wave of the thickness extensional vibration mode, said device comprising:

a plate-like body comprising a plurality of layers of a lead titanate-zirconate system piezoelectric material, said plurality of layers being stacked to form said plate-like body and thereby defining a direction of thickness;

at least three electrodes so disposed that the electrodes are overlapped with each other on opposite sides of respective piezoelectric layers in said direction of thickness;

each of said electrodes having a vibrating electrode portion and a conducting portion for connecting the vibrating electrode portion to a side edge of said plate-like body;

wherein all of said conducting portions are so formed that no given conducting portion is overlapped with any adjacent conducting portion, or any portions of other electrodes, in the direction of the thickness; and

wherein said piezoelectric material has such an effective Poisson's ratio that the piezoelectric material is not usable to trap the fundamental mode energy of the thickness extensional vibration mode by lowering the resonance frequency.

4,918,351

VIBRATION WAVE MOTOR

Sumio Kawai, Hachioji, Japan, assignor to Olympus Optical Co., Tokyo, Japan

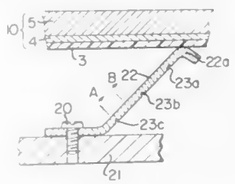
Continuation of Ser. No. 168,178, Mar. 15, 1988, Pat. No. 4,871,937. This application Apr. 7, 1989, Ser. No. 334,888

Claims priority, application Japan, Mar. 27, 1987, 62-74955

The portion of the term of this patent subsequent to Oct. 3, 2006, has been disclaimed.

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—323 4 Claims



1 A vibration wave motor comprising:

a stator having a flange at the base thereof;

a plurality of supporting arms formed by elastic metal members fixed to said flange of said stator and having elasticity in the vertical direction;

a vibration preventing member mounted on said supporting arms;

a vibration member having an elastic metal member and electrostrictive elements affixed to the lower end surface of said elastic metal member, said vibration member being mounted on said vibration preventing member;

a movable member mounted on said elastic metal member; and

a stopper arranged above said movable member with a rotational-friction reducing member intervening therebetween, said stopper being secured to said stator;

whereby a frictional force is produced between said movable member and said vibration member by said stopper and said elastic supporting arms.

4,918,352

METAL HALIDE LAMPS WITH OXIDIZED FRAME PARTS

Carl H. Hess, Mentor-on-the-Lake; Frank I. Ewing, Solon; Ralph M. Potter, Pepper Pike; Timothy D. Russell, Huntsburg, and Edward G. Zubler, Chagrin Falls, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 7, 1988, Ser. No. 268,144

Int. Cl.[4] H01J *17/18, 61/34*

U.S. Cl. 313—25 2 Claims

1. A metal halide arc discharge lamp comprising an arc tube supported within an outer vitreous envelope by metal frame parts having a nickel surface wherein the arc tube contains a fill comprising mercury, a sodium halide and an inert starting gas and wherein an oxidizing agent is present within the inside

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of said outer envelope in an amount sufficient to release oxygen in an amount equivalent to about 2×10^{-6} to 2×10^{-3} moles

per liter of outer envelope volume to oxidize the surface of said metal frame parts during operation of the lamp.

4,918,353

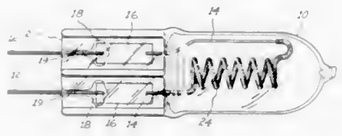
REFLECTOR AND LAMP COMBINATION

Clark D. Nelson, Mattoon, Ill.; Richard Malinowski, Chesterland, Ohio; Catherine Mers, Willoughby, Ohio; Diana Essock, Moreland Hills, Ohio; Vito Arsena, Highland Hts., Ohio, and Mary Jaffe, Cleveland Hts., Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 138,416, Dec. 28, 1987, abandoned, which is a continuation-in-part of Ser. No. 101,928, Sep. 29, 1987, Pat. No. 4,835,439, and a continuation-in-part of Ser. No. 101,929, Sep. 29, 1987, Pat. No. 4,833,576. This application Jun. 13, 1989, Ser. No. 366,336

Int. Cl.[4] F21V *7/09*

U.S. Cl. 313—113 16 Claims



1. A reflector and lamp combination comprising (a) a vitreous reflector member having a front reflecting portion terminating in an elongated hollow cavity portion which protrudes rearwardly from said reflector member and (b) a tungsten-halogen lamp permanently secured in said hollow cavity portion with an aluminum phosphate cement comprising a mixture of (i) aluminum phosphate containing excess phosphoric acid, (ii) relatively small particle size alumina particles and (iii) a mixture of relatively medium and coarse particle size inert refractory filler material, wherein said tungsten-halogen lamp comprises a vitreous envelope having at least one metal inlead construction hermetically sealed in at least on end thereof and extending into said end thorough at least one opening extending into said envelope wherein said inlead construction comprises an outer metal lead, an intermediate molybdenum sealing foil which forms said hermetic seal with said vitreous envelope and an inner lead extending into said envelope, said inner and outer leads being connected to said sealing foil, wherein the surface portion of said sealing foil which is adjacent said outer terminal lead is exposed to an oxidizing environment and has been coated with an aqueous solution of alkali metal silicate.

4,918,354

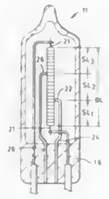
COMPACT COILED COIL INCANDESCENT FILAMENT WITH SUPPORTS AND PITCH CONTROL

Pierce Johnson, Jr., Topsfield, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Dec. 18, 1987, Ser. No. 135,193

Int. Cl.[4] H01K *1/02, 1/18*

U.S. Cl. 313—279 19 Claims



1. An incandescent filament comprising a coiled coil of refractory metal wire having a body length, BL, and a diameter, d, wherein the primary winding diameter, D_1, and the secondary winding diameter, D_2, of said filament are defined by the equations:

$D_1 = d(A+2)$;

$D_2 = D_1(B+2)$;

wherein:

$1.40 \leqq A \leqq 3.00$; and $\leqq B \leqq 10.0$;

said coiled coil filament requiring at least one intermediate support for the use thereof, the distance between the mounted ends of said filament and said support, SL, satisfying the equations:

$SL \leqq (\frac{1}{4})$ BL and $SL \leqq 20D_2$;

and the inner pitch, IP, of said coiled coil filament is defined as follows:

$$IP \frac{(B(A+2)+1) \cdot PP}{(B(A+2)+2)}$$

wherein PP is the primary pitch of said coiled coil filament.

4,918,355

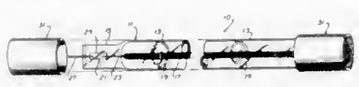
ELECTRIC LAMP WITH PROTECTIVE BASE

Merle E. Morris, and Stephen P. Senft, both of Lexington, Ky., assignors to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 718,309, Apr. 1, 1985, abandoned. This application Nov. 3, 1986, Ser. No. 926,826

Int. Cl.[4] H01K *1/24, 1/46*

U.S. Cl. 313—318 12 Claims



1. In an electric lamp for providing radiant heat, said lamp including an envelope having an elongated, substantially cylindrically shaped body portion and at least one sealed end portion of flattened configuration located at one end of said body portion, a conductive filament located within said body portion, at least one lead-in conductor positioned within said sealed end portion and having a first end thereof projecting within said body portion and connected to said filament and a second end thereof projecting externally of said sealed end portion, and a base secured to said sealed end portion, the improvement wherein said base comprises:

an electrically conductive member of hollow configuration electrically coupled to said second end of said lead-in conductor, said base located substantially about said flattened sealed end portion and extending over and engaging at least a portion of said substantially cylindrically shaped body portion of said envelope having said conductive filament therein to substantially totally surround both said flattened sealed end portion and said portion of said cylindrically shaped body portion to thereby substantially prevent breakage of said sealed end portion, said hollow base only directly engaging said substantially cylindrically shaped body portion and not directly engaging said sealed end portion.

4,918,356

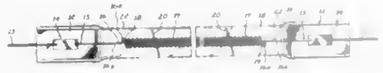
ELECTRIC INCANDESCENT LAMP AND METHOD OF MANUFACTURE THEREFOR

Edward A. Enyedy, Eastlake, and Richard L. Hansler, Pepper Pike, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 17, 1988, Ser. No. 243,371

Int. Cl.[4] H01K *1/18, 1/40, 3/06*

U.S. Cl. 313—579 29 Claims



1. An electric incandescent lamp comprising, in combination, an elongated hermetically sealed light transmissive lamp envelope containing an inert gas filling, an incandescent refractory metal coiled filament having a linear axis substantially coincident with the longitudinal axis of the lamp envelope and extending substantially the full length of the lamp envelope, and lead-in conductors sealed through opposite ends of the lamp envelope and each joined directly to opposite single end turns of the coiled filament, the lead-in conductors each comprising refractory metal wire having a bent end with its exterior surface facing the filament which is joined to the single end turn at a circumferential edge location with the opposite free end of each conductor extending outwardly and being aligned substantially parallel to the longitudinal axis of the lamp envelope, said bent end joined to said filament so as to avoid electrical shorting between adjacent turns of said filament.

4,918,357

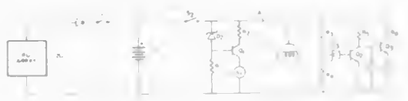
COMBINATION INCANDESCENT AND SOLAR-ELECTRIC LIGHT BULB WITH AUTOMATIC SWITCHING DEVICE AND CHARGING MEANS THEREFOR

Nelson J. Waterbury, 211 E. 70th Street, New York, N.Y. 10021

Filed Jul. 15, 1987, Ser. No. 73,563

Int. Cl.[4] H05B *39/10*

U.S. Cl. 315—87 3 Claims



1. A dual-filament incandescent light bulb comprising:

a transparent or translucent evacuated bulb mounted on a light bulb base; first and second filaments and an array of photovoltaic cells mounted within said bulb wherein said first and second filaments and said array of photovoltaic cells are connected to separate electrical contacts within said base.

4,918,358

APPARATUS USING CHARGED-PARTICLE BEAM

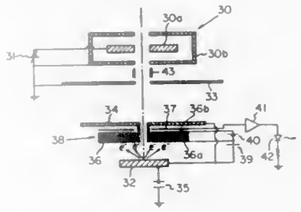
Ryuzo Aihara, and Haruo Kasahara, both of Tokyo, Japan, assignors to Jeol, Ltd., Tokyo, Japan

Filed Jul. 6, 1988, Ser. No. 215,739

Claims priority, application Japan, Jul. 14, 1987, 62-175633; Oct. 16, 1987, 62-261036

Int. Cl.[4] G21G *1/00*

U.S. Cl. 315—111.81 11 Claims



2. An apparatus using a charged-particle beam, comprising:

an emitter producing a charged-particle beam;

an accelerating electrode for accelerating the beam;

a lens for focusing the accelerated beam onto a target;

a means for producing a retarding electric field between the lens and the target;

an auxiliary electrode which is disposed between the lens and the target and maintained at substantially the same potential as the target; and

a secondary electron detector disposed between the auxiliary electrode and the target.

4,918,359

CATHODE RAY TUBE DISPLAY DEVICE

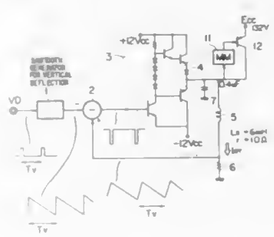
Masanori Ogino; Takeo Yamada, and Miyuki Ikeda, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 10, 1989, Ser. No. 335,434

Claims priority, application Japan, Apr. 11, 1988, 63-87109

Int. Cl.[4] H01J *29/70, 29/76*

U.S. Cl. 315—397 6 Claims



1. A vertical deflection circuit used for the projection cathode ray tube of a projection display device and including a vertical deflection coil, a push-pull amplifier circuit for amplifying a vertical deflection signal, and a sawtooth generator for vertical deflection, the projection display device being provided with the projection cathode ray tube, projection lens means, and projection screen means, the optical axis of the projection lens means being deviated from the center axis of the electron gun of the projection cathode ray tube in a direction from the center axis toward the end point of a vertical scanning operation on the display screen of the projection cathode ray tube, the vertical deflection circuit comprising:

a back-flow blocking diode connected in series with the output part of the push-pull amplifier circuit so that an

output current from the push-pull amplifier circuit can flow through the diode at the starting time of a vertical scanning operation for the projection cathode ray tube; and

a resonating capacitor connected in parallel to the vertical deflection coil so that the connecting point of the resonating capacitor and the vertical deflection coil is connected to the current outputting terminal of the back-flow blocking diode, for generating a fly-back pulse in cooperation with the inductance of the vertical deflection coil on the basis of the electromagnetic energy of the vertical deflection coil at the end of the vertical scanning operation, the fly-back pulse being cut off by the back-flow blocking diode.

4,918,360

ELECTRIC-DRIVING DEVICE FOR OPENABLE MEMBERS

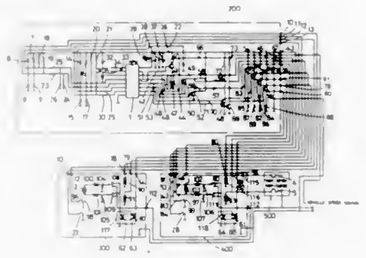
Takahiko Tanaka, Hamana; Kazuklyo Okada; Akira Tsunoda, both of Kosai; Nobuyuki Yamamoto, Toyohashi; Tatsuo Maeda, Hiroshima; Seiichi Omoto, Hiroshima, and Kozo Odoi, Hiroshima, all of Japan, assignors to ASMO Co., Ltd., Kosai and Mazda Co., Ltd., Hiroshima, both of, Japan

Filed Aug. 2, 1988, Ser. No. 227,128

Claims priority, application Japan, Aug. 4, 1987, 62-195108; Aug. 4, 1987, 62-195106

Int. Cl.[4] H02P *7/68*

U.S. Cl. 318—41 4 Claims



1. An electric-driving device for an openable member wherein the openable member is opened and closed according to rotation of a motor shaft provided with a motor, said device comprising:

a reduction gear mechanism which is rotated by said motor shaft and which operates the openable member via a driving shaft;

a switching means for switching the direction of rotation of said motor;

an open command switch and a close command switch which command the opening and closing of said openable member, respectively;

an open/close command determination means for determining whether or not said open command switch and said close command switch have been operated;

an actuation means for actuating the motor via said switching means to open and close the openable member according to a signal generated by the open/close command determination means;

a position sensor provided on the driving shaft for detecting if the driving shaft is rotated in a defined rotation position just before the openable member is closed;

a rotation sensor provided in said motor for generating a pulse synchronized with the motor rotation;

a motor rotation calculating means for calculating a generating number of said pulse after the motor rotation is started by way of said actuation means;

a momentary stopping means for stopping the motor by switching the switching means in accordance with generation of a position signal from the position sensor if the calculated pulse generating number reaches a defined number before the generation of the position signal; and

a momentary stopping prohibiting means for prohibiting actuation of said momentary stopping means if the calculated pulse generating number does not reach the defined number before the generation of the position signal.

4,918,361

TORQUE TRANSMITTING APPARATUS

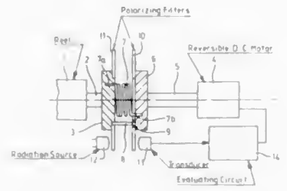
Volker Weinert, Taufkirchen, Fed. Rep. of Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 29, 1989, Ser. No. 414,945

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1988, 3833467

Int. Cl.[4] H02P *7/00*

U.S. Cl. 318—480 17 Claims



1. Torque transmitting apparatus comprising and adjustable electric motor; a first rotary member driven by said motor; a second rotary member coaxial with said first member; a photoelectronic detector including a radiation source and a transducer disposed in the path of radiation issuing from said source and having an output arranged to transmit signals the characteristics of which vary as a function of changes of intensity of radiation which impinges upon said transducer; resilient means for transmitting torque between said members; first and second polarizing filters rotatable with said first and second members, respectively,and extending across said path to vary the intensity of radiation which impinges upon said transducer as a function of angular displacement of said members relative to each other against the resistance of said resilient means; and means for adjusting said motor in response to variations of the characteristics of said signals.

4,918,362

METHOD OF GUIDING INDUSTRIAL TRUCKS HAVING AT LEAST ONE STEERABLE WHEEL AND SYSTEM FOR CARRYING OUT THE METHOD

Sven Christensen, Hamburg; Rolf Haelbich, Halstenbek; Jürgen Hänel, Hasloh; Siegfried Hoener, and Volker Pridat, both of Hamburg, all of Fed. Rep. of Germany, assignors to Firma Jungheinrich Unternehmensverwaltung KG, Hamburg, Fed. Rep. of Germany

Filed Dec. 15, 1988, Ser. No. 285,096

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3743016

Int. Cl.[4] B64C *13/18;* **G05D** *1/02*

U.S. Cl. 318—587 11 Claims

1. A system for guiding industrial trucks having at least one steerable wheel and other wheels consisting of driven wheels or rollers, said system comprising a guiding signal line providing at the ground a trace for emitting radiation in one of the modes consisting of reflection and a field derived from power that is supplied to said line,

which guiding signal line constitutes a guiding element,

said system also comprising branches extending to the left or right from a straight portion of the guiding element and consisting of arcuate guiding elements,

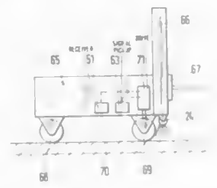
said system comprising special marks in front of each of said branches,

said marks being operable in one of the modes consisting of an identification-signal from the ground and a signal modulation of the radiation from the guiding signal line,

in which system the industrial truck comprises a sensor centrally scanning said guiding element and for receiving the radiation and circuitry for evaluating the radiation which has been received by said sensors so as to derive signals from said radiation,

said industrial truck comprising steering means (26) for controlling a deflection of at least one steerable wheel of said industrial truck,

which steering means are operatively connected to the sensor by means for controlling the steering means independence on a signal that has been received by the sensor for



causing the steerable wheel to be laterally deflected to a course that is laterally offset from the guiding signal line,

the industrial truck further comprising a direction-presetting subassembly for controlling the steerable wheel, said subassembly is presettable by one of the modes consisting of a time measurement and a travel measurement, and

means (**24, 31, 33, 50, 56**) for effecting a control lateral deflection of said steerable wheel are provided and are triggerable by one of said modes,

triggering means for triggering said deflection control means are provided and comprise one of the signal generators consisting of an identification mark and means for modulating said radiation,

said deflection control means being operable to effect a lateral offset of said steerable wheel from the guide element (**4, 5; 15, 16**) at the ground and to maintain the offset for a travel along a course that is parallel to the guiding signal line (**4, 5; 15, 16**).

4,918,363

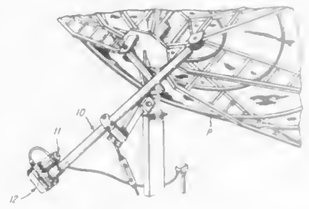
ACTUATOR FOR TVRO PARABOLIC ANTENNA

Russell E. Hollis, and Paul R. Hollis, both of Dayton, Ohio, assignors to Venture Mfg. Co., Dayton, Ohio

Filed Sep. 30, 1988, Ser. No. 252,381

Int. Cl.[4] H02H *5/00;* **H01Q** *3/08*

U.S. Cl. 318—626 10 Claims



1. Actuator apparatus especially advantageous in application to outdoor antennas, particularly TVRO parabolic antennas, to be operated by remote control, comprising a tub-shaped receptacle including a base having a peripherally encompassing relatively projected wall structure defining therewith a cavity, said wall structure being transversely bridged in part by a releasably confined plate releasably connected to one surface portion of which is a terminal strip adapted for the connection thereto of a remote source of electrical energy, said plate mounting thereto for rotation thereon a perpendicularly related shaft one end portion of which projects in the direction of said base, means releasably connected with and defining a cap for said receptacle forming therewith a housing having an opening in line with said shaft the opposite end portion of which is projected in the vicinity of the outermost surface of said cap for access thereto and a slip fit coupling thereof to an actuator exterior to said housing, said terminal strip providing means for the electrical connection thereto of a drive motor external to said housing, gear means having a slip fit coupled relation to said shaft intermediate said plate and said cap, said gear means positioning immediately of said plate and being geared to further gear means intermediate said plate and said cap a portion of which is in bearing relation to a pivot pin mounted within and in connection with one of said plate and said cap, an opening in said cap through which access is provided for coupling the drive shaft of the exterior motor in driving relation to said gear means, and control means to provide for incremental periods of rotation of said shaft releasably connected to a further surface portion of said plate and operatively connected to said shaft, said control means being in a circuit including the exterior motor on their common electrical connection with said terminal strip, to which a external source of electrical energy is connected to provide for selective limited periods of operation of said motor and said shaft as and when required.

4,918,364

METHOD FOR CONTROLLING NOISE AND VIBRATION OF MACHINE TOOLS WITH HIGH EFFICIENCY

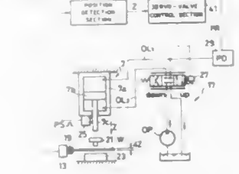
Kinshiro Naito, Kanagawa, Japan, assignor to Amada Company, Limited, Japan

Filed Feb. 9, 1987, Ser. No. 12,173

Claims priority, application Japan, Feb. 7, 1986, 61-25282

Int. Cl.[4] G05D *15/00*

U.S. Cl. 318—646 8 Claims



1 A method for controlling the noise and vibration of a punch press having a stroke action part for punching an object such as a plate and the like, comprising:

punching the object at a first speed of the stroke action part to measure a time of a predetermined interval of a stroke movement of the stroke action part while a certain load is added to the stroke action part in the predetermined interval;

comparing the measured time with a theoretical value experimentally predetermined depending on punching conditions; and

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revising the first speed to a second speed in the predetermined interval of the stroke movement of the stroke action part so that the measured time may approach the theoretical value, thereby reducing levels of the noise and the vibration of the punch press to below predetermined values, wherein the second speed is lower than that of the stroke action part before and/or after the punching operating is performed.

4,918,365

ELECTROMECHANICAL ACTUATOR HAVING CONTROL AND DRIVE CIRCUIT

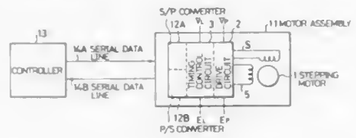
Jiro Tanuma; Naoji Akutsu, and Tadashi Kasai, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 79,453, Jul. 30, 1987, Pat. No. 4,825,133. This application Dec. 23, 1988, Ser. No. 288,974

Claims priority, application Japan, Aug. 5, 1986, 61-182728; Aug. 8, 1986, 61-185237; Aug. 8, 1986, 61-185238; Oct. 15, 1986, 61-243089

Int. Cl.[4] H02P *8/00*

U.S. Cl. 318—685 **8 Claims**



1. An actuator control system comprising:

an electromechanical actuator including an electric motor, and a control and drive circuit mounted integrally with said electric motor;

a controller for controlling said electromechanical actuator, said controller supplying a control signal in the form of serial data to said control and drive circuit of said electromechanical actuator, said control signal commanding the amount of rotation of said electric motor;

said control and drive circuit comprising a serial-to-parallel converter fro converting said control signal in the form of serial data into parallel data, a timing-control circuit fed by said serial-to-parallel converter, said timing-control circuit being responsive to said parallel data from said serial-to-parallel converter for producing a drive signal for controlling the timing of operation of said electric motor, a drive circuit fed by said timing-control circuit and responsive to said drive signal for producing a drive current to said electric motor, said timing control circuit producing, upon completion of rotation of said electric motor through the commanded amount of rotation, a completion signal as parallel data for indicating completion of said commanded amount of rotation, and a parallel-to-serial converter receiving said completion signal as said parallel data from said timing-control circuit for converting said parallel data into serial data and supplying said serial data to said controller.

4,918,367

METHOD FOR CONTROLLING THE TORQUE OF AN AC MOTOR

Pasi Pohjalainen, Espoo, Finland, assignor to ABB Stromberg Drives OY, Helsinki, Finland

Filed Feb. 6, 1989, Ser. No. 306,167

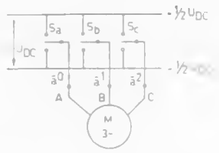
Claims priority, application Finland, Feb. 8, 1988, 880557

Int. Cl.[4] H02P *7/00*

U.S. Cl. 318—801 **7 Claims**

1. A method for controlling an ac motor supplied by an inverter having several switches, comprising the steps of:

determining a value ($\Delta\gamma$) representing the difference between a reference value and actual value of the angle between the stator flux and rotor flux of the motor on the basis of a value representing the requirement for torque change of the motor, e.g. by means of the difference (ΔT) between a reference value (T^*) and an actual value (T) of the torque, and a quantity representing the magnetic state of the motor, such as the actual value of the stator flux (χs) or a quantity corresponding thereto or proportional thereto, such as the reference value of the stator flux, the actual difference value of the air gap flux, the actual or reference value of the exciting current or other corresponding quantity dependent on the actual value of the stator flux (χs);



determining a first quantity ($k_1\Delta\gamma$) directly proportional to the determined differential value;

shifting a stitching moment of the switches of the inverter in a first sense with said first quantity to change the angle (γ) between the stator flux an rotor flux in a stepwise manner;

determining a second quantity ($k_2\Delta\gamma$) directly proportional to the determined differential value; an

shifting that stitching moment of the switches of the inverter which is next in turn with said second quantity ($k_2\Delta\gamma$) in a second sense opposite with respect to the first sense to change the rotating speed of the stator flux.

4,918,368

SYSTEM FOR CHARGING BATTERIES AND MEASURING CAPACITIES AND EFFICIENCIES THEREOF

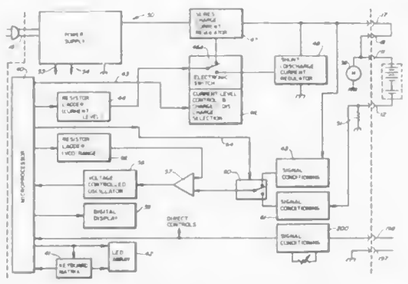
William Baker, Indianapolis; James C. Stevens, Plainfield, and Phong B. Chau, Indianapolis, all of Ind., assignors to Span, Inc., Indianapolis, Ind.

Division of Ser. No. 925,832, Oct. 29, 1986, Pat. No. 4,746,854. This application Feb. 29, 1988, Ser. No. 162,219

The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.

Int. Cl.[4] H02J *7/04*

U.S. Cl. 320—40 **14 Claims**



1. Control apparatus for battery current control, comprising: battery terminals, current flow control means coupled to said battery terminals for effecting flow of battery current in at least one direction, current- monitoring means and voltage monitoring means coupled to said battery terminals, microprocessor means coupled to said current monitoring means and said voltage monitoring means for register of battery current data and battery voltage data and coupled to said current flow control means to apply control signals thereto, memory means associated with said microprocessor means for storage of registered battery voltage data and for storage of accumulated capacity data, said microprocessor means being arranged to effect a mode of operation in which said accumulated capacity data is set at an initial value and said current flow control means effects flow of battery current and in which monitoring and control operations are thereafter effected periodically, said monitoring and control operations including comparisons of presently registered and stored battery voltage data and further including capacity-determining operations for processing registered battery current data to accumulate capacity data in said memory means.

4,918,369

HYDRO-ENERGY CONVERSION SYSTEM

Donald Solorow, 65 Prospect St., Stamford, Conn. 06902

Continuation of Ser. No. 936,616, Dec. 1, 1986, abandoned. This application Nov. 18, 1988, Ser. No. 273,103

Int. Cl.[4] H02J *7/00*

U.S. Cl. 322—35 **16 Claims**

1. A water driven system included in a water line of a closed loop water system, said water driven system comprising:

a flow control valve for controlling the flow of the water in said closed loop water system;

a turbine operatively connected to said flow control valve for receiving under controlled conditions the water from said closed loop water system;

a check valve located immediately downstream of said turbine to prevent water from flowing back into said turbine thereby protecting said turbine from damage;

a first shut-off valve for connecting said water driven system to said closed loop water system and located at a point upstream of said flow control valve and said turbine, wherein said first shut-off valve permits water to flow from said closed loop water system into said water driven system when said first shut-off valve is open;

a second shut-off valve for connecting said water driven system to said closed loop water system and located at a point downstream of said flow control valve and said turbine, wherein said second shut-off valve permits water to flow from said water driven system into said closed loop water system when said second shut-off valve is open; and

a generator operatively connected to said turbine for generating electricity in response to operation of said turbine.

4,918,370

LOW VOLTAGE-CONTROLLED, STAND-BY ELECTRONIC CIRCUIT WITH DELAYED SWITCH OFF

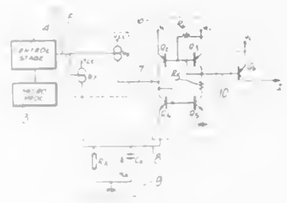
Edoardo Botti, Mortara, and Massimo Nisetto, Padua, both of Italy, assignors to SGS-Thomson Microelectronics s.r.l., Agrate Brianza Mi, Italy

Filed May 25, 1989, Ser. No. 356,810

Claims priority, application Italy, May 26, 1988, 20758 A/88

Int. Cl.[4] G05F *3/16*

U.S. Cl. 323—351 **7 Claims**



1 A low voltage-controlled, stand-by electronic circuit with delayed switch off, comprising a switching means defining a stand-by input receiving a stand-by switching signal switching between a first active state and a second disabling states, and delay means connected to said stand-by input and receiving said stand-by switching signal for generating a delayed switch off signal after switching of said stand-by switching signal from said first active to said second disabling state, said switching means including a controlled current source having a first and a second control inputs, said first control input being connected to said stand-by input and said second control input being connected to said delay means to receive said delayed switch off signal, said controlled current source being switched on upon said stand-by switching signal switching from said second disabling to said first active state and remaining on upon said stand-by switching signal switching from said first active to said second disabling state and in absence of said delayed switch off signal, said controlled current source being switched off by said delayed switch off signal on said second control input.

4,918,371

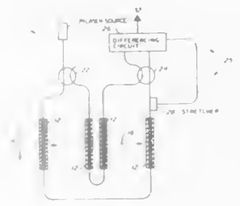
FIBER OPTIC MAGNETOMETERS FOR MULTIPLE ORDER GRADIOMETERS

Lloyd C. Bobb, Warminster, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 20, 1988, Ser. No. 208,931

Int. Cl.[4] G01R *33/22, 33/23;* G01B *9/02*

U.S. Cl. 324—244 **9 Claims**



1 In a magnetic field gradiometer of the type wherein magnetometers are arranged in a plurality of pairs to detect a multiple order gradient, the improvement comprising:

each said magnetometer is a magnetostrictive segment on an

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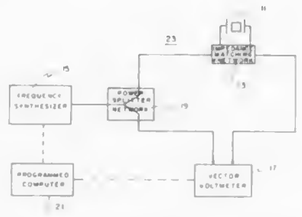
optical fiber element and said magnetometers of opposite effective polarities are arranged in each said pair and said magnetometers of the same effective polarity in at least two of said pairs are disposed on the same optical fiber element.

4,918,372

METHOD OF MEASURING THE THERMAL HYSTERESIS OF QUARTZ CRYSTAL RESONATORS

Raymond L. Filler, Lebanon, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 29, 1988, Ser. No. 246,146
Int. Cl.[4] G01R *29/22*
U.S. Cl. 324—727 3 Claims



1. A method of measuring the thermal hysteresis of a quartz crystal resonator, which method comprises the combination of the steps of:

(a) establishing and maintaining a preselected temperature on the quartz crystal being measured;

(b) exciting two (2) modes, $f_{A(1)}$ and $f_{B(1)}$ of said quartz crystal with an external frequency source;

(c) measuring the frequency $f_{A(1)}$ and $f_{B(1)}$ of each of said modes by varying the frequency of said external frequency source until the phase shift across the resonator is, in each instance, zero;

(d) computing the difference frequency, $\Delta f_{(1)}$ according to the expression

$$\Delta f_{(1)} = |K \cdot f_{A(1)} - f_{B(1)}|,$$

where K is a constant number chosen to make Δf convenient;

(e) changing the temperature by an amount within the expected operating temperature range of the quartz crystal;

(f) resetting the temperature to approximately said first recited preselected temperature;

(g) in a series of steps, each of which is performed at a further reset temperature, measuring the frequency $f_{A(2)}$ and $f_{B(2)}$ of each of said modes while said quartz crystal is maintained at a reset temperature by varying the frequency source for each of the modes until the phase shift across the resonator is, in each instance, zero;

(h) comparing the difference frequency $\Delta f_{(2)}$ computed from the expression

$$\Delta f_{(2)} = f_{A(2)} - f_{B(2)}$$

to the difference frequency $\Delta f_{(1)}$;

(i) repeating the steps g and h until $\Delta f_{(2)}$ is equal to $\Delta f_{(1)}$; and interpreting the frequency differences

$$\Delta f_{A(1,2)} = f_{A(2)} - f_{A(1)}$$

and

$$\Delta f_{B(1,2)} = f_{B(2)} - f_{B(1)}$$

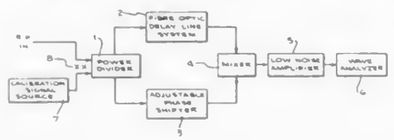
as indicative and representative of the thermal hysteresis of each of the respective said two modes of said quartz crystal resonator at said preselected temperature, after a change away from that temperature followed by a return thereto.

4,918,373

R.F. PHASE NOISE TEST SET USING FIBER OPTIC DELAY LINE

Irwin L. Newberg, Northbridge, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 18, 1988, Ser. No. 169,714
Int. Cl.[4] G01R *27/02*
U.S. Cl. 324—613 28 Claims



1. A noise test set for analyzing noise present in a test signal comprising:

a. light means for generating light;

b. modulation means connected to said light means for modulating the light generated by said light means with the test signal;

c. delay means connected to said modulation means for delaying the modulated light, said delay means including a fiber optic cable having two ends, one end of which is connected to said modulated light;

d. demodulation means connected to the other end of said fiber optic cable for extracting from the modulated light the delayed test signal; and

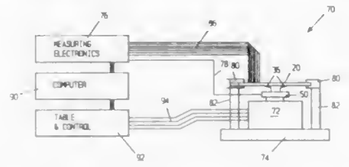
e. detector means connected to the undelayed test signal and to the delayed test signal for extracting the noise present in the test signal.

4,918,374

METHOD AND APPARATUS FOR INSPECTING INTEGRATED CIRCUIT PROBE CARDS

John P. Stewart; Ronald C. Seubert, and Donald B. Snow, all of King County, Wash., assignors to Applied Precision, Inc., Mercer Island, Wash.

Filed Oct. 5, 1988, Ser. No. 254,269
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—158 R 29 Claims



1. A system for inspecting an integrated circuit probe card having a plurality of probe wires terminating in respective probe points arranged in a probe point array, said system comprising:

an X-Y table;

a checkplate mounted on said X-Y table, said checkplate having a planar measurement surface and a conductivity transition border formed on said measurement surface in which the resistance between the surface of said checkplate and a measurement terminal varies between two values on opposite sides of said border;

mounting means for mounting said probe card adjacent said checkplate with said probe points contacting the measurement surface of said checkplate;

impedance measuring means for measuring the impedance between each probe wire of said probe card and the measurement terminal of said checkplate to identify on which side of said border the probe point of each probe wire is contacting the surface of said checkplate; and

control means for driving said X-Y table to cause said probe point array to scan across the measurement surface of said checkplate from one side of said conductivity transition border to the other and for recording the location of said checkplate relative to said probe card when each of said probe points crosses said conductivity transition border

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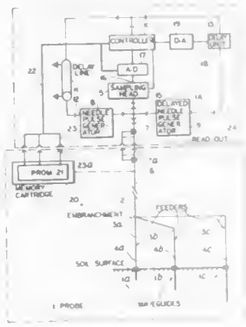
4,918,375

REFLECTOMETRIC MOISTURE METER FOR CAPILLARY-POROUS MATERIALS, ESPECIALLY FOR THE SOIL

Marek Malicki, and Wojciech Skierucha, both of Lublin, Poland, assignors to Polska Akademia Nank Instytut Agrofizyki, Doswiadczalna, Poland

Filed Jun. 21, 1988, Ser. No. 210,662
Claims priority, application Poland, Jul. 3, 1987, 266617; Jul. 3, 1987, 266616; Apr. 28, 1988, 272128
Int. Cl.[4] G01R *27/28*
U.S. Cl. 324—642 21 Claims



1. A reflectometric moisture meter for capillary-porous materials comprising:

read-out means for reading the moisture of capillary-porous media from probe means installed in media of interest; said probe means measuring the velocity of electromagnetic wave propagation in said medium as determined by its moisture,

said read-out means further comprising:

a controller means to control co-operation of components of the read-out means and to compute results of the measurements;

an interface means for the communication of the controller with out components of said reflectometric moisture meter;

voltage pulse means to generate two needle pulses of voltage to supply the probe means;

pulse delay means to set the phase difference between said needle pulses of voltage; and

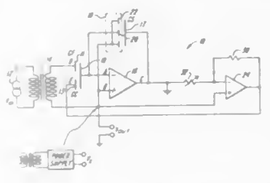
sampling means to catch samples of voltage from pulses returning as reflected from the probe means.

4,918,376

A.C. CAPACITIVE GAUGING SYSTEM

Noel S. Podnje, Needham Heights, and Roy S. Mallory, Bedford, both of Mass., assignors to ADE Corporation, Newton, Mass.

Filed Apr. 17, 1990, Ser. No. 320,290
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—663 14 Claims



1. A compensated capacitive probe system comprising:

an operational amplifier;

a probe having a measuring plate, and forming with an object to be capacitively gauged a feedback path from an output to an inverting input of said operational amplifier, said plate having a guard plate;

first means for driving said guard plate with a voltage held at the voltage of said measuring plate by said operational amplifier;

second means for driving said operational amplifier at its inverting input with an input signal;

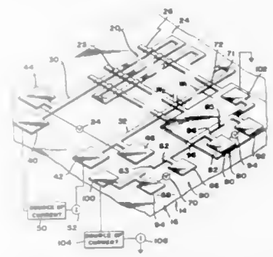
means for coupling across physically separated conductors and into said input signal a portion of the signal at said guard plate which compensates for both stray capacitance of said measuring plate and departure of said operational amplifier from mathematically ideal conditions.

4,918,377

INTEGRATED CIRCUIT RELIABILITY TESTING

Martin G. Buehler, La Canada, and Hoshyar R. Sayah, Los Angeles, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 5, 1988, Ser. No. 279,676
Int. Cl.[4] G01R *31/00, 27/02, 27/14*
U.S. Cl. 324—691 7 Claims



4. Apparatus for use in determining the reliability of circuit conductors on an uneven surface of an integrated circuit device wherein the surface has regions at first and second different heights and said circuit conductors have portions extending in steps between said regions of different heights, comprising:

an elongated assay conductor on said integrated circuit device, said assay conductor extending along multiple steps between regions at said first and second heights, said elongated conductor having opposite ends and having assay conductor pads at said ends;

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a test structure assembly which includes first and second elongated test conductors each extending along a region of substantially uniform height, with said first and second test conductors lying at regions of said first and second heights, and with said first and second conductors having the same widths as portions of said assay conductor that lie respectively at said regions of first and second heights;

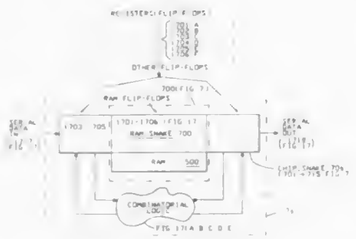
means for measuring the resistance along the length of said assay conductor, and along the length of each of said test conductors.

4,918,378

METHOD AND CIRCUITRY FOR ENABLING INTERNAL TEST OPERATIONS IN A VLSI CHIP

Haluk Katircioglu, Irvine; John A. De Beule, Rancho Santa Margarita, and Debaditya Mukherjee, El Toro, all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Jun. 12, 1989, Ser. No. 364,412
Int. Cl.[4] G01R *31/28*
U.S. Cl. 365—201 **10 Claims**



1. In a VLSI integrated circuit chip structure which includes a RAM memory array and combinatorial logic circuitry having registers which are controlled to perform either as latches or flip-flops, a method for internal testing of said RAM memory array and said combinatorial logic circuitry which includes the steps of:

(a) connecting said registers in serial concatenation to form a shift chain circuit;

(b) initializing said shift chain circuit to make said registers function as multifunction shift registers (MFSR) flip-flops;

(c) initializing one or more of said MFSR's to receive an input and to generate an output test data pattern for input to said combinatorial logic circuitry while inhibiting the operation of all other MFSR's except an output MFSR;

(d) initializing a test counter circuit for controlling the number of test pattern data into said output MFSR;

(e) collecting output test data from said combinatorial logic circuitry for placement in said output MFSR as a signature;

(f) accessing said signature, in said output MFSR, by a maintenance controller;

(g) comparing said accessed signature with a predetermined signature to assess whether said combinatorial logic circuitry is operating properly without error.

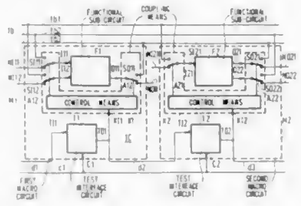
4,918,379

INTEGRATED MONOLITHIC CIRCUIT HAVING A TEST BUS

Abraham Jongepier, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Aug. 31, 1988, Ser. No. 239,090
Claims priority, application Netherlands, Feb. 16, 1988, 8800374
Int. Cl.[4] G01R *31/28*
U.S. Cl. 324—73.1 **9 Claims**

1. An integrated monolithic circuit having a predetermined internal structure and comprising a functional circuit which is partitioned into at least two macro circuits, each macro circuit having a functional sub-circuit, and test interface circuits which are coupled to the macro circuits, the functional circuit being coupled to external connections and the test interface circuits being coupled to one another, characterized in that the integrated monolithic circuit comprises a test bus which can be



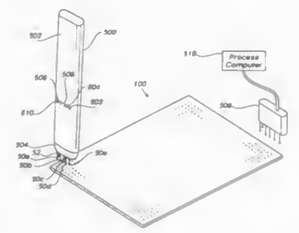
coupled to the macro circuits and also comprises coupling means which can be controlled by the test interface circuit in order to couple the test bus to at least one of an input and an output of the macro circuit, the test bus being at least one of coupled to additional external connections and multiplexed with the external connections of the functional circuit.

4,918,380

SYSTEM FOR MEASURING MISREGISTRATION

Tom R. Paur, 22608 NE. 12th Pl., Redmond, Wash. 98053

Continuation-in-part of Ser. No. 216,080, Jul. 7, 1988. This application Oct. 3, 1988, Ser. No. 253,017
Int. Cl.[4] G01R *31/02, 31/04;* **H05K** *1/09*
U.S. Cl. 324—73.1 **11 Claims**



1. A system for measuring the amount of misregistration of a panel comprising:

a plurality of layers each having electrically conductive traces which require interconnection between said layers, said layers including an exterior layer and a plurality of inner layers inwardly located relative to said exterior layer, said layers being positioned in registration with each other within a predetermined maximum tolerance range;

a plurality of electrically conductive quantifying conductor means for providing a path of electrical conductivity to said inner layer, said quantifying conductor means comprising at least first and second conductor portions each said first and second conductor portions including a plurality of conductors aligned along common first and second axes respectively, said first portion of conductors being aligned in an arrangement substantially identical to said second portion of conductors, wherein said first axis is angled to said second axis, said quantifying conductor means further including at least one common conductor;

registration trace means formed upon said inner layer for cooperating with said quantifying conductor means to determine the direction and quantity of misregistration of said inner layer with said exterior layer, said trace means having a common portion adapted to be in electrical contact with said at least one common conductor whether or not said inner layer is in registration with said exterior layer, said trace means having a quantifying trace portion adapted to produce a plurality of incrementally varying clearances between said quantifying conductor means and said trace means if said inner layer is in perfect registration with said exterior layer, said quantifying conductors being out of electrical contact with said trace means if said inner layer is in perfect registration with said exterior layer, and one or more of said quantifying conductors being in electrical contact with said trace means if said inner layer is out of registration with said exterior layer wherein electrical contact of said trace means with said first portion of conductors indicates misregistration in a first direction and electrical contact between said trace means and said second portion of conductors indicates misregistration in a second direction; and

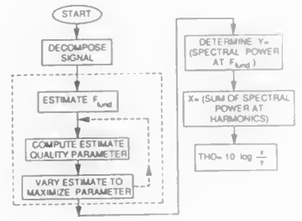
tester means for determining the electrical contact between said plurality of conductors and said at least one common conductor, said tester means including a plurality of probes for contacting said conductors and said at least one common conductor for determining if a conductive path exists between any one of said conductors of said first and second conductor portions and said at least one common conductor.

4,918,381

AUTOMATED METHOD FOR DETERMINING TOTAL HARMONIC DISTORTION

Martin A. Bender, Seattle, and Thomas V. Bruhns, Everett, both of Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 6, 1989, Ser. No. 335,312
Int. Cl.[4] G01R *23/16*
U.S. Cl. 324—77 B **10 Claims**



1. A method of determining the total harmonic distortion of a signal, comprising the steps:

decomposing the signal into a plurality of discrete frequency bands;

approximating the fundamental frequency of the signal; and

summing the relative spectral powers of the signal in frequency bands that contain harmonics of the approximated fundamental frequency;

wherein the fundamental frequency is approximated by:

determining which frequency band contains the maximum spectral power;

selecting a candidate frequency within said frequency band;

summing the relative spectral powers in frequency bands that contain harmonics of the candidate frequency; and

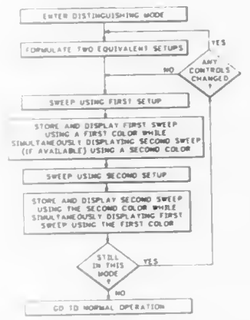
repeating the foregoing two steps, at least once, with different candidate frequencies and consider as the fundamental frequency the candidate frequency that yields the greatest sum.

4,918,382

METHOD FOR DISTINGUISHING BETWEEN REAL AND SPURIOUS RESPONSES IN A SPECTRUM ANALYZER

Robert W. Bales, and Joan E. Bartlett, both of Portland, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 20, 1989, Ser. No. 325,845
Int. Cl.[4] G01R *23/16*
U.S. Cl. 324—77 B **6 Claims**



1 A method for distinguishing between real and spurious responses in a swept frequency spectrum analyzer, comprising the steps of:

formulating two setups for the spectrum analyzer such that both setups produce a similar response for input signals that are mixing with a desired harmonic of a first local oscillator;

alternating on each sweep of the swept frequency spectrum analyzer which of the two formulated setups is used;

storing and displaying in real time each sweep as it is generated; and

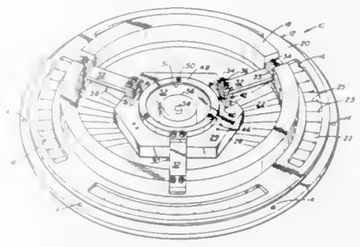
simultaneously displaying the results of the previous sweep overlaid with each sweep displayed in real time.

4,918,383

MEMBRANE PROBE WITH AUTOMATIC CONTACT SCRUB ACTION

Richard E. Huff, 1408 Solana Dr., Belmont, Calif. 94002, and Miklos Perlaki, 1406 Sage Rd., Colfax, Calif. 95713

Continuation-in-part of Ser. No. 4,523, Jan. 20, 1987, and a continuation-in-part of Ser. No. 162,763, Mar. 1, 1988. This application Sep. 28, 1988, Ser. No. 250,458
Int. Cl.[4] G01R *1/067*
U.S. Cl. 324—158 F **10 Claims**



1 An apparatus for providing an automatic lateral impingement scrubbing motion when a test membrane of a test probe engages a device under test (DUT), the apparatus comprising:

(a) a plurality of flexing means, including:

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(i) at least one spring having a fixed length; and
(ii) at least one spring having a variable length;
(b) a plurality of electrical conducting means, formed for communicating a plurality of electrical signals between a test membrane and a DUT;
(c) a flexible planar means:
(i) formed for being stretched; and
(ii) configured for carrying the plurality of electrical conducting means;
(d) a translation means
(i) formed with an upper surface disposed for being coupled to at least one of the flexing means; and
(ii) formed with a lower surface:
(1) formed to define an aperture through itself, the aperture being formed for securing over itself the flexible planar means when stretched;
(2) disposed for being coupled to the flexible planar means; and
(e) a peripheral support means, formed for suspending the translation means and the plurality of flexing means.

4,918,384

SPRING CONTACT PIN FOR TESTING AN ELECTRICAL AND/OR ELECTRONIC DEVICE

Klaus Giringer, Herrenberg, and Jochen Laube, Constance, both of Fed. Rep. of Germany, assignors to Feinmetall GmbH, Herrenberg, Fed. Rep. of Germany

Filed Jun. 10, 1988, Ser. No. 205,434
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1987, 3719309
Int. Cl.[4] G01K *1/06*
U.S. Cl. 324—158 P **10 Claims**

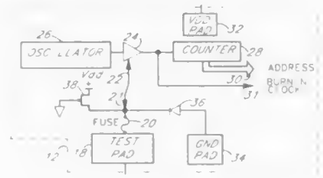
1. A spring contact pin for contacting an electrical or electronic circuit article to be tested, said spring contact pin comprising:
a continuous elongated sleeve open at least at a front end and having metallic conductivity over its entire length;
an elongated front contact bolt axially slidable in said sleeve and received therein, said front contact bolt having:
a head outside said sleeve and spaced from said front end thereof, said head being formed with a tip engageable with said article and an annular shoulder facing said front end,
a shank extending from said shoulder into said sleeve at said front end and having a diameter less than that of said head, and
an inner end of said front contact bolt located within said sleeve;
an elongated inner spring disposed within said sleeve and bearing at one end directly and continuously upon said inner end of said front contact bolt and biasing said front contact bolt outwardly from said front end of said sleeve;
means located within said sleeve for supporting an opposite end of said inner spring to enable said inner spring to bias said front contact bolt outwardly;
means located within said sleeve and engageable by said inner end of said front contact bolt for limiting displacement of said bolt outwardly from said front end of said sleeve; and
an outer spring surrounding said shank and braced continuously between said shoulder and said front end of said sleeve for continuously biasing said bolt outwardly so that spring forces of said inner spring and said outer spring are simultaneously applied additively to said front contact bolt.

4,918,385

METHOD AND PROCESS FOR TESTING THE RELIABILITY OF INTEGRATED CIRCUIT (IC) CHIPS AND NOVEL IC CIRCUITRY FOR ACCOMPLISHING SAME

Robert W. Shreeve, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 51,888, May 18, 1987. This application Feb. 7, 1989, Ser. No. 307,727
Int. Cl.[4] G01R *31/00, 31/02*
U.S. Cl. 324—158 R **5 Claims**



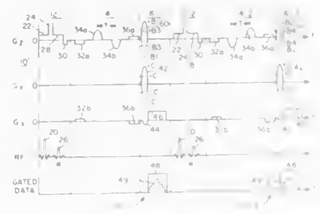
1. A test circuit for use in cycling integrated circuits during born-in, comprising:
a. a test mode for receiving a reference potential during a test operation,
b. test vector address circuitry for applying test vector signals to an integrated circuit during the test mode of operation,
c. enable means connected between said test node and said address circuitry for applying an enable reference potential to said address circuitry during test operation, and
d. disable means connected between a DC bias and a reference potential for switching from said test operation upon removal of said reference potential from said test node and thereby disabling said address circuitry, said disable means includes a diode and a transistor connected in series between a DC bias voltage and a point of reference potential, and both said diode and transistor connected to said test node, whereby the removal of a reference potential from said test node controls conductivity in both said diode and transistor and in turn is operative to enable and disable said address circuitry.

4,918,386

METHOD FOR SIMULTANEOUSLY OBTAINING THREE-DIMENSIONAL NMR ANGIOGRAMS AND STATIONARY TISSUE NMR IMAGES

Charles L. Dumoulin, Ballston Lake, N.Y.; Steven P. Souza, Williamstown, Mass., and Harvey E. Cline, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 23, 1988, Ser. No. 288,849
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **16 Claims**



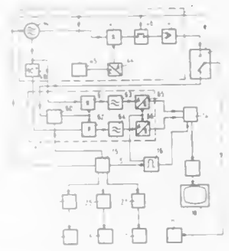
1. A method for simultaneously obtaining a three dimensional (3D) nulcear magnetic resonance (NMR) image of moving spins in a region of a sample, and a 3D NMR image of stationary spins in the same sample region, comprising the steps of:
(a) immersing the sample in a main static magnetic field,
(b) nutating, in an excitation subsequence of each of a plurality S of successive NEX = 1 NMR sequences, the spins of all nuclei of a selected species;
(c) generating, in a flow-encoding subsequence after each nutation, at least one modulated flow-encoding signal pulse in a first magnetic field gradient impressed upon the sample in a first direction selected to cause a resulting NMR response echo signal from the spin of a nucleus moving in the first direction to be different from the NMR response echo signal from the spin of a substantially stationary nucleus;
(d) then, in a subsequent imaging subsequence, acquiring responsive to a readout magnetic field gradient impressed upon the sample in a second direction, independent of the first direction, a set of data from the NMR response signal evoked, from at least the sample portion, with each of the plurality S of combinations of phase-encoding amplitudes operating upon the selected sample portion in the remaining two independent directions of a 3D Cartesian coordinate system;
(e) processing the data in each of the acquired NMR response signal data sets to generate at least one of
(1) a difference data set from which response data obtained from stationary nuclei has been substantially removed,
(2) a summation data set from which response data obtained from moving nuclei has been substantially removed, and
(3) a phase data set indicating direction of flow for flow amplitudes obtained in the difference data set; and
(f) generating, responsive to the plurality of data sets, both an image of moving spins, projected in a selected plane in a 3D volume, and an image of stationary spins in the same plane.

4,918,387

MR SPECTROSCOPY METHOD

Graeme C. McKinnon, Zurich, and Peter Bösiger, Eanetbaden, both of Switzerland, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 21, 1988, Ser. No. 274,532
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1987, 3739856
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **13 Claims**



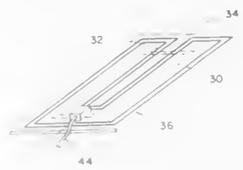
1. A magnetic resonance spectroscopy method for demonstrating the presence of lactic acid or lipids in which an examination zone is exposed in the presence of a steady magnetic field to a sequence which comprises a first frequency-selective RF pulse (HF1) acting as a 90° RF pulse for water suppression, followed by a non-selective 180° RF pulse (HF3) which is followed by a second frequency-selective RF pulse (HF2) also acting as a 90° RF pulse for water suppression, wherein a first distance in time between the first frequency-selective RF pulse (HF1) and the non-selective 180° RF pulse (HF3) is the same as a second distance in time between said non-selective 180° RF pulse (HF3) and the second frequency-selective RF pulse (HF2), said first and second distances in time being approximately equal to the reciprocal value of four times the scalar coupling constant J of lactic acid.

4,918,388

QUADRATURE SURFACE COILS FOR MAGNETIC RESONANCE IMAGING

Mehrdad Mehdizadeh, University Hts.; David A. Molyneaux, Willoughby Hills, and G. Neil Holland, Chagrin Falls, all of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Continuation-in-part of Ser. No. 199,202, May 26, 1988, Pat. No. 4,879,516, Ser. No. 120,475, Nov. 13, 1987, Pat. No. 4,839,594, and Ser. No. 86,277, Aug. 17, 1987, Pat. No. 4,841,248, which is a continuation-in-part of Ser. No. 931,726, Nov. 17, 1986, Pat. No. 4,752,738, and Ser. No. 765,708, Aug. 14, 1985, Pat. No. 4,793,356. This application Aug. 19, 1988, Ser. No. 234,278
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—322 **17 Claims**



1. A magnetic resonance imaging apparatus comprising:

a main magnetic field means for providing a magnetic field through an examination region;
a magnetic resonance excitation means for exciting magnetic resonance of nuclei of a subject in the examination region;
a thin quadrature coil for quadrature detecting magnetic resonance signals from the excited nuclei of the subject including:
a thin dielectric layer;
a thin loop coil fixedly mounted on one surface of the thin dielectric layer;
a thin Helmholtz coil fixedly mounted on an obverse surface of the thin dielectric layer; and,
processing means for processing the quadrature detected magnetic resonance signals into an image representation.

4,918,389

DETECTING MISFIRING IN SPARK IGNITION ENGINES

Richard Schleupen, Grossingersheim; Christian Zimmermann, Ingersheim, and Arnd-Matthias Langner, Kornwestheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 1, 1988, Ser. No. 239,797
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1988, 8810869
Int. Cl.[4] F02P *17/00*
U.S. Cl. 324—399 **12 Claims**

1. A method of detecting misfiring in an internal combustion engine comprising
detecting a signal indicative of the voltage in the primary winding of the ignition coil,
generating, in response to ignition, a reference voltage pulse, representing normal firing, having a predetermined magnitude and a predetermined duration (t2-t1) corresponding to the period during which a minimum spark burning voltage is normally maintained and exceeding the period within which primary winding voltage decays in the absence of combustion, and
comparing the detected voltage signal with the reference voltage to detect when the magnitude of the detected signal falls below said predetermined magnitude before the end of the predetermined duration thereby indicating misfiring in the engine.

4,918,390

METHOD AND SYSTEM FOR MONITORING THE CONDITION OF A PLURALITY OF ELECTRICAL DEVICES

Pinhas Ziv, 31 Adirim Street, Tel Aviv, and Michael Steiner, 36 Azar Street, Ramat Hasharon, both of Israel

Filed Apr. 13, 1989, Ser. No. 337,676
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—415 **21 Claims**

1. A method of monitoring a plurality of electrical devices to detect their condition and to determine the location of a particular one of said devices, comprising:
connecting said plurality of devices in parallel across two line conductors;
for each device, including a voltage-dropping element in series with the line at the input side of the respective device;
for each device, including a current-limiting element in series with the respective device, said current-limiting element passing a fixed current independently of voltage above a predetermined threshold;
initially applying a voltage to the line of greater magnitude than the sum of said predetermined threshold and the voltage of the voltage-dropping element for the first device;

sequentially increasing said applied voltage in a plurality of steps at least equal to the number of devices connected to the line conductors, the voltage in each step being increased to a value greater than the sum of the voltage-dropping elements for the respective devices and of all the preceding devices, but less than the latter sum increased by the voltage of the voltage-dropping element of the next device;
and measuring the current through the line initially and after each of said voltage steps.

4,918,391

SODIUM CONTENT MONITOR HAVING A UNITARY HOUSING

Jeffrey M. Byrd, Pembroke Pines, Fla., assignor to Enseal, Inc., Fort Lauderdale, Fla.

Filed Mar. 17, 1988, Ser. No. 169,434
Int. Cl.[4] G01N *27/02*
U.S. Cl. 324—446 **7 Claims**

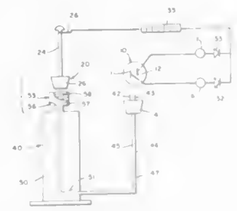
1. Apparatus for measuring the sodium content of foods or beverages comprising
a unitary housing including a body portion and a probe portion, said body portion containing an electronic circuit for operating the apparatus, said probe portion having sensing contacts attached to an end thereof
a liner member between said contacts and said probe portion whereby a substantially crevice-free arrangement is created between said contacts and said probe
a switch attached to said housing for activating said electronic circuit
said electronic circuit comprising an AC generator, an AC amplifier, an AC-DC convertor, and means for converting a signal from the AC-DC converter into a visual signal which is displayed on said housing.

4,918,392

POLARITY TESTER FOR DEVICES INCORPORATING SOCKET MEANS FOR POWER TRANSMISSION TO ACTIVE ELEMENTS

Peter K. Torres, 348 Lincoln Ave., North Dighton, Mass. 02764

Filed Jan. 4, 1989, Ser. No. 293,361
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—537 **14 Claims**



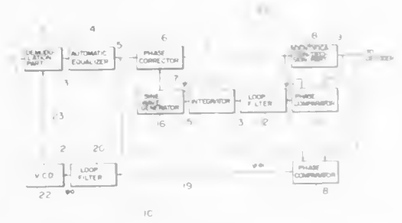
11. A method for testing a device in the on state having a plug for receiving a power input and socket means for transmission of power to a circuit element, said method comprising the steps of: providing a polarized receptacle in a tester with first and second indicators respectively connected to first and second terminals of said receptacle and providing a probe in said tester; connecting said plug into said polarized receptacle mechanically engaging with and electrically connecting said probe to b contact of said socket means; and energizing a circuit comprising said device by connecting a source between said indicators and said probe, whereby one or the other of said indicators is connected in a series circuit with the device in correspondence with the polarity of the device and further whereby neither or both of said indicators is connected in response to an open circuit or short circuit respectively in the device.

4,918,393

PHASE CONTROL DEVICE

Yasushi Yokosuka; Yasuyuki Kozima, both of Hitachi, and Kazuhiko Takaoka, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 17, 1988, Ser. No. 272,537
Claims priority, application Japan, Nov. 18, 1987, 62-289380
Int. Cl.[4] H03D *3/00*
U.S. Cl. 329—318 **6 Claims**



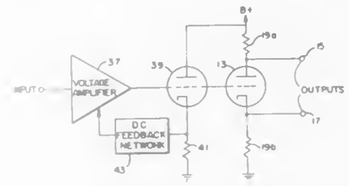
1. A phase control device incorporated in a demodulator including a signal delay part, said phase control device comprising:
a first phase control loop not including said signal delay part; and
a second phase control loop including said signal delay part and a portion of this second phase control loop being connected to said first phase control loop, said second phase control loop receiving an input signal wherein any input signal received by said second phase control loop is not affected by an output signal of said first phase control loop.

4,918,394

AUDIO FREQUENCY POWER AMPLIFIER WITH IMPROVED CIRCUIT TOPOLOGY

Richard Modafferi, Vestal, N.Y., assignor to Modafferi Acoustical Systems, Ltd., Baldwin, N.Y.

Filed Mar. 23, 1989, Ser. No. 328,110
Int. Cl.[4] H03F *5/00*
U.S. Cl. 330—3 **13 Claims**



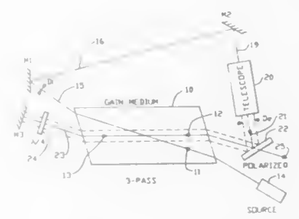
7 An audio power amplifier input circuit (57), comprising an input terminal;
power supply B+ and B− terminals;
a voltage amplifier stage (45);
a split-load phase inverter stage (13, 19*a*, 19*b*,);
a pair of output terminals (15, 17);
a DC feedback network connected from said split-load phase inverter stage (13, 19*a*, 19*b*), to said voltage amplifier stage (45); and
a transistor emitter-follower having transistors (47, 49) and load resistors (19*c*, 19*d*) connected between said split-load phase inverter stage (13, 19*a*, 19*b*), and the output terminals (15, 17) of said audio power amplifier input circuit (57).

4,918,395

MULTIPASS LASER AMPLIFIER WITH AT LEAST ONE EXPANDED PASS

John C. Difonzo, San Mateo County, and Bertram C. Johnson, Sunnyvale, both of Calif., assignors to Spectra-Physics, San Jose, Calif.

Filed Nov. 21, 1988, Ser. No. 274,407
Int. Cl.[4] H01S *3/08*
U.S. Cl. 330—4.3 **47 Claims**



1 An apparatus for amplifying a laser pulse to generate an output laser pulse, comprising:
a gain medium having an active region, a first optical path characterized by a first axis through the active region and

a second optical path characterized by a second axis through the active region and wherein the first axis intersects the second axis within the gain medium at an angle A;

first means for supplying the laser pulse along the first optical path, so that the laser pulse has a transverse dimension D_i as it propagates along the first optical path, to generate a first pass amplified pulse;

second means for expanding the first pass amplified pulse in the transverse dimension D_i to an expanded pulse with a transverse dimension D_e, and for guiding the expanded pulse along the second optical path, to generate the output laser pulse.

4,918,396

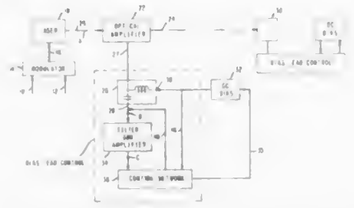
MONITORING AND/OR CONTROL OF OPTICAL AMPLIFIERS

Thirumala R. Halemane, Howell; Bartley C. Johnson, Cranbury, and Robert M. Jopson, Rumson, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 5, 1989, Ser. No. 333,218

Int. Cl.[4] H01S *3/13*; H04B *9/00*

U.S. Cl. 330—4.3 **5 Claims**



1. A semiconductor optical amplifier comprising a bias lead, a DC bias signal source coupled to provide a DC bias signal to the bias lead, means coupled to combine a data signal transmitted to the optical amplifier with an additional amplitude signal, a filter network adapted to block data signals and to pass only the additional amplitude signal, path defining means coupled to pass to said bias lead the DC bias signal from said bias signal source and to pass to the filter network a signal induced on the bias lead by signals amplified by the optical amplifier, and a control network coupled to receive the signal from said filter to generate a control signal and transmit said control signal to the bias signal source to regulate the power generated by the optical amplifier by controlling the value of the DC bias signal generated by the bias signal source.

4,918,397

GAIN CONTROL CIRCUIT

Alexander C. Kidger, Coventry, England, assignor to GEC Plessey Telecommunications Limited, England

Filed Jan. 17, 1989, Ser. No. 297,688

Claims priority, application United Kingdom, Jan. 27, 1988, 8801750

Int. Cl.[4] H03G *3/00*

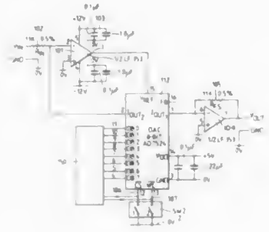
U.S. Cl. 330—86 **5 Claims**

1. A gain control circuit for controlling the gain of an input signal, the circuit comprising:

(a) input stage means, including a first operational amplifier having two inputs, and operative for receiving, at one of the inputs, said input signal, the gain of which is to be controlled, said first amplifier having an output from which an output signal is conducted;

(b) R-2R-resistive network means connected to the output of said first amplifier, and operative for splitting the output signal of the first amplifier into respective first and second signals conducted along first and second signal paths, said second path being connected to said one input of the first amplifier to which said input signal was conducted;

(c) digital control means connected to the resistive network means, and operative for controlling the ratio of the first and second signals in the respective first and second signal paths; and



(d) output stage means, including a second operational amplifier having two inputs, one of which is connected to the first signal path, and an output from which a gain control output signal is conducted.

4,918,398

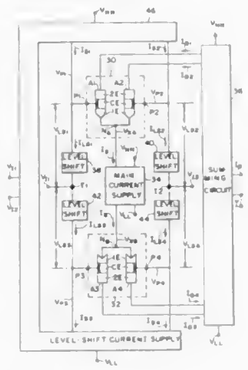
DIFFERENTIAL AMPLIFIER USING VOLTAGE LEVEL SHIFTING TO ACHIEVE RAIL-TO-RAIL INPUT CAPABILITY AT VERY LOW POWER SUPPLY VOLTAGE

Johan H. Huijsing, Schipluiden, and Marien G. Maris, Delft, both of Netherlands, assignors to North American Philips Corporation, Signetics Division, Sunnyvale, Calif.

Filed Feb. 10, 1989, Ser. No. 309,469

Int. Cl.[4] H03F *3/45*

U.S. Cl. 330—252 **28 Claims**



1. An electronic circuit, coupled between respective sources of a high supply voltage and a low supply voltage whose difference is a power supply voltage that defines a power supply range, for amplifying a circuit input signal differentially provided between first and second input terminals as respective first and second input voltages, the circuit comprising:

first differential means for amplifying the voltage difference between first and second input points respectively coupled to the first and second terminals to produce at least one amplified first internal signal, the first means being operatively conductive to so produce each first internal signal when the common-mode voltage V_{CM} of the circuit input signal is in a portion of the supply range extending up to the high supply voltage.

second differential means for amplifying the voltage difference between third and fourth input points respectively coupled to the first and second terminals to produce at least one amplified second internal signal, the second means being operatively conductive to so produce each second internal signal when V_{CM} is in a portion of the supply range extending down to the low supply voltage such that at least one of the differential means is operatively conductive as V_{CM} traverses substantially the entire supply range when the power supply voltage is greater than or equal to a specified minimum level; and

summing means for combining the internal signals to generate at least one circuit output signal; characterized by level-shift means comprising:

network means, coupled between the terminals and the points, for selectively causing the voltages at the first and second points to be respectively higher than the first and second input voltages by respective first and second voltage level shifts and for selectively lower than the first and second input voltages by respective third and fourth voltage level shifts; and

level-shift supply means for providing current to the network means to control the values of the level shifts.

4,918,399

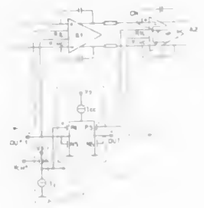
COMMON MODE SENSING AND CONTROL IN BALANCED AMPLIFIER CHAINS

Daniele Devecchi, Desio, and Guido Torelli, Alessio, both of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Dec. 9, 1988, Ser. No. 281,725

Int. Cl.[4] H03F *3/45*

U.S. Cl. 330—253 **1 Claim**



1. A chain of fully differential amplifiers comprising:

at least two amplifiers connected in cascade, each amplifier of the chain comprising an input differential pair of transistors each having a gate connected, respectively, to a first and a second input terminal of the amplifier, the respective sources of said transistors being connected in common; wherein at least the first or preceding one of said at least two cascaded amplifiers has two output terminals cascadedly connected to the following amplifier in the chain;

means for sensing the output common mode voltage of said first or preceding amplifier;

means for comparing the sensed output common mode voltage of said first or preceding amplifier with a preset reference voltage and for generating an error voltage signal proportional to the difference between said sensed output common mode voltage and said preset reference voltage; and

means for maintaining said output common mode voltage of said first or preceding amplifier below a maximum value set by said reference voltage by applying said error signal to an output common mode voltage control terminal of said first or preceding amplifier;

wherein said sensing means, said comparing means and said means for applying said error signal comprise an electrical connection between said commonly connected sources of said input differential pair of transistors of said amplifier which follows said first or preceding amplifier in the chain of cascaded amplifiers and a first input terminal of a differential input comparator having a second input terminal to which said preset reference voltage is applied by means of a level shifting circuit: and

an electrical connection between an output of said differential input comparator and said output common mode voltage control terminal of said first or preceding amplifier

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4,918,400

AMPLIFIER CIRCUIT

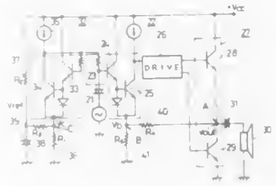
Takashi Otsuki, Ota, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Apr. 18, 1989, Ser. No. 339,729

Claims priority, application Japan, Apr. 20, 1988, 63-97322

Int. Cl.[4] H03F *3/30*

U.S. Cl. 330—273 **6 Claims**



1. An amplifier circuit comprising an input amplifier stage for amplifying an input a.c. signal, a push-pull output stage for driving a load in accordance with the output signal of the amplifier stage, a bias stage having the same construction as the input amplifier stage for setting a bias for the amplifier stage, first resistor means connected between the bias stage and a ground and to be given a current passing through the bias stage, second resistor means connected between a power supply and the first resistor means in series with the first resistor means, and third resistor means connected between the output point of the push-pull output stage and the ground, the third resistor means comprising two resistors connected in series with each other, whereby a signal obtained at the point of connection between the two resistors is negatively fed back to the input amplifier stage to set a gain for the input amplifier stage.

4,918,401

STEP ADJUSTABLE DISTRIBUTED AMPLIFIER NETWORK STRUCTURE

Erik Langer, Marktoberdorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 24, 1986, Ser. No. 889,063

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1985, 3534831

Int. Cl.[4] H03F *3/60*; H03G *3/10*

U.S. Cl. 330—277 **19 Claims**

1. An incrementally adjustable distributed network arrangement including a signal delay line connected to an input signal (E) and an output delay line providing a signal output (A), the arrangement comprising delay elements (Z_{Gm}, Z_{Dm}, mϵ{1, . . . , n+1}) and a number of controlled sources ($T_1 \ldots T_n$; VCCS), connected together to form a distributed amplifier responsive to a signal input (E) and providing a signal output (A), the distributed amplifier comprising:

(a) the number of controlled sources (VCCS) being selected to produce a predetermined level of amplification and

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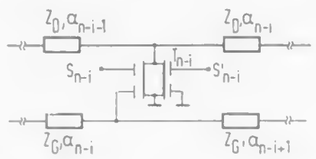
each controlled source being individually switched to turn-on or turn-off;

(b) a plurality of dual gate FETs ($T_1 \ldots T_n$) comprising said controlled sources, each dual gate FET having a first gate (G_1) for receiving the input signal voltage through serially connected delay elements (Z_{Gm}) forming the input signal delay line, and each dual gate FET having a second gate respectively connected to receive a suitable dc voltage for turning its respective FET on and off; and

(c) the dual gate FETs ($T_1 \ldots T_n$) being series connected, the respective first gates of the dual gate FETs ($T_1 \ldots T_n$) being coupled to the input signal delay line of the distributed amplifier, the respective drains of the dual gate FETs ($T_1 \ldots T_n$) being coupled to the output delay line formed by serially connected delay line elements of the distributed amplifier, the respective sources of the dual gate FETs ($T_1 \ldots T_n$) being coupled to a fixed potential, delay elements being coupled between gates of succeeding dual gate FETs and between drains of succeeding dual gate FETs, respectively, the output delay line as well as the signal delay line being respectively terminated with a resistance; and



a system of second FETs wherein individual second FETs being disposed in parallel with a corresponding controlled source to form a parallel connected FET in order to avoid impedance transitions during the turning on and off of one or more controlled sources (VCCS), each individual second FET having a first gate (G_1) that is connected to a fixed potential and a second gate (G_m) that is at a switching voltage at which no current flows in the system of second FETs with the parallel connected FET, when applied signal voltage input, is active, and that this second FET system is active when there is no current flow in the parallel connected FET transistor that is provided with signal voltage.

4,918,402

DELAY CIRCUIT HAVING AT LEAST ONE ALL-PASS NETWORK

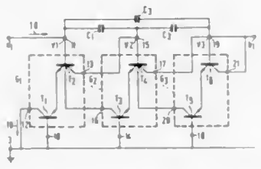
Johannes O. Voorman; Pieter J. Snijder, and Johannes S. Vromans, all of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 231,616, Aug. 11, 1988, abandoned, which is a continuation of Ser. No. 39,545, Apr. 17, 1987, abandoned. This application Feb. 22, 1989, Ser. No. 314,294

Claims priority, application Netherlands, Sep. 15, 1986, 8602329

Int. Cl.[4] H03F *1/34*

U.S. Cl. 330—294 22 Claims



1. A delay circuit comprising at least one all-pass network which has an input terminal for receiving an input signal, an output terminal for supplying an output signal, and a reference terminal for carrying a reference potential and which comprises an at least second-order filter section comprising first, second and third transconductors, which each have a first input, a second input, a first output and a second output, the first input of each of the three transconductors being coupled to the reference terminal, the second input of the first transconductor being coupled to the input terminal, the second input of the second transconductor being coupled to the second output of the first transconductor and to the first output of the third transconductor, the second input of the third transconductor being coupled to the second output of the second transconductor and to the output terminal, said filter section further comprising a first capacitor coupled between the second inputs of the first transconductor and the second transconductor and a second capacitor coupled between the second inputs of the first transconductor and the third transconductor, characterized in that the filter section further comprises a third capacitor coupled between the second inputs of the second transconductor and the third transconductor.

4,918,403

FREQUENCY SYNTHESIZER WITH SPUR COMPENSATION

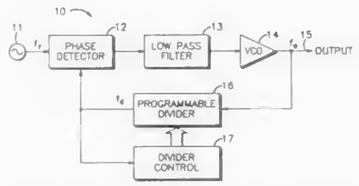
Frederick L. Martin, North Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 202,065, Jun. 3, 1988, Pat. No. 4,816,774. This application Mar. 27, 1989, Ser. No. 329,239

The portion of the term of this patent subsequent to Mar. 18, 2006, has been disclaimed.

Int. Cl.[4] H03L *7/18*

U.S. Cl. 331—1 A 6 Claims



1. A frequency synthesizer for providing a synthesized output frequency f_o comprising:

a synthesizer loop including a programmable divider;

memory means for providing information for said synthesizer loop;

a divider control means providing divider values to said programmable divider, said divider control means providing varying values to said programmable divider for fractional division to produce a desired output frequency f_o, and including at least a first and second accumulator means;

said first accumulator means including an input for receiving data, a first output for varying said divide value, and a second output for providing data to said second accumulator means, and

said second accumulator means including an input connected to said second output of said first accumulator means and an output for varying said divide value;

means for providing an offset value to at least one of said first and second accumulator means.

4,918,404

PHASE LOCKED LOOP WITH SELF-ADJUSTING CIRCUIT FOR OSCILLATOR WORKING POINT

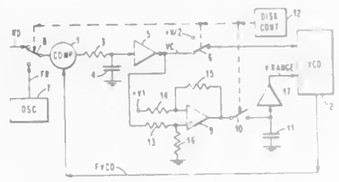
Paolo Vitiello, Rho, and Luca Bergamo, Milan, both of Italy, assignors to Bull HN Information Systems Italia S.p.A., Milan, Italy

Filed Sep. 22, 1988, Ser. No. 248,004

Claims priority, application Italy, Dec. 18, 1987, 23078 A/87

Int. Cl.[4] H03L *7/10*

U.S. Cl. 331—11 5 Claims



1. A self-adjusting phase lock circuit which comprises first means for comparing the frequency and/or the phase of a reference frequency signal to a variable frequency periodic input signal and generating an error voltage related to the differences in frequency and/or phase between said signals and further comprising a voltage controlled oscillator having a controlled input and an adjusting input for receiving said error voltage and an adjusting voltage respectively, said oscillator generating said reference frequency signal as a function of said error and adjusting voltages, and wherein said phase lock circuit further comprises:

second means for decoupling said error voltage from said control input and for applying a predetermined reference voltage to said control input of said oscillator;

third means for comparing the frequency of said reference frequency signal to a nominal working frequency signal to generate a voltage related to the error between said working frequency signal and the frequency of said reference frequency signal;

fourth means coupled to said third means operative in response to said voltage generated by said third means for generating said adjusting voltage;

fifth means coupled to said fourth means for sampling and holding said adjusting voltage;

sixth high input impedance means coupled to said fifth means for applying said voltage to said adjusting input of said oscillator;

seventh means coupled to synchronously control said second and fifth means respectively to decouple said error voltage and to sample said adjusting voltage; and,

said third, fourth, fifth, sixth means and said oscillator being connected to form a feedback control loop for controlling the frequency of said reference frequency signal by feeding back said adjusting voltage.

4,918,405

SIGNAL GENERATOR UTILIZING A COMBINED PHASE LOCKED AND FREQUENCY LOCKED LOOP

Earl C. Herleikson, Otis Orchards, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 26, 1988, Ser. No. 263,081

Int. Cl.[4] H03L *7/18, 1/02*

U.S. Cl. 331—11 7 Claims

1. A frequency synthesizer apparatus of the phase locked loop type for providing a modulate output signal having a selectable frequency comprising

controlled oscillator means having an output terminal and a frequency control terminal, said controlled oscillator means providing an output signal to said output terminal having a selectable frequency determined by the magnitude of a frequency control signal applied to said frequency control terminal;

a feedback path responsive to said output signal provided by said controlled oscillator means to said output terminal thereof for supplying a feedback signal to said frequency control terminal of said controlled oscillator means, and said feedback path including a frequency discriminator network including a phase detector means having an output port and first and second input ports and first coupling means for coupling said output signal from said output terminal to said first and second input ports of said phase detector means, time delay means having a time delay of Tau, said time delay means being connected to delay said output signal coupled to one of said first and second input ports, variable phase shift means having a phase shift control terminal, said variable phase shift means connected to shift the phase of the output signal

coupled to one of said first and second input ports of said phase detector, said phase detector providing an error signal to said output port thereof, the magnitude of said error signal being proportional to the difference in phase between the signals coupled to said first and second input ports of said phase detector, second coupling means for coupling said error signal provided by said phase detector to said frequency control terminal of said controlled oscillator means; and

modulation coupling means for coupling a modulation signal to said phase shift control terminal of said variable phase shift means, said variable phase shift means responsive to said modulation signal to shift the phase of the output signal coupled to one of said first and second input ports of said phase detector in accordance with said modulation signal to effect modulation of said output signal coupled to said output terminal by said controlled oscillator means.

4,918,406

TIMING RECOVERY SCHEME FOR BURST COMMUNICATION SYSTEMS HAVING A VCO WITH INJECTION LOCKING CIRCUITRY

Randall L. Baumbach, Arnold, Md.; Richard G. Berard, Chelmsford, and Robert G. Curtis, Sudbury, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 948,276, Dec. 31, 1986, Pat. No. 4,847,876.

This application Apr. 26, 1989, Ser. No. 343,225

Int. Cl.[4] H03B *5/12;* **H03L** *7/06*

U.S. Cl. 331—117 R 4 Claims

1. An oscillator for generating a highly stable sinusoidal signal at a predetermined frequency comprising:

resonant tank means, having two terminals, for establishing the predetermined frequency;

generator means, for providing a predetermined constant current at a terminal;

first and second transistor means, the emitters of said first and second transistor means coupled to the terminal of said generator means, and the collectors of said first and second transistor means coupled to corresponding ones of the two terminals of said resonant tank means;

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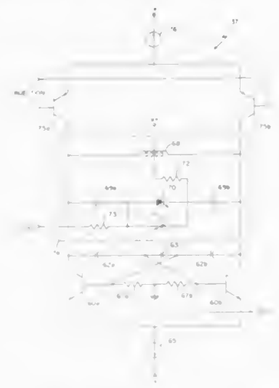
first capacitor means, for coupling the collector of said first transistor means to the base of said second transistor means;

second capacitor means, having substantially the same capacitance as said first capacitor means, for coupling the



collector of said second transistor means to the base of said first transistor means; and

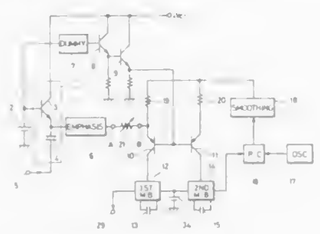
third capacitor means, having a capacity larger than the capacity of said first capacitor means, for coupling the base of said first transistor means to the base of said second transistor means.

4,918,407

OSCILLATION CIRCUIT

Yuichi Ichikawa, Gunma, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Sep. 14, 1989, Ser. No. 407,188
Claims priority, application Japan, Sep. 19, 1988, 63-234124
Int. Cl.[4] H03L 7/00
U.S. Cl. 331—25 8 Claims



1. An oscillation circuit, comprising:

a first multivibrator (**12**);

a second multivibrator (**14**) having the same circuit configuration as that of said first multivibrator;

a reference oscillation circuit (**17**) oscillating at a constant frequency;

a phase comparing circuit (**16**) for comparing in phase an oscillation output signal of said reference oscillation circuit with that of said second multivibrator; and

a smoothing circuit (**18**) for smoothing an output signal of said phase comparing circuit to supply the smoothed output to said first and second multivibrators as a control current for determining an oscillation frequency,

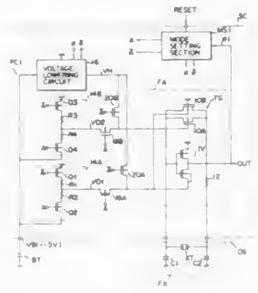
whereby an oscillation frequency of said first multivibrator is stabilized.

4,918,408

OSCILLATION CIRCUIT

Kazuhisa Sakihama, Yokohama; Takuya Fujimoto, Kawasaki, and Akihiro Sueda, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 15, 1988, Ser. No. 284,524
Claims priority, application Japan, Dec. 18, 1987, 62-320424
Int. Cl.[4] H03B 5/36
U.S. Cl. 331—116 R 27 Claims



1. An oscillation circuit comprising:

a power source terminal section to which an external voltage is applied;

an oscillator section including an amplifier, a feedback reactance connected between input and output terminals of said amplifier, and a transfer gate connected as a feedback resistor between the input and output terminals of said amplifier and comprised of a plurality of switching elements; and

power control means for independently converting the external voltage to first, second, and third internal voltages which are respectively supplied as a power source voltage and as gate control voltages to said amplifier and to the plurality of switching elements comprising the transfer gate.

4,918,409

FERRITE DEVICE WITH SUPERCONDUCTING MAGNET

Bernard J. Lamberty, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 12, 1988, Ser. No. 282,554
Int. Cl.[4] H01P 1/387
U.S. Cl. 333—1.1 16 Claims

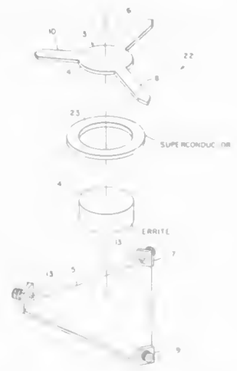
1. A ferrite device, comprising:

a wave transmission means for carrying propagating electromagnetic wave energy;

a ferrite means for controlling the propagation of electromagnetic wave energy in the wave transmission means when biased by a magnetic field; and

a superconductor means, which encircles the ferrite means,

for producing a magnetic field which magnetically biases the ferrite means, the superconductor means being closed



and carrying a continuously circulating current which produces the magnetic field

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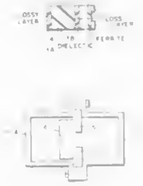
4,918,410

ISOLATOR FOR MICROWAVE ELECTROMAGNETIC RADIATION

Adalbert Beyer, Straelen, and Ingo Wolff, Aachen, both of Fed. Rep. of Germany, assignors to Britist Telecommunications, Public Limited Company, London, United Kingdom

Filed May 7, 1985, Ser. No. 731,518
Claims priority, application United Kingdom, May 9, 1984, 8411792
Int. Cl.[4] H01P 1/37
U.S. Cl. 333—24.2 27 Claims



1. A non-reciprocal E-plane device comprising:

waveguide means, adapted to receive microwave signals, for propagating microwave signals therethrough; and

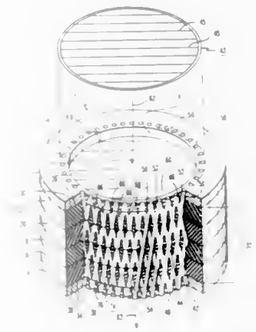
a lamella structure disposed in said waveguide means, said structure including a ferrite layer adapted to be disposed in a magnetic field, a microwave energy absorbing layer, and a dielectric spacer layer disposed between the energy absorbing layer and the ferrite layer, said layers being oriented parallel to the E-plane of said waveguide means and said dielectric layer having a dielectric constant of at least 1.5, said structure attenuating signals propagating through said waveguide means in a first direction by a first attenuation and attenuating signals propagating through said waveguide means in a second direction opposite said first direction by a second attenuation much greater than said first attenuation.

4,918,411

DIELECTRIC APERTURE ASSEMBLY AND METHOD FOR FABRICATING THE SAME

John H. Staehlin, Lutherville, and James A. Bingham, Ellicott City, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 31, 1988, Ser. No. 264,607
Int. Cl.[4] H01P 3/18
U.S. Cl. 333—239 21 Claims



1. A fabricated dielectric aperture assembly for passing an RF signal therethrough, comprising:

a plurality of layers of solid dielectric material stacked to form a generally laminar structure, said laminar structure having a pair of opposing outer surfaces;

a first layer of electrically conductive material having an opening therethrough to define a first aperture, said first layer of electrically conductive material positioned in abutting contact with one of said pair of laminar structure outer surfaces;

a second layer of electrically conductive material having an opening therethrough to define a second aperture, said second layer of electrically conductive material positioned in abutting contact with the other of said pair of laminar structure outer surfaces and positioned so that said second aperture is in substantial alignment with said first aperture;

said laminar structure and said first and second layers of electrically conductive material forming a generally laminar assembly;

a grid-like structure having a body portion and first and second end portions integral with and respectively extending from opposite ends of said body portion, said grid-like structure having a configuration to define an inner wall, an outer wall, a plurality of openings extending from said inner wall to said outer wall and an interior portion bounded by said inner wall;

said grid-like structure body portion being embedded in said plurality of solid layers of dielectric material forming said laminar structure so that at least a portion of each said layer of solid dielectric material is positioned within said interior portion;

said first and second end portions of said grid-like structure being embedded in said first and second electrically conductive layers, respectively, in surrounding relation with said first and second apertures; and

said grid-like structure in combination with said plurality of layers of dielectric material and said first and second layers of electrically conductive material defining a waveguide for providing an RF signal transmission path through said portion of each said layer of solid dielectric material positioned within said interior portion of said grid-like structure between said first and second apertures.

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4,918,412

DEVICE FOR ASSISTING A COMPUTER OPERATOR IN THE USE OF COMPUTER PROGRAMS

Michael F. Churchill, Victoria, Canada, assignor to Wheel Ease Reference Corporation, Victoria, Canada

Filed Oct. 19, 1988, Ser. No. 259,831
Claims priority, application Canada, Oct. 30, 1987, 550642
Int. Cl.[4] G06C *3/00*
U.S. Cl. 235—88 R 6 Claims

1. A facilitating device for users of a computer program, which device comprises:
(a) a first card;
(b) a first data area on said first card including data on operations performable with said computer program, said first data area being an annular band on a frontal face of said first card radially spaced from the center of said first card,
(c) a second data area on said first card including data on commands to be entered into a computer to carry out the operations performable with said computer program, said second data area lying between said annular band and the center of said first card;
(d) said first and second data areas being arranged so that each command in the second data area lies at essentially the same fixed angle on said card from the data in the first data area which refers to the operation performable using that command;
(e) a second card in the form of a disc concentric with the center of said first card overlying said second data area and rotatable about the center, said second card having an indicator thereon, said second card being of smaller radius than said annular band so that said first data area is exposed to view;
(f) window means in said second card for selectively revealing a computer command corresponding to a particular operation when the first and second cards have been rotated relative to each other such that said indicator is directed at that portion of the first data area which refers to that particular operation.

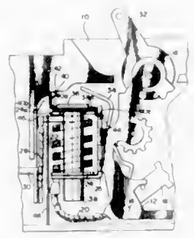
4,918,413

CLAMP FOR CAPTIVE TUBE IN ELECTROMAGNETIC CIRCUIT BREAKERS

Konrad J. Richter, Sr., Lawrenceville, N.J., assignor to Heinemann Electric Company, Lawrenceville, N.J.

Filed Feb. 22, 1989, Ser. No. 313,954
Int. Cl.[4] H01H *9/02*
U.S. Cl. 335—202 7 Claims

1. An electromagnetic circuit breaker comprising an insulating breaker housing, containing a series circuit within the housing through a pair of breaker switch contacts and a magnetic coil and an actuation linkage supported on a frame fixed to the housing for opening and closing the switch contacts, including a manual actuation means and a movable armature attractable to a pole piece terminating a non-magnetic tube containing and guiding a magnetic core located within the magnetic coil and having a radially extending tube flange at the pole piece end, a bobbin on which the coil is wound and the tube being both supported by the frame, and a clamping member so engaging an interior wall of the housing that a surface of



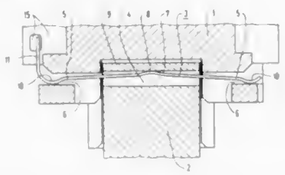
the clamping member will engage the tube flange and urge the tube flange against the reaction of the frame to hold the tube flange against its supporting surface and clamp in place all structure between the clamping member and the frame.

4,918,414

ELECTROMAGNETIC SWITCHING DEVICE

Georg Streich, Amberg; Guenter Gnahn, Sulzbach-Rosenberg, and Kurt Held, Amberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 19, 1989, Ser. No. 382,736
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1988, 8811205
Int. Cl.[4] H01F *7/13*
U.S. Cl. 335—274 3 Claims



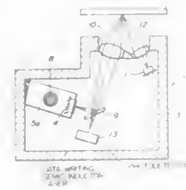
1. An electromagnetic switching device having a polar surface, comprising:
a. a magnet armature having an opening at one end away from said polar surface;
b. a contact carrier having oppositely disposed slots;
c. a mechanism for coupling the magnet armature with said contact carrier further including:
i. a plate spring located in said opening of the magnet armature and having its ends protrude out of said armature and engage with said slots; and
ii. said plate spring have a first cylindrical formation located in the middle of said plate spring inside of said opening, said first formation projecting in the plate spring's return direction and having a longitudinal axis running across the longitudinal axis of the plate spring.

4,918,415

DATA READING AND/OR WRITING APPARATUS FOR USE WITH AN OPTICAL CARD

Akihiko Hashimoto, Hachioji; Toshihiro Kitahara, Akishima; Hiroshi Hashi, Higashimurayama, and Takao Rokutan, Koganei, all of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed May 18, 1987, Ser. No. 50,472
Claims priority, application Japan, May 23, 1986, 61-118663; May 28, 1986, 61-122892; Mar. 17, 1987, 62-60228
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—454 30 Claims



1.An apparatus which reads data out of an optical card, the apparatus comprising:
an optical head means including a reading light source which emits a reading light beam, a first optical system which projects the reading light beam on the optical card to illuminate a part of the optical card, a second optical system which forms an image of the illuminated part of the optical card , and a photodetector which receives said image of said part of the card, said photodetector having at least one data detector which reads data from said image to produce a data signal, said first and second optical systems having optical axes whice are inclined with respect to a surface of the optical card;
a first driving means for moving said optical card and the optical head means relative to each other in a first direction of the optical card along which first direction a plurality of tracks are recorded on the optical card; and
a second driving means for moving said optical card and the optical head means relative to each other in a second direction which is perpendicular to the surface of the optical card;
wherein said photodetecter comprises at least two focusing detectors which are separated from each other in said first direction such that only in a focused condition the image of the illuminated part of the optical card is equally received by the focusing detectors, and the apparatus further comprises a differential amplifier which detects a focusing error by deriving a difference between output signals from said focusing detectors to generate a focusing control signal by means of which said second driving means is driven to correct the focusing error.

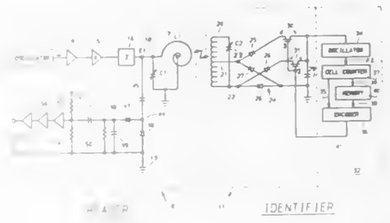
4,918,416

ELECTRONIC PROXIMITY IDENTIFICATION SYSTEM

Charles A. Walton, Los Gatos, and France Rode, Los Altos, both of Calif., assignors to Sielex Systems, Inc., Cupertino, Calif.

Continuation of Ser. No. 28,031, Mar. 18, 1987, abandoned, which is a continuation of Ser. No. 669,069, Nov. 7, 1984, abandoned. This application Aug. 26, 1988, Ser. No. 240,341
Int. Cl.[4] G06K *19/06*
U.S. Cl. 235—497 10 Claims

1. An identification system comprising:
a reader having
a first signal generator for generating a first signal, and
a first antenna connected to said first signal generator for radiating said first signal;
an identifier having
a second antenna mutually coupled to said first antenna for receiving radiated power from said first antenna and for sending signals to said first antenna,
a data-generating circuit powered by said radiated power for generating data in binary form having a selected series of first and second logic states and including transitions in logic level at the beginning and end of a short period for representing the first logic state and transitions in logic level at the beginning and end of a longer period for representing the second logic state, and



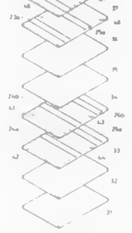
a modulation circuit connected to said data generating circuit for modulating the electrical parameter of said second antenna with said data and through said mutual coupling thereby affect an electrical parameter of said first antenna; and
a detecting circuit coupled to said reader for detecting changes in said electrical parameter of said first antenna to identify said identifier by detecting said data.

4,918,417

INDUCTOR HAVING PARALLEL LINE ELECTRODES

Yukio Sakamoto, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 6, 1989, Ser. No. 362,065
Claims priority, application Japan, Jun. 9, 1988, 63-76547[U]
Int. Cl.[4] H01F *17/00, 27/30*
U.S. Cl. 336—83 7 Claims



1. An inductor comprising:
a sintered body obtained by stacking a plurality of ceramic green sheets of cofire the same,
a plurality of line electrodes arranged so as to extend between first and second side surfaces of the sintered body and arranged side by side in a direction perpendicularly intersecting such a direction as to connect the first and second side surfaces thereof in said sintered body, and

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a plurality of outer electrodes respectively formed on the first and second side surfaces of said sintered body so as to be electrically connected to both ends of said line electrodes,

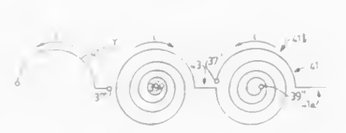
said inductor having a structure in which a plurality of inductor elements formed between the plurality of outer electrodes formed on the first side surface of the sintered body and the plurality of outer electrodes formed on the second side surface thereof are arranged side by side in the direction perpendicularly intersecting the direction to connect the first and second side surfaces, characterized in that the line electrodes constituting the adjacent inductor elements are formed of line electrode materials applied to said different ceramic green sheets such that the line electrodes constituting the inductor elements adjacent to each other in the direction perpendicularly intersecting the direction to connect the first and second side surfaces of said sintered body are not positioned in the same plane.

4,918,418

INDUCTIVE COIL STRUCTURE WITH ELECTRICAL RETURN PATH

Izrail Tsala, Princeton Junction, N.J., assignor to Caterpillar Inc., Peoria, Ill.

Filed Aug. 4, 1988, Ser. No. 228,137
Int. Cl.[4] H01F *27/28*
U.S. Cl. 336—180 7 Claims



1. An inductive coil structure, comprising:

a base sheet having first and second sides;

a first and second interconnection channel disposed between the first and second sides of said base sheet, and being spaced apart one from another;

a first inwardly spiraling coil of electrically conductive material disposed on the first side of said base sheet, said first coil terminating at said first interconnection channel;

a second outwardly spiraling coil of electrically conductive material disposed on the second side of said base sheet and substantially aligned with said first coil, said second coil beginning at said first interconnection channel and ending in a connection portion, and being electrically connected via said first interconnection channel to said first coil;

a third inwardly spiraling coil of electrically conductive material disposed on the second side of said base sheet, said third coil beginning at the connection portion and terminating at said second interconnection channel;

a fourth outwardly spiraling coil of electrically conductive material disposed on the first side of said base sheet and substantially aligned with said third coil, said fourth coil beginning at said second interconnection channel, and being electrically connected via said second interconnection channel to said third coil; and

electrical conductors on the first and second sides of said base sheet and forming portions of an electrical return path from the coils, the conductors being located adjacent said first coil and said third coil respectfully and following the outer contours thereof so that current flowing through the conductors adds to the inductive sensitivity of the coils.

4,918,419

IGNITION COIL FOR ENGINE

Yasuhiko Ida, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1989, Ser. No. 388,117
Claims priority, application Japan, Aug. 5, 1988, 63-103942[U]
Int. Cl.[4] H01F *15/10*
U.S. Cl. 336—192 1 Claim

1. In an ignition coil for an engine wherein the ignition coil includes a bobbin, a coil on said bobbin, a terminal member having a groove in a portion thereof attached to said bobbin, and said coil having a terminal end positioned in said groove portion with the grooved portion being crushed onto a fused to said terminal end, the improvement comprising:

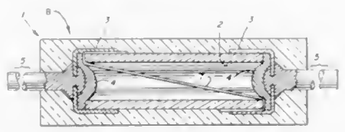
a guide member attached to said bobbin and positioning said terminal end of said coil above the bottom of said groove, said terminal end being attached to said grooved portion above the bottom of said groove.

4,918,420

MINIATURE FUSE

William Sexton, 418 Franklin St., Porter, Ind. 46304

Continuation-in-part of Ser. No. 80,799, Aug. 8, 1987. This application Nov. 4, 1988, Ser. No. 267,395
Int. Cl.[4] H01H *85/02, 85/14*
U.S. Cl. 337—205 6 Claims



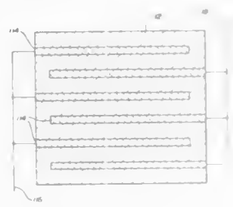
1. A miniature cartridge fuse having a length no more than about one quarter inch, and an outer diameter no greater than about 0.1 inch, said fuse comprising: a subassembly of an inner transparent insulating housing which cannot withstand short circuit blowout conditions, a fuse element disposed within said inner housing and a pair of conductive terminals at the opposite axial ends of said housing electrically and physically connected to the ends of said fuse element; said sub-assembly being encapsulated by an outer transparent encapsulating body of insulating material immediately surrounding the exterior surfaces of said inner housing to reinforce it for substantially its entire extent, and said encapsulating body being made of transparent material to enable the fuse element to be seen through and the surrounding encapsulation material, and is a much stronger material than the material out of which said inner housing is made and to prevent the explosion of the fuse under fuse blowout conditions.

4,918,421

NONLINEAR RESISTOR FOR LOW TEMPERATURE OPERATION

William N. Lawless, and Tapan K. Gupta, both c/o CeramPhysics, Inc., 921 Eastwind Dr., Ste. 110, Westerville, Ohio 43081

Filed Mar. 20, 1986, Ser. No. 841,602
Int. Cl.[4] H01C *7/10*
U.S. Cl. 338—21 18 Claims



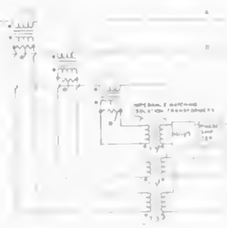
1. A sintered multilayer capacitor-type resistor having nonlinear voltage/current characteristics at temperatures below room temperature down to about 4 K. comprising, a plurality of alternating layers of (a) a metal electrode and (b) a ceramic composition of matter comprising at least about 90 mole % of zinc oxide and up to about 10 mole % of additional metal oxides effective to provide electrical nonlinearity within the composition and including the combination of from about 0.002 mole % to about 0.02 mole % of aluminum oxide and a total amount of from about 0.003 mole % of about 0.2 mole % of at least one alkali metal oxide selected from the group consisting of sodium oxide, potassium oxide, rubidium oxide, and cesium oxide, and wherein said plurality of alternating layers are electrically connected in parallel.

4,918,422

METHOD AND APPARATUS FOR EXTRACTING INBOUND INFORMATION GENERATED LINE-TO-LINE IN A MULTI-PHASE ELECTRIC DISTRIBUTION SYSTEM

Sioe T. Mak, St. Louis County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 25, 1988, Ser. No. 185,792
Int. Cl.[4] H04B *3/56*
U.S. Cl. 340—310 R 17 Claims



1. Apparatus for extracting inbound information generated line-to-line in a multi-phase electric distribution system, each phase of the distribution system having a voltage waveform thereon whose amplitude and phase is substantially fixed, said voltage waveform functioning as a carrier, said information being inserted as single current pulses onto at least some of the voltage waveforms at fixed locations on said waveforms, said apparatus comprising:

means for deriving waveforms from each primary of a multi-phase electric distribution system, which derived waveforms include at least a carrier component corresponding to the voltage waveform for its associated primary and at least some of which derived waveforms include a signal component; and

means for summing the waveforms derived from the primaries;

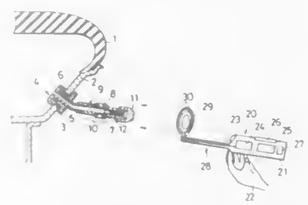
said waveform deriving means including means for adjusting the amplitude and phase of the waveform derived from at least one primary such that the carrier components of the derived waveforms substantially cancel without cancelling the signal components.

4,918,423

TIRE INSPECTION DEVICE

Hiroshi Fukuyama, Tokyo; Makoto Morinaga, Chigasaki; Norio Goshima, Tokyo; Makoto Nakao, Tokyo; Kiyoshi Oono, Tokyo, and Isao Watanabe, Tokyo, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 223,493
Claims priority, application Japan, Jul. 23, 1987, 62-184542; Dec. 15, 1987, 62-317165; Dec. 23, 1987, 62-326415
Int. Cl.[4] B60C *23/00*
U.S. Cl. 340—442 6 Claims



1. In a tire inspection device for a tire adapted to be mounted on a rim of a wheel, the inspection device comprising a first element adapted to be mounted at least in part to a valve affixed to said rim, and a sensing device adapted to be moved into and away from a position adjacent said first element, the first element comprising a sensor for sensing a physical characteristic of said tire and/or said wheel, the improvement wherein:

said first element comprises a resonator, said resonator comprising a first coil and a capacitor coupled to said sensor, said first coil and capacitor comprising a resonant circuit that resonates in response to external electromagnetic radiation, whereby a resonance characteristic of said resonator varies as a function of a physical characteristic of said tire and/or wheel sensed by said sensor; and

said sensing device comprises a main body including a signal processor, said processor having an oscillator with a second coil mounted externally of said main body, whereby oscillations of said oscillator produce an electromagnetic wave radiating from said second coil and said resonance characteristic of said resonator affects the state of oscillation of said oscilator when said second coil is positioned adjacent said first coil, said processor further comprising means for detecting changes in the state of oscillation state of said oscillator, and a display for indicating the occurrence of said changes of state of said oscillator.

4,918,424

TWO-STAGE BRAKE LIGHT SYSTEM

R. Douglas Sykora, Rte. 6, Box 131, Potter Rd., Maryville, Tenn. 37801

Filed Sep. 12, 1988, Ser. No. 242,578
Int. Cl.[4] B60Q *1/00*; H01H *3/14*
U.S. Cl. 340—464 **10 Claims**

1. A two-stage brake light system for a vehicle equipped with a brake pedal, comprising:

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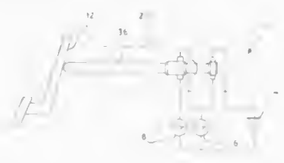
a power source;
warning light means for signalling that said brake pedal has been depressed a first selected amount;
stop light means for a signalling that said brake pedal has been depressed a second selected amount which is greater than said first selected amount;
switch means mounted proximate said brake pedal responsive to the quantity of depression of said brake pedal such that said warning signal means is connected to said power source when said brake pedal is depressed by said first selected amount and such that said stop light means is connected to said power source when said brake pedal is depressed by said second selected amount, said switch means having a plunger which is mechanically engaged by said brake pedal when said brake pedal is depressed, a housing that defines an internal cavity which slidably receives a portion of said plunger therein, and biasing



means disposed within said cavity for urging said plunger outwardly towards said brake pedal, said switch means further including first and second contact pairs, said first of said contact pairs being warning light contacts electrically connected with said warning light means and said second of said contact pairs being stop light contacts electrically connected with said stop light means, said warning light contacts being actuated by contact actuators to energize said warning light means from said power source when said plunger is moved with respect to said housing by said first selected amount, and said stop light contacts being actuated by further contact actuators to energize said stop light means from said power source when said plunger is moved with respect to said housing by said second selected amount, said contact actuators and said further contact actuators being displaced by the surface contour of said plunger.

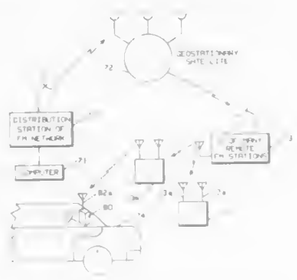
4,918,425

MONITORING AND LOCATING SYSTEM FOR AN OBJECT ATTACHED TO A TRANSPONDER MONITORED BY A BASE STATION HAVING AN ASSOCIATED ID CODE

M. Barry Greenberg, North Miami Beach, Fla., and Daniel E. Ely, 7360 Grand Ave., Winter Park, Fla. 32792, assignors to Daniel E. Ely, Winter Park, Fla.

Filed Jul. 25, 1988, Ser. No. 223,954
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—539 21 Claims

1. A monitoring and finding system comprising a monitoring base station and a transponder, said base station having a transceiver and alarm condition alerting means, said transceiver having means for intermittently transmitting encoded signals having at least an ID code, said transponder being secured to an object to be monitored and having means for receiving said signals, recognizing said ID code and transmitting an encoded timely response including said ID code, said transceiver having means for detecting the absence of said timely transponder response and activating said alerting means, said transceiver and transponder both having means for selectively transmitting at a normal power or at a relatively higher power, said transceiver having means for transferring the next signal in said intermittent transmission from the normal power to said higher power in the absence of said timely transponder response and



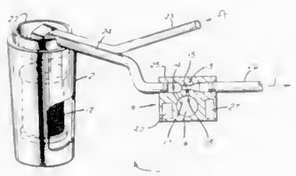
for encoding instructions in said next signal for the transponder to likewise transfer to said higher transmitting power, said transceiver having means, responsive to each receipt of said timely transponder response, for setting the transmission of the next signal to said normal power and for encoding instructions to the transponder to transfer to normal power, said high power transmission enabling communication between base and transponder in an out-of-range condition, said base having manual means for de-activating said alerting means, whereby after such manual de-activation, subsequent re-activation of said alerting means indicates a probable out-of-range condition.

4,918,426

METHOD AND APPARATUS FOR SENSING FLUID FLOW VOLUME TO INDICATE END OF FILTER LIFE

Lawrence D. Butts, Wyoming, and Thomas A. Niezgoda, Kentwood, both of Mich., assignors to Amway Corporation, Ada, Mich.

Filed May 2, 1988, Ser. No. 189,342
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—611 21 Claims



1. A method for indicating the operating condition of an impurity filter receiving a variable fluid flow, comprising the steps of:
generating a pressure differential proportional to the instantaneous rate of fluid flow;
generating an electrical signal which is a function of said pressure differential;

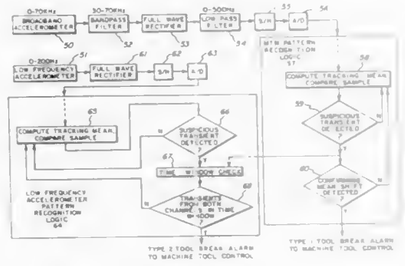
integrating said signal to provide a representation of the total volume of fluid having passed through said filter; and
activating an indicator when the magnitude of said representation has advanced to a value corresponding to a predetermined volume of fluid to be filtered;
wherein said signal generating step is conducted only at spaced intervals during periods when said pressure differential is below a predetermined threshold value and is conducted continuously when said pressure differential is above said predetermined threshold value.

4,918,427

MULTI-LEVEL TOOL BREAK DETECTION USING MULTI-MODE SENSING

Charles E. Thomas, Scotia; Steven R. Hayashi, Schenectady, and Douglas G. Wildes, Ballstor Lake, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 27, 1989, Ser. No. 329,044
The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—680 16 Claims



1. A machine tool monitoring system for detecting cutting tool breakage that does and does not cause an immediate major change in cutting conditions, comprising:
means for sensing vibrations generated by interaction of a cutting tool and workpiece and deriving a high frequency vibration signal having a frequency in a range between 30 KHz and 100 KHz;
means for sensing at least one parameter related to forces acting on the tool during a cutting process and producing a low frequency signal having a frequency less than about 1 KHz;
means for preprocessing, sampling and digitizing each of said signals and respectively computing first and second tracking mean signals from a given number of previous samples;
pattern recognition means for detecting signal transients that may be caused by a tool break; and
alarm means for determining that transients in said first and second mean signals are in close time coincidence and occur in a designated time window, and generating a minor tool break alarm.

4,918,428

TWO DIMENSIONAL NUMERICAL DISPLAY WITH TREAD INDICATOR

Joseph Bebel, Howell, N.J., assignor to Ametek, Inc., New York, N.Y.

Filed Mar. 22, 1988, Ser. No. 172,002
Int. Cl.[4] G09G *3/04*
U.S. Cl. 340—756 11 Claims

1. A solid state display device comprising a substantially planar support means having:
(a) multiple energizable display elements disposed on said support means to form substantially rectilinear segments;
(b) said segments being arranged to define multiple trapezoids of substantially rectangular configuration;
(c) said segments including:
(i) a first set of said segments extending lengthwise in a first substantially straight line,
(ii) a second set of segments extending lengthwise in a second substantially straight line substantially parallel to said first straight line;
(iii) substantially parallel spaced segments extending lengthwise substantially perpendicular to said first and second straight lines to define said rectangles in a generally ladder-like configuration;
(d) said segments defining a central pair of adjacent rectangles having a first common segment forming a common side of each said adjacent rectangle,
(e) four segments of said central rectangles lying in said substantially parallel substantially straight lines;
(f) a third set of segments of said display additional to those forming said central pair of adjacent rectangles forming additional rectangles in excess of one at opposite sides of said central pair;
(g) said additional rectangles including:
(i) first additional rectangles disposed above and below said central rectangles with each having a segment of said third set of segments forming a common side with said central rectangles,

(ii) second additional rectangles disposed above and below said first additional rectangles with each having a segment of said third set of segments forming a common side with said first additional rectangles,
(h) said four segments of said central rectangles lying in said substantially straight lines being of substantially the same length,
(i) the segments of said first additional rectangles lying in said substantially straight lines being of a length less than the length of said four segments of said central rectangles lying in said straight lines;
(j) the segments of said second additional rectangles lying in said substantially straight lines being of a length less than the length of the segments lying in said straight lines in said first additional rectangles;
(k) the segments in each adjacent pair of rectangles being selectively energizable to display digits,
(l) said digits having:
(i) a first height in the direction of said straight lines when said digit is formed by the segments of said central pair of rectangles,
(ii) a second height when said digit is formed by a central rectangle and a first additional rectangle, and
(iii) a third height when said digit is formed by a first additional rectangle and a second additional rectangle,
(iv) said third height being less than said second height and said second height being less than said first height.

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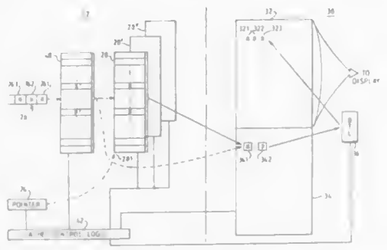
4,918,429

DISPLAY SYSTEM WITH SYMBOL FONT MEMORY

David A. Clarke, Eastleigh, United Kingdom, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 26, 1987, Ser. No. 114,254
Claims priority, application United Kingdom, Apr. 2, 1987, 8707849
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—790 8 Claims



1. A display system comprising a symbol table in general purpose storage which includes blocks of data forming symbol definitions for each of a set of symbols forming a desired symbol set, an all points addressable (APA) display buffer which includes on-screen APA storage for data indicative of pels to be displayed on a screen and off-screen APA storage for symbol definitions, and buffer control logic for associating symbol definitions in off-screen APA storage with locations in on-screen APA storage such that symbols are displayed at desired locations on the display screen, wherein the display system additionally comprises cache control logic for copying the definition of a symbol for display from the symbol table in general purpose storage to off-screen APA storage if the definition for the selected symbol is not already held in off-screen APA storage, whereby the off-screen APA storage is configured as a cache for holding definitions for selected symbols.

4,918,431

METHOD AND APPARATUS FOR AUTOMATICALLY ADJUSTING THE OUTPUT POWER OF A TRANSMITTER

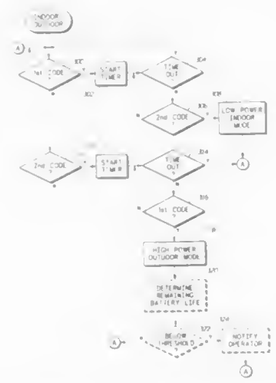
Jaime A. Borras, Hialeah, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 31, 1988, Ser. No. 264,387
Int. Cl.[4] H04Q *7/00*; H04B *9/00*
U.S. Cl. 340—825.44 18 Claims

1. A method for adjusting the output power of a transmitting device, comprising the steps of:

(a) receiving a first code when located in a first code reception area;

(b) moving into a second code reception area to receive a second code: and,



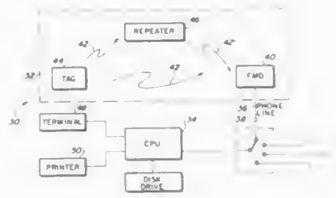
(c) modifying the output power of the transmitting device in response to receiving said first code and said second code.

4,918,432

HOUSE ARREST MONITORING SYSTEM

James D. Pauley, Estes Park; Allen E. Ripingill, Jr., Louisville; James B. Waite, Loveland, and John Loyd, Boulder, all of Colo., assignors to B. I. Incorporated, Boulder, Colo.

Continuation of Ser. No. 251,018, Sep. 27, 1988, abandoned, which is a continuation of Ser. No. 877,317, Jun. 23, 1986, abandoned. This application Aug. 15, 1989, Ser. No. 394,291
Int. Cl.[4] G08B *23/00*; G05B *23/02*; G08C *19/00*
U.S. Cl. 340—573 27 Claims



1. A system for monitoring the presence or absence of an individual within a defined area, said system comprising:

(a) an identification tag that is attached to the individual, said identification tag including:

a first power source,

sensing means for sensing prescribed conditions associated with the operation and use of said tag, and

means coupled to said first power source for periodically transmitting in short data bursts an identification signal including identification information that uniquely identifies said tag, and hence the individual to whom the tag is attached, and status information that indicates the prescribed conditions sensed by said sensing means;

(b) receiving means positioned within said defined area for receiving said identification signal;

(c) processing means coupled to said receiving means for noting the time of receipt and content of the received identification signals, from which time and content information a determination can be made as to the presence or absence of the individual within the defined area during any given time period; and

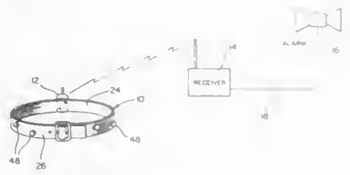
(d) tamper means included within said processing means for sensing one of a plurality of tamper conditions associated with the use of said processing means and for generating a tamper condition signal in the event that one of said plurality of tamper conditions occurs.

4,918,433

WATER IMMERSION ALARM BELT

Robert L. Moore, Box 67 Moorewood Ave., Merrittstown, Pa. 15463

Filed Sep. 21, 1989, Ser. No. 410,409
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—573 11 Claims



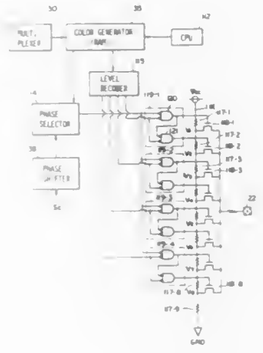
1. A horizontally elongated water immersion alarm belt to be used in conjunction with an electrically actuatable, portable signal generator supported therefrom and a remote signal receiver operatively associated with an alarm for actuation thereof responsive to said signal receiver receiving a predetermined signal from said signal generator and wherein said signal generator includes a pair of electrical conductors serially connected in an electrical supply circuit for said signal generator electrically connected to a suitable source of electrical potential for actuation of said signal generator, said belt including inner and outer layers and upper and lower margins and being adapted to horizontally encircle and be secured about a human body portion, first and second elongated, relatively electrically insulated conductors extending longitudinally of said belt between said layers and adapted to have said pair of electrical conductors connected thereto, first and second sets of electrically conductive contact members mounted from and extending through one of said layers with the contact members of each set of contact members being spaced longitudinally of said belt, said first and second contact members being electrically connected to said first and second conductors, respectively, said one layer including first and second sets of a plurality of housing portions constructed of water impervious material and disposed on the side of said one layer remote from the other layer and within which portions of said first and second contact members are exposed for contact by an electrically conductive liquid within said sets of housing portions, said housing portions opening at least partially downwardly toward said lower margin and each housing portion defining an air vent opening therein at an elevation spaced above the lower most extremity of the corresponding exposed contact member portion.

4,918,434

T.V. GAME SYSTEM

Hiroo Ueda, Toyonaka, and Hiromitsu Yagi, Itami, both of Japan, assignors to Nintendo Co., Ltd., Kyoto and Ricoh Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 28,005, Mar. 18, 1987, abandoned, which is a continuation of Ser. No. 709,342, Mar. 6, 1985, abandoned, which is a division of Ser. No. 564,091, Dec. 21, 1983, abandoned. This application Apr. 25, 1989, Ser. No. 344,540
Claims priority, application Japan, Dec. 22, 1982, 57-234487; Dec. 23, 1982, 57-234473
Int. Cl.[4] G09G *1/28*
U.S. Cl. 340—703 14 Claims



1. A color encoder which is connected to a color television receiver such that a color image can be displayed by the color television receiver, comprising:

first means for generating a predetermined number of phase signals, each having a frequency which is related to the frequency of a reference frequency signal, each of said predetermined number of phase signals being different in phase from each other and each corresponding to a hue capable of being output to said color television receiver;

second means for generating color code signals including a hue code for designating the hue to be output and a level selection code for designating a color level to be output;

third means for selecting one of said phase signals obtained from said first means in accordance with said hue code included in one of said color code signals output from said second means;

fourth means for generating an amplitude selection signal in accordance with said level selection code included in the one of said color code signals; and

fifth means, responsive to the amplitude selection signal from said fourth means, for generating a color signal by changing the level of the phase signal selected by said third means to have a predetermined amplitude selected by said amplitude selection signal and which is associated with the chroma of the color signal and varies between two voltages at least one of which is also selected by said amplitude selection signal, an average value of said level-changed phase signal being associated with the degree of brightness of the color signal.

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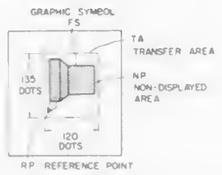
4,918,435

METHOD FOR PROCESSING ANIMATED GRAPHICS

Masato Ryouki, and Akihito Shibata, both of Nagoya, Japan, assignors to Kabushiki Kaisha Okuma Tekkosho, Nagoya, Japan

Continuation of Ser. No. 712,232, Mar. 15, 1985, abandoned. This application Dec. 6, 1988, Ser. No. 281,901
Claims priority, application Japan, Mar. 30, 1984, 59-63965
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—747 8 Claims



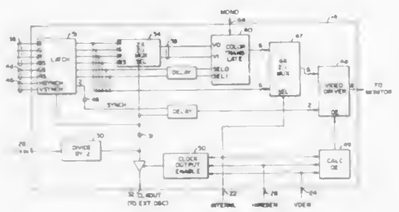
1. A method for processing animated graphics, the animation being effected by shifting displayed symbols, the method comprising the steps of:
displaying a graphic symbol which is to be shifted on a display means so as to thereby effect animation, the displaying beingon the basis of display data preliminarily set in a video RAM:
initially describing said graphic symbol in an original graphic storage area, wherein said graphic symbol is initially described only once in said original graphic storing areas;
defining a transfer area including an area containing said graphic symbol initially described once in said original graphic storing area and further including a non-display area at the outer periphery thereof, wherein graphics contained within said transfer area are to be moved so as to effect animation; and
entering data corresponding to said transfer area including said graphic symbol into said video RAM so that said graphic symbol is moved by a preselected distance on said display means, the movement of said graphic symbol thereby effecting animation.

4,918,436

HIGH RESOLUTION GRAPHICS SYSTEM

Arun Johary, San Jose, Calif., assignor to Chips and Technology, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 56,847, Jun. 1, 1987, abandoned. This application Jul. 21, 1987, Ser. No. 76,099
Int. Cl.[4] G09G *1/28*
U.S. Cl. 340—799 13 Claims



7. A circuit for a use with a graphics adapter in a digital computer, said graphics adapter having at least two outputs, and said graphics adapter being configurable to generate two pixels in parallel per dot clock cycle on the two outputs, said circuit comprising:
serializing means having at least two inputs and at least one output for receiving the two pixels generated in parallel by the graphics adapter and converting the two pixels into a serial stream of pixels on its output by generating a first pixel during the first half of the dot clock cycle and a second pixel during the second half of the dot clock cycle;
video line driver means for driving a monitor; and
means responsive to an externally-supplied signal for coupling either the output of said serializing means or the outputs of the graphics adapter to said video line driver means.

4,918,437

HIGH DATA RATE SIMULCAST COMMUNICATION SYSTEM

Leon Jasinski, Ft. Lauderdale, and Francis R. Steel, deceased, late of Parkland, all of Fla. (by Lynne A. Steel, personal representative), assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 13, 1988, Ser. No. 257,904
Int. Cl.[4] H04B *7/00*
U.S. Cl. 340—825.44 10 Claims

1. A method for transmitting a message to a paging transceiver in a communication system comprising a plurality of transmission calls defining different geographical areas, each transmission cell having a transmitter for transmitting an address identifying the paging transceiver and the message, and a receiver for receiving an acknowledgement signal generated by the paging transceiver, said method comprising the steps of:
transmitting the address at a first data bit rate, the address being simulcast from the transmitters located within each of the plurality of transmission cells;
transmitting the acknowledgement signal from the paging transceiver in response to having received the address;
receiving the acknowledgement signal by at least one receiver located within the plurality of transmission cells;
identifying the transmission cell in which the paging transceiver is located from the received acknowledgement signal; and
selecting the transmitter in the transmission cell in which the paging transceiver is located for transmitting the address and the message at a second data bit rate higher than the first data bit rate.

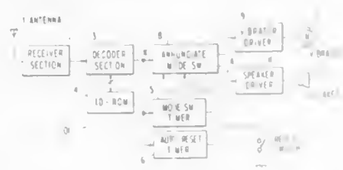
4,918,438

PAGING RECEIVER HAVING AUDIBLE AND VIBRATOR ANNUNCIATING MEANS

Koji Yamasaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 28, 1987, Ser. No. 54,915
Claims priority, application Japan, May 30, 1986, 61-123249
Int. Cl.[4] G08B *5/22*
U.S. Cl. 340—825.46 14 Claims

1. A paging receiver comprising:
receiver means for receiving a paging signal which includes a page number;
memory means for storing a page number which is assigned to said receiver;
decoder means for comparing said page number including in said paging signal received with said page number which is stored in said memory means, and producing a detection pulse if said two page numbers coincide;
a first and a second timer means starting in response to said detection pulse, for producing, respectively, a mode switch pulse and an auto-reset pulse on lapse of a first and a second predetermined period of time, said first period of time being shorter than said second period of time;
reset switch means for generating a manual reset pulse;
a tactile and an audible annunciator means; and



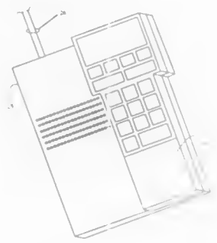
annunciation mode switching means for driving one of said annunciator means in response to said detection pulse, stopping said one annunciator means driven and driving the other annunciator means in response to said mode switch pulse, stopping said other annunciator means in response to said auto-reset pulse, and stopping the driven annunciator means in response to said manual reset pulse

4,918,439

REMOTE CONTROL DEVICE

Steve Wozniak, Los Gatos, and Charles H. Van Dusen, San Jose, both of Calif., assignors to CL 9, Inc., Los Gatos, Calif.

Division of Ser. No. 66,786, Jun. 23, 1987. This application Oct. 5, 1988, Ser. No. 254,518
Int. Cl.[4] H04M *11/06*; H04B *1/16*
U.S. Cl. 340—825.690 5 Claims



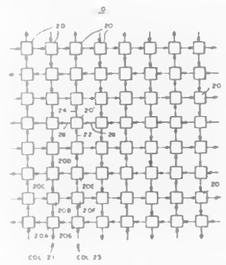
1. A remote control device comprising
at least one manually actuatable control element,
transducer means for emitting a signal;
circuit means for causing said transducer means to emit said signal in response to said control element being actuated;
serial input means for receiving a command signal from an external source and communicating said command signal to said circuit means, said command signal causing said circuit means to cause said transducer means to emit a signal; and
output means for enabling said remote control device to provide signals to said external source to enable the remote control device to provide status information or other data from the remote control device to the external source in response to a request from said external source;
wherein said circuit means comprises memory means for storing a plurality of commands for causing said transducer means to emit different signals, said serial input means permitting data to be loaded into said memory means from said external source.

4,918,440

PROGRAMMABLE LOGIC CELL AND ARRAY

Frederick C. Furtek, 32 Hamilton Rd., Apt. 206, Arlington, Mass. 02174

Filed Nov. 7, 1986, Ser. No. 928,527
Int. Cl.[4] H04Q *1/16*; G06F *7/38*
U.S. Cl. 340—825.83 22 Claims



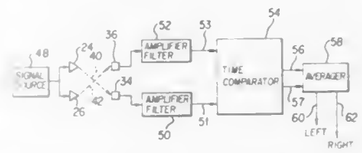
10. A digital device containing an array of programmable logic cells, comprising:
a. a plurality of functionally identical, programmable logic cells, each having a plurality of signal inputs and a plurality of signal outputs and being programmable to assume one of a plurality of available states;
b said plurality of cells being arranged operatively in a topology forming an array of rows and columns of cells such that each cell except those cells on the periphery of the array has four immediate neighbor cells;
c each of said cells being disposed in one of a plurality of distinct possible cell orientations, the orientations being related such that any cell orientation can be obtained from any other cell orientation through one of a reflection, a rotation, and a rotation followed by a reflection; and
d. said array containing at least one cell in each of said cell orientations.

4,918,441

NON-CONTACT SENSING UNIT FOR ROW CROP HARVESTER GUIDANCE SYSTEM

Carl E. Bohman, New Holland, Pa., assignor to Ford New Holland, Inc., New Holland, Pa.

Filed Dec. 22, 1988, Ser. No. 288,598
Int. Cl.[4] G08G *1/00*
U.S. Cl. 340—901 20 Claims



1 A guidance system for a row crop harvesting machine having at least first and second crop row separators adapted to move along opposite sides of a crop row of stalks, said guidance system comprising:
first and second transmitters for transmitting first and second energy beams, respectively;
first and second energy beam receptors;
said transmitters and receptors being mounted on said first and second row separators such that the first energy beam is received by said first receptor and said second energy

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beam is received by said second receptor, and said first and second energy beams having intersecting paths which cross a crop row so that said energy beams are interrupted by the stalks, the region of intersection of said energy beams defining the lateral position of said harvesting machine relative to said crop row; and,

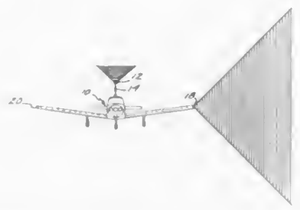
means responsive to said first and second receptors for producing steering control signals indicating the direction in which said harvesting machine must be steered in order to align said harvesting machine along said crop row.

4,918,442

AIRPLANE COLLISION AVOIDANCE SYSTEM

Donald W. Bogart, Jr., 5786 Campo Walk, Long Beach, Calif. 90803

Filed Oct. 3, 1988, Ser. No. 252,897
Int. Cl.[4] H04N *7/18*
U.S. Cl. 340—961 **2 Claims**



1. A collision avoidance system for airplanes including:

television cameras, which create images of objects through correspondingly arranged pixels, positioned on an aircraft so as to view areas of potential collision; a machine vision system responsively connected to said television cameras;

an on-board annunciator display responsively connected to said machine vision system positioned to be viewed by the pilot of said aircraft;

wherein said machine vision system includes a computer programmed to identify correspondingly predetermined contrasting individual pixel arrangements as collision hazards which cause alarm signals; and electronic means to send said alarm signals to said annunciator display.

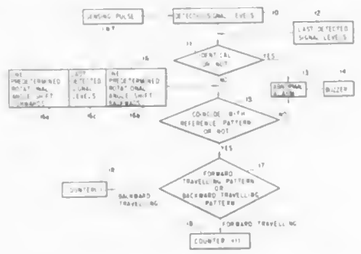
4,918,443

METHOD FOR DETERMINING A ROTATIONAL ANGLE OF A ROTARY BODY

Yukio Yoshida, Namerikawa; Akiyoshi Takimoto, Toyama, and Shigenobu Murai, Uozu, all of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Continuation of Ser. No. 133,424, Dec. 15, 1987, abandoned.
This application Sep. 5, 1989, Ser. No. 403,795
Claims priority, application Japan, Dec. 16, 1986, 61-297750
Int. Cl.[4] H03M *1/24*
U.S. Cl. 341—6 **3 Claims**

1. A method of determining a rotational position of a rotary body; consisting of the steps of generating n-phase rotational angular position signals formed in rectangular waves, respectively, which alternately repeat a high level and a low level at an interval equal to n times a predetermined rotational angle interval which is an even number ($2m$) fraction of 360 degrees, wherein m is an integer and n is a division larger than unity of m, and which are phase-shifted by said predetermined rotational angle interval with respect to one another, according to an encoding pattern on an encoder rotating synchronously with said rotary body and also generating sensing pulses at the predetermined rotational angle interval just behind the respective level changes of the rotational angular position signals; detecting the respective levels of said n-phase rotational angular position signals in response to the issue of the sensing pulse; comparing a variation pattern of a combination of detected n levels with a reference variation pattern and, if they do not coincide with each other, generating an abnormal alarm signal; discrimating whether said variation pattern is a forward traveling pattern or a backward traveling pattern, if said both variation patterns coincide with each other as a result of the comparison; and adding (+1) to a position counter if said variation pattern is a forward traveling pattern, or adding (−1) to the position counter if said variation pattern is a backward traveling pattern

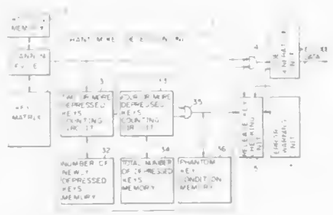


4,918,444

KEY-DEPRESSION DATA INPUT DEVICE

Norio Matsubayashi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 18, 1988, Ser. No. 169,889
Claims priority, application Japan, Mar. 19, 1987, 62-65309
Int. Cl.[4] H03M *11/00*
U.S. Cl. 341—25 **7 Claims**



1. A key-depression data input device for detecting a depressed key in a plurality of keys arranged in a key matrix, said device comprising:

phantom key detection means for detecting an occurrence of a phantom key state;

key release checking means for checking a released key among depressed keys, the releasing of said released key causing a cancellation of the phantom key state;

means for generating code data corresponding to the depressed keys when said key release checking means detects that said released key is the key satisfying a predetermined depression-release sequence condition; and

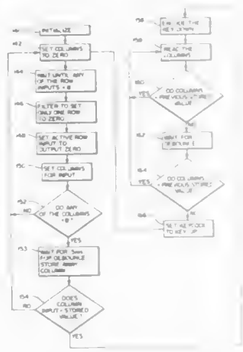
means for producing an error warning when said key release checking means detects that said released key is not the key satisfying the predetermined depression-release sequence condition.

4,918,445

SCANNING, ROW-COLUMN TYPE KEYBOARD

Grant L. Bower, Seattle, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 20, 1988, Ser. No. 221,856
Int. Cl.[4] H03M *11/00*
U.S. Cl. 341—26 **4 Claims**



1. A method of detecting key operations in a matrix keyboard, the keyboard having a plurality of keys each operable to connect one of a set of first wires with one of a set of second wires, each key being uniquely identified by the particular first and second wires which it serves to connect, the method comprising first and second operations performed sequentially:

the first operation including

driving each of the first wires with a first logic signal; and

sensing the presence of a first logic signal on one of the second wires, said sensing indicating that a key has been operated, and serving to identify the particular second wire to which the operated key is connected;

the second operation including:

driving the second wire on which the first logic signal was sensed with a second logic signal; and

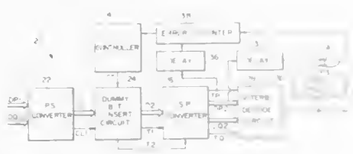
sensing the presence of a second logic signal on one of the first wires, said sensing of a second logic signal serving to identify the particular first wire to which the operated key is connected.

4,918,446

DECODER WITH REDUCED SYNCHRONIZATION CAPTURE TIME

Toshiharu Yagi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 30, 1988, Ser. No. 251,487
Claims priority, application Japan, Sep. 30, 1987, 62-248598
Int. Cl.[4] H03M *13/12*
U.S. Cl. 341—94 **2 Claims**



1. A decoder comprising:

dummy bit inserting means to which are serially inputted received data individually associated with second code bits which constitute a time sequence of second code symbols, said time sequence of second code symbols being produced by converting a time sequence of transmission data bits into a time sequence of first code symbols by convolutional coding and then deleting, in a group of first code bits which consitute a predetermined consecutive number of said first code symbols, those of said first code bits which are located in positions determined by a deleting pattern, said dummy bit inserting means inserting in synchronism with said deleting pattern on a trial-and-error basis any dummy bits in those positions where said first code bits have been deleted, and outputting a time sequence of received data in which said dummy bits have been inserted together with a first timing signal indicative of the positions of said dummy bits and a second timing signal which is associated with an end of each of said first code symbol;

serial-to-parallel converting means for applying serial-to-parallel conversion to the time sequence of received data in which the dummy bits have been inserted and the first timing signal by using the second timing signal, and producing a time sequence of parallel data associated with the time sequence of the first code symbols and third timing signals which are parallel and indicative of positions of the dummy bits in said time sequence of parallel data; and

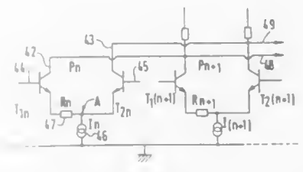
maximum likelihood decoding means for identifying the dummy bits out of the time sequence of parallel data by using the third timing signals, then decoding the time sequence of parallel data on a maximum likelihood basis by giving a predetermined maximum likelihood value to said dummy bits identified, and then outputting decoded data bits.

4,918,447

INTEGRATED D/A CONVERTER INCLUDING MEANS FOR REDUCING GLITCHES

Jean-Pierre Michel, Yerres, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 6, 1986, Ser. No. 860,270
Claims priority, application France, May 14, 1985, 85 07282
Int. Cl.[4] H03M *1/66*
U.S. Cl. 341—144 **6 Claims**



1. An integrated digital-to-analogue (D/A) converter circuit provided with a device for reducing glitches, which converts control signals having n binary states Bn into analogue signals and which comprises, n differential pairs Pn of transistors T1n and T2n connected to n current generators which supply currents of a value In weighted according to the binary weights 2^n of the binary states Bn, characterized in that, the transistors T1n receive their respective binary control signals and the transistors T2n receive respective binary control signals which are inverse to the control signals for the transistors T1n, the instant of triggering of the differential pairs at the leading edge of the control signal is shifted over the instants of triggering at a trailing edge of the control signal in that the shift of the triggering threshold of the transistors T1n with respect to the transistors T2n is effected over a constant value Vd obtained by the device for reducing glitches and comprising respective resistors connected in series with the emitters of the transistors of one of the series of transistors T1n or T2n in such a manner that Rn.In/2=Vd.

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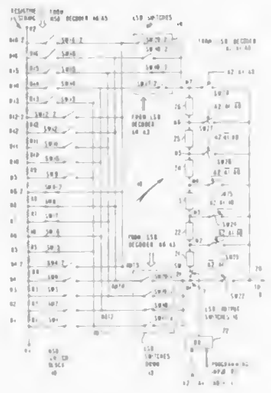
4,918,448

DEVICE FOR EXTENDING THE RESOLUTION OF A N-BIT RESISTIVE DIGITAL-TO-ANALOG CONVERTER TO A (N+P)-BIT DIGITAL-TO-ANALOG CONVERTER

Philippe Hauviller, Paris, and Michel Verhaeghe, Vence, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 26, 1988, Ser. No. 249,542
Claims priority, application France, Oct. 9, 1987, 87480013.9
Int. Cl.[4] H03M *1/68*
U.S. Cl. 341—145 9 Claims



1. Device for extending the resolution of a N-bit digital-to-analog DAC converter having N-digital inputs (A6..A3) and one output (7) to a (N+P)-bit DAC having (N+P) digital inputs (A6..A0) set to a first or second binary value (0 or 1) and one output, for converting a (N+P)-bit word into an analog voltage generated on the (N+P)-bit DAC,

said N-bit DAC comprising a first string (2) made of 2^N resistive elements (R1 to R16), each having a first and a second taps,

said string being mounted in series between a first terminal connected to a first voltage (V1) and a second terminal connected to a second voltage (V2), and

a first set of at least 2^N switches (10,12), each switch being mounted between the first tap of a resistive element and the N-bit DAC output and being responsive to one of the 2^N combinations of the values of the N digital inputs to establish a first conductive path between the first tap of a selected one of said resistive elements and the output of the N-bit DAC,

said device being characterized in that it comprises:

a second string (18) comprising at least 2^P-2 elements and being connected in series between a first node (M1) connected to the N-bit DAC output, and a second node (M7), said elements having first and second pads,

a second set of switches (14), each switch being mounted between the second tap of a resistive element of the first string and said second node and being responsive to the same combinations of the values of the N digital inputs as the first set of switches to establish a second conductive path between said second node (M7) and the second tap of the selected one of said resistive elements (R1 to R16),

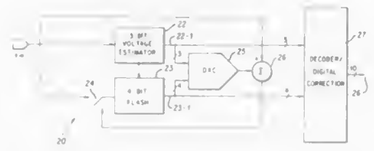
means (22, SW21) responsive to a specific combination of the P-bits to disconnect the second string from the first and second nodes (M1, M7) and provide the voltage generated at the N-bit DAC output to the output of the (N+P)-bit DAC when all said P-bits are set to the first value.

4,918,449

MULTISTEP FLASH ANALOG TO DIGITAL CONVERTER WITH VOLTAGE ESTIMATOR

Sing W. Chin, Alameda, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 13, 1989, Ser. No. 310,634
Int. Cl.[4] H03M *1/36*
U.S. Cl. 341—156 7 Claims



1. An N bit multistep flash analog to digital converter comprising:

an input terminal for receiving an analog input signal;

an output bus for providing an N bit digital word representing the magnitude of said input signal;

an analog signal estimator having an input lead coupled to said input terminal and an output bus for providing an M bit estimator word representing an approximate magnitude of said analog input signal;

a P bit flash converter having an input lead for receiving an analog signal to be converted and an output bus for providing a P bit digital word representing the magnitude of said analog signal applied to said input lead of said flash converter;

means for providing a residual analog signal equal to said input analog signal minus the analog equivalent of said M bit estimator word and a P bit digital word from a first cycle of said P bit flash converter;

switch means for coupling said input lead of said P bit flash converter to receive said analog input signal during a first cycle of said P bit flash converter and to receive said residual analog signal during a second cycle of said P bit flash converter; and

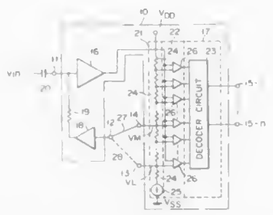
means for combining said M bit estimator word and said P bit digital words resulting from said first and second cycles of said P bit flash converter in order to provide said N bit digital output word.

4,918,450

ANALOG/DIGITAL CONVERTER CIRCUIT

Hisashi Sugiyama, and Yasuhiro Sugimoto, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 19, 1989, Ser. No. 367,654
Claims priority, application Japan, Jun. 20, 1988, 63-151772
Int. Cl.[4] H03M *1/36*
U.S. Cl. 341—159 14 Claims



1. An analog/digital converter circuit comprising:

a capacitor having a first end, to which an analog voltage is applied, and a second end;

an input buffer circuit having an input terminal, connected to the second end of said capacitor, and an output terminal;

a reference voltage generating circuit for generating a plurality of reference voltages having different voltage levels;

a voltage comparator circuit having a plurality of voltage comparators for comparing the output voltage of said input buffer circuit with each of the reference voltages generated by said reference voltage generating circuit, and generating a digital signal corresponding to the comparison results;

a decoder circuit for decoding the output of said voltage comparator circuit; and

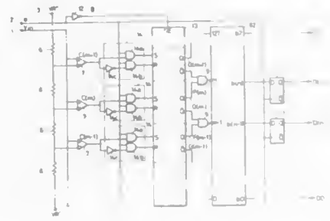
D.C. bias voltage selection/supply means for selecting one of the reference voltages of said reference voltage generating circuit and supplying the selected reference voltage as a D.C. bias voltage to the input terminal of said input buffer circuit.

4,918,451

A/D CONVERTER WITH PREVENTION OF COMPARATOR OUTPUT DISCONTINUITIES

Hideki Ando, and Takahiro Miki, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1988, Ser. No. 265,223
Claims priority, application Japan, Nov. 20, 1987, 62-294558
Int. Cl.[4] H03M *1/00*
U.S. Cl. 341—159 4 Claims



1. An A/D converter for converting an analogue signal into a digital signal in synchronization with a sampling clock (ϕ), comprising

resistance type potential divider means comprising a plurality of resistor elements connected in series between a first reference voltage terminal receiving a first reference voltage and a second reference voltage terminal receiving a second reference voltage which has a different value from that of said first reference voltage,

a plurality of comparator means for comparing individually a plurality of voltages outputted from one end of each of resistors of said resistance type potential divider means with the level value of said analogue signal,

data transfer means for storing and holding output bits of said plurality of comparator means in the form of logic data bits, said data transfer means shifting discontinuous portions of said logic data bits

means responsive to the output bits of said data transfer means for generating an address signal, and

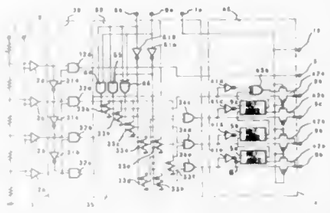
encoder means for outputting a predetermined digital value corresponding to said address signal.

4,918,453

A/D CONVERTER HAVING MULTIPLICATION FUNCTION

Masatoshi Kimura; Sumitaka Takeuchi, and Keisuke Okada, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 14, 1988, Ser. No. 181,338
Claims priority, application Japan, Sep. 18, 1987, 62-235883
Int. Cl.[4] H03M *1/36*
U.S. Cl. 341—160 7 Claims



1. A semiconductor integrated circuit for receipt of analog values and digital values and for producing a mathematical product for the values and the complement of the product when the digital value is negative, comprising:

a plurality of comparators which respectively compare the analog values inputted with individual reference voltages and output representative values for said analog values;

multiplication means, coupled to said comparators, for controlling values outputted from said plural comparators by applying control signals corresponding to the digital values and for producing a multi-bit product of said representative values and said digital values; and

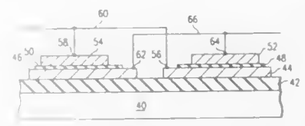
complement operation means, coupled to said multiplication means, for converting said product into a complement product when a particular digital values is negative.

4,918,454

COMPENSATED CAPACITORS FOR SWITCHED CAPACITOR INPUT OF AN ANALOG-TO-DIGITAL CONVERTER

Adrian B. Early, Buda, and Baker P. L. Scott, III, Austin, both of Tex., assignors to Crystal Semiconductor Corporation, Austin, Tex.

Filed Oct. 13, 1988, Ser. No. 257,477
Int. Cl.[4] H03M *1/00*
U.S. Cl. 341—172 40 Claims



1. A delta-sigma modulator for an analog-to-digital converter, the delta-sigma modulator having at least one stage of integration and a switched capacitor input sampling circuit, the switched capacitor input circuit comprising:

a switched capacitor having first and second terminals;

first switching circuitry for connecting the first terminal of said switching capacitor to an input voltage and the second terminal thereof to a reference voltage during a charging cycle;

second switch circuitry for connecting the second terminal of said capacitor to the input of the delta-sigma modulator on the input of at least one stage of integration and the first

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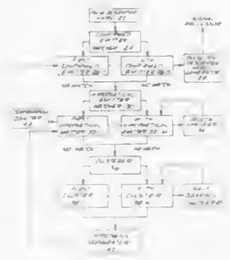
terminal of the switching capacitor connected to a reference voltage during a charge redistribution cycle;
clock means for controlling the delta-sigma modulator and generating control signals for said first and second switch circuitry to operate in either the charging cycle or the charge redistribution cycle;
said switching capacitor comprising:
a first lower electrode;
a second lower electrode;
a first upper electrode disposed over said first lower electrode;
a second upper electrode disposed over said second lower electrode;
a first layer of capacitor dielectric disposed between said first lower electrode and said first upper electrode;
a second layer of capacitor dielectric disposed between said second upper electrode and said second lower electrode;
at least said first and second lower electrodes or said first and second upper electrodes being fabricated from a semiconductor material;
said first and second lower electrodes being substantially identical;
said first and second upper electrodes being substantially identical;
first terminal means for connecting said first lower electrode to said second upper electrode and comprising said first terminal; and
second terminal means for interconnecting said first upper electrode to said second lower electrode and comprising said second terminal.

4,918,455

ASSOCIATIVE HIERARCHIACL DEINTERLEAVER

Mark W. Maier, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 3, 1988, Ser. No. 266,739
Int. Cl.[4] G01S *7/44*
U.S. Cl. 342—13 **41 Claims**



1. A method for deinterleaving a plurality of signal pulses where each signal pulse is characterized by at least two parameters, the method comprising the steps of:
associating signal pulses having a similar value for one of the parameters into a group of signal pulses;
predicting a value for another parameter for an additional signal pulse not associated with the group;
associating signal pulses with the group which have values for the other parameter which are similar to the predicted parameter value; and
reporting an indication of at least one of the parameter values of the signal pulses associated with the group if the group has more than a threshold number of signal pulses associated with it.

4,918,456

APPARATUS FOR DETECTING HETEROGENEITY OF WATER SURFACE

Nikolai V. Druzhinin; Anatoly R. Pavlenko; Valentin G. Abakumov; Adnan D. Al-Kadimi; Sergei V. Zhluktenko; Vladimir S. Lazebny, all of Kiev; Anatoly I. Kalmykov, Kharkov; Elena G. Kuzoyatova, Donetsk; Viktor Y. Chuev; Anatoly S. Sysoev, both of Novorossiisk; Alexandr P. Pichugin; Anatoly B. Fetisov, both of Kharkov; Stanislav V. Denbnovetsky; Alexandr V. Leschishin, both of Kiev; Vladimir P. Kuzmin, and Vladimir N. Mikhailov, both of Novgorod, all of U.S.S.R., assignors to Kievsky Politekhnichesky Institut, Kiev, U.S.S.R.

Filed Feb. 4, 1988, Ser. No. 152,343
Int. Cl.[4] G01S *13/95*
U.S. Cl. 342—26 **9 Claims**

1. An apparatus for detecting heterogeneity of water surface, comprising:
a transceiver generating sounding radar pulses, receiving a radar signal reflected from the water surface and forming a video signal carrying hydrometeorological information on heterogeneity of the water surface:
a hydrometeorological information processing unit connected to said transceiver and comprising:
an amplitude selector connected to an output of said transceiver and selecting a part of the video signal in an amplitude range ensuring maximum contrast of the heterogeneity against the background of the water surface;
a video signal amplifier having an input connected to an output of said amplitude selector;
a video signal switching member having an input connected to an output of said video signal amplifier;
a cathode ray storage device having a plurality of inputs and one data output which is connected to an output of said video signal switching member;
a mode selector unit of the cathode ray storage device connected to said cathode ray storage device;
a readout signal switching member controlling a signal read out from said cathode ray storage device, an input of said switching member being connected to said data output of said cathode ray storage device;
a driving generator having one of outputs thereof connected to an input of said transceiver;
a control unit having one input connected to another output of said transceiver, another input connection to one of the outputs of said driving generator, one output connected to another input of said readout signal switching member, a second output connected to said video signal switching member, and a third output connected to said mode selector unit of the cathode ray storage device;
an electron beam control system having:
a sweep voltage former having one input connected to another output of said driving generator and another input connected to one of the outputs of said transceiver;
a sweep signal converter having an input connected to an output of said sweep voltage former;
and a focusing and deflection system having an input connected to an output of said sweep signal converter

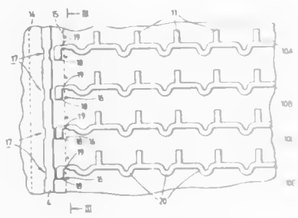
and an output connected to said cathode ray storage device;
an indicator having a plurality of inputs and an output, one of said inputs being connected to the output of said readout signal switching member, a second input being connected to the output of said sweep voltage former, and a third input being connected to one of the outputs of said control unit.

4,918,457

ANTENNA FORMED OF STRIP TRANSMISSION LINES WITH NON-CONDUCTIVE COUPLING

Peter J. Gibson, Crawley, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 23, 1989, Ser. No. 302,077
Claims priority, application United Kingdom, Dec. 20, 1985, 8531502
Int. Cl.[4] H01Q *1/38*
U.S. Cl. 343—700 MS **10 Claims**



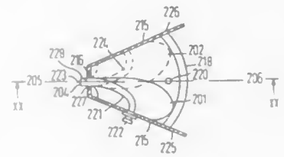
1. An antenna comprising a substrate supporting strip transmission line conductors distributed over an area defining a radiation aperture, said antenna including:
a. an elongate primary strip transmission line having an end thereof defining a feeder port and having a multiplicity of coupling portions of predetermined dimensions disposed at predetermined positions therealong;
b. a multiplicity of coupling strip conductors extending parallel to respective ones of the coupling portions of the primary strip transmission line, each of said strip conductors having predetermined dimensions and being spaced at a predetermined distance from said respective coupling portion;
c. a multiplicity of elongate secondary strip transmission lines, each having a first end electrically connected to a first end of a respective one of the strip conductors and extending away from the primary strip transmission line; and
d. shielding means disposed adjacent coupling spaces defined by said predetermined distances from the coupling portions to the coupling strip conductors for minimizing radiation from the antenna of energy coupled between said coupling portions and said coupling strip conductors;
the predetermined dimensions of the coupling portions and of the strip conductors and the predetermined distances therebetween being established to effect differing predetermined degrees of energy coupling between the primary strip transmission line and the secondary strip transmission lines and to effect production of a predefined radiation pattern.

4,918,458

SECONDARY RADAR TRANSPONDER

Anton Brunner, Rosenstrasse 2, 8136 Wangen, and Karl-Heinz Kristkoiz, Schlierachstrasse 4, 8000 Muenchen 90, both of Fed. Rep. of Germany

Filed May 14, 1980, Ser. No. 153,922
Claims priority, application Fed. Rep. of Germany, May 30, 1979, 2921855; Jul. 20, 1979, 2929343
Int. Cl.[4] G01S *13/74*; H01Q *3/00*
U.S. Cl. 343—795 **41 Claims**



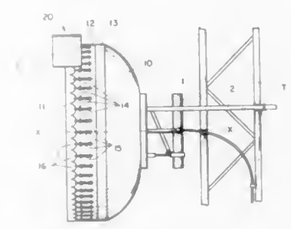
1 An antenna structure for a secondary radar transponder, comprising: a pair of spaced radiator halves which extend from a feed
location in a V-shaped diverging pattern toward
a radiator end; and said radiator halves rotated at least partially with respect
to the plane of feeding and each of said halves including a surface width which increases toward said radiator end and is arcuately terminated thereat.

4,918,459

APPARATUS FOR PROTECTING ANTENNAS

John S. De Teso, 1902 First St., La Marque, Tex. 77568

Filed Feb. 27, 1989, Ser. No. 315,484
Int. Cl.[4] H01Q *1/42*
U.S. Cl. 343—872 **12 Claims**



1 Apparatus for protecting the shroud and radome portions of a parabolic antenna which includes a parabolic reflector having a central axis and a concave face around the periphery of which is attached said shroud and radome, a protective cover covering said reflector face for protection from physical damage and damage from the environment, said apparatus comprising:
an elongated shield which curves from one end to another providing a cylindrical surface; and,
attachment means affixed to said shield and by which said shield apparatus may be attached to said antenna so that when the axis of said antenna is inclined relative to the surface of the earth said shield overlies the uppermost periphery of said protective cover in spaced relationship therewith in close proximity to prevent birds from perching thereon.

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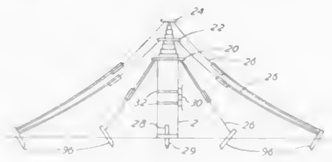
4,918,460

TELESCOPIC MAST WITH A REEL FOR WINDING SETS OF STAYS

Brian S. Collins, Sittingbourne; Reginald F. Batters, Maidstone; Mervyn Brameld, Gillingham, all of United Kingdom, and Timothy Price, Vienna, Va., assignors to C&S Antennas Limited, United Kingdom

Filed Aug. 31, 1988, Ser. No. 238,658
Claims priority, application United Kingdom, Sep. 2, 1987, 8720658; European Pat. Off., May 27, 1988, 88304842.3
Int. Cl.[4] H01Q *1/12*
U.S. Cl. 343—877 4 Claims



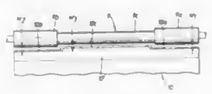
2. A method of winding stays for use in erecting a telescopic mast having at least three sets of stays, comprising winding stays sequentially on one or more winding reels, in which at least some of the stays other than the stay of the lowermost set of stays are wound with stays of two adjacent sets alternating, one of the adjacent sets being wound each stay with an end innermost on the reel for attachment to a stay fixing location and the other set being wound each stay with an end outermost on the reel for attachment to the said stay fixing location.

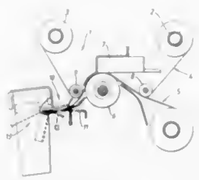
4,918,461

INK FILM RECORDING APPARATUS

Shogo Murakami, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Apr. 28, 1989, Ser. No. 344,670
Claims priority, application Japan, Jun. 14, 1988, 63-78615[U]
Int. Cl.[4] G01D *15/10*
U.S. Cl. 366—76 PH 15 Claims





1. A recording apparatus for recording information on a recording medium by applying ink to selected portions of the recording medium from an ink film, said recording apparatus comprising:

recording head means in contact with the ink film for transferring ink from the ink film to selected portions of the recording medium;

transport means for transporting the ink film and the recording medium together along a path adjacent said recording head means; and

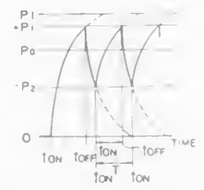
ink film separating means for separating the ink film from the recording medium after said recording head means transfers ink to the recording medium, said ink film separating means comprising roller means for guiding the ink film away from the recording medium without causing wrinkles in the ink film and a separating plate adjacent said roller means, said roller means comprising a pair of side rollers and a center roller extending between said side rollers, said side rollers having a diameter larger than the diameter of said center roller, said separating plate having a separating edge spaced from said side and center rollers at a distance selected to enable said separating plate to separate the ink film and the recording medium, said separating edge having a configuration complementary to the configuration of said side and center rollers.

4,918,462

METHOD AND APPARATUS FOR DRIVING A SOLID SCAN TYPE RECORDING HEAD

Satoru Tomita, Yokohama; Kazuyuki Shimada, Tokyo, and Chiaki Taniguchi, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 13, 1989, Ser. No. 337,964
Claims priority, application Japan, Apr. 14, 1988, 63-92091
Int. Cl.[4] G01D *9/42, 15/06*
U.S. Cl. 346—107 R 20 Claims



1. A method for driving a solid scan type recording head having a plurality of elements having a function such as light emission, exothermic and discharge, comprising the steps of:

generating a plurality of pulse signals different from each other in one of a frequency and duty ratio thereof over a fixed time, depending on a difference in characteristics of said plurality of elements, each of said pulse signals varying in level so as to rise the power level of the related element in a rise response characteristic thereof before the power level of said related element completely falls to a predetermined lowest power level in accordance with a fall response characteristic thereof;

selecting one of said plurality of pulse signals for each of said plurality of elements, depending on the characteristic of the element of concern; and

generating a driving signal for each of said plurality of elements from the corresponding selected one of said plurality of pulse signals and corresponding image data, said driving signal being supplied to the corresponding one of said elements,

said driving signal changing in accordance with the corresponding pulse signal so that the power level of the related element changes without becoming equal to said predetermined lowest power level over said fixed time.

4,918,463

COMPACT PRINTER HAVING AN INTEGRAL CUT-SHEET FEEDER

Michael J. Piatt, Enon, Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.

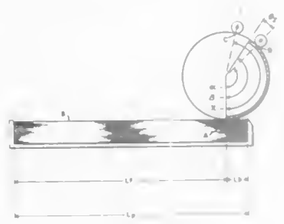
Division of Ser. No. 20,416, Mar. 2, 1987, Pat. No. 4,763,138.
This application May 17, 1988, Ser. No. 201,996
Int. Cl.[4] G01D *9/24;* B41J *11/02*
U.S. Cl. 345—134 8 Claims

1. In printer apparatus of the kind having a housing, a print zone and means for printing across successive sectors of print

sheets moved through said print zone, an improved construction for feeding and transporting print sheets comprising:

(a) a sheet-feeding and recording-transport member having friction surfaces that are movable to circulate between a sheet-supply zone and a sheet printing zone;

(b) means for driving said member so that said surfaces circulate between said zones;



(c) a sheet supply station including means for supporting a stack of sheets and positioning successive face sheets of such stack at said sheet-supply zone; and

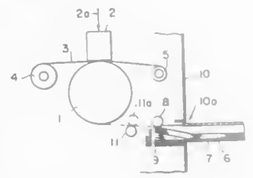
(d) means for effecting periodic feeding contact between friction surfaces of said member and successive face sheets of a positioned stack in timed relation with the circulating movement of said member.

4,918,464

HEAT-SENSITIVE IMAGE TRANSFER TYPE PRINTING APPARATUS

Makoto Isshiki, Ichikawa, Japan, assignor to Dai Nippon Insatu Kabushiki Kaisha, Japan

Filed Nov. 25, 1988, Ser. No. 276,133
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH 8 Claims



7. A heat-sensitive image transfer type printing apparatus comprising:

record-sheet supporting means having a supporting surface upon which a record sheet is supported;

a thermal head disposed in opposing relationship with said supporting surface of said record-sheet supporting means with a gap therebetween and having a plurality of heating elements which can be selectively energized in response to an input image signal;

transfer-ink-film transportation means for transporting a transfer ink film, having at least one major surface containing dyes, between said supporting surface of said record-sheet supporting means and said thermal head; and

record-sheet feed means for feeding a record sheet from a record-sheet feed part to said gap such that said transported record sheet is superposed on said transfer ink film, whereby the dyes are transferred from said transfer ink film to said superposed record sheet by selective energization of said plurality of heating elements of said thermal head and said transfer dyes are recorded on said superposed record sheet;

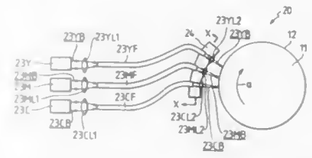
wherein said record-sheet feed means comprises dust removal means disposed at a position in the record-sheet feed path extending from said record-sheet feed part to said gap so as to remove dust particles or the like attached to the surface of the record-sheet being transported, wherein said dust removal means comprises a grounded electric discharge brush in contact with the image receiving layer of the record-sheet being transported.

4,918,465

MULTI-COLOR BEAM SCANNER WITH SIMULTANEOUS SCANNING ALONG A PLURALITY OF SCAN LINES

Naoyuki Morita, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 10, 1988, Ser. No. 204,805
Claims priority, application Japan, Jun. 10, 1987, 144971; Jun. 10, 1987, 144972
Int. Cl.[4] G01D *15/14;* H04N *1/46*
U.S. Cl. 346—108 17 Claims



1. In a multi-color beam exposure system in which light of plural colors is emitted and focused to form a multi-color focused image on a photosensitive material would around a drum, the improvement comprising:

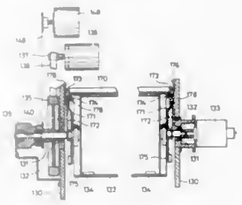
means for providing a plurality of said multi-color beams focused on said photosensitive material and in the axial direction of said drum to form a plurality of said multi-color beams along each one of a plurality of scan lines in the axial direction of the drum thereby to expose said photosensitive material along a plurality of scan lines simultaneously.

4,918,466

LIGHT BEAM IMAGE RECORDING APPARATUS HAVING COMMONLY DRIVEN MEMBER

Kazuhisa Takahashi, Yokohama; Keiichi Kawasaki, Tokyo, and Yuji Itoh, Chigawaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 17,637, Feb. 24, 1987, abandoned, which is a continuation of Ser. No. 713,702, Mar. 19, 1985, Pat. No. 4,698,648. This application Feb. 13, 1989, Ser. No. 310,500
Claims priority, application Japan, Mar. 22, 1984, 60-053485; Nov. 27, 1984, 60-250308
Int. Cl.[4] B01D *15/14*
U.S. Cl. 346—108 9 Claims



1. Image recording apparatus comprising:

a rotatable endless carrying body for recording an image on

a recording sheet, said endless carrying body being in contact with the recording sheet in a recording position;
means for supplying the recording sheet to the recording position;
means for discharging the recording sheet from the recording position;
a first motor for driving said endless carrying body with the recording sheet during execution of a recording process;
means for scanning a light beam in a direction intersecting a driving direction of the recording sheet; and
a second motor for driving said endless carrying body and at least one of said supplying means and said discharging means during non-execution of the recording process.

4,918,467
RECORDING WEB DRIVE WITH ROTATING PRESSURE PAD

Herbert F. Sanford, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

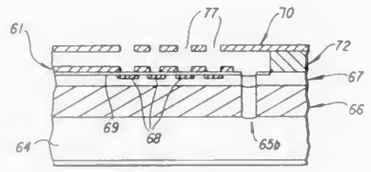
Filed Jun. 30, 1988, Ser. No. 213,379
Int. Cl.[4] G01D *9/42, 15/14*
U.S. Cl. 346—110 R 11 Claims

1. A paper drive system for a hard copy recorder of the type in which a light sensitive paper web is moved past a recording region in which the paper web is exposed to luminous signals to be recorded, comprising:
a cathode ray tube with an elongated fiber optic faceplate which produces luminous signals along a linear recording region of predetermined length;
a circular cylindrical pressure pad of a length at least as great as the length of the recording region and having a hard tire of predetermined diameter located midway along the length of said pressure pad, said pressure pad further having a cylindrical compliant foam surface on either side of the tire, the outer diameter of the foam surface being slightly larger than the diameter of the tire, the combined length of the foam surface and width of the tire being at least as great as the length of the recording region;
means for mounting said pressure pad for rotation about a first axis parallel with the linear recording region and located relative to the faceplate so that only the foam surface contacts the faceplate;
a drive roller rotatable about a second axis parallel with the first axis and located on one side of the plane containing the recording region and the first axis, the drive roller being located relative to the hard tire on said pressure pad so as to grip a paper web between the tire and the drive roller;
means for rotating said drive roller; and
an idler roller rotatable about a third axis parallel with the first axis on the opposite side of the plane containing the recording region and the first axis from the second axis, the idler roller further being located relative to the hard tire on said pressure pad so as to grip a paper web between the tire and the idler roller.

4,918,468
METHOD AND APPARATUS FOR CHARGED PARTICLE GENERATION

Fred Miekka, Boxborough, and Leo A. Beaudet, Milford, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 270,527, Nov. 21, 1988, abandoned. This application May 15, 1989, Ser. No. 352,395
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—159 26 Claims



1. An improved method of generating charged particles for electrostatic imaging which comprises:
applying an alternating potential between a first electrode substantially in contact with one side of a solid dielectric member and a second electrode substantially in contact with an opposite side of the solid dielectric member, said second electrode having an edge surface disposed opposite said first electrode to define a discharge region at the junction of the edge surface and the solid dielectric member, to induce charged particle producing electrical discharges in said air region between said solid dielectric member and the edge surface of said electrode;
applying a charged particle extraction potential between said second electrode and a further electrode member to extract charged particles produced by the electrical discharges in said air region; and
applying the external charged particles to a further member to form an electrostatic image,
wherein the improvement comprises supplying a controlled gas to the discharge site to displace at least some of the air during charged particle generation, said controlled gas being selected from the group consisting of nitrogen, elemental noble gasses, mixtures of elemental noble gasses, and mixtures of nitrogen with one or more elemental noble gasses.

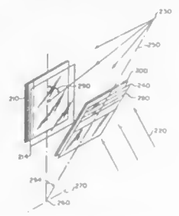
4,918,469
DIFFRACTIVE COLOR AND TEXTURE EFFECTS FOR THE GRAPHIC ARTS

Stephen P. McGrew, 1718 Columbus Pl., Santa Clara, Calif. 95051

Division of Ser. No. 820,195, Jan. 17, 1986, Pat. No. 4,717,221, which is a continuation of Ser. No. 314,553, Feb. 8, 1982, Pat. No. 4,629,282, which is a continuation-in-part of Ser. No. 203,563, Nov. 5, 1983, abandoned. This application Nov. 17, 1987, Ser. No. 121,615
Int. Cl.[4] G03H *1/22, 1/30*
U.S. Cl. 350—3.69 6 Claims

1. A method of forming a graphical composition, comprising combining a plurality of image regions, said image regions

together forming an image, each of said image regions being recorded as a hologram, at least one of said image regions

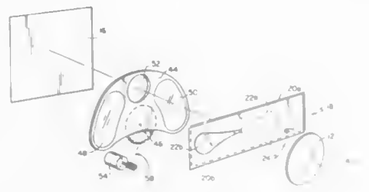


being limited by recording through a mask such that one image region does not overlay another image region.

4,918,470
APPARATUS FOR CONTROLLING THE COLOR BALANCE OF A PHOTOGRAPHIC IMAGE

George D. Whiteside, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 5, 1988, Ser. No. 279,659
Int. Cl.[4] G03B *21/00*
U.S. Cl. 354—21 14 Claims

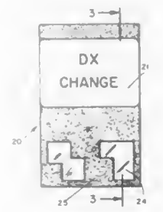


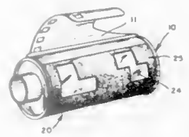
1. Photographic apparatus comprising:
a film cassette for containing at least one frame of a photosensitive material and having indicia on an external surface thereof in which a characteristic of the photosensitive material is encoded in a binary format;
means for supporting the photosensitive material in position for exposure;
means for directing scene light along an optical path and onto the photosensitive material during an exposure;
an optical filter assembly having at least one filter, said optical filter assembly having a first mode of operation wherein one filter is positioned within said optical path and filters the scene light before it strikes the photosensitive material, and a second mode of operation wherein said one filter is located out of the optical path and scene light is permitted to strike the photosensitive material in an unfiltered condition;
means responsive to an encoded photosensitive material characteristic in said indicia and to a factor external of the photosensitive material for generating a composite signal representative of the extent such characteristic and factor may have on the color balance of a photographic image subsequently formed in such photographic material; and
means coupled to said optical filter assembly and responsive to said composite signal for placing said optical filter assembly in either said first or second modes of operation in accordance with said signal, prior to the exposure of the photosensitive material.

4,918,471
FILM SPEED CODE CHANGER FOR USE WITH AN ENCODED FILM CARTRIDGE

Roy E. Harling, 1914 Corinth Ave., Los Angeles, Calif. 90025, and Timothy D. Skeer, 11902 Honeybrook St., Moorpark, Calif. 93021

Filed Mar. 17, 1989, Ser. No. 325,360
Int. Cl.[4] G03B *7/00*
U.S. Cl. 354—21 6 Claims





1. A film speed code changer for use with an encoded film cartridge which contains film and which has a coded surface with a conductive surface with a non-conductive region the dimensions of which provide a film speed code which enables an automatic camera to read film speed data for the film, said film speed code changer comprising:
a. a sheet of flexible material having a conductive surface and a backing surface;
b. adhering means for adhering said backing surface of said sheet of flexible material to the coded surface of the encoded film cartridge; and
c. insulating means for forming a non-conductive region on said conductive surface of said sheet of flexible material, the dimensions of said non-conductive region provide a changed film speed code which causes the automatic camera to read different film speed data for the film.

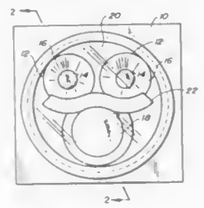
4,918,472
WATERPROOF CAMERA WINDOW

Thomas T. Reed, 215 Alison Ave., Rohnert Park, Calif. 94928

Filed Jun. 21, 1989, Ser. No. 369,322
Int. Cl.[4] G03B *17/08*
U.S. Cl. 354—64 5 Claims

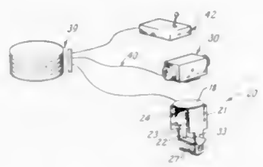
1. A window for an submersible camera, said camera including a light source for generation and emission of light rays, and further including a camera lens, said window comprising:
a generally planar, optically transparent window member, of a size to cover both said light source and said camera lens, said window member having an outside surface and an inside surface;
a first mask portion on said window member outside surface, said first masked portion located between said light source and said camera lens and conditioned to alter the optical reflectivity of light rays emitted from said light source; and
a second mask portion on said window member inside sur-

face, said second masked portion located between said light source and said camera lens and conditioned to alter



the optical reflectivity of light rays emitted from said light source.

4,918,473
SURVEILLANCE CAMERA SYSTEM
David M. Blackshear, Molena, Ga., assignor to Diamond Electronics, Inc., Carroll, Ohio
Filed Mar. 2, 1988, Ser. No. 163,257
Int. Cl.[4] G03B *29/00*
U.S. Cl. 354—81 **17 Claims**



1. A surveillance camera system comprising a housing that includes an at least partially transparent, generally hemispherically shaped dome having a geometric center; a camera mount mounted within said housing for panning movements about a pan axis that extends through or closely adjacent to said dome center and for tilting movements about a tilt axis that transverses said pan axis through or closely adjacent to said dome center; electric motor means mounted within said housing for panning and tilting said camera mount; a camera mounted upon said camera mount with its center of gravity located adjacent said pan and tilt axes; rotary electric coupling means mounted to said housing; and electric connector means for connecting said camera and said motor means with an ancillary video display and camera orientation control means through said rotary coupling means, said rotary electric coupling means being adapted to transmit electrical signals during continuous unidirectional panning movement of said camera mount.

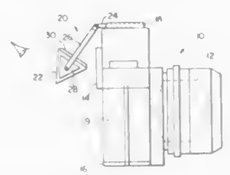
4,918,474
CAMERA
Masaharu Kawamura; Shosuke Hsraguchi, and Hideki Morishima, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 3, 1989, Ser. No. 305,857
Claims priority, application Japan, Feb. 8, 1988, 63-028183
Int. Cl.[4] G03B *1/18, 1/66, 17/36*
U.S. Cl. 354—173.1 **25 Claims**

1. A motor-driven camera of the prewind type in which, when loading a film, an automatic loading for automatically winding the film onto a take-up spool is performed, then a prewinding action for preliminary winding the film is consecutively performed and, after completion of the prewinding action, one frame of the film is rewound for every photographing shot, comprising:

(a) an electric film counter for counting the number of frames of the film in response to the transport of the film;
(b) detection means for detecting the movement of the film; and
(c) a determining circuit for determining a state of the camera when said detection means has detected that the film is not moving,

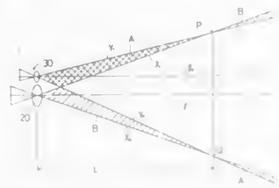
(c-1) said determining circuit determining the prewinding action to have been completed when a counted value of said electric film counter is greater than a predetermined value, and
(c-2) said determining circuit determining the automatic loading to have failed when the counted value of said electric film counter is not greater than said predetermined value.

4,918,475
CAMERA WITH SPECTROSCOPE ATTACHMENT
Clarence C. Edwards, 4256 E. Capitol St., Washington, D.C. 20019
Filed Aug. 16, 1988, Ser. No. 232,686
Int. Cl.[4] G03B *13/02, 17/48*
U.S. Cl. 354—76 **27 Claims**



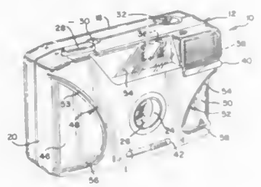
1. Apparatus for determining the spectral light distribution of a scene and photographing the scene, comprising:
a camera adapted to have color film therein,
an optical path including lens means in said camera in advance of color film therein,
a spectroscope, and
means for supporting said spectroscope on said camera for movement between a first position for enabling the viewing of a scene therethrough and a second position in which the spectroscope is remote from the optical path in advance of film in said camera.

4,918,476
STILL CAMERA
Yasuyuki Tejima, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 17, 1988, Ser. No. 194,920
Claims priority, application Japan, May 19, 1987, 62-120206
Int. Cl.[4] G03B *13/12, 17/18*
U.S. Cl. 354—221 **42 Claims**



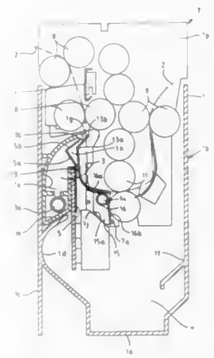
1. A camera having means for indicating whether a person being photographed is within the picture taking area of a lens associated with said camera, comprising:
means for delaying the actuation of a shutter of said camera;
means for indicating that said actuation of said shutter has been delayed; and
means for setting a viewing angle of said indicating means to substantially coincide with said picture taking area of said lens, wherein said person being photographed can see said indicating means by looking at said camera when said person is within said picture taking area of said lens.

4,918,477
CAMERA HOUSING WITH GRIPPING RECESSES
Hari Matsuda, Evanston, and Scott W. Robinson, Northbrook, both of Ill., assignors to W. Hsking Enterprises, Ltd., Hong Kong
Filed Nov. 15, 1988, Ser. No. 271,512
Int. Cl.[4] G03B *17/02*
U.S. Cl. 354—288 **12 Claims**



1. In a generally rectangular still camera housing having generally parallel vertical front and rear wall faces joined by first and second vertical side wall faces and top and bottom wall faces, a depressible shutter release button on said top wall surface adjacent the right end thereof and to be depressed by the index finger of the right hand, said front wall face having an objective lens window between said side wall faces, the improvement comprising: a first gripping area to one side of said lens opening for the user's right hand, said area being a first recessed surface inwardly offset into said front wall face, the outer margin of said first recessed surface extending to said first side wall face, the inner margin of said first surface being defined by a first terminal step forming a finger-guiding bounding surface joining said first recessed surface to said front wall face and extending along a concave arc extending across said front wall face from an upper portion of said first side wall surface where it intersects the same substantially transversely thereto and then progressively curves in the same direction downwardly thereafter where it reaches a substantially vertical extent in the lower half of the recessed surface, to serve as a barrier between the user's fingers and said lens opening the size and location of said first recessed surface enabling the tip end of the user's middle finger to be placed in abutment with a portion of said first terminal step when the tip end of the user's index finger is placed in contact with said depressible shutter release button on said top wall face.

4,918,478
TANK WITH RACK FOR WET PROCESSING PHOTOGRAPHIC MATERIAL
Werner Sperber, Munich; Harald Fengler, Taufkirchen, and Wilfried Hehn, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Aug. 11, 1989, Ser. No. 392,643
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1988, 8810735
Int. Cl.[4] G03D *3/08*
U.S. Cl. 354—320 **16 Claims**



1 An arrangement for processing photosensitive material, particularly for wet processing running lengths of photographic material, comprising a treatment vessel for the photosensitive material; means defining a path for the photosensitive material and designed to be removably mounted in said vessel, said path defining means including a support and a guide mounted on said support for movement between an inoperative position and an operative position in which said guide is arranged to direct the photosensitive material along said path; means urging said guide to said inoperative position; and cooperating first and second means on said guide and in said vessel, respectively, for moving said guide from said inoperative position to said operative position upon insertion of said support in said vessel.

4,918,479
CAMERA
Manabu Inoue; Yoshiaki Hata, both of Osaka; Koulchi Kobayashi, and Norifumi Nakagawa, both of Tokyo, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka and Copal Company, Ltd., Tokyo, both of, Japan
Filed May 15, 1989, Ser. No. 351,782
Claims priority, application Japan, May 16, 1988, 63-118796
Int. Cl.[4] G03B *1/00, 7/00, 7/097*
U.S. Cl. 354—400 **14 Claims**

1 A camera comprising:
operable means changeable from an initial position to a predetermined position and vice versa;
drive means for driving said operable means;
detection means for detecting that said operable means reaches the predetermined position;
a first control means for controlling said drive means so that

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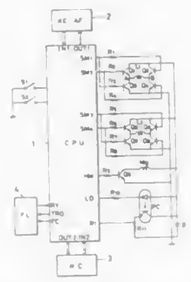
said operable means changes from the initial position to the predetermined position; and

a second control means for controlling said drive means so



that said operable means returns to the initial position unless said operable means reaches the predetermined position within a predetermined driving amount of said drive means.

4,918,480

ELECTROMAGNETIC SHUTTER FOR CAMERA

Masakatsu Hori, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 27, 1988, Ser. No. 263,419

Claims priority, application Japan, Oct. 30, 1987, 62-275401

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—400 **20 Claims**

1. An electromagnetic shutter of a camera in which a lens is moved to a focal position by rotation of a single reversible motor in one direction, and in which exposure control is effected by reverse rotation of said motor in an opposed direction, said shutter comprising a first rotating member which is continuously associated with rotation of the reversible motor in forward and reverse directions, a second rotating member which contacts the first rotating member at a specific rotational position so as to rotate together when the first member rotates in the forward direction, a focus adjusting lens barrel which moves in an optical axis direction in association with rotation of the second rotating member, a lens shutter which is supported by the second rotating member and which is opened and closed by relative rotation of the first rotating member with respect to the second rotating member, one-way clutch means which allows the second rotating member to rotate only in one direction, from its initial position into a terminal end position, and which prevents rotation of the second rotating member in an opposite direction, and means for releasing the one-way clutch means when the second rotating member reaches the terminal and position.

4,918,481

CAMERA CAPABLE OF BRACKETING EXPOSURE

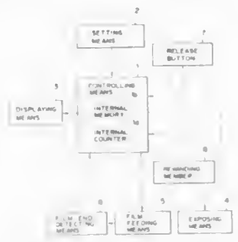
Seiichi Yasukawa; Takashi Saegusa, both of Kawasaki, and Tsutomu Wakabayashi, Tokyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed May 22, 1989, Ser. No. 354,808

Claims priority, application Japan, May 26, 1988, 63-129031

Int. Cl.[4] G03B *7/00*

U.S. Cl. 354—410 **13 Claims**



1. A camera comprising:

(a) exposure means for exposing a film;

(b) film feeding means for winding up the film from a cartridge in which is loaded the film having a predetermined number of frames to be exposed;

(c) setting means for setting a number of frames to be exposed in the bracketing exposure mode;

(d) bracketing control means for controlling said exposure means and said film feeding means in such a way that exposure values are changed for each frame of a number of frames set by said setting means when said set number of frames are exposed, said bracketing control means having counter means for counting the number of frames exposed in the bracketing exposure mode, said bracketing control means comparing the content in said counter means with said set number of frames; and

(e) detection means for detecting that said feeding means has wound up from said cartridge the film having said predetermined number of frames, and thereafter generating a detection signal;

(f) said bracketing control means resetting said counter means in response to said detection signal.

4,918,482

IMAGE FORMING APPARATUS

Mitsuru Ogura, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 23, 1988, Ser. No. 248,775

Claims priority, application Japan, Oct. 14, 1987, 62-259272

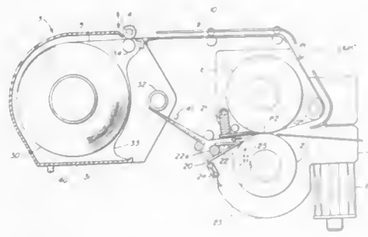
Int. Cl.[4] G03B *27/32, 27/52*

U.S. Cl. 355—27 **7 Claims**

1. In an image forming apparatus for forming a visible image by superposing an image receiving sheet on a light receiving sheet, said light receiving sheet having a selectively hardened image formed thereon and pressing said sheets together to transfer said selectively hardened image onto said image receiving sheet, said apparatus including take-up means for causing said light receiving sheet to travel along a take-up path to be wound up around a take-up shaft, the improvement wherein said image forming apparatus further includes

a separator disposed normally on said take-up path for separating said image receiving sheet from said light receiving sheet after said image is transferred,

retracting means for retracting said separator from said take-up path, and



a control unit which activates said retracting means after ascertaining that a new cartridge containing unused light receiving sheet has been inserted into said apparatus.

4,918,483

PHOTOGRAPHIC DISPLAY AND APPARATUS FOR MAKING ELEMENTAL PRINTS OF THE SAME

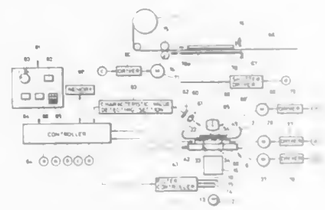
Katsumi Otake, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 169,790, Mar. 18, 1988. This application Jun. 20, 1989, Ser. No. 368,509

Claims priority, application Japan, Mar. 18, 1987, 62-39569; Mar. 18, 1987, 62-63184; Apr. 6, 1987, 62-84275

Int. Cl.[4] G03B *27/52, 27/44*

U.S. Cl. 355—40 **10 Claims**



1. A photographic printer for making a plurality of enlarged print portions of a corresponding plurality of divisions into which a single frame of an original film is nominally divided, said original film being placed in a printing position defined between a projection light and a photographic material on which enlarged image portions of said divisions of said single frame are formed, said printer comprising:

a printing stage, movable in two directions perpendicular to each other, for holding said original film;

motor means for moving said printing stage in said two directions; and

control means for controlling said motor means according to patterns of said divisions into which said single frame of said original film is nominally divided so as to place said divisions of said single frame sequentially in said printing position.

4,918,484

PICTURE FRAME NUMBER DISCRIMINATING METHOD AND APPARATUS THEREFOR

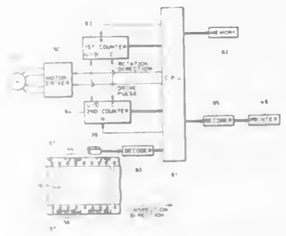
Yoichi Ujiie, and Syuji Tahara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 17, 1988, Ser. No. 258,963

Claims priority, application Japan, Oct. 16, 1987, 62-261043

Int. Cl.[4] G03B *27/52*

U.S. Cl. 355—41 **11 Claims**



1. A method of discriminating a frame number of a film, the photographic film of which is printed with frame numbers and coded frame number bar codes, and the frame number bar code is read with a sensor to discriminate a frame number of a frame on a film mask, comprising the steps of:

measuring the transportation quantity of said film in synchronism with reading said frame number bar code; and

calculating the frame number of a frame on said film mask in such a manner that a distance between the read frame number bar code or the associated frame number and the center of said film mask is obtained based on the transportation quantity of said film, the number of frames within said distance is obtained through division of said distance by a pitch between frame number bar codes, and the frame number of a frame on said film mask is calculated based on the number of frames and said read frame number.

4,918,485

ROLL FILM CAMERA

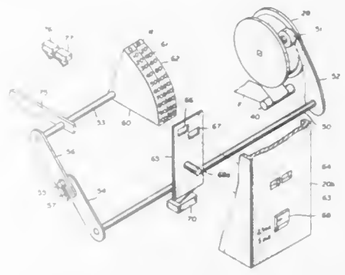
Kenjiro Ishii; Fumio Fukumoto; Koichi Nagata, all of Osaka, and Akira Shibata, Tokyo, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 6, 1989, Ser. No. 334,295

Claims priority, application Japan, Apr. 6, 1988, 63-83096

Int. Cl.[4] G03B *27/32, 27/52, 1/60*

U.S. Cl. 355—64 **14 Claims**



1. A roll film camera for photographing original images on a strip of film wound up in a roll, which comprises:

a supply reel for winding thereon the part of said roll film yet to be used for photographing original images,

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a takeup reel for winding the part of said roll film already used for photographing original images,

photographing means disposed between said supply reel and said takeup reel and adapted to expose said roll film to original images and effect the photographing of original images on said roll film,

takeup means for causing said roll film to be taken up on said takeup reel from said supply reel synchronously with the photographing motion of said photographing means,

detecting means for detecting the diameter of said roll film wound on said supply reel,

designating means for designating the thickness of said roll film, and

converting means for converting the diameter of said roll film detected by said detecting means into the length of said roll film in accordance with the thickness of said roll film designated by said designating means.

4,918,486

THERMAL DEVELOPING AND TRANSFERRING APPARATUS

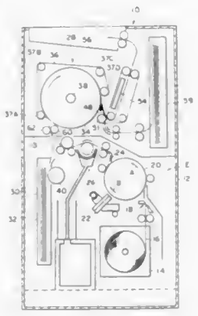
Hiroshi Nakamura, and Nagao Ogiwara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

Filed May 8, 1989, Ser. No. 348,460

Claims priority, application Japan, May 10, 1988, 63-112728; Jun. 10, 1988, 63-143368; Aug. 31, 1988, 63-218158

Int. Cl.[4] G03B *27/30*

U.S. Cl. 355—106 20 Claims



1. A thermal developing and transferring apparatus in which an image exposed on a light-sensitive an material being developed and transferred to an image receiving material, said apparatus comprising:

a heating drum;

and endless belt partially brought into contact with an outer peripheral surface of said heating drum, said endless belt pinching the light-sensitive material and the image receiving material between said endless belt and said heating drum so as to contact with each other; and

means for superposing the light-sensitive material and the image receiving material one on the other and transporting the superposed materials to a position between said heating drum and said endless belt, said means superposing the light-sensitive material and the image receiving material while curving these two materials in conformity with the outer peripheral surface of said heating drum, whereby, when the two materials are wound around the outer peripheral surface of said heating drum while being pressed between said heating drum and said endless belt, the two materials are maintained in normal superposed positions without being influenced by a difference between winding radius with which the two materials are wound around said heating drum.

4,918,487

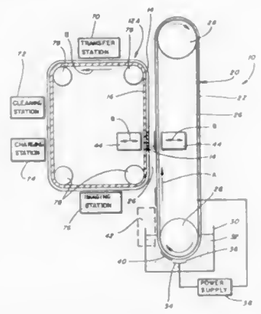
TONER APPLICATOR FOR ELECTROPHOTOGRAPHIC MICROIMAGERY

Joseph R. Coulter, Jr., Miami Springs, Fla., assignor to Coulter Systems Corporation, Bedford, Mass.

Filed Jan. 23, 1989, Ser. No. 300,779

Int. Cl.[4] G03G *15/10*

U.S. Cl. 355—256 43 Claims



15. A toner applicator for toning a fractional area on a photoconductor to a predetermined image density that prevents dispersion of any liquid toner or carrier liquid beyond the fractional area to be toned and is capable of rapid drying comprising:

a photoconductor disposed over a conductive substrate having at least one fractional area thereon that is to be toned;

a carrier member having a conductive layer and electrostatically deposited liquid toner thereon to form a toner predeposit thereon of desired density in an area corresponding to said fractional area to be toned on said photoconductor, said carrier member being in close proximity to said photoconductor;

means for contacting said toner deposit on said carrier member with said fractional area on said photoconductor; and

means for toning said fractional area on said photoconductor by transferring toner thereto from said toner pre-deposit so that the quantity of liquid transferred to said photoconductor is minimal and can be rapidly removed therefrom without affecting the toner deposit on said photoconductor.

4,918,488

SCAVENGING APPARATUS

Clyde M. Creveling, Rochester; Carl R. Bothner, Brighton; Timothy G. Armstrong, Greece, and Richard A. Weitzel, Hilton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 26, 1989, Ser. No. 371,488

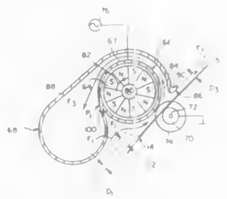
Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—296 9 Claims

1. In an electrostatographic copier or printer in which desired latent images, formed on the imaging surface of an imaging member, are made visible with charged, loose particles of toner that are electrostatically attracted and held to the latent image at a development station, and in which the desired loose toner image, so developed, is thereafter transferred at a transfer station to a suitable receiver for fusing thereto, a scavenging apparatus for removing, prior to such desired image transfer, unwanted particles from the image and non-image areas of the imaging surface of such imaging member, without adversely affecting the wanted toner particles forming the desired image remaining thereon, the scavenging apparatus including:

(a) a conductive shell spaced from the imaging surface of the imaging member, said shell having an electrical potential source connected thereto creating an electrostatic field for electrostatically loosening such unwanted particles on the imaging surface without adversely affecting the wanted loose toner particles forming the desired image remaining thereon;

(b) a rotatable magnetic roller disposed inside said stationary shell, said magnetic roller creating a magnetic field about said shell for attracting and removing from the imaging surface, any loosened particles that are magnetizable; and



(c) a vacuum system having a pickup nozzle, said pickup nozzle being adjacent said shell spaced from the imaging surface of the imaging member and said vacuum system being useful for pneumatically augmenting the removal of unwanted particles otherwise (i) magnetically being removed by said magnetic roller, and/or (ii) electrostatically under a removal tendency from said shell, as well as, being useful for pneumatically and directly removing non-magnetic unwanted particles from the imaging surface.

4,918,489

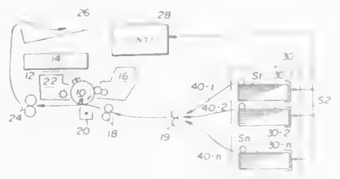
METHOD OF SUPPLYING RECORDING SHEETS IN IMAGE FORMING APPARATUS

Osamu Inage, and Takahiro Yagishita, both of Yokohama, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed May 24, 1989, Ser. No. 356,130

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—309 12 Claims



1. A method of supplying recording sheets from a plurality of paper supplying units to a reference position within a main body of an image forming apparatus which forms an image on each of the recording sheets supplied successively from the paper supplying units via corresponding transport paths having different lengths, said method comprising the steps of:

receiving from the paper supplying units data related to the lengths of the transport paths between the paper supplying units and the reference position within the main body of the image forming apparatus;

calculating from the received data a time when a supply of a second recording sheet is to start from a second paper supplying unit which is designated relative to a time when a first recording sheet supplied from a first paper supplying unit which is designated reaches the reference position when it is assumed that the length of the corresponding transport path from the first paper supplying unit is zero; and

driving the first and second paper supplying units with timings based on the calculated times, so that a recording speed of the image forming apparatus is maintained constant regardless of the length of the transport path used.

4,918,490

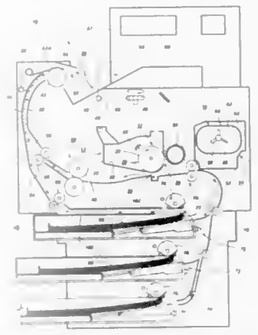
BATCH MODE DUPLEX PRINTING

Denis J. Stemmle, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 19, 1989, Ser. No. 382,139

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—318 10 Claims



1. In a printer for printing and outputting collated sets of plural duplex copy sheets from a multipage job set of multiple electronically reorderable page images, wherein said collated outputted duplex copy sheets have one said page image printed on one side of a copy sheet and another said page image printed on the other side of the copy sheet, and wherein said printer includes a duplexing buffer loop providing a plural copy sheet capacity duplexing path for recirculating therein plural copy sheets imaged on one side back to be imaged on their opposite sides to make said duplex copies, the improvement comprising;

electronically dividing the multipage job set into plural batches of plural page images per batch with the number of page images per batch corresponding to said copy sheet capacity of said duplexing path,

within a said batch, reordering said plural page images within said batch for proper collated duplex printing with said duplexing buffer loop,

printing copy sheets from one said batch of page images at a time, by printing the first sides of a corresponding batch of copy sheets with alternate pages of said one batch and recirculating said copy sheets is in said duplexing path, and then printing the remaining page images of said one batch (the alternate page images not printed on said first sides of said copy sheets) onto the second sides of said batch of copy sheets, prior to printing page images from any other said batch of page images,

and consecutively repeating this process for subsequent said batches until a collated copy set is produced from the multipage job set.

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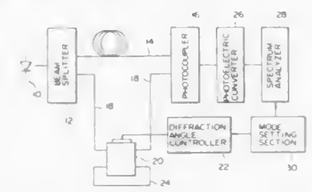
4,918,491

EMISSION SPECTRAL WIDTH MEASURING APPARATUS FOR LIGHT SOURCE

Yoji Sonobe, Tokyo, Japan, assignor to Anritsu Corp., Tokyo, Japan

Filed Jun. 24, 1988, Ser. No. 211,452
Claims priority, application Japan, Jun. 30, 1987, 62-161056
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—345 **17 Claims**



1. An apparatus for measuring an emission spectral width of a light source, comprising:
- beam splitter means for receiving and splitting a measurement beam emitted from said light source to obtain first and second split beams;
- first optical fiber means for receiving and guiding the first split beam from said beam splitter means;
- second optical fiber means for receiving and guiding the second split beam from said beam splitter means;
- photocoupler means for receiving the first and second split beams propagating through said first and second optical fiber means, and for mixing the received first and second split beams to obtain an intermediate frequency signal;
- spectrum analyzer means for receiving the intermediate frequency signal obtained by said photocoupler means and for analyzing a frequency of the intermediate frequency signal to display a spectrum waveform;
- acoustic optical means arranged substantially midway along said second optical fiber means, said acoustic optical means having a shift path for diffracting and frequency-shifting an input beam and outputting the frequency-shifted diffracted beam to said second optical fiber means, and a transmission path for causing an input beam to rectilinearly propagate therethrough without light diffraction and outputting the transmission beam to said second optical fiber means; and
- diffraction control means for controlling said acoustic optical means to switch said shift path and said transmission path.

4,918,492

MICHAELSON OPTICAL FIBER INTERFEROMETER AND ITS APPLICATION IN PARTICULAR IN THE MEASUREMENT OF TEMPERATURES

Pierre Ferdinand, Houilles, and Chieh Liu, Paris, both of France, assignors to Electricite de France - Service National, Paris, France

Filed Mar. 24, 1988, Ser. No. 172,529
Claims priority, application France, Mar. 24, 1987, 87 04089
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—345 **11 Claims**

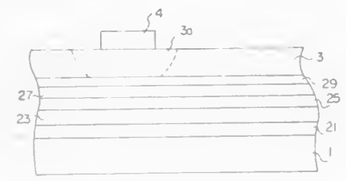
1. A Michelson optical fiber interferometer for measuring the temperature of a flowing fluid and comprising an emitter arm, a source of light for exciting the emitter arm, a receiver arm, a photodetector associated with the receiver arm, an optical coupler uniting said emitter arm and said receiver arm so as to form a reference arm and a measurement arm, a sensor of the physical phenomenon to be evaluated terminating said measurement arm, said reference arm and said measurement arm being constituted by one and the same single mode optical fiber for carrying only a reference wave and a measuring wave interfering together and having a free end opposed to said optical coupler at which free end a diopter acts as a partially transparent mirror which reflects less than one-half of the impinging reference optical wave and is coupled to said sensor which sensor returns the measurement optical wave through the diopter, wherein said sensor comprises a hollow and open cell which has two opposed faces defined by transparent diopters which are parallel to each other and between which at least a part of said flow fluid is received, and a mirror parallel to said end of said optical fiber for returning the measurement optical wave through said diopter of said end of said optical fiber, said cell being interposed between said end of said optical fiber and said mirror and having a substantially constant length insensitive to thermal changes.

4,918,493

SAGFET WITH BUFFER LAYERS

Arthur E. Geissberger; Robert A. Sadler; Gregory E. Menk, and Matthew L. Balzan, all of Roanoke, Va., assignors to ITT Corporation, New York, N.Y.

Filed Aug. 10, 1988, Ser. No. 230,625
Int. Cl.[4] H01L *27/12*
U.S. Cl. 357—4 **7 Claims**



1. A composite buffer structure for GaAs semiconductor products on a GaAs substrate comprising:
- a semi-insulating GaAs substrate having a first major surface on a plane oriented up to about 20 degrees towards the (1,1,1)A plane from the (1,0,0) crystalline plane;
- a first layer of epitaxial GaAs directly on said first major surface;
- an AlAs/GaAs superlattice directly on said first layer;
- a second layer of epitaxial GaAs directly on said superlattice;
- a first AlGaAs layer having a first mole fraction of Al directly on said second layer;
- a second AlGaAs layer having a second mole fraction of Al directly on said first AlGaAs layer, said second mole fraction being higher than said first mole fraction;
- a third layer of epitaxial GaAs directly on said second AlGaAs layer.

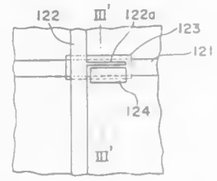
4,918,494

THIN FILM TRANSISTOR

Mitsuhiro Koden, Nara; Hirohisa Tanaka, Gose, and Kohzo Yano, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Continuation of Ser. No. 235,728, Aug. 19, 1988, Pat. No. 4,843,438, which is a continuation of Ser. No. 57,743, Jun. 3, 1987, abandoned, which is a continuation of Ser. No. 797,660, Nov. 13, 1985, abandoned. This application Jan. 31, 1989, Ser. No. 304,278
Claims priority, application Japan, Nov. 13, 1984, 59-239653; Nov. 13, 1984, 59-239654
Int. Cl.[4] H01L *45/00, 27/12, 29/78, 23/48*
U.S. Cl. 357—4 **7 Claims**

4. A thin film transistor, comprising:
- an insulative substrate having a relatively planar transistor supporting surface;
- a gate electrode bus disposed on said supporting surface of said substrate and extending along said surface in a first lateral direction, said gate electrode bus having an edge and having a transistor forming a portion, thereof, functioning as a transistor gate;
- a gate insulating film disposed atop at least said transistor forming portion of said gate electrode bus;
- a semiconductor film disposed atop said gate insulating film;
- a source electrode bus disposed atop said semiconductor film and extending along a second lateral direction orthogonal to said first lateral direction, but substantially in the plane of said supporting surface;



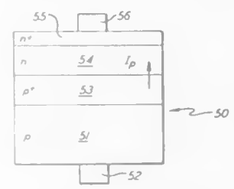
said source electrode bus having a branch portion extending therefrom and the entirety of said branch portion is disposed over said portion of said transistor gate without extending over a substantial portion of said edge thereof to thereby reduce gate to source leakage; and
- a drain electrode disposed atop said semiconductor film, parallel to said branch portion and extending over portion of said transistor gate without intersecting said source electrode bus.

4,918,497

BLUE LIGHT EMITTING DIODE FORMED IN SILICON CARBIDE

John A. Edmond, Apex, N.C., assignor to Cree Research, Inc., Durham, N.C.

Filed Dec. 14, 1988, Ser. No. 284,293
Int. Cl.[4] H01L *33/00*
U.S. Cl. 357—17 **64 Claims**



1. A light emitting diode formed in silicon carbide that emits light in the blue to violet portion of the visible spectrum and comprising:
- an n-type substrate of alpha-type silicon carbide;
- an ohmic contact to said substrate;
- a substantially uncompensated n-type monocrystalline epitaxial layer alpha-type silicon carbide upon said n-type substrate;
- a p-type monocrystalline epitaxial layer of alpha-type silicon carbide upon said n-type epitaxial layer and forming a p-n junction with said n-type layer, said p-type epitaxial layer having a carrier concentration less than the carrier concentration of said uncompensated n-type epitaxial layer; and
- an ohmic contact to said p-type epitaxial layer, said diode producing a peak emission at a wavelength of between about 455 and 460 nanometers with a spectral half width at peak wavelength of no more than about 50 nanometers.

4,918,496

INFRARED EMITTING DEVICE WITH DISLOCATION FREE LAYER

Yuichi Matsushima, Tanashi; Kazuo Sakai; Shigeyuki Akiba, both of Tokyo, and Katsuyuki Utaka, Musashino, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1988, Ser. No. 213,608
Claims priority, application Japan, Jul. 2, 1987, 62-163903
Int. Cl.[4] H01L *33/00*
U.S. Cl. 357—17 **7 Claims**

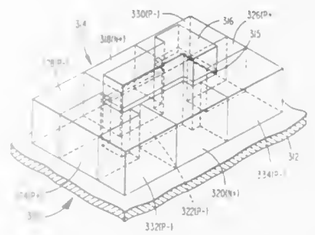
1. An infrared emitting device which has, on a InP substrate, an active semiconductor layer for emitting light in a 2 to 3 μm wavelength region and clad semiconductor layers directly overlying and underlying said active semiconductor layer and having an energy gap greater than that of said active semiconductor layer, characterized in that at least one of said semiconductor layers forming said active semiconductor layer and said clad layers has a lattice constant different from that of said substrate so as to obtain an energy gap necessary to sufficiently confine carriers in said active semiconductor layer and that said at least one semiconductor layer is formed to a thickness smaller than a predetermined value obtainable of crystal growth with no dislocation which arises from lattice mismatch.

4,918,498

EDGELESS SEMICONDUCTOR DEVICE

Dora Pius, South Bound Brook, and Alfred C. Ipri, Hopewell Township, Mercer County, both of N.J., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 48,706, May 12, 1987, abandoned. This application Oct. 24, 1988, Ser. No. 262,061
The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.
Int. Cl.[4] H01L *27/12*
U.S. Cl. 357—23.7 **5 Claims**



1. A common island semiconductor device comprising an island of a first conductivity type semiconductor material disposed on an insulating substrate, said island having a top surface and being completely surrounded by a peripheral sidewall, with a common boundary between said top surface and said sidewall;

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said island being divided into a first conductivity type portion and two second conductivity type portions, with junctions between said first type portion and said second type portions,

a gate electrode insulating overlying said island, and extending from a first termination point within said first type portion to a second termination point within said first type portion, said first termination point and said second termination point each being spaced from said sidewall, and said gate electrode lying entirely within and spaced from said common boundary, said first type conductivity portion having a first channel stop area extending from said first termination point to said common boundary, and a second channel stop area extending from said second termination point to said common boundary, and

second conductivity type source and drain regions respectively within said second conductivity type portions, spaced from each other by the first conductivity type portion underlying said gate electrode and by said first conductivity type channel stop areas, said second conductivity type source region extending to said sidewall at a first location, and said second conductivity type drain region extending to said sidewall at a second location spaced from said first location.

4,918,499

SEMICONDUCTOR DEVICE WITH IMPROVED ISOLATION BETWEEN TRENCH CAPACITORS

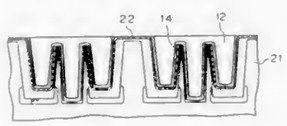
Takeshi Matsutani, Machida, and Kazunori Imaoka, Komae, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 12, 1988, Ser. No. 256,412

Claims priority, application Japan, Nov. 13, 1987, 62-285440

Int. Cl.[4] H01L *21/00*

U.S. Cl. 357—23.6 **5 Claims**



1. A semiconductor device comprising:

a semiconductor substrate;

a plurality of memory cells on the semiconductor substrate, each of said memory cells comprising:

a transistor having a gate electrode and a source-drain region; and

a capacitance electrically coupled to said transistor, said capacitance including:

a first trench formed in said semiconductor substrate;

a first insulating film formed on the surface of said first trench;

a first conducting layer formed on said first insulating film and acting as a node;

a first dielectric film formed on said first conducting layer; and

a second conducting layer formed on said first dielectric film and acting as a cell plate;

isolation regions substantially surrounding each of said memory cells, each of said isolation regions comprising:

a second trench formed in said semiconductor substrate;

a second insulating film formed on the surface of said second trench, said first conducting layer being formed on said second insulating film and extending from said capacitance, so that the side surface of said second trench is substantially covered;

a second dielectric film formed on said first conducting layer and extending from said capacitance; and

a third conducting layer continuously formed on said second dielectric film and extending from said capacitance, said first conducting layer and said second dielectric film substantially surrounding said capacitance and extending to a position below said gate electrode of said transistor.

4,918,500

SEMICONDUCTOR DEVICE HAVING TRENCH CAPACITOR AND MANUFACTURING METHOD THEREFOR

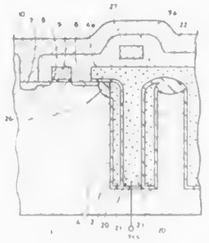
Masahide Inuishi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1988, Ser. No. 211,931

Claims priority, application Japan, Jun. 29, 1987, 62-161663

Int. Cl.[4] H01L *29/78, 29/06, 27/02*

U.S. Cl. 357—23.6 **6 Claims**



1. A semiconductor memory device comprising:

a semiconductor substrate having a major surface having a predetermined impurity concentration of a first conductivity type and having a trench formed for forming capacitance for storing information charges,

a first insulating layer formed on opposite side walls of said trench,

a first contiguous conductive layer of a second conductivity type formed along and in contact with sidewall portions of said first insulating layer on said opposite side walls of said trench,

a second insulating layer formed along and in contact with the sidewall portions of said first conductive layer of the second conductivity type, and

a second conductive layer of the second conductivity type formed in an inner portion of a trench formed by said second insulating layer and said first insulating layer.

4,918,501

SEMICONDUCTOR DEVICE AND METHOD OF PRODUCING THE SAME

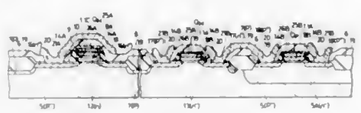
Kazuhiro Komori, Kodaira; Kenichi Kuroda, Tachikawa, both of Japan, and June Sugiura, Troy, N.Y., assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 10,998, Feb. 5, 1987, abandoned, which is a division of Ser. No. 736,770, May 22, 1985, Pat. No. 4,663,645. This application Dec. 29, 1988, Ser. No. 291,647

Claims priority, application Japan, May 23, 1984, 59-102555; Aug. 13, 1984, 59-167825

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.5 **18 Claims**



1. A semiconductor device comprising:

a first MISFET having a gate electrode and a semiconductor

region as a source or drain region, said semiconductor region comprising a first semiconductor region and a second semiconductor region, the second semiconductor region being formed between said gate electrode and said first semiconductor region, said second semiconductor region having a lower impurity concentration than that of said first semiconductor region; and

a plurality of second MISFETs, each having a gate electrode structure and a semiconductor region as a source or drain region, each to be used as a memory cell, the plurality of second MISFETs being arrayed in a matrix, said gate electrode structure comprising a first gate electrode and a second gate electrode formed over and aligned with said first gate electrode, said second gate electrode being made of a double-layer film comprising a first film of polycrystalline silicon and a second film of a material selected from the group consisting of refractory metals and platinum and silicides of refractory metals and platinum, opposed peripheral sides of at least said first gate electrode being covered with a dense silicon oxide insulating film, said silicon oxide insulating film being a thermal oxide film, so as to improve the charge retention characteristics of the first gate electrode as compared to charge retention characteristics of the first gate electrode without the dense insulating film, each of said dense insulating films on opposed peripheral sides of the first gate electrode being covered with a respective sidewall insulation film, said semiconductor region comprising a third semiconductor region and a fourth semiconductor region, the fourth semiconductor region being formed between said third semiconductor region and said gate electrode structure, wherein said first, second, third and fourth semiconductor regions all have the same conductivity type, wherein said fourth semiconductor region of each said second MISFET is formed substantially in alignment with the first and second gate electrodes of said second MISFET, wherein said second semiconductor region is formed substantially in alignment with said gate electrode of said first MISFET, wherein said first semiconductor region is formed substantially in alignment with a sidewall insulation film formed on a side of the gate electrode of the first MISFET, wherein the third semiconductor region is formed in alignment with a sidewall insulation film covering a dense insulating film covering a peripheral side of a first gate electrode, and wherein said fourth semiconductor region has a lower impurity concentration than that of said third semiconductor region.

4,918,502

SEMICONDUCTOR MEMORY HAVING TRENCH CAPACITOR FORMED WITH SHEATH ELECTRODE

Toru Kaga, Urawa; Shinichiro Kimura, Hachioji, and Hideo Sunami, Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 20, 1987, Ser. No. 123,235

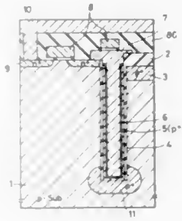
Claims priority, application Japan, Nov. 28, 1986, 61-281722; Nov. 28, 1986, 61-281716

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.6 **25 Claims**

1. A semiconductor memory comprising memory cells each of which is constructed of a trench type charge storage capacitor formed within a semiconductor substrate of a first conductivity type, a switching transistor, and a heavily doped embedded impurity region formed at the bottom of said trench capacitor and within said semiconductor substrate, and wherein each trench capacitor is comprised of:

a first capacitor electrode including a sheath-shaped structure having a bottom portion which is electrically connected with the semiconductor substrate via said heavily doped embedded impurity region and which has a sideward periphery covered with an insulator film thereby forming an insulator barrier with said semiconductor substrate and a second capacitor electrode having a part which is buried inside said sheath-shaped first electrode through a dielectric film of said capacitor and another part which is electrically connected with an impurity doped layer of a second conductivity type opposite to said first



conductivity type formed in a surface region of said semiconductor substrate to function as one of a source and drain regions of said transistor.

4,918,503

DYNAMIC RANDOM ACCESS MEMORY DEVICE HAVING A PLURALITY OF ONE TRANSISTOR TYPE MEMORY CELLS

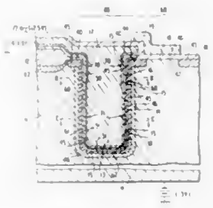
Yasushi Okuyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 13, 1988, Ser. No. 181,030

Claims priority, application Japan, Apr. 13, 1987, 62-91167

Int. Cl.[4] H01L *29/78, 29/34, 27/02, 27/10*

U.S. Cl. 357—23.6 **10 Claims**



1. A dynamic random access memory device comprising a semiconductor substrate of one conductivity type and having a major surface, a transfer gate transistor formed on said major surface of said substrate and having source and drain regions of a conductivity type opposite to said substrate, a trench formed in said substrate from said major surface of said substrate into said substrate, said trench having an upper wall adjacent to said major surface of said substrate and a lower wall adjacent to said upper wall continuously and including a bottom portion, an impurity layer of a conductivity type opposite to said substrate formed on said upper and lower walls of said trench and connected to one of said source and drain regions of said transistor, a dielectric film of a storage capacitor, said dielectric film including a first portion provided on said upper wall of said trench and a second portion provided on said lower wall of said trench, said first portion of said dielectric film being thicker than said second portion of said dielectric film, and a capacitor electrode continuously formed on said first and second portions of said dielectric film within said trench.

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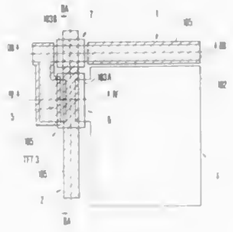
4,918,504
ACTIVE MATRIX CELL

Kinya Kato, Saitama; Nobuhiko Kakuda, Tokyo; Noboru Naito, Tokyo, and Tsutomu Wada, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Jul. 22, 1988, Ser. No. 222,844
Claims priority, application Japan, Jul. 31, 1987, 62-192341; Dec. 22, 1987, 62-322983; Dec. 28, 1987, 62-329956
Int. Cl.[4] H01L *27/12, 29/78*
U.S. Cl. 357—23.7 13 Claims



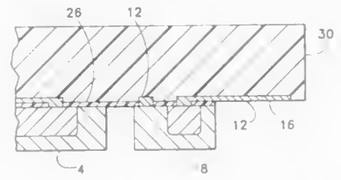
1. An active matrix cell using a thin-film field effect transistor of a top gate staggered structure including a first conductor group constituting a source and a drain, a semiconductor film, a first insulating film serving as a gate insulating film, and a second conductor group including a gate electrode, all of which are formed on a substrate in the order mentioned above, wherein said semiconductor film and said first insulating film have the same area and constitute a two-layered region, a second insulating film having substantially the same thickness as that of said two-layered region is formed in contact with a side surface of said two-layered region under at least said gate electrode, and said gate electrode is formed on said first insulating film and said second insulating film.

4,918,505
METHOD OF TREATING AN INTEGRATED CIRCUIT TO PROVIDE A TEMPERATURE SENSOR THAT IS INTEGRAL THEREWITH

Morley M. Blouke, Beaverton, and Brian L. Corrie, Gaston, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 19, 1988, Ser. No. 221,069
Int. Cl.[4] H01L *11/14*
U.S. Cl. 357—24 5 Claims

5. An integrated circuit comprising:
a support member,
a thinned semiconductor die that has front and back faces, the support member being attached to the die in confronting relationship with the front face of the die and being substantially coextensive therewith, the die having at least first and second functional regions that are electrically isolated from each other, the first functional region being a temperature sensor that senses the temperature of the support member and the second functional region and

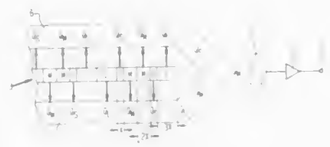


comprising at least one zone of p-type material and at least one zone of n-type material that meets the zone of p-type material in a p-n junction, and the second functional region being a charge-coupled device, and
at least first and second connection pads that are connected respectively to the zone of p-type material and the zone of n-type material.

4,918,506
SELECTABLE RESOLUTION LINE-SCAN IMAGE SENSOR

Rudolph H. Dyck, Palo Alto, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Sep. 13, 1985, Ser. No. 775,668
Int. Cl.[4] H01L *29/78, 27/14, 31/00;* G11C *19/28*
U.S. Cl. 357—24 24 Claims

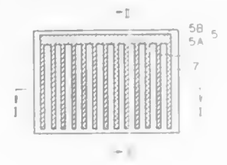


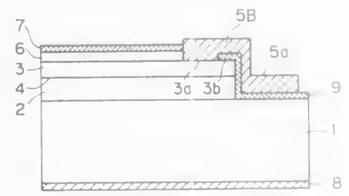
1. A selectable-resolution solid state image sensor comprising:
a row of photoelements, each photoelement having a surface area exposed to incident light and producing an electrical signal related in magnitude to said incident light intensity and the surface area of the individual photoelements, said row including first photoelements having a first size aperture and second photoelements having a second size aperture different than said first aperture;
means for transporting the electrical signals from the photoelements in response to a clock signal; and
means connected to said transporting means for selectively combining the electrical signals from groups of adjacent photoelements.

4,918,507
SEMICONDUCTOR DEVICE

Susumu Yoshida, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1988, Ser. No. 186,237
Claims priority, application Japan, May 8, 1987, 62-112915
Int. Cl.[4] H01L *27/14, 31/00*
U.S. Cl. 357—30 3 Claims





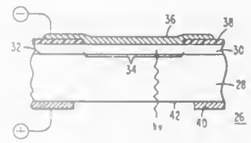
1. A semiconductor device comprising:
a semiconductor substrate of a first conductivity type;
a first semiconductor layer of the first conductivity type formed partially on a surface of said semiconductor substrate;
a second semiconductor layer of a second conductivity type formed on said first semiconductor layer;
an insulating film formed over a surface region from a surface of said semiconductor substrate not provided with said first semiconductor layer to a part of a surface of said second semiconductor layer;
a first electrode formed on said insulating film and another part of the surface of said second semiconductor layer to be electrically connected with said second semiconductor layer on said another part, a region of said first electrode on said insulating film on said semiconductor substrate serving as a region to be bonded with an external terminal, said first electrode being a comb-type electrode structure having grid electrode extensions formed on said second semiconductor layer and said first electrode further including a bar electrode section formed on both said second semiconductor layer and said insulating film; and
a second electrode formed on a back surface of said semiconductor substrate.

4,918,508
VERTICAL PHOTOCONDUCTIVE DETECTOR

Robert J. McIntyre, Quebec, Canada, and Ramon U. Martinelli, Hightstown, N.J., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 845,335, Mar. 28, 1986, abandoned. This application Nov. 18, 1988, Ser. No. 274,630
Int. Cl.[4] H01L *27/14, 29/161, 23/48*
U.S. Cl. 357—30 18 Claims

1. A vertical photoconductive detector comprising:
a substrate layer of semiconductor material entirely of a first conductivity type substantially transparent at the wavelength to be detected and doped sufficiently such that a first major surface of said substrate layer serves as a first ohmic contact with;
an active region of semiconductor material overlying said substrate, and being entirely of said first conductivity type or entirely intrinsic and absorptive of light at the wavelength to be detected, said active region having first and second major surfaces wherein the entire first major surface of said active region is in contact with the substrate layer;

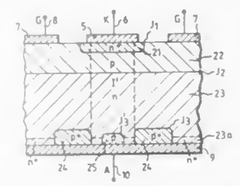


a second ohmic contact comprising a metal, or metal alloy, overlying the entire second major surface of said active region; and
means for making electrical contact to said substrate layer.

4,918,509
GATE TURN-OFF THYRISTOR

Heinrich Schlangenotto, Neu-Isenburg; Wolf-Dieter Nowak, Frankfurt, and Hermann Berg, Eppstein, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 36,382, Apr. 9, 1987, abandoned. This application Jul. 21, 1989, Ser. No. 384,111
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1986, 3612367; Apr. 12, 1986, 8609997[U]
Int. Cl.[4] H01L *29/74*
U.S. Cl. 357—38 24 Claims



1. In a gate turn-off thyristor having an npnp structure formed in a semiconductor body and having a cathode side $n\pm$-type emitter zone which is divided into a plurality of emitter strips, with each n^+-type emitter strip being opposed by a pair of anode-side $p\pm$-type emitter strips which are positioned so as to overlap the respective edges of the respective cathode-side emitter strip, and further having a p-type control base zone and an n-type main base zone disposed between said cathode side and anode side emitter strips, with said n-type main base zone having a higher doped n^+-type region which extends along the anode side major surface of said semiconductor body and into which said p^+-type emitter strips extend from said anode side major surface; the improvement wherein; a single field limiting lower doped p-type zone is disposed between each said pair of anode side p^+-type emitter strips positioned opposite a respective said cathode side emitter strip in said n^+-type region at said anode side major surface, and forms a zone which is spaced from each of the adjacent pair of said anode side p^+-type emitter strips.

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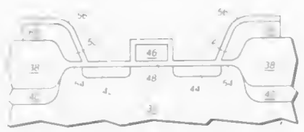
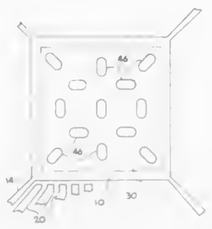
4,918,510
COMPACT CMOS DEVICE STRUCTURE
James R. Pfiester, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 31, 1988, Ser. No. 264,913
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—42 11 Claims



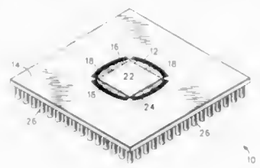
1. A CMOS structure comprising:
a semiconductor substrate having a surface and a surface region of P-type conductivity at said surface;
field isolation at said surface, extending, at least in part, above said surface and having a peripheral edge surrounding said surface region;
a first layer of polycrystalline silicon forming a frame abutting and interior to said peripheral edge and overlying said surface region;
a first layer of insulating material overlying said surface region;
a second layer of patterned polycrystalline silicon overlying said first layer of insulating material, traversing said surface region, and insulatively separated from said first layer of polycrystalline silicon by a second layer of insulating material;
N-type source and drain regions formed in portions of said surface region not overlaid by said second layer of patterned polycrystalline silicon;
and P-type source and drain regions formed in said first layer of polycrystalline silicon on opposite sides of said first layer of patterned polycrystalline silicon.

4,918,511
THERMAL EXPANSION COMPENSATED METAL LEAD FRAME FOR INTEGRATED CIRCUIT PACKAGE
Candice H. Brown, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Filed Feb. 1, 1985, Ser. No. 697,318
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—70 1 Claim



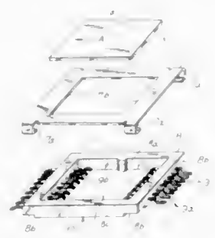
1. A metal lead frame for an integrated circuit package comprising a central metal die support portion having thermal stress relieving means formed in at least one surface thereof comprising parallel grooves having a depth of from about 40 to 70% of the thickness of said lead frame to inhibit breakage of a silicon die susequently attached thereto when the package is heated during normal operation and the silicon has a different coefficient of expansion than the central metal die support portion of the lead frame to which it is bonded.

4,918,512
SEMICONDUCTOR PACKAGE HAVING AN OUTWARDLY ARCED DIE CAVITY
Norman L. Owens, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 19, 1988, Ser. No. 286,676
Int. Cl.[4] H01L *23/02, 23/12, 23/28, 23/48*
U.S. Cl. 357—74 10 Claims



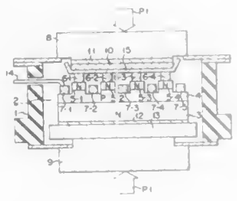
1. A semiconductor device package comprising a die cavity having four sides and a corner between each of said four sides, each of said corners being defined by an angle of greater than 90 degrees.

4,918,513
SOCKET FOR AN INTEGRATED CIRCUIT CHIP CARRIER AND METHOD FOR PACKAGING AN INTEGRATED CIRCUIT CHIP
Mitsukazu Kurose, and Masahiro Minowa, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed Jun. 3, 1988, Ser. No. 201,978
Claims priority, application Japan, Jun. 5, 1987, 62-140973; Jun. 5, 1987, 62-140976; Sep. 29, 1987, 62-245536; Sep. 30, 1987, 62-247470
Int. Cl.[4] H01L *23/10*
U.S. Cl. 357—74 29 Claims



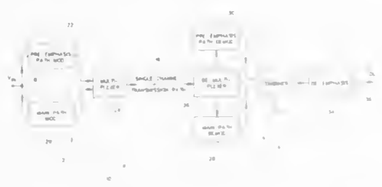
1. A device for fixedly packaging an interchangeable IC on an electronic circuit substrate comprising:
a chip carrier substrate upon which the IC is mounted, the chip carrier substrate having electrodes on the surface thereof;
an IC bearing chip mounted on the chip carrier substrate and electrically connected with said electrode pattern; and
an IC chip socket comprising a guide member formed with a central opening for receiving at least a portion of the chip carrier substrate and a plurality of connector pins supported by the guide member, each having one end extending within the central opening of the guide member for contact with and electrically coupling with the electrodes of the chip carrier substrate and a second end extending outside the guide member extending in a substantially transverse direction relative to the guide member for coupling to the electronic circuit substrate;
whereby the chip carrier substrate is changeably mounted and the IC chip socket is surface mountable on the electronic circuit substrate.

4,918,514
PRESS-CONTACT TYPE SEMICONDUCTOR DEVICE
Hideo Matsuda; Yasunori Usui, both of Yokohama; Shinjiro Kojima, Chigasaki, and Masaru Ando, Kamakura, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 25, 1988, Ser. No. 173,458
Claims priority, application Japan, Mar. 31, 1987, 62-78653
Int. Cl.[4] H01L *23/42, 23/44, 23/46*
U.S. Cl. 357—79 18 Claims



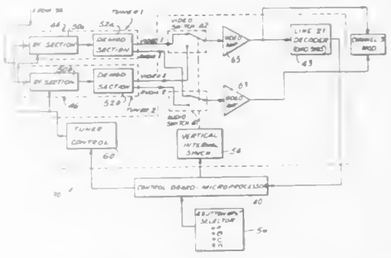
1. A press-contact type semiconductor device having at least one semiconductor element sandwiched between electrodes to which external pressure is applied, and comprising:
a semiconductor element having a mesa structure and including extraction electrodes;
a casing in which said semiconductor element is arranged,
external electrodes arranged to sandwich and presscontact said semiconductor element placed in said casing; and
a composite plate comprising a soft metal plate and a hard metal plate, both interposed between one of said external electrodes and said semiconductor element, said soft metal plate contacting said extraction electrodes, said hard metal plate interposed between said soft metal plate and said one of said extraction electrodes, and said soft metal plate being 5 to 20 times thicker than said extraction electrodes and one-eighth to one-twentieth the thickness of said hard metal plate.

4,918,515
COMPATIBLE TELEVISION TRANSMISSION SYSTEM WITH SEPARATE PREEMPHASIS PATH WITHIN SINGLE CHANNEL
Yves C. Faroudja, 26595 Anacapa Dr., Los Altos, Calif. 94022
Filed Jun. 20, 1988, Ser. No. 209,192
Int. Cl.[4] H04N *7/04*
U.S. Cl. 358—11 22 Claims



1. A method for reducing noise and interference artifacts in a television video signal for passage through a degrading medium comprising the steps of:
at a transmission end, dividing the television signal into two paths, a main path and a preemphasis path,
developing a main path television signal in the main path,
deriving a preemphasis component from the television signal in the preemphasis path in accordance with at least one predetermined preemphasis criterion,
multiplexing the preemphasis component from the preemphasis path into a single spectrum including the main path television signal, the single spectrum having a bandwidth substantially no greater than that required by the main path television signal without substantial intermixture of the preemphasis component and the main path television signal, and
passing the single spectrum through the degrading medium.

4,918,516
CLOSED CIRCUIT TELEVISION SYSTEM HAVING SEAMLESS INTERACTIVE TELEVISION PROGRAMMING AND EXPANDABLE USER PARTICIPATION
Michael J. Freeman, Sands Point, N.Y., assignor to 501 Actv, Inc., Port Washington, N.Y.
Filed Oct. 26, 1987, Ser. No. 113,017
Int. Cl.[4] H04N *7/00*
U.S. Cl. 358—86 19 Claims



1. A closed circuit discrete multichannel interactive television system for providing individualized interactive television programming to a plurality of users connected into said closed circuit interactive television system, said system comprising a localized head end multichannel television signal transmission means for transmitting a multichannel television signal comprising a plurality of selectable channels, a plurality of conventional television receiver means for selectively receiving individualized television programming on a common program display channel, and an interface and selection means disposed between each of said television receiver means and said localized head end multichannel television signal transmission means for receiving said transmitted multichannel television signal comprising said plurality of selectable channels and converting it into an individualized selected television channel for display of said selected channel on said common program display channel on the television receiver means associated with a given user in response to an independent user selection of a given interactive response to a plurality of selectable interactive responses in said multichannel television signal transmission, each of said interactive responses being associated with a different channel in said plurality of selectable channels, each of said users having an associated television receiver means and interface and selection means for making said independent interactive user selection for providing said individualized television programming on said common program display channel, said multichannel television signal transmission comprising a plurality of different interactively selectable audio/video television signals respectively associated with each of said plurality of selectable channels comprising said transmitted multichannel television signal, said interactively selectable television signals being in at least frame accurate synchronization with respect to each other, said interactively, selectable television signals further comprising command signals embedded therein for controlling provision of said individualized television programming on said common program display channel, said interface and selection means being responsive to said embedded command signals for enabling switching of said individualized television channel be-

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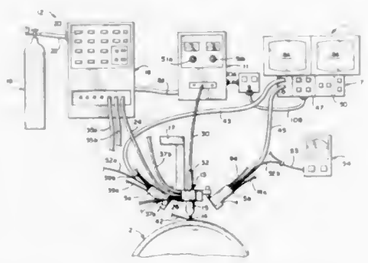
tween said plurality of interactively selectable television channels for display of said associated audio/video television signal corresponding to said selected one of said plurality of selectable channels on said common program display channel in a substantially instantaneous seamless interactive television display presentation on said common program display channel of said associated television receiver means, different television receiver means in said system being capable of displaying different individualized associated audio/visual television signals on said common program display channel at substantially the same time dependent on the various independent interactive user selections of respective ones of said plurality of selectable channels by said plurality of users at any given time, said interface and selection means comprising a microprocessor means and a television signal tuner means, said television signal tuner means comprising a pair of tuners one of which is tuned to a currently selected channel of said transmitted multichannel television signal and the other of which is tunable in advance of receipt of a next successive frame to the next selected channel of said transmitted multichannel television signal for providing selective next channel tuning before each channel switching between said plurality of selectable channels, said microprocessor means responding to said individualized independent user interactive selection and said embedded command signals for pretuning said other tuner in said associated television receiver means to a television signal frequency corresponding to said next selected channel for providing a display on said associated television receiver means common program display channel dependent on said independent user selection before an actual change in said television display on said common program display channel from said currently selected channel in said plurality of selectable channels occurs in response to said independent user interactive selection; whereby said seamlessness is maintained for said television display on said common program display channel despite interactive changes in said television channel selected for display from said plurality of channels comprising said multichannel television signal.

4,918,517

SYSTEM AND PROCESS FOR VIDEO MONITORING A WELDING OPERATION

Charles E. Burgoon, Kenosha, Wis., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 26, 1989, Ser. No. 301,713
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—101 **35 Claims**



1. A system for visually monitoring a process wherein an intense point source of light is generated in an area on a workpiece that is being worked, comprising:

a lens assembly for projecting an image of the point source and the area of the workpiece being worked onto a sensing means;

a filter assembly having at least one filter element that includes a central region of low light transmission for dimming the image of the point source projected onto the sensing means, and a peripheral region of high light transmission for freely transmitting the image of the area where the workpiece is being worked, and

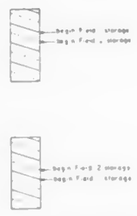
means for adjusting the apparent size of the central region of low light transmission relative to the image.

4,918,518

METHOD AND APPARATUS FOR THE RECORDING AND REPLAY OF INTERLACED SIGNALS

Larry G. Phillips, Knoxville, Tenn., assignor to North American Philips Corporation, New York, N.Y.

Filed Jun. 15, 1988, Ser. No. 209,452
Int. Cl.[4] H04N *5/04, 5/262*
U.S. Cl. 358—148 **28 Claims**



1. Apparatus for recording in a memory an interlaced input signal having an input even field, an input odd field, an even field vertical synchronization signal and even field horizontal synchronization signals associated with said even field, and an odd field vertical synchronization signal and odd field horizontal synchronization signals associated with said odd field, comprising

input means for receiving said interlaced signal;

first means connected to said input means and responsive at least in part to said vertical synchronization signals for generating field signals selecting one of said fields as output top field and the other of said fields as output bottom field; and

timing means connected to said first means and responsive at least in part to said horizontal synchronization signals for generating a first selector signal indicative of the presence of an output top field and a second selector signal indicative of the presence of an output bottom field, respectively, in response to said field signals.

4,918,519

COLOR IMAGE SENSING APPARATUS HAVING COLOR BALANCE ADJUSTMENT

Masao Suzuki, and Tadashi Okino, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1988, Ser. No. 180,341
Claims priority, application Japan, Apr. 23, 1987, 62-101021; Apr. 24, 1987, 62-099931
Int. Cl.[4] H04N *9/73*
U.S. Cl. 358—29 **17 Claims**

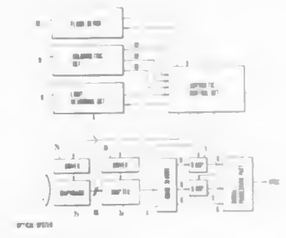
1. An image sensing apparatus arranged to be used in combination with a flash device, comprising:

(a) color image sensing means;

(b) first signal forming means for forming a first signal according to the brightness of an object, without emitting light by said flash device; and

(c) control means for forming a third signal by indicating balance of a second signal corresponding to the quantity

of light emitted by said flash device between said first signal, and for adjusting a color balance of an output of



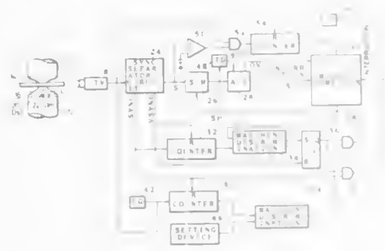
said color image sensing means according to said third signal.

4,918,520

DEVICE FOR DETECTING THE POSITION OF CRYSTALLIZATION INTERFACE

Nobuo Katsuoka, Takasaki; Masahiko Nigorikawa, Takehu, and Shuji Ohmori, Annaka, all of Japan, assignors to Shin-Etu Handotai Company, Limited, Tokyo, Japan

Filed Apr. 25, 1988, Ser. No. 185,894
Claims priority, application Japan, Apr. 27, 1987, 62-104084
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—93 **5 Claims**



1. A device for detecting the position of a crystallization interface, comprising:

image-pickup means adapted to scan an area about a crystallization interface and output a luminance signal (S);

luminance signal sampling means adapted to sample said luminance signal (S) from the side of a melt (16) to the side of a monocrystal rod (12) along a sensing line (L) intersecting said crystallization interface, thereby successively outputting a series of sampled luminance signals (S_j) relating to said sensing line, and determine pixel positions (j) of said sampled luminance signals (S_j) in correspondence with said sensing line (L);

reference level determination means adapted to set a value as a reference level (S_o) relative to a specific level (P) of said sampled luminance signals (S_j);

crystallization interface discrimination means adapted to discriminate said crystallization interface by comparing levels of said series of sampled luminance signals (S_j) with said reference level (S_o) and detecting a moment at which one of said levels of said sampled luminance signals (S_j) exceeds said reference level (S_o), said interface discrimination means recognizing said crystallization interface at said moment; and

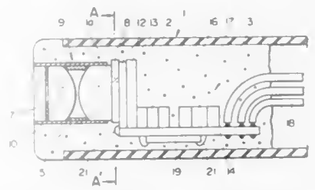
crystallization interface position determination means adapted to determine that one (k) of said pixel positions corresponding to said moment of discrimination of said crystallization interface is a pixel position corresponding to said crystallization interface.

4,918,521

SOLID STATE IMAGING APPARATUS

Hisao Yabe; Hisao Ogiu; Toshiyuki Takara; Koji Takamura; Masaaki Nakazawa; Akinobu Uchikubo, all of Hachiouji; Tomoaki Sato, Higashiyamatoshi; Atsushi Miyazaki; Akifumi Ishikawa, both of Hachiouji, and Takeaki Nakamura, Hino, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 14, 1988, Ser. No. 143,995
Claims priority, application Japan, Jan. 20, 1987, 62-11013; Feb. 27, 1987, 62-44481
Int. Cl.[4] H04N *7/18;* **A61B** *1/06*
U.S. Cl. 358—98 **12 Claims**



1. A solid state imaging apparatus comprising:

an image forming optical system fitted within a lens frame;

a solid state imaging chip arranged to have its imaging surface positioned in the focal plane of said image forming optical system;

a circuit substrate to which said solid state imaging chip is directly mechanically affixed substantially at right angles, and to which said solid state imaging chip and a signal cable at the tip are electrically connected; and

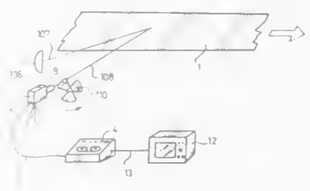
a sealing member in sealing contact with at least a part of the periphery of said solid state imaging chip.

4,918,522

METHOD OF TAKING PICTURES OF A QUICK-MOVING OBJECT BY MEANS OF VIDEO METHOD

Rauno Pajunen, Tampere, Finland, assignor to Tamfelt Oy Ab, Tampere, Finland

Filed Aug. 9, 1988, Ser. No. 230,340
Claims priority, application Finland, Aug. 14, 1987, 873530
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—101 **6 Claims**

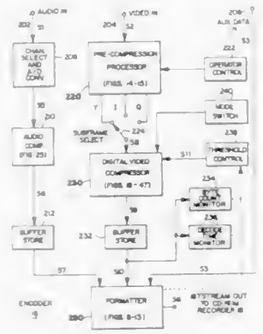


1. A method of taking pictures of a quick moving object by means of a video camera having a lens and an image sensor, said image sensor including semiconductor dot detectors in a matrix arrangement and a light sensitive image display screen with corresponding dot images, said method comprising the steps of

conducting light impulse of a constant high intensity from

the object to said lens during a predetermined short exposing time,
activating said image sensor is response to said light impulse to produce an image on the screen which corresponds to said object, said image remaining on the screen after the end of the light impulse,
reading said image remaining on the screen subsequent to activation of said image sensor,
converting said image into electrical signals,
recording said electrical signals in the form of a variable magnetic field on a video tape,
whereby the exposing time is shorter than the time used for reading and recording the image.

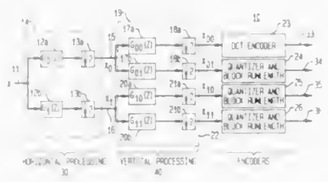
4,918,523
DIGITAL VIDEO FORMATTING AND TRANSMISSION SYSTEM AND METHOD
Allen H. Simon, Belle Mead; Stuart J. Golin, East Windsor; Brian Astle, Cranbury, all of N.J.; John M. Keith, Wasbington Crossing, Pa., and Suz H. Wan, East Brunswick, N.J., assignors to Intel Corporation, Santa Clara, Calif.
Filed Oct. 5, 1987, Ser. No. 104,456
Int. Cl.[4] H04N *7/12, 11/04*
U.S. Cl. 358—133 **16 Claims**



1. A method for transmitting a compressed digital video signal, each frame of said signal comprising a plurality of coded regions, each said region being represented by a region descriptive code and a region fill code, said region descriptive codes conveying the size and locations of said regions within said frame, said region fill codes conveying pixel amplitude indications for said regions, said method comprising:
forming a group of said region descriptive codes;
forming a group of said region fill codes;
forming a data stream having a segment containing said grouped region specific codes and a separate data segment containing said grouped region fill codes;
separately variable length coding said groups of codes in accordance with their respective statistical distributions; and transmitting said data stream.

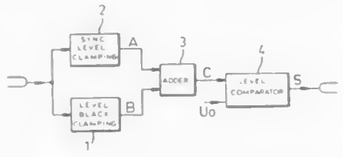
4,918,524
HDTV SUB-BAND CODING USING IIR FILTER BANK
Rashid Ansari, Hillsborough Township, Somerset County, N.J., and Antonio Fernandez, Brooklyn, N.Y., assignors to Bell Communications Research, Inc., Livingston, N.J.
Filed Mar. 14, 1989, Ser. No. 323,488
Int. Cl.[4] H04N *7/12*
U.S. Cl. 358—133 **7 Claims**

1. A method for coding a video signal comprising the steps of
dividing said video signal into a plurality of sub-band signals by applying said signal to at least one polyphase filter bank unit comprising two signal processing paths one of which paths includes an infinite impulse response allpass filter, and



reconstructing said video signal by applying said sub-band signal to at least one filter bank unit comprising two signal processing paths one of which includes a finite impulse response filter.

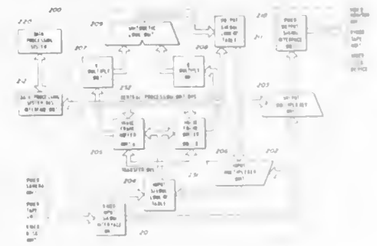
4,918,525
METHOD AND DEVICE FOR PRECISION SYNC PULSES SEPARATION
Emil P. Vladkov, Sofia, Bulgaria, assignor to Bulgarska Televisia Kam Komitet Sa Televisia I Radio, Sofia, Bulgaria
Filed Feb. 13, 1989, Ser. No. 310,368
Claims priority, application Bulgaria, Feb. 24, 1988, 83105
Int. Cl.[4] H04N *5/08*
U.S. Cl. 358—153 **4 Claims**



1. A method of precision synchronization pulse separation which comprises the steps of:
(a) clamping a composite video signal at a sync level to produce a sync level clamped output;
(b) simultaneously clamping said composite video signal at a level black level to produce a level black clamped output;
(c) summing said clamped outputs to produce a summation signal; and
(d) comparing said summation signal with a reference signal in a level comparator to produce output synch pulses.

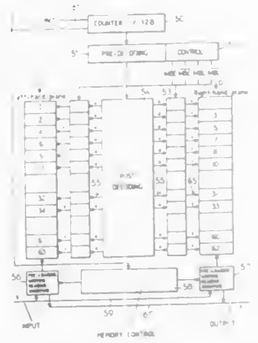
4,918,526
APPARATUS AND METHOD FOR VIDEO SIGNAL IMAGE PROCESSING UNDER CONTROL OF A DATA PROCESSING SYSTEM
Richard E. Lewis, and John C. Kingsolver, both of Albuquerque, N. Mex., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Mar. 20, 1987, Ser. No. 28,404
Int. Cl.[4] H04N *5/14*
U.S. Cl. 358—160 **20 Claims**

1. A video signal processing unit responsive to signals from a data processing unit, said video image processing unit processing input video image signals to provide a preselected output video image signals, said video signal processing unit comprising:
register means for storing said signals from said data processing unit;
first image frame buffer means for storing video image signals;
second image frame buffer means for storing video image signals, at least one of said image frame buffer means coupled to an input terminal, said input terminal having said input video image signals applied thereto;
transfer means for transferring video image signals between said first image frame buffer means and said second image



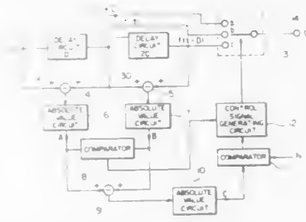
frame buffer means in response to said data processing signals; and
combining means for combining video image signals in said first image frame buffer means and said second image frame buffer means.

4,918,527
DEVICE AND METHOD WITH BUFFER MEMORY, PARTICULARLY FOR LINE/COLUMN MATRIX TRANSPOSITION OF DATA SEQUENCES
Pierre Penard, Rennes, and Philippe Quenard, Assigne, both of France, assignors to Etat francais (CNET), Issy Les Moulineaux and Telediffusion de France, Montrouge Cedex, both of, France
Filed Dec. 1, 1988, Ser. No. 278,678
Claims priority, application France, Dec. 3, 1987, 87 16781
Int. Cl.[4] G06F *15/347, 15/66;* **H04N** *5/76*
U.S. Cl. 358—160 **4 Claims**



1. A buffer memory device, particularly for the line/column matrix transposition of word sequences of (n×n) words (n being an even whole number) of the type of elementary image blocks used in digital television, each source sequence being converted into a transposed sequence,
wherein said buffer memory is divided into two identical storage half-planes, each provided with individual reading/writing means,
and addressing means cooperating with means for sequencing of the reading/writing operations of the storage half-planes, said sequencing means for controlling the execution of a succession of pairs of reading/writing operations, each pair simultaneously comprising a reading operation on one of said storage half-planes, and a writing operation on the other half-plane, said sequencing means comprising means for generating an addressing cycle, said addressing cycle consisting of a successing of two alternated, elementary addressing cycles for the filling and reading of words loaded in the buffer memory, respectively, each source sequence being loaded in alternation, in one and then in the other elementary addressing cycle, the corresponding transposed sequence being read according to the opposite elementary addressing cycle.

4,918,528
CONTOUR CORRECTION DEVICE
Tomonori Oohashi, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
PCT No. PCT/JP88/00480, § 371 Date Feb. 17, 1989, § 102(e) Date Feb. 17, 1989, PCT Pub. No. WO88/09592, PCT Pub. Date Dec. 1, 1988
PCT Filed May 20, 1988, Ser. No. 304,846
Claims priority, application Japan, May 25, 1987, 62-127831
Int. Cl.[4] H04N *5/208*
U.S. Cl. 358—162 **6 Claims**



1. A contour correction device comprising:
first delay means for delaying an input image signal by a first predetermined delay time;
second delay means for delaying said input image signal by a second predetermined delay time which is longer than said first predetermined delay time;
means for computing an absolute value A of the difference in the amplitude between an output signal from said first delay means and said input image signal;
means for computing an absolute value B of the difference in the amplitude between said output signal from said first delay means and an output from the second delay means;
first comparison means for comparing said absolute values A and B and for producing an output signal representative of the result of the comparison throughout a period in which a condition A<B or A>B is met;
means for computing an absolute value C of the difference between said absolute values A and B;
second comparison means for comparing said absolute value C with a threshold value N and for producing an output signal representative of the result of the comparison throughout a period in which a condition of C>N or C<N is met; and
means for outputting a contour enhanced image signal, said means selectively outputting, in accordance with the two comparison results,
said input image signal throughout a period in which both the conditions C>N and A<B are simultaneously met,
said output signal from said first delay means throughout a period in which the condition of C<N is met, and
said output signal from said second delay means throughout a period in which both the conditions C>N and A>B are simultaneously met.

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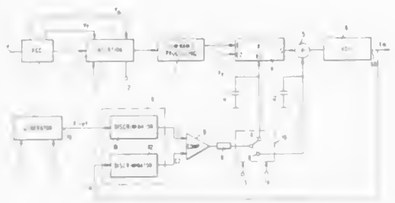
4,918,529

DEVICE FOR SETTING MINIMAL AND MAXIMAL FREQUENCIES OF A FREQUENCY MODULATED VIDEO SIGNAL

Patrick Douziech, and Philippe Berger, both of Villingen, France, assignors to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Jun. 2, 1988, Ser. No. 201,412
Claims priority, application France, Jun. 5, 1987, 87 07942
Int. Cl.[4] H04N 5/52
U.S. Cl. 358—174 5 Claims



1. A setting device for minimum and maximum reference frequencies f_{min} and f_{max} of a frequency modulated video signal, comprising in series an automatic gain control amplifier (1), a processing circuit of the luminance signal (3), a variable gain amplifier (4), an adder (5), a voltage-controlled oscillator (6), further comprising:

an insertion circuit (2) located between the AGC amplifier (1) and the processing circuit (3), which receives from the amplifier a first reference voltage level (Vf) corresponding to the minimum reference frequency f_{min} and a second reference voltage level (Vb) corresponding to the maximum reference frequency f_{max}, respectively synchronized with first (I1) and second (I2) control signals;

a frequency generator (7) adapted to produce said two reference frequencies f_{min} and f_{max} synchronized with the control signals (I1), I2);

a discrimination circuit (8) which receives at one input, in relation with the control signals, either the minimum reference frequency f_{min}, or the maximum reference frequency f_{max} from the generator (7) and at another input the frequency modulated video signal (FM) of the output of said voltage-controlled oscillator (6), and which provides two voltage levels (e1, e2) in relation with said input frequencies;

a comparator (9) receiving on each of its inputs one of said two voltage levels from the discrimination circuit (8) and providing a difference voltage level corresponding to the difference between said two input voltage levels; and

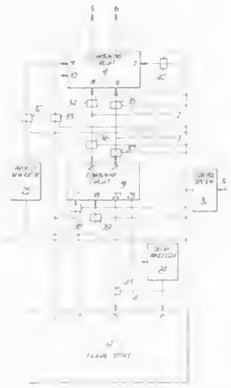
a switch (10) connected with the output of said comparator (9) and controlled by third and fourth control signals (I3 and I4) in order that the output level of the comparator permits either to control the setting of the gain of the variable gain amplifier, or to feed one of the inputs of the adder depending on whether the reference frequency at the input of the discriminator is the minimum frequency or the maximum frequency in order to servo-control said frequency modulated video signal from the voltage controlled oscillator either by the reference frequency f_{min}, or by the reference frequency f_{max}.

4,918,530

PROCESSING OF VIDEO IMAGE SIGNALS

Nicholas Barton, Wokingham, and Robert Billing, Crowthorne, both of United Kingdom, assignors to Questech Limited, Wokingham, United Kingdom

Continuation of Ser. No. 148,612, Jan. 26, 1988, abandoned. This application Aug. 25, 1989, Ser. No. 398,540
Int. Cl.[4] H04N 5/272
U.S. Cl. 358—183 5 Claims



1. A video image processing system comprising a recycling frame store having first and second inputs for receiving respectively a video image signal and an associated key signal and first and second outputs for providing respectively, during each field of said video image signal applied at the first input a corresponding video image signal and associated key signal which were stored during the previous field; a first combining circuit having third and fourth signal inputs for receiving respectively a first video image signal and an associated key signal, fifth and sixth signal inputs coupled to receive signals from the said first and second outputs of said recycling frame store and third and fourth signal outputs coupled to provide signals to said first and second signal inputs of said recycling frame store, said first combining circuit providing at said third output a composite of the signals received at the said third and fifth inputs and providing at said fourth output a composite of the signals received at said fourth and sixth inputs; a second combining circuit having seventh and eighth signal inputs connected to receive respectively said first video signal and the associated key signal associated, ninth and tenth signal inputs coupled to receive signals from said first and second inputs of said recycling frame store, an eleventh signal input for receiving a second video signal, and fifth and sixth signal outputs, said second combining circuit providing at said fifth signal output a composite of the signals provided at said seventh, ninth and eleventh signal inputs and providing at said sixth signal output a composite of the signals provided at said eighth and tenth signal inputs.

4,918,531

COMMERCIAL MESSAGE TIMER

Gene H. Johnson, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Oct. 25, 1988, Ser. No. 261,243
Int. Cl.[4] H04N 5/262, 5/272
U.S. Cl. 358—183 14 Claims

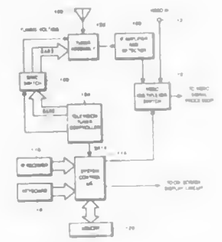
1. A signal selection system, comprising:

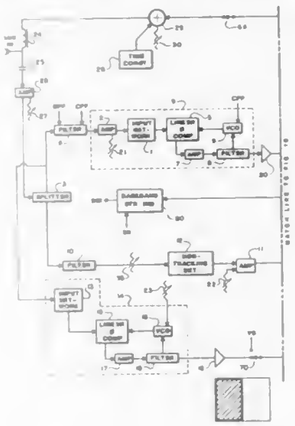
selecting means for selecting, in response to a selection signal, a particular signal from a plurality of signals which may be presented thereto;

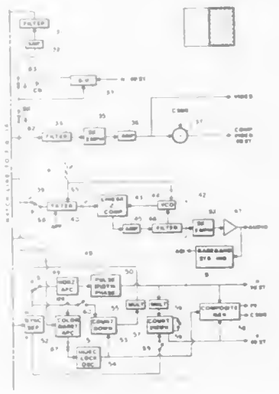
control means coupled to said selecting means for generating said selection signal for controlling the selection of said particular signal from said plurality of signals; said control means having an input for receiving a timer start signal;

said control means including timer means responsive to said timer start signal for timing a predetermined time period; and

memory means coupled to said control means for storing, in response to said timer start signal, data relating to the selection of said particular signal; said control means generating said selection signal for selecting said particular signal in accordance with said stored data upon expiration of said predetermined time period if a different one of said plurality of signals were selected after the occurance of said timer start signal and during said predetermined time period.







tion power of said FM deviation band is substantially recovered while inherent noise power is rendered less; whereby the signal-to-noise (S/N) ratio of a modulation component of each said FM deviation band is increased.

4,918,532

FM RECEIVER METHOD AND SYSTEM FOR WEAK MICROWAVE TELEVISION SIGNALS

Edward O'Connor, 10212 Plymouth Ave., Cleveland, Ohio 44125

Filed Mar. 18, 1987, Ser. No. 27,435
Int. Cl.[4] H04N 5/455; H04B 1/10; H03D 3/24
U.S. Cl. 358—188 38 Claims

1. In a system adapted to receive and demodulate an FM signal, a method for threshold-extending the demodulation of said FM signal, comprising; performing at least one direct FM demodulating operation on said FM signal, characterized in that each said at least one performed direct FM demodulating operation comprises tuning to render the direct FM demodulating operation responsive to an FM deviation band which is substantially inclusive of a direct FM modulation component of said FM signal, said direct FM demodulating operation being primarily responsive to FM deviation frequencies included by said FM deviation band and less responsive to frequencies excluded by said FM deviation band; so that modula-

4,918,533

IMAGE SENSING DEVICE WITH SHUTTER-READOUT COORDINATION

Nobuaki Date; Nobuo Tezuka; Syuichiro Saito; Akihiko Tojo, all of Kanagawa, and Susumu Kozuki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 83,010, Aug. 5, 1987, abandoned, which is a continuation of Ser. No. 668,741, Nov. 6, 1984, abandoned. This application Sep. 20, 1988, Ser. No. 248,270
Claims priority, application Japan, Nov. 11, 1983, 58-211912; Nov. 11, 1983, 58-211913; Nov. 11, 1983, 58-211914; Jul. 8, 1984, 59-165458; Jul. 8, 1984, 59-165459
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—213.13 77 Claims

1. An image sensing device comprising:

image sensing means arranged to convert an optical image into an electrical signal;

shutter means for blocking light incident upon said image sensing means;

periodic signal generating means for generating periodic signals for driving said image sensing means;

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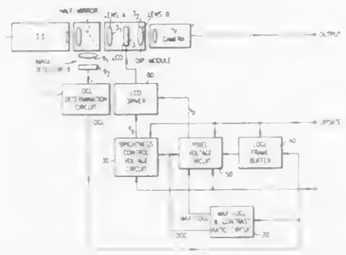
a switch means arranged to generate an instruction to operate said shutter means;
delay means arranged to operate in response to a predetermined periodic signal produced after the instruction generated by said switch means; and

shutter driving means arranged to cause said shutter means to begin to open after the lapse of time delayed by said delay means, said shutter driving means then closing said shutter means.

4,918,534
OPTICAL IMAGE PROCESSING METHOD AND SYSTEM TO PERFORM UNSHARP MASKING ON IMAGES DETECTED BY AN I.I./TV SYSTEM

Kwok L. Lam; Heang-Ping Chan, both of Chicago; Kunio Doi, Willowbrook, all of Ill.; Kenichi Komatsu, and Michitaka Honda, both of Tochigi, Japan, assignors to The University of Chicago, Chicago, Ill. and Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 22, 1988, Ser. No. 184,791
Int. Cl.[4] H04N *3/15, 7/18*
U.S. Cl. 358—225 **20 Claims**

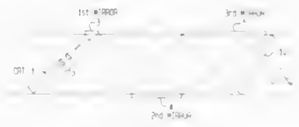


1. An optical image processing method in a radiographic system in which an image of an object is produced by an image intensifier and converted to video signals by means of a television (TV) camera system, comprising:
placing a liquid crystal display (LCD) between said image intensifier and said T.V. camera system at a location shifted from a focal plane of said TV camera system, said LCD defining plural pixels which are controllable so that light from said image produced by said image intensifier and impinging on said plural LCD pixels can be selectively attenuated by application of selected control signals to said LCD; and
generating said control signals selectively based on predetermined parameters of said radiographic system and said image; and
applying said selectively generated control signals to said LCD to perform selective attenuation and corresponding dynamic range compression of light passing through respective ones of said plural LCD pixels, thereby to perform unsharp masking of said image produced by said image intensifier using said LCD.

4,918,535
TELEVISION PROJECTION SYSTEM

Dietrich Grabis, St. Rafael, Calif., and Peter Knoll, Ettlingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 25, 1988, Ser. No. 262,539
Int. Cl.[4] H04N *5/74*
U.S. Cl. 358—237 **5 Claims**

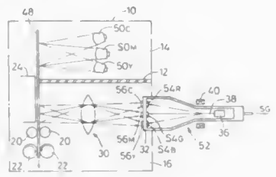


1. A projection television system having
a miniature cathode ray tube (CRT), with a TV screen (8) to provide a TV display, and
a viewing screen (10) for viewing a projected image of the TV display on the TV screen (8); said TV screen (8) being positioned laterally with respect to the viewing screen and at least approximately parallel to the central axis of the viewing screen (10);
a plurality of mirrors (3, 4) in an optical path between the TV display on the TV screen and the viewing screen (10) for deflection of the display from the TV screen (8) toward the viewing screen (10), and
an optical enlarging lens system (2), located in said optical path between the TV screen (8) and said mirrors (3, 4),
wherein said optical enlarging lens system (2) is arranged to project the TV display from the TV screen (8) of the cathode ray tube (1) onto a first one of said first mirrors (3), and from the first mirror into a second mirror (4) located at least approximately parallel to said first mirror (3) and laterally offset with respect thereto, the display being then projected from said second mirror (4) onto the rear of said viewing screen (10).

4,918,536
FACSIMILE RECORDING SYSTEM USING PHOTOSENSITIVE MICROCAPSULE RECORDING MEDIUM

Kenji Sakakibara, Ichinomiya; Jun Sakai, Nagoya; Shigeyuki Hayashi, Nagoya; Michitoshi Akao, Nagoya; Satoshi Furukawa, Suzuka, and Elji Fujii, Gifu, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Oct. 27, 1988, Ser. No. 263,264
Claims priority, application Japan, Mar. 4, 1986, 61-47018; Jun. 2, 1986, 61-82508; Jun. 13, 1986, 61-136187; Oct. 30, 1987, 62-167638[U]
Int. Cl.[4] G01D *9/42*
U.S. Cl. 358—296 **16 Claims**



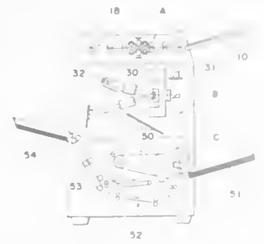
1. An image recording system comprising:
a photosensitive medium having a layer of microcapsules formed on a substrate, each of said microcapsules including a photosensitive resin whose strength is varied upon exposure to a radiation, and a chromogenic material

which is capable of chemically reacting with a developer material, to form a visible image;
an exposing device for forming a latent image on said photosensitive medium according to image signals, by exposure of said medium to the radiation, said latent image being developed into a visible image;
a communication device for translating facsimile signals into corresponding picture signals, said facsimile signals being received from a remote facsimile transmitter through a communication channel and representing an image of a subject copy; and
control means connected to said communication device and said exposing device, for applying said picture signals as said image signals to said exposing device, and thereby forming on said photosensitive medium the latent image represented by said picture signals.

4,918,537
IMAGE FORMING APPARATUS

Hiroshi Mori, Ichikawa; Toshiaki Kobayashi, Tenri; Mitsuru Ogura, Nara, and Shougo Iwai, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 5, 1989, Ser. No. 293,809
Claims priority, application Japan, Jan. 13, 1988, 63-5280; Mar. 24, 1988, 63-71152
Int. Cl.[4] G02F *1/13;* **G01D** *15/06;* **H04N** *1/29*
U.S. Cl. 358—300 **37 Claims**

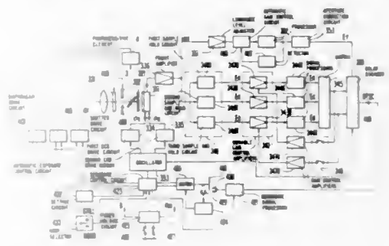


1. An image forming apparatus comprising
optical image memory means, provided with a first frame and a second frame, for forming and storing an optical image by the use of radiation of a light beam;
image write-in means for writing images of a first original document and a second original document into the first frame and second frame of the optical image memory means, respectively;
moving means for moving the first frame to the write-in position facing the image write-in means when the image of the first original document is going be written into the first frame of the optical image memory means, and for moving the second frame to the write-in position forming the image write-in means when the image of the second original document is going to be written into the second frame of the optical image memory means;
image reading-out means disposed at a position facing the write-in position, provided with a light source, for radiating the image stored in the optical image memory means, onto a photosensitive material; and
printing means for forming, onto a copying medium, an image corresponding to the light image radiated onto the photosensitive material by the image reading-out means.

4,918,538
ELECTRONIC PHOTOGRAPHY SYSTEM WITH STILL AND MOTION PICTURE MODES

Syuichiro Saito, Kanagawa, and Tadashi Okino, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 559,221, Dec. 8, 1983, Pat. No. 4,714,966.
This application Oct. 23, 1987, Ser. No. 112,957
Claims priority, application Japan, Dec. 14, 1982, 57-218876
Int. Cl.[4] H04N *5/238, 5/781*
U.S. Cl. 358—335 **14 Claims**



1. A photography system comprising:
(a) a displacing member for an aperture member having an opening size which varies as the displacing member moves;
(b) light receiving means for producing a signal responsive to an amount of light passing through said aperture member;
(c) detecting means for detecting a movement speed of said displacing member;
(d) operating means for operating to create an output of said detecting means and an output of said light receiving means;
(e) drive means responsive to an output of said operating means for moving said displacing member;
(f) mode control means for controlling an operation mode in which said operating means operates so as to vary a movement speed of said aperture member;
(g) picture information recording means for generating picture information responsive to the light passing through said aperture member and for recording said picture information; and
(h) indicating means for indicating an amount of said picture information to be recorded by said picture information recording means, the operation mode being changed depending upon an indication state of said indicating means.

4,918,539
FREQUENCY MULTIPLEXING CIRCUIT IN OPTICAL VIDEO DISC RECORDER

Toshiaki Hioki, Ogaki; Yoshihiko Morita, Gifu; Hiroshi Watanabe, Gifu, and Tateo Toyama, Gifu, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Apr. 18, 1988, Ser. No. 182,809
Int. Cl.[4] G11B *7/00*
U.S. Cl. 358—342 **5 Claims**

1. A frequency multiplexing circuit in an optical video disc recorder for limiting a recording signal and optically recording the recording signal as a two-level signal on a rotary disc, comprising:
a first signal source for supplying a first signal comprising a frequency-modulated video signal,
a second signal source for supplying a second signal in a frequency band corresponding to a low frequency band of said first signal,
adder means for adding said first signal and said second signal to frequency-multiplex said second signal on the

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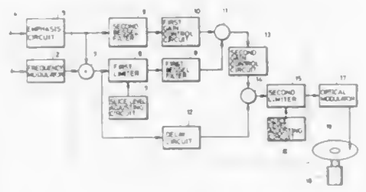
low frequency band of said first signal thereby to generate a recording signal,
first limiter means for symmetrically limiting an amplitude of the recording signal output from said adder means by a predetermined slice level,
first filter means for separating a low-frequency component, including the frequency band of said second signal, from an output of said first limiter means with a predetermined delay characteristic without changing a phase characteristic of an output of said first limiter means,
second filter means for delaying the second signal supplied from the second signal source with the same delay characteristic as that of said first filter means without changing a phase characteristic,



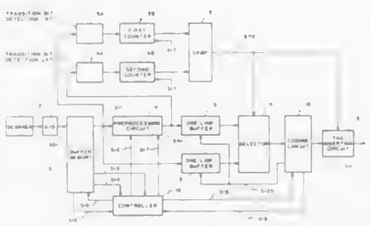
first subtracter means for subtracting an output of said second filter means from an output of said first filter means,
delay means for delaying the recording signal output from said adder means with the same delay characteristic as that of said first filter means without changing the phase characteristic,
second subtracter means for subtracting an output of said first subtracter means from an output of said delay means, and
second limiter means for symmetrically limiting an amplitude of an output of said second subtracter means by a predetermined slice level.

4,918,540

SYSTEM FOR ENCODING OR DECODING ANALOG VIDEO SIGNALS

Nobuhiro Obtani, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jul. 28, 1988, Ser. No. 225,538
Claims priority, application Japan, Jul. 29, 1987, 62-191089
Int. Cl.[4] H04N *1/41*
U.S. Cl. 358—429 **15 Claims**



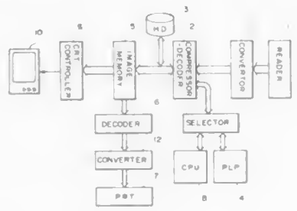
1. In an encoder apparatus for use in a digital transmission of video signals including halftones, said encoder apparatus comprising:
A/D converter means for converting halftone video signal pixels into first digital signals of a "1" or "0" bit by comparing said halftone video signals with threshold data which is periodically generated;
converting means for converting said first digital signals into second digital signals whose run-lengths of "1" and "0" codes are extended depending upon the characteristics of said first digital signals;
first counting means for counting a number of runs contained in each line of said first digital signals;
second counting means for counting the number of runs contained in each line of the second digital signals;
selecting means for selecting any of said first and second digital signals according to the numbers of the counts of said first and second counting means, said first digital signals being selected when the count output of said first counting means is smaller than the count of said second counting means;
encoding means for run-length encoding the digital signal selected by said selecting means to generate encoded video signals; and
tag inserting means for inserting first and second tag data indicating the selection of said first and second digital signals, respectively, by said selecting means.

4,918,541

IMAGE PROCESSING METHOD AND APPARATUS

Yoshihiro Ishida, Kawasaki; Yuji Nishigaki, Odawara, and Naoto Kawamura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1987, Ser. No. 38,288
Claims priority, application Japan, Apr. 17, 1986, 61-88610; Apr. 17, 1986, 61-88611; Apr. 17, 1986, 61-88612; Apr. 18, 1986, 61-91098
Int. Cl.[4] H04N *1/415*
U.S. Cl. 358—433 **34 Claims**



1. An image processing apparatus comprising:
enter means for entering a page of image codes which are obtained by compressing a page of image data;
decode means for decoding the image codes entered by said enter means and generating image data;
process means for image conversion processing the image data generated by said decode means, before the decode of the page of the image codes by said decode means is completed; and
compression means for compressing the image data processed by said process means, before the process of the page of the image data by said process means is completed.

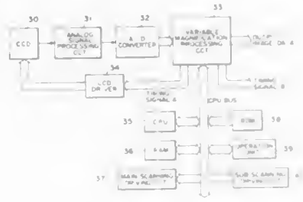
4,918,542

IMAGE PROCESSING APPARATUS CAPABLE OF SMOOTH MULTI-AREA VARIABLE MAGNIFICATION PROCESSING

Nao Nagashima, and Toshihiro Kadowaki, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 1, 1987, Ser. No. 91,901
Claims priority, application Japan, Sep. 2, 1986, 61-207018
Int. Cl.[4] H04N *1/393*
U.S. Cl. 358—451 **16 Claims**

1. An image processing apparatus comprising:
reader means, comprising a linear image sensor, for reading an image line by line and generating image data;
first moving means for repeatedly moving a reading position of said reader means in a main scanning direction a plurality of times;
second moving means for moving the reading position of said reader means in a sub-scanning direction every time the reading position of said reader means is moved in the main scanning direction;
process means for performing a variable magnification processing on the image data generated by said reader means; and



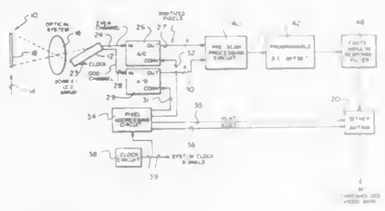
control means for controlling the variable magnification processing of said process means, said control means controlling the variable magnification processing to be performed on the image data during a succeeding movement of the reading position of said reader means in the main scanning direction, in accordance with the variable magnification processing performed on the image data during a preceding movement of the reading position of said reader means in the main scanning direction.

4,918,543

APPARATUS FOR THRESHOLDING AN IMAGE SIGNAL

Eugene M. Petilli, Henrietta, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 24, 1989, Ser. No. 301,679
Int. Cl.[4] H04N *1/032*
U.S. Cl. 358—465 **10 Claims**



1. An image signal processing apparatus comprising:
image scanning means having optical means for scanning an original in a two-dimensional manner, and photoelectric converting means for converting an optical image obtained by said optical means into an electrical signal;
DC offset means for removing a predetermined DC level from said peak to peak electrical signal to provide a predetermined DC offset;
analog to digital conversion means for converting said electrical signal into a digital signal;
digital attenuation filter means having less than unity gain for providing a DC attenuation of said electrical signal; and
dither converter means using at least a main dither matrix for performing dither conversion of said digital signal.

4,918,544

MULTI-SPINDLE SYNCHRONIZATION CONTROL SYSTEM FOR MAGNETIC DISK APPARATUS

Hiromi Ishizaka, and Takashi Machida, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jun. 17, 1988, Ser. No. 207,984
Claims priority, application Japan, Jun. 17, 1987, 62-151797; Jun. 17, 1987, 62-151798
Int. Cl.[4] G11B *19/28*
U.S. Cl. 360—73.03 **4 Claims**

1 A spindle motor synchronization control system for a magnetic disk apparatus, comprising:
a magnetic disk unit having a magnetic disk rotated by a spindle motor, output means for detecting rotation of said spindle motor and outputting an index pulse, and control means for controlling rotation of said spindle motor by a control signal;
signal generator means for generating a signal of a predetermined frequency;
first counter means for counting down the signal outputs from said signal generator means into a master index pulse generated upon each rotation of said spindle motor;
pulse interval discriminator means for detecting a time interval between the master index pulse and the index pulse output from said magnetic disk unit and comparing the time interval with a reference interval;
inhibit means for inhibiting the output signal from said signal generator means for a time interval corresponding to the number of periods determined by an output from said pulse interval discriminator means; and
second counter means for counting down outputs from said inhibit means and supplying the outputs as the control signal to said control means of said magnetic disk unit, said control means changing the rotational speed of said spindle motor in response to said control signal until said time interval becomes shorter than said reference interval.

4,918,545

DISK CLAMP FOR RIGID DISK FILE WITHOUT RADIAL LOAD

John N. Scheffel, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 25, 1988, Ser. No. 262,418
Int. Cl.[4] G11B *17/02*
U.S. Cl. 360—98.08 **10 Claims**

1. A clamping means that acts through a spacer ring to clamp a stack of rigid disks in spaced parallel relationship to a hub having a portion supporting the lower end of the stack, said clamping means comprising:
an annular member having a plurality of uniformly spaced radial slots to define a plurality of substantially identical tapered leaf springs; and
each leaf spring terminating at its wider end in a common solid hoop-shaped rim that overhangs and contacts the spacer ring along a circular line in the same horizontal plane as, and near, the centroid of the cross-sectional area

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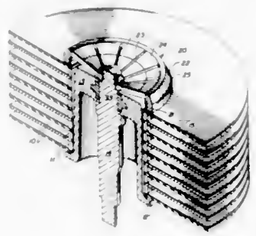
of the rim when the clamping means is uncompressed; and means for applying a compressive force on the small



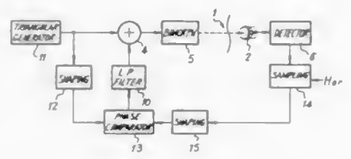
innermost ends of the leaf springs to clamp the disks to the hub.

4,918,546

TRACKING CONTROL DEVICES FOR VIDEO TAPE RECORDERS

Isao Saito, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 386,041, Jun. 7, 1982, abandoned. This application Aug. 21, 1985, Ser. No. 767,659
Claims priority, application Japan, Jun. 9, 1981, 56-88364
Int. Cl.[4] G11B *5/52*
U.S. Cl. 360—77.13 10 Claims



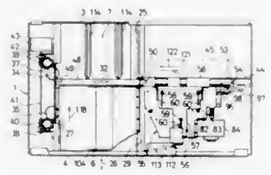
9. Apparatus according to claim 8, in which said means connected to modify said head control signal comprises a signal adder.

4,918,547

DOOR OPENING AND CLOSING MECHANISM FOR AN AUTOMATIC CHARGER FOR RECORDING MEDIA

Takashi Kikuchi, and Shigeo Aoyagi, both of Iwaki, Japan, assignors to Alpine Electronics Inc., Tokyo, Japan

Division of Ser. No. 807,368, Dec. 10, 1985, Pat. No. 4,777,547.
This application Jun. 16, 1988, Ser. No. 207,671
Claims priority, application Japan, Dec. 10, 1984, 59-186121; Dec. 10, 1984, 59-186122; Dec. 10, 1984, 59-186123; Dec. 10, 1984, 59-186124; Dec. 10, 1984, 59-186125
Int. Cl.[4] G11B *15/68*
U.S. Cl. 360—92 2 Claims



1. An automatic recording medium changer adapted to receive a medium container capable of holding a plurality of recording media, said changer comprising:

a body having a plurality of sides with one of said sides having an opening for inserting said medium container into said body;

a door supported by said body in operative relationship to said opening, said door being capable of repeatedly exposing and covering said opening;

door driving means for driving said door, comprising a rack coupled to said door and extending in an axis parallel to the direction in which said door is moved, a gear which engages said rack, and a motor for driving said gear;

wherein said door includes first and second edges and said body includes first and second guide rails for supporting respectively said first and second edges in slidable relationship to said opening; and

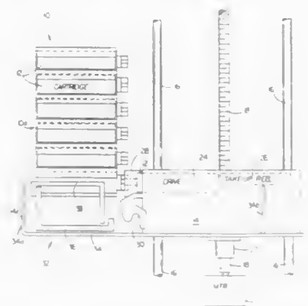
wherein said door includes a hollow portion adjacent to said rack for receiving said gear in engaging relationship to said rack.

4,918,548

CARTRIDGE LOADER

Miles C. O'Donnell, Andover, and Edward Steltzer, Westboro, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed May 9, 1988, Ser. No. 191,617
Int. Cl.[4] G11B *15/68*
U.S. Cl. 360—92 36 Claims



1. A drive loading system for data storage modules, comprising

a rack with slots for a plurality of data storage modules, said rack having a front side and a back side;

a carriage movable alongside said front side of said rack to a desired position to select a module;

a drive mounted on said carriage to receive and utilize a selected module as a storage medium; and

a linear actuator supported by said carriage having a linear insertion stroke for removing said selected module from a slot in said rack and inserting it into said drive and an extraction stroke for withdrawing said module from said drive and returning said module to said rack, said linear actuator including a rigid pawl articulated with respect to a portion of said linear actuator.

35. A data storage cartridge loading method comprising

placing cartridges in slots in a rack,

arranging a drive for utilizing a selected cartridge in operative alignment with said rack for movement therealong,

advancing a cartridge toward the drive in an insertion stroke by pushing the cartridge from its end farthest from the drive, and

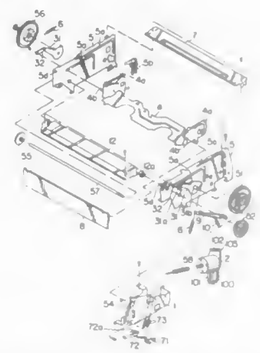
retracting the cartridge by gripping the cartridge and pulling it out of the drive.

4,918,549

AUTOMATIC CASSETTE LOADING APPARATUS

Noboru Katono, Mito; Yoshihiro Shibata, Katsuta, and Tadashi Takamiya, Nakaminato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 57,651, Jun. 10, 1987, abandoned, which is a continuation of Ser. No. 619,379, Jun. 11, 1984, abandoned. This application Dec. 27, 1988, Ser. No. 289,532
Claims priority, application Japan, Jun. 15, 1983, 58-105788
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—93 11 Claims



1. An automatic cassette loading apparatus in which a cassette holder for holding and transporting a tape cassette is moved between respective positions of a cassette delivery position, a cassette insertion position, and a cassette loaded position comprising:

a loading motor;

power transmission means coupled to said motor for transmitting drive power from said loading motor to said cassette holder to cause transporting of said cassette holder between predetermined ones of said respective positions; a cam means included in said power transmission means which is moved in response to the transmission of power by said power transmission means;

first and second members which each have a first end, coupled to said cam means, and a second end;

first and second switches which each have a high and a low state, the high and low states of the first switch being controlled by the second end of the first member and the high and low states of the second switch being controlled by the second end of the second member;

an end of tape sensor including a photodetector arrangement for detecting both leading and trailing end of tape conditions of the tape cassette when the tape cassette is in a tape loaded position and reaches a leading or trailing end of its tape, wherein the photodetector arrangement of the end of tape sensor is in a first predetermined state when the tape cassette is not in the cassette loaded position, wherein the photodetector arrangement is in a second predetermined state when the tape cassette is in the cassette loaded position and is not in either a leading or trailing end of tape condition, wherein the photodetector arrangement is in a third predetermined state when the tape cassette is in the cassette loaded position and in a leading end of tape condition, and wherein the photodetector arrangement is in a fourth predetermined state when the tape cassette is in the cassette loaded position and in a trailing end of tape condition; and

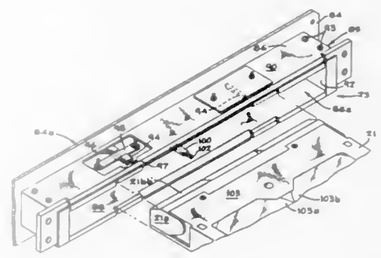
control means, responsive to the states of said first and second switches and the first, second, third and fourth predetermined states of the photodetector arrangement of the end of tape sensor for controlling the activation of said motor to move said cassette holder between predetermined ones of the cassette delivery position, the cassette insertion position and the cassette loaded position, in such a manner that the cassette delivery position is defined by a second mode of said first switch, a second mode of said second switch and the first predetermined state of said photodetector arrangement of the end of tape sensor, the cassette insertion position is defined by a first mode of said first switch, a first mode of said second switch and said first predetermined state of said photodetector arrangement of the end of tape sensor, and the cassette loaded position is defined by said second mode of said first switch, said first mode of said second switch and the second, third or fourth predetermined state of said photodetector arrangement of the end of tape sensor.

4,918,550

MIS-INSERTION APPARATUS FOR A TAPE TRANSPORT CAPABLE OF RECEIVING CASSETTES OF VARYING SIZES FOR PLAY

Antoni S. Baranski, San Carlos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Division of Ser. No. 117,771, Nov. 5, 1987, Pat. No. 4,853,805.
This application May 10, 1989, Ser. No. 350,080
Int. Cl.[4] G11B *15/675*
U.S. Cl. 360—94 5 Claims



1. In a magnetic recording and reproducing apparatus capable of receiving cassettes of varying size, one at a time for play, mis-insertion apparatus preventing a cassette having a front insertion face with beveled and non-beveled edge portions and side and rear mis-insertion faces with relatively sharp edges from being mis-inserted into a cassette receiving compartment of an elevator of the apparatus, said mis-insertion apparatus comprising:

a cassette receiving sleeve extending forwardly of the elevator of the apparatus, said sleeve including a bottom plate, a top plate and connecting side plates, which define a cassette insertion opening in the cassette receiving sleeve compatible with the largest size cassette to be inserted into the sleeve;

at least one detent mounted on the cassette receiving sleeve and biased into the cassette insertion opening of the mis-insertion apparatus, said detent disposed in the path of the cassette to be inserted into the cassette insertion opening of the cassette receiving sleeve; and

said detent having an abutment face extending generally perpendicularly downwardly from the top plate of the cassette receiving sleeve, said detent engageable with the respective side of the cassette to be inserted into the cassette insertion opening in the cassette receiving sleeve said detent being immovable to prevent admission of the cassette to the elevator when a face of the cassette engaging the abutment face corresponds to a mis-insertion position for the cassette, and the detent being movable against its bias into the cassette insertion opening to admit the cassette to the elevator when the beveled edge portions of the front insertion face of the cassette to be inserted into the

VOL 1113 ISS 3 AP 17 1990 UMI

cassette receiving sleeve are positioned to engage and move the abutment face of the detent against its bias and out of the cassette insertion opening of the cassette receiving sleeve.

4,918,551

APPARATUS FOR LOADING A RECORD MEDIUM CASSETTE

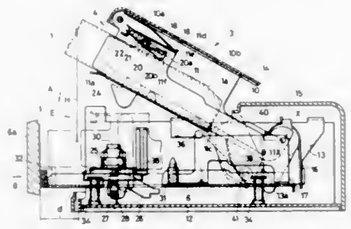
Shuji Yoshida, Saitama; Eiji Ohshima, Tokyo, and Yoshio Kusui, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 867,223, May 27, 1986, abandoned. This application Jul. 5, 1988, Ser. No. 214,827

Claims priority, application Japan, May 27, 1985, 60-113782; May 27, 1985, 60-78895[U]

Int. Cl.[4] G11B *15/66*

U.S. Cl. 360—96.5 **7 Claims**



1. An apparatus for recording and/or reproducing a signal on a magnetic tape in a cassette tape:

said apparatus having an outer casing which defines an aperture in a side thereof for use in loading and unloading a cassette into and from the apparatus through the aperture;

tape cassette receiving means for receiving and holding a cassette, said receiving means being pivotally connected to said apparatus and constructed for pivotal movement through said aperture between a substantially-flush closed position and an angularly disposed open position;

said cassette receiving means including a first holder pivotally connected to said apparatus and a second holder adapted to hold a cassette which is pivotally connected to a slide member in the interior of the apparatus;

said slide member adapted to move between a retracted position and a recording/reproducing position, said slide member constructed to receive said second holder when the cassette receiving means is in the closed position and move said second holder and cassette to the operative position.

4,918,552

CASSETTE TAPE RECORDER HAVING MEANS FOR PREVENTING CASSETTE VIBRATION DURING PLAYBACK/RECORDING

Yoshio Tsutsumi, and Seiichi Suzuki, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

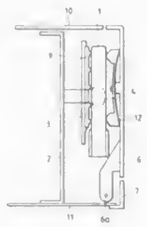
Filed Aug. 4, 1988, Ser. No. 228,144

Claims priority, application Japan, Sep. 10, 1987, 62-137619; Dec. 24, 1987, 62-325301

Int. Cl.[4] G11B *15/68*

U.S. Cl. 360—96.5 **14 Claims**

1. In a cassette tape recorder of the type having a recess for loading a cassette, a hiding plate located at the back of the recess for hiding an internal mechanism of the tape recorder, the hiding plate having means for positioning the cassette thereon and for moving the tape within the cassette during a playback/recording operation of the recorder, and means for pushing the cassette against the hiding plate, the improvement comprising:



an elastic sheet, located on the surface of said hiding plate, for preventing vibration of the cassette which occurs during the playback/recording operation of the recorder.

4,918,553

RECORDING/REPRODUCING APPARATUS FOR A DISK CASSETTE

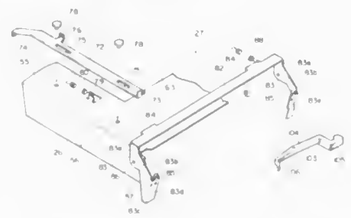
Masayuki Suzuki, Tokyo, and Hirokimi Iwata, Ibaragi, both of Japan, assignors to Sony Coporation, Tokyo, Japan

Filed May 23, 1988, Ser. No. 197,287

Claims priority, application Japan, May 23, 1987, 62-78054[U]

Int. Cl.[4] G11B *5/012*

U.S. Cl. 360—99.06 **14 Claims**



1. Positioning apparatus for a disk cassette comprising

a disk cassette rotatably accommodating a disk-like recording medium and having positioning holes at least on one flat surface thereof,

a holder holding said disk cassette and being vertically movable so as to cause said disk cassette to take selectively a first position in which said disk-like recording medium is attached to rotational disk drive means or a second position spaced above said first position,

means for shifting said holder between said first position and said second position, and

means for engaging with said positioning holes in said disk cassette when said holder is in said first position for positioning said disk cassette,

and further comprising locking means mounted, on said holder for rotation along a lateral wall of said disk cassette, said locking means being rotated substantially simultaneously with termination of insertion of said disk cassette into said holder for retaining said disk cassette in the vicinity of said positioning holes of said disk cassette and locking said disk cassette relative to said holder.

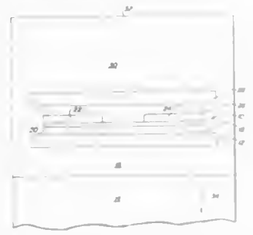
4,918,554

PROCESS FOR MAKING A SHIELDED MAGNETORESISTIVE SENSOR

Christopher H. Bajorek, Rochester, Minn.; Cheng T. Horng, and Edward T. Yen, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 27, 1988, Ser. No. 249,916

Int. Cl.[4] G11B *5/39;* **G01R** *33/02;* **H01L** *43/00;* **H01F** *7/06*

U.S. Cl. 360—113 **10 Claims**

1. The method for making a shielded magnetoresistive sensor comprising the steps of:

depositing a layer of a magnetic alloy comprising 3 to 6% aluminum, 6 to 12% silicon and the remainder iron to form a first shield member;

heat treating said layer of a magnetic alloy at a temperature greater than 400° C. for a predetermined time to enhance the magnetic properties of said first shield member;

depositing a first layer of a suitable electrically insulating material over said first shield member;

depositing, in the presence of a magnetic field, a thin film of a magnetoresistive conductive layer formed of a magnetic material, said magnetic field being operable to orient said layer of magnetic material in a preferred direction;

depositing a second layer of a suitable electrically insulating material over said layer of magnetoresistive material; and

depositing a layer of soft magnetic material over said second layer of said electrically insulating material to form a second shield member.

4,918,555

MAGNETIC HEAD CONTAINING AN FE-BASE SOFT MAGNETIC ALLOY LAYER

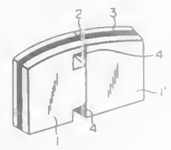
Yoshihito Yoshizawa; Kiyotaka Yamauchi, both of Kumagaya; Toshikazu Nishiyama, Fukaya, and Shigekazu Suwabe, Kumagaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 223,843

Claims priority, application Japan, Jul. 23, 1987, 62-183876; Jul. 23, 1987, 62-183877

Int. Cl.[4] G11B *5/147*

U.S. Cl. 360—125 **20 Claims**



1. A magnetic head having a magnetic path which contains at least one magnetic gap in its magnetic path, wherein the magnetic path comprises an Fe-base soft magnetic alloy layer, with at least 50% of the structure of said alloy layer consisting of fine crystalline particles having a body-centered cubic structure and an average particle size of 500Å or less.

4,918,556

MAGNETIC DISK RECORDING AND REPRODUCING APPARATUS

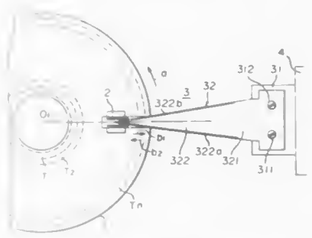
Joichiro Ezaki, Saku; Kazumasa Fukuda, Komoro, and Masanori Sakai, Nagano, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Aug. 17, 1988, Ser. No. 233,129

Claims priority, application Japan, Aug. 27, 1987, 62-213287

Int. Cl.[4] G11B *5/012*

U.S. Cl. 360—97.02 **14 Claims**



1. A magnetic recording and reproducing apparatus of a type wherein a magnetic disk having a magnetic recording layer formed on a rigid substrate is rotatable at a high speed and a magnetic head is disposed on the surface of the disk so that magnetic recording and reproduction are conducted by the head while rotating the disk at a high speed, wherein the surface roughness R_{max} of the magnetic disk is adjusted at a level of at most 100 Å, and the flying height of the magnetic head at the initiation of flying is adjusted at a level within a range of from 0.01 to 0.04 μm.

4,918,557

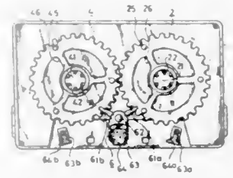
CLEANER FOR MAGNETIC HEAD OF TAPE RECORDER

Benjamin Lee, 2F, 87Shu Hsin Road, Su Lio Town, Taipei Hsien, Taiwan

Filed Jul. 18, 1988, Ser. No. 220,537

Int. Cl.[4] G11B *5/41*

U.S. Cl. 360—128 **9 Claims**



1. A cleaner for a magnetic head of a tape recorder having spaced revolving shafts, comprising a tape cartridge provided with at least one cartridge hole positioned and dimensioned to coaxially receive an associated revolving shaft of the tape recorder; at least one generally circular gear arranged within said cartridge and having a gear hole coaxial with an associated cartridge hole during use and dimensioned to engage and rotate with an associated revolving shaft, said at least one gear defining a surface in a plane to one side of said at least one gear; a plurality of posts projecting from said surface and substantially equally spaced from each other along the circumference of said at least one gear; a rocker centrally installed on said

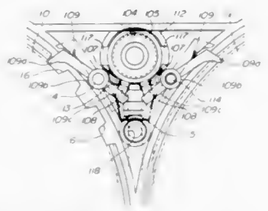
cartridge proximate to said at least one gear and mounted for reciprocal movements proximate to the magnetic head; actuating means for engaging successive posts during rotation of said at least one gear and causing said rocker to reciprocate; and a cleaning element arranged on said rocker to reciprocate while in contact with the magnetic head to thereby clean the magnetic head of the tape recorder.

4,918,558

MAGNETIC TAPE CASSETTE HAVING REEL LOCKS CONTROLLED BY AN OPTICAL TAPE END DETECTING ELEMENT

Tadao Igarashi; Takashi Ota, both of Miyagi, and Takeo Oba, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 21, 1988, Ser. No. 287,155
Claims priority, application Japan, Dec. 22, 1987, 62-324526
Int. Cl.[4] G11B *23/02*
U.S. Cl. 360—132 **8 Claims**



1. A magnetic tape cassette comprising:
a pair of tape reels each being rotatable about its axis for receiving a tape;
a housing defining a space for enclosing said pair of reels;
a pair of reel lock arms pivotably arranged in the housing for engaging with the peripheries of said reels and restricting rotation of said reels;
first spring means for establishing engagement between said reel lock arms and the peripheries of said reels;
an opening formed in a bottom face of said housing through which a tape end detecting element can be introduced;
a sliding member arranged in said housing for covering said opening, said sliding member sliding along a predetermined path;
a pair of cam members provided on said sliding member for rotating said reel lock arms to release engagement between said reel lock arms and the peripheries of said reels when said tape end detecting element is inserted into said opening;
a guide member for defining the predetermined path of said sliding member and for defining a predetermined optical path along which light emitted by said detecting element can pass; and
second spring means biasing said sliding member towards a bottom position in which said opening is closed by said sliding member.

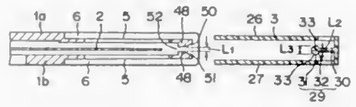
4,918,559

SHUTTER ASSEMBLY FOR A DISK CARTRIDGE

Hiroshi Maruyama, Toride; Yoshitake Kato, and Minoru Fujita, both of Ibaragi, all of Japan, assignors to Hitachi Maxwell, Ltd., Osaka, Japan

Continuation of Ser. No. 865,119, May 20, 1986, abandoned. This application Jul. 31, 1989, Ser. No. 387,434
Claims priority, application Japan, May 20, 1985, 60-107272; Aug. 30, 1985, 60-191235; Sep. 9, 1985, 60-197747
Int. Cl.[4] G11B *23/03*
U.S. Cl. 360—133 **5 Claims**

1. A disc cartrige comprising a cartridge case for rotatably accommodating a recording disc and a shutter made entirely of a plastic resin material for opening and closing at least one head accessing opening defined on said cartridge case, wherein said shutter comprises first and second parallel plate members joined by a connecting plate which connects corresponding ends of said first and second parallel plates to form a general U-shaped closure, a first engaging means comprising at least one deformable resilient member consisting of said plastic resin material projected perpendicular from an intermediate portion of said connection plate between and parallel to said first and second parallel plate members, said at least one resilient member having a resilient body portion and a free end portion formed as a tip and a second engaging means formed on said cartridge case having a surface for engagement with said first engaging means, said first engaging means being resiliently bent upon contact of said tip of said free end portion with said surface of said second engaging means when said shutter is assembled on said cartridge case such that said first engaging means is bent upwards to ride up and interlock with said second engaging means thereby mounting said plastic resin shutter on said cartridge case.

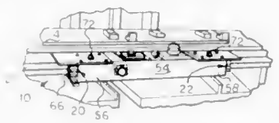


4,918,560

PROXIMITY OPERATED MACHINE CONTROL

Roy R. Storer, 303 Townline-Kossuth Rd., St. Marys, Ohio 45885

Filed Jul. 29, 1988, Ser. No. 225,833
Int. Cl.[4] H01H *9/00*
U.S. Cl. 361—190 **9 Claims**



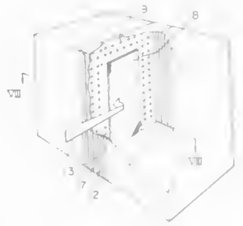
1. A machine control for electrically-operated machines having a machine control circuit wherein the circuit includes a pair of electrical switches connected in series whereby both switches must be simultaneously closed to energize the machine, the improvement comprising, in combination, first and second switches connected in series included in the machine control circuit, at least one of said switches including proximity sensing means for sensing the presence of an operator upon the operator locating a hand portion within a predetermined distance of said sensing means, an access to said sensing means defined on the associated switch, and yieldable force resistance means located within said access accessible to the operator's hand whereby said force resistance means must be overcome by the operator's hand to locate the hand within said predetermined distance of said sensing means.

4,918,561

HOUSING FOR ELECTRONIC APPARATUS

Hiroshi Watanabe, Hitachi; Yoshiaki Takahashi, Mito; Masayuki Sakata, Takahagi; Keshirou Adachi, Tokorozawa; Jushi Ide, Mito, and Atsuo Yoshida, Kokubunji, all of Japan, assignors to Hitachi, Ltd, Tokyo and Hitachi Process Computer Engineering, Inc., Hitachi, both of, Japan

Filed Oct. 6, 1988, Ser. No. 254,224
Claims priority, application Japan, Oct. 12, 1987, 62-254553
Int. Cl.[4] H65K *7/20*
U.S. Cl. 361—384 **4 Claims**



1. A housing for accommodating an electronic apparatus including heat-generating parts, the housing comprising a cooling air inlet means formed on at least one of a front side and a rear side of the housing for enabling a flow of cooling air to enter the housing to cool the heat generating parts accommodated therein, said cooling air inlet means having noise absorbing means disposed therein and including an inlet port, said inlet port formed in an arcuate fashion curving inwardly toward an interior of the housing wherein an intake air velocity is reduced by said inlet port and noise generated by a noise source disposed in the housing is reduced by said noise absorbing means.

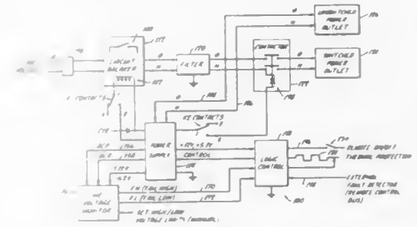
4,918,562

POWER CONTROLLER WITH VOLTAGE-CONTROLLED CIRCUIT BREAKER

Peter S. Pulizzi, Fountain Valley; John D. Pequet, Laguna Nigel; Roger W. Cook, Garden Grove, and Stephen J. Kane, Placentia, all of Calif., assignors to Pulizzi Engineering, Inc., Santa Ana, Calif.

Filed Jan. 30, 1989, Ser. No. 303,912
Int. Cl.[4] H02H *3/24*
U.S. Cl. 361—86 **18 Claims**

1. A power controller apparatus which comprises:
a. a circuit breaker having an electrically-actuatable trip coil for enabling the circuit breaker to be tripped-off electrically;
b. means for electrically connecting the circuit breaker to an operating voltage;
c. at least one unswitched power outlet connected to the circuit breaker to receive operating voltage therefrom;
d. operating voltage monitoring means for monitoring said operating voltage and for providing a voltage indication when the operating voltage moves outside of a preestablished operating voltage range; and
e. logic control means for receiving said voltage indication and for tripping-off the circuit breaker in response thereto, said control means having associated therewith a capacitor and means for charging the capacitor only when the circuit breaker is tripped on and is receiving said operating voltage and relay means for connecting the charged capacitor to the circuit breaker trip coil for thereby causing the energizing thereof in response to said voltage indication.

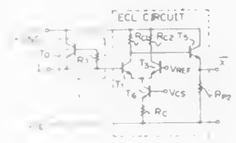


4,918,563

ECL GATE ARRAY SEMICONDUCTOR DEVICE WITH PROTECTIVE ELEMENTS

Yasunori Kanai, Inagi; Kazumasa Nawata; Mitsuhisa Shimizu, both of Kawasaki, and Toshiaki Sakai, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 91,321, Aug. 31, 1987, abandoned, which is a continuation of Ser. No. 942,921, Dec. 17, 1986, abandoned, which is a continuation of Ser. No. 653,740, Sep. 24, 1984, abandoned. This application Feb. 27, 1989, Ser. No. 316,532
Claims priority, application Japan, Sep. 22, 1983, 58-175974
Int. Cl.[4] H02H *3/20*
U.S. Cl. 361—91 **2 Claims**



1. A semiconductor device comprising:
a semiconductor chip;
a high potential level power supply line arranged on said peripheral portion of said chip;
an internal gate region having a plurality of internal gates arranged on a central portion of the chip, said internal gate comprising an ECL gate having a pair of transistors with commonly connected emitters and collectors operatively connected to said high potential level power supply line through a resistor;
a plurality of emitter-follower-type output transistors arranged on a peripheral region of said chip and on an outer region of said internal gate region, said output transistors having a collector operatively connected to said high potential level power supply line, a base for receiving signals from said internal gates and an emitter for outputting signals to an external portion of said semiconductor device, said output transistors being NPN type;
a plurality of input/output pads arranged on said peripheral region of said chip and on an outer region of said emitter-follower-type output transistors, said input/output pads

comprising a first pad operatively connected to said emitter of the output transistor to operate as an output pad, and a second pad operatively connected to said base of the transistor of the ECL gate to operate as an input pad;

a plurality of protective elements arranged in a vicinity of said input/output pads and of said high potential level power supply line, said protective elements comprising an NPN type transistor having a collector operatively connected to said high potential level power supply line, an emitter operatively connected to said input/output pads, and a base operatively connected to said input/output pad, said protective elements being conductive when a high electrostatic energy is applied to said input/output pads, for preventing destruction of said transistors of the ECl gate or said output transistors;

wherein each of said output transistors and a corresponding one of said transistors of the protective elements are formed within the same collector land, and said high potential level power supply line extends over said collector land and is connected to said collector land, base regions of said protective transistors and output transistors are formed in said collector land respectively, emitter regions of said protective transistors and output transistors are formed in said base regions thereof respectively; and

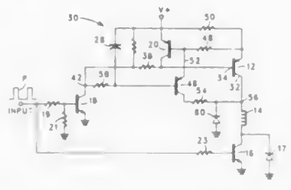
a low potential level power supply line being formed on said chip.

4,918,564

LOAD DRIVER WITH DELAYED TURN-OFF

Charles J. Walker, Round Lake Beach, and Steve Dominguez, Elgin, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 30, 1989, Ser. No. 358,969
Int. Cl.[4] H02H *3/08*
U.S. Cl. 361—94 4 Claims



1. A load driver circuit, comprising:

an output transistor having an input terminal and an output terminal;

a load connected to the output terminal of the output transistor;

means for repetitively turning the output transistor on;

a protective circuit coupled to the output transistor for sensing and limiting the current in the output transistor to a safe level, and for turning the output transistor off in response to a fault sense signal; and

a delay circuit coupled to the load and to the protective circuit; and responsive to abnormal load conditions for applying a fault sense signal to the protective circuit after the output transistor has been turned on for a brief, preselected interval, thereby permitting the protective circuit to turn off the output transistor.

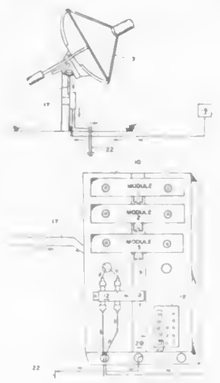
4,918,565

ELECTRICAL SURGE SUPPRESSOR

Larry J. King, P.O. Box 348, Clinton, N.C. 28328

Filed Aug. 11, 1988, Ser. No. 230,863
Int. Cl.[4] H02H *3/20*
U.S. Cl. 361—119 8 Claims

1. An electrical surge suppressor for use with and as protection for a video satellite receiver system havng an antenna, a television receiver located remote from the antenna, coaxial cable means connecting the antenna to the receiver, and a ground mechanically and electrically joining the antenna, receiver, and cable means, said surge suppressor comprising: a base member connected to ground; a dual ground block mechanically and electrically connected to said base member for carrying video signals within the coaxial cable means of the



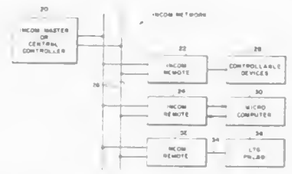
system; a plurality of protector modules each of which is mechanically and electrically connected to a single control function conductor of the system and communicable with the ground whereby the suppressor will shunt electrical impulse energy to ground without damage to the components of the video satellite receiver system, replacement of the elements of the surge suppressor, or distortion of the video signal.

4,918,566

ELECTRONIC CONTROL OF SOLENOID OPERATED CIRCUIT BREAKERS

Bruce L. Brodsky, Bridgeville, and David L. Davidson, New Alexandria, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 27, 1988, Ser. No. 199,417
Int. Cl.[4] H02J *3/00*
U.S. Cl. 361—166 37 Claims



1. An electronic controller for controlling solenoid operated circuit breakers, used to provide electrical power to one or more electrical loads, coupled to a master controller through a common network line forming a bidirectional communication link therebetween, comprising:

receiving means for receiving commands from said master controller over said common network line;

control means for controlling said circuit breaker in accordance with the command from said master controller; and

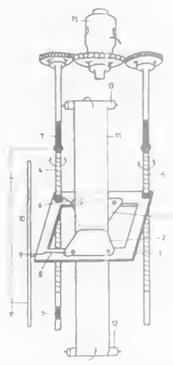
circuit breaker status determining means for determining the status of the circuit breaker independently of the electrical load to which the circuit breaker is connected to verify that the command was properly executed.

4,918,567

MOVING CORONA DISCHARGING APPARATUS

Chiu-Fong Liaw, Hsin Chu Hsien, Taiwan, assignor to Industrial Technology Research Institute, Hsin Chu Hsien, Taiwan

Filed Dec. 8, 1988, Ser. No. 281,068
Int. Cl.[4] H01F *1/02*
U.S. Cl. 361—229 6 Claims



1. A corona discharging apparatus comprising:

a DC high voltage regulator;

a pair of thin electrodes arranged edge-to-edge, said electrodes having an adjustable air gap separating them;

a polymer film inserted in said gap, said electrodes being reciprocally movable along said film within a predetermined distance for performing corona discharge, said corona discharge caused by an electric field generated in said air gap by connecting one of said thin electrodes to said voltage regulator and grounding the other thin electrode;

an insulating platform for supporting said electrodes; and

a pair of threaded metal bars for supporting the platform, said bars driven by a motor causing said bars to rotate in both a clockwise and a counterclockwise direction and thereby inducing said platform and electrodes to reciprocate along said film.

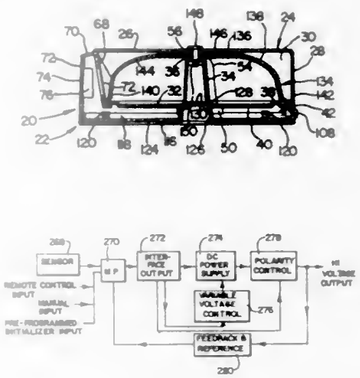
4,918,568

AIR QUALITY CONTROL SYSTEMS

Judson F. Stone, Northfield, and Harold O. Schwartz, Elburn, both of Ill., assignors to Air Physics Corporation, Northfield, Ill.

Filed Apr. 22, 1988, Ser. No. 184,762
Int. Cl.[4] H01T *23/00*
U.S. Cl. 361—231 19 Claims

1. An air quality control system for altering the state of small particles present in the air such as organisms, dust and smoke, an enclosed space comprising a source of high voltage, a charged surface exposed within said space adapted to develop either a positive or negative electrostatic charge on said surface, said surface being connected to said source of high voltage whereby a continuous electrostatic charge is applied to said surface, means for switching the polarity of said source of high voltage to achieve either a continuous and non-pulsing positive electrostatic charge, and means providing for circulation of air relative to said charged surface whereby the electrical charges of said small particles present in the air located



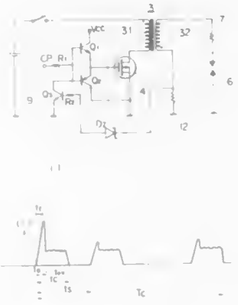
proximate said charged surface are altered due to exposure to said electrostatic charge.

4,918,569

REGULATED FORWARD CONVERTER FOR GENERATING REPEATING SPARK DISCHARGE PULSES

Tsutomu Maeda; Kiyoshi Matsui; Takayuki Kanno, and Kunihiro Sato, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation of Ser. No. 212,642, Jun. 28, 1988, abandoned. This application Sep. 25, 1989, Ser. No. 411,265
Claims priority, application Japan, Jun. 30, 1987, 62-163214; Jun. 30, 1987, 62-163634
Int. Cl.[4] F23Q *3/00*
U.S. Cl. 361—263 5 Claims



1. A discharge load driving circuit, comprising:

a transformer having a low voltage coil and a high voltage coil wound around a magnetic core, said high voltage coil having a transformation ratio for setting a high self-resonance frequency value for said transformer to thereby output high voltage at a short rise time;

a switching element operably connected to said transformer for switching on and off a d-c input supplied thereto through the low voltage coil of said transformer;

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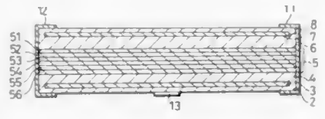
a driver circuit for driving a switching element driving pulse;
a control circuit for controlling said driver circuit;
a discharge load connected to said high voltage coil for discharging load by a high voltage output generated in said high voltage coil when said switching element is turned on; and
a detector for detecting a flow of discharge current in said discharge load;
said switching element repeates its on-off action in a predetermined period for supplying a required amount of discharge energy to said discharge load until self-propagation of a flame subsequent to generation of a flame nucleus by a spark discharge of said discharge load.

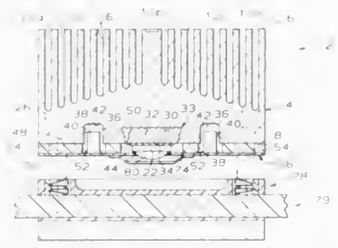
4,918,570
ELECTRONIC COMPONENT AND ITS PRODUCTION METHOD
Hisatake Okamura; Teruhisa Tsuru, and Tetsuo Taniguchi, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan
Filed Apr. 10, 1989, Ser. No. 335,259
Claims priority, application Japan, Dec. 20, 1988, 63-323115
Int. Cl.[4] H01G *4/10, 7/00;* H01P *1/20*
U.S. Cl. 361—321 **20 Claims**



1. An electronic component comprising:
an electronic component core having upper and lower main surfaces, said electronic component core including at least one core layer formed of a non-metal material, which has at least one conductive land forming an inductor on at least one main surface thereof;
a pair of intermediate layers, which are made of a non-metal material and formed on said upper and lower main surfaces of said electronic component core;
at least a pair of shielding electrode layers which are formed of a metal material on top of said intermediate layers and are partially exposed;
a pair of protective layers formed on top of said shielding electrode layers;
a grounding terminal which is exposed outside of said layers and is connected with exposed portions of said shielding electrode layers; and
input and output terminals formed on outside surfaces of said layers.

4,918,571
CHIP CARRIER WITH ENERGY STORAGE MEANS
Dimitry G. Grabbe, Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Continuation of Ser. No. 32,900, Mar. 31, 1987, abandoned. This application Apr. 11, 1988, Ser. No. 183,305
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—386 **16 Claims**

1. An electrical component of the type used to interconnect an integrated circuit having pads or the like to a substrate, the electrical component comprising:
a housing means having heat sink means, conductor means and spacer means;
the heat sink means having a top surface and a bottom surface, the bottom surface having recesses and an integrated circuit receiving zone positioned thereon, the top surface of the heat sink means configured to dissipate heat efficiently, insuring that the integrated circuit remains within given operating temperatures;
the conductor means having conductors thereon, respective conductors electrically engage respective pads of the integrated circuit, the conductor means having a first opening extending therethrough;
the spacer means having an upper surface which cooperates with the bottom surface of the heat sink means and a lower surface which cooperates with the conductor means, the spacer means being dimensioned with essentially the same thickness as the integrated circuit, second and third openings extend through the spacer means, respective second openings of the spacer means align with the recesses of the heat sink means, and the first opening of the conductor means aligns with the integrated circuit receiving zone of the heat sink means and a respective third opening of the spacer means;

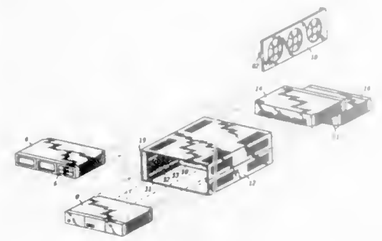


The integrated circuit secured to the integrated circuit receiving zone, such that the integrated circuit extends into the respective third opening in the spacer means and is in substantial alignment with the first opening in the conductor means;
energy storage means positioned proximate the integrated circuit, the energy storage means being secured to respective conductors of the conductor means and extending through the second openings of the spacer means, into the recesses of the heat sink means;
whereby during the operation of the integrated circuit, numerous pads of the integrated circuit can be switched simultaneously requiring a large instantaneous power supply, causing the energy storage means to supply the power required for effective operation.

4,918,572
MODULAR ELECTRONIC PACKAGE
Carl R. Tarver, Phoenix; James G. Lawrence, Buckeye, both of Ariz., and Charles L. Whittington, Lake Zurich, Ill., assignors to Motorola Computer X, Inc., Schaumburg, Ill. and Emtek Health Care Systems, Inc., Tempe, Ariz.
Filed Dec. 27, 1988, Ser. No. 289,885
Int. Cl.[4] H05K *7/10*
U.S. Cl. 361—395 **4 Claims**

1. A method of assembling an electronic module, said method comprising the following steps:
(a) providing a box-like housing member having two substantially open opposing sides;
(b) providing at least two electronic sub-modules, each of said electronic sub-modules performing a sub-function of said electronic mdoule and each comprising a first connector means;
(c) securing a circuit board within said housing member substantially coplanar with said sides, said circuit board comprising
(i) a plurality of electrical conductors,
(ii) second connector means coupled to said plurality of conductors and located on a first side of said circuit board, and

(iii) third connector means coupled to said plurality of conductors and located on a second side of said circuit board;
(d) inserting a first one of said electronic submodules through one side of said housing member until its first connector means couples to said second connector means; and

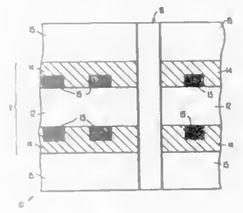


(e) inserting a second one of said electronic submodules through another side of said housing member until its first connector means couples to said third connector means;
whereby said electronic module can be assembled without utilizing wiring harnesses.

4,918,573
ELECTRICAL CIRCUIT AND AN ADJUSTABLE COMPONENT SPACER USED THEREIN
Dean J. Stavrakas, and John W. Swann, both of Baltimore, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Aug. 14, 1989, Ser. No. 393,154
Int. Cl.[4] H05K *1/18, 7/08*
U.S. Cl. 361—403 **12 Claims**

5. A component spacer for maintaining a gap between an electrical component and a printed circuit board to which the component is electrically attached by at least two connectors, comprising:
a generally flat partition having a bifurcated section defining an elongated slot extending therethrough for receiving one of the connectors and having an aperture extending therethrough which is spaced from the slot for receiving another of the connectors; and
projections extending vertically from the partition for contacting a printed circuit board,
wherein a plurality of projections vertically extend along the elongated slot and serrations extend into the bifurcated section of the partition transversely of the elongated slot between the projections.

4,918,574
MULTILAYER CIRCUIT BOARD WITH REDUCED SUSCEPTABILITY TO SHORTS CAUSED BY TRAPPED IMPURITIES
Joseph G. Hoffarth; Donald J. Lazzarini; John A. Welsh, all of Binghamton, and John P. Wiley, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation-in-part of Ser. No. 95,089, Sep. 11, 1987, abandoned, which is a continuation of Ser. No. 922,422, Oct. 23, 1986, abandoned. This application Apr. 15, 1988, Ser. No. 183,491
Int. Cl.[4] H05K *1/11*
U.S. Cl. 361—414 **7 Claims**



1. A multilayer circuit board for use in applications where circuit lines and through holes have a high density rendering them susceptible to shorts caused by trapped impurities, comprising:
a plurality of circuit cores, each of said circuit cores including a substrate of a first insulating material with a conductive pattern of circuit lines thereon and plated through holes therethrough and having one level of impurities;
a conformal layer of a second insulating material encapsulating said circuit lines on at least one side of at least one of said circuit cores to eliminate said shorts caused by said trapped impurities, said second insulating material having a composition different from that of said first insulating material; and
a third insulating material separating adjacent circuit cores from one another.

4,918,575
PROTECTIVE DEVICE FOR A WIRING FIELD OF A BACKPLANE OF A SUBASSEMBLY CARRIER
Eugen Assel, Knetzgau; Burkhard Dasbach, Erlangen, and Bruno Gebhard, Forchheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Oct. 28, 1988, Ser. No. 264,215
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1987, 87144964[U]
Int. Cl.[4] H05K *9/00*
U.S. Cl. 361—424 **9 Claims**

1. In a subassembly carrier which includes a transverse bar, two opposed lateral parts, a backplane and a wiring field of parallel pins disposed on and extending away from the backplane, a protective device comprising:
at least one U-shaped lateral section, the U-shaped lateral section having a lateral portion and two legs extending transversely from opposite ends of the lateral section, a first one of the two legs being connected to one of the two opposed lateral parts, a second one of the two legs including a longitudinal receptacle having a longitudinal channel formed therein;
a shield plate cooperating the the U-shaped lateral section to

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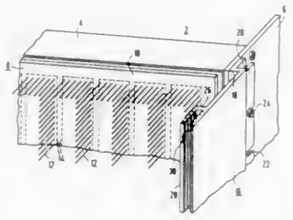
enclose and protect the wiring field, the shield plate being releasibly secured to the second one of the two legs; and



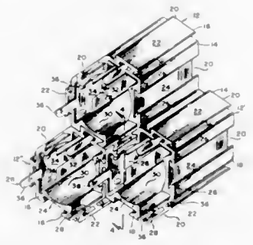
a fastening means for detachably fastening the shield plate to the receptacle.

4,918,576

PHOTOGRAPHIC FLASH LIGHTING UNIT

William R. Farrall, Grand Island, and Donald R. Farrall, Lincoln, both of Nebr., assignors to Farrall Instruments, Inc., Grand Island, Nebr.

Filed Nov. 18, 1988, Ser. No. 273,255
Int. Cl.[4] G03B *15/02*
U.S. Cl. 362—11 24 Claims



1. A photographic flash lighting unit configured to interfit with other like units, comprising:

a tubular housing which is polygonal in cross-section and having first and second ends, said housing having a plurality of elongate side faces, each of said faces having coupling means, a first plurality of said faces having male coupling means, a second plurality of said faces having female coupling means configured to matingly engage said male coupling means of like units;

said faces having male coupling means being disposed on said housing in alternating relationship to said faces having female coupling means;

locking means disposed on each of said faces having like coupling means for securing like lighting units to each other, said locking means including a spring-biased pin member provided to each of said faces of like coupling configuration, each of said pin members having at least one locking pin and being secured to an interior surface of said housing so that said pin projects vertically outwardly from said face;

lock receiving means for receiving said locking means of like lighting apparatus, said lock receiving means being located at least on said faces which alternate on said housing with said faces having said locking means;

a lamp element mounted to said housing to project axially from said first end;

connector means mounted to said second end of said housing for connection to a power supply; and

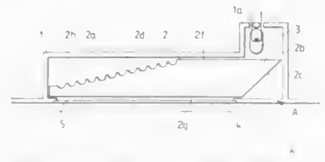
circuit means located within said housing to connect said connector means to said lamp for energization thereof.

4,918,577

ILLUMINATION LIGHT TRANSMITTING DEVICE

Mitsuru Furudate, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1988, Ser. No. 244,887
Claims priority, application Japan, Jan. 16, 1988, 63-3935[U]
Int. Cl.[4] F21V *7/04*
U.S. Cl. 362—31 1 Claim



1. An illumination light transmitting device comprising:

an external light source; and

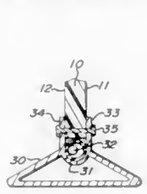
a rectangular illumination light transmitting body having an upper portion including a substantially flat surface and a surface positioned so as to form an oblique angle with said flat surface and having a plurality of curved grooves formed therein, a lower portion having a substantially flat surface, and a light reflective side surface; wherein said external light source is disposed opposite said flat surface of said upper portion and light from said external light source is reflected by said side surface onto said surface having a plurality of curved grooves formed therein.

4,918,578

LIGHT PIPING DISPLAYS

Kenneth W. Thompson, 5641 173rd St. W., Farmington, Minn. 55024

Continuation-in-part of Ser. No. 96,956, Sep. 15, 1987, abandoned. This application Sep. 30, 1988, Ser. No. 251,258
Int. Cl.[4] F21V *7/04*
U.S. Cl. 362—31 25 Claims



1. A visual display device illuminated by edge-lighting means, comprising:

a transparent panel of light piping material and a light-scattering design integrated with said panel, said transparent panel having equidistantly spaced first and second outer surfaces in all light piping portions thereof and defining the thickness thereof, said transparent panel additionally having a light-receiving perimeter edge along the perimeter thereof,

a readily conformable flexible bendable and deformable cylindrical shock absorbing light string comprising a flexible cylindrical transparent light refracting plastic conduit as the outer element of said light string, and lighting elements housed in the interior of said refracting conduit for emitting light radially outward to said light refracting conduit, and

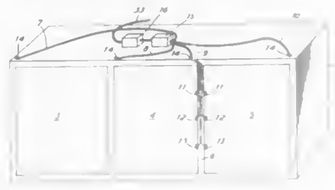
holder means nudging said light string linearly contiguously against said light-receiving edge, said holding means fixing said light string in conformable relationship against said light-receiving edge of said transparent panel such that radially outward light from said lighting elements is refracted through said light refracting conduit to said light-receiving edge and into said transparent panel, the relationship between said transparent panel and light string and holder means being such that said design of said transparent panel appears to be miraculously illuminated because of the limited bulk of said light string and said holder means at said light-receiving edge.

4,918,579

APPARATUS FOR ILUMINATING AN ENVIRONMENT WHICH OPERATES BELOW NORMAL AMBIENT TEMPERATURE

Derek N. Bennett, Edmonton, England, assignor to Less Lighting Limited, Edmonton, England

Filed Apr. 24, 1989, Ser. No. 342,138
Claims priority, application United Kingdom, Mar. 13, 1989, 8905684
Int. Cl.[4] F21V *8/00*; F25D *27/00, 21/02*
U.S. Cl. 362—32 12 Claims



1. Apparatus for illuminating an environment which operates below normal ambient temperature comprising an enclosure having an interior adapted to house product at below normal ambient temperatures, means for creating below normal ambient temperature within said enclosure interior, means for indiscriminately illuminating said enclosure interior with noninformative light, said indiscriminate illuminating means including at least one fibre optic light transmitter strand, said fibre optic light transmitter strand extending from within said enclosure interior to a point outside said enclosure interior, a light emitting first part of said fibre optic light transmitter strand being located within said enclosure interior, and means for delivering light into a second part of said fibre optic light transmitter strand located outside of said enclosure interior.

4,918,580

VEHICLE HEADLAMP

Naohi Nino, Shizuoka, Japan, assignor to Koito Seisakusho Co., Ltd., Shizuoka, Japan

Filed Nov. 4, 1988, Ser. No. 267,470
Claims priority, application Japan, Nov. 5, 1987, 62-278195
Int. Cl.[4] B60Q *1/04*
U.S. Cl. 362—61 8 Claims

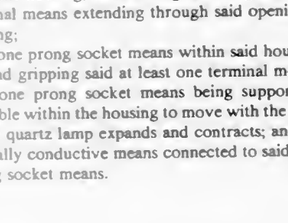
1. A vehicle headlamp comprising:

a compound light reflector including a plurality of concave light reflecting surfaces which are arranged to have a first common focus, either one of a second common focus and a second common focal line, and a common optical axis, each light reflecting surface being so shaped as to provide an elliptical line when cut by a vertical plane, at least one of said light reflecting surfaces being so shaped as to provide a parabolic line when cut by a horizontal plane;

a light source located on said first common focus of said compound light reflector;

a shade plate positioned in front of said compound light reflector, said shade plate having an upper edge located in the vicinity of one of said second common focus and said second common focal line; and

a converging lens located in front of said shade plate in such a manner that a focus of the lens is positioned on said upper edge of said shade plate,



wherein light rays produced by said light source are reflected by the respective light reflecting surfaces to produce respective light beams which are permitted to project forward through said lens, said respective light beams having contoured cross-sectional pattern zones which are different in lateral length.

4,918,582

MATING TERMINAL AND SOCKET ASSEMBLY

James D. McIngvale, Jr., Hernando, and Margaret A. Self, Lake Cormorant, both of Miss., assignors to F.L. Industries, Inc., Livingston, N.J.

Continuation-in-part of Ser. No. 133,795, Dec. 16, 1987, abandoned. This application Mar. 14, 1988, Ser. No. 167,561
Int. Cl.[4] F21S *3/02*
U.S. Cl. 362—217 22 Claims

1. An apparatus, comprising:

a quartz lamp, said quartz lamp containing a filament therein;

at least one terminal means connected to and extending outwardly from said quartz lamp, said at least one terminal means being electrically connected to said filament;

at least one housing, said housing including an opening, said terminal means extending through said opening into said housing;

at least one prong socket means within said housing receiving and gripping said at least one terminal means, said at least one prong socket means being supported by and movable within the housing to move with the quartz lamp as the quartz lamp expands and contracts; and

electrically conductive means connected to said at least one prong socket means.

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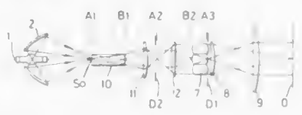
4,918,583
ILLUMINATING OPTICAL DEVICE
Yuji Kudo, Yokohama, and Koichi Matsumoto, Tokyo, both of Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Apr. 19, 1989, Ser. No. 340,444
Claims priority, application Japan, Apr. 25, 1988, 63-101925; Aug. 11, 1988, 63-200922
Int. Cl.[4] F21V *7/04*
U.S. Cl. 362—268 17 Claims

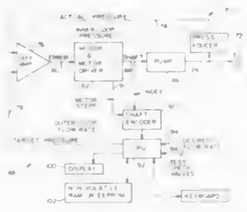


1. An illuminating optical device having an optical integrator capable of receiving a light flux from a light source and substantially forming a plane light source comprising a plurality of light source images and uniformly illuminating an object, including:
a square-pillar-like internal reflection type integrator having a plurality of reflecting surfaces capable of reflecting the light flux from said light source and forming a plurality of virtual images of said light source on a plane near the entrance surface thereof;
a fly-eye type integrator comprising a plurality of lens elements receiving the light flux from said light source and capable of forming a plurality of light source images on a plane, said lens elements being juxtaposed in proximity to one another; and
relay lens means provided between said two integrators so that the exit surface of one of said two integrators which is adjacent to the light source and the entrance surface of the other integrator which is adjacent to the object are substantially conjugate with each other.

4,918,584
SELF-ADJUSTING SERVO DEVICE AND METHOD
Kenneth W. Goff, Abington, Pa., assignor to Performance Controls, Inc., Horhsam, Pa.
Filed Jul. 8, 1988, Ser. No. 216,533
Int. Cl.[4] G05B *13/00*; G05F *1/00*
U.S. Cl. 364—177 21 Claims

1. In a servomechanism, the servomechanism being connected to control the position of a movable object, the servomechanism being controlled by a command signal, the servomechanism including means for generating a position signal indicative of the measured position of the object, the improvement comprising:
(a) means for sampling the command signal and the position signal at a plurality of points in time,
(b) means for generating an error signal proportional to the difference between the command signal and the position signal, at each of said points in time, the generating means being connected to the sampling means,
(c) means for selectively altering the polarity of the signal produced by the generating means, the polarity being altered according to the point in time at which the signal is sampled,
(d) means for integrating the signals produced by the polarity altering means, and
(e) means for varying a selected parameter of the command signal, in response to the output of the integrating means, the varying means being connected to the integrating means, the varying means being capable of changing the parameter such that the magnitude of the error signal from the generating means tends to decrease.

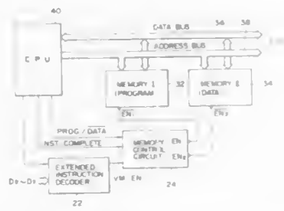
4,918,585
MAINTENANCE REMINDER SYSTEM FOR A PUMP
Les A. Miller, San Jose; Vance J. Nau, Cupertino; Ronald E. Honganen, Campbell, and Chih-Hua Chung, Fremont, all of Calif., assignors to Spectra Physics, Inc., San Jose, Calif.
Filed Jan. 11, 1988, Ser. No. 142,371
Int. Cl.[4] F04B *49/00*
U.S. Cl. 364—185 23 Claims



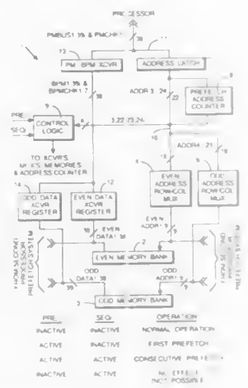
1. An apparatus for providing maintenance reminders for a pump comprising:
control means for said pump which generates at least one signal from which can be derived information indicating when another pump stroke has been conpleted;
calculating means coupled to said signal for calculating the volume of liquid which has been pumped since the last maintenance and for comparing said volume to a threshold value and for displaying a maintenance reminder if the threshold is exceeded.

4,918,586
EXTENDED MEMORY DEVICE WITH INSTRUCTION READ FROM FIRST CONTROL STORE CONTAINING INFORMATION FOR ACCESSING SECOND CONTROL STORE
Akihiro Niimura, Toyonaka, and Teiichi Lee, Osaka, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Jul. 30, 1986, Ser. No. 892,088
Claims priority, application Japan, Jul. 31, 1985, 60-170406; Sep. 20, 1985, 60-209282
Int. Cl.[4] G06F *13/00*, *7/00*, *12/06*
U.S. Cl. 364—200 3 Claims

1. A memory device for use in a CPU system, comprising:
a first addressable memory coupled to and directly accessible by a CPU;
a second addressable memory coupled to said CPU;
said first memory including at least a first instruction which specifies an access to said second memory and is immediately followed in said first memory by a second instruction which contains an operation code specifying an operation to be performed with respect to one or more addresses in said second memory and contains an address code identifying said one or more addresses in said second memory; and
selecting means for selecting one of said first and second memories in response to information supplied from said CPU, wherein said selecting means normally selects said first memory and, when said CPU reads said first instruction from said first memory, said selecting means selects said second memory temporarily only when said CPU accesses said one or more addressed in said second memory designated by said address code of said second instruction in said first memory;
wherein said selecting means includes a memory control circuit coupled to said CPU and having a first output terminal for supplying a first enable signal to said first memory and a second output terminal for supplying a second enable signal to said second memory, and a first instruction decoder coupled between said CPU and said memory control circuit to receive said first instruction from said CPU and to decode said first instruction and to supply an output to said memory control circuit.



4,918.587
PREFETCH CIRCUIT FOR A COMPUTER MEMORY SUBJECT TO CONSECUTIVE ADDRESSING
Richard G. Pechter, Escondido; Ronald Selkovitch, Ramona; Quoanh W. Tsy, and William C. Woolf, both of San Diego, all of Calif., assignors to NCR Corporation, Dayton, Ohio
Filed Dec. 11, 1987, Ser. No. 131,602
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—200 3 Claims



1. An apparatus for accelerating the rate that consecutively addressed data in a partitioned computer memory is furnished to a processor in the computer, comprising:
an addressable memory array having an even address bank and an odd address bank;
a processor bus;
an address latch connecting the processor bus to both the even and the odd banks of the memory array;
means connected between said latch and said address banks for receiving a first address from said latch and for consecutively indexing said first address to consecutively address the even and odd banks of the memory array;
an even transceiver register connected between the even bank of the memory array and the processor bus;
an odd transceiver register connected between the odd bank of the memory array and the processor bus; and
means responsive to a consecutive addressing command signal from the processor for enabling a first of said registers to provide data to the processor bus in time coincidence with addressing, by said indexing means, the memory array bank corresponding to a second of said registers and for enabling said second register to latch data from such corresponding memory array bank.

4,918,588
OFFICE AUTOMATION SYSTEM WITH INTEGRATED IMAGE MANAGEMENT
Richard M. Barrett, Chelmsford; Murray Edelberg, Carlisle; Joseph A. Nicholls, Chelmsford; Clinton J. O'Brien, North Billerica, and Bruce R. Silver, Weston, all of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.
Filed Dec. 31, 1986, Ser. No. 948,375
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 9 Claims

1. In an image management system, means for retrieving image documents from a plurality of types of bulk image storage media comprising:
(A) a relational data base system,
(B) at least one document locator data base, each for use by the relational data base system for determining a media address from a logical document identifier, the media address identifying one of a plurality of different types of storage media,
(C) an image system data base for use by the relational data base system for determining a physical device address from a media address, wherein the image system data base includes a table for each of a plurality of types of bulk image storage media, each such table including information about physical device addresses of the storage media of the type to which the table corresponds
whereby the physical device address of at least a portion of the image document identified by the logical document identifier can be determined.
5. An office automation system comprising:
(A) a plurality of bulk image storage devices, at least two of which use different types of storage media,
(B) means for defining image documents and associating with each image document a logical document identifier, where an image document is a logical group of stored

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images, said defining means being capable of including, in a single image document, images stored on the different types of media,

(C) an image access subsystem for receiving a logical document identifier and for providing access to images, which are stored on said storage devices, of the image document associated with the received logical document identifier in a manner idependent of the type of medium on which each of the images is stored,

(D) a word processing subsystem arranged to provide a logical document identifier to the image access subsystem and to display an image identified thereby as a part of a word processing document.

(E) a data base subsystem providing a field data type of the type "image document" by which an image document can be associated with a data base record in such a way that the image document can be retrieved from said storage devices by providing the content of an "image document" field to the image access subsystem as a logical document identifier,

(F) an electronic mail subsystem for delivering message packages including image documents retrieved from said storage devices by providing a logical document identifier to the image access subsystem.

4,918,589

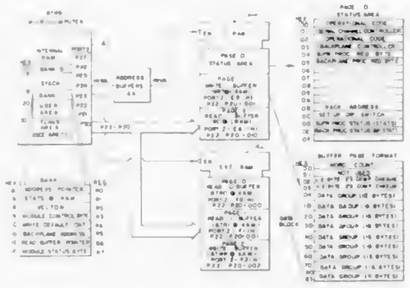
METHOD AND APPARATUS FOR LINKING PROCESSORS IN A HIERARCHICAL CONTROL SYSTEM

William E. Floro, Willoughby; Mark Luboski, Euclid, and Timothy J. Murphy, Parma, all of Ohio, assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Continuation of Ser. No. 793,589, Oct. 31, 1985, abandoned. This application Apr. 19, 1989, Ser. No. 342,637

Int. Cl.⁴ G06F *15/16*

U.S. Cl. 364—132 24 Claims



1. An inter-processor communication module for insertion into an equipment rack with a plurality of I/O modules and for connection to a backplane therein for transfer of I/O data between a higher-level system processor and a local area system processor in a programmable controller system, wherein the I/O data is of the type which is converted to and from operating signals for monitoring and controlling I/O devices on a real-time machine or process, the inter-processor communication module comprising:

serial channel controller means with a serial I/O port for sending and receiving serial data messages over a serial data channel to and from the higher-level system processor, wherein the serial data messages include I/O address information which relates I/O data in the serial data messages to I/O modules in the equipment rack with the inter-processor communication module;

the serial channel controller means including means operatively connected to the serial data port and responsive to the address information in the serial data messages for inserting into, and extracting from, the serial data messages, I/O data which is related by address to the I/O modules in the equipment rack with the inter-processor communication module; and

backplane controller means connected during operation to the backplane and responsive to address signals generated by the local area system processor during an I/O scan sequence for transferring the I/O data related to the I/O modules in the equipment rack through the backplane of the equipment rack to or from the local area system processor as a block of parallel data;

a common read/write memory;

arbitration circuitry coupling the serial channel controller means and the backplane controller means to the common read/write memory for alternating access to the common read/write memory; and

wherein the serial channel controller means includes means for transferring the I/O data to or from the the common read/write memory as a block of I/O data;

and wherein the backplane controller means includes means for transferring the block of I/O data to or from the common read/write memory to link the serial I/O port and the backplane.

4,918,590

HYBRID CIRCUIT MODULE HAVING BRIDGE CIRCUIT AND RECTIFYING CIRCUIT DISPOSED ON A SAME SUBSTRATE

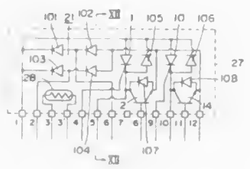
Nobuo Ohtuka, Oizumi, and Kouichi Matsumoto, Kumagaya, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 15, 1988, Ser. No. 271,306

Claims priority, application Japan, Nov. 16, 1987, 62-288779; Nov. 16, 1987, 62-288800

Int. Cl.⁴ H02M *5/44*

U.S. Cl. 363—37 5 Claims



1. A hybrid circuit module molded by electrically insulating and thermally conductive material for supplying controlled frequency electric power to a load comprising:

a substrate plate of thermally conductive material having output terminals for supplying electric power to said load;

input terminals for supplying A.C. power;

signal terminals for receiving ON/OFF switching signals; and

electrical conductors connecting said output terminals, input terminals and signal terminals to form a hybrid circuit, wherein said hybrid circuit includes: a converting circuit means comprising a plurality of rectifying diodes electrically connected together for rectifying said A.C. power received via said input terminals; a bridge circuit means, located adjacent to said converting circuit to thus shorten a length of electrical conductors between said converting circuit and said bridge circuit, said bridge circuit means comprising a plurality of semiconductor switching elements connected in a bridge form for switching ON/OFF in response to said switching signals received via said signal terminals,

wherein, when switching signals are supplied to said signal terminals by a predetermined ON/OFF combination, a rectified output from said converting circuit is transformed into an electric power of a predetermined controlled frequency and said electric power is supplied from said output terminals to said load.

4,918,591

HIGH FREQUENCY INTERFERENCE SUPPRESSION FILTER FOR CIRCUITS TO BE CONNECTED TO A CONDUCTOR

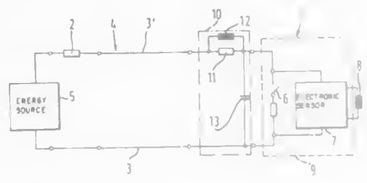
Walter Link, Rutesbeim, Fed. Rep. of Germany, assignor to Euchner & Co., Fed. Rep. of Germany

Filed Sep. 16, 1988, Ser. No. 245,373

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1987, 3731394

Int. Cl.⁴ H03H *7/06*

U.S. Cl. 363—39 10 Claims



1. A high frequency interference suppression filter for a circuit to be connected to a conductor comprising inductor means in series with the circuit to be protected from interference, at least one capacitor connected in parallel to the circuit, and an ohmic series resistor connected in parallel to the inductor means whose value is set to the characteristic impedance of the conductor.

4,918,592

POWER REGULATING SYSTEM FOR PORTABLE ENGINE GENERATOR

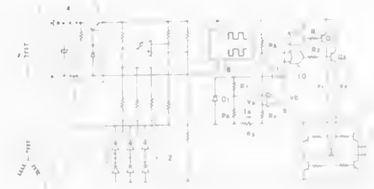
Motohiro Shimizu, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1987, Ser. No. 114,107

Claims priority, application Japan, Oct. 31, 1986, 61-258568; Oct. 31, 1986, 61-258569; Oct. 31, 1986, 61-258570

Int. Cl.⁴ H02H *7/06*

U.S. Cl. 363—50 20 Claims



1. In a power regulating system for a portable generator provided with an engine, an AC generator driven by the engine, a rectifier circuit for rectifying an AC output of the AC generator, an inverter for reconverting a direct current obtained through rectification into an alternating current of arbitrary frequency according to a driving signal, the improvement comprising an over current detecting means for detecting an over current state of said inverter and a driving signal stopping means, wherein the driving signal to said inverter is stopped for a predetermined period of time only when the over current state is detected, and then is recommenced after said predetermined period of time, and if the over current state is detected again, the driving signal to said inverter is stopped again for a predetermined period of time and then recommenced after said predetermined period of time and repeating such operation until such time that the over current state is not detected.

4,918,593

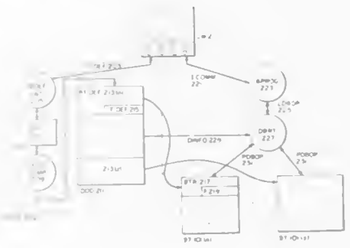
RELATIONAL DATABASE SYSTEM

Val J. Haber, Chelmsford, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Jan. 8, 1987, Ser. No. 1,474

Int. Cl.⁴ G06F *7/00*

U.S. Cl. 364—200 15 Claims



1. In a relational data base system including data dictionary means, a first base table and a second base table, each of which has at least one user-defined row defined in the data dictionary in such fashion that the first base table and the second base table are referenced and referencing, and operational means responsive to data base operation commands and to the data dictionary for performing operations on the rows,

means for maintaining a dependence between a first user-defined field in a row in one of the base tables and a row in the other of the base tables comprising:

dependence defining means in the data dictionary for defining the dependence; and

means in the operational means responsive to the dependence defining means for reestablishing the dependence as defined in the dependence defining means whenever a data base operation alters the row.

4,918,594

METHOD AND SYSTEM FOR LOGICAL SIMULATION OF INFORMATION PROCESSING SYSTEM INCLUDING LOGIC CIRCUIT MODEL AND LOGIC FUNCTION MODEL

Nobuhiko Onizuka, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 4, 1987, Ser. No. 11,068

Claims priority, application Japan, Feb. 7, 1986, 61-23782

Int. Cl.⁴ G06F *15/00, 9/00*

U.S. Cl. 364—200 10 Claims

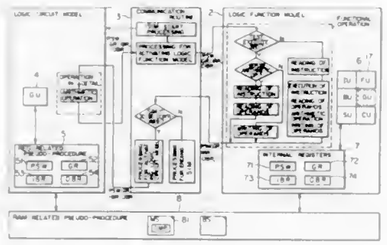
1. A logical simulation method executing by a computer for simulating operation of a data processing system that includes a plurality of logic units using a logic function model defined by a pseudo-procedure describing functional operations of the data processing system in terms of machine language instructions and using a logic circuit model defined by at least one of the logic units composed of a plurality of basic logic elements, wherein a communication routine performs a data transfer between said logic circuit model and said logic function model and wherein said communication routine controls execution of one instruction to be tested, comprising the steps of:

(a) executing by means of said logic circuit model, a logical operation of a logic circuit associated with some of said plurality of logic units to execute said one instruction; and

(b) executing in response to termination of step (a) a functional operation by said logic function model of logic units

of said plurality of logic units other than said some of said plurality of logic units wherein said step (b) includes,

(c) deciding whether or not said one instruction makes appearance in precedence to an operation processing, wherein if said one instruction makes appearance in precedence to the operation processing,



(d) performing processing for reading out said instruction and operands and

wherein when said instruction makes appearance succeedingly to the operation processing,

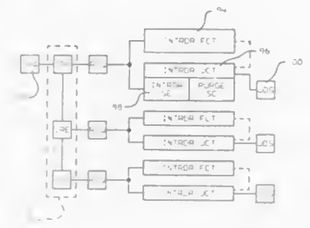
(e) performing processing of writing operands of said instruction.

4,918,595

SUBSYSTEM INPUT SERVICE FOR DYNAMICALLY SCHEDULING WORK FOR A COMPUTER SYSTEM

Kenneth A. Kahn; Robert M. Martinez, both of Poughkeepsie, N.Y., and Juha P. Vainkainen, Espoo, Finland, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jul. 31, 1987, Ser. No. 80,371
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 **10 Claims**



1. A method for operating a computer system which includes an operating system that communicates with a subsystem which prepares a job for execution by said operating system, a support program that processes a unit of work required by said job, a function control table chain in which one entry in said chain corresponds to said support program, a scheduler element in said job being represented on said function control table chain by said support program which corresponds to said unit of work that must be performed by processing said job and a data set containing an input stream created by said job, said method comprising the steps of:

(a) associating said data set directly with a job data set control block which is associated with a dynamically created and dynamically terminable internal reader job;

(b) creating and adding to a function control table entry in said function control table chain an internal reader support program corresponding to a scheduler element in said internal reader job and scheduling said function control table entry; and

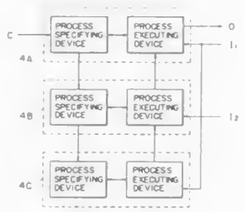
(c) dispatching said internal reader support program and processing said data set which was associated directly with said job data set control block.

4,918,596

HIERARCHICAL INFORMATION PROCESSING SYSTEM

Akira Nakano, 13-13, Mita 2-Chome, Meguro-Ku, Tokyo-To, Japan

Filed Jul. 1, 1986, Ser. No. 880,722
Claims priority, application Japan, Jul. 1, 1985, 60-144285
Int. Cl.[4] G06F *15/16, 9/40*
U.S. Cl. 364—200 **6 Claims**



1. An information processing unit comprising;

(a) at least one downward input means for acquiring process specifying information;

(b) material input means for acquiring material information to be processed;

(c) at least one upward input means for acquiring external result information which is generated by an external information processing system;

(d) a processing device comprising: means for re-composing said process specifying information into and then outputting

1. "self specifier" information corresponding to a job for said unit within a predetermined performance of the device,

2. "others specifier" information corresponding to an excess job to be executed by said external information processing system, and

3. "output specifier" information for combining results of execution in accordance with said "self specifier" and "others specifier" information to form processed information;

said re-composing means being controlled independently of the contents of said process specifying information;

means for generating internal result information in accordance with said "self specifier" information received directly from said re-composing means by processing said material information received directly from said material input means; and means for generating processed information in accordance with said "output specifier" information by processing internal result information and external result information which is the result of execution in accordance with said "others specifier" information;

(e) at least one downward output means for sending said "others specifier" information to said external information processing system; and

(f) at least one upward output means for sending said processed information.

4,918,557

ADAPTIVE INTERFACE FOR TRANSFERRING SEGMENTED MESSAGE BETWEEN DEVICE AND MICROCOMPUTER ON LINE DIVISION MULTIPLEXED BUS

Iyengar N. Krishnan, Milford, and Herbert J. Toegel, Middlebury, both of Conn., assignors to Alcatel USA Corp., New York, N.Y.

Filed Dec. 14, 1984, Ser. No. 682,035
Int. Cl.[4] G06F *13/12, 13/28, 13/42, 15/16*
U.S. Cl. 364—200 **6 Claims**

1. An interface for connecting a device and a microcomputer, said interface comprising:

a first means for transporting data between a first port, for connection to said device, and a second port for connection to said microcomputer, said first means including a data storage medium, said data being a segment of a segmented message, the last segment of said segmented message including an end of message signal;

a second means for transporting data between said first port and said second port, said second means inlcuding an address storage medium;

means for selecting either said first means or said second means for transporting data across said interface, said second means being selected when the microcomputer has direct memory access capability;

means, connected to said first and second means and responsive to said end of message signal, for registering an end of said segmented message, said end of message registering means including separate means for registering the end of a message to said microcomputer, and the end of a message from said microcomputer, so that the microcomputer can detect when a message is complete by reading said end of message registering means;

means, responsive to a signal from said end of message registering means for registering a request to interrupt said microcomputer when an end of message is registered; and

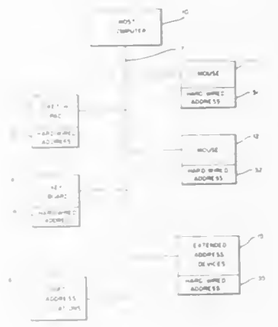
means connected to said interrupt request registering means for selectively providing said interrupt requests, said selective providing means inlcuding an interrupt mask register having bit positions set by said microcomputer, and an interrupt service register connected to said interrupt request registering means and said interrupt mask register for receiving bits therefrom and having bit positions, said bit positions being set by said interrupt service register as a logical AND of the setting of the corresponding bits in said interrupt request registering means and the inverse of the setting of the corresponding bits in said interrupt mask register, said interrupt service register providing said interrupt request based on the setting of said bits.

4,918,598

METHOD FOR SELECTIVELY ACTIVATING AND DEACTIVATING DEVICES HAVING SAME FIRST ADDRESS AND DIFFERENT EXTENDED ADDRESSES

Peter B. Ashkin, Los Gatos, and Michael Clark, Glendale, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Division of Ser. No. 765,396, Aug. 14, 1985, Pat. No. 4,910,655. This application Dec. 14, 1987, Ser. No. 132,124
Int. Cl.[4] G06F *13/42*
U.S. Cl. 364—200 **3 Claims**



1. A method for transferring signals and data, wherein the signals and data are transferred under the control of a host computer between the host computer and first and second peripheral devices, wherein the signals and data are transferred over a bus coupling the first and second peripheral devices to the host computer, wherein the first and second peripheral devices are initially inactive, and wherein the first and second peripheral devices have a same first address, comprising the steps of:

the host computer initially activating the first peripheral device by transmitting over the bus (1) the first address of the first peripheral device and (2) a signal that matches a first number stored as an extended address of the first peripheral device, wherein the second peripheral device remains inactive;

after the first peripheral device is activated, the host computer sending a command over the bus to the first address of the first peripheral device, wherein the first peripheral device executes the command without the host computer sending the extended address of the first peripheral device, and wherein the second peripheral device remains inactive;

the host computer both activating the second peripheral device and deactivating the first peripheral device by transmitting over the bus a second number as an extended address, wherein the second number is the extended address of the second peripheral device, and wherein the second number is different from the first number;

after the second peripheral device is activated, the host computer sending a command over the bus to the first address of the second peripheral device, wherein the second peripheral device executes the command without the host computer sending the extended address of the second peripheral device, and wherein the first peripheral device remains inactive.

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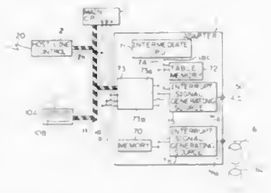
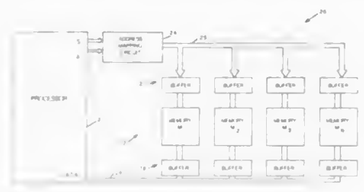
4,918,599
INTERRUPT CONTROL SYSTEM
Shigeru Hashimoto, Inagi; Yasuyuki Higashiura, Tachikawa; Yoshiyasu Sugimura, Tokyo, and Hisayuki Nishimura, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Sep. 29, 1986, Ser. No. 912,094
Claims priority, application Japan, Sep. 30, 1985, 60-217079
Int. Cl.[4] G06F 9/46
U.S. Cl. 364—200 6 Claims



1. An interrupt control system in a process execution system having a plurality of sources for generating an interrupt signal, and a main process device for receiving said interrupt signal and interrupting a process being executed in accordance with a process priority of said sources generating said interrupt signal so as to execute the process for said interrupt signal, comprising:
adapter means including
(a) an intermediate process means for receiving an interrupt signal from the plurality of said interrupt signal generating sources connected thereto having different process priorities, and for receiving process priority information corresponding to the respective process priorities of the plurality of interrupt generating sources;
(b) rewritable table memory means connected to said intermediate process means for providing the process priority information corresponding to said interrupt signal, and for storing the process priority information;
(c) means for changing the process priority information for each of the sources for generating an interrupt signal in said rewritable table memory means,
said intermediate process means includes means for receiving said interrupt signal, for obtaining from said rewritable table memory means the process priority information of the corresponding interrupt signal generating source, and for informing said main process device of the process priority together with said interrupt signal.

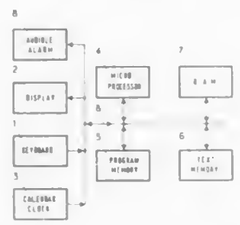
4,918,600
DYNAMIC ADDRESS MAPPING FOR CONFLICT-FREE VECTOR ACCESS
David T. Harper, III, Dallas, and Darel A. Linebarger, Plano, both of Tex., assignors to Board of Regents, University of Texas System, Austin, Tex.
Filed Aug. 1, 1988, Ser. No. 226,721
Int. Cl.[4] G06F 12/06
U.S. Cl. 364—200 20 Claims

1. A method of dynamic address mapping for conflict-free vector access in a vector processing system having a processor accessing a main memory having a multiplicity of N memory modules in which sequential memory addresses are mapped to different ones of the memory modules, said processor including means for referencing successive addresses differing by a constant access stride, said method comprising the steps of:
(a) determining a stride S greater than 1 for which a vector is to be accessed;
(b) accessing said main memory to load data for said vector in said main memory using a storage scheme that is preselected for said vector and is a predetermined function of said stride S and permits conflict-free sequential access and conflict-free access with said stride S;
(c) accessing said main memory to access data for said vector by using the storage scheme preselected for said vector; and



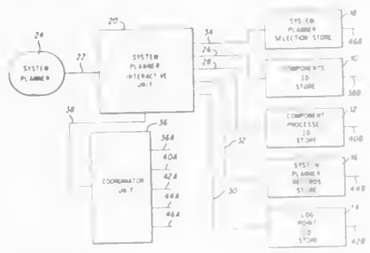
(d) repeating steps (a), (b) and (c) for a multiplicity of different vectors, wherein different respective strides S are determined for the vectors, and said main memory is accessed using different respective storage schemes for said vectors, so that the storage scheme is selected dynamically for said multiplicity of vectors.

4,918,601
ELECTRONIC FRANKING MACHINE WITH OPERATING MODE SELECTION
Bernard Vermesse, L'Hay-Les-Roses, France, assignor to SMH Alcatel, Paris, France
Filed Feb. 29, 1988, Ser. No. 161,946
Claims priority, application France, Feb. 27, 1987, 87 02668
Int. Cl.[4] G07B 17/00
U.S. Cl. 364—464.02 7 Claims



1. A franking machine comprising a keyboard, display, a calendar clock, a microprocessor, a program memory, a text memory, and a working memory connected to a bus, a first set of messages for normal franking operations and a second set of messages for special operations being stored in the text memory, the program memory containing programs with each program relating to one of the messages in the first and second sets of messages, each message in said first and second sets of messages being split up into at least one screen comprising as many lines of characters as can be displayed on the display, the second set of messages being accessible by means of a Menu key on the keyboard, such that pressing said Menu key causes a beginning-of-menu first message of the second set of messages to appear, said first message including a plurality of options each designated by a different digit corresponding to a different key on the keyboard, wherein:
said first message includes an option for changing the operating mode of the machine, said option being designated by a digit corresponding to one of the keys on the keyboard;
the second set of messages includes a first selecting message for selecting the machine operating mode, said first selecting message giving the current operation mode of the machine and proposing that the mode be confirmed, and also giving three options for changing mode: a one-off mode option; a burst mode option for an unlimited number of franking operations; and a limited burst mode option for franking operations limited to a number N; with each option being designated by a digit corresponding to one of the keys of the keyboard; and
the second set of messages also includes a confirming message for confirming the selected mode and a further selecting message for selecting the number of pieces to which limited burst mode is to be limited.

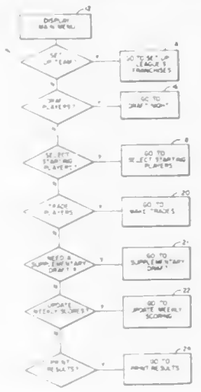
4,918,602
DATA PROCESSING SYSTEM AND METHOD
William K. Bone, Willowbrook, and John M. Giannini, St. Charles, both of Ill., assignors to Computer Associates International, Inc., Garden City, N.Y.
Filed Jul. 15, 1987, Ser. No. 73,815
Int. Cl.[4] G06F 9/00
U.S. Cl. 364—401 16 Claims



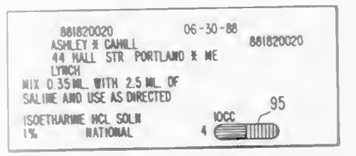
1. In combination, in a system for computer implementation of business products:
(a) a first signal store containing signals indicative of literal identification of component processes for said products;
(b) a second signal store containing signals indicative of literal identification of log points for said component processes;
(c) system planner interactive means for receipt of such stored signals from said first signal store and said second signal store, for display of said literal identifications of said component processes and said log points, and responsive to planner input for selection of said displayed identifications of both said component processes and said log points to define said products; and
(d) a third signal store for storage of signals indicative of said planner selections of said displayed identifications.

4,918,603
COMPUTERIZED STATISTICAL FOOTBALL GAME
Patrick Hughes, 2322 Cedar La., Vienna, Va. 22180; Michael Hughes, 6203 Danrobbin Dr., Bethesda, Md. 20815, and David Yager, 1908 Wilson La., #101, McLean, Va. 22102, assignors to Michael B. Hughes, Bethesda, Md.; Patrick J. Hughes, Vienna and David C. Yager, McLean, both of, Va.
Filed Aug. 1, 1988, Ser. No. 226,724
Int. Cl.[4] G06F 15/44
U.S. Cl. 364—410 3 Claims

1. A computer for playing football based upon actual football games, comprising:
means for setting up individual football franchises;
means for drafting actual football players into said franchises;
means for selecting starting player rosters from said actual football players;
means for trading said actual football players;
means for scoring performances of said actual football players based upon actual game scores such that franchises automatically calculate a composite win or loss score from a total of said individual actual football players' scores;
said players' scores are for quarterbacks, running backs and pass receivers in a first group and kickers in a second group; and
wherein said players in said first and second groups receive bonus points.



4,918,604
PRESCRIPTION DRUG DEPICTION AND LABELING SYSTEM
Mark S. Baum, Brooklyn, N.Y., assignor to Medco Containment Services, Inc., Elmwood Park, N.J.
Filed Oct. 3, 1988, Ser. No. 258,183
Int. Cl.[4] G06F 15/42
U.S. Cl. 364—413.01 10 Claims



1. A system for preparing a label for prescription drugs comprising data storage means storing a multiplicity of files of data, each file of data representing a color illustration of a different pill or capsule of a prescription drug, computer means to select one of said files of data and to print in color a graphic illustration of the pill or capsule represented by such file of data on a prescription drug label.

4,918,605
METHOD AND SYSTEM FOR DETECTING AND PROCESSING ULTRASONIC DOPPLER SIGNALS
Toshio Shirasaka, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 2, 1987, Ser. No. 127,469
Claims priority, application Japan, Dec. 5, 1986, 61-290960
Int. Cl.[4] G06F 15/42; G06G 7/60
U.S. Cl. 364—413.25 8 Claims

5. A system for detecting and processing ultrasonic Doppler signals to display a fluid flow image, comprising:
means for transmitting an ultrasonic beam in a raster direction a predetermined number of times and for respectively

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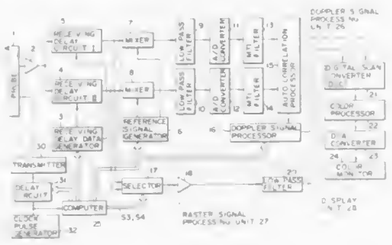
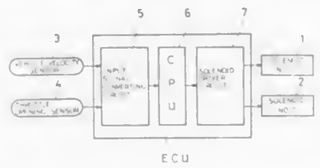
receiving a plurality of echo signals having a plurality of directivities different from the raster direction;
means for obtaining Doppler data from the respective received echo signals;



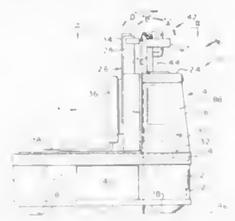
selecting means for selecting each echo signal as tomogram data from the respective received echo signals;
means for acquiring a fluid flow image in accordance with the obtained Doppler data and the tomogram data; and
means for displaying the acquired flow image.

4,918,606
AUTOMATIC TRANSMISSION WITH FAIL-SAFE FUNCTION
Yasunobu Ito, and Masanari Yamamoto, both of Anjo, Japan, assignors to Aisin-Warner Kabushiki Kaisha, Aichi, Japan
Continuation of Ser. No. 83,393, Aug. 10, 1987, abandoned. This application Aug. 21, 1989, Ser. No. 396,793
Claims priority, application Japan, Aug. 11, 1986, 61-188194
Int. Cl.[4] B60K *41/08*; G06F *15/50*
U.S. Cl. 364—424.1 6 Claims



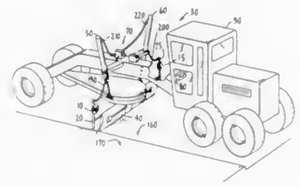
1. An automatic transmission having shift solenoids controlled by a microcomputer in response to a vehicle velocity signal and a throttle opening signal, comprising:
computing means for computing a speed changing rate in the vehicle velocity by comparing a vehicle velocity signal indicating the present vehicle velocity with a vehicle velocity signal indicating an immediately preceding vehicle velocity; and
fail-safe means for controlling said shift solenoids so that said automatic transmission is immediately and permanently set at a gear corresponding to said immediately preceding vehicle velocity until said vehicle is stopped when said speed changing rate computed by said computing means exceeds a predetermined value indicating at least a partial malfunctioning of said vehicle velocity sensor

4,918,607
VEHICLE GUIDANCE SYSTEM
John E. Wible, Plainesville, Ohio, assignor to Caterpillar Industrial Inc., Mentor, Ohio
Filed Sep. 9, 1988, Ser. No. 242,241
Int. Cl.[4] G06F *15/50*; B62D *1/00*
U.S. Cl. 364—424.02 18 Claims



1. A self guided material handling vehicle having a longitudinal axis, a frame and a load carrying apparatus mounted on the frame, said self guided vehicle being adapted to navigate along an underlying surface in response to instructions stored in an onboard computer based on information received from a plurality of first and second elevationally and transversely spaced apart targets, comprising:
a laser signaling device mounted on the frame and rotatable about an axis of rotation extending in an elevational direction generally perpendicularly to the longitudinal axis, said laser signaling device being adapted to deliver a light beam signal at a first preselected elevational angle relative to the axis of rotation, and said first targets being adapted to reflect the light beam signal delivered at the first angle;
means for directing the delivered light beam signal, during a preselected portion of said rotation and during each revolution of the laser signaling device, at a second different preselected elevational angle relative to the axis of rotation, said second targets being adapted to reflect the light beam signal delivered at the second angle, and said directing means being fixedly attached to the frame and static relative to the laser signaling device;
means for receiving a reflection of said light beam signals and delivering a vehicle position signal in response to receiving a reflection of each light beam signal.

4,918,608
METHOD FOR AUTOMATIC DEPTH CONTROL FOR EARTH MOVING AND GRADING
Christopher O. Middleton, 1925 46th Ave., #141, Capitola, Calif. 95010, and Colin L. Robson, 6124 Corte De La Reina, San Jose, Calif. 95120
Filed Jun. 9, 1988, Ser. No. 204,508
Int. Cl.[4] A01B *63/114*
U.S. Cl. 364—424.07 12 Claims



1 A method of controlling a hydraulic system for grading a first surface at a chosen depth relative to a reference surface by means of an earth grader carrying a vertically adjustable blade

at the chosen depth relative to the reference surface by action of the hydraulic system on the blade, including the steps of:
implementing a calibration procedure, including determining a reference time interval relating to a travel time of an acoustic pulse from a transducer to the reference surface and back to the transducer, so that the reference time interval corresponds to the chosen depth of the blade as determined by an operator of the earth grader;
emitting a ranging pulse from the transducer toward the reference surface and starting a counter at a first time, the transducer being mounted in a fixed position relative to the blade, such that the ranging pulse reflects from the reference surface back toward the transducer;
stopping the counter when the reflected ranging pulse reaches the transducer, thereby generating a count corresponding to the length of time taken by the ranging pulse to reflect from the reference surface back to the transducer and further corresponding to an actual blade depth;
vertically adjusting the blade by a distance relating to the count such that the actual blade depth corresponds to the chosen blade depth;
repeating the steps of emitting the ranging pulse, starting and stopping the counter, and vertically adjusting the blade, whereby variations in the height of the reference surface are automatically compensated by the adjustments of the blade as the grader moves along the reference surface; and
compensating the adjustments of the blade for temperature variations after the reference time interval has been determined, and before each time the ranging pulse is emitted

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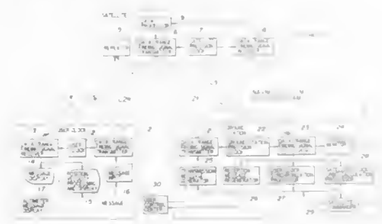
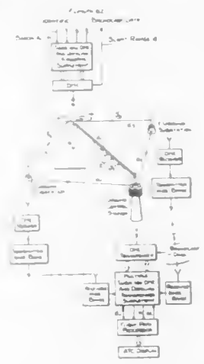
4,918,609
SATELLITE-BASED POSITION-DETERMINING SYSTEM
Koji Yamawaki, 2052-1, Wakasiba-cho, Riugasaki-shi, Ibaragi, Japan
Filed Oct. 11, 1988, Ser. No. 255,248
Int. Cl.[4] G01S *5/02*
U.S. Cl. 364—449 5 Claims



5. A satellite-based position-determining system comprising:
a ground station equipped with a ground receiver, a ground transmitter and a ground clock coupled to said ground receiver and said ground transmitter for generating a ground clock signal;
at least two satellites deployed in geostationary orbit and each equipped with a satellite receiver, a satellite transmitter and a satellite clock coupled to said satellite receiver and said satellite transmitter for generating a satellite clock signal;
a user equipment of unknown position equipped with a user clock, a user receiver and a user transmitter for communicating with said satellites, wherein said satellite receiver and said satellite transmitter communicate with said user transmitter and said ground receiver, respectively; and
means operably coupled to said user receiver for determining the position of said user's equipment such that at least one of said satellite transmitters and said user transmitter both emit a range-finding signal toward each other based on respective clock time signals of said satellite clock and said user clock, each of said at least one of said satellite receiver and said user receiver receive each other's range-finding signal and measures each respective arrival time of said range-finding signals based on the respective clock time signals, and a time offset between the satellite and user clock signals is calculated from said measured arrival times to synchronize at least one of said satellite clock signals and said user clock signal and to determine the position of said users equipment; and
means for automatically calibrating an error in the user clock signal by measuring the tendency of said clock signal to diverge while said user equipment is at a fixed position.

4,918,610
NAVIGATION, COMMUNICATION, AND SURVEILLANCE SYSTEM BASED ON DME
Alfred R. G. Becker, Braunschweig, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany
Continuation of Ser. No. 137,958, Dec. 24, 1987, abandoned, which is a continuation of Ser. No. 772,635, Sep. 5, 1985, abandoned. This application Mar. 16, 1989, Ser. No. 324,319
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1984, 3433364
Int. Cl.[4] G01S *13/76*
U.S. Cl. 364—451 5 Claims



1. A surveillance system using a 3-way DME and including an aircraft, a central ground station, and at least one ground substation located at a substantial distance from said central ground station and connected with the latter via a respective broad-band link; said surveillance system comprising:
a DME interrogator on said aircraft for transmitting an interrogating first pulse train, and a DME transponder at said central ground station for receiving said first pulse train from said aircraft and for transmitting to said aircraft with a predetermined delay a marked second pulse train in response to said first pulse train;
means associated with said DME interrogator for transmitting from said aircraft to said central ground station on the DME frequency of said first pulse train a third pulse train in response to receipt of said second pulse train from said central ground station, said third pulse train containing within a marking dead time for said DME transponder respective data identifying the aircraft and its altitude, and means associated with said ground substation for receiving said third pulse train from said DME interrogator and for transmitting said third pulse train from said ground substation via the respective broad-band link to said central ground station;
means on board the aircraft and at said central ground sta-

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tion for calculating a primary slant range between the aircraft and said central ground station based on the direct inter-aircraft/central ground station transit times measured for said first and second pulse trains and for said second and third pulse trains, respectively;

computing means at said central ground station for subtracting from (a) the travel times of said third pulse train received by said central ground station from said aircraft via said ground substation and the associated broad-band link (b) the travel times of said third pulse train received by said central ground station from said ground substation via said broad-band link, for calculating a secondary slant range between said aircraft and said ground substation, and for thereafter determining the aircraft position from (i) said primary slant range and said secondary slant range, (ii) the fixed distance between said central ground station and said ground substation to which the associated secondary slant range has been calculated, and (iii) the altitude of the aircraft transmitted in said third pulse train, said two slant ranges and the associated fixed distance forming the three sides of a triangle, and said computing means serving further for calculating the azimuth angle of the aircraft from the aircraft position; and

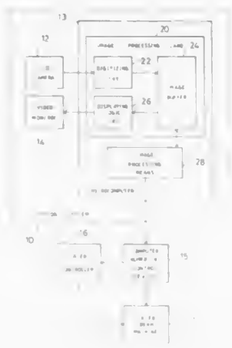
means for transmitting the azimuth angle of the aircraft from said central ground station to the aircraft for navigational purposes in said second pulse train within a coding window delayed in said second pulse train for a period of time longer than said marking dead time.

4,918,611

METHOD AND APPARATUS FOR CONTROLLING LASER CUTTING BY IMAGE PROCESSING

Jia-Ming Shyu; Inn-Ming Chen; Chung C. Ku; Ting-Yao Chen, and Yunghsueh Chao, all of Hsinchu Hsien, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu Hsien, Taiwan

Filed Jul. 18, 1988, Ser. No. 220,513
Int. Cl.[4] G06F *15/46*; G06K *9/00*
U.S. Cl. 364—474.08 **10 Claims**



1. A method for controlling laser cutting by a laser beam machine, comprising the steps of:

(a) photographing an object with a photographing device for developing an original pattern image;

(b) thresholding said original pattern image for developing binary pattern image information;

(c) selecting from a contour extracting mode for extracting contours of said binary pattern image information, a skeleton extracting mode for extracting skeletons of said binary pattern image information, and a combination mode of said contour extracting mode for extracting the contours of a first portion of said binary pattern image information and said skeleton extracting mode for extracting the skeletons of remaining portions of said binary pattern image information;

(d) scanning said binary pattern image information and extracting at least one of the contours and the skeletons of said binary pattern image information in response to said step (c);

(e) linking said one of the contours and the skeletons from said step (d) in a point by point sequence;

(f) converting said one of the contours and the skeleton is into a series of line vector data, respectively, by a curve approximation process;

(g) setting a starting/terminating point of said laser beam machine for said series of line vector data;

(h) rearranging the sequence of said series of line vector data from an innermost line to an outermost line thereof; and

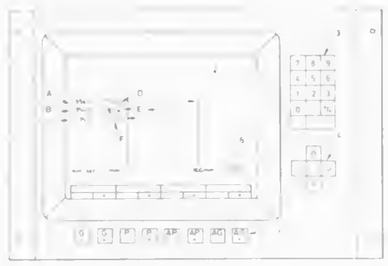
(i) converting said rearranged series of line vector data into a computer numerical control program, and inputting said program into a computer numerical control device for controlling the cutting paths of said laser beam machine.

4,918,612

ELECTRONIC DEVICE FOR CONTROLLING THE TOOL POSITION OF A MACHINE TOOL

Herbert Handte, Filderstadt, Fed. Rep. of Germany, assignor to Moog GmbH, Fed. Rep. of Germany

Filed Feb. 4, 1988, Ser. No. 152,133
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—474.22 **3 Claims**



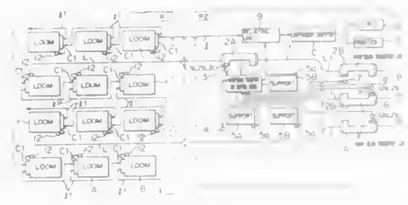
1. Apparatus for controlling the tool position of a machine tool, comprising data memory means for storing tool position data in a given sequence and tool adjustment speed data, means for entering of said tool position data and tool adjustment speed data into said data memory means, means for retrieving said data for controlling the tool movement to tool positions determined by said tool position data with adjustment speeds determined by said tool adjustment speed data, display means for the visual display of the entered position data and adjustment speed data, and means for marking selected ones of the displayed position data and adjustment speed data on said display means, and at the same time of the associated storage position in said data memory means, further comprising alteration memory means connected to said entering means for receiving alteration data for altering at least one of position data and adjustment speed data, gating means connected to said alteration memory means and to said data memory means, order entering means for selectively entering one of the orders "percental alteration", "absolute alteration" and "overwrite with altered value" into said gating means, and computer means controlled by said gating means for performing one of the operations of altering at least the marked data in the marked storage position and overwriting such marked data with the entered value, in accordance with the entered order.

4,918,613

EXCHANGE COMPONENT TRANSPORT CONTROL SYSTEM FOR LOOMS

Yoshimi Iwano; Masanobu Sakai, and Hajime Suzuki, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Aug. 11, 1988, Ser. No. 231,087
Claims priority, application Japan, Aug. 24, 1987, 62-209739
Int. Cl.[4] G06F *15/46*; B65G *35/00*
U.S. Cl. 364—478 **12 Claims**



1. A transport control system for controlling the transport of an exchange component by an unmanned transport car toward and from a plurality of looms, said system comprising:

supervisory computer means connected to each of said looms by a monitoring signal line for fetching weaving information concerning warp breakage, weft breakage, weft insertion errors and/or the like for each loom;

a multiplexor relaying unit provided on said monitoring signal line intermediate said looms and said supervisory computer;

means disposed at each of said looms for transmitting a stop command for said unmanned transport car; and

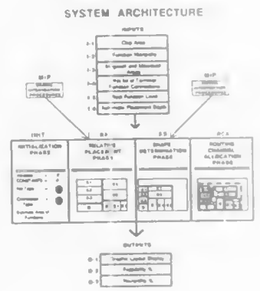
transport control means for transmitting a stop command over said monitoring signal line to said relaying unit, said relaying unit relaying said stop command to said stop command transmitting means.

4,918,614

HIERARCHICAL FLOORPLANNER

Hossein Modarres, Mountain View; Susan Raam, Fremont, and Jiun-Hao Lai, Santa Clara, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Jun. 2, 1987, Ser. No. 57,843
Int. Cl.[4] G06F *15/60*
U.S. Cl. 364—490 **17 Claims**
MICROFICHE APPENDIX INCLUDED
(4 Microfiche, 138 Pages)



1. A method of making, including floorplanning functions for, an integrated circuit, said integrated circuit comprising a hierarchy of N level of functions,

where N is an integer ($N \geqq 1$) representing the number of hierarchical levels of functionality in the integrated circuit, the first of said levels representing the integrated circuit as a whole, and

where n is an integer ($1 \leqq n \leqq N$) representing the level of any particular function in the hierarchy,

said hierarchy defining at least one of said (n)th level functions (a parent function) as a plurality of (n+1)st level functions (children functions, each being a child function),

each child function (which is not also a parent function) being a terminal function, each terminal function being connected to at least one other terminal function, by at least one net,

each net defining a plurality of interconnected terminal functions, comprising the steps of:

designing the integrated circuit,

estimating the number of connections between functions throughout all N levels of the hierarchy,

determining the location on the integrated circuit of each (n)th level function in the hierarchy, based in part upon said estimated number of connections, and

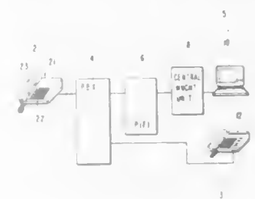
fabricating the integrated circuit having the location of each (n)th level function as determined in the previous step.

4,918,615

BUILDING MANAGEMENT SYSTEM

Masashi Suzuki, Tokyo, and Minoru Yagishita, Kanagawa, both of Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1988, Ser. No. 248,128
Claims priority, application Japan, Sep. 23, 1987, 62-238476
Int. Cl.[4] G06F *15/20*; G08C *19/16*
U.S. Cl. 364—505 **6 Claims**



1. A building management system for managing operation of a plurality of utility devices in a building divided into partitions, comprising:

at least one terminal means for sending and receiving signals including commands; and

central station means for coordinating control of the plurality of utility devices based on the commands sent from said terminal means;

said terminal means comprising:

control means for supplying to said central station means an ID code designating a predetermined partition of the building and data indicating one of the utility devices in the predetermined partition and control commands for the one of the utility devices; and

response output means for outputting responses from said central station means; and

said central station means comprising;

a building partition file designating the predetermined partition of the building corresponding to the ID code;

a classified-by-partition point file including utility device numbers, kinds of service, and addresses for each utility device in the predetermined partition;

means for providing a predetermined response corresponding to the control commands for the one of the utility devices indicated by the data from said terminal

means by making reference to said classified-by-partition point file; and

output means for outputting an address of the one of the utility devices and the control commands therefor.

4,918,616

TOOL MONITORING SYSTEM

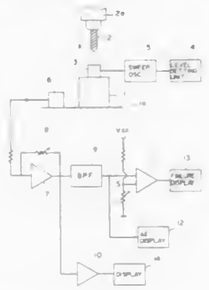
Kiyokazu Yoshimura; Norio Miyawaki, both of Kyoto; Hiroyuki Yamada, Osaka; Hideaki Nakamura, Kyoto; Koichi Tshujino, Kyoto; Takaharu Takinami, Kyoto; Tatemitsu Hirayama, Kumamoto; Tatsuhiko Naito, Osaka; Ryoichi Miyake; Takeshi Yamada, both of Kyoto; Tetsuro Iwakiri, and Kazuaki Otsuka, both of Kumamoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed May 16, 1985, Ser. No. 734,679

Claims priority, applicatioo Japan, May 18, 1984, 59-101554; Sep. 28, 1984, 59-205338; Oct. 5, 1984, 59-210176; Oct. 29, 1984, 59-227196

Int. Cl.[4] G06F *15/46*

U.S. Cl. 364—507 **12 Claims**



1. A tool monitoring system for detecting a failure of a tool employed in a tool machine, comprising

artificial signal generating means for generating a predetermined artificial tool failure signal simulating the acoustic emission signal obtained in an actual failure of the tool,

acoustic emission transducing means adapted to be mounted at least temporarily during a setting mode on the tool machine near the tool and driven by said artificial signal generating means for applying said artificial tool failure signal to the tool machine,

acoustic emission sensing means mounted on the tool machine near the tool so as to receive, in a setting mode of said system where said transducing means is mounted on the machine, said applied artificial tool failure signal form said acoustic emission transducing means through the tool machine and to receive in a monitoring mode of said system where the tool is operated, an actual tool failure signal if said tool fails, said acoustic emission sensing means converting said artificial signal or an actual tool failure signal into an electrical signal; and

signal processing means responsive to the electrical signal generated by said acoustic emission sensing means and, in said setting mode of said system, for adjusting a characteristic of said electrical signal for later detection of a tool failure signal, said signal processing means being responsive to said electrical signal generated by said acoustic emissions sensing means, in a monitoring mode of said system, for detecting a failure of said tool, said signal processing means comprising:

amplying means for adjusting in said setting mode a magnitude of said electrical signal fed from said acoustic emission sensing means to an optimum level reflecting a position of said acoustic emission transducing means;

storage means for storing an optimum amplification degree of said amplifying means at which a magnitude of said electrical signal is adjusted to said optimum magnitude;

setting means for, in said monitoring mode of said system where said tool is operated, setting an amplification degree of said amplifying means to said optimum amplification degree stored in said storage means; and

means responsive to an output of the amplifying means during said monitoring mode for determining the existence of a tool failure.

4,918,617

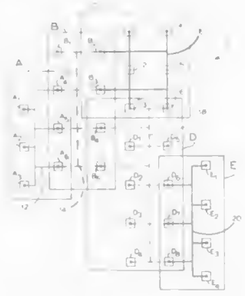
NEURAL-MODEL COMPUTATIONAL SYSTEM WITH MULTI-DIRECTIONALLY OVERLAPPING BROADCAST REGIONS

Daniel W. Hammerstrom, Aloha, and James L. Bailey, Hillsboro, both of Oreg., assignors to Oregon Graduate Center, Beaverton, Oreg.

Filed Nov. 10, 1988, Ser. No. 269,422

Int. Cl.[4] G06F *15/18*

U.S. Cl. 364—513 **1 Claim**



1. A neural-model-architectural, layered, multi-directional-feed computational system comprising

plural groups of computational (connection) nodes, and;

bus means operatively associated with said groups organizing the same into plural, partially overlapping broadcast regions allowing selective, simultaneous, multi-directional broadcast communication between the nodes in forward, rearward and lateral overlapping regions.

4,918,618

DISCRETE WEIGHT NEURAL NETWORK

Max S. Tomlinson, Jr., San Diego, Calif., assignor to Analog Intelligence Corporation, Carlsbad, Calif.

Filed Apr. 11, 1988, Ser. No. 180,236

Int. Cl.[4] G06F *15/18*

U.S. Cl. 364—513 **4 Claims**

1. A Discrete Weight Neural Network system for the mapping of a received Input Vector to a produced Output Vector, where the mapping function is adaptively learned by the application of a received Error Vector and a received update signal; said Discrete Weight Neural Network comprising:

(1) an Input Layer comprising one or more Input Layer Processing Elements;

(2) a Tensor Weight Layer comprising one or more Tensor Weight Elements;

(3) a Hidden Layer comprising one or more Hidden Layer Processing Elements;

(4) a Matrix Weight Layer comprising one or more Matrix Weight Elements;

(5) an Output Layer comprising one or more Output Layer Processing Elements;

(6) each Input Layer Processing Element comprising:

(a) an input data line means for receiving as input data value an element of the Input Vector

(b) an output data line means for outputing a data output value; and

(c) means for transferring the input data from the input data line means to the output data line means;

(7) each Hidden Layer Processing Element comprising:

(a) one or more weighted data input line means for receiving weighted data input values;

(b) one or more weighted error input line means for receiving weighted error input values;

(c) a data output line means for transmitting a data output value;

(d) a net data feedback output line means for transmitting a net data feedback output value;

(e) an error output line means for transmitting an error output value;

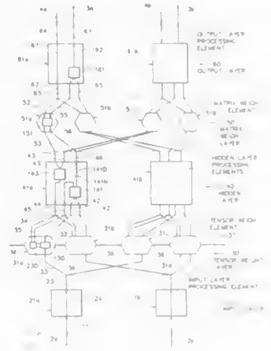
(f) means for combining weighted data input values, for producing said data output value, and for producing said net data feedback output value; and

(g) means for combining weighted error input values and for producing said error output value;

(8) each Output Layer Processing Element comprising:

(a) one or more weighted data input line means for receiving weighted data input values;

(b) a data output line means for transmitting a data output value as an element of the Output Vector;



(c) summation means connected to said weighted data input lines for receiving the weighted data input value and for producing the data output value as a sum thereof;

(d) an input error line means for receiving an element of the Error Vector;

(e) an output error line means for transmitting an error output value; and

(f) means for transferring error information from said input error line means to said output error line means;

(9) each Matrix Weight Element comprising:

(a) a data input line means connected to the data output line means of one of said one or more Hidden Layer Processing Elements for receiving the data output value from that Hidden Layer Processing Element as a data input value;

(b) a weighted data output line means connected to one of the weighted data input line means of one of said one or more Output Layer Processing Elements for transmitting a weighted data output value to the Output Layer Processing Element as one of its weighted data input values;

(c) a error input line means connected to the error output line means of one of said one or more Output Layer Processing Elements for receiving the error output value from that Output Layer Processing Element as an error input value;

(d) a weighted error output line means connected to one of the weighted error input line means of one of said one or more Hidden Layer Processing Element(s) for transmitting a weighted error output value to that Hidden Layer Processing Element as one of its weighted error input values; and

(e) a weighting means including a weight value for transferring the data input value in proportion to the weight value as the weighted data output value to the weighted data output line means and for transferring the error input value in proportion to the weight value as the weighted data output value to the weighted error output line means; and

(10) each Tensor Weight Element comprising:

(a) a data input line means connected to a data output line means of one of said one or more Input Layer Processing Elements for receiving the data output value from that Input Layer Processing Element as a data input value;

(b) a weighted data output line means connected to one of the weighted data input line means of one of said one or more Hidden Layer Processing Elements for transmitting a weighted data output value to that Hidden Layer Processing Element as one of its weighted data input values;

(c) an error input line means connected to the error output line means of one of said one or more Hidden Layer Processing Elements for receiving the error output value from that Hidden Layer Processing Element as an error input value;

(d) a net data feedback input line means connected to the net data feedback output line means of one of said one or more Hidden Layer Processing Elements for receiving the net data feedback output value from that Hidden Layer Processing Element as a net data feedback input value;

(e) an update signal line means for receiving the update signal;

(f) selective weighting means comprising:

(i) selection means for producing a selected weight value, said selected weight value being either a low weight value or a high weight value dependent on said selector value; and

(ii) combining means for producing the weighted data output value from the data input value and the selected weight value; and

(g) selection change means for receiving the low weight value, the high weight value, the selector value, the error input value, the net data feedback input value, and the update signal and for determining therefrom if switching the selector value and thereby causing the non-selected weight value to become the selected weight value would decrease the total error, and if it would, for producing a switch signal.

4,918,619

MULTIPLEXED JUNCTION PROBE FOR FUEL GAGING SYSTEM AND SYSTEM CONTAINING SAME

Eugene F. Orloff, Long Beach, Calif.; Martin Horowitz, Lynbrook, and Charles H. Ritter, Great River, both of N.Y., assignors to Gull Inc., Smithtown, N.Y. and McDonnell Douglas Corporation, Long Beach, Calif.

Filed Dec. 20, 1984, Ser. No. 685,396

The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.

Int. Cl.[4] G06G *7/57*; B64D *37/00*; G08B *5/36*; G01F *23/00*

U.S. Cl. 364—509 **29 Claims**

29. A multiplexed fuel gaging system for aircraft having at least one fuel tank with multiple fuel sensing units comprising:

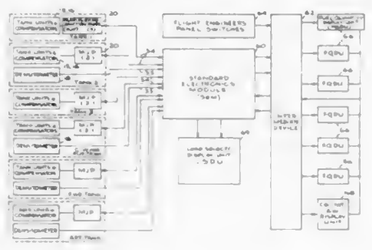
a plurality of elements mounted within a tank for sensing fuel and providing signals corresponding to fuel measurement;

signal processing apparatus on board the aircraft for con-

VOL 1113 ISS 3 AP 17 1990 UMI

verting analog data signals to digital values corresponding to measured fuel quantity;

a multiplexer associated with a tank and including circuitry separately coupled to the individual tank mounted elements, the multiplexer also being coupled to the signal processing apparatus by a common signal path;



first circuit means included in the multiplexer for electrically driving said elements; and

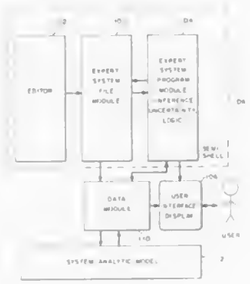
second circuit means in the multiplexer for measuring each element in a predetermined sequence and forming a data stream of analog signals corresponding to the signals from said elements for transmission to the signal processing apparatus over said common signal path.

4,918,620

EXPERT SYSTEM METHOD AND ARCHITECTURE

Mehmet E. Ulug, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 16, 1988, Ser. No. 207,594
Int. Cl.[4] G06F *15/18*
U.S. Cl. 364—513 34 Claims



1. An expert system architecture for practice on a digital computer having memory means for storing data files, comprising:

means for storing a plurality of alphanumeric strings representing rule premises and rule conclusions as well as a rule indicator of how the premises of each rule are to be logically combined;

means for reading a user selected one of the rules stored in the memory means to enable subsequent display of the selected rule to the user.

means for displaying the selected rule to the user;

means for querying the user for a response regarding the veracity of each premise of the selected rule;

means for determining from the rule indicator a specific logic to be applied for combining the premises of the selected rule;

means for applying, upon receiving user input regarding the veracity of each rule premise, the specific logic to the selected rule premises to determine whether the specific logic is satisfied;

model means for providing an analytic model of an application being represented by the expert system, said model means comprising a plurality of subroutines that are callable for performing a quantitative analysis of said represented application;

means for querying the user for information to enable performance, using said analytic model, of a quantitative analysis associated with the selected rule;

means for calling a selected model means subroutine associated with the user selected rule;

means for providing, for the selected rule, and expert system recommendation to the user embodying results of the quantitative analysis performed by said model means;

means for comparing quantitative analysis results obtained from said selected subroutine with predetermined acceptability criteria and generating a results comparison;

means, upon finding unacceptable analytic results, for querying the user for additional information to enable performance of an additional quantitative analysis;

means for calling an additional model subroutine to perform said additional quantitative analysis; and

said system recommendation embodying the results of said additional quantitative analysis.

4,918,621

METHOD FOR REPRESENTING A DIRECTED ACYCLIC GRAPH OF WORLDS USING AN ASSUMPTION-BASED TRUTH MAINTENANCE SYSTEM

Robert A. Nado, and Paul H. Morris, both of Mountain View, Calif., assignors to IntelliCorp, Inc., Mountain View, Calif.

Continuation of Ser. No. 896,543, Aug. 13, 1986, abandoned.
This application Dec. 13, 1988, Ser. No. 285,323
Int. Cl.[4] G06F *15/18*
U.S. Cl. 364—513 10 Claims

1. In an artificial intelligence worlds mechanism implemented on a computer system, said worlds mechanism containing a graph of worlds, each one of said worlds having associated therewith a first set of assertions, said first set of assertions being determined from a second set of assertions inherited from ancestor worlds together with additions and deletions specific to each one of said worlds, and each said world having a method for testing if an assertion is properly within said first set of assertions, a method for creating worlds comprising:

creating a graph of worlds by employing an assumption-basedtruth maintenance system (ATMS), said ATMS comprising in combination an ATMS tool for carrying out ATMS procedures and an ATMS database comprising a collection of assumptions; and thereafter

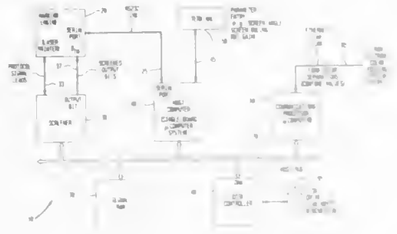
constructing justifications between said worlds by means of said ATMS, wherein a justification is a data structure representing derivation steps linking an assertion with other assertions and/or assumptions such that assertions and/or assumptions are in a conditions so they can be arbitrarily deleted.

4,918,622

ELECTRONIC GRAPHIC ARTS SCREENER

Edward M. Granger; John F. Hamilton, Jr., and Larry G. Wash, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 16, 1988, Ser. No. 272,568
Int. Cl.[4] G01D *15/00*
U.S. Cl. 364—518 51 Claims



1. Apparatus for producing a screened bit-mapped halftone reproduction of a continuous tone image, said apparatus comprising:

means for determining a location, within a screened halftone reproduction, of an image bit that is to be currently generated as part of said halftone reproduction and for generating, in response to said location, first and second pluralities of control signals;

means for accepting from a data source a stream of digital values representing corresponding continuous tone values that collectively form at least a portion of a digitized continuous tone image and for providing, in response to said first plurality of control signals, a successive one of the digital values contained in said stream;

control means, operative in response to said second plurality of control signals, for generating an initialization signal;

means for storing a plurality of reference cells wherein each of said reference cells contains a different pre-defined halftone dot pattern;

means, responsive to said initialization signal, for determining a location of a sampling point situated within any of said reference cells and corresponding to said image bit location;

means, connected to said storing means, for selecting in response to said one digital value, a particular one of said plurality of reference cells and for accessing, in response to the sampling point location, a value of a corresponding bit stored in said one reference cell; and

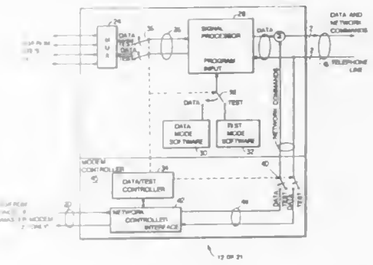
means, connected to said storing means, for providing the value of said corresponding bit as the image bit in the screened bit-mapped halftone reproduction.

4,918,623

TESTING THE PERFORMANCE OF A COMMUNICATION LINE BETWEEN TWO MODEMS USING MODEM PROCESSOR

John A. Lockitt, Sherborn; Kelly A. Lyndon, Boston; Robert M. Wilson, Walpole, and Bruce C. Giese, Rockland, all of Mass., assignors to Codex Corporation, Mansfield, Mass.

Continuation of Ser. No. 784,212, Oct. 4, 1985, abandoned. This application Oct. 19, 1988, Ser. No. 262,108
Int. Cl.[4] G06F *11/00*
U.S. Cl. 364—514 21 Claims



1 Apparatus for quantitatively testing the performance of a communication line that carries customer data in both directions between two modems, said communication line carrying both customer data and a test command for controlling said testing, said apparatus comprising

a digital signal processor in each said modem coupled to said communication line for performing both digital modulation and demodulation of customer data carried on said line in accordance with a data program, and a series of quantitative tests of said line in accordance with a test program using test signal tones generated digitally, and

in each said modem a programmable host processor separate from and coupled to said digital signal processor and responsive to said test command for selectively causing said digital signal processor to switch between performing said modulation and demodulation of customer data and said performing said series of quantitative tests.

4,918,624

VECTOR GENERATOR SCAN CONVERTER

James M. Moore, and James F. Leighton, both of Livermore, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 5, 1988, Ser. No. 152,900
Int. Cl.[4] G06F *15/66*; G06K *15/00*
U.S. Cl. 364—519 12 Claims

11. A vector generator scan converter, comprising:

input interface means for receiving compressed graphics data;

a microprocessor connected to the input interface means, the microprocessor including and AMD-2901 arithmetic logic unit;

a working memory connected to the microprocessor;

a microcode memory connected to the microprocessor and containing a set of instructions for operating the microprocessor, including receiving and storing the compressed graphics data in the working memory, and calculating vector slopes and lengths from the compressed data;

a pipeline register between the microcode memory and the arithmetic logic unit;

a vector generator means connected to the microprocessor for constructing vectors from vector starting points, slopes and lengths received from the microprocessor to

produce a fully graphic image from the compressed graphics data;

at least one image buffer memory connected to the vector generator means for storing the full graphic image produced by the vector generator means;

output interface means responsive to the microprocessor for outputting the full graphic images from the image buffer memory.

4,918,625

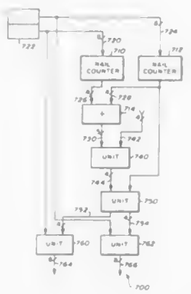
METHOD AND APPARATUS FOR PROCESSING TRANSLUCENT OBJECTS

Johnson K. Yan, Cupertino, Calif., assignor to CAE-Link Corporation, Binghamton, N.Y.

Continuation of Ser. No. 943,349, Dec. 19, 1986, abandoned. This application Jul. 18, 1989, Ser. No. 382,046

Int. Cl.[4] G06F *15/62*

U.S. Cl. 364—522 **1 Claim**



1. An apparatus for receiving a plurality of signals each representing a state of a flag bit of an array of flag bits representing a visible bed of nails of a polygon surface and for receiving a plurality of signals representing a translucency factor for the polygon surface and for developing a plurality of signals each representing a flag bit of an array of flag bits representing a translucent bed of nails of the visible bed of nails of the visible portion of the polygon surface, the apparatus comprising in combination:

first nail counter means responsive to a first portion of the visible bed of nails signals and operative to develop a plurality of signals which represent a number of flag bits represented by said first portion of said visible bed of nails signals that have a predetermined state;

second nail counter means responsive to a second portion of said visible bed of nails signals and operative to develop a plurality of signals which represent the number of flag bits represented by said second portion of said visible bed of nails signals that have said predetermined state;

adder means connected to said first and said second nail counter means, said adder means being responsive to said first and said second nail counter means developed signals and operative to develop a plurality of signals which represent the number of flag bits of said visible bed of nails signals that have said predetermined state;

first means connected to said adder means, said first means for receiving said adder means developed signals and for receiving the signals representing the translucency factor for the polygon surface and for developing a plurality of signals which represent a count of a total number of holes to cut in the visible bed of nails;

second means connected to said first means and to said second nail counter means, said second means for receiving said first means developed signals and for receiving said second nail counter means developed signals and for developing a plurality of signals apportioning the holes to cut between said first portion of said visible bed of nails signals and said second portion of said visible bed of nails signals;

third means connected to said second means, said third means for receiving said second means developed signals and for receiving said first portion of said visible bed of nails signals and for developing a portion of the translucent bed of nails of said visible bed of nails of said visible portion of said polygon surface signals; and

fourth means connected to said second means, said fourth means for receiving said second means developed signals and for receiving said second portion of said visible bed of nails signals and for developing a portion of said translucent bed of nails of said visible bed of nails of said visible portion of said polygon surface signals.

4,918,626

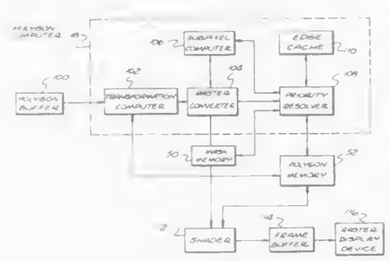
COMPUTER GRAPHICS PRIORITY SYSTEM WITH ANTIALIASING

Gary S. Watkins; Glen A. Eckart, and Russell A. Brown, all of Salt Lake City, Utah, assignors to Evans & Sutherland Computer Corp., Salt Lake City, Utah

Filed Dec. 9, 1987, Ser. No. 130,811

Int. Cl.[4] G06F *15/72, 15/62*

U.S. Cl. 364—522 **20 Claims**



13. A hidden surface elimination system for resolving priority as between primitives for a computer graphics image display with respect to picture element areas, the primitives P_1, P_2 and so on being defined in planes, $a_1x+b_1y+c_1z+d_1=0$; $a_2x+b_2y+c_2z+d_2=0$ and so on, the hidden surface elimination system comprising:

means for receiving primitive data to specify components for a computer graphics display in the form of said primitives P_1 and P_2 and so on;

structure for sequencing said picture element areas to be occupied by said primitives P_1 and P_2 as specified by the received primitive data to identify primitives contending for a picture element area, said structure for sequencing comprising a raster converter for scan converting said primitives; and

memory means for receiving the determined values $(c_2a_1-c_1a_2)$, $(c_2b_1-c_1b_2)$ and $(c_2d_1-c_1d_2)$ and means for identifying said values for use on occurrence of another pixel with contention between the primitives P_1 and P_2.

4,918,628

STABILITY METER FOR FLOATING OBJECTS

Michael J. Griffin, Winsor; Christopher Lewis, Southampton, and Anthony Lawther, Portswood, all of United Kingdom, assignors to University of Southampton, Southampton, United Kingdom

PCT No. PCT/GB86/00776, § 371 Date Sep. 30, 1987, § 102(e) Date Sep. 30, 1987, PCT Pub. No. WO87/03855, PCT Pub. Date Jul. 2, 1987

Continuation of Ser. No. 124,108, Sep. 30, 1987, abandoned. This PCT application Dec. 18, 1986, Ser. No. 391,727

Claims priority, application United Kingdom, Dec. 18, 1985, 8531192

Int. Cl.[4] G06F *15/20*; B63B *43/04*

U.S. Cl. 364—562 **4 Claims**

1. Apparatus for generating a signal representing the metacentric height of a floating object, comprising:

roll sensor means, which has an output and means for facilitating a fixed coupling of said roll sensor means to a floating object, for producing at said output a signal which varies in response to variation of an angle of inclination of the object; and

signal generating means coupled to said output of said roll sensor means and including: means for sampling in a first operational mode said signal from said output of said roll sensor means at predetermined time intervals over a time period; means for analyzing in a second operational mode said samples acquired in said first operational mode to determine a frequency spectrum which defines a roll motion of the floating object and which has frequency components within a predetermined bandwidth; means for identifying in a third operational mode one of said frequency components as a dominant frequency component within said frequency spectrum; and means for determining in a fourth operational mode a metacentric height of the floating object from said dominant frequency component, said signal generating means having at least one output and means for producing at said output of said signal generating means a signal representing said metacentric height of said object.

4,918,627

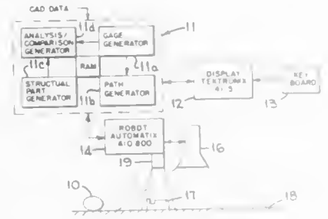
COMPUTER INTEGRATED GAGING SYSTEM

Christopher J. Garcia, Morgan Hill; Leslie O. Lincoln, Sunnyvale, and Keith A. Johnson, San Jose, all of Calif., assignors to FMC Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 892,616, Aug. 4, 1986, abandoned. This application Jun. 3, 1987, Ser. No. 58,687

Int. Cl.[4] G06F *15/40*

U.S. Cl. 364—552 **73 Claims**



15. The method of inspecting a fabricated structural part to determine conformance to known part dimensional feature and tolerance call-outs using a computer coupled to a multidimensionally movable position measuring apparatus, comprising the steps of

constructing a multidimensional model of an inspection gage using the known part dimensional feature and tolerance call-outs,

generating an inspection path relative to the part selected, thereby defining movement of the position measuring apparatus,

moving the position measuring apparatus along the inspection path,

determining the positions of the dimensional features on the fabricated part as the position measuring apparatus moves along the inspection path,

constructing a multidimensional model of the fabricated structural part using the determined positions of the structural features,

comparing the inspection gage model with the fabricated structural part model to determine if the part is within or out of said tolerance call-outs from the comparison and

indicating if the part is reworkable or scrap if the part is determined to be out of tolerance, wherein the step of indicating if the part is reworkable comprises the steps of

altering the fabricated structural part model within the known tolerance call-outs,

recomparing the altered fabricated part model with the inspection gage model, and

indicating that the fabricated structural part is reworkable if the gage fits the altered part model and scrap if the gage does not fit.

4,918,629

ENGINE TRIM TACHOMETER UNIT AND CALIBRATION METHOD

Kris L. Hackelman, Mukilteo, and Alfons R. Kontvis, Alderwood Manor, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 7, 1988, Ser. No. 178,718

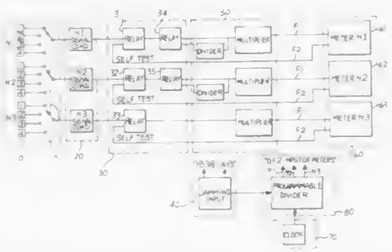
Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—565 **1 Claim**

1. An engine trim tachometer system comprising in combination:

a plurality of engine speed parameter measuring channels;

rotary switching means for selecting an engine to be trimmed;
signal conditioning means comprising a plurality of RC circuits coupled between said rotary switching means and said plurality of engine speed parameter measuring channels;
said signal conditioning means responsive to an engine speed



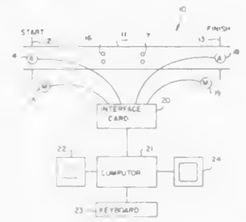
parameter for generating a signal having frequencies from 10 Hz to 8400 Hz;
a clock circuit;
a plurality of measuring display devices responsive to the output of said plurality of engine speed measuring channels; and,
programmable divider circuit means coupled between said clock and said plurality of display devices.

4,918,630

COMPUTER TIMING SYSTEM HAVING BACKUP TRIGGER SWITCHES FOR TIMING COMPETITIVE EVENTS

Donald A. Plouff, Noblesville, Ind., and Robert H. Weller, Rothschild, Wis., assignors to GTE North Incorporated, Westfield, Ind.

Filed Dec. 7, 1988, Ser. No. 281,131
Int. Cl.[4] G04F *8/00*
U.S. Cl. 364—569 **4 Claims**



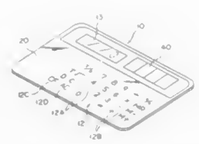
1. A computer system for timing a contestant on a water race course with separated start and finish positions, comprising:
a computer;
a first automatic switch at said start position;
a first manual switch on the start position;
a second automatic switch on the finish position;
a second manual switch at said finish position;
a card interfacing said switches and said computer for providing said computer information pertaining to the time and identification of the corresponding switch when a first automatic switch, a first manual switch, a second automatic switch, and a second manual switch is activated;
software means for programming said computer for:
(a) displaying said time and identification of the corresponding switch;
(b) stringing contestant identification with a corresponding time;
(c) comparing the times associated with said first switches and selecting as the contestant's start time the time corresponding to the first automatic switch, or in the absence of thereof, the time corresponding to the first manual switch;
(d) comparing the times associated with said second switches and selecting and displaying as the finish time the time corresponding to the second automatic switch, or the absence thereof, the time corresponding to the second manual switch; and
(e) subtracting the selected start time from said selector finish time to obtain the elapsed time of the contestant, and means to display said elapsed time with identification of the corresponding contestant.

4,918,631

COMPACT TYPE ELECTRONIC INFORMATION CARD

Kazuya Hara, Tokorozawa, and Kenji Rikuna, Tanashi, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 746,200, Jun. 18, 1985, Pat. No. 4,749,982. This application Sep. 1, 1987, Ser. No. 91,959
Claims priority, applicatioo Japan, Sep. 7, 1984, 59-135698; Jul. 22, 1987, 62-111330[U]
Int. Cl.[4] G06K *5/00*; G06F *7/02*
U.S. Cl. 364—708 **32 Claims**



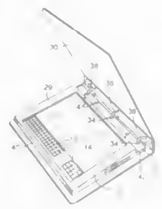
1. A compact electric apparatus having predetermined upper and lower surfaces and a substantially uniform thickness comprising:
an electronic component assembly including a plurality of key input contacts for inputtting numeral data and collation instruction data, integrated circuit means having memory means for prestoring identification data and control means for collating said identification data with numeral data according to said collation instruction data and for generating a collation result signal, display means connected to said integrated circuit means for displaying a collation result, and battery means for supplying a drive voltage to said integrated circuit means; said electronic component assembly having first and second surfaces;
upper cover means for covering said first surface of said electronic component assembly and including a plurality of key operation portions having means for inputting numeral data and collation instruction data through said key input contacts;
lower cover means for covering said second surface of said electronic component assembly and having a cavity for disposing said electronic component assembly; and
fixing means for fixing said electronic component assembly, said upper cover means and said lower cover means together.

4,918,632

NOTEBOOK MOUNTAIILE COMPUTER SYSTEM

Dennis C. York, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 17, 1988, Ser. No. 272,579
Int. Cl.[4] G06F *15/02*; B42F *3/00*
U.S. Cl. 364—708 **13 Claims**



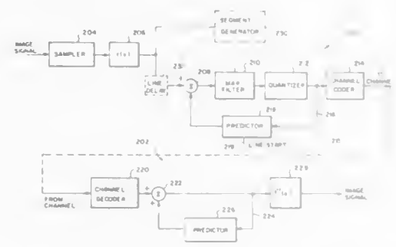
8. A portable information system comprising
a notebook binder comprising a plurality of rings therein, said rings being readily opened and closed; and
a portable computer unit sized for receipt within said binder, said computer unit comprising microprocessor means for receiving, storing and processing data, display means for enabling said microprocessor means to produce a readily observable, visual display of information, input means for providing data to said microprocessor means, and a housing for containing said microprocessor means, display means and input means, said housing comprising a plurality of openings therethrough sized to receive said rings of said binder, said housing further comprising a lower section and an upper section, said upper section comprising said openings for the receipt of said rings of said binder, said lower section containing said display means and said input means therein, said upper section having a thickness less than that of said lower section.

4,918,633

DIGITAL IMAGE NOISE REDUCTION METHOD AND TRANSMISSION SYSTEM

James R. Sullivan, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 802,107, Nov. 25, 1985, abandoned. This application Mar. 22, 1988, Ser. No. 171,630
Int. Cl.[4] G06K *9/36, 9/40*
U.S. Cl. 364—574 **10 Claims**



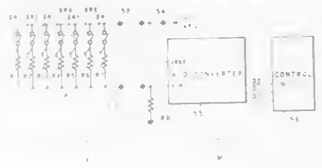
1. A signal processing method for reducing noise in an image signal, comprising the steps of:
(a) sampling an image to produce a sampled image signal representing pixel amplitude values, the sampled image signal including noise having a known probability density function (pdf);
(b) digitizing the pixel amplitude values to produce a digital image;
(c) forming an image difference signal from the digital image signal by taking the difference between successive pixel amplitude values;
(d) processing the image difference signal in digital processing means including a digital MAP filter incorporating a MAP estimator for estimating the signal and noise pdf's of a signal having a Laplacian pdf degraded by noise having a known pdf, to produce a MAP filtered image difference signal; and
(e) recovering a restored digital image signal from the MAP filtered image difference signal by summing successive amplitude difference values in the MAP filtered image difference signal.

4,918,634

KEY INPUT APPARATUS

Kadotaro Nishimori, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 22, 1988, Ser. No. 158,660
Claims priority, application Japan, Feb. 23, 1987, 62-39697; Feb. 27, 1987, 62-46072; Feb. 27, 1987, 62-46073
Int. Cl.[4] G06F *3/023*
U.S. Cl. 364—709.12 **19 Claims**



1. A key input apparatus with a plurality of key switches for outputting respective information, said key input apparatus comprising:
a variable resistance circuit including a plurality of key units connected with each other in parallel and a pair of terminals, each key unit including a key switch and a resistance element connected with the key switch in series,
a voltage generating unit including a power source connected with one terminal of said variable resistance circuit and a resistance element connected with said other terminal of said variable resistance circuit in series for generating an analog voltage corresponding to a resistance value of said variable resistance circuit, and
an analog-to-digital converter for converting said analog voltage into a digital signal.

4,918,635

ULTRAFAST DIGITAL PHOTONIC SIGNAL PROCESSING USING OPTICAL NONCOLLINEAR SECOND HARMONIC GENERATION

Yao Li, 3605 Sedgwick Ave., #B22; Robert R. Alfano, 3777 Independence Ave., both of Bronx, N.Y. 10463, and George Eichmann, 18 Arbor La., Roslyn Heights, N.Y. 11577

Filed Nov. 15, 1988, Ser. No. 271,566
Int. Cl.[4] G06F *7/56*; G06G *7/16*
U.S. Cl. 364—713 **2 Claims**

2. Apparatus for performing multiplication type operations two quantities optically comprising:
a. a second harmonic generating crystal,
b. means for providing a pair of identical primary frequency coherent beams of light, one of the beams being encoded with one of the quantities and the other beam being encoded with the other quantity, said
c. pair of beams being directed off-axis into said second

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harmonic generating crystal so as to produce an on-axis frequency doubled beam of light, the frequency doubled

beam of light being encoded with the product of the two quantities, and

d. means for detecting the frequency doubled output beam.

4,918,636

CIRCUIT FOR COMPARING A PLURALITY OF BINARY INPUTS

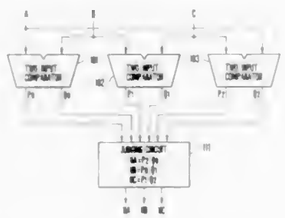
Jun Iwata; Takeshi Nishikawa, both of Tokyo, and Toshihiko Nakamura, Yamanashi, all of Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 23, 1988, Ser. No. 289,268

Claims priority, application Japan, Dec. 24, 1987, 62-325201; Dec. 24, 1987, 62-325202

Int. Cl.[4] G06F *7/02*

U.S. Cl. 364—715.06 **7 Claims**



1. A comparator for receiving M numbers, where M is greater than or equal to three and for generating a signal indicating which of said M numbers are minimum, said comparator comprising:

a plurality of two-input comparators each receiving two of said M numbers $A_1, A_2, \ldots, A_M$, and generating and outputting a signal representing a relation between different numbers A_i and A_j, where $i \neq j$; and

a judging circuit receiving outputs from all of said two-input comparators, and generating and outputting a signal representing which of said M numbers $A_1, A_2, \ldots, A_M$ is minimum.

4,918,637

MULTICHANNEL DECIMATION/INTERPOLATION FILTER

Douglas W. Morton, Everett, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 323,512, Mar. 13, 1989, abandoned, Division of Ser. No. 3,158, Jan. 13, 1987, Pat. No. 4,881,191. This application Sep. 26, 1989, Ser. No. 415,371

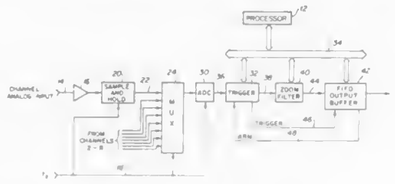
Int. Cl.[4] G06F *15/31*

U.S. Cl. 364—724.17 **5 Claims**

1. An apparatus comprising:

input means for providing an input digital signal, and input digital signal being comprised of a plurality of samples provided at a first rate;

signal processing means having an input coupled to the input means for processing the samples comprising the input digital signal and for producing a first output signal, said processing means including means for processing signal samples at a second rate greater than the first, said second



rate defining a characteristic processing interval for processing a single signal sample, the difference between the second and first rates leaving unused processing intervals during which the processing means is not processing samples to the input digital signal, said signal processing means processing samples of the first output signal during certain of said unused processing intervals.

4,918,638

MULTIPLIER IN A GALOIS FIELD

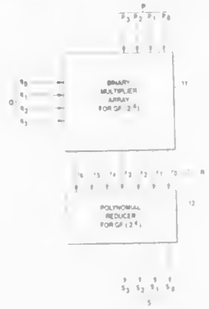
Michihito Matsumoto, Osaka, and Kazuhiro Murase, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 9, 1987, Ser. No. 107,363

Claims priority, application Japan, Oct. 15, 1986, 61-244541; Oct. 21, 1986, 61-249910

Int. Cl.[4] G06F *7/52*

U.S. Cl. 364—746.1 **5 Claims**



1. An apparatus for carrying out multiplication of field elements $P=\Sigma p_i \cdot \alpha^i$, $Q=\Sigma q_i \cdot \alpha^i$ ($i=0$ through $m-1$) in a Galois field $GF(2^m)$ whose generator polynomial is $g(x)=x^m+\Sigma k_i \cdot x^i$ ($i=0$ through $m-1$, k_i=binary coefficient) comprising:

a binary multiplier array supplied with the field elements P, Q for generating partial products $R=\Sigma r_n \cdot \alpha^n$ ($n=0$ through $2m-2$) where $r_n=\Sigma p_u \cdot q_v$ for all $n=u+v$ ($u=0$ through $m-1 \leqq n$ and $v=0$ through $m-1 \leqq$); and

a polynomial reducer supplied with the partial products R for generating final products $S=\Sigma s_i \cdot \alpha^i$ ($i=0$ through $m-1$, Si=binary component of S) through division of the partial products R by the generator polynomial.

4,918,639

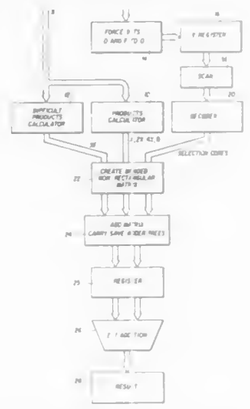
OVERLAPPED MULTIPLE-BIT SCANNING MULTIPLICATION SYSTEM WITH BANDED PARTIAL PRODUCT MATRIX

Eric M. Schwarz, Endicott, and Stamatis Vassiliadis, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 3, 1987, Ser. No. 116,172

Int. Cl.[4] G06F *7/52*

U.S. Cl. 364—754 **27 Claims**



1. In a system for multiplying a multiplicand X by a multiplier Y, each of which is either a floating point sign magnitude number in binary notation including a sign, a fraction, and an exponent, or an unsigned number in binary notation, means for multiplying the fractions of said sign magnitude numbers or said unsigned numbers, comprising:

overlapped scanning means for scanning said multiplier with S successive bits at a time, each scan overlapping one of the bits of the previous scan, wherein S is greater than three;

assembly means responsive to said successive scanned bits to select and encode modified partial products of said multiplicand for assembly in a plurality of rows of a banded partial product matrix, said partial products having $q-1+S-2$ bit positions, where q is the width of the significant bits plus the sign of said multiplicand in binary two's complement form which includes bit 0 with the least significant bit bit being the $(q-1)$th bit; and

means for adding said modified partial products in parallel.

4,918,640

ADDER CELL HAVING A SUM PART AND A CARRY PART

Wolfgang Heimsch, and Ernst Muellner, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

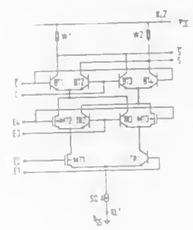
Filed Jan. 12, 1989, Ser. No. 296,070

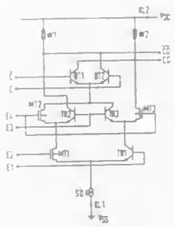
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1988, 3803542

Int. Cl.[4] G05F *7/50*; H03K *17/16*

U.S. Cl. 364—768 **19 Claims**

1. An adder cell having a sum part and a carry part, comprising the sum part containing a first differential amplifier having a first MOS transistor (MT1) and a first transistor (TR1), a second differential amplifier having a second MOS transistor (MT2) and a second transistor (TR2), a third differential amplifier having a third MOS transistor (MT3) and a third transistor (TR3), a fourth differential amplifier composed of first and second bipolar transistors (BT1, BT2), a fifth differential amplifier composed of third and fourth bipolar transistors (BT3, BT4), a current source (SQ) and first and second resistors (W1, W2); a first terminal of the first MOS transistor (MT1) and a first terminal of the first transistor (TR1) being connected in common to a first circuit terminal (KL1) via the current source (SQ); a first terminal of the second MOS transistor (MT2) and a first terminal of the second transistor (TR2) being connected to a second terminal of the first MOS transistor (MT1), and a first terminal of the third MOS transistor (MT3) and a first terminal of the third transistor (TR3) being connected to a second terminal of the first transistor (TR1); a first terminal of the first bipolar transistor (BT1) and a first terminal of the second bipolar transistor (BT2) being connected to a second terminal of the second MOS transistor (MT2) and to a second terminal of the third transistor (TR3); a first terminal of the third bipolar transistor (BT3) and a first terminal of the fourth bipolar transistor (BT4) being connected to a second terminal of the second transistor (TR2) and to a second terminal of the third MOS transistor (MT3); a second terminal of the first bipolar transistor (BT1) and a second terminal of the third bipolar transistor (BT3) being connected in common to a second circuit terminal (KL2) via the first resistor (W1); a second





terminal of the second bipolar transistor (BT2) and a second terminal of the fourth bipolar transistor (BT4) being connected in common to the second circuit terminal (KL2) via the second resistor (W2); a first input (E1) being connected to a control terminal of the first transistor (TR1) and a second input (E2) being connected to a gate terminal of the first MOS transistor (MT1); a control terminal of the second transistor (TR2) and a control terminal of the third transistor (TR3) connected together to form a third input (E3); a gate terminal of the second MOS transistor (MT2) and a gate terminal of the third MOS transistor (MT3) connected together to form a fourth input (E4); a first carry input (C) being connected to a base terminal of the second bipolar transistor (BT2) and to a base terminal of the third bipolar transistor (BT3); a second carry input ($\bar{C}$) being connected to a base terminal of the first bipolar transistor (BT1) and to a base terminal of the fourth bipolar transistor (BT4); a first sum output (S) being connected to the second terminal of the fourth bipolar transistor (BT4) and to the second terminal of the second bipolar transistor (BT2); a second sum output ($\bar{S}$) being connected to the second terminal of the

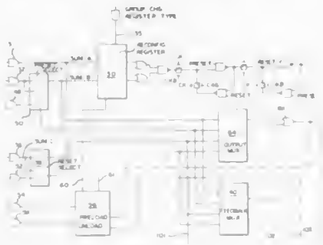
first bipolar (BT1) and to the second terminal of the third bipolar transistor (BT3).

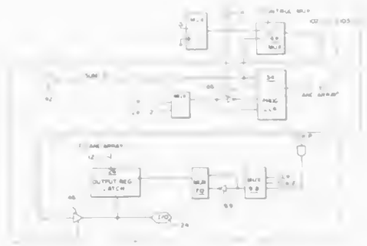
4,918,641

HIGH-PERFORMANCE PROGRAMMABLE LOGIC DEVICE

Robin J. Jigour, San Jose; Shueh-Mien J. Lee, Sunnyvale, and Ali Pourkeramati, Santa Clara, all of Calif., assignors to ICT International CMOS Technology, Inc., San Jose, Calif.

Filed Aug. 26, 1987, Ser. No. 89,644
Int. Cl.[4] G06F *7/38;* H01Q *9/04*
U.S. Cl. 364—716 18 Claims





14. For use in a programmable logic device in which a gate array produces product sum terms, a macrocell comprising

programmable register means for receiving a plurality of sum terms, said programmable register means being configurable as either a D flip-flop, a T flip-flop, or a JK flip-flop,

said programmable register means being dynamically alterable for individually controlled macrocells and serving multiple functions based on programming of said macrocell,

a first sum term is used as an input to a flip-flop, a second sum term is used as a preset signal and as an input to a flip-flop, a third sum term is used as a reset signal and as a clock signal, and a further sum term is used as an output-enable and as a clock signal,

an I/O terminal means connected to receive an output from said programmable register means and connected to receive sum terms,

a first feedback from said register means to said gate array, and

a second feedback from said I/O terminal means to said gate array wherein said programmable register means and said I/O terminal means can function independently,

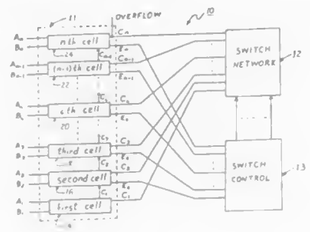
each macrocell being functional in simultaneously implementing two independent sum-of-product logic functional combinatorially and sequentially with each of said logic functions being programmably routed as feedback signals to said gate array or as an output to an I/O terminal.

4,918,642

ISOLATED CARRY PROPAGATION FAST ADDER

Chih C. Chang, 2017 B Jason Dr., Huntingdon Valley, Pa. 19006

Filed Mar. 29, 1988, Ser. No. 174,986
Int. Cl.[4] G06F *7/50*
U.S. Cl. 364—787 6 Claims



1. An apparatus for adding two binary numbers, each binary number having at least two binary digits, said digits increasing in significance from a least significant digit to a most significant digit, said apparatus comprising:

(a) an adder base including a universal cell of a first type comprising a first double switch cell and at least one universal cell of a second type, each cell receives a binary digit of each of said binary numbers with said universal cell of said first type receiving said least significant digit and said at least one universal cell of said second type each receiving binary digits in increasing order of significance to and including said most significant digit, and each cell having an output carry node which is electrically connected to or isolated from the output carry node of another cell, which receives a more significant digit, based upon the value of the binary digits received by both said another cell and all cells which receives digit of decreasing significances down to, but not including, said each cell; and

(b) a switch control for controlling a switch network whereby said switch network provides a path from any one carry node to any other carry node in accordance with dynamic connection and dynamic isolation properties.

4,918,643

METHOD AND APPARATUS FOR SUBSTANTIALLY IMPROVING THE THROUGHPUT OF CIRCUIT SIMULATORS

Chiu-Seung R. Wong, Durham, N.C., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 21, 1988, Ser. No. 209,618
Int. Cl.[4] G06G *7/62;* G06J *1/00*
U.S. Cl. 364—802 7 Claims

1. A method for simulating with a circuit simulation processor a steady state operation of a periodic piece-wise linear switched system having a plurality of switched states;

comprising the steps of:

defining a cycle of operation of the switched system;

defining subintervals of the cycle in which different switched states in the switching system define a different system topology in the different subintervals;

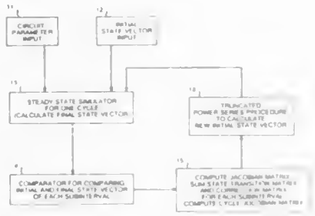
determining an initial value of a state vector for the periodic piece-wise linear switched system at the beginning of the cycle;

simulating a single cycle of operation to obtain a final value of the state vector for the periodic piece-wise linear switched system at the end of the cycle;

comparing the initial and final values of the state vector to determine if a steady state condition in the simulation of operation has been achieved;

wherein the improvement comprises:

computing a subinterval Jacobian matrix for each subinterval by computing a subinterval state transition matrix; and adding a correction square matrix to the subinterval state transition matrix to account for changes in subinterval time durations;



computing a cycle Jacobian matrix by subtracting an identity matrix from a product of all computed subinterval Jacobian matrices;

adjusting the value of the initial value of the state vector to a new value form the computed cycle Jacobian matrix through a truncated power-series procedure; and

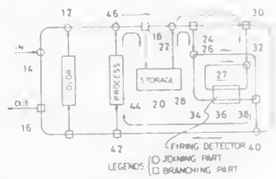
repeating the above described steps subsequent to the step of determining an initial value until steady state simulation is achieved.

4,918,644

SYSTEM CONTAINING LOOP SHAPED TRANSMISSION PATHS FOR TRANSMITTING DATA PACKETS USING A PLURALITY OF LATCHES CONNECTED IN CASCADE FASHION

Hiroaki Terada, Osaka; Katushiko Asada, Hyoko; Hiroaki Nishikawa, Osaka; Souichi Miyata; Satoshi Matsumoto, both of Nara; Hajime Asano, Osaka; Masahisa Shimizu, Osaka; Hiroki Miura, Osaka; Kenji Shima, and Shinji Komori, both of Hyogo, all of Japan, assignors to Sanyo Electric Co., Ltd.; Sharp Kabushiki Kaisha; Matsushia Electric Industrial Co., Ltd., all of Osaka and Mitsubishi Denki Kabushiki Kaisha, Tokyo, all of, Japan

Filed May 28, 1986, Ser. No. 868,291
Claims priority, application Japan, May 31, 1985, 60-119165; May 31, 1985, 60-119166; May 31, 1985, 60-119167; May 31, 1985, 60-119168; May 31, 1985, 60-119169; Mar. 12, 1986, 61-55948
Int. Cl.[4] G06F *7/04, 7/20, 7/32*
U.S. Cl. 364—900 23 Claims



1. A data processing apparatus, comprising:

a first data transmission path constituted by a self-running type shift register for transmitting a data packet containing identification data, said first data transmission path including a plurality of latching means coupled to each other in cascade fashion and the data packet being sequentially shifted into said latching means in a bit-parallel fashion;

a second data transmission path constituted by a self-running type shift register for transmitting a data packet containing identification data, said second data transmission path including a plurality of latching means coupled to each other in cascade fashion and the data packet being sequentially shifted into said latching means in a bit-parallel fashion;

identification data detecting means coupled with said first and second data transmission paths for detecting the identification data contained in the data packets being respectively transmitted thereon, said identification data detecting means including first and second extracting means for extracting said identification data from the respective data packets being transmitted on said first and second data transmission paths;

determining means for comparing said identification data extracted by said first and second identification data extracting means to determine whether or not the data packets to be paired are transmitted on said first and second data transmission paths; and

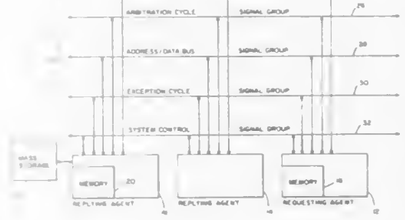
new data packet producing means coupled with said first and second data transmission paths for producing one new data packet in accordance with the data packets being transmitted respectively on said first and second data transmission path in response to a determination by said determining means that data packets to be paired are transmitted on said first and second transmission paths.

4,918,645

COMPUTER BUS HAVING PAGE MODE MEMORY ACCESS

Brian E. J. Lagoy, Jr., West Townsend, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Sep. 17, 1987, Ser. No. 98,449
Int. Cl.[4] G06F *12/00, 13/00*
U.S. Cl. 364—900 20 Claims



1. Memory control apparatus for use in a data processing system having at least a requesting agent and said replying agent electrically coupled together by a system bus, the requesting agent requesting access to a memory on the replying agent for storing and retrieving data therein over the system bus, the apparatus comprising:

means, associated with a replying agent, for detecting a request for initiating an access to a memory on the replying agent, the request detecting means being coupled to a system bus, and request being made over the system bus by a requesting agent;

means, responsive to the request detecting means detecting the request, for asserting a plurality of memory address control signals for accessing a plurality of times the memory on the replying agent, the control signals comprising at least a row address strobe signal associated with a

memory row address and a column address strobe signal associated with a memory column address; and

means for detecting a completion of the access to the memory, the completion detecting means being responsive to an end of access control signal generated by the requesting agent, the access completion detecting means being coupled to the memory address control signal asserting means for halting the operation thereof after the end of access control signal is detected; and wherein

the memory address control signal asserting means asserts the memory address contorl signals by asserting the row address strobe in conjunction with a row address being indicative of a page of data within the memory, and thereafter asserts and deasserts a plurality of times the column address strobe signal in conjunction with a plurality of column addresses for performing a page mode type of memory access.

4,918,646

INFORMATION RETRIEVAL APPARATUS

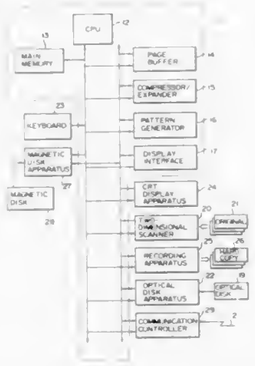
Kenji Hirose, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 21, 1987, Ser. No. 88,156

Claims priority, application Japan, Aug. 28, 1986, 61-199915; Sep. 5, 1986, 61-209064

Int. Cl.[4] G06F *7/06, 3/14, 15/40*

U.S. Cl. 364—900 **18 Claims**



1. An information retrieval apparatus comprising:

information groups storage means for storing a plurality of information groups, each of said information groups including a plurality of information units storing information;

title structure storage means for storing a plurality of title structure items, each title structure item corresponding to one information group, each title structure item having a format different from other title structure items corresponding to other information groups and each title structure item having a plurality of retrieval keys for retrieving information from said information groups storage means, each of said plurality of retrieval keys having attribute data which include a name of said retrieval key, at least one of said plurality of retrieval keys belonging to a plurality of retrieval keys of more than one title structure item;

designation means for designating a desired retrieval key corresponding to information to be retrieved, said desired retrieval key belonging to a plurality of retrieval keys of more than one title structure item;

extraction means for extracting, from said title structure items, retrieval keys having attribute data identical to that of the desired retrieval key designated by said designation means; and

retrieval means for enabling retrieval of information from said information groups storage means by using said extracted retrieval keys, thereby enabling retrieval of information from said information groups corresponding to a plurality of title structure items having a plurality of retrieval keys including said desired retrieval key.

4,918,647

PROGRAMMABLE INTERFACE UNIT WHICH GENERATES DEDICATED CONTROL SIGNALS IN RESPONSE TO A SINGLE CONTROL WORD

Philip A. Downey, Linlithgow, Scotland, assignor to Burr-Brown Limited, Livingston, Scotland

Filed Aug. 4, 1986, Ser. No. 892,324

Claims priority, application United Kingdom, Apr. 5, 1986, 8608369

Int. Cl.[4] G06F *9/06, 5/00*

U.S. Cl. 364—900 **2 Claims**

1. An enhancement to a digital signal processing system provided with a system bus, a data processing unit and a memory unit respectively coupled to the system bus for developing an interface control word and for applying the interface control word to the system bus, said digital signal processing system also provided with a control register, a control transfer bus (50) coupled between the system bus and the control register for causing the interface control word to be entered into the control register, a digitizer coupled to the system bus for transmitting digitized analog input signals, the digitizer comprising a sample-and-hold circuit electronically coupled to a multiplexer unit, that in turn is coupled to an analog-to-digital converter,

said enhancement to said digital processing system comprising:

(a) a first control line coupled between the control register and the sample-and-hold circuit for delivering a first control signal generated by said control register in response to the entered interface control word for determining the time duration for monitoring an analog input signal;

(b) a second control line coupled between the control register and the multiplexer for delivering a second control signal generated by said control register in response to the entered interface control word for determining which analog input signal is monitored; and

(c) a third control line coupled between the control register and the analog-to-digital converter for delivering a third control signal generated by said control register in response to the entered interface control word for determining when the analog-to-digital converter processes an analog input signal.

4,918,648

WORD PROCESSING DEVICE CAPABLE OF EDITING MANY DISTINCT DOCUMENTS USING A SINGLE SELECTION PROCESS

Yasuhiro Taguchi, and Hiroichi Yoshida, both of Yamatokoriyama, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 818,710, Jan. 14, 1986, abandoned. This application Aug. 29, 1988, Ser. No. 239,010

Claims priority, application Japan, Jan. 25, 1985, 60-13115

Int. Cl.[4] B41J *5/30;* **G06F** *3/00*

U.S. Cl. 364—900 **7 Claims**

1. A word processing device comprising:

keyboard means for supplying input characters and sentence editing control signals;

input means for providing a call-up signal;

storage means, responsive to said sentence editing control signals from said keyboard means, for storing predetermined registered sentences and releasing selected registered sentences;

sentence buffer means, responsive to said sentence editing control signals from said keyboard means, for storing the selected registered sentences released from said storage means;

paste buffer means, responsive to said sentence editing control signals from said keyboard means, for storing partial word data selected from one or more of the selected registered sentences in said sentence buffer means to be used in editing one or more distinct documents;

said paste buffer means, being further responsive to said call-up signal, for calling up said partial word data one or more times from said paste buffer means to allow the word processing device to edit one or more distinct documents with the selected partial word data without requiring re-selection and storing of the selected partial word data;

display means, responsive to said keyboard means and said sentence buffer means, for displaying said characters from said keyboard means and the selected registered sentences from said sentence buffer means; and

editor controller means, responsive to said call-up signal produced by said input means, for inserting said partial word data into a desired position of a presently edited document, said desired position being a different position in each document;

said keyboard means providing said editor controller means with additional data not stored in said paste buffer means;

said editor controller means inserting said additional data into a desired position of said presently edited document, thereby causing said presently edited document to be modified by the data stored in said paste buffer means and by said additional data provided by said keyboard means.

4,918,649

METHOD FOR GENERATING INSTRUCTIONS FOR INHIBITION SWITCH-OFF OF POWER AFTER POWER-OFF OPERATION

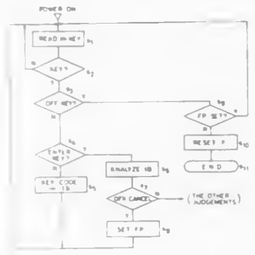
Kosuke Nishimura, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 585,377, Mar. 2, 1984, Pat. No. 4,768,162. This application Jul. 13, 1988, Ser. No. 218,258

Claims priority, application Japan, Mar. 16, 1983, 58-45349

Int. Cl.[4] G06F *1/04, 12/16, 3/02*

U.S. Cl. 364—900 **2 Claims**



1 A method for controlling power supply to an electronic apparatus wherein memory contents are erased upon a power-off, comprising the steps performed by said electronic apparatus, subsequent to a power-off operation resultant from octuation of a power switch, of:

generating an instruction for inhibiting a switch-off of the power to said electronic apparatus after the power-off operation;

detecting the inhibiting instruction developed by the step of generating; and

controlling the power supply to continue supply of power to said electronic apparatus in response to the detected output of said inhibiting instruction.

4,918,650

MEMORY CONTROL INTERFACE APPARATUS

Nicholas De Wolf, Aspen, Colo., assignor to ON! Systems, Libertyville, Ill.

Filed Dec. 22, 1986, Ser. No. 944,563

Int. Cl.[4] G06F *12/16;* **G11C** *7/00*

U.S. Cl. 364—900 **3 Claims**

1. A memory control interface apparatus for connecting an external memory device with a microprocessor system comprising:

means coupled to said microprocessor system for identifying a predetermined number of data request signals, said data request signals corresponding to data transfers between said microprocessor based system and said external memory device;

first refreshing means coupled to said external memory and coupled to said data request signal identifying means for refreshing said external memory device at a first predetermined rate responsive to said identified number of data request signals;

means coupled to said data request identifying means for generating a predetermined time interval signal responsive to each of said data request signals;

second timing means coupled to said time interval generating means responsive to the absence of said time intervals for producing a time out signal; and

second refreshing means coupled to said second timing means and coupled to said external memory device re-

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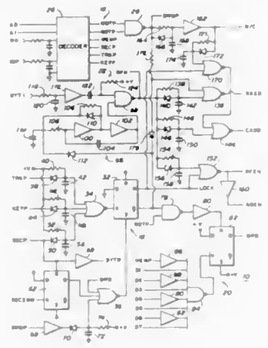
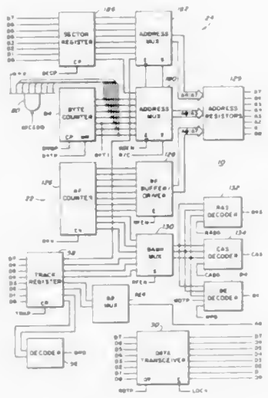
sponsive to said time out signal for periodically refreshing said external memory device at a second predetermined





rate; and wherein said second predetermined refreshing rate is less than said first predetermined refreshing rate.

4,918,651

METHOD AND DISK CONTROLLER ARCHITECTURE FOR ZERO LATENCY DATA READ

Carl Bonke, Rancho Santa Margarita, and Aurelio Cruz, San Juan Capistrano, all of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Filed Jul. 18, 1988, Ser. No. 220,535
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—900 2 Claims

2. A circuit architecture for a zero latency transfer of data from a track on a data disk having numerous sectors to a buffer memory under the control of a microprocessor comprising:

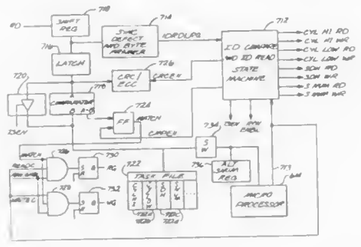
means for capturing identification bytes from the sectors, the capture means having a detection signal output;

a state machine, responsive to the detection signal output and commands from the microprocessor, having a plurality of paired read and write command outputs and a transfer enable output,

a plurality of registers for track identification and sector number identification having one-to-one correspondence with and responsive to the read/write command pairs from the state machine;

a comparison means connected between the capture means and the plurality of registers for comparing data bytes present in the capture means with data bytes present in the registers enabled by the corresponding read command from the state machine;

transfer means connected across the comparison means and responsive to the transfer enable command from the state machine for transferring data bytes from the capture



means to the registers as enabled by the corresponding write command from the state machine;

means for transferring data from the sector on the disk to the buffer memory; and

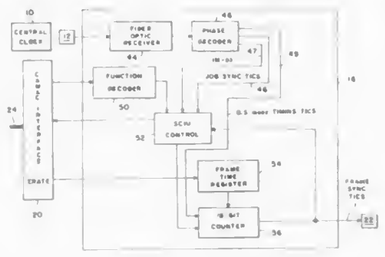
means for transferring a data byte written to the sector number register by the transfer means to the microprocessor.

4,918,652

REAL-TIME SIMULATION CLOCK

Donald R. Bennington, and Daniel J. Crawford, both of Newport News, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 10,949, Feb. 5, 1987, abandoned. This application Sep. 28, 1988, Ser. No. 251,073
Int. Cl.[4] G06F *1/04, 15/52, 15/50*
U.S. Cl. 364—900 7 Claims



1. A clock system for synchronizing opertations within a data processing network,

said data processing network having network hardware, network software, and network communications means,

said network hardware including a central computer and peripheral hardware,

said network software including a monitor running on the central computer and a stored program adapted to run on the central computer,

said stored program producing output for controlling the peripheral hardware,

said data processing network including at least one remote site where the peripheral hadware is located, and

said network communications means including data transfer means and control signal transmission means between the cetral computer and the remote site;

said clock system comprising:

clock hardware, clock software and a clock network,

said clock hardware comprising a central clock and at least one site clock interface unit, one such said site clock interface unit being located at each remote site,

said central clock comprising means for accurately generating reference standard signals marking the passage of small equal intervals of time,

said central clock additionally comprising means for counting the reference standard signals,

said central clock additionally comprising means to generate timing tic, said timing tic being a first discrete signal which is generated at the end of each timing tic interval,

said timing tic interval being the basis upon which the clock system builds longer intervals of time by the adding of multiple timing tic intervals,

said timing tic interval being determined by the central clock counting the passage of a plurality of small intervals of time,

said central clock additionally comprising means to generate a job sync tic, said job sync tic being a second discrete signal which is generated after the central clock counts a clock common multiple of timing tics,

said clock common multiple being a whole number of timing tic intervals necessary to mark the time between job sync tics,

said job sync tic being the signal to the monitor to start a job on the central computer,

said job sync tic additionally being the signal to the site clock interface unit to begin counting timing tics,

said site clock interface unit comprising means to generate a frame tic, said frame tic being a third discrete signal generated repetitively by the site clock interface unit after the passage of each frame time interval,

said frame time interval being the time necessary for the central computer to complete a single input-process-output cycle for the stored program which is producing output for the peripheral hardware at the remote site,

said frame time interval being dependent on the requirements of the peripheral hardware and the complexity of the stored program and therefore independent of the frame time interval at any other remote site,

said frame time interval commencing simultaneously with the generation of a job sync tic,

said frame time interval being evenly divisible into the clock common multiple so that the site clock interface unit generates a frame tic at the same time that the central clock generates a job sync tic,

said site clock interface unit additionally comprising means to generate a look-at-me signal,

said look-at-me signal serving to signal the central computer that the peripheral hadware is ready to begin an input-process-output cycle,

said look-at-me signal being generated upon receipt by the look-at-me signal generation means of a frame tic,

said clock software comprising a static scheduler running on the main computer,

said static scheduler comprising means to configure the date processing network such that the requirements of both the clock system and the stored program are met prior to running the stored program,

said static scheduler additionally comprising means to transmit a count enable signal to the site clock interface unit to prepare the site clock interface unit for the running of the stored program,

said static scheduler additionally comprising means for submitting the stored program to the monitor for running as a job on the central computer,

said static scheduler additionally comprising means to transmit a count disable signal to the site clock interface unit to inactivate the site clock interface unit upon termination of the the running of the stored program,

said clock network comprising means of transmitting signals between the central clock and the site clock interface unit,

said clock network additionally compring means of transmitting signals between the central clock and the central computer, and

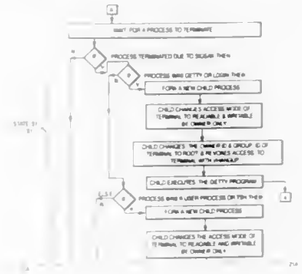
said clock network additionally comprising means of transmitting signals between the central computer and the site clock interface unit.

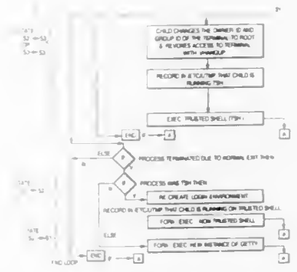
4,918,653

TRUSTED PATH MECHANISM FOR AN OPERATING SYSTEM

Abhai Johri, and Gary L. Luckenbaugh, both of Gaithersburg, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1988, Ser. No. 149,446
Int. Cl.[4] H04L *9/00*
U.S. Cl. 364—900 7 Claims





1. A method in a UNIX-type operating system for creating, in response to a secure attention request signal from a Secure Attention Key, a trusted path between a terminal connected to a data processor running an init process under said operating system and a trusted shell portion of a trusted computing base in said data processor, comprising the steps of:

testing for the termination of an existing process running under the control of said init process;

executing a fork system call by said init process for a new child process when said existing process terminates due to said secure attention request signal from a Secure Attention Key;

changing the access mode of the terminal to be accessible by said init process;

revoking access to the terminal by all other processes except said init process;

executing an exec system call to overlay said trusted shell onto said new child process;

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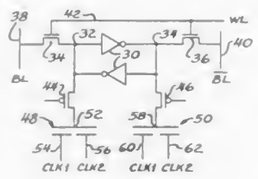
changing the access mode of the terminal to be accessible by said trusted shell.

4,918,654
SRAM WITH PROGRAMMABLE CAPACITANCE DIVIDER

S. Sheffield Eaton, Jr., and Michael Parris, both of Colorado Springs, Colo., assignors to Ramtron Corporation, Colorado Springs, Colo.

Division of Ser. No. 69,389, Jul. 2, 1987, Pat. No. 4,809,225.
This application Jan. 3, 1989, Ser. No. 292,818
Int. Cl.[4] G11C *11/22, 11/24*
U.S. Cl. 365—145 14 Claims



4. In a static RAM memory arrangement of the type having a volatile static RAM memory cell portion having first and second internal nodes (**32, 34**) coupled to respective complementary bit lines, and a nonvolatile memory cell portion coupled to the volatile memory cell portion, the improvement wherein the nonvolatile portion consists essentially of first and second ferroelectric capacitor dividers each comprising a pair of capacitors coupled together to form a common node (**52, 58**) and a pair of poles (**54, 56; 60, 62**), said common nodes of said first and second dividers being coupled to said first and second internal nodes, respectively, each said divider including ferroelectric dielectric material,

the improvement further comprising a signal generator located outside of said memory cell and coupled to provide at least one selectively variable voltage (CLK1) directly to one pole (**54**) of said first divider and to the corresponding said pole (**60**) of said second divider, and further comprising circuitry coupling a voltage to the other poles (**56, 62**) of said dividers so that the remanent polarization of the dielectric in said capacitance dividers represents the nonvolatile stored data.

5. In combination, a volatile data storage latch, a nonvolatile storage arrangement, and a signal generator,

the latch having cross-coupled transistors arranged in flip-flop configuration, and having first and second internal nodes which are coupled to receive complementary data to be stored in the latch;

the nonvolatile storage arrangement comprising first and second capacitance dividers, each said divider comprising two capacitors with ferroelectric dielectric material, the two capacitors being coupled together to provide a common node and a pair of poles,

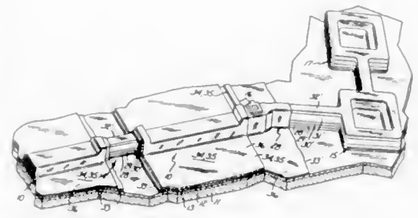
the common node of the first divider being coupled to said first internal node of said latch, the common node of the second divider being coupled tot he second internal node of the latch, so that the remanent polarization state of the ferroelectric material corresponds to nonvolatile stored data;

the signal generator having a first output and providing a first time-varying voltage thereon, said first output being directly coupled to one pole of said first divider and one pole of said second divider, and further including circuitry coupling a voltage to the other poles of said dividers.

4,918,655
MAGNETIC DEVICE INTEGRATED CIRCUIT INTERCONNECTION SYSTEM

James M. Daughton, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 29, 1988, Ser. No. 161,534
Int. Cl.[4] G11C *5/06, 11/15*
U.S. Cl. 365—173 34 Claims



1. A composite metallization interconnection system used on and at least partly through an electrical insulating layer having openings therein which layer is supported on a major surface of a semiconductor material substrate in a monolithic integrated circuit, said composite metallization interconnection system providing both electrical interconnections between circuit components in said integrated circuit and magnetic interaction regions capable of having a current established therethrough so as to result in a magnetoresistive response therein, said composite metallization interconnection system comprising:

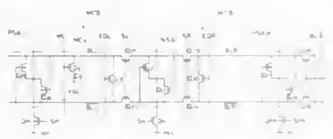
a first selected region in said semiconductor material substrate intersecting said major surface thereof of a selected conductivity type, said first selected region occurring at a first one of said openings in said insulating layer which extends from said major surface at said first selected region through said insulating layer to an outer surface thereof; and

a first composite structure portion electrically connected to said first selected region and extending through said first opening to be supported on said outer surface of said insulating layer and include a first one of said magnetic interaction regions, said first composite structure portion comprising (i) a first magnetic structure having an intermediate layer of a separating material which has first and second major surfaces on opposite sides thereof with there being on each a thin film of magnetoresistive, anisotropic ferromagnetic material, and with said first magnetic structure being supported at said thin film on said intermediate layer first surface by said insulating layer, said first magnetic interaction region being present at a selected location in said thin film, and (ii) a first conductive structure of an electrical conductivity substantially greater than that of said first magnetic structure, said first conductive structure being supported at a side thereof by said thin film on said intermediate layer second major surface except at said first magnetic interaction region at which said first conductive structure is absent.

4,918,656
DYNAMIC RANDOM ACCESS MEMORY WITH FET EQUALIZATION OF BIT LINES

Hiroshi Miyamoto, and Michihiro Yamada, both Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1987, Ser. No. 132,646
Claims priority, application Japan, Feb. 10, 1987, 62-28782
Int. Cl.[4] G11C *7/00, 11/40*
U.S. Cl. 365—189.06 10 Claims



1. A dynamic random access memory comprising:

a plurality of memory cell array blocks (MCB_{m1}, MCB_{j2}) each including a plurality of word lines (WL_i), a plurality of divided bit line pairs (BLL_j, BLL_j, BLR_j, BLR_j), and memory cells (MC_{ij}) each connected to one of said divided bit line pairs and to one of said word lines,

first sense amplifying means (PSA_{jL}, PSA_{jR}, NSA_j) for amplifying a potential difference of each said divided bit line pair so that one divided bit line is at a first potential, and second sense amplifying means for amplifying a potential difference of each said divided bit line pair so that the other divided bit line is at a second potential, and

equalizing means (Q_{j9}, Q_{j10}) for equalizing respective ones of said divided bit line pairs, said equalizing means comprising FET means for coupling bit lines of respective divided bit line pairs, each said FET means having gate electrode means for receiving an equalizing signal;

switching means (Q_{j11}, Q_{j12}, Q_{j13}, Q_{j14}) for coupling said divided bit line pairs of adjacent ones of said memory cell array blocks, and

timing controller means coupled to said equalizing means for controlling respective timings of said equalizing signal applied to each said FET means of said equalizing means to stop said equalizing means selectively and at different times among said memory cell blocks such that each said equalizing means is stopped after sensing operation is started in a memory cell array block different from the memory cell array block including said equalizing means.

4,918,657
SEMICONDUCTOR MEMORY DEVICE PROVIDED WITH AN IMPROVED PRECHARGE AND ENABLE CONTROL CIRCUIT

Yasushi Takahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 18, 1988, Ser. No. 169,683
Claims priority, application Japan, Mar. 18, 1987, 62-64671
Int. Cl.[4] G11C *7/00;* H03K *5/13*
U.S. Cl. 365—203 9 Claims

1. A semiconductor memory device fabricated in a semiconductor substrate, comprising:

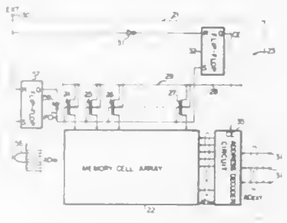
(a) a control node to which an external control signal is applied, said external control signal being shifted between a first level and a second level;

(b) a memory cell array having a plurality of memory cells each arranged in a matrix form of rows and columns;

(c) an address decoder circuit, having a plurality of decoder outputs respectively coupled to said rows, for selecting one of the decoder outputs when actuated by a first control signal in an active level on the basis of an external address signal, said first control signal being shifted between said active level and an inactive level;

(d) a precharging circuit actuated by a second control signal in an active level and performing a precharging operation prior to a read/write operation, said second control signal being shifted between said active level and an inactive level;

(e) a first control circuit responsive to said external control signal in said second level for shifting said first control signal from said active level to said inactive level and to said second control signal in said inactive level for shifting said first control signal from said inactive level to said active level;



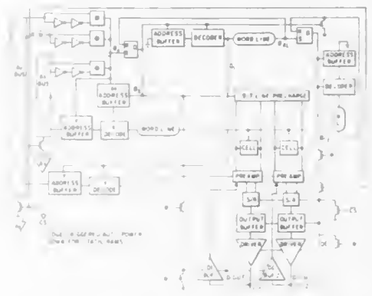
(f) a logic gate producing an additional control signal of said first level when all of said decoder outputs are in an inactive state, said additional control signal being shifted between said first level and said second level; and

(g) a second control circuit responsive to said external control signal in said first level for shifting said second control signal from said active level to said inactive level and to said additional control signal in said first level for shifting the second control signal from said inactive level to said active level.

4,918,658
STATIC RANDOM ACCESS MEMORY WITH ASYNCHRONOUS POWER-DOWN

Ashwin H. Shah, Dallas, and Pallab K. Chatterjee, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 31, 1983, Ser. No. 528,203
The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—227 3 Claims



1. A static random access memory comprising:

(a) an array of memory cells arranged in rows and columns;

(b) address decoder means for receiving a plurality of address bits to select a particular one of said memory cells;

(c) said address decoder comprising row address decoder means to receive and decode bits of said address bits

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corresponding to a row of said array, and column address decoder means to receive and decode bits of said address bits corresponding to a column of said array; and

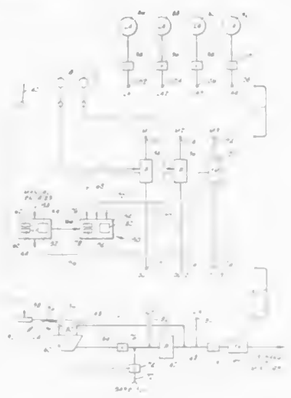
(d) power-up means, connected to said row and column address decoder means, and responsive to a transition of predetermined duration of said address bits, to provide an asynchronous first power up energy signal to said row decoder means to provide power to said row decoder means and, means responsive to said first energy signal, to subsequently asynchronously provide a power up energy signal to said column decoder means and asynchronously remove said power up energy signal from said row decoder means.

4,918,659

APPARATUS AND METHOD FOR ADDING A SELECTED ADDITIVE INTO A MIXTURE

Dale E. Bragg; Mark A. Clark, and Randy G. Fleming, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 200,085, May 27, 1988, Pat. No. 4,886,367.
This application Sep. 6, 1989, Ser. No. 403,739
Int. Cl.[4] B01F *15/02*
U.S. Cl. 366—132 4 Claims



1. A method of providing a mixture of substances at a well site, comprising the steps of:

transporting to the well site on a single vehicle a plurality of containers each containing a respective liquid additive and each including an additive outlet, a plurality of liquid additive metering means for providing a metered flow of a liquid additive each including a metering inlet and a metering outlet, and mixer means for mixing a metered liquid additive and a base liquid, which mixer means includes a plurality of additive inlets;

manually connecting, at the well site, with a first hose the additive outlet of a selected one of the containers and the metering inlet of a selected one of the liquid additive metering means;

manually connecting, at the well site, with a second hose the metering outlet of the selected metering means and a selected one of the additive inlets of the mixing means; and

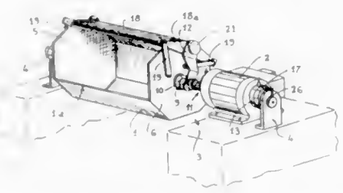
controlling, at the well site, the selected metering means to provide a metered flow of the liquid additive of the selected one of the containers so that provided in the mixing means is a mixture having a desired concentration of the liquid additive of the selected one of the containers.

4,918,660

INDUSTRIAL TREATMENT MACHINES WITH ROTATING VESSEL

Yvan Perrot, Port-Lesney, Arbois, France (39600)

Filed Apr. 5, 1988, Ser. No. 177,603
Claims priority, application France, Apr. 14, 1987, 87 05467
Int. Cl.[4] B01F *15/02, 9/02*
U.S. Cl. 366—185 9 Claims



1. In an industrial machine having a rotating vessel which includes a door adapted to close an access opening made between opposing longitudinal walls thereof and wherein the door is moveably mounted to the vessel by pivotable rods and wherein a motor means is provided for rotating the vessel, the improvement comprising, a drive shaft means extending from said motor means, a radial arm having first and second ends, said first end being connected to said drive shaft means so as to be rotated thereby, an eccentric means, first connector means for connecting said eccentric means to said second end of said radial arm, second connector means for connecting said eccentric means to the door so that the door is connected to said drive shaft means, said eccentric means and said second connector means permitting an extension of the door to permit opening and closing of the door relative to the access opening in the vessel.

4,918,661

OPTICAL DISK

Keiichi Yamauchi, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 69,084, Jul. 2, 1987, Pat. No. 4,817,068.
This application Dec. 13, 1988, Ser. No. 284,005
Claims priority, application Japan, Jul. 3, 1986, 61-157535
Int. Cl.[4] G11B *17/22*
U.S. Cl. 369—30 5 Claims

1. An optical disk, comprising a plurality of optical information tracks recorded thereon for tracing by a pickup, said tracks being divided into:

a first group of tracks in a first region of said disk containing information to be reproduced with said pickup; and

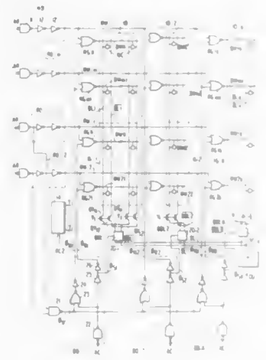
a second group of tracks in a second region of said disk for tracing by said pickup during a pause mode and being blank, containing none of said information to be reproduced with said pickup except address information identifying said second group of tracks for the exclusive use of the pause mode and for no other purpose.

4,918,662

SEMICONDUCTOR MEMORY DEVICE HAVING REDUNDANT STRUCTURE FOR SEGMENTED WORD LINE ARRANGEMENT

Kenji Koodo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 28, 1988, Ser. No. 174,469
Claims priority, application Japan, Mar. 27, 1987, 62-74905
Int. Cl.[4] G11C *17/00, 29/00*
U.S. Cl. 365—210 11 Claims



1. A semiconductor memory device comprising a plurality of memory blocks each having a plurality of normal segment word lines, a plurality of normal memory cells coupled to said normal segment word lines, at least one redundant segment word line in rows common to other memory blocks, and a plurality of redundant memory cells coupled to said redundant segment word lines;

a plurality of first control word lines extending through said memory blocks in the respective rows;

at least one second control word line extending through said memory block in the row;

a plurality of first decoders provided for said first control word lines, the output of one of said first decoders being made at an active level to select the associated first control word line;

at least one second decoder provided for said at least one second control word line, the output of said second decoder being made at an active level to select the second control line coupled thereto when the selected first control line is associated with the normal memory cells including at least one defective normal memory cell;

a plurality of first block control lines each provided for each of said memory blocks;

a plurality of second block control lines each provided for each of said memory blocks;

a plurality of first selection circuits each coupled to one of said first control word lines, one of said first block control lines and one of said normal segment word lines, each of said first selection circuits selecting the normal segment word line coupled thereto when both of the one first control word line and the one first block control line coupled thereto take their active levels;

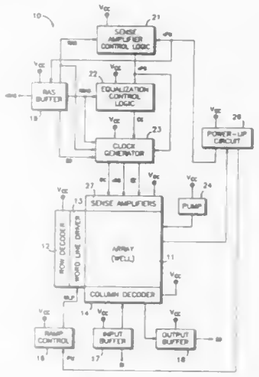
a plurality of second selection circuits, each coupled to the one second control word line, one of said second block control lines and one of said redundant segment word lines, each of said second selection circuits selecting the associated redundant segment word line when both of the associated second control word line and the associated second block control line take their active level, and a control circuit coupled to said first and second block control lines for activating one of said first block control lines when said at least one second control word line is not made at the active level and deactivating all of said first block control lines when said at least one second control word line is made active.

4,918,663

LATCH-UP CONTROL FOR A CMOS MEMORY WITH A PUMPED WELL

Scott I. Remington, and Richard D. Crisp, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 16, 1987, Ser. No. 97,029
Int. Cl.[4] G11C *7/00, 13/00*
U.S. Cl. 365—226 15 Claims



1. A CMOS DRAM having an array of memory cells located at intersections of word lines and bit lines including transfer device transistors of a first conductivity type formed in an array well of a second conductivity type, comprising:

a plurality of sense amplifiers each coupled to a pair of bit lines, each said sense amplifier having a first portion for being enabled by being coupled to a first power supply terminal and a second portion for being enabled by being coupled to a second power supply terminal;

power-up detection means, coupled to the first power supply terminal and the array well, for detecting a power-up condition; and

power-up control means, coupled to the power-up detection means, for disabling the first portions of the sense amplifiers during the power-up condition and enabling the second portions of the sense amplifiers during the power-up condition.

4,918,664

APPARATUS AND METHOD FOR PRESERVING DATA INTEGRITY IN MULTIPLE-PORT RAMS

Paul E. Platt, Starkville, Miss., assignor to Cypress Semiconductor, San Jose, Calif.

Filed Jan. 18, 1989, Ser. No. 298,472
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—230.05 4 Claims

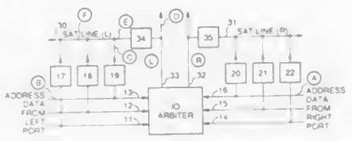
1. In a random access memory having more than one port capable of accessing the same storage addresses, a system for protection of data integrity at each port comprising:

first and second ports capable of providing first and second address transition signals to enable data storage in a single memory address;

a comparator means coupled to said first and second ports (1) for detecting address transitions indicating that said second port is addressing a particular memory address coincidentally when said first port is addressing the same

memory address and for (2) generating a busy output signal for that address in the event of such coincidence;

a transition detection means for detecting the transition resulting from the removal of said busy output signal from said comparator and for providing a busy removal transition signal equivalent to an address detection signal in the event of such detection; and



means for logically ORing said busy removal transition signal from said transition detection means with the address transition signal from said second port, whereby, in response to an output from said combining means, the data from said second port may then be written into or read out of said single memory address irrespective of whether said second port itself is providing an address transition signal at that time.

4,918,665

APPARATUS FOR MIXING MATERIAL

Friedrich W. Herfeld, Wall 1, 5983 Neuenrade, Fed. Rep. of Germany

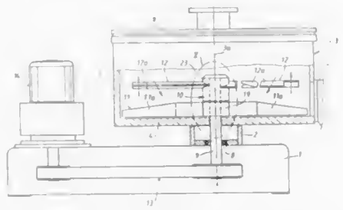
PCT No. PCT/EP86/00324, § 371 Date Jan. 27, 1987, § 102(e) Date Jan. 27, 1987, PCT Pub. No. WO86/07286, PCT Pub. Date Dec. 18, 1986

PCT Filed May 30, 1986, Ser. No. 16,723

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1985, 3520040

Int. Cl.[4] B01F *7/00*

U.S. Cl. 366—294 20 Claims



1. Mixing apparatus comprising a mixing vessel for containing a quantity to material to be mixed; at least two stirrers; means mounting said stirrers within said vessel for rotation about a common axis; common drive means for said stirrers; and drive transmission means coupling said drive means to said stirrers, said transmission means comprising planetary gear means having a rotary sun gear member, a rotary ring gear member, and a rotary carrier member carrying rotary planet gears in mesh with the sun gear member and the ring gear member, means coupling said drive means to one of said members, means connecting one of said stirrers to another of said rotary members, and means connecting the other of said stirrers to the remaining one of said members, said transmission means being responsive to the resistance imposed by material in said vessel to the rotation of the respective stirrers to adjust the speeds of rotation of said stirrers so that the stirrer encountering the least resistance rotates at the fastest speed.

4,918,666

TUBULAR PIEZO-ELECTRIC SENSOR WITH HIGH SENSITIVITY

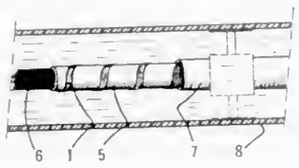
Claude Beauducel, Henonville, and Etienne Bolze, Rueil-Malmaison, both of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Dec. 22, 1988, Ser. No. 288,099

Claims priority, application France, Dec. 30, 1987, 87 18357

Int. Cl.[4] G01V *1/38*

U.S. Cl. 367—15 12 Claims



1. A tubular piezo-electric sensor comprising at least one sensitive element made from a substrate having piezo-electric properties and associated with electrodes, said sensitive element being disposed on a hollow tubular support, means impregnated with a fluid disposed inside said hollow tubular support for forming an coustic screen for highly dampening acoustic waves passing through said tubular support, and means for maintaining a pressure inside the tubular support substantially equal to a static pressure prevailing outside the tubular piezo-electric sensor.

4,918,668

MARINE VIBRATOR TUNEABLE ARRAY

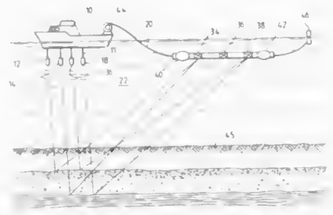
John J. Sallas, Plano, Tex., assignor to Halliburton Geophysical Services, Inc., Houston, Tex.

Filed Jan. 30, 1989, Ser. No. 304,786

The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.

Int. Cl.[4] G01V *1/38*

U.S. Cl. 367—22 13 Claims



1. A method of reducing pressure waves in marine seismic exploration propagating substantially horizontally from an array of marine vibrator sources wherein a plurality of marine vibrator sources are spaced from each other by known separations and at least one receiver is employed, each vibrator producing an output signal having given phase, frequency and amplitude, comprising the steps of:

(a) establishing a spacing between said plurality of marine vibrators and said receiver sufficient to establish said receiver as being in the far-field;

(b) locking the output signal of each of said marine vibrator sources in phase and frequency to a known reference phase and to a known reference frequency, respectively;

(c) maintaining the known separations between said marine vibrators;

(d) varying the known reference frequency over a range of discrete frequencies; and

(e) varying the individual output amplitude of each marine vibrator at the discrete frequencies so that the resultant pressure waves traverse the known separations resulting in phase shifts which diminish the resultant amplitude of the pressure waves received by said receiver correlative to the output amplitude of the individual marine vibrators and the pressure wave velocity.

4,918,669

METHOD AND APPARATUS FOR SONIC DIP MEASUREMENT

Roland E. Chemali, and Voldi E. Maki, Jr., both of Austin, Tex., assignors to Halliburton Logging Services, Inc., Houston, Tex.

Continuation of Ser. No. 176,686, Apr. 1, 1988, abandoned. This application Jul. 26, 1989, Ser. No. 385,045

Int. Cl.[4] G01V *1/40*

U.S. Cl. 367—27 8 Claims

1. A method for determining the dip in earth formations traversed by a borehole, comprising the steps of:

transmitting acoustic energy in the frequency range of 100 to 200 kilohertz through a formation radially with respect to the axis of a borehole from at least three angularly spaced points relative to the borehole axis;

generating first and second electrical receiver signals, respectively, representative of and in response to the arrival of acoustic energy at first and second longitudinally spaced locations from each respective transmission point, at each of said three angularly spaced points wherein said first and second locations are spaced vertically by a spacing distance of one inch or less, said spacing distance being chosen to be about one wavelength or less of acoustic energy at the highest operating frequency of 200 kHz in the slowest expected formation to be encountered; and

measuring the difference in elapsed time between the arrival of said first and second acoustic signals at each of the three angularly spaced points by measuring the acoustic wave phase shift between said representative electrical receiver signals at various depths along the borehole wherein the dip in the earth formation traversed by said borehole may be determined by correlating variation in the difference in elapsed time between said first and second acoustic signals for each of said transmission points.

4,918,670

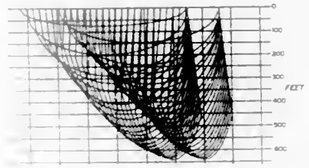
METHOD FOR INTERVAL VELOCITY ANALYSIS AND DETERMINATION OF REFLECTOR POSITION FROM BEFORE STACK SEISMIC DATA

Shein S. Wang, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Feb. 15, 1989, Ser. No. 310,971

Int. Cl.[4] G01V *1/28*

U.S. Cl. 367—38 10 Claims



6. A method for determining the depth of a subsurface reflector comprising the steps of:

receiving seismic data representing travel times of seismic pulses generated by a plurality of seismic sources and received by a plurality of seismic detectors;

segregating said seismic data into data from selected source receiver pairs;

determining constant travel time curves for each selected source receiver pair;

selecting a vertical line in alignment with a basement position relative to each selected source receiver pair;

determining the crossing points of all constant travel time curves that cross said vertical line representing said basement position;

identifying the correct velocity by locating the section of said vertical line where said crossing points are most concentrated;

calculating the minimum for each of said constant travel time curves;

determining the tangent to each of said constant travel time curves at said minimum; and

identifying the location of the reflector by connecting said tangents to each of said constant travel time curves.

4,918,671

DEPTH SOUNDER OPERATION FOR HOSTILE ENVIRONMENTS

Robert K. Tendler, 19 Lawrence Ave., Chestnut Hill, Mass. 02167

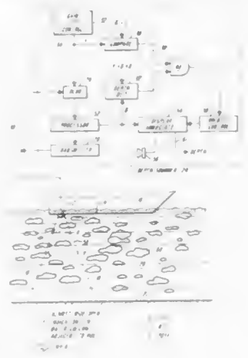
Filed Apr. 5, 1989, Ser. No. 333,610

Int. Cl.[4] G01S *9/66*

U.S. Cl. 367—87 9 Claims

1. In a depth sounding system adapted to be used on a vessel which includes a depth sounder for indicating the depth of water under said vessel and a transducer coupled thereto, with the transducer projecting a pulsed beam of energy into the water beneath said vessel, a system for eliminating false depth sounder readings caused by an unsuitable water condition characterized by targets within a predetermined distance down from the bottom of the vessel comprising:

means coupled to said transducer for sensing returns from targets within a water column that extends a predetermined depth below said vessel in the beam of said transducer; and,



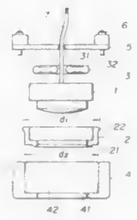
means for inhibiting all current dpeth indicating outputs of said depth sounder responsive to said sensed returns, whereby false indications of depth due to an unsuitable water condition are eliminated from being indicated upon the detection of said unsuitable water condition.

4,918,672

ULTRASONIC DISTANCE SENSOR

Makoto Iwabuchi, Tone, and Sinichi Ohzawa, Tokyo, both of Japan, assignors to Niles Parts Co., Ltd., Tokyo, Japan

Filed Aug. 11, 1988, Ser. No. 231,360
Int. Cl.[4] G01S *15/00*
U.S. Cl. 367—99 9 Claims



1. An ultrasonic distance sensor whereby an ultrasonic wave is transmitted from and received by a single ultrasonic transmitting and receiving element to measure the time required for a reflected ultrasonic wave to arrive at said element for detecting proximate distances, comprising:

a casing having an opening therein for receiving an ultrasonic transmitting and receiving element;

an ultrasonic transmitting and receiving element having a portion located in said opening; and

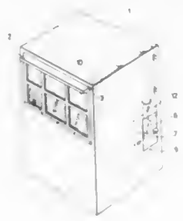
a first resilient member for securing said element in said casing by pressure, said resilient member lying intermediate said element and said casing and having first and second beads in contact respectively with an opening portion and a side portion of an inner surface of said casing.

4,918,673

NEWSPAPER VENDING MACHINE LAST SALE RECORDER

Bernard W. Stabel, 1234 S. Elms Rd., Flint, Mich. 48532

Filed Feb. 23, 1989, Ser. No. 313,823
Int. Cl.[4] G04B *47/00*; G07F *11/00*
U.S. Cl. 368—10 6 Claims



1. A time counting data collection means for a newspaper vending machine of the type which includes a door which must be opened to gain access to the newspaper comprising:

a switch which is mounted so that the switch is activated by the opening of a newspaper vending machine door;

a predetermining subtractive counter having a counter coil input and an output whereby the counter subtracts one digit each time the counter coil input receives an electrical signal from the switch and whereby the output produces an open circuit when the counter digit is zero;

an elapsed time indicator which measures time when power is applied;

a power supply;

means for electrically connecting the power supply in series with the switch and the counter coil input of the predetermining subtractive counter;

means for electrically connecting the power supply in series with the elapsed time indicator and the output of the predetermining subtractive counter.

4,918,674

ALARM TIMEPIECE

Shigeru Shimozono, and Nobuhiro Tanaka, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Japan

Continuation of Ser. No. 196,836, May 9, 1988, abandoned, which is a continuation of Ser. No. 927,850, Nov. 6, 1986, abandoned. This application Nov. 14, 1988, Ser. No. 274,734
Claims priority, application Japan, Nov. 14, 1985, 60-255714
Int. Cl.[4] G04C *21/16*
U.S. Cl. 368—255 14 Claims

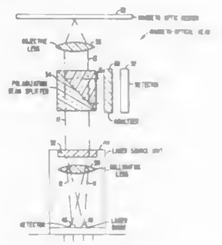
1. An alarm timepiece comprising: a frame, a cover, and a rising part of the frame which rises from a bottom of the frame to connect with the cover, a collet mounted within said frame, a printed circuit board secured to said collet, said collet and said frame forming a compartment therebetween for housing timepiece movements and electronic components, a diaphragm having a piezo-electric element attached thereto, said diaphragm mounted directly to said frame and obliquely within said compartment to lean from the bottom of the frame against the rising part of the frame to form a sound box with said frame, said diaphragm forming one wall of said compartment so that vacant space in the compartment becomes resonance space for said diaphragm, and a plurality of circuit components mounted on the printed circuit board and depending therefrom into the compartment, at least one of the circuit components being mounted in the vertical space above the obliquely extending diaphragm.

4,918,675

MAGNETO-OPTICAL HEAD WITH SEPARATE OPTICAL PATHS FOR ERROR AND DATA DETECTION

Wai-Hon Lee, Cupertino, Calif., assignor to Pencom International Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 938,085, Dec. 4, 1986, Pat. No. 4,794,585, which is a continuation-in-part of Ser. No. 860,154, May 6, 1986, Pat. No. 4,731,772. This application Jan. 20, 1988, Ser. No. 141,459
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—13 8 Claims



1. A magneto-optical head for reading information recorded on a reflective medium, comprising:

a laser source unit (44) for directing a laser beam (11) having a first polarization as it leaves said laser source unit to said medium (58);

a polarization beam-splitter (54), mounted between said laser source unit and said medium, for deflecting substantially all of a first component (15) of a reflected beam (13) of said laser beam off said medium, said first component having a second polarization orthogonal to said first polarization;

first photodetector means (62) for detecting said first component deflected off said polarization beam-splitter;

second photodetector means (48) mounted in said laser source unit; and

a first diffraction grating (52), coupled to said laser source unit, for producing a diffracted beam (19) from a non-deflected portion (17) of said reflected beam for tracking error and focus error detection within said laser source unit.

4,918,676

TRACK ACCESSING APPARATUS FOR OPTICAL DISK

Toshiyuki Miyasaka, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 29, 1988, Ser. No. 226,308
Claims priority, application Japan, Jul. 31, 1987, 62-191585
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—32 16 Claims

1. A disk apparatus for focusing a light beam onto a disk, the disk having a plurality of spiral tracks for guiding the light beam and a standard portion defining a starting end of each track, the tracks having a first track and a second track located on the inner side of the first track, said disk apparatus comprising:

means for rotating the disk;

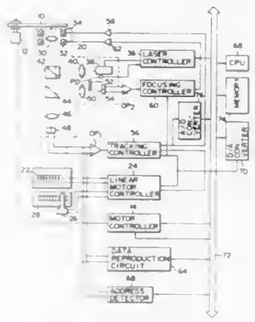
means for directing the light beam onto the disk rotated by said rotating means;

means for detecting a position where the light beam is directed by said directing means;

means for moving the light beam directed by said directing means from the first track toward the second track;

first calculating means for calculating a number of tracks between the first track and the second track;

second calculating means for calculating a number of the tracks corresponding to the pass times the standard portion of any track during the light beam moves from the



first track toward the second track in accordance with the directing position of the light beam, a rotating speed of the disk rotated by said rotating means, and the number of the tracks calculated by said first calculating means;

means for adding the number of the tracks calculated by said first calculating means and the number of the tracks calculated by said second calculating means; and

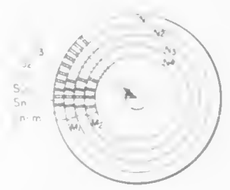
means for adjusting the light beam moved by said moving means on the second track in accordance with the number of the tracks added by said adding means.

4,918,677

INFORMATION RECORDING/REPRODUCING APPARATUS INCLUDING A PLURALITY OF RECORDING OR REPRODUCING RATES

Takaaki Ashinuma, Yokohama, and Takehiko Shibata, Kokubunji, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1986, Ser. No. 820,230
Claims priority, application Japan, Jan. 23, 1985, 60-10504; Jan. 30, 1985, 60-16000; Feb. 8, 1985, 60-23327
Int. Cl.[4] G11B *21/08, 20/12, 7/013*
U.S. Cl. 369—32 25 Claims



1 An apparatus for recording/reproducing information comprising:

recording/reproducing means for at least one of recording information on and reproducing information from a rotary recording medium rotated at a predetermined constant angular velocity, wherein the recording medium comprises a plurality of information recording tracks each comprising at least one sector, the sector comprising a

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sector identification area for identifying the sector and a data area;

generating means for generating a sync signal for recording information to the recording medium or for reading information from the recording medium; and

control means for controlling a frequency of said sync signal in response to the designation of a track address at which information should be recorded or a track address from which information should be reproduced;

wherein said control means maintains the frequency of said sync signal for data of the sector identification area constant regardless of the designated track address and forces a frequency of said sync signal for data of the data area to be changed in response to a change in the designated track address.

4,918,678

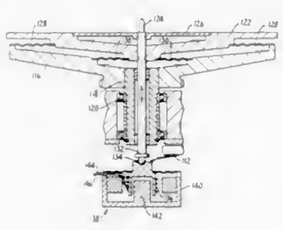
DISC REPRODUCING SYSTEM FOR COMPENSATING MECHANICAL IMPERFECTIONS

Ray M. Dolby, 50 Walnut St., San Francisco, Calif. 94118

Continuation of Ser. No. 774,018, Sep. 9, 1985, abandoned, which is a divisioo of Ser. No. 374,921, May 5, 1982, abandoned, which is a contiouation of Ser. No. 5,992, Jan. 24, 1979, abandooed, which is a continuation-in-part of Ser. No. 859,799, Dec. 12, 1977, abandoned, and Ser. No. 965,423, Dec. 1, 1978, abandoned. This application Jan. 19, 1989, Ser. No. 300,158

Int. Cl.[4] G11B *3/34*

U.S. Cl. 369—43 12 Claims



1. A phonograph disc playback apparatus comprising:

a turntable, adapted to support a disc thereon, said disc having position-modulated signal grooves thereon and spurious vertical deviations affecting the modulations of the signal grooves;

a cartridge;

said cartridge including means for reproducing the modulations of the signal grooves on the disc to provide an audio signal, wherein the effects of said vertical deviations on the modulations of the signal grooves are also reproduced by said reproducing means as noise in the audio signal;

reference path sensor means for sensing the spurious vertical deviations of the disc on the turntable, said sensor means providing a second signal to indicate the vertical deviations; and

an actuator responsive to the second signal from the sensor means for moving the portion of the disc at the cartridge with respect to the cartridge to reduce noise in the audio signal caused by the spurious vertical deviations of the disc at the cartridge.

4,918,679

OPTICAL RECORD CARRIER SCANNING APPARATUS PROVIDING OPTOELECTRONIC POSITIONING OF THE SCANNING SPOT

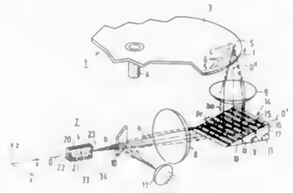
Willem G. Opheij, and Louis-Marie H. Cobben, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 28, 1988, Ser. No. 173,914

Claims priority, application Netherlands, Jan. 21, 1988, 8800133

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—44 17 Claims



1. An apparatus for scanning information recording tracks on an optical record carrier, comprising:

a radiation source for supplying a scanning beam which is tunable to different wavelengths;

an imaging optical system for forming said scanning beam into a scanning spot on a recording track to be scanned, said optical system comprising a diffraction grating positioned in the path of said scanning beam between said radiation source and said recording track for diffracting the beam so that only a selected higher diffraction order sub-beam thereof is formed into said scanning spot, the diffraction angle of said selected sub-beam being dependent on the wavelength of said scanning beam; and

tuning control means coupled to said radiation source for controlling the wavelength of said scanning beam produced thereby, thereby controlling the diffraction angle of said selected sub-beam and the position of said scanning spot in relation to said recording track.

4,918,680

FOCUS-SERVO CORRECTION UTILIZING STORAGE OF DETECTED FOCUS ERRORS

Toshiyuki Miyasaka, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 8, 1988, Ser. No. 229,878

Claims priority, application Japan, Aug. 14, 1987, 62-202856

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—45 9 Claims

1. An optical apparatus for focusing a light beam onto an object, comprising:

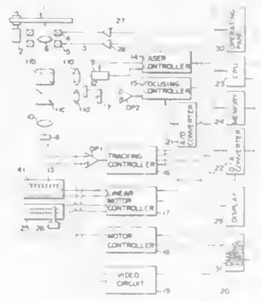
means for rotating the object;

means for directing the light beam onto a plurality of portioons of the object rotated by the rotating means;

means for detecting the light beam from the plurality of portions of the object onto which the light beam is directed by the directing means so as to generate a plurality of focus-error signals, each representing a distance of the directing means with respect to each of the plurality of portions of the object onto which the light beam is directed by the directing means;

means for storing the plurality of focus-error signals detected from the plurality of the portions of the object by the detecting means; and

means for adjusting the distance of the directing means with respect to each of the plurality of portions of the object in



accordance with the plurality of focus-error signals stored in the storing means.

4,918,682

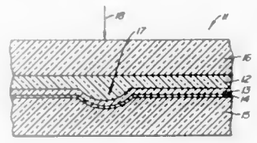
ABLATIVE AND BUMP-FORMING OPTICAL RECORDING MEDIA INCLUDING A METALLIC REFLECTIVE LAYER

Joel D. Finegan, Campbell, Calif., assignor to Tandy Corporation, Fort Worth, Tex.

Filed Feb. 5, 1988, Ser. No. 152,519

Int. Cl.[4] G11B *7/24*

U.S. Cl. 369—275 28 Claims



1. A storage medium including a reflective layer, said storage medium including at least one polymer layer being deformable by a recording laser having a point of focus directed on said polymer layer, said polymer layer reaching a temperature at said point of focus during recordation, said reflective layer comprising a reflective metallic material which softens or melts at or below said temperature of said polymer layer, wherein said reflective metallic material has a melting point less than 200° C.

4,918,681

DATA REPRODUCING APPARATUS USING IDLING CURRENT

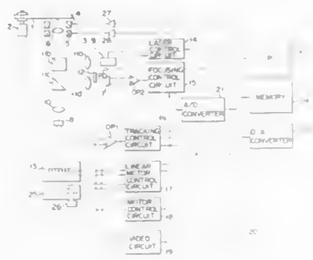
Hidetoshi Ikeda, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 24, 1987, Ser. No. 137,572

Claims priority, application Japan, Dec. 25, 1986, 51-311515

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—116 4 Claims



1. A laser current control system in an optical reproducing memory system, comprising:

an optical memory device in which data is recorded;

means for generating a light beam to effect reproducing of the data recorded in said optical memory device;

optical means for focusing the light beam onto said optical memory device while reproducing said data recorded in said optical memory device; and

means for supplying a current to said generating means, said supplying means including first means for supplying an idling current insufficient to generate a light beam, and second means for supplying an operation current sufficient to generate a light beam.

4,918,683

OPTICAL INFORMATION MEDIUM HAVING A BASE PLATE MADE OF POLYMETHYLMETHACRYLATE WHICH IS A COPOLYMER OF METHYL METHACRYLATE AND METHYL ACRYLATE

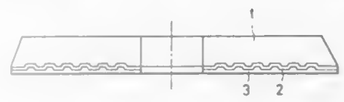
Yoshie Kodera, Yokohama; Hisashi Kabe, Kamakura; Tetsu Ohishi, Hiratsuka, and Jun Matsumoto, Odahara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 104,983, Oct. 6, 1987, abandoned. This application Apr. 6, 1988, Ser. No. 178,267

Claims priority, application Japan, Oct. 6, 1986, 61-236123

Int. Cl.[4] G11B *7/24*

U.S. Cl. 369—275 16 Claims



1. An optical information medium for reproducing recorded information optically, comprising a base plate and an information recorded layer supported on said base plate, wherein said base plate is made of polymethylmethacrylate which is a copolymer of methyl methacrylate and methyl acrylate, wherein a quantity of extracted monomer of said copolymer included in said base plate is less than 2 ppm after immersing in water at a temperature of 60° C. for seven days.

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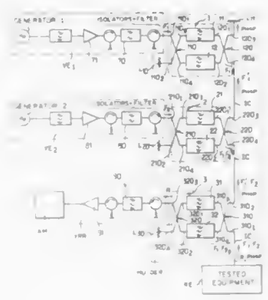
4,918,684

DEVICE FOR THE MEASUREMENT OF INTERMODULATION PRODUCTS OF A RECEIVER SYSTEM

Christian Boschet, St Orens de Gameville, and Jacques Sombrin, Toulouse, both of France, assignors to Centre National d'Etudes Spatiales, Paris, France

Filed Sep. 26, 1988, Ser. No. 249,445
Claims priority, application France, Sep. 25, 1987, 87 13317
Int. Cl.[4] H04B *7/14*
U.S. Cl. 370—17 14 Claims



1. A device for the measurement of intermodulation products of a receiver system of at least two transmitted electromagnetic signals of different frequencies said device comprising:

at least two transmission channels for said transmitted electromagnetic signals, each channel enabling the transfer of one of said signals of different frequencies;

a reflective reception channel connected to an apparatus for the measurement of intermodulation products, said reception channel enabling the transfer of electromagnetic signals in a frequency band centered on the reception frequency band of said receiver;

a reflective reception multiplexer/demultiplexer with directional filters, the inputs/outputs of which are respectively connected to said first and second transmission channels, to the reflective reception channel and to said receiver system, said multiplexer/demultiplexer comprising a directional filter associated with each channel, each of said directional filters transmitting at the frequency of the electromagnetic signals transferred by the channel with which it is associated and being reflective at the frequency of the electromagnetic signals of the other channels and of the intermodulation products located outside the reception frequency band.

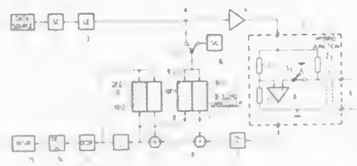
4,918,685

TRANSCEIVER ARRANGEMENT FOR FULL-DUPLEX DATA TRANSMISSION COMPRISING AN ECHO CANCELLER AND PROVISIONS FOR TESTING THE ARRANGEMENT

Simon J. M. Tol, Hilversum, and Kornelis J. Wouda, Nuenen, both of Netherlands, assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 15, 1988, Ser. No. 219,678
Claims priority, application Netherlands, Jul. 24, 1987, 8701750
Int. Cl.[4] H04B *1/58*
U.S. Cl. 370—32.1 3 Claims

1. A transceiver arrangement for full-duplex data transmission over a two-wire circuit, said arrangement comprising a transmitter part, a receiver part, a hybrid junction connecting the transmitter and receiver parts to the two-wire circuit, and an echo canceller whose input is connected to the transmitter part and whose output is connected to the receiver part, the hybrid junction comprising first switching means enabled in a test mode for disconnecting the receiver part from the two wire circuit, characterized in that the arrangement also comprises second switching means enabled in the test mode for



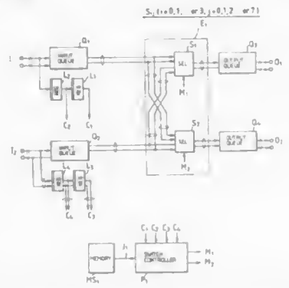
disconnecting the input of the echo canceller from the transmitter part and for connecting it to a data signal source arranged for generating a data signal that is substantially uncorrelated with the transmitter signal.

4,918,686

DATA TRANSFER NETWORK SUITABLE FOR USE IN A PARALLEL COMPUTER

Takehisa Hayashi, Tokyo; Koichiro Omada, Kanagawa; Teruo Tanaka, Tokyo; Naoki Hamanaka, Tokyo, and Shigeo Nagashima, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 27, 1988, Ser. No. 224,894
Claims priority, application Japan, Jul. 27, 1987, 62-185479
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—60 6 Claims



1. A data transfer network for transferring data between a plurality of processors, comprising:

(a) a first group of partial network means each for transferring data among processors belonging to a corresponding one of first processor groups, within the plurality of processors, each of the plurality of processors being assigned with an address switch comprises first and second address portions, each of the first processor group comprising processors whose addresses differ in first address portion and are same in second address portion, each partial network means having:

first input terminals each for receiving data from a corresponding processor belonging to one group within the first processor groups, corresponding to the partial network means;

first output terminals each for providing data to a corresponding processor belonging to the corresponding one group, within the first processor groups; and

first transfer means for concurrently transferring different data received at ones of the first input terminals to ones of the first output terminals;

said first transfer means comprising first plural switch means connected in multistages, each of said first plural switch means transferring data received at ones of first input terminals provided in the first switch means to ones of first output terminals provided in the first switch means, the first input terminals of part of the first plural switch means being used as the first input terminals of the partial network means;

(b) a second group of partial network means each for transferring data among processors belonging to a corresponding one of second processor groups, within the plurality of processors, each group of the second processor groups comprising processors whose addresses differ in second address portions and are same in first address portions and each partial network means having:

second input terminals each for receiving data from a corresponding processor belonging to one group within the second processor groups, corresponding to the partial network means;

second output terminals each for providing data to a corresponding processor belonging to the corresponding one group, within the second processor groups; and

second transfer means for concurrently transferring different data received at ones of the second input terminals to ones of the second output terminals;

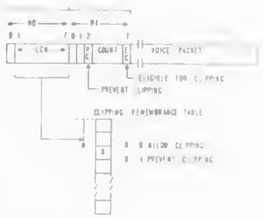
said second transfer means comprising second plural switch means connected in multi-stages, each of said second plural switch means transferring data received at ones of second input terminals provided in the second switch means to ones of second output terminals provided in the second switch means, the second input terminals of part of the second plural switch means being used as the second input terminals of the partial network means.

4,918,687

DIGITAL PACKET SWITCHING NETWORKS

Lionel Bustini, Nice; Andre Cretegny, Le Pecq; Gerard Marmigere, Drap; Guy Platel, Villeneuve Loubet, and Pierre Secondo, Saint Jeannet, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 20, 1988, Ser. No. 247,025
Claims priority, application European Pat. Off., Sep. 23, 1987, 87480011.3
Int. Cl.[4] H04J *3/26*
U.S. Cl. 370—60.1 12 Claims



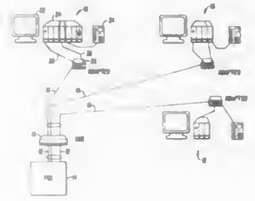
1. A process for improving the traffic between real time terminals through a digital packet switching network including nodes wherein incoming packets are enqueued prior to being forwarded toward their destination, with clipping operations being performed within said nodes by selectively discarding enqueued packets, said process being characterized in that said packets include a so-called EC field set to a value that alternates between consecutive communicated packets to ensure that said consecutive communicated packets are not eligible for clipping within the network.

4,918,688

METHOD AND APPARATUS FOR COUPLING COMPUTER WORK STATIONS

Jeffrey J. Krause, Los Altos; George W. Harris, Jr., Mountain View; Richard A. Lagueux, Jr., San Jose; Luca Kafiero, Palo Alto; Maurillo T. DeNicolo, Mountain View, and Mario Mazzolo, Campbell, all of Calif., assignors to Convergent Technologies, Inc., San Jose and David Systems, Inc., Sunnyvale, both of, Calif.

Filed Oct. 31, 1986, Ser. No. 925,444
Int. Cl.[4] H04J *1/14*
U.S. Cl. 370—76 23 Claims



1. An apparatus for coupling a plurality of cluster work stations to a master work station over two-wire telephone lines at a central hub, each of said two-wire telephone lines having a first end connected to one of said cluster and master work stations and a second end connected to said hub, comprising:

means in said hub for determining which of said two-wire telephone lines is coupled to said master work station, wherein said first end of any of said two-wire telephone lines could be coupled to said master work station and said master and cluster work stations can be reconfigured to couple said master work station to said first end of a different one of said two-wire telephone lines;

means in said hub for providing transmissions received from said second end of said two-wire telephone line connected to said master work station to said second end of said two-wire telephone lines connected to all of said cluster work stations; and

means in said hub for providing transmissions received from said second end of said two-wire telephone lines connected to said cluster work stations only to said second end of said two-wire telephone line connected to said master work station.

4,918,689

ASYNCHRONOUS COMMUNICATION SYSTEM

Yu N. Hui, North Plainfield, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Continuation of Ser. No. 786,219, Oct. 10, 1985, abandoned. This application Oct. 13, 1988, Ser. No. 257,428
Int. Cl.[4] H04J *3/02*
U.S. Cl. 370—85.9 16 Claims

1. A method for communicating information between a transmitter and a receiver as an information frame transmitted in a time interval corresponding to a given rate comprising the steps of

interconnecting said transmitter and said receiver with a plurality of parallel communication paths, and

transceiving on said paths an electrical pattern in said frame wherein said pattern is composed of a plurality of signals

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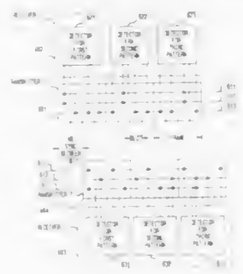
distributed over said paths and distributed in time at sub-intervals of said interval and wherein each arrangement of



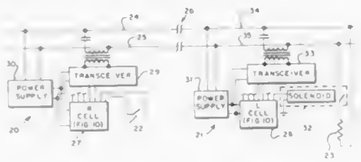
said signals in said frame corresponds to a unique code word identifying said information.

4,918,690

NETWORK AND INTELLIGENT CELL FOR PROVIDING SENSING, BIDIRECTIONAL COMMUNICATIONS AND CONTROL

Armas C. Markkula, Jr., Woodside; Wendell B. Sander, Los Gatos; Shabtai Evan, Saratoga; Stephen B. Smith, Scotts Valley, and William B. Twitty, Santa Cruz, all of Calif., assignors to Echelon Systems Corp., Los Gatos, Calif.

Filed Nov. 10, 1987, Ser. No. 119,330
Int. Cl.[4] H04J *3/26*
U.S. Cl. 370—94 24 Claims



1. A network for sensing, communicating and controlling comprising:

a plurality of programmable cells, each of which includes a permanent, unique cell identification number;

said cells performing the functions of sensing, communications and controlling with each of said cells being assigned to perform at least one of said functions of sensing, communicating or controlling in said network;

groups of said cells being programmed to perform group functions each being a common task carried out by said cells in said group within said network each of said cells in a given group being assigned a group identification number, the information needed to carry out said group function being programmed into and distributed among said cells in said group;

said cells communicating with one another over at least one medium using said cell identification numbers and group identification numbers;

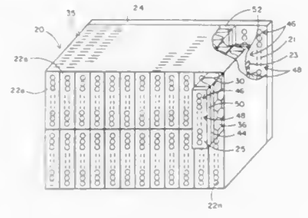
whereby a network for sensing, communicating and controlling is realized.

4,918,691

TESTING OF INTEGRATED CIRCUIT MODULES

Louis E. Chall, Jr., Costa Mesa, Calif., assignor to Ford Aerospace Corporation, Newport Beach, Calif.

Filed May 30, 1989, Ser. No. 358,291
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—15.1 2 Claims



1. A method of testing a high-performance leadless interconnection system for integrated circuits comprising several modules each comprising:

a substrate for supporting chip carriers; and

a plurality of chip carriers mounted on said substrate adjacent to each other, each of said carriers including:

a carrier body having a geometric shape such that said carriers are disposed on said substrate to form a mosaic;

connection pads so arranged on the periphery of said geometric shape of each said body that when said carriers are disposed in said mosaic, each connection pad is immediately adjacent to a corresponding connection pad of another carrier of the mosaic; and

an integrated circuit chip mounted on each said carrier body; wherein:

said chips, carrier and mosaic are so configured as to allow each said chip to selectively transmit and receive data to and from a chip on any adjacent carrier in said mosaic through said connection pads; and

immediately adjacent ones of said connection pads are electrically connected to each other without the use of intervening wires or leads formed on said carrier;

said method comprising the steps of:

(a) configuring the chips of one of said modules (hereinafter referred to as the testing module) to produce and receive test data;

(b) connecting said testing module to other of said modules seriatim; and

(c) examining data received from said other modules by said testing module to diagnose the operation of said other modules.

4,918,692

AUTOMATED ERROR DETECTION FOR MULTIPLE BLOCK MEMORY ARRAY CHIP AND CORRECTION THEREOF

Hideto Hidaka; Kazuyasu Fujishima, and Yoshio Matsuda, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1988, Ser. No. 201,413
Claims priority, application Japan, Jun. 3, 1987, 62-139174
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—2.2 9 Claims

1. A semiconductor memory device having integral error check and correction circuitry, comprising:

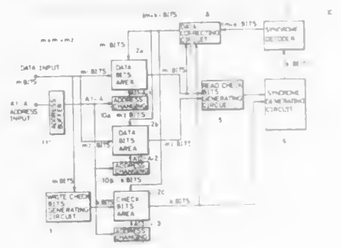
a semiconductor chip,

a plurality of memory cell array blocks each comprising a plurality of memory cells formed on said chip;

a plurality of selecting means formed on said chip and corresponding with said plurality of memory cell array blocks for selecting any of said plurality of memory cells in said

corresponding memory array block in response to an externally applied address signal, said memory cell array blocks being arranged together to store data words, each data word comprising at least two of said memory cell array blocks;

error check and correction means formed on said chip for checking and correcting errors included in information stored in a code word, said code word representing a plurality of said memory cell array blocks and including a data word region and a check bit region together comprising a plurality of memory cells which are simultaneously selected by said plurality of selecting means, the number



of said errors correctable by said error check and correction means within a code word being less than a prescribed number; and

a plurality of address signal changing means formed on said chip and corresponding with each of said plurality of memory cell array blocks,

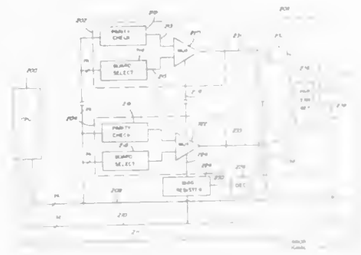
each of said address signal changing means including link means and being capable of being previously set by cutting any of said link means to change said externally applied address signal corresponding to an individual memory array block so that the number of errors within a code word becomes less than said prescribed number.

4,918,693

APPARATUS FOR PHYSICALLY LOCATING FAULTY ELECTRICAL COMPONENTS

Joseph L. Ardini, Jr., Needham, and Robert J. Allison, Jr., Medfield, both of Mass., assignors to Prime Computer, Inc., Natick, Mass.

Filed Jan. 28, 1988, Ser. No. 149,595
Int. Cl.[4] G05F *11/22*
U.S. Cl. 371—21.6 14 Claims



1. Apparatus for determining the physical location of a faulty computer component, for use with a computer system having separate data, address, and control signal buses and further having addressable components mounted on a plurality of physically separate mounting boards, said apparatus comprising,

means for generating an error signal when an error is detected at a specific address,

means responsive to the generation of said error signal for storing the address corresponding to the location causing said error signal in first storage means,

means for placing said address corresponding to the location of said error on the address bus,

means associated with each mounting board for generating a board select signal when an address which is physically located on that board is placed on the address bus,

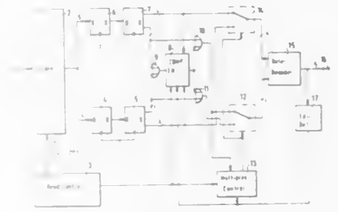
means responsive to the generation of said error signal and said board select signal for storing a signal in a second storage means for indicating the faulty mounting board.

4,918,694

METHOD AND APPARATUS FOR CORRECTION OF ERRORS IN DIGITAL AUDIO DATA

Hannfried Preissler, Darmstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 2, 1988, Ser. No. 202,192
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1987, 3719406
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—37.4 9 Claims



1 Method of correcting digital audio data read out from a magnetic tape, wherein code blocks are formed each from a plurality of data words together with a first check word and wherein a defined multiplicity of said code blocks form a data field composed of several rows of an equal number of data word blocks followed by an interface control word, for which field each defined column has a plurality of second check words arrayed in respective check word rows, and wherein said audio data is present in a first and a second recording and wherein, further, the following combination of method steps is performed.

error recognitions and, so far as possible, error corrections are performed by reference to said first check words;

thereafter data words are selected between corresponding data words of said first and second recording to maximize the number of error free data words; and

by reference to said second check words error corrections are thereafter made.

4,918,695

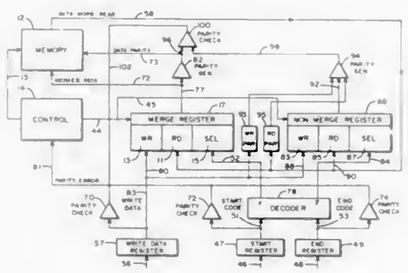
FAILURE DETECTION FOR PARTIAL WRITE OPERATIONS FOR MEMORIES

James H. Scheuneman, St. Paul; Michael E. Mayer, Fridley, and Paul L. Peirson, Forest Lake, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Aug. 30, 1988, Ser. No. 238,083
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—51.1 16 Claims

1. In a memory system capable of partial write operation comprising error detection means and partial write means for merging error-corrected read data and write data under the control of a start code and an end code, which respectively define the starting bit of said read data and the end bit of said read data which is to be overwritten with said write data, the

improvement comprising decode means which receives and decodes said start code and said end code for producing a selection code and the bit-by-bit complement of such selection code, merge means coupled to said decode means which utilizes said read data, said write data, and said selection code,



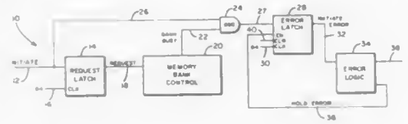
non-merge means coupled to said decode means which utilizes said read data, said write data and said bit-by-bit complement of said selection code, and parity generating and checking means coupled to both said merge means and said non-merge means for checking partial write operations.

4,918,696

BANK INITIATE ERROR DETECTION

David M. Purdham, Brooklyn Park, and James H. Scheuneman, St. Paul, both of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Sep. 19, 1988, Ser. No. 245,600
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—57.1 2 Claims



1. A bank initiate error detection system for a multibank computer memory system wherein each of said banks of said multibank system comprises,

control means responsive to initiate signals for said associated bank for providing a bank busy control signal for said associated bank following an initiate signal to said control means which has initiated a memory operation in said bank, wherein said bank busy signal persists until said memory operation is completed,

error initiate means responsive to said associated initiate signals and to said associated bank busy signals for generating initiate error signals when both signals are present, and

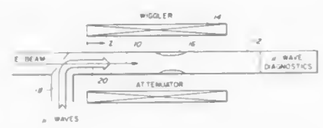
error means responsive to said associated initiate error signals for indicating when an initiate error occurs due to a second initiate signal being received by said associated bank before the operation associated with a first initiate signal for said associated bank has been completed.

4,918,698

METHOD OF SUPPRESSING FEEDBACK OSCILLATIONS IN FREE ELECTRON LASERS

Joel Fajans, Berkeley, Calif., and Jonathan Wurtele, Brookline, Mass., assignors to Regents of the University of California, Berkeley, Calif.

Filed Feb. 24, 1989, Ser. No. 315,500
Int. Cl.[4] H01S *3/00*
U.S. Cl. 372—2 5 Claims



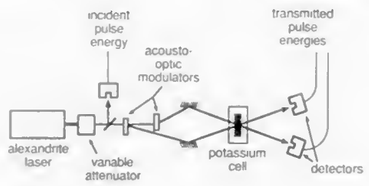
1. In a method of suppressing feedback oscillations in a free electron laser having an elongated waveguide, means for providing an electron beam propagating through said waveguide, means for superimposing microwave energy onto said electron beam, and means for providing a wiggler field to provide an interaction region inside said waveguide, the improvement wherein said method comprises placing an attenuator in said interaction region inside said waveguide.

4,918,699

SYSTEM FOR COMBINING LASER BEAM BY TRANSFER OF ENERGY THEREBETWEEN IN ATOMIC VAPOR

Robert W. Boyd, 149 Irving Rd., Rochester, N.Y. 14618; Alexander L. Gaeta, 13 Lilac Dr., Apt. #12, Rochester, N.Y. 14620; Mark T. Gruneisen, 5330 San Mateo Blvd., N.E., #F85, Albuquerque, N. Mex. 87109, and Kenneth R. MacDonald, 7 Puntilla Dr., Tijeras, N. Mex. 87059

Filed May 30, 1989, Ser. No. 358,120
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—21 15 Claims



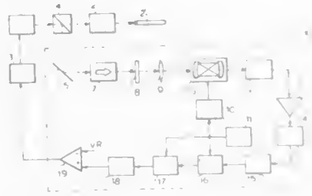
9. A system for combining coherent optical energy which comprises an atomic medium having at least two states one of which is a populated state, means for providing a plurality of beams of said energy each having a frequency corresponding to approximately the energy of the transition between said states and which differ in frequency by the inverse of the lifetime of said excited state, means for transmitting said beams through said medium in sufficient proximity so that nonlinear interaction occurs therebetween, and means for deriving one of said beams from said medium to which energy of said other beam is transferred.

4,918,700

METHOD AND DEVICE FOR AUTOMATIC FREQUENCY CONTROL OF SEMICONDUCTOR LASERS

Piero Gambini, Turin, Italy, assignor to Cselt - Centro Studi e Laboratori Telecomunicazioni S.P.A., Turin, Italy

Filed Mar. 24, 1989, Ser. No. 328,439
Claims priority, application Italy, Mar. 31, 1988, 67288 A/88
Int. Cl.[4] H01S *3/13, 3/00*
U.S. Cl. 372—32 6 Claims



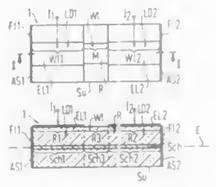
1. A method for the automatic frequency control of a semiconductor laser, wherein a spectral analysis of the light signals emitted by the laser is effected, the signals representative of the spectrum are converted into electrical signals, the derivative of such electrical signals is determined, and an error signal is obtained from the derivative and is sent to means driving the laser, said method comprising the steps of controlling said spectral analysis by a ramp voltage signal; detecting the derivative zero crossing in a ramp period, the zero crossing identifying the actual emission frequency of the laser; and sampling the ramp signal in correspondence with the zero crossing of the derivative, and adding the sample obtained algebraically to a reference signal dependent on the nominal emission frequency of the laser, the signal resulting from the algebraic sum forming said error signal.

4,918,701

SEMICONDUCTOR LASER ARRANGEMENT AND METHOD FOR THE OPERATION THEREOF

Markus-Christian Amann, Munich, and Bernhard Stegmueller, Augsburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 7, 1989, Ser. No. 389,995
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1988, 3832760
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—50 6 Claims



1. A semiconductor laser arrangement, comprising:

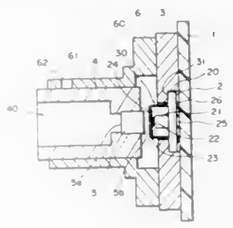
first and second semiconductor laser connected to one another, said first semiconductor laser predominantly generates or amplifies waves of a first defined polarization state, said second semiconductor laser predominantly generates or amplifies waves of a second defined polarization state, said first and second semiconductor laser being quasi-index-guided laser diodes each having an active layer in planes parallel to one another.

4,918,702

LASER UNIT

Akiyoshi Kimura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1988, Ser. No. 277,545
Claims priority, application Japan, Dec. 2, 1987, 62-304919; Dec. 2, 1987, 62-304920; Dec. 26, 1987, 62-331554; Dec. 26, 1987, 62-331555; Dec. 26, 1987, 62-331556; Dec. 26, 1987, 62-331557; Dec. 26, 1987, 62-331558; Jan. 20, 1988, 63-8498; Aug. 25, 1988, 63-209430
Int. Cl.[4] H01S *3/04*
U.S. Cl. 372—34 41 Claims



1. A laser unit, comprising:

a first unit having a laser source for emitting laser beam, said first unit being made of a high thermal conductivity material to absorb heat from said laser source; and

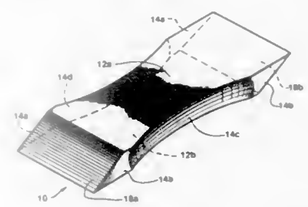
a second unit having a collimator lens for collimating the laser beam emitted from said laser source, said second unit having a low thermal conductivity material for thermally insulating the collimator lens from said first unit.

4,918,703

SLAB GEOMETRY LASER MATERIAL WITH CONCAVE EDGES

Mark J. Kukla, Ballston Spa, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 21, 1989, Ser. No. 341,394
Int. Cl.[4] H01S *3/06*
U.S. Cl. 372—66 20 Claims



1 An article for receiving a signal from an external pumping means, said article comprising:

a substantially rectangular longitudinal slab of laser material having a pair of opposing edge faces and a pair of opposing pump faces, said pump faces being substabtially planar and at least one of said pump faces being designated for receiving the signal from the pumping means; and

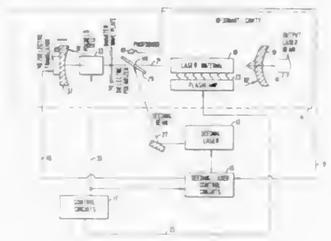
means for reducing parasitic oscillations including each of said edge faces having a concave portion.

4,918,704

Q-SWITCHED SOLID STATE PULSED LASER WITH INJECTION SEEDING AND A GAUSSIAN OUTPUT COUPLING MIRROR

Andrea L. Caprara, and Jean-Marc Heritier, both of San Jose, Calif., assignors to Quantel International, Inc., Santa Clara, Calif.

Filed Jan. 10, 1989, Ser. No. 295,649
Int. Cl.[4] H01S *3/08*
U.S. Cl. 372—99 10 Claims



1. In a pulsed laser system having a quantity of solid state light amplifying material positioned within a resonant cavity on an optical axis thereof between first and second mirrors in a manner that laser light oscillates between said mirrors through the light amplifying material, a laser output beam being directed through said second mirror and out of said resonant cavity, an optical arrangement comprising:

means including a flashlamp directing a pulse of optical energy to said light amplifying material for exciting said light amplifying material to emit light,

Q-switch means positioned along said optical axis between said light amplifying material and one of said first and second mirrors for controllably attenuating said emitted light passing therethrough,

means illuminating said light amplifying material with a coherent beam of light from a source external to said resonant cavity for limiting operation of the laser system to a single longitudinal mode of said laser light,

said second mirror having a partial reflectivity that varies as a substantially continuous smoothly varying function of radial position across a surface of said mirror, a maximum partial reflectivity occurring substantially coincident with said optical axis at a center of the varying partial reflectivity function, thereby providing partial transmission of laser light therethrough out of said resonant cavity as the pulsed laser output beam, and

the relative curvature of said first and second mirrors and the optical characteristics of other elements in the resonant cavity being chosen to cause a diameter of the laser light returning to the second mirror to be greater than the diameter of the light reflected from the second mirror by a magnification ratio that is in excess of substantially 1.3.

4,918,705

FURNACE ENCLOSURE HAVING A CLEAR VIEWPATH

Neil A. Johnson, Schenectady; Russell S. Miller, Ballston Spa, both of N.Y., and Gordon B. Hunter, Loveland, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 6, 1989, Ser. No. 376,094
Int. Cl.[4] H05B *7/00*
U.S. Cl. 373—10 12 Claims

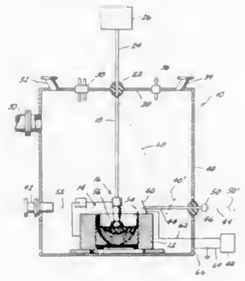
1. A method for providing a clear optical path to the interior of a furnace in which high intensity surface heating of metal is in progress which comprises,

providing a furnace enclosure,

providing a viewport through a wall of said enclosure,

providing an articulatable metal mirror surface in said enclosure optically aligned with said viewport of a charge the same as that of said particles,

determining the charge on particles from high intensity surface heating of metal in said furnace,



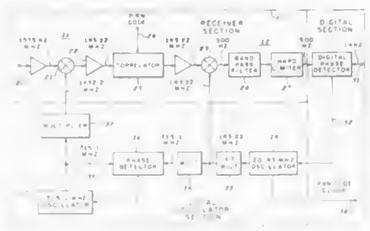
providing a high voltage electric source, and applying said high voltage to said metal mirror whereby particulate matter in said furnace is repelled from said metal mirror surface.

4,918,706

SPREAD SPECTRUM LONG LOOP RECEIVER

Fred W. Phillips, Afton; Kelly L. Mahoney, Louisa, and Edmund S. Zavada, Charlottesville, all of Va., assignors to Sperry Marine Inc., Charlottesville, Va.

Filed Dec. 28, 1988, Ser. No. 290,967
Int. Cl.[4] H04K *1/04*
U.S. Cl. 375—1 10 Claims



1. Spread spectrum receiver apparatus having an input for receiving a carrier signal phase modulated with a predetermined code, comprising

correlator means responsive to said received signal and to a local code identical to said predetermined code to provide a correlator signal,

local oscillator means for providing a local oscillator signal,

said local oscillator signal tending to leak into said input resulting in a leakage signal in said receiver apparatus,

said correlator means being responsive to said leakage signal to spread the spectrum thereof into a plurality of spectral lines,

mixer means responsive to said correlator signal and said local oscillator signal for providing a last IF signal,

said local oscillator means being constructed and arranged so that said local oscillator signal results in said last IF signal having a frequency that lies between two consecutive of said spectral lines, and

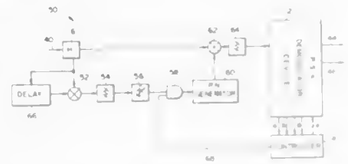
filter means responsive to said last IF signal for filtering out said spectral lines from said last IF signal.

4,918,707

SPREAD SPECTRUM DEMODULATING DEVICE FOR SPREAD SPECTRUM COMMUNICATION SYSTEM

Masashi Yoshihara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 8, 1988, Ser. No. 281,413
Claims priority, application Japan, Dec. 9, 1987, 62-311423
Int. Cl.[4] H04K *1/00*
U.S. Cl. 375—1 3 Claims



1. A spread spectrum demodulating device for a spread spectrum communication system, comprising:

splitter means for splitting into two a spread spectrum signal produced by spreading a PSK (Phase Shift Keying) modulated data signal by a PN (Pseudo Noise) signal;

delay means for delaying one of two outputs of said splitter means by half a bit;

first mixer means supplied at one input terminal with the one output of said splitter means and at the other input terminal with an output of said delay means for recovering a spread clock out of the spread spectrum signal;

first band-pass filter means for filtering an output of said first mixer means to separate the recovered spread clock;

phase shifter means for adjusting the separated recovered clock with respect to phase;

AND gate means for gating an output of said phase shifter means in response to a sweep control signal which is entered from outside;

PN generator means for generating the PN signal in response to the recovered spread clock which is fed from said AND gate means;

second mixer means for inversely spreading the other output of said splitter means by an output of said PN generator means; and

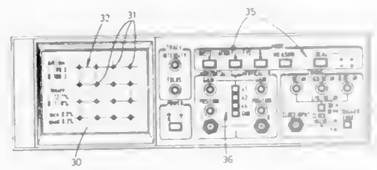
second band-pass filter means for removing unnecessary waves from an output of said second mixer means.

4,918,708

ANALYSIS OF DIGITAL RADIO TRANSMISSIONS

John R. Pottinger, Dunfermline, and Murdo J. McKissock, South Queensferry, both of Scotland, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 17, 1987, Ser. No. 27,296
Claims priority, application United Kingdom, Mar. 17, 1986, 8606572
Int. Cl.[4] H04B *17/00*
U.S. Cl. 375—10 4 Claims



1. An apparatus for analyzing digital radio transmissions comprising:

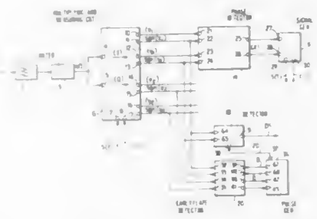
sampling means for sampling received radio signals to produce for each sampling instant a signal or signals as samples which are representative of the modulation state of the transmission at the sampling instant, and processing means which is configured to receive and measure a given number of said signals, wherein said processing means is configured to process said signals in accordance with one or more stored routines to generate one or more parameters which are indicative of the condition of the transmission, wherein said samples are represented by digitally encoded numbers and said processing means is arranged to allocate said numbers to one of a plurality of groups, the number of groups corresponding to the number of modulation states of the transmission, and wherein said processing means is further configured to carry out a plurality of processing stages, a first processing stage comprising the evaluation of a set of statistics which comprise data representative of the position of each sample in a co-ordinate system, and a second stage of which comprises forming, using a least mean square error technique, a model cluster array which is a closest fit to the array represented by said statistics, said modelling stage producing a set of coefficients from which is calculated parameters representing distortions of a constellation, and wherein said processing means is further configured to evaluate a radial residual non-linearity parameter and an angular residual non-linearity parameter, said parameters being evaluated by removing linear effects using a least mean squares error technique.

4,918,709

DATA DEMODULATOR BAUD CLOCK PHASE LOCKING

Alan P. Fitch, Wallington, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 5, 1988, Ser. No. 280,613
Claims priority, application United Kingdom, Dec. 11, 1987, 8729018
Int. Cl.[4] H03D *3/20*
U.S. Cl. 375—82 17 Claims



1. A method of phase-locking a locally generated baud rate clock signal in a coherent data demodulator to the baud rate of a received shift keyed signal which is phase-modulated to represent digital data,

separately multiplying together a received shift keyed signal of a given carrier frequency and each of two quadrature phase versions of a locally generated carrier signal of said given frequency to produce two bi-level channel signals,

determining with respect to each channel signal, in each period thereof occurring in each successive half cycle of one of the two channel signals, a respective first sign signal representing which is the predominant level of this channel signal in each half-cycle period for said one channel signals;

determining with respect to each channel signal, in each period thereof occurring in each successive half cycle of the other of the two channel signals, a respective second sign signal representing which is the predominant level of

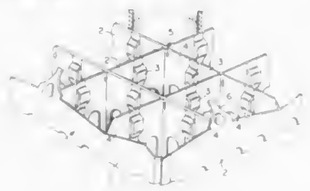
this other channel signal in each half-cycle period for said other channel signals periods;
producing a narrow pulse in respect of each of the four signals thus produced;
combining all the narrow pulses into a single continuous pulse sequence;
detecting in each period of the baud rate clock which narrow pulses in the sequence are early and which are late relative to an edge of the baud rate clock pulse; and
advancing or retarding the phase of the baud rate clock in accordance with this detection to adjust the baud rate clock phase into a desired phase relationship with the baud rate transitions in the received shift keyed signal.

4,918,710

FABRICATION PROCEDURE FOR A CROSS-BRACING GRID FOR A FUEL ASSEMBLY OF A NUCLEAR REACTION

Josette Bard, Miribel, France, assignor to Framatome, Courbevoie and Cogema, Velizy Villacoublay, both of, France

Filed Aug. 24, 1988, Ser. No. 235,593
Claims priority, application France, Aug. 24, 1987, 87 11861
Int. Cl.[4] C22F *1/18*
U.S. Cl. 376—438 **8 Claims**



1. A process for manufacturing a cross-bracing grid for a fuel assembly of a pressurized water nuclear reactor, said process comprising the steps of
(a) heating a flat product made of a zirconium base alloy which contains 2 to 3% of niobium and which is tin-free at a temperature at which the zirconium alloy is in the $\alpha+\beta$ form;
(b) cooling the flat product at a regulated and moderate rate from the temperature at which the zirconium alloy is in the $\alpha+\beta$ form;
(c) cutting and cold-forming the cooled flat product to form plates of the cross-bracing grid;
(d) assembling the plates to form a lattice of the grid; and
(e) subjecting the grid, as a whole, to aging in the α phase at a temperature between 500° and 550° C. for a period of ten to thirty hours.

4,918,711

METHOD FOR IMPROVE X-RAY DIFFRACTION DETERMINATIONS OF RESIDUAL STRESS IN NICKEL-BASE ALLOYS

Robert M. Berman, and Isadore Cohen, both of Pittsburgh, Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 26, 1988, Ser. No. 186,422
Int. Cl.[4] G01N *23/20*
U.S. Cl. 378—72 **7 Claims**

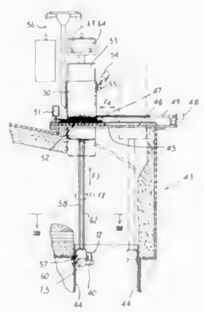
3. A method for measuring residual stress in nickel-base alloys comprising:
providing a nickel-base alloy for measurements;
covering part of a predetermined area of the surface of said nickel-base alloy with a standard material, wherein the standard material consists of tungsten powder dispersed in a dispersing medium;
exposing covered and uncovered surfaces of said alloy to x-ray diffraction determinations of said surfaces; and
measuring the residual stress in said alloy based on said determinations.

4,918,712

DEVICE FOR DETERMINING THE MASS PER UNIT VOLUME OF AN ELEMENTARY VOLUME OF MATERIAL

Christian Le Floc'h, Blanquefort; Bernard Mazeron, St-Aubin De Medoc; Daniel Babot, and Gilles Peix, both of Villeurbranne, all of France, assignors to Societe Nationale Industrielle et, Paris, France

Filed Mar. 24, 1989, Ser. No. 328,328
Claims priority, application France, Apr. 6, 1988, 88 04545
Int. Cl.[4] G01B *15/02*
U.S. Cl. 378—89 **8 Claims**



1. Device for delivering an indication about the mass per unit volume of the contents of an elementary volume comprising:
a movable common support (**12, 57**);
a directional X or gamma radiation source (**1**) rotatively mounted on said common support about a first axis (**13**);
a directional photoelectronic photon detector (**5**) rotatively mounted on said common support about a second axis (**14**);
said first and second axes being orthogonal to the plane defined by the axis (**4**) of the radiation beam (**2**) emitted by said source (**1**) and by the axis (**7**) of the reception channel (**10**) of said detector (**5**);
means (**63, 64**) for rotating said source (**1**) and said detector (**5**) about said first and second axes, respectively; and
means (**46, 47, 48, 49**) for moving said common support in a direction orthogonal to said first and second axes.

4,918,713

SYSTEM AND METHOD FOR CORRECTING FOR SCATTERED X-RAYS

Michitaka Honda, Nishinasuno, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Feb. 18, 1987, Ser. No. 16,129
Claims priority, application Japan, Feb. 18, 1986, 61-33553
Int. Cl.[4] G21K *1/00*; H05G *1/64*
U.S. Cl. 378—99 **20 Claims**

10. A system for correcting for scatter radiation S(x,y) in a total radiation distribution T(x,y) of an object under given irradiation conditions to provide a primary radiation distribution P(x,y) of said object under said irradiation conditions, comprising:
first means for storing a function T(x,y) which represents a total distribution of detected radiation passed through the object under said given irradiation conditions;
second means for storing a function PSF(x,y) which represents a normalized distribution of detected radiation passed through a mask and a radiation scattering medium under said given irradiation conditions;

image minifying means for converting a pixel content size of said function T(x,y) into a smaller pixel content;
means for determining P(x,y) ** PSF(x,y) as a function of T(x,y) and PSF(x,y) and for determining S(x,y) as a function of P(x,y) ** PSF(x,y), wherein S(x,y) represents a distribution of radiation scattered by said object;

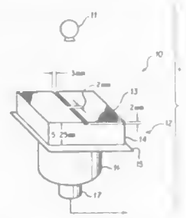


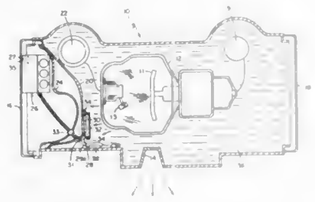
image magnifying means for converting a pixel content size of S(x,y) into the same pixel content size as said function T(x,y); and
means for subtracting S(x,y) from said image magnifying means from said function T(x,y) to obtain a function P(x,y), which represents a scatter-free distribution of radiation passed through said object under said given irradiation conditions.

4,918,714

X-RAY TUBE EXPOSURE MONITOR

Joseph R. Adamski, Sudbury, Mass.; Richard L. Barrett, Norwalk, Conn., and Ted Bakowski, Lewisboro, N.Y., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Aug. 19, 1988, Ser. No. 234,365
Int. Cl.[4] G01R *31/24*
U.S. Cl. 378—121 **32 Claims**



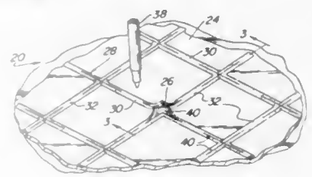
1. An apparatus for monitoring X-ray energy comprising:
an X-ray tube housing having a bulkhead and containing a fluid;
an X-ray tube disposed within said housing and being immersed in said fluid;
means substantially mounted within said housing for sensing the presence of X-ray radiation from said X-ray tube;
means electrically coupled to said sensing means through said bulkhead and disposed within said housing for recording the presence of X-ray radiation in response to said sensing means detecting the presence of X-ray radiation; and
means disposed within said X-ray tube for storing said recording in a data storage element wherein the results of said recording can be accessed upon servicing of said X-ray tube.

4,918,715

IMAGE LOCATION MARKING DEVICES FOR RADIOGRAPHS, METHOD OF MAKING AND METHODS OF USE

Steven B. Krupnick, Philadelphia, and Thomas J. McLaughlin, Swarthmore, both of Pa., assignors to Webb Research II Corporation, Philadelphia, Pa.

Filed May 1, 1989, Ser. No. 345,920
Int. Cl.[4] H05G *1/28*
U.S. Cl. 378—164 **37 Claims**



35. A method of locating a desired part of a being from a radiographic image of a portion of the body of a being containing said desired part comprising applying a marking device over a selected portion of the body said being, said device comprising a flexible substrate in the form of a sheet of material which is sufficiently translucent or transparent to enable the portion of the body of said being disposed under said device to be visible therethrough and having indicia producing means located thereon, said indicia producing means producing said desired indicia when said film is exposed to radiation and developed to produce said radiographic image, said indicia producing means comprising carrier means having very fine particles of a radio-opaque material disposed therein, said carrier means with said particles therein being applied on said substrate in a first group of plural rows of lines, with the spacing between said lines of said first group being preselected, said method additionally comprising disposing a radiosensitive film with respect to said portion of the being's body so that said portion of the being's body is interposed between said marking device and said film, exposing said film to radiation through the device and the portion of the patient's body, and thereafter developing the film so that a plurality of lines are produced over the radiographic image of the portion of the being's body to facilitate the location of said desired part.

4,918,716

X-RAY EXAMINATION INSTALLATION HAVING TWO IMAGE PICK-UP UNITS

Alfred Hahn, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 7, 1989, Ser. No. 307,464
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1988, 8803431
Int. Cl.[4] H05G *1/02*
U.S. Cl. 378—197 **6 Claims**

1. An x-ray examination installation comprising:
a first image pickup unit including a first carrier with opposite ends, and a first x-ray source and a first x-ray image receiver respectively mounted individually adjustable at said opposite ends of said first carrier;
a second image pickup unit including a second carrier having opposite free ends and a second x-ray source and a second x-ray image receiver mounted individually adjustable at said opposite ends of said second carrier;
a floor-mounted pedestal having a horizontal axis extending therethrough;
means for directly mounting said first image pickup unit to said pedestal for rotation around said horizontal axis; and

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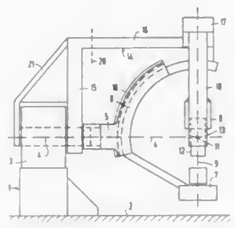
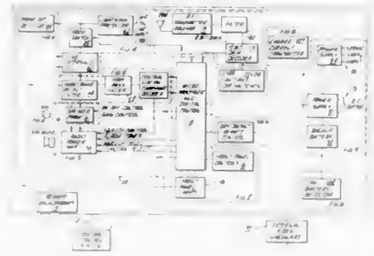
means for intermediately mounting said second image pickup unit to said pedestal for rotation around said horizontal axis so that said first and second image pickup units are individually adjustable in two respective planes.



4,918,717
ALARM SYSTEM HAVING BIDIRECTIONAL COMMUNICATION WITH SECURED AREA

W. Michael Bissonnette, Sepulveda, and Milton E. Hamilton, Glendora, both of Calif., assignors to Knight Protective Industries, North Hollywood, Calif.

Filed Aug. 23, 1988, Ser. No. 234,445
Int. Cl.[4] H04M *11/04*
U.S. Cl. 379—40 40 Claims

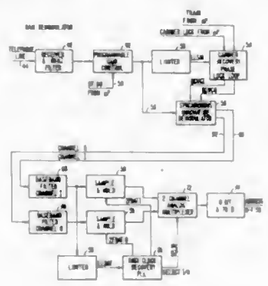


16. A security system comprising a master alarm unit for location in a secured area, the unit including means for telephone connection with a central control station, multiple remote detectors for location in different zones in the secured area, at least some remote detector units including a microphone for listening in to the zone where located, means for operationally connecting the detector units with the master unit to transmit a function signal from the master unit due to activation of at least one remote detector to the central control station, the master unit including a switch for selectively signalling the central control station as a function signal a need for the emergency services of at least one of the police, medical or fire departments, and additional switches for signalling as a function signal a silent duress and a test signal, at least some of the switches being operable by a user selectively from or remotely of the secured area, and wherein the central control station receives a function signal from the master unit and is enabled to identify the source of the function signal, and wherein the master unit includes a speaker phone with an amplifier for selective operation in a high-volume output mode, and means in the master unit for selectively responding to a signal from the central control system to permit operation in the high-volume output mode.

4,918,718
QUADRATURE AMPLITUDE MODULATION WITH LINE SYNCHRONIZATION PULSE FOR VIDEO TELEPHONE

Lawrence D. Emmons, and Gary Fletcher, Jr., both of Grass Valley, Calif., assignors to Luma Telecom, Inc., Sunnyvale, Calif.

Filed Jun. 28, 1988, Ser. No. 212,549
Int. Cl.[4] H04M *11/00*; H04L *27/20, 27/22*
U.S. Cl. 379—53 11 Claims

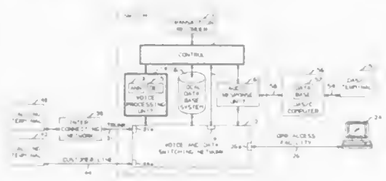


1. A method for transmitting data corresponding to pixels in a video image over a telephone line using quadrature amplitude modulation (QAM) with in-phase (I) and quadrature (Q) channels, comprising the steps of;
assigning adjacent amplitudes of sine waves in a data packet on said I and Q channels to adjacent color, gray or luminance values;
assigning overlapping sine wave cycles on said I and Q channels in said data packet to the same or neighboring pixels;
transmitting a synchronizing signal at the beginning of each transmission of a data packet, said synchronizing signal being a plurality of cycles on said I and Q channels; and
initializing a demodulator to the phase of said synchronizing signal.

4,918,719
ELIMINATION OF FALSE REQUESTS FOR TELEPHONE OPERATOR ASSISTANCE

Abraham N. Daudelin, Colts Neck, N.J., assignor to American Telephone and Telegraph Company, N.Y.

Continuation of Ser. No. 916,611, Oct. 8, 1986, abandoned. This application Dec. 2, 1988, Ser. No. 283,057
Int. Cl.[4] H04M *11/00, 11/10*
U.S. Cl. 379—67 2 Claims



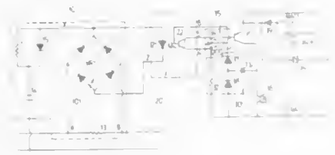
1. In an assistance switching system connected by an interoffice trunk to a local switching system, a method of controlling a telephone connection, comprising the steps of:
in said assistance switching system, connecting said interoffice trunk by switched access to one of a plurality of operator positions;
in said assistance switching system, responsive to receipt of a signal from said operator position, disconnecting said trunk from said operator position and connecting said interoffice trunk by switched access to an announcement system for announcing a message comprising one of a plurality of numbers;
announcing from said assistance switching system over said interoffice trunk a message defining a spoken command for requesting connection of said interoffice trunk to an operator position;
in said local switching system, responsive to receipt of a "flash" signal from a customer station, changing a state of said interoffice trunk to "hold" in said local switching system;
determining in said assistance switching system if said interoffice trunk is in the "hold" state in said local switching system said determining comprising the step of monitoring said communication link for detecting said spoken command over a predefined interval of time, and if said command is not detected during said predetermined interval of time, said interoffice trunk is determined to be in said "hold" state in said local switching system, and if said command is detected during said predetermined interval, said interoffice trunk is determined not to be in said "hold" state in said local switching system;
if said interoffice trunk is determined to be in said "hold" state in said local switching system, disconnecting said interoffice trunk in said assistance switching system; and
if said interoffice trunk is determined not to be in said "hold" state in said local switching system, connecting said interoffice trunk to any of said plurality of operator positions.

such that said second transistor means turns on when said first transistor means turns on;
whereby, during the duration of the incoming signal along said telephone line said first and second transistor means are turned on to allow power of said voltage source to be applied to said electric appliance.

4,918,720
CIRCUIT DEVICE FOR CONTROLLING THE ACTUATED STATE OF AN ELECTRIC APPLIANCE

George T. Buehl, 5035 Forest Lane Cir., Dallas, Tex. 75244

Filed Sep. 27, 1988, Ser. No. 249,748
Int. Cl.[4] H04M *1/00*
U.S. Cl. 379—376 13 Claims

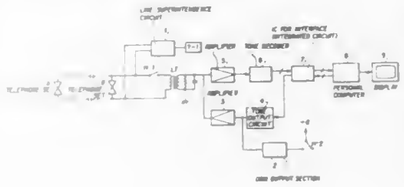


1. A circuit device responsive to an incoming signal transmitted along a telephone line for controlling an activated state of an electric appliance, comprising:
means for picking up said incoming signal from said telephone line, said means for picking up comprising a resistor disposed in said telephone line, rectifier means having a pair of input terminals connected across said resistor means, and a pair of output terminals adapted to output said picked-up signal;
means coupled to said picking-up means for generating an actuating signal in response to said picked-up signal;
first transistor means having first base, collector and emitter electrodes, said first base electrode being operatively coupled to said actuating signal generating means so as to allow said first transistor means to be turned on by said actuating signal; and
second transistor means having second base, collector and emitter electrodes, said second emitter electrode being adapted to connect to one terminal of a unidirectional voltage source for biasing said second transistor means, said second collector electrode being adapted to connect through said electric appliance to the other terminal of said unidirectional voltage source, and said second base electrode being coupled to said first collector electrode

4,918,721
PUSH BUTTON PHONE CAPABLE OF SENDING TO THE TELEPHONE LINE ALPHABETICAL CHARACTERS

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Aug. 24, 1988, Ser. No. 237,944
Claims priority, application Japan, Aug. 24, 1987, 62-209720
Int. Cl.[4] H04M *11/06*
U.S. Cl. 379—96 9 Claims



1. A terminal apparatus for receiving upper and lower case alphabetical characters and being coupled to telephone lines and to a pushbutton telephone having numerical keys used to represent alphabetical characters and special keys used to represent control characters and being capable of communicating on said lines upper and lower case alphabetical characters in the form of DTMF signals, said terminal apparatus comprising.
receiving means for receiving said DTMF signals;
decoding means responsive to said receiving means for decoding the DTMF signals corresponding to predetermined combinations of said keys being pressed; and
controller means responsive to said decoded signals corresponding to a combination of at least one particular control character and a particular alphabetical character received in succession by said decoding means to generate an output electrical signal indicative of said particular alphabetical character in upper case or lower case.

4,918,722
CONTROL OF ELECTRONIC INFORMATION DELIVERY

David W. Duehren, Belmont; Eric R. Giler, Wellesley Hills, and Stephen A. Ide, Needham, all of Mass., assignors to Brooktrout Technology, Inc., Wellesley Hills, Mass.

Filed May 11, 1988, Ser. No. 192,839
Int. Cl.[4] H04M *11/00*; H04N *1/21*
U.S. Cl. 379—100 5 Claims

1. A method for causing a selected message to be sent from a first location to any specified remote location accessible from the first location via the public switched telephone system, comprising
storing, at the first location, messages including the selected message,
thereafter, receiving at the first location, via the public switched telephone system, delivery commands issued by any remote telephone device, said commands identifying said selected message and said specified remote location,
decoding said commands to identify the selected message and the specified remote location,
fetching said selected message from among said messages,

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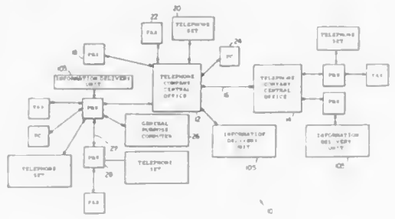
initiating a telephone call to said specified remote location, and



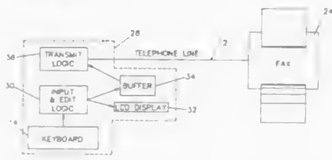
sending to a facsimile-capable receiving device at said specified remote location via the public switched telephone system said selected message in facsimile compatible form.

4,918,723

KEYBOARD TO FACSIMILE MACHINE TRANSMISSION SYSTEM

Jerry R. Iggulden, 21600 Cleardale St., Newhall, Calif. 91321, and Donald A. Streck, 832 Country Dr., Ojai, Calif. 93023, assignors to Jerry R. Iggulden, Santa Clarita and Donald A. Streck, Ojai, both of, Calif., a part interest

Filed Oct. 7, 1988, Ser. No. 254,925
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—100 41 Claims



1. A keyboard to facsimile machine transmission device comprising:

(a) a keyboard comprising a plurality of sensible and pressable keys, said keys comprising character keys and delimiter keys;

(b) display means for displaying characters associated with character symbols inputted at an input thereof;

(c) buffer means for storing sequences of symbols associated with said character and delimiter keys;

(d) input logic means connected to said keyboard for determining the ones of said keys that have been pressed, for sequentially storing symbols associated therewith in said buffer means, and for sequentially outputting character symbols associated with said character keys to said input of said display means;

(e) transmit logic means for establishing a telephonic connection to a facsimile machine, for sequentially retrieving said symbols stored in said buffer means, for using said character symbols are retrieved from said buffer means to formulate lines of facsimile compatible data representing said characters associated with said character symbols as retrieved from said buffer means; and for transmitting said lines of facsimile compatible data to said facsimile machine; and,

(f) page definition table means for defining the characteristics of a pseudo page to be transmitted by the keyboard to facsimile transmission device; and wherein,

(g) said transmit logic means includes means connected to said page definition table means for inserting leading and trailing areas without said characters therein in said lines of facsimile compatible data containing said characters and for inserting lines not containing said characters as necessary to create a pseudo page as the output of said facsimile machine as defined by said page definition table means.

4,918,724

COIN FRAUD PREVENTING UNIT AND MODULAR CONFIGURATIONS FOR PAY TELEPHONE STATIONS

Allen W. Vogl, Melbourne; Steven C. Poe, West Melbourne; John H. MacNeill, Indialantic, and Douglas J. Buron, Micco, all of Fla., assignors to International Teleservice Corporation, Melbourne, Fla.

Filed Sep. 15, 1989, Ser. No. 407,947
Int. Cl.[4] H04M *1/15, 17/02, 1/08;* G07F *3/02*
U.S. Cl. 379—145 41 Claims

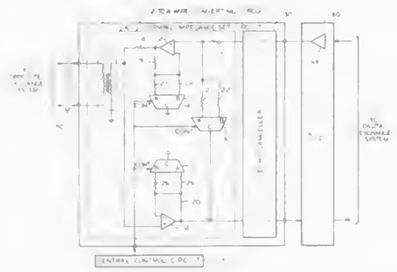
21. A coin fraud preventing device for use in a pay telephone station, comprising a relatively thin base having a pawl pivotally arranged thereon, the pawl having a tooth biased through an aperture in the base, and the base being sized to fit in a coin channel cover plate slot in the pay telephone station.

4,918,725

TERMINAL IMPEDANCE SETTING CIRCUIT FOR A TWO-WIRE TO FOUR-WIRE CONVERTING CIRCUIT

Kiyoh Takahashi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 23, 1988, Ser. No. 276,154
Claims priority, application Japan, Nov. 25, 1987, 62-298280
Int. Cl.[4] H04M *1/76;* H04B *1/66*
U.S. Cl. 379—394 12 Claims



1. A terminal impedance setting circuit in a two-wire to four-wire converting circuit which accommodates a two-wire trunk line and which is connected to an analog/digital converter which converts back and forth between an analog signal transmitted over said trunk line and a digital signal propagated in an exchange, said terminal impedance setting circuit setting a terminal impedance which matches a characteristic impedance of said trunk line, said terminal impedance setting circuit comprising:

a DC blocking section connected to said trunk line for blocking a direct current component while passing an alternating current component;

a first amplifier for amplifying an analog output signal of said analog/digital convertr and sending the resulting amplified signal to said trunk line via said DC blocking section;

a second amplifier for receiving and amplifying an input received over said trunk line via said DC blocking section an for delivering the resulting amplified signal to an analog input terminal of said analog/digital converter;

a series-connected resistor connected serially between said first amplifier and said analog output of said analog/digital converter;

a plurality of shunt resistors connected between an input terminal of said first amplifier and an output terminal of said second amplifier and having predetermined resistance values, each of said resistance values being associated with a respective one of a plurality of kinds of characteristic impedances which are presumed with said trunk line, said shunt resistors individually constituting a voltage dividing circuit with said series-connected resistor;

a first semiconductor switch for selecting any of the plurality of kinds of shunt resistors in response to a command for setting a terminal impedance value given externally so as to set up said voltage dividing circuit;

negative feedback circuits each being associated with said first amplifier and with said second amplifier, each of said negative feedback circuits having a plurality of different kinds of ground resistors each of which has a particular resistance value associated with a respective one of the characteristic impedance values of said trunk line; and

at least one second semiconductor switch for selecting a combination of the ground resistors in response to said command which is given externally and for forming a ground resistance value associated with the characteristic impedance of the trunk line;

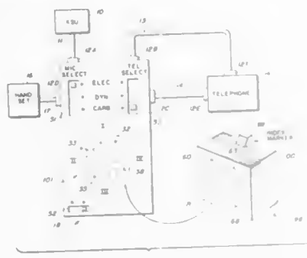
said first semiconductor switch and said second semiconductor switch being operated, in response to said command given externally, which is representative of any of the plurality of kinds of characteristic impedance of said trunk line so as to produce a terminal impedance matching with the characteristic impedance of said trunk line.

4,918,726

LINE POWERED UNIVERSAL TELEPHONE AMPLIFIER

Gary K. Snyder, 1011 E. Calle Monte Vista Dr., Tempe, Ariz. 85284

Filed Apr. 10, 1989, Ser. No. 335,741
Int. Cl.[4] H04M *1/60*
U.S. Cl. 379—395 5 Claims



1. In combination with a telephone system, said system including

a telephone device selected from the group consisting of a hybrid coil telephone and an electronic telephone,

a system for servicing said telephone device,

a telephone handset microphone normally connected to said telephone device and selected from the group consisting of an electret microphone, a dynamic microphone, and a carbon microphone,

a telephone line interconnecting said telephone device and telephone device servicing system and including at least two pairs of wires, one of said wire pairs carrying power for said telephone device,

the improvement comprising an amplification device for interfacing between said telephone handset microphone and said telephone device, said amplification device including

(a) current shunting means;

(b) microphone output transmission means;

(c) means for connecting said amplification device

(i) to said handset microphone and intermediate said handset microphone and said telephone device such that output from said microphone passes through said microphone output transmission means to said telephone device,

(ii) to said telephone line and intermediate said telephone line and said telephone device such that power in said telephone line passes through said current shunting means to said telephone device;

said current shunting means shunting a selected amount of said power from said telephone line to operate said microphone output transmission means,

said microphone output transmission means including

(d) switch means to connect said microphone output

(i) to a first amplifier means when said microphone is a carbon microphone, and

(ii) to a second amplifier means when said microphone is selected from the group consisting of an electret microphone and a dynamic microphone;

(e) summing means for summing the signals from said first and second amplifier means to produce an output signal; and,

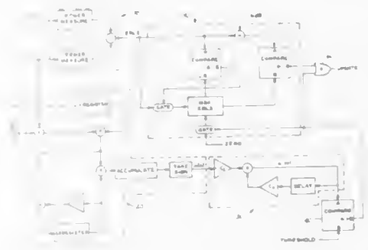
(f) interface means for transmitting said output signal from said summing means to said telephone device.

4,918,727

DOUBLE TALK DETECTOR FOR ECHO CANCELLER AND METHOD

Charles E. Rohrs, and Richard C. Younce, both of South Bend, Ind., assignors to Tellabs Incorporated, Lisle, Ill.

Filed Jun. 9, 1988, Ser. No. 204,247
Int. Cl.[4] H04B *3/23*
U.S. Cl. 379—410 52 Claims



1. A double talk detector for controlling convergence of an adaptive filter, wherein the adaptive filter is for being coupled to transmit and receive paths for separating the transmit path into transmit in and transmit out paths, for developing and periodically updating an adjustable estimated impulse response h[n] of an end path and for generating, in accordance with the estimated impulse response and a receive path signal, an estimate of an echo signal occurring on the transmit in path in response to the receive path signal, which echo estimate signal is algebraically combined with a transmit in path signal to yield a transmit out path signal, said double talk detector comprising an echo return loss enhancement (ERLE) detector for generating an ERLE signal having a value in accordance with the

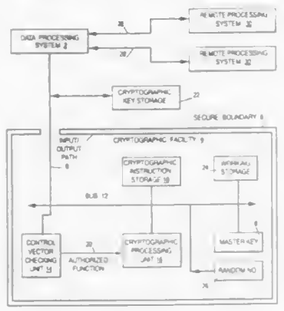
ratio of transmit in signal energy to transmit out signal energy; an end path switch detector for developing a Δh[n] vector representing the change in the estimated impulse response from one time period to the next, and for generating a signal having a value in accordance with the strength of the directionality of change of the Δh[n] vector; and comparator means for sensing the values of said ERLE signal and said end path switch detector signal and for controlling convergence of the adaptive filter in accordance with the values, such that the adaptive filter is enabled to update the estimated impulse response and converge whenever said ERLE signal has a value greater than a selected value, irrespective of the value of said end path switch detector signal, and such that the adaptive filter is inhibited from updating the estimated impulse response and converging when said ERLE signal value is less than said selected value and said end path switch detector signal has a value less than a predetermined value.

4,918,728

DATA CRYPTOGRAPHY OPERATIONS USING CONTROL VECTORS

Stephen M. Matyas, Manassas, Va.; Dennis G. Abraham, Concord, N.C.; Donald B. Johnson, Manassas, Va.; Ramesh K. Karne, Herndon, Va.; An V. Le, Arlington, Va.; Rostislaw Prymak, Dumfries, Va.; Julian Thomas, Lagrange, N.Y.; John D. Wilkins, Somerville, Va., and Phil C. Yeh, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1989, Ser. No. 401,486
Int. Cl.[4] H04L *9/00*
U.S. Cl. 380—21 **43 Claims**



1. In a data processing system which processes cryptographic service requests for performing data cryptography functions on data using cryptographic keys which are associated with control vectors defining the functions which each key is allowed by its originator to perform, an apparatus for validating that the data cryptography functions requested for a cryptographic key have been authorized by the originator of the key, comprising:

a cryptographic facility characterized by a secure boundary through which passes an input path for receiving said cryptographic service requests, data, cryptographic keys and their associated control vectors, and an output path for providing responses thereto, there being included within said boundary a cryptographic control means coupled to said input path, a control vector checking means and a cryptographic processing means coupled to said control means, and a master key storage coupled to said processing means, for providing a secure location for executing data cryptography functions in response to said received service requests;

said cryptographic control means receiving over said input path a cryptographic service request for performing a data cryptography function with a cryptographic key;

said control vector checking means having an input coupled to said input path for receiving a control vector associated with said cryptographic key and an input coupled to said cryptographic control means, for receiving control signals to initiate checking that said control vector authorizes the data cryptographic function which is requested by said cryptographic service request;

said control vector checking means having an authorization output coupled to an input of said cryptographic processing means, for signalling that said data cryptography function is authorized, the receipt of which by said cryptographic processing means initiates the performance of the requested data cryptography function with said cryptographic key.

4,918,729

VOICE SIGNAL ENCODING AND DECODING APPARATUS AND METHOD

Norimasa Kudoh, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 30, 1988, Ser. No. 291,934
Claims priority, application Japan, Jan. 5, 1988, 63-523
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—36 **8 Claims**

1. A voice signal encoding and decoding apparatus comprising:

an encoding section including:

predictive filter means for computing a predicted value of an input signal to the encoding section;

means for computing a difference signal by subtracting from the input signal the predicted value of the input signal computed by the predictive filter means; and

means for encoding the difference signal computed by the difference signal computing means; and a decoding section including:

means for decoding a received encoded difference signal;

means for detecting an error in a signal;

predictive synthesizing filter means for computing a predicted value of an output signal;

means for computing the output signal by adding the signal decoded by the decoding means and the predicted value of the output signal computed by the predictive synthesizing filter means; and

predictive synthesizing filter control means for expanding a resonant frequency band width of the predictive synthesizing filter means when an error is detected by the error detecting means.

4,918,730

PROCESS AND CIRCUIT ARRANGEMENT FOR THE AUTOMATIC RECOGNITION OF SIGNAL SEQUENCES

Klaus Schulze, Nusse, Fed. Rep. of Germany, assignor to Media Control-Musik-Medien-Analysen Gesellschaft mit Beschrankter Haftung, Waldshut-Tiengen, Fed. Rep. of Germany

Filed Jun. 24, 1988, Ser. No. 210,932
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1987, 3720882
Int. Cl.[4] G10L *5/00;* **G06J** *1/00*
U.S. Cl. 381—43 **20 Claims**

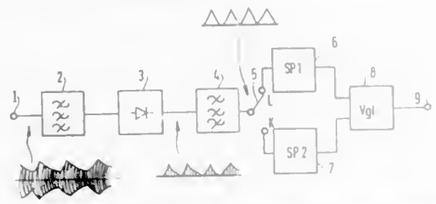
1. A method for automatically recognizing a plurality of preset signal sequences in a broadcast signal comprising the steps of:

generating one preset envelope signal from each of said plurality of preset signal sequences;

differentiating each preset envelope signal to obtain differentiated preset envelope signals;

transforming each differentiated preset envelope signal into digital, level-normalized, non-coded preset envelope signals by determining the signs of each differentiated envelope signal;

storing preset time segments for each of said sign-coded, preset envelope signals;



generating a broadcast envelope signal from said broadcast signal that is to be examined;

differentiating said broadcast envelope signal;

transforming said differentiated broadcast envelope signal into a digital, level-normslized, sign-coded broadcast envelope signal by determining the signs of said differentiated broadcast envelope signal;

comparing time segments of the sign-coded broadcast envelope signal with the stored present time segments of the preset envelope signals of the present signal sequences; and

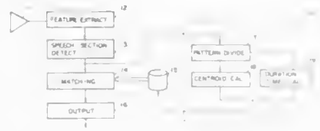
when a preset degree of concordance is exceeded, generating a recognition signal.

4,918,731

SPEECH RECOGNITION METHOD AND APPARATUS

Tetsuya Muroi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Jun. 30, 1988, Ser. No. 213,826
Claims priority, application Japan, Jul. 17, 1987, 62-179562; Aug. 13, 1987, 62-202940
Int. Cl.[4] G10L *7/08*
U.S. Cl. 381—43 **13 Claims**



4. A speech recognition apparatus comprising:

means for extracting a feature vector (X) from an unknown input speech pattern which is composed of feature vectors ($X = x_1 x_2 x_3 \ldots x_I$) of speech data included in I number of frames of the unknown input speech pattern;

means for comparing the feature vector (X) of the input speech pattern with a plurality of reference patterns (Y) and for calculating an accumulated distance (D) between the input speech pattern and each of the reference patterns;

each of the reference patterns (Y) being represented as a time series having N number of states, each reference pattern being composed of a feature vector ($y_1 y_2 y_3 \ldots y_N$) which represents a feature quantity of each of the states and a duration time ($L = l_1, l_2, l_3, \ldots l_N$) of each of the states, so that local distances (d) among I number of feature vectors of each of the reference patterns are calculated, and also a difference between the duration time of each of the states included in each of the reference patterns and a duration time of a corresponding state of the input pattern is calculated;

the accumulated distance being calculated by accumulating the obtained local distances in sequence along paths which extend from a beginning state to a last state out of the states of the reference pattern, and a weight (W) depending on the obtained difference in the duration time being added to the local distances when a transition of state occurs while accumulating the local distances;

outputting means for determining one optimum path having the smallest accumulated distance for each of the reference patterns and for selecting, as an identification result, one reference pattern having the optimum path having the accumulated distance smaller than the accumulated distance of the optimum paths of the other reference patterns,

wherein the weight (W) is a function of the difference in the duration time of each state between the input speech pattern and the reference pattern; and

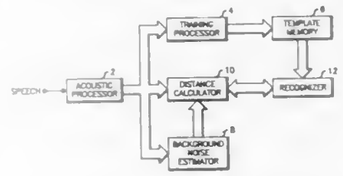
wherein the weight (W) has a value of 0 in the case where the duration time of each of the states of the input speech pattern is equal to or more than half of the duration time of the corresponding state of the reference pattern and is equal to or smaller than one and half times the duration time of the corresponding state of the reference pattern, and wherein the weight (W) is set infinitive in cases other than the said case.

4,918,732

FRAME COMPARISON METHOD FOR WORD RECOGNITION IN HIGH NOISE ENVIRONMENTS

Ira A. Gerson, Hoffman Estates, and Brett L. Lindsley, Schaumburg, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 816,598, Jan. 6, 1986, abandoned. This application May 25, 1989, Ser. No. 357,688
Int. Cl.[4] G10L *7/08*
U.S. Cl. 381—43 **6 Claims**



4. A word recognition detector which compares stored speech recognition templates which are framed into time segments and channelized into at least two channels which are frequency band-limited to an input signal which has been contaminated by high levels of noise and which is framed into a time segment and channelized into at least two channels which are frequency band-limited, the word recognition detector comprising:

means for determining, from the input signal, a first noise level associated with a first of the at least two channels and a second noise level associated with a second one of the at least two channels;

means for adding a buffering level to each of said first and second noise levels to create respectively first and second buffered noise levels;

means for determining, from the input signal, a first signal level associated with a first of the at least two channels and a second signal level associated with a second of the at least two channels;

means for normalizing the level of each said first and second

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signal levels to create, respectively, normalized first and second signal levels;

means for normalizing a first channel stored recognition template and means for normalizing a second channel stored speech recognition template to create, respectively, first and second normalized template signal levels;

means for subtracting said normalized first signal level from said normalized first template signal level to determine a first difference and means for subtracting said normalized second signal level from said normalized second template signal level to determine a second difference; and

means for generating a distance measure by adding together at least a first and a second addend, further comprising:

(a) means for selecting a first addend as the absolute value of said first difference if said first signal level is greater than said first buffered noise level, or as said first difference if said first signal level is less than said first buffered noise level and if said first difference is a positive value, or as a predeterммined nominal differential value if said first signal level is less than said first buffered noise level and if said first difference is a negative value; and

(b) means for selecting a second addend as the absolute value of said second difference if said second signal level is greater than said second buffered noise level, or as said second difference if said second signal level is less than said second buffered noise level and if said second difference is a positive value, or as a predetermined nominal differential value if said second signal level is less than said second buffered noise level and if said second difference is a negative value.

4,918,733

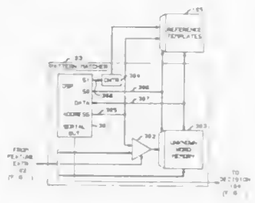
DYNAMIC TIME WARPING USING A DIGITAL SIGNAL PROCESSOR

Jeffrey W. Daugherty, Lisle, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 30, 1986, Ser. No. 891,770

Int. Cl.[4] G10L *5/06*

U.S. Cl. 381—43 **4 Claims**



1. A method for performing automatic voice recognition comprising the steps of:

storing in a reference memory a plurality of reference speech pattern templates each comprising a plurality of reference time frames having sets of acoustic features signals and each representative of a prescribed spoken reference speech pattern;

analyzing by a feature extraction unit a speech utterance to determine a plurality of unknown time frames to obtain sets of acoustic feature signals;

initially storing in an unknown word memory and said sets of acoustic feature signals of said plurality of unknown time frames;

obtaining a final accumulated correspondence signal for one of said templates by a pattern matcher performing the substeps of

(1) forming an initial sequence of accumulated correspondence signals in response to the sets of acoustic feature signals of one of said templates and one set of acoustic feature signals of a first one of said plurality of unknown time frames;

(2) storing in said unknown word memory said initial sequence in a sequential group of memory locations in descending chronological order;

(3) determining a local correspondence signal corresponding to an individual memory location in said sequential group of memory locations from said sets of acoustic features for said plurality of unknown time frames and said one of said templates;

(4) calculating a accumulated correspondence signal of the sequence of accumulated correspondence signals corresponding to said individual memory location in said group of memory locations for a second one of said plurality of unknown time frames by adding said local correspondence signal to the minimum of the contents of said individual memory location and absolute values of first and second memory locations following said individual memory location;

(5) storing the negative of the calculated accumulated correspondence signal into said first individual memory location upon said contents of said individual memory location being the minimum and otherwise storing said calculated accumulated correspondence signal into said individual memory location;

(6) repeating substeps 3 through 5 to obtain the accumulated correspondence signals in descending order for each memory location of said group of memory locations;

(7) repeating substeps 3 through 6 to obtain the final accumulated correspondence signal of the sequence of said accumulated correspondence signals for the remaining ones of said plurality of said unknown time frames;

obtaining a final accumulated correspondence signal for each of the remaining ones of said templates by said pattern matcher performing substeps 1 through 7 for each of the remaining ones of said templates; and

indicating by a decision unit in response to the final accumulated correspondence signals the speech pattern represented by said speech utterance.

4,918,734

SPEECH CODING SYSTEM USING VARIABLE THRESHOLD VALUES FOR NOISE REDUCTION

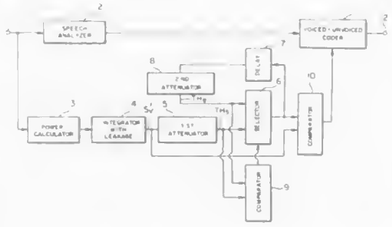
Ryujiro Muramatsu, Yokohama; Takanori Miyamoto, Fuchu; Kazuhiro Kondo, Kokubunji, and Toshiro Suzuki, Tama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 21, 1987, Ser. No. 52,395

Claims priority, application Japan, May 23, 1986, 61-117416

Int. Cl.[4] G10L *3/00*

U.S. Cl. 381—46 **2 Claims**



1. A speech coding system comprising:

means for calculating the power of an input speech signal at a predetermined time interval;

first attenuator means for attenuating the power of said input speech signal at a first attenuation rate and providing a first threshold value signal;

selector means, connected to receive said first threshold value signal and a second threshold value signal, for selecting one of said first and second threshold value signals having an amplitude larger than the other of said first and second threshold value signals and outputting said selected threshold value signal;

second attenuator means for attenuating the output of said selector means at a second attenuation rate smaller than said first attenuation rate

to produce said second threshold value signal, said second attenuator means including delay means for supplying said second threshold value signal to said selector means after a predetermined time delay;

comparator means for comparing the power of said input speech signal with the output of said selector means to generate a discriminating signal representative of whether the power of said input speech signal exceeds the output of said selector means; and

coding means for coding said input speech signal depending on said discriminating signal delivered from said comparator means to produce a voiced frame when said discriminating signal represents that the power of said input speech signal exceeds the output of said selector means and an unvoiced frame when said discriminating signal represents that the power of said input speech signal does not exceed the output of said selector means, said voiced frame including said coded input speech signal and an indicator for indicating that said input speech signal is a voice signal, and said unvoiced frame including said coded input speech signal and an indicator for indicating that said input speech signal is an unvoiced signal.

4,918,735

SPEECH RECOGNITION APPARATUS FOR RECOGNIZING THE CATEGORY OF AN INPUT SPEECH PATTERN

Makoto Morito; Yukio Tabei, and Kozo Yamada, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 909,957, Sep. 22, 1986, Pat. No. 4,852,181. This application Jan. 9, 1989, Ser. No. 295,194

Claims priority, application Japan, Sep. 26, 1985, 60-213417; Sep. 26, 1985, 60-213418; Oct. 11, 1985, 60-224878; Jan. 6, 1986, 61-451

Int. Cl.[4] G10L *5/00*

U.S. Cl. 381—47 **4 Claims**

1. A speech recognition apparatus for recognizing an input speech comprising:

(a) a means for evaluating a noise pattern N by time-averaging feature vectors Nl, where l is a subscript indicative of a frame number, within a prescribed noise detection interval prior to inputting the input speech, each of said feature vectors Nl being composed of a plurality of channel components evaluated by frequency-analyzing environmental noise;

(b) a first memory for storing said noise pattern N;

(c) a means for frequency-analyzing the input speech to evaluate a feature vector A_i, where i is a subscript indicative of a speech frame number, each composed of a plurality of channel components of a plurality of channels corresponding to frequency components of the input speech at a prescribed speech frame period;

(d) a means for evaluating a speech feature vector B_i of the input speech by subtracting said noise pattern N from each feature vector A_i of the input speech evaluated in each of said speech frame when the speech is inputted after said evaluation of the noise pattern;

(e) a means for evaluating frame power in each of said speech frame from said speech feature vector B_i to detect a start point and an end point of the input speech using said frame power;

(f) a means for converting said speech feature vector B_i of the input speech to local peaks vector R_i including,

a means for evaluating a least square fit line from said speech feature vector B_i in each of said speech frame,

a means for evaluating a spectrum normalized speech feature vector Z_i composed of components Z_i^k, where i is a subscript indicative of a speech frame number and k is a superscript indicative of the channel number k = 1 to K, by spectrum normalizing said speech feature vector B_i using said least square fit line, and

a means for evaluating a local peaks vector R_i of the input speech composed of binary components $\pi[i]_i^k$ by making a binary value "1" the components Z_i^k of said spectrum normalized speech feature vector Z_i corresponding to channels being the local maximum in a frequency direction of said vector Z_i while making a binary value "0" the other components Z_i^K of said vector Z_i, said local maximum being extracted based on the following conditions: $(Z_i^k > Z_i^{k+1})$ and $(Z_i^{k-1} < Z_i^k)$ and $(Z_i^k > 0)$, wherein k = 1 to K, $Z_i^0 = -\infty$, and $Z_i^{K+1} = -\infty$,

(g) a second memory for storing an input pattern composed of a time series of said local peaks vector R_i of the input speech;

(h) a third memory for storing a plurality of previously prepared reference patterns each of which is represented by a time series of local peaks vectors and corresponds to some word to be recognized respectively;

(i) a means for evaluating pattern similarities between an input pattern composed of a time series of local peaks vectors R_i from the start point to the end point of an input speech and a plurality of said reference patterns of the same format as that of said input pattern by making use of pattern matching; and

(j) a means for judging a word name given to a reference pattern having a maximum pattern similarity among said pattern similarities evaluated for each reference pattern as a recognized result.

4,918,736

REMOTE CONTROL SYSTEM FOR HEARING AIDS

Lourens G. Bordewijk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 22, 1985, Ser. No. 757,693

Claims priority, application United Kingdom, Sep. 27, 1984, 8424471

Int. Cl.[4] H04R *25/00*; H04B *5/02, 5/06*

U.S. Cl. 381—68 **10 Claims**

1. A combination of a hearing aid adapted to be supported upon the head of a user of the aid, and a remote control unit, the remote control unit comprising,

control means for manual operation by the user of the hearing aid, an encoder unit having an input and an output and with the input coupled to the control means, the encoder unit being adapted to convert control operations carried out by the user of the control means into a first control signal and to apply said first control via its output to an input of a transmitter, said transmitter providing wireless

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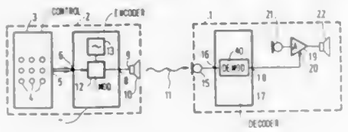
transmission of the first control signal by means of acoustic waves,

the hearing aid comprising,

a microphone pick-up for receiving the acoustic wave first control signal transmitted by the transmitter of the remote control unit, a series arrangement of the microphone, an amplifier and a loudspeaker, filter means coupled to an



output of the microphone for deriving the first control signal from an output signal of the microphone, and an output of the filter means being coupled to an input of a decoder unit which receives the first control signal, the decoder unit being adapted to convert the first control signal into a second control signal at its output for controlling at least one operational parameter of the hearing aid.

4,918,737

HEARING AID WITH WIRELESS REMOTE CONTROL

Walter Luethi, Ebnat-Kappel, Switzerland, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 7, 1988, Ser. No. 216,102

Claims priority, application Switzerland, Jul. 7, 1987, 2577/87

Int. Cl.[4] H04R *25/00*; H04B *5/00*

U.S. Cl. 381—68.4 **17 Claims**

1. A hearing aid comprising:

a housing worn at the head of a user containing controllable means for amplifying incoming sound and means for receiving and demodulating capacitively transmitted control signals for said means for amplifying, said means for receiving and demodulating including first means for forming a plate capacitor having a voltage which varies responsive to said transmitted control signals; and

a wireless control device integrated in a wristwatch disposed remote from said housing including a rotatable ring disposed around a circumference of said wristwatch for manually entering control instructions for said means for amplifying, and means for modulating and capacitively transmitting said control signals to said housing including second means for forming a plate capacitor having a voltage which varies responsive to said control instructions and thereby generating said control signals as an electric field to induce said voltage at said first means for forming a plate capacitor.

4,918,738

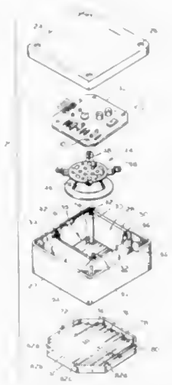
STRUCTURAL ASSEMBLY FOR HOUSING AN ACOUSTICAL SYSTEM

Joseph F. Bader, Crete, Ill., assignor to Federal Signal Corporation, Oak Brook, Ill.

Filed Dec. 5, 1988, Ser. No. 279,498

Int. Cl.[4] H01L *41/08*

U.S. Cl. 381—190 **14 Claims**



1. An acoustical system for generating loud sound levels over a wide audio frequency range comprising:

a generally cylindrically-shaped cavity formed of a wall member and having front and back ends;

a baffle member being disposed to close the front end of said cavity;

a rear wall panel being disposed to close the back end of said cavity;

a crystal/diaphragm driver assembly being formed of a piezoelectric crystal of a generally circular configuration and a generally conically-shaped diaphragm whose apex is fixedly attached to said crystal, said driver assembly converting electrical signals applied thereto into acoustical signals;

means for mounting said crystal at a first predetermined desired distance from said rear wall panel to form a rear Helmholtz leading chamber therebetween;

said means for mounting said crystal including a plurality of tabs formed on the edge of said crystal at equally spaced apart distances and a plurality of support posts extending from the back side of said baffle member and terminating in mounting pins, said tabs having openings at their free ends for receiving said mounting pins so as to locate said crystal at the first predetermined distance from said rear wall panel; and

said baffle member being spaced at a second predetermined desired distance from said crystal so as to form a front, outer enclosing chamber.

4,918,739

PROCESS AND SYSTEM FOR DIGITAL ANALYSIS OF IMAGES APPLIED TO STRATIGRAPHIC DATA

Maria A. Lorente; Jeanny T. De Rincon; Orlando Morean, and Terence B. Wright, all of Caracas, Venezuela, assignors to Maraven, S.A., Caracas, Venezuela

Filed Aug. 12, 1988, Ser. No. 231,724

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—1 **16 Claims**

1. A process for image digital analysis to achieve morphological characterization of image components which comprises:

capturing an original image from at least one of a microscope and a photograph;

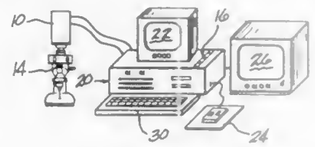
electronically digitizing said image into a digital matrix representing two dimensions;

transferring said digitized image to a video monitor;

modifying said digitized image;

processing two dimensional data obtained from said digitized image into statistical distributions;

interpreting said digitized image wherein said interpreting step comprises transforming said processed data into said



statistical distributions; classifying the sizes of said image components by means of phi diameter distributions; characterizing relative elongation of said image components by means of moments of the statistical distributions associated with each component being sampled; characterizing the irregularity of each said component by comparing measurements of its perimeter to the perimeter of a substantially equiareal circle; and obtaining a slope of said components by means of semicircular projections of the components orientation; and

generating a graphical output of said statistical distributions.

4,918,740

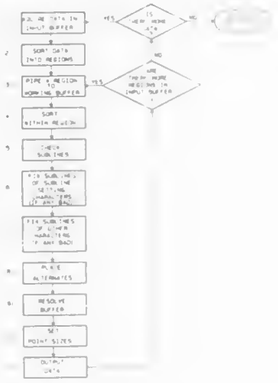
PROCESSING MEANS FOR USE IN AN OPTICAL CHARACTER RECOGNITION SYSTEM

David J. Ross, Menlo Park, Calif., assignor to Palantir Corporation, Santa Clara, Calif.

Continuation of Ser. No. 144,622, Jan. 11, 1988, abandoned, which is a continuation of Ser. No. 782,742, Oct. 1, 1985, abandoned. This application Jul. 21, 1989, Ser. No. 384,053

Int. Cl.[4] G05K *9/34*

U.S. Cl. 382—9 **23 Claims**



1. The method of analyzing character information consisting of pixel data and subline information of unknown characters to determine the character type of each of said unknown characters, said method comprising the steps of:

fetching a plurality of character information segments, each representing a character and including subline information consisting of the location of that character's ascender line, lowercase line, base line, and descender line with respect to the pixels forming that character;

for a selected one of said character information segments, determining if said subline information is accurate based upon comparison with the subline information of a selected one of said character information segments;

providing accurate subline information by resetting said subline information of said selected one of said character information segments, with respect to the pixels forming that character, if inaccurate, without altering the subline information of character information segments corresponding to adjacent characters; and

using said accurate subline information to determine the character type of said selected one of said character information segments.

4,918,742

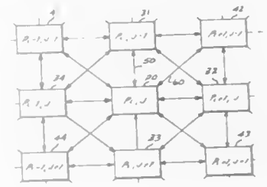
IMAGE PROCESSING USING MULTI-PASS CONVOLUTION WITH SMALL KERNELS

Robert M. Simonds, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 22, 1988, Ser. No. 185,100

Int. Cl.[4] G06F *15/31*; H04N *5/21*

U.S. Cl. 382—41 **21 Claims**



1. A method of processing an image represented by a multi-dimensional image array of image elements by convolving the image array with a kernel, the method comprising convolving a decomposed form of the kernel with the image array to produce a modified array, the decomposed form comprising a linear combination of one or more terms, at least one term comprising the convolutional product of two or more primitive kernels, each primitive kernel having a center element and even or odd parity with respect to reflection about the center element along each of the dimensions of the image array.

4,918,743

CIRCUIT FOR GENERATING A DUAL PURPOSE CONTROL SIGNAL IN A DISK APPARATUS

Hiroshi Tsuyuguchi, Tokyo, Japan, assignor to Teac Corporation, Tokyo, Japan

Filed Oct. 26, 1988, Ser. No. 262,958

Claims priority, application Japan, Nov. 13, 1987, 62-287127

Int. Cl.[4] G05B *5/00*

U.S. Cl. 388—812 **15 Claims**

1. In an apparatus having a head for data transfer with a disklike record medium, in combination:

(a) a disk drive motor for imparting rotation to the record medium;

(b) speed sensor means for providing a MOTOR SPEED signal representative of the speed for rotation of the record medium.

(c) signal supply means for supplying a MOTOR ON signal dictating the rotation and nonrotation of the disk drive motor;

(d) motor control and drive means coupled to the signal supply means for setting the disk drive motor into rotation when the MOTOR ON signal dictates the rotation of the disk drive motor, and to the speed sensor means for driv-

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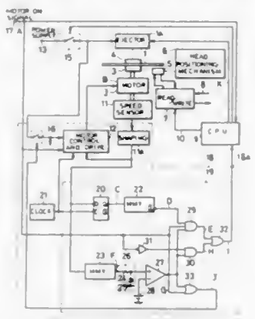
ing the disk drive motor at a prescribed normal speed in response to the MOTOR SPEED signal in order to enable date transfer between the head and the record medium; and

(e) a MOTOR STATUS signal generator circuit coupled to both the speed sensor means and the signal supply means for generating a dual implication MOTOR STATUS signal in response to the MOTOR SPEED signal and the MOTOR ON signal, the MOTOR STATUS signal having first and second prescribed states and being in:

(1) the first prescribed state when the MOTOR ON signal dictates the rotation of the disk drive motor and when, at the same time, the disk drive motor is in rotation at a first reference speed which is substantially equal to the normal speed;

(2) the first prescribed state when the MOTOR ON signal dictates the nonrotation of the disk drive motor and



when, at the same time, the disk drive motor is in rotation at less than the first reference speed and more than a second reference speed which is less than the first reference speed;

(3) the second prescribed state when the MOTOR ON signal dictates the rotation of the disk drive motor and when, at the same time, the disk drive motor is in rotation at less than the first reference speed;

(4) the second prescribed state when the MOTOR ON signal dictates the nonrotation of the disk drive motor and when, at the same time, the disk drive motor is out of rotation or in rotation at not more than the second reference speed; and

(5) the first or second prescribed state when the MOTOR ON signal dictates the rotation of the disk drive motor and when, at the same time, the disk drive motor is in rotation at more than the first reference speed.

4,918,744

MOTOR-DRIVEN POWER STEERING UNIT

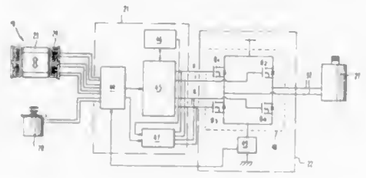
Yasuo Shimizu, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1988, Ser. No. 204,326
Claims priority, application Japan, Jul. 1, 1987, 62-164777
Int. Cl.[4] G05B *5/00*
U.S. Cl. 388—833 **2 Claims**

1. A motor-driven power steering unit furnished with an electric motor for generating an auxiliary steering force in a steering system that couples a steering wheel to wheels of a vehicle, said steering unit assisting in the turning of the steering wheel by controlling an electric current to be applied to said electric motor based upon steering information, the motor-driven power steering unit comprising:

a steering force detecting means for detecting a steering force generated in said steering system; and

an overload preventing means for decreasing an electric current being applied to said electric motor when the



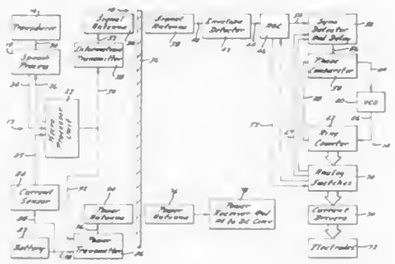
steering force detected with said steering force detecting means exceeds a predetermined value.

4,918,745

MULTI-CHANNEL COCHLEAR IMPLANT SYSTEM

Steve Hutchison, Kirkwood, Mo., assignor to Storz Instrument Company, St. Louis, Mo.

Filed Oct. 9, 1987, Ser. No. 106,571
Int. Cl.[4] H04B *5/00*; A61N *1/00*
U.S. Cl. 455—41 **22 Claims**



1. A system for electrically stimulating sensory nerves via electrically powered stimulating electrodes, the system comprising:

means for generating a plurality of channels of electrical information in response to an external stimulus;

means for transmitting said plurality of channels of electrical information across a first single wireless transcutaneous path, said means for transmitting including means for combining said plurality of channels of electrical information into a single wide bandwidth amplitude modulated ("AM") signal containing said plurality of channels of electrical information for transmission across said transcutaneous path;

means for receiving said single wide bandwidth AM signal containing said plurality of channels of electrical information transmitted across the single transcutaneous path;

means for recovering from said received wide bandwidth AM signal said plurality of channels of electrical information contained therein;

means for distributing said recovered plurality of channels of electrical information to a plurality of stimulating electrodes in a predetermined sequence in time;

means for generating a periodically varying narrow bandwidth signal distinct from said wide bandwidth AM signal;

means for transmitting electrical power via the periodically varying narrow bandwidth signal across a second single wireless transcutaneous path;

means for receiving said periodically varying signal transmitted across said second transcutaneous path to obtain said transmitted electrical power; and

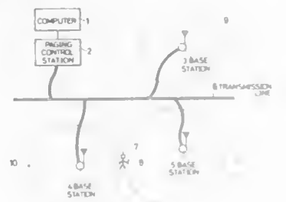
means for coupling said obtained electrical power to said means for recovering and said means for distributing, whereby said means for recovering and said means for distributing can operate without an implanted battery.

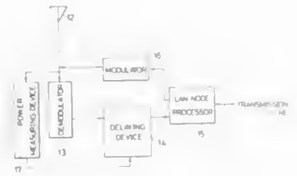
4,918,746

COMMUNICATION SYSTEM WITH MOBILE STATIONS

Mutsumi Serizawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 1, 1988, Ser. No. 162,819
Claims priority, application Japan, May 15, 1987, 62-116929
Int. Cl.[4] H04B *1/38*
U.S. Cl. 455—54 **2 Claims**





2. A communication system, comprising:

(a) a transmission line for transferring an information signal;

(b) a control station connected to said transmission line;

(c) at least one mobile station for receiving a first information signal by radio to transmit a second information signal by radio; and

(d) a plurality of base stations connected to said transmission line, each of said base stations including a delaying means, and

(e) first receiving means for receiving the first information signal from said control station through the transmission line to transmit the first information signal to said mobile station by radio, and second receiving means for receiving the second information signal transmitted from said mobile station by radio to transmit the second information signal to said control station via said transmission line,

said delaying means being constructed for delaying the second information signal from said base station such that, when a plural number of said base stations simultaneously receive the second information signal from said mobile station, said plural number of said base stations transmit the second information signals with time delay to said control station through said transmission line, wherein,

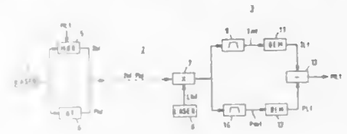
each of said base stations includes an isolating means for blocking the delayed second information signal from being transmitted to said transmission line when the same delayed second information signal has already been transmitted to said transmission line from the other of said base stations.

4,918,747

METHOD AND DEVICE FOR COMPENSATING, IN A COHERENT OPTICAL COMMUNICATION SYSTEM WITH HETERODYNE DETECTION, AT THE RECEIVING SIDE, PHASE NOISE OF A TRANSMITTING LASER AND OF A LOCAL LASER

Johan P. Bekooij, Zoeterwoude-Rijndijk, Netherlands, assignor to Staat Der Nederlanden, The Hague, Netherlands

Filed Dec. 23, 1988, Ser. No. 289,624
Claims priority, application Netherlands, Jan. 12, 1988, 8800067
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—617 **6 Claims**



1. Method for compensating phase noise, generated by lasers, in a coherent optical communication system, which comprises:

an optical transmitter with a transmitting laser for generating an HF information signal which is formed by a carrier wave modulated by information, as well as for generating an HF pilot signal which is formed by an unmodulated carrier wave, which two HF signals are transmitted via a transmission medium,

an optical receiver for receiving said HF signals via said transmission medium, which receiver is provided with a heterodyne circuit comprising a local laser for generating a local HF signal, a mixer circuit for mixing this local HF signal with the HF signals received, and at least one MF filter circuit for letting pass only an MF information signal corresponding to the HF information signal and an MF pilot signal corresponding to the HF pilot signal,

characterized

in that the MF information signal (Imf) is demodulated into an LF information signal (Ilf) and the MF pilot signal (Pmf) into an LF pilot signal (Plf) in a manner whereby said LF information signal and said LF pilot signal have either a cophase of an antiphase relation to each other,

and in that said LF signals — dependent on their cophase or antiphase relation to one another — are linearly substracted from one another or added to one another, thereby producing an LF signal of reduced phase noise.

4,918,748

APPARATUS AND METHOD FOR PHASE NOISE AND POST TUNING DRIFT CANCELLATION

Iradj Shahriary, Santa Monica, and Kevin M. McNab, Redondo Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 9, 1987, Ser. No. 118,902
Int. Cl.[4] H04B *1/26, 1/10*
U.S. Cl. 455—315 **15 Claims**

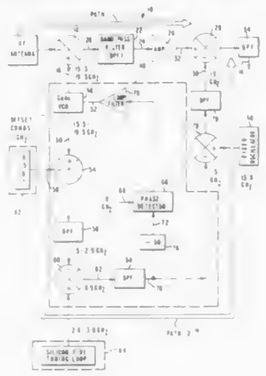
1. In a multi-conversion receiver having first and second oscillators for upconverting and downconverting a received signal, the improvement comprising:

first means for impressing the frequency and noise and drift generated by the first oscillator onto the received signal thereby resulting in a noise and drift impressed received signal;

second means for impressing said noise and drift created in the first oscillator onto the frequency generated by the second oscillator thereby resulting in a noise and drift impressed frequency from the second oscillator; and

third means for subtracting the noise and drift impressed frequency of the second oscillator from the noise and drift

impressed received signal whereby the resultant receiver output is substantially free of noise and drift created by the



first oscillator thereby permitting the use of efficient but noisy first oscillators.

4,918,749

RECEIVING CONFIGURATION FOR MICROWAVE SIGNALS

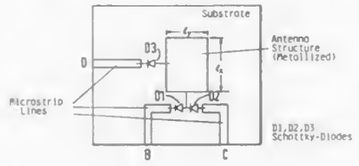
Helmut Entschladen, Bochum; Rainer Strietzel, Heidelberg, and Bernd Siedelhofer, Schriesheim, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Fed. Rep. of Germany

Filed Aug. 21, 1987, Ser. No. 88,062

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1986, 3628583

Int. Cl.[4] H04B *1/26*

U.S. Cl. 455—327 **10 Claims**



1. A receiving device for microwave signals, comprising a single antenna, formed in strip-line technology and having a rectangular shape with adjacent sides perpendicular to each other, for receiving an energy signal and a data signal, said energy signal and said data signal having polarized waveforms whose polarization planes differ by 90°, and two separate detector circuits connected to respectively perpendicularly extending sides of the rectangular antenna for receiving the energy signal and the data signal, respectively, said detector circuits each including a rectifying circuit.

4,918,750

MOTOR VEHICLE RADIO-CASSETTE UNIT CAMOUFLAGE SYSTEM

Alan Buckley, 162 W. 21 St., New York, N.Y. 10128

Filed Apr. 18, 1988, Ser. No. 182,732

Int. Cl.[4] H04B *1/08*

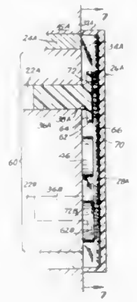
U.S. Cl. 455—345 **2 Claims**

1. A theft prevention camouflage system for a radio-cassette unit including control means, said radio-cassette unit being mounted in the dashboard of a motor vehicle, the radio-cassette having a cassette recess, including, in combination,

cover means capable of being removably positioned at the dashboard by a user for concealing the radio-cassette unit from view,

said cover means including a rectangular cover having opposed inner and outer rectangular surfaces relative to the dashboard, said inner and outer surfaces having a rectangular edge and a protruding lip extending transversely from said inner surface around said edge, said inner surface and said lip defining a hollow, said control means being positioned in said hollow when said cover is mounted over the radio-cassette unit,

mounting means connected to said cover means, said mounting means being for being removably positioned in the cassette recess so as to hold said cover means in place around the radio-cassette unit, the cassette recess being



generally rectangular in cross-section and said mounting means being a tongue member generally rectangular in cross-section and having opposed inner and outer ends, said inner end being removably connected to said inner surface of said cover, said tongue member along with said outer end of said tongue member being capable of being removably positioned in the recess, and

a hook-and-loop connector mounted to said cover and to said tongue member, one element of said hook-and-loop connector being connected to the entire inner surface of said cover and the other element of said hook-and-loop connector being connected to said inner end of said tongue member, wherein said tongue member is removably connected to said inner surface of said cover and is capable of being removably connected to said inner surface at a selected position by the user in accordance with the location of the cassette recess.

4,918,751

METHOD FOR OPTICAL PULSE TRANSMISSION THROUGH OPTICAL FIBERS WHICH INCREASES THE PULSE POWER HANDLING CAPACITY OF THE FIBERS

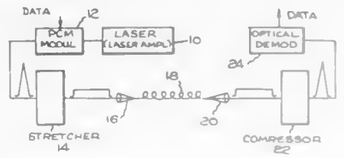
Maurice Pessot, and Gerard A. Mourou, both of Rochester, N.Y., assignors to The University of Rochester, Rochester, N.Y.

Filed Oct. 5, 1987, Ser. No. 104,749

Int. Cl.[4] H04B *9/00*

U.S. Cl. 455—608 **11 Claims**

1. The method of optical communication of optical pulses over an optical fiber which increases the pulse power handling capacity of the fiber and which comprises the step of stretching and compressing the pulse at opposite ends of the fiber, said compressing step being carried on after the pulse is transmitted



through the fiber, said stretching step being a plurality of orders of magnitude and being sufficient to reduce the peak power of the pulses while being transmitted through the fiber to avoid non-linear peak power dependent effects.

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DESIGN PATENTS

GRANTED APR. 17, 1990

ERRATA

For CLASS	See PATENT NO.
D09-352	307,238
D99-352	307,302

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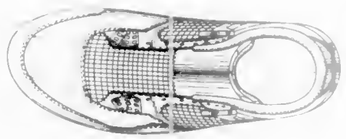
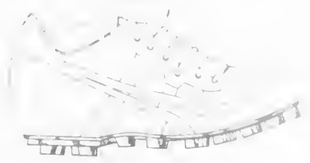
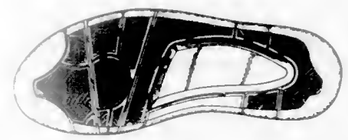
307,210
UPPER FOR A SHOE
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.
Filed Jun. 30, 1989, Ser. No. 373,487
Term of patent 14 years
U.S. Cl. D2—314



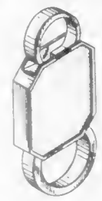
307,211
SHOE SOLE
Takashi Arai, Kobe, Japan, assignor to Asics Corporation, Kobe, Japan
Filed Oct. 2, 1987, Ser. No. 103,638
Claims priority, application Japan, Apr. 2, 1987, 62-12870
Term of patent 14 years
U.S. Cl. D2—317



307,212
CUP SHAPED SHOE OUTSOLE
Michael A. Aveni, Lake Oswego, Oreg., assignor to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.
Filed Jun. 30, 1989, Ser. No. 373,778
Term of patent 14 years
U.S. Cl. D2—320



307,213
KEYRING
Robert Scungio, Warwick, R.I., assignor to G. Pruefer Mfg. Co., Johnston, R.I.
Filed May 27, 1987, Ser. No. 60,480
Term of patent 14 years
U.S. Cl. D3—61



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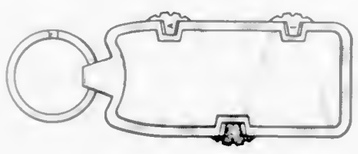
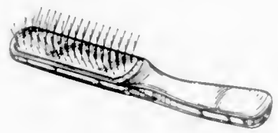
307,214
COMBINED KEY RING AND CONTAINER
Garfield G. Litton, Glen Rock, N.J., assignor to Revlon, Inc., New York, N.Y.
Filed Apr. 27, 1989, Ser. No. 344,156
Term of patent 14 years
U.S. Cl. D3—62

307,215
KEY-HOLDER PARKING-SPACE RECORDER
Mary K. Chan, 252 N. Crimea, Ventura, Calif. 93001
Filed Jan. 23, 1987, Ser. No. 6,583
Term of patent 14 years
U.S. Cl. D3—62

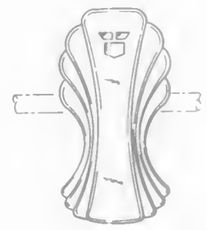


307,216
POWER DRIVEN SHOE BRUSH
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Aug. 25, 1987, Ser. No. 89,254
Claims priority, application United Kingdom, Jun. 24, 1987, 1043068
Term of patent 14 years
U.S. Cl. D4—102

307,217
HAIR BRUSH OR SIMILAR ARTICLE
James C. Fong, Taipei, Taiwan, assignor to Tong-Fong Brush Factory Co., Ltd., Taipei, Taiwan
Filed Dec. 15, 1986, Ser. No. 941,956
Term of patent 14 years
U.S. Cl. D4—134



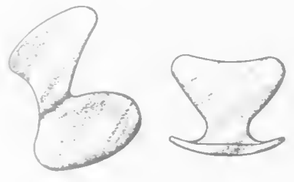
307,218
CLAMP FOR GARMENT HANGERS OR THE LIKE
William D. Arnold, St. Louis, Mo., assignor to Lee-Rowan Company, St. Louis, Mo.
Filed Jun. 9, 1988, Ser. No. 204,404
Term of patent 14 years
U.S. Cl. D6—328



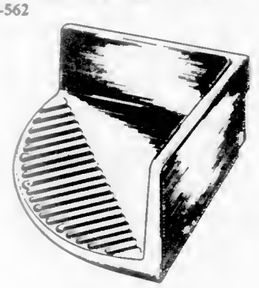
307,219
BENCH SEAT
George Provencher, 4391 Casa Oro, Yorba Linda, Calif. 92686
Filed Oct. 29, 1986, Ser. No. 924,510
Term of patent 14 years
U.S. Cl. D6—381

307,220
BOTTLE HOLDER
David T. Kaufman, Jr., Jeffersontown, Ky., assignor to Lesco Design & Manufacturing Co., Inc., LaGrange, Ky.
Filed Jun. 24, 1987, Ser. No. 65,721
Term of patent 14 years
U.S. Cl. D6—462

307,221
ORTHOPEDIC CHAIR SEAT
William E. Mudge, 601 Hickory Rd., Hudson, Wis. 54016
Filed Mar. 2, 1987, Ser. No. 20,673
Term of patent 14 years
U.S. Cl. D6—502



307,222
CORNER SHELF
E. Pekka Korpijaako, Rocky Hill, and Stephen A. Miller, North Brunswick, both of N.J., assignors to The Willette Corporation, New Brunswick, N.J.
Filed May 21, 1987, Ser. No. 52,801
Term of patent 14 years
U.S. Cl. D6—562



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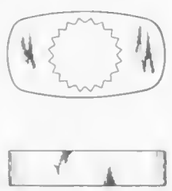
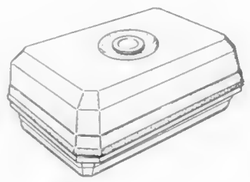
307,223
CONDIMENT MILL
Ambrogio Rossari, Milan, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Jul. 15, 1987, Ser. No. 73,420
Claims priority, application Italy, Jan. 20, 1987, 20547/87[U]
Term of patent 14 years
U.S. Cl. D7—679

307,224
CAN HOLDER FOR AN AUTOMOBILE
Atsuya Mizukami, Tokyo, Japan, assignor to Tanaka Manufacturing Company Limited, Tokyo, Japan
Filed Jul. 10, 1987, Ser. No. 72,237
Claims priority, application Japan, Feb. 2, 1987, 62-3734
Term of patent 14 years
U.S. Cl. D7—619

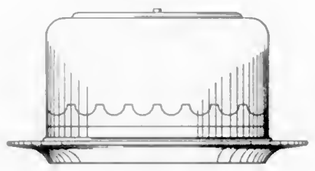
307,225
INVERTED BOTTLE HOLDER
Jason Freidenfelds, 26 Stafford St., Madison, N.J. 07940
Filed Jun. 22, 1988, Ser. No. 209,784
Term of patent 14 years
U.S. Cl. D7—619

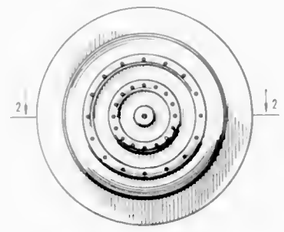


307,226
PORTABLE COOLER FOR ALLERGENIC EXTRACTS
John F. Baker, P.O. Box 27193, Concord, Calif. 94527-1983
Continuation-in-part of Ser. No. 732,350, Apr. 23, 1985, Pat. No. Des. 291,858. This application Jul. 10, 1987, Ser. No. 72,222
Term of patent 14 years
U.S. Cl. D7—605

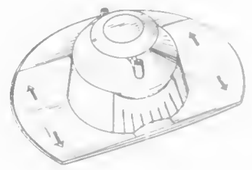


307,227
CELEBRATION CAKE COVER
Paul Sibilio, 2118 - 61st St., Brooklyn, N.Y. 11204, and George Hitt, 137-99 Bedell St., Jamaica, N.Y. 11413
Filed Jan. 11, 1988, Ser. No. 142,826
Term of patent 14 years
U.S. Cl. D7—610



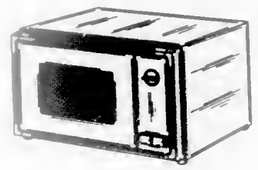


307,228
HOLDER FOR VEGETABLES TO BE CUT
A. Börner, Niederkail, Fed. Rep. of Germany, assignor to A. Börner GmbH, Fed. Rep. of Germany
Filed Aug. 24, 1987, Ser. No. 88,195
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1987, 7 AR 22/87
Term of patent 14 years
U.S. Cl. D7—683

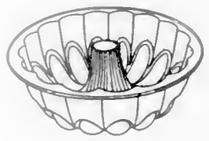


307,229
TEA BREWER
Tassilo V. Grolman, Füllerstr. 4, D-6370 Oberursel/Taunus, Fed. Rep. of Germany
Filed May 20, 1986, Ser. No. 865,541
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1985, 10 MR 665
Term of patent 14 years
U.S. Cl. D7—305

307,230
MICROWAVE OVEN
Junichi Sakamoto, and Kouji Satake, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Aug. 28, 1984, Ser. No. 645,544
Claims priority, application Japan, Feb. 29, 1984, 59-8063
Term of patent 14 years
U.S. Cl. D7—351



307,231
CAKE PAN OR THE LIKE
Richard J. Ciaccio, Wrentham, Mass., assignor to Dart Industries Inc., Deerfield, Ill.
Filed Mar. 4, 1987, Ser. No. 21,898
Term of patent 14 years
U.S. Cl. D7—354



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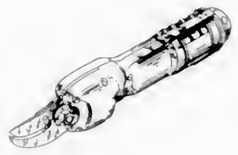
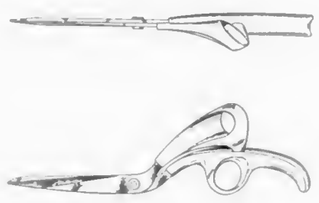
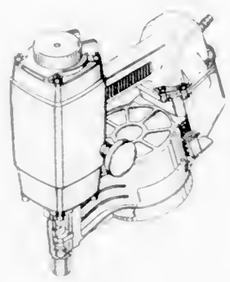
307,232
CORDLESS ELECTRIC PRUNER
Fusao Fushiya, and Hajime Ohta, both of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan
Filed Mar. 25, 1988, Ser. No. 172,866
Claims priority, application Japan, Nov. 4, 1987, 62-45011
Term of patent 14 years
U.S. Cl. D8—7



307,233
SCISSORS
David S. Chapin, Raleigh, N.C., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Feb. 2, 1987, Ser. No. 10,231
Term of patent 14 years
U.S. Cl. D8—57

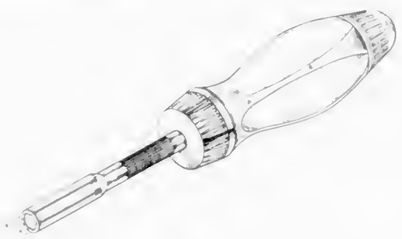


307,234
NAIL GUN
Fusao Fushiya, and Masaki Muromachi, both of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan
Filed Jul. 14, 1987, Ser. No. 73,208
Claims priority, application Japan, Jan. 20, 1987, 62-1984
Term of patent 14 years
U.S. Cl. D8—69



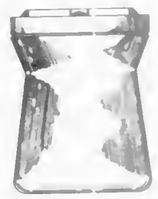
307,235
SCREWDRIVER
Jacques Goudeman, Sevres, France, assignor to Facom, S.A., Morangis, France
Filed Nov. 10, 1987, Ser. No. 118,961
Claims priority, application France, May 11, 1987, 87 2786
Term of patent 14 years
U.S. Cl. D8—82

307,236
SCREWDRIVER
Steven S. Cascio, Kenosha; Donald J. Caldwell, Milwaukee; Tom S. Severson; Steven R. Wente, both of Kenosha, and Mark S. Bakula, Muskego, all of Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.
Filed Jul. 11, 1986, Ser. No. 884,439
Term of patent 14 years
U.S. Cl. D8—82

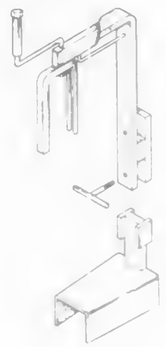


307,237
LOCK FOR ZIPPERED LUGGAGE
Urs Gisiger, Gaensbruehlweg 4, 2545 Selzach, Switzerland
Filed Jun. 3, 1987, Ser. No. 57,832
Term of patent 14 years
U.S. Cl. D8—331

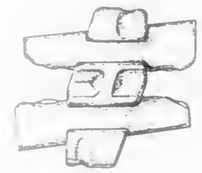
307,238
CONTAINER
Timothy J. May, Appleton, Wis., assignor to Reynolds Metals Company, Richmond, Va.
Filed Nov. 8, 1988, Ser. No. 269,268
Term of patent 14 years
U.S. Cl. D9—352

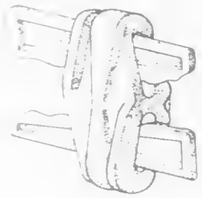


307,239
CARGO STRAP WINDER
Steve Topping, 2362 W. Euclid Ave., Stockton, Calif. 95204
Filed Jan. 2, 1987, Ser. No. 1,512
Term of patent 14 years
U.S. Cl. D8—359

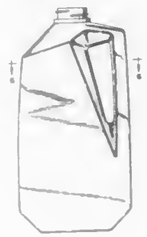


307,240
CABLE CLAMP
Carl H. Baker, P.O. Box 2127, Mackenzie, British Columbia, Canada
Filed Sep. 11, 1985, Ser. No. 774,742
Claims priority, application Canada, Mar. 11, 1985, 55781
Term of patent 14 years
U.S. Cl. D8—396





307,241
BOTTLE
Joseph Thompson, Upper Saddle River, N.J., assignor to Sterling Drug Inc., New York, N.Y.
Filed Apr. 25, 1988, Ser. No. 186,073
Term of patent 14 years
U.S. Cl. D9—378



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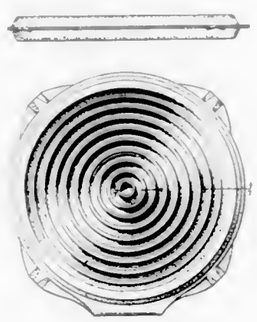
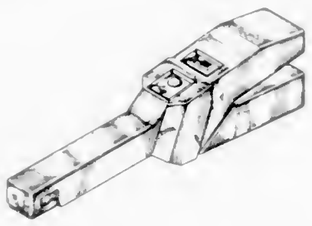
307,242
PACKAGE
Gilbert L. Horton, Kernersville, N.C., assignor to Sara Lee Corporation, Winston-Salem, N.C.
Filed Jun. 15, 1987, Ser. No. 61,394
Term of patent 14 years
U.S. Cl. D9—414

307,243
CONTAINER FOR PIZZA OR THE LIKE
Jay J. Baker, Box 579, Brocton, N.Y. 14716
Filed Dec. 17, 1987, Ser. No. 134,452
Term of patent 14 years
U.S. Cl. D9—426

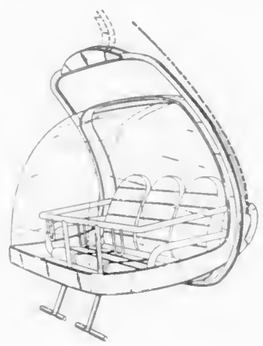


307,244
CURRENT PROBE
Daniel Arnoux, 10 Rue d'Alsace, St. Germain en Laye, France (78100)
Filed Jan. 16, 1987, Ser. No. 3,922
Term of patent 14 years
U.S. Cl. D10—79

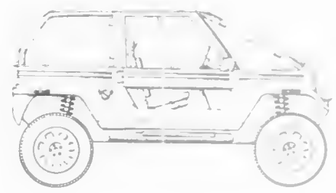


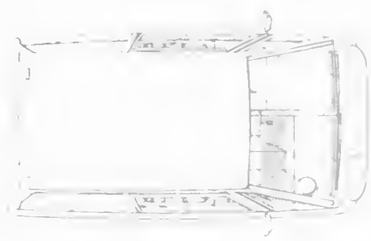
307,245
INTRUSION DETECTOR UNIT
Jack Biersdorff, Los Altos, Calif., assignor to C & K Systems, Inc., San Jose, Calif.
Filed Jul. 29, 1987, Ser. No. 79,490
Term of patent 14 years
U.S. Cl. D10—106

307,246
CHAIRLIFT UNIT WITH A PIVOTABLE CANOPY
Konrad Bergius, Stans-Oberdorf, Switzerland, and Hans-Werner Mattis, Darmstadt, Fed. Rep. of Germany, assignors to Von Roll Transportsysteme AG, Thun, Switzerland
Filed Aug. 3, 1987, Ser. No. 80,597
Claims priority, application Switzerland, Feb. 12, 1987, 115755
Term of patent 14 years
U.S. Cl. D12—52

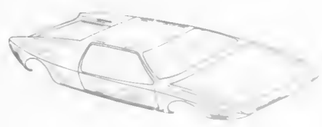


307,247
VEHICLE
Alain J. Clenet, 1211 Harbor Hill Dr., Santa Barbara, Calif. 93109
Filed Oct. 30, 1987, Ser. No. 114,389
Term of patent 14 years
U.S. Cl. D12—90

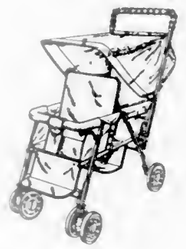




307,248
AUTOMOBILE BODY
Karl V. Dettling, 11429 Hieber Rd., Manchester, Mich. 48158
Filed Sep. 25, 1987, Ser. No. 101,272
Term of patent 14 years
U.S. Cl. D12—91



307,249
BABY CARRIAGE
David T. Yee, Hacienda Heights, and Eric Lin, Alhambra, both of Calif., assignors to A B Oriental Trading Co., Inc., Los Angeles, Calif.
Filed Dec. 18, 1987, Ser. No. 135,154
Term of patent 14 years
U.S. Cl. D12—129



307,250
BABY CARRIAGE
Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan
Filed Apr. 22, 1987, Ser. No. 41,323
Claims priority, application Japan, Nov. 26, 1986, 61-46881
Term of patent 14 years
U.S. Cl. D12—129

307,251
WHEEL HOLDER FOR A STROLLER
Staffan Ramer, Gislaved, Sweden, assignor to Alvema Aktiebolag, Solna, Sweden
Filed Aug. 20, 1987, Ser. No. 87,391
Claims priority, application Sweden, Feb. 20, 1987, 870377
Term of patent 14 years
U.S. Cl. D12—133

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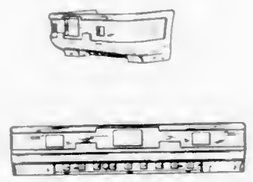
307,252
PROTECTIVE COVER FOR PICKUP TRUCKS
Parker E. Pratt, 7937 W. Tuckey La., Glendale, Ariz. 85303
Filed May 26, 1987, Ser. No. 54,671
Term of patent 14 years
U.S. Cl. D12—156

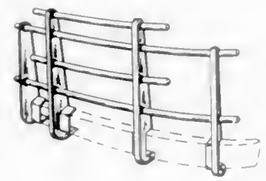
307,253
VAN CADDY FOR GOLFING PARAPHERNALIA
Lee R. Roberts, 3325 S. 41 Hwy., Dalton, Ga. 30720, and Steve Kearbey, P.O. Box 2601, Dalton, Ga. 30722
Filed Feb. 24, 1987, Ser. No. 18,006
Term of patent 14 years
U.S. Cl. D12—157

307,254
TRUCK BUMPER
Charles E. Koske, and Ross S. Sasamura, both of Fremont, Calif., assignors to Paccar Inc., Bellevue, Wash.
Filed Aug. 31, 1987, Ser. No. 91,259
Term of patent 14 years
U.S. Cl. D12—169

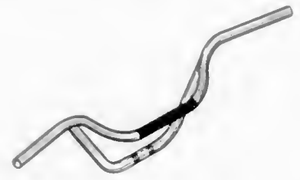


307,255
FRONT BUMPER FOR AN AUTOMOBILE
Yoshihiro Hamasaki, Toyota, and Kazumi Fukagawa, Tokyo, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed May 13, 1987, Ser. No. 49,087
Term of patent 14 years
U.S. Cl. D12—169

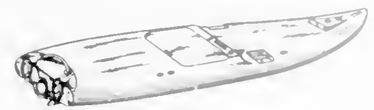
307,256
VEHICLE GUARD
Fred B. Holland, 409 S. Guadalupe, Redondo Beach, Calif. 90277
Filed Aug. 17, 1987, Ser. No. 93,895
Term of patent 14 years
U.S. Cl. D12—171



307,257
HANDLE BAR OR SIMILAR ARTICLE
Byron Tsai, Taichung Hsien, Taiwan, assignor to Giant Manufacturing Co., Ltd., Taichung Hsien, Taiwan
Filed Nov. 5, 1987, Ser. No. 117,649
Term of patent 14 years
U.S. Cl. D12—178

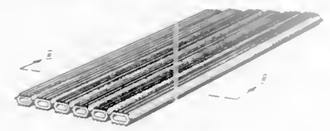


307,258
JET SURFBOARD
Egon G. Mooostory, 3743 Robertson Blvd., Culver City, Calif. 90232
Filed Mar. 30, 1988, Ser. No. 175,508
Term of patent 14 years
U.S. Cl. D12—307



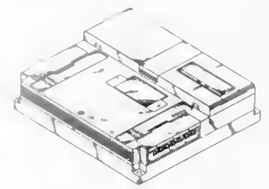
307,259
AIRCRAFT HOT AIR RELEASE SHROUD
Hiram B. Holt, 1713 Betty St., SW., Decatur, Ala. 35601
Filed Nov. 23, 1987, Ser. No. 124,467
Term of patent 14 years
U.S. Cl. D12—345

307,260
SOLAR COLLECTOR PANEL
Mel Happy, 2 Beahan Pla., Cherrybrook, N.S.W. 2120, and Stephen L. Merrett, 21 Daly St., Bilgola Plateau, N.S.W. 2107, both of Australia
Filed Mar. 12, 1987, Ser. No. 25,089
Term of patent 14 years
U.S. Cl. D13—102



307,261
BATTERY PACK
Tsuguo Miki, and Kaoru Sumita, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Oct. 3, 1988, Ser. No. 251,864
Term of patent 14 years
U.S. Cl. D13—103

307,262
PROGRAMMABLE CONTROLLER
Yoshinori Abe, Kanagawa; Muneaki Inoue, and Kazuhiro Hata, both of Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 29, 1987, Ser. No. 139,242
Claims priority, application Japan, Sep. 10, 1987, 62-37298
Term of patent 14 years
U.S. Cl. D13—162



307,263
CONTROL UNIT OF PROGRAMMABLE CONTROLLER
Katsuhiro Ishida, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Mar. 10, 1988, Ser. No. 166,166
Claims priority, application Japan, Sep. 14, 1987, 62-37584
Term of patent 14 years
U.S. Cl. D13—162

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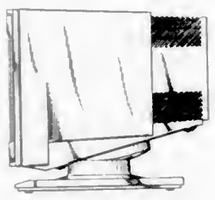
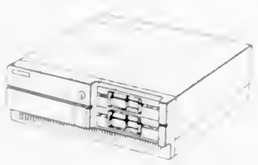
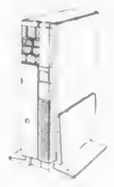
307,264
TOUCH CONTROL SCREEN DISPLAY TERMINAL
Jeffrey C. Brown, Seattle, and Terry G. Morey, Renton, both of Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.
Filed May 20, 1986, Ser. No. 867,256
Term of patent 14 years
U.S. Cl. D14—113



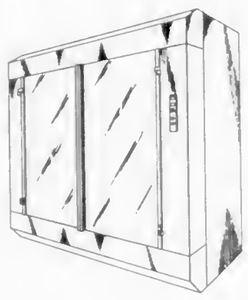
307,265
OPERATION AND CONTROL UNIT FOR A COMPUTER
Masaki Hara; Masayuki Sakai, and Naoto Katoh, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed May 21, 1987, Ser. No. 52,665
Claims priority, application Japan, Dec. 17, 1986, 61-49893
Term of patent 14 years
U.S. Cl. D14—100



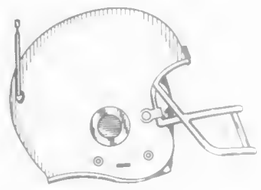
307,266
OPERATION AND CONTROL UNIT FOR A COMPUTER
Masaki Hara; Masayuki Sakai, and Katsuo Fukuyama, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed May 21, 1987, Ser. No. 52,664
Claims priority, application Japan, Dec. 17, 1986, 61-49894
Term of patent 14 years
U.S. Cl. D14—100



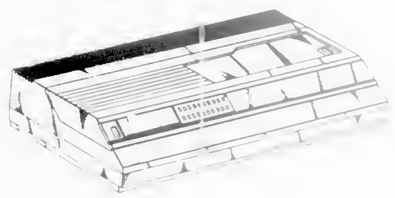
307,267
MICROFILM RETRIEVING AND SCANNING LIBRARY
Andrew V. McClare, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Feb. 27, 1987, Ser. No. 20,253
Term of patent 14 years
U.S. Cl. D14—107



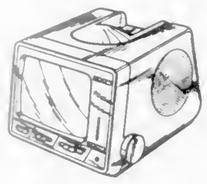
307,268
TELEVISION SET
Mike Lee, 2324 Tomich Rd., Hacienda Heights, Calif. 91745
Filed Apr. 2, 1987, Ser. No. 33,500
Term of patent 14 years
U.S. Cl. D14—126



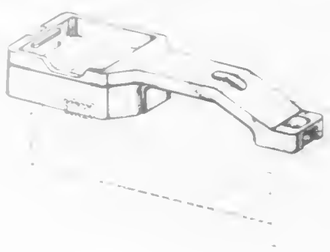
307,269
VIDEO PLAYER
Monte D. Lavine, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 3, 1987, Ser. No. 34,320
Term of patent 14 years
U.S. Cl. D14—135



307,270
TELEVISION RECEIVER
Yong H. Ham, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Oct. 14, 1987, Ser. No. 108,294
Claims priority, application Rep. of Korea, Jun. 18, 1987, 9262/11987
Term of patent 14 years
U.S. Cl. D14—134



307,271
TELEPHONE HANDSET HANG-UP DEVICE OR SIMILAR ARTICLE
Albert L. Nagele, Wilmette, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 21, 1988, Ser. No. 288,042
Term of patent 14 years
U.S. Cl. D14—138



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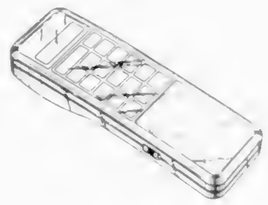
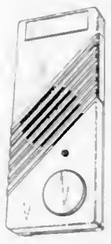
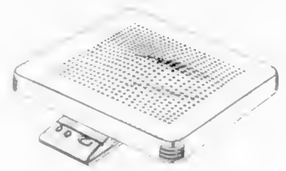
307,272
TELEPHONE HANDSET
Guy E. Desbarats, London, England, assignor to British Telecommunications public limited company, London, England
Filed Dec. 19, 1988, Ser. No. 286,023
Claims priority, application United Kingdom, Jun. 22, 1988, 1051769
Term of patent 14 years
U.S. Cl. D14—148

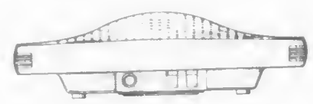


307,273
SPEECH MODULE FOR AN INTERCOMMUNICATION SYSTEM
Martin F. Carlile, Doncaster, England, assignor to Tunstall Telecom Limited, Whitley Bridge, United Kingdom
Filed Nov. 12, 1987, Ser. No. 120,088
Claims priority, application United Kingdom, May 13, 1987, 1042136
Term of patent 14 years
U.S. Cl. D14—159



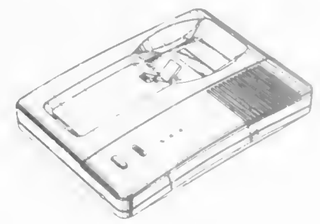
307,274
AUDIO TELECONFERENCE EQUIPMENT WITH ACOUSTIC ECHO CANCELLER
Kiyoshi Sasaki, and Keigo Kawasaki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Oct. 27, 1988, Ser. No. 263,491
Claims priority, application Japan, Apr. 27, 1988, 17398/1988
Term of patent 14 years
U.S. Cl. D14—243



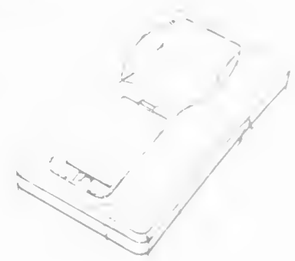


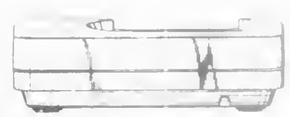
307,275
COVER SET FOR A TRANSMITTER-RECEIVER TELEPHONE HANDSET
Ronald Pollard, 4480 Goldfield Ave., Long Beach, Calif. 90807
Filed Nov. 14, 1988, Ser. No. 270,110
Term of patent 14 years
U.S. Cl. D14—249

307,276
TELEPHONE BASE UNIT
Guy E. A. Desbarats, London, England, assignor to British Telecommunications Public Limited Company, United Kingdom
Filed Apr. 27, 1989, Ser. No. 343,637
Claims priority, application United Kingdom, Oct. 31, 1988, GB1054658
Term of patent 14 years
U.S. Cl. D14—149

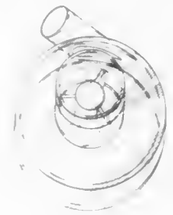


307,277
TELEPHONE CHARGING UNIT
Guy E. A. Desbarats, London, England, assignor to British Telecommunications Public Limited Company, United Kingdom
Filed Apr. 27, 1989, Ser. No. 343,544
Claims priority, application United Kingdom, Oct. 31, 1988, 1054659
Term of patent 14 years
U.S. Cl. D14—251

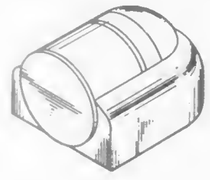




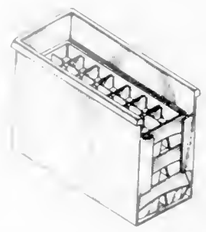
307,278
AQUARIUM PUMP CHAMBER
Heinz Turbanisch, Nuremberg, Fed. Rep. of Germany, assignor to Jet-Pumpen HT GmbH, Nuremberg, Fed. Rep. of Germany
Filed Jun. 18, 1987, Ser. No. 63,905
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1986, MRV11324
Term of patent 14 years
U.S. Cl. D15—8



307,279
CUTTING TOOTH FOR A ROTATING DRAG BIT
Lloyd Vincent, Salt Lake City, Utah, assignor to Eastman Christensen Company
Filed Oct. 16, 1986, Ser. No. 919,813
Term of patent 14 years
U.S. Cl. D15—21



307,280
ROTATABLE ICE CUBE TRAY UNIT
Blake E. Waller, 607 N. Carlisle St., and Clarence B. McCally, 101 Woodlawn Ter., both of Bamberg, S.C. 29003
Filed May 2, 1988, Ser. No. 189,593
Term of patent 14 years
U.S. Cl. D15—90



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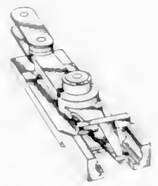
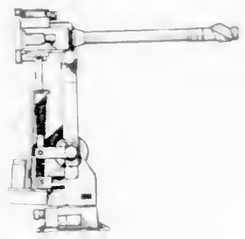
307,281
COMBINED TIE WIRE HOLDER AND SHEAR UNIT
Charles E. Burford, Dallas, Tex., assignor to Burford Corp., Maysville, Okla.
Filed Jun. 12, 1987, Ser. No. 61,177
Term of patent 14 years
U.S. Cl. D15—145

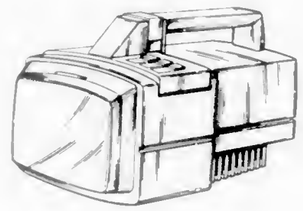


307,282
INDUSTRIAL ROBOT
David E. Suica; Edward J. Bailey, and Walter Binder, all of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed Feb. 11, 1987, Ser. No. 13,379
Term of patent 14 years
U.S. Cl. D15—199

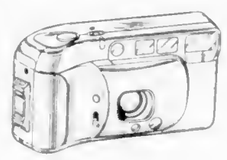


307,283
SUNGLASSES
Robert C. Lewis, Akron, Ohio, assignor to Ohio Sunglass Corporation, Akron, Ohio
Filed Feb. 16, 1988, Ser. No. 156,086
Term of patent 14 years
U.S. Cl. D16—104

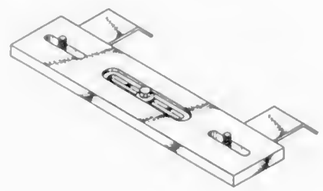
307,284
PORTABLE SPECTROPHOTOMETER
Marco Del Corno, and Sergio Zeni, both of Milan, Italy, assignors to Maxmeyer-Duco MM.D. S.p.A., Milan, Italy
Filed Jul. 20, 1988, Ser. No. 221,626
Claims priority, application Italy, Jan. 27, 1988, 20522/88[U]
Term of patent 14 years
U.S. Cl. D16—130



307,285
CAMERA
Noboru Tanaka, Kawasaki; Nobuhiro Ago, and Shuichi Tamura, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 12, 1986, Ser. No. 906,771
Claims priority, application Japan, Mar. 14, 1986, 61-9257
The portion of the term of this patent subsequent to Mar. 6, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D16—209

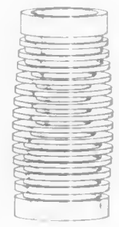


307,286
PHOTOGRAPHY SUPPORT BRACKET
Mark A. Ginder, 65 Hendricks Isle #1, Ft. Lauderdale, Fla. 33301
Filed Jul. 24, 1986, Ser. No. 888,986
Term of patent 14 years
U.S. Cl. D16—242



307,287
ELECTRONIC MUSIC KEYBOARD
Masaki Koide, Kunitachi, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Dec. 7, 1987, Ser. No. 129,080
Term of patent 14 years
U.S. Cl. D17—6

307,288
CLARINET TUNING BARREL
Donald E. Getzen, 15 Lake View Dr., Lake Geneva, Wis. 53147
Filed May 25, 1987, Ser. No. 66,406
Term of patent 14 years
U.S. Cl. D17—13



307,289
ELECTRONIC CALCULATOR WITH PRINTER
Hiroshi Sakaguchi, and Masaki Kawamura, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jun. 17, 1987, Ser. No. 63,286
Claims priority, application Japan, Dec. 18, 1986, 61-50583
Term of patent 14 years
U.S. Cl. D18—7

307,290
CALCULATOR OR SIMILAR ARTICLE
Ray Chen, Taipei, Taiwan, assignor to Cal-Comp Electronics, Inc., Taipei, Taiwan
Filed Nov. 25, 1987, Ser. No. 125,076
Term of patent 14 years
U.S. Cl. D18—7

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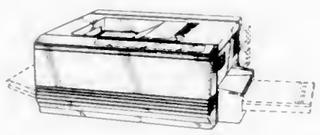
307,291
ELECTRONIC CALCULATOR
Yukihiko Ida, Higashi-Kurume, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Jul. 7, 1987, Ser. No. 70,510
Term of patent 14 years
U.S. Cl. D18—7

307,292
ELECTRONIC CALCULATOR
Hiroshi Sakaguchi, and Tadahiko Saimen, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Dec. 22, 1987, Ser. No. 136,388
Claims priority, application Japan, Jun. 22, 1987, 62-25561
Term of patent 14 years
U.S. Cl. D18—7

307,293
CASE FOR ELECTRONIC CALCULATOR
Masaji Sawada, and Toshiya Takahashi, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Oct. 16, 1987, Ser. No. 109,846
Claims priority, application Japan, Apr. 20, 1987, 62-15570
Term of patent 14 years
U.S. Cl. D18—11

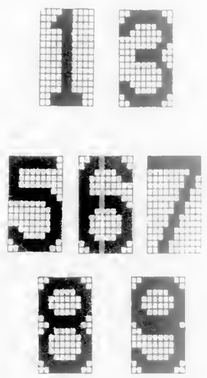
307,294
INK RIBBON CASSETTE FOR AN ELECTRONIC COMPUTER
Hidetoshi Kodama, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Aug. 24, 1987, Ser. No. 88,941
Claims priority, application Japan, Feb. 24, 1984, 62-6771
The portion of the term of this patent subsequent to Apr. 23, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—12

307,295
PRINTER
Kazuo Yoshida, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Oct. 6, 1987, Ser. No. 105,201
Claims priority, application Japan, Apr. 7, 1987, 62-13263
Term of patent 14 years
U.S. Cl. D18—13

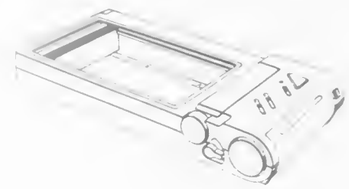


307,296
PRINTER
Jeffrey J. Ivarson, San Rafael, and Daniel J. Riley, San Francisco, both of Calif., assignors to Varitronic Systems, Inc., Minneapolis, Minn.
Filed Nov. 17, 1986, Ser. No. 931,631
Term of patent 14 years
U.S. Cl. D18—13

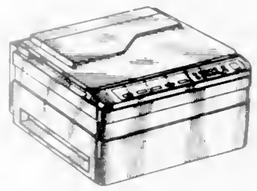
307,297
FONT OF TYPE
Kenneth D. Collister, Elkhart, Ind., assignor to Miles Inc., Elkhart, Ind.
Filed Dec. 5, 1988, Ser. No. 280,391
Term of patent 14 years
U.S. Cl. D18—26



307,298
PORTABLE COPIER
Koji Hikawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Jun. 11, 1987, Ser. No. 60,514
Claims priority, application Japan, Dec. 27, 1986, 051706/86
Term of patent 14 years
U.S. Cl. D18—36



307,299
ELECTRONIC COPYING MACHINE
Kunio Hara, Chiba, and Shin-ichi Hiroki, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 10, 1987, Ser. No. 23,877
Claims priority, application Japan, Sep. 11, 1986, 61-35603
Term of patent 14 years
U.S. Cl. D18—38



307,300
BACK-LIGHTED SIGN FRAME
Walter A. Morelle, 201 Madison St., Waterville, N.Y. 13480
Filed Aug. 3, 1987, Ser. No. 80,593
Term of patent 14 years
U.S. Cl. D20—42

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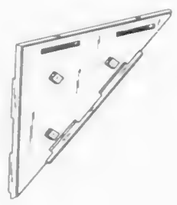
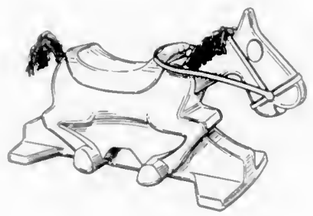
307,301
CORNER ADVERTISEMENT HOLDER
John L. Kraus, Shorewood, Wis., assignor to Frank Mayer & Associates, Grafton, Wis.
Filed Jan. 21, 1987, Ser. No. 5,736
Term of patent 14 years
U.S. Cl. D20—42

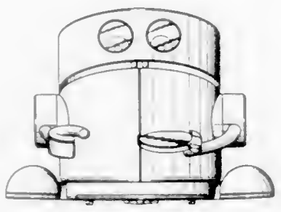


307,303
GAME TOKEN
David Hammerquist, P.O. Box 181, Boise, Id. 83701
Filed Jan. 8, 1987, Ser. No. 1,548
Term of patent 14 years
U.S. Cl. D21—53

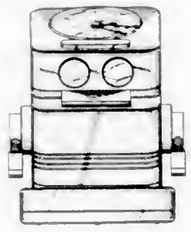
307,304
TOY RIDING PONY
Daniel G. Hahn, 1040 E. North Ave., Olney, Ill. 62450
Filed Feb. 5, 1988, Ser. No. 152,565
Term of patent 14 years
U.S. Cl. D21—70



307,302
TOY COIN BANK ROBOT
Hiroshi Horiuchi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed May 5, 1987, Ser. No. 46,300
Claims priority, application Japan, Nov. 8, 1986, 61-44217
Term of patent 14 years
U.S. Cl. D99—38



307,305
TOY CLOCK ROBOT
Hiroshi Horiuchi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed May 5, 1987, Ser. No. 46,303
Claims priority, application Japan, Nov. 8, 1986, 61 44216
Term of patent 14 years
U.S. Cl. D21—121



307,306
STUFFED ANIMAL TOY
Julie C. Boyd, and Hilda M. Curry, both of Rte. #1, Box 264, Stoneville, N.C. 27048
Filed Jan. 30, 1987, Ser. No. 8,930
Term of patent 14 years
U.S. Cl. D21—148

307,307
TOY WITH PIVOTABLE SECTIONS FOR FORMING MULTIPLE FACES
Robert T. Staake, 1507 Lanvale Dr., St. Louis, Mo. 63119
Filed Feb. 27, 1987, Ser. No. 19,778
Term of patent 14 years
U.S. Cl. D21—190

307,308
RACKET CLUB
Hal W. Cooper, 1111 Trisha Ave., Des Moles, Iowa 50313
Filed Jul. 27, 1987, Ser. No. 78,068
Term of patent 14 years
U.S. Cl. D21—212

307,309
GOLF PUTTER HEAD
Brian A. Doran, Buellton, Calif., and Robert H. Redkey, 1630 Maple, Solvang, Calif. 93463, assignors to Robert H. Redkey, Solvang, Calif.
Filed Mar. 11, 1987, Ser. No. 24,549
Term of patent 14 years
U.S. Cl. D21—215

307,310
WATERBOARD FIN
Lawrence S. Bucknell, 62-202 Kamehameha Hwy., Haleiwa, Hi. 96712
Filed Jan. 28, 1988, Ser. No. 150,533
Term of patent 14 years
U.S. Cl. D21—231

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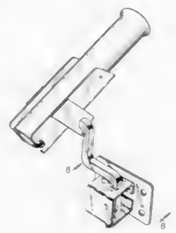
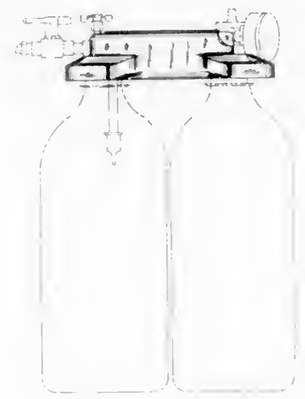
307,311
TENT
Todd Dalland, 110 Reade St., New York, N.Y. 10013
Filed Mar. 26, 1987, Ser. No. 30,912
Term of patent 14 years
U.S. Cl. D21—253

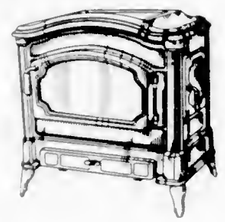
307,312
FISHING POLE HOLDER
Arnold R. Engle, 1644 NE. 143rd Ave., Portland, Oreg. 97230
Filed Jul. 30, 1987, Ser. No. 79,791
Term of patent 14 years
U.S. Cl. D22—147



307,313
COMBINED MANIFOLD COVERING AND HANDLE FOR MULTIPLE BOTTLE SPRAYER ASSEMBLY
Duane C. Nugent, 344 E. 2nd St., Perrysburg, Ohio 43551
Filed Oct. 26, 1987, Ser. No. 113,806
Term of patent 14 years
U.S. Cl. D23—225



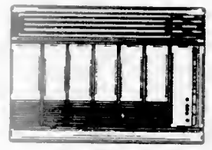
307,314
STOVE
Claude Berlaimont, Couvin, Belgium, assignor to Fonderies du Lion, S.A., Frasnes-Lez-Couvin, Belgium
Filed May 18, 1987, Ser. No. 51,060
Claims priority, application Benelux, Nov. 20, 1986, 3968
Term of patent 14 years
U.S. Cl. D23—346



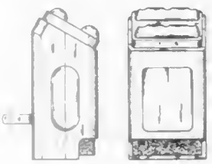
307,315
STOVE
Claude Berlaimont, Couvin, Belgium, assignor to Fonderies du Lion, S.A., Frasnes-Lez-Couvin, Belgium
Filed Jul. 8, 1987, Ser. No. 71,795
Claims priority, application Benelux, Jan. 26, 1987, 4025
Term of patent 14 years
U.S. Cl. D23—346

307,316
STOVE
Claude Berlaimont, Couvin, Belgium, assignor to Fonderies du Lion, S.A., Frasnes-Lez-Couvin, Belgium
Filed Jul. 7, 1987, Ser. No. 70,537
Claims priority, application Benelux, Jan. 13, 1987, 4018
Term of patent 14 years
U.S. Cl. D23—346

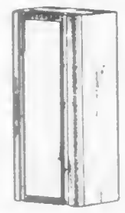
307,317
AIR CONDITIONER
Hiroshi Moritani, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 25, 1987, Ser. No. 125,056
Claims priority, application Japan, Jun. 4, 1987, 62-23047
Term of patent 14 years
U.S. Cl. D23—353



307,318
ELECTRONIC IONIZER FOR AIR TREATMENT
Ronald O. Hilger, Elmhurst, and Michael Yurkovic, Chicago, both of Ill., assignors to Associated Mills Inc., Chicago, Ill.
Filed Feb. 8, 1988, Ser. No. 153,653
Term of patent 14 years
U.S. Cl. D23—364



307,319
HOUSING FOR INDUCING AIR FLOW PAST A GEL-TYPE PRODUCT FOR PRODUCING A FRAGRANCE
David H. Hildebrandt, New Britain, Conn., assignor to Waterbury Companies, Inc., Waterbury, Conn.
Filed Jul. 6, 1987, Ser. No. 70,279
Term of patent 14 years
U.S. Cl. D23—366



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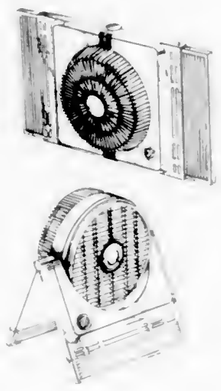
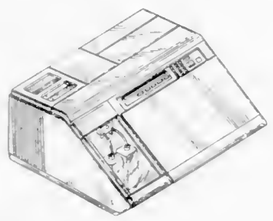
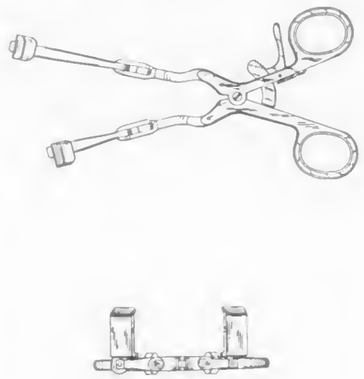
307,320
COMBINED WINDOW AND FLOOR FAN
Shao Shin-Chin, Taipai Hsin, Taiwan, assignor to Holmes Products Corp., Holliston, Mass.
Filed Apr. 29, 1988, Ser. No. 187,891
Term of patent 14 years
U.S. Cl. D23—382



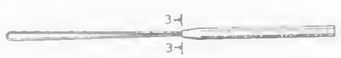
307,321
CLINICAL ANALYZER OR THE LIKE
Jeffrey D. Bransky, LaGrange; James T. Tyranski, Cary; Robert J. Nelson, Mundelein, and Dave H. Bloom, Vernon Hills, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.
Filed May 6, 1987, Ser. No. 46,966
Term of patent 14 years
U.S. Cl. D24—1.1



307,322
TEMPOROMANDIBULAR JOINT RETRACTOR INSTRUMENT OR THE LIKE
J. Franklin Dolwick, Gainesville, Fla., assignor to Walter Lorenz Surgical Instruments, Inc., Jacksonville, Fla.
Filed Aug. 13, 1987, Ser. No. 84,745
Term of patent 14 years
U.S. Cl. D24—10



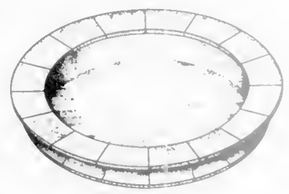
307,323
SURGICAL INSTRUMENT FOR ENDARTERECTOMIES
Timothy M. Scanlan, St. Paul, Minn., assignor to Scanlan International, Inc., St. Paul, Minn.
Filed Feb. 21, 1985, Ser. No. 703,764
Term of patent 14 years
U.S. Cl. D24—28



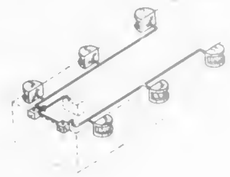
307,324
DUAL VENT FILTER FOR USE WITH INTRAVENOUS TUBING
John M. Unger, Lake Geneva, Wis.; Birendra K. Lal, Glendale Heights, and Thomas Kasting, McHenry, both of Ill., assignors to Baxter International Inc., Deerfield, Ill.
Filed May 22, 1987, Ser. No. 54,164
Term of patent 14 years
U.S. Cl. D24—52

307,325
EARPLUG OR SIMILAR ARTICLE
Ross Gardner, Jr., Indianapolis, Ind., assignor to Cabot Corporation, Waltham, Mass.
Filed Nov. 5, 1987, Ser. No. 117,275
Term of patent 14 years
U.S. Cl. D24—67

307,325
SWIMMING POOL
Lynn F. Smith, 202 N. Pennsylvania Ave., Centre Hall, Pa. 16828
Filed Apr. 23, 1987, Ser. No. 41,369
Term of patent 14 years
U.S. Cl. D25—2

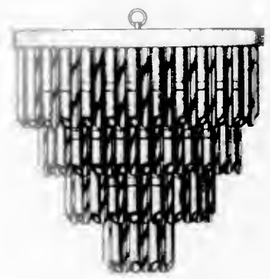


307,327
BOAT LIGHTING SYSTEM
James A. Daniels, Box 271, Clearwater, Minn. 55320
Filed Feb. 16, 1988, Ser. No. 155,744
Term of patent 14 years
U.S. Cl. D26—35



307,328
WALL MOUNTED LUMINAIRE
James E. Roulstone, Spring, Tex., assignor to Innovative Controls, Inc., Tex.
Filed Jun. 24, 1987, Ser. No. 65,713
Term of patent 14 years
U.S. Cl. D26—85

307,329
LIGHTING FIXTURE
William Segill, Newton; Mark E. Segill, Framingham, and Michael Dangelo, Seekonk, all of Mass., assignors to American Lighting Fixture Corp., Taunton, Mass.
Filed May 20, 1988, Ser. No. 196,347
Term of patent 14 years
U.S. Cl. D26—91



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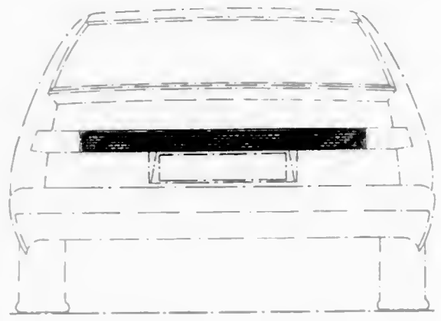
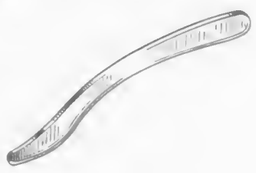
307,330
VEHICLE REAR SIGNAL LIGHT LENS
Carmelo Vitale, Mozzate, and Ezio Villa, Arese, both of Italy, assignors to Alfa Lancia Industriale S.p.A., Arese, Italy
Filed Feb. 26, 1988, Ser. No. 160,928
Claims priority, application Italy, Sep. 4, 1987, 22264/87[U]
Term of patent 14 years
U.S. Cl. D26—122



307,331
APPLICATOR FOR A COSMETIC PRODUCT
Mary Pflieger, Teaneck, N.J., assignor to Revlon, Inc., New York, N.Y.
Filed Nov. 27, 1987, Ser. No. 126,144
Term of patent 14 years
U.S. Cl. D28—7

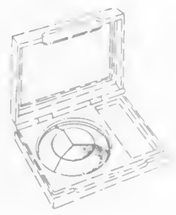


307,332
COSMETIC APPLICATOR
Karin Dahm, Rodenberger Allee 1, 3052 Bad Neandorf 1, Fed. Rep. of Germany
Filed Sep. 3, 1986, Ser. No. 903,310
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1986, 9AR28/86
Term of patent 14 years
U.S. Cl. D28—7

307,333
DISPOSABLE RAZOR
Frank A. Ferraro, Trumbull, Conn., and David S. Byrne, Atlantic Highlands, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed Jul. 24, 1987, Ser. No. 77,542
The portion of the term of this pateot subsequent to Apr. 17, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—46

307,334
DISPOSABLE RAZOR
Frank A. Ferraro, Trumbull, Conn., and David S. Byrne, Atlantic Highlands, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed Jul. 24, 1987, Ser. No. 77,537
The portion of the term of this patent subsequent to Apr. 17, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—46

307,335
COSMETIC CAKE
Jill E. Scalamandre, and Marlene Tietjen, both of New York, N.Y., assignors to Revlon, Inc., New York, N.Y.
Filed Jan. 4, 1988, Ser. No. 140,469
Term of patent 14 years
U.S. Cl. D28—76



307,336
COMBINED CONTAINER/BOTTLE AND COSMETIC WAND APPLICATORS OR THE LIKE
Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414, and Gino H. Cassai, Brooklyn, N.Y., assignors to Henry J. Cassai, Howard Beach, N.Y.
Division of Ser. No. 736,448, May 21, 1985, abandoned. This application Mar. 28, 1989, Ser. No. 329,500
Term of patent 14 years
U.S. Cl. D28—77

307,337
COSMETIC CAKE
Jill E. Scalamandre, and Marlene Tietjen, both of New York, N.Y., assignors to Revlon, Inc., New York, N.Y.
Filed Jan. 4, 1988, Ser. No. 140,470
Term of patent 14 years
U.S. Cl. D28—76

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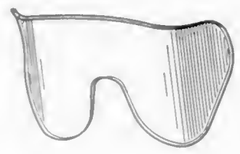
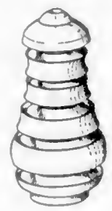
307,337
COMBINED CONTAINER/BOTTLE AND COSMETIC WAND APPLICATORS OR THE LIKE
Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414, and Gino H. Cassai, Brooklyn, N.Y., assignors to Henry J. Cassai, Howard Beach, N.Y.
Division of Ser. No. 765,394, Aug. 14, 1985, abandoned. This application Apr. 14, 1989, Ser. No. 337,531
Term of patent 14 years
U.S. Cl. D28—77

307,338
VISOR
Gilbert Vandeputte, Berchem, Belgium, assignor to Engicom, Brussel, Belgium
Filed Nov. 12, 1987, Ser. No. 119,433
Claims priority, application Benelux, May 15, 1987, 62137-00
Term of patent 14 years
U.S. Cl. D29—18



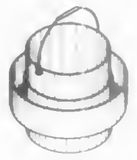
307,339
PET TOY
Joseph P. Markham, and Peter Emily, both of Lakewood, Colo., assignors to Bounce, Inc., Lakewood, Colo.
Filed Jul. 15, 1987, Ser. No. 73,432
Term of patent 14 years
U.S. Cl. D30—160



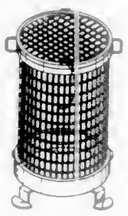
307,340
EXTRACTOR FOR REMOVING WASTE PRODUCTS
Patrick C. Armour, 667 Kingman Dr., Vacaville, Calif. 95688
Filed Apr. 23, 1987, Ser. No. 41,580
Term of patent 14 years
U.S. Cl. D32—1

307,341
FABRIC STEAMER
Masao Tsuji, Old Lyme, and Howard L. Rauch, Old Saybrook, both of Conn., assignors to North American Philips Corp., New York, N.Y.
Filed Dec. 17, 1986, Ser. No. 943,291
Term of patent 14 years
U.S. Cl. D32—17

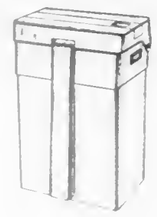
307,342
BUCKET
Michael A. Giallourakis, Tarpon Springs, Fla., assignor to Sponge Fishing Company, Inc., Tarpon Springs, Fla.
Filed Oct. 9, 1987, Ser. No. 106,324
Term of patent 14 years
U.S. Cl. D32—53



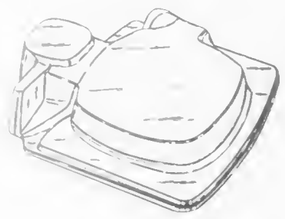
307,343
TRASH BARREL SPARK ARRESTER
Charles S. Lauraine, Jr., and Stephen E. Driscoll, both of Rte. 8, Box 1550, Odessa, Tex. 79763
Filed Aug. 11, 1986, Ser. No. 895,679
Term of patent 14 years
U.S. Cl. D34—1



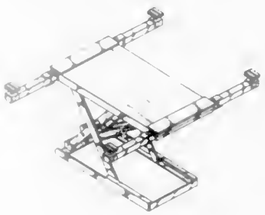
307,344
COMPACTING GARBAGE CAN
Henry Massonnet, Nurieux-Volognat 01760, France
Filed Nov. 25, 1987, Ser. No. 125,062
Claims priority, application France, Jun. 10, 1987, 87 3441
Term of patent 14 years
U.S. Cl. D34—7



307,345
JACK BOTTOM PLATE
Anders Persson, and Leif Högberg, both of Eskilstuna, Sweden, assignors to Aktiebolaget Nike, Eskilstuna, Sweden
Filed Jun. 6, 1988, Ser. No. 203,348
Claims priority, application Sweden, Dec. 9, 1987, 87-2922
Term of patent 14 years
U.S. Cl. D34—31



307,346
VEHICLE LIFT
Yusuke Kawana, Otowa, Japan, assignor to Sugiyasu Industries Co., Ltd., Takaham, Japan
Filed Feb. 2, 1988, Ser. No. 151,268
Claims priority, application Japan, Dec. 3, 1987, 62-49673
Term of patent 14 years
U.S. Cl. D34—31



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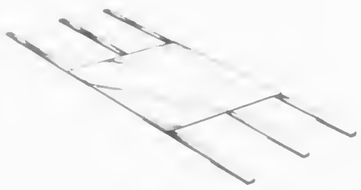
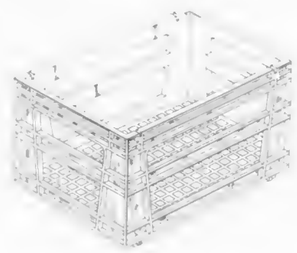
307,347
FORK LIFT CANOPY COVER
Donald C. Gibson, 371 Via Marco La., Anaheim, Calif. 92806
Filed Jul. 18, 1986, Ser. No. 886,746
Term of patent 14 years
U.S. Cl. D34—35



307,348
BASKET
Toshimichi Yoshikawa, Kita Katsuragi, Japan, assignor to Kabushiki Kaisha Yoshikawa Kuni Kogyosho, Nara, Japan
Filed Apr. 22, 1986, Ser. No. 857,548
Claims priority, application Japan, Nov. 15, 1985, 60-48071
The portion of the term of this patent subsequent to Dec. 26, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D34—40

307,349
BEVERAGE CASE
Thomas Box, Tinton Falls, N.J., assignor to Spectrum International, Inc., Tinton Falls, N.J.
Filed Dec. 7, 1987, Ser. No. 129,053
Term of patent 14 years
U.S. Cl. D34—43



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF APRIL, 1990

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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ABB Stromberg Drives OY: *See*—
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McAlpine, James B.; Jackson, Marianna; and Karwowski, James, 4,918,174, Cl. 536-7.100.
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ABCO Industries, Inc.: *See*—
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Tsujii, Nobuhiro; Abe, Genryu; Yamaguchi, Akira; Mishuku, Minoru; and Tsuchiya, Nobujiro, 4,917,961, Cl. 428-552.000.
Abe, Koichi: *See*—
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Abe, Ryutaro: *See*—
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Abe, Shinya: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Suzuki, Takeshi; Suzuki, Yoshikazu; Tagaya, Osamu; Suzuki, Kouichi; Abe, Koichi; and Yamada, Kouji, 4,917,829, Cl. 260-413.000.
Abe, Susumu; Ikai, Tadayoshi; and Ogawa, Masahiro, to Toyota Jidosha Kabushiki Kaisha. Production process of silicon carbide short fibers. 4,917,866, Cl. 423-345.000.
Abe, Tetsuya: *See*—
Nohira, Hiroyuki; Kamei, Masarao; Kanazawa, Hideki; Abe, Tetsuya; Yamada, Yoko; and Etoh, Yuko, 4,917,817, Cl. 252-299.010.
Abraham, Dennis G.: *See*—
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B., Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D.; and Yeh, Phil C., 4,918,728, Cl. 380-21.000.
Abraham, Jacob A.: *See*—
Jain, Kailash C.; and Abraham, Jacob A., 4,918,032, Cl 437-228.000.
Abrams, Stuart G.; and Dyer, Keith E., to Board of Regents, University of Texas System, The. Needle disposal device 4,917,243, Cl. 206-365.000.
Abumehdi, Cyrus: *See*—
Gilham, Dennis T.; Herbert, Raymond J.; and Abumehdi, Cyrus, 4,917,010, Cl. 101-93.040.
Acker, Michael: *See*—
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Actel Corporaton: *See*—
Galbraith, Douglas C.; and Ahrens, Michael G., 4,918,341, Cl 307-530.000.
Adachi, Hideki: *See*—
Murakami, Koichi; Adachi, Hideki; Miyata, Masanori; and Honjo, Takeshi, 4,917,366, Cl. 270-53.000.
Adachi, Koshirou: *See*—
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Adam, Colin M.; Okazaki, Kenji; Skinner, David J.; and Corey, Robert G., to Allied-Signal Inc. Rapidly solidified aluminum-transition metal-silicon alloys. 4,917,739, Cl. 148-437.000.
Adamantech, Inc.: *See*—
McCormick, William, 4,917,930 Cl. 424-78.000.
Adams, Carol A.; and Adams, James D. Beverage cooler insert. 4,916,923, Cl. 62-457.100.
Adams, Eddie D.: *See*—
Roberts, Therese L.; and Adams, Eddie D., 4,917,240, Cl. 206-232.000.
Adams, James D.: *See*—
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Adams, Sally E.: *See*—
Kingsman, Alan J.; Kingsman, Susan M.; and Adams, Sally E., 4,918,166, Cl. 530-350.000.
Adamski, Joseph R.; Barrett, Richard L.; and Bakowski, Ted, to Varian Associates, Inc. X-ray tube exposure monitor. 4,918,714, Cl. 378-121.000.
Adamson, Arthur P.; and Butler, Lawrence, to General Electric Company. High bypass turbofan engine having a partially geared fan drive turbine. 4,916,894, Cl. 60-226.100.
ADE Corporation: *See*—
Poduje, Noel S.; and Mallory, Roy S., 4,918,376, Cl. 324-663.000.
Adeka Argus Chemical Co., Ltd.: *See*—
Akutsu, Mitsuo; Iwakura, Syuji; Oya, Keiji; and Tabata, Keiji, 4,918,046, Cl. 503-216.000.
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Adir Et Cie: *See*—
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Adler, Richard J.: *See*—
Busby, Kenneth O.; Adler, Richard J.; Miner, Lynn M.; and Kiuttu, Gerald F., 4,918,325, Cl. 307-106.000.
Adolf, Gunther: *See*—
Hauptmann, Rudolf; Swetly, Peter; Meindl, Peter; Adolf, Gunther; Falkner, Edgar; Bodo, Gerhard; and Maurer-Fogy, Ingrid, 4,917,887, Cl. 424-85.700.
Adolphs, Peter: *See*—
Gardziella, Arno; Schwieger, Karl-Heinz; Adolphs, Peter; and Suren, Josef, 4,918,116, Cl. 523-149.000.
Adur, Ashok M.; and Shedd, Charles D., to BP Performance Polymers, Inc. Filled elastomer blends. 4,918,127, Cl. 524-415.000.
Advanced Cardiovascular Systems, Inc.: *See*—
Miller, Gary H.; Kraus, Jeffrey L.; and Guthrie, Linda T., 4,917,102, Cl. 128-772.000.
Advanced Micro Devices, Inc.: *See*—
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Asche, Henning; and Affolter, Heidi, 4,917,886, Cl. 424-81.000.
Agency of Industrial Science & Technology: *See*—
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Agfa-Gevaert Aktiengesellschaft: *See*—
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Augstein, Joachim; and Ahmed, Maqbool, 4,917,897, Cl. 424-450.000.
Ahrens, Michael G.: *See*—
Galbraith, Douglas C.; and Ahrens, Michael G., 4,918,341, Cl. 307-530.000.
Aihara, Ryuzo; and Kasahara, Haruo, to Jeol, Ltd. Apparatus using charged-particle beam. 4,918,358, Cl. 315-111.810.
Aikin, John A.; Angus, Derek; Reinwald, John W.; and Schankula, Jack, to Atomic Energy of Canada Limited. Valve leakage inspection, testing and maintenance process. 4,916,938, Cl. 73-46.000.
Aikins, Jerry L., to Zimmer, Inc. Prosthetic ligament. 4,917,700, Cl. 623-13.000.
Ainger, Raymond, II: *See*—
Grossi, Benedetto; and Ainger, Raymond, II, 4,917,082, Cl. 606-46.000.
Air Physics Corporation: *See*—
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Deeba, Michel; Ford, Michael E.; and Johnson, Thomas A., 4,918,233, Cl. 564-479.000.
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Airflow Research and Manufacturing Corporation: *See*—
Van Houten, Robert, 4,917,572, Cl. 415-206.000.
Airfoil Textron Inc.: *See*—
Spain, Raymond G., 4,916,997, Cl. 87-1.000.
Aisin Seiki Kabushiki Kaisha: *See*—
Eguchi, Katsuhiko; and Ohmi, Atsushi, 4,917,052, Cl. 123-41.470.
Ishihara, Hiroshi; and Hirose, Kimiharu, 4,917,424, Cl. 292-336.300.
Aisin-Warner Kabushiki Kaisha: *See*—
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Ito, Yasunobu; and Yamamoto, Masanari, 4,918,606, Cl. 364-424.100.
Ajaxon, Bengt M.: *See*—
Wretlind, Karl A. J.; and Ajaxon, Bengt M., 4,917,880, Cl. 424-5.000.
Akai, Yoshito; Konaga, Nobuyuki; Arisato, Yasunori; and Moritsu, Yukikazu, to Okuno Chemical Industry Co., Ltd. Metal coated ceramic composition. 4,917,958, Cl. 428-457.000.
Akamatsu, Hideo: *See*—
Matsuzaka, Syoji; Akamatsu, Hideo; Nishiwaki, Shu; and Suda, Yoshihiko, 4,917,996, Cl. 430-567.000.
Akana, Yoshinori: *See*—
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Akao, Michitoshi: *See*—
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Akebono Brake Industry Co., Ltd.: *See*—
Ikegami, Hiroshi, 4,917,220, Cl. 188-196.00D.
Akiba, Shigeyuki: *See*—
Matsushima, Yuichi; Sakai, Kazuo; Akiba, Shigeyuki; and Utaka, Katsuyuki, 4,918,496, Cl. 357-17.000.
Akutsu, Mitsuo; Iwakura, Syuji; Oya, Keiji; and Tabata, Keiji, to Adeka Argus Chemical Co., Ltd. Heat-sensitive recording material. 4,918,046, Cl. 503-216.000.
Akutsu, Naoji: *See*—
Tanuma, Jiro; Akutsu, Naoji; and Kasai, Tadashi, 4,918,365, Cl. 318-685.000.
Al-Janaby, Harith J.: *See*—
Dahn, Jeffrey R.; and Al-Janaby, Harith J., 4,917,871, Cl. 423-61.000.
Al-Kadimi, Adnan D.: *See*—
Druzhinin, Nikolai V.; Pavlenko, Anatoly R.; Abakumov, Valentin G.; Al-Kadimi, Adnan D.; Zhluktenko, Sergei V.; Lazebny, Vladimir S.; Kalmykov, Anatoly I.; Kuzoyatova, Elena G.; Chuev, Viktor Y.; Sysoev, Anatoly S.; Pichugin, Alexandr P.; Fetisov, Anatoly B.; Denbnovetsky, Stanislav V.; Leschishin, Alexandr V.; Kuzmin, Vladimir P.; and Mikhailov, Vladimir N., 4,918,456, Cl. 342-26.000.
Albert, Barry R. Shovel blade and method of manufacture. 4,916,984, Cl. 76-113.000.
Albert, Bernhard; Hauser, Peter; Acker, Michael; Schrott, Wolfgang; and Wagenblast, Gerhard, to BASF Aktiengesellschaft. Optical recording medium which has a reflector layer containing a silicon-phthalocyanine derivative. 4,917,989, Cl. 430-270.000.
Alberts, Heinrich: *See*—
Probst, Joachim; Schafer, Walter; Schuster, Klaus; Alberts, Heinrich; Muller, Hanns P.; Schmidt, Adolf; and Wieczorrek, Wolfhart, 4,918,135, Cl. 524-714.000.
Albertson, Orris E.; and Baturay, Allen. Sludge incineration in single stage combustor with gas scrubbing followed by afterburning and heat recovery. 4,917,027, Cl. 110-346.000.
Albrektsson, Tomas, to Nobel Pharma AB. Bone ingrowth chamber. 4,917,703, Cl. 623-66.000.
Alcan International Limited: *See*—
Enright, Philip G., 4,917,728, Cl. 75-68.00R.
Alcatel Business Systems Limited: *See*—
Gilham, Dennis T.; Herbert, Raymond J.; and Abumehdi, Cyrus, 4,917,010, Cl. 101-93.040.
Alcatel USA Corp.: *See*—
Krishnan, Iyengar N.; and Toegel, Herbert J., 4,918,597, Cl. 364-200.000.
Alco Electronic Products, Inc.: *See*—
Stokoe, Philip T.; and Boulais, Dennis R., 4,918,273, Cl. 200-550.000.
Aldrich Chemical Co., Inc.: *See*—
Brown, Herbert C., 4,918,207, Cl. 549-504.000.
Brown, Herbert C., 4,918,229, Cl. 564-302.000.
Brown, Herbert C., 4,918,242, Cl. 568-658.000.
Brown, Herbert C., 4,918,246, Cl. 568-812.000.
Alexander, Douglas J.: *See*—
Koblasz, Arthur; Hollister, James K.; Alexander, Douglas J.; and Kirschner, Jonathan, 4,917,155, Cl. 141-1.000.
Alexander, Roy P.; and Milford, Alan H. Pool chemical dispenser. 4,917,868, Cl. 422-119.000.
Alfa Lancia Industriale S.p.A.: *See*—
Pasquali, Renato; and Verga, Luigi, 4,917,404, Cl. 280-853.000.
Alfano, Robert R.: *See*—
Li, Yao; Alfano, Robert R.; and Eichmann, George, 4,918,635, Cl. 364-713.000.
Aljoe, Ronald R.: *See*—
Rhodes, John C.; Aljoe, Ronald R.; and Ellers, Berne F., 4,917,936, Cl. 428-137.000.
All-Prime Enterprise Corp.: *See*—
Wu, Pauli, 4,917,245, Cl. 206-471.000.
Allain, Reid P., to Kennedy, Robert B., a part interest. Method and apparatus for processing shrimp. 4,916,776, Cl. 17-71.000.
Allelix Biopharmaceuticals Inc.: *See*—
Goodbody, Anne E.; Tsuyoshi, Endo; Vukovic, John; and Misawa, Masanaru, 4,918,011, Cl. 435-119.000.
Allen-Bradley Company, Inc.: *See*—
Floro, William E.; Luboski, Mark; and Murphy, Timothy J., 4,918,589, Cl. 364-132.000.
Allenson, Stephan J., to Nalco Chemical Company. Water clarification process. 4,917,803, Cl. 210-728.000.
Allied-Signal Inc.: *See*—
Adam, Colin M.; Okazaki, Kenji; Skinner, David J.; and Corey, Robert G., 4,917,739, Cl. 148-437.000.
Fecher, Douglas A., 4,917,000, Cl. 91-369.200.
Strnad, George, 4,917,325, Cl. 242-107.40B.
Allison, C. Jay; and Park, David W., to Weyerhaeuser Company. Flame retardant plant. 4,917,922, Cl. 428-22.000.
Allison, Robert J., Jr.: *See*—
Ardini, Joseph L., Jr.; and Allison, Robert J., Jr., 4,918,693, Cl. 371-21.600.
Alpar, Tibor; Gyorvari, Janos; and Schmidt, Erno , to Fakombinat. Apparatus for the production of building units from afterhardening materials. 4,917,587, Cl. 425-64.000.
Alpine Electronics Inc.: *See*—
Kikuchi, Takashi; and Aoyagi, Shigeo, 4,918,547, Cl. 360-92.000.
Alps Electric Co., Ltd.: *See*—
Furudate, Mitsuru, 4,918,577, Cl. 362-31.000.
Iihama, Takao; and Wada, Hidekazu, 4,917,317, Cl. 242-4.00R.
Notoya, Reiko; and Nagayama, Tatsumi, 4,917,972, Cl. 429-44.000.
Alternativt Fiskeredskap AS: *See*—
Pedersen, Didrik, 4,916,851, Cl. 43-101.000.
Althaus, Wolfgang, to Wilkinson Sword Gesellschaft Mit Beschrankter Haftung. Wet-shave razor. 4,916,814, Cl. 30-40.200.
Althausen, Ferinand: *See*—
Proksa, Ferdinand; Sulzbach, Hans-Michael; Raffel, Reiner; and Althausen, Ferinand, 4,917,502, Cl. 366-159.000.
ALZA Corporation: *See*—
Lee, Eun S.; Edgren, David; and Yum, Su I., 4,917,895, Cl. 424-448.000.
Amada Company, Limited: *See*—
Naito, Kinshiro, 4,918,364, Cl. 318-646.000.
Amann, Markus-Christian; and Stegmueller, Bernhard, to Siemens Aktiengesellschaft. Semiconductor laser arrangement and method for the operation thereof. 4,918,701, Cl. 372-50.000.
Amax Inc.: *See*—
Chou, Eddie C. J.; Beckstead, Leo W.; Kucera, Charles J., Jr.; and Papafingos, Pandelis, 4,917,726, Cl. 75-623.000.
Ambasz, Emilio. Collapsible luggage carrier. 4,917,392, Cl. 280-40.000.
Amca International Limited: *See*—
Wildey, Allan J., 4,917,315, Cl. 241-275.000.
American Cyanamid Company: *See*—
Kazan, John, 4,918,199, Cl. 548-956.000.
Ramsay, Michael V. J.; Tiley, Edward P.; Pereira, Oswy Z.; Ward, John B.; Porter, Neil; Noble, Hazel M.; Fletton, Richard A.; Noble, David; and Sutherland, Derek R., 4,918,098, Cl. 514-450.000.
Ramsey, Michael V. J.; Bain, Brian M.; Ward, John B.; Noble, Hazel M.; Porter, Neil; Fletton, Richard A.; Noble, David; Sutherland, Derek R.; and Howes, Peter D., 4,918,096, Cl. 514-450.000.
American Saw & Mfg. Company: *See*—
White, Raymond E., 4,917,600, Cl. 432-121.000.
American Seating Company: *See*—
McDowell, Keith A.; and Clark, Vaughn L., 4,917,931, Cl. 428-88.000.
American Standard, Inc.: *See*—
Bergmann, Konrad; Ems, Josef; and Nikolayczik, Hans, 4,917,294, Cl. 236-93.00B.
Beyer, Barry C.; and Pendergrass, Thomas M., 4,917,350, Cl. 251-129.110.
Ring, Harry K., 4,917,174, Cl. 165-26.000.
American Telephone and Telegraph Company: *See*—
Daudelin, Abraham N., 4,918,719, Cl. 379-67.000.
American Telephone and Telegraph Company,AT&T Bell Laboratories: *See*—
Flamm, Daniel L.; Ibbotson, Dale E.; and Johnson, Wayne L., 4,918,031, Cl. 437-225.000.
Ames, Gerald L.: *See*—
Plenzler, John A.; and Ames, Gerald L., 4,917,592, Cl. 425-503.000.
Ametek, Inc.: *See*—
Bebel, Joseph, 4,918,428, Cl. 340-756.000.
Amherst Process Instruments, Inc.: *See*—
Poole, Trent A.; Ford, Norman C.; and Dahneke, Barton E., 4,917,494, Cl. 356-335.000.
Amici, Francis R.; Fontaine, Brian; and Dubois, Craig, to Hasbro, Inc. Doll with sound generating mechanism. 4,917,645, Cl. 446-184.000.
Amoco Corporation: *See*—
Cameron, John R., 4,916,946, Cl. 73-155.000.
Edwards, Robert C., 4,918,201, Cl. 549-259.000.
Gardner, Hugh C.; and Newman-Evans, Richard H., 4,918,157, Cl. 528-322.000.

AMP Incorporated: *See*—
Demler, Henry W., Jr.; Dola, Frank P.; Kimmel, David J.; and Sotolongo, Thomas J., 4,917,616, Cl. 439-101.000.
Grabbe, Dimitry G., 4,917,623, Cl. 439-284.000.
Grabbe, Dimitry G., 4,918,571, Cl. 361-386.000.
Kikuchi, Shoji; Onoue, Nobuaki; and Tanigawa, Junichi, 4,917,614, Cl. 439-83.000.
Yeomans, Michael A., 4,916,810, Cl. 29-863.000.
Ampex Corporation: *See*—
Baranski, Antoni S., 4,918,550, Cl. 360-94.000.
Sayers, Richard C., 4,917,244, Cl. 206-387.000.
Amrein, Bruce E.; Melnik, George; McCoy, Curtis L.; and Martin, James A., to United States of America, Army. Override control for vehicle drive train. 4,916,983, Cl. 74-878.000.
Amway Corporation: *See*—
Butts, Lawrence D.; and Niezgoda, Thomas A., 4,918,426, Cl. 340-611.000.
Strobridge, John R., 4,917,882, Cl. 424-59.000.
Strobridge, John R., 4,917,883, Cl. 424-59.000.
An, Seung-Ho: *See*—
Bobek, Miroslav V.; An, Seung-Ho; and Bernacki, Ralph J., 4,918,056, Cl. 514-25.000.
Anabuki, Yukitaka: *See*—
Hara, Nobuyuki; Anabuki, Yukitaka; Murakami, Katsutoshi; and Harada, Mitsuhiko, 4,917,725, Cl. 75-752.000.
Analog Intelligence Corporation: *See*—
Tomlinson, Max S., Jr., 4,918,618, Cl. 364-513.000.
Anchor Industries, Inc.: *See*—
Christensen, Lincoln H., 4,916 763, Cl. 4-503.000.
Anderson, Dwayne B. Utility conduit protector. 4,916,871, Cl 52-98.000.
Anderson, Floyd E.; Robb, Stephen P.; Shaw, Pern; and Terry, Lewis E. Microprocessor having high current drive. 4,918,333, Cl. 307-270.000.
Anderson, Lowell R.; Hashem, Mohamed M.; and Login, Robert B., to GAF Chemicals Corporation. N-(pyrrolidonyalkyl)-N-acyl taurine surfactants. 4,918,198, Cl. 548-550.000.
Ando, Akira; Kittaka, Toshihiko; and Sakabe, Yukio, to Murata Manufacturing Co. Ltd. Energy-trapping-by-frequency lowering-type piezoelectric resonance device. 4,918,350, Cl. 310-320.000.
Ando, Hideki; and Miki, Takahiro, to Mitsubishi Denki Kabushiki Kaisha. A/D converter with prevention of comparator output discontinuities. 4,918,451, Cl. 341-159.000.
Ando, Hironori: *See*—
Yamada, Shuji; and Ando, Hironori, 4,917,460, Cl. 350-255.000.
Ando, Masahiro: *See*—
Kobayashi, Junji; Fujiki, Makoto; Kimura, Takashi; Ando, Masahiro; and Matsuoka, Hidetoshi, 4,917,328, Cl. 242-204.000.
Ando, Masaru: *See*—
Matsuda, Hideo; Usui, Yasunori; Kojima, Shinjiro; and Ando, Masaru, 4,918,514, Cl. 357-79.000.
Andrew, Robert J.; Frost, Roger A.; and Herbert, Paul F., to J. C. Bamford Excavators Limited. Materials handling vehicle. 4,917,204, Cl. 180-140.000.
Andriola, Robert: *See*—
Heiber, Werner; Andriola, Robert; Williams, Paul; and Ebert, Charles, 4,917,676, Cl. 424-449.000.
Andros Analyzers Incorporated: *See*—
Rogers, Raymond E., 4,918,311, Cl. 250-343.000.
Andus Corporation: *See*—
Kittler, Wilfred C., 4,917,963, Cl. 428-610.000.
Angelico, Mario; and Contos, Simos, to Pharmaricherche Di Allesandra Tonozzi e C. s.a.s. Pharmaceutical compositions for the prophylaxis and therapy of calculosis of biliary tract and of biliary dyspepsia. 4,917,898, Cl. 424-452.000.
Angus, Derek: *See*—
Aikin, John A.; Angus, Derek; Reinwald, John W.; and Schankula, Jack, 4,916,938, Cl. 73-46.000.
Anheuser-Busch Companies, Inc.: *See*—
Katz, Edward; and Edmonson, Douglas A., 4,917,914, Cl. 426-551.000.
Anritsu Corp.: *See*—
Sonobe, Yoji, 4,918,491, Cl. 356-345.000.
Ansari, Rashid; and Fernandez, Antonio, to Bell Communications Research, Inc. HDTV Sub-band coding using IIR filter bank. 4,918,524, Cl. 358-133.000.
Anthony Industries, Inc.: *See*—
Sable, Chester A.; Maldarelli, Lawrence V.; and Church, Henry, 4,917,795, Cl. 210-120.000.
Aoki, Hideyuki; and Miura, Masakatsu, to Aisin-Warner Kabushiki Kaisha. Automatic transmission 4,916,977, Cl. 475-205.000.
Aoki, Masayoshi: *See*—
Yasumura, Mitsuru; Ohike, Atsuo; Ueda, Takao; Aoki, Masayoshi; Suzuki, Tomio; and Horiai, Makoto, 4,916,831, Cl. 34-134.000.
Aoyagi, Hikaru: *See*—
Takada, Toshihiro; Matsumoto, Shinichi; Aoyagi, Hikaru; Yamanaka, Mikio; Ohmura, Keiichi; and Yashiro, Toshiyuki, 4,918,042, Cl. 502-314.000.
Aoyagi, Muneo; and Nakae, Atsuo, to Kao Corporation. Bleaching composition. 4,917,813, Cl. 252-99.000.
Aoyagi, Shigeo: *See*—
Kikuchi, Takashi; and Aoyagi, Shigeo, 4,918,547, Cl. 360-92.000.
Apple Computer, Inc.: *See*—
Ashkin, Peter B.; and Clark, Michael, 4,918,598, Cl. 364-200.000
Applied Precision, Inc.: *See*—
Stewart, John P.; Seubert, Ronald C.; and Snow, Donald B., 4,918,374, Cl. 324-158.00R.
Aptel, Philippe: *See*—
Liou, Jun K.; and Aptel, Philippe, 4,917,798, Cl. 210-321.890.
APV Douglas Machine Corporation: *See*—
Korkowski, James F., 4,917,229, Cl. 198-418.400.
Pazdernik, Irvan L., 4,917,663, Cl. 493-416.000.
Aquapore Moisture Systems: *See*—
Prassas, Thomas N., 4,917,535, Cl. 405-36.000.
Arai, Michio. Full face type helmet. 4,916,759, Cl. 2-414.000.
Arai, Minoru: *See*—
Katoh, Shoji; and Arai, Minoru, 4,917,641, Cl. 441-115.000.
Araki, Kazuhiko: *See*—
Tsuda, Yoshinao; Mishina, Tadashi; Obata, Minoru; Araki, Kazuhiko; Inui, Jun; and Nakamura, Tadao, 4,918,074, Cl. 514-258.000.
Archer, Gary L.: *See*—
Prisco, Anthony J., Jr.; Sewter, Bruce R.; Briggs, William E.; and Archer, Gary L., 4,917,807, Cl. 210-774.000.
Archibald, Thomas G.: *See*—
Baum, Kurt; and Archibald, Thomas G., 4,918,158, Cl. 526-282.000.
Arco Chemical Technology, Inc.: *See*—
Shih, T. Thomas; and Chang, Te, 4,918,204, Cl. 549-429.000.
Ardini, Joseph L., Jr.; and Allison, Robert J., Jr., to Prime Computer, Inc. Apparatus for physically locating faulty electrical components. 4,918,693, Cl. 371-21.600.
Arimoto, Shunji: *See*—
Sakakibara, Shigeru; and Arimoto, Shunji, 4,918,150, Cl. 525-502.000.
Arisato, Yasunori: *See*—
Akai, Yoshito; Konaga, Nobuyuki; Arisato, Yasunori; and Moritsu, Yukikazu, 4,917,958, Cl. 428-457.000.
Arkles, Barry C., to Huls America Inc. Chromogenic and fluorogenic silanes and using the same. 4,918,200, Cl. 549-214.000.
Arlon, Philippe; Eustache, Jean-Pierre; and Maubray, Daniel, to Valeo Systemes D'Essuyage. Windshield wiper drive mechanism with retracted parking position. 4,916,774, Cl. 15-250.160.
Armun: *See*—
Berlin, Frank; McGuire, Leonard; and Campbell, Eugene E., 4,916,757, Cl. 2-159.000.
Armstead, James P.: *See*—
Snow, Arthur; and Armistead, James P., 4,918,117, Cl. 523-215.000.
Armstrong, Timothy G.: *See*—
Creveling, Clyde M.; Bothner, Carl R.; Armstrong, Timothy G.; and Weitzel, Richard A., 4,918,488, Cl. 355-296.000.
Armstrong World Industries, Inc.: *See*—
Caldwell, Kenneth G., 4,916,782, Cl. 28-111.000.
Arndt, Douglas C.; and Hedgcoth, Virgie L., to Identicator Corporation. Method of enhancing the resolution of a fingerprint image in a fingerprint recording system. 4,917,987, Cl. 430-139.000.
Arndt, Rainold: *See*—
Stindl, Wolfgang; Zimmerman, Ingfried; Reckers, Renate; Wendt, Hans; and Arndt, Rainold, 4,918,065, Cl. 514-179.000.
Aronson, Michael P.: *See*—
Foster, Jeffrey N.; Karpusiewicz, William M.; Irwin, Charles F.; Pham, Hien T.; and Aronson, Michael P., 4,917,811, Cl. 252-95.000.
Arsena, Vito: *See*—
Nelson, Clark D.; Malinowski, Richard; Mers, Catherine; Essock, Diana; Arsena, Vito; and Jaffe, Mary, 4,918,353, Cl. 313-113.000.
Asa, David T.: *See*—
Asa, Maurice; and Asa, David T., 4,917,274, Cl. 222-420.000.
Asa, Maurice; and Asa, David T. Miniscule droplet dispenser tip. 4,917,274, Cl. 222-420.000.
Asada, Katushiko: *See*—
Terada, Hiroaki; Asada, Katushiko; Nishikawa, Hiroaki; Miyata, Souichi; Matsumoto, Satoshi; Asano, Hajime; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; and Komori, Shinji, 4,918,644, Cl. 364-900.000.
Asada, Toshiyuki; Ushijima, Fumihiro; Higashiyama, Yasuhiko; and Suzuki, Toshitake, to Toyota Jidosha Kabushiki Kaisha. Planetary gear type speed change device to provide six forward speed stages with two single pinion type simple planetary gear mechanisms. 4,916,980, Cl. 475-281.000.
Asahi Kogaku Kogyo K.K.: *See*—
Yamamoto, Masato; Nakajima, Masahiro; Yamanaka, Toshimasa; and Satou, Kouji, 4,918,264, Cl. 200-5.00R.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Hori, Masakatsu, 4,918,480, Cl. 354-400.000.
Iizuka, Takashi, 4,917,457, Cl. 350-173.000.
Ito, Takayuki, 4,917,482, Cl. 350-423.000.
Saito, Taizo, 4,918,306, Cl. 250-235.000.
Tejima, Yasuyuki, 4,918,476, Cl. 354-221.000.
Asano, Hajime: *See*—
Terada, Hiroaki; Asada, Katushiko; Nishikawa, Hiroaki; Miyata, Souichi; Matsumoto, Satoshi; Asano, Hajime; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; and Komori, Shinji, 4,918,644, Cl. 364-900.000.
Asbury, Charles E., Jr.; Boltak, Boris; and Clausen, Victor H., to H. B. Fuller Company. Tape dispenser. 4,917,327, Cl. 242-156.000.
Asbury, Charles T.; and Asbury, Genevieve J. Distillation apparatus. 4,917,770, Cl. 202-176.000.
Asbury, Genevieve J.: *See*—
Asbury, Charles T.; and Asbury, Genevieve J., 4,917,770, Cl. 202-176.000.

Asche, Henning; and Affolter, Heidi, to Ciba-Geigy Corporation. Novel topically administrable pharmaceutical compositions. 4,917,886, Cl. 424-81.000.
Ashinuma, Takaaki; and Shibata, Takehiko, to Canon Kabushiki Kaisha. Information recording/reproducing apparatus including a plurality of recording or reproducing rates. 4,918,677, Cl. 369-32.000.
Ashkin, Peter B.; and Clark, Michael, to Apple Computer, Inc. Method for selectively activating and deactivating devices having same first address and different extended addresses. 4,918,598, Cl. 364-200.000.
Ashton, Jefferson P.: *See*—
Gaidry, John E.; Quebedeaux, Larry J.; Donovan, Joseph F.; and Ashton, Jefferson P., 4,917,183, Cl. 166-278.000.
ASMO Co., Ltd.: *See*—
Tanaka, Takahiko; Okada, Kazukiyo; Tsunoda, Akira; Yamamoto, Nobuyuki; Maeda, Tatsuo; Omoto, Seiichi; and Odoi, Kozo, 4,918,360, Cl. 318-41.000.
Aso, Hiroaki, to Mitsubishi Denki Kabushiki Kaisha. Engine starting and charging device. 4,918,323, Cl. 290-46.000.
Assel, Eugen; Dasbach, Burkhard; and Gebhard, Bruno, to Siemens Aktiengesellschaft. Protective device for a wiring field of a backplane of a subassembly carrier. 4,918,575, Cl. 361-424.000.
Astle, Brian: *See*—
Simon, Allen H.; Golin, Stuart J.; Astle, Brian; Keith, John M.; and Wan, Suz H., 4,918,523, Cl. 358-133.000.
AT&T Bell Laboratories: *See*—
Daugherty, Jeffrey W., 4,918,733, Cl. 381-43.000.
Halemane, Thirumala R.; Johnson, Bartley C.; and Jopson, Robert M., 4,918,396, Cl. 330-4.300.
Jahns, Jurgen; and Murdocca, Miles J., 4,917,456, Cl. 350-169.000.
Meyer, Robert B.; and Patel, Jayantilal S., 4,917,475, Cl. 350-350.00R.
Tol, Simon J. M.; and Wouda, Kornelis J., 4,918,685, Cl. 370-32.100.
Wong, Chiu-Seung R., 4,918,643, Cl. 364-802.000.
Ataka, Kikuo: *See*—
Toda, Fumio; Tanaka, Koichi; and Ataka, Kikuo, 4,918,190, Cl. 544-351.000.
Atlantic Pharmaceutical Products, Ltd.: *See*—
Bourbon, Pierre; Lagny, Pierre; and Billot, Pierre, 4,917,901, Cl. 424-673.000.
Atlantic Richfield Company: *See*—
Nowak, Anthony V., 4,918,020, Cl. 436-56.000.
Weisbrod, Kirk R., 4,916,945, Cl. 73-153.000.
Atlas Powder Company: *See*—
Beltz, Donald R., 4,917,017, Cl. 102-470.000.
Atomic Energy of Canada Limited: *See*—
Aikin, John A.; Angus, Derek; Reinwald, John W.; and Schankula, Jack, 4,916,938, Cl. 73-46.000.
Atsumi, Kunio: *See*—
Yamamoto, Yuichi; Atsumi, Kunio; Sakagami, Kenji; Yoshida, Takashi; Nishihata, Ken; and Kondo, Sinichi, 4,918,068, Cl. 514-206.000.
Atwater, Robert M., to Gillette Company, The. Razor blade cutting edge structure. 4,916,817, Cl. 30-346.550.
Aubry, Michael E., to General Motors Corporation. Hood latch assembly having unitary latching lever which functions both as a primary and secondary latch. 4,917,417, Cl. 292-117.000.
Auffret, Jean-Claude: *See*—
Claramonte, Manuel P.; Bonnet, Guy M.; and Auffret, Jean-Claude, 4,917,707, Cl. 23-300.000.
Augstein, Joachim; and Ahmed, Maqbool, to Fisons plc. Pharmaceutical compositions. 4,917,897, Cl. 424-450.000.
Augurt, Thomas A.: *See*—
Macaro, Louise; Dyckman, John; Augurt, Thomas A.; and Zwarun, Andrew, 4,918,003, Cl. 435-31.000.
August Faller KG: *See*—
Heitele, Jurgen; and Mohrhauser, Klaus, 4,917,288, Cl. 229-102.000.
Aukland Group (USA), Inc.: *See*—
Gray, Norman, 4,917,850, Cl. 264-301.000.
Aurentz, John A., to Briles Rivet Corporation. Countersink forming tooling. 4,917,550, Cl. 408-225.000.
Automated Machinery Systems, Inc.: *See*—
Small, Mason S., 4,917,051, Cl. 112-171.000.
Automatic Orange Juicer Corporation, The: *See*—
Nelson, Stewart C., 4,917,007, Cl. 99-509.000.
Avanti Manufacturing Co.: *See*—
Mazzei, Angelo L.; Wearin, Jim; and Figgs, Joseph E., 4,917,304, Cl. 239-64.000.
AVL AG: *See*—
Marsoner, Hermann; and Kleinhappl, Erich, 4,917,864, Cl. 422-63.000.
AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik: *See*—
Melde-Tuczai, Helmut; Greylinger, Wilhelm; and Nowotny, Klaus, 4,917,169, Cl. 164-369.000.
Avon Products, Inc.: *See*—
Cupolo, Dennis A.; Fonseca, Geoffrey P.; Fernandez, Fernando; Greenbaum, Jean; and Brown, Jeffrey M., 4,917,967, Cl. 428-669.000.
Ayata, Naoki: *See*—
Hamasaki, Bunei; Igarashi, Hajime; Nakai, Akiya; and Ayata, Naoki, 4,918,320, Cl. 250-548.000.
Aydelette, Charles B., Sr. Device to attract fish. 4,916,845, Cl. 43-4.000.
Ayer, David L. Modular electrical wiring system. 4,918,258, Cl. 174-53.000.
B. Braun Melsungen AG: *See*—
Haindl, Hans-Guenter, 4,917,668, Cl. 604-167.000.
B. F. Goodrich Company, The: *See*—
Sharaby, Zaev, 4,918,151, Cl. 526-211.000.
B. I. Incorporated: *See*—
Pauley, James D.; Ripingill, Allen E., Jr.; Waite, James B.; and Loyd, John, 4,918,432, Cl. 340-573.000.
Babcock Industries Inc.: *See*—
Gokee, Donald J., 4,917,224, Cl. 192-4.00A.
Gokee, Donald J., 4,917,418, Cl. 292-125.000.
Babel, Bernard; Josserand, Joseph; Lehmann, Hans; and Ruffin, Jean A., to Charmilles Technologies, S.A. EDM cutting machine including device for preventing transmission of sealing plate movement to guide head arm. 4,918,279, Cl. 219-69.120.
Babot, Daniel: *See*—
Le Floc'h, Christian; Mazeron, Bernard; Babot, Daniel; and Peix, Gilles, 4,918,712, Cl. 378-89.000.
Bacharach, Inc.: *See*—
Novack, Robert L.; and Tozier, John E., 4,916,935, Cl. 73-27.00R.
Bacom, David P.: *See*—
Whalen, R. William; and Bacom, David P., 4,917,611, Cl. 434-218.000.
Bader, Joseph F., to Federal Signal Corporation. Structural assembly for housing an acoustical system. 4,918,738, Cl. 381-190.000.
Badesha, Santokh S.; Stolka, Milan; and Schank, Richard L., to Xerox Corporation. Photoresponsive imaging members with hole transporting polysilylene ceramers. 4,917,980, Cl. 430-58.000.
Badiali, Roberto: *See*—
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Cummins, Donald L.; and Santichen, Stephen P., to General Motors Corporation. Electronic starting motor control. 4,917,410, Cl. 290-38.00R.

Cummins, Donald L., to General Motors Corporation. Electronic starting motor control with low voltage protection. 4,917,411, Cl. 290-38.00R.

Cupolo, Dennis A.; Fonseca, Geoffrey P.; Fernandez, Fernando; Greenbaum, Jean; and Brown, Jeffrey M., to Avon Products, Inc. Multiple-layered article and method of making same. 4,917,967, Cl. 428-669.000.

Currie, Janie K.; Loza, Roman; and Fendler, Eleanor J., to Standard Oil Company, The. Process of making ceramics. 4,917,842, Cl. 264-56.000.

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Cypress Semiconductor: *See—*
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Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
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Dalebout, William T.; and Measom, Ty, to Weslo, Inc. Exercise machine safety switch. 4,918,266, Cl. 200-52.00R.

Dalki r, Peter. Process for manufacturing a liquid absorbing pad. 4,917,762, Cl. 162-5.000.

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Daudelin, Abraham N., to American Telephone and Telegraph Company. Elimination of false requests for telephone operator assistance. 4,918,719, Cl. 379-67.000.

Daudi, Anwar R., to Motor Wheel Corporation. Method of wheel manufacture for correcting rotational non-uniformity of a pneumatic tire and wheel assembly, apparatus for performing such method, and the resulting wheel. 4,917,440, Cl. 301-9.0DN.

Daugherty, Jeffrey W., to AT&T Bell Laboratories. Dynamic time warping using a digital signal processor. 4,918,733, Cl. 381-43.000.

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de Chambost, Emmanuel; and Sonrier, Michel, to Thomson-CSF. Electronic optics device with variable illumination and aperture limitation, and application thereof to an electron beam lithographic system. 4,918,318, Cl. 250-492.200.

Decker, William T. Fluid injector. 4,917,152, Cl. 137-891.000.

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De Guzman, Joselito S. Contamination control mats and methods and apparatus for removing sheets therefrom. 4,917,975, Cl. 428-81.000.

De Jonckheere, Raphael, to Peaudouce, Societe Anonyme. Disposable diaper pantie. 4,917,696, Cl. 604-385.200.

De Jonghe, Lutgard C.; Visco, Steven J.; Liu, Meilin; and Mailhe, Catherine C., to United States of America, Energy. Lithium/organosulfur redox cell having protective solid electrolyte barrier formed on anode and method of making same. 4,917,974, Cl. 429-104.000.

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De Longcamp, Guy Le Feron. Deformable wheel useful for instance as a vehicle wheel or in a gearing. 4,917,162, Cl. 152-5.000.

de Loos-Vollebregt, Margaretha T. C., to Perkin-Elmer Corporation, The. Furnace for electrothermal atomization of samples for analysis by atomic absorption spectrophotometry. 4,917,493, Cl. 356-312.000.

DeMars, Robert A. Portable towel heating device. 4,918,290, Cl. 219-400.000.

DeMartin, Antonio, to Quik-Dam Srl. Bicycle pedal and shoe clip. 4,916,972, Cl. 74-594.600.

Demay, Henri; Hauschild, Remi; and Nicco, Adrien, to Norsolor (Orkem Group). Grafted ethylene polymers and copolymers and their applications as binders for coating. 4,917,734, Cl. 106-270.000.

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De Teso, John S. Apparatus for protecting antennas. 4,918,459, Cl 343-872.000.

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Duncan, Malcolm, to Magnetrol International. Liquid level regulator device. 4,917,135, Cl. 137-2.000.
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Ansari, Rashid; and Fernandez, Antonio, 4,918,524, Cl. 358-133.000.

Fernandez, Fernando: *See—*
Cupolo, Dennis A.; Fonseca, Geoffrey P.; Fernandez, Fernando; Greenbaum, Jean; and Brown, Jeffrey M., 4,917,967, Cl. 428-669.000.

Ferrari Engineering S.p.A.: *See—*
Razelli, Giovanni B.; and Buoncristiani, Piero, 4,916,978, Cl. 475-226.000.

Fetisov, Anatoly B.: *See—*
Druzhinin, Nikolai V.; Pavlenko, Anatoly R.; Abakumov, Valentin G.; Al-Kadimi, Adnan D.; Zhluktenko, Sergei V.; Lazebny, Vladimir S.; Kalmykov, Anatoly I.; Kuzoyatova, Elena G.; Chuev, Viktor Y.; Sysoev, Anatoly S.; Pichugin, Alexandr P.; Fetisov, Anatoly B.; Denbnovetsky, Stanislav V.; Leschishin, Alexandr V.; Kuzmin, Vladimir P.; and Mikhailov, Vladimir N., 4,918,456, Cl. 342-26.000.

Fettes, Don G.; Marusiak, Myles P.; and Mushka, Gerald R., to Water Conditioning Canada Ltd. Regeneration sensing device. 4,917,794, Cl. 210-96.100.

Feurgard, Rene , to Framatome. Pipe for supporting and positioning measuring devices in the core of a nuclear reactor. 4,917,853, Cl. 376-255.000.

Fibertek, Inc.: *See—*
Koechner, Walter, 4,917,481, Cl. 350-363.000.

Fickert, Werner: *See—*
Seubert, Bernhard; Beilharz, Helmut; Fickert, Werner; Jeromin, Gunter; and Spitaler, Ulrich, 4,918,059, Cl. 514-33.000.

Fieselman, Troy W.: *See—*
Marcum, Thomas J.; Fieselman, Troy W.; and Weber, Richard B., 4,917,832, Cl. 261-77.000.

Figgs, Joseph E.: *See—*
Mazzei, Angelo L.; Wearin, Jim; and Figgs, Joseph E., 4,917,304, Cl. 239-64.000.

Filler, Raymond L., to United States of America, Army. Method of measuring the thermal hysteresis of quartz crystal resonators. 4,918,372, Cl. 324-727.000.

Fillmore, William E.: *See—*
Fuchs, Timothy J.; Fillmore, William E.; and Haffner, Eugene F., 4,917,269, Cl. 222-109.000.

Filss, Peter; and Heidrich, Wolfgang, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Process and apparatus for cleaning hot gases. 4,917,873, Cl. 423-239.000.

Fina Technology, Inc.: *See—*
Butler, James R.; and Licht, William P., 4,917,789, Cl. 208-89.000.

Finegan, Joel D., to Tandy Corporation. Ablative and bump-forming optical recording media including a metallic reflective layer. 4,918,682, Cl. 369-275.000.

First Brands Corporation: *See—*
Scheibner, Gerald H., 4,917,506, Cl. 383-63.000.

Fischer, Harry C. Energy storage apparatus and method. 4,916,916, Cl. 62-199.000.

Fisher, Duncan M.; and Klein, Jeffrey L., to Motorola, Inc. Method for forming self-aligned vias in multi-level metal integrated circuits. 4,917,759, Cl. 156-643.000.

Fisher, Gordon, to Shipley Company Inc. Method for analyzing additive concentration. 4,917,774, Cl. 204-153.100.

Fisher, Gordon, to Shipley Company Inc. Method for analyzing additive concentration. 4,917,777, Cl. 204-153.100.

Fisons plc: *See—*
Augstein, Joachim; and Ahmed, Maqbool, 4,917,897, Cl. 424-450.000.
Brown, Kenneth; Clark, Andrew R.; and Salliss, Richard, 4,918,078, Cl. 514-291.000.

Fitch, Alan P., to U.S. Philips Corporation. Data demodulator baud clock phase locking. 4,918,709, Cl. 375-82.000.

Fitzpatrick, Harvey J., Jr., to Halliburton Company. Method for setting well casing using a resin coated particulate. 4,917,188, Cl. 166-295.000.

Fitzpatrick, Mark E.: *See—*
Graham, Andrew C.; and Fitzpatrick, Mark E., 4,918,336, Cl. 307-448.000.

Fitzsimmons, Alan H.; and Hammer, Joe K., to Prestolite Electric Incorporated. Brush wear indicator. 4,918,348, Cl. 310-242.000.

Flamm, Daniel L.; Ibbotson, Dale E.; and Johnson, Wayne L., to American Telephone and Telegraph Company,AT&T Bell Laboratories. Processes depending on plasma generation using a helical resonator. 4,918,031, Cl. 437-225.000.

Flammang, David; Reniric, Alexis C. M.; and Begemann, Malcolm J. S., to Vitatron Medical B. V. Pacing system and method for physiological stimulation of the heart utilizing Doppler means. 4,917,115, Cl. 128-419.0PG.

Flanigen, Edith M.: *See—*
Lok, Brent M. T.; Marcus, Bonita K.; Messina, Celeste A.; and Flanigen, Edith M., 4,917,876, Cl. 423-306.000.

Flaschel, Erwin: *See—*
Leuba, Jean-Louis; Renken, Albert; and Flaschel, Erwin, 4,918,016, Cl. 435-176.000.

Fleming, Randy G.: *See—*
Bragg, Dale E.; Clark, Mark A.; and Fleming, Randy G., 4,918,659, Cl. 366-132.000.

Fleming, Robert H.: *See—*
Kwis, Stanley H.; Fleming, Robert H.; O'Meara, John P.; and Widicus, Warren A., 4,917,907, Cl. 426-90.000.

Flemings, Merton C.: *See—*
Poole, John W.; Flemings, Merton C.; Gaspar, Thomas A.; and Simpson, Matthew A., 4,917,852, Cl. 264-500.000.

Fletcher, Charles J. Ice maker with vertical cooling member 4,916,921, Cl. 62-356.000.

Fletcher, Gary, Jr.: *See—*
Emmons, Lawrence D.; and Fletcher, Gary, Jr., 4,918,718, Cl. 379-53.000.

Fletcher-Terry Company, The: *See—*
Kozyrski, Vincent T.; and Millett, Claude R., 4,916,820, Cl. 33-42.000.

Fletton, Richard A.: *See—*
Ramsay, Michael V. J.; Tiley, Edward P.; Pereira, Oswy Z.; Ward, John B.; Porter, Neil; Noble, Hazel M.; Fletton, Richard A.; Noble, David; and Sutherland, Derek R., 4,918,098, Cl 514-450.000.
Ramsey, Michael V. J.; Bain, Brian M.; Ward, John B.; Noble, Hazel M.; Porter, Neil; Fletton, Richard A.; Noble, David; Sutherland, Derek R.; and Howes, Peter D., 4,918,096, Cl. 514-450.000.

Flick, September: *See—*
Boyd, James B.; Flick, September, and Stein, Otto A., 4,917,258, Cl. 220-240.000.

Flight Equipment & Engineering Limited: *See—*
Morgan, Arthur, 4,917,438, Cl. 297-411.000.

Flinchbaugh, David E., to Murray Corporation. Method of and system for determining refrigerant/lubricant ratio within enclosed flow apparatus. 4,916,915, Cl. 62-129.000.

Florent, Jean-Claude: *See—*
Monneret, Claude; Florent, Jean-Claude; and Genot, Agnes, 4,918,173, Cl. 536-6.400.

Florida Institute of Phosphate Research: *See—*
Marten, Jerome H.; and Lloyd, G. Michael, 4,917,024, Cl. 110-233.000.

Florifoam, Inc.: *See—*
Castronovo, Joseph A., Jr., 4,916,765, Cl. 5-437.000.

Floro, William E.; Luboski, Mark; and Murphy, Timothy J., to Allen-Bradley Company, Inc. Method and apparatus for linking processors in a hierarchical control system. 4,918,589, Cl. 364-132.000.

Flowers, Dale R.; Goffinet, Kevin P., Miles, Anthony W.; Rowe, John T., Jr.; and Vorhees, Kevin H., to International Business Machines Corporation. Touch sensing display screen signal processing apparatus and method. 4,918,262, Cl. 178-18.000.

Fluorochem Inc.: *See—*
Baum, Kurt; and Archibald, Thomas G., 4,918,158, Cl. 526-282.000.

FMC Corporation: *See—*
Garcia, Christopher J.; Lincoln, Leslie O.; and Johnson, Keith A., 4,918,627, Cl. 364-552.000.

Focke & Co. (GmbH & Co.): *See—*
Focke, Heinz, 4,916,883, Cl. 53-53.000.
Focke, Heinz; and Liedtke, Kurt, 4,916,884, Cl. 53-462.000.

Focke, Heinz, to Focke & Co. (GmbH & Co.). Process and apparatus for the testing of packs. 4,916,883, Cl. 53-53.000.

Focke, Heinz; and Liedtke, Kurt, to Focke & Co. (GmbH & Co.). Cuboid pack for cigarettes or the like and process for producing it. 4,916,884, Cl. 53-462.000.

Fonseca, Geoffrey P.: *See—*
Cupolo, Dennis A.; Fonseca, Geoffrey P.; Fernandez, Fernando; Greenbaum, Jean; and Brown, Jeffrey M., 4,917,967, Cl 428-669.000.

Fontaine, Brian: *See—*
Amici, Francis R.; Fontaine, Brian; and Dubois, Craig, 4,917,645, Cl. 446-184.000.

Fontenot, Darrell E.: *See—*
Freeman, T. Austin; Baldridge, Morris G.; Szarka, David D., and Fontenot, Darrell E., 4,917,184, Cl. 166-285.000.

Ford Aerospace Corporation: *See—*
Chall, Louis E., Jr., 4,918,335, Cl. 307-303.100.
Chall, Louis E., Jr., 4,918,691, Cl. 371-15.100.

Ford, Lionel H.: *See—*
Blanchard, Alan; and Ford, Lionel H., 4,917,151, Cl 137-815.000.

Ford, Michael E.: *See—*
Deeba, Michel; Ford, Michael E.; and Johnson, Thomas A., 4,918,233, Cl. 564-479.000.

Ford Motor Company: *See—*
Bonnett, Roy E.; Carpenter, Ronald A.; and Gallagher, Stephen W., 4,917,435, Cl. 296-190.000.
Diehl, Roy E.; and Berger, Alvin H., 4,917,225, Cl. 192-82.00T
Gandhi, Haren S.; and Kummer, Joseph T., 4,916,898, Cl. 60-274.000.
Siegl, Walter O.; and Chattha, Mohinder S., 4,917,729, Cl. 106-14.150.

Ford New Holland, Inc.: *See—*
Bohman, Carl E., 4,918,441, Cl. 340-901.000.
Sheehan, Ronald T.; and Seymour, Shaun A., 4,916,888, Cl 56-147.000.

Ford, Norman C.: *See—*
Poole, Trent A.; Ford, Norman C., and Dahneke, Barton E., 4,917,494, Cl. 356-335.000.

Forensic Applications Corporation: *See—*
Jensen, Richard E.; Nichols, Donald H.; and Hemphill, D. Gary, 4,917,867, Cl. 422-102.000.

Forestier, Serge: *See—*
Lang, Gerard; Forestier, Serge; and Lagrange, Alain, 4,918,176, Cl. 536-17.200.

Form Design Incorporation: *See—*
Matsumoto, Tamotsu, 4,916,770, Cl. 15-28.000.

Formulations Development Labs: *See—*
Park, Moo K.; and Caldwell, Henry C., 4,918,103, Cl. 514-520.000.

Forsaen, Gustav, to Utec S.M. AB. Device for reversing an air flow in a drying chamber. 4,916,832, Cl. 34-191.000.

Forster, Wolfgang C.: *See—*
Vanderlaan, Douglas G.; and Forster, Wolfgang C., 4,918,120, Cl. 523-465.000.

Fossel, Eric T., to Beth Israel Hospital Association, The. Process for the detection of cancer. 4,918,021, Cl. 436-64.000.

Foster, Jeffrey N.; Karpusiewicz, William M.; Irwin, Charles F.; Pham, Hien T.; and Aronson, Michael P., to Lever Brothers Company. Bleach compositions and process for making same. 4,917,811, Cl. 252-95.000.

Four Seasons Solar Products Corporation: *See—*
Gilliland, Terry, 4,916,881, Cl. 52-741.000.

Fournier-Zaluski, Marie-Claude: *See—*
Cartwright, Terence; Bouboutou-Tello, Romaine; Lelievre, Yves; and Fournier-Zaluski, Marie-Claude, 4,918,105, Cl. 514-575.000.

Fox, Daniel W.: *See—*
Clagett, Donald C.; Fox, Daniel W.; Shafer, Sheldon J.; and Sybert, Paul D., 4,918,149, Cl. 525-439.000.

Fox, Jack J.: *See—*
Watanabe, Kyoichi A.; Chu, Chung K.; and Fox, Jack J., 4,918,179, Cl. 536-24.000.

Foy, Dennis M.; and Baughman, Charles, to J.I.T. Corporation. Collapsible container. 4,917,255, Cl. 220-4.00F.

Frackenpohl, Alfred: *See—*
Herchenbach, Paul; Frackenpohl, Alfred; and Rugen, Hermann, 4,917,406, Cl. 280-455.100.

Framatome: *See—*
Bard, Josette, 4,918,710, Cl. 376-438.000.
Falduti, Claude, 4,917,172, Cl. 165-1.000.
Feurgard, Rene , 4,917,853, Cl. 376-255.000.
Sundheimer, Patrick; and Pascal, Yves, 4,917,146, Cl. 137-561.00A.

Francis, John F., to Gillette Company, The. Safety razors magazines. 4,916,812, Cl. 30-40.000.

Franks, George J., Jr. Ground bracket. 4,917,615, Cl. 439-98.000.

Franks, Stephen H.; Dillon, David M.; and McCarty, Read S., to Baxter International Inc. Method and vessel for separation of cryoglobin. 4,917,804, Cl. 210-737.000.

Fraser, Howard H., Jr.; and Kassouf, Thomas L., to Carrier Corporation. Horizontal scroll compressor with oil pump. 4,917,582, Cl. 418-55.000.

Frederickson, Jeffrey W.; and Kocher, Douglas R. Apparatus and method for dispensing solution to prevent smear in the manufacture of printed circuit boards. 4,917,547, Cl. 408-1.00R.

Freeman, Michael J., to 501 Actv, Inc. Closed circuit television system having seamless interactive television programming and expandable user participation. 4,918,516, Cl. 358-86.000.

Freeman, T. Austin; Baldridge, Morris G.; Szarka, David D.; and Fontenot, Darrell E., to Halliburton Company. Cement head and plug. 4,917,184, Cl. 166-285.000.

French, James C.: *See—*
Hokanson, Gerard C.; Schaumberg, John P.; French, James C.; and Tunac, Josefino B., 4,918,100, Cl. 514-451.000.

Frenette, Richard; Young, Robert N.; and Kakushima, Masatoshi, to Merck Frosst Canada, Inc. Leukotriene antagonists. 4,918,092, Cl. 514-382.000.

Freudenstein, Ferdinand; and Sohn, Wayne J., to Columbia University in the City of New York, The Trustees of. Swing beam internal-combustion engines. 4,917,066, Cl. 123-48.00B.

Frey, Otto; and Koch, Rudolf, to Sulzer Brothers Limited. Interverte-bral prosthesis. 4,917,704, Cl. 623-17.000.

Frick, Richard H.: *See—*
Kons, Hugo L.; and Frick, Richard H., 4,917,746, Cl. 156-164.000.

Friedman, Charles G.: *See—*
Kaufmann, Peter J.; and Friedman, Charles G., 4,917,891, Cl. 424-401.000.

Friedr. Boesner GmbH: *See—*
Taubert, Hubert, 4,917,555, Cl. 411-411.000.

Frigerio, Marco: *See—*
Gandolfi, Carmelo A.; Frigerio, Marco; Tofanetti, Odoardo; and Tognella, Sergio, 4,918,087, Cl. 514-356.000.

Frings, Heinz; Ronthaler, Karl-Heinz; and Steffens, Ralf, to Leybold Aktiengesellschaft. Bearing support for a twin-shaft pump. 4,917,583, Cl. 418-206.000.

Friskney, Stephen H., to White Consolidated Industries, Inc. Dishwasher rack with movable fence. 4,917,248, Cl. 211-41.000.

Fritz, Dieter: *See—*
Durchschlag, Gerald; Lang, Alfred; Rotter, Franz; Fritz, Dieter; and Kopilovitsch, Heinz, 4,917,339, Cl. 246-382.000.

Froes, Francis H.: *See—*
Eylon, Daniel; and Froes, Francis H., 4,917,858, Cl. 419-28.000.

Frost, Roger A.: *See—*
Andrew, Robert J.; Frost, Roger A.; and Herbert, Paul F., 4,917,204, Cl. 180-140.000.

Fruit-E-Frost Corporation: *See—*
Weis, William T.; and Weis, Michael R., 4,916,920, Cl. 62-342.000.

Fry, Francis J.; and Burney, Bryan, to Indianapolis Center for Advanced Research, Inc. Ultrasound location and therapy method and apparatus for calculi in the body. 4,917,095, Cl. 128-660.030.

Fuchs, Timothy J.; Fillmore, William E.; and Haffner, Eugene F., to Owens-Illinois Closure Inc. Liquid containing and dispensing package. 4,917,269, Cl. 222-109.000.

Fudickar, Harald: *See—*
Thies, Peter; and Fudickar, Harald, 4,917,741, Cl. 156-73.100.

Fuelberth, Walter K.; and Fedor, Andrew, Jr., to General Motors Corporation. Torque biased differential mechanism. 4,916,973, Cl. 475-53.000.

Fuji Die Co., Ltd.: *See—*
Tsuji, Nobuhiro; Abe, Genryu; Yamaguchi, Akira; Mishuku, Minoru; and Tsuchiya, Nobujiro, 4,917,961, Cl. 428-552.000.

Fuji Electric Co., Ltd.: *See—*
Nakamura, Yoichi; Kuroda, Masami; and Furusho, Noboru, 4,917,981, Cl. 430-75.000.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Ishido, Hideki; Ushijima, Takayuki; Igarashi, Katsumasa, and Ishizeki, Seiichi, 4,917,444, Cl. 303-100.000.

Fuji Kogyo Co., Ltd.: *See—*
Ohmura, Ryuichi, 4,916,815, Cl. 30-151.000.

Fuji Photo Film Co., Ltd.: *See—*
Ikeda, Kensuke; Iwakura, Ken; and Satomura, Masato, 4,918,047, Cl. 503-216.000.
Ikeda, Tadashi; and Takei, Haruo, 4,917,997, Cl. 430-572.000.
Koizumi, Shigeo; Nishikawa, Nobuo; and Kita, Nobuyuki, 4,917,988, Cl. 430-169.000.
Kojima, Tetsuro; Matsushita, Tetsunori; Toya, Ichizo; and Takeuchi, Kazuhiko, 4,917,995, Cl. 430-565.000.
Komai, Toshiya; Kawahara, Sei; and Ikeda, Mitsuhiro, 4,917,844, Cl. 264-85.000.
Kosha, Kideaki; Ejiri, Kiyomi; Miura, Toshihiko; Fukino, Koyotaka; and Masaki, Kouichi, 4,917,947, Cl. 428-329.000.
Matsuoka, Katsumi; Takashima, Masanobu; Iwakura, Ken; and Saeki, Keiso, 4,918,045, Cl. 503-213.000.
Morita, Naoyuki, 4,918,465, Cl. 346-108.000.
Mukunoki, Yasuo; Yoneyama, Masakazu; and Yamada, Sumito, 4,917,993, Cl. 430-523.000.
Nakamura, Hiroshi; and Ogiwara, Nagao, 4,918,486, Cl. 355-106.000.
Otake, Katsumi, 4,918,483, Cl. 355-40.000.
Takiue, Tomoyuki; Kameoka, Kimitaka; Naoi, Takashi; and Tanaka, Yasunobu, 4,916,829, Cl. 34-30.000.
Ujiie, Yoichi; and Tahara, Syuji, 4,918,484, Cl. 355-41.000.

Fuji Seiki Machine Works, Ltd.: *See—*
Yamaguchi, Tomio; Harada, Shoichi; Suzuki, Akira; and Takamura, Ikuei, 4,917,708, Cl. 51-419.000.

Fujii, Eiji: *See—*
Sakakibara, Kenji; Sakai, Jun; Hayashi, Shigeyuki; Akao, Michitoshi; Furukawa, Satoshi; and Fujii, Eiji, 4,918,536, Cl. 358-296.000.

Fujii, Kohji: *See—*
Uehara, Kenichiro; Nagasaka, Toshio; and Fujii, Kohji, 4,916,811, Cl. 29-863.000.

Fujikawa, Tetsuzo; and Tamba, Shinichi, to Kawasaki Jukogyo Kabushiki Kaisha. Motor vehicle. 4,917,201, Cl. 180-68.200.

Fujiki, Makoto: *See—*
Kobayashi, Junji; Fujiki, Makoto; Kimura, Takashi; Ando, Masahiro; and Matsuoka, Hidetoshi, 4,917,328, Cl. 242-204.000.

Fujikura Ltd.: *See—*
Sakaya, Masuji; Motai, Tsuneaki; Mochizuki, Masataka; and Mashiko, Kouichi, 4,917,175, Cl. 165-45.000.

Fujikura, Yoshiaki: *See—*
Koshino, Junji; Fujikura, Yoshiaki; Fujita, Manabu; and Toi, Nao, 4,918,052, Cl. 512-22.000.

Fujimoto, Hiroaki: *See—*
Okazaki, Masaki; Hasegawa, Junichi; and Fujimoto, Hiroaki, 4,917,053, Cl. 123-52.0MB.

Fujimoto, Nobuyuki: *See—*
Sugimoto, Yoshiaki; Hosokawa, Toshihiro; Uchiumi, Yutaka; Sasamoto, Shuji; and Fujimoto, Nobuyuki, 4,917,658, Cl. 474-242.000.

Fujimoto, Takuya: *See—*
Sakihama, Kazuhisa; Fujimoto, Takuya; and Sueda, Akihiro, 4,918,408, Cl. 331-116.00R.

Fujimura, Fumio: *See—*
Satake, Toshimi; Minami, Toshiaki; Fujimura, Fumio; Oda, Satoshi; and Magami, Masato, 4,918,044, Cl. 503-209.000.

Fujino, Tomoya: *See—*
Tanabe, Haruo; Ishida, Masaji; Fujino, Tomoya, and Kurata, Tadahiko, 4,918,298, Cl. 235-384.000.

Fujisaka, Hisato; Tsujino, Koichi; and Shimada, Tunetaka, to Omron Tateisi Electronics Company. Article identifying system. 4,918,296, Cl. 235-380.000.

Fujisawa, Masao: *See—*
Yamane, Akira; and Fujisawa, Masao, 4,916,828, Cl. 34-10.000.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Yasumura, Mitsuru; Ohike, Atsuo; Ueda, Takao; Aoki, Masayoshi; Suzuki, Tomio; and Horiai, Makoto, 4,916,831, Cl. 34-134.000.

Fujishima, Kazuyasu: *See—*
Hidaka, Hideto; Fujishima, Kazuyasu; and Matsuda, Yoshio, 4,918,692, Cl. 371-2.200.

Fujita, Manabu: *See—*
Koshino, Junji; Fujikura, Yoshiaki; Fujita, Manabu; and Toi, Nao, 4,918,052, Cl. 512-22.000.

Fujita, Minoru: *See—*
Maruyama, Hiroshi; Kato, Yoshitake; and Fujita, Minoru, 4,918,559, Cl. 360-133.000.

Fujita, Takanori: *See—*
Moritani, Masahiko; Fujita, Takanori; Niwano, Masahiro; and Yokoo, Kazuhiro, 4,918,152, Cl. 526-262.000.

Fujita, Toshio: *See—*
Takano, Yusaku; Hizume, Akio; Takeda, Yorimasa; Fujita, Toshio; Kinoshita, Shushi; Morita, Kikuo; and Ikuta, Masahiro, 4,917,738, Cl. 148-325.000.

Fujita, Yuji: *See—*
Shiba, Takashi; Fujita, Yuji; Takahashi, Toshimitsu; and Yamada, Jun, 4,918,349, Cl. 310-313.00C.

Fujitani, Yasuo: *See—*
Shimada, Toshimasa; Tanemura, Katsuhei; Fujitani, Yasuo; Otake, Katsumoto; Oda, Shigeo; and Sumiya, Yoshio, 4,917,176, Cl. 165-95.000.

Fujitsu Limited: *See—*
Hashimoto, Shigeru; Higashiura, Yasuyuki; Sugimura, Yoshiyasu; and Nishimura, Hisayuki, 4,918,599, Cl. 364-200.000.
Kanai, Yasunori; Nawata, Kazumasa; Shimizu, Mitsuhisa; and Sakai, Toshiaki, 4,918,563, Cl. 361-91.000.
Matsubayashi, Norio, 4,918,444, Cl. 341-25.000.
Matsutani, Takeshi; and Imaoka, Kazunori, 4,918,499, Cl. 357-23.600.

Fujiwara, Ryota: *See—*
Koga, Shigetoshi; Hosokawa, Yoshio; Sueki, Hideo; Okano, Mikio; Fujiwara, Ryota; Inagawa, Yukihisa; and Fukui, Ken, 4,917,538, Cl. 405-150.000.

Fujiyoshi, Yoshihiro: *See—*
Yagi, Toru; Hirosawa, Yoshiaki; Tokita, Kaname; and Fujiyoshi, Yoshihiro, 4,917,056, Cl. 123-90.160.

Fukatsu, Hiroshi: *See—*
Nakagawa, Susumu; Fukatsu, Hiroshi; Katoh, Yoshiaki; and Murase, Satoshi, 4,918,070, Cl. 514-206.000.

Fukaya, Yukio; Hatano, Kazuyuki; and Sainohira, Kazuhiro, to Onoda Autoclaved Light Weight Concrete Co., Ltd. Method for treating waste water. 4,917,802, Cl. 210-605.000.

Fukino, Koyotaka: *See—*
Kosha, Kideaki; Ejiri, Kiyomi; Miura, Toshihiko; Fukino, Koyotaka; and Masaki, Kouichi, 4,917,947, Cl. 428-329.000.

Fukuda, Hideo, to Nippon Zeon Co., Ltd. Vulcanizable rubber composition. 4,918,144, Cl. 525-263.000.

Fukuda, Kazumasa: *See—*
Ezaki, Joichiro; Fukuda, Kazumasa; and Sakai, Masanori, 4,918,556, Cl. 360-97.020.

Fukuda, Kiyohito: *See—*
Samejima, Masakuni; Fukuda, Kiyohito; and Matsumoto, Mitsuru, 4,917,620, Cl. 439-272.000.

Fukuhara, Akinobu; and Kamm, Gerard R., to Union Carbide Chemicals and Plastics Company Inc. Method for on-line decoking of flame cracking reactors. 4,917,787, Cl. 208-48.00R.

Fukui, Ken: *See—*
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Peck, James V.; and Minaskanian, Gevork, 4,917,896, Cl. 424-449.000.
Miner, Lynn M.: *See*—
Busby, Kenneth O.; Adler, Richard J.; Miner, Lynn M.; and Kiuttu, Gerald F., 4,918,325, Cl. 307-106.000.
Minnesota Mining and Manufacturing Company: *See*—
Dufresne, Joel R.; and Sondermann, William L., 4,917,093, Cl. 128-421.000.
Funkenbusch, Arnold W., 4,917,970, Cl. 428-694.000.
Heinecke, Steven B., 4,917,928, Cl. 428-41.000.
Heinecke, Steven B., 4,917,929, Cl. 428-41.000.
Krepski, Larry R.; Heilmann, Steven M.; and Rasmussen, Jerald K., 4,918,231, Cl. 564-363.000.
Miller, Alan G., 4,917,730, Cl. 106-21.000.
Winters, John C., 4,917,942, Cl. 428-286.000.
Minolta Camera Kabushiki Kaisha: *See*—
Inoue, Manabu; Hata, Yoshiaki; Kobayashi, Kouichi; and Nakagawa, Norifumi, 4,918,479, Cl. 354-400.000.
Ishii, Kenjiro; Fukumoto, Fumio; Nagata, Koichi; and Shibata, Akira, 4,918,485, Cl. 355-64.000.
Nakao, Sachiko, 4,917,483, Cl. 350-423.000.
Nishimori, Kadotaro, 4,918,634, Cl. 364-709.120.
Yokoyama, Tomoaki, 4,917,043, Cl. 118-658.000.
Minowa, Masahiro: *See*—
Kurose, Mitsukazu; and Minowa, Masahiro, 4,918,513, Cl. 357-74.000.
Miroshnichenko, Ivan I.: *See*—
Bogdanov, Vasily S.; Miroshnichenko, Ivan I.; Bogdanov, Nikolai S.; Vorobiev, Nikolai D.; Pirotsky, Vladimir Z.; and Shevchenko, Ivan N., 4,917,312, Cl. 241-72.000.
Misawa, Masanaru: *See*—
Goodbody, Anne E.; Tsuyoshi, Endo; Vukovic, John; and Misawa, Masanaru, 4,918,011, Cl. 435-119.000.
Mishina, Tadashi: *See*—
Tsuda, Yoshinao; Mishina, Tadashi; Obata, Minoru; Araki, Kazuhiko; Inui, Jun; and Nakamura, Tadao, 4,918,074, Cl. 514-258.000.
Mishuku, Minoru: *See*—
Tsujii, Nobuhiro; Abe, Genryu; Yamaguchi, Akira; Mishuku, Minoru; and Tsuchiya, Nobujiro, 4,917,961, Cl. 428-552.000.
Misono, Makoto: *See*—
Hattori, Yasuyuki; Fukuoka, Noriaki; Tamura, Shigeru; Hashiba, Kunizo; Tsukada, Kiyoshi; and Misono, Makoto, 4,918,248, Cl 568-885.000.
Mita Alumi Ind. Co., Ltd.: *See*—
Mita, Masamichi, 4,917,262, Cl. 220-366.000.
Mita Industrial Co., Ltd.: *See*—
Yamada, Shuji; and Ando, Hironori, 4,917,460, Cl. 350-255.000.
Mita, Masamichi, to Mita Alumi Ind. Co., Ltd. Cooking vessel with adjustable vent spaces. 4,917,262, Cl. 220-366.000.
Mita, Ryuichi; Katoh, Toshio; Higuchi, Chojiro; Oura, Takeshi; and Yamaguchi, Akihiro, to Mitsui Toatsu Chemicals, Incorporated. Preparation process of α-l-aspartyl-l-phenyl-alanine methyl ester or hydrohalide thereof. 4,918,216, Cl. 560-41.000.
Mitoya, Yasunobu, to Tokai TRW & Co., Ltd. Method of manufacturing ball joint. 4,916,788, Cl. 29-898.044.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Ando, Hideki; and Miki, Takahiro, 4,918,451, Cl. 341-159.000.
Aso, Hiroaki, 4,918,323, Cl. 290-46.000.
Hidaka, Hideto; Fujishima, Kazuyasu; and Matsuda, Yoshio, 4,918,692, Cl. 371-2.200.
Inada, Masanori; Ohtani, Hichiro; and Yamakawa, Tomoya, 4,916,948, Cl. 73-202.500.
Inuishi, Masahide, 4,918,500, Cl. 357-23.600.

Isozumi, Shuzoo, 4,918,324, Cl. 290-48.000.
Kimura, Masatoshi; Takeuchi, Sumitaka; and Okada, Keisuke, 4,918,453, Cl. 341-160.000.
Kodama, Seiki; Murata, Shigemi; and Maruhashi, Hideki, 4,917,064, Cl. 123-414.000.
Matsunaga, Yoshihiro; Nishimori, Tadao; and Matsuoka, Hiromasa, 4,917,806, Cl. 210-662.000.
Miyamoto, Hiroshi; and Yamada, Michihiro, 4,918,656, Cl. 365-189.060.
Ohmori, Makoto, 4,918,299, Cl. 235-488.000.
Okamoto, Kyoichi; and Takami, Kazuo, 4,916,958, Cl. 74-6.000.
Oohashi, Tomonori, 4,918,528, Cl. 358-162.000.
Terada, Hiroaki; Asada, Katushiko; Nishikawa, Hiroaki; Miyata, Souichi; Matsumoto, Satoshi; Asano, Hajime; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; and Komori, Shinji, 4,918,644, Cl. 364-900.000.
Yoshida, Susumu, 4,918,507, Cl. 357-30.000.
Yoshino, Masataka; Morisaki, Takao; Odegawa, Hiromi; and Oohori, Masaharu, 4,917,311, Cl. 241-36.000.

Mitsubishi Gas Chemical Company, Inc.: *See—*
Doya, Masaharu; Kondo, Toshio; Igarashi, Hideo; and Uchiyama, Takako, 4,918,196, Cl. 548-342.000.
Ishizuka, Koichi; Gaku, Morio; Ishii, Kenzi; Kinbara, Hidenori; and Motegi, Masakazu, 4,917,758, Cl. 156-630.000.
Kondoh, Shigeo; and Umemura, Toshikazu, 4,918,160, Cl. 528-483.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Kato, Fusao; and Umezu, Yoshio, 4,917,557, Cl. 414-229.000.
Kobayashi, Kazuyoshi; Takizawa, Shozo; and Fukuyama, Kazuo, 4,917,205, Cl. 180-140.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Shimazutsu, Hiroaki; Matsumoto, Teruyuki; Miyamoto, Osamu; and Hayashi, Kanji, 4,916,824, Cl. 33-551.000.
Takano, Yusaku; Hizume, Akio; Takeda, Yonmasa; Fujita, Toshio; Kinoshita, Shushi; Morita, Kikuo; and Ikuta, Masahiro, 4,917,738, Cl. 148-325.000.

Mitsubishi Rayon Company Limited: *See—*
Hongo, Masafumi; Shigemitsu, Hideyuki; Yamamoto, Naoki; and Yanagase, Akira, 4,918,132, Cl. 524-504.000.

Mitsubishi Steel Mfg. Co., Ltd.: *See—*
Hamo, Kazunori, 4,917,859, Cl. 419-36.000.

Mitsui Petrochemical Industries, Ltd.: *See—*
Moriya, Satoru; Ishimoto, Akio; Akana, Yoshinori; Yamamoto, Yozo; Kishimura, Kotaro; and Ikejiri, Fumitoshi, 4,918,133, Cl. 524-518.000.

Mitsui Toatsu Chemicals, Inc.: *See—*
Iimuro, Shigeru; Kitamura, Takashi; and Morimoto, Yoshio, 4,918,245, Cl. 568-727.000.
Kajimoto, Nobuyuki; Nagata, Teruyuki; and Wada, Masaru, 4,918,186, Cl. 540-492.000.
Mita, Ryuichi; Katoh, Toshio; Higuchi, Chojiro; Oura, Takeshi; and Yamaguchi, Akihiro, 4,918,216, Cl. 560-41.000.
Yoshimoto, Takeo; Umemoto, Mitsumasa; Igarashi, Keiichi; Kubota, Yutaka; Yamazaki, Hideo; Enomoto, Yuji; and Yanagita, Hirohisa, 4,918,106, Cl. 514-604.000.

Mitsuse, Masami: *See—*
Miyamoto, Masahiko; Tanaka, Shinji; Mitsuse, Masami; Murata, Kohei; and Masui, Yoshihiro, 4,917,034, Cl. 114-29.000.

Miura, Hiroki: *See—*
Terada, Hiroaki; Asada, Katushiko; Nishikawa, Hiroaki; Miyata, Souichi; Matsumoto, Satoshi; Asano, Hajime; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; and Komori, Shinji, 4,918,644, Cl. 364-900.000.

Miura, Masakatsu: *See—*
Aoki, Hideyuki; and Miura, Masakatsu, 4,916,977, Cl. 475-205.000.

Miura, Toshihiko: *See—*
Kosha, Kideaki; Ejiri, Kiyomi; Miura, Toshihiko; Fukino, Koyotaka; and Masaki, Kouichi, 4,917,947, Cl. 428-329.000.

Miyagi, Kiyoshi: *See—*
Sakaitani, Katsutoshi; Nakamura, Hiroyuki; and Miyagi, Kiyoshi, 4,917,927, Cl. 428-40.000.

Miyaka, Toshio: *See—*
Hirao, Mamoru; Hijiya, Hiromi; and Miyaka, Toshio, 4,917,916, Cl. 426-658.000.

Miyake, Ryoichi: *See—*
Yoshimura, Kiyokazu; Miyawaki, Norio; Yamada, Hiroyuki; Nakamura, Hideaki; Tshujino, Koichi; Takinami, Takaharu; Hirayama, Tatemitsu; Naito, Tatsuhiko; Miyake, Ryoichi; Yamada, Takeshi; Iwakiri, Tetsuro; and Otsuka, Kazuaki, 4,918,616, Cl. 364-507.000.

Miyama, Masao: *See—*
Yamada, Toyokazu; Miyama, Masao; Sugimura, Hideo; and Shinohara, Takeshi, 4,917,851, Cl. 264-40.700.

Miyamoto, Hiroshi; and Yamada, Michihiro, to Mitsubishi Denki Kabushiki Kaisha. Dynamic random access memory with FET equalization of bit lines. 4,918,656, Cl. 365-189.060.

Miyamoto, Masahiko; Tanaka, Shinji; Mitsuse, Masami; Murata, Kohei; and Masui, Yoshihiro, to Osakawan Marine Corporation. Carrying barge. 4,917,034, Cl. 114-29.000.

Miyamoto, Osamu: *See—*
Ono, Akira; Fuse, Toshikazu; Miyamoto, Osamu; Makino, Shoso; Yamato, Yoshihisa; Kametani, Hiroshi; Tokura, Susumu; Tanaka, Hiromi; Ito, Toru; Nakao, Hitomi, Tokuoka, Shuji; and Takeda, Toshihide, 4,917,920, Cl. 427-389.900.
Shimazutsu, Hiroaki; Matsumoto, Teruyuki; Miyamoto, Osamu; and Hayashi, Kanji, 4,916,824, Cl. 33-551.000.

Miyamoto, Takanori: *See—*
Muramatsu, Ryujiro; Miyamoto, Takanori; Kondo, Kazuhiro; and Suzuki, Toshiro, 4,918,734, Cl. 381-46.000.

Miyasaka, Toshiyuki, to Kabushiki Kaisha Toshiba. Track accessing apparatus for optical disk. 4,918,676, Cl. 369-32.000.

Miyasaka, Toshiyuki, to Kabushiki Kaisha Toshiba. Focus-servo correction utilizing storage of detected focus errors. 4,918,680, Cl. 369-45.000.

Miyashita, Kunio: *See—*
Tajima, Fumio; Samman, Nicolas; Miyashita, Kunio; Katayama, Hiroshi; Ito, Motoya; Narushima, Seiichi; and Yamamuro, Kiyoshi, 4,918,346, Cl. 310-156.000.

Miyata, Masanori: *See—*
Murakami, Koichi; Adachi, Hideki; Miyata, Masanori; and Honjo, Takeshi, 4,917,366, Cl. 270-53.000.

Miyata, Souichi: *See—*
Terada, Hiroaki; Asada, Katushiko; Nishikawa, Hiroaki; Miyata, Souichi; Matsumoto, Satoshi; Asano, Hajime; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; and Komori, Shinji, 4,918,644, Cl. 364-900.000.

Miyatake, Tsutomu, to Sumitomo Heavy Industries, Ltd. Position sensor having double focuses and utilizing a chromatic aberration. 4,918,301, Cl. 250-216.000.

Miyawaki, Norio: *See—*
Yoshimura, Kiyokazu; Miyawaki, Norio; Yamada, Hiroyuki; Nakamura, Hideaki; Tshujino, Koichi; Takinami, Takaharu; Hirayama, Tatemitsu; Naito, Tatsuhiko; Miyake, Ryoichi; Yamada, Takeshi; Iwakiri, Tetsuro; and Otsuka, Kazuaki, 4,918,616, Cl. 364-507.000.

Miyazaki, Atsushi: *See—*
Yabe, Hisao; Ogiu, Hisao; Takara, Toshiyuki; Takamura, Koji; Nakazawa, Masaaki; Uchikubo, Akinobu; Sato, Tomoaki; Miyazaki, Atsushi; Ishikawa, Akibumi; and Nakamura, Takeaki, 4,918,521, Cl. 358-98.000.

Mizuishi, Kouji: *See—*
Katsuoka, Nobuo; Mizuishi, Kouji; Hirano, Yoshihiro; Sato, Kenichi; and Otsuka, Seiichiro, 4,916,955, Cl. 73-862.440.

Mizutani, Takayuki: *See—*
Kuwabara, Naruo; Kozima, Toshio; and Mizutani, Takayuki, 4,918,278, Cl. 219-69.100.

Mjoen, Jarle: *See—*
Strommen, Roe D.; Mjoen, Jarle; and Wang, Kjetil, 4,916,797, Cl. 29-426.500.

Mlaker, John J.; and Holmes, William K., to Hi-Ranger, Inc. Aerial lift bucket rotation device including bucket leveling means. 4,917,214, Cl. 182-2.000.

MM Systems Corporation: *See—*
Nicholas, John D., 4,916,878, Cl. 52-396.000.

Mobay Corporation: *See—*
Slocum, Gregory H.; Hurley, Michael F.; Templin, Wallace D., and Schumacher, Donald W., 4,917,902, Cl. 425-553.000.

Mobil Oil Corp.: *See—*
Chou, Tai-Sheng; Huss, Albin, Jr.; Kennedy, Clinton R.; and Kurtas, Robert S., 4,918,255, Cl. 585-331.000.
Jennings, Alfred R., Jr.; Jones, Lloyd G.; and Shu, Paul, 4,917,185, Cl. 166-281.000.
Nemet-Mavrodin, Margaret, 4,918,256, Cl. 585-415.000.
Owen, Hartley, 4,917,790, Cl. 208-113.000.
Rankel, Lillian A.; and Whitehurst, Darrell D., 4,917,788, Cl. 208-73.000.

Mochizuki, Masataka: *See—*
Sakaya, Masuji; Motai, Tsuneaki; Mochizuki, Masataka; and Mashiko, Kouichi, 4,917,175, Cl. 165-45.000.

Modafferi Acoustical Systems, Ltd.: *See—*
Modafferi, Richard, 4,918,394, Cl. 330-3.000.

Modafferi, Richard, to Modafferi Acoustical Systems, Ltd. Audio frequency power amplifier with improved circuit topology. 4,918,394, Cl. 330-3.000.

Modarres, Hossein; Raam, Susan; and Lai, Jiun-Hao, to LSI Logic Corporation. Hierarchical floorplanner. 4,918,614, Cl. 364-490.000.

Moebes, Hellmuth: *See—*
Dulat, Bernd; and Moebes, Hellmuth, 4,917,330, Cl. 244-3.160.

Moeller, Rolf B.: *See—*
Beha, Johannes G.; Blacha, Armin U.; Clauberg, Rolf; Moeller, Rolf B.; and Pohl, Wolfgang D., 4,918,309, Cl. 250-306.000.

Moelzer, Peter: *See—*
Pollner, Juergen; Trummer, Gregor; and Moelzer, Peter, 4,917,563, Cl. 414-428.000.
Pollner, Juergen; Trummer, Gregor; and Moelzer, Peter, 4,917,564, Cl. 414-428.000.

Mogel, Helmut. Protective lining arrangement. 4,916,939, Cl. 73-49.200.

Mohan, Raja, to Edo Corporation. Fiber reinforced article capable of revealing damage due to surface impacts and method of making same. 4,917,938, Cl. 428-215.000.

Mohaupt, John M.; and Riemenschneider, Mark R., to R. A. Jones & Co., Inc. Packaging container ejection apparatus. 4,917,659, Cl. 493-12.000.

Mohrhauser, Klaus: *See—*
Heitele, Jurgen; and Mohrhauser, Klaus, 4,917,288, Cl. 229-102.000.

Mold-Masters Limited: *See—*
Gellert, Jobst U.; and Schmidt, Harald H., 4,917,594, Cl. 425-549.000.

Moli Energy Limited: *See—*
Dahn, Jeffrey R.; and Al-Janaby, Harith J., 4,917,871, Cl. 423-61.000.

Molinoff, Henry C. Mouth moisturizing device. 4,917,674, Cl. 604-286.000.

Moll, Philipp; and Kaiser, Albrecht, to Pfaff Industriemaschinen GmbH. Method and apparatus for positioning limp workpieces for treatment thereof. 4,917,369, Cl. 271-228.000.

Molstad, Roger D., to K-W Manufacturing Co., Inc. Easily adjustable towed mower. 4,916,889, Cl. 56-14.900.

Molyneaux, David A.: *See—*
Mehdizadeh, Mehrdad, Molyneaux, David A. and Holland, G Neil, 4,918,388, Cl. 324-322.000.

Molyneux, Keith W.: *See—*
Lynam, Niall; and Molyneux, Keith W., 4,917,824, Cl. 252-582.000.

Monarch Knitting Machinery Corporation: *See—*
Pernick, Bruce M., 4,916,925, Cl. 66-141.000.

Monget, Francois: *See—*
Cahuzac, Georges J. J.; and Monget, Francois, 4,917,756, Cl. 156-429.000.

Monneret, Claude; Florent, Jean-Claude; and Genot, Agnes, to Laboratories Hoechst S.A. 2',6'-Dideoxy derivatives of anthracycline glycosides. 4,918,173, Cl. 536-6.400.

Monolite S.R.L.: *See—*
Candiracci, Angelo, 4,917,284, Cl. 228-5.100.

Montedipe S.p.A.: *See—*
Roffia, Paolo; Tonti, Sergio, Cesana, Alberto; Mantegazza, Maria Angela; and Padovan, Mario, 4,918,194, Cl. 546-184.000.

Montedison S.p.A.: *See—*
Dal Canale, Enrico; Bonsignore, Stefanio; and Du Vosel, Annick, 4,918,217, Cl. 560-073.000.

Monticello, Samuel A., to Young, Robert L., a part interest. Method and apparatus for hoof repair and securing a shoe to a hoof. 4,917,192, Cl. 168-4.000.

Moog GmbH: *See—*
Handte, Herbert, 4,918,612, Cl. 364-474.220.

Moon, Chang-Kiu. Drug, preparation and use thereof. 4,918,099, Cl. 514-453.000.

Moore, Andrew S.; Bartholic, David B., Barger, Dwight F., and Reagan, William J., to Englehard Corporation. Gas/solid contact method for removing sulfur oxides from gases. 4,917,875, Cl. 423-244.000.

Moore, David W., to Super Seal Mfg. Ltd. Dock seal. 4,916,870, Cl. 52-2.00C.

Moore, Jack S., Jr.: *See—*
Spaller, Albert E., Jr.; and Moore, Jack S., Jr., 4,917,660, Cl. 493-42.000.

Moore, James M.; and Leighton, James F., to United States of America, Energy. Vector generator scan converter. 4,918,624, Cl. 364-519.000.

Moore, Robert L. Water immersion alarm belt. 4,918,433, Cl. 340-573.000.

Mopfelan S.p.A.: *See—*
Vittone, Andrea; Chiappini, Giuseppe; and Di Paola, Massimo, 4,917,749, Cl. 156-242.000.

Mora, Saturnino F., Jr.; and Jimenez, Godofredo A. Electromechanical door lock system. 4,917,419, Cl. 292-144.000.

Morawski, Gerd: *See—*
Buchmuller, Horst; and Morawski, Gerd, 4,917,025, Cl. 110-245.000.

Morean, Orlando: *See—*
Lorente, Maria A.; De Rincon, Jeanny T.; Morean, Orlando; and Wright, Terence B., 4,918,739, Cl. 382-1.000.

Morel, Simone. Applicator case for lipstick and similar applications. 4,917,133, Cl. 132-318.000.

Mores, Maryanne: *See—*
Cassidy, Patrick E.; Farley, James M.; and Mores, Maryanne, 4,918,153, Cl. 528-125.000.

Morgan, Arthur, to Flight Equipment & Engineering Limited. Adjustable-width seating for passenger-carrying vehicles. 4,917,438, Cl. 297-411.000.

Morgan, Douglas H. Temporomandibular joint prostheses. 4,917,701, Cl. 623-16.000.

Morgan, Michael E.; and Phelps, Martha A., to Hi-Tek Polymers, Inc. Quaternary ammonium acrylic monomers and alcohol soluble polymers made therefrom. 4,918,228, Cl. 564-208.000.

Morgan, Michael E.: *See—*
Karcher, Dennis J.; Morgan, Michael E.; and Phelps, Martha A., 4,918,181, Cl. 536-114.000.

Morgenroth, Konstantin: *See—*
Bauer, Wolfgang; Morgenroth, Konstantin; Reh, Kuno; and Ritter, Josef, 4,917,731, Cl. 106-22.000.

Mori, Akio: *See—*
Takahashi, Mineo; Nakayama, Susmum; Suzuki, Satoshi; Mori, Akio; Seo, Hiroyuki; Imamura, Minoru; Tanaka, Hiroshi; and Yoneyama, Norihiro, 4,918,261, Cl. 174-135.000.

Mori, Hiroshi; Kobayashi, Toshiaki; Ogura, Mitsuru; and Iwai, Shougo, to Sharp Kabushiki Kaisha. Image forming apparatus. 4,918,537, Cl. 358-300.000.

Mori, Kiyoaki; and Kameda, Keiji, to Tsudakoma Corporation. Standby weft yarn cutting preventing device for a multicolor fluid jet loom. 4,917,153, Cl. 139-435.100.

Mori, Shinji, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Webbing retractor. 4,917,324, Cl. 242-107.000.

Mori, Shosei; Shinjo, Kenji; and Iwaki, Takashi, to Canon Kabushiki Kaisha. Optically active mesomorphic compound and liquid crystal composition containing same. 4,917,821, Cl. 252-299.630.

Morimoto, Yoshio: *See—*
Iimuro, Shigeru; Kitamura, Takashi; and Morimoto, Yoshio, 4,918,245, Cl. 568-727.000.

Morinaga, Makoto: *See—*
Fukuyama, Hiroshi; Morinaga, Makoto; Goshima, Norio; Nakao, Makoto; Oono, Kiyoshi, and Watanabe, Isao, 4,918,423, Cl. 340-442.000.

Morisaki, Takao: *See—*
Yoshino, Masataka; Morisaki, Takao; Odegawa, Hiromi; and Oohori, Masaharu, 4,917,311, Cl. 241-36.000.

Morishima, Hideki: *See—*
Kawamura, Masaharu; Haraguchi, Shosuke, and Morishima, Hideki, 4,918,474, Cl. 354-173.100.

Morita, Kikuo: *See—*
Takano, Yusaku; Hizume, Akio; Takeda, Yonmasa; Fujita, Toshio; Kinoshita, Shushi; Morita, Kikuo; and Ikuta, Masahiro, 4,917,738, Cl. 148-325.000.

Morita, Naoyuki, to Fuji Photo Film Co., Ltd. Multi-color beam scanner with simultaneous scanning along a plurality of scan lines. 4,918,465, Cl. 346-108.000.

Morita, Yoshihiko: *See—*
Hioki, Toshiaki; Morita, Yoshihiko; Watanabe, Hiroshi; and Toyama, Tateo, 4,918,539, Cl. 358-342.000.

Moritani, Masahiko; Fujita, Takanori; Niwano, Masahiro; and Yokoo, Kazuhiro, to Sumitomo Chemical Company, Limited. Process for the production of formed article of aromatic vinyl resin. 4,918,152, Cl. 526-262.000.

Morito, Makoto; Tabei, Yukio; and Yamada, Kozo, to Oki Electric Industry Co., Ltd. Speech recognition apparatus for recognizing the category of an input speech pattern. 4,918,735, Cl. 381-47.000.

Moritsu, Yukikazu: *See—*
Akai, Yoshito; Konaga, Nobuyuki; Arisato, Yasunori; and Moritsu, Yukikazu, 4,917,958, Cl. 428-457.000.

Moriya, Satoru; Ishimoto, Akio; Akana, Yoshinori, Yamamoto, Yozo; Kishimura, Kotaro; and Ikejiri, Fumitoshi, to Mitsui Petrochemical Industries, Ltd. Cycloolefin type random copolymer compositions. 4,918,133, Cl. 524-518.000.

Morris, Drew W. Crusher for battery cathodes. 4,917,313, Cl. 241-99.000.

Morris, Jo: *See—*
Winter, Walter W., Morris, Jo; and Cannon, Dale E., 4,918,322, Cl. 379-88.000.

Morris, Merle E.; and Senft, Stephen P., to GTE Products Corporation. Electric lamp with protective base. 4,918,355, Cl. 313-318.000.

Morris, Paul H.: *See—*
Nado, Robert A.; and Morris, Paul H., 4,918,621, Cl. 364-513.000.

Morris, Richard F.: *See—*
Englehart, Theodore M.; Morris, Richard F.; and Sanghvi, Narendra T., 4,917,096, Cl. 128-660.100.

Morse Controls Limited: *See—*
Crack, David J., 4,916,964, Cl. 74-473.00P.

Morton, Douglas R.: *See—*
Johnson, Roy A.; Bundy, Gordon L.; Youngdale, Gilbert A., Morton, Douglas R., and Wallach, Donald P., deceased, 4,917,826, Cl. 552-522.000.

Morton, Douglas W., to Hewlett-Packard Company. Multichannel decimation/interpolation filter. 4,918,637, Cl. 364-724.170.

Moser, Hans: *See—*
Pissiotas, Georg, Moser, Hans; and Bohner, Beat, 4,917,721, Cl. 71-96.000.

Moshier, William C.; Brupbacher, John M.; Christodoulou, Leontios, and Nagle, Dennis C., to Martin Marietta Corporation. Porous metal-second phase composites. 4,917,964, Cl. 428-614.000.

Mosser, Mark F.: *See—*
Hornberger, Dennis A.; Mosser, Mark F.; and McMordie, Bruce G., 4,917,960, Cl. 428-550.000.

Motai, Tsuneaki: *See—*
Sakaya, Masuji; Motai, Tsuneaki; Mochizuki, Masataka; and Mashiko, Kouichi, 4,917,175, Cl. 165-45.000.

Motegi, Masakazu: *See—*
Ishizuka, Koichi; Gaku, Morio; Ishii, Kenzi; Kinbara, Hidenori; and Motegi, Masakazu, 4,917,758, Cl. 156-630.000.

Motegi, Takuji: *See—*
Watanabe, Yasuhiko; Nakamura, Nobuyoshi; Kuriyama, Yoshinori; and Motegi, Takuji, 4,917,742, Cl. 156-79.000.

Mothrath, Georg: *See—*
Hahnewald, Andrea; and Mothrath, Georg, 4,918,294, Cl. 219-521.000.

Motor Wheel Corporation: *See—*
Daudi, Anwar R., 4,917,440, Cl. 301-9.0DN

Motorola Computer X, Inc.: *See—*
Tarver, Carl R.; Lawrence, James G.; and Whittington, Charles L., 4,918,572, Cl. 361-395.000.

Motorola, Inc.: *See—*
Borras, Jaime A., 4,918,431, Cl. 340-825.440.
Dworsky, Lawrence, 4,918,050, Cl. 505-1.000.
Fisher, Duncan M.; and Klein, Jeffrey L., 4,917,759, Cl. 156-643.000.
Gerson, Ira A.; and Lindsley, Brett L., 4,918,732, Cl. 381-43.000.
Jasinski, Leon; and Steel, Francis R., deceased, 4,918,437, Cl. 340-825.440.
Martin, Frederick L., 4,918,403, Cl. 331-1.00A.
Owens, Norman L., 4,918,512, Cl. 357-74.000.
Pfiester, James R., 4,918,510, Cl. 357-42.000.
Remington, Scott I.; and Crisp, Richard D., 4,918,663, Cl. 365-226.000.
Walker, Charles J.; and Dominguez, Steve, 4,918,564, Cl. 361-94.000.

Mottate, Tatsuo, to Nippon Thompson Co. Ltd. Thin linear motion rolling guide unit. 4,917,508, Cl. 384-45.000.
Mougne, Marcel L. Method and apparatus for measuring and calculating bulk water in crude oil. 4,916,940, Cl. 73-61.10R.
Mourou, Gerard A.: *See*—
Pessot, Maurice; and Mourou, Gerard A., 4,918,751, Cl. 455-608.000.
Moya, Edward J.: *See*—
Kay, Nathan; McNab, Donald W.; and Moya, Edward J., 4,917,522, Cl. 401-269.000.
MPM Music - S.r.l.: *See*—
Pirchio, Paolo, 4,917,341, Cl. 248-164.000.
MTD Products, Inc.: *See*—
Solomon, Fred D., 4,917,079, Cl. 126-433.000.
Mueller, Donald E.; and Boyd, William A., to Westinghouse Electric Corp. Self-latching reactivity-reducing device for use in on-site spent fuel assembly storage. 4,917,856, Cl. 376-447.000.
Mueller, Franz-Josef; and Matt, Dominique, to BASF Aktiengesellschaft. Preparation of acetic acid and methyl acetate. 4,918,218, Cl. 560-232.000.
Muellner, Ernst: *See*—
Heimsch, Wolfgang; and Muellner, Ernst, 4,918,640, Cl. 364-768.000.
Mukherjee, Debaditya: *See*—
Katircioglu, Haluk; De Beule, John A.; and Mukherjee, Debaditya, 4,918,378, Cl. 365-201.000.
Mukunoki, Yasuo; Yoneyama, Masakazu; and Yamada, Sumito, to Fuji Photo Film Co., Ltd. Silver halide photographic materials. 4,917,993, Cl. 430-523.000.
Mullens, Patrick L. Rapid freezing apparatus. 4,916,922, Cl. 62-384.000.
Muller, Franz. Sliding nut or screw for insertion into C-bars. 4,917,553, Cl. 411-85.000.
Muller, Hanns P.: *See*—
Probst, Joachim; Schafer, Walter; Schuster, Klaus; Alberts, Heinrich; Muller, Hanns P.; Schmidt, Adolf; and Wieczorrek, Wolfhart, 4,918,135, Cl. 524-714.000.
Muller, Udo: *See*—
Jacob-Grinschgl, Wolfgang; and Muller, Udo, 4,918,263, Cl. 178-19.000.
Mullet, Paul W.; and Voth, Elmer D., to Excel Industries, Inc. Rotary mulching mower. 4,916,887, Cl. 56-13.800.
Mulligan, Seamus: *See*—
Geoghegan, Edward J.; Mulligan, Seamus; and Panoz, Donald E., 4,917,899, Cl. 424-461.000.
Mumallah, Naim A., to Phillips Petroleum Company. Altering subterranean formation permeability. 4,917,186, Cl. 166-295.000.
Mund, Konrad: *See*—
Richter, Gerhard; Weidlich, Erhard; Mund, Konrad; and Boder, Horst, 4,917,760, Cl. 156-655.000.
Munk, Heinz; and Stephan, Hans W. Magnetocaloric monostable and bistable inductors for electrical energy and refrigeration. 4,916,907, Cl. 62-3.100.
Munteanu, Marina A., to International Flavors & Fragrances, Inc. Container with microporous membrane for dispensing vapor from volatile liquid. 4,917,301, Cl. 239-43.000.
Murai, Asao; and Yamamoto, Masao, to Sanraku Incorporated. Method of quantitative assay for vitamin B_{12} and reagent for assaying vitamin B_{12}. 4,918,005, Cl. 435-34.000.
Murai, Shigenobu: *See*—
Yoshida, Yukio; Takimoto, Akiyoshi; and Murai, Shigenobu, 4,918,443, Cl. 341-6.000.
Murakami, Hiroyoshi, to Omron Tateisi Electronics Co. Automatic transaction terminal having means for presetting the denominations of notes stored in a plurality of note cartridges. 4,917,792, Cl. 209-534.000.
Murakami, Katsutoshi: *See*—
Hara, Nobuyuki; Anabuki, Yukitaka; Murakami, Katsutoshi; and Harada, Mitsuhiko, 4,917,725, Cl. 75-752.000.
Murakami, Koichi; Adachi, Hideki; Miyata, Masanori; and Honjo, Takeshi, to Canon Kabushiki Kaisha. Sheet handling apparatus. 4,917,366, Cl. 270-53.000.
Murakami, Shogo, to Kabushiki Kaisha Toshiba. Ink film recording apparatus. 4,918,461, Cl. 366-76.0PH.
Murakami, Yoshiteru: *See*—
Ohta, Kenji; Katayama, Hiroyuki; Takahashi, Akira; Murakami, Yoshiteru; and Hirokane, Junji, 4,917,751, Cl. 156-272.200.
Muramatsu, Ryujiro; Miyamoto, Takanori; Kondo, Kazuhiro; and Suzuki, Toshiro, to Hitachi, Ltd. Speech coding system using variable threshold values for noise reduction. 4,918,734, Cl. 381-46.000.
Murase, Akira. *See*—
Oguni, Masanory; Ichikawa, Hachiro; Murase, Akira; Ozawa, Hiroo; and Tsuge, Akihiko, 4,917,877, Cl. 423-412.000.
Murase, Kazuhiro: *See*—
Matsumoto, Michihito; and Murase, Kazuhiro, 4,918,638, Cl. 364-746.100.
Murase, Satoshi: *See*—
Nakagawa, Susumu; Fukatsu, Hiroshi; Katoh, Yoshiaki; and Murase, Satoshi, 4,918,070, Cl. 514-206.000.
Murase, Tadashi, to Colin Electronics Co., Ltd. Method and apparatus for measuring blood pressure. 4,917,098, Cl. 128-677.000.
Murata Kikai Kabushiki Kaisha: *See*—
Kojima, Toshiaki; Uchida, Hiroshi; and Kubota, Yasuhiko, 4,917,326, Cl. 242-128.000.
Murata, Kohei: *See*—
Miyamoto, Masahiko; Tanaka, Shinji; Mitsuse, Masami; Murata, Kohei; and Masui, Yoshihiro, 4,917,034, Cl. 114-29.000.
Murata Manufacturing Co. Ltd.: *See*—
Ando, Akira; Kittaka, Toshihiko, and Sakabe, Yukio, 4,918,350, Cl. 310-320.000.
Okamura, Hisatake; Tsuru, Teruhisa; and Taniguchi, Tetsuo, 4,918,570, Cl. 361-321.000.
Sakamoto, Yukio, 4,918,417, Cl. 336-83.000.
Murata, Shigemi: *See*—
Kodama, Seiki; Murata, Shigemi; and Maruhashi, Hideki, 4,917,064, Cl. 123-414.000.
Murata, Tatsuo: *See*—
Takao, Hideaki; Murata, Tatsuo; Kanbe, Junichiro; Tamura, Miki; Kamio, Masaru; Sekimura, Nobuyuki, and Kikuchi, Yoshiki, 4,917,471, Cl. 350-339.00F.
Murdocca, Miles J.: *See*—
Jahns, Jurgen; and Murdocca, Miles J., 4,917,456, Cl. 350-169.000.
Murib, Jawad H., to Quantum Chemical Corporation. Catalytic conversion of methane to higher hydrocarbons. 4,918,257, Cl. 585-500.000.
Muroi, Tetsuya, to Ricoh Company, Ltd. Speech recognition method and apparatus. 4,918,731, Cl. 381-43.000.
Murphy, Michael K., to Zeftek, Inc. Door finger guide for doors on auto rack cars. 4,917,021, Cl. 105-378.000.
Murphy, Timothy J.: *See*—
Floro, William E., Luboski, Mark, and Murphy, Timothy J., 4,918,589, Cl. 364-132.000.
Murray Corporation: *See*—
Flinchbaugh, David E., 4,916,915, Cl. 62-129.000.
Murray, Douglas J.: *See*—
Hopmann, Mark E.; Murray, Douglas J.; and Strattan, Scott C., 4,917,191, Cl. 166-381.000.
Murray, Stephen G., to General Motors Corporation. Secondary oil system for gas turbine engine. 4,917,218, Cl. 184-6.110.
Murray, Stuart W.; Hankins, Ronald G.; and Bowman, Thomas E., to CMI Corporation. Twin bin self erect silo. 4,917,560, Cl. 414-332.000.
Murri, Daniel G., to United States of America, National Aeronautics and Space Administration. Actuated forebody strakes. 4,917,333, Cl. 244-75.00R.
Murtagh, Mary: *See*—
Carty, Barbara A.; Grealish, Anna; and Murtagh, Mary, 4,917,889, Cl. 424-693.100.
Mushka, Gerald R.: *See*—
Fettes, Don G.; Marusiak, Myles P.; and Mushka, Gerald R., 4,917,794, Cl. 210-96.100.
Muth, Gunter: *See*—
Wohlleben, Wolfgang; Muth, Gunter; and Puhler, Alfred, 4,918,015, Cl. 435-172.300.
Muth, Stephan R. W.; and Vollath, Guenther, to VanDam, Inc. Sheet folding method and apparatus. 4,917,405, Cl. 281-5.000.
Muto, Hiroaki: *See*—
Chiba, Tohru, Muto, Hiroaki, Tanioka, Soji, Nishiyama, Yuichi; Hoshi, Noboru; and Onda, Yoshiro, 4,917,885, Cl. 424-78.000.
NACAM: *See*—
Haldric, Bernard; Benedi, Gregorio; and Baudon nee Chardons, Sylvie, 4,916,971, Cl. 74-552.000.
Nacenta Atmella, Jose M., to Catalana De Gas, S.A. Arrangement for cooking by gas combustion. 4,917,075, Cl. 126-33.000.
Nado, Robert A.; and Morris, Paul H., to IntelliCorp, Inc. Method for representing a directed acyclic graph of worlds using an assumption-based truth maintenance system. 4,918,621, Cl. 364-513.000.
Nadolph, Bruno; and Bucking, Rene. Device for keeping warm or cooling foods or beverages. 4,917,076, Cl. 126-375.000.
Nagakura, Hodaka, to Sanshin Kogyo Kabushiki Kaisha. Engine control means for marine propulsion. 4,917,061, Cl. 123-179.00B.
Naganawa, Hiroshi: *See*—
Yoshimoto, Akihiro; Jodo, Osamu; Watanabe, Yoshio; Okamoto, Rokuro; Ishikura, Tomoyuki; Naganawa, Hiroshi; Sawa, Tsutomu; and Takeuchi, Tomio, 4,918,172, Cl. 536-6.400.
Nagao, Yoshimitsu; Kumagai, Toshio; Tamai, Satoshi; Kuramoto, Yasuhiro; and Shimidzu, Hisashi, to Lederle (Japan), Ltd. Azetidin-2-one derivatives, and process for production thereof using tin enolates. 4,918,184, Cl. 540-200.000.
Nagasaka, Toshio: *See*—
Uehara, Kenichiro; Nagasaka, Toshio; and Fujii, Kohji, 4,916,811, Cl. 29-863.000.
Nagashima, Nao; and Kadowaki, Toshihiro, to Canon Kabushiki Kaisha. Image processing apparatus capable of smooth multi-area variable magnification processing. 4,918,542, Cl. 358-451.000.
Nagashima, Shigeo: *See*—
Hayashi, Takehisa; Omada, Koichiro; Tanaka, Teruo; Hamanaka, Naoki; and Nagashima, Shigeo, 4,918,686, Cl. 370-60.000.
Nagata, Hiroshi; Iino, Atsushi; Kato, Nobuhide; Ishikawa, Hiroshi; and Hamada, Yasuhiko, to NGK Insulators, Ltd. Oxygen sensors. 4,916,934, Cl. 73-23.000.
Nagata, Koichi: *See*—
Ishii, Kenjiro; Fukumoto, Fumio; Nagata, Koichi; and Shibata, Akira, 4,918,485, Cl. 355-64.000.
Nagata, Teruyuki: *See*—
Kajimoto, Nobuyuki; Nagata, Teruyuki; and Wada, Masaru, 4,918,186, Cl. 540-492.000.
Nagayama, Tatsumi: *See*—
Notoya, Reiko; and Nagayama, Tatsumi, 4,917,972, Cl. 429-44.000.
Nagle, Dennis C.: *See*—
Moshier, William C.; Brupbacher, John M.; Christodoulou, Leontios; and Nagle, Dennis C., 4,917,964, Cl. 428-614.000.
Naito, Kinshiro, to Amada Company, Limited. Method for controlling noise and vibration of machine tools with high efficiency. 4,918,364, Cl. 318-646.000.

Naito, Noboru: *See*—
Kato, Kinya; Kakuda, Nobuhiko; Naito, Noboru; and Wada, Tsutomu, 4,918,504, Cl. 357-23.700.
Naito, Tatsuhiko: *See*—
Yoshimura, Kiyokazu; Miyawaki, Norio; Yamada, Hiroyuki; Nakamura, Hideaki; Tshujino, Koichi; Takinami, Takaharu; Hirayama, Tatemitsu; Naito, Tatsuhiko; Miyake, Ryoichi; Yamada, Takeshi; Iwakiri, Tetsuro; and Otsuka, Kazuaki, 4,918,616, Cl. 364-507.000.
Nakae, Atsuo: *See*—
Aoyagi, Muneo; and Nakae, Atsuo, 4,917,813, Cl. 252-99.000.
Nakagawa, Norifumi: *See*—
Inoue, Manabu; Hata, Yoshiaki; Kobayashi, Kouichi; and Nakagawa, Norifumi, 4,918,479, Cl. 354-400.000.
Nakagawa, Susumu; Fukatsu, Hiroshi, Katoh, Yoshiaki, and Murase, Satoshi, to Banyu Pharmaceutical Co., Ltd. Cephalosporin derivatives and antibacterial agents. 4,918,070, Cl. 514-206.000.
Nakagiri, Takashi: *See*—
Matsuda, Hiroshi; Saito, Kenji; Sakai, Kunihiro; Eguchi, Ken; Nishimura, Yukuo; and Nakagiri, Takashi, 4,917,939, Cl. 428-216.000.
Nakahara, Fumio: *See*—
Ohmi, Tadahiro; Sugiyawa, Kazuhiko; Nakahara, Fumio; and Umeda, Masaru, 4,917,136, Cl. 137-15.000.
Nakahara, Keisuke; Yoshikoshi, Hideyuki, Hinami, Toshio; and Kawawa, Takaho, to NKK Corporation. Method for producing titanium fluoride. 4,917,872, Cl. 423-76.000.
Nakahashi, Masako; Shirokane, Makoto; Takeda, Hiromitsu; Yamazaki, Tatsuo; Okutomi, Tsutomu; Niwa, Shozi; Okawa, Mikio; and Homma, Mitsutaka, to Kabushiki Kaisha Toshiba. Air-tight ceramic container. 4,917,642, Cl. 445-44.000.
Nakai, Akiya: *See*—
Hamasaki, Bunei; Igarashi, Hajime; Nakai, Akiya; and Ayata, Naoki, 4,918,320, Cl. 250-548.000.
Nakajima, Masahiro: *See*—
Yamamoto, Masato; Nakajima, Masahiro; Yamanaka, Toshimasa; and Satou, Kouji, 4,918,264, Cl. 200-5.00R.
Nakajima, Mutsuo: *See*—
Haneishi, Tatsuo; Okazaki, Takao; Torikata, Akio; Nakajima, Mutsuo; Enokita, Ryuzo; Katayama, Toshiaki; and Iwado, Seigo, 4,918,054, Cl. 514-8.000.
Nakajima, Nobuyuki; and Yamaguchi, Toshio, to Diesel Kiki Co., Ltd. Variable capacity compressor. 4,917,578, Cl. 417-295.000.
Nakajima, Shigeo: *See*—
Yoshimoto, Yoshikazu; Wada, Hiroshi; Suzuki, Tomonari, Yoshida, Masaru; and Nakajima, Shigeo, 4,917,971, Cl. 429-91.000.
Nakajima, Terumi; Kawai, Nobufumi, Shudo, Koichi, and Shiba, Tetsuo, to Tsumura & Co.; Tokyo Metropolitan Institute for Neurosciences; and Takeda Chemical Industries, Ltd. Glutamate receptor inhibitor and insecticidal composition. 4,918,107, Cl. 514-616.000.
Nakajima, Yoshihiro: *See*—
Hayashi, Tsutomu; Nakajima, Yoshihiro; Matsuto, Takushi; Saito, Mitsuru; Sakakibara, Kenji; Yamazaki, Katsumi; Yakigaya, Nobuyuki; and Nakamura, Kazuhiko, 4,916,901, Cl. 60-489.000.
Nakamichi Co., Ltd.: *See*—
Iwaya, Yutaka, 4,917,212, Cl. 181-141.000.
Nakamura, Akio; Kodama, Naoki; Hayashi, Osami; and Saita, Hirofumi, to Shin-Etsu Polymer Co., Ltd. Method for electrically connecting IC chips, a resinous bump-forming composition used therein and a liquid-crystal display unit electrically connected thereby. 4,917,466, Cl. 350-336.000.
Nakamura, Hajime: *See*—
Nakamura, Susumu; Yokoi, Koichi; and Nakamura, Hajime, 4,917,595, Cl. 425-567.000.
Nakamura, Hideaki: *See*—
Yoshimura, Kiyokazu; Miyawaki, Norio; Yamada, Hiroyuki; Nakamura, Hideaki; Tshujino, Koichi; Takinami, Takaharu; Hirayama, Tatemitsu; Naito, Tatsuhiko; Miyake, Ryoichi; Yamada, Takeshi; Iwakiri, Tetsuro; and Otsuka, Kazuaki, 4,918,616, Cl. 364-507.000.
Nakamura, Hiroshi; and Ogiwara, Nagao, to Fuji Photo Film Co. Ltd. Thermal developing and transferring apparatus. 4,918,486, Cl. 355-106.000.
Nakamura, Hiroyuki: *See*—
Sakaitani, Katsutoshi; Nakamura, Hiroyuki, and Miyagi, Kiyoshi, 4,917,927, Cl. 428-40.000.
Nakamura, Kazuhiko: *See*—
Hayashi, Tsutomu; Nakajima, Yoshihiro; Matsuto, Takushi; Saito, Mitsuru; Sakakibara, Kenji; Yamazaki, Katsumi, Yakigaya, Nobuyuki; and Nakamura, Kazuhiko, 4,916,901, Cl. 60-489.000.
Nakamura, Masuhisa: *See*—
Harada, Hiroshi; Matsushita, Yoshihiro; Nakamura, Masuhisa; and Yonetani, Yukio, 4,918,206, Cl. 549-468.000.
Nakamura, Nobuyoshi: *See*—
Watanabe, Yasuhiko; Nakamura, Nobuyoshi; Kuriyama, Yoshinori; and Motegi, Takuji, 4,917,742, Cl. 156-79.000.
Nakamura, Shinichi; Teshima, Hideo; and Terada, Eiichi, to Idemitsu Petrochemical Co., Ltd. Styrene-based/polymercaptan polymer and process for production thereof. 4,918,159, Cl. 528-376.000.
Nakamura, Susumu; Yokoi, Koichi; and Nakamura, Hajime, to Sankyo Engineering Co., Ltd. Nozzle touch sprue bushing device. 4,917,595, Cl. 425-567.000.
Nakamura, Tadao: *See*—
Tsuda, Yoshinao; Mishina, Tadashi; Obata, Minoru; Araki, Kazuhiko; Inui, Jun; and Nakamura, Tadao, 4,918,074, Cl. 514-258.000.
Nakamura, Takeaki: *See*—
Yabe, Hisao; Ogiu, Hisao; Takara, Toshiyuki; Takamura, Koji; Nakazawa, Masaaki; Uchikubo, Akinobu; Sato, Tomoaki; Miyazaki, Atsushi; Ishikawa, Akibumi; and Nakamura, Takeaki, 4,918,521, Cl. 358-98.000.
Nakamura, Tetsuo; and Kikuchi, Kazuhiro, to Honda Giken Kogyo Kabushiki Kaisha. Cutting line head assembly for rotary cutter. 4,916,886, Cl. 56-12.700.
Nakamura, Toshihiko: *See*—
Iwata, Jun; Nishikawa, Takeshi; and Nakamura, Toshihiko, 4,918,636, Cl. 364-715.060.
Nakamura, Yoichi; Kuroda, Masami; and Furusho, Noboru, to Fuji Electric Co., Ltd. Photosensitive member for electrophotography. 4,917,981, Cl. 430-75.000.
Nakamura, Yukio. Throttle operating device for jet-propelled small-sized boats. 4,916,967, Cl. 74-502.200.
Nakanishi, Akira, to Sony Corporation. Page turning apparatus. 4,916,839, Cl. 40-475.000.
Nakano, Akira. Hierarchical information processing system. 4,918,596, Cl. 364-200.000.
Nakano, Yasuhiko. *See*—
Horuke, Satoru; Nakano, Yasuhiko; Okano, Shigetarou; Kimura, Shigeru; Matsuzaki, Masanobu; Yamamoto, Toshiteru; Ooki, Kenji; Hamano, Eiji; and Kubo, Mikio, 4,917,209, Cl. 180-219.000.
Nakanosono, Haruhiko: *See*—
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Nakao, Hitomi *See*—
Ono, Akira; Fuse, Toshikazu; Miyamoto, Osamu; Makino, Shoso; Yamato, Yoshihisa; Kametani, Hiroshi, Tokura, Susumu; Tanaka, Hiromi; Ito, Toru; Nakao, Hitomi; Tokuoka, Shuji; and Takeda, Toshihide, 4,917,920, Cl. 427-389.900.
Nakao, Makoto: *See*—
Fukuyama, Hiroshi; Morinaga, Makoto; Goshima, Norio; Nakao, Makoto; Oono, Kiyoshi; and Watanabe, Isao, 4,918,423, Cl. 340-442.000.
Nakao, Sachiko, to Minolta Camera Kabushiki Kaisha. F-theta lens system with variable focal length. 4,917,483, Cl. 350-423.000.
Nakashima, Kouji: *See*—
Tanaka, Haruhiko; Kagawa, Fukashi; and Nakashima, Kouji, 4,918,111, Cl. 521-89.000.
Nakatani, Umewaka: *See*—
Hara, Shigeyoshi; Endo, Zen-ichiro; and Nakatani, Umewaka, 4,918,138, Cl. 524-785.000.
Nakayama, Kiyoshi; Honda, Haruo; Ogawa, Yukie; Ozawa, Tatsuya; and Ohta, Tetsuo, to Kyowa Hakko Kogyo Co., Ltd. Method for producing carnitine, L-carnitinamide hydrolase and method for producing same. 4,918,012, Cl. 435-128.000.
Nakayama, Susmum: *See*—
Takahashi, Mineo; Nakayama, Susmum; Suzuki, Satoshi; Mori, Akio, Seo, Hiroyuki; Imamura, Minoru; Tanaka, Hiroshi; and Yoneyama, Norihiro, 4,918,261, Cl. 174-135.000.
Nakazawa, Masaaki: *See*—
Yabe, Hisao; Ogiu, Hisao; Takara, Toshiyuki; Takamura, Koji, Nakazawa, Masaaki; Uchikubo, Akinobu; Sato, Tomoaki; Miyazaki, Atsushi; Ishikawa, Akibumi; and Nakamura, Takeaki, 4,918,521, Cl. 358-98.000.
Nalco Chemical Company: *See*—
Allenson, Stephan J., 4,917,803, Cl. 210-728.000.
Naoi, Takashi: *See*—
Takiue, Tomoyuki; Kameoka, Kimitaka; Naoi, Takashi; and Tanaka, Yasunobu, 4,916,829, Cl. 34-30.000.
Narikiyo, Hidetoshi, to Kabushiki Kaisha Toshiba. Air conditioning apparatus having two refrigerating circuits in central unit and control method of defrosting the same. 4,916,913, Cl. 62-81.000.
Narumi, Tadataka; Abe, Ryutaro; Honaga, Susumu; and Toyama, Yoshiyuki, to Toyoda Koki Kabushiki Kaisha. Flow control apparatus for a power steering device. 4,917,139, Cl. 137-110.000.
Narushima, Seiichi. *See*—
Tajima, Fumio; Samman, Nicolas; Miyashita, Kunio; Katayama, Hiroshi; Ito, Motoya, Narushima, Seiichi; and Yamamuro, Kiyoshi, 4,918,346, Cl. 310-156.000.
Nasu, Nobuo, to Kabushiki Kaisha Kawakami Seisakusho. Apparatus for cutting laminated sheet material. 4,916,992, Cl. 83-422.000.
National Distillers and Chemical Corporation: *See*—
Jones, Jeffrey A.; and Heimberg, Manfred, 4,917,849, Cl. 264-211.240.
National Manufacturing & Supply Corporation: *See*—
Russell, V. L., and Cannon, Kerry, 4,916,772, Cl. 15-104.330.
National Research Development Corporation: *See*—
Gittos, Maurice W., 4,918,084, Cl. 514-348.000.
National Research Institute for Metals: *See*—
Inoue, Kiyoshi; Takeuchi, Takao; Iijima, Yasuo; and Kosuge, Michio, 4,917,965, Cl. 428-614.000.
National Rolling Mills, Inc.: *See*—
Platt, William J., 4,916,877, Cl. 52-317.000.
National Science Council: *See*—
Wang, Ikai; and Lin, Yu-Ming, 4,918,239, Cl. 568-360.000.
National Semiconductor Corporation: *See*—
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Tamagawa Seiki Kabushiki Kaisha: *See—*
Takaba, Yosuke, 4,918,347, Cl. 310-179.000.
Tamai, Satoshi: *See—*
Nagao, Yoshimitsu; Kumagai, Toshio; Tamai, Satoshi; Kuramoto, Yasuhiro; and Shimidzu, Hisashi, 4,918,184, Cl. 540-200.000.
Tamamori, Hideo, to Nippon Air Brake Co., Ltd. Load dependent valve for railway vehicles. 4,917,148, Cl. 137-596.180.
Tamba, Shinichi: *See—*
Fujikawa, Tetsuzo; and Tamba, Shinichi, 4,917,201, Cl. 180-68.200.
Tamfelt Oy Ab: *See—*
Lappanen, Lasse; and Taipale, Seppo, 4,917,937, Cl. 428-196.000.
Pajunen, Rauno, 4,918,522, Cl. 358-101.000.
Tammera, Robert F. Toy vehicle with simulated loading. 4,917,649, Cl. 446-427.000.
Tamura, Miki: *See—*
Takao, Hideaki; Murata, Tatsuo; Kanbe, Junichiro; Tamura, Miki; Kamio, Masaru; Sekimura, Nobuyuki; and Kikuchi, Yoshiki, 4,917,471, Cl. 350-339.00F.
Tamura, Shigeru: *See—*
Hattori, Yasuyuki; Fukuoka, Noriaki; Tamura, Shigeru; Hashiba, Kunizo; Tsukada, Kiyoshi; and Misono, Makoto, 4,918,248, Cl. 568-885.000.
Tan, Ryou, to Honda Giken Kogyo Kabushiki Kaisha. Method for mending a dent on a member made of aluminum alloy. 4,916,795, Cl. 29-402.180.
Tanabe, Haruo; Ishida, Masaji; Fujino, Tomoya; and Kurata, Tadahiko, to Omron Tateisi Electronics Co. Checkin gate apparatus. 4,918,298, Cl. 235-384.000.
Tanaka, Haruhiko; Kagawa, Fukashi; and Nakashima, Kouji, to Shell Oil Company. Composition for non-crosslinked foam. 4,918,111, Cl. 521-89.000.
Tanaka, Hideo: *See—*
Harada, Susumu; and Tanaka, Hideo, 4,917,840, Cl. 264-40.500.
Tanaka, Hideshi: *See—*
Takanashi, Itsuo; Tanaka, Hideshi; Kato, Shigeru; Osada, Naomi; and Ichito, Toshikatsu, 4,917,513, Cl. 400-120.000.
Tanaka, Hirohisa: *See—*
Koden, Mitsuhiro; Tanaka, Hirohisa; and Yano, Kohzo, 4,918,494, Cl. 357-4.000.
Tanaka, Hiromi: *See—*
Ono, Akira; Fuse, Toshikazu; Miyamoto, Osamu; Makino, Shoso; Yamato, Yoshihisa; Kametani, Hiroshi; Tokura, Susumu; Tanaka, Hiromi; Ito, Toru; Nakao, Hitomi; Tokuoka, Shuji; and Takeda, Toshihide, 4,917,920, Cl. 427-389.900.
Tanaka, Hiroshi: *See—*
Takahashi, Mineo; Nakayama, Susmum; Suzuki, Satoshi; Mori, Akio; Seo, Hiroyuki; Imamura, Minoru; Tanaka, Hiroshi; and Yoneyama, Norihiro, 4,918,261, Cl. 174-135.000.
Tanaka, Keisi: *See—*
Ichihashi, Eishun; Tooka, Sigetaka; and Tanaka, Keisi, 4,917,228, Cl. 198-347.000.
Tanaka, Koichi: *See—*
Toda, Fumio; Tanaka, Koichi; and Ataka, Kikuo, 4,918,190, Cl 544-351.000.
Tanaka, Nobuhiro: *See—*
Shimozono, Shigeru; and Tanaka, Nobuhiro, 4,918,674, Cl. 368-255.000.
Tanaka, Shinji: *See—*
Miyamoto, Masahiko; Tanaka, Shinji; Mitsuse, Masami; Murata, Kohei; and Masui, Yoshihiro, 4,917,034, Cl. 114-29.000.
Tanaka, Takahiko; Okada, Kazukiyo; Tsunoda, Akira; Yamamoto, Nobuyuki; Maeda, Tatsuo; Omoto, Seiichi; and Odoi, Kozo, to ASMO Co., Ltd.; and Mazda Co., Ltd. Electric-driving device for openable members. 4,918,360, Cl. 318-41.000.
Tanaka, Teruo: *See—*
Hayashi, Takehisa; Omada, Koichiro; Tanaka, Teruo; Hamanaka, Naoki; and Nagashima, Shigeo, 4,918,686, Cl. 370-60.000.
Tanaka, Yasunobu: *See—*
Takiue, Tomoyuki; Kameoka, Kimitaka; Naoi, Takashi; and Tanaka, Yasunobu, 4,916,829, Cl. 34-30.000.
Tanaka, Yuji: *See—*
Kuronaga, Tadayoshi; Tanaka, Yuji; and Kato, Kikuo, 4,917,042, Cl. 118-72.000.
Tandy Corporation: *See—*
Finegan, Joel D., 4,918,682, Cl. 369-275.000.
Tanemura, Katsuhei: *See—*
Shimada, Toshimasa; Tanemura, Katsuhei; Fujitani, Yasuo; Otake, Katsumoto; Oda, Shigeo; and Sumiya, Yoshio, 4,917,176, Cl. 165-95.000.
Tang, Youchi: *See—*
Xie, Youchang; Bu, Naiyu; Liu, Jun; Yang, Ge; Qiu, Jianguo; Yang, Naifang; and Tang, Youchi, 4,917,711, Cl. 55-68.000.
Tanigawa, Junichi: *See—*
Kikuchi, Shoji; Onoue, Nobuaki; and Tanigawa, Junichi, 4,917,614, Cl. 439-83.000.
Taniguchi, Chiaki: *See—*
Tomita, Satoru; Shimada, Kazuyuki; and Taniguchi, Chiaki, 4,918,462, Cl. 346-107.00R.
Taniguchi, Tetsuo: *See—*
Okamura, Hisatake; Tsuru, Teruhisa, and Taniguchi, Tetsuo, 4,918,570, Cl. 361-321.000.
Tanioka, Soji: *See—*
Chiba, Tohru; Muto, Hiroaki; Tanioka, Soji; Nishiyama, Yuichi; Hoshi, Noboru; and Onda, Yoshiro, 4,917,885, Cl. 424-78.000.
Tanner, Alan R.: *See—*
Sharifian, Hossein; and Tanner, Alan R., 4,917,781, Cl. 204-72.000.
Tanuma, Jiro; Akutsu, Naoji; and Kasai, Tadashi, to Oki Electric Industry Co., Ltd. Electromechanical actuator having control and drive circuit. 4,918,365, Cl. 318-685.000.
Tapper, Thomas E.; and Cesari, Jeffrey. Cylinder head gasket elimination process. 4,917,062, Cl. 123-193.0CH.
Taracks, Donald: *See—*
Mathur, Anoop; MacArthur, Ward J.; Gabel, Steven D.; Taracks, Donald; Zhao, Jianliang; and Spethman, Donald H., 4,916,909, Cl. 62-59.000.
Tarumi, Noriyoshi: *See—*
Tomono, Makoto; Tarumi, Noriyoshi; and Sato, Masayuki, 4,917,982, Cl. 430-99.000.
Tarver, Carl R.; Lawrence, James G.; and Whittington, Charles L., to Motorola Computer X, Inc.; and Emtek Health Care Systems, Inc. Modular electronic package. 4,918,572, Cl. 361-395.000.
Tassone, Joseph V.: *See—*
Cole, Richard W.; Marsh, Richard L.; and Tassone, Joseph V., 4,917,543, Cl. 405-262.000.
Tate & Lyle Public Limited Company: *See—*
Jackson, Graham; and Jenner, Michael R., 4,918,182, Cl. 536-124.000.
Tate, Susumu: *See—*
Kurita, Kazuo; Watanabe, Youichi; and Tate, Susumu, 4,917,848, Cl. 264-184.000.
Taubert, Hubert, to Friedr. Boesner GmbH. Joining element for two machine parts of components, such as a fit-stretch fastener and fit-stretch bolt. 4,917,555, Cl. 411-411.000.
Taylor, Larry. Flow through voltammetric analyzer and method using deoxygenator. 4,917,776, Cl. 204-153.100.
Taylor, Martha K.; Seidy, Wassim; and Srinivasan, Subramani, to McNeil-PPC, Inc. Folded flange sealed sanitary napkin. 4,917,675, Cl. 604-385.100.
TDK Corporation: *See—*
Ezaki, Joichiro; Fukuda, Kazumasa; and Sakai, Masanori, 4,918,556, Cl. 360-97.020.

Maeda, Tsutomu, Matsui, Kiyoshi; Kanno, Takayuki, and Sato, Kunihiro, 4,918,569, Cl. 361-283.000.
Teac Corporation: *See—*
Tsuyuguchi, Hiroshi, 4,918,743, Cl. 388-812.000.
Technochemie GmbH: *See—*
Stenzenberger, Horst, and Koenig, Peter, 4,917,954, Cl 428-411.100.
Tecumseh Products Company: *See—*
Richardson, Hubert, Jr.; Tomell, Phillip A., and Maertens, Michael J., 4,917,581, Cl. 417-363.000.
Teich AG: *See—*
Jud, Wilfried, 4,917,247, Cl. 206-610.000.
Teijin Seiki Company Limited *See—*
Tachibana, Juro; and Nishimura, Yoshihide, 4,916,784, Cl 28-203.000.
Tachibana, Juro; and Nishimura, Yoshihide, 4,916,785, Cl 28-206.000.
Tejima, Yasuyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Still camera. 4,918,476, Cl. 354-221.000.
Tektronix, Inc.: *See—*
Bales, Robert W.; and Bartlett, Joan E., 4,918,382, Cl. 324-77.00B
Blouke, Morley M.; and Corrie, Brian L., 4,918,505, Cl. 357-24.000.
Buzak, Thomas S.; Vatne, Rolf S.; and Whitlow, Dana E., 4,917,463, Cl. 350-331.00R.
Telectronics Pacing Systems, Inc.: *See—*
Rebell, Allan K., 4,917,104, Cl. 128-772.000.
Telediffusion de France: *See—*
Penard, Pierre; and Quenard, Philippe, 4,918,527, Cl. 358-160.000.
Telefonaktiebolaget L M Ericsson: *See—*
Granestrad, Per O., 4,917,449, Cl. 350-96.140
Tellabs Incorporated: *See—*
Rohrs, Charles E.; and Yource, Richard C., 4,918,727, Cl 379-410.000.
Temple University: *See—*
Speaker, Tully J.; Chang, Frank N.; and Hsu, Stephen C 4,917,892, Cl. 424-401.000.
Templin, Wallace D.: *See—*
Slocum, Gregory H.; Hurley, Michael F.; Templin, Wallace D. and Schumacher, Donald W., 4,917,902, Cl 425-553.000.
Tendler, Robert K. Depth sounder operation for hostile environments 4,918,671, Cl. 367-87.000.
Tengowski, Joseph L.: *See—*
Baker, Steven F.; and Tengowski, Joseph L., 4,917,389, Cl 277-42.000.
Ten Hoven, James A.: *See—*
Heinrich, Martin W.; and Ten Hoven, James A., 4,918,343, Cl 310-58.000.
Tennison, Stephen R.: *See—*
Lear, Anthony M.; Tennison, Stephen R.; and Satchell, Paul W., 4,917,835, Cl. 264-29.100.
Terada, Eiichi: *See—*
Komatsu, Takashi; and Terada, Eiichi, 4,918,155, Cl 528-202.000
Nakamura, Shinichi; Teshima, Hideo; and Terada, Eiichi, 4,918,159, Cl. 528-376.000.
Terada, Hiroaki; Asada, Katushiko; Nishikawa, Hiroaki; Miyata, Souichi; Matsumoto, Satoshi; Asano, Hajime; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji, and Komori, Shinji, to Sanyo Electric Co., Ltd.; Sharp Kabushiki Kaisha; Matsushia Electric Industrial Co., Ltd.; and Mitsubishi Denki Kabushiki Kaisha. System containing loop shaped transmission paths for transmitting data packets using a plurality of latches connected in cascade fashion. 4,918,644, Cl 364-900.000.
Terada, Yasuharu; Shimada, Yukio; and Horita, Yoshiyuki, to Yoshida Kogyo K. K. Adjustable fastener. 4,916,779, Cl 24-585.000.
Teradyne Laser Systems, Inc.: *See—*
Weisz, John R., 4,918,284, Cl. 219-121.780.
Teramae, Tomohiro: *See—*
Kusaba, Tomoyuki; Shinsugi, Kazue; Katoh, Tsuguhiro; Meki, Naoto; Sugano, Masayo; Teramae, Tomohiro; Oguri, Yukio; and Uematsu, Tamon, 4,918,089, Cl. 514-365.000.
Terhume, Mike. Snow gun. 4,917,297, Cl 239-14.200.
Terndrup, Brian R.: *See—*
Terndrup, Thomas E.; and Terndrup, Brian R., 4,917,672, Cl 604-192.000.
Terndrup, Thomas E.; and Terndrup, Brian R. Shield for an hypodermic syringe injection needle. 4,917,672, Cl. 604-192.000.
Terneu, Robert: *See—*
Thomas, Jean-Francois; Terneu Robert; Van Cauter, Albert, and Van Laethem, Robert, 4,917,717, Cl. 65-60.100.
Terry, Barbara S. Compact disposable diaper 4,917,693, Cl 604-385.100.
Terry, Lewis E.: *See—*
Anderson, Floyd E.; Robb, Stephen P.; Shaw, Pern, and Terry, Lewis E., 4,918,333, Cl 307-270.000.
Tesch, Gunter. Fiber containing aggregate and process for its preparation. 4,917,943, Cl. 428-288.000.
Teshima, Hideo: *See—*
Nakamura, Shinichi; Teshima, Hideo; and Terada, Eiichi, 4,918,159, Cl. 528-376.000.
Tetrafluor, Inc.: *See—*
Lee, John; Vernon, Richard J. Janian, Robert, Rossi, David A., and Charles, Stanley E., 4,917,390, Cl. 277-165.000.
Texaco Inc.: *See—*
Harper, Gary L.; Brady, Samuel D., IV; and Shivers, Robert M., III, 4,917,195, Cl. 175-7.000.
Lin, Jiang-Jen; Knifton, John F.; and Yeakey, Ernest L., 4,918,222, Cl 562-518.000.
Nelson, Edward C.; Storm, David A.; and Patel, Mabendra S., 4,918,244, Cl. 568-698.000.
Texas Instruments Incorporated: *See—*
Boulanger, Henry J., 4,917,414, Cl. 292-98.000.
Jensen, Millard J.; and Levine, Jules D., 4,917,752, Cl. 156-292.000.
Shah, Ashwin H.; and Chatterjee, Pallab K., 4,918,658, Cl 365-227.000.
Textron, Inc.: *See—*
Oliff, Jaroslav J., Batting, Robert D.; and Hopkins, John W., 4,916,837, Cl. 37-252.000.
Textron Lycoming: *See—*
Kiernan, John D., Jr., and Sembler, Frederick, 4,917,181, Cl. 165-166.000.
Tezuka, Nobuo: *See—*
Date, Nobuaki; Tezuka, Nobuo; Saito, Syuichiro; Tojo, Akihiko; and Kozuki, Susumu, 4,918,533, Cl. 358-213.130.
Thakur, Madhukar L., to Thomas Jefferson University. Novel use of a radiolabelled antibody against stage specific embryonic antigen for the detection of occult abscesses in mammals. 4,917,878, Cl. 424-1.100.
Theodor Grabener Pressensysteme GmbH & Co. KG: *See—*
Grabener, Thomas; and Grabener, Theodor, 4,917,588, Cl 425-150.000.
Thermacore, Inc. *See—*
Gernert, Nelson J., 4,917,177, Cl. 165-104.260.
Thiel, Norbert; and Zondler, Rolf, to Nokia Graetz. Graphite-containing conductive suspension for picture tubes. 4,917,822, Cl. 252-511.000.
Thelmann, Dieter; and Olszewski, Egon, to Benteler Aktiengesellschaft. Mandrel for bending pipes. 4,916,952, Cl. 72-466.000.
Thies, Peter; and Fudickar, Harald, to C. S. Fudickar KG. Process and apparatus for making an endless conveyor belt, for joining ends of a belt and for repairing a belt. 4,917,741, Cl. 156-73.100.
Thom, Howard L., to Thom's Inc. Picnic table with wheelchair and chair access. 4,917,436, Cl. 297-157.000.
Thomas, Charles E.; Hayashi, Steven R.; and Wildes, Douglas G., to General Electric Company. Multi-level tool break detection using multi-mode sensing. 4,918,427, Cl. 340-680.000.
Thomas, Jean-Francois; Terneu, Robert; Van Cauter, Albert; and Van Laethem, Robert, to Glaverbel. Apparatus for and process of coating glass. 4,917,717, Cl. 65-60.100.
Thomas Jefferson University: *See—*
Thakur, Madhukar L., 4,917,878, Cl. 424-1.100.
Thomas, Julian: *See—*
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostslaw; Thomas, Julian; Wilkins, John D.; and Yeh, Phil C., 4,918,728, Cl. 380-21.000.
Thommes, James M., to Cyclomatic Industries, Inc. System for supplying power 4,918,285, Cl 219-130.100.
Thompson, John G. Helical visual display device. 4,916,752, Cl. 40-427.000.
Thompson, Kathaleen H Canine seasonal panties. 4,917,683, Cl. 604-387.000.
Thompson, Kenneth W. Light piping displays. 4,918,578, Cl. 362-31.000.
Thompson, Thomas R., to White Consolidated Industries, Inc. Snap-in gasket system for refrigerator and freezer doors. 4,916,864, Cl. 49-478.000.
Thom's Inc.: *See—*
Thom, Howard L., 4,917,436, Cl. 297-157.000.
Thomson Consumer Electronics, Inc.: *See—*
Johnson, Gene H., 4,918,531, Cl. 358-183.000.
Ritt, Peter M.; and Stork, Harry R., 4,917,978, Cl 430-23.000.
Thomson-CSF: *See—*
de Chambost, Emmanuel; and Sonrier, Michel, 4,918,318, Cl. 250-492.200.
Pocholle, Jean P.; Yannic, Bourbin; Papuchon, Michel; Huignard, Pierre J.; and Puech, Claude, 4,917,450, Cl. 350-96.110.
Thomson, John E. Monohull sailboat with enlarged deck area. 4,917,035, Cl. 114-39.100.
Thonnessen, Franz: *See—*
Breitkopf, Norbert; Hofs, Wolfgang; Kalbfell, Heinz; Thonnessen, Franz; Lappe, Peter; and Springer, Helmut, 4,918,247, Cl. 568-854.000.
Thyssen Industrie AG: *See—*
Manschwetus, Helmut, 4,917,314, Cl. 241-194.000.
Thyssen Stahl AG: *See—*
Pircher, Hans; Kawalla, Rudolf; Sussek, Gerd, Wilms, Walter; and Wolpert, Waldemar, 4,917,969, Cl. 428-685.000.
Tidman, Derek A., to GT-Devices. Apparatus and method for facilitating supersonic motion of bodies through the atmosphere. 4,917,335, Cl. 244-130.000.
Til Industries, Inc.: *See—*
Smith, Thomas J., 4,917,617, Cl. 439-135.000.
Tiitola, Antti-Jussi; and Kvist, Martti, to Karhu-Titan. Foot testing method. 4,917,105, Cl. 128-779.000.
Tiley, Edward P.: *See—*
Ramsay, Michael V. J.; Tiley, Edward P.; Pereira, Oswy Z.; Ward, John B.; Porter, Neil; Noble, Hazel M.; Fletton, Richard A.; Noble, David; and Sutherland, Derek R., 4,918,098, Cl. 514-450.000.

Timmons, Philip R.: *See*—
D'Silva, Themistocles D. J.; Powell, Gail S.; Timmons, Philip R., and Pennicard, Richard G., 4,918,085, Cl. 514-407.000.
Tirel, Malcolm D.; and Long, William E., to Ciba-Geigy AG. Developing agents. 4,917,992, Cl. 430-465.000.
Tirp, Erwin, and Peters, Heinz, to Windmoller & Holscher. Device for collecting bags or sacks. 4,917,661, Cl. 493-194.000.
Titti, Otello U., Cesta, Patrick P.; Wheeler, Alan G.; and Collins, John C., to Valvoline Oil & Chemicals Ltd. Production of plastic foam material. 4,918,113, Cl. 521-138.000.
TMC Corporation. *See*—
Holzl, Klaus, 4,917,399, Cl. 280-615.000.
Toda, Fumio; Tanaka, Koichi; and Ataka, Kikuo, to Ube Industries, Ltd. Crystalline complex compounds of propargyl alcohols and tertiary diamines, and process of separation and purification of propargyl alcohols using the same. 4,918,190, Cl. 544-351.000.
Toda Kogyo Corp.: *See*—
Katamoto, Tsutomu; Kurata, Tokihiro; and Horiishi, Nanao, 4,917,952, Cl. 428-403.000.
Todd, Gregory A.; and Southworth, Michael H., to Medical Designs, Inc. Transcutaneous nerve stimulator for treatment of sympathetic nerve dysfunction. 4,917,092, Cl. 128-421.000.
Todd, Paul H., Jr., and Guzinski, James A., to Kalamazoo Holdings, Inc. Purification of beta acids for hydrogenolysis and such purified beta acids. 4,918,240, Cl. 568-366.000.
Toegel, Herbert J.: *See*—
Krishnan, Iyengar N.; and Toegel, Herbert J., 4,918,597, Cl. 364-200.000.
Toering, Jack. *See*—
Ballast, Rodney G., 4,916,798, Cl. 29-432.000.
Tofanetti, Odoardo. *See*—
Gandolfi, Carmelo A.; Frigerio, Marco; Tofanetti, Odoardo; and Tognella, Sergio, 4,918,087, Cl. 514-356.000.
Toft, Mark A. *See*—
Brazdil, James F. Jr., Glaeser, Linda C.; and Toft, Mark A., 4,918,214, Cl. 558-319.000.
Tognella, Sergio: *See*—
Gandolfi, Carmelo A.; Frigerio, Marco; Tofanetti, Odoardo; and Tognella, Sergio, 4,918,087, Cl. 514-356.000.
Toi, Nao. *See*—
Koshino, Junji; Fujikura, Yoshiaki; Fujita, Manabu; and Toi, Nao, 4,918,052, Cl. 512-22.000.
Tojo, Akihiko: *See*—
Date, Nobuaki; Tezuka, Nobuo; Saito, Syuichiro; Tojo, Akihiko; and Kozuki, Susumu, 4,918,533, Cl. 358-213.130.
Tokai TRW & Co., Ltd.: *See*—
Mitoya, Yasunobu, 4,916,788, Cl. 29-898.044
Tokita, Kaname. *See*—
Yagi, Toru, Hirosawa, Yoshiaki; Tokita, Kaname; and Fujiyoshi, Yoshihiro, 4,917,056, Cl. 123-90.160.
Tokuju Kosakusho Co., Ltd.: *See*—
Yasumura, Mitsuru; Ohike, Atsuo; Ueda, Takao; Aoki, Masayoshi; Suzuki, Tomio; and Horiai, Makoto, 4,916,831, Cl. 34-134.000.
Tokuoka, Shuji. *See*—
Ono, Akira; Fuse, Toshikazu; Miyamoto, Osamu; Makino, Shoso; Yamato, Yoshihisa; Kametani, Hiroshi; Tokura, Susumu; Tanaka, Hiromi, Ito, Toru; Nakao, Hitomi; Tokuoka, Shuji; and Takeda, Toshihide, 4,917,920, Cl. 427-389.900.
Tokura, Susumu. *See*—
Ono, Akira; Fuse, Toshikazu; Miyamoto, Osamu; Makino, Shoso; Yamato, Yoshihisa; Kametani, Hiroshi; Tokura, Susumu; Tanaka, Hiromi, Ito, Toru; Nakao, Hitomi; Tokuoka, Shuji; and Takeda, Toshihide, 4,917,920, Cl. 427-389.900.
Tokuyama Soda Kabushiki Kaisha. *See*—
Kawaguchi, Toshio; Shibuya, Shigeri, and Kusumoto, Koshi, 4,918,136, Cl. 524-751.000.
Tokyo Electric Co., Ltd.: *See*—
Kurimoto, Yukuo, 4,918,297, Cl. 235-383.000.
Tokyo Electric Power Co., Inc., The: *See*—
Shimada, Toshimasa, Tanemura, Katsuhei; Fujitani, Yasuo; Otake, Katsumoto; Oda, Shigeo; and Sumiya, Yoshio, 4,917,176, Cl. 165-95.000.
Tokyo Metropolitan Institute for Neurosciences: *See*—
Nakajima, Terumi; Kawai, Nobufumi, Shudo, Koichi; and Shiba, Tetsuo, 4,918,107, Cl. 514-616.000.
Tol, Simon J. M.; and Wouda, Kornelis J., to AT&T Bell Laboratories. Transceiver arrangement for full-duplex data transmission comprising an echo canceller and provisions for testing the arrangement. 4,918,685, Cl. 370-32.100.
Toledo Scale Corp.: *See*—
Loshbough, Richard C., 4,917,199, Cl. 177-210.00C.
Tomell, Phillip A.: *See*—
Richardson, Hubert, Jr.; Tomell, Phillip A.; and Maertens, Michael J., 4,917,581, Cl. 417-363.000.
Tomford, Johann: *See*—
Sacco, Bruno; and Tomford, Johann, 4,917,203, Cl. 180-68.600.
Tomforde, Johann, to Daimler-Benz AG. Motor vehicle door with a multi-shell door body. 4,917,433, Cl. 296-146.000.
Tomita, Satoru; Shimada, Kazuyuki; and Taniguchi, Chiaki, to Ricoh Company, Ltd. Method and apparatus for driving a solid scan type recording head. 4,918,462, Cl. 346-107.00R.
Tomkins, Donald W.; and Holden, Laurence, to Holtronic Technologies Limited. Method of and apparatus for the positional detection of objects. 4,917,497, Cl. 356-347.000.
Tomlinson, Max S., Jr., to Analog Intelligence Corporation. Discrete weight neural network. 4,918,618, Cl. 364-513.000.
Tomono, Makoto; Tarumi, Noriyoshi; and Sato, Masayuki, to Konishiroku Photo Industry Co., Ltd. Toner for use in developing electrostatic images containing polypropylene. 4,917,982, Cl. 430-99.000.
Tonti, Sergio: *See*—
Roffia, Paolo; Tonti, Sergio; Cesana, Alberto; Mantegazza, Maria Angela; and Padovan, Mario, 4,918,194, Cl. 546-184.000.
Tooka, Sigetaka. *See*—
Ichihashi, Eishun; Tooka, Sigetaka; and Tanaka, Keisi, 4,917,228, Cl. 198-347.000.
Toon, Keith: *See*—
Crahan, Douglas; Bendig, Steve; and Toon, Keith, 4,917,544, Cl. 406-14.000.
Toppan Moore Co., Ltd.: *See*—
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Usui Kokusai Sangyo Kaisha Ltd.: *See—*
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Vaillant de Guelis, Hubert; Roland, Jean-Pierre; and Jamain, Patrice, to Aerospatiale Societe Nationale Industrielle. Magnetic bearing for active centering of a body movable relative to a static body with respect to at least one axis. 4,918,345, Cl. 310-90.500.
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Ilmarinen, Antti I., 4,917,768, Cl. 162-358.000.
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van den Wildenberg, Leonardus J., to P.J. Zweegers en Zonen Landbouwmachinefabriek B.V. Baling material and baling device for making baled articles. 4,917,008, Cl. 100-5.000.
Vanderlaan, Douglas G.; and Forster, Wolfgang C., to Reichhold Chemicals, Inc. Low styrene emission unsaturated polyester resins. 4,918,120, Cl. 523-465.000.
van der Schoot, Jelle, to Staalkat B.V. Method and apparatus of loading or unloading a plurality of stacks of trays from a container. 4,917,559, Cl. 414-331.000.
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Van Hoose, Sandra S. Doll for facilitating therapeutic communication and attitudinal healing. 4,917,607, Cl. 434-236.000.
Van Horn, Wendell E., to OO Chemicals, Inc. Distillation apparatus for removal of volatile acids from aqueous solutions. 4,917,769, Cl. 202-158.000.
Van Houten, Robert, to Airflow Research and Manufacturing Corporation. Centrifugal blower with axial clearance. 4,917,572, Cl. 415-206.000.
Van Laethem, Robert: *See—*
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Van Woudenberg, Walter: *See—*
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Varlet, Jean-Pierre, to Valois. Device for filling an aerosol receptacle with gas through a pump crimped on the receptacle. 4,917,156, Cl. 141-20.000.
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Victor Company of Japan: *See—*
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Vidrine, Matthew; and Lucero, Robert. Adjustable ball fitting for fluid lines. 4,917,408, Cl. 285-261.000.
Vifor S.A.: *See—*
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Villez, Yves, to Boussac Saint Freres B.S.F. Diaper with lengthwise elastics and method for continuous manufacture of such diapers. 4,917,695, Cl. 604-370.000.
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Viswanathan, Ravi; and DePrince, Randolph B., to International Minerals & Chem. Corp. Delivery device for the administration of stabilized growth promoting hormones. 4,917,685, Cl. 604-891.100.
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Vitiello, Paolo; and Bergamo, Luca, to Bull HN Information Systems Italia S.p.A. Phase locked loop with self-adjusting circuit for oscillator working point. 4,918,404, Cl. 331-11.000.
Vittone, Andrea; Chiappini, Giuseppe; and Di Paola, Massimo, to Mopfelan S.p.A. Process for the continuous production of manufactured articles reinforced with mixtures of hydraulic binders. 4,917,749, Cl. 156-242.000.
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Vladkov, Emil P., to Bulgarska Televisia Kam Komitet Sa Televisia I Radio. Method and device for precision sync pulses separation. 4,918,525, Cl. 358-153.000.
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Vonhausen, Robert: *See—*
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Wakameda, Atsushi; Yatsuka, Nobuaki; and Sasamoto, Yasuhiko, to Taiyo Fishery Co., Ltd. Process for the production of transglutaminase-containing food having improved texture. 4,917,904, Cl. 426-7.000.
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Walsh, David J.; Lougheed, William M.; Gentili, Fred; and Fazl, Mahmood, to Walsh Manufacturing (Mississuaga) Limited. Anastomosis devices, kits and method. 4,917,087, Cl. 606-153.000.
Walsh Manufacturing (Mississuaga) Limited: *See—*
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Wang, Ikai; and Lin, Yu-Ming, to National Science Council. Method of producing cyclohexanone from cyclohexanol through oxidative dehydrogenation. 4,918,239, Cl. 568-360.000.
Wang, Kjetil: *See—*
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Huber, Val J., 4,918,593, Cl. 364-200.000.
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Wang, Shein S., to Conoco Inc. Method for interval velocity analysis and determination of reflector position from before stack seismic data. 4,918,670, Cl. 367-38.000.
Wang, Teh-Chuan, to Du Pont de Nemours, E. I., and Company. Large diameter oriented monofilaments. 4,917,950, Cl. 428-373.000.
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Ramsey, Michael V. J.; Bain, Brian M.; Ward, John B.; Noble, Hazel M.; Porter, Neil; Fletton, Richard A.; Noble, David; Sutherland, Derek R.; and Howes, Peter D., 4,918,096, Cl. 514-450.000.
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Watanabe, Kyoichi A.; Chu, Chung K.; and Fox, Jack J., to Sloan-Kettering Institute for Cancer Research. 2'-fluoro-arabinofuranosyl purine nucleosides. 4,918,179, Cl. 536-24.000.
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Watanabe, Toshio, to Semiconductor Energy Laboratory Co., Ltd. Method of manufacturing liquid crystal devices. 4,917,473, Cl. 350-341.000.
Watanabe, Yasuhiko; Nakamura, Nobuyoshi; Kuriyama, Yoshinori; and Motegi, Takuji, to Nippon Steel Chemical Co., Ltd. Method of making lightweight panels and their core materials. 4,917,742, Cl. 156-79.000.
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LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Anken, Milton. *See—*
Halbert, Seymour P.; and Anken, Milton, B1 4,474,878, Cl 435-7.000.
Halbert, Seymour P.; and Anken, Milton, B1 4,642,285, Cl. 435-7.000.

Bellamy, John C., II: *See—*
Collins, Arthur A.; Bellamy, John C., II; and Christensen, Richard L., B1 3,956,593, Cl. 370-63.000.

Christensen, Richard L.: *See—*
Collins, Arthur A.; Bellamy, John C., II; and Christensen, Richard L., B1 3,956,593, Cl. 370-63.000.

Collins, Arthur A.; Bellamy, John C., II; and Christensen, Richard L., to Sevin Rosen Bayless Borovoy. Time space time (TST) switch with combined and distributed state store and control store. B1 3,956,593, 4-17-90, Cl. 370-63.000.

Diamedix Corporation: *See—*
Halbert, Seymour P.; and Anken, Milton, B1 4,474,878, Cl 435-7.000.
Halbert, Seymour P.; and Anken, Milton, B1 4,642,285, Cl 435-7.000.

Halbert, Seymour P.; and Anken, Milton, to Diamedix Corporation. Sandwich EIA for antigen associated with hepatitis. B1 4,474,878, 4-17-90, Cl. 435-7.000.

Halbert, Seymour P.; and Anken, Milton, to Diamedix Corporation. Sandwich EIA for antigen. B1 4,642,285, 4-17-90, Cl. 435-7.000.

Hitachi Cable, Ltd.: *See—*
Shinohara, Yoshihiro; Oizumi, Kiyoshi; Itoh, Yasuhiko; and Hori, Makoto, B1 4,658,892, Cl. 165-133.000.

Hori, Makoto: *See—*
Shinohara, Yoshihiro; Oizumi, Kiyoshi; Itoh, Yasuhiko; and Hori, Makoto, B1 4,658,892, Cl. 165-133.000.

Itoh, Yasuhiko: *See—*
Shinohara, Yoshihiro; Oizumi, Kiyoshi; Itoh, Yasuhiko; and Hori, Makoto, B1 4,658,892, Cl. 165-133.000.

Monarch Marking Systems, Inc.: *See—*
Wisecup, David R., B1 4,680,836, Cl. 24-704.200.

Oizumi, Kiyoshi: *See—*
Shinohara, Yoshihiro; Oizumi, Kiyoshi; Itoh, Yasuhiko; and Hori, Makoto, B1 4,658,892, Cl. 165-133.000.

Reed, Alan C.; and Sherwood, John H., to Utility Devices, Inc. Data recording method and apparatus. B1 4,169,290, 4-17-90, Cl. 364-900.000.

Sevin Rosen Bayless Borovoy: *See—*
Colhns, Arthur A.; Bellamy, John C., II; and Christensen, Richard L., B1 3,956,593, Cl. 370-63.000.

Sherwood, John H.: *See—*
Reed, Alan C.; and Sherwood, John H., B1 4,169,290, Cl. 364-900.000.

Shinohara, Yoshihiro; Oizumi, Kiyoshi; Itoh, Yasuhiko; and Hori, Makoto, to Hitachi Cable, Ltd. Heat-transfer tubes with grooved inner surface. B1 4,658,892, 4-17-90, Cl. 165-133.000.

Utility Devices, Inc.: *See—*
Reed, Alan C.; and Sherwood, John H., B1 4,169,290, Cl 364-900.000.

Wisecup, David R., to Monarch Marking Systems, Inc. One-piece plastics fastener. B1 4,680,836, 4-17-90, Cl 24-704.200.

LIST OF DESIGN PATENTEES

A B Oriental Trading Co., Inc.: *See—*
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A. Borner GmbH: *See—*
Borner, A., 307,228, Cl. D7-683.000.

Abbott Laboratories: *See—*
Bransky, Jeffrey D.; Tyranski, James T.; Nelson, Robert J.; and Bloom, Dave H., 307,321, Cl. D24-1.100.

Abe, Yoshinori; Inoue, Muneaki; and Hata, Kazuhiro, to Mitsubishi Denki Kabushiki Kaisha. Programmable controller. 307,262, 4-17-90, Cl. D13-162.000.

Ago, Nobuhiro: *See—*
Tanaka, Noboru; Ago, Nobuhiro; and Tamura, Shuichi, 307,285, Cl. D16-209.000.

Aktiebolaget Nike: *See—*
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Alfa Lancia Industriale S.p.A.: *See—*
Vitale, Carmelo; and Villa, Ezio, 307,330, Cl. D26-122.000.

Alvema Aktiebolag: *See—*
Ramer, Staffan, 307,251, Cl. D12-133.000.

American Lighting Fixture Corp.: *See—*
Segill, William; Segill, Mark E.; and Dangelo, Michael, 307,329, Cl. D26-91.000.

Aprica Kassai Kabushikikaisha: *See—*
Kassai, Kenzou, 307,250, Cl. D12-129.000.

Arai, Takashi, to Asics Corporation. Shoe sole. 307,211, 4-17-90, Cl. D2-317.000.

Armour, Patrick C. Extractor for removing waste products. 307,340, 4-17-90, Cl. D32-1.000.

Arnold, William D., to Lee-Rowan Company. Clamp for garment hangers or the like. 307,218, 4-17-90, Cl. D6-328.000.

Arnoux, Daniel. Current probe. 307,244, 4-17-90, Cl. D10-79.000.

Asics Corporation: *See—*
Arai, Takashi, 307,211, Cl. D2-317.000.

Associated Mills Inc.: *See—*
Hilger, Ronald O.; and Yurkovic, Michael, 307,318, Cl. D23-364.000.

Aveni, Michael A., to Nike, Inc.; and Nike International Ltd. Cup shaped shoe outsole. 307,212, 4-17-90, Cl. D2-320.000

Bailey, Edward J.: *See—*
Suica, David E.; Bailey, Edward J.; and Binder, Walter, 307,282, Cl. D15-199.000.

Baker, Carl H. Cable clamp. 307,240, 4-17-90, Cl. D8-396.000

Baker, Jay J. Container for pizza or the like. 307,243, 4-17-90, Cl. D9-426.000.

Baker, John F. Portable cooler for allergenic extracts. 307,226, 4-17-90, Cl. D7-605.000.

Bakula, Mark S.: *See—*
Cascio, Steven S.; Caldwell, Donald J.; Severson, Tom S.; Wente, Steven R.; and Bakula, Mark S., 307,236, Cl. D8-82.000

Baxter International Inc.: *See—*
Unger, John M.; Lal, Birendra K.; and Kasting, Thomas, 307,324, Cl. D24-52.000.

Bergius, Konrad; and Mattis, Hans-Werner, to Von Roll Transportsysteme AG. Chairlift unit with a pivotable canopy. 307,246, 4-17-90, Cl. D12-52.000.

Berlaimont, Claude, to Fonderies du Lion, S.A. Stove. 307,314, 4-17-90, Cl. D23-346.000.

Berlaimont, Claude, to Fonderies du Lion, S.A. Stove. 307,315, 4-17-90, Cl. D23-346.000.

Berlaimont, Claude, to Fonderies du Lion, S.A. Stove. 307,316, 4-17-90, Cl. D23-346.000.

Biersdorff, Jack, to C & K Systems, Inc. Intrusion detector unit. 307,245, 4-17-90, Cl. D10-106.000.

Binder, Walter: *See—*
Suica, David E.; Bailey, Edward J.; and Binder, Walter, 307,282, Cl. D15-199.000.

Bloom, Dave H.: *See—*
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Borner, A., to A. Borner GmbH. Holder for vegetables to be cut. 307,228, 4-17-90, Cl. D7-683.000.

Bounce, Inc.: *See—*
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Box, Thomas, to Spectrum International, Inc. Beverage case. 307,349, 4-17-90, Cl. D34-43.000.

Boyd, Julie C.; and Curry, Hilda M. Stuffed animal toy. 307,306, 4-17-90, Cl. D21-148.000.

Bransky, Jeffrey D.; Tyranski, James T.; Nelson, Robert J.; and Bloom, Dave H., to Abbott Laboratories. Clinical analyzer or the like. 307,321, 4-17-90, Cl. D24-1.100.

British Telecommunications public limited company. *See—*
Desbarats, Guy E., 307,272, Cl. D14-148.000.
Desbarats, Guy E. A., 307,276, Cl. D14-149.000.
Desbarats, Guy E. A., 307,277, Cl. D14-251.000.

Brown, Jeffrey C.; and Morey, Terry G., to John Fluke Mfg. Co., Inc. Touch control screen display terminal. 307,264, 4-17-90, Cl. D14-113.000.

Bucknell, Lawrence S. Waterboard fin. 307,310, 4-17-90, Cl. D21-231.000.

Burford, Charles E., to Burford Corp. Combined tie wire holder and shear unit. 307,281, 4-17-90, Cl. D15-145.000.

Burford Corp.: *See—*
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Byrne, David S.: *See—*
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Ferraro, Frank A.; and Byrne, David S., 307,334, Cl. D28-46.000.

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Cal-Comp Electronics, Inc.: *See—*
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Caldwell, Donald J.: *See—*
Cascio, Steven S.; Caldwell, Donald J.; Severson, Tom S.; Wente, Steven R.; and Bakula, Mark S., 307,236, Cl. D8-82.000

Canon Kabushiki Kaisha. *See—*
Tanaka, Noboru; Ago, Nobuhiro; and Tamura, Shuichi, 307,285 Cl. D16-209.000.

Carlile, Martin F., to Tunstall Telecom Limited. Speech module for an intercommunication system. 307,273, 4-17-90, Cl. D14-159.000.

Casai, Gino H.: *See—*
Cassai, Henry J.; and Casai, Gino H., 307,336, Cl. D28-77.000

Cascio, Steven S.; Caldwell, Donald J.; Severson, Tom S.; Wente, Steven R.; and Bakula, Mark S., to Snap-on Tools Corporation. Screwdriver. 307,236, 4-17-90, Cl. D8-82.000

Casio Computer Co., Ltd.: *See—*
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Koide, Masaki, 307,287, Cl. D17-6.000.

Cassai, Gino H.: *See—*
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Cassai, Henry J.; and Cassai, Gino H., to Cassai, Henry J. Combined container/bottle and cosmetic wand applicators or the like. 307,336, 4-17-90, Cl. D28-77.000.

Cassai, Henry J.; and Cassai, Gino H., to Cassai, Henry J. Combined container/bottle and cosmetic wand applicators or the like. 307,337, 4-17-90, Cl. D28-77.000.

Chan, Mary K. Key-holder parking-space recorder. 307,215, 4-17-90, Cl. D3-62.000.

Chapin, David S., to Cooper Industries, Inc. Scissors. 307,233, 4-17-90, Cl. D8-57.000.

Chen, Ray, to Cal-Comp Electronics, Inc. Calculator or similar article. 307,290, 4-17-90, Cl. D18-7.000.

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Cincinnati Milacron Inc.: *See—*
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Clenet, Alain J. Vehicle. 307,247, 4-17-90, Cl. D12-90.000.

Collister, Kenneth D., to Miles Inc. Font of type. 307,297, 4-17-90, Cl. D18-26.000.

Cooper, Hal W. Racket club. 307,308, 4-17-90, Cl. D21-212.000.

Cooper Industries, Inc.: *See—*
Chapin, David S., 307,233, Cl. D8-57.000.

Curry, Hilda M.: *See—*
Boyd, Julie C.; and Curry, Hilda M., 307,306, Cl. D21-148.000.

Dahm, Karin. Cosmetic applicator. 307,332, 4-17-90, Cl. D28-7.000.

Dalland, Todd. Tent. 307,311, 4-17-90, Cl. D21-253.000

Dangelo, Michael: *See—*
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Daniels, James A. Boat lighting system. 307,327, 4-17-90, Cl. D26-35.000.

Dart Industries Inc.: *See—*
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Del Corno, Marco; and Zeni, Sergio, to Maxmeyer-Duco MM.D. S.p.A. Portable spectrophotometer. 307,284, 4-17-90, Cl. D16-130.000.

Desbarats, Guy E., to British Telecommunications public limited company. Telephone handset. 307,272, 4-17-90, Cl. D14-148.000.

Desbarats, Guy E. A., to British Telecommunications Public Limited Company. Telephone base unit. 307,276, 4-17-90, Cl. D14-149.000.

Desbarats, Guy E. A., to British Telecommunications Public Limited Company. Telephone charging unit. 307,277, 4-17-90, Cl. D14-251.000.

Dettling, Karl V. Automobile body. 307,248, 4-17-90, Cl. D12-91.000.

Dolwick, J. Franklin, to Walter Lorenz Surgical Instruments, Inc. Temporomandibular joint retractor instrument or the like. 307,322, 4-17-90, Cl. D24-10.000.

Doran, Brian A.; and Redkey, Robert H., to Redkey, Robert H. Golf putter head. 307,309, 4-17-90, Cl. D21-215.000.

Driscoll, Stephen E.: *See—*
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Engle, Arnold R. Fishing pole holder. 307,312, 4-17-90, Cl. D22-147.000.

Facom, S.A.: *See—*
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Ferraro, Frank A.; and Byrne, David S., to Warner-Lambert Company. Disposable razor. 307,333, 4-17-90, Cl. D28-46.000.

Ferraro, Frank A.; and Byrne, David S., to Warner-Lambert Company. Disposable razor. 307,334, 4-17-90, Cl. D28-46.000.

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Berlaimont, Claude, 307,315, Cl. D23-346.000
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Fratelli Guzzini S.p.A.: *See—*
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Fukagawa, Kazumi: *See—*
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Fushiya, Fusao; and Ohta, Hajime, to Makita Electric Works, Ltd. Cordless electric pruner. 307,232, 4-17-90, Cl. D8-7.000.

Fushiya, Fusao; and Muromachi, Masaki, to Makita Electric Works, Ltd. Nail gun. 307,234, 4-17-90, Cl. D8-69.000.

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Gardner, Ross, Jr., to Cabot Corporation. Earplug or similar article. 307,325, 4-17-90, Cl. D24-67.000.

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Gibson, Donald C. Fork lift canopy cover. 307,347, 4-17-90, Cl. D34-35.000.

Ginder, Mark A. Photography support bracket. 307,286, 4-17-90, Cl. D16-242.000.

Gisiger, Urs. Lock for zippered luggage. 307,237, 4-17-90, Cl. D8-331.000.

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Hahn, Daniel G. Toy riding pony. 307,304, 4-17-90, Cl. D21-70.000.
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Hamasaki, Yoshihiro; and Fukagawa, Kazumi, to Toyota Jidosha Kabushiki Kaisha. Front bumper for an automobile. 307,255, 4-17-90, Cl. D12-169.000.
Hammerquist, David. Game token. 307,303, 4-17-90, Cl. D21-53.000.
Happy, Mel; and Merrett, Stephen L. Solar collector panel. 307,260, 4-17-90, Cl. D13-102.000.
Hara, Kunio; and Hiroki, Shin-ichi, to Kabushiki Kaisha Toshiba. Electronic copying machine. 307,299, 4-17-90, Cl. D18-38.000.
Hara, Masaki; Sakai, Masayuki; and Katoh, Naoto, to Mitsubishi Denki Kabushiki Kaisha. Operation and control unit for a computer. 307,265, 4-17-90, Cl. D14-100.000.
Hara, Masaki; Sakai, Masayuki; and Fukuyama, Katsuo, to Mitsubishi Denki Kabushiki Kaisha. Operation and control unit for a computer. 307,266, 4-17-90, Cl. D14-100.000.
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Hikawa, Koji, to Ricoh Company, Ltd. Portable copier. 307,298, 4-17-90, Cl. D18-36.000.
Hildebrandt, David H., to Waterbury Companies, Inc. Housing for inducing air flow past a gel-type product for producing a fragrance. 307,319, 4-17-90, Cl. D23-366.000.
Hilger, Ronald O.; and Yurkovic, Michael, to Associated Mills Inc. Electronic ionizer for air treatment. 307,318, 4-17-90, Cl. D23-364.000.
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Mizukami, Atsuya, to Tanaka Manufacturing Company Limited. Can holder for an automobile. 307,224, 4-17-90, Cl. D7-619.000.
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Pollard, Ronald. Cover set for a transmitter-receiver telephone handset. 307,275, 4-17-90, Cl. D14-249.000.
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Austin, David C. H. Rose plant named 'Ausboard'. 7,220, 4-17-90, Cl. 1.000.

Jackson & Perkins Company: *See*—
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Warriner, William A., to Jackson & Perkins Company. Rose plant Jacrored. 7,221, 4-17-90, Cl. 20.000.

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189.06 4,918,656
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230.05 4,918,664
CLASS 366
76 PH 4,918,461
99 4,917,501
132 4,918,659
159 4,917,502
185 4,918,660
294 4,918,665
CLASS 367
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CLASS 368
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CLASS 370
17 4,918,684
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63 B1 3,956,593
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CLASS 371
2.2 4,918,692
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CLASS 372
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14 4,917,499
102 4,917,503
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CLASS 376
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72 4,918,711
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121 4,918,714
164 4,918,715
197 4,918,716
CLASS 379
40 4,918,717
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67 4,918,719
88 4,918,322
96 4,918,721
100 4,918,722
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CLASS 380
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CLASS 381
36 4,918,729
43 4,918,730
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68 4,918,736
68.4 4,918,737
187 4,917,504
190 4,918,738
CLASS 382
1 4,918,739
9 4,918,740
41 4,918,742
CLASS 383
4 4,917,505
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CLASS 384
45 4,917,508
275 4,917,509
503 4,917,510
540 4,917,511
CLASS 388
812 4,918,743
833 4,918,744
CLASS 400
56 4,917,512
120 4,917,513
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249 4,917,515
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CLASS 401
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127 4,917,520
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CLASS 403
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CLASS 404
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CLASS 405
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241 4,917,542
262 4,917,543
270 4,916,937
CLASS 406
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123 4,917,546
CLASS 408
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CLASS 411
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VOL 1113 ISS 3 AP 17 1990 UMI

85	4,917,553	321	4,917,590	572	4,917,997	224	4,917,646	311	4,918,081	4 4	4,918,171
392	4,917,554	392	4,917,591		CLASS 431	297	4,917,647	317	4,918,082	6 4	4,918,172
411	4,917,555	503	4,917,592	1	4,917,596	424	4,917,648	323	4,918,083		4,918,173
	CLASS 414	549	4,917,593	289	4,917,597	427	4,917,649	348	4,918,084	7 1	4,918,174
217	4,917,556		4,917,594	320	4,917,598	453	4,917,650	351	4,918,086	17 2	4,918,176
229	4,917,557	553	4,917,902	328	4,917,599		CLASS 450	356	4,918,087	18 7	4,918,177
288	4,917,558	567	4,917,595		CLASS 432	58	4,917,651	357	4,918,088	24	4,918,179
331	4,917,559		CLASS 426	121	4,917,600		CLASS 453	365	4,918,089	27	4,918,178
332	4,917,560	7	4,917,904		CLASS 433	252 1	4,918,018	367	4,918,090	56	4,918,180
414	4,917,561	39	4,917,905	7	4,917,601		CLASS 455	369	4,918,091	114	4,918,181
420	4,917,562	56	4,917,906	8	4,917,602	41	4,918,745	382	4,918,092	124	4,918,182
428	4,917,563	90	4,917,907	29	4,917,603	54	4,918,746	383	4,918,093	171	4,918,175
	4,917,564	102	4,917,908	174	4,917,604	315	4,918,748	407	4,918,085		CLASS 540
701	4,917,565		4,917,909	178	4,917,605	327	4,918,749	419	4,918,094	200	4,918,184
722	4,917,566		4,917,910	219	4,917,608	345	4,918,750	423	4,918,095	364	4,918,185
731	4,917,567	243	4,917,911	225	4,917,606	608	4,918,751	430	4,918,096	492	4,918,186
737	4,917,568	291	4,917,912		CLASS 434	617	4,918,747		4,918,097	523	4,918,187
	CLASS 415	536	4,917,913	20	4,917,609		CLASS 460		4,918,098		CLASS 544
84	4,917,569	551	4,917,914	33	4,917,610	111	4,917,652	451	4,918,100	66	4,918,188
104	4,917,570	573	4,917,915	218	4,917,611		CLASS 464	453	4,918,099	221	4,918,189
197	4,917,571	658	4,917,916	236	4,917,607	85	4,917,653	468	4,918,101	326	4,918,191
206	4,917,572		CLASS 427		CLASS 435		CLASS 474	505	4,918,102	351	4,918,190
	CLASS 416	26	4,917,917	5	4,917,998	112	4,917,655	520	4,918,103		CLASS 546
134 R	4,917,573	220	4,917,919	6	4,917,999	133	4,917,654	560	4,918,104	104	4,918,192
193 A	4,917,574	389.9	4,917,920	7	4,918,000	144	4,917,656	575	4,918,105	184	4,918,194
	CLASS 417	430.1	4,917,921		4,918,004	242	4,917,658	604	4,918,106	220	4,918,193
52	4,917,575		CLASS 428		B1 4,474,878		CLASS 475	616	4,918,107		CLASS 548
53	4,917,576	22	4,917,922		B1 4,642,285	53	4,916,973	621	4,918,108	257	4,918,195
66	4,917,577	34 1	4,917,923	24	4,918,001	111	4,916,975		CLASS 521	342	4,918,196
295	4,917,578	34 8	4,917,924	29	4,918,002	115	4,916,976	82	4,918,110	406	4,918,197
322	4,917,579	35.7	4,917,925	31	4,918,003	166	4,916,974	89	4,918,111	550	4,918,198
345	4,917,580	40	4,917,926	34	4,918,005	183	4,916,981	134	4,918,112	956	4,918,199
363	4,917,581	41	4,917,927	68 1	4,918,008	205	4,916,977	138	4,918,113		CLASS 549
	CLASS 418		4,917,928	69 1	4,918,006	226	4,916,978	27	4,918,114	214	4,918,200
55	4,917,582	81	4,917,929	69 2	4,918,007	281	4,916,980	144	4,918,115	259	4,918,201
61 3	4,917,585	88	4,917,931	73	4,918,009		CLASS 493		CLASS 522	299	4,918,202
206	4,917,583	90	4,917,932	119	4,918,011	8	4,917,657	149	4,918,116	401	4,918,203
256	4,917,584	99	4,917,933	128	4,918,012	12	4,917,659	215	4,918,117	429	4,918,204
	CLASS 419	116	4,917,934	136	4,918,013	42	4,917,660	334	4,918,118	458	4,918,205
9	4,917,857	137	4,917,935	172 1	4,918,014	194	4,917,661	461	4,918,119	468	4,918,206
28	4,917,858	196	4,917,936	172 3	4,918,015	416	4,917,662	465	4,918,120	504	4,918,207
36	4,917,859	215	4,917,937	176	4,918,016		4,917,663		CLASS 524		CLASS 552
	CLASS 420	216	4,917,938	289	4,918,019	470	4,917,664	27	4,918,121	205	4,918,208
49	4,917,860	283	4,917,939		CLASS 436	472	4,917,665	95	4,918,122	522	4,917,826
463	4,917,861	286	4,917,940	56	4,918,020		CLASS 501	110	4,918,123	602	4,917,827
	CLASS 422	288	4,917,941	64	4,918,021	87	4,918,034	151	4,918,124		CLASS 556
4	4,917,862	308 4	4,917,942	79	4,918,022	135	4,918,035	165	4,918,125	422	4,918,209
21	4,917,586	313 3	4,917,943	106	4,918,024		CLASS 502	188	4,918,126	425	4,918,210
58	4,917,863	328	4,917,944	165	4,918,025	66	4,918,036	415	4,918,127		CLASS 558
63	4,917,864	329	4,917,945		CLASS 437	107	4,918,037	450	4,918,128	31	4,918,211
72	4,917,865	335	4,917,946	33	4,918,026	112	4,918,038	457	4,918,129	214	4,918,212
102	4,917,867	349	4,917,947	35	4,918,027	113	4,918,039	499	4,918,130	271	4,918,213
119	4,917,868	373	4,917,948	81	4,918,028	125	4,918,040	500	4,918,131	319	4,918,214
162	4,917,869	402 2	4,917,949	119	4,918,029	217	4,918,041	504	4,918,132	401	4,918,215
226	4,917,870	403	4,917,950	225	4,918,030	314	4,918,042	518	4,918,133		CLASS 560
	CLASS 423	408	4,917,951		4,918,031		CLASS 503	609	4,918,134	41	4,918,216
61	4,917,871	411 1	4,917,952	228	4,918,032	209	4,918,044	714	4,918,135	073	4,918,217
76	4,917,872	413	4,917,953	245	4,918,033	213	4,918,045	751	4,918,136	232	4,918,218
239	4,917,873	423 1	4,917,954		CLASS 439	216	4,918,046	785	4,918,138	254	4,918,219
244	4,917,874	447	4,917,955	39	4,917,612		4,918,047	813	4,918,139	352	4,918,220
	4,917,875	457	4,917,956	67	4,917,613		4,918,048	860	4,918,140		CLASS 562
306	4,917,876	458	4,917,957	83	4,917,614		CLASS 505		CLASS 525	431	4,918,221
345	4,917,866	550	4,917,958	98	4,917,615	1	4,918,049	99	4,918,142	518	4,918,222
412	4,917,877	552	4,917,959	101	4,917,616		4,918,050	132	4,918,143	556	4,918,223
	CLASS 424	600	4,917,960	135	4,917,617		4,918,051	263	4,918,144	557	4,918,224
1 1	4,917,878	610	4,917,961	157	4,917,618		CLASS 512	271	4,918,145	600	4,918,225
	4,917,879	614	4,917,962	191	4,917,619	22	4,918,052	354	4,918,146	607	4,918,226
5	4,917,880		4,917,963	224	4,917,621		CLASS 514	386	4,918,147		CLASS 564
10	4,917,881	621	4,917,964	271	4,917,622	8	4,918,054	424	4,918,148	44	4,918,227
59	4,917,882	659	4,917,965	272	4,917,620	14	4,918,055	439	4,918,149	208	4,918,228
	4,917,883	669	4,917,966	284	4,917,623	25	4,918,056	502	4,918,150	302	4,918,229
73	4,917,884	685	4,917,967	328	4,917,624	30	4,918,057		CLASS 526	307	4,918,230
78	4,917,885	694	4,917,969	358	4,917,625		4,918,058	211	4,918,151	363	4,918,231
	4,917,930		4,917,970	369	4,917,626	33	4,918,059	262	4,918,152	437	4,918,232
81	4,917,886		CLASS 429	371	4,917,627	46	4,918,060	282	4,918,158	479	4,918,233
85 7	4,917,887	19	4,917,971	391	4,917,628	62	4,918,061		CLASS 528	480	4,918,234
85 91	4,917,888	44	4,917,972	405	4,917,629	76	4,918,062	125	4,918,153	503	4,918,235
195 1	4,917,890	91	4,917,973	578	4,917,630	78	4,918,063	190	4,918,154		CLASS 568
401	4,917,891	104	4,917,974	583	4,917,631	114	4,918,064	202	4,918,155	306	4,918,236
	4,917,892	218	4,917,976	624	4,917,632	179	4,918,065	272	4,918,156	322	4,918,237
423	4,917,893		CLASS 430	722	4,917,633	183	4,918,066	322	4,918,157	342	4,918,238
440	4,917,894	1	4,917,977	746	4,917,634	196	4,918,067	376	4,918,159	360	4,918,239
448	4,917,895	23	4,917,978		4,917,635	206	4,918,068	483	4,918,160	366	4,918,240
449	4,917,676	58	4,917,980		CLASS 440		4,918,070		CLASS 530	648	4,918,241
	4,917,896	75	4,917,981	42	4,917,637	211	4,918,069	300	4,918,161	658	4,918,242
450	4,917,897	99	4,917,982	77	4,917,638	247	4,918,072	324	4,918,162	698	4,918,244
452	4,917,898	109	4,917,983	88	4,917,639	255	4,918,073	330	4,918,166	697	4,918,243
461	4,917,899	114	4,917,984	89	4,917,640	258	4,918,074	387	4,918,163	727	4,918,245
493	4,917,900	115	4,917,985		CLASS 441	262	4,918,075		4,918,164	812	4,918,246
673	4,917,901	139	4,917,986	115	4,917,641	277	4,918,076	391	4,918,165	854	4,918,247
693 1	4,917,889	169	4,917,987		CLASS 445	284	4,918,077	502	4,918,167	885	4,918,248
	CLASS 425	270	4,917,988	44	4,917,642	291	4,918,078		CLASS 534	910	4,918,249
64	4,917,587	286	4,917,989		CLASS 446	299	4,918,079	565	4,918,168	934	4,918,250
150	4,917,588	378	4,917,990	14	4,917,643	300	4,918,080	617	4,918,183		
174 4	4,917,903	465	4,917,991	26	4,917,644			618	4,918,169		
197	4,918,017	523	4,917,992	184	4,917,645				CLASS 536		
318	4,917,589	543	4,917,993					1 1	4,918,170		
		565	4,917,994								
		567	4,917,995								
			4,917,996								

	CLASS 570		CLASS 604	265	4,917,686	385 2	4,917,682	97	4,917,111		CLASS 623
143	4,918,251	51	4,917,670	286	4,917,674		4,917,696	132	4,917,086	2	4,917,698
189	4,918,252	95	4,917,666	306	4,917,688	387	4,917,683	133	4,917,678	6	4,917,680
231	4,918,253	96	4,917,667	338	4,917,689		4,917,697	151	4,917,677		4,917,681
	CLASS 585	164	4,917,669		4,917,690	468	4,917,684	153	4,917,087	13	4,917,699
328	4,918,254	167	4,917,668	339	4,917,691	891 1	4,917,685		4,917,090		4,917,700
331	4,918,255	168	4,917,671	355	4,917,692		CLASS 606		4,917,091	16	4,917,701
415	4,918,256	192	4,917,672	362	4,917,694	7	4,917,084	159	4,917,085		4,917,702
500	4,918,257	198	4,917,673	370	4,917,695	15	4,917,083	194	4,917,088	17	4,917,704
		248	4,917,687	385 1	4,917,675	46	4,917,082	215	4,917,089	66	4,917,703

CLASSIFICATION OF DESIGNS

D2—	314	307,210		69	307,234		307	307,258		145	307,281		121	307,305		85	307,328
	317	307,211		82	307,235		345	307,259		199	307,282		148	307,306		91	307,329
	320	307,212			307,236	D13	102	307,260	D16	104	307,283		190	307,307		122	307,330
D3—	61	307,213		331	307,237		103	307,261		130	307,284		212	307,308	D28—	7	307,331
	62	307,214		359	307,239		162	307,262		209	307,285		215	307,309			307,332
		307,215		396	307,240			307,263		242	307,286		231	307,310		46	307,333
D4—	102	307,216	D9—	352	307,238	D14—	100	307,265	D17—	6	307,287		253	307,311			307,334
	134	307,217		378	307,241			307,266		13	307,288	D22—	147	307,312		76	307,335
D6—	328	307,218		414	307,242		107	307,267	D18—	7	307,289	D23—	225	307,313		77	307,336
	381	307,219		426	307,243		113	307,264			307,290		346	307,314			307,337
	462	307,220	D10—	79	307,244		126	307,268			307,291			307,315	D29—	18	307,338
	502	307,221		106	307,245		134	307,270			307,292			307,316	D30—	160	307,339
	562	307,222	D12—	52	307,246		135	307,269		11	307,293		353	307,317	D32—	1	307,340
D7—	305	307,229		90	307,247		138	307,271		12	307,294		364	307,318		17	307,341
	351	307,230		91	307,248		148	307,272		13	307,295		366	307,319		53	307,342
	354	307,231		129	307,249		149	307,276			307,296		382	307,320	D34—	1	307,343
	605	307,226			307,250		159	307,273		26	307,297	D24—	11	307,321		7	307,344
	610	307,227		133	307,251		243	307,274		36	307,298		10	307,322		31	307,345
	619	307,224		156	307,252		249	307,275		38	307,299		28	307,323			307,346
		307,225		157	307,253		251	307,277	D20—	42	307,300		52	307,324		35	307,347
	679	307,223		169	307,254	D15	6	307,278			307,301		67	307,325		40	307,348
	683	307,228			307,255		21	307,279	D21—	53	307,303	D25—	2	307,326		43	307,349
D8—	7	307,232		171	307,256		90	307,280		70	307,304	D26—	35	307,327	D99—	38	307,302
	57	307,233		178	307,257												

CLASSIFICATION OF PLANTS

P—	1	7,220		20	7,221						

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PATENTS

01	4,916,789		4,917,142		4,917,974		4,918,641		4,918,034	17	4,916,768
	4,916,848		4,917,147		4,917,975		4,918,651		4,918,041		4,916,794
	4,917,244		4,917,167		4,917,987		4,918,675		4,918,077		4,916,841
	4,917,271		4,917,179		4,918,020		4,918,678		4,918,146		4,916,852
	4,917,298		4,917,190		4,918,030		4,918,682	11	4,916,833		4,916,936
	4,917,490		4,917,268		4,918,102		4,918,688		4,918,475		4,917,005
	4,917,505		4,917,274		4,918,110		4,918,690	12	4,916,765		4,917,021
	4,917,544		4,917,292		4,918,158		4,918,691		4,916,800		4,917,101
04	4,916,846		4,917,304		4,918,162		4,918,698		4,916,808		4,917,202
	4,916,941		4,917,355		4,918,163		4,918,704		4,916,912		4,917,231
	4,917,267		4,917,362		4,918,236		4,918,717		4,916,915		4,917,285
	4,917,351		4,917,379		4,918,281		4,918,718		4,916,969		4,917,300
	4,917,422		4,917,390		4,918,285		4,918,723		4,917,085		4,917,338
	4,917,514		4,917,398		4,918,290		4,918,740		4,917,100		4,917,345
	4,917,516		4,917,419		4,918,308		4,918,748		4,917,104		4,917,363
	4,917,535		4,917,425		4,918,311	08	4,917,219		4,917,112		4,917,380
	4,917,537		4,917,429		4,918,312		4,917,240		4,917,134		4,917,384
	4,917,657		4,917,448		4,918,329		4,917,297		4,917,239		4,917,546
	4,918,055		4,917,455		4,918,335		4,917,726		4,917,253		4,917,589
	4,918,082		4,917,472		4,918,336		4,917,832		4,917,342		4,917,615
	4,918,333		4,917,484		4,918,341		4,918,432		4,917,461		4,917,622
	4,918,512		4,917,485		4,918,373		4,918,467		4,917,498		4,917,634
	4,918,572		4,917,491		4,918,377		4,918,650		4,917,542		4,917,694
	4,918,726		4,917,499		4,918,378		4,918,654		4,917,570		4,917,769
05	4,917,252		4,917,504		4,918,383	09	4,916,755		4,917,640		4,917,796
	4,917,354		4,917,517		4,918,395		4,916,819		4,917,671		4,917,837
06	Re 33,201		4,917,522		4,918,416		4,916,820		4,917,673		4,917,924
	4,916,754		4,917,523		4,918,436		4,916,838		4,917,677		4,917,949
	4,916,756		4,917,540		4,918,439		4,917,050		4,917,699		4,917,956
	4,916,761		4,917,549		4,918,442		4,917,082		4,917,770		4,918,050
	4,916,773		4,917,550		4,918,449		4,917,114		4,918,014		4,918,174
	4,916,791		4,917,556		4,918,455		4,917,116		4,918,120		4,918,201
	4,916,793		4,917,558		4,918,469		4,917,170		4,918,322		4,918,251
	4,916,796		4,917,598		4,918,471		4,917,181		4,918,391		4,918,270
	4,916,816		4,917,599		4,918,472		4,917,273		4,918,403		4,918,295
	4,916,823		4,917,610		4,918,506		4,917,347		4,918,425		4,918,353
	4,916,860		4,917,611		4,918,511		4,917,452		4,918,431		4,918,477
	4,916,871		4,917,643		4,918,515		4,917,536		4,918,437		4,918,534
	4,916,881		4,917,666		4,918,535		4,917,621		4,918,487		4,918,564
	4,916,893		4,917,667		4,918,545		4,917,630		4,918,724		4,918,568
	4,916,896		4,917,669		4,918,550		4,917,645		4,474,878		4,918,602
	4,916,922		4,917,681		4,918,562		4,917,678		4,642,285		4,918,732
	4,916,923		4,917,688		4,918,585		4,917,865	13	4,916,776		4,918,733
	4,916,928		4,917,701		4,918,587		4,917,868		4,916,878		4,918,738
	4,916,930		4,917,785		4,918,598		4,917,971		4,917,128	18	4,916,763
	4,916,985		4,917,795		4,918,608		4,918,258		4,917,155		4,916,790
	4,916,987		4,917,847		4,918,614		4,918,369		4,917,479		4,916,799
	4,917,029		4,917,888		4,918,618		4,918,597		4,917,693		4,916,801
	4,917,081		4,917,895		4,918,619	10	4,917,451		4,917,712		4,916,822
	4,917,083		4,917,896		4,918,621		4,917,495		4,917,831		4,916,902
	4,917,097		4,917,932		4,918,624		4,917,719		4,918,262		4,917,000
	4,917,102		4,917,963		4,918,625		4,917,977		4,918,473		4,917,002
	4,917,126		4,917,968		4,918,627		4,917,986	16	4,917,567		4,917,019

	4,917,095		4,918,002		4,917,488		4,918,719		4,918,085		4,916,888
	4,917,096		4,918,021		4,917,646	35	4,917,447		4,918,101		4,916,935
	4,917,140		4,918,025		4,917,659		4,917,603		4,918,282		4,916,984
	4,917,143		4,918,049		4,917,663		4,917,784		4,918,334		4,916,994
	4,917,218		4,918,149		4,917,680		4,917,830		4,918,497		4,916,998
	4,917,248		4,918,161		4,917,730		4,917,862		4,918,565		4,917,017
	4,917,249		4,918,192		4,917,867		4,917,921		4,918,643		4,917,062
	4,917,282		4,918,273		4,917,942		4,918,018	38	4,917,238		4,917,123
	4,917,350		4,918,284		4,917,970		4,918,325	39	Re 33,198		4,917,161
	4,917,358		4,918,354		4,918,231		4,918,526		4,916,807		4,917,177
	4,917,388		4,918,376		4,918,554		4,916,757		4,916,858		4,917,196
	4,917,410		4,918,392		4,918,578		4,916,803		4,916,892		4,917,232
	4,917,411		4,918,440		4,918,655		4,916,863		4,916,894		4,917,561
	4,917,530		4,918,468		4,918,695		4,916,911		4,916,949		4,917,569
	4,917,685		4,918,470		4,918,696		4,916,918		4,916,954		4,917,577
	4,917,700		4,918,548	28	4,917,200		4,916,924		4,917,046		4,917,608
	4,917,912		4,918,588		4,917,234		4,916,925		4,917,079		4,917,616
	4,917,999		4,918,593		4,917,533		4,916,957		4,917,086		4,917,623
	4,918,026		4,918,623		4,918,582		4,917,007		4,917,092		4,917,631
	4,918,125		4,918,645		4,918,664		4,917,013		4,917,109		4,917,737
	4,918,185		4,918,671	29	4,917,149		4,917,020		4,917,160		4,917,776
	4,918,207		4,918,693		4,917,295		4,917,035		4,917,199		4,917,854
	4,918,229		4,918,714		4,917,534		4,917,066		4,917,224		4,917,856
	4,918,242		4,918,722		4,917,543		4,917,072		4,917,263		4,917,892
	4,918,246	26	4,916,798		4,917,866		4,917,111		4,917,269		4,917,902
	4,918,368		4,916,818		4,917,910		4,917,132		4,917,283		4,917,955
	4,918,420		4,916,847		4,917,914		4,917,157		4,917,289		4,917,960
	4,918,531		4,916,861		4,917,936		4,917,173		4,917,296		4,917,978
	4,918,630		4,916,869		4,918,064		4,917,178		4,917,302		4,917,985
	4,918,727		4,916,873		4,918,168		4,917,180		4,917,357		4,918,039
19	4,916,830		4,916,898		4,918,175		4,917,182		4,917,367		4,918,081
	4,916,879		4,916,914		4,918,203		4,917,198		4,917,378		4,918,094
	4,917,264		4,916,932		4,918,422		4,917,235		4,917,389		4,918,165
	4,917,552		4,916,961		4,918,745		4,917,280		4,917,412		4,918,200
	4,917,573		4,916,966	30	4,917,193		4,917,290		4,917,418		4,918,204
20	4,916,887		4,916,973		4,917,436		4,917,291		4,917,459		4,918,233
	4,917,382		4,916,979	31	4,917,531		4,917,301		4,917,592		4,918,237
	4,917,391		4,916,997		4,918,576		4,917,348		4,917,635		4,918,249
	4,917,416		4,917,014	32	4,917,277		4,917,371		4,917,697		4,918,288
21	4,916,865		4,917,039		4,917,884		4,917,372		4,917,715		4,918,371
	4,916,970		4,917,047		4,918,286		4,917,383		4,917,745		4,918,433
	4,917,018		4,917,071	33	4,916,821		4,917,392		4,917,812		4,918,441
	4,917,070		4,917,124		4,917,023		4,917,405		4,917,814		4,918,566
	4,917,107		4,917,150		4,917,088		4,917,439		4,917,823		4,918,571
	4,917,121		4,917,163		4,917,852		4,917,462		4,917,842		4,918,584
	4,917,318		4,917,213		4,918,260		4,917,582		4,917,845		4,918,642
	4,917,414		4,917,217	34	4,916,753		4,917,605		4,917,849		4,918,711
	4,917,841		4,917,225		4,916,760		4,917,606		4,917,858		4,918,715
	4,918,181		4,917,242		4,916,849		4,917,617		4,917,879	44	4,917,387
	4,918,228		4,917,255		4,916,872		4,917,647		4,917,938		4,917,740
	4,918,355		4,917,256		4,916,921		4,917,650		4,917,966	45	4,916,837
22	4,917,024		4,917,278		4,916,986		4,917,672		4,918,017		4,916,864
	4,917,037		4,917,279		4,917,120		4,917,674		4,918,022		4,917,058
	4,917,045		4,917,281		4,917,131		4,917,676		4,918,145		4,917,307
	4,917,144		4,917,287		4,917,230		4,917,718		4,918,151		4,917,313
	4,917,183		4,917,395		4,917,275		4,917,733		4,918,214		4,917,527
	4,917,188		4,917,417		4,917,344		4,917,861		4,918,257		4,917,723
	4,917,192		4,917,420		4,917,381		4,917,876		4,918,317		4,917,816
	4,917,195		4,917,426		4,917,413		4,917,889		4,918,348		4,918,156
	4,917,408		4,917,430		4,917,454		4,917,934		4,918,352		4,918,287
	4,918,250		4,917,431		4,917,456		4,917,941		4,918,356	46	4,916,869
	4,918,254		4,917,435		4,917,503		4,917,967		4,918,363	47	4,916,917
23	4,916,775		4,917,440		4,917,625		4,917,980		4,918,388		4,917,015
	4,917,361		4,917,443		4,917,648		4,917,994		4,918,421		4,917,074
	4,917,626		4,917,445		4,917,649		4,918,003		4,918,463		4,917,152
24	4,916,876		4,917,477		4,917,653		4,918,056		4,918,532		4,917,154
	4,916,983		4,917,524		4,917,675		4,918,103		4,918,560		4,917,308
	4,917,396		4,917,548		4,917,736		4,918,104		4,918,589		4,917,601
	4,917,496		4,917,551		4,917,739		4,918,179		4,918,607		4,917,660
	4,917,607		4,917,575		4,917,764		4,918,189		4,680,836		4,917,683
	4,917,644		4,917,581		4,917,788		4,918,197	40	4,916,772		4,917,761
	4,917,834		4,917,585		4,917,790		4,918,244		4,916,946		4,917,825
	4,917,964		4,917,604		4,917,791		4,918,328		4,917,184		4,917,874
	4,918,036		4,917,627		4,917,807		4,918,338		4,917,186		4,918,241
	4,918,060		4,917,713		4,917,811		4,918,357		4,917,191		4,918,424
	4,918,406		4,917,724		4,917,875		4,918,386		4,917,321		4,918,518
	4,918,411		4,917,729		4,917,878		4,918,394		4,917,322	48	Re 33,199
	4,918,573		4,917,824		4,917,881		4,918,427		4,917,349		4,916,762
	4,918,653		4,917,826		4,917,894		4,918,488		4,917,520		4,916,840
25	4,916,764		4,917,882		4,917,907		4,918,490		4,917,560		4,916,842
	4,916,817		4,917,883		4,917,908		4,918,516		4,918,040		4,916,910
	4,916,906		4,917,931		4,917,909		4,918,543		4,918,303		4,916,940
	4,916,989		4,918,032		4,917,913		4,918,574		4,918,659		4,916,945
	4,917,006		4,918,051		4,918,031		4,918,595		4,918,670		4,916,959
	4,917,078		4,918,090		4,918,038		4,918,604	41	4,916,854		4,916,999
	4,917,084		4,918,100		4,918,069		4,918,620		4,916,866		4,917,041
	4,917,094		4,918,210		4,918,075		4,918,622		4,917,044		4,917,089
	4,917,103		4,918,219		4,918,127		4,918,633		4,917,258		4,917,185
	4,917,130		4,918,240		4,918,157		4,918,635		4,917,286		4,917,187
	4,917,137		4,918,293		4,918,187		4,918,639		4,917,463		4,917,189
	4,917,197		4,918,305		4,918,198		4,918,699		4,917,464		4,917,243
	4,917,368		4,918,315		4,918,199		4,918,703		4,917,465		4,917,266
	4,917,385		4,918,426		4,918,226		4,918,705		4,917,547		4,917,409
	4,917,475		4,918,673		4,918,234		4,918,750		4,917,613		4,917,423
	4,917,494	27	4,916,909		4,918,255		4,918,751		4,917,679		4,917,442
	4,917,572		4,916,993		4,918,256	37	Re 33,200		4,917,800		4,917,541
	4,917,586		4,917,036		4,918,304		4,916,766		4,917,998		4,917,602
	4,917,600		4,917,049		4,918,372		4,916,783		4,918,019		4,917,632
	4,917,670		4,917,093		4,918,396		4,916,845		4,918,382		4,917,687
	4,917,774		4,917,113		4,918,413		4,917,108		4,918,385		4,917,709
	4,917,777		4,917,129		4,918,418		4,917,119		4,918,505		4,917,732
	4,917,793		4,917,174		4,918,428		4,917,655		4,918,617		4,917,752
	4,917,801		4,917,229		4,918,498		4,917,706		4,918,632		4,917,759
	4,917,804		4,917,337		4,918,523		4,917,850	42	4,916,782		4,917,781
	4,917,930		4,917,421		4,918,524		4,917,891		4,916,810		4,917,789
	4,917,951		4,917,453		4,918,689		4,918,004		4,916,877		4,917,803

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	4,917,890		4,918,720		4,917,215		4,918,728		4,917,922		4,917,003
	4,918,063		3,956,593		4,917,329	53	4,916,827		4,918,164		4,917,110
	4,918,123	49	4,916,920		4,917,332		4,916,880		4,918,259		4,917,127
	4,918,153		4,917,027		4,917,333		4,917,099		4,918,374		4,917,214
	4,918,193		4,917,386		4,917,335		4,917,241		4,918,380		4,917,254
	4,918,222		4,917,571		4,917,481		4,917,327		4,918,381		4,917,261
	4,918,243		4,918,266		4,917,628		4,917,331		4,918,405		4,917,402
	4,918,314		4,918,626		4,917,714		4,917,334		4,918,409		4,917,665
	4,918,332		4,169,290		4,917,805		4,917,336		4,918,445		4,917,746
	4,918,454	50	4,916,859		4,917,940		4,917,356		4,918,629		4,917,911
	4,918,459		4,917,566		4,918,117		4,917,506		4,918,637		4,917,928
	4,918,510	51	4,916,752		4,918,167		4,917,526		4,918,742		4,917,929
	4,918,600		4,916,758		4,918,493		4,917,682	54	4,917,950		4,918,061
	4,918,658		4,916,916		4,918,603		4,917,747	55	4,916,850		4,918,178
	4,918,663		4,916,919		4,918,652		4,917,753		4,916,874		4,918,343
	4,918,668		4,917,125		4,918,706		4,917,782		4,916,976		4,918,517
	4,918,669										

DESIGN PATENTS

01	307,259		307,296	16	307,303	29	307,218		307,335	44	307,213
04	307,252		307,309	17	307,271		307,307		307,336	45	307,280
06	307,215		307,340		307,304	34	307,214		307,337	48	307,281
	307,219		307,347		307,318		307,222	37	307,233		307,328
	307,226	08	307,339		307,321		307,225		307,242		307,343
	307,239	09	307,319	18	307,297		307,241		307,306	49	307,279
	307,245		307,333		307,325		307,331	39	307,282	53	307,264
	307,247		307,334	19	307,308		307,349		307,283	55	307,221
	307,249		307,341	21	307,220	36	307,227		307,313		307,236
	307,254	12	307,286	25	307,231		307,243	41	307,210		307,238
	307,256		307,322		307,329		307,267		307,212		307,288
	307,258		307,342	26	307,248		307,269		307,312		307,301
	307,268	13	307,253	27	307,323		307,300	42	307,326		307,324
	307,275	15	307,310		307,327		307,311				

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06	7,221										

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April 24, 1990 Volume 1113 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of March 1, 1990, and was announced in the *Official Gazette* at 1111 O.G. 24 on Feb. 20, 1990.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1242.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Jan. 26, 1990

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on April 21, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,658,441 through 4,660,222
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on April 19, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,380,090 through 4,380,832
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small entity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED FEBRUARY 4, 1990
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,313,548	06/222,659	2/02/82
4,313,745	06/219,680	2/02/82
4,313,751	06/235,923	2/02/82
4,313,755	06/230,777	2/02/82
4,313,914	06/225,909	2/02/82
4,313,946	06/228,853	2/02/82
4,313,959	06/258,097	2/02/82
4,314,038	06/248,882	2/02/82
4,314,163	06/219,215	2/02/82
4,567,616	06/698,697	2/04/86
4,567,618	06/615,520	2/04/86
4,567,620	06/502,320	2/04/86
4,567,621	06/587,624	2/04/86
4,567,623	06/654,423	2/04/86
4,567,625	06/676,569	2/04/86
4,567,634	06/632,221	2/04/86
4,567,638	06/574,054	2/04/86
4,567,643	06/691,302	2/04/86
4,567,647	06/591,960	2/04/86
4,567,651	06/433,315	2/04/86
4,567,652	06/442,518	2/04/86
4,567,653	06/605,371	2/04/86
4,567,662	06/627,838	2/04/86
4,567,680	06/572,886	2/04/86
4,567,683	06/547,990	2/04/86
4,567,691	06/595,732	2/04/86
4,567,693	06/543,851	2/04/86
4,567,699	06/669,750	2/04/86
4,567,710	06/702,883	2/04/86
4,567,715	06/450,663	2/04/86
4,567,724	06/620,219	2/04/86
4,567,731	06/669,076	2/04/86
4,567,732	06/497,893	2/04/86
4,567,736	06/728,429	2/04/86
4,567,756	06/593,026	2/04/86
4,567,763	06/536,088	2/04/86
4,567,764	06/565,509	2/04/86
4,567,779	06/595,391	2/04/86
4,567,780	06/588,921	2/04/86
4,567,787	06/550,333	2/04/86
4,567,791	06/465,320	2/04/86
4,567,798	06/658,332	2/04/86
4,567,800	06/569,917	2/04/86
4,567,805	06/571,506	2/04/86
4,567,821	06/618,587	2/04/86
4,567,824	06/583,488	2/04/86
4,567,836	06/602,806	2/04/86
4,567,839	06/505,806	2/04/86
4,567,840	06/509,365	2/04/86
4,567,841	06/472,240	2/04/86
4,567,844	06/621,983	2/04/86
4,567,856	06/654,169	2/04/86
4,567,867	06/622,656	2/04/86
4,567,874	06/565,519	2/04/86
4,567,876	06/667,152	2/04/86
4,567,877	06/635,603	2/04/86
4,567,878	06/737,864	2/04/86
4,567,879	06/718,667	2/04/86
4,567,886	06/455,905	2/04/86
4,567,911	06/664,801	2/04/86
4,567,913	06/672,295	2/04/86
4,567,922	06/594,118	2/04/86
4,567,930	06/496,374	2/04/86
4,567,931	06/538,165	2/04/86
4,567,945	06/565,679	2/04/86
4,567,947	06/531,937	2/04/86
4,567,948	06/692,954	2/04/86
4,567,951	06/560,425	2/04/86
4,567,952	06/489,301	2/04/86
4,567,956	06/357,650	2/04/86
4,567,961	06/535,599	2/04/86
4,567,964	06/627,789	2/04/86
4,567,968	06/632,669	2/04/86
4,567,983	06/663,333	2/04/86
4,567,985	06/667,222	2/04/86
4,567,990	06/523,723	2/04/86
4,567,997	06/465,950	2/04/86
4,567,999	06/456,054	2/04/86
4,568,007	06/573,295	2/04/86
4,568,014	06/537,187	2/04/86
4,568,017	06/691,407	2/04/86
4,568,018	06/681,513	2/04/86
4,568,025	06/616,079	2/04/86
4,568,036	06/621,948	2/04/86
4,568,049	06/572,918	2/04/86
4,568,051	06/568,337	2/04/86
4,568,060	06/372,066	2/04/86
4,568,068	06/454,547	2/04/86

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Patent Number	Serial Number	Issue Date
4,568,070	06/591,629	2/04/86
4,568,076	06/640,825	2/04/86
4,568,077	06/632,033	2/04/86
4,568,079	06/602,609	2/04/86
4,568,083	06/441,566	2/04/86
4,568,085	06/604,884	2/04/86
4,568,090	06/663,722	2/04/86
4,568,097	06/570,946	2/04/86
4,568,099	06/637,250	2/04/86
4,568,103	06/635,072	2/04/86
4,568,107	06/677,984	2/04/86
4,568,108	06/621,670	2/04/86
4,568,111	06/527,547	2/04/86
4,568,112	06/614,796	2/04/86
4,568,116	06/658,494	2/04/86
4,568,118	06/623,534	2/04/86
4,568,119	06/402,767	2/04/86
4,568,127	06/526,278	2/04/86
4,568,131	06/666,643	2/04/86
4,568,132	06/683,694	2/04/86
4,568,138	06/669,388	2/04/86
4,568,144	06/636,065	2/04/86
4,568,150	06/594,317	2/04/86
4,568,152	06/505,513	2/04/86
4,568,156	06/668,993	2/04/86
4,568,193	06/629,033	2/04/86
4,568,202	06/713,462	2/04/86
4,568,207	06/614,640	2/04/86
4,568,212	06/600,950	2/04/86
4,568,225	06/606,831	2/04/86
4,568,227	06/505,884	2/04/86
4,568,229	06/720,477	2/04/86
4,568,236	06/400,994	2/04/86
4,568,248	06/604,237	2/04/86
4,568,281	06/561,888	2/04/86
4,568,285	06/689,138	2/04/86
4,568,306	06/593,599	2/04/86
4,568,309	06/578,901	2/04/86
4,568,314	06/616,551	2/04/86
4,568,323	06/607,939	2/04/86
4,568,327	06/583,733	2/04/86
4,568,331	06/542,484	2/04/86
4,568,335	06/415,757	2/04/86
4,568,340	06/559,344	2/04/86
4,568,350	06/600,719	2/04/86
4,568,364	06/592,135	2/04/86
4,568,381	06/621,000	2/04/86
4,568,382	06/557,570	2/04/86
4,568,395	06/732,108	2/04/86
4,568,401	06/716,512	2/04/86
4,568,404	06/718,167	2/04/86
4,568,409	06/552,737	2/04/86
4,568,424	06/668,539	2/04/86
4,568,425	06/613,312	2/04/86
4,568,428	06/510,832	2/04/86
4,568,430	06/697,964	2/04/86
4,568,433	06/649,570	2/04/86
4,568,440	06/527,690	2/04/86
4,568,475	06/693,394	2/04/86
4,568,486	06/656,655	2/04/86
4,568,487	06/446,477	2/04/86
4,568,499	06/629,217	2/04/86
4,568,510	06/484,391	2/04/86
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4,568,522	06/417,309	2/04/86
4,568,538	06/742,717	2/04/86
4,568,549	06/543,538	2/04/86
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4,568,567	06/659,164	2/04/86
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4,568,606	06/681,974	2/04/86
4,568,634	06/671,268	2/04/86
4,568,637	06/521,857	2/04/86
4,568,643	06/548,615	2/04/86
4,568,644	06/640,247	2/04/86
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4,568,669	06/537,047	2/04/86
4,568,671	06/509,451	2/04/86
4,568,672	06/644,732	2/04/86
4,568,678	06/592,045	2/04/86
4,568,680	06/678,235	2/04/86
4,568,684	06/682,070	2/04/86
4,568,688	06/601,188	2/04/86
4,568,691	06/684,253	2/04/86
4,568,694	06/504,459	2/04/86
4,568,698	06/652,893	2/04/86
4,568,714	06/605,464	2/04/86
4,568,728	06/630,925	2/04/86
4,568,736	06/650,944	2/04/86
4,568,762	06/686,791	2/04/86
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4,568,803	06/583,076	2/04/86
4,568,807	06/637,172	2/04/86
4,568,818	06/577,298	2/04/86
4,568,819	06/451,066	2/04/86
4,568,824	06/471,758	2/04/86
4,568,827	06/504,921	2/04/86
4,568,836	06/464,938	2/04/86
4,568,868	06/640,523	2/04/86
4,568,869	06/568,075	2/04/86
4,568,871	06/574,222	2/04/86
4,568,872	06/497,625	2/04/86
4,568,875	06/568,671	2/04/86
4,568,888	06/550,070	2/04/86
4,568,893	06/696,748	2/04/86
4,568,902	06/480,754	2/04/86
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4,568,908	06/686,170	2/04/86
4,568,918	06/619,935	2/04/86
4,568,926	06/609,276	2/04/86
4,568,931	06/443,686	2/04/86
4,568,942	06/417,252	2/04/86
4,568,943	06/499,396	2/04/86
4,568,946	06/547,834	2/04/86
4,568,949	06/606,661	2/04/86
4,568,972	06/552,940	2/04/86
4,568,994	06/540,030	2/04/86
4,569,000	06/430,997	2/04/86
4,569,008	06/733,137	2/04/86
4,569,054	06/505,485	2/04/86
4,569,056	06/604,853	2/04/86
4,569,057	06/624,528	2/04/86
4,569,058	06/596,659	2/04/86
4,569,071	06/593,850	2/01/86
4,569,077	06/567,165	2/04/86
4,569,083	06/578,019	2/04/86

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,684,023, Re. S. N. 07/389,341, Filed Aug. 3, 1989, Cl. 206/459, CONTENT-IDENTIFYING CARTON STRUCTURE, Jeffery J. Cortopassi, Owner of Record: *Taco Bell, Corp., Irvine, Calif.*, Attorney or Agent: Leopard Presser, Ex. Gp.: 241

4,730,413, Re. S. N. 07/495,874, Filed Mar. 15, 1990, Cl. 49/48, REMOVABLE AUTOMOBLIE SIDE WINDOW, Donald J. Henry, Owner of Record: *Nami Products, Inc., New Albany, Pa.*, Attorney or Agent: Mark Levy, Ex. Gp.: 357

4,730,914, Re. S. N. 07/493,956, Filed Mar. 15, 1990, Cl. 350/629, ELONGATE ARCUATE MIRROR WITH GENERALLY CONVEX SURFACE PORTIONS, Thomas R. Stout, Owner of Record: *Inventor*, Attorney or Agent: Douglas W. Sprinkle, Ex. Gp.: 257

4,733,942, Re. S. N. 07/492,779, Filed Mar. 13, 1990, Cl. 350/96.34, OPTICAL FIBER COATED WITH AN ORGANOPOLYSILOXANE CURABLE WITH ACTING RAYS, Yoshinori Hida, et al., Owner of Record: *Shin-Etsu Chemical Co., Chiyoda, Japan*, Attorney or Agent: Hopgood, Calimafde, Kalil, Blaustein & Judlowe, Ex. Gp.: 251

4,763,550, Re. S. N. 07/495,480, Filed Mar. 19, 1990, Cl. 83/191, SELF EQUALIZING PIERCING MACHINE, Edward J. Waltonen et al., Owner of Record: *Lamb Robb, Bloomfield Hills, Mich.*, Attorney or Agent: Donald L. Wood, Ex. Gp.: 324

4,843,767, Re. S. N. 07/478,123, Filed Feb. 9, 1990, Cl. 51/247, AUTOMATIC FORAGE HARVESTER KNIFE SHARPENING SYSTEM, Stanley R. Johnson, Owner of Record: *Deere & Company, Moline, Ill.*, Attorney or Agent: Joel S. Carter, Ex. Gp.: 323

4,878,210, Re. S. N. 07/494,391, Filed Mar. 16, 1990, Cl. 367/137, VISUALIZING METHOD FOR THREE DIMENSIONAL STANDING WAVE SOUND FIELD, Hideto Mitome, Owner of Record: *Agency of Industrial Science & Tech., Ministry of International Trade & Industry / Tokyo, Japan*, Attorney or Agent: Gregory J. Maier, Ex. Gp.: 222

Requests for Reexamination Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,256,789, Reexam No. 90/001,960, Requested Mar. 15, 1990, Cl. 428/35, INJECTION MOLDED POLYETHLYENE TEREPHTHALATE PARISON FOR BLOW MOLDING, S. Suzuki, et al., Owner of Record: *Yoshino Kogyosho Co., Ltd., Tokyo, Japan*, Attorney or Agent: Oliff & Berridge, Ex. Gp.: 150, Requester: Owner

4,695,901, Reexam No. 90/001,958, Requested Mar. 13, 1990, Cl. 380/5, METHOD AND APPARATUS FOR REMOVING PSUEDO-SYNC AND/OR AGC PULSES FROM A VIDEO SIGNAL, John O. Ryan, Owner of Record: *Macrovision, Santa Clara, Calif.*, Attorney or Agent: Unknown, Ex. Gp.: 230, Requester: W.B. Day, Overland Park, Kans.

4,793,087, Reexam No. 90/001,961, Requested Mar. 16, 1990, Cl. 43/23, APPARATUS FOR MOUNTING POWER TRANSMISSION BELTS ON AND REMOVING SAME FROM PULLEYS, Yoshihiko Kwmujama, et al., Owner of Record: *Mitsubishi Belting Ltd., Nacata, Japan*, Attorney or Agent: Woods, Phillips, Mason, et al., Ex. Gp.: 320, Requester: Owner

4,845,059, Reexam No. 90/001,959, Requested Mar. 15, 1990, Cl. 501/98, PROCESS FOR PRODUCING A SIALON POWDER, Yasuhiko Kohtoku, Owner of Record: *Ube Industries, Ltd., Ube-Shi, Japan*, Attorney or Agent: Finnegan, Henderson, Farabow, et al., Ex. Gp.: 110, Requester: Owner

4,849,032, Reexam No. 90/001,957, Requested Mar. 14, 1990, Cl. 148/11.50, ORTHODONTIC COIL SPRING AND METHOD OF MAKING THE SAME, Kozo Kawaguchi, Owner of Record: *GAC International, Inc., Central Islip, N.Y.*, Attorney or Agent: M.D. Giarrantana, Ex. Gp.: 110, Requester: Fredrickson & Byron, Minneapolis, Minn.

Erratum

The following registration number, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of Jan. 30, 1990, was listed inadvertently:

TM 191 1,580,472

Consequently, the certificate of registration bearing the above-identified registration number was not issued on the date indicated, and the registration number has been vacated.

Mar. 23, 1990 PATRICIA M. DAVIS
Administrator for Trademark Operations

Erratum

The Registrant of Registration No. 880,322 listed in the "Index of Registrants" section of the Trademark Official Gazette of Dec. 19, 1989 at TMI 31, was incorrectly identified as "RCV Corp., dba Valcon".

The Registrant's name as corrected is "IRRIGATION SPECIALTIES COMPANY".

Mar. 23, 1990 PATRICIA M. DAVIS
Administrator for Trademark Operations

Erratum

The following registration number was inadvertently listed as cancelled in the "Trademark Registrations Cancelled, Section 8" section of the Trademark Official Gazette of Aug. 8, 1989:

TM 216 1,225,067

Consequently, the above-identified registration is still active.

Mar. 23, 1990 PATRICIA M. DAVIS
Administrator for Trademark Operations

Errata

The following registration numbers were inadvertently listed as cancelled in the "Trademark Registrations Cancelled, Section 8" section of the Trademark Official Gazette of Jan. 9, 1990:

TM 170 1,248,826
TM 173 1,249,328

Consequently, the above-identified registrations are still active.

Mar. 23, 1990 PATRICIA M. DAVIS
Administrotor for Trademark Operations

Reclassification Alert Report

This report is a summary of classification changes which became effective by issuance of Classification Orders in January March 1990. Information includes:

- subclasses established or abolished
- subclass title, indent, or position change
- classes where existing subclass definitions have changed

This Reclassification Alert Report may appear form time to time in the Official Gazette, and is intended to provide an interim notice of classification changes pending publication of the Manual of Classification and revisions thereto.

Mar. 16, 1990 WILLIAM S. LAWSON
Administrator far Documentation

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Class	First Subclass	Last Subclass	Action	Order Number
015			Definition	1324
019			Definition	1325
028			Definition	1318
029			Definition	1319
029			Definition	1318
029	004.5		Abolish	1324
029	004.51	004.56	Establish	1324
029	006		Abolish	1324
029	006.01		Establish	1324
029	017	019	Abolish	1324
029	017.1	017.9	Establish	1324
029	018.1		Establish	1324
029	023		Abolish	1324
029	023.1		Establish	1324
029	023.5		Abolish	1324
029	023.51		Establish	1324
029	025.01	025.03	Establish	1324
029	081		Abolish	1324
029	081.01	081.02	Establish	1324
029	081.021		Establish	1324
029	081.03	081.09	Establish	1324
029	081.1		Establish	1324
029	081.11	081.17	Establish	1324
029	148.3	148.4	Abolish	1324
029	149.5		Abolish	1324
029	150		Abolish	1324
029	155		Abolish	1324
029	156.4	156.6	Abolish	1324
029	156.61	156.63	Abolish	1324
029	156.7	156.8	Abolish	1324
029	157		Abolish	1324
029	157.1		Abolish	1324
029	157.3	157.6	Abolish	1324
029	158	159	Abolish	1324
029	159.01	159.03	Abolish	1324
029	159.1	159.3	Abolish	1324
029	569.1		Abolish	1324
029	570.1		Abolish	1324
029	888		Establish	1324
029	888.01		Establish	1324
029	888.011	888.012	Establish	1324
029	888.02		Establish	1324
029	888.021	888.025	Establish	1324
029	888.03	888.04	Establish	1324
029	888.041	888.049	Establish	1324
029	888.05		Establish	1324
029	888.06		Establish	1324
029	888.07		Establish	1324
029	888.071	888.076	Establish	1324
029	888.08	888.09	Establish	1324
029	888.091	888.092	Establish	1324
029	888.1	888.4	Establish	1324
029	888.41	888.45	Establish	1324
029	888.451	888.453	Establish	1324
029	888.46		Establish	1324
029	888.51		Establish	1324
029	888.61		Establish	1324
029	889		Establish	1324
029	889.1	889.2	Establish	1324
029	889.21	889.23	Establish	1324
029	889.3	889.6	Establish	1324
029	889.61		Establish	1324
029	889.7		Establish	1324
029	889.71	889.72	Establish	1324
029	889.721	889.722	Establish	1324
029	890		Establish	1324
029	890.01	890.03	Establish	1324
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029	890.04		Establish	1324
029	890.041	890.049	Establish	1324
029	890.05		Establish	1324
029	890.051	890.054	Establish	1324
029	890.06	890.09	Establish	1324
029	890.1		Establish	1324
029	890.11	890.12	Establish	1324
029	890.121	890.129	Establish	1324

Class	First Subclass	Last Subclass	Action	Order Number
029	890.13		Establish	1324
029	890.131	890.132	Establish	1324
029	890.14		Establish	1324
029	890.141	890.149	Establish	1324
029	890.15		Establish	1324
029	891		Establish	1324
029	891.1	891.2	Establish	1324
029	892		Establish	1324
029	892.1		Establish	1324
029	892.11		Establish	1324
029	892.2	892.3	Establish	1324
029	893		Establish	1324
029	893.1	893.3	Establish	1324
029	893.31	893.37	Establish	1324
029	894		Establish	1324
029	894.1	894.3	Establish	1324
029	894.31	894.32	Establish	1324
029	894.321	894.325	Establish	1324
029	894.33		Establish	1324
029	894.331	894.333	Establish	1324
029	894.34		Establish	1324
029	894.341	894.345	Establish	1324
029	894.35		Establish	1324
029	894.351	894.354	Establish	1324
029	894.36		Establish	1324
029	894.361	894.362	Establish	1324
029	894.37	894.38	Establish	1324
029	894.381		Establish	1324
029	895		Establish	1324
029	895.1	895.2	Establish	1324
029	895.21		Establish	1324
029	895.211	895.213	Establish	1324
029	895.22	895.23	Establish	1324
029	895.3		Establish	1324
029	895.31	895.33	Establish	1324
029	897		Establish	1324
029	897.1	897.3	Establish	1324
029	897.31		Establish	1324
029	897.312		Establish	1324
029	897.32	897.35	Establish	1324
029	893		Establish	1324
029	893.01	898.04	Establish	1324
029	893.041	898.049	Establish	1324
029	893.05		Establish	1324
029	893.051	898.059	Establish	1324
029	893.06		Establish	1324
029	893.061	898.069	Establish	1324
029	898.07	898.09	Establish	1324
029	898.1		Establish	1324
029	898.11	898.15	Establish	1324
029	899		Establish	1324
029	899.1		Establish	1324
033			Definition	1318
033			Definition	1324
034			Definition	1325
040			Definition	1325
049			Definition	1325
051			Definition	1324
052			Definition	1324
057			Definition	1325
057			Definition	1318
060			Definition	1325
072			Definition	1325
072			Definition	1324
073			Definition	1325
073			Definition	1318
074			Definition	1324
074	394		Abolish	1325
074	626		Abolish	1325
074	645		Abolish	1325
074	660		Abolish	1325
074	674	675	Abolish	1325
074	677		Abolish	1325
074	679		Abolish	1325
074	681	682	Abolish	1325
074	686	691	Abolish	1325

Class	First Subclass	Last Subclass	Action	Order Number
029	898.11		Establish	1324
029	898.111	898.115	Establish	1324
029	898.12		Establish	1324
029	898.121	898.125	Establish	1324
029	898.13		Establish	1324
029	898.131	898.135	Establish	1324
029	898.14		Establish	1324
029	898.141	898.145	Establish	1324
029	898.15		Establish	1324
029	898.151	898.155	Establish	1324
029	898.16		Establish	1324
029	898.161	898.165	Establish	1324
029	898.17		Establish	1324
029	898.171	898.175	Establish	1324
029	898.18		Establish	1324
029	898.181	898.185	Establish	1324
029	898.19		Establish	1324
029	898.191	898.195	Establish	1324
029	898.2		Establish	1324
029	898.201	898.205	Establish	1324
029	898.21		Establish	1324
029	898.211	898.215	Establish	1324
029	898.22		Establish	1324
029	898.221	898.225	Establish	1324
029	898.23		Establish	1324
029	898.231	898.235	Establish	1324
029	898.24		Establish	1324
029	898.241	898.245	Establish	1324
029	898.25		Establish	1324
029	898.251	898.255	Establish	1324
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029	898.261	898.265	Establish	1324
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029	898.301	898.305	Establish	1324
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029	898.311	898.315	Establish	1324
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029	898.331	898.335	Establish	1324
029	898.34		Establish	1324
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029	898.35		Establish	1324
029	898.351	898.355	Establish	1324
029	898.36		Establish	1324
029	898.361	898.365	Establish	1324
029	898.37		Establish	1324
029	898.371	898.375	Establish	1324
029	898.38		Establish	1324
029	898.381	898.385	Establish	1324
029	898.39		Establish	1324
029	898.391	898.395	Establish	1324
029	898.4		Establish	1324
029	898.401	898.405	Establish	1324
029	898.41		Establish	1324
029	898.411	898.415	Establish	1324
029	898.42		Establish	1324
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029	898.431	898.435	Establish	1324
029	898.44		Establish	1324
029	898.441	898.445	Establish	1324
029	898.45		Establish	1324
029	898.451	898.455	Establish	1324
029	898.46		Establish	1324
029	898.461	898.465	Establish	1324
029	898.47		Establish	1324
029	898.471	898.475	Establish	1324
029	898.48		Establish	1324
029	898.481	898.485	Establish	1324
029	898.49		Establish	1324
029	898.491	898.495	Establish	1324
029	898.5		Establish	1324
029	898.501	898.505	Establish	1324
029	898.51		Establish	1324
029	898.511	898.515	Establish	1324
029	898.52		Establish	1324
029	898.521	898.525	Establish	1324
029	898.53		Establish	1324
029	898.531	898.535	Establish	1324
029	898.54		Establish	1324
029	898.541	898.545	Establish	1324
029	898.55		Establish	1324
029	898.551	898.555	Establish	1324
029	898.56		Establish	1324
029	898.561	898.565	Establish	1324
029	898.57		Establish	1324
029	898.571	898.575	Establish	1324
029	898.58		Establish	1324
029	898.581	898.585	Establish	1324
029	898.59		Establish	1324
029	898.591	898.595	Establish	1324
029	898.6		Establish	1324
029	898.601	898.605	Establish	1324
029	898.61		Establish	1324
029	898.611	898.615	Establish	1324
029	898.62		Establish	1324
029	898.621	898.625	Establish	1324
029	898.63		Establish	1324
029	898.631	898.635	Establish	1324
029	898.64		Establish	1324
029	898.641	898.645	Establish	1324
029	898.65		Establish	1324
029	898.651	898.655	Establish	1324
029	898.66		Establish	1324
029	898.661	898.665	Establish	1324
029	898.67		Establish	1324
029	898.671	898.675	Establish	1324
029	898.68		Establish	1324
029	898.681	898.685	Establish	1324
029	898.69		Establish	1324
029	898.691	898.695	Establish	1324
029	898.7		Establish	1324
029	898.701	898.705	Establish	1324
029	898.71		Establish	1324
029	898.711	898.715	Establish	1324
029	898.72		Establish	1324
029	898.721	898.725	Establish	1324
029	898.73		Establish	1324
029	898.731	898.735	Establish	1324
029	898.74		Establish	1324
029	898.741	898.745	Establish	1324
029	898.75		Establish	1324
029	898.751	898.755	Establish	1324
029	898.76		Establish	1324
029	898.761	898.765	Establish	1324
029	898.77		Establish	1324
029	898.771	898.775	Establish	1324
029	898.78		Establish	1324
029	898.781	898.785	Establish	1324
029	898.79		Establish	1324
029	898.791	898.795	Establish	1324
029	898.8		Establish	1324
029	898.801	898.805	Establish	1324
029	898.81		Establish	1324
029	898.811	898.815	Establish	1324
029	898.82		Establish	1324
029	898.821	898.825	Establish	1324
029	898.83		Establish	1324
029	898.831	898.835	Establish	1324
029	898.84		Establish	1324
029	898.841	898.845	Establish	1324
029	898.85		Establish	1324
029	898.851	898.855	Establish	1324
029	898.86		Establish	1324
029	898.861	898.865	Establish	1324
029	898.87		Establish	1324
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029	898.881	898.885	Establish	1324
029	898.89		Establish	1324
029	898.891	898.895	Establish	1324
029	898.9		Establish	1324
029	898.901	898.905	Establish	1324
029	898.91		Establish	1324
029	898.911	898.915	Establish	1324
029	898.92		Establish	1324
029	898.921	898.925	Establish	1324
029	898.93		Establish	1324
029	898.931	898.935	Establish	1324
029	898.94		Establish	1324
029	898.941	898.945	Establish	1324
029	898.95		Establish	1324
029	898.951	898.955	Establish	1324
029	898.96		Establish	1324
029	898.961	898.965	Establish	1324
029	898.97		Establish	1324
029	898.971	898.975	Establish	1324
029	898.98		Establish	1324
029	898.981	898.985	Establish	1324
029	898.99		Establish	1324
029	898.991	898.995	Establish	1324
029	899.2		Establish	1324
029	899.201	899.205	Establish	1324
029	899.21		Establish	1324
029	899.211	899.215	Establish	1324
029	899.22		Establish	1324
029	899.221	899.225	Establish	1324
029	899.23		Establish	1324
029	899.231	899.235	Establish	1324
029	899.24		Establish	1324
029	899.241	899.245	Establish	1324
029	899.25		Establish	1324
029	899.251	899.255	Establish	1324
029	899.26		Establish	1324
029	899.261	899.265	Establish	1324
029	899.27		Establish	1324
029	899.271	899.275	Establish	1324
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029	899.281	899.285	Establish	1324
029	899.29		Establish	1324
029	899.291	899.295	Establish	1324
029	899.3		Establish	1324
029	899.301	899.305	Establish	1324
029	899.31		Establish	1324
029	899.311	899.315	Establish	1324
029	899.32		Establish	1324
029	899.321	899.325	Establish	1324
029	899.33		Establish	1324
029	899.331	899.335	Establish	1324
029	899.34		Establish	1324
029	899.341	899.345	Establish	1324
029	899.35		Establish	1324
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029	899.381	899.385	Establish	1324
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029	899.4		Establish	1324
029	899.401	899.405	Establish	1324
029	899.41		Establish	1324
029	899.411	899.415	Establish	1324
029	899.42		Establish	1324
029	899.421	899.425	Establish	1324
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029	899.431	899.435	Establish	1324
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029	899.441	899.445	Establish	1324
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029	899.451	899.455	Establish	1324
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029	899.83		Establish	1324
029	899.831	899.835	Establish	1324
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029	899.93		Establish	1324
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029	899.941	899.945	Establish	1324
029	899.95		Establish	1324
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029	899.96		Establish	1324
029	899.961	899.965	Establish	1324
029	899.97		Establish	1324
029	899.971	899.975	Establish	1324
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029	899.99		Establish	1324
029	899.991	899.995	Establish	1324

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029	900		Establish	1324
029	900.01	900.03	Establish	1324
029	900.04		Establish	1324
029	900.041	900.049	Establish	1324
029	900.05		Establish	1324
029	900.051	900.054	Establish	1324
029	900.06	900.09	Establish	1324
029	900.1		Establish	1324
029	900.11	900.12	Establish	1324
029	900.121	900.129	Establish	1324
029	900.13		Establish	1324
029	900.131	900.132	Establish	1324
029	900.14		Establish	1324
029	900.141	900.149	Establish	1324
029	900.15		Establish	1324
029	901		Establish	1324
029	901.1	901.2	Establish	1324
029	902		Establish	1324
029	902.1		Establish	1324
029	902.11		Establish	1324
029	902.2	902.3	Establish	1324
029	903		Establish	1324
029	903.1	903.3	Establish	1324
029	903.31	903.37	Establish	1324
029	904		Establish	1324
029	904.1	904.3	Establish	1324
029	904.31	904.32	Establish	1324
029	904.321	904.325	Establish	1324
029	904.33		Establish	1324
029	904.331	904.333	Establish	1324
029	904.34		Establish	1324
029	904.341	904.345	Establish	1324
029	904.35		Establish	1324
029	904.351	904.354	Establish	1324
029	904.36		Establish	1324
029	904.361	904.362	Establish	1324
029	904.37	904.38	Establish	1324
029	904.381		Establish	1324
029	905		Establish	1324
029	905.1	905.2	Establish	1324
029	905.21		Establish	1324
029	905.211	905.213	Establish	1324
029	905.22	905.23	Establish	1324
029	905.3		Establish	1324
029	905.31	905.33	Establish	1324
029	907		Establish	1324
029	907.1	907.3	Establish	1324
029	907.31		Establish	1324
029	907.312		Establish	1324
029	907.32	907.35	Establish	1324
029	908		Establish	1324
029	908.01	908.04	Establish	1324
029	908.041	908.049	Establish	1324
029	908.05		Establish	1324
029	908.051	908.059	Establish	1324
029	908.06		Establish	1324
029	908.061	908.069	Establish	1324
029	908.07	908.09	Establish	1324
029	908.1		Establish	1324
029	908.11	908.15	Establish	1324
029	909		Establish	1324
029	909.1		Establish	1324
033			Definition	1318
033			Definition	1324
034			Definition	1325
040			Definition	1325
049			Definition	1325
051			Definition	1324
052			Definition	1324
057			Definition	1325
057			Definition	1318
060			Definition	1325
072			Definition	1325
072			Definition	1324
073			Definition	1325
073			Definition	1318
074			Definition	1324
074	394		Abolish	1325
074	626		Abolish	1325
074	645		Abolish	1325
074	660		Abolish	1325
074	674	675	Abolish	1325
074	677		Abolish	1325
074	679		Abolish	1325
074	681	682	Abolish	1325
074	686	691	Abolish	1325

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074	700	701	Abolish	1325
074	705		Abolish	1325
074	710		Abolish	1325
074	710.5		Abolish	1325
074	711		Abolish	1325
074	713	715	Abolish	1325
074	720.5		Abolish	1325
074	730	733	Abolish	1325
074	730.1		Establish	1325
074	731.1		Establish	1325
074	732.1		Establish	1325
074	733.1		Establish	1325
074	740		Abolish	1325
074	750	770	Abolish	1325
074	772	774	Abolish	1325
074	776	794	Abolish	1325
074	796	805	Abolish	1325
074	810		Abolish	1325
074	810.1	810.2	Establish	1325
074	812		Abolish	1325
074	880	892	Establish	1325
083			Definition	1324
091			Definition	1325
092			Definition	1324
092			Definition	1325
123			Definition	1324
128			Definition	1318
134			Definition	1324
134	900	902	Establish	1321
134	D001	D002	Abolish	1321
138			Definition	1324
140			Definition	1324
157			Definition	1324
165			Definition	1324
172			Definition	1324
174	068.5		Abolish	1319
174	250	268	Establish	1319
180			Definition	1325
184			Definition	1325
188			Definition	1325
192			Definition	1325
209			Definition	1318
219			Definition	1319
228			Definition	1324
235			Definition	1329
241			Definition	1324
242			Definition	1318
242			Definition	1324
250	201		Abolish	1329
250	201.1	201.9	Establish	1329
250	203		Abolish	1329
250	203.1	203.7	Establish	1329
250	206.1	206.3	Establish	1329
250	208	209	Abolish	1329
250	208.1	208.6	Establish	1329
250	227		Abolish	1329
250	227.11	227.32	Establish	1329
250	231		Abolish	1329
250	231.1	231.19	Establish	1329
250	578		Abolish	1329
250	578.1		Establish	1329
250	900	908	Establish	1329
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252			Definition	1327
277			Definition	1324
280			Definition	1325
285			Definition	1324
303			Definition	1320
307			Definition	1329
310			Definition	1318
310			Definition	1325
315			Definition	1318
318			Definition	1325
322			Definition	1325
322			Definition	1318

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323			Definition	1318
324	055	065	Abolish	1318
324	073		Abolish	1320
324	073.1		Establish	1320
324	207	208	Abolish	1326
324	207.11	207.26	Establish	1326
324	475		Abolish	1318
324	600	727	Establish	1318
328			Definition	1318
330			Definition	1319
333			Definition	1318
334			Definition	1318
335			Definition	1319
340			Definition	1318
356			Definition	1329
356			Definition	1318
358	213.14		Abolish	1329
361			Definition	1318
361			Definition	1319
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364			Definition	1318
365			Definition	1319
365			Definition	1329
366			Definition	1325
369			Definition	1319
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416			Definition	1325
416			Definition	1324
418			Definition	1325
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422	082.01	082.09	Establish	1328
422	082.11	082.13	Establish	1328
425			Definition	1324
427			Definition	1319
427			Definition	1324
428			Definition	1324
428			Definition	1319
437			Definition	1324
440			Definition	1325
455			Definition	1319
464			Definition	1325
474			Definition	1325
474			Definition	1324
475	001	349	Establish	1325
475	900	904	Establish	1325
548	262	269	Abolish	1327
548	262.2		Establish	1327
548	262.4		Establish	1327
548	262.6		Establish	1327
548	262.8		Establish	1327
548	263.2		Establish	1327
548	263.4		Establish	1327
548	263.6		Establish	1327
548	263.8		Establish	1327
548	264.2		Establish	1327
548	264.4		Establish	1327
548	264.6		Establish	1327
548	264.8		Establish	1327
548	265.2		Establish	1327
548	265.4		Establish	1327
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548	265.8		Establish	1327
548	266.2		Establish	1327
548	266.4		Establish	1327
548	266.6		Establish	1327
548	266.8		Establish	1327
548	267.2		Establish	1327
548	267.4		Establish	1327
548	267.6		Establish	1327
548	267.8		Establish	1327
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548	269.2		Establish	1327
548	269.4		Establish	1327
800	001		Abolish	1322
800	002		Establish	1322
800	200		Establish	1322
800	205		Establish	1322
800	220		Establish	1322
800	230		Establish	1322
800	235		Establish	1322
800	240		Establish	1322
800	250		Establish	1322
800	255		Establish	1322
800	D001	D071	Establish	1322
901			Definition	1325
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D006			*Excl Change	1323
D007	001	040	Abolish	1323
D007	042	058	Abolish	1323
D007	068		Abolish	1323
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D007	098	152	Abolish	1323
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D007	412		Title Change	1323
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D015			*Excl & Sch Changes	1323
D021			*Sch Change	1323
D023			*Excl & Sch Changes	1323
D025	119		Title Change	1323
D028			*Sch Change	1323
D029			*Excl Change	1323
D034			*Excl change	1323
D099			*Excl Change	1323

*Excl and Sch abbreviation are referring to references under the Exclusion and Search Notes of Design Classes

Status of PTO Services

The following is an update of the status of PTO services for March 1990

Service Item	FY 1990 Goal (Calendar Days)*	Monthly Average (Calendar Days)*
Filing Receipts:		
Patents	22	14
Trademarks	30	44
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	16 Hours
Window Coupons	5	2
Mail Coupons	12	7
Letter Orders	16	14
Electronic Ordering Service (EOS)	11	4
Certified Copies:		
Trademark Registrations	21	19
Applications-As-Filed	17	11
File-Wrapper/Contents	N/A	14
Walk-up Certification	1	1
Patent appllication Expedited	5	4
Trademark Search Library:		
Filing Pending Marks	25	59
Filing Reg. Certificates	Issue Date+2 days	+2 Days
Filing Temp. Drawings	8	24
Assignments:		
Recording Patent-New Applications	43	37
Recording Patent-Mail Room Recpts.	20	37
Receipt Date of Bulk Pat. Docs. Returned by End of Month		Jan. 12-Jan. 19, 1990
Recording Trademarks	20	25
Receipt Date of Bulk Trademarks Documents Returned by end of Month		Jan. 31-Feb. 13, 1990
Avg. Days from Issue Fee Payment to Issue Date	90-100	104
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On Time
Patent Copies Available	95% on Issue Date	+53 Days
Trademark Copies Available	95% on Issue Date	99% on Issue Date

* Unless otherwise noted.

Mar. 30, 1990

THERESA A. BRELSFORD
Assistant Commissioner
for Administration

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PATENT NOTICES

Certificates of Correction For Week of April 24, 1990

D. 302,091	4,818,356	4,837,137	4,844,169
Re. 32,969	4,820,102	4,837,544	4,844,491
4,586,792	4,821,203	4,837,573	4,844,526
4,667,472	4,821,675	4,837,766	4,844,740
4,671,658	4,821,868	4,838,340	4,845,042
4,676,919	4,822,502	4,838,368	4,845,188
4,684,215	4,822,867	4,838,624	4,845,338
4,695,459	4,824,746	4,838,797	4,845,357
4,703,660	4,825,461	4,839,112	4,845,534
4,722,416	4,825,692	4,839,280	4,845,679
4,729,652	4,825,804	4,839,397	4,845,933
4,749,459	4,826,094	4,839,536	4,845,978
4,765,896	4,826,989	4,839,549	4,846,359
4,771,017	4,827,275	4,839,908	4,846,635
4,772,854	4,827,832	4,840,069	4,846,666
4,783,997	4,828,396	4,840,149	4,846,672
4,788,377	4,829,088	4,840,159	4,846,796
4,788,564	4,830,315	4,840,366	4,846,818
4,789,115	4,830,910	4,840,532	4,846,990
4,797,473	4,831,021	4,840,724	4,847,222
4,798,875	4,831,072	4,840,744	4,847,316
4,800,450	4,831,354	4,841,084	4,847,552
4,800,716	4,831,613	4,841,167	4,847,645
4,802,657	4,831,654	4,841,209	4,848,577
4,802,997	4,833,096	4,841,460	4,848,667
4,805,585	4,833,625	4,841,772	4,848,783
4,810,707	4,833,873	4,842,383	4,849,182
4,810,712	4,834,523	4,842,408	4,851,840
4,810,946	4,834,606	4,842,488	4,855,032
4,811,281	4,834,705	4,842,492	4,855,302
4,812,541	4,834,860	4,842,700	4,858,486
4,812,556	4,835,072	4,842,846	4,859,043
4,812,652	4,835,451	4,843,269	4,860,906
4,812,685	4,835,513	4,843,432	4,866,282
4,813,294	4,835,586	4,843,452	4,876,941
4,813,631	4,835,714	4,843,479	4,879,264
4,815,712	4,836,229	4,843,785	4,884,285
4,815,807	4,836,404	4,843,866	4,889,888
4,815,823	4,836,508	4,844,030	4,891,504
4,816,298	4,836,525	4,844,045	
4,816,660	4,836,861	4,844,067	
4,818,347	4,837,082	4,844,125	

Disclaimers

4,484,995.—*Ronald G. Pirich*, Bay Shore; *David J. Larson, Jr.*, Huntington Station, both of N.Y. THERMALLY CONTROLLED SPUTTERING OF HIGH ANISOTROPY MAGNETIC MATERIAL. Patent dated Nov. 27, 1984. Disclaimer filed Jan. 9, 1990, by the assignee, Grumman Aerospace Corporation.

Hereby enters this disclaimer to the remaining term of said patent.

4,634,932.—*Ole K. Nilssen*, Barrington, Hills, Ill. LIGHTING SYSTEM. Patent dated Jan. 6, 1987. Disclaimer filed Feb. 2, 1990, by the inventor.

The term of this patent subsequent to December 2, 2003, has been disclaimed.

4,651,059.—*Ole K. Nilssen*, Barrington, Ill. HIGH-FREQUENCY POWER-LIMITED LIGHTING SYSTEM. Patent dated Mar. 17, 1987. Disclaimer filed Feb. 2, 1990, by the inventor.

The term of this patent subsequent to December 2, 2003, has been disclaimed.

4,667,133.—*Ole K. Nilssen*, Barrington Hills, Ill. POWER-LIMITED LIGHTING SYSTEM. Patent dated May 19, 1987. Disclaimer filed Feb. 2, 1990, by the inventor.

The term of this patent subsequent to December, 2, 2003, has been disclaimed.

4,866,329.—*Robert A. Ferenc*, Middletown, Conn. WIDE ANGLE WARNING LIGHT. Patent dated Sept. 12, 1989. Disclaimer filed Feb. 15, 1990, by the assignee, Whelen Technologies, Inc.

The term of this patent subsequent to December 20, 2005, has been disclaimed.

4,895,892.—*Yoshikatsu Satake; Takashi Kaneko; Yutaka Kobayashi; Yo Iizuka; Toshitak Kouyama; Takayuki Katto; Zenya Shiiki*, all of Iwaki, Japan. MELT-STABLE POLY(ARYLENE THIOETHER-KETONE) COMPOSITIONS. Patent dated Jan. 23, 1990. Disclaimer filed Feb. 14, 1990, by the assignee, Kureha Kagaku Kogyo K. K.

The term of this patent subsequent to October 10, 2006, has been disclaimed.

4,895,924.—*Yoshikatsu Satake; Yo Iizuka*, both of Iwaki; *Hirayuki Endo*, Shinbayashi; *Toshitaka Kouyama*, Iwaki; *Takayuki Katto*, Iwaki; *Zenya Shiiki*, Iwaki, all of Japan. POLY(ARYLNE THIOETHER-KETONE) FIBERS AND PRODUCTION PROCESS THEREOF. Patent dated Jan. 23, 1990. Disclaimer filed Feb. 14, 1990, by the assignee, Kureha Kagaku Kogyo K. K.

The term of this patent subsequent to October 10, 2006, has been disclaimed

4,895,925.—*Yoshikatsu Satake; Takashi Kaneko; Yutaka Kobayashi; Yo Iizuka; Takayuki Katto; Zenya Shiiki*, all of Iwaki, Japan. MELT-STABLE POLY(ARYLENE THIOETHER-KETONE) AND PRODUCTION PROCESS THEREOF. Patent dated Jan. 23, 1990. Disclaimer filed Feb. 14, 1990, by the assignee, Kureha Kagaku Kogyo K. K.

The term of this patent subsequent to October 10, 2006, has been disclaimed

Disclaimer and Dedication

4,585,583.—*Keith Roberson*, Freeland; *Don L. Stevens*, Sanford; *Harold E. Filter*, Midland, all of Mich. IN SITU SOLIDIFICATION OF ION EXCHANGE BEADS. Patent dated Apr. 29, 1986. Disclaimer and Dedication filed Dec. 18, 1989, by the assignee, The Dow Chemical Company.

Hereby disclaims and dedicates to the Public all claims of the said patent.

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PATENT APPLICATION	New patent application and associated papers and fees.
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These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions*, and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

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	Sacramento: California State Library	(916) 322-4572
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PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF March 24, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	7-7-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	9-1-88
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-5-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	2-29-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	11-9-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	3-23-88
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 STEWART LEVY, Acting Director	3-25-88
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-13-89
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	6-23-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	10-11-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-2-89

Expiration of patents: The patents within the range of numbers indicated below expire during March 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,718,937 to 3,723,991 inclusive
Plant Patents ..... 3,314 to 3,320 inclusive

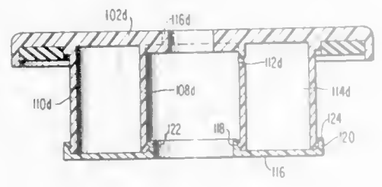
REEXAMINATIONS

APRIL 24, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,942,680 (1258th)
SPRAY PAINT CONTAINER AND ATTACHMENT THEREFOR

Larry E. Seeley, 1278 Front St., Binghamton, N.Y. 13905, and Edward H. Seeley, Box 72, Great Bend, Pa. 18821
Reexamination Request Nos. 90/001,362, Oct. 28, 1987 and 90/001,400, Dec. 21, 1987.
Reexamination Certificate for Patent No. 3,942,680, issued Mar. 9, 1976, Ser. No. 465,695, Apr. 30, 1974.
Continuation-in-part of Ser. No. 384,280, Jul. 31, 1973, Pat. No. 3,858,810. This application Dec. 21, 1987, Ser. No. 465,695
Int. Cl.[5] B65D *45/16*
U.S. Cl. 220—324



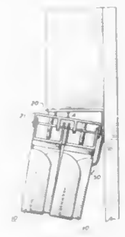
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–24 is confirmed.

1. A closure for a spray paint container comprising a cover adapted to carry a spray paint gun, means carried by said cover and cooperable with the container for releasably securing said cover to the container, means carried by said cover providing for communication between the interior of the container when said cover is releasably secured thereto and the exterior of the container including a housing having walls at least in part defining a chamber, said cover having an aperture therethrough in communication with said chamber, one of the walls of said housing having an aperture therethrough providing communciation between said chamber and the interior of the container when said cover is secured thereto, said apertures being spaced one from the other, and means carried by said cover and cooperable with the container for sealing the cover to the container when said cover is secured thereto whereby said apertures provide a vent passage through said cover and housing into the container.

B1 4,254,929 (1259th)
APPARATUS FOR ENABLING MOVEMENT OF A BINDER

Robert H. Popper, Jr., Mountain Lakes, N.J., assignor to J. S. Popper Inc.
Reexamination Request No. 90/001,509, May 13, 1988.
Reexamination Certificate for Patent No. 4,254,929, issued Mar. 10, 1981, Ser. No. 11,219, Feb. 12, 1979.
Filed May 13, 1988, Ser. No. 11,219
Int. Cl.[5] A47F *7/14*
U.S. Cl. 248—447



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–10** is confirmed.

1. An apparatus for enabling access to and automatic storage upon release of a binder relative to a support, comprising:
(a) means for enabling initial movement for access to and final movement for automatic storage of the binder relative to the support in a substantially off-horizontal plane; and
(b) means for enabling initial movement for automatic storage upon release of and final movement for access to the binder relative to the support in a substantially off-vertical plane, connected to the substantially off-horizontal plane movement enabling means.

REISSUES

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,202

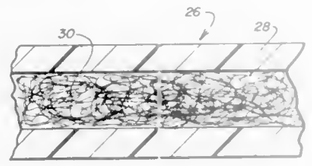
ENERGY TRANSMISSION DEVICE

Florian B. Janoski, Allentown, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Original No. 4,290,366, dated Sep. 22, 1981, Ser. No. 57,898, Jul. 16, 1979. Application for reissue Jul. 15, 1985, Ser. No. 754,727

Int. Cl.[5] F42B 3/10

U.S. Cl. 102—202.3 29 Claims



1. An energy transmission device for transmitting an explosive signal from an initiator to a receptor comprising:

(a) an elongated tube; and

(b) a self-oxidizing material loosely contained within said tube and extending substantially along the length of said tube for propagating an explosive signal through said tube, *said self-oxidizing material having a detonation rate of at least about 4,000 ft. per second when contained in said tube.*

Re. 33,203

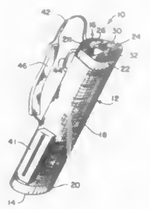
GOLF BAG DEVICE

Eric W. Reimers, 235 N. First St., Missoula, Mont. 59802

Original No. 4,685,561, dated Aug. 11, 1987, Ser. No. 783,767, Oct. 3, 1985. Application for reissue Apr. 10, 1989, Ser. No. 336,018

Int. Cl.[5] A63B 55/00, 55/06

U.S. Cl. 206—315.5 27 Claims



18. A golf bag device, comprising:

a bag portion in which the clubs and other equipment are stored, the bag portion having a closed end and an open end and being enclosed to form a generally tubular element, the bag portion including a rigid collar situated at said open end, a rigid base situated at said closed end exterior enclosing means adapted to extend between said collar and said base to separate the interior from the exterior of the bag portion; and

carrying means attached to the bag portion by which the bag device may be lifted and transported;

wherein the bag portion is characterized by having a longitudinal cross-section in the nature of a parallelogram, with said base and said collar forming lower and upper surfaces, respectively, which are parallel to a setting surface when the bag portion is in a rest mode, the rest mode being when the bag portion is placed upon such a setting surface such that said lower surface of said base abut thereagainst, and the side edges of said parallelogram, formed by the enclosing means, are offset from vertical in said rest mode defining an angle of incline for the bag device.

Re. 33,204

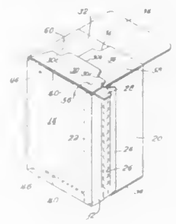
CARTON FOR PACKAGING ICE CREAM OR LIKE FROZEN INITIALLY LIQUID OR SEMI-SOLID MATERIAL

Thomas W. Froom, Pittsford, N.Y., assignor to Rolph-Clark-Stone Packaging Corporation, Newport News, Va.

Original No. 4,555,027, dated Nov. 26, 1985, Ser. No. 533,454, Sep. 19, 1983. Application for reissue Nov. 25, 1987, Ser. No. 126,257

Int. Cl.[5] B65D 5/54

U.S. Cl. 206—626 20 Claims



15. A carton for ice cream or the like, comprising:

(a) a rectilinear carton body comprising cover, rear, bottom, front and front cover panels interconnected in the order named and at least a portion of said front cover panel is adhesively secured to said front panel and said cover panel is articulatable relative to said rear panel, each of said panels has first and second sides;

(b) an end wall forming flap extends from each of said rear, bottom and front panel sides, said end wall forming flaps are facially disposed and adhesively interconnected and form first and second end walls;

(c) a cover flap extends from said cover panel sides and each cover flap has a portion thereof releasably secured between the end wall forming flaps of an associated end wall;

(d) means operably connect each side of said front cover panel with the adjacent cover flap;

(e) end lips extend from each of said end walls, each end lip underlies and contacts the underside of said cover panel without being adhesively secured thereto;

(f) a front lip extends from said front panel and underlies and contacts the underside of said cover panel without being adhesively secured thereto; and,

(g) said lips have cooperatively shaped adjacent end portions so that an end portion of one lip abuts an end portion of an adjacent lip and thereby provides extended surface-to-surface contact with said cover panel.

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Re. 33,205

LINEAR ANALOG LIGHT-LEVEL MONITORING SYSTEM HAVING SHORT LEADS TO REDUCE ELECTRONIC NOISE

Frederick H. Blake, Mill Creek, Wash., assignor to Multipoint Control Systems, Inc., Mill Creek, Wash.

Original No. 4,647,763, dated Mar. 3, 1987, Ser. No. 614,129, May 25, 1984. Application for reissue Apr. 22, 1988, Ser. No. 185,099

Int. Cl.[5] **H01J** *40/14*

U.S. Cl. 250—214 AL **24 Claims**

1. A system for remote monitoring of light levels, comprising:

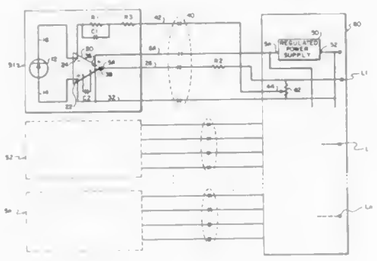
at least one sensor unit each remotely located from a central location, each sensor unit comprising:

(a) sensor means for sensing the level of light at a remote location and for providing a sensor signal linearly proportional to the sensed level of light;

(b) isolation means responsive to said sensor signal for isolating said sensor signal from electrical noise and for providing a noise-free output signal proportional to said sensor signal, said isolation means including feedback means for establishing the ratio of said output signal to said sensor signal; and

a control unit located at said central location comprising:

(a) at least one interconnect means, each for receiving a corresponding sensor unit output signal and for providing the received output signal from said control unit; and



(b) at least one calibration means each coupled to a corresponding sensor unit feedback means for modifying the ratio of the output signal to the sensor signal of the corresponding sensor unit.

PLANT PATENTS

GRANTED APRIL 24, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,222

MAGNIFICENT MAGENTA MAPLE

Melvin L. Schmidt, P.O. Box 246, Wathena, Kans. 66090, assignor to Melvin L. Schmidt and Kathleen A. Schmidt, both of Wathena, Kans.

Filed Sep. 6, 1988, Ser. No. 241,054

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—51 **1 Claim**

1. A new and unique variety of red maple, *Acer rubrum*, as described and illustrated, being particularly distinguished as to novelty by a combination of the shape of the tree which exhibits a desirable well-shaped, compact, symmetrical oval crown in contrast to the species which is often loosely shaped and much less compact, and a brilliant, true magenta fall leaf color quite unlike that of other members of the species and any patented variety; the vivid magenta exhibited during most of the fall leaf color period dictates the name I have chosen for this tree: 'Magnificent Magenta Maple.'

7,223

IRIS PLANT NAMED PARIS

Joseph P. van Eijk, Ve Bennekom, Netherlands, assignor to H. J. A. Rooyakkers B.V. and World Flower B.V., both of, Netherlands

Filed Apr. 10, 1989, Ser. No. 336,020

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of iris plant named Paris, as illustrated and described.

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ERRATA

For CLASS	See PATENT NO.
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033-001	4,918,817
029-596	4,918,830
029-598	4,918,832
029-606	4,918,833
029-621	4,918,834
029-722	4,918,835
029-732	4,918,846
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423-658	4,919,716
204-098	4,919,791
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435-007 4,920,063

PATENTS

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435-007 4,920,063
264-003 4,920,079
544-316 4,920,134
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530-385 4,920,194
534-016 4,920,195
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525-409 4,920,203
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549-214 4,920,212
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368-242 4,920,365
360-068 4,920,461
360-078 4,920,462
364-521 4,920,514
361-385 4,920,574

PATENTS

GRANTED APRIL 24, 1990

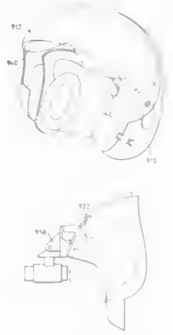
GENERAL AND MECHANICAL

4,918,752

HELMET WITH DETACHABLE FRONT SECTION

Michael Briggs, St. Albans, England, assignor to Helmet Limited, Moat Factory, Hertfordshire, England

Filed May 6, 1988, Ser. No. 191,060
Claims priority, application United Kingdom, May 8, 1987, 8710960
Int. Cl.[5] A42B *3/02*
U.S. Cl. 2—6 6 Claims



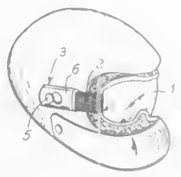
1. A helmet having a single rear part and two or more interchangeable front parts, the rear part comprising a shell shaped to extend at least partially over the top of the wearer's head and to each side of the head, each of the front parts accommodating a different piece of optical equipment, each front part being shaped to fit against the rear part to complete the shell of the helmet, and means for detachably connecting each front part to the rear part.

4,918,753

ADJUSTABLE FASTENING FOR SECURING GOGGLES TO A HELMET

Jean-Francois Mermillod, Saint-Jean-De-Sixt, France, assignor to Saer-Jmp, Bischheim, France

Filed Nov. 14, 1988, Ser. No. 270,004
Claims priority, application France, Nov. 13, 1987, 87 15724
Int. Cl.[5] A61F *9/02*
U.S. Cl. 2—10 10 Claims



1. A fastener for detachably securing a strap of a pair of goggles to the side of a motor-cyclist's helmet, said fastener comprising

a support for fixing to the helmet,

a fastener stud-piece for fixing detachably and reversibly to said support in first and second alternative positions,

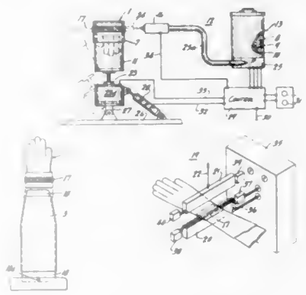
and a buckle for attaching to an end of said strap and for cooperating with said stud-piece, whereby to secure said strap detachably to the helmet.

4,918,754

FLOCKED GLOVE AND PLASTIC SLEEVE MEMBER BONDED THERETO

Alfred F. Leatherman, and Clyde P. Repik, both of Columbus, Ohio, assignors to William C. Heller, Jr., Milwaukee, Wis.

Filed May 4, 1988, Ser. No. 190,150
Int. Cl.[5] A41D *13/08*
U.S. Cl. 2—16 8 Claims



6. A protective garment unit comprising a flocked glove of a rubber-like shell having a flocked lining, a plastic sleeve member having a cuff portion telescoped into said glove, a hot-melt adhesive band including a hot-melt adhesive resin and sub-micron particles interposed between said cuff portion and said glove, said particles generating heat in the presence of an RF magnetic field, and said adhesive band being intimately adhesively bonded to said rubber-like shell of said glove and said sleeve and forming a hermetic connection of said glove to said sleeve

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4,918,755

DISPOSABLE GLOVE OR MITT FOR SELF-SERVICE GASOLINE AND FROZEN FOOD HANDLER

Duane W. Kinnear, R.D. #1, 11770 Ridge Rd., East Springfield, Pa. 16411

Filed Sep. 30, 1988, Ser. No. 251,306
The portion of the term of this patent subsequent to May 30, 2005, has been disclaimed.
Int. Cl.[5] A41D *19/00*
U.S. Cl. 2—161 R 3 Claims

1. A glove or mitt to be worn for self-service gasoline or for handling frozen food or for protecting emergency medical personnel, having a palm side of a flexible sheet of closed cell foamed plastic bubbles, the bubbles being of random sizes with the largest bubbles being of diameter about the thickness of the sheet and the medium sized and smaller bubbles being nestled together to fill the spaces between the larger bubbles and between the upper and lower surfaces of the sheet, and the

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bubbles being filled with air or other gas, which provides a cushioned gripping surface and thermal insulation for pumping

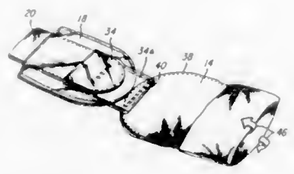
gasoline and for handling frozen foods and for providing cold weather protection for emergency medical personnel.

4,918,756

WATERPROOF FIREFIGHTER'S GLOVE

William L. Grilliot, and Mary I. Grilliot, both of 1986 Home Ave., Dayton, Ohio 45417

Filed Nov. 30, 1988, Ser. No. 278,214
Int. Cl.[5] A41D *19/00*
U.S. Cl. 2—164 24 Claims



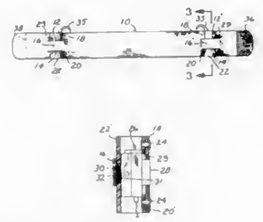
6. A firefighter's waterproof glove comprising an outer layer of abrasion resistant material, an intermediate layer of waterproof material, and an inner layer of thermal barrier material, stitching means extending through the intermediate layer and through the inner layer and attaching together the intermediate layer and the inner layer, sealing means sealingly attached to the intermediate layer and covering the stitching means, and securing means attaching the sealing means to the outer layer, whereby the layers are secured in desired relative positions as a firefighter's hand enters and withdraws from the inner layer of the glove and whereby the intermediate layer is maintained as a waterproof barrier as water is prevented from passage through the stitching means.

4,918,757

HEARING AID HEADBAND SUPPORT

Gwen V. Janssen, 837 N.W. 10, Oklahoma City, Okla. 73106, and Roy C. Rowland, 603 Sunnybrook, Edmond, Okla. 73034

Filed Jan. 30, 1989, Ser. No. 303,435
Int. Cl.[5] A42B *1/00*; G02C *11/06*
U.S. Cl. 2—171 4 Claims



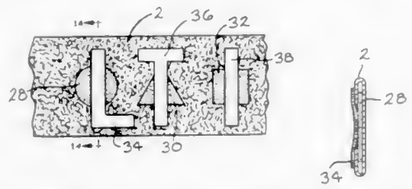
1. A hearing aid support, comprising:
an elongated flexible headband having a length capable of surrounding a user's head from the forehead hairline across the position of the mastoid bones to the nape of the neck in end overlapping relation and having a width selected in accordance with the dimensions of a hearing aid to be supported;
means including a tube or patch strip securing a bone conduction oscillator or air receiver hearing aid to said headband in a manner for contact between the oscillator and the user's skull bone,
said headband having a plurality of longitudinal parallel spaced-apart slits at the position of the mastoid bone forming a lateral strip on either side of a center strip,
the tube being resilient, flexible and coextensive with the headband width and transversely threaded through the headband slits and gripped by the strips; and,
a hearing aid unit within the bore of said tube.

4,918,758

CHANGEABLE MESSAGE STRETCH BAND

Joseph R. Rendina, 1554 River View St., Monroe, Mich. 48161

Continuation of Ser. No. 143,035, Jan. 12, 1988, abandoned. This application Feb. 27, 1989, Ser. No. 316,598
Int. Cl.[5] A42B *1/24*
U.S. Cl. 2—171 3 Claims



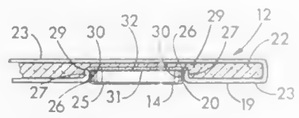
1. A tubular stretch band comprising a preferred inside surface and a preferred outside surface and interior surfaces, and further comprising at least one opening in the said outside surface, and further comprising a first material, having a plurality of loops, in communication with the said interior surfaces and the said opening, whereby the said loops on the said first material are exposed within the said opening to preferentially receive at least one graphic comprising a second material, having a plurality of hooks, wherein said second material is removably attached to the said first material by the user of the said band to enable the user of the said band to communicate changeable messages.

4,918,759

TIMEKEEPING CAP

Ernest R. Anderson, 5810 Leanre La., McFarland, Wis. 53538, and John K. Gahan, 5812 Glenway St., McFarland, Wis. 53558

Filed Dec. 20, 1988, Ser. No. 287,494
Int. Cl.[5] A42B *1/02*
U.S. Cl. 2—199 7 Claims



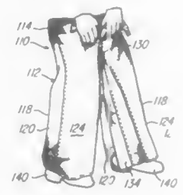
2. A timekeeping cap comprising:
(a) a crown portion which may be placed and worn on a human head;
(b) a visor portion which extends from the crown portion for shade, the visor portion including a lower surface, a relatively stiff core and a layer of material substantially covering the core, and having a cavity which opens to the lower surface; and
(c) a clock which is positioned substantially within the cavity and which includes a clockface through which time may be viewed, and near peripheral portions of the cavity the layer of material forms flaps which extend at least partially into the cavity between the clock and core, wherein the layer of material includes hem portions overlying peripheral portions of the cavity and clockface, said hem portions being formed by the layer of material being folded back onto itself and being attached together.

4,918,760

FIREFIGHTER'S TROUSERS CAPABLE OF RECEIVING A BOOTED FOOT

William L. Grilliot, and Mary I. Grilliot, both of 1986 Home Avenue, Dayton, Ohio 45417

Continuation-in-part of Ser. No. 182,399, Apr. 18, 1988, Pat. No. 4,817,211. This application Mar. 29, 1989, Ser. No. 330,125
The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—227 8 Claims



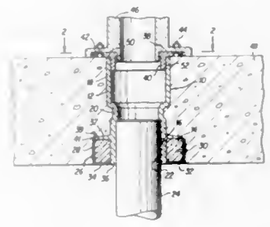
1. A firefighter's trousers which are easily donned by a firefighter who wears boots, in which each of the boots has a foot part and a leg part, the foot part and the leg part of each of the boots having given dimensions, the trousers comprising an outer shell of abrasion resistant material and an inner liner of insulation material, the inner liner being covered by the outer shell, the outer shell having a torso part and a pair of leg parts, the inner liner having a torso part and a pair of leg parts, each of the leg parts of the outer shell and each of the leg parts of the inner liner of the trousers having a lower portion which is adapted to cover the leg part of a firefighter's boot, the leg parts of the inner liner being tubular and forming a tubular passage significantly greater in dimensions than the given dimensions of the foot part and leg part of the boots, the leg parts of the outer shell freely encompassing the respective leg part of the inner liner whereby the boots move easily through the leg parts of the trousers as a firefighter dons the trousers while wearing the boots, the lower portion of each of the leg parts of the outer shell having a bottom edge, the lower portion of each of the leg parts of the inner liner having a bottom edge, the bottom edge of the lower portion of the leg parts of the outer shell and the bottom edge of the leg parts of the inner liner being immediately above the foot parts of the boots as the boots and trousers are worn by the firefighter, wherein the lower portion of the leg parts of the inner liner and the lower portion of the leg parts of the outer shell cover the leg parts of the boots, and whereby the legs of the firefighter are adequately protected while permitting ease of donning of the trousers while the firefighter wears boots, each of the leg parts of the outer shell including two separate sections which extend upwardly from the bottom edge of the leg part of the outer shell, the sections extending substantially the entire length of the leg parts, fastener means carried by the sections of each of the leg parts of the outer shell for attaching together the two sections of the leg parts of the outer shell, whereby the sections of the leg parts of the outer shell are attached together after the trousers are donned, the leg parts of the outer shell forming a tubular passage having a dimension only slightly greater than the given dimension of the leg part of the boots when the sections of the lower portion of the leg parts of the outer shell are attached together, whereby the lower portion of the leg parts of the outer shell closely enclose the lower portion of the leg parts of the inner liner, and whereby folds are formed in the lower portion of the leg parts of the inner liner as the lower portion of the leg parts of the inner liner closely covers the leg part of the boots.

4,918,761

METHOD OF USING A TOILET-FLANGE CAST-IN MOUNT

Gerold J. Harbeke, 2807 S. Military Trail, West Palm Beach, Fla. 33415

Filed Jun. 2, 1988, Ser. No. 201,147
Int. Cl.[5] E03D *11/16*
U.S. Cl. 4—252 R 6 Claims



1. A method of installing a toilet flange in a building, said method comprising the steps of:
casting a one-piece, tubularly-shaped mount having a bottom end portion with an inside diameter of the size and shape of a female coupling for three inch pipe and a top end portion with an inside diameter of four inch pipe, said bottom end portion defining approximately a three and one half inch internal diameter bottom opening for receiving a three inch pipe and said top end portion defining approximately a four inch internal diameter top opening for receiving a four inch external diameter tubularly-shaped stub of a toilet-flange therein, said top end portion being substantially longer than said bottom end portion and being of such a length as to make the overall length of said mount greater than the thickness of a concrete floor in which said mount is to be embedded;

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attaching said mount to a form for casting said concrete floor with said bottom end portion being adjacent said form;

casting a concrete floor in said form about said mount with the bottom opening exposed on the bottom of the floor and with the top opening exposed on the top of the floor;

cutting off said top end portion a sufficient amount so that said mount has a length corresponding to a thickness of the cast concrete floor;

inserting a three inch pipe into a bottom opening and affixing it to the bottom-end portion and inserting a tubularly shaped stub of a toilet-flange into the top opening, said tubularly-shaped stub having approximately a four inch external diameter of substantial length matching the internal diameter of said top end portion; and

wrapping an intumescent-material collar for closing off three inch pipe in a three inch female coupler about the bottom end portion at a bottom end thereof and casting it into said concrete floor with said mount for expanding and thereby closing off said bottom end portion and the three inch pipe mounted therein when it is exposed to the heat of a fire.

4,918,762

DOUBLE-URINAL FLUSHING APPARATUS AND METHOD FOR AUTOMATIC OPERATION

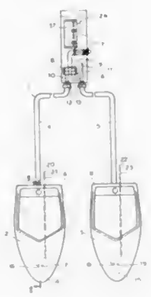
Fritz Uhlmann, Niederwichtrach, Switzerland, assignor to Bieri Pumpenbau AG, Munsingen, Switzerland

Continuation of Ser. No. 168,154, Mar. 15, 1988, Pat. No. 4,815,150. This application Nov. 21, 1988, Ser. No. 273,832

Claims priority, application Switzerland, Mar. 17, 1987, 00997/87

Int. Cl.[5] E03D *13/00*

U.S. Cl. 4—303 **4 Claims**



1. In a urinal installation of the type having two urinals connected to two water supply lines connected to a main water supply line, a solenoid valve connected in each of said two water supply lines for flushing said urinals, each urinal having a siphon with two electrodes respectively disposed in each of said siphons, an electronic control device for measuring the conductivity of flushing water in said siphons, electronic control means responsive to said electrodes for activating said solenoid valves for flushing said urinals, wherein the improvement comprises:

said main water supply line being of a size sufficient for flushing a single urinal and, said control means having first means for deactivating one of said solenoid valves when the other is activated for flushing one of said two urinals, whereby said urinals can be flushed using a main water supply line designed for a single urinal.

4,918,763

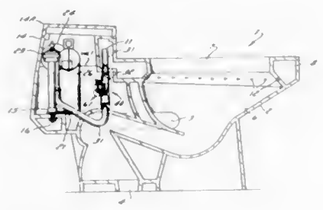
WATER CLOSET WITH SUPPLEMENTED RIM WASH WATER FLOW

John J. Brotcke, Germantown, Wis., assignor to Canaceramic Limited, Tortola, British Virgin Isls.

Filed Jan. 23, 1989, Ser. No. 300,047

Int. Cl.[5] E03D *1/24*

U.S. Cl. 4—331 **4 Claims**



1. A water closet (1) comprising:

a bowl (2) which includes an opening (3) for admitting flush water, a water and waste discharge (4), and sides (6) terminating in a bowl rim (7) having a water conveying passage (8) therein, a rim water inlet (11) into said passage and rim water outlet means (12) from said passage for washing said bowl sides;

a tank means (14) for storing flush water at a full first level (WL1) whereat a substantial volume of said water will not flow by gravity into said rim and having a water inlet (15) for connection to a supply of water (16) under pressure and a flush water outlet (21) connected to said bowl flush water admitting opening;

a water inlet valve means (23) mounted in flow control relation to said water inlet and movable between water inlet open and closed positions by a first water level sensing means (24) in response to the water level in said tank;

a flush valve means (26) mounted in said tank and manually movable to an open position to permit discharge of water from said tank into said bowl and automatically movably by a flush valve closing means to a closed position after said water level in said tank drops;

a rim water supply conduit means (31) including a longitudinal flow path, said conduit means connected in flow communication between said water inlet valve means and said rim water inlet;

a flow control valve means (32) having a valve element mounted in said conduit movable between conduit open and closed positions;

a tank water withdrawing means (40) including a high suction zone (42) below said rim inlet having an output (43) in fluid communication with said rim inlet and an aperture means (51) connecting said zone in fluid communication with said tank, said withdrawing means being automatically operative only when water is flowing through said rim passage during flushing to cause a portion of the water stored in said tank to be withdrawn for flow upward into said rim inlet during flushing so that stored tank water will supplement the volume of water flowing from said water inlet to said rim passage; and

a second water level sensing means (61) including a float element having an adjustable connection to said valve element to move the latter between said conduit open and closed positions, said adjustable connection permitting the position of said float element to be regulated relative to the position of said valve element to cause said flow control valve means

to be in said open position when said tank water level is at said first level and remains in said open position when said water level is falling to an intermediate level (INT) below said first level to permit water from said water inlet valve means, when open, to immediately flow through said conduit to said rim inlet; and

to move to said closed position when said tank water level drops below said intermediate level to a second level and remains in said closed position when said water level is rising from said second level to said first level to enable flow to said rim passage to be stopped at any desired time after minimum rim wash requirements have been met to minimize the amount of water used for rim wash, and then cause water flowing from said water inlet to flow through said aperture means to refill said tank.

4,918,764

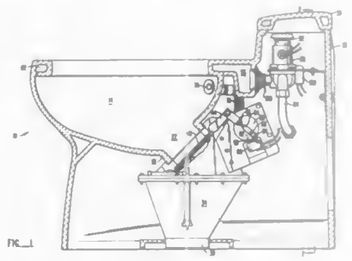
ELECTRICALLY OPERATED TOILET

Vernon W. Haselswerdt, Willits, and John M. Mayfield, Jr., Ukiah, both of Calif., assignors to Microphor, Inc., Willits, Calif.

Filed Jun. 13, 1988, Ser. No. 206,251

Int. Cl.[5] E03D *5/10*

U.S. Cl. 4—406 **12 Claims**



1. An electrically operated toilet comprising:

water receiving means for receiving pressurized water;

a toilet bowl in fluid communication with the water receiving means, the toilet bowl having a discharge opening for flowing waste material therefrom;

an electrically operated water valve, coupled to the water receiving means, for selectively allowing water to flow into the toilet bowl;

an electrically operated waste valve, coupled to the toilet bowl, for selectively allowing waste material to flow through the discharge opening, the waste valve including a cover for covering the discharge opening; and

control means, coupled to the water valve and to the waste valve, for operating the water valve and the waste valve so that water is allowed to flow into the toilet and subsequently out of the discharge opening, the control means comprising:

a first switch for selectively activating the water valve;

a motor;

linkage means, coupled to the motor and to the cover, for moving the cover for selectively uncovering the discharge opening when the motor is activated;

switch activating means, disposed in close proximity to the first switch, for causing the first switch to activate the water valve when the motor is activated, the switch activating means including a cam mounted on the motor, the cam rotating when the motor is activated, and the cam having a lobe which selectively contacts the first switch.

4,918,765

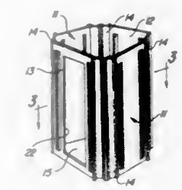
PORTABLE TOILET CABANA

George W. Harding, Clearwater, Fla., assignor to Poly-John Enterprises Corp., Whiting, Ind.

Continuation of Ser. No. 85,188, Aug. 14, 1987. This application Mar. 1, 1989, Ser. No. 317,547

Int. Cl.[5] A47K *11/02*

U.S. Cl. 4—460 **12 Claims**



1 A portable toilet-type cabana comprising:

four vertically arranged, generally flat, wide walls arranged at right angles to each other and made of relatively resilient, thin plastic sheet material, with each of the vertical side edges of the walls being bent into an integral, narrow edge flange extending outwardly of the plane of the respective wall, and the adjacent side edges of the wall being spaced apart;

a generally flat, narrow corner panel formed of thin plastic sheet material and being of about the same height as the walls, extending between each pair of adjacent spaced apart wall side edges at an obtuse angle relative to their respective walls for interconnecting the adjacent wall side edges for forming an octagon-like enclosure with alternating wide and narrow sides, the width of the corner panels being roughly in the range of about a quarter of the width of the walls;

the vertical side edges of the panels being bent into integral, narrow edge flanges extending outwardly of the plane of their respective panels and outwardly of the enclosure, and arranged in contact with an adjacent wall side edge flange;

and fastening means securing the adjacent contacting flanges together to provide a column-like strip extending the height of the walls at the opposite sides of the narrow sides defining the octagon-like enclosure for reinforcing and rigidifying the enclosure.

4,918,766

HYROTHERAPY EXERCISING DEVICE WITH SCISSOR LIFT TREADMILL

Angelo Leonaggeo, Jr., 7 High St., Bedford Hills, N.Y. 10507

Filed Oct. 16, 1984, Ser. No. 661,344

Int. Cl.[5] E04H *3/18*

U.S. Cl. 4—495 **9 Claims**

1. Apparatus for exercising and massaging a person, a horse or any animal comprising:

(a) a tank for containing a pool of water having a bottom wall and upstanding sidewalls and end walls:

(b) a cage for supporting the person, horse or other animal in said tank;

(c) a treadmill means forming the cage bottom;

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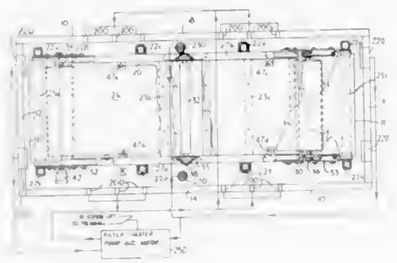
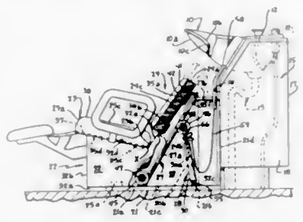
(d) means for driving said treadmill means;
(e) a scissor lift device for raising and lifting the cage and treadmill means, said scissor lift device including two parallel upper pairs of arm members and tow parallel lower pairs, each of said arm members having an upper end and a lower end, the upper end of each of said upper arm members being pivotably connected to said treadmill means, the lower end of each of said upper arm members being pivotably connected to a respective one of the upper ends of said lower arm members so as to create a first and a second axis of rotation where said upper arm members meet said lower arm members, said upper and said lower arm pairs being operable in tandem, said lift device further



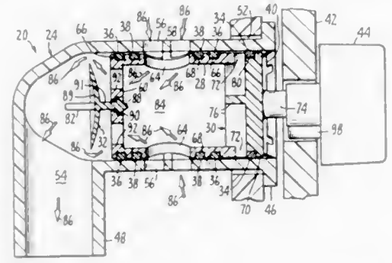
including a stabilizer bar provided so as to span between said parallel tandem arm pairs at the first axis of rotation where said upper arms meet said lower arms;
(f) means for powering the scissor lift device, said scissor lift powering means being connected to said scissor lift device in the area of the second axis of rotation;
(g) a plurality of spaced output nozzles in the said tank walls;
(h) means for injecting water into the pool under pressure through said nozzles to provide turbulence in the pool for massaging portions of the body situated in said tank between said tank;
(i) a filtration system for cleaning and purifying the tank water; and
(j) means for powering the filtration system.

4,918,767
SHAMPOO CHAIR AND BOWL APPARATUS
Gary M. Benting, Rockford, Ill., assignor to Smith Investment Company, Belvidere, Ill.
Filed May 30, 1989, Ser. No. 357,907
Int. Cl.[5] A45D *19/00, 44/10*
U.S. Cl. 4—517 **12 Claims**



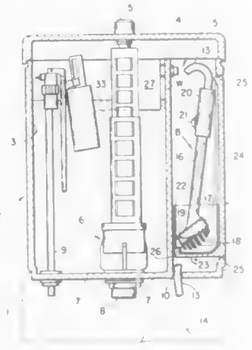
1. A shampoo chair and bowl apparatus comprising, a shampoo bowl having water supply and drain fittings, a front side, a neck receiving depression in the front side defining an upwardly and forwardly facing neck rest at the bottom of the depression, and means mounting the shampoo bowl with the neck rest at a selected elevation above a floor, a shampoo chair including a stationary base adapted to rest on a floor at the front side of the shampoo bowl, a movable chair frame and a seat and a back rest fixed to the frame for movement as a unit therewith, guide means mounting the chair frame on the base for movement along a linear guide path inclined upwardly and rearwardly at a preselected angle toward the shampoo bowl between a lower and an upper position, the chair frame and guide means being constructed and arranged to support and guide the chair frame during movement along said guide path with the back rest extending upwardly and rearwardly from the seat generally parallel to said guide path toward the neck rest on the shampoo bowl, and selectively operable means for positioning the chair frame in different adjusted positions between said raised and lowered positions.

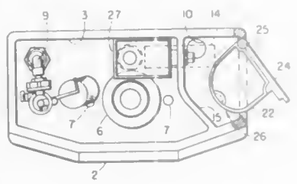
4,918,768
AIR VALVE FOR SPAS AND BATHS
Daniel A. DeSousa, Clayton; William G. Badley, Antioch, and Ralph D'Innocente, Pittsburg, all of Calif., assignors to Jacuzzi Whirlpool Bath, Walnut Creek, Calif.
Filed Nov. 18, 1987, Ser. No. 122,051
Int. Cl.[5] A61H *33/02*
U.S. Cl. 4—542 **15 Claims**



1. An air valve for controlling the supply of air to a venturi jet of a spa, wherein the spa includes an air supply pip that fluidically connects the air valve to the venturi jet, the valve comprising:
a housing adapted for mounting on a side wall of the spa, wherein the housing has an interior chamber extending between first and second ends, wherein a portion of the interior chamber adjacent the first end thereof is an open, cylindrical bore, wherein the housing includes a pipe coupling for fluidically connecting the second end of the interior chamber to the air supply pipe, and wherein the housing includes a housing port extending between the cylindrical bore and the exterior of the housing;
a cylindrical barrel rotatable within the cylindrical bore of the housing, wherein the barrel is adapted for insertion into the cylindrical bore through the open end of the bore, wherein the barrel includes an interior cavity having a first end that is fluidically sealed and is positioned adjacent the open end of the cylindrical bore and a second end that is fluidically open to the interior chamber of the housing, wherein the barrel includes a barrel port extending through the wall of the barrel between the cavity and the exterior of the barrel, and wherein the barrel port is longitudinally positioned such that the barrel and housing ports can overlap;
retaining means for retaining the barrel within the cylindrical bore of the housing, said retaining means including a protrusion within the interior chamber of the housing that limits the maximum insertion of the barrel into the cylindrical bore, and including a retaining ring that engages the inner wall of the cylindrical bore and retains the barrel between the retaining ring and the protrusion;
sealing means for sealing between the cylindrical outer surface of the barrel and the cylindrical bore of the housing to prevent air from flowing between the exterior and interior of the housing except when the housing and barrel ports overlap; and
means for rotating the barrel between an open position wherein the housing and barrel ports are aligned and a closed position wherein the housing and barrel ports do not overlap and are fluidically isolated by the sealing means.

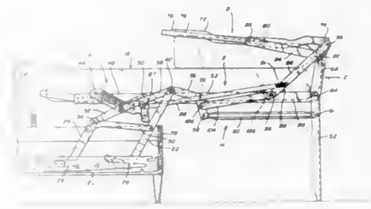
4,918,769
FLUSH TANK FOR A WATER CLOSET HAVING SELF CONTAINED WASHING MEANS
Luigi Gandini, Cernusco Lombardone, Italy, assignor to American Standard Inc., New York, N.Y.
Filed Apr. 10, 1989, Ser. No. 335,256
Int. Cl.[5] A47K *17/00*; E03C *00/00*
U.S. Cl. 4—661 **6 Claims**





1. A flush tank assembly which is adapted to be mounted in fluid commnication with the flush water inlet opening of a toilet bowl comprising:
a flush tank having a vertically extending partition wall positioned between the two vertical side walls of said tank to form a first chamber which houses a water control and flush valve assembly and is adapted to discharge flush water into the toilet bowl, and a second chamber which houses a removably mounted washing means;
said washing means including a manually-operated valve means operatively coupled to said washing means to control the flow of wash water therethrough;
and a flexible conduit coupled between said water inlet source and said washing means so that when said washing means is removed from said second chamber, wash water is manually regulated through said washing means to cleanse the toilet bowl as needed.

4,918,770
SOFA BED WITH CLOSING AND OPENING ASSIST
Michael F. Hartline, Saltillo, and Nikki O. White, Tupelo, both of Miss., assignors to Super Sagless Corp., Tupelo, Miss.
Filed Nov. 21, 1988, Ser. No. 281,182
Int. Cl.[5] A47C *17/04*
U.S. Cl. 5—13 **5 Claims**



1 A sofa bed frame supporting a mattress and movable between a closed or sofa configuration, a partially open configuration and a fully open or bed configuration comprising
a main angle and a rear leg for supporting the front end of the main angle when the frame is in the bed configuration,
a center angle pivotally connected at one end to the front end of the main angle, said center angle being coplanar with the main angle when the frame is in the bed configuration and substantially perpendicular to the main angle when the frame is in the sofa configuration,
a front tube pivotally connected to the other end of the center angle and being generally coplanar with the main and center angles when the frame is in the bed configuration and lying in a plane substantially parallel to and spaced above the main angle when the frame is in the sofa configuration,
a front leg pivotally connected to the front tube for supporting the front tube when the frame is in the bed configuration,
a front leg lock link pivotally connected intermediate its ends to the center angle and pivotally connected at one end to the front leg,
a rear leg control link pivotally connected at one end to the rear leg,
a lock link pivotally connected at one end to the other end of the front leg lock link and slidably connected at its other end to the main angle,
a pull link pivotally connected at one end to the other end of the lock link,
and actuating means including a crank directly connected to the pull link and the rear leg control link and responsive to the frame being moved from the closed to the partially open configuration for causing the pull link to pivot the front tube upwardly slightly on the center angle so as to relieve pressure on the mattress folded between the main angle and the front tube and also for causing the rear leg control link to lower the rear leg to a position to support the front end of the main frame, responsive to the frame being moved from the partially open to the closed configuration for causing the pull link to pivot the front tube downwardly toward the main angle so as to compress the mattress folded between them and also for causing the rear leg control link to raise the rear leg to a stored position.

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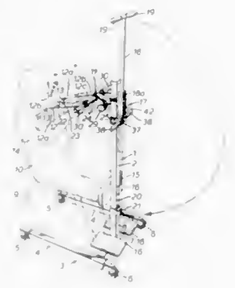
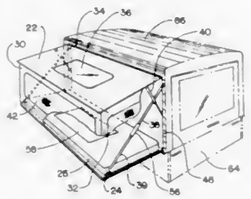
4,918,771
PATIENT LIFTING AND HOIST THEREFOR
David R. James, Glenyard, England, assignor to James Industries Limited, Gloucester, England
Filed May 30, 1984, Ser. No. 615,305
Claims priority, application United Kingdom, Jun. 2, 1983, 8315121
Int. Cl.[5] A61G 7/10
U.S. Cl. 5—81 R 27 Claims



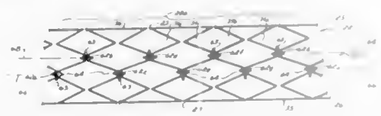
11. An invalid host for lifting a seated invalid to a standing position comprising an upstanding support structure, a pivotal lifting arm arrangement projecting from one side of said support structure and providing laterally spaced attachment points for the attachment of a padded body support sling passed around the back of the invalid below the arms thereof with the attachment points rigidly located laterally of an arm arrangement which is pivotal about a fixed horizontal axis with the attachment points disposed at a radius comparable to the average length of a human thigh bone, knee location abutment means on the support structure, foot support means mounted on said support structure and a lifting mechanism operative to raise the lifting arm arrangement about said horizontal pivot axis through an angle sufficient to raise the patient, with the knees of the latter located against said abutment means, to the standing position on the foot support means while supported from behind and laterally located by the sling.

4,918,772
FOLDING SLEEPER SHELL
Hudson C. Haile, 1881 Fosse Way, Titusville, Fla. 32796
Filed Sep. 7, 1988, Ser. No. 241,908
Int. Cl.[5] B60R 15/00
U.S. Cl. 5—119 2 Claims



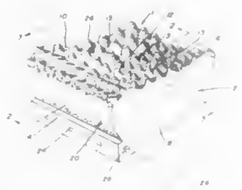
1. A folding sleeping assembly for humans including a rectangular rigid frame, a rigid rectangular bed member, a rigid rectangular roof member, and having three rectangular flexible side walls of water resistant fabric, the assembly being suitable for mounting in the side of a vehicle element such as a pickup truck topper, van body, or mobile or motor home such that when installed the short dimension of said frame is approximately vertical, with said sleeping assembly comprising:
said rectangular rigid frame having an open area bordered by edges having a flanged cross section, said edges including relatively long top and bottom edges and relatively short side edges said roof member being rotatably hinged on one long edge to the long top edge of said frame, said rigid bed member being rotatably hinged on one long edge to the bottom edge of said frame, said side walls being formed by a substantially rectangular flexible water resistant fabric panel having one long edge attached to a periphery of said roof member except for said long edge of said roof member hinged to said frame, and another long edge of said water resistant fabric panel attached to said bed member's periphery except for said one long edge of said bed member hinged to said frame, such that
when said bed member is rotated upward about its hinged attachment to a vertical folded position against said frame, and said roof member is rotated downward about its hinged attachment to a vertical folded position, said sleeping assembly comprises a compact flat assembly in a stored configuration and,
when said roof member is rotated outward and upward approximately 90 degrees about its hinged attachment, and when said bed member is rotated outward and downward approximately 90 degrees about its hinged attachment, said flexible water resistant fabric panel is stretched between the members as to compirse three side walls of said sleeping assembly with a fourth side of said sleeping assembly open to the interior of a vehicle element to which said frame is attached, such that said sleeping assembly forms a deployed assembly in a use configuration and
when said sleeping assembly is deployed by rotating said roof member upwardly and said bed member downwardly the spring loaded cylinder at each end of said sleeping assembly hingedly connected at each end of said cylinder between said frame and said roof member such that the weight of said roof member is by said cylinders so as to minimize the effort of deployment, said bed member is counterbalanced by said cylinders through said side walls as to keep said flexible fabric taut, said cylinders facilitate rotation of the deployed sleeping assembly so that the bed member can be made level, and
when deployed, said bed member is fixed in the desired position by diagonal adjustable length bar assemblies located at each end of said sleeping assembly and which are suitable for loading either in tension or compression and which each said bar assembly is hingedly attached at each end between said frame and outer corners of said bed member and comprise a tension loaded element when said bed is carrying the load of one or more humans, and a compression element when said bed member is unloaded and said pneumatic spring loaded cylinders are attempting to lift said roof member and consequently lift said bed member through the attached side wall of said assembly, and which each said adjustable bar assembly is comprised of two long flat metal pieces with means for selectively connecting the metal pieces together at spaced locations forming a connection to provide overall length adjustment, and which said adjustable bar assembly connection is held in place by a metal tubular lock which slides down over said connection and is of sufficient length to hold said connection and said bar assembly in a rigid configuration.

4,918,773
POSTURIZED SPRING BEDDING PRODUCT
Terence A. Scott, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.
Filed Dec. 16, 1988, Ser. No. 285,778
Int. Cl.[5] A47C 27/07
U.S. Cl. 5—252 22 Claims
9. A spring interior comprising a plurality of longitudinally extending bands of springs disposed side by side and connected together in the top and bottom faces of the bands, each of said bands of springs comprising a single length of wire formed into a plurality of substantially vertical coil springs arranged in a row and interconnected by interconnecting segments of wire located alternately in the top and bottom faces of the bands, each of said interconnecting segments comprising a longitudinally extending bridging portion, each of the coil springs being interlaced with the adjacent coil springs of the same row, and



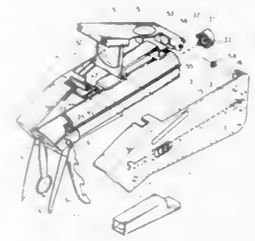
the spring interior being characterized by differing firmness of the coil springs throughout the length of the spring interior, said differing firmness being the result of posture rods extending through interlaced portions of a plurality of pairs of interlaced coils of the spring interior, each posture rod being located between said top and bottom faces of the bands.

4,918,774
MEDICAL SUPPORT PILLOW
Michael D. Popitz, Boston, Mass., assignor to Brigham and Women's Hospital, Boston, Mass.
Filed Aug. 16, 1989, Ser. No. 394,642
Int. Cl.[5] A47G 9/00
U.S. Cl. 5—441 20 Claims



1. A support pillow for supporting and maintaining the head and neck of a human in the sniffing position in which the neck is flexed upwards and the head is angled downwardly to achieve alignment of the airway axes, comprising:
a base, said base having an opposing neck end and head end, an opposing left side and right side, and a bottom surface;
a neck support, for supporting the neck, said neck support positioned at said neck end of said base;
a head support for supporting the head, said head support including a center head supporting surface which slopes downwardly from said neck support toward said head end;
said head support further including a left head supporting surface which slopes downwardly from said left side toward said center head supporting surface;
said head support further including a right head supporting surface which slopes downwardly from said right side toward said center head supporting surface; and
said head support and said neck support being dimensioned relative to each other to automatically align and maintain alignment of the oropharyngeal, the laryngeal and the tracheal airway axes of the human in the sniffing position when said head and neck are positioned upon said support pillow.

4,918,775
PORTABLE SAFETY DEVICE COMBINATION FOR OUTDOOR USE
Ching-Baiu Leu, 6F-1, No. 283, An-Ho Road, Taipei, Taiwan
Filed Dec. 21, 1988, Ser. No. 288,956
Int. Cl.[5] B25F 1/04
U.S. Cl. 7—168 9 Claims



1. A portable safety device for outdoor use comprising:
a first and a second shell;
two grooves respectively disposed in said first and second shells;
a switch disposed on said first shell and exposed to the outer environment of said first shell;
first and second conductive plates disposed on said first shell which electrically communicate with each other by said switch;
a cylindrical lighting means disposed between said first and second shells and one end thereof protruding from the combination of said first and second shells;
fixing means disposed on the other end of the combination of said first and second shells for connecting said lighting means, and said first and second shells together;
a telescope movably disposed upon said lighting means and having an open position and a closed position, said telescope having an object lens pivotally engaged thereto and an eye lens connected thereto;
a slidably elongated means provided on the object lens of said telescope for slidably moving said telescope from said closed position to said open position and two ends thereof respectively sliding on the grooves of said first and second shells;
engaging means disposed on one end of said telescope which is near the eye lens of said telescope for connecting said telescope with said first and second shells; and
a T-shaped block disposed near the other end of said telescope which is near the object lens of said telescope for releasing said telescope so that said telescope may move from said closed position to said open position;
whereby upon the movement of said T-shaped block, said telescope may move from said closed position to said open position.

4,918,776
METHOD OF MANUFACTURING SHOES AND INSOLE PART
Shingo Motoda, Tokyo, Japan, assignor to Kabushiki Kaisha Tobi, Tokyo, Japan
Filed Oct. 12, 1988, Ser. No. 256,789
Claims priority, application Japan, Jul. 19, 1988, 63-179693
Int. Cl.[5] A43D 11/00
U.S. Cl. 12—142 F 3 Claims
1. A method of manufacturing shoes comprising forming an insole part comprising the steps of: cementing a soft and thin insole sheet on a thick insole base having a rigidity and strength sufficient to withstand a lasting in such a way that the insole base may be easily peeled apart from the insole sheet, temporarily fixing the insole part on the bottom of a last with the

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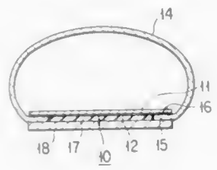
insole sheet directed outwardly, covering the last with an upper contacting the last tightly, lasting an end portion of the upper and superposing the end portion on a peripheral end portion of the insole part, cementing the end portion of the upper and the peripheral portion of the insole part, releasing



the temporary fixing of the insole part, superposing an outsole on the insole part and the end portion of the upper, cementing the outsole to the end portion of the upper, pulling out the last, and removing at least a part of the insole base from the insole part by peeling the insole base apart from the insole sheet.

4,918,777

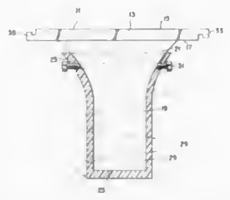
SLAB-STEM UNIT FORMING A TRAFFICWAY

Eddie L. Ashley, 3616 Ferry Ave., Niagara Falls, N.Y. 14302

Continuation of Ser. No. 129,534, Dec. 7, 1987, abandoned. This application Mar. 31, 1989, Ser. No. 331,688

Int. Cl.[5] E01D *15/12*

U.S. Cl. 14—73 **7 Claims**



1. A unitary construction element for use along with other similar elements to be assembled into a flat, horizontally disposed pedestrian traffic way, said elements adapted to be removeably secured to a site foundation, said structure comprised of a plurality of such elements disconnectively interlocked one with another to prevent substantial horizontal or vertical movement, said construction element comprising:

a. a unitary body, said body having an upper load bearing surface portion and a lower load supporting portion,

b. said upper portion comprised of a rectangular slab having substantially flat top and bottom surfaces, said bottom surface in touch contact with said site foundation,

c. said lower portion comprised of at least one integral support stem perpendicularly attached to said bottom surface of said slab, the bottom portion of said support stem, or stems, positioned in support contact with a site foundation separate anchor boot,

d. said support stem, or stems, having a substantially uniform cross-section along the lower portions thereof to facilitate easy removal of the element from a site foundation, said stem, or stems, having outwardly flared upper portions positioned adjacent the junction of said stem, or stems, and said slab,

e. the ratio between the surface area atop said slab and the cumulative cross-sectional area of the lower, non-flared portions of said stem, or stems, being between about 4 to 1 and about 6 to 1.

f. including a separate anchor boot designed to be secured into said site foundation and to receive a substantial portion of said stem.

4,918,778

ENDLESS ROTARY BAND CLEANING DEVICE, PARTICULARLY FOR CLEANING A CONVEYOR BELT OR SUPPORTING SURFACES OF OBJECTS

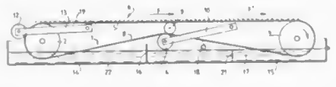
Guillaume Chupin, Versailles, and Denis Dandeville, Mantes la Ville, both of France, assignors to VIFE, Versailles, France

Filed Oct. 14, 1988, Ser. No. 258,271

Claims priority, application France, Oct. 16, 1987, 87 14869

Int. Cl.[5] B08B *1/02*

U.S. Cl. 15—97 R **14 Claims**



1. An endless rotary band cleaning device, wherein the endless cleaning band is mounted on at least three rollers disposed parallel to each other, namely: two main rollers one at least of which is driven in rotation and a secondary roller disposed in the space between the two main rollers, these three rollers being adapted so that the cleaning band follows, in its upper part, a rectilinear path going from the first to the second main roller while forming a cleaning surface then, in its lower part, a sinuous path comprising two portions situated on each side of said secondary roller, namely:

(i) an upstream portion which extends between the second main roller and the secondary roller, in which the band follows an upgoing course in a first zone and is continuously subjected to a washing with a washing liquid, and

(ii) a downstream portion which extends between the secondary roller and the first main roller, and in which the band follows a downgoing course in a second zone and is impregnated with a cleaning liquid for carrying out said cleaning.

4,918,779

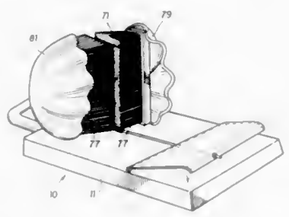
FOOT SPRAYING AND CLEANING DEVICE

Matt B. Burns, P.O. Box 958, Hanalei, Haena County, Hi. 96714

Filed Feb. 27, 1989, Ser. No. 315,807

Int. Cl.[5] A61H *33/00*; A47K *7/03*; A46B *11/06*

U.S. Cl. 15—104.92 **11 Claims**



1. An improved foot cleaning device, comprising:

(a) a base having a fluid piping system mounted thereon, said fluid piping system including an inlet and at least one outlet comprising an elongated spray bar having a plurality of outlet orifices therein, and valve means interposed between said inlet and said at least one outlet;

(b) an actuator for said valve means including a foot pedal on said base and linkage means connected between said foot pedal and said valve means for transferring pedal movements into actuating movements of said valve means between respective open and closed positions; and

(c) said spray bar being embedded within a brush mounted on said base.

4,918,780

WIPER ARM ASSEMBLY FOR MOTOR VEHICLES

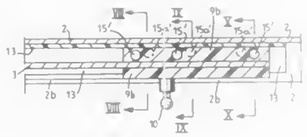
Marcello Scorsiroli, Turin, Italy, assignor to Champion Spark Plug Italiana S.P.A., Italy

Filed Aug. 5, 1988, Ser. No. 229,016

Claims priority, application Italy, Aug. 7, 1987, 67695 A/87

Int. Cl.[5] B60S *1/36*

U.S. Cl. 15—250.21 **18 Claims**



1. A wiper arm assembly for motor vehicles or the like, comprising:

a mounting head rigidly secured to a drive shaft;

a channel coupled to said mounting head;

spring means coupled between said mounting head and said channel and biasing an outer end of said channel towards the surface to be wiped;

a sliding element located inside a portion of said channel spaced from said mounting head, said sliding element provided with an arm extension, said sliding element being connected to the vehicle body by means of a rod provided with an articulation at both of its ends; and

macroscopic, solid, antifriction means comprised of balls or rollers located between the outer walls of said sliding element and the inner walls of said channel portion, for reducing friction between said sliding element and said channel portion along a substantial length of said channel portion.

4,918,781

HAND VACUUM CLEANER

John F. Sovis, Coldwater, Mich.; Robert M. Smith, Copley, Ohio, and George H. Brambull, Boulder, Colo., assignors to Royal Appliance Mfg. Co., Cleveland, Ohio

Division of Ser. No. 153,971, Feb. 9, 1988, which is a continuation of Ser. No. 877,881, Jun. 24, 1986, Pat. No. 4,730,362, which is a division of Ser. No. 670,553, Nov. 9, 1984, Pat. No. 4,633,543. This application Mar. 31, 1989, Ser. No. 332,558

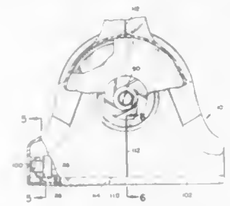
Int. Cl.[5] A47L *5/26*

U.S. Cl. 15—392 **2 Claims**

1. A hand-held vacuum cleaner including a housing, a nozzle assembly and a rotating brush contained in the nozzle,

said nozzle assembly including a nozzle having integrally formed opposed bearing housing cavities, said cavities being sized to closely receive bearing housings of said rotating brush and having open ends to expose the bearing housings;

and a nozzle guard including bearing housing retaining



elements comprising clip elements received in the open ends and disposed for deflecting interference fit to the bearing housings whereby said brush is positively retained in the nozzle assembly to minimize vibrational movement.

4,918,782

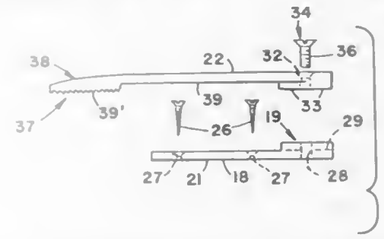
CARPET FASTENER

Bijan Zahedi, 1333 Grand Ave., Piedmont, Calif. 94610

Filed Feb. 21, 1989, Ser. No. 312,476

Int. Cl.[5] A47G *27/02*

U.S. Cl. 16—11 **7 Claims**



1. A carpet fastener for securing a carpet to an underlying surface, comprising:

an anchor member for disposition against said underlying surface, said anchor member having a boss at one end and a relatively thin flat arm proportioned to extend therefrom under an adjacent region of said carpet, said anchor member having screw passages for enabling securing of said anchor member to said underlying surface and having a threaded passage in said boss,

a carpet clamping member for disposition over said anchor member and said adjacent region of said carpet in substantially parallel relationship with said anchor member, said clamping member having a connector end for engagement with said anchor member at said boss thereof and having a passage in said connector end that aligns with said threaded passage of said boss, said clamping member further having an opposite end extending from said connector end with a flat pressure pad undersurface for exerting clamping pressure against said carpet, said clamping member having a length sufficient to position said pressure pad undersurface beyond the location of said arm of said anchor member, said clamping member being downwardly stepped at the junction between said pressure pad and the adjoining portion of said clamping member to locate said pressure pad undersurface at a lower level than said adjoining portion of said clamping member and wherein said pressure pad

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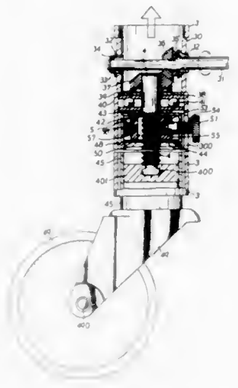
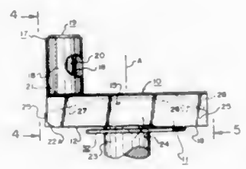
4,918,783
ADJUSTABLE WHEEL STRUCTURE
Jack Chu, No. 1-67, Wen Long Ts'un, Ming Hsiung Hsiang, Chiayi Hsien, Taiwan
Filed May 16, 1989, Ser. No. 352,449
Int. Cl.[5] B60B *33/04*
U.S. Cl. 16—19 4 Claims



1. An improved adjustable wheel structure adapted for use in
a trailing vehicle comprising: an outer tube having a number of facets disposed at the top end thereof with a hand operated shaft being horizontally guided through the faceted portion, and a first bevel gear means being mounted to the shaft and located within said outer tube;
an inner tube disposed within said outer tube and having a closed top end which is provided with a hole so that a screw rod can be located therethrough; on the top portion of said inner tube being provided with a peripheral recess which defines an inward protrusion in said inner tube, thereby a supporting board having a central hole disposed thereon can be supported in place so as to form a chamber near the top portion of said inner tube;
a slidable nut member housed in said chamber at the top portion of said inner tube, having an oval-shaped through hole with said screw rod going therethrough; the surface of said oval-shaped hole being half threaded and half smoothed; a vertical hole being disposed on an upper wall of said nut member, in communication with a horizontal burrow horizontally disposed on a side wall of said nut member;
an adjusting bolt member having a peripheral groove disposed at the front end thereof being led through holes on the outer tube and inner tube and into said horizontal burrow with a pin element located in said vertical hole and engaged with said peripheral groove so as to operatively join said nut member and bolt member together;
the top end of said screw rod being provided with a second bevel gear engaged with said first bevel gear mounted on said shaft;
the hole on said outer tube, through which said adjusting bolt member is guided, being large enough to permit the bolt member to move upward or downward in adjustment along with the nut member in said inner tube; whereby the actuation of said adjusting bolt member can move said nut member inward or outward so as to keep the half threaded inner surface of said nut member engaged with or disengaged from said screw rod where the other half smoothed inner surface is in contact with said screw rod allowing the wheel structure to be adjusted in slow or fast manner.

4,918,784
T-HANDLE TURNER
Richard J. Cude, 102 S. 300 East, Copperton, Utah 84005, and Joseph N. King, 2189 W. 12974 South, Riverton, Utah 84065
Filed May 26, 1989, Ser. No. 357,097
Int. Cl.[5] A47B *95/02*
U.S. Cl. 16—114 R 3 Claims

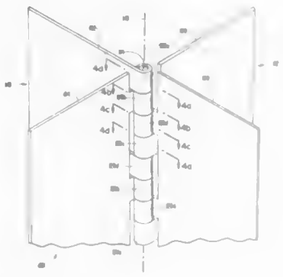


1. A T-handle turner device including, in combination, a hollow elongate body, designed for releasably receiving a crossbar of an external T-handle the cross bar being provided with a shaft, said body having a partially open underside and also a central transverse axis of rotation; a rotatable handle pivotally mounted to said body opposite said underside and spaced from said axis; and spring means secured to said body proximate said underside for releasably receiving and constraining said shaft of said external T-handle, whereby to position the same in central alignment with said axis of rotation.

4,918,785
MECHANICAL KNOT FOR ROPES
Raiphael F. Spinner, deceased, late of R.R. 3, Hillsboro, Ill. 62049, and Clement F. Marley, R.R. 2, Box 165, Nokomis, Ill. 62075
Continuation-in-part of Ser. No. 113,468, Oct. 27, 1987, Pat. No. 4,872,240. This application Mar. 10, 1989, Ser. No. 321,579
Int. Cl.[5] B65H *69/04;* D03J *3/00*
U.S. Cl. 16—114 B 4 Claims

1. In combination, a cable or rope and a device for tying a knot in the cable or rope to form a first loop for connection to a load, the device comprising:
a hollow metal or plastic cylinder of uniform diameter along its entire length and having at least one longitudinal opening equal in length to from about two to four diameters of the cable or rope or cylinder;
wherein an end of the cable or rope is threaded through the device and a portion is pushed out of the device through the longitudinal opening to form a second loop, the end of the cable or rope is wound at least once about the device and is threaded with each winding through the second loop forming the knot.

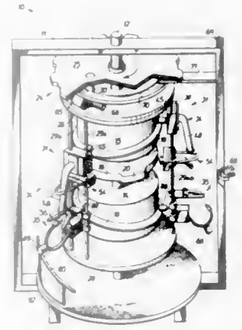
4,918,786
HINGE WITH LEAVES WHICH REINFORCE ONE ANOTHER AGAINST BENDING DEFLECTOR
John C. Perry, 3170 Falcon Dr., Carlsbad, Calif. 92008
Continuation of Ser. No. 35,746, Apr. 8, 1987, abandoned. This application Nov. 8, 1988, Ser. No. 270,442
Int. Cl.[5] E05D *5/06, 7/00*
U.S. Cl. 16—365 4 Claims



1. A hinge for pivotally joining two members comprising:
separate hinge leaves including at least one pair of separate hinge leaves to be secured to one member and at least one additional leaf to be secured to the other member, and each hinge leaf comprising an elongate strip having longitudinal edges,
rotary bearing means pivotally joining said hinge leaves along longitudinal edges thereof for independent rotation of each leaf relative to each remaining leaf about a pivot axis extending lengthwise of the leaves and comprising bearing sleeves on the hinge leaves along longitudinal edges of the leaves disposed in close end to end coaxial relation, and a hinge pin extending through the bearing sleeves, and wherein
(a) all of said bearing sleeves have approximately the same length and spacing along said axis, (b) each hinge leaf comprises at least one pair of coaxial bearing sleeves, (c) each pair of adjacent bearing sleeves on each hinge leaf straddle bearing sleeves on all of the other leaves but only a single bearing sleeve on each of the other hinge leaves, (d) the two hinge leaves of each leaf pair define therebetween an included angle and are relatively rotatable on said axis to vary said included angle, and (e) the two hinge leaves of each leaf pair are adapted to straddle their respective one of the members joined by the hinge, whereby each leaf of each leaf pair resists bending of the other leaf of the respective leaf pair.

4,918,787
POULTRY LUNG EXTRACTOR AND NECK BREAKER
Jacobus E. Hazenbroek, Burg. de Zeeuwstraat 52, Numansdorp, Netherlands
Filed Jan. 23, 1989, Ser. No. 299,406
Int. Cl.[5] A22C *21/00*
U.S. Cl. 17—11 18 Claims

1. A method of processing partially eviscerated poultry in which the birds are moved in series suspended invertedly by their legs from a conveyor through a series of processing stations, said method comprising the steps of:
moving the birds in sequence adjacent a lung extraction station having a lung extractor tube movably mounted for insertion downwardly into the visceral cavity of the bird and applying a suction to the extractor tube only when a bird is adjacent the lung extraction station, wherein in the



absence of a bird adjacent the lung extraction station no suction is applied.

4,918,788
PROCESS AND APPARATUS FOR RECOVERING MEAT FROM CARCASE SECTIONS IN PARTICULAR SEVERED ANIMAL HEADS
Bob Passchier, Earlspark, Loughrea, County Galway, Ireland
PCT No. PCT/NL88/00011, § 371 Date Nov. 23, 1988, § 102(e) Date Nov. 23, 1988, PCT Pub. No. WO88/07329, PCT Pub. Date Oct. 6, 1988
PCT Filed Mar. 22, 1988, Ser. No. 297,260
Claims priority, application Ireland, Mar. 24, 1987, 756/87
Int. Cl.[5] A22C *25/16*
U.S. Cl. 17—46 25 Claims

1 A continuous process for recovering meat from a plurality of animal carcass sections of the same type and approximately the same size in particular severed animal heads, which process comprises
(a) mounting the carcass parts in sequence on a continuously moving powered conveyor, by securing each part at one of its sides to one of a plurality of pivotally mounted locating members, the part resting at its other side on one of a plurality of supporting members so that by pivoting the part secured to said locating member said part can be turned upside down in which position it rests at its other end on a trailing or leading supporting member;
(b) advancing each mounted carcass section past a plurality of work stations, wherein a given work station may be attended by a manual operator or an automatic tool or a combination of both;
(c) dissecting each moving carcass part in a succession of steps, one at each work station, to obtain progressive separation of the meat from the bones; and,
(d) recovering the separated meat.

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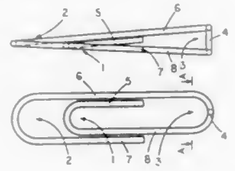
4,918,789
TRIPOD CLIP
Haw-Renn Chen, and Feichu H. Chen, both of 4057 Little Hollow Pl., Moorpark, Calif. 93021
Filed Aug. 29, 1988, Ser. No. 237,947
Int. Cl.[5] B42F *1/02*
U.S. Cl. 24—67.9 1 Claim



1. A clip with triangular cross section comprising three U-shapes with the smallest U-shape sitting inside the largest U-shape and the medium-size U-shape with two legs connected to one leg of each of said largest and smallest U-shapes sitting at the open end of said smallest and largest U-shapes contains one or more vertically-formed curvatures in the manner that said two legs of said medium-size U-shape lie on two planes with different orientation such that said smallest U-shape and said largest U-shape lie on said two planes while the leg with free end of said smallest U-shape is bent to be somewhat in parallel to said largest U-shape plane and the leg with free end of said largest U-shape is bent to be somewhat in parallel to said smallest U-shape plane whereby the capability of clipping a thick stack of paper or the like for said clip with triangular cross section is better than a clip without said vertically-formed curvatures.

4,918,790
CAM BUCKLE
Morgan T. Cirket, San Diego, and Michael J. Duly, Chula Vista, both of Calif., assignors to Soniform, Inc., El Cajon, Calif.
Filed May 12, 1989, Ser. No. 351,862
Int. Cl.[5] A44B *21/00*
U.S. Cl. 24—71 R 8 Claims

1. A cam buckle for tightening a strip of web-like material about an article to be secured comprising:
a frame having a pair of side walls with front and rear ends,
a loop pivotally attached to said side walls, the loop being adapted for holding one end of said strip of web-like material,
a first bar extending between said side walls and attached thereto at a position forwardly of the pivotable attachment of the loop,
a second bar mounted on the side walls and extending generally parallel to the first bar, the second bar being adapted for holding the other end of said strip of web-like material,
the buckle being movable between an unlocked position in which the front ends engage the article to be secured and the pivotable attachment of the loop is above the second bar and a locked position in which the pivotable attachment of the loop moves rearwardly of the second bar and passes over center relative to the second bar, and
said second bar being slidably mounted on said side walls and being slidable toward said first bar when tension is exerted on the strip of web-like material whereby the strip is clamped between the first and second bars.

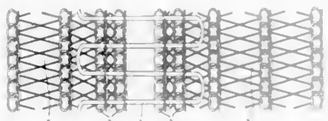
4,918,791
CLOTHING BUTTON GUARD
James A. Hardin, 317 Broadway, South Haven, Mich. 49090
Filed Mar. 6, 1989, Ser. No. 318,837
Int. Cl.[5] A44B *1/16*
U.S. Cl. 24—90.5 4 Claims

1. A guard for protecting a clothing button, said guard comprising a container having a side wall and an end wall to define an enclosure means for surrounding a clothing button, said side wall having an elongated longitudinal slot formed therein to allow said clothing button to be slid completely into said enclosure means, and a cap releasably secured to said guard side wall at a top edge thereof wherein said clothing button is virtually surrounded by said guard.

4,918,792
DEVICE FOR ATTACHING A LICENSE PLATE TO AN AUTOMOBILE
Edward E. Engels, 50 Chapin Greene Dr., Ludlow, Mass. 01056
Continuation-in-part of Ser. No. 105,865, Oct. 8, 1987, abandoned. This application Oct. 7, 1988, Ser. No. 254,614
Int. Cl.[5] A44B *15/00*
U.S. Cl. 24—300 6 Claims

1. A fastening device intended to engage holes of a conventional license plate comprised of paired identical anchoring means interconnected by a coil spring, said anchoring means being comprised of:
(a) an abutment base having a flat first surface and an opposite second surface, first and second extremities, and a fulcrum shoulder disposed upon said first surface at said first extremity,
(b) a straight penetrating post perpendicularly emergent from said first surface adjacent said first extremity, said post having a series of conical serrations, each serration having a top extremity, and a bottom extremity of larger diameter than said top extremity, said bottom extremities being directed toward said first surface,
(c) an offset leg emergent from said second surface at a site opposite said post, and
(d) a connecting arm emergent from said offset leg in a direction away from said abutment base and centered upon a plane substantially parallel to said abutment base, said connecting arm terminating in a distal extremity having an aperture,
said anchoring means being interconnected by way of said apertures to the extremities of said coil spring whose length is such that the spring is under tension when the penetrating posts are inserted into the holes of the license plate.

4,918,793
ZIP FASTENER AND A PROCESS FOR ITS MANUFACTURE
Siegfried W. Spindler, Schondorf, Fed. Rep. of Germany, assignor to Ries GmbH Bekleidungsverschlussfabrik, Fed. Rep. of Germany
Filed Oct. 6, 1987, Ser. No. 104,906
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1986, 3634162
Int. Cl.[5] A44B *19/10, 19/56*
U.S. Cl. 24—392 8 Claims



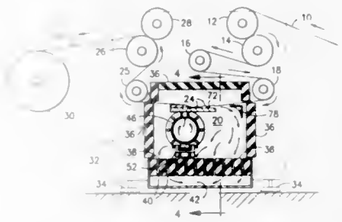
1. A zip fastener comprising:
coupling member rows each comprised of a continuous monofilament connected to a carrying tape, said carrying tape being comprised of two strips of knitted textile fabric each having the loops of at least two wales adjacent one margin disposed in closely spaced relation to each other and the loops of the remaining wales being substantially spaced from each other with transversely extending yarns interconnecting adjacent wales and
said continuous monofilament having an S-shaped configuration folded back upon itself along a central longitudinal axis to define two plies with the monofilament of each ply being knitted only into said closely spaced loops adjacent said one margin of each strip respectively with said one margins of said strips being disposed in superimposed alignment with each other adjacent said longitudinal axis.
5. Process for the manufacture of a zip fastener comprising coupling member rows each comprised of a continuous monofilament connected to a carrying tape comprising:
knitting two strips of textile fabric each having the loops of at least two wales adjacent one margin disposed in closely spaced apart relation to each other and the loops of the remaining wales being substantially spaced from each other with transversely extending yarns interconnecting adjacent wales, inserting a continuous S-shaped monofilament into only said loops of said at least two wales during knitting with said one margins of said strips being disposed adjacent each other and folding said S-shaped monofilament back upon itself along a central longitudinal axis extending between said strips.

4,918,794
PULL FOR SLIDE FASTENER SLIDERS
Billy R. Harvey, and David W. Rohrer, both of Jackson, Wyo., assignors to Life-Link International, Inc., Jackson, Wyo.
Filed Oct. 13, 1987, Ser. No. 107,095
Int. Cl.[5] A44B *19/26*
U.S. Cl. 24—429 7 Claims

1. In a slide fastener comprising a slider and a pull tab connected to said slider having an opening therein, the improvement comprising a flexible elastic pull member attachment attached to said pull tab, said member having a length at least twice that of its width and an upper and lower portion thereof,

the upper portion of said member defining a slot of a size sufficient to accept the lower portion of said member, said member comprising an elastomeric foam with a fabric backing on at least one side thereof.

4,918,795
METHOD TO SOFTEN FABRIC BY AIR IMPINGEMENT
Louis Dischler, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.
Continuation of Ser. No. 243,201, Sep. 8, 1988, abandoned, which is a continuation of Ser. No. 171,261, Mar. 21, 1988, abandoned, which is a division of Ser. No. 74,568, Jul. 17, 1987, Pat. No. 4,837,902. This application Aug. 10, 1989, Ser. No. 391,690
Int. Cl.[5] D06C *19/00*
U.S. Cl. 26—1 2 Claims



1. The method of treating a web of fabric comprising the steps of: supplying a web of fabric at low tension, taking up the web of fabric supplied and breaking up the fiber-to-fiber bonds in the web of fabric between the supply and take-up thereof by projecting a plurality of low pressure, high velocity streams of gaseous fluid against only one side of the web of fabric in a direction opposite and substantially tangential to the path of travel of the web of fabric causing vibrations in the web of fabric to create saw-tooth waves therein having small bending radii which travel down the fabric to increase the drape and flexibility thereof.

4,918,796
TENSIONING MACHINE
Harry Gresens, Benningen, Fed. Rep. of Germany, assignor to Bruckner Trocbentechnik GmbH & Co. KG, Leonburg, Fed. Rep. of Germany
Filed Apr. 22, 1985, Ser. No. 725,903
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1984, 3423905; Aug. 31, 1984, 3432177
Int. Cl.[5] B65H *23/028;* D06C *3/04*
U.S. Cl. 26—94 14 Claims

1. In a tensioning machine for the treatment of a length of textile fabric, said machine including:
(a) an endless conveyor strand movable continuously along

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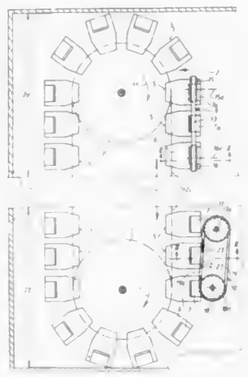
a horizontal fabric conveying path from a fabric inlet end to a fabric outlet end, and return, and

(b) a plurality of spaced apart grippers carried by said conveyor strand, each of said grippers having a support table for supporting one edge of said fabric and a two-arm flap rockable about a horizontal axis between said arms and above said table between a closed position in which a first arm of said flap on one side of said axis and at a level between said axis and said table is enabled to clamp said fabric against said table and an open position in which said first arm of said flap is disabled from clamping said fabric against said table, each of said flaps having its second arm on the opposite side of said axis,

the improvement comprising:

(c) flap closing means at the inlet end of said path engageable with the second arm of each of said flaps for rocking each of said flaps to its closed position as it arrives at said inlet end,



(d) continuously movable flap opening means at the outlet end of said path for rocking each of said flaps to its open position as it arrives at said outlet end;

(e) releasable latch means for releasably maintaining said flap in its open position during the return of said strand from the outlet end to the inlet end;

(f) means mounting said flap opening means alongside said conveyor strand in the path of movement of each of said flaps and at such level as to engage said first arm of each of said flaps between said axis and said table with sufficient force to rock each such flap from its closed position to its open position and to effect latching engagement of said flap with said latch means; and

(g) means for continuously driving said flap opening means in the direction of movement of said conveying path and at substantially the same speed as said conveyor strand.

4,918,797

METAL ROOF PANEL SEAMER APPARATUS

Neil A. Watkins, Rte. 5, Box 9; Peter M. Rook, Rte. 5, Box 69, both of Starkville, Miss. 39759, and George Woodruff, Rte. 6, Box 248, Corinth, Miss. 38834

Filed Feb. 17, 1989, Ser. No. 312,733

Int. Cl.[5] B21D *37/00*

U.S. Cl. 29—243.5 **9 Claims**

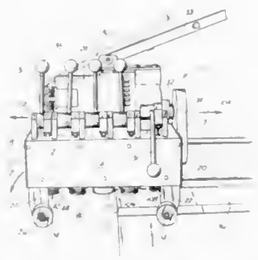
1. A self-propelled, bi-directional apparatus for forming a standing seam joining metal roof panels, of the type having side portions that terminate upwardly with a preformed partially closed interlocking portion to be substantially parallel with the plane of the panel, the apparatus comprising:

(a) a support frame;

(b) a first plurality of drive rollers, positioned along the frame for contacting an end portion of a panel;

(c) a second plurality of seam forming rollers, positioned along each side of the drive rollers, and moveable a sufficient distance from the corresponding drive roller to straddle the unformed seam between the drive roller and the seam roller;

(d) means for camming each seam roller independently of



the other seam rollers to a second position to engage into the seam between the first pair of seam and drive rollers;

(e) means for camming each subsequent seam roller against its corresponding drive roller to form the seam from its first unseamed configuration to its formed configuration; and

(f) a third plurality of rollers for allowing the machine to move in the opposite direction when the third plurality of rollers are engaged against the seam.

4,918,798

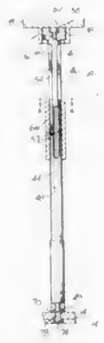
RIVET REMOVAL TOOL

Charles R. Reed, P.O. Box 4316, Elkhart, Ind. 46514

Filed May 23, 1988, Ser. No. 197,528

Int. Cl.[5] B23P *11/00*

U.S. Cl. 29—243.54 **18 Claims**



1. A tool for removing fasteners from a workpiece, said tool comprising an elongate generally tubular housing, a longitudinal bore having a continuous inner surface defined through said housing, said housing including a lower positioning part, and an upper support part slidably connected to said lower positioning part, means to movably connect said upper support part and said lower positioning part while maintaining said continuous inner surface, a shaft located in said housing bore and supported by said housing upper part, said shaft slidable within said bore relative to said housing lower part and contacting said bore inner surface along the entire length of said bore inner surface to support the shaft, and means for sliding said housing upper part and shaft between a first position wherein a terminal end of said shaft is spaced from a workpiece and a fastener to be removed, and a second position wherein said housing upper part and shaft are urged toward said workpiece with said shaft forcibly contacting said fastener to remove the fastener from the workpiece, shoulder means at an upper end of the bore inner surface, said shaft abutting said shoulder means inner surface at both said first and second positions of the housing to provide constant longitudinal support for the entire length of the shaft whereby the housing supports the entire shaft against vibrational forces transmitted from the lower end of the shaft.

4,918,799

METHOD AND APPARATUS FOR FORMING STRINGERS FOR FREE-STANDING CIRCULAR STAIRCASES

Louis Benedetti, 10 Continental Ave., Forest Hills, N.Y. 11375

Filed Apr. 10, 1989, Ser. No. 335,992

Int. Cl.[5] B23Q *3/00*; **B27H** *1/00*

U.S. Cl. 29—467 **8 Claims**

1. A method of forming stringers for a curved staircase, said method comprising the steps of:

connecting beams between corresponding points on first and second patterns so that said beams are substantially perpendicular to said patterns, said patterns having a plurality of radial lines of said points indicated thereon;

attaching portions of a stringer to respective beams, at a height that increases from beam to beam for each consecutive beam; and

removing the stringer from said beams when the form of the stringer is set.

4,918,800

CONTINUOUS METHOD FOR MAKING DECORATIVE SHEET MATERIALS

Gerald G. Reafler, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 3, 1989, Ser. No. 332,191

Int. Cl.[5] B21B *1/24*

U.S. Cl. 29—527.2 **5 Claims**

1. A continuous method for making a protective and decorative sheet material which comprises:

(A) forming a highly reflective, specular, continuous metal layer on a continuously moving web of a stretchable, thermoformable, polymeric carrier film; and

(B) cracking the metal layer biaxially at a temperature below the glass transition temperature of the carrier film by continuously bending and drawing the web around a first cracking member having a linear cracking edge to create a first series of substantially linear and parallel microscopic cracks in the metal layer, continuously bending and drawing the web around a second cracking member having a linear cracking edge which is non-parallel to the first cracking member edge to create a second series of substantially linear and parallel microscopic cracks in the metal layer, said first series of cracks being non-parallel to the second series, and thereby forming in the metal layer a substantially regular, microscopic parallelogram crack pattern, the so cracked metal layer

(a) having a 20-degree gloss of at least 100; and

(b) being capable, when the sheet material is stretched above the glass transition temperature of the carrier film, of exhibiting a brushed metal appearance having a 20-degree gloss of less than 100.

4,918,801

INSULATION SYSTEM METHOD FOR MULTITURN COILS OF HIGH VOLTAGE ELECTRICAL ROTATING MACHINES

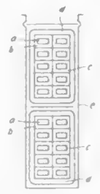
Kurt K. Schwarz, and Thomas D. Smith, both of Norwich, England, assignors to Laurence, Scott & Electromotors Ltd., Norwich, United Kingdom

Filed Jun. 3, 1988, Ser. No. 201,788

Claims priority, application United Kingdom, Jun. 4, 1987, 8713087

Int. Cl.[5] H02K *15/06*

U.S. Cl. 29—596 **9 Claims**



1 A method of insulating sultiturn high voltage stator windings of electrical rotating machines, comprising the steps of applying interturn insulation in the form of glass-backed mica paper pre-treated with resin taken to a B-stage cure, at least to straight, slot engaging parts of the windings prior to mounting thereof on the stator, mechanically consolidating and thermally curing said interturn insulation, applying main insulation to said slot-engaging parts, said parts having consolidated and cured interturn insulation, and end parts of the windings in the form of glass backed mica paper pre-treated with resin without a curing agent, mounting said slot engaging parts of the windings on the stator, connecting end parts of the windings to said slot engaging parts thereof so as to electrically complete said windings and impregnating the electrically completed windings on the stator with a resin compound by a vacuum and pressure process followed by a thermal cure.

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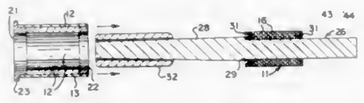
4,918,802

METHOD AND APPARATUS FOR MAKING PERMANENT MAGNET ROTORS

Edward J. Schaefer, Bluffton, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.

Filed Feb. 6, 1989, Ser. No. 306,687
Int. Cl.[5] H02K *15/02*
U.S. Cl. 29—598 18 Claims



1. A method of manufacturing a rotor, comprising the steps of:

(a) positioning a plurality of permanent magnet segments at angularly spaced locations within the interior or a thin-walled metal cylinder, the interior surfaces of said segments forming an interior opening;

(b) moving an expanding means into said interior opening formed by said segments;

(c) moving said expanding means to displace said segments outwardly against said cylinder and elastically stretch said cylinder; and

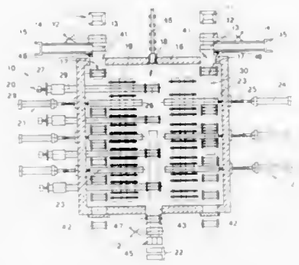
(d) replacing said expanding means with support means for holding said segments in said outwardly displaced positions.

4,918,803

PLANT FOR ROLLING LONG PRODUCTS FROM BILLETS AND BLOOMS COMING FROM A PLURALITY OF CONTINUOUS CASTING LINES

Bruno DiGiusto, Udine, Italy, assignor to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

Filed Jul. 18, 1988, Ser. No. 220,684
Claims priority, application Italy, Aug. 5, 1987, 83428 A/87
Int. Cl.[5] B21B *1/26, 1/46, 13/22;* B22D *11/12*
U.S. Cl. 29—33 C 12 Claims



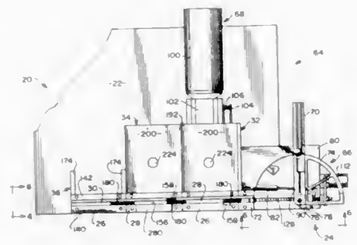
1. A plant for rolling long products from billets and blooms coming from at least two continuous casting lines, each said at least two continuous casting lines including a shears, said plant comprising a temperature-equalizing furnace disposed downstream of the shears and comprising an inlet in the temperature-equalizing furnace downstream of each said at least two continuous casting lines, an intake roller conveyor downstream of each said inlet, fixed supports defining a zone of equalization of the temperature of the billets and blooms, a discharge rollery conveyor disposed in an intermediate position in said temperature-equalizing furnace between said intake roller conveyors, said discharge roller conveyor including discharge rollers supported by a roller support device, said roller support device including means for transversely and vertically displacing said discharge rollers, internal traversing means for transferring the billets and blooms from said intake roller conveyors to said fixed supports and for moving the billets and blooms on said fixed supports to said discharge rollers of said discharge roller conveyor, and an outlet in the temperature-equalizing furnace downstream of said discharge roller conveyor.

4,918,804

MODULAR APPLICATION TOOLING FOR ELECTRICAL CONNECTORS

Eric P. Bleuel, Woodridge; Peter Ingwersen, Gilberts; Leonard J. Lickus, Plainfield; Thomas P. Pellegrino, Lisle; Hasmukh Shah, Wheaton, and Robert A. Suthard, Woodridge, all of Ill., assignors to Molex Incorporated

Filed Mar. 6, 1989, Ser. No. 320,021
Int. Cl.[5] H01R *43/00*
U.S. Cl. 29—33 M 19 Claims



1. Modular application tooling for electrical connectors each having a housing and electrical terminals, said tooling comprising:

a base unit including a connector feed drive system and a work station drive system;

at least one modular feed track unit including a track segment defining a feed track extending along a feed path in a feed direction;

said base unit including a connector delivery unit for delivering electrical connectors to said feed track;

at least one modular pusher unit including a body portion movable in said feed direction and including a pawl member supported by said body portion and receivable into said feed path for advancing electrical connectors along said feed path;

said connector feed drive system including means for selectively moving said pusher unit in said feed direction; and

at least one modular work station including a tooling component movable relative to said feed path;

said work station unit including a drive takeoff system connected between said work station drive system comprising a continuously operated work station drive motor and said tooling component for selectively operating said tooling component.

4,918,805

WELDING METHOD FOR CYLINDER HEAD REPAIR

Kenneth J. Liszka, Downers Grove; Daniel J. Dobruse, Oak Park, both of Ill.; Steve E. Potopa, Phillips, Wis.; Charles E. Gammill, Greenville, and Jerry D. Gammill, Leland, both of Miss., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 22, 1988, Ser. No. 288,521
Int. Cl.[5] B23P *15/00*
U.S. Cl. 29—888.06 5 Claims

1. A method for repair and rebuilding of pot-type cast iron cylinder heads for diesel engines, said method including the steps of:

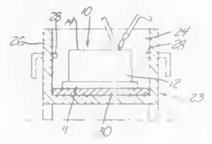
determining the locations of any cracks and rejecting any heads unsuitable for repair

placing each non-rejected head in an individual insulated oven having an insulated lid;

preheating the head in the oven to a suitable temperature for welding;

if required, building up the entire fireface with weld metal applied by gas welding;

gas welding any cracks in the head while maintaining the preheat temperature and protecting the valve seats and injector well from contact with molton weld metal; and



after welding, encapsulating the head in the oven with the lid in place and allowing to cool;

wherein the improvements comprise;

establishing said suitable preheating temperature at a minimum of about 1800 degrees F. and attaining said suitable temperature over a time period of at least 40 minutes;

performing welding of the fireface and other repair areas with cast welding rod equivalent to AWS RC1-A specification; and

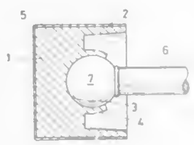
continuing the encapsulated oven cooling step for a time sufficient to remove residual stresses.

4,918,806

METHOD FOR MANUFACTURING A PISTON

Ryuji Watanabe, Oizumi; Motohiko Kosano, Isezaki, and Hirokazu Kawakami, Ota, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Feb. 14, 1989, Ser. No. 310,790
Claims priority, application Japan, Feb. 18, 1988, 63-35674
Int. Cl.[5] B23P *15/10*
U.S. Cl. 148—16.5 9 Claims



1. A method of manufacturing a piston comprising the steps of:

forming a generally cylindrical metal piston with a main body having an outer first diameter and with a skirt wall extending from the main piston body with the skirt wall outer diameter tapering inwardly towards its free end to have a diameter less than said first diameter, and

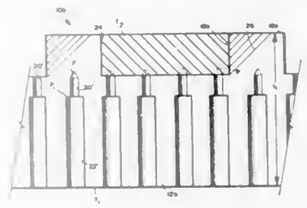
heat treating the piston to cause the skirt wall to expand outwardly to assume substantially said first diameter.

4,918,807

SCREEN AND METHOD OF MANUFACTURE

Frey A. Frejborg, Glens Falls, N.Y., assignor to A. Ahlstrom Corporation, Karhula, Finland

Filed Oct. 19, 1988, Ser. No. 259,816
Int. Cl.[5] B23P *15/16*
U.S. Cl. 29—163.8 16 Claims



1. A method of manufacturing a metal screen generally flat plate having first and second opposite faces, comprising the steps of:

(a) drilling first holes having a first diameter through said first face and into the body of the metal screen plate a predetermined distance to terminate within the plate body at a position P short of said second face;

(b) drilling second holes of a second diameter, larger than the first diameter, through said first face, generally concentric with said first holes; and

(c) machining the second face to remove metal material along the majority of the surface thereof to a depth to expose the position P so that the first holes extend entirely through the plate body, and leave the plurality of parallel, substantially continuous ridges in said second face spaced one from the other defining slots therealong after machining is completed.

9. A method of manufacturing a metal screen generally flat plate having first and second opposite faces, comprising the steps of:

(a) forming first openings through said first face and into the body of the screen plate a predetermined distance to terminate within the plate body short of said second face;

(b) forming second openings through the first face larger than the first openings, and generally concentric therewith; and

(c) removing material from said second face in longitudinally extending generally parallel rows thereof along the majority of the surface thereof to a depth at least equal to the depth of the plate less said predetermined distance to form a plurality of grooves in said second face so that the openings extend entirely through the plate body and open into said grooves, but leave a plurality of continuous ridges in said second face spaced one from the other on opposite sides of said grooves after material removal is completed.

4,918,808

DEVICE FOR REMOTELY LINING A STEAM GENERATOR TUBE OF A PRESSURIZED WATER NUCLEAR REACTOR

Jean P. Cartry, and Bruno Fraissenet, both of Lyons, France, assignors to Framatome, Courbevoie, France

Division of Ser. No. 44,254, Apr. 30, 1987, Pat. No. 4,793,044.
This application Nov. 22, 1988, Ser. No. 274,893
Claims priority, application France, Apr. 30, 1986, 86 06342
Int. Cl.[5] B23P *15/26*
U.S. Cl. 29—727 8 Claims

1. Device for remotely lining a steam generator tube of a pressurized water nuclear reactor, the tube (8) having two ends crimped into a tube plate (2) having a thickness, brelow said tube plate said steam generator forming a water box (3) accessi-

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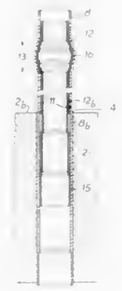
ble from outside through a manhold (**9**), by insertion of a liner (**12**) into said tube (**8**) through one of its ends, diametral expansion of said liner (**12**) in at least two expansion regions situated in the vicinity of its ends, one of said regions being within the thickness of said tube plate (**2**) and the other beyond said tube plate (**2**), and crimping by roller-expanding of said liner (**12**) in each of said regions, said device comprising

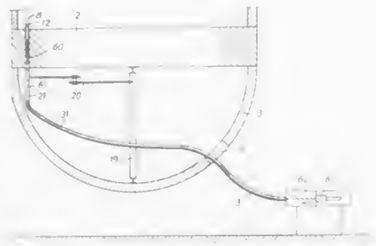
(a) a manipulating means (**19**) equipped with an arm (**20**) whose end is vertically alignable with any one of the tubes (**8**) of said steam generator, under said tube plate (**2**);

(b) a tubular guiding member (**21**) attached to the end of said arm (**20**) in a direction at right-angles to said tube plate (**2**);

(c) a flexible tube (**31**) attached at one of its ends to said tubular guiding member (**21**) passing through said manhole and having its other end outside said water box;

(d) a loading and manipulating assembly (**22, 23, 24**) adapted to be connected to an end of the flexible tube (**31**) which is external to said water box for introducing and moving a liner (12), inside said flexible tube (**31**);





(e) a hydraulic expander (**34**) which is placed inside said liner (**12**) and attached, in order to be moved, to the end of a flexible tubular member (**30**) which is connected to means for supplying a pressurized hydraulic fluid to said expander (**34**); and

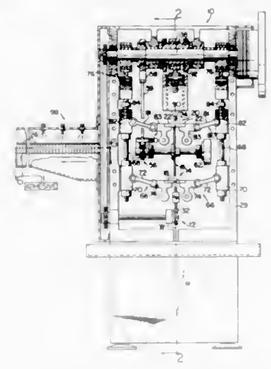
(f) a manipulating and roller-expanding assembly (**60, 61, 62**) comprising a roller-expanding appliance (**60**), a tubular flexible member (**61**) and a manipulating device (**62**), said roller-expanding appliance being connected to an end of said flexible tubular member, and said manipulating device being arranged outside said water box and associated to said flexible member so that said flexible member (**61**) and said roller-expanding appliance (**60**) can move in said flexible tubing (**31**), said roller-expanding appliance (**60**) being further connected to driving means (**67, 74, 75**) by flexible member (**76**) passing through said flexible tubular member (**61**).

4,918,809

NAIL MAKING MACHINE

Wilhelm A. Steinhilber, 124 White Birch Dr., Guilford, Conn. 06437

Filed Dec. 18, 1987, Ser. No. 134,944
Int. Cl.[5] B21G *3/20*
U.S. Cl. 29—792 29 Claims



1. A nail making machine comprising a first workstation, wire feeding means for delivering an axially elongated wire having a free end to said first workstation, wire pointing and cutting means at said first workstation for forming a pointed nail blank from the wire and severing the pointed nail blank from the wire, a second workstation having a second station axis, nail blank conveying means for moving a nail blank from said first workstation to said second workstation and supporting the nail blank at said second workstation with a free end portion of the nail blank in a head forming position wherein the axis of the nail blank is coaxially aligned with said second station axis, heading means for delivering a head forming blow to the free end portion of a pointed nail blank supported in said forming position at said second workstation and including a ram supported for movement toward and into head forming engagement with the free end portion of a nail blank supported in said forming position and away from said second workstation, and gripping means for applying holding force to a pointed nail blank such as aforesaid to hold the nail blank in said forming position and increasing the holding force applied to the nail blank in response to movement of the ram into head forming engagement with the free end and including a pair of holding jaws disposed at laterally opposite sides of said second station axis, means for supporting said jaws for pivotal movement in opposite directions about laterally spaced apart pivot axes located at opposite sides of said second station axis and along a line normal to said second station axis and spaced from said jaws in a direction away from said ram along said second station axis, and means for pivoting said supporting means between a closed position wherein said jaws engage and hold a pointed nail blank such as aforesaid in said forming position and an open position wherein said jaws are out of holding engagement with a pointed nail blank.

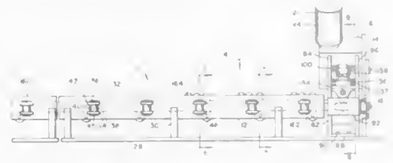
4,918,810

STRUCTURE FOR SECURING COMPOSITE MEMBERS TOGETHER

Richard N. Anderson, 9885 Melba La., Whitesville, Ky. 42378

Filed Oct. 3, 1980, Ser. No. 193,816
Int. Cl.[5] B23P *19/00*
U.S. Cl. 29—798 22 Claims

1. Structure for securing an elongated wood member having longitudinally extending spaced apart recesses in one side thereof to an elongated metal member having at least one substantially flat side with transversely spaced apart longitudinally extending flanges extending outwardly therefrom to form a generally U-shaped configuration with the flat side comprising means for guiding the wood member together with the metal member in movement toward means for deforming a portion of one of the flanges of the metal member into the wood member with the flanges of the metal member extending within the recesses in the wood member in an exact finished relation of the wood member with the metal member and deforming means positioned adjacent the wood member and



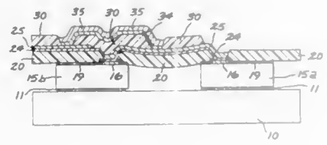
metal member and operably associated therewith with the flanges of the metal member extending within the recesses in the wood member in an exact finished relation of the wood member with the metal member for deforming the one flange of the metal member toward the other flange of the metal member into the wood member at the side of one of the recesses in the wood member which the one flange extends within which side is closest the other flange of the metal member to lock the wood and metal members together into a composite member as the wood and metal members are passed through the deforming means.

4,918,811

MULTICHIP INTEGRATED CIRCUIT PACKAGING METHOD

Charles W. Eichelberger, Schenectady, and Robert J. Wojnarowski, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 215,187, Jul. 5, 1988, abandoned.
Division of Ser. No. 912,456, Sep. 26, 1986, Pat. No. 4,783,695.
This application Aug. 8, 1989, Ser. No. 391,398
Int. Cl.[5] H05K *3/34*
U.S. Cl. 29—840 5 Claims



1. A method for packaging integrated circuit chips, said method comprising the steps of

disposing a plurality of integrated chips on a substrate, said chips including interconnection pads;

applying a polymer film layer over said chips and said substrate so that said film bridges said chips in a manner to leave vacant space between said film and said substrate;

providing a plurality of via openings in said polymer film, said openings being disposed over at least some of said interconnecting pads; and

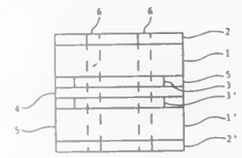
providing a pattern of electrical conductors on said film so said conductors extend between said via openings so as to electrically connect selected interconnection pads.

4,918,812

PROCESSING OF CORES FOR CIRCUIT BOARDS OR CARDS

Robert E. Ruane, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1988, Ser. No. 213,944
Int. Cl.[5] H05K *3/10*
U.S. Cl. 29—846 7 Claims



1. A method for processing cores for circuit boards or cards which comprises:

(a) providing two coresx, each being a dielectric material having conductive planes on both major surfaces thereof;

(b) providing said two cores with internal conductive planes and external conductive planes wherein the internal conductive planes are smaller than the external conductive planes, but larger than the desired dimensions of the final core;

(c) temporarily fixing together said two cores by placing between the internal conductive planes an adhesive sheet of prepreg dielectric and subsequently sealing the peripheral face planes;

(d) simultaneously processing the two external conductive planes to thereby form signal patterns; and

(e) removing said seal from the peripheral face planes and separating the cores from each other, thereby simultaneously providing said two cores, each having one signal plane and one uncircuitized plane.

4,918,813

METHOD OF SHAPING PLUG RECEPTACLE

Akio Mori; Kazuhiro Watanabe, and Shoichi Mochizuki, all of Goenba, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jul. 21, 1989, Ser. No. 382,949
Claims priority, application Japan, Aug. 23, 1988, 63-207396
Int. Cl.[5] H01R *43/16*
U.S. Cl. 29—874 6 Claims

1. A method of shaping a receptacle, comprising the steps of:

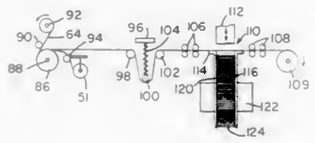
providing a connective plate (**11**) at one end of a strip-like conductor (**1**), the connective plate having a first portion (**11***a*) disposed perpendicular to longitudinal edges (**7**) of said conductor and a second portion (**11***b*) disposed parallel to the longitudinal edges;

providing a stamped blank (**M**) having a resilient contact plate (3) extending from said second portion of said connective plate, and finger-shaped projections (**5, 5'**) extending respectively from opposite sides of said resilient contact plate through respective extensions (**4**);

bending said extensions in such a manner that flat surfaces of

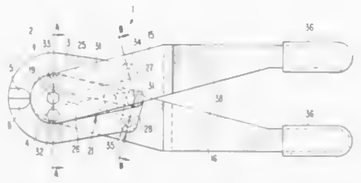
said finger-shaped projections are disposed perpendicular to flat surfaces of said resilient contact plate;
subsequently bending said first portion of said connective plate in such a manner that the flat surfaces of said resilient contact plate are disposed perpendicular to flat surfaces of said strip-like conductor; and
subsequently further bending the first portion of said connective plate such that the flat surfaces of the finger-shaped projections are perpendicular to the flat surfaces of said strip-like conductor.

4,918,814
PROCESS OF MAKING A LAYERED ELASTOMERIC CONNECTOR
John P. Redmond, 5213 Deerfield Ave., Mechanicsburg, Pa. 17055; Ray N. Shaak, 1303 King St., Lebanon, Pa. 17042, and Albert Shirk, 139 N. Locust St., Palmyra, Pa. 17078
Division of Ser. No. 898,857, Aug. 20, 1986, abandoned, which is a continuation of Ser. No. 683,987, Dec. 20, 1984, abandoned. This application Jan. 22, 1988, Ser. No. 146,879
Int. Cl.[5] H01R *13/48*
U.S. Cl. 29—878 12 Claims



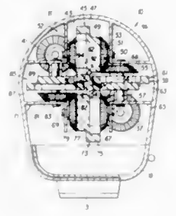
1. A method for producing a layered elastomeric connector for establishing electrical contact between at least two discrete electrically conductive surfaces, including the steps of:
a. selecting a plurality of electrically conductive fibrous mats and a plurality of sheets of a heat bondable electrically nonconductive elastomer of substantially equal size,
b. exposing the fibrous mats to a coupling agent to promote bonding prior to stacking and drying the mats prior to stacking,
c. alternately stacking the elastomer sheets and the fibrous mats to form an alternating stratified arrangement,
d. heating the stacked sheets and mats thereby bonding the fibrous mats and the elastomer into a unitary stratified structure.

4,918,815
MULTI-LINK CUTTING TOOL
Karel B. F. Juros, 705 Hillwood Dr., Statesboro, Ga. 30458
Filed Jan. 9, 1989, Ser. No. 294,450
Int. Cl.[5] B26B *17/00, 17/02, 17/04*
U.S. Cl. 30—191 13 Claims



1. A multi-link cutting tool comprising: a concentric-cutter head; a first and second handle, each of which is held in position and pivots about the center of the concentric cutter head; and a connecting linkage between each handle and the concentric cutter head comprising: a first link connecting the first handle and a pivot pin; a second link connecting the second handle and the pivot pin; a third link connecting the pivot pin and a first jaw member of the concentric cutter head; and a fourth link connecting the pivot pin and a second jaw member of the concentric cutter head.

4,918,816
PENCIL SHARPENER
Anthony J. Alpha, P.O. Box 844, Amelia, La. 70340
Filed Mar. 28, 1989, Ser. No. 329,547
Int. Cl.[5] B21D *39/00*
U.S. Cl. 30—452 10 Claims



1. An improved pencil sharpener having a sharpener mechanism comprising:
(a) an actuator shaft bearingly supported by support structure;
(b) force transmission means associated with said shaft for transmitting rotations of said shaft;
(c) a first pair of opposed cutters drivingly connected with said shaft via said force transmission means;
(d) a second pair of opposed cutters drivingly connected with said shaft via said force transmission means;
(e) each said cutter having a cutting surface extending completely circumferentially thereabout; and
(f) said cutters comprising cutting means configured for sharpening a pencil of elongated cross-section.

4,918,817
ARTICLE POSITIONING APPARATUS
Homer L. Eaton, 652 Neptune Ave., Leucadia, Calif. 92204
Continuation-in-part of Ser. No. 101,420, Sep. 28, 1987, abandoned. This application Jan. 5, 1989, Ser. No. 293,821
Int. Cl.[5] G01B *5/24*
U.S. Cl. 33—1 M 11 Claims

1. In apparatus for positioning an article at particular X, Y plot coordinates of a work surface, one or more positioners coupled to the article and responsive to control means operative to generate control signals corresponding to the X, Y plot coordinates, each positioner comprising:
a work platform adapted to be fixed relative to the work surface;
a mounting body pivotally carried by the work platform for rotation in an arc about an axis perpendicular to the work surface;

tape drive means carried by the mounting body and having a drive shaft rotatable in response to control signals from the control means;
a tape spool rotatably carried by the mounting body;
an elongated tape wound upon the tape spool, coupled to the tape drive means, and connected at one end to the article, the tape having tape indicia at predetermined intervals along its length, and further having sufficient stiffness to resist bending under compressive loads applied by the tape drive means whereby operation of the tape drive means in one direction pulls upon the tape, and in the opposite direction pushes upon the tape, thereby to pull or push the article over the work surface; and
tape movement sensor means fixed relative to the tape and cooperative with the tape indicia as the tape indicia moves past the tape movement sensor means to provide feedback signals to the control means corresponding to longitudinal movement of the tape relative to the mounting body

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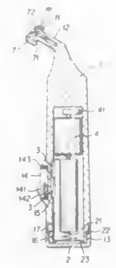
4,918.818
MULTI-PURPOSE MASSAGE SHAVER
Yin-Fei Hsieh, No. 10, Sublane 12, Lane 629, Neihu Road, Sec. 1, Taipei, Taiwan
Filed Sep. 22, 1988, Ser. No. 247,287
Int. Cl.[5] B26B *19/38*
U.S. Cl. 30—34.05 4 Claims



1. A multiple purpose masager and shaver device comprising:
an elongated housing having a generally cylindrical base and central portion and a generally conical upper portion, the base having an open lower end and said base and central portion being hollow;
end sealing means including a cap threadedly mounted on the open end of said base for releasably sealing said open end so that the hollow interior of said housing is waterproof when said cap is mounted on said base;
an electric motor mounted in the hollow central portion of said housing;
vibrator means including a block and an eccentric drive therefor coupled to said motor; battery means mounted in the hollow base of said housing; external switch means mounted on said housing and coupled between said battery means and said motor for selectively energizing said motor to drive said block in eccentric rotation to thereby cause said housing to vibrate;
mounting means including a laterally extending U-shaped track mounted on the upper end of said housing at substantially the apex of the conical end for receiving a shaver head or a massage head; and lock means carried by said track for releasably securing a head on said track.

4,918,819
ELECTRIC SHAVING APPARATUS
Haas Labrijn, Drachten, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.
Filed Sep. 26, 1988, Ser. No. 249,615
Claims priority, application Netherlands, Oct. 5, 1987, 8702363
Int. Cl.[5] B26B *19/38*
U.S. Cl. 30—43 7 Claims

1 An electric shaving apparatus comprising at least one drivable shaving member, a first housing section which accommodates the drive mechanism for the shaving member and a detachable second housing section which accommodates an electric power source; and a switching device which comprises an actuating member and a contact member, said switching device being arranged in an electric circuit which also includes the drive mechanism and the power source, wherein the actuating member is arranged on a wall of the first housing section and is detachably coupled to the contact member in the second housing section by mechanical means comprising a crank shaft having crank webs and a connecting rod, the crank shaft being rotatably supported in said wall of the first housing section, a crank web at the outer side being provided with a crank pin and the connecting rod being coupled to a crank web at the inner side of said wall.

4,918,820
FOLDABLE POCKET SAW
William B. Korb, Melrose, Conn., and Paul W. Koetsch, Springfield, Mass., assignors to American Saw & Mfg. Company, East Longmeadow, Mass.
Filed Jan. 27, 1989, Ser. No. 302,376
Int. Cl.[5] B26B *3/06*
U.S. Cl. 30—161 5 Claims

1 A foldable pocket saw comprising a handle, a discrete rotatable member including a plurality of circumferentially spaced, radially extending notches in the periphery thereof rotatably disposed on a mounting head which extends out-

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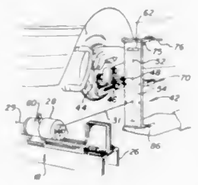
wardly of one end of the handle, a fastener for removably affixing a conventional saw blade onto said rotatable member, a spring actuated detent mechanism disposed within the handle and comprising a spring loaded pawl movable within the handle and in generally coplanar relationship with the rotatable member to engage selectively with one of the notches to prevent rotation of the rotatable member and thereby lock the saw blade in each of a plurality of positions relative to the handle.

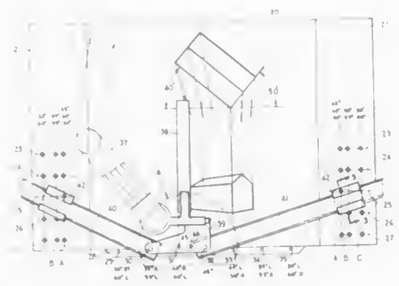
4,918,821
METHOD OF DETERMINING WHEEL ALIGNMENT
Bengt A. Bjork, Novato, Calif., assignor to Nicator AB, Sweden
Filed Jul. 15, 1988, Ser. No. 219,374
Int. Cl.[5] G01B *11/00, 11/26*
U.S. Cl. 33—203.18 17 Claims



1. A method of determining wheel alignment for the wheels of an automobile where a body of the automobile is clamped on a chassis straightening/measuring bench comprising the steps of:
determining a centerline and datum plane for the automobile;
calibrating a measuring system to the centerline and datum plane whereby a laser beam is projectable by the measuring system parallel to the centerline in the datum plane and wherein the projection of the laser beam is movable by the calibrated measuring system to selected positions in the datum plane and in a plane perpendicular to the datum plane;
lifting the front suspension of each front wheel hub relative to the bench until the associated wheel hub is at the normal ride height relative to the datum plane;
mounting a wheel alignment measuring unit having a plurality of association sales to each front wheel hub;
measuring the camber of each front wheel hub while the wheel hub is lifted by projecting the laser beam onto a predetermined camber scale of the measuring unit;
measuring the caster of each front wheel hub while the wheel hub is lifted by projecting the laser beam onto a predetermined caster scale of the measuring unit;
measuring the SAI/KPI of each front wheel hub while the wheel hub is lifted by projecting the laser beam onto a predetermined SA1/KPI scale of the measuring unit;
measuring the toe of each front wheel hub while the wheel hub is lifted by projecting the laser beam onto a predetermined toe scale of the measuring unit; and
measuring the TOOT of each front wheel hub while the wheel hubs are lifted by projecting the laser beam onto a predetermined TOOT scale of the measuring unit.

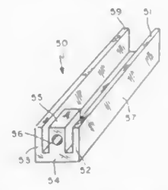
4,918,822
PERSPECTIVE DRAFTING APPARATUS
Semond Levitt, 1835 Lippincott Rd., Huntingdon Valley, Pa. 19006
Filed May 15, 1989, Ser. No. 351,790
Int. Cl.[5] B43L *13/14*
U.S. Cl. 33—432 11 Claims

1. For use with a drafting apparatus for developing accurate perspective views from plan views of objects, wherein the drafting apparatus is of the type including a normally rectangular drafting board having upper and lower edges and left and right side edges, and a drafting machine movably affixed to the drafting board, the drafting machine having a vertical scale and a pair of left and right straight edges extending laterally in opposite directions from the vertical scale, the improvement comprising,
(a) a pair of left and right vanishing point guides within which each of the left and right straight edges is respectively slidable,
(b) left and right vanishing point guides positioning means for coupling said left and right vanishing point guides to the drafting board respectively at the left and right marginal areas thereof for pivoting movement with respect to the latter in a plane parallel to the plane of the drafting board upper surface and about left and right axes orthogonal to said plane, said left and right vanishing point guides positioning means comprising first positioning means for respectively fixing said left and right pivoting movement



coupling axes of said vanishing point guides at at least one left and one right selectable point along at least a first line extending parallel to the lower edge of the drafting board, and
(c) first and second selectably coactable drafting machine vertical scale angular control means, said first vertical scale angular control means being fixedly positioned with respect to said vertical scale, and said second vertical scale angular control means including locating means for fixedly positioning said second angular control means at at least one point on a second line parallel to the lower edge of the drafting board, said vertical scale being fixed for pivoting movement in a plane parallel to the plane of the drafting board upper surface about an axis orthogonal to said plane when said first and second coactable angular control means are coactably associated.

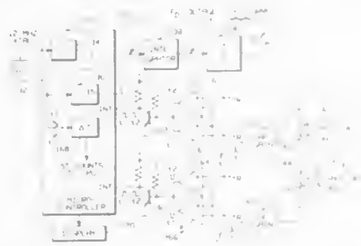
4,918,823
GUNSIGHT
Julio A. Santiago, 13713 Susan La., Burnsville, Minn. 55337
Continuation-in-part of Ser. No. 145,030, Jan. 19, 1988. This application Jul. 1, 1988, Ser. No. 214,726
Int. Cl.[5] F41G *1/00*
U.S. Cl. 33—241 6 Claims



1. A sighting device for mounting on the top of a weapon comprising:

a channel member having a first sidewall extending upward;
a second sidewall extending upward from said channel member;
a sight post located between said first sidewall and said second sidewall wherein said sight post has an illuminated area to provide an illuminated sight and wherein said first sidewall has an interior light reflecting surface to reflect the light from said illuminated sight back to the user if the sight is not correctly aimed at an object and said second sidewall has an interior light reflecting surface to reflect the light from said illuminated sight back to the user if the sight is not correctly aimed at an object.

4,918,824
ELECTRONIC DIGITAL COMPASS
James G. Farrar, Lighthouse Point, Fla., assignor to International Navigation, Inc., Opa-Locka, Fla.
Filed Oct. 5, 1988, Ser. No. 253,780
Int. Cl.[5] G01C *17/30*
U.S. Cl. 33—361 39 Claims



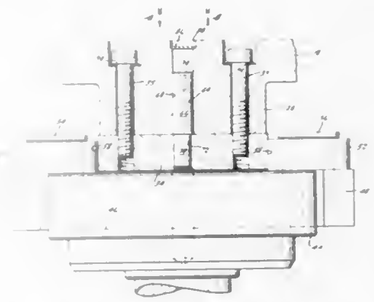
1. An apparatus for sensing a magnetic field, comprising in combination:
a magnetostrictive core which exhibits reentrant behavior;
driving means for inducing said reentrant behavior by exposing said core to a drive magnetic field; and
sensing means for sensing a change in magnetic flux in the form of a pulse occurring when said core exhibits said reentrant behavior as a result of exposure to said drive magnetic field and said magnetic field.

4,918,825
MICROMETER CARTRIDGE HEADSPACE GAUGE
Stephen S. Lesh, 28459 Siests La., Eugene, Oreg. 97402, and Herman J. Waske, 2602 Sorrel Way, Eugene, Oreg. 97401
Filed Jan. 23, 1989, Ser. No. 299,477
Int. Cl.[5] G01B *5/00*
U.S. Cl. 33—506 3 Claims

1. A firearm cartridge headspace gauge comprising;
a hollow gauge barrel having a central axis,
said barrel formed internally to conform precisely to the external physical dimensions of a given firearm cartridge caliber and type,
a barrel head sharing said central axis, said barrel head contains an internally threaded portion formed to precisely match and secure to an externally threaded portion of said gauge barrel,
said barrel and said barrel head contain external means indicating headspace of a cartridge contained therein, said external indicating means comprises a vernier scale in the

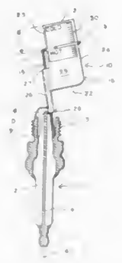
manner of a micrometer scale disposed about the periphery of said barrel and said barrel head.

4,918,826
INDEX TABLE AND METHOD OF ALIGNMENT
Bruce L. Moore, Farmington Hills, and Graham D. Cottam, Novi, both of Mich., assignors to H. R. Krueger Machine Tool Inc., Farmington, Mich.
Filed Aug. 30, 1988, Ser. No. 238,324
Int. Cl.[5] G01B *5/25*
U.S. Cl. 33—645 3 Claims



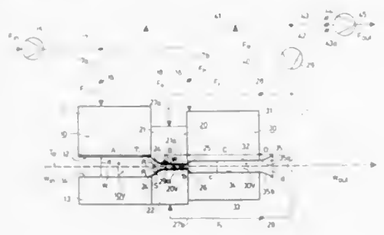
1 A method of accurately aligning a fully assembled powered index table mounted on a base and having a predetermined number of stations about the periphery thereof, a drive means, a lock means for each station and an eccentric pin for locating each lock means relative to the table, the method comprising the steps of:
(a) measuring the linear deviation of each station from the desired precise location thereof;
(b) fabricating a new eccentric pin for each station having an eccentricity chosen to eliminate said deviation at said station; and
(c) for each deviant station loosening said lock means, replacing the original eccentric pin with said new eccentric pin and retightening said lock means, without disassembling said table from said base.

4,918,827
DEVICE FOR DETERMING THE OPERATING TEMPERATURE RANGE OF A SPARK PLUG
John H. Orsos, Manuel Gonzales de la Rosa #473,, Lima 17, Peru
Filed Oct. 26, 1988, Ser. No. 262,689
Int. Cl.[5] G01B *5/02, 5/18*
U.S. Cl. 33—836 4 Claims



1. A device for measuring the length of the conical surface of the ceramic insulator centered within the threaded sleeve of a spark plug, said device comprising:
(a) an elongated probe rod having upper and lower extremities,
(b) indicator means movably associated with said probe rod,
(c) a holder having retainer means which accommodates said probe rod in a manner to permit sliding movement of the probe rod in the direction of its axis, said retainer means having upper and lower extremities from which said probe rod protrudes, said lower extremity being configured as a narrow abutment tip,
(d) scale means adapted to interact with said indicator means,
(e) control means associated with the upper extremity of said probe rod, and
(f) a bent portion adjacent the upper extremity of said probe rod, said bent portion functioning as both control means and indicator means.

4,918,828
METHOD AND APPARATUS FOR DRYING A MOVING WEB
Reijo Ruottu; Raimo Rajala, both of Kaarina; Ilkka Jokioinen, and Sture Ahlskog, both of Lieto, all of Finland, assignors to Valmet Paper Machinery Inc., Finland
Filed Oct. 21, 1988, Ser. No. 261,161
Claims priority, application Finland, Nov. 2, 1987, 874805
Int. Cl.[5] F26B *3/28*
U.S. Cl. 34—4 20 Claims

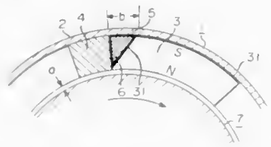


18. A method for drying a moving web comprising the steps of:
passing the web through a first infrared treatment gap of a first infrared dryer unit; and then
passing the web through a gas-support gap of a gas-support unit into which web-supporting gas blowings are directed on both sides of the web, said gas-support gap having a width less than the width of said first infrared treatment gap; and then
passing the web through a second infrared treatment gap of a second infrared dryer unit, said second infrared treatment gap having a width less than the width of said first infrared treatment gap and greater than said width of said gas-support gap of said gas-support unit.

4,918,829
FLUIDIZED BED FLIGHT APPARATUS
Gerald E. Harris, Haddonfield, N.J., assignor to Campbell Soup Corporation, Camden, N.J.
Filed Mar. 31, 1988, Ser. No. 176,233
Int. Cl.[5] F26B *17/18*
U.S. Cl. 34—10 16 Claims

15. In a method of fluidizing particles in an indexing fluidized bed apparatus by introducing fluidizing medium into a confining vessel through a bottom through which fluidizing medium is introducible and distributible in an indexing fluidized bed apparatus to fluidize particles which are urged through the fluidizing medium by a flight, the improvement comprising preventing particles from escaping under the flight by imparting a horizontal velocity component to the fluidizing medium near the flight adjacent the bottom after the medium has been introduced into the vessel.

4,918,830
METHOD OF PREPARING A PERMANENT MAGNET DC MACHINE
Hiroaki Aso, Mitsubishi Denki Kabushiki Kaisha Himeji Seisakusho, 840, Chiyoda-cho, Himeji-shi, Hyogo-ken, Japan
Filed Mar. 21, 1989, Ser. No. 326,648
Claims priority, application Japan, Apr. 12, 1988, 63-89430
Int. Cl.[5] H02K *15/02*
U.S. Cl. 29—596 11 Claims



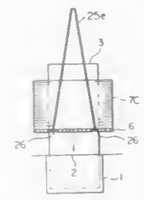
1. A method of preparing a permanent magnet DC machine which comprises:
attaching by welding auxiliary magnetic poles having higher reversible permeability than that of main magnetic poles constituted by anisotropic permanent magnets which are

to be attached to the inner circumferential surface of a yoke;
joining a non-magnetic substance having a triangular shape in cross section to a side surface of each of said auxiliary magnetic poles and the inner circumferential surface of said yoke so as to form a leakage magnetic path breaking section at the radially outer part of each of said non-magnetic substances, the length of said leakage magnetic path breaking section being greater than the air gap formed between a rotor and a stator;
positioning said main magnetic poles of anistropic permanent magnets with respect to the other side surface of each of said non-magnetic substances and the inner circumferential surface of said yoke, and
fixing by an adhesive agent said main magnetic poles on the inner circumferential surface so as to adjoin said auxiliary magnetic poles through said non-magnetic substances.

4,918,831
METHOD OF FABRICATING COMPOSITE ROTOR LAMINATIONS FOR USE IN RELUCTANCE, HOMOPOLAR AND PERMANENT MAGNET MACHINES
Gerald B. Kliman, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Division of Ser. No. 138,404, Dec. 28, 1987. This application Oct. 20, 1989, Ser. No. 424,438
Int. Cl.[5] H02K *15/02*
U.S. Cl. 29—598 5 Claims

1. A method for constructing a disk lamination for the rotor of a homopolar or switched reluctance magnetic machine comprising:
(a) providing a magnetic portion of a disk lamination having an interior core portion of uniform thickness and a plurality of pole pieces extending generally outward therefrom along respective radial lines so as to define an outer circumferential disk edge and form an interpole space, respectively, between each adjacent pair of said pole pieces, respectively;
(b) inserting the magnetic portion in a jig, the jig comprising a plurality of tables corresponding geometrically in location and configuration to the plurality of interpole spaces;
(c) positioning the magnetic portion such that the pole pieces are positioned between the plurality of tables;
(d) guiding a non-magnetic segment, respectively, into each interpole space, respectively, by sliding said segment along the top of the table until angularly opposed edges of the non-magnetic segment abut respective adjacent edges of the pole pieces adjacent thereto; and
(e) bonding the edges of the pole pieces to the abutting edges of the non-magnetic segments.

4,918,832
LAMINATED IRON CORE ASSEMBLING PROCESS
Osamu Tokumasu; Yoshihiro Kuzuha; Hirosi Suzuki, and Bunichiro Awata, all of Ako, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Feb. 24, 1989, Ser. No. 315,264
Claims priority, application Japan, Feb. 24, 1988, 63-39352
Int. Cl.[5] H01F *41/02*
U.S. Cl. 29—606 10 Claims



1. A process for assembling a laminated iron core on a support structure about an electrical coil from a plurality of lamination sections to form a shell-type transformer core comprising the steps of:
stacking a plurality of lamination sections on a support structure in a staggered relationship to form a first core section which has joint ends to form overlapping joints between an adjacent core section;
conveying said first core section onto said support structure at which a laminated iron core is to be assembled; and
assembling the plurality of lamination sections on site into a second core section which connects said joints ends of said first core section to define a magnetic circuit around said coil;
wherein said step of stacking said first core section comprises preparing a first support member, placing a slider sheet of a low coefficient of friction on said first support member, and stacking said lamination sections on said slider sheet; and
said conveying step comprises sliding and placing said first core section together with said slider sheet onto said support structure.

4,918,833
METHOD OF ASSEMBLING AN ELECTRONIC TRANSDUCER
John J. Allard, Morrison; Merle L. Kemp, Prophetstown, and Alan J. Janicek, Morrison, all of Ill., assignors to General Electric Company, Fort Wayne, Ind.
Filed Apr. 8, 1988, Ser. No. 179,202
Int. Cl.[5] G01L *7/08, 9/04*
U.S. Cl. 29—621.1 25 Claims

1. A method of assembling an electronic transducer having a collar with a flange thereon, a strain gauge having a flexible dielectric carrier, a dielectric casing member including at least one recess therein, and a set of terminals mounted to the dielectric casing member with each terminal having a supporting section within the at least one recess and an electrical connector section exteriorly thereof, a metallic casing member including at least one end face, a recess means for subjection to fluid pressure and defining with the at least one end face a flexible diaphragm therebetween adapted to be deflected upon the subjection of the recess means to fluid pressure, an electronic device having a plurality of solid state components associated in circuit relation, a set of electrical connector clips, and a set of contact blades, the method comprising the steps of:
adhering the carrier of the strain gauge to the at least one end face of the metallic casing member so that the strain gauge spans at least in part across the diaphragm so as to be conjointly flexible therewith;

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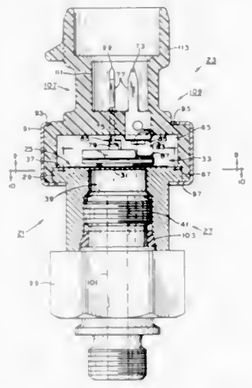
securing the electrical connector clips in preselected locations on the electronic device in circuit relation therewith;
connecting at least some of the electrical connector clips in circuit relation to the strain gauge;
disposing the electronic device in spaced apart relation adjacent the carrier with the solid state components being remote from the carrier during the connecting step;
mounting the contact blades to the supporting sections of the terminals with the contact blades extending in preselected locations from the supporting sections, respectively;
associating the dielectric casing member and the metallic casing member in a preselected assembly position with respect to each other so as to enclose the strain gauge, the electronic device, the contact blades, the electrical connector clips and the supporting sections of the terminals within the recess means of the dielectric component;



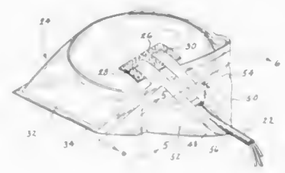
arranging the contact blades in circuit relation with respective ones of the electrical connector clips connected in circuit relation with at least the electronic device during the associating step;
placing the collar in part about the metallic casing member and the dielectric casing member with the flange on the collar being engaged with one of the dielectric casing member and the metallic casing member when the metallic casing member and the dielectric casing member are in the preselected assembly position thereof; and
deforming a part of the collar into displacement preventing engagement with the other of the dielectric casing member and the metallic casing member thereby to return the metallic and dielectric casing members in the preselected assembly position thereof.

4,918,834
ENVELOPE FOR PROTECTING DISASSEMBLED STATOR COIL

Daniel Klawitter, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jan. 17, 1989, Ser. No. 297,990
Int. Cl.[5] B23P *19/04*; B65D *33/16*
U.S. Cl. 29—722 12 Claims

1. A repair aid for a two-cycle internal combustion engine having a crankshaft extending through a crankcase and through an alternator stator coil, said stator coil having electrical wires connected to said engine, said stator coil being removed from said crankshaft during repair to said engine and being subject to damage and abrasion during movement of said engine during repair while said stator coil dangles from said engine by said wires and is subject to striking miscellaneous objects in the immediate vicinity, said repair aid comprising a protective envelope enveloping said stator coil and having an opening therein through which said electrical wires pass such that said stator coil remains connected to said engine by said wires during said repair, wherein said protective envelope comprises a first portion enabling insertion of said stator coil with said wires attached and extending outwardly therefrom, and a second portion movable to close said first portion with said wires still extending outwardly therefrom to permit said stator coil to remain attached to said engine by said wires, and protect and envelope said stator coil during repair of said

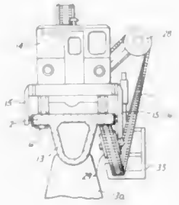


engine without requiring removal of said wires from said engine, wherein said first portion of said envelope is a pocket, and said second portion of said envelope is a flap extending from said pocket and folded back onto said pocket with said stator coil therein and leaving an opening through which said wires extend, wherein said flap is folded along a pair of fold lines forming first and second folded flap portions defining a slit therebetween through which said wires extend, wherein said fold lines are on a single said flap in a single plane.

4,918,835
APPARATUS FOR COMPLETING A LINEAR MOTOR STATOR

Manfred Weisio; Hans G. Raschbichler; Luitpold Miller, all of Ottobrunn, and Otto Breitenbach, Nuremburg, all of Fed. Rep. of Germany, assignors to Kabelmetal Electro GmbH, Hanover and Thyssen Industrie AG, Essen, both of, Fed. Rep. of Germany

Division of Ser. No. 268,232, Nov. 7, 1988, Pat. No. 4,860,030. This application May 23, 1989, Ser. No. 356,760
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 3737719
Int. Cl.[5] H02K *15/085*
U.S. Cl. 29—732 5 Claims



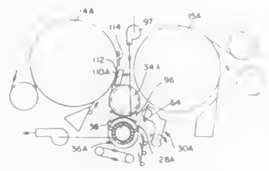
1. Apparatus for providing a multiphase winding into the grooves of a stator of a linear motor, the stator being mounted with open grooves facing down, on the underside of a support and carrier plate being carried in an elevated position, comprising in combination,
a plurality of individually reelable stores provided for individual payout of cable from respective ones of said stores;
means for meander shaping the individual cables;
a conveyor belt means provided on the vehicles for moving individual and spaced apart holding elements towards a particular area;
mains in said particular area of the vehicle for placing the holding elements as provided by the conveyor belt onto

portions of the meandering cables as arriving in the particular area;
means on the vehicle for connecting said holding elements together thereby forming a winding package; and
an outrigger boom for receiving said winding package as assembled and placing it within reach of a tool by means of which the portions of the cable holding said holding elements are forced into stator grooves.

4,918,836
TAIL CUTTER APPARATUS AND METHOD

Gregory L. Wedel, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Continuation-in-part of Ser. No. 14,569, Feb. 13, 1987. This application Aug. 23, 1988, Ser. No. 235,394
Int. Cl.[5] F26B *5/00*
U.S. Cl. 34—23 23 Claims



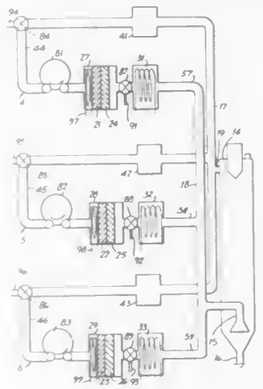
23. A method for cutting a tail from a web extending through a single tier section, said method comprising the steps of:
guiding the web and felt extending contiguously with the web around a dryer of the dryer section such that the web is disposed between a felt and the dryer for drying the web;
guiding the felt around a felt roll disposed downstream relative to the dryer;
guiding the web from the felt roll to and around a guide roll disposed downstream relative to the felt roll;
guiding the web back towards the felt roll such that a first and second open draw of the web are defined between the felt roll and the guide roll.
pivoting a cutting device into operative cutting cooperation with the web for cutting the tail from the web during movement of the web through one of the open draws; and
guiding the web and felt contiguously from the felt roll to and around a further dryer disposed downstream relative to the dryer.

4,918,837
DEVICE FOR GENERATING A CONTINUOUS STREAM OF DRIED GASES

Roderich W. Gräff, Engerländer Str. 2 - 4, 6108 Weiterstadt 2, Fed. Rep. of Germany

Filed Feb. 15, 1985, Ser. No. 703,213
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1984, 3405260
Int. Cl.[5] F26B *21/06*
U.S. Cl. 34—80 6 Claims

1. A device for the generation of a continuous stream of dried gas, preferably air, comprising a drying hopper containing a material to be dried; a plurality of containers containing adsorption means therein; a plurality of conduits connected to said drying hopper and being at times switchable-off, and a plurality of blowers; said blowers, said conduits and said containers being combined into a number of groups of equal size and including one of said blowers, one of said conduits and one of said conduits, said groups being interchangeable with each other and removable from the device and connectable immediately to said drying hopper via a respective conduit, each container in each of said groups being immediately coupled to an assigned blower, and wherein the adsorption means of each

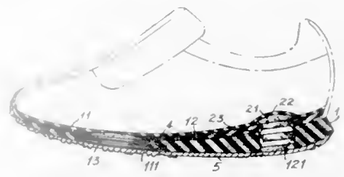


container is intermittently passed through by a heated-up regeneration gas.

4,918,838
SHOE SOLE HAVING COMPRESSIBLE SHOCK ABSORBERS

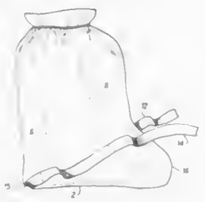
David J. H. Chang, Taichung, Taiwan, assignor to Far East Athletics Ltd., Taipei, Taiwan

Filed Aug. 5, 1988, Ser. No. 228,458
Int. Cl.[5] A43B *13/20, 21/26*
U.S. Cl. 36—28 12 Claims



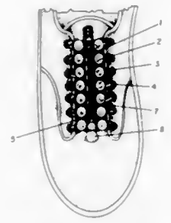
1. A shoe sole unit with compressible shock absorbers comprising:
shock absorbers which comprise a replaceable generally cylindrically-shaped air cylinder installed at the heel, and a replaceable polygonal-shaped air bellows at the forefoot portion respectively;
a sole unit which provides on the forefoot and the heel portion a suitable recess for receiving each of said replaceable shock absorbers; and
a removable innersole pad disposed above said sole unit and said replaceable shock absorbers thereby obtaining a shock absorbing shoe sole unit with that also provides energy return, and motion control.

4,918,839
SANITARY SHOE COVER
Bobby C. Brandon, Columbus, Miss., assignor to Teknamed Corporation, Columbus, Miss.
Filed Nov. 22, 1988, Ser. No. 274,487
Int. Cl.[5] A43B 3/16
U.S. Cl. 36—7.1 R 5 Claims



1. A shoe cover, comprising:
a pair of substantially flat sheets of material secured together along peripheral edges thereof and forming a substantially straight edged bottom portion, a deformable heel portion, a toe portion, an instep portion and having an opening formed at an upper portion of the flat sheets;
at least one securing strip means secured to said heel portion and securable around said instep portion for selectively adjusting a length dimension of said bottom portion and for securing said flat sheets of material to a shoe wherein said heel portion comprises a rear corner portion of said flat sheets of material.

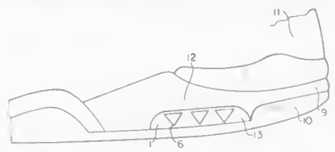
4,918,840
FOOTWEAR FASTENER
Elisa Nardulli, 4828 Denney Ave., North Hollywood, Calif. 91601
Filed Jan. 26, 1989, Ser. No. 301,847
Int. Cl.[5] A43B 11/00, 11/12
U.S. Cl. 36—50 1 Claim



1. Apparatus for tightening shoes, which comprises:
a. a zipper;
b. buttons, sewn to the top surface of the zipper; and
c. elastic loops, sewn to the zipper, which loop through the existing eyelets of a shoe and loop around the buttons.

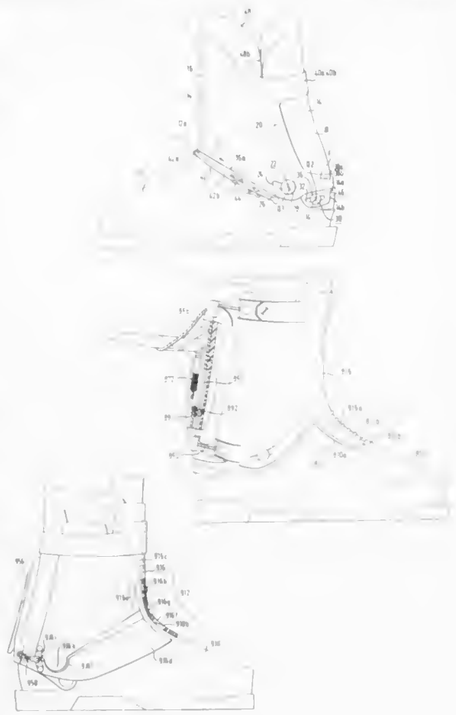
4,918,841
ATHLETIC SHOE WITH IMPROVED MIDSOLE
Jerome P. Turner, 25742 Buckles Bucklestone Ct., Laguna Hills, Calif. 92653, and John W. Thomas, 36 Christamon W., Irvine, Calif. 92714
Filed Jan. 30, 1989, Ser. No. 303,945
Int. Cl.[5] A43B 13/14, 13/18, 13/04
U.S. Cl. 36—114 7 Claims

1. An athletic shoe comprising an upper shoe connected to a multilayer sole, said multilayer sole comprising in combination:
(a) an inner sole;
(b) an outer sole;
(c) a midsole intermediate between said inner and outer sole, said midsole having a cavity which is provided with a resilient member said resilient member comprising a first module having one or more parallel grooves which in cross-section have a triangular profile and a second module having one or more parallel raised strips which in cross-section have a



triangular profile, said second module being joined to said first module by insertion of the raised strips of said second module into the grooves of said first module, and said joined first and second modules being located in said cavity of said midsole.

4,918,842
SKI BOOT
Josef Lederer, Jetzendorf, Fed. Rep. of Germany, assignor to Salomon S.A., Annecy Cedex, France
Continuation of Ser. No. 53,827, May 26, 1987, Pat. No. 4,759,137, which is a continuation of Ser. No. 926,100, Nov. 3, 1986, abandoned, which is a continuation of Ser. No. 815,177, Dec. 20, 1985, abandoned, which is a continuation of Ser. No. 561,635, Dec. 15, 1983, abandoned. This application Apr. 20, 1988, Ser. No. 184,014
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247516
The portion of the term of this patent subsequent to Feb. 25, 2003, has been disclaimed.
Int. Cl.[5] A43B 5/04
U.S. Cl. 36—117 19 Claims



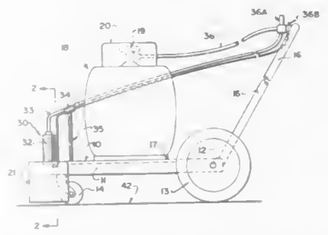
1. A ski boot comprising:

(a) a toe-and-heel-portion having a sole portion and instep portion;
(b) an anklet front portion and an anklet rear portion; each of said two anklet portions being pivotally mounted on said toe-and-heel-portion, whereby said anklet portions are pivotally movable between an open position, which allows a person's foot to be inserted into the boot, and a closed position, in which said anklet portions may be brought together to close about a person's ankle;
(c) an upper closing device positioned on an upper portion of at least one of said two anklet portions; and
(d) a lower tightening means positioned on a lower portion of at least one of said two anklet portions for applying a force against a person's foot located within said boot;
wherein said lower tightening means and said upper closing device comprise means that extend substantially horizontally across a back portion of said rear anklet portion.

4,918,843
GROUND ENGAGING TOOL
Martin V. Kiesewetter, Morton, and William J. Renski, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed Feb. 21, 1989, Ser. No. 313,278
Int. Cl.[5] E02F 9/28
U.S. Cl. 37—142 A 6 Claims

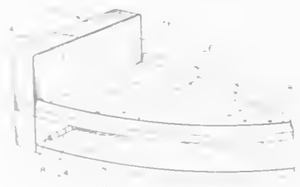
1. A ground engaging tool having an adapter nose, a ground engaging tip mounted on the adapter nose, and a tip retainer mechanism for retaining the tip on the adapter nose, said adapter nose defining a transverse bore extending between first and second sides thereof, said tip defining a cavity operative to mate with the adapter nose and a pair of laterally spaced holes in first and second sidewalls thereof, and a recess defined in one of the first and second sides of the adapter nose or one of the first and second sidewalls of the tip and in axial alignment with the respective one of the transverse bore or the laterally spaced holes, the recess has a predetermined depth, when assembled the laterally spaced holes, the recess, and the transverse bore are in substantial axial alignment, the ground engaging tool comprising:
a generally annular split spring retainer disposed in the recess, said spring retainer defining a bore therein;
a holder defining a receiving opening therein, said holder being disposed in the recess and encircles the spring retainer, the holder having an axial thickness greater than the depth of the recess and being operative to provide a snug fit between the tip and adapter nose to substantially eliminate excessive vibrations of the tip on the adapter; and
a pin having a diameter larger than the diameter of the bore in the retainer, said pin being disposed in the transverse bore, the laterally spaced holes, and the spring retainer, said pin being held in place by a mechanical fit between the pin and the spring retainer.

4,918,844
MAINTAINING AN ICE RINK ADJACENT A SIDE EDGE
Frederick J. Marsh, 3 Dunn Street, Kitimat, British Columbia, Canada (V8C 1C6)
Filed Jul. 14, 1989, Ser. No. 379,986
Int. Cl.[5] E01H 5/10; F23C 5/14
U.S. Cl. 37—197 17 Claims



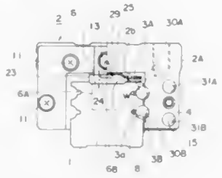
1 A method of maintaining an ice rink of the type used for sporting activities comprising a horizontal ice surface and a substantially vertical side surface defining an edge of the ice surface, the method comprising applying heat to the ice surface solely adjacent the edge so as to cause melting of the ice at the edge, and moving the application of heat along the edge so as to apply the heat in a narrow strip along the edge.

4,918,845
CLAMP TYPE ELECTRIC STEAM IRON STAND
Paul M. Livecchi, P.O. Box 27171, San Diego, Calif. 92128
Filed Nov. 21, 1988, Ser. No. 273,994
Int. Cl.[5] D06F 75/08, 75/40
U.S. Cl. 38—142 4 Claims



1 An electric iron stand comprising:
a vertically oriented rear wall member having a top edge, a bottom edge and a front wall surface, said rear wall member having a top portion and a bottom portion;
a horizontally oriented electric iron support platform having a front end and a rear end, the rear end of said support platform being rigidly attached to the front wall surface of said rear wall member at a height intermediate its top portion and its bottom portion, said electric iron support platform having resilient bevel contoured side wall flanges extending upwardly from its lateral sides for detachably capturing an electric iron therebetween; and
an elongated clamping leg having a front end and a rear end, said rear end being secured to the front wall surface of said rear wall member adjacent its bottom edge.

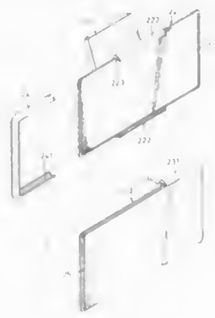
4,918,846
DUST SEAL FOR A LINEAR GUIDE APPARATUS
Toru Tsukada, Gumma, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 23, 1988, Ser. No. 276,159
Claims priority, application Japan, Nov. 24, 1987, 62-178543[U]
Int. Cl.[5] F16C *29/06, 29/08*
U.S. Cl. 384—15 **1 Claim**



1. A dust seal of a linear guide apparatus, wherein said linear guide apparatus comprises an axially extending guide rail having a bolt inserting hole for securing said guide rail to a base, axially extending ball rolling grooves formed in both side surfaces of said guide rail, and a slider having ball rolling grooves respectively opposing to said ball rolling grooves of said guide rail and supported on said guide rail, movably in the axial direction, by rolling balls inserted in said ball rolling grooves, said dust seal comprising:
a side seal member attached to each axial end of said slider, having seal protrusions for sliding contact with surfaces of said ball rolling grooves, and having a void portion at a position corresponding to an opening of a bolt inserting hole in the upper surface of said guide rail;
an upper seal member attached to an upper inner surface of said slider opposing axially extending flat ridge portions of said upper surface of said guide rail adjacent to said opening of said bolt inserting hole, said upper seal member being bent to have a cross section which provides a resilient property; and
a pair of seal plates secured to wing portions of said upper seal member for resilient contact with said flat ridge portions of the guide rail, thereby preventing intrusion of foreign particles into said ball rolling grooves.

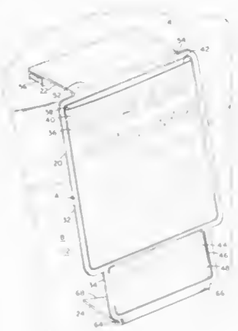
4,918,847
COMBINED DISPLAY BOARD AND CLIP
Yeou-Ching Lee, Taipei, Taiwan, assignor to Alvin Lee Jewelry, Inc., Taipei, Taiwan
Filed Nov. 2, 1988, Ser. No. 265,996
Int. Cl.[5] G09F *1/12*
U.S. Cl. 40—152.1 **18 Claims**

1. A combined display board and clip comprising:
a first clamping member,
a second clamping member,
means for connecting said first and second clamping members in a pivotal position, and
spring means for urging said first clamping member to a clamping position with respect to said second clamping member,
wherein at least one of said first and second clamping members is a display board which includes a base plate having opposite edges, a cover plate having opposite edges, and an edge-piece means having a groove means for releaseably receiving and clamping together said edges of said cover plate and said base plate, and wherein said display board is rectangular, said edge-piece means extending along the edges of said display board and including two opposite U-shaped edge segments, one of said edge segments being formed integrally with said cover plate, the



other one of said edge segments being a separate piece from said cover plate and said base plate.

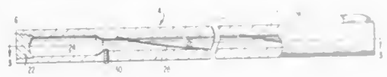
4,918,848
DISPLAY STAND FOR USE WITH WATER HEATERS
Geoffery Stein, Solon, Ohio, assignor to Mor-Flo Industries, Inc., Cleveland, Ohio
Filed Nov. 9, 1988, Ser. No. 268,757
Int. Cl.[5] G09F *7/00*
U.S. Cl. 40—584 **7 Claims**



1. A display stand for use on water heaters comprising:
a single piece of rigid plastic sheet formed with a generally flat front first panel having a top edge, a bottom edge, a front surface adapted to display information, and a rear surface;
a generally flat imperforate top second panel immovably extending directly and rearwardly from said first panel and having a front edge rigidly fixed to said first panel top edge, a rear edge, a top surface, and a bottom surface with attachment means fixed thereon adapted to engage the top of a water heater, said second panel forming a fixed obtuse angle with the portion of said first panel extending therebelow; and
a generally flat bottom third panel immovably extending directly and rearwardly from said first panel and having a front edge rigidly fixed to said first panel bottom edge and a rear edge, said third panel forming a fixed acute angle with the portion of said first panel extending thereabove;

and said third panel rear edge being concave for engagement with the cylindrical side wall of the water heater to maintain the lower end of the display stand in lateral position thereon.

4,918,849
MUZZLE-LOADING FIREARM
Angel H. L. Spota, 1808 Old Meadow Rd., McLean, Va. 22102
Filed Apr. 27, 1989, Ser. No. 343,589
Int. Cl.[5] F41C *27/00*
U.S. Cl. 42—51 **4 Claims**



1. A muzzle-loading firearm comprising:
a stock;
a barrel integral with or fastened to said stock, said barrel having an opening of substantially constant cross-section extending longitudinally within said barrel from a muzzle end of said barrel toward a breach end of said barrel and a longitudinally extending chamber at said breach end of said barrel, said chamber having a larger cross-sectional area than that of said opening;
closing means for closing said chamber at said breech end of said barrel, said closing means being integral with or fixed to said barrel at said breech end thereof;
lock means operably connected to said chamber for igniting a charge in said chamber; and
detaining means for preventing a projectile inserted in said opening of said barrel from entering said chamber

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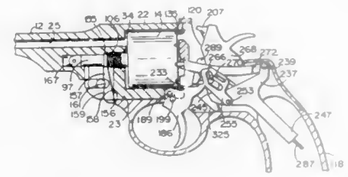
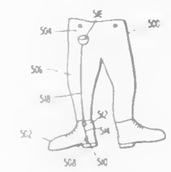
4,918,850
GAS SEAL REVOLVER
Jens O. Rick, 220 Sanborn, Big Rapids, Mich. 49307
Continuation of Ser. No. 135,035, Dec. 18, 1987, abandoned. This application Mar. 6, 1989, Ser. No. 319,928
Int. Cl.[5] F41C *1/02*
U.S. Cl. 42—59 **26 Claims**



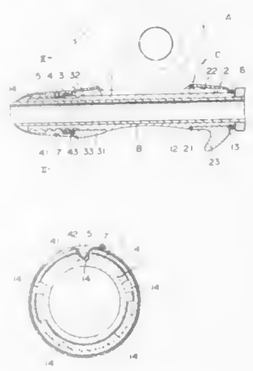
1. A gas seal revolver comprising:
a frame;
a barrel having a longitudinal bore extending therethrough with forward and rearward ends, and a first seal element extending about a marginal portion of said rearward end of said bore;
means for mounting said barrel on said frame to permit longitudinal motion therebetween;
a cylinder positioned adjacent and operably supported on said barrel, said cylinder having a plurality of parallel chambers, adapted to receive cartridges therein, with ends which open toward said barrel and a second seal element extending about a marginal portion of each said chamber end and shaped to engage said first seal element and therewith form a leak-resistant gas seal; and
means for shifting said barrel between a firing position wherein said first and second seal elements are engaged to seal said barrel bore and said cylinder chamber for increased projectile speed, and a rest position wherein said first and second seal elements are disengaged to permit said cylinder and said barrel to move with respect to one another;
said barrel further being pivotally mounted on said frame to permit said barrel and said cylinder to tip open on said frame to facilitate reloading and cleaning of said revolver.

4,918,851
TEMPERATURE MEASUREMENT APPARATUS FOR USE IN RECREATIONAL AND SPORTING ACTIVITIES
Aaron J. Peikin, 315 N. Wayne Ave., Wayne, Pa. 19087
Continuation-in-part of Ser. No. 266,884, Nov. 3, 1988, Pat. No. 4,864,763, which is a continuation-in-part of Ser. No. 922,876, Oct. 24, 1986, Pat. No. 4,782,617. This application Jun. 12, 1989, Ser. No. 365,173
Int. Cl.[5] A43B *1/10*
U.S. Cl. 43—1 **12 Claims**



1. A wader comprising:
(a) at least one foot portion having disposed thereon a temperature sensing means;
(b) a torso portion having disposed thereon a temperature measurement display means;
(c) an electrical power source;
(d) means for electrically interconnecting said temperature sensing means, said temperature measurement display means, and said electrical power source.

4,918,852
FIXTURE FOR A FISHING REEL
Yoshiro Yamato, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed Jun. 19, 1989, Ser. No. 367,679
Claims priority, application Japan, Jun. 21, 1988, 63-82135[U]
Int. Cl.[5] A01K *87/06*
U.S. Cl. 43—22 **4 Claims**



1. A fixture for a fishing reel, comprising:

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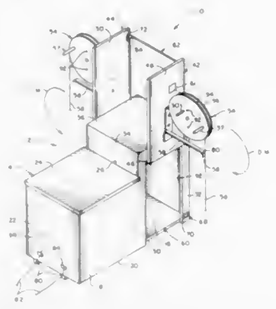
a tubular fixture body having a screw thread disposed at an outer periphery of one lengthwise end thereof;
a fixing holder fixed to another lengthwise end of said fixture body;
a movable pusher positioned at one side of said fixture body and supported to said fixture body to be movable toward or away from said fixing holder; and
a threaded ring screwable with said screw thread to operate said movable pusher to undergo movement toward or away from said fixing holder, said screw thread being provided with a plurality of locking grooves each extending lengthwise of said fixture body, said plurality of locking grooves being spaced apart circumferentially around said fixture body, said threaded ring being provided with at least one engaging projection selectively engageable one at a time with said plurality of locking grooves to restrain said threaded ring from loosening relative to said movable pusher, said engaging projection being changeable in position between an engaging position where said engaging projection engages with one of said locking grooves and a disengaging position where said engaging projection disengages from one of said locking grooves.

4,918,853

PORTABLE, COLLAPSIBLE ICE FISHING DEVICE

Charles A. Bascom, and Betty A. Bascom, both of R.R. #1, Box 37, Elmira, Mich. 49730

Filed Jan. 5, 1989, Ser. No. 293,762
Int. Cl.[5] A01K *97/08*
U.S. Cl. 43—26 **14 Claims**



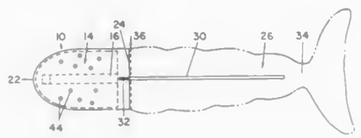
1. A portable, collapsible ice fishing device for carrying and storing goods in one configuration and for supporting a fisherman and his equipment in another configuration, comprising:
(A) a monolithic frame having
(i) a hollow seat section which is adapted to store goods and which comprises
(a) side walls,
(b) a bottom, and
(c) a seat portion on which a fisherman sits,
the seat section being sized to fit between the fisherman's legs and extend in the posterior/anterior direction with respect to such fisherman when he sits on the seat portion in straddle-fashion;
(ii) a hollow storage section which is adapted to store goods and which comprises
(a) a front wall,
(b) a rear wall located adjacent to said seat portion,
(c) two side walls each forming a continuation of one of said seat section side walls,
(d) a bottom,
(e) each storage section side wall having a door opening defined therein for providing access inside the frame,
(f) a door hingeably attached to each storage section side wall go cover the door opening in such side wall, each door having an inside surface which is located inside the storage section when the door is closed to face the inside surface of the other door, and an outside surface that is outside the storage section when the door is closed to face in a direction opposite to the outside surface of the other door,
(g) hinge means hingeably connecting each door to a storage section side wall and permitting such hingeably connected door to swing from a first position covering the door opening associated therewith with the door inside surface facing towards the inside of the storage section and towards the inside surface of the other door 180° to a second position which is upright with respect to the storage section bottom and with the door inside surface facing outwardly with respect to the storage section inside and in a direction opposite to the inside surface of the other door so that the door outside surfaces face each other,
(h) a top surface on said storage section, with the doors extending above said top surface in the second position,
(i) a fishing reel element mounted on the inside surface of each door,
(j) a flexible bobber element mounted on the inside surface of each door to be adjacent to the fishing reel mounted on such door,
(k) a connecting rod pivotably mounted on the outside surface of one of said doors,
(l) rod attaching means mounted on the outside surface of the other door to releasably affix the connecting rod to such other door and connect the doors together, said rod and said rod attaching means being located to be positioned above the storage section top surface when the doors are in the second position,
(m) a closure latch element mounted on each door, and
(n) a closure latch receiving element mounted on each storage section side wall to receive the closure latch element associated therewith;
(iii) means connecting the inside of the hollow storage section to the inside of the hollow seat section; and (B) skid means mounted on the seat section bottom and storage section bottom for facilitating the sliding movement of said frame over ice and snow.

4,918,854

REMOVABLY ATTACHABLE NOISE MAKING LURE ADDITION APPARATUS AND METHOD

Jerome B. Webre, Jr., 5252 Twin City Hwy., #465, Groves, Tex. 77619

Filed Oct. 3, 1988, Ser. No. 251,805
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.31 **9 Claims**



1. A removably attachable noise making lure addition comprising:
A. a hollow containment means;
B. a weight receiving channel means in said hollow containment means through which weight and noise means are introduced and extracted, said channel means in a base of said hollow containment means to which a hook is removably attached;
C. a removably attachable eye means, that seals said weight receiving channel means, and to which fishing line is attached;
D. a hook receiving means in said hollow containment means for removably attaching fishing hooks;
E. a conically shaped hollow outer frame of said hollow containment means;
F. a rigid center section of said frame through which said weight receiving channel passes and into which said removably attachable eye means is secured; and
G. a base of said conically shaped frame to which said hook and a fish attracting means are attached.

4,918,855

TRAP FOR CATCHING ANIMALS

Davis W. Simpson, 2819 Whisper Path, San Antonio, Tex. 78230

Filed Apr. 20, 1987, Ser. No. 40,082
Int. Cl.[5] A01M *23/24*
U.S. Cl. 43—85 **11 Claims**

1. An animal trap comprising:
first and second arms;
edible means for holding said first and second arms in a first open position;
biasing means for biasing said first and second arms toward a second closed position; and
engaging means formed in each of said first and second arms for engaging a portion of the body of an animal after the animal breaks said edible means, said engaging means further comprising a base jaw and a spring jaw, a first end of said base jaw and a first end of said spring jaw being integral with said biasing means, said spring jaw further comprising a latch formed at a second end thereof.

4,918,856

INSECT TRAP FOR FLEAS OR THE LIKE

Billy B. Olive, Rte. 1, Box 166, Durham, N.C. 27705, and Clarence O. Williams, 3617 Sheffield Dr., Rocky Mount, N.C. 27801

Filed May 24, 1989, Ser. No. 357,048
Int. Cl.[5] A01M *1/04*
U.S. Cl. 43—113 **20 Claims**

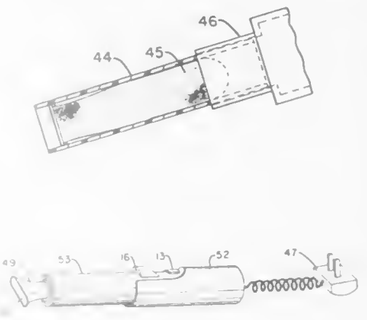
1. A trap for catching insects, comprising:
(a) insect trapping means comprising a sticky landing surface and means to support said sticky landing surface in a position accessible to live insects to be trapped and killed by contacting said surface; and
(b) a self-contained, gradually decaying, radiant light source continuously operative independent of a combustible fuel or electrical energy supply and positioned proximate said insect trapping means to provide a luring color of light uniquely suited to attracting the insects to be trapped to said sticky landing surface.

4,918,857

PEST COLLECTION AND DISPOSAL DEVICE

Bill R. Wade, and Thelma L. Wade, both of Farmington, Wash., assignors to Bilon, Inc., Farmington, Wash.

Continuation-in-part of Ser. No. 96,371, Sep. 11, 1987. This application Jul. 27, 1988, Ser. No. 225,046
Int. Cl.[5] A01M *1/06*
U.S. Cl. 43—139 **6 Claims**



1. An improved pest collection device consisting of an expandible and retractable array of interconnected, hollow duct members, at least one of said a duct members is adapted for sliding telescopic motion, said duct members positioned at least partly in an adjacent member to vary the length of the array, at least one of said duct members having an electric power supply compartment, a motor fan compartment, and an insect collection compartment wherein said collection compartment has a disposable-replaceable cartridge means which comprises: an elongated hollow body having inlet and outlet ends, a flexible closure member positioned at said inlet end and is deflectable to provide an entrance to the hollow body when an air stream flows therein, and a filter means positioned adjacent said outlet end of said hollow body through which said air stream flows for removing a pest entrained in said air stream;
whereby, the disposable cartridge enables pests to be collected and disposed of without presenting an unsanitary, or unsightly condition, as well as inhibiting escape of insects from within the cartridge during disposal, each of said compartments arranged to enable air to flow into said device at an inlet of said insect collection compartment and flow to said motor fan compartment and to be exhausted from said array.

4,918,858

MULTIPLE PURPOSE FISHING DEVICE

Marvin L. Maxfield, Sr., 609 Greenwood, #4, Wichita, Kans. 67211

Filed Jun. 12, 1989, Ser. No. 364,880
Int. Cl.[5] A01K *97/00*
U.S. Cl. 43—17.2 **18 Claims**

1. A fishing accessory comprising:
a substantially straight pin element having opposite ends;
a loop on one end of said pin element, said loop being arranged to present an eye and a gap in the eye providing access thereto;
a weight received on said pin element for axial sliding movement thereon toward and away from said loop;

a second weight on said pin element at a location spaced away from the first mentioned weight; and

retaining means comprising a compression spring com-

pressed between said first and second weights and acting to urge the first weight toward said loop, said spring being yieldable to permit movement of the first weight away from the loop to open said gap.

4,918,859

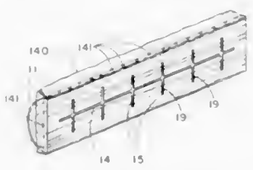
STRUCTURE FOR GROWING MUSHROOMS

Thomas S. Shevlin, Rt. 1, Box 139, Lower Salem, Ohio 45745

Continuation of Ser. No. 63,030, Jun. 17, 1987, abandoned. This application Oct. 28, 1988, Ser. No. 263,971

Int. Cl.[5] A01G *1/04*

U.S. Cl. 47—1.1 **14 Claims**



1. A structure for growing forest mushrooms comprising:

a slab wood log having a longitudinal cut face and a bark back;

a recess located in said cut face for receiving mushroom spawn;

mushroom spawn located on the longitudinal cut face of said slab wood log; and

a sheet of flexible film material extending over said cut face.

4,918,860

TREE BRANCH SPREADER

Dennis Breadner, R.R. #1, Clarksburg, Ontario N0H 1J0, Canada

Filed May 9, 1989, Ser. No. 349,491

Int. Cl.[5] A01G *17/04*

U.S. Cl. 47—42 **5 Claims**

1. A fixed length tree spreading device comprising a shaft provided with engagement means at each of its ends, wherein the shaft comprises an elongate member of thin sheet strip having an L-cross section in which each limb of the L-cross section is approximately the same length and wherein the included angle between the limbs is from about 90° to about 100°; and wherein each engagement means comprises two upstanding tabs, one on each limb of the L-cross section, together with a short protruding spike member therebetween substantially in line with the angle of the shaft.

4,918,861

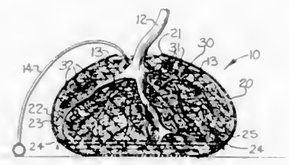
PLANT GROWTH BED WITH HIGH LOFT TEXTILE FIBERS

Tim D. Carpenter, Colorado Springs, Colo., and Claude C. Hobbs, Waco, Tex., assignors to Hobbs Bonded Fibers, Groesbeck, Tex.

Filed Nov. 15, 1988, Ser. No. 271,729

Int. Cl.[5] A01G *31/00*

U.S. Cl. 47—59 **10 Claims**



1. A plant growth bed for growing plants comprising a substantially close-ended bag formed of a relatively thin plastic material impervious to passage of liquids and air therethrough, and a relatively high loft bedding of crimped textile fibers in said bag, the major portion of said crimped textile fibers being hydrophobic synthetic staple fibers, the remaining minor portion of said crimped fibers being hydrophilic staple fibers for enhancing liquid retention, said hydrophobic and hydrophilic fibers being blended together through the bedding and being unconnected to each other so as to permit readily forming a hole in the bedding for reception of a transplanted plant, said relatively high loft bedding of crimped textile fibers providing open spaces around the crimped fibers to allow for optimum air for proper root development and plant growth, said bedding of textile fibers substantially filling the bag to thereby substantially prevent the bedding from undesirably shifting about with the bag, said high loft bedding when not compressed having an overall thickness of at least about 3 inches and density of 0.5 to 2 pounds per cubic foot, and said bedding being readily compressible, as for compact shipment, to bout 1/5 the thickness of the uncompressed high loft bedding and to readily return to a high loft state upon the release of a compressive force thereon.

4,918,862

METHOD FOR GRINDING TROCHOIDAL AND CIRCULAR BEARING RACES

Michel A. Pierrat, 2355 24th St., Boulder, Colo. 80304

Continuation-in-part of Ser. No. 176,846, Apr. 4, 1988. This application Apr. 20, 1989, Ser. No. 340,917

Int. Cl.[5] B24B *5/00*

U.S. Cl. 51—105 EC **4 Claims**

1. The method of forming a trochoidal surface on a blank for use in a speed change device comprising the steps of

providing a first rotary table,

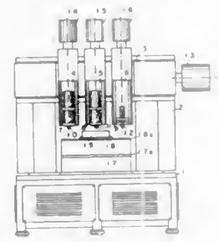
mounting a second rotary table on said first table so that it is free to rotate relative to said first table,

displacing the axis of rotation of said second table from said the axis of rotation of said first table by a predetermined distance,

securing said blank to said second table,

driving said second rotary table in a direction opposite from said first table,

providing a grinding wheel, and



rotating said grinding wheel while in contact with said blank and during the rotation of both of said tables.

4,918,863

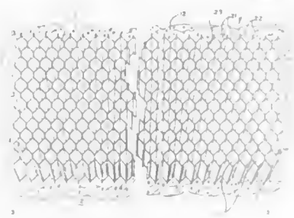
METHOD AND APPARATUS FOR PLANTING SEEDS AND GROWING PLANTS

Nabil N. Youssef, 2168 N. 1450 East, North Logan, Utah 84321

Continuation of Ser. No. 450,783, Dec. 17, 1982. This application Dec. 29, 1988, Ser. No. 291,550

Int. Cl.[5] A01G *9/02*

U.S. Cl. 47—85 **6 Claims**



1. A method of planting seeds and growing plants, comprising the following steps in the following order:

providing a group of adjoining enclosures secured together, each comprising joined, upstanding, continuous wall members having no apertures therethrough, both the top and the bottom of each enclosure being entirely open between said wall members;

placing the group of enclosures upon the soil of a growing plot, the lowermost ends of the enclosures being in contact with said soil;

filling each enclosure at least partially with a plant germinating soil mix;

planting at least one seed in the germinating soil mix of at least selected ones of the group of enclosures; and

allowing the seeds to germinate and the roots of the resulting plants to grow generally downward into the soil, and the plants to grow to harvestable maturity.

4,918,864

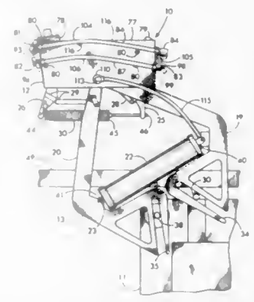
VARIABLE SPEED DOOR OPERATOR

John T. Lanenschlous; Henry M. Ebbott, both of Madison; Raymond A. Beckeman, McFarland, and Glen M. Gregerson, Janesville, all of Wis., assignors to Air-Lec Industries, Inc., Madison, Wis.

Filed Sep. 20, 1988, Ser. No. 246,979

Int. Cl.[5] E05F *15/02*

U.S. Cl. 49—137 **12 Claims**



1. A variable speed controller for selectively varying a moving speed of a door which is moved between first and second positions by an automatic door operator having a control system and a cylinder with a reciprocating piston therein which is positioned identically with respect to the cylinder when the door is in both the first and second positions, comprising:

(a) A first passageway;

(b) A second passageway;

(c) At least one door position responsive valve means operably connected to the control system, cylinder and said passageways for directing fluid from the control system through the first passageway to the cylinder to initiate movement of the door toward the second position when the door is in proximity to its first position and the control system is discharging the fluid; and for directing fluid from the control system through the second passageway to the cylinder to initiate movement of the door toward the first position when the door is in proximity to its second position and the control system is discharging the fluid; and

(d) variable check valve means in the second passageway for permitting unrestricted fluid flow from the cylinder to be exhausted when fluid is exhausted from the cylinder through the second passageway, and for permitting selectively variable restriction of fluid flow from the control system to the cylinder through the second passageway so that movement of the door from the second position to the first position may be initiated at a selected speed.

4,918,865

WINDOW OPENER

Shoichi Hirai, Nishinomiya, Japan, assignor to Nippon Cable System Inc., Takarazuka, Japan

Continuation of Ser. No. 151,669, Feb. 2, 1988. This application Jun. 8, 1989, Ser. No. 364,503

Claims priority, application Japan, Feb. 7, 1987, 62-26926

Int. Cl.[5] E05F *11/04*

U.S. Cl. 49—347 **8 Claims**

1. A window opener for open-and-close operation of a window having a window frame and a wing member rotatably connected to said window frame, comprising:

a pulley;

a rotary shaft engaged with said pulley for co-rotation;

a first pull cable wound on said pulley in a first direction so

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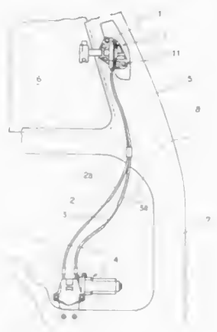
that a pull-operation of said first pull cable causes a rotation of said rotary shaft in a certain direction;

a second pull cable wound on said pulley in a direction opposite to said first direction so that a pull-operation of said second pull cable causes a reciprocating rotation of said rotary shaft in an opposite direction;



a driving device for alternation of pull-operations of said first pull cable and said second pull cable in opposite directions; and

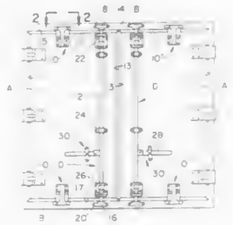
a link mechanism for converting a rotational torque of said rotary shaft in both directions into an opening-and-closing force for said wing member.

4,918,866

DOOR CONTROL MECHANISM

John V. Pastva, Parma Heights, Ohio, assignor to The Eastern Company, Cleveland, Ohio

Filed Aug. 26, 1987, Ser. No. 89,431
Int. Cl.[5] E06B *3/34*
U.S. Cl. 49—381 9 Claims



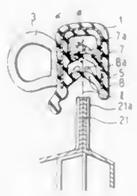
1. In a cargo carrying structure having a rectangular door frame in an upright plane and a door pivoted at one edge to an upright side of the frame, and having an opposite edge spaced from and parallel to the pivoted edge, and further having a latching means for maintaining the door in a closed position adjacent the opposite edge, said frame being subject to racking in use, a follower on said door between the pivoted edge and the latching means, and a cam member on the frame engageable by the follower during and after closing of the door, and prior to latching, said follower comprising a mounting portion secured to a face of the door and opposed follower surfaces stationary relative to the door and extending beyond a top or bottom edge of the door in overlapping relationship with the frame when the door is closed for engaging the cam member, and said cam member having a mounting portion secured to the frame and a wedge extending from the mounting portion outwardly from the plane of the frame a distance sufficient to contact the follower surfaces when the door is partially closed, said wedge having two opposite and converging surfaces each tapering in two directions, one direction being outwardly from the mounting portion and the other direction being transversely of the outward direction, to be received between and cooperate with the opposed follower surfaces as the door is pivoted shut.

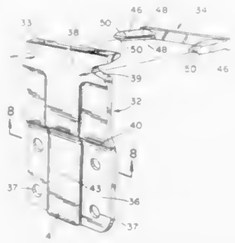
4,918,867

OPENING TRIM

Keizo Hayashi, Nagoya, and Masahiro Nozaki, Aichi, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Feb. 21, 1989, Ser. No. 312,946
Claims priority, application Japan, Apr. 14, 1988, 63-050388[U]
Int. Cl.[5] E06B *7/16*
U.S. Cl. 49—490 3 Claims





1. An opening trim which is mounted to a body flange of a door mounting opening portion of an automobile, and provided with a U-like cross-section and grasping lips on the inside of the U-like cross-section, comprising:

(a) a portion intended to grasp a thick portion of the body flange and a usual portion continuing to the portion intended to grasp the thick portion;

(b) said portion intended to grasp the thick portion and said usual portion being molded integrally by means of extrusion molding; and

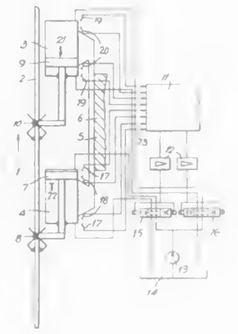
(c) the inclination angle of the grasping lips at least in one side of said portion intended to grasp the thick portion with respect to the flange inserting surface being made smaller than that in said usual portion.

4,918,868

ECCENTRIC GRINDER

Walter Barth, Leinfelden; Karl-Heinz Braunbach, Hornbach, and Manfred Stäbler, Leinfelden-Echterdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE87/00540, § 371 Date Jun. 6, 1989, § 102(e) Date Jun. 6, 1989, PCT Pub. No. WO88/04218, PCT Pub. Date Jun. 16, 1988
PCT Filed Nov. 21, 1987, Ser. No. 368,363
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1986, 3642741
Int. Cl.[5] B24B *7/00*
U.S. Cl. 51—120 16 Claims



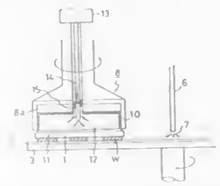
1. Eccentric grinder comprising a housing, comprising an eccentric which is located therein and driven so as to rotate, comprising a grinding plate which is rotatably supported in the eccentric and whose axis of rotation extends at a distance from and parallel to the axis of rotation of the eccentric, comprising a first grinding plate rotating ring with internal drive means and comprising a second grinding plate rotating ring with external drive means which are both rigidly connected at the grinding plate so as to be concentric to the axis of rotation of the latter and are assigned respectively to one of two rolling rings which are concentric relative to the axis of rotation of the eccentric and comprise external and internal rolling means in the housing, and comprising a switching device which is fastened at the housing and has three manually adjustable switching positions for triggering, as desired, a rolling movement of the first grinding plate rotating ring at the first rolling ring or of the second grinding plate rotating ring at the second rolling ring or for stopping a rolling movement of both grinding plate rotating rings, characterized in that the rolling rings (31, 32) are supported in the housing (10) so as to be rotatable and are in continuous engagement by means of their rolling means (34, 35) with the drive means (28, 29) of the respective assigned grinding plate rotating ring (26, 27), and in that the switching device (38; 238; 338; 438; 538) comprises a locking device (40; 240; 340; 440; 540) which secures the first rolling ring (30) against rotation at the housing (10) in the first switching position and secures the second rolling ring (31) against rotation at the housing (10) in the second switching position and releases both rolling rings (30, 31) for free rotational movement in a third switching position.

4,918,869

METHOD FOR LAPPING A WAFER MATERIAL AND AN APPARATUS THEREFOR

Satoru Kitta, Nagano, Japan, assignor to Fujikoshi Machinery Corporation, Nagano, Japan

Filed Oct. 26, 1988, Ser. No. 262,952
Claims priority, application Japan, Oct. 28, 1987, 62-272658
Int. Cl.[5] B24B *5/00*
U.S. Cl. 51—131.1 1 Claim



1 An apparatus for lapping a wafer material which comprises:

(a) a turn table horizontallv rotatable around a vertical axis;

(b) a pressing plate, to the lower surface of which at least one wafer material is bonded, and mounted on the turn table to bring the wafer material into contact with the turn table;

(c) a top ring in the form of a downwardly opening cup, the opening thereof being covered by spreading a membrane of an elastic material fluid-tightly sealed to the periphery of the cup, rotatable around a vertical axis and mounted on the pressing plate to be in contact therewith by the mambrane of an elastic material;

(d) a means to supply a pressurized fluid to the space on the inner surface of the membrane of an elastic material; and

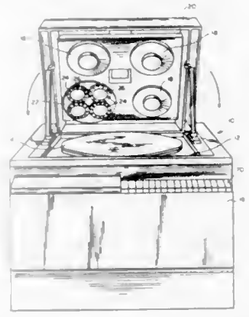
(e) a means to regulate the pressure of the pressurized fluid.

4,918,870

FLOATING SUBCARRIERS FOR WAFER POLISHING APPARATUS

Walter Torbert, Newark; Kenneth C. Struven, San Carlos; Robert E. Lorenzini, Atherton, and Anthony C. Bonora, Menlo Park, all of Calif., assignors to Siltec Corporation, Menlo Park, Calif.

Filed May 16, 1986, Ser. No. 864,282
Int. Cl.[5] B24B *37/04*
U.S. Cl. 51—131.3 14 Claims



1. An assembly for polishing one of two generally parallel opposed surfaces of a thin wafer having height deviations in an area of said one surface, said assembly comprising:

a. a main carrier having a first face;

b. at least one subcarrying means mounted on said first face of said main carrier for independent angular movement

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relative to said main carrier, each subcarrying means for carrying a single wafer and having a first side and a second side, said first side having a face area conforming in shape to an area of said opposed wafer surface which is directly opposed to said area of said one wafer surface having said height deviations, to provide support from said subcarrying means through said wafer for said area of said one wafer surface and resist deformation thereof during polishing; and

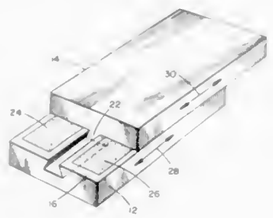
c. means for applying polishing force to a wafer adhered to said subcarrying means through pressure exerted onto said second side thereof while simultaneously allowing said subcarrying means to move angularly relative to said main carrier, whereby said one surface of said wafer is uniformly polished with said area of said one wafer surface supported so that the height deviations therein are substantially eliminated.

4,918,871

RENEWABLE AROMATIC CEDAR BLOCK

James C. Widmann, 8 Putnam Ave., South Norwalk, Conn. 06854

Filed May 4, 1989, Ser. No. 347,343
Int. Cl.[5] B24B *25/00*
U.S. Cl. 51—181 R 4 Claims



1. A device of cedar wood for providing an aromatic cedar scent comprising:

a first block of cedar wood having a substantially flat surface;

abrasive means secured to the said flat surface and being of a hardness greater than cedar wood;

a second block of cedar wood having a substantially flat surface;

said second block being disposed with its flat surface in contact with the abrasive means;

means to maintain the first and second blocks in slidable contact whereby relative reciprocal sliding will abrade the said flat surface of the second block to renew the scent producing effect thereof.

4,918,872

SURFACE GRINDING APPARATUS

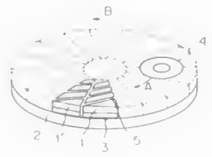
Takesi Sato; Kepichi Mitsuhashi; Yoji Tomita, and Yasuoki Sasaki, all of Ibaraki, Japan, assignors to Kanebo Limited, Tokyo, Japan

Continuation of Ser. No. 16,985, Feb. 19, 1987, abandoned, which is a continuation of Ser. No. 732,207, May 9, 1984, abandoned. This application Jul. 8, 1988, Ser. No. 216,483
Claims priority, application Japan, May 14, 1984, 59-97223
Int. Cl.[5] B24D *5/10*
U.S. Cl. 51—209 R 4 Claims

1. A surface grinding apparatus having a plurality of grinding wheel segments secured in a predetermined arrangement to a rotary driving platen so that the working surfaces of the segments form a single plane wherein planar surfaces of articles to be ground are brought into sliding contact with said segments at said plane, which comprises:

(a) the arrangement of said grinding wheel segments forming a first plurality of surface grooves extending in a generally radial direction and away from the direction of rotation of said grinding wheel segments to the outer periphery of said arrangement of segments;

(b) at least one second surface groove intersecting and in communication with said first plurality of surface grooves and leading to the outer periphery of said arrangement of grinding wheel segments; and



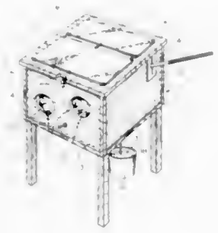
(c) predetermined ones of said grinding wheel segments having a horizontal hole therethrough communicating with a vertical hole open to the working surfaces of said grinding wheel segments, said horizontal holes being in communication with the outer periphery of said arrangement of grinding wheel segments to enhance removal of waste grinding fluid from said working surfaces to said outer periphery of said arrangement of grinding wheel segments.

4,918,873

METHOD AND APPARATUS FOR REFURBISHING GOLF CLUBS

Donald R. Bass, 1341 Overlook Dove, Smyrna, Ga. 30080

Filed Feb. 21, 1989, Ser. No. 313,159
Int. Cl.[5] B24C *1/00, 3/00*
U.S. Cl. 51—281 R 9 Claims



9. The method of refurbishing a golf club head which comprises the steps of providing a refurbishing chamber, positioning the head of the club within the refurbishing chamber and the grip of the club outside of the chamber, and spraying the club head with an abrasive medium as the club head is manually manipulated by the club grip or that portion of the club shaft located outside of the chamber wherein a refurbishing chamber is provided of the type that has an open top case formed with a self sealing slot that extends to a slot entry at the upper rim of the base and a repositionable lid, and wherein the head of the club is positioned within the refurbishing chamber by passing the club shaft down through the slot entry and into the self sealing slot from the upper rim with the lid lifted from the base rim.

4,918,874

METHOD OF PREPARING ABRASIVE ARTICLES

Lawrence W. Tiefenbach, Jr., Traverse City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 5, 1988, Ser. No. 229,181
Int. Cl.[5] B24D *3/00*
U.S. Cl. 51—293 21 Claims

1. A method of preparing an abrasive greenware article comprising:

(a) admixing abrasive grits and a bond phase comprising silica particles, callodial alumina, a flux selected from the group consisting essentially of metal oxides or precursors thereof and water, to form a slurry,

such that the silica particles are on the average smaller than the average grit particles;

(b) drying the slurry to form a precursor powder;

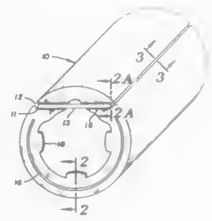
(c) compacting the precursor powder to form an abrasive greenware article.

4,918,875

HAND-HELD SANDING DEVICE

Kenneth J. Klocke, 206 - 20th St., East, West Fargo, N. Dak. 58078

Filed May 19, 1988, Ser. No. 196,017
Int. Cl.[5] B24B *9/10*
U.S. Cl. 51—370 10 Claims



1. A hand-held sanding device for use with sandpaper or other abrasive sheet material, which device comprises:

(A) a generally cylindrical tubular body of tough rugged semi-rigid resilient rubber or rubber-like material having an arcuate outer face adapted to engage the back surface of a sheet of sandpaper or other abrasive sheet material over at least a substantial portion of said face,

(B) a relatively narrow flat or shallow concave longitudinal panel along one side of said body, and

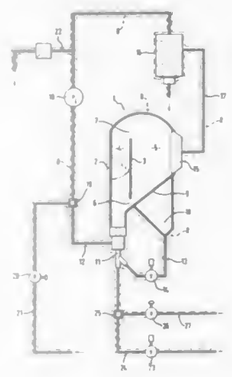
(C) a pair of parallel spaced apart longitudinal slots or channels on opposite sides of the cylindrical body having closely spaced apart side walls for resiliently gripping the opposite parallel edges of a sheet of sandpaper or other abrasive sheet material for securely holding the abrasive sheet material in tight abutting engagement with said body face.

4,918,876

DEVICE TO DEBURR MOLDED PARTS SUBJECT TO LOW-TEMPERATURE BRITTLENESS

Sabine Donath, Oberhausen; Peter Grund, Erkrath; Peter Holz, Linnich; Udo Jakobs, Krefeld, and Wolfgang Volker, Tonisvorst, all of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Fed. Rep. of Germany

Filed Mar. 13, 1989, Ser. No. 322,784
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1988, 3810463
Int. Cl.[5] B24C *3/04;* B24B *31/10*
U.S. Cl. 51—426 7 Claims



1. In a device for deburring molded parts subject to low-temperature brittleness in which the molded parts are circulated and cooled down by a cryogenic agent and treated with an abrasive, the improvement being in a substantially closed circulation chamber, means for circulating the conveying gas in said circulation chamber to cool down and circulate the molded parts, means for supplying abrasive into said circulation chamber for treating the molded parts said circulation chamber having a lockable filling and removal opening for putting in and taking out the molded parts, said circulation chamber having connections for introducing and removing the conveying gas and a connection for administering the abrasive, a partition dividing said circulation chamber into an acceleration zone with a small flow cross-section and an expansion zone with a wide flow cross-section; an opening for the transition from said acceleration zone into said expansion zone, and an opening linking said expansion zone with the beginning of said acceleration zone.

4,918,877

INFLATABLE TUBULAR STRUCTURE

Walter J. Dutka, 4468 Seneca St., West Seneca, N.Y. 14224

Filed Dec. 8, 1988, Ser. No. 281,076
Int. Cl.[5] E04G *11/04;* E04B *1/345*
U.S. Cl. 52—2 J 4 Claims

1. A free-standing semi-cylindrical shaped, self-supporting, flexible framework structure, including:

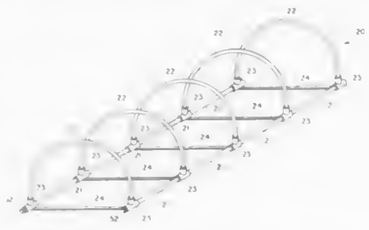
a plurality of hollow connectors having a central passageway and a secondary passageway leading into said central passageway and normal to said central passageway, said plurality of hollow connectors disposed in two horizontal parallel rows;

two parallel horizontal air inflatable tubes having opposite ends disposed through the central passageways of said hollow connectors;

a plurality of secondary tubes having opposite ends, each end of each said secondary tube is disposed in the secondary passageway of one of said hollow connectors on each

said horizontal tube, thereby giving an archer framework between the parallel horizontal tubes;

an air inlet means comprising a ridged plug having a hollow air tube disposed therethrough disposed at one of said ends for each of said horizontal and secondary tubes and



a seal means comprising a ridged plug disposed in the other said end for each of said horizontal and secondary tubes;

a plurality of horizontal stabilizer straps, the ends of said straps attached to opposing connectors on said horizontal tubes.

4,918,878

PAY TELEPHONE ENCLOSURE

Robert A. Paschke, Prior Lake, Minn.; James A. Mosel, Eau Claire, Wis.; Charles H. Kratsch, Maple Grove, Minn.; Dean White, and Travis H. Edinger, both of Chippewa Falls, Wis., assignors to Electric Avenue, Inc., Edina, Minn.

Filed May 27, 1988, Ser. No. 199,484
Int. Cl.[5] E04H *14/00*
U.S. Cl. 52—28 61 Claims

1. A pay telephone housing comprising:

a first panel;

a second panel secured at a first angle relative to said first panel;

a back panel secured at a second angle relative to said second panel;

a third panel secured at a third angle relative to said back panel and generally parallel to said first panel;

a fourth panel secured at a fourth angle relative to said third panel and generally parallel to said second panel, at least one of said angles being an obtuse angle; and

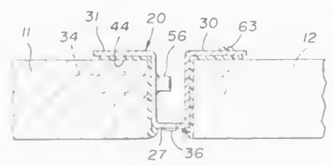
an enclosure portion located between said first and said fourth panel including a planar telephone support member, said telephone support member secured within said enclosure portion generally parallel to said back panel.

4,918,879

MERCHANDISING WALL STRUCTURE INCLUDING READILY ATTACHABLE AND DETACHABLE PANELS AND HAVING PLASTIC REVEALS

Constance C. Bodurow, Canton; Larry D. Murphy, New Philadelphia, both of Ohio, and Gordon R. Perry, New York, N.Y., assignors to Commercial and Architectural Products, Inc., Dover, Ohio

Filed May 29, 1987, Ser. No. 56,141
Int. Cl.[5] E04B *2/82*
U.S. Cl. 52—36 9 Claims



1. A modular merchandising wall panel construction including at least first and second vertically oriented structural members having vertical edges, said structural members in edge-to-edge lateral engagement, and means affixing said structural members together and permitting ready disassembly thereof, said means comprising a plurality of recesses provided in an edge of a first one of said structural members and a rotary bolt lock affixed within each recess, and an elongate vertical standard affixed at an edge of the second one of said structural members,

A. each of said rotary bolt locks comprising:

(1) a housing having an opening at an edge thereof,

(2) a hub rotatably mounted in said housing and having an aperture provided therein adapted to receive a driving means,

(3) a radial arm affixed to said hub,

(4) an arcuate bolt extending from an end of said radial arm; and

B. said elongate standard comprising:

(1) a steel channel-form body member including a web having spaced apart parallel edges, a pair of sidewalls one extending from each edge of said web, said sidewalls being oriented substantially parallel to each other and substantially perpendicular to said web, and each sidewall having an edge spaced apart from the associated edge of said web, and

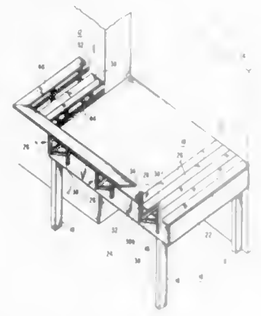
(2) a pair of laterally outwardly extending flanges one extending from said edge of each of said sidewalls, said flanges comprising a mounting flange engaging a face of the second of said structural members and having an aperture provided in said flange and affixing means extending through said aperture and engaged in said second structural member, and a guide flange for engaging the first of said structural members, the sidewall connected to said guide flange being provided with a plurality of pairs of slots, one pair of slots being juxtaposed opposite each of said rotary lock bolts of said first structural member; wherein said two structural members are solidly affixed together edge-to-edge with said elongate standard therebetween, the arcuate bolt of said rotary bolt lock emerging from the aperture of said housing, entering the first slot of one of said pairs of slots in said standard sidewall and returning through the second slot.

4,918,880

DECK SEAT AND SAFETY RAIL COMBINATION

Wayne R. Carney, R.D. 2 Box 177, Stockton, N.J. 08889

Filed Jan. 11, 1989, Ser. No. 295,827
Int. Cl.[5] A47C *11/00*
U.S. Cl. 52—8 15 Claims



1. In combination with a horizontal deck arrangement supported above ground level and having a facia member attached to and extending below the deck along the periphery thereof, a seat and safety rail assembly comprising:

a plurality of brackets spaced along said periphery and attached in upstanding relationship to said facia member, each said bracket comprising:

an extended, generally vertical lower post member,

a seat support member substantially perpendicular to said post member, having a front extremity joined to said post member and a back extremity, said seat support member extending from said post member away from and lying substantially entirely outside said facia member;

a back support member joined to said back extremity of said seat support member and extending away from said seat support member in a direction generally opposite said post member;

a top rail support member joined to said back support member remote from said seat support member and having at least a portion thereof extending from said back support member outwardly from said facia member;

a brace extending between said seat support member and said extended post member for maintaining said two last-named members in substantially fixed relationship; and

means adjacent the end of said extended post member remote from said seat support member for fastening said assembly to said facia member.

4,918,881

OBSERVATION DOME FOR BUILDINGS

Douglas J. Cottle, 2303 Central Ave., and Andrew C. Helton, 608 Baltimore St., both of Middletown, Ohio 45044

Filed Feb. 3, 1989, Ser. No. 306,774
Int. Cl.[5] E04B *7/16*
U.S. Cl. 52—65 3 Claims

1. An observation dome for mounting to a building to form a permanent part of an exterior wall thereof, said dome comprising:

a semi-spherical transparent dome having a circular edge adapted to be sealingly mounted to a surface of a building, said dome having an aperture therethrough for receiving a telescope;

means mounted within said cone for supporting and adjustably aiming a telescope positioned for use with said dome, said means comprising a ring sized to receive an end of a telescope, a plurality of screws operably associated with said ring for securing said end of a telescope in said ring, and a plurality of legs associated with said ring for adjustably aiming a telescope secured by said ring, said legs being telescopically adjustable and each said leg being universally adjustably attached at a first end to said ring

and attached at a second end to the inside surface of said dome, and

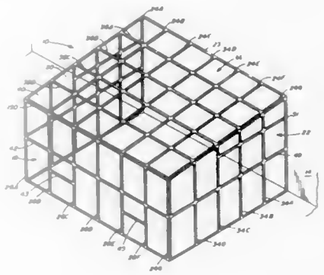
sealing means mounted on said cone for providing a weather-proof closure of said aperture.

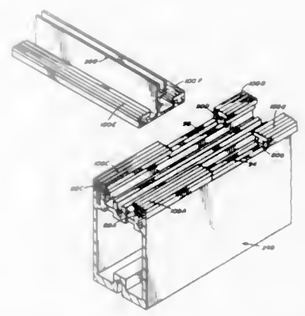
4,918,882

GLAZING RETAINER ASSEMBLY

Murrell N. Funk, Houston, Tex., assignor to Texas Aluminum Industries, Inc., Houston, Tex.

Filed Dec. 21, 1988, Ser. No. 287,725
Int. Cl.[5] E04B *1/32*
U.S. Cl. 52—86 9 Claims





1. An assembly for providing support for a glass or other transparent medium comprising:

a beam having a first channel;

a first glazing retainer having a first glazing retainer flange being received in the first channel;

a first glazing strip being attached to and being supported by the first glazing retainer;
a mullion bar being connected to the beam; and
a second glazing strip being attached to the mullion bar, the first and second glazing strips being on the same plane for supporting the glass or other transparent medium.

4,918,883

APPARATUS FOR COMPOSITE POLE REPAIR

Richard A. Owen, and Richard C. Hannay, both of Houston, Tex., assignors to Team, Inc., Alvin, Tex.

Filed Jun. 14, 1988, Ser. No. 206,579
Int. Cl.[5] E02D *27/42*; E04C *5/07*
U.S. Cl. 52—101 **33 Claims**

1. A composite structural encasement apparatus for bonding to wooden poles for transfer of tensile stresses comprising:
(a) a plurality of woven glass fiber mat strips, arranged with the longer dimension substantially parallel to the longitudinal axis of the pole, wherein the percentage of the woven fibers running along the length of the strops and running parallel to the length of the pole is within the range of from 50% to 80% of the total fibers, and wherein the remaining fibers are arranged so that ½ of the remaining fibers, from 10% to 25%, are placed at a 45° angle to the longitudinal fibers, and the remaining 10% to 25% percent of the woven fibers are placed at an opposite 45° angle to the longitudinal fibers relative to the first set of angled fibers;
(b) a liquid resin for saturation of the woven mat strips which subsequently hardens to form, in combination with the mat strips, a fiberglass encasement repair cylinder for a pole; and,
(c) an ultraviolet resistant coating for application to the exterior of the encasement.

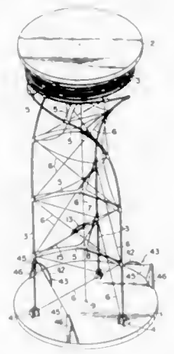
4,918,884

DEPLOYABLE AND COLLAPSIBLE STRUCTURE

Kakuma Okazaki, Yokohama, and Takayuki Kitamura, Yokosuka, both of Japan, assignors to Japan Aircraft Mfg. Co., Ltd., Yokohama, Japan

Filed Nov. 14, 1988, Ser. No. 272,215
Claims priority, application Japan, May 15, 1987, 62-117110; May 15, 1987, 62-71688; May 15, 1987, 62-71689
Int. Cl.[5] E04H *12/18*
U.S. Cl. 52—108 **1 Claim**

1. A deployable and collapsible structure comprising a pair of end plates; plural longerons arranged parallel to one another and elastically buckled, said longerons being pivoted on the end plates at their both ends; a plurality of radial spacers arranged along the axial direction of the longerons equally spaced from their adjacent ones; paired diagonal cords stretched between two adjacent radial spacers, between the lowest radial spacer and its closest end plate, and between the uppermost radial spacer and its closest end plate; and a pull cord connected to at least one of the end plates, one of the pair of end plates being moved toward the other when the pull cord is pulled, while one of the pair of end plates being separated from the other when the pull cord is loosened, and the longerons being buckled like a coil when the end plates approach each other, while the longerons being deployed like a straight line when the end plates separate from each other; and guide means on one of the pair of end plates for freely slidably glid-



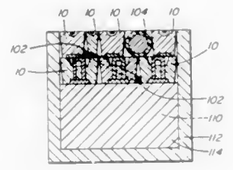
ing, relative to said one of the end plates, one end of one cord of each of the paired diagonal cords stretched between said one of the pair of end plates and the radial spacer closest to it, and said one end of each of the diagonal cords guided by said guide members being connected to the top of the pull cord.

4,918,885

METHOD AND APPARATUS FOR INHIBITING ICE MASS FORMATION

William P. Trumble, Kanata; Alan D. Ross, Gloucester, and Kevin H. Dick, Nepean, all of Canada, assignors to Bell Canada, Montreal, Canada

Filed Oct. 30, 1987, Ser. No. 114,967
Claims priority, application Canada, May 15, 1987, 537312
Int. Cl.[5] E02D *35/00*
U.S. Cl. 52—125.3 **19 Claims**



1. A method of inhibiting the formation of an ice mass around equipment housed in a chamber subject to water penetration, comprising packing a plurality of compressible, non-absorbent, smooth-surfaced blocks around the equipment to substantially fill the chamber, each block having an upwardly facing handle.

4,918,886

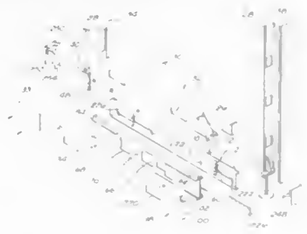
RACEWAY SYSTEM FOR MODULAR WALL PANELS

Fredrick C. Benoit, Corona; Ruben Cardenas, Culver City; Daniel Schmid, Torrance, and Joseph M. Wisniewski, Huntington, all of Calif., assignors to Harpers, Torrance, Calif.

Filed May 31, 1989, Ser. No. 359,287
Int. Cl.[5] E04F *17/00*
U.S. Cl. 52—221 **22 Claims**

1. In a wall panel of substantially rectangular configuration

comprising a rigid frame having a parallel pair of vertical frame members at the opposite side edges of said panel, a horizontally disposed bottom frame member, and a raceway for electrical power wires connected to the bottom of the bottom frame member, the improvement comprising:
a raceway frame for said raceway secured to and extending along said bottom frame member;
a horizontally elongate substantially rectangular raceway cover of a horizontal length substantially equivalent to the overall width of said panel and of an area to substantially fully enclose a side of said raceway;



detachably engageable means, comprising cooperating portions on a lower horizontal edge of said cover and on a lower portion of said raceway frame, for detachably securing said lower edge of said cover to said raceway frame in a manner to prevent displacement of said cover away from said raceway frame when an upper horizontal edge of said cover is locked to said raceway frame; and
lock means from locking a portion of said upper edge of said cover to said raceway frame in a manner to prevent displacement of said upper edge of said cover away from said raceway frame otherwise then by actuation of said lock means by an auxiliary tool.

4,918,887

PROTECTIVE TENDON TENSIONING ANCHOR ASSEMBLIES

Edgar A. Davis, San Jose, Calif.; Richard L. Watts, Springfield, and John Crigler, Dumfries, both of Va., assignors to VSL Corporation, Los Gatos, Calif.

Filed Oct. 14, 1987, Ser. No. 109,471
Int. Cl.[5] E04C *5/08*
U.S. Cl. 52—223 L **5 Claims**

1. A sealed anchor assembly for use in anchoring a post tensioning tendon in a concrete structure, comprising:
an anchor body for mounting in the concrete structure and for connection to the tendon, said anchor body having a bore extending therethrough of a size and shape to allow said tendon to extend through said bore; tendon mounting surface means in said bore for connection to said tendon, surface means on said body extending transverse to said bore, a raised rim on said body surrounding one end of said bore, an annular sealing surface formed on said rim,
a sealing cap for mounting on said body to close and seal said one end of said bore to prevent the ingress through said one end of harmful materials into said bore; said cap having a collar to closely fit over and around said rim, an annular sealing surface on the interior of said cap for cooperation with said sealing surface on said body, finger means on said cap for locking said cap in place on said body closing said one end of said bore, said fingers extending from said cap, surface means on said finger means for engaging said transversely extending surface means on said body to lock said cap on said body,
a resilient annular seal means for mounting on said cap to seal between said cap and said body, said seal means being of a size and shape to engage and be compressed between said sealing surfaces on said body and said cap when said cap is locked in place on said body, and
a tubular trumpet member for mounting on said body at the

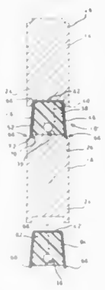
end of said bore, opposite said one end said trumpet member having an opening therethrough of a size and shape to fit around the tendon when said tendon extends into said body.

4,918,888

CHINKING CLOSURE SYSTEM FOR LOG STRUCTURES

Randy K. Giles, and Gordon H. Lucas, both of Jefferson County, Tenn., assignors to Hearthstone Builders, Inc., Dandridge, Tenn.

Filed Feb. 29, 1988, Ser. No. 161,748
Int. Cl.[5] E04B *1/10*
U.S. Cl. 52—233 **8 Claims**



1. An improved chinking closure system for adjacent logs in a log structure comprising:
at least a pair of logs including a first log and second log disposed below said first log, each said log having an elongated body of preselected length along its longitudinal axis and having an upper portion and a lower portion and further defining a width along its traverse axis terminating in first and second exterior surfaces, said logs being arranged such that said lower portion of said first log is juxtaposed and spaced from said upper portion of said second log such that a chink is defined therebetween;
a compressible insulation block member for insertion into said chink so as to engage said upper portion of said second log and said lower portion of said first log whereby said block member supports said first log in a selectively

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spaced position above said second log and provides insulation therebetween, said compressible insulating block member being provided with a bore extending longitudinally there through for receiving electrical wiring; and

at least one closure member having an upper portion which is releasably connected to said lower portion of said first log and a lower portion which is releasably connected to said upper portion of said second log.

4,918,889

HIGH-RISE BUILDING

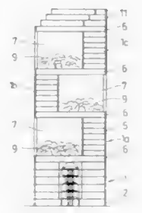
Björn Lundström, Vasavägen 37, S-181 42 Lidingö, and Olle Rex, Attundavägen 6, S-161 52 Bromma, both of Sweden

Filed Aug. 25, 1989, Ser. No. 398,744

Claims priority, application Sweden, Aug. 26, 1988, 8802994

Int. Cl.[5] E04H *1/00*

U.S. Cl. 52—234 8 Claims



1. A high-rise building comprising a plurality of storeys, characterized in that two or more units of superimposed storeys of said plurality of storeys are arranged on top of one another; in that each storey unit has a common garden area located within the confines of the high-rise building limiting area with a garden floor area on the same level as the lowermost storey of the unit; in that each storey unit is served by an elevator and staircase arrangement which is restricted to its respective storey unit and accessable from the garden floor area of the lowermost storey of the unit; and in that the garden areas are mutually connected from the ground floors of the lowermost storeys of respective units of the high-rise building by means of separate elevators and staircases.

4,918,890

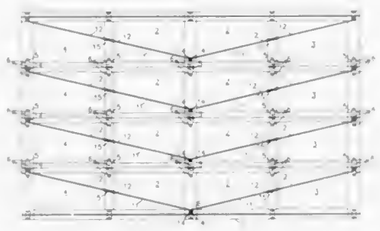
GARAGE DOOR ANTISAG DEVICE

Thomas A. Stafford, 3116 Jordan St., Boise, Id. 83702

Filed Feb. 21, 1989, Ser. No. 313,190

Int. Cl.[5] E04G *23/00*

U.S. Cl. 52—291 2 Claims



1. An antisag device for use on garage doors having at least two width defining rectangular panels, one being the right hand panel and the other being the left hand panel, whith comprises a pair of adjustable tensive members having off set eyeholes at first and second ends and wherein a first tensive member is tensively and diagonally attached across the right hand panel were said first end of said first tensive member is attached to the upper right hand corner of the right hand panel while said second end is attached to a center point between the lower left hand corner of the right hand panel and the lower right hand corner of the left hand panel and further wherein a second tensive member is tensively and diagonally attached across the left hand panel where said first end of said second tensive member is attached to the upper left hand corner of the left hand panel while said second end is attached to said center point.

4,918,891

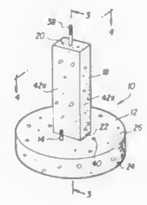
PRECAST CONCRETE FOUNDATION ELEMENTS AND SYSTEM AND METHOD OF USING SAME

Mark Gerszewski, Norfolk, Va., assignor to U.M.C., Inc., Virginia Beach, Va.

Continuation-in-part of Ser. No. 49,060, May 12, 1987, abandoned. This application Apr. 18, 1989, Ser. No. 339,842

Int. Cl.[5] E02D *27/10*

U.S. Cl. 52—295 14 Claims



1. A precast one-piece foundation element to be constructed in a factory and transported to a construction site for constructing houses said one piece foundation element comprising:

a concrete, broad, flat-shaped footing having a breadth in all directions of a plane which is greater than twice the thickness thereof, said breadth in said all directions of said plane being around 20 inches or greater, said broad, flat-shaped footing having a broad top side and a broad bottom side;

cast together, as one piece, with said broad, flat-shaped footing on the top side thereof, an elongated concrete pier having a bottom end and a top end and having a substantially greater length dimension than a greatest lateral dimension thereof, said pier extending in elongation perpendicularly away from a central portion of said top side of said footing at the bottom end of said pier, the greatest lateral dimension of said pier being smaller than half the breadth of said footing;

pier reinforcing embedded in and extending substantially throughout said concrete pier into said concrete footing so as to bridge said concrete pier and footing and thereby reinforce a strength with which these two members are bonded one to the other;

footing reinforcing embedded in and cast with said footing, said footing reinforcing extending in said footing laterally beyond said lateral surfaces of said elongated concrete pier;

a bolt, cast with, and thereby embedded in, said pier and extending from the top end thereof, said bolt being sufficiently embedded in said pier so as to allow the foundation element to be lifted and moved about by engaging the bolt only;

whereby a portion of a house foundation can be formed by boring a round hole in the ground of a depth less than a combined footing thickness and pier length and of a breadth greater than a greatest footing breadth, and then placing said precast foundation element therein with the top end of said pier extending above ground for forming a platform on which said house can be built.

4,918,892

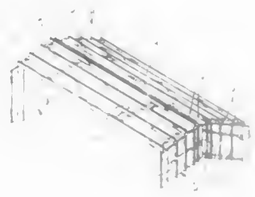
HARDWARE ASSEMBLY FOR MOUNTING COPING

Michio Akasaka, 52 Aka Yamaura, Ooaza Yakushiji Shikatsu-chu, Nishi Kasugai-gun, Japan

Filed May 31, 1989, Ser. No. 359,727

Int. Cl.[5] E04H *12/00*

U.S. Cl. 52—300 5 Claims



1. Assembly for mounting coping on a surface comprising:

a first vertical plate including means for fastening a first end of a cover thereon and means for allowing bending of the plate along a vertical line so as to form an angle defined by the bent plate;

a second vertical plate including means for fastening a second end of a cover thereon and means for allowing bending of the plate along a vertical line so as to form an angle defined by the bent plate; and

first and second covers to be mounted by their respective ends each to the first and second vertical plates and wherein each cover includes a mating edge for contacting a substantial portion of the mating edge of the other cover when the first and second covers are mounted on the vertical plates and the vertical plates bent to conform to and mounted on a structural body.

4,918,893

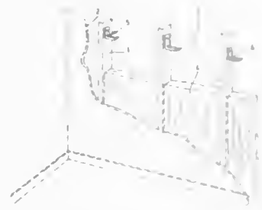
ONE-PIECE STUD ATTACHMENT FOR SUPPORTING NON-RIGID INSULATION WITHIN A WALL STRUCTURE

Jack-Eric Vandenbroucke, 33, Lisière, St-Constant, (Quebec), Canada (J0L 1X0), and Jack Vandenbroucke, 1493, Bachand, Carignan, (Quebec), Canada (J3L 4E6)

Filed Oct. 26, 1988, Ser. No. 262,707

Int. Cl.[5] E04B *1/74*

U.S. Cl. 52—404 20 Claims



1. A one-piece stud attachment for supporting non-rigid insulation filling cavities within a wall structure including a plurality of spaced apart, generally parallel studs, each of said cavities being delimited by two adjacent ones of said studs, said stud attachment comprising a first and a second tongue portions angularly disposed with respect to each other, said first tongue portion comprising means for attaching the same to one of said studs with the second tongue portion projecting into one of said cavities delimited by the latter stud, which second tongue portion penetrating said non-rigid insulation to support it and thereby prevent slippage thereof downwardly by gravity, wherein at least one of said first and second tongue portions is embossed in order to increase the mechanical rigidity of said stud attachment.

4,918,894

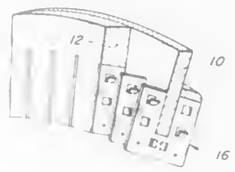
REFRACTORY SUPPORTING ANCHORING SYSTEM

Gary L. Page, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Nov. 21, 1988, Ser. No. 275,045

Int. Cl.[5] E06B *1/58, 1/60;* E04B *1/41*

U.S. Cl. 52—506 7 Claims



1. In an insulated structure comprising a metal member having an interior surface and an open end, said interior surface having an applied thermally insulating refractory liner, and said liner extending to said open end, the improvement wherein:

a plurality of refractory supporting anchors are attached to said open end in a substantially uniformly spaced pattern, said anchors including:

(a) a plate with a slot defined therein for insertion onto, and attachment to, said open end of said metal member; and

(b) at least one refractory supporting element defined longitudinally on each of said plates defining lateral sides of said slot and extending for a distance equal to the thickness of said refractory liner, said refractory supporting elements being substantially surrounded by said applied refractory.

4,918,895

SANDWICH WALL SYSTEM PANEL

Hugo A. Landheer, Spijkenisse, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands

Filed Jan. 11, 1989, Ser. No. 295,960

Claims priority, application United Kingdom, Jan. 11, 1988, 8800504

Int. Cl.[5] E04C *1/10*

U.S. Cl. 52—580 10 Claims

1. A sandwich wall system panel comprising an insulating core, a first metal skin adhered to one face of the core, a second metal skin adhered to the opposite face of the core, first and second longitudinal edges of each of said first and second metal skins being arranged at opposite longitudinal edges of the panel, a rim portion associated with and extending along the first longitudinal edge of each of said first and second metal skins, said rim portions facing one another, the free ends of said rim portions extending in parallel spaced relation to one another, effective to define a central joining tongue extending from one longitudinal edge of the panel, a pair of spaced parallel legs, one extending along said second longitudinal edge of each of said first and second skins and projecting beyond the core said legs being spaced to form a groove to receive the central joining tongue formed by the rim portions of an adjacent, similar panel, and at least one separate rigid connector,

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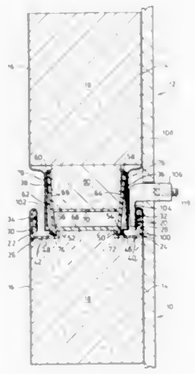
inserted between and connecting said tongue—forming free ends of said rim portions to said spaced parallel legs to prevent

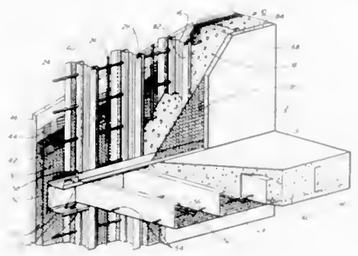


movement of said rim portions towards and away from one another.

4,918,896
TELESCOPIC FLAGPOLE
Harold Wiese, North Highland, P.O. Box 236, Madison, S. Dak. 57042
Filed Oct. 17, 1988, Ser. No. 258,802
Int. Cl.[5] E04H *12/32*
U.S. Cl. 52—632 9 Claims

1. A lanyard free telescoping flagpole comprising:
(A) a bottom segment, at least one intermediate segment, and a top segment, each of said segments comprising a rigid elongated cylindrical tube of a size to fit telescopically within the next adjacent lower tube,
(B) guide means to facilitate telescopic movement of adjacent tubes comprising:
(1) bushings adjacent to the upper ends of said bottom and intermediate segments, said bushings being engageable with the outer surfaces of the next adjacent upper tube, and
(2) annular shoulders projecting from the lower ends of said intermediate and top segments, said shoulders being engageable with the inner surfaces of the next adjacent lower tube,
(C) stop means to limit upward extension of adjacent tubes comprising internal bushing rings spaced downwardly from the bushings of the upper ends of the bottom and intermediate segments, said rings being engageable with the outer surfaces of the next adjacent upper tube and with the projecting shoulders of the next adjacent upper tube,
(D) locking means for securing adjacent tubes in extended relation, and
(E) flag-engaging means on said top segment.

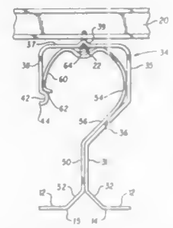
4,918,897
CONSTRUCTION SYSTEM FOR DETENTION STRUCTURES AND MULTIPLE STORY BUILDINGS
Charles W. Luedtke, 110 Bransford Rd., NE., Atlanta, Ga. 30342
Filed Oct. 6, 1987, Ser. No. 106,542
Int. Cl.[5] E04B *1/00*
U.S. Cl. 52—747 7 Claims



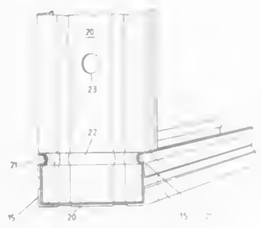
1. A method of constructing a light gauge metal reinforced concrete structure upon a foundation comprising the steps of:
(a) erecting a first level of said structure, said first level including a plurality of light gauge metal framed wall panels having an upper end and a base upon said foundation, by securing said bases to said foundation for forming a framed enclosure;
(b) securing a floor/ceiling member to said upper ends of said wall panels for providing a ceiling over said first level and a floor for a succeeding level;
(c) placing exterior sheathing over said wall panels for enclosing said first level;
(d) loosely fastening a diagonally extending tension strap between said upper end and said base of each of said wall panels;
(e) erecting a second level of said wall panels over said first level wall panels for forming a second story framed enclosure;
(f) tightening said diagonal tension straps of said first level for resisting lateral loads on said wall panels;
(g) erecting successive levels in sequence as detailed in steps a through f for constructing a multi-story structure to a desired height; and
(h) installing a roof assembly over said structure.

4,918,898
BUILDING PANEL
John D. McLeod, Jr., P.O. Box 885007, Leesburg, Fla. 32788-5007
Filed Feb. 7, 1989, Ser. No. 307,036
Int. Cl.[5] E04C *1/10*
U.S. Cl. 52—588 15 Claims

1. A building panel adapted to connect with an adjacent panel of similar structure comprising:
a substantially planar central portion with two opposed edges,
a first riser at one of said edges extending substantially normal to said central portion and connected to said central portion by a first portion extending outwardly at an angle relative to said central portion, a first channel-shaped locking member connected to said first riser by a second portion extending inwardly relative to said central portion at an angle of 45° relative to said first riser, said first channel-shaped locking member being substantially centered relative to said first riser and defining a longitudinally extending opening at least partly bounded by said second portion,
a second riser at the other said edge extending substantially normal to said central portion and connected to said central portion by a third portion extending outwardly at an angle relative to said central portion, a second channel-shaped locking member connected to said second riser by a fourth portion extending outwardly relative to said central portion at an angle of 45° relative to said second riser, said second channel-shaped locking member being substantially centered relative to said second riser and dimensioned to be snugly received internally of a longitudinally extending opening of a first channel-shaped locking member of an adjacent panel with said second riser and said fourth portion of said panel abutting a first riser and a second portion of said adjacent panel.

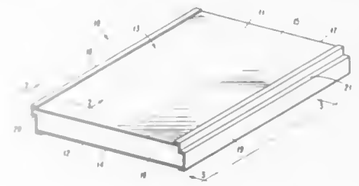


4,918,899
BUILDING FRAME CONSTRUCTION
Alexandros Karytinos, 12 Churcher Street, Thorngate, Australia (5082)
Filed Dec. 14, 1988, Ser. No. 284,208
Claims priority, application Australia, Dec. 16, 1987, PI5935
Int. Cl.[5] E04B *2/58*
U.S. Cl. 52—690 9 Claims



1. Building frame construction comprising upper and lower wall plates and wall studs, each wall plate having a first end and being of a cross-section of a general channel shape that is defined by two side flanges and a web joined to and extending between the plate flanges, each plate flange having an inturned rib adjacent the plate first end, the wall studs joining the upper and lower wall plates, each of said wall studs also having a first end and being of a cross-section of general channel shape defined by two side flanges joined by a web, the flanges of each stud having imperforated deformations defining grooves extending across the full widths of the stud flanges adjacent at least that of said stud first end which inter-engage the inturned ribs of a plate to form an interference fit upon erection and thereby firmly retain that stud end to that plate, said studs and wall plates being of metal roll-formed to said channel shape.

4,918,900
LIGHT-WEIGHT WALL PANEL FOR PROTECTIVE ENCLOSURE
Kevin A. Fee, Marion, and Mark S. Hollinrake, Hiawatha, both of Iowa, assignors to Inter Innovation LeFebure Manufacturing Corp., Cedar Rapids, Iowa
Filed Jun. 30, 1989, Ser. No. 374,303
Int. Cl.[5] E04C *2/00*
U.S. Cl. 52—811 11 Claims



1. A wall panel for a protective enclosure, the wall panel having oppositely facing major surfaces and a compound wall structure there between, which structure comprises:
an outer wall structure including a plurality of first boards, and a plurality of first metal sheets, said first boards being disposed adjacent one another and said first metal sheets being interleaved between each two adjacent ones of such first boards to from a stack, said stack extending parallel of said major surfaces of said wall panel such that the combined thicknesses of the first boards and interleaved first metal sheets establish the width of said wall panel, adjacent first boards and a respective one of said interleaved first metal sheets being joined to each other by first elongate metal members extending substantially perpendicular through such adjacent first boards and forming a matrix of metal with such interleaving first metal sheets, said matrix permeating said stack of said first boards, said elongate metal members of said matrix extending substantially in parallel to, and said first metal sheets extending in planes perpendicular to, major surfaces of said wall panel;
an inner wall structure disposed adjacent said outer wall structure, said inner wall structure including at least first and second adjacent layers of second boards, said layers being disposed in planes parallel to said major surfaces of said wall panel, and an interleaving second metal sheet disposed between adjacent ones of said at least first and second layers of second boards, said inner wall structure being joined to said outer wall structure by second elongate metal members extending perpendicular to said major surfaces of said wall panel through said layers of interleaved second metal sheet and second boards and into said first boards; and
a metal shell encasing said inner and outer wall structures.

4,918,901
DEVICE FOR THE INFEED OF DISCRETE STRIPS OF TIN FOIL IN CIGARETTE PACKAGING MACHINERY
Antonio Gamberini, and Alessandro Minarelli, both of Bologna, Italy, assignors to G. D. Societa Per Azoni, Italy
Filed Sep. 16, 1987, Ser. No. 97,445
Claims priority, application Italy, Sep. 24, 1986, 3516 A/86
Int. Cl.[5] B65B *11/30*
U.S. Cl. 53—234 4 Claims

1 A device for the infeed of discrete strips of tin foil in cigarette packaging machinery, comprising:

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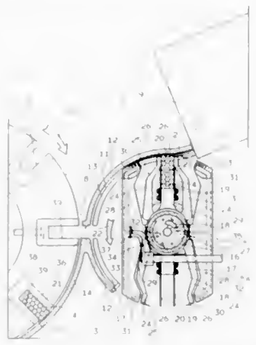
indexing means provided with at least one slot designed to accommodate a bundle of cigarettes, and designed to transfer bundles of cigarettes singly and in succession from a point of their entry into said slot, to a folding station, said slot having two transversally opposite flanks on said indexing means, said indexing means includes an indexing head which is rotatable about a given axis, said slot comprising radial side walls immovably mounted to and incorporated into said indexing head and opening radially outwards in relation to said axis;

cigarette feeding means for feeding a bundle of cigarettes to said slot;

supply means downstream from said cigarette feeding means in direction of movement of said indexing means which turn out a succession of discrete strips of tin foil for feeding said foil to said indexing means, said supply means being located adjacent to said indexing means;



a folding station at which, in use, each discrete strip of foil is to be wrapped around a corresponding said bundle of cigarettes;

feed means, and means for moving said feed means as one with said indexing means, for transferring said discrete strips of foil singly and in succession from said supply means to said folding station;

two releasable holding means, integral with said feed means and disposed at respective said flanks of said slot, for taking receipt of each discrete strip of foil from said supply means and holding it to said indexing means on both flanks of the slot so that it bridges over the slot and the respective said bundle of cigarettes accommodated therein during transfer of the slot from said point of entry, to said folding station.

4,918,902

METHOD OF AND APPARATUS FOR FILLING INERT GAS IN A CAN

Tohru Honma, Omiya; Shigeki Mori, Kuki; Kunihiko Ohya, Kasukabe; Shiro Matsumoto, Kasukabe; Akira Nakata, Ageo; Ichiro Abe, Yokohama, and Naoto Hosaka, Kamakura, all of Japan, assignors to Hokkai Can Co., Ltd. and Kirin Brewery Co., Ltd., both of Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 225,838

Int. Cl.[5] B65B *31/04*

U.S. Cl. 53—403 20 Claims

1. An apparatus for filling an inert gas in a cap including a can cap having a panel and a peripheral wall depending from the panel along the entire periphery of the panel and a can barrel filled with contents, said apparatus comprising:

can cap holder means for holding the can cap with the panel up;

a can barrel lifting/lowering device for lifting the can barrel up to a first position in which an upper edge of the can barrel is spaced a gap from a lower edge of the peripheral wall of the can cap held by said can cap holder means, and then for lifting the can barrel up to a second position in which the upper edge of the can barrel is fitted into the peripheral wall of the can cap; and

an inert gas injector having a plurality of injector nozzles along said gap for injecting an inert gas through said gap

into said can cap and said can barrel to replace air in said can cap and said can barrel with the injected gas, when said can barrel is in said first position, said inert gas injector includes an inert gas discharge passage disposed in opposite relation to said injector nozzles for discharging an excessive inert gas injected from said injector nozzles and discharged through said can barrel and said can cap.

4,918,903

PROCESS FOR BOTTLING LIQUID PRODUCTS WHICH WILL CONTAIN FRAGRANCE OILS

Sylvester Holston; Robert Ziek, both of Cincinnati, and William Woodruff, Urbana, all of Ohio, assignors to The Drackett Company, Cincinnati, Ohio

Filed Jun. 2, 1989, Ser. No. 360,652

Int. Cl.[5] B65B *3/04;* **B67B** *3/20*

U.S. Cl. 53—471 16 Claims

1. A process for bottling a liquid product that will contain fragrance oils which comprises

(a) sequentially filling a bottle having a threaded neck with liquid product and fragrance oils, said fragrance oils being added to said bottle in temporarily bound form whereby the wetting of said bottle neck with fragrance oils is essentially avoided,

(b) applying a threaded cap to said bottle filled according to step (a) so that the threads on said cap engage the threads on said bottle;

(c) applying a torque to said cap to tighten it to a predetermined degree on said bottle, and

(d) subsequent to the filling step (a), allowing said fragrance oil contained in said bottle in said bound form to be released to the liquid product.

4,918,904

METHOD FOR FORMING CLAM-LIKE PACKAGING SYSTEM

Daniel A. Pharo, 1901 Avenue of the Stars, Suite 450, Los Angeles, Calif. 90067

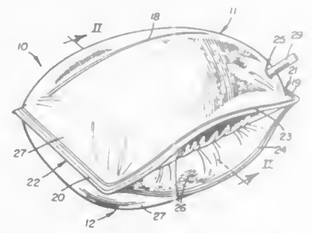
Division of Ser. No. 262,537, Oct. 25, 1988, Pat. No. 4,874,093, which is a continuation-in-part of Ser. No. 89,228, Aug. 25, 1982, Pat. No. 4,872,558. This application Aug. 11, 1989, Ser. No. 392,431

Int. Cl.[5] B65B *23/22*

U.S. Cl. 53—472 6 Claims

1. A method for forming a packaging system comprising the steps of

forming a package to define a first bag portion superimposed over a second bag portion thereof with each of said first and second bag portions defining an inflatable chamber therein, including forming at least one seam transversely across said first and second bag portions to define at least



one passage between said first and second bag portions inter-communicating the inflatable chambers thereof,

securing overlying side edge portions of said bag portions together at opposite lateral sides thereof to define an article-retaining pocket therebetween and to expose said pocket on only one side of said package.

4,918,905

METHOD AND DEVICE FOR PACKAGING AN ELONGATE BODY

Frans Hoekstra, Diepenveen, Netherlands, assignor to Thomassen & Drijver-Verblifa N.V., Netherlands

Filed Jun. 28, 1988, Ser. No. 212,677

Claims priority, application Netherlands, Jul. 3, 1987, 8701576

Int. Cl.[5] B65B *11/16*

U.S. Cl. 53—411 18 Claims

1. Method for packaging an elongate body, for example a stack of covers, comprising the following steps:

the providing of an elongate body for packaging;

the providing of a sheet of packaging material;

the wrapping of said body with said sheet of packaging material such that said sheet protrudes over a predetermined distance beyond at least one outer end of said body;

the folding over of the protruding part from two opposing sides to the relevant end face of said body such that two tapering flaps are formed; characterized by the following step;

the joining of these two flaps substantially to each other only.

4,918,906

METHOD AND APPARATUS FOR PRODUCING A BAG-IN-CARTON

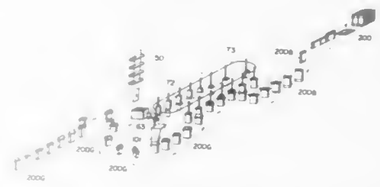
Shigeich Ako, New South Wales, Australia, assignor to Matsushima Engineering Co., Ltd., Nagasaki, Japan

Filed Mar. 18, 1988, Ser. No. 169,943

Claims priority, application Japan, Mar. 20, 1987, 62-64492; Mar. 20, 1987, 62-64493

Int. Cl.[5] B65B *43/14, 43/04*

U.S. Cl. 53—449 22 Claims



2. A method for producing a bag-in-carton, comprising the steps of:

(a) providing a flat carton blank having folding lines;

(b) providing a first conveyor means;

(c) feeding said flat carton blank to said first conveyor means;

(d) folding said blank along the folding lines thereof on said first conveyor means to form a square tubular-shaped carton which has side panels and a bottom portion and lies on one side on said first conveyor means which supports and conveys said carton horizontally;

(e) raising said square tubular-shaped carton lying on the side panel thereof vertically and transferring it to a second conveyor means while turning the carton so that the carton runs on said second conveyor means with the side panels thereof parallel to said further conveyor means;

(f) bonding the bottom portion of said square tubular shaped carton while it is being conveyed;

(g) providing a flattened bag having a filling aperture;

(h) feeding the flattened bag to said second conveyor means with a top portion thereof being unsealed;

(i) inserting said bag into the square tubular shaped carton, after inflating said bag to a square-tubular shape from above said square tubular shaped carton conveyed;

(j) measuring and filling product to be packed in a bag-in-carton into said bag; and

(k) successively sealing the filling aperture of said bag and an open portion of said square-tubular shaped carton.

4,918,907

FORMING AND FILLING FLEXIBLE PLASTIC PACKAGING

Kevin V. Roach, Carver; M. Selim Cetiner, Sudbury; Vincent E. Faherty, Brockton, and Francis P. Ventura, Upton, all of Mass., assignors to T W Kutter Inc., Avon, Mass.

Filed Jan. 20, 1988, Ser. No. 146,038

Int. Cl.[5] B65B *5/06*

U.S. Cl. 53—453 41 Claims

30. In forming and filling flexible plastic packages comprising forming a web of plastic pulled through and processed in a thermoformer to provide formed receptacles, placing articles in said formed receptacles to provide filled receptacles, providing a cover over said filled receptacles, sealing said cover to said web around said receptacles, and cutting said web between said filled receptacles to provide separate packages, the improvement wherein said forming comprises,

advancing a thin flexible web of plastic through said thermoformer,

providing a first pressure difference on opposite sides of said

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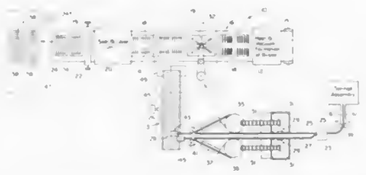
plastic web when heated and positioned in a mold of said thermoformer to provide an initial contour with substantially uniform stretching of said heated, plastic web, and thereafter providing a second pressure difference which is larger than said first pressure difference and is sufficiently



large to force the heated plastic web into the desired shape of a mold of said thermoformer to provide formed receptacles with a wall thickness at least equal to a predetermined minimum thickness sufficient to maintain integrity of said packages.

4,918,908

APPARATUS FOR FEEDING BLANKS TO A FOLDING TURRET OF A PACKAGING MACHINE

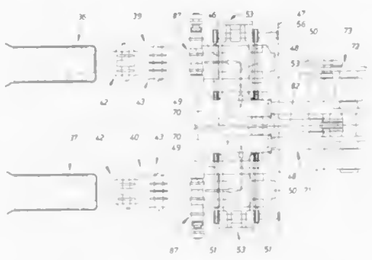
Heinz Focke, and Helmut Granz, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Nov. 7, 1988, Ser. No. 268,304

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1987, 3738102

Int. Cl.[5] B65B *13/20*

U.S. Cl. 53—579 **13 Claims**



1. Apparatus for feeding blanks to a packaging unit, in the form of a folding turret, with pockets, each receiving a blank, the blanks being conveyable into a position above a pocket of the folding turret and being pressable into the upwardly open pocket as a result of a downward movement, characterized by the following features:

(a) means for pressing the blanks (**10**) in pairs into two respective pockets (**32,33**) of the folding turret (**31**) which are arranged next to one another,

(b) means for simultaneously feeding the blanks (**10**) on separate blank tracks (**39,40**), the distance between these tracks being greater than the distance between the pockets (**32, 33**) of the folding turret (**31**),

(c) means for moving the blanks (**10**), immediately before entering the pockets (**32,33**), towards one another, transversely relative to the blank tracks (**39,40**), to a distance corresponding to the distance between the pockets (**32,33**), in order to be pushed into the pockets (**32,33**) simultaneously.

4,918,909

GREEN ASPARAGUS HARVESTER

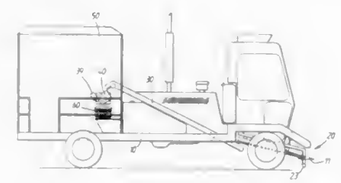
William J. Salkeld, Cowra, Australia, assignor to Linero Pty. Ltd., Cowra, Australia

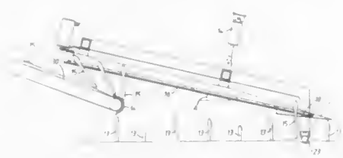
Filed Aug. 30, 1988, Ser. No. 238,572

Claims priority, application Australia, Aug. 31, 1987, PI4077

Int. Cl.[5] A01D *45/00*

U.S. Cl. 56—327.2 **14 Claims**





1. A green asparagus harvester having (i) a spear selection and picking unit and (ii) a harvested spear collection unit, characterized in that the spear selection and picking unit comprises

(a) a comb comprising at least one pair of tynes, the tynes of said pair being spaced from the each other and defining a tapered feed channel for asparagus spears which have a height sufficient to be engaged by adjacent edges of said pair of tynes;

(b) a pair of elongate soft conveyors associated with said pair of tynes, said pair of soft conveyors (i) being mounted adjacent to each other with one end thereof adjacent to the narrow end of the feed channel formed by its associated pair of tynes, and (ii) being spaced apart a distance sufficient to enable the pair of soft conveyors to grip the top of a spear of asparagus without causing damage thereto; the elongate direction of each soft conveyor forming an acute angle relative to the horizontal;

(c) an asparagus spear sensing device associated with and mounted adjacent to said pair of soft conveyors, near to the end thereof which is adjacent to the narrow end of the feed channel formed by its associated pair of tynes, said sensing device being activated by the top of a passing spear of asparagus gripped by its associated pair of soft conveyors; and

(d) an asparagus spear cutting means, adapted to cut a spear of asparagus at or near its base, said cutting means being positioned substantially below said sensing device and being activated when said device is activated; and further characterized in that said spear collection unit comprises

(e) at least one main conveyor having a tail pulley and a shroud partially surrounding said tail pulley, said at least one main conveyor being mounted with its tail pulley adjacent to, but lower than the upper end of said pair of soft conveyors, whereby the bottom end of a cut spear of asparagus being transported by said pair of soft conveyors bears against said shroud and is partially rotated in its associated pair of soft conveyors before being released therefrom, so that the cut spear of asparagus falls on to the main conveyor for transportation tip first by the main conveyor;

(f) a cleated conveyor mounted at the end of said at least one main conveyor, said cleated conveyor being adapted to transport cut asparagus spears deposited thereon from said at least one main conveyor in a direction substantially at right angles to the direction of conveying of said at least one main conveyor; and

(g) at least one accelerator roller between the discharge end of said at least one main conveyor and said cleated conveyor.

4,918,910

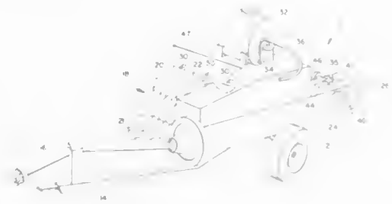
APPARATUS FOR DISPENSING A SUBSTANCE ONTO A CROP MATERIAL AT A CONTROLLED RATE

Ronald T. Sheehan, Lancaster; Shaun A. Seymour, New Holland; Mark K. Chow, Leola, and Richard P. Strosser, Akron, all of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Feb. 22, 1989, Ser. No. 313,427

Int. Cl.[5] A01D *39/00;* **A01F** *15/08*

U.S. Cl. 56—341 **20 Claims**



13. In a baler for picking up crop material and forming it into bales, apparatus for dispensing a substance from a container onto said crop material at a controlled rate, said apparatus comprising:

means for sensing the moisture content of said crop material to develop a first signal;

control circuit means responsive to said first signal for producing a pulse width modulated signal; and,

dispensing means including an electric motor responsive to said pulse width modulated signal for dispensing said substance onto the crop material at a rate determined by said pulse width modulated signal.

14. In a baler for picking up crop material and forming it into round bales, apparatus for dispensing a substance from a container onto said crop material at a controlled rate, said apparatus comprising:

means for sensing the size of a bale being formed in said baler to produce a first signal;

control circuit means responsive to said first signal for determining the rate of bale size increase and from said rate producing a control signal representing the bulk rate of crop flow into said baler; and,

dispensing means responsive to said control signal for dispensing said substance onto the crop material at a rate determined by said control signal.

4,918,911

SPINNING APPARATUS

Gerhard Grau, Muellheim, and Josef Derichs, Moenchengladbach, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Fed. Rep. of Germany

Filed Dec. 8, 1988, Ser. No. 281,823

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1987, 3741430

Int. Cl.[5] D01H *7/66, 7/50*

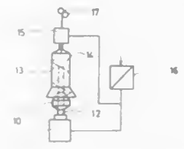
U.S. Cl. 57—100 **17 Claims**

1. In a spinning machine having an electric motor for rotating a bobbin-supporting spindle to build a package of yarn thereon and a funnel for guiding yarn onto the spindle, an apparatus comprising:

an electric motor for rotating the funnel;

means for supplying electrical power;

means, connected to the electrical power supplying means, for controlling the frequency to the electrical power supply;



means for commonly connecting the electric motors to the frequency controlling means, whereby both electrical motors are supplied with electrical power of the same frequency; and

said funnel electric motor having a torque characteristics for rotation of the funnel at a lower rate relative to the contemporaneous rate of rotation of the spindle.

4,918,912

CUT AND ABRASION RESISTANT SPUN YARNS AND FABRICS

Grant H. Warner, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 19, 1989, Ser. No. 354,196

Int. Cl.[5] D02G *3/04, 3/44;* **A43B** *17/00;* **A41B** *11/02*

U.S. Cl. 57—255 **8 Claims**

1. A spun yarn comprised of about 40–60 percent para-aramid fiber, about 20–40 percent nylon fiber, and about 10–30 percent acrylic fiber.

2. A spun yarn of claim 1 wherein the percentage of para-aramid fiber is about 50 percent, the percentage of nylon fiber is about 30 percent, and the percentage of acrylic fiber is about 20 percent.

4,918,913

METHOD OF, AND DEVICE FOR, PERFORMING A START SPINNING OPERATION FOR SPINNING OF A YARN IN A FRICTION SPINNING APPARATUS

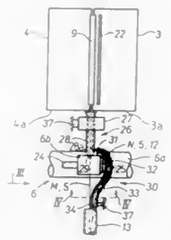
Emil Briner, Winterthur, and Samuel Wehrli, Pfäffikon, both of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Jun. 6, 1988, Ser. No. 203,061

Claims priority, application Switzerland, Jun. 12, 1987, 02208/87

Int. Cl.[5] D01H *15/02*

U.S. Cl. 57—263 **24 Claims**



1. In a method of performing a start spinning operation entailing starting or recommencing spinning of a yarn in a friction spinning apparatus, wherein freely floating fibers are delivered in a fiber infeed duct to a friction spinning surface of

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friction spinning means of the friction spinning apparatus, the fibers are conveyed on the friction spinning surface to a yarn formation location at which there is produced a yarn, and the yarn is withdrawn by yarn draw-off means, the improvement comprising the steps of:

conveying fibers to the yarn formation location;

twisting the fibers at the yarn formation location so as to form a twisted fiber structure of substantially predeterminate size;

generating an air jet for bypassingly conveying the twisted fiber structure and a yarn formed subsequent thereto past the yarn draw-off means;

engaging the twisted fiber structure and the subsequent formed yarn by yarn take-up means disposed after the yarn draw-off means with respect to a predeterminate direction of movement of the yarn;

interrupting the air jet; and

introducing the yarn into the yarn draw-off means.

10. A device for performing a start spinning operation entailing starting or recommencing spinning of a yarn in a friction spinning apparatus, wherein:

said friction spinning apparatus comprises:

first friction spinning means provided with a friction spinning surface;

said first friction spinning means defining a yarn formation location at which there is formed a twisted fiber structure;

means for delivering fibers to the friction spinning surface of the first friction spinning means;

the fibers being formed into the twisted fiber structure at the yarn formation location during the start spinning operation;

a pair of yarn draw-off rolls for withdrawing the twisted fiber structure in the form of a yarn in a yarn withdrawal direction;

at least one roll of said pair of yarn draw-off rolls comprising a non-continuous yarn draw-off roll;

a second friction spinning means arranged in close proximity but in non-contacting relationship with respect to the first friction spinning means;

said first and second friction spinning means forming therebetween a gap of substantially constant but predeterminate width;

said device for performing the start spinning operation comprising:

a blowing duct through which travels an air jet;

said blowing duct having an outlet and a predeterminate blowing direction for the air jet;

the outlet of said blowing duct being directed towards the yarn formation location and the blowing direction being oriented such that thrust of the air jet is divisible into two force components of different magnitudes defining a force component of larger magnitude and a force component of smaller magnitude;

the force component of larger magnitude being effective in the yarn withdrawal direction;

a yarn take-up means disposed after the pair of yarn draw-off rolls viewed in the yarn withdrawal direction; and

a yarn guiding element provided between the first and second friction spinning means and the yarn draw-off rolls for enabling the twisted fiber structure and a portion of the air jet in the blowing duct to bypass the non-continuous yarn draw-off roll such that the twisted fiber structure and a subsequent yarn portion can be engaged by the yarn take-up means.

4,918,914

YARN QUALITY MONITORING METHOD AND APPARATUS

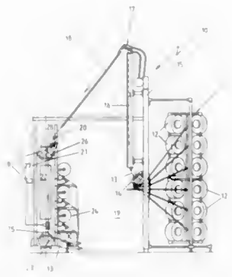
David C. Eaton, Buxton, United Kingdom, assignor to Rieter Scragg Limited, Cheshire, England

Filed Nov. 20, 1987, Ser. No. 123,242

Claims priority, application United Kingdom, Dec. 11, 1986, 8629597

Int. Cl.[5] D02G *1/02*; D01H *13/26, 13/32*; G06F *15/46*

U.S. Cl. 57—264 20 Claims



1. A method of texturizing a yarn and simultaneously monitoring the quality of a crimped yarn produced during said yarn texturizing process, comprising the steps of:

forwarding a yarn to a crimping device in a texturizing zone and texturizing said yarn in said zone to insert a crimp therein;

measuring a first velocity of the crimped yarn whilst forwarding the crimped yarn through said zone from said crimping device under a first tension which is sufficient to draw out the crimp;

then forwarding the crimped yarn under a stabilizing second tension which is insufficient to draw out the crimp and

measuring a second velocity of the yarn whilst so forwarding it;

and calculating a crimp velocity value from said yarn velocity measurements.

5. An apparatus for texturizing a yarn and simultaneously monitoring the quality of a crimped yarn produced during said texturizing comprising:

a texturizing zone and means disposed in said texturizing zone for crimping a yarn to insert a crimp therein;

first forwarding and tensioning means operable to forward the crimped yarn through said texturizing zone from said crimping means under a first tension sufficient to draw out the crimp therein;

first velocity measuring means operable to measure the velocity of the crimped yarn whilst it is forwarded under said first tension;

second forwarding and tensioning means operable to forward said crimped yarn under a second stabilising tension insufficient to draw out the crimp;

second velocity measuring means operable to measure the velocity of the crimped yarn whilst it is forwarded under said stabilizing second tenson; and

calculating means operable to calculate a crimp velocity value from said yarn velocity measurements.

4,918,915

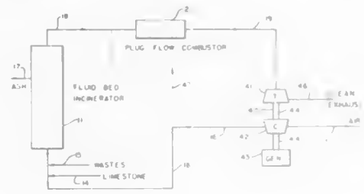
METHOD FOR CLEAN INCINERTION OF WASTES

William C. Pfefferle, 51 Woodland Dr., Middletown, N.J. 07748

Continuation-in-part of Ser. No. 98,785, Sep. 21, 1987, abandoned. This application Mar. 17, 1988, Ser. No. 169,595

Int. Cl.[5] F02C *3/04*

U.S. Cl. 60—39.02 5 Claims



1. A method for the destruction of hazardous carbonaceous wastes comprising solids, which comprises;

(a) gasifying said carbonaceous wastes and producing an intimate admixture of the gaseous products of said gasification with air, said admixture containing at least a stoichiometric amount of said air;

(b) passing said admixture to a plug flow combustion zone, and

(c) effecting sustained and essentially complete combustion of said admixture under essentially adiabatic conditions in the combustion zone to destroy said gaseous products and to form a heated combustion effluent; said combustion being characterized by said admixture having an adiabatic flame temperature such that the actual flame temperature in the combustion zone is greater than about 1350° K.;

wherein combustion of said admixture is stabilized by mixing of said admixture with hot combustion products prior to passage to said plug flow combustion zone.

4,918,916

METHOD FOR TRANSFERRING WATER FROM COMBUSTION GASES TO AIR OF COMBUSTION

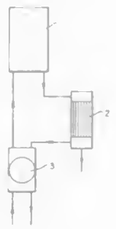
Lars Tiberg, Vad 4201, S-770 20 Söderbärke, Sweden

Filed Aug. 22, 1988, Ser. No. 236,368

Claims priority, application Sweden, Aug. 28, 1987, 87033387

Int. Cl.[5] F01N *3/02*

U.S. Cl. 60—273 3 Claims



1. A method for transferring water from combustion gases to air-of-combustion when combusting hydrogen containing or moist fuels, comprising cooling the combustion gases to a temperature beneath or in proximity of their dew point temperature, and then further cooling the gases in a regenerative heat exchanger, having a combustion gas side and an air-of-combustion side, with the incoming air-of-combustion, so that water vapor is condensed on the combustion gas side and revaporized on the air-of-combustion side, and transferring both heat and water vapor from the combustion gas side to the air-of-combustion side.

4,918,917

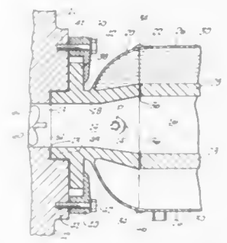
LIQUID COOLED EXHAUST FLANGE

Woodrow E. Woods, 3640 Fiscal Ct., Riviera Beach, Fla. 33404

Filed May 22, 1989, Ser. No. 354,883

Int. Cl.[5] F02B *37/00*

U.S. Cl. 60—320 4 Claims



1. A liquid-cooled exhaust flange for mating a liquid-jacketed exhaust conduit system to a conventional internal combustion engine turbo charger discharge port, comprising:

a generally cylindrical elongated exhaust conduit member adapted to mate in sandwiched relationship between said turbo charger housing and said liquid-jacketed exhaust conduit system;

a cooling liquid-jacket housing integrally and concentrically connected to said exhaust conduit member adapted to mate in fluidly communicating relationship with a flow of cooling liquid within said liquid-jacketed exhaust conduit system;

said liquid-jacket housing covering a substantial portion of the external surface area of said exhaust conduit member so as to reduce the temperature of the external surface of said exhaust flange.

4,918,918

VARIABLE DISPLACEMENT PISTON MACHINE

Kenichi Miki, and Yoichiro Kotake, both of Settsu, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

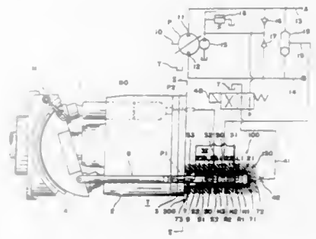
PCT No. PCT/JP87/00908, § 371 Date Jul. 25, 1988, § 102(e) Date Jul. 25, 1988, PCT Pub. No. WO88/03992, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 24, 1987, Ser. No. 251,220

Claims priority, application Japan, Nov. 25, 1986, 61-281567

Int. Cl.[5] F16D *39/00*

U.S. Cl. 60—489 11 Claims



1. A variable displacement piston machine comprising:

a valve plate which is fixed to a housing and provided with

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a high-pressure port, a low-pressure port, and a first control port located between both the ports;

a cylinder block which is rotatably mounted and includes a plurality of piston chambers regularly spaced from each other in the circumferential direction and extending in the axial direction, and pistons reciprocating in the respective piston chamber, one end of the cylinder block being in slidable contact with the valve plate so that the piston chambers communicate with the high-pressure port, first control port and low-pressure port as the cylinder block rotates;

a swash plate inclinably mounted to the other end of the cylinder block for adjusting the stroke of the pistons;

a feedback valve for performing a feedback control of the inclining motion of the swash plate, wherein first and second spools engaged with each other are fitted in a valve chamber provided in a main body in such a manner that the first and second spools can move back and forth, the second spool is pressed toward an end of the valve chamber by a spring while the first spool is connected to the swash plate through a connecting member, the second spool is moved against the force of the spring by the pressure of fluid introduced from an introduction passage open to the valve chamber and connects a first control passage communicating with the first control port selectively either to a high-pressure passage communicating with the high-pressure port or to a tank passage while the first spool connects the first control passage selectively either to the tank passage or to high-pressure passage in accordance with an inclining motion of the swash plate and shifts the second spool with the aid of the pressure of fluid introduced into the introduction passage so as to diminish the inclination of the swash plate, and the inclining motion of the swash plate is controlled by shifting the first spool in accordance with the inclination of the swash plate; and

second-spool regulating means provided in the introduction passage for regulating a speed at which the second spool moves.

4,918,919

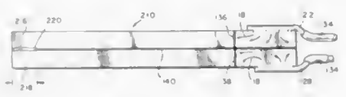
SPLIT MEMORY ELEMENT

William C. McCoy, Zionsville; James E. Small, Logansport, and Gregory Cole, Carmel, all of Ind., assignors to Catheter Research, Inc., Indianapolis, Ind.

Continuation of Ser. No. 246,430, Sep. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 104,641, Oct. 2, 1987, Pat. No. 4,777,799. This application Jul. 19, 1989, Ser. No. 383,233

Int. Cl.[5] F03G 7/06

U.S. Cl. 60—528 34 Claims



1. A memory element comprising

a tip member, and

first and second strip members aligned in side-by-side relation, each of the tip member, first strip member, and second strip member being made of a shape-memory alloy and having a characteristic internal structure, each strip member including a proximal portion coupled to the tip member, a distal portion, and partition means for interconnecting the proximal and distal portions, each partition means having an internal structure which is dissimilar to the characteristic internal structure of the tip member and the first and second strip members.

4,918,920

HYDRAULIC REMOTE CONTROL DEVICE FOR CONTROLLED MEMBERS, SUCH AS EXTERNAL REAR VIEW MIRRORS ON VEHICLES

Bernard Duroux, Garancieres, France, assignor to Britax (GECO) S.A., Vulaines sur Seine, France

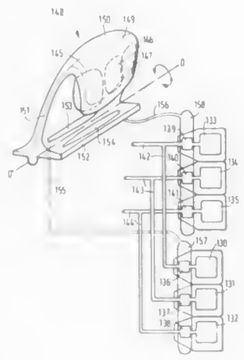
PCT No. PCT/FR87/00371, § 371 Date May 24, 1988, § 102(e) Date May 24, 1988, PCT Pub. No. WO88/02322, PCT Pub. Date Apr. 7, 1988

PCT Filed Sep. 29, 1987, Ser. No. 207,054

Claims priority, application France, Oct. 2, 1986, 86 13776

Int. Cl.[5] F15B 7/02

U.S. Cl. 60—536 26 Claims



1. A hydraulic remote control device for at least one controlled member (211) movable on a support (213, 210), said device comprising:

a manually operated control member and

at least two hydraulic positioning circuits each comprising:

a positioning transmitter (9), which is fluid pressure transmitter comprising a flexible walled deformable bag containing a hydraulic fluid,

at least one positioning receiver (214), which is a fluid pressure receiver having a variable volume chamber (215), and

at least one line (9a, 216) connecting the transmitter to the receiver, said hydraulic circuits being such that the flexible walled bag (9) of the transmitter of at least one hydraulic circuits mechanically deformed by the manual actuation of the control member, in such manner that fluid contained in it is transferred to at least one of the receivers (214) connected to it, and the receivers (214) mechanically connect the controlled member (211) to its support (213, 210) in order to modify the position of the controlled member relative to the support in response to the operation of the control member, characterized in that the flexible walled bag (9) of each transmitter is mounted directly in the manually operated control member, and in that the manually actuated control member is a direct contact manipulator button comprising a rigid casing (1, 2, 4) delimiting on the one hand an internal space for each of the flexible walled bags (9) and on the other hand at least one opening (8) directly facing at least one portion of the flexible wall of each deformable bag (9), for the purpose of permitting the deformation of each bag (9) by direct pressure applied by the user to its flexible wall.

4,918,921

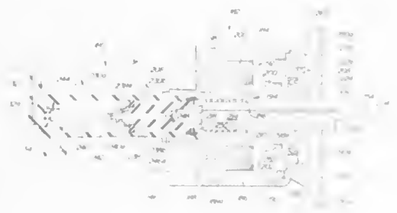
COAXIAL PUSH ROD AND HOLLOW SCREW BALL NUT DRIVE FOR MASTER CYLINDER

Keith V. Leigh-Monstevens, Troy, and Brian D. Mabee, Warren, both of Mich., assignors to Automotive Products plc, Warwickshire, United Kingdom

Filed Oct. 22, 1987, Ser. No. 111,294

Int. Cl.[5] B60T 13/74

U.S. Cl. 60—545 3 Claims



3. A master cylinder assembly comprising

(a) an electric motor including a housing and a hollow armature;

(b) a hydraulic master cylinder including a housing rigid with said motor housing, a cylinder defining an elongated bore, a piston movable linearly and slidably in said bore, inlet means in said cylinder for admitting hydraulic fluid into said bore from a reservoir, and an outlet fitting in said cylinder communicating with said bore and operative to convey hydraulic fluid out of said bore for delivery to a slave device in response to linear movement of said piston in said bore;

(c) nut means driven by said armature;

(d) an annular output shaft defining a bore extending axially therethrough and having a threaded portion threadably engaging said nut means so that rotation of said armature upon energization of said motor linearly advances said output shaft;

(e) a first push rod drivingly connected at its outboard end to said piston, having its inboard end disposed within said output shaft bore, and drivingly connected to said output shaft so that said piston is moved linearly in response to linear advancement of said output shaft; and

(f) a second push rod having its inboard end disposed within said output shaft bore in juxtaposition to the inboard end of said first push rod and extending at its outboard end out of the end of said output shaft remote from said master cylinder.

4,918,922

MASTER CYLINDER PISTON WITH INTAKE VALVE AND FLOW/RESISTING ANNULAR RING

Toshihirn Nakano, Chiryu; Shinji Sakata, Nishlo; Hitoshi Ichioka, Toyota; Kiyohiko Minagawa, Anjo, and Hideaki Iijima, Hazu, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 1, 1989, Ser. No. 345,247

Claims priority, application Japan, Apr. 30, 1988, 63-058907[U]

Int. Cl.[5] B60T 11/20

U.S. Cl. 60—589 8 Claims

1. A master cylinder comprising,

a body having an inner bore;

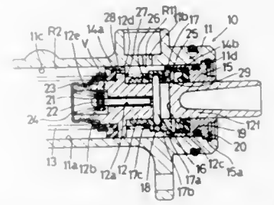
piston means sealingly mounted in the inner bore for axial movement therein, the body and the piston means defining a supply chamber in fluid communication with a source of fluid and a pressure chamber having an outlet therein,

biasing means for biasing the piston means in one axial direction within the inner bore;

valve means slidably mounted in the piston means for limited axial movement therein between a closed position wherein the valve means is sealingly engaged with the piston means and an open position wherein a gap is maintained between the valve means and the piston means, the valve means including passage means for providing fluid communication between the supply chamber and the pressure chamber when the valve means is in open position;

orifice means in the piston means for limiting flow of the fluid from the pressure chamber to the supply chamber at least during the limited movement of the valve means from the open position to closed position; and

overflow means on the piston means that is responsive to movement of the piston means against the bias of the biasing means for establishing fluid communication between the passage means and the supply chamber only when the valve means is in the closed position.



4,918,923

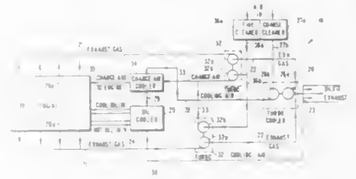
INTERNAL COMBUSTION ENGINE TURBOSYSTEM AND METHOD

William E. Woollenweber, 3169 Camino del Arco, La Costa, Calif. 92009-7856, and Niels J. Beck, 4073 The Hill Rd., Bonita, Calif. 92109

Continuation-in-part of Ser. No. 159,840, Feb. 24, 1988. This application Jun. 6, 1988, Ser. No. 201,919

Int. Cl.[5] F01P 3/20; F02G 3/02

U.S. Cl. 60—597 11 Claims



1 An internal combustion engine system with an exhaust-driven, cooling system, comprising:

a multi-cylinder, internal combustion-engine assembly;

means for providing a mixture of fuel and air to the internal combustion engine assembly;

mean for carrying exhaust gas from the internal combustion engine assembly;

means for providing a flow of coolant to and from the internal combustion engine assembly for cooling the internal combustion engine assembly and for carrying heat generated by operation of the internal combustion engine assembly away from the internal combustion engine assembly;

a heat exchanger, connected with said means for providing a flow of coolant, to dissipate the heat carried by said coolant from the internal combustion engine assembly prior to its return to the internal combustion engine assembly;

a turbocooler having a turbine connected with the means for carrying exhaust gas from the internal combustion engine

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assembly so that the exhaust gas carried from the internal combustion engine assembly by said exhaust means drives the turbine of the turbocooler, said turbocooler also having a ducted fan means driven by the turbine of the turbocooler, said ducted fan means communicating with atmosphere and generating a ducted flow of cooling air;

means for directing the ducted flow of cooling air generated by the ducted fan means of said turbocooler through the heat exchanger to cool the coolant and dissipate the heat generated in operation of the internal combustion engine assembly; and

means for controlling the cooling air flow generated by said turbocooler ducted fan means, comprising:

means for controlling the volume of exhaust gas driving the turbine of said turbocooler, including:

a turbocooler turbine housing defining a first annular chamber and a second chamber, said chambers having a dividing wall positioned therebetween, said first annular chamber having an exit port directing exhaust gas to the turbocooler turbine, said second chamber having an exit port directing exhaust gas to the turbocooler exit;

a valve port in said dividing wall, said valve port forming a valve seat;

a valve head movable with respect to the valve seat in said dividing wall, said valve head blocking said valve port in one position, thereby directing the exhaust gas from said first annular chamber to act upon the turbine of said turbocooler, and being spaced from said valve seat in another position, thereby diverting the exhaust gas into said second chamber and outwardly from said second chamber through said turbocooler exit, thereby bypassing the turbine of said turbocooler;

means to operate said valve head including a cylinder housing connected with said turbocooler turbine housing at one end, the walls of said cylinder housing forming a cylinder with a wall at the other end forming a bearing opening; a piston formed by a piston rod carried within said bearing opening and a piston head within said cylinder in sealing engagement with walls forming the cylinder, said valve head being carried by said piston rod outside of said cylinder; an energy storing mechanism within said cylinder and acting on said piston rod to urge the valve head in one direction; a further orifice in the cylinder housing walls forming said cylinder to permit the application of fluid pressure to said piston head to overcome the energy of said energy storage device and move the piston head, piston rod and valve head in the other direction; and

means for activating said controlling means, including:

means connecting said cylinder wall orifice with a source of fluid pressure of the internal combustion engine;

a control valve located in said pressure connecting means adapted to control the pressure delivered to said cylinder housing; and

control valve activating means being adapted to operate said control valve in response to engine operating conditions whereby said control valve operates to admit pressure through said pressure connecting means to said cylinder housing to operate said valve head in response to engine operating conditions.

4,918,924

TURBOCHARGING PRESSURE CONTROLLING APPARATUS

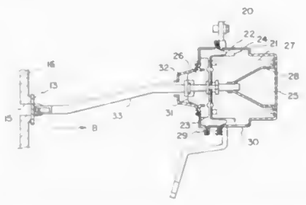
Michio Kyoya, Sagamihara, and Katsuhiko Fukuzumi, Sanda, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Mitsubishi Jukogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 6, 1988, Ser. No. 254,025

Claims priority, application Japan, Oct. 7, 1987, 62-153875[U]

Int. Cl.[5] F02B *37/12*

U.S. Cl. 60—602 **1 Claim**



1. A turbocharging pressure controlling apparatus, comprising: a control valve (**13**) for regulating the pressure of air supplied to an internal combustion engine, and an air actuator comprising

a case (**21**) having a fixed position relative to the internal combustion engine;

a first diaphragm (**22**) disposed in said case and dividing the interior thereof into an atmospheric chamber (**25**) and a positive pressure chamber (**26**);

a second diaphragm (**31**) disposed in said case for sealing a side of said positive pressure chamber opposite said atmospheric chamber;

a rod (**33**) having a proximal end extending through said first and second diaphragms and outwardly of said case, and a distal end coupled to said control valve for actuating said valve by extension and retraction motions thereof;

a compression spring (**27**) disposed in said atomspheric chamber for urging said first diaphragm toward said positive chamber when no positive pressure is supplied to said positive pressure chamber;

a positive pressure supply nipple (**29**) for supplying positive pressure to said positive pressure chamber; and

an aperture (**30**) in said case establishing continuous open communication between said atmospheric chamber and the surrounding atmosphere,

wherein a retraction of said rod against the force of the spring resulting from the application of a positive pressure to said supply nipple opens the control valve to attendantly reduce the pressure of air supplied to the internal combustion engine.

4,918,925

LAMINAR FLOW FUEL DISTRIBUTION SYSTEM

Walter J. Tingle, Danvers, Mass., assignor to General Electric Company, Lynn, Mass.

Continuation-in-part of Ser. No. 102,976, Sep. 30, 1987, abandoned. This application Oct. 5, 1988, Ser. No. 253,525

Int. Cl.[5] F02C *7/22*

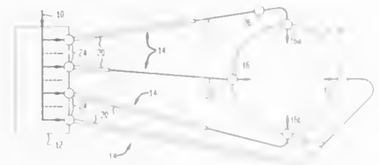
U.S. Cl. 60—739 **22 Claims**

1. A fuel distribution system for a gas turbine engine, said system comprising, in combination:

a distributor for receiving pressurized fuel;

a plurality of fuel injectors;

a corresponding plurality of fuel lines, each said fuel line connecting a different one of said fuel injectors in parallel fluid communicating relation with said distributor; and



means incorporated in each said fuel line for establishing laminar flow of fuel therethrough from light-off to maximum power of said engine

4,918,926

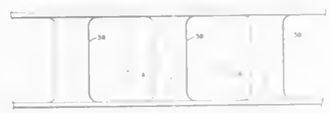
PREDFIFFUSER FOR A GAS TURBINE ENGINE

John P. Nikkanen, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 20, 1982, Ser. No. 380,459

Int. Cl.[5] F02C *1/00*

U.S. Cl. 60—751 **2 Claims**



1. For a gas turbine engine having an engine case and a centerline, an axial flow compressor and an annular burner mounted in said engine case about the engine's centerline, an annular prediffuser interposed between said compressor and said burner and axially spaced therefrom, a shell surrounding and radially spaced from said burner defining a dump diffuser, said prediffuser having a pair of radially spaced annular shaped walls defining an annular passage for leading the air discharging from the compressor to said dump diffuser and then to said burner, a first portion of said spaced annular shaped walls being concentric relative to each other so as to define a vane section, vanes mounted between said spaced annular walls in said vane section for removing the swirl component from the swirling air discharging from said compressor, a second portion of said spaced annular walls diverging radially inwardly and outwardly relative to each other for defining a diffuser section, circumferentially spaced struts extending between said annular walls for defining therewith open ended passageways and each passageway having an axial centerline, a plurality of circumferentially spaced fuel nozzles in said annular burner, each having a centerline, the centerline of said each of said fuel nozzles being in coincidence with the centerline of each of said open ended passageways so that the number of said struts equals the number of said fuel nozzles and that the area of the discharge end of said annular diffuser is relatively the same relative to what it would be without the inclusion of said struts by extending the spaced annular walls radially to compensate for the area that would be taken up by said struts that would otherwise block the flow passing through the discharge end of the diffuser had the struts not been there.

4,918,927

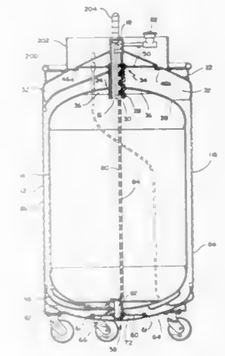
CRYOGENIC LIQUID CONTAINER

Lester K. Eigenbrod, Indianapolis, Ind., assignor to Harsco Corporation, Wormleysburg, Pa.

Filed Sep. 6, 1989, Ser. No. 403,374

Int. Cl.[5] F17C *1/00*

U.S. Cl. 62—45.1 **15 Claims**



1. A container for storing liquefied gas comprising:

an inner vessel having an upper head, a lower head and a sidewall extending between said upper and lower head, said upper head having an opening therethrough;

an outer shell having an upper head, a lower head and a sidewall extending between said upper and lower head, said upper head of said outer shell having an opening therethrough;

a necktube extending between said opening in said upper head of said outer shell and said opening in said upper head of said inner vessel, said necktube connected to said opening in said outer shell; and

an upper lateral support structure comprising a collar disposed to surround said necktube at a portion of said necktube near said inner vessel, said collar being spaced apart from said necktube at a predetermined distance along its length and joined to said upper head of said inner vessel and support means for limiting an amount of lateral movement of said collar and said necktube, said support means extending substantially across a space between said collar and an interior surface of said outer shell, said support means being spaced apart from said collar and from said interior surface of said outer shell at a predetermined distance therefrom.

4,918,928

APPARATUS FOR TESTING IC DEVICES AT LOW TEMPERATURE AND COOLING BAG FOR USE IN TESTING IC DEVICES AT LOW TEMPERATURE

Osamu Morioka, Kakogawa; Keizo Tokushige, Matsubara; Akeo Kimura, Iruma, and Takahiro Nihei, Fukushima, all of Japan, assignors to Kabushiki Kaisha Kobe Seikosho, Kobe and Japan LSI Co., Ltd., Tokyo, both of, Japan

Filed Dec. 15, 1988, Ser. No. 284,547

Claims priority, application Japan, Dec. 17, 1987, 62-319761; Dec. 17, 1987, 62-191985[U]; Dec. 17, 1987, 62-191986[U]; May 30, 1988, 63-72270[U]

Int. Cl.[5] F25B *19/00*

U.S. Cl. 62—51.1 **8 Claims**

6. An apparatus for testing IC devices at a low temperature characterized in that the apparatus comprises a test chamber for accommodating therein the IC device to be tested for performance, a blow nozzle for forcing a refrigerant into the test chamber from outside, a tray for receiving the refrigerant

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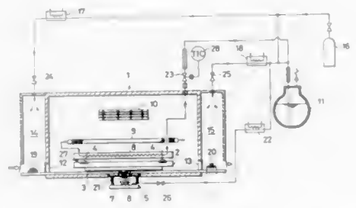
as forced out from the blow nozzle in the form of a liquid, gas circulation means for circulating the refrigerant in the form of a gas within the test chamber through a path over the tray to



cool the interior of the test chamber, and a cooling disk to be cooled by the gas circulation means for cooling the IC device in contact or proximity therewith.

4,918,929

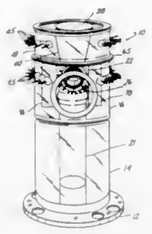
MULTI-DETECTOR DEWAR

John S. Chudy, Long Beach; M. John Kniffin, and D. Yvonne McNeil, both of Santa Ana, all of Calif., assignors to Ford Aerospace Corporation, Newport Beach, Calif.

Division of Ser. No. 68,300, Jul. 1, 1987, which is a continuation of Ser. No. 1,063, Jan. 7, 1987, abandoned. This application May 31, 1988, Ser. No. 200,224

Int. Cl.[5] F25B *19/00*

U.S. Cl. 62—51.1 2 Claims



1. A dewar assembly comprising:

a metallic mounting base defining a reference plane;

a glass coldfinger substantially in the form of a hollow cylinder, the rim of one end of said coldfinger being fused to said mounting base, said coldfinger including a detector support affixed to the other end of said cylinder; and

a glass envelope including a plurality of separate sections, one of said sections being a base section having a rim on each end, said rim on one end of said base section being fused to said mounting base, and said detector support protruding beyond the rim at the other end of said base section when said base section and coldfinger are fused to said mounting base.

4,918,930

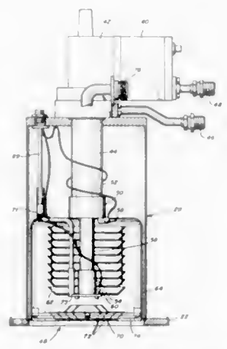
ELECTRONICALLY CONTROLLED CRYOPUMP

Peter W. Gaudet, Chelmsford; Donald A. Olsen, Millis; Michael J. Eacobacci, Randolph; John T. Harvell, Sudbury; Robert J. Lepofsky, Wellesley, all of Mass.; David E. Roche, Nashua, N.H., and Steveo A. Bender, Liverpool, N.Y., assignors to Helix Technology Corporation, Waltham, Mass.

Filed Sep. 13, 1988, Ser. No. 243,707

Int. Cl.[5] B01D *8/00*

U.S. Cl. 62—55.5 43 Claims



1. A cryopump comprising, as an integral assembly:

a cryogenic refrigerator;

a gas condensing cryopanel cooled by the refrigerator;

a temperature sensor coupled to the cryopanel;

an electrically actuated valve adapted to pass gases from the cryopanel; and

a programmable electronic processor coupled to the sensor to provide a temperature indication, coupled to the valve to control opening and closing of the valve, and coupled to the refrigerator to drive the refrigerator.

4,918,931

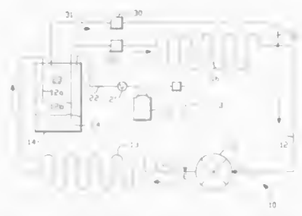
COMPRESSOR SLUGGING PREVENTION METHOD FOR A REFRIGERATION SYSTEM

Albert R. Lowes, Roseville, Calif., assignor to Mydax Corporation, Auburn, Calif.

Filed Sep. 5, 1989, Ser. No. 402,501

Int. Cl.[5] F25B *43/04*

U.S. Cl. 62—83 23 Claims



8. An electrical refrigeration compressor system for preventing refrigerant front slugging the compressor, comprising:

a compressor having an inlet and an outlet, the inlet and outlet connected by a closed main loop;

an injection means for injecting an immiscible charging gas into the compressor system to raise pressure by a predetermined amount;

a receiver for separating the injected charging gas and the refrigerant flowing in the main loop of the operating compressor system; and

a branch in the main loop for conducting the collected charging gas from the receiver into the compressor, the branch having control means for allowing passage of the charging gas into the branch and into the compressor when the compressor system is turned off, the presence of the charging gas in the compressor pressurizing the compressor and preventing slugging of the compressor by the refrigerant in the compressor system.

4,918,932

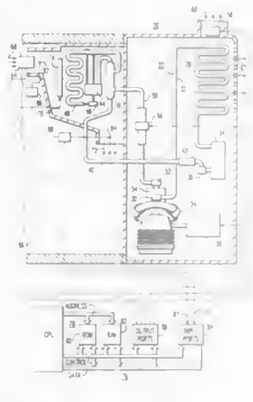
METHOD OF CONTROLLING THE CAPACITY OF A TRANSPORT REFRIGERATION SYSTEM

Alan D. Gustafson, Eden Prairie; Lowell B. Naley, Minnetonka; David A. Christiansen, Bloomington; Stanley O. Holum, Eagan; Robert L. Harrington, Eden Prairie; Dennis R. Johnson, Savage, and Gregory R. Truckenbrod, Fridley, all of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed May 24, 1989, Ser. No. 356,146

Int. Cl.[5] F25B *1/00*

U.S. Cl. 62—89 6 Claims



1. A method of controlling a refrigeration system having a compressor driven by a prime mover, a condenser, a condenser fan, an evaporator, and an evaporator fan, to control the temperature of a served space to a selected set point temperature, wherein the evaporator fan draws return air from the served space and discharges conditioned air back into the served space, comprising the steps of:

sensing the temperature of the return air,

sensing the temperature of the discharge air,

determining the average of the sensed return air and discharge air temperatures,

determining the difference between the average air temperature and the selected set point temperature to provide an average error.

and using the average error to control the capacity of the refrigeration system,

said step of using the average error to control the capacity of the refrigeration system including the steps of:

determining a proportional error as a function of the average error,

determining an integral error as a function of the integral of the average error,

determining a lower limit error as a function of the integral of the difference between the discharge air temperature and the selected set point temperature, plus a predetermined floor temperature,

calculating an error signal by summing the proportional error, integral error and floor error,

comparing the error signal with predetermined parameters, and controlling the capacity of the refrigeration system in response to the comparing step.

4,918,933

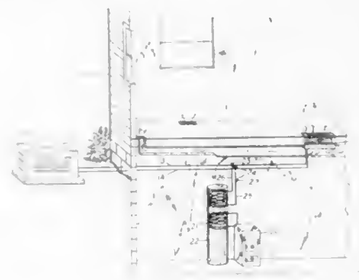
ADD-ON REFRIGERANT BOILER FOR ELECTRIC HEAT PUMP

David F. Dyer, P.O. Box 2255, Auburn, Ala. 36831

Filed Nov. 14, 1988, Ser. No. 270,772

Int. Cl.[5] F25B *7/00*

U.S. Cl. 62—79 4 Claims



3. A method of supplying desired quantities of heat to the refrigerant of an electric heat pump, comprising the steps of

a. positioning an electric heat pump to operate in its heating cycle, with the compressor adjusted to function as desired,

b. positioning a boiler near the heat pump,

c. connecting and adjusting at least one controllable valve to each heat pump pipe line that carries refrigerant to its heating or condensing coils and away from said coils,

d. installing refrigerant heat pipe coils in the boiler and connecting same to the two controllable valves, forming a loop for conveying the refrigerant,

e. installing a pump in the refrigerant pipe line that connects the controllable valve, installed in the heat pump refrigerant line that carries refrigerant away from its heating or condensing coils, to the refrigerant heat pipe coils located in the boiler, said pump positioned to circulate the refrigerant from the heat pump pipe line through said refrigerant heat pipe coils in the boiler, thus picking up heat produced by the boiler burn, and back up through the loop and the other controllable valve into the heat pump pipe line that carries said hot refrigerant into the heat pump heating or condensing coils, where said heat is released.

4,918,934

METHOD FOR COOLING ROOMS

Georg Mayer, Innsbrucker Str. 37, 1 Berlin 62; Friedrich H. Schmidt, Kaule 34, 5060 Bergisch Gladbach 1, and Friedrich H. Schmidt, Kaule 34, 5060 Bergisch Gladbach 1, all of Fed. Rep. of Germany

Filed Sep. 21, 1988, Ser. No. 247,283

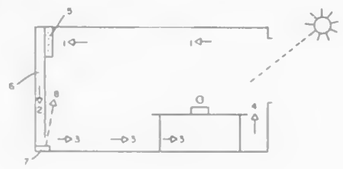
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1987, 3731800; Sep. 29, 1987, 3732792; Oct. 5, 1987, 3733671

Int. Cl.[5] F25D *17/04*

U.S. Cl. 62—89 3 Claims

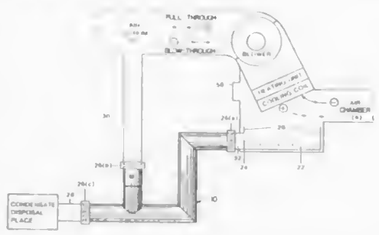
1. A method for dissipating thermal loads of a room using an extremely low air flow rate comprising, providing a drop shaft in a room allowing warm air to contact said drop shaft which has cooling surfaces in its upper part to cool and move air warm air entering the drop shaft at its upper end is cooled and is moved downwards by gravity to leave the drop shaft at its

lower end, deflecting air leaving the drop shaft at its lower end into a hollow floor and passing said air from the hollow floor



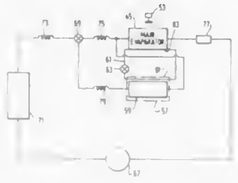
through predetermined openings, under or next to the thermal loads located in the room.

4,918,935
FLUIDIC FLOW CONTROL
Warren C. Treat, 1410 Woodlands Dr., Tyler, Tex. 75703
Filed Mar. 13, 1989, Ser. No. 322,517
Int. Cl.[5] F25D *17/06*
U.S. Cl. 62—93 **22 Claims**



1. A method of removing liquid from an air chamber comprising the steps of: providing a liquid removal conduit communicating with the air chamber and with a source of gas; delivering air into said liquid removal conduit between said air chamber and said source of gas; and controlling the flow rate of air into said liquid removal conduit to permit flow of liquid through the conduit toward the source of gas while preventing flow of gas through the conduit toward the air chamber.

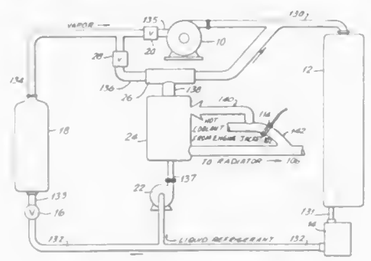
4,918,936
REFRIGERATING CYCLE UTILIZING COLD ACCUMULATION MATERIAL
Noriaki Sakamoto, Ibaraki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuatioo of Ser. No. 153,713, Feb. 8, 1988, abandoned. This application Apr. 13, 1989, Ser. No. 338,342
Claims priority, applicatioo Japan, Feb. 27, 1987, 62-045762
Int. Cl.[5] F25B *41/00*
U.S. Cl. 62—117 **21 Claims**



1. A refrigerating cycle comprising:

a cold accumulation material;
a main evaporator for generating cold air for cooling a refrigerator compartment;
a cold-accumulation evaporator for cooling the cold-accumulation material, an outlet thereof being connected to an input of the main evaporator;
a refrigerant supplying means for supplying refrigerant; and
a flowpath switching means for supplying refrigerant from the supplying means via a first refrigerant flowpath to the main evaporator only and via a second refrigerant flowpath to the cold-accumulation evaporator and the main evaporator respectively.

4,918,937
HYBRID THERMAL POWERED AND ENGINE POWERED AUTOMOBILE AIR CONDITIONING SYSTEM
Solomon S. Fineblum, 112 Shady La., Randolph, N.J. 07869
Filed May 30, 1989, Ser. No. 358,648
Int. Cl.[5] F25B *1/06*
U.S. Cl. 62—175 **11 Claims**



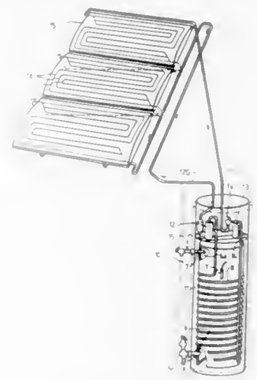
1. In a hybrid air conditioning system for a motor vehicle comprising a mechanical compressor driven by the engine of said motor vehicle and, in a refrigerant circuit parallel, therewith, a thermal compression means, said mechanical compressor and said thermal compression means in a circuit including an evaporator, a suction valve a condenser, a reservoir, an expansion pressure reduction means upstream of said evaporator, a refrigerant pump, a vapor generating heat exchanger and a means for conducting coolant from the coolant jacket of said engine into and through said vapor generating heat exchanger in thermal contact with liquid refrigerant, various temperature and pressure detection means, and a control circuit, that improvement comprising:

A check-valve in fluid flow series with said thermal compression means;
An electrical ON-OFF switch which turns on said mechanical compressor as soon as the air conditioner is turned on when said engine is running;
A timer switch for turning on said refrigerant pump after a period of said mechanical compressor operation sufficient to assure that said mechanical compressor has been effective in achieving the initial cool-down of the passenger compartment;
A coolant by-pass valve in engine coolant line from said coolant jacket of said engine to the radiator of said motor vehicle;
A pressure switch at the outlet of said thermal compression means adapted to sense a minimum pressure of refrigerant vapor as required for condensation, said pressure switch actuating controls to unload said mechanical compressor by turning off said mechanical compressor when said thermal compression means is capable of driving refrigeration system as indicated by the high pressure at the outlet of said thermal compressor;

Whereby, initially, the refrigerant vapor is pulled out of said evaporator, compressed and forced into said condenser by the action of said mechanical compressor which is powered by said engine, said refrigerant vapor condensing into liquid within said condenser, from whence it flows into and through said reservoir and thence through said expansion, pressure-reduction means which is immediately upstream of said evaporator which is in heat transfer contact with air in said passenger compartment, wherein the refrigerant in said evaporator is endothermally evaporated such that heat is absorbed from said passenger compartment through the evaporator into said evaporating vapor and such that the vapor is pulled from said evaporator through said suction valve into the suction inlet of said mechanical compressor until sufficient time has elapsed for the coolant in said engine coolant jacket to get hot enough to boil said refrigerant in said vapor generating heat exchanger, the time being measured by said timer which acts to close off said coolant by-pass valve, thus forcing coolant to flow through said vapor generating heat exchanger, and some cool-down has been achieved in said passenger compartment, additional time being measured by another said timer which acts to energize said refrigerant pump which draws some of the liquid refrigerant from the fluid conduit downstream of said reservoir and drives said liquid into said vapor generating heat exchanger wherein the hot engine coolant transfers sufficient heat to boil the high pressure liquid refrigerant such that the resulting high pressure vapor flows from said vapor generating heat exchanger into the primary inlet of said thermal compression means, wherein the vapor is greatly accelerated and wherein sufficient suction is created to draw refrigerant vapor from said evaporator and wherein the vapor is compressed and from whence the compressed vapor is driven into said condenser wherein the vapor is exothermally condensed and from whence the liquid refrigerant flows into and through said reservoir and into a liquid refrigerant conduit which directs some refrigerant into said refrigerant pump and some refrigerant into said expansion, pressure-reducing means which releases low pressure liquid refrigerant for inlet into said evaporator wherein the refrigerant endothermally absorbs heat from the evaporator and from which the refrigerant flows into the secondary inlet of said thermal compression means in the refrigerant branch which flows from the evaporator outlet tube at a point between said evaporator and said suction valve, into said branch which contains the thermal compression means and check valve in series, to continue the refrigeration cycle which is driven by said thermal compression means which receives its energy from the waste heat in the hot engine coolant and thereby conserving the energy which is usually used to drive said conventional mechanical compressor which is taken from said engine, thus improving the fuel consumption of such vehicles so equipped.

4,913,938
HEAT EXCHANGER
Lockwood De Forest, Mosman; Ian D. Roberts, Nunawading, and Christoper W. S. Dixon, Brighton, all of Australia, assignors to Siddons Industries Limited, Victoria, Australia
Continuation-in-part of Ser. No. 819, Jan. 6, 1987, abandoned. This application Apr. 8, 1988, Ser. No. 179,450
Claims priority, application Australia, Jan. 8, 1986, PH4142
Int. Cl.[5] F25B *27/00*
U.S. Cl. 62—238.6 **20 Claims**

1. A water heater comprising:
a generally cylindrical water tank having a wall formed from material having heat transfer properties;
a cold water inlet adjacent one end of the tank;
a hot water outlet adjacent the other end of the tank;
a tube comprising iron adapted to carry a refrigerant fluid and helically wound externally about said tank wall with the helical windings being axially spaced one from the other;
heat-conductive bonding material substantially coextensive with the length of said tube disposed solely directly between said tube and said tank wall for securing said tube and said tank wall substantially continously one to the other, leaving the tank wall between the helical windings of said tube free of bonding material, said tube and heat-conductive bonding material being in heat-conductive relation with said tank wall through its external surface to transfer heat from condensation of refrigerant fluid in said tube through said wall to the water contained in the tank, said tube about said tank being under tension to reduce the



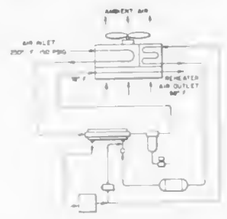
likelihood of the heat-conductive bonding material breaking during expansion and contraction of the tube and tank during use;
said tube extending from a position adjacent said one end of the tank to a position not exceeding about 75% of the length of said wall of said tank;
an evaporator positioned to be exposed to ambient conditions for absorbing heat energy from said ambient conditions and having a passage for carrying the refrigerant fluid whereby such fluid may be heated by said ambient conditions; and
a compressor connected to said passage and to said tube to circulate refrigerant fluid through said tube and to said evaporator.

4,918,939
SELF-CONTAINED AIR DRYING UNIT
Vincent P. Fresch, Elm Grove; Titus Mathews, Kenosha, and Anthony R. Rossi, Brookfield, all of Wis., assignors to Pneumatech, Inc., Kenosha, Wis.
Filed Jan. 10, 1989, Ser. No. 295,482
Int. Cl.[5] F25D *21/00*
U.S. Cl. 62—272 **3 Claims**

1. An improved self-contained air drying unit of the type in which heated air from a compressor is introduced into the unit and cooled and dried in a heat exchanging evaporator which has been supplied with liquid refrigerant, wherein the improvement comprises:
aftercooler means disposed within the unit for reducing the temperature of the air prior to its introduction into the heat exchanging evaporator,
condenser means disposed within the unit and substantially adjacent said aftercooler means for cooling the compressed refrigerant gas and producing liquid refrigerant,
air circulating means disposed within the unit for generating an air current within the unit such that ambient air is

drawn across both of said aftercooler means and said condenser means, and

reheating means for raising the temperature of the air exiting the heat exchanging evaporator with said reheating means disposed within the unit and substantially adjacent and



upstream of said aftercooler means and said condenser means so that said air circulating means first draws ambient air across said reheating means so that the ambient air is cooled prior to being drawn across said aftercooler and condenser means.

4,918,940

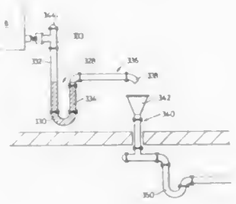
AIR CONDITIONING APPARATUS

Christopher M. Buckley, Newcastle under Lyme, England, assignor to Scientific Glass (Drainline) Limited, Great Britain

Filed Mar. 24, 1989, Ser. No. 328,336

Int. Cl.[5] F25D *21/14*

U.S. Cl. 62—285 **6 Claims**



1. Air conditioning apparatus including ducting defining a flow passage from an air inlet to an air output and operatively connected to the interior of a structure to be air conditioned, air processing means within the ducting for treatment of the air passing therethrough, air impeller means for inducing a flow of air through the ducting in use, and drain means for removing surplus moisture derived from operation of the apparatus; characterised in that said drain means comprises a first pipework section leading directly from a collector in which said surplus moisture is operatively deposited and including a U-shaped trap having a downleg leading from the collector and an upleg, a fluid seal being operatively maintained in said trap to prevent air flow along said fist section; a second pipework section leading laterally from an upper end portion of said upleg to a delivery spout; and a third pipework section including an open topped tundish positioned in use to receive fluid flow from the delivery spout while providing an air gap between the second and third pipework sections to prevent siphonic voiding of the fluid seal in the trap in use, said third section delivering the surplus moisture to an outflow in use; all said pipework sections being formed of circular section clear glass tubular components having high resistance to corrosion and accumulation of deposits and low coefficient of thermal expansion connected by readily releasable couplings incorporating compression seals of flexible material which will not readily support microbiological growth, whereby visual inspection of the integrity of the fluid seal and the cleanliness of the drain means in use is facilitated and to provide ease of dismantling for routine cleaning and disinfection.

4,918,941

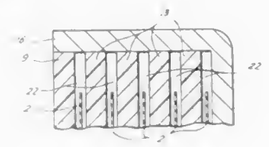
CRYOGENIC ULTRAMICROTOME SEAL

Herbert K. Hagler, Dallas, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed May 16, 1989, Ser. No. 353,804

Int. Cl.[5] F25C *5/02*

U.S. Cl. 62—320 **15 Claims**



1. A thermal seal for use in a cryogenic ultramicrotome having a cryogenic chamber and a microtome arm extending through an aperture in said cryogenic chamber from a reactively high temperature exterior of said chamber to a relatively low temperature interior of said chamber, said seal comprising:

a seal container attached to said cryogenic chamber;

a plurality of thermally insulating baffle inserts within said container together forming a plurality of baffle chambers, each baffle insert having an aperture therein substantially aligned with said aperture of said cryogenic chamber and being larger than an exterior dimension of a cross-section of said microtome arm; and

a plurality of thermally insulating baffle membranes, each membrane being located and moveable within a respective one of said baffle chambers, each membrane having an aperture substantially aligned with said aperture of said cryogenic chamber and being dimensioned for slidable engagement with said exterior dimension of said microtome arm.

4,918,942

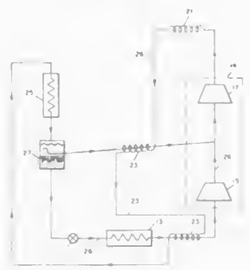
REFRIGERATION SYSTEM WITH DUAL EVAPORATORS AND SUCTION LINE HEATING

Heinz Jaster, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 11, 1989, Ser. No. 419,982

Int. Cl.[5] F25B *7/00*

U.S. Cl. 62—335 **5 Claims**



1. A refrigeration system using a two phase refrigerant for use in a refrigerator having a freezer compartment and a fresh food compartment, said refrigeration system comprising:

a refrigerant flow control means;

a first evaporator for providing cooling to the freezer compartment;

a two stage compressor;

a condenser;

a capillary tube;

a second evaporator for providing cooling to the fresh food compartment;

conduit means for connecting all the above elements together in series in the order listed, in a refrigerant flow relationship; and

a phase separator having an inlet and two outlets, the first outlet for providing liquid phase refrigerant, the second outlet for providing gaseous phase refrigerant, said phase separator having its inlet connected to said second evaporator and its first outlet connected to the refrigerant flow control means by said conduit means, the second outlet of said phase separator connected between the first and second stages of said compressor, a first fraction of said capillary tube in a heat transfer relationship with the conduit means connecting said phase separator second outlet between the first and second stages of said compressor, a second fraction of said capillary tube in a heat transfer relationship with the conduit means connecting said first evaporator with the suction side of said first stage compressor.

4,918,943

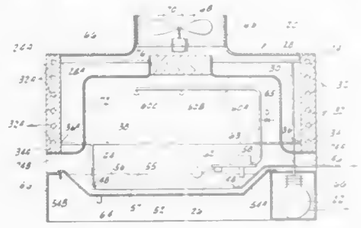
CONDENSER

Paul A. Faust, 26 Grantwood La., St. Louis, Mo. 63123

Filed Jan. 26, 1989, Ser. No. 301,837

Int. Cl.[5] F28D *5/00*

U.S. Cl. 62—305 **29 Claims**



1. A condenser for compressed refrigerant gas or vapor from a compressor comprising

a first heat exchanger for the transfer of heat from compressed refrigerant received from the compressor to ambient air, the first heat exchanger having an inlet for receiving compressed refrigerant, an outlet, and a first conduit connecting said first heat exchanger inlet and outlet and means for transferring heat from the first conduit to ambient air,

a second heat exchanger having two substantially parallel walls each of which has an outer surface with at least one of said walls being heat conductive, an inlet for receiving compressed refrigerant from the first heat exchanger outlet, an outlet for delivering cooled compressed refrigerant to an evaporator, and a second heat exchanger conduit connecting the second heat exchanger inlet and outlet for the flow of compressed refrigerant therethrough, the second heat exchanger conduit being between the two walls and substantially parallel to the outer surfaces of the two walls,

evaporative cooling means for cooling the outer surface of the heat conductive wall of the second heat exchanger as compressed refrigerant flows through the second heat exchanger conduit, and

a partition for preventing mixing of ambient air used for heat exchange with the first heat exchanger and air used for evaporative cooling of the second heat exchanger.

4,918,944

FALLING FILM EVAPORATOR

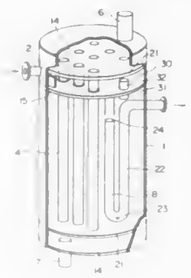
Kenji Takahashi, Abiko; Takuji Torii, Ushiku; Takao Senshu, Shizuoka; Tetsuji Yamashita, Shizuoka, and Shizuo Zushi, Hadano all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 21, 1988, Ser. No. 260,698

Claims priority, application Japan, Oct. 23, 1987, 62-266389

Int. Cl.[5] F75B *43/02*

U.S. Cl. 62—471 **13 Claims**



1. In a falling film evaporator in which a plurality of heat exchanger tubes are provided in a shell to form an evaporating compartment utilizing a falling film, a liquid-film flow of a liquid refrigerant being formed over outside surfaces of said heat exchanger tubes to effect heat exchange between said liquid refrigerant and fluid flowing in said heat exchanger tubes, the improvement comprising a gas-liquid separating means which is arranged in a space of said evaporating compartment to communicate with a compressor which comprises a part of a refrigeration cycle; said gas-liquid separating means comprising a pipeline in which a lubricating oil in said evaporating compartment is intermingled with a refrigerant to be supplied from an evaporator to said compressor and through which the thus-intermingled fluid is supplied to said compressor and further comprising means for introducing a liquid refrigerant and a lubricating oil collected in a lower portion of the evaporating compartment into a refrigerant discharge pipeline by utilization of a pressure difference between a pressure in the evaporating compartment and a pressure in the refrigerant discharge pipeline, said pipeline serving to cause a gas refrigerant within the evaporating compartment to be discharged.

4,918,945

BINARY SOLUTION COMPRESSIVE HEAT PUMP WITH SOLUTION CIRCUIT

Vinko Mucic, Walldorf, Fed. Rep. of Germany, assignor to TCH Thermo-Consulting-Heidelberg GmbH, Heidelberg, Fed. Rep. of Germany

PCT No. PCT/EP88/00291, § 371 Date Nov. 18, 1988, § 102(e) Date Nov. 18, 1988, PCT Pub. No. WO88/09468, PCT Pub. Date Dec. 1, 1988

PCT Filed Apr. 8, 1988, Ser. No. 283,947

Claims priority, application Fed. Rep. of Germany, May 18, 1987, 3716642

Int. Cl.[5] F25B *1/00*

U.S. Cl. 62—502 **3 Claims**

1. Binary solution compressive heat pump or refrigeration machine (10) with an evaporator (12) and a condenser (20) which are connected together in a solution circuit, in which a binary refrigerant formed from an ammonia-water mixture is circulated, wherein gaseous refrigerant is driven out in the

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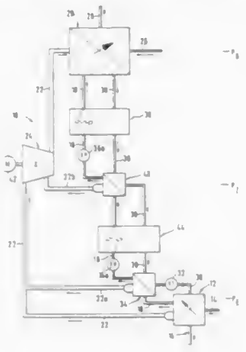
evaporator (12) at a low pressure level (p_E) with the input of thermal energy at a low temperature level and the poor solution thus produced is pumped with pressure increase by means of a pump in a first pipeline branch (18) to the condenser (20) where the gaseous refrigerant driven out in the evaporator (12) is reabsorbed in the poor solution after its pressure is increased to the condenser pressure (p_R) by means of a compressor (24) with removal of the resorption heat thereby produced at an elevated temperature level, and the rich solution thus formed flows back to the evaporator (12) in a second pipeline branch (30) with its pressure lowered by means of a throttling member (32), and a temperature exchanger (38) is inserted into the sections of the first and second pipeline branches (18; 30) which are at the condenser pressure (p_R), in which heat contained in the rich solution issuing from the condenser (20) is transferred to the poor solution flowing to the condenser and heat contained in the rich solution issuing from the temperature exchanger (38) is used for the further evaporation of the



poor solution fed to the temperature exchanger, the additional evaporator for the further evaporation of the poor solution being disposed on the one hand in the section of the second pipeline branch (30) running between the temperature exchanger (38) and the throttling member (32), characterized in that at least two pumps (36*a*; 36*b*) increasing the pressure in the poor solution step-wise to the condenser pressure (p_R) are inserted into the first branch (18) of the solution circuit carrying the poor solution from the evaporator (12) to the condenser (20), and the additional evaporator (40) is disposed on the other hand in the section of the first pipeline branch running between the two pumps (36*a*; 36*b*), which is at an intermediate pressure (p_Z) and that the gaseous refrigerant additionally expelled from the poor solution in the additional evaporator (40) at the level of the intermediate pressure (p_Z) is pumped to the condenser (20) by a separate compressor or by being fed into a medium pressure stage of the multistage compressor (24) pumping the gaseous refrigerant from the main evaporator to the condenser.

4,918,946

PROCESS AND DEVICE FOR BENDING GLASS SHEETS

Luc Vanaschen, Eupen, Belgium; Hans W. Kuster, Aachen, Fed. Rep. of Germany, and Herbert Radermacher, Raeren, Belgium, assignors to Saint-Gobain Vitrage, c/o Saint-Gobain Recherche, Aubervilliers, France

Filed Jul. 5, 1989, Ser. No. 375,480

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1988, 3822639

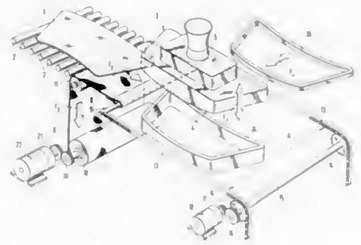
Int. Cl.[5] C03B *23/03*

U.S. Cl. 65—104 15 Claims

1. A process for bending glass sheets according to which a glass sheet is loaded flat on the end of a conveyor going through a tunnel furnace, comes out again through the other end of the tunnel furnace after having reached its bending temperature, is conveyed by a first transfer device to a bending unit which comprises at least one upper bending form, is picked up by suction by the at least one upper bending form, which then is raised, and is bent to the desired shape by the bending unit, then is directed by a second transfer device to a cooling station, the transfer from the tunnel furnace to the bending unit being obtained by the reversible movement, parallel to the general direction of movement of the glass sheet, from the front end of a flexible conveyor belt the rear end of which is under the transport plane of the glass sheet, the initial position of the front end of the flexible conveyor belt being located between the downstream end of the conveyor and the bending unit.

4. A device for bending glass sheets, said device comprising:

(a) a horizontal furnace through which a roller conveyor passes;



(b) a bending station placed at the outlet of said horizontal furnace, said bending station comprising at least one vertically mobile upper bending form;

(c) a first device for the transfer of glass sheets between roller conveyor and said bending station; and

(d) a second device for the transfer of bent glass sheets to a cooling station, wherein:

(e) said first device comprises a section of a flexible conveyor belt made of a heat resistant material; and

(f) the front edge of said section is able to be moved in a reversible way between a ready position located between said conveyor and said bending station and an extreme downstream position located on the other side of said bending station.

4,918,947

KNITTING MACHINE FOR PRODUCING WARP KNIT

Francisco Speich, Gipf-Oberfrick, Switzerland, assignor to Textilma AG, Hergiswil, Switzerland

PCT No. PCT/CH87/00116, § 371 Date May 12, 1988, § 102(e) Date May 12, 1988, PCT Pub. No. WO88/02038, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 11, 1987, Ser. No. 211,232

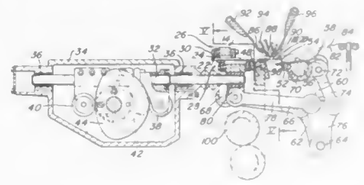
Claims priority, application Switzerland, Sep. 16, 1986, 3702/86

Int. Cl.[5] D04B *23/00*

U.S. Cl. 66—203 16 Claims

1. Knitting machine for producing a warp knit fabric including warp threads, the machine including knitting needles (18, 20) guided reciprocatingly to and from an advanced position transverse to a knockover bit, warp thread guides (52, 54, 51_1, 54_1,) for the needles, the warp thread guides being movable between the knitting needles for placing the warp threads on the knitting needles when the knitting needles are in the advanced position thereof, and at least one reciprocating filling thread guide (86) transverse to the needles (18, 20), the improvement comprising the knitting needles (18, 20) being uniformly distributed on upper and lower knitting-needle bars (14, 16), the knitting-needle bars lying on the same side of the

goods, and being arranged alternately to one another and capable of being alternately driven, each knitting-needle bar



(14, 16) being assigned a set of warp thread guides (52, 54, 52_1,54_1).

4,918,948

THREAD FEEDER FOR KNITTING MACHINES

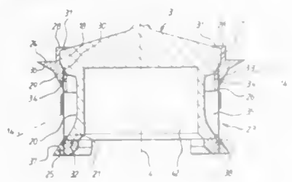
Seigfried Nürk, Albstadt, Fed. Rep. of Germany, assignor to SIPRA Patententwicklungs- u.Beteiligungsgesellschaft mbH, Albstadt, Fed. Rep. of Germany

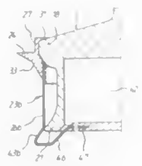
Filed Apr. 5, 1988, Ser. No. 177,780

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1987, 3711558

Int. Cl.[5] D04B *15/48*

U.S. Cl. 66—132 T 17 Claims





1. Thread feeding device for feeding a thread to a knitting machine, comprising: a carrier means; a rotor mounted on said carrier means for rotation about an axis and having a first and second end section; means coupled to said rotor for rotating the latter about said axis; a thread feeding and storage means fastened to said rotor; a thread entry guide means for guiding the thread when being fed to said feeding and storage means; and a thread guide means for guiding the thread when running out of said feeding and storage means; said feeding and storage means being a premanufactured rod cage at least having a thread lead-in section and a thread storage section for storing at least one turn of said thread, said storage section comprising a plurality of rod-like, rectilinear supporting elements having support surfaces, said supporting elements having first and second ends and being disposed substantially parallel to said axis such that said support surfaces are distributed on a substantially cylindrical surface coaxial with said axis, said lead-in section being a ring, said ring comprising a plurality of holes in each of which one of said first ends of said supporting elements is fixedly secured, and a substantially continuous, conically and inwardly tapering circumferential lead-in surface outside of said substantially cylindrical surface and coaxially disposed with respect to said axis and extending at least up to the supporting elements for leading the thread coming from said entry guide means onto said storage section; and first and second means for easily mounting and dismounting said feeding and storage means as a whole to and from said rotor for cleaning, repairing and replacing the same, said first means easily and removably attaching and centering said ring on said first rotor end section, and said second means at least easily centering said second ends of said supporting elements on said second rotor end section.

4,918,949

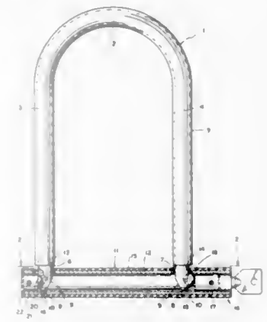
TAMPER-RESISTANT LOCK

Dixon Newbold, Gloucester Providence, R.I., assignor to Rhode Gear USA, Providence, R.I.

Filed Mar. 25, 1988, Ser. No. 173,455

Int. Cl.[5] E05B *67/22*

U.S. Cl. 70—38 A 12 Claims



1. A tamper-resistant lock having a shackle and a housing, said shackle comprising a U-shaped member having spaced apart legs with free ends, said free ends being identically constructed and symmetrically arranged and each having means thereon for engaging and being secured by a lock mechanism in the housing, and said housing having a pair of spaced receiving means for receiving either of said ends, whereby said shackle may be assembled in locked relationship to said housing with either end thereof inserted in either of said receiving means, said lock mechanism being disposed in said housing in association with one of said receiving means for engaging and securing one end of said shackle when said one end is placed in said one receiving means, and means for securing the other end of said shackle in the other said receiving means when said lock mechanism is in engagement.

4,918,950

HIGH SECURITY PADLOCK

William R. Foshee, Noblesville, Ind., assignor to Best Lock Corporation, Indianapolis, Ind.

Division of Ser. No. 55,185, May 28, 1987, Pat. No. 4,836,001, which is a continuation of Ser. No. 718,538, Apr. 1, 1985, abandoned. This application Feb. 21, 1989, Ser. No. 312,685

Int. Cl.[5] E05B *67/22*

U.S. Cl. 70—38A 7 Claims

1. A lock comprising:

a padlock case having a bottom end wall, the padlock case being formed to include a core-receiving chamber having an opening in the bottom end wall,

a lock core in the core-receiving chamber,

a padlock cap having a rear face, and

means for mounting the padlock cap on the lock core to protectively block at least a portion of the chamber open-

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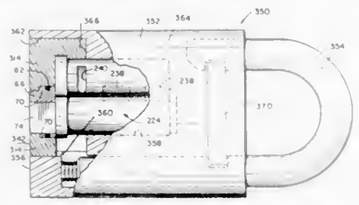
ing in the bottom end wall of the padlock case, wherein the lock core includes:

a core body of figure-eight cross section having an upper lobe and an integral lower lobe, the upper lobe having an exterior surface, the lower lobe being formed to include a chamber for receiving a key plug, and wherein



the mounting means depends from the rear face of the padlock cap and includes flange means for detachably engaging the padlock cap to an exterior surface of the upper lobe of the core body.

4,918,951

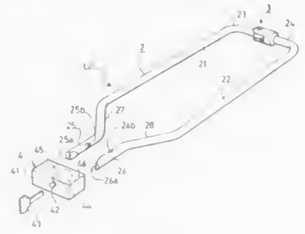
LOCKING DEVICE PARTICULARLY USEFUL FOR LOCKING MOTORCYCLES, BICYCLES AND THE LIKE

Abraham Kavizky, 9 Ilanot Street, Gat Rimon 49920, Israel

Filed Jun. 29, 1989, Ser. No. 373,138

Int. Cl.[5] E05B *67/06*

U.S. Cl. 70—53 **10 Claims**



1. A locking device particularly useful for locking a motorcycle, bicycle or other movable object to be fixed with respect to a fixed object, comprising a shackle for enclosing a part of the movable object and a part of the fixed object; and a lock for locking the shackle when in an enclosing position to attach the movable object to the fixed object when the lock is in its locked position, or for releasing the shackle to permit detachment of the movable object from the fixed object when the lock is in its released condition; characterized in that:

said shackle comprises a pair of rigid bars of strong material disposed in a common plane;

said pair of rigid bars being pivotally mounted to each other at one end so as to be pivotal in said common plane to an open position or a closed position and terminating opposite to the pivotal mounting in a pair of free ends extending parallel to each other;

said locking device comprising a housing enclosing a locking mechanism and formed with a pair of openings for receiving the free ends of the shackle thereby to lock the movable object to the fixed object;

said free ends of the rigid bars being bent inwardly towards each other such as to permit them to be inserted into relatively closely-spaced openings in the lock housing, while the remainders of the bars are relatively widely-spaced to permit them to enclose relatively large parts of the movable object and of the fixed object.

4,918,952

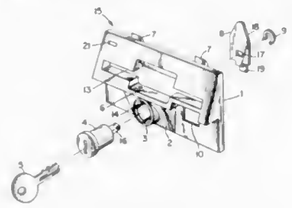
COMPUTER DATA DRIVE LOCKING DEVICE

Robert P. Lakoski, Austin, Tex., and Jody L. Numbers, Tempe, Ariz., assignors to Lama Systems, Inc., Austin, Tex.

Filed Aug. 2, 1988, Ser. No. 227,129

Int. Cl.[5] E05B *65/00*

U.S. Cl. 70—57 **6 Claims**



1. A computer data drive locking device for a computer having a slotted data storage or receiving access member and having a chassis surrounding the member, where the chassis has a front opening, comprising:

(a) a bezel dimensioned to cover the front opening of the chassis and defining a slot,

(b) mounting means for attaching said bezel to the chassis,

(c) a reinforced lock-plug receptacle formed in and extending through said bezel, said receptacle containing an elongated groove,

(d) a key-actuated lock-plug seated in said receptacle and capable of rotation relative to said receptacle, said lock-plug containing an elongated projection corresponding to said groove where said projection and groove restrict the rotation of said lock to a preselected limit and further comprising lug means on said bezel to restrict rotation of said locking bar to the preselected limit,

(e) a locking bar connected to said lock-plug and capable of movement between a slot-blocking position and a slotun-blocking position, said locking bar being located behind said bezel,

(f) where actuating said lock-plug moves said locking bar to the blocking position to block said bezel slot and the slotted access member of the computer to prevent introduction of articles to or removal of articles from the slotted access member.

4,918,953

LOCK MECHANISM

Donald J. Newman, Somerville, Australia, assignor to Ogden Industries Pty. Ltd., Huntingdale, Australia

Filed Jan. 31, 1989, Ser. No. 304,235

Claims priority, application Australia, Feb. 1, 1988, PI 6513

Int. Cl.[5] E05B *63/12*

U.S. Cl. 70—131 **15 Claims**

1. A lock bolt mechanism for mounting to a door or like closure having an inside face and an outside face including:

a housing adapted to be mounted to the inside face of said door,

a lock bolt mounted on said housing for movement relative thereto between locked and unlocked terminal positions,

an inside actuator rotatably mounted on said housing,

a first drive connection between said inside actuator and said lock bolt whereby said bolt is caused to move in response to rotation of said inside actuator,

an outside actuator adapted to be accessible from the outside face of said door and adapted to be rotatably mounted on said door or said housing,

a second drive connection between said outside actuator and said lock bolt whereby said bolt is caused to move in response to rotation of said outside actuator,

a gear train forming part of said second drive connection, said gear train including at least one partial gear wheel having a segment which has no gear teeth, and a second

gear wheel for engagement with said partial gear wheel, rotation of said outside actuator causing said partial gear wheel to engage said second gear wheel to move said lock bolt between said terminal positions,

said second gear wheel being disengaged from said partial gear wheel to break said second drive connection when said lock bolt is in either terminal position.

4,918,954

LOCK MECHANISM FOR EQUIPMENT OF DATA PROCESSING TECHNOLOGY

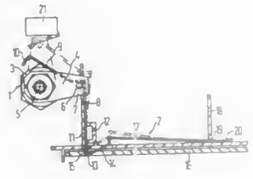
Heinz Stickel, Groebenzell, and Peter Reihl, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 14, 1989, Ser. No. 365,740

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1988, 8807729

Int. Cl.[5] E05B *65/06*

U.S. Cl. 70—134 **20 Claims**



1. A lock mechanism for data processing equipment, comprising:

a rack including movable locking means biased towards a locking position;

a switch mounted on said rack to be actuated into a locked condition or an unlocked condition, including an actuating member;

a key-operated lock mounted on said rack including a lever mounted to pivot about a pivot axis to a locking position and to an unlocking position;

a first actuation element carried by said lever for engaging said actuating member and operating said switch into the unlocked condition when said lever is pivoted to the unlocked position;

a movable part to be locked, said movable part being movable relative said rack towards and away a locking position; and

a second actuation element carried by said lever to engage and move said locking means out of engagement with said movable part when said lever is pivoted to the unlocking position.

4,918,955

VEHICLE KEY DEVICE

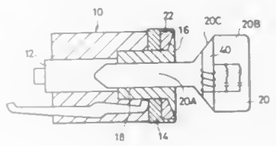
Takashi Kimura, and Mitsuo Mori, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Oct. 6, 1987, Ser. No. 105,039

Claims priority, application Japan, Oct. 7, 1986, 61-238489

Int. Cl.[5] E05B *47/00*

U.S. Cl. 70—277 **10 Claims**



1. A vehicle lock having a keyhole for inserting a key comprising:

a key;

a wound coil surrounding the keyhole for magnetically coupling the key in response to the inserting of the key in the keyhole;

signal generating means for applying a data detecting signal to the wound coil;

circuit means mounted on the key disposed to magnetically couple the wound coil for generating first predetermined data in the data detecting signal, said first predetermined data being distinctive to the key;

signal detecting means for detecting the generated first predetermined data;

means for storing second predetermined data; and

control means responsive to the first predetermined data and the second predetermined data for selectively generating a permission signal.

4,918,956

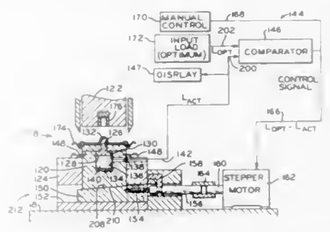
MONITORABLE AND COMPENSATABLE FEEDBACK TOOL AND CONTROL SYSTEM FOR A PRESS USING A SOLID TOOL BACKUP ELEMENT

Daniel A. Schoch, Minster, Ohio, assignor to The Minster Machine Company, Minster, Ohio

Continuation-in-part of Ser. No. 90,215, Aug. 27, 1987. This application Jan. 30, 1989, Ser. No. 304,185

Int. Cl.[5] B21D *37/10*; **B21J** *9/20, 13/00*

U.S. Cl. 72—21 **8 Claims**



1. A method of monitoring and controlling a back-up load to at least one of an upper and lower tool in a press during the actuation of the tools on a workpiece comprising:

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applying a variable back-up force to the one tool wherein the back-up force is effected at least during tool actuation,

sensing the back-up load at said one tool during actuation of the tools on the workpiece and producing a signal correlated to the sensed load;

comparing a predetermined reference load signal and said sensed signal and producing an output control signal as a function of said compared signals; and

controlling, in response to said control signal, the back-up load on said one tool by adjusting the position of a solid, non-fluid back-up element to increase or decrease resistance in a direction opposite to the direction of force applied by the other tool.

4,918,957

LOCK WITH LOCKING FUNCTION RELEASED BY INSERTION OF A CODED CARD

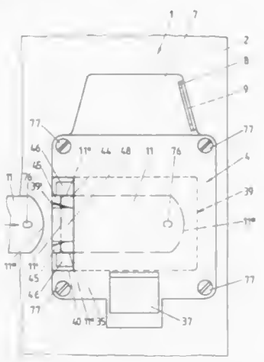
Armin Eisermann, Eichholzstrasse 14, D-5620 Velbert 1, Fed. Rep. of Germany

Filed Jul. 25, 1988, Ser. No. 224,073

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724711; Jul. 25, 1987, 3724710

Int. Cl.[5] E05B *47/00*

U.S. Cl. 70—276 **10 Claims**



1. In a lock with a locking function of a bolt which is released by the insertion of a coded, scanned card, and carried out by means of a key, in particular for use in safety deposit box compartments of public swimming pools or the like, the lock having a casing with an outwardly open card insertion shaft, and a slide which is displaceable by the leading edge of the card during insertion, said slide being biased away from the direction of card insertion and having a control finger for lifting a locking pawl associated with the bolt, the improvement comprising:

said card insertion shaft being arranged on a second slide which is displaceable by the locking movement of the bolt, said first slide having a cam and being supported by said second slide, when said second slide is displaced forwardly from its stop position said cam is controlled on the leading edge of the card, whereby said first slide releases the function of the bolt locking repeat barrier.

4,918,958

DEVICE FOR BENDING CONICAL WIRES

Reiner Glomb, and Ralf Fangmeier, both of Solingen, Fed. Rep. of Germany, assignors to Kieserling & Albrecht GmbH & Co., Werkzeugmaschinenfabrik, Fed. Rep. of Germany

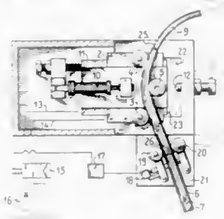
PCT No. PCT/DE85/00403, § 371 Date Dec. 5, 1986, § 102(e) Date Dec. 5, 1986, PCT Pub. No. WO86/04837, PCT Pub. Date Aug. 28, 1986

PCT Filed Oct. 18, 1985, Ser. No. 5,163

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1985, 3505739

Int. Cl.[5] B21D *7/08*; B21B *37/02*

U.S. Cl. 72—10 **5 Claims**



1. A process for bending and coiling wire with at least one cylindrical section and at least one longitudinal section having an increasing or decreasing cross-section over its length wherein the wire is bent while being fed between at least three bending rollers with approximately equal curvature along the range of cylindrical longitudinal sections, comprising the steps of

coiling said wire by feeding said wire between three bending rollers;

changing the amount of bending of the wire during coiling within the range of the longitudinal sections having increasing or decreasing cross sections at a point on the longitudinal section having a variable diameter by means of measuring said change in diameter of said wire by a measuring device and switching from the amount of bending appropriate for the smaller ultimate diameter to the amount of bending appropriate for a larger diameter, or vice versa, based upon said measuring;

the switching taking place at a point at which the minor ultimate diameter of the section having the varying diameter is located a predetermined distance from the bending rollers, which distance is 20% to 60% of the length of the section with the varying diameter.

4,918,959

METHOD FOR PREVENTING THE BUILDUP OF OILY DEPOSITS ON ROLLING MILL SCALE

Dennis P. Parazak, St. Louis; Charles W. Burkhardt, Fenton, both of Mo., and Rainer Langwald, Oberhausen, Fed. Rep. of Germany, assignors to Petrolite Corporation, St. Louis, Mo.

Filed Feb. 6, 1989, Ser. No. 306,601

Int. Cl.[5] B21B *45/06, 45/08*

U.S. Cl. 72—39 **8 Claims**

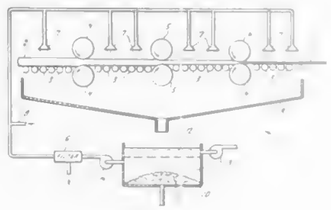
1. A method of preventing the formation of oily mill scale comprising the steps of:

a. hot rolling steel into a shaped object using a series of carrier and heavy rolls journalled such that lubricant used to reduce the journal friction of the rolls is emitted and deposited onto mill scale resulting from the rolling operation;

b. spraying the rolled steel in multiple stages as the steel moves from one heavy roll to another with a solution consisting essentially of a surfactant in an aqueous carrier, said surfactant being present in an amount sufficient to

emulsify the journal lubricant and sprayed with a force sufficient to flake off the mill scale;

c. conveying the sprayed liquid, the emulsified journal lubricant, and the flaked off mill scale together into a container



wherein the mill scale settles to the bottom of the container;

d. separating the sprayed liquid into an aqueous phase and an organic phase; and

e. recovering the mill scale from the bottom of the container

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4,918,960

METHOD FOR REMOVING SCALE FROM A METAL STRIP

Jury V. Lipukhim, ploschad Metallurgov, 5, kv. 15; Leonid I. Danilov, ulitsa Vereschagina, 51, kv. 8; Eduard A. Garber, ulitsa M. Gorkogo, 85, kv. 17, and Anatoly N. Subbotin, prospekt Pobedy, 120, kv. 14, all of Vologodskaya oblast Cherepovets, U.S.S.R.

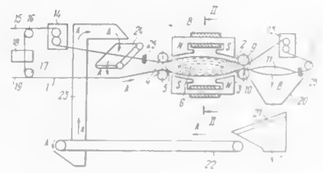
PCT No. PCT/SU88/00012, § 371 Date Sep. 21, 1988, § 102(e) Date Sep. 21, 1988, PCT Pub. No. WO88/05348, PCT Pub. Date Jul. 28, 1988

PCT Filed Jan. 15, 1988, Ser. No. 271,951

Claims priority, application U.S.S.R., Jan. 21, 1987, 4175586

Int. Cl.[5] B21B *45/06*

U.S. Cl. 72—40 **4 Claims**



1. A method of removing scale from a metal strip, comprising the steps of stretching and flattening said strip in a horizontal position first in one direction and then another direction opposite to said one direction in a manner to form spaced, horizontally arranged upper and lower sections of said strip; moving the strip, including the upper and lower sections thereof, through a cleaning zone defined between said strip sections; introducing abrasive ferromagnetic cleaning powder into said cleaning zone; pressing said powder against the surfaces of said upper and lower strip sections during their movement through said cleaning zone to descale said strip; and, withdrawing said powder, scale, and descaled strip from said cleaning zone.

4,918,961

MACHINE FOR SPLINING CLUTCH HUBS WITH CLOSE TOLERANCE SPLINE BELLMOUTH AND OIL SEAL SURFACE ROUNDNESS

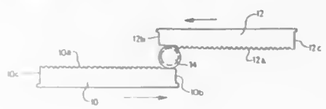
Gary R. Hill, Mt. Clemens, Mich., assignor to Micromatic Textron Inc., Holland, Mich.

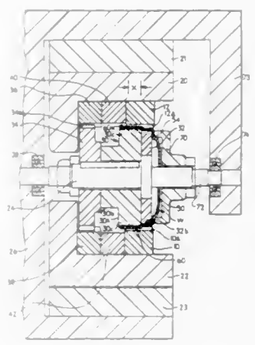
Continuation of Ser. No. 51,316, May 19, 1987, Pat. No. 4,833,905. This application Aug. 24, 1988, Ser. No. 235,958

The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.

Int. Cl.[5] B21H *5/00*

U.S. Cl. 72—88 **3 Claims**





1. In a machine for forming axially-extending splines on a sleeve of a cup-shaped power transmission member wherein the sleeve is mounted on a rotatable toothed mandrel between a pair of sliding toothed racks which are slidable past opposite sides of the mandrel with the mandrel teeth intermeshing with the rack teeth with the sleeve therebetween and wherein the sleeve has an open end and another end closed by an annular end wall, the improvement comprising the mandrel and pair of racks being in offset relation to one another and the mandrel teeth having an outer periphery which is defined by an imaginary cylinder of a single diameter and which extends axially from a first mandrel end proximate to said annular end wall toward a second mandrel end remote from said annular end wall, said mandrel and pair of racks being offset to such an extent that the second mandrel end includes an annular axially extending portion in non-intermeshing relationship with said pair of racks and having a length for receiving a ring-shaped portion of the sleeve of selected axial length adjacent the open sleeve end, said outer periphery of the mandrel teeth being uninterrupted from the first mandrel end toward the second mandrel end sufficient for the sleeve to extend to said axially extending portion of the second mandrel end, and said mandrel having means for engaging the power transmissionmember of axially position the ring-shaped portion of the sleeve to overlie said axially extending portion so as not to be located between the intermeshing mandrel teeth and rack teeth and thus not splined with the remainder of the sleeve, said selected axial length of the ring-shaped portion not splined being sufficient to reduce bellmouth of the formed splines.

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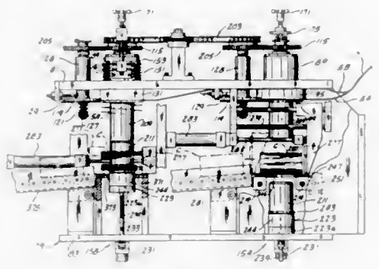
4,918,962
APPARATUS AND METHOD FOR FORMING EDGEWISE WOUND CORES
Harold L. Fritzsche, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.
Division of Ser. No. 237,042, Aug. 26, 1988, which is a division of Ser. No. 904,140, Sep. 4, 1986, Pat. No. 4,796,451, which is a division of Ser. No. 660,211, Oct. 12, 1984, Pat. No. 4,613,780.
This application Mar. 27, 1989, Ser. No. 329,285
Int. Cl.[5] B21C *47/04*
U.S. Cl. 72—134 29 Claims



1. A method of forming edgewise wound cores from a generally thin strip of ferromagnetic material at an operation station therefor, the operating station including a stripping arbor vertically movable between a pair of opposite positions, the method comprising the steps of:

deforming the strip generally edgewise thereof into a plurality of helical convolutions at the operation station and receiving the helical convolutions generally in an axial stack thereof about the stripping arbor in one of the opposite positions thereof to effect the formation on the stripping arbor of a respective one of the edgewise wound cores;

moving the striping arbor generally vertically with the respective one edgewise wound core thereon from the one opposite position of the stripping arbor toward the other of the opposite positions thereof and stripping the respective one edgewise wound core from the stripping arbor during the generally vertical movement of the stripping arbor between the one and other opposite positions thereof; and

supporting the respective one edgewise wound core in a preselected stripped position spaced generally vertically between the one and other opposite positions of the stripping arbor upon the occurrence of the stripping step.

4,918,963
RETRACTABLE ROLLING MILL INSTRUMENTATION PLATFORM
Jeffrey L. Manning, Forest, and Clemens F. Zurlippe, Madison Heights, both of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed May 1, 1989, Ser. No. 345,819
Int. Cl.[5] B21B *37/00*
U.S. Cl. 72—199 6 Claims

1. A rolling mill instrumentation platform comprising:

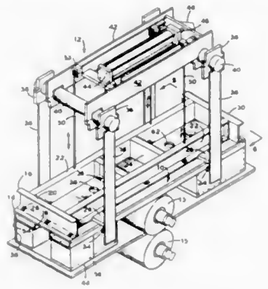
(a) a generally rectangular, rigid plate;

(b) stiffening means fixedly secured to said plate for maintaining the rigidity of said plate;

(c) positioning means for accurately positioning said plate with respect to a rolling mill, said positioning means comprising a first portion secured to said plate and a second portion secured to said rolling mill;

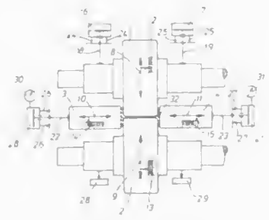
(d) retracting means for retracting said plate from said accurately positioned location, said retracting means comprising a framework secured to said rolling mill;

(e) operating means for moving said plate between its said accurately positioned location and an elevated position above said accurately positioned location; and,



(f) support means for securing instrumentation to said plate, said support means comprising a housing secured to said plate on each side of the longitudinal axis of the monitored roll of said rolling mill, said housings enclosing and protecting the said instrumentation from the adjacent environment of said rolling mill.

4,918,964
ADJUSTING MECHANISM FOR A UNIVERSAL STAND
Georg Engel, Kaarst, and Ernst-August Häberer, Korschenbroich, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft
Filed Jan. 22, 1988, Ser. No. 146,952
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3701889
Int. Cl.[5] B21B *13/10, 37/08*
U.S. Cl. 72—225 5 Claims



1. In a universal stand including horizontal rolls and vertical rolls and an adjusting mechanism, wherein the horizontal rolls and the vertical rolls are adjustable by means of combined electromechanic coarse adjustments and hydraulic fine adjustments, the electromechanic coarse adjustment as well as the hydraulic fine adjustment being monitored with respect to position by means of displacement pickups, the improvement comprising

(a) the hydraulic fine adjustments being additionally monitored by means of pressure pickups or rolling force pickups, the hydraulic fine adjustments being operated for the adjustment and opening of the rolls under pressure, and the hydraulic fine adjustments being controlled in accordance with displacement, and

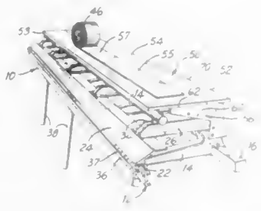
(b) an electronic control device for storing and reproducing all actual values measured by the pickups with respect to position, pressure and rolling force.

4,918,965
MULTIHIGH ROLLING MILL
Kazuo Kobayashi, Naka; Toshiyuki Kajiwara, Hitachi; Teruo Sekiya, Takahagi, and Tomoaki Kimura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
PCT No. PCT/JP87/00574, § 371 Date Feb. 24, 1988, § 102(e) Date Feb. 24, 1988, PCT Pub. No. WO88/00862, PCT Pub. Date Feb. 11, 1988
PCT Filed Jul. 31, 1987, Ser. No. 183,735
Claims priority, application Japan, Aug. 8, 1986, 61-185121
Int. Cl.[5] B21B *13/14*
U.S. Cl. 72—243 28 Claims

5. A multi-high rolling mill having a plurality of small-diameter work rolls, a plurality of backup rolls supporting said work rolls and arranged in the substantially vertical direction thereof, intermediate rollers supporting said small-diameter work rolls with respect to the whole length thereof, and support rollers supporting said intermediate rollers; and

each of said support rollers having a plurality of divisional rollers arranged in the axial direction thereof, each of the divisional rollers being arranged in a zigzag manner in accordance with the axial direction of the intermediate roller so that the axes of said divisional rollers are aligned with upper and lower divisional rollers relatively in the vertical direction, and second support rollers being further provided to support the relative upper and lower divisional rollers, commonly.

4,918,966
WORK TABLE FOR SHEET METAL BRAKES
Michael G. Raccioppi, Jr., 32 Leswing Ave., Saddle Brook, N.J. 07662
Filed Aug. 21, 1989, Ser. No. 396,363
Int. Cl.[5] B21D *5/02, 43/00*
U.S. Cl. 72—319 14 Claims



1. A work table for use in connection with a sheet metal brake having a frame, a clamp extending longitudinally along the frame, and bending means for bending a sheet of metal about a longitudinal bend line when the sheet of metal is held in the clamp, the work table comprising:

a table top extending in a longitudinal direction and having opposite surfaces;

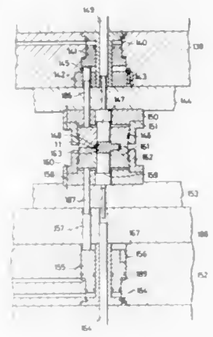
bracket means for mounting the table top upon the frame of the sheet metal brake such that the table top is located above the clamp and the longitudinal direction of the table top is aligned generally parallel to the longitudinal bend line, the bracket means including a support arm extending laterally along the bracket means and providing a generally horizontal support surface for the table top when the bracket means is secured to the frame of the sheet metal brake;

securing means for securing the bracket means to the frame in fixed relationship therewith; and

movable means coupling the table top with the bracket means for movement of the table top relative to the bracket means between a first position wherein the table top is essentially horizontal and one surface of said table top will rest upon the support surface provided by the support arm of the bracket means to overlie the clamp so that the opposite surface of said table top provides an essentially horizontal work surface for the preparation of the sheet of metal to be bent, and a second position wherein the table top is moved away from the clamp to expose the clamp for use in concert with the bending means for bending the prepared sheet of metal;

the bracket means further including means for defining the second position of the table top, said second position being established by said bracket means and one surface of said table top.

4,918,967
FULLY ENCLOSED DIE FORGING APPARATUS
Nobuyuki Ishinaga, Sagamihara, Japan, assignor to Aida Engineering, Ltd., Kanagawa, Japan
Filed Jul. 1, 1988, Ser. No. 214,334
Claims priority, application Japan, Jul. 6, 1987, 62-168318; Apr. 28, 1988, 63-105812
Int. Cl.[5] B21J *13/02*
U.S. Cl. 72—354 8 Claims



1. A fully enclosed die forging apparatus comprising a slide having an upside cylinder mechanism, a bolster having an underside cylinder mechanism, an upside die and an underside die disposed opposedly in a vertical direction between said slide and said bolster, an upside cylinder mechanism contained in said slide which urges said upside die downward, an underside cylinder mechanism contained in said bolster which urges said underside die upward, an upside punch inserted in said upside die that moves synchronously with the movement of said slide, an underside punch inserted in said underside die and supported by said bolster, and a cam mechanism intrinsic to and carried by said underside cylinder mechanism independently from said dies for causing both of said punches to accel-

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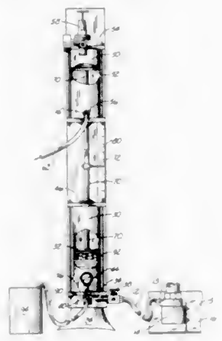
erate into said dies by moving said upside die and said underside die downward at a slower speed than the moving speed of said slide.

4,918,968

APPARATUS AND METHOD OF DETECTING LEAKS IN PRESSURIZED PIPING SYSTEMS

Kenneth L. Hoffman, 2515 West Anna, Grand Island, Nebr. 68801

Filed Jul. 10, 1989, Ser. No. 377,879
Int. Cl.[5] G01M *3/26*
U.S. Cl. 73—40 12 Claims



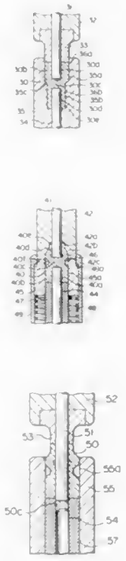
1. An apparatus for detecting leaks in a pressurized liquid piping system comprising:
a mounting frame;
a fill cylinder attached to said frame, said fill cylinder including a movable liquid-tight piston disposed therein and being movable between opposite ends of said fill cylinder;
a selectively closable test line port, and a selectively closable liquid product suction port formed in said fill cylinder on one side of said liquid-tight piston, and a vent port formed in said fill cylinder on the opposite side of said liquid-tight piston;
means for connecting said test line port to a pressurized liquid piping system to be tested;
means for connecting said liquid product suction port to a supply of liquid product;
means for determining the pressure of liquid product in the fill cylinder on one side of said liquid-tight piston;
a pressure cylinder attached to said frame and being spaced from and coaxially aligned with said fill cylinder, said pressure cylinder including a movable pressure piston disposed therein and being movable between opposite ends of said pressure cylinder;
a pressure regulator port formed in said pressure cylinder on one side of said pressure piston, and an access port formed in said pressure cylinder on the opposite side of said pressure piston;
a connecting rod attached to and interconnecting said liquid-tight piston and said pressure piston, said rod being disposed to span the space between the fill cylinder and the pressure cylinder;
means for applying a predetermined pressure to one side of the pressure piston through said pressure regulator port;
means for applying pressure to the opposite side of the pressure piston through said access port; and
means for indicating the position of said connecting rod relative to the frame in the space between the fill cylinder and the pressure cylinder, whereby movement of the rod toward the fill cylinder indicates a leak in the pressurized liquid piping system being tested.

4,918,969

FORGING METHOD FOR A HOLLOW ARTICLE

Hirosato Takeuchi; Yutaka Tanaka; Osahiko Miyazaki; Noboru Saito; Haruo Kubo; Naoyuki Kotake, and Makoto Nagumo, all of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 223,151, Jul. 22, 1988, abandoned. This application Jun. 9, 1989, Ser. No. 364,381
Claims priority, application Japan, Jul. 22, 1987, 62-181233
Int. Cl.[5] B21D *28/32;* B21J *5/12*
U.S. Cl. 72—334 4 Claims



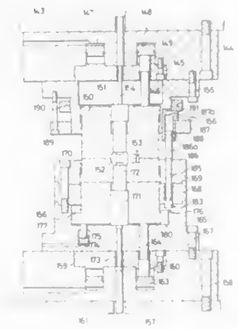
1. A forging method for a hollow article having a peripheral groove, comprising the steps of:
a first step of disposing a columnar material into a first stepped die with a cavity having large and small internal diameter portions and extruding one end portion of said material with a first punch in a direction opposite to an advancing direction of said first punch to thereby form a first blind hole in the center portion of said material;
a second step of deepening said first blind hole in a second stepped die with a cavity having large and small internal diameter portions and a stepped portion until the hole reaches the proximity of the stepped portion, and extruding the other end portion of said material into the inside of said small internal diameter portion of said cavity with a second punch previously extended thereinto to thereby simultaneously form stepped material having a large outer diameter portion and a small outer diameter portion with a stepped portion therebetween and a second blind hole at said other end portion thereof while leaving a blind portion between said first and second blind holes;
a third step of fitting said first and second blind holes to third punches while exposing in an unsupported manner the outer periphery of the small outer diameter portion of said stepped material from a third die and pressurizing, by means of a sleeve, only an end face portion of said small outer diameter portion formed with said second blind hole to expand said small outer diameter portion of said stepped material toward the outer periphery to form an expanded portion, thereby forming a peripheral groove between said expanded portion and the stepped portion of said stepped material; and
a fourth step of punching out said blind portion between said first and second blind holes of said stepped material to cause said first and second blind holes to communicate with each other.

4,918,970

FULLY ENCLOSED DIE FORGING APPARATUS

Nobuyuki Ishinaga, Sagamihara, Japan, assignor to Aida Engineering, Ltd., Kanagawa, Japan

Filed Jul. 1, 1988, Ser. No. 214,283
Claims priority, application Japan, Jun. 7, 1987, 62-168317; Apr. 28, 1988, 63-105811
Int. Cl.[5] B21J *13/02*
U.S. Cl. 72—354 9 Claims



1. A fully enclosed die forging apparatus comprising a slide having an upside die set plate, a bolster having an underside die set plate, an upside die and an underside die disposed opposedly in a vertical direction between said slide and said bolster, an upside cylinder mechanism disposed on said upside die set plate which urges said upside die downward, an underside cylinder mechanism disposed on said underside die set plate which urges said underside die upward, a support member for supporting the underside die, an upside punch inserted in said upside die that moves synchronously with the movement of said slide, an underside punch inserted in said underside die and supported by said bolster and a cam mechanism, said cam mechanism comprising at least one horizontal cam and at least one vertical cam in contact with said horizontal cam, said support member and horizontal cam being interengaged, at least one push pin having an upper end and a lower end, a push pin cylinder having a piston which abuts the upper end of said push pin for movement thereof synchronously with movement of the slide, the lower end of the push pin contacting the vertical cam for corresponding movement thereof, to cause descending movement of the support in response to movement of the horizontal cam produced by the vertical cam, whereby to cause both of said punches to accelerate into said dies by moving said upside die and said underside die downwardly at a slower speed than the moving speed of said slide.

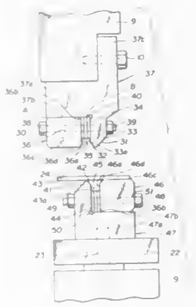
4,918,971

BENDING TOOL

Osamu Makino, 1-15-3, Bubai-cho, Fuchu-shi, Tokyo, Japan

Filed Mar. 13, 1989, Ser. No. 322,610
Claims priority, application Japan, Apr. 22, 1988, 63-98074
Int. Cl.[5] B21D *5/01*
U.S. Cl. 72—389 5 Claims

1. A bending tool for a bending press, comprising:
a first die having a first die body, and a blade provided at one end of said first die body as one bending member, said blade having a pointed edge with a bending angle of about 90°, said pointed edge disposed so that the bending angle is bisected by a vertical center line of said blade, the blade in cross section having a longer side on an outside thereof and a shorter side on an inside thereof, a first bending block disposed in relation to said first die body at a position laterally spaced from the shorter side of said blade as another bending member, said first bending block having a rectangular end face opposing the shorter side of said blade, and a first gap having a predetermined depth and an adjustable width between the blade and the first bending block;
a second die having a second die body, and a blade provided at one end of said second die body as one bending member, said blade having a pointed edge with a bending angle of about 90°, said pointed edge is disposed so that the bending angle is bisected by a vertical center line of said blade, said blade in cross section having a longer side on an outside thereof and a shorter side of an inside thereof,



a second bending block disposed in relation to said second die body at a position laterally spaced from the shorter side of said blade as another bending member, said second bending block having a rectangular end face opposing the shorter side of said blade, and a second gap having a predetermined depth and an adjustable width disposed between the blade and the second bending block;
spacers inserted between the blades and the bending blocks in each of the first and second dies; wherein,
said first and second dies are disposed in moveable opposition to each other in a manner such that a perpendicular bisector extending through an apex of a bending edge of the blade of the first die passes substantially to a center of said second gap, while a perpendicular bisector extending through an apex of the bending edge of the blade of the second die passes substantially to a center of said first gap,
wherein, in at least one of said first and second dies, either a bending member of a blade or a bending block is formed

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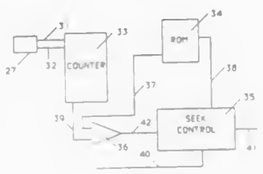
integral with the die body and the other bending member is removably mounted of the die body by fastening means, said die body having a flat surface extending horizontally from a base of the bending member integrally formed with the die body to a lateral end of the die body, and further, a base end surface of the bending member removably mounted on the die body is engaged with said horizontally extending flat surface.

4,918,972

DUAL REFERENCE TRACK SCHEME

Philip Kenny, Los Altos; Dan Cautis, San Mateo, and John Bizjak, San Jose, all of Calif., assignors to Brier Technology, Inc., San Jose, Calif.

Filed Nov. 10, 1988, Ser. No. 269,585
Int. Cl.[5] G01B *21/10*
U.S. Cl. 73—1 R **7 Claims**



1. A method for calibrating a servo head and a data head having a fixed relationship with each other, said method comprising the steps of:
providing a plurality of servo tracks on a storage media;
providing a first reference track on said storage media;
providing a second reference track on said storage media;
defining an anchor servo track as a servo track beneath said servo head when said data head is positioned over said first reference track;
generating a servo track count by counting servo tracks crossed by said servo head when said data head is moved from said first reference track to said second reference track;
comparing said servo track count to a stored track count, said stored track count representing the number of servo tracks crossed when a distance between said servo head and said data head is a nominal value;
generating a first error signal by taking the difference between said servo track count and said stored track count, said difference proportional to a difference in separation between said servo head and said data head from said nominal value.

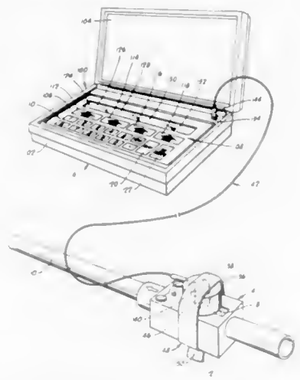
4,918,973

APPARATUS AND METHOD FOR CALIBRATING A MEASURING DEVICE

Richard M. Kruse, Wichita, Kans., assignor to Great Plains Industries, Inc., Wichita, Kans.

Filed Mar. 18, 1988, Ser. No. 170,315
Int. Cl.[5] G01F *25/00*
U.S. Cl. 73—3 **6 Claims**

2. An apparatus for calibrating a flowmeter which includes a body and an electromagnetic member disposed in the body, said apparatus comprising:
calibration means for providing a calibration signal characterized as electrical pulses;
electromagnetic means, connected to said calibration
means, for transmitting electromagnetic pulses in response to said electrical pulses; and connecting means for connecting said electromagnetic
means to the body of the flowmeter so that the electromagnetic member of the flowmeter is responsive to said electromagnetic pulses, said connecting means includes a strap, including two ends and having said electromagnetic means connected thereto intermediate said two ends, said



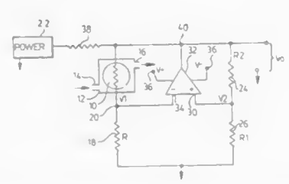
two ends adapted to be secured together after said strap is wrapped around the body of the flowmeter.

4,918,974

METHOD AND APPARATUS FOR THE MEASUREMENT OF THE THERMAL CONDUCTIVITY OF GASES

Raynald Hachey, Shipshaw; Daniel Lamarre, Duberger, and Jacques Marcotte, Jonquiere, all of Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Feb. 6, 1989, Ser. No. 307,318
Int. Cl.[5] G01N *25/36*
U.S. Cl. 73—27 R **18 Claims**



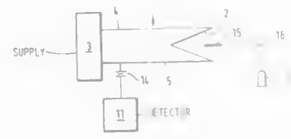
1. A method for the measurement of gas thermal conductivity employing a katharometer including:
supplying electric power to a single katharometer element having a temperature/resistance characteristic to heat it to a predetermined temperature value and a corresponding resistance value;
passing a test gas whose thermal conductivity is to be measured over the katharometer element to thereby change its temperature from the predetermined value and its resistance from the corresponding value;
employing the change of resistance of the element to change the supply of electrical power to the element to restore its temperature to the predetermined value and its resistance to the corresponding value; and
measuring the amount of power supplied to the element with its temperature restored to the predetermined value to determine the test gas thermal conductivity;
wherein the test gas whose conductivity is to be measured is entrained in a carrier gas;
the method employing two measurements spaced in time to determine the proportion of the test gas entrained in the carrier gas;
the method including circulating the carrier gas through the katharometer element and a probe in contact with the test gas for a first period of time sufficient to entrain the test gas in the carrier gas to form a mixture of gases, and thereafter making a first measurement;
thereafter purging the katharometer with carrier gas to remove the gas mixture and making a second measurement within a short period of time after the first measurement; and
employing the first and second measurements to eliminate the temperature of the katharometer element body as a variable from the gas thermal conductivity measurement.

4,918,975

METHOD AND APPARATUS FOR TESTING FLUID-FILLED SYSTEMS FOR LEAKS

Günter Voss, Much, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 175,800
Claims priority, application European Pat. Off., Mar. 31, 1987, 87104737.9
Int. Cl.[5] G01M *3/20*
U.S. Cl. 73—40.7 **19 Claims**



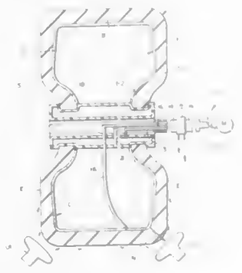
1. A method of determining the presence of a leak in a system containing a fluid, which at least has a liquid phase, comprising:
exposing a part of the system to be tested to a test gas, passing the fluid past a membrane separator, and sampling for the presence of the test gas that has passed through the membrane separator with the aid of a detector sensitive to the test gas.

4,913,976

METHOD OF INSPECTING TIRES FOR DEFECTS

Robert D. Fogal, Sr., Chambersburg, Pa., assignor to International Marketing, Inc., Chambersburg, Pa.

Continuation-in-part of Ser. No. 337,215, Apr. 12, 1989. This application Jul. 21, 1989, Ser. No. 383,122
Int. Cl.[5] G01M *3/04, 17/02*
U.S. Cl. 73—40.7 **34 Claims**



25. A method of inspecting a tire for defects comprising the steps of applying a first coating material which accentuates defects under ultraviolet light to an interior surface of a tire, applying ultraviolet light to an exterior surface of the coated tire whereby coating material which has migrated through a defect in the tire to the exterior is accentuated and thereby readily detected, applying a second coating material which is an admixture of a material which accentuates defects when influenced by predetermined electromagnetic wavelengths and a tire sealant which will seal the tire defects during migration therethrough to the interior surface of the tire, buffing the exterior tread surface of the tire, and applying the predetermined electromagnetic wavelengths to the buffed exterior tread surface of the coated tire whereby the defect accentuation material of the second coating which has migrated through a defect in the tire is accentuated and thereby readily detected.

4,918,977

LIQUID LEAKAGE DETECTOR LINE

Yasuhiko Takahashi, Nara; Kunimitsu Tamura, Higashiosaka; Nagato Niimura, Urawa; Keizo Asao, Matsubara; Teruyosi Honoki, Higashiosaka; Tadaaki Masui, Osaka, and Masuo Ishizaka, Higashiosaka, all of Japan, assignors to Tatsuta Electric Wire and Cable Co., Ltd., Osaka, Japan

Filed Sep. 30, 1987, Ser. No. 103,478
Claims priority, application Japan, Sep. 30, 1986, 61-151258[U]; Sep. 30, 1986, 61-151259[U]; Sep. 30, 1986, 61-151260[U]; Sep. 30, 1986, 61-151261[U]; Sep. 30, 1986, 61-151262[U]; Sep. 30, 1986, 61-151263[U]; Nov. 13, 1986, 61-174698[U]
Int. Cl.[5] G01M *3/18*
U.S. Cl. 73—40.5 R **18 Claims**

1. A liquid leakage detector line comprising:
a pair of wiry electrodes each including a conductor covered with an insulator layer made of a macromolecular material including an ester bond and adapted to dissolve in the presence of strong acids or alkalis, said wiry electrodes being disposed substantially in parallel with each other; and
a liquid-absorbent material covering said pair of wiry electrodes.

4,918,978

MEANS AND METHOD FOR DETECTING LEAKS IN TANKS

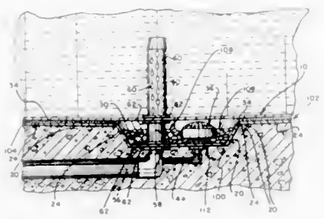
Marion C. Green, 1999 Amidon Suite 208, Wichita, Kans. 67203

Filed Mar. 20, 1989, Ser. No. 326,230
Int. Cl.[5] G01M *3/32*
U.S. Cl. 73—49.2 **19 Claims**

1. A system for detecting leaks in a tank, or the like, comprising an excavation basin in a ground having a surface and including a periphery and defining a generally saucer-like formation with a basin surface which slopes from said periphery;
tank supported by said excavation basin, said tank having a permeation barrier extending from the periphery of the basin excavation and supported by and conforming to the basin surface of the saucer-like formation, an impervious corrosion curtain integrally bound to said permeation barrier at the periphery of the basin and defining an upright side wall of the tank, particulate matter supported by said permeation barrier, a liquid-impervious liner continu-

ously extending from the top of and down said corrosion curtain up-right side wall and across the top of the particulate material that is being supported by the permeation barrier;

liquid-leakage receiver positioned in said particulate matter; said liquid-leakage receiver comprising a receiver base having a solid outside wall, a solid inside wall generally concentrically disposed with respect to said solid outside



wall, and a hub generally concentrically disposed with respect to said solid outside wall and said solid inside wall;

monitor conduit bound to said receiver and piercing the barrier and extending under the excavation basin outwardly therefrom beyond the periphery of said excavation basin;

and a leak-check tube attached to said monitor conduit under the ground and projected upwardly therefrom beyond the surface of the ground.

4,918,979

LIQUID TESTING APPARATUS

Derry F. Pearce, Airport West; Eugene Dimitriadis, Clayton, and James R. Starkey, Mulgrave, all of Australia, assignors to Godfrey Howden Pty. Ltd., Australia

Filed May 31, 1988, Ser. No. 200,161

Claims priority, application Australia, May 29, 1987, PI2219/87

Int. Cl.[5] G01N *29/02*

U.S. Cl. 73—61.1 R **17 Claims**

1. Liquid testing apparatus including a housing comprising means defining at least one chamber capable of receiving liquid to be tested, optically transparent reflecting means in the housing and having a plurality of reflecting surfaces in said means defining at least one chamber, light transmitting means in the housing for radiating light onto said reflecting means, reflected light receiving means in the housing for receiving light from the transmitting means which has been reflected on said plurality of surfaces and means for converting said reflected light into a first electrical signal indicative of the refractive index of the liquid, means in the housing for generating at least one sonic pulse and for transmitting same through liquid to be tested in said means defining at least one chamber, means in the housing for generating a second electrical signal indicative of the sonic velocity of the liquid and derived from said at least one transmitted pulse, means in the housing for sensing the temperature of the liquid under test, means in the housing for generating a third signal dependent on the temperature sensed and means for transmitting said first, second and third signals for determining the quality of the tested liquid.

4,918,980

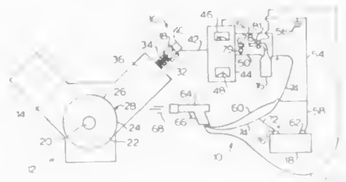
DIESEL ENGINE TIMING APPARATUS AND METHOD

Theos E. Theofanous, 4747 Kester Mill Rd., Winston-Salem, N.C. 27103

Filed Nov. 15, 1988, Ser. No. 271,497

Int. Cl.[5] G01M *15/00*

U.S. Cl. 73—119 A **12 Claims**



1. A diesel engine timing light assembly for a diesel engine system including a high voltage coil and a power supply, said timing assembly comprising:

(a) a luminosity probe comprising a housing adapted to be mountable in a glow plug opening of a selected cylinder of a diesel engine, said housing comprising a light-transmissive housing portion adapted to transmit light from combustion of fuel in said selected cylinder into the housing;

(b) a photocell mountable in the luminosity probe housing for receiving light transmitted into the housing and generating an on or off signal depending on the respective presence or absence of light received by the photocell;

(c) an inductive pick-up, strobe-type timing light operatively connectable (1) to said coil by an electrical wire joined at one end thereof to the timing light and attachable at an opposite end thereof to a positive secondary terminal of the coil and (2) to said power supply; and

(d) an amplifier operatively attachable: (i) in signal receiving relationship to said photocell, for receiving said on or off signal therefrom, and amplifying same to produce an on or off output signal; (ii) to said power supply; and (iii) to said coil by: (A) a first electrical wire joined at one end thereof to the amplifier and attachable at an opposite end thereof to said positive secondary terminal of the coil; and (B) a second electrical wire joined at one end thereof to the amplifier and attachable at an opposite end thereof to a negative secondary terminal of the coil, the first and second electrical wires, at their said one ends joined to the amplifier, being in electrical connection with amplifier circuitry means for generating said on or off output signal, and with said amplifier being attachable to said photocell by a third electrical wire connectable at one end thereof to the amplifier circuitry means and at an opposite end thereof to said photocell, so that said on or off output signal is transmittable from the amplifier to the coil, to generate a corresponding voltage signal which is inductively transmittable from the coil to said timing light when operatively connected therewith.

4,918,981

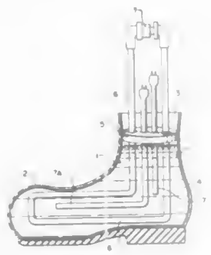
METHOD FOR MEASURING MOISTURE VAPOR TRANSMISSION RATE IN WEARING APPAREL

Robert W. Gore, Newark, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Oct. 28, 1988, Ser. No. 263,931

Int. Cl.[5] G01M *3/26*

U.S. Cl. 73—76 **3 Claims**



3. The method of claim 1 or 2 wherein the liner material is microporous expanded polytetrafluorethylene.

4,918,982

DEVICE FOR MEASURING AND TRANSMITTING THE COMBUSTION RADIATION IN THE COMBUSTION CHAMBER OF COMBUSTION ENGINES

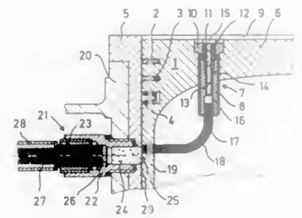
Franz Pischinger, Aachen; Ulrich Spicher, Stolberg, and Georg Heuser, Aachen, all of Fed. Rep. of Germany, assignors to FEV Motorentechnik GmbH & Co. KG, Aachen, Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 299,443

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1988, 3801949

Int. Cl.[5] G01M *15/00*

U.S. Cl. 73—116 **6 Claims**



1. A device for measuring and transmitting combustion radiation occurring in the combustion chamber of a combustion engine having a fixed part and at least one part moveable relative to the fixed part for together defining the combustion chamber, said parts having confronting relatively slideable surfaces defining a gap therebetween, the device comprising at least one optical sensor mounted in said movable part and facing said chamber, an optical light guide extending from said sensor and terminating at said gap, said light guide having a surface area at said gap for emitting signals from said chamber representing the combustion radiation, and an optical receiver mounted in said fixed part and terminating at said gap opposite said optical light guide for receiving and transmitting said signals.

4,918,983

APPARATUS FOR CHECKING MOTOR VEHICLE TIRES

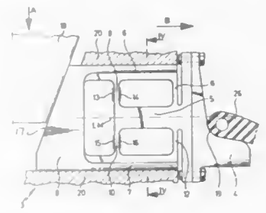
Günther Himmler, Darmstadt, Fed. Rep. of Germany, assignor to Gebr. Hofmann GmbH & Co. KG Maschinenfabrik, Pfungstadt, Fed. Rep. of Germany

Filed Apr. 28, 1989, Ser. No. 344,593

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1988, 3814646

Int. Cl.[5] G01M *17/02*

U.S. Cl. 73—146 **8 Claims**



1 Apparatus for checking a motor vehicle tire comprising:

clamping means disposed in a circular array and adapted to be displaced in a radially outward direction to bear against the internal bead of a tire to be checked;

force measuring means each associated with a respective clamping means and adapted, in the radially outward movement of the clamping means, to detect the compression force applied to the respective inner circumferential angular region of the tire bead by each clamping means, each force measuring means including a measuring body, a frame structure radially movably guided in the measuring body, a substantially central force transmission portion connected to the respective clamping means to be disposed within said frame structure, a plurality of resiliently bendable support portions supporting said force transmission portion is relation to said frame structure and extending substantially perpendicularly to the direction of the applied force, and strain gauges carried on respective ones of said support portions and connected to form a measuring bridge; and

a display means for displaying the detected compression forces.

4,918,984

DEVICE FOR MEASURING THE MODIFICATION TIME OF THE PHYSICAL STATE OF A FLUID MEDIUM

Jean-Luc Martinoli, Villeneuve La Garenne; Alain Rousseau, both of Paris, and Pascal Vilain, Hadancourt le Haut Clocher, all of France, assignors to Serbio, France

Filed Dec. 30, 1988, Ser. No. 292,171

Claims priority, application France, Dec. 30, 1987, 87 18348; Jul. 6, 1988, 88 09151

Int. Cl.[5] G01N *11/10*

U.S. Cl. 73—64.1 **10 Claims**

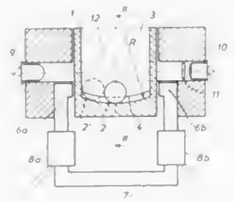
1 An apparatus for determining the time of change of the physical state of a fluid sample comprising:

(i) a container for holding the fluid sample, said container having a bottom;

(ii) a ferromagnetic member movable in the bottom of the container along a predetermined curvilinear path;

(iii) means for generating a periodic magnetic field coupled to said ferromagnetic member, said periodic magnetic field imparting to said ferromagnetic member a sustained pendular motion along said path, said periodic magnetic field having a period substantially equalling the natural

period of pendular motion of said ferromagnetic member along said path within said fluid sample and



(iv) detecting means for detecting the variations of the amplitude and/or the frequency of said pendular motion during said time of change.

4,918,985

DYNAMIC BALANCING SYSTEM OVERCOMING AERODYNAMIC FORCES

Robert Rollet, La Roquette/Siagne, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Jan. 10, 1989, Ser. No. 295,490
Claims priority, application France, Jan. 12, 1988, 88 00269
Int. Cl.[5] G01M *1/16*
U.S. Cl. 73—471 6 Claims

1. A system designed to eliminate the aerodynamic forces which are exerted on an object in rotation about a fixed axis, comprising first motive means, a shaft rotated by the first motive means about the axis and to which the object is fixed, the system comprising a chamber which encloses the object and is rotated about the fixed axis by second motive means, wherein the chamber has a circumferential wall provided with generally radial and vertical blades which extend inwardly from the wall.

4,918,986

QUICK-CLAMPING FIXTURE WITH CENTERING FEATURE FOR CLAMPING VEHICLE WHEELS ON THE SPINDLE OF A BALANCING MACHINE

Horst Warkotsch, Schulze-Delitzsch-Str. 21, 3006 Burgwedel 1, Fed. Rep. of Germany

Filed Feb. 6, 1989, Ser. No. 306,709
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1988, 3808755
Int. Cl.[5] G01M *01/02*
U.S. Cl. 73—487 4 Claims

1. In a quick-clamping fixture having centering means for clamping a vehicle wheel on the spindle of a balancing machine comprising

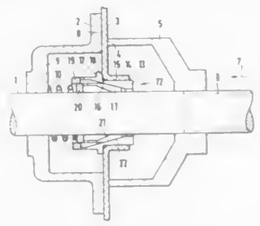
a flange fixed to said spindle for contact with the center portion of said vehicle wheel,

a nut threaded on said spindle for moving said wheel toward said fixed flange,

a clamping collet slidably mounted on said spindle which fits inside a flanged cylindrical opening in said center portion of said vehicle wheel, and

a spring on said spindle for urging said clamping collet into engagement with said cylindrical opening in said wheel, the improvement in which

said clamping collet is a two part collet having an inner part



with an outer conical surface and an outer part with a complementary inner conical surface which surfaces slide over each other as the parts are urged toward each other by said spring to expand the collet

said outer part having an external cylindrical surface which mates with said flanged cylindrical opening in said center portion of said vehicle wheel,

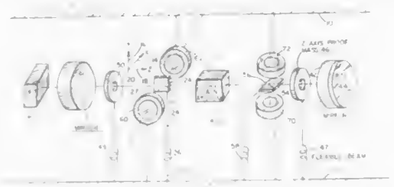
one of said collet parts having a contact surface for abutting said spring and the other of said collet parts having a surface abutting a counterbearing.

4,918,987

LASER ACCELEROMETER

Frederick Vescial, Orange, and Frederick Aronowitz, Laguna Niguel, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 19, 1988, Ser. No. 144,999
Int. Cl.[5] G01P *15/13*
U.S. Cl. 73—517 B 12 Claims



1. A laser accelerometer comprising:

an optical cavity characterizing a frame having an input axis (x), a cross axis (y) orthogonal to and co-planar with said input axis and a (z) axis passing through the intersection of said (x) and (y) axes, said (z) axis being orthogonal to the plane of said (x) and (y) axes;

an (x) axis proof mass having a predetermined blanking surface;

a flexible beam having a first end coupled to said (x) axis proof mass and a second end coupled to said frame, deflection of said flexible beams permitting a predetermined range of movement of said (x) proof mass on said input axis in a direction opposite to sensed acceleration of said frame;

a laser light source having a mirror means within said cavity for providing a light ray coaxially aligned with said (z) axis, said laser source being characterized to have a transverse electromagnetic field characteristic having a null intensity region centered on the (z) axis, said mirror means transmitting a light ray therethrough;

detector means having at least a first detector on a sensitive plane, said plane being normal to said (z) axis, said detector being positioned to be centered to said light ray and responsive to said transmitted light ray intensity signal;

bias and amplifier means coupled to said detector means for providing a bias current to said first detector and for amplifying said intensity signal, said intensity signal being characterized to have a magnitude related to the intensity of said transmitted light ray;

said (x) axis proof mass blanking surface being centrally positioned within and normal to said light ray null intensity region to provide increased blanking of said light ray in response to transverse movement of said mass on said input axis, said (x) axis proof mass deflecting said flexible beam and moving said blanking surface in a direction transverse to said light ray to partially blank said light ray in response to acceleration in the direction of said input axis (x);

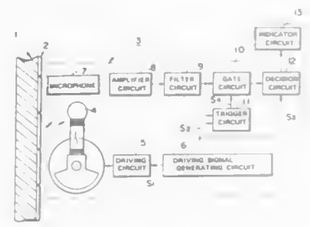
control means responsive to said intensity signal for applying an (x) axis restoring force to restore said (x) axis proof mass to said central position and for providing an (x) axis output signal proportional to the restoring force.

4,918,988

METHOD OF DETECTING A DEFECTIVE POSITION IN A CEMENT INTIMATE MIXTURE FILLED PORTION IN A BUILDING

Masaaki Ebihara, Kasukabe, and Kyosuke Nomura, Musashino, both of Japan, assignors to Taisei Corporation, Tokyo, Japan

Continuation of Ser. No. 137,508, Dec. 23, 1987, abandoned.
This application Feb. 24, 1989, Ser. No. 316,608
Int. Cl.[5] G01M *7/00*
U.S. Cl. 73—594 14 Claims



1. A method of testing for a defective position in a cement intimate mixture comprising the steps of:

(a) tapping a surface of the cement intimate mixture to be tested;

(b) converting a tapping sound generated by the tapping to a tapping sound signal which exhibits an attenuation characteristic;

(c) passing said tapping sound signal through a gate circuit having a passing characteristic substantially corresponding to a reverse of an attenuation characteristic in a perfect cement intimate mixture thereby to inhibit passing of a tapping sound signal which would be produced in the case of a perfect cement intimate mixture and also to inhibit passing of a tapping sound signal generated at the instant of the tapping;

(d) obtaining at least one of a peak value of an amplitude or an integrated value of the signal after passage thereof through said gate circuit; and

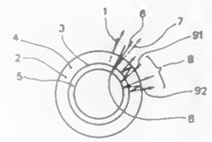
(e) comparing said peak value of the amplitude or said integrated value with a reference value to determine whether a defective portion exists in the cement intimate mixture.

4,918,989

ULTRASONIC METHOD OF MEASURING THE THICKNESS OF THE PLATING ON A METAL TUBE, THE CORRESPONDING APPARATUS AND ITS APPLICATION TO ZR PLATED ALLOY TUBES

Didier Desruelles, Albertville; André Bodin, and Philippe Moinard, both of Montreuil Juigné, all of France, assignors to Compagnie Europeenne du Zircoaium - CEZUS, Courbevoie, France

Filed Mar. 9, 1989, Ser. No. 321,071
Claims priority, application France, Mar. 30, 1988, 88 04726
Int. Cl.[5] G01N *29/00*
U.S. Cl. 73—627 17 Claims



1. A method for non-destructive measuring a thickness of a plating metallurgically bonded on metal tubes, said each tube having a core with an acoustic impedance, and said plating with a thickness of at least 0.4 mm and an acoustic impedance interfacing said core impedance, wherein said plating impedance differs from said core impedance by at least 1.0%, said method using an emitter-receiver transducer in immersion positioned outside said tube for producing ultrasonic waves to generate at least a single echo through said tube, wherein said method comprises the following steps:

selecting a properly dampened transducer with a principal resonance frequency between four and 20 MHz as said emitter-receiver transducer;

positioning said transducer in relation to said tube at a distance as well as orientation to generate a distance parameter and orientation parameter, wherein said parameters with the produced ultrasound waves form a signal-to-noise ratio which is increased by adjusting said parameters; and

determining the thickness of said plating from at least one double echo or a triple echo generated at said interfacing of said plating and said core, wherein said double and triple echoes correspond respectively to two or three return paths of the ultrasonic waves having the same travel time but a different reflexion-transmission chronology.

4,918,990

ULTRASONIC TRANSDUCER ASSEMBLY

Kenneth A. Fowler; Dana R. Patch, both of Medfield, and Frederick H. Hotchkiss, Harvard, all of Mass., assignors to Panametrics, Inc., Waltham, Mass.

Continuation of Ser. No. 19,003, Feb. 26, 1987. This application May 8, 1989, Ser. No. 350,218
Int. Cl.[5] B23K *11/30*
U.S. Cl. 73—629 10 Claims

1. An ultrasonic transducer assembly for use within a welding electrode structure, wherein said welding electrode structure can be disassembled and includes a welding electrode tip detachably fitted to a shank, the electrode tip having a front surface adapted for welding a workpiece and a rear surface distal from the front surface, the ultrasonic transducer assembly comprising:

A. transducer means, including a transducer element, de-

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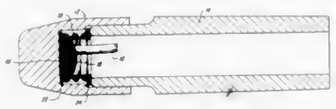
tachably positionable inside the electrode tip, between the shank and the rear surface of the electrode tip, and having a front surface, for generating, transmitting and receiving ultrasonic waves, said transducer means further including a rigid support element having front and rear surfaces and a peripheral flange, said rear surface of said support element being joined to said front surface of said transducer element, and said front surface of said support element being adapted for detachably contacting the rear surface of the electrode tip, so that said transducer means can be detachably coupled to the rear surface of the electrode tip, and

B. biasing means, interposed between said transducer means



and the shank, for generating a biasing force between the shank and the electrode tip and biasing said front surface of said transducer means into contact with the rear surface of the electrode tip, so that said transducer means is acoustically and detachably coupled to the rear surface of the electrode tip, said biasing means including a compression spring for generating said biasing force, said compression spring being located between the shank and the support element flange, said compression spring having first and second ends, said first end bearing against said flange, and said second end bearing against the shank, so that said biasing force is transmitted from the shank to said flange, and said transducer element is isolated from said biasing force.

4,918,991

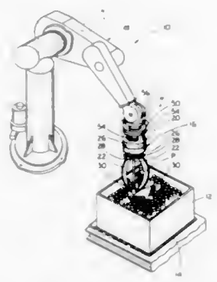
METHOD FOR SAMPLING NUCLEAR FUEL PELLETS WITH A ROBOT GRIPPER MECHANISM

George D. Bucher, McCandless Twp., Allegheny County; John T. DiGrande, Imperial, both of Pa.; Lester C. Frye, Irmo, S.C., and Mark S. Stoutamire, Bridgeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 936,561, Dec. 1, 1986, Pat. No. 4,830,565. This application Dec. 7, 1988, Ser. No. 280,867

Int. Cl.[5] G21C *21/00*

U.S. Cl. 73—864 9 Claims



4. A method of gently burrowing a plurality of angularly displaced gripping fingers into a stack of nuclear fuel pellets and grasping a pellet located at a predetermined depth in the stack, comprising the steps of:

(a) lowering said fingers into the stack of pellets toward the predetermined depth therein;

(b) rotating said fingers in a first direction relative to the stack and at a first predetermined speed concurrently as said fingers are being lowered into the stack;

(c) pausing said lowering of said fingers;

(d) rotating said fingers in a second direction opposite to said first direction relative to the stack and at a second predetermined speed faster than said first speed concurrently as said fingers are paused;

(e) repeating steps (a) through (d) until said desired predetermined depth is reached; and

(f) closing said fingers upon reaching said predetermined depth to grasp a pellet located at said depth in the stack of pellets.

4,918,992

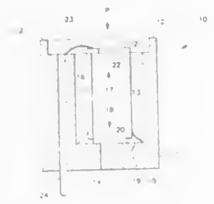
HIGH PERFORMANCE GLASS TO METAL SOLDER JOINT

Milton W. Mathias, El Paso, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 117,776, Nov. 5, 1987, abandoned. This application Mar. 14, 1989, Ser. No. 324,987

Int. Cl.[5] G01L *7/08, 9/06*

U.S. Cl. 73—727 7 Claims



1. A pressure sensor comprising:

a semiconductor die including a pressure sensing means, wherein said pressure sensing means is exposed at a surface of said die;

a glass member having first and second opposed ends, wherein said first end is bonded to said semiconductor die so that said first end surrounds said pressure sensing means on said surface of said semiconductor die, and wherein substantially all of the surface of said glass member at said second end is coated with a solder wetable material which includes titanium;

a metal member having a solder wetable area, wherein said solder wetable area will, when adjacent said second end, substantially cover at least said surface of said glass at said second end; and

a solder joint between said second end and said solder wetable area, wherein said solder is the sole means of support provided to said joint.

4,918,993

METHOD OF GAUGING PRE-EXISTING IN-SITU STRESS FROM AN EXTRACTED SAMPLE

David R. Hughson, 217 Rosedale Heights Drive, Toronto, Ontario, Canada (M4T 1C7)

Filed Aug. 21, 1987, Ser. No. 88,154

Claims priority, application United Kingdom, Aug. 21, 1986, 8620389

Int. Cl.[5] G01N *3/06*

U.S. Cl. 73—801 1 Claim

1. An apparatus for testing a prepared specimen comprising:

at least a pair of platens each including a hard, flat and smooth loading face with at least one of the faces being perpendicular to a compressive axis of the apparatus and another of the faces being optionally free to rotationally adapt to a plane of a specimen end cap;

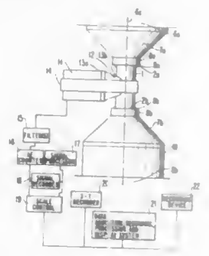
means for applying gradually and substantially uniformly increasing compressive force on the specimen by moving in a relative manner the loading faces towards each other;

means for measuring a compressive force applied by the loading faces to the specimen; and

a single acoustic emission detecting device for mounting directly on an intermediate portion of a cylindrical face of the specimen, the detecting device including:

an acoustic emission transducer for converting pulses emitted by such specimen under stress into detectable electronic signals;

means for holding said detecting device in contact with such specimen;



means for electronically filtering said electronic signals to pass only those signals in a frequency range typical of acoustic emission signals; and

means for cumulatively counting a number of said signals passed by said filter means; and

wherein an interface is defined between said detecting device and such specimen being tested, and further comprising a wave guide provided at a detecting end of said detecting device, said wave guide including:

an end conforming to a cylindrical side wall shape of such specimen, and

a couplant interposed between said wave guide and a detecting end of said detecting device and also between said wave guide and the specimen.

4,918,994

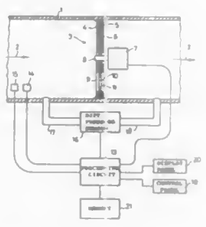
GAS METER

Albert Kramer, De Bilt, Netherlands, assignor to EMS Holland B.V., De Bilt, Netherlands

Continuation-in-part of Ser. No. 52,792, May 21, 1987, abandoned. This application Dec. 2, 1988, Ser. No. 279,549

Int. Cl.[5] G01F *1/40*

U.S. Cl. 73—861.53 15 Claims



1. A method for measuring a quantity of gas flowing per unit time through a pipe provided with an adjustable restriction having a plurality of selectable different restriction areas and having means for measuring the pressure difference across the restriction, comprising the steps:

(a) establishing for each selectable different restriction area a range of measurable pressure differences, each range having upper and lower pressure difference limits,

(b) measuring the pressure difference across a selected restriction,

(c) if the measurement difference is larger than the upper limit for the currently selected restriction, selecting the next restriction whose area is larger than that of the currently-selected restriction, if the measured pressure difference is smaller than the lower limit for the currently-selected restriction, selecting a preceding restriction whose area is smaller than that of the currently-selected restriction,

(d) measuring the actual pressure difference across the last-selected restriction,

(e) determining the quantity per unit time of flowing gas by multiplying the actual pressure difference measured in step (d) by a factor determined by the last-selected restriction area.

4,918,995

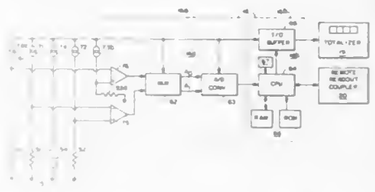
ELECTRONIC GAS METER

Arthur N. J. Pearman, St. Paul; Gerald D. Hunter, Lino Lakes; Michael A. Woessner, Golden Valley, and Robert E. Gilman, St. Michael, all of Minn., assignors to Gas Research Institute, Chicago, Ill.

Filed Jan. 4, 1988, Ser. No. 140,714

Int. Cl.[5] G01F *1/68*

U.S. Cl. 73—861.02 21 Claims



1. A compact gas meter for measuring usage of natural gas or the like by a consumer over a time interval to enable billing of the consumer by a utility, comprising: a housing having a passageway therethrough with a gas inlet adapted for connection to a source of natural gas provided by the utility and a gas outlet adapted for connection to gas utilization means of the consumer, gas flow sensing means mounted on said housing and including a solid state flow sensor having a substrate bearing a thin film heating element and first and second thin film temperature sensing elements flanking said heating element, and means locating said flow sensor in said passageway to directly sense gas flow through said passageway, said flow sensor being oriented to extend generally coplanar with the direction of flow of the gas through said passageway, with one of said temperature sensing elements located upstream of the gas flow through said passageway and the other one of said temperature sensing elements located downstream of the gas flow, said flow sensor being operable when energized to provide an output signal indicative of gas flow rate through said passageway, signal processing circuit means mounted within said housing and electrically connected to said flow sensor, said signal processing circuit means including signal sampling means for periodically sampling the output signal provided by said flow sensor during sampling periods and generating a signal representative of gas flow volume over a predetermined time interval, power switch means responsive to said signal sampling means for energizing said flow sensor during said sampling periods, said signal sampling means defining operating cycles for said power switch means, each operating cycle including an active period of a given duration and an inactive period of a substantially longer duration, said power switch means energizing said flow sensor enabling said flow sensor to

provide its output signal only during the active period of each operating cycle, and indicating means controlled by said sampling means to provide an indication of the gas flow volume measured by the gas flow sensor.

4,918,996

TURBINE FLOWMETER

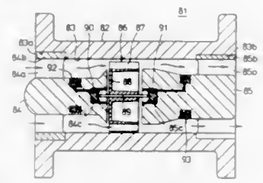
Takashi Kato, Kawasaki; Yutaka Morita, Takarazuka; Takeshi Yamaguchi, Kyoto; Kazuo Tsuge, Yokohama; Kyoji Imamura, Yokohama; Yoshio Kawai, Yokohama; Hiroaki Hasegawa, and Hiroyuki Amemori, both of Kawasaki, all of Japan, assignors to Osaka Gas Co., Ltd., Osaka and Tokico Ltd., Kawasaki, both of, Japan

Filed Sep. 30, 1987, Ser. No. 106,175

Claims priority, application Japan, Sep. 30, 1986, 61-231527; Sep. 30, 1986, 61-150145[U]

Int. Cl.[5] G01F *1/10*

U.S. Cl. 73—861.91 **1 Claim**



1. A turbine flowmeter comprising:

an impeller rotatably provided within a flow passage through which a fluid to be measured flows, said impeller comprising a rotary shaft which rotates together with said impeller;

a pair of bearing members having bearing surfaces for axially supporting said rotary shaft;

oil accumulating means for accumulating a lubricating oil therein;

oil supplying means for supplying the lubricating oil in said oil accumulating means in small quantities to the bearing surface of at least one of said bearing members; and

an upstream side supporting member provided on an upstream side of said impeller and a downstream side supporting member provided on a downstream side of said impeller,

each of said upstream and downstream side supporting members having a space in which said bearing member is mounted, said oil accumulating means being provided within each of said upstream and downstream side supporting members, said oil supplying means comprising capillary means opening in a vicinity of said bearing surface, a communicating hole in each of said upstream and downstream side supporting members for enabling communication between said oil accumulating means and said space and a fiber yarn provided inside said communicating hole for supplying the lubricating oil in said oil accumulating means in small quantities to the bearing surface of the corresponding bearing member through said capillary means due to a capillarity introduced in said capillary means.

4,918,997

VERNIER TORQUEMETER

Jean Pouillange, Gressy, France, assignor to CGEE Alsthom, Perret, France

Filed Mar. 17, 1988, Ser. No. 169,535

Claims priority, application France, Mar. 17, 1987, 87 03638

Int. Cl.[5] G01L *3/10*

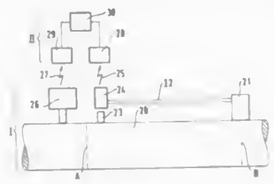
U.S. Cl. 73—862.34 **7 Claims**

1. A device for measuring an angle of twist between first and second sections (A, B) of a shaft, while the shaft is rotating, the device being characterized in that it comprises:

first means (**21**) fixed to the shaft at said second section for generating information representative of the phase at said second section and transmitting said information to the vicinity of said first section;

a first heteropolar vernier inductor (**23, 24**) including a component which is fixed to said shaft at said first section for receiving said information from said first means and transmitting said information in the form of a first resulting magnetic induction (**25**);

a first stationary bi-polar receiver (**28**) picking up said first magnetic induction and providing an output signal;



a secondary stationary bi-polar receiver (**29**) picking up second magnetic induction (**27**) provided by second means (**26**) on the shaft and providing an output signal constituting a phase reference; and

a phase comparator (**30**) receiving said output signals from said receivers at inputs thereof and providing an output signal proportional to the phase difference between said signals, and thus to said angle of twist.

4,918,998

MOTOR-SPEED REDUCER DEVICE INCLUDING SAFETY MEANS FOR DRIVING AN ELEMENT

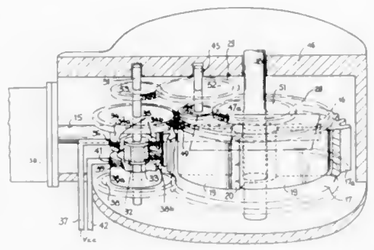
Pierre Periou, Cergy Pontoise, France, assignor to Rockwell-CIM, France

Filed Nov. 7, 1988, Ser. No. 267,868

Claims priority, application France, Nov. 23, 1987, 87 16211

Int. Cl.[5] G01L *3/14*

U.S. Cl. 73—862.34 **5 Claims**



1. A motor-speed reducer device comprising: a driving input shaft, an output shaft, a deformable coupling coupling the input shaft to the output shaft, said coupling including a worm and a speed reducer driven by the worm, and a sensor for detecting torque between the input shaft and the output shaft during operation of the device and causing deformation of the coupling, said sensor including a pair of cheeks with each cheek fixed to an end of one of said input and output shafts, two electrically conductive tracks with each track extending along a portion of a circumference of one of said cheeks, a coil spring having one end attached to one of said cheeks and another end attached to the other cheek and an electrical circuit connected to said tracks and including means for monitoring the torque detected by said sensor.

4,918,999

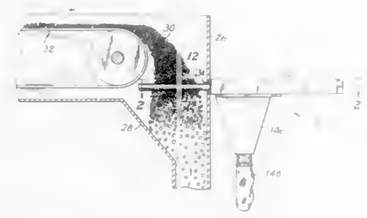
SAMPLER FOR SOLID MATERIALS

Hugo Wenshau, Dallas, and Grant G. Rice, Arlington, both of Tex., assignors to Intersystems, Inc., Omaha, Nebr.

Filed Apr. 28, 1989, Ser. No. 345,018

Int. Cl.[5] G01N *1/20*

U.S. Cl. 73—863.54 **16 Claims**



1. A sampler comprising

a support frame,

probe means mounted on said support frame, with said probe means including a probe cavity portion formed thereon,

translational drive means mounted on said support frame,

first connection means connecting said translational drive means and said probe means for extension of said probe means and retraction of said probe means relative to said support frame,

rotational drive means mounted on said support frame,

second connection means connecting said rotational drive means and said probe means for rotation of said probe means relative to said support frame,

mounting means for mounting said support frame on a product flow chute, and

control system means for control of said extension of said probe means into said product flow chute and into a stream of product flow, followed by rotation of said probe with said probe cavity directed substantially toward said stream of product flow to receive a sample of said product flow, further rotation of said probe means with said probe cavity directed partially away from said product stream, followed by retraction of said probe means away from said product flow chute and followed by further rotation of said probe means to discharge said sample of said product.

4,919,000

CONVEYOR BELT CROSS-STREAM SAMPLING SYSTEM AND ASSOCIATED METHOD

John B. Long, 421 Heron Hill Dr., Louisville, Tenn. 37777

Filed Jun. 6, 1989, Ser. No. 363,544

Int. Cl.[5] G01N *37/00*

U.S. Cl. 73—863.91 **11 Claims**

1. A system for taking a cross-stream increment of bulk material carried along a moving conveyor belt comprising:

a sampler;

means for moving the sampler across the moving conveyor belt at substantially a right angle with respect to the direction of movement of bulk material carried by the belt so that when operatively moved across the belt, the sampler passes through the bulk material in a manner segregating and removing a cross-stream increment of bulk material from the belt and leaving a path in the material having an upstream and downstream edge;

said sampler including an upstream side oriented generally perpendicular to the flow of bulk material on the belt, a downstream side and a back plate joining the upstream and downstream sides and oriented substantially perpendicular to the upstream side, each of said upstream and downstream sides including a leading edge for entering the bulk material in advance of the remainder of the upstream and downstream sides and the back plate and wherein the leading edges of the upstream and downstream sides are contained generally in a plane oriented substantially parallel to the back plate so that the upstream side provides the surface area of said sampler projected upstream of the bulk material flow; and

said downstream side joined to said back plate so as to define an acute interior angle therewith so that for a preselected sample-accepting capacity of said sampler at a predetermined spacing between said leading edges of said upstream and downstream side plates, the upstream projected area of said sampler is relatively small as compared to a sampler wherein said upstream and downstream sides are parallel.

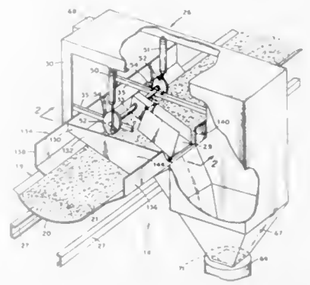
6. A system for taking a cross-stream increment of bulk material carried along a moving conveyor belt comprising:

a sampler including an upstream side having a surface facing generally upstream of the flow of bulk material along the moving conveyor belt;

means for supporting the sampler generally above the conveyor belt;

means for moving the sampler across the conveyor belt at substantially a right angle with respect to the direction of movement of bulk material flow so that when operatively moved across the belt, the sampler passes through the bulk material in a manner segregating and removing a cross-stream increment of bulk material from the belt; and

means associated with said sampler support means and positioned upstream of the sampler for limiting the buildup of bulk material against the upstream side surface of the sampler when the sampler is positioned within the flow of the bulk material so that when bulk material has built up against the upstream side surface of the sampler by a predetermined amount, additional bulk material buildup is intercepted by said limiting means.



9. A system for taking a cross-stream increment of bulk material moving along a conveyor belt comprising;

a sampler;

means for supporting the sampler for rotation about an axis so that when rotated, the sampler moves across the conveyor belt at substantially a right angle with respect to the direction of movement of bulk material flow and passes through the bulk material in a manner segregating and removing a cross-stream increment of bulk material from the belt;

means for rotating the sampler about its rotation axis so that during a pass of the sampler through the material, the sampler enters the bulk material at one side of the belt corresponding to an entry-side of the belt and exits the bulk material at the other side of the belt corresponding to an eject-side of the belt;

collection mean for collecting the cross-stream increment removed from the belt by the sampler and having an opening positioned adjacent the eject-side of the belt for

VOL 1113 ISS 4 AP 24 1990 UMI

receiving the cross-stream increment of bulk material removed from the belt by the sampler;

control means associated with said rotating means for halting the rotation of said sampler and disposing said sampler in a parked position adjacent the eject-side of the belt upon completion of an increment-collecting cycle so that ingress of bulk material into the collection means opening from the belt between increment-collecting cycles is restricted by the sampler; and

skirt means disposed adjacent said eject-side of the belt and including spaced-apart panels extending generally upwardly from the belt to define said opening therebetween for accommodating passage of the sampler therethrough during an increment-collecting cycle, said panels cooperating with said sampler when said sampler is in its parked position to restrict entry of bulk material into said opening when said sampler is in said parked position.

4,919,001

COARSE/FINE ADJUSTMENT COAXIAL HANDLE FOR FEEDING MICROSCOPE STAGE

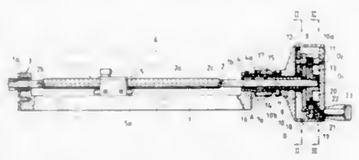
Takashi Ogiwara; Kesao Isono, both of Ina, and Masahide Katagiri, Hachiouji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1988, Ser. No. 254,923

Claims priority, application Japan, Oct. 9, 1987, 62-255614; Oct. 9, 1987, 62-255615

Int. Cl.[5] G02B *21/26*; F16H *37/06*; G05G *11/00*

U.S. Cl. 74—10.52 4 Claims



1. A coarse/fine adjustment coaxial handle for feeding microscope stage comprising a feed screw shaft rotatably supported on a base block and screwed in a stage supporting member, a tubular member rotatably fitted over said feed screw shaft and equipped with a first disc plate fixed to the tubular member at one end thereof, a fine adjustment knob rotatably fitted over said tubular member and having an outer circumferential wall surrounding said first disc plate, a reduction gear mechanism including a intermediate gear pivoted on said first disc plate and interposed between said fine adjustment knob and said feed screw shaft, a first frictional resistance to said tubular member with an elastic pressing member interposed between the other end of said tubular member and said base block, a second disc plate rotatably fitted within said fine adjustment knob and connected to said first disc plate, and a coarse adjustment handle pivoted to an eccentric position on said second disc plate.

4,919,002

STEPLESS SPEED CHANGE APPARATUS

Takeshi Kume, Amagasaki, Japan, assignor to T.K.M. Engineering Kabushiki Kaisha, Amagasaki, Japan

Filed Feb. 22, 1989, Ser. No. 313,747

Claims priority, application Japan, Feb. 23, 1988, 63-41610; Aug. 31, 1988, 63-219499

Int. Cl.[5] F16H *15/08*

U.S. Cl. 74—199 7 Claims

1. A stepless speed change apparatus comprising:

a frame;

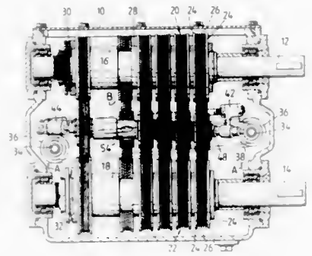
first and second parallel shafts journaled on said frame;

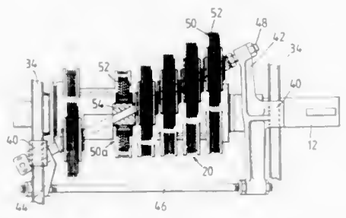
a plurality of first disc means mounted on said first shaft so as to rotate therewith;

a plurality of second disc means mounted on said second shaft so as to rotate therewith;

said first and second disc means having diameters increasing axially in the opposite directions to each other;

an intermediate shaft supported on said frame between said parallel shafts at an angle to a plane containing the axes of the parallel shafts, said intermediate shaft being adapted to shift in a direction transverse to said plane;





a plurality of intermediate disc means of the same diameter, which are mounted rotatably on said intermediate shaft with their axes in parallel to said parallel shafts, each of said intermediate disc means being aligned radially with one of said first disc means and one of said second disc means; and

whereby any one of said intermediate disc means can, depending on the position of said intermediate shaft, engage with the aligned first and second disc means at their peripheries.

4,919,003

VIDEO GAME AND THE LIKE CONTROL ASSEMBLY

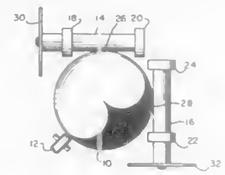
James L. Lawson, Liverpool, and David C. Harris, Dewitt, both of N.Y., assignors to The Torrington Company, Torrington, Conn.

Continuation of Ser. No. 505,339, Jun. 17, 1983, abandoned. This application Jan. 31, 1986, Ser. No. 823,988

Int. Cl.[5] G05G *9/00*

U.S. Cl. 74—471 XY 1 Claim

1. In combination: a manual control ball rotatable in any direction at variable speeds; a pair of perpendicular rotatable shafts each contacting the control ball at a control ball-shaft contact point, each rotatable shaft having a pair of circumferential grooves, one circumferential groove being axially spaced on the opposite side of the control ball-shaft contact point from the other circumferential groove, said circumferential grooves providing inner ball raceways; a pair of outer bearing rings on each shaft, each ring having an inner circumferential groove forming an outer ball raceway, balls located in



the raceways; and an encoder disk mounted on each rotatable shaft.

4,919,004

SPEED CHANGE OPERATING DEVICE

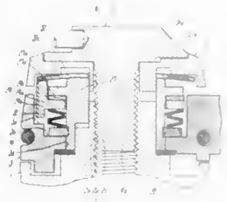
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Division of Ser. No. 79,465, Jul. 30, 1987, Pat. No. 4,815,330, which is a division of Ser. No. 665,941, Oct. 29, 1984, Pat. No. 4,751,850. This application Oct. 20, 1988, Ser. No. 260,058

Claims priority, application Japan, Apr. 3, 1984, 59-67162; Apr. 3, 1984, 59-67163; Jul. 25, 1984, 59-156222

Int. Cl.[5] G05G *9/00*

U.S. Cl. 74—475 9 Claims



1. A speed-change operating device adapted to switch a derailleur from one to another of plural speed stages of a bicycle, said derailleur having a return spring for returning the derailleur to a rest position. said speed-change operating device comprising:

a base member adapted to be supported on said bicycle, said base member having a lever shaft,

an operating lever rotatably supported on said lever shaft and adapted to actuate said derailleur,

a friction mechanism for applying to said lever a rotational resistance adapted to overcome a bias supplied by said return spring of said derailleur,

a positioning mechansim for positioning said lever at one of said plural speed change stages, said positioning mechanism including a positioning member having a plurality of engaging portions oriented substantially on a circle centered around said lever shaft and an engaging member engageable with at least one of said engaging portions, and

an operating mechansim to select between an operating mode and an non-operating mode for said positioning mechanism for positioning said lever, wherein said operating lever includes a boss and said speed-change operating device further comprises an adjusting screw member screwably engaged with said lever shaft of said base member and a cap member non-rotatably supported relative to said base member and axially movable relative to said lever shaft of said base member, said positioning mechanism being interposed between said boss and said cap member, said cap member being axially movable relative to said lever shaft of said base member responsive to screwing movement of said adjusting screw member relative to said lever shaft of said base member to enable said friction mechanism to move selectively toward and away from said operating lever to select an actuation mode of one of said friction mechanism and said positioning mechanism.

4,919,005

DEVICE FOR ACTUATING AN INCOMPRESSIBLE DRIVE CABLE

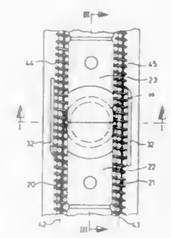
Bernd Schleicher, Munich, Fed. Rep. of Germany, assignor to Webasto AG Fahrzeugtechnik, Gauting, Fed. Rep. of Germany

Filed Mar. 21, 1989, Ser. No. 326,725

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1988, 3809949

Int. Cl.[5] F16C *1/10*; B60J *7/057*

U.S. Cl. 74—501.6 10 Claims



1. Device for actuating at least one incompressible helically threaded drive cable, that is axially movable for displacing a movable part in a vehicle body, comprising a drive pinion seated on a drive shaft and a cable guideway for guiding the drive cable in proximity to the drive pinion, wherein the cable guideway has boundary edges that, in use, contact the drive cable and form a slope angle, with respect to a longitudinal axis of the drive cable, which is other than 90 degrees, and form an acute approach angle that is enclosed between said boundary edges of the cable guideway and sections of turns of the helical thread which face them, said approach angle being larger than an acute elevation angle that is enclosed between the turns of the helical thread and a plane which extends perpendicularly relative to the longitudinal axis of the drive cable.

4,919,006

VISCOUS DIFFERENTIAL

Mark A. Willett, Novi, and James P. McCarthy, Milford, both of Mich., assignors to GKN Automotive, Inc., Auburn Hills, Mich.

Filed Jan. 22, 1988, Ser. No. 147,295

Int. Cl.[5] F16H *35/04*

U.S. Cl. 74—650 41 Claims

1. A limited slip viscous differential between a first axle, a second axle, and a third axle, comprising:

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a housing having a first end and a second end, said housing having a first axle hub at said first end thereof for receiving said first axle, said housing having a second axle hub at said second end thereof for receiving said second axle, said housing further having an inner surface of cylindrical shape;
first connection means on said housing for rotatably connecting said housing to said third axle;
a first drum rotatably mounted in said housing adjacent said first end thereof, said first drum having an outer surface spaced from said inner surface of said housing, said outer surface of said first drum and said inner surface of said housing defining a first chamber;
second connection means on said first drum and said first axle for causing said first drum to rotate with said first axle and for permitting said first axle to be slidable relative to said first drum;
a second drum rotatably mounted in said housing adjacent said second end thereof, said second drum having an outer surface spaced from said inner surface of said housing, said outer surface of said second drum and said inner surface of said housing defining a second chamber;
third connection means on said second drum and said second axle for causing said second drum to rotate with said second axle and for permitting said second axle to be slidable relative to said second drum;
an annular bulkhead disposed in said housing between said first and second drums and separating said first chamber from said second chamber, said annular bulkhead having a cut-out provided diametrically therethrough;
at least one thrust block inserted in said cut-out to maintain a predetermined interaxial space between the adjacent ends of said first and second axles;
a first set of first drum annular plates attached to said outer surface of said first drum;
a second set of first drum annular plates attached to said inner surface of said housing, said second set of first drum annular plates interleaving said first set of first drum annular plates;
a first set of second drum annular plates attached to said outer surface of said second drum;
a second set of second drum annular plates attached to said inner surface of said housing, said second set of second drum annular plates interleaving said first set of second drum annular plates; and
a high viscosity fluid contained in said first and second chambers for transferring torque from said third axle to at least one of said first and second axles when at least one of said first and second axles rotate at an angular velocity different from that of said housing.

4,919,007

CONTINUOUSLY VARIABLE TRANSMISSION WITH FORWARD AND REVERSE GEARING

Frederik E. C. Van Der Hardt Aberson, Eindhoven, and Siebren C. Van Der Veen, Veldhoven, both of Netherlands, assignors to Van Doorne's Transmissie B.V., Tilburg, Netherlands

Continuation of Ser. No. 463,301, Feb. 2, 1983, abandoned. This application Apr. 1, 1986, Ser. No. 846,839

Claims priority, application Netherlands, Feb. 15, 1982, 8200564

Int. Cl.[5] F16H *37/08*

U.S. Cl. 474—72 3 Claims

1. A transmission comprising a centrifugal drive away clutch means having an input shaft, a forward and reverse reduction gear means connecting the input shaft to a primary shaft of an infinitely variable V-belt transmission such that the input shaft and primary shaft are arranged in a spaced parallel relationship, said reduction gear means being provided with a shifting means slidable on a shaft coaxially arranged with the input shaft, to shift the gearing means from forward to reverse position, the reduction gear means including a first gear of a forward gear train and a first gear of a reverse gear train, said first gears of said gear trains being selectively engageable by said slidable shifting means and being mounted on said coaxial shaft for rotation relative thereto whereby said coaxial shaft rotates freely with low inertia when said drive away clutch is disengaged, the V-belt transmission having a secondary shaft coupled to the primary shaft by the V-belt and further connected to an output shaft of the transmission.

4,919,008

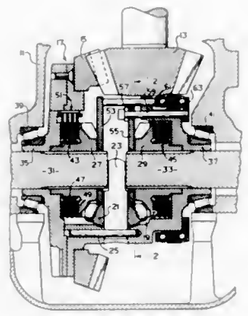
DIFFERENTIAL SMART CLUTCH WITH GEAR REACTION

Edward J. Goscenski, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 10, 1988, Ser. No. 154,395

Int. Cl.[5] F16H *1/44*

U.S. Cl. 475—234 16 Claims



1. A differential gear mechanism of the type including a gear case defining a gear chamber; a differential gear arrangement disposed in said gear chamber, said differential gear arrangement including at least one pinion gear and a pair of bevel side gears in meshing engagement with said pinion gear; clutch means operable between a disengaged condition and an engaged condition, effective to retard relative rotation between said gear case and each of said side gears, said clutch means comprising at least a pair of clutching surfaces with each of said side gears disposed to be engaged in response to movement of each of said side gears toward an adjacent surface of said gear case; and actuating means for actuating said clutch means, said actuating means comprising a fluid pressure actuated displacement mechanism operable to achieve an output displacement in response to an external fluid pressure input signal, characterized by:
(a) said fluid pressure actuated displacement mechanism being disposed external to said gear case; and
(b) said actuating means including means operable in response to said output displacement to exert an axially outward biasing force on said side gears, aiding a normal biasing force exerted by each of said side gears on the respective clutching surfaces, as a result of gear reaction forces, during differentiation.

4,919,009

TWO TURBINE VARIABLE SPEED FLUID COUPLING MARINE TRANSMISSION

Neil A. Newman, Omro, Wis., and Thomas C. Bowen, Thousand Oaks, Calif., assignors to Brunswick Corporation, Skokie, Ill.

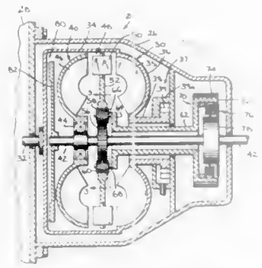
Filed Aug. 16, 1988, Ser. No. 232,703

Int. Cl.[5] F16H *47/08*

U.S. Cl. 475—44 13 Claims

1. In a marine drive for a boat, said marine drive including an engine and a propulsion unit, the improvement comprising a fluid coupling interposed in the marine drive between the engine and the propulsion unit, said fluid coupling comprising:

a rotatable fluid pump connected to the engine;
a rotatable forward turbine adapted to be driven in a first rotational direction by said fluid pump;
a rotatable reverse turbine adapted to be driven by said fluid pump;
a rotatable output shaft drivingly connectable to said forward and reverse turbines and coupled to said propulsion unit;
selective engagement means for selectively engaging said forward and reverse turbines with said output means for selectively imparting rotation to said output means in either a first or a second rotational direction; and



counterrotation means provided between said reverse turbine and said output shaft so that, when said reverse turbine is selectively engaged with said output shaft, said output shaft is driven in a rotational direction opposite said first direction of rotation of said forward turbine, said counterrotation means comprising a planetary gearset, including a ring gear to which said reverse turbine is mounted, a sun gear mounted at its center to said output shaft, and two or more planet gears disposed between said sun gear and said ring gear.

4,919,010

TRANSMISSION APPARATUS AND METHOD

Edward G. Trachman, Birmingham; Shan Shih, Troy, and John Arzoian, Dearborn, all of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jul. 3, 1985, Ser. No. 751,582

Int. Cl.[5] F16H *57/10*

U.S. Cl. 475—281 5 Claims

1. Transmission apparatus comprising a first planetary gear set having a first sun gear, first planet gears, a first planet gear carrier, and a first ring gear, a second planetary set comprising a second sun gear, second planet gears, a second planet gear carrier and a second ring gear, a clutch connected to the second ring gear and to the second sun gear for selectively locking the second ring and sun gears and thereby locking the second planetary set, a brake connected to the second sun gear, a one-way clutch connected to the brake, plural input means connected to the first planetary set and output means connected to the second planetary set.

4,919,011

ROLLER SPEED REDUCTION DRIVE

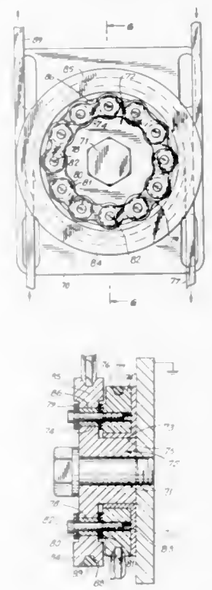
Dennis E. Kemp, Jr., Maplewood, N.J., assignor to Mark T. Basseches, Pleasantville, N.Y., a part interest

Filed Jan. 3, 1989, Ser. No. 292,920

Int. Cl.[5] F16H *13/06, 55/49*

U.S. Cl. 475—183 4 Claims

1. A gearless planetary speed reducer comprising a frame, a stator having an arcuate surface fixed to said frame, drive roller means having a drive surface surrounding said stator and circular in transverse section supported by said frame for rotation about a main axis coincident with the radius of said arcuate surface, said drive surface and arcuate surface defining an annular space therebetween, output drive means supported by said frame for rotation about said main axis, and a plurality of planetary roller means fixed to said output drive means for



rotation about axes spaced from said main axis, said planetary roller means being disposed in said annular space and including peripheral portions in frictional driving contact with said arcuate surface and said drive surface.

4,919,012

PILOT OPERATED SOLENOID VALVE IN AN AUTOMATIC TRANSMISSION CONTROL CIRCUIT

Ralph C. Bolz, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 1, 1989, Ser. No. 317,400

Int. Cl.[5] B60K *41/06*

U.S. Cl. 74—866 11 Claims

1. In a control system for an electronically controlled automatic transmission having multiple ratio gearing, fluid pressure operated clutch and brake servos for controlling the relative motion of the gear elements to effect ratio changes, a control pressure passage communicating with said servos, a control pressure pump and a fluid pressure regulator valve communicating with said control pressure passage for maintaining a predetermined control system pressure, the improvement comprising:
a throttle valve assembly including;
a pressure regulating throttle valve in communication with said regulator valve, including a pressure inlet port in said throttle valve communicating with said control pressure passage, a low pressure port in said throttle valve communicating with a low pressure region of said control system, a valve spring acting on said throttle valve, a throttle valve outlet pressure port and a throttle valve outlet pressure area on said throttle valve communicating with said outlet pressure port thereby establishing a pressure modulating function;
a pilot valve assembly comprising a valve orifice, a valve

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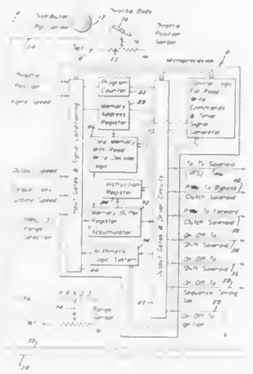
element registering with said valve orifice and adapted thereby to control the flow through said orifice;

a solenoid actuator having an armature engagable with said valve element, a spring acting on said armature whereby the effective solenoid force acting on said valve element is the algebraic sum of the solenoid electromotive force and the actuator spring force;

an exhaust port communicating with one side of said valve element, a control pressure chamber, means for distributing a regulated control pressure of reduced value to said pressure chamber, said regulated control pressure acting on the other side of said valve element and on said throttle valve; and

a microprocessor controller with input signal sensors for said solenoid actuator including means for developing a solenoid actuator voltage signal in response to varying transmission operating variables whereby said pilot valve assembly establishes a throttle valve actuating function in response to solenoid force changes of reduced magnitude.

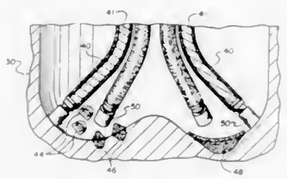


4,919,013

PREFORMED ELEMENTS FOR A ROTARY DRILL BIT

Redd H. Smith, and Jeffrey B. Lund, both of Salt Lake City, Utah, assignors to Eastman Christensen Company, Salt Lake City, Utah

Filed Sep. 14, 1988, Ser. No. 244,122
Int. Cl.[5] B21K 5/02; B22F 7/00
U.S. Cl. 76—108.2 19 Claims



1. A process for the production of a rotary drill bit having abrasion and erosion resistant internal watercourses therein for conveying fluid from the interior of the bit to the surface thereof, comprising the steps of:

(a) providing a hollow mold for molding at least a portion of the drill bit;

(b) providing one or more flexible or moldable tubular elements corresponding to said internal watercourses to be formed and positioning said elements within said mold, said elements being fabricated of a hard metal powder dispersed in a polymeric binder;

(c) positioning a bit blank at least partially within said mold;

(d) packing said mold with a powdered matrix material; and

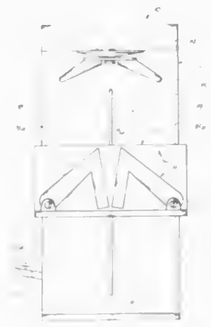
(e) infiltrating said powdered matrix material and said tubular elements with a binder in a furnace to form said bit, the heat from said furnace burning out said polymeric binder in said elements.

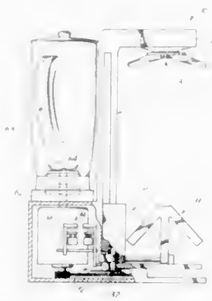
4,919,014

BOTTLE CLOSURE OPENER

Joseph Chen, and Isabelita H. Chen, both of #4 Lantawan St., Quezon City, Philippines

Filed May 22, 1989, Ser. No. 355,284
Claims priority, application Philippines, Jun. 6, 1988, 37014
Int. Cl.[5] B67B 7/18
U.S. Cl. 81—3.2 4 Claims





1. A bottle closure opener for use in screw type bottle caps comprising:

(a) a housing having a front panel provided with an elongated vertical opening disposed at the mid-section thereof, a rear wall disposed proximate said front wall, opposed side walls with vertical grooves disposed at the outer surfaces thereof, a base, and a ceiling case;

(b) a bottle platform having an L-shape body formed by a bottle seat and a vertical case provided with vertical guide blocks adapted to be slidably held on the vertical grooves of said walls, said vertical case having a vertical slit disposed at the mid-section thereof and aligned with the elongated vertical opening on said front panel;

(c) a bottle body clamping unit comprising a pair of opposed identical bottle clamps of V-shape formation laterally disposed on said bottle seat, the lower ends of each of said bottle clamps being fixedly secured on a clamp shaft extending to the inside of said vertical case, a bottle clamping mechanism being operably held and concealed within said vertical case, said mechanism comprising identical sector-gear type clamp levers fixedly secured at the rear ends of said clamp shafts, identical sector-gear type relay levers pivotally held on said vertical case, the gear teeth of said relay levers meshing with the gear teeth of said clamp levers, and the outer ends of said relay levers provided with slots disposed in a superimposed relation with each other to define a space coincident with the vertical slit on said vertical case;

(d) a driving mechanism consisting of a vertical drive shaft journalled for rotation at the rear end of and aligned with the elongated vertical opening of said front panel, said drive shaft provided with a drive shaft gear integrated with a lower clutch member having a clutch lining at its lower end and drivingly connected to a reversible motor, and a drive pinion gear at its upper end thereof, a helically threaded hollow shaft having an unthreaded lower portion telescopically received on said drive shaft, the upper end of which abuts an annular shoulder disposed at a distance below the top end of said drive shaft, an upper clutch member integrated at the lower end of said unthreaded portion in vertical alignment with said lower clutch member, a clutch spring provided at the upper end of said drive shaft, a screw nut screwably engage on said threaded hollow shaft, said screw nut having an attached nut finger extending through the vertical slit on said vertical case of said bottle platform;

(e) a bottle cap opener unit driven by a gear train supported within said ceiling case and having its final gear drivingly connected to said drive shaft, said final gear being rotatably keyed to a vertically slidably cap opener pin having a reduced lower square portion and coaxially aligned with the center between said bottle clamps, and cap opener blades suspendedly supported on said reduced square portion; and

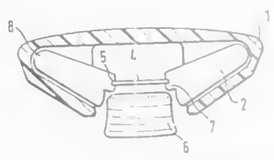
(f) control switches comprising a "down" switch and an "up" switch operably connected to a reversible motor, said "down" switch being actuated by a switch arm to drive said driving mechanism to move down said screw nut and bottle platform, and said "up" switch being actuated by switch lever having a screw nut lifter normally positioned at the lower end of the unthreaded portion of said hollow shaft to raise said screw nut to move up said screw nut and bottle platform.

4,919,015

SCREW CAP OPENER

Jukka K. Pohjola, Oskelantie 1 A 7, 00320 Helsinki, Finland

PCT No. PCT/FI87/00145, § 371 Date Mar. 29, 1989, § 102(e) Date Mar. 29, 1989, PCT Pub. No. WO88/03511, PCT Pub. Date May 19, 1988
PCT Filed Oct. 30, 1987, Ser. No. 334,976
Claims priority, application Finland, Apr. 11, 1986, 864474
Int. Cl.[5] B67B 7/18
U.S. Cl. 81—3.44 6 Claims



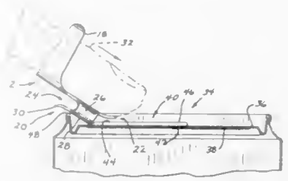
1. A screw cap opening device comprising a cylindrical body (1) having downwardly slanting spokes (3) formed on the inside surface thereof, said spokes having recesses, and positioned therein, upwardly turning pressing parts (2) adapted to squeeze against sides of the screw cap to be opened when said device is pressed against the top of the screw cap.

4,919,016

TAB TOP BEVERAGE CONTAINER OPENER

John C. Hanegraaf, Rt. 4 Otte Ct., Appleton, Wis. 54915

Filed Feb. 14, 1989, Ser. No. 311,072
Int. Cl.[5] B67B 7/00
U.S. Cl. 81—3.55 11 Claims



1. An opener tool for use in opening cans of the type having a lid with a scored closure for inward displacement by a pivotable tab, said tab including a lever end and an opener end, with the lever end of the tab being adapted for pivoting upwardly in an arcuate path to move the opener end of the tab downwardly into displacing engagement with the closure, said opener tool comprising:

a ring-like member including means defining a passage for receiving at least a portion of a finger therein, said ring-like member including a portion adapted to bear against the front of said finger extending forwardly of said means defining a passage for receiving at least a portion of a finger therein; and

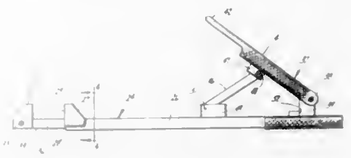
tab engaging means for engaging said tab, said tab engaging means being associated with said forwardly extending portion of said ring-like member and being rigidly interconnected with the portion of said ring-like member adapted to bear against the front of said finger and projecting outwardly therefrom, said tab engaging means including a tab receiving passage extending along an axis sustantially parallel to, and spaced from, the longitudinal axis of the portion of said finger received within said ring-like member.

4,919,017

HOSE CLAMP TOOL

William E. Thomas, 5048 Genesee Rd., Lapeer, Mich. 48446

Filed Jan. 27, 1989, Ser. No. 303,500
Int. Cl.[5] B25B 27/20
U.S. Cl. 81—9.3 17 Claims



1. A hose clamp tool to overcome the resilient force of a resilient, circular hose clamp and force the lugs at the arcuate ends of the clamp toward each other to increase the diameter of the clamp enough to allow the clamp to move along an elastomeric hose, the tool comprising:

first and second elongated members, the first elongated member comprising a rigid tube having first and second ends;

a first jaw joined to the first end of the tube and comprising a pressure surface facing away from the second end, the

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second elongated member extending along the tube and being guided by it to slide longitudinally along it and having a first end extending beyond the first end of the tube and a second end in the vicinity of the second end of the tube;

a second jaw joined to the first end of the second elongated member and comprising a pressure surface facing the pressure surface of the first jaw;

an axle on one of the elongated members remote from the first end of that member;

a handle pivotally mounted on the axle to pivot relative to the elongated member on which it is mounted and having a free end that moves arcuately relative to that member and extends toward the first end thereof; and

a link having a first end pivotally attached to the handle to pivot about a first axis located between the axle and the free end of the handle and having a second end pivotally attached to the other elongated member to pivot about a second axis fixedly located relative to the latter elongated member, whereby moving the handle in one direction moves the pressure surfaces of the jaws toward each other to grasp the lugs of a hose clamp and move them toward each other to increase the diameter of the hose clamp, and moving the handle in the opposite direction moves the pressure surfaces apart to release the hose clamp lugs.

4,919,018

HYDRAULIC POWER WRENCH

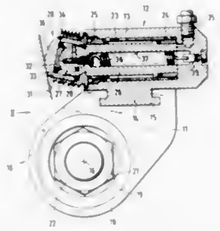
Karl Beuke, Neunkirchen-Seelscheid, Fed. Rep. of Germany, assignor to Paul-Heinz Wagner, Fed. Rep. of Germany

Filed Jan. 11, 1989, Ser. No. 295,868

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1988, 8800773[U]; Mar. 10, 1988, 3807924; Apr. 8, 1988, 3811776

Int. Cl.[5] B25B *13/46*

U.S. Cl. 81—57.39 **17 Claims**



1. An hydraulic power wrench having a cylinder unit (**12**) and a wrench head (**10**) connected to a casing (**13**) of said cylinder unit (**12**), said wrench head (**10**) having an axis (**16**) of rotation and being connectable with a screw (**22**) to be turned for a rotational pulling of said screw, a piston rod (**26**) slidably disposed within said casing (**13**) of the cylinder unit (**12**) and having a pressure means for supporting contact against a stationary abutment (**31**), a guiding track formed in the casing in slidable engagement with a guiding track formed in the wrench head, said guiding tracks are is disposed generally parallel to the axis of the wrench head (**10**) such that the casing is displaceable relative to the wrench head along said axis.

4,919,019

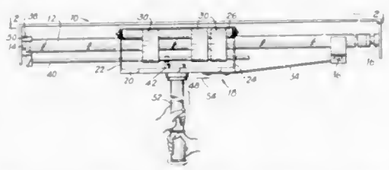
DEVICE FOR THE REMOVAL OR INSTALLATION OF FLUORESCENT TUBES OF THE SINGLE-PIN TYPE

Henry M. Unger, Weston, and Michael Vorobyov, Bethel, both of Conn., assignors to Unger Licencing Ltd., N.Y.

Filed Jun. 7, 1989, Ser. No. 362,710

Int. Cl.[5] B25B *3/00*

U.S. Cl. 81—53.12 **3 Claims**



1. A device for use in the removal and installation of single-pin type fluorescent tubes in lighting fixtures, including:

a cradle adapted to be positioned around a said tube intermediate the ends of said tube;

first means carried by said cradle for resiliently securing a said tube within said cradle against axial displacement relative thereto;

second means carried by said cradle and supported for axial movement in a direction parallel to a said tube, said second means having engagement means for engagement with an end wall of a lighting fixture;

third means carried by said cradle and operative to move said second means to an axially extended position; and,

fourth means carried by said cradle for operating said third means from a position remote from said cradle;

whereby, operation of said third means is operative to move a said tube and said cradle in a direction axially of said tube and oppositely to the direction of movement of said second means upon engagement of said second means with a said end wall of a said lighting fixture;

in which said cradle has axially spaced end walls, and said second means includes a rod supported in said end walls for axial sliding movement in said end walls, an abutment member carried by said rod at a position intermediate said end walls, and means reacting between said abutment member and an adjacent end wall of said cradle and resiliently biasing said rod into a retracted first position;

said third means includes an eccentric cam supported for rotation about a longitudinal axis of said cam, said cam engaging said abutment member and being operative to cam said second means against said bias and into an extended second position; and

said fourth means includes a stub-shaft journalled for rotation in said cradle and to which said eccentric cam is attached, and, means for attaching said stub-shaft to an extension pole, whereby said cradle and a fluorescent tube supported within said cradle can be manually manipulated, and, whereby rotation of said pole will result in operation of said second means from said first position to said second position resulting from rotation of said eccentric cam.

4,919,020

SPRING-LOADED MAGNETIC DRIVER AND METHOD OF ASSEMBLY THEREOF

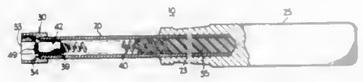
David A. Huebschen, Kenosha, Wis., assignor to Snap-on Tools Corporation, Kenosha, Wis.

Filed Jun. 23, 1989, Ser. No. 370,848

Int. Cl.[5] B25B *13/02*

U.S. Cl. 81—125 **14 Claims**

1. In a driving tool including a hollow tubular shank and a socket coupled to the shank at one end thereof and communicating therewith for receiving an associated rotatable fastening member, the improvement comprising: a body of adhesive material disposed in the shank and spaced from the one end thereof, a compression spring disposed in the shank and having one end thereof embedded in said body of adhesive material for fixedly mounting said spring in the shank, and magnet means



coupled to said spring at the other end thereof, said spring in its normal uncompressed condition projecting from said body of adhesive material a distance such that said magnet means is disposed for magnetic engagement with an associated fastening member received in the socket.

4,919,021

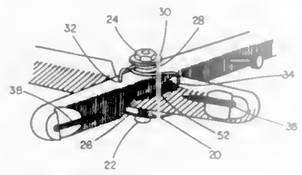
PLIERS FOR CLOSING A LOCKING RING

Joseph K. Franks, Rosman, N.C., assignor to Jensen Engineering, Asheville, N.C.

Filed Nov. 10, 1986, Ser. No. 929,009

Int. Cl.[5] B25B *7/02*

U.S. Cl. 81—426.5 **10 Claims**



1. Pliers comprising;

first and second handles; said handles each having a jaw element; each jaw element having a free end; means for pivoting said handles in a plane of rotation for moving said free ends; means for urging said jaw elements away from one another in a direction normal to said plane of rotation of said handles; said means for urging including an incline plane on each of said jaw elements; a groove in each jaw; said grooves substantially facing one another; said incline planes contacting one another as said free ends of said jaw elements are moved toward one another thereby moving said grooves in a direction normal to the plane of rotation of said handles.

4,919,022

RATCHET WRENCH

Akira Ono, Saitama, and Toshiro Iritani, Sagamihara, both of Japan, assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 188,143, Apr. 29, 1988, abandoned, which is a continuation of Ser. No. 861,540, May 9, 1986, abandoned. This application Jun. 5, 1989, Ser. No. 363,419

Int. Cl.[5] B25B *19/00*

U.S. Cl. 81—464 **6 Claims**

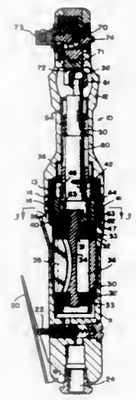
1. A powered ratchet wrench comprising, in axial alignment to form an elongated handle:

a rotary motor having a rotatable output shaft;

a rotary impact clutch mechanism also having a rotatable output shaft and rotated by

said rotatable output shaft of said rotary motor;

a reversible ratchet mechanism having an oscillatable ratchet yoke and being oscillatably driven through said yoke by the output shaft of said impact clutch; and



a single ended tool drive spindle driven by said ratchet mechanism and having its drive axis normal to the axes of said rotary motor and said impact clutch.

4,919,023

QUICK-CHANGE TOOL ADAPTER

Harry W. Bloink, 16880 Kinloch, Redford, Mich. 48240

Filed Mar. 22, 1988, Ser. No. 171,546

Int. Cl.[5] B23B *29/20*

U.S. Cl. 82—160 **10 Claims**

1. A quick-change adapter for affixing and precisely locating a working member such as a tool, a workpiece or the like upon a machining device, comprising:

a first holder having a first surface including a first engagement portion;

a second holder having a second surface including a second engagement portion and a portion defining an aperture through said second surface;

a first means for affixing one of said working member and said machining device to said first holder;

second means for affixing the other of said machining device and said working member to said second holder;

a shank on said first holder extending from said first surface and dimensioned to be received in said aperture in said second surface; and

means connected to said second holder for drawing on said shank so as to bring said first and second engagement portions into firm abutment against one another;

wherein said first and second engagement portions are configured as helical face gears;

wherein said shank includes an end opposite said first holder

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and a ramp surface tapering radially inwardly in the direction of an axis of said shank from said end and towards said first holder; and wherein said drawing means comprises at least three pins disposed on said second holder around said aperture and movable therein, each of said pins being abuttable against said ramp surface of said shank; and

wherein said drawing means further comprises means on said second holder for biasing said pins away from said ramp surface of said shank, and a radially floating cam ring carried by said second holder disposed around said pins and said aperture, said cam ring including a cam surface against which said biasing means biases said pins;

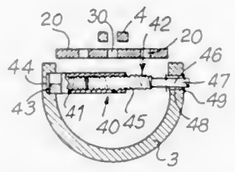
said second holder including a first facing portion facing towards said cam ring and said cam ring including a second facing portion opposite said first facing portion and radially spaced from said first facing portion, whereby rotation of said cam ring about said second holder causes said pins to abut said ramp surface of said shank while said cam ring is free to move radially with respect to said second holder during such rotation.

4,919,024

HARP MADE FROM COMPOSITE MATERIAL

Didier Budin, 30, Avenue de la Grande Armee, 75017 Paris, France

Filed Jul. 29, 1988, Ser. No. 226,367
Claims priority, application France, Jul. 31, 1987, 87 10900
Int. Cl.[5] G10D *1/04*
U.S. Cl. 84—265 10 Claims



1. A harp formed of a plurality of constituent parts comprising a base, a body having a lower sill connected to said base and an upper sill, a neck having a pier on one end thereof connected to said upper sill of said body and another end connected to an upper cone on one end of a pillar, a soundboard having a bridge molded thereon fitted on said body wherein said soundboard has a lower sill connected to said base and said soundboard and bridge are pierced by a plurality of sound holes, said neck and pier being formed of one piece and said body and its upper sill and lower sill being formed of one piece, said pillar having another end provided with a lower cone connected to said lower sill of said soundboard wherein the body has a pair of lateral walls fitted internally with at least one sound adjustable spacer disposed between said lateral walls of said body.

4,919,025

METHOD AND APPARATUS FOR PROCESSING CONTINUOUSLY MANUFACTURED TUBING

George K. Snyder, Lockport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

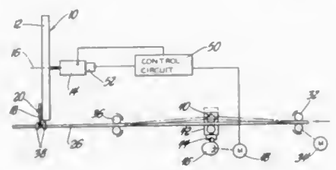
Filed Oct. 24, 1988, Ser. No. 261,306
Int. Cl.[5] B26D *3/16*
U.S. Cl. 83—54 6 Claims

1. In a process for the continuous manufacture of straight tubes of predetermined precise length from straight resilient tube stock, the method of momentarily stopping the tube stock at a cutting station comprising the steps of:

guiding the tube stock through a normally straight travel path to the cutting station,

periodically momentarily increasing a predetermined length of the travel path so as to stretch a portion of the tube stock in advance of the cutting station,

controlling the rate of the path length increase and thereby the amount of tube stock stretch to momentarily stop the advance of the tube stock at the cutting station while



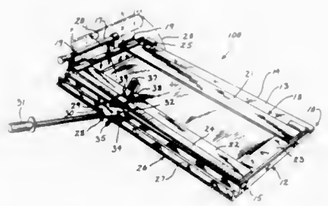
feeding of the tube stock along the travel path continues, whereby only for the duration of the momentary stop is the travel path increased and resultantly a portion of the tube stock at the cutting station measured from the leading end and encompassing the prescribed length is essentially stationary to facilitate a precise cutting operation thereon.

4,919,026

APPARATUS FOR CUTTING FLEXIBLE MATERIALS

Gordon F. Julson, Jr., 2732 S. Burrell St., Milwaukee, Wis. 53207

Filed Sep. 13, 1988, Ser. No. 243,984
Int. Cl.[5] B26D *3/12*
U.S. Cl. 83—56 25 Claims



1. A method of cutting a web of flexible material, comprising the steps of:

securing a blade holder to a deck over which said web is to be directed;

disposing a thin, flat blade in said holder, said holder having a trans verse dimension exceeding the thickness dimension of said blade by an amount in the range of about 0.001 to 0.125 inches, such that said blade is substantially unconstrained within said holder;

inducing said blade to move with respect to said web in response to said web moving relative to said blade, such that said blade exhibits an up and down motion relative to said web, thereby sawing through said web.

4,919,027

SHEET DIVERTING AND DELIVERY SYSTEM

Francis J. Littleton, Alden, N.Y., assignor to Littleton Industrial Consultants, Inc., Alden, N.Y.

Filed Nov. 20, 1987, Ser. No. 123,548
Int. Cl.[5] B41F *13/60;* **B65H** *29/60, 29/68*
U.S. Cl. 83—107 13 Claims

1. A sheet diverter and delivery system for receiving a fast moving, continuous web, cutting sheets therefrom and diverting alternate sheets to one of two delivery paths for subsequent processing, all while maintaining substantially continuous control of the individual sheets, comprising:

first conveyor means including cutting means for cutting a fast moving continuous web into a stream of separate sheets and directing the sheets along an original travel path at an original speed;

sheet controlling means disposed downstream of said first conveying means and along the original travel path of said first conveying means to securely engage the lead edge of the web before it is cut;

second conveyor means and third conveyor means each having an entrance end and an exit end and each including at least a pair of closely spaced face to face belts, said entrance ends being positioned downstream of said sheet controlling means, said second conveyor means disposed above said third conveyor means, said second and third conveyor means being driven at a speed at least approximately the original speed of the sheets and being positioned on alternate sides of the original travel path and diverging from the original travel path at approximately the same angle;

a pair of rotating diverter means positioned in close proximity to the entrance ends of said second and third conveyor means for alternately diverting the separate sheets from the original travel path into said second and third conveyor means without the use of a stationary diverter or guide member, each of the diverter means being synchronized with the speed of the one of the second and third conveyor means with which the diverter means is associated to engage the leading edge of the sheet to be diverted at a sufficiently small angle and directly divert the leading edge of the sheet under substantially continuous control into the grasp and control of the associated conveyor means before the trailing edge of the sheet is disengaged from said sheet controlling means so as to avoid damage and misalignment of the sheet, the diverter means thereafter continuing to support substantially the entire length of the sheet as the sheet is taken up by the associated conveyor means and ultimately released by said sheet controlling means; and

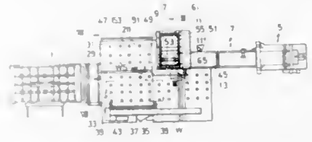
means connected with each of said second and third conveyor means for decelerating and shingling said sheets for delivering two separate streams of shingled sheets to a subsequent processing station.

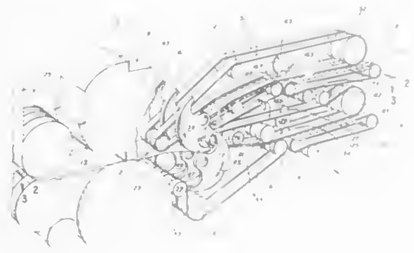
4,919,028

SHEARING MACHINE

Chuo Tobita, Isehara, and Eiji Matsuno, Atsugi, both of Japan, assignors to Amada Company, Limited, Isehara, Japan

Continuation of Ser. No. 941,579, Dec. 15, 1986, abandoned, which is a continuation of Ser. No. 729,330, May 1, 1985, abandoned. This application Jul. 29, 1988, Ser. No. 227,411
Claims priority, application Japan, May 2, 1984, 59-64398; May 11, 1984, 59-67727; May 11, 1984, 59-67729; Apr. 22, 1985, 60-58884; Apr. 22, 1985, 60-58882
Int. Cl.[5] B26D *7/18*
U.S. Cl. 83—153 22 Claims





15. A shearing machine comprising upper and lower blades for shearing a sheet-like workpiece, workpiece clamping and positioning means movable along the X and Y axes to feed and position a workpiece on a fixed work-table, a swingable work-table connected to said fixed work-table to remove scraps and a scrap carrying means for carrying scraps from said workpiece clamping and positioning means onto said swingable work-table, said scrap carrying means further including a lower fixed jaw means, an upper movable jaw means, and a spring means to keep said upper movable jaw means downwardly biased over said fixed jaw means for carrying said scraps;

said carrying means is movable along a first guide means and is so arranged as to grip and release the scraps near the ends of the first guide means, the scraps being gripped and released near the ends of the first guide means by cam means; and

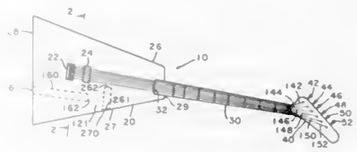
said first guide means and the said cam means are held by a holding means which are movable up and down to enable said carrying means to project out of and lower from the top surface of the fixed and swingable work-tables.

4,919,029

ASYMMETRIC INSERT LOADED STRINGED INSTRUMENT

Richard Excellente, 19 Marc Dr., Howell, N.J. 07731

Filed Jan. 10, 1989, Ser. No. 295,441
Int. Cl.[5] G10D *1/08*
U.S. Cl. 84—291 16 Claims



1. In a stringed instrument comprising a solid body having a front surface and a rear surface, peripheral edges connecting said front and rear surfaces, a neck extending from one end of said body, and strings tensioned on the body over a bridge and a neck in a substantially common plane, the improvement comprising:

a rigid mass of density greater than that of said body at least partially embedded in said body in such a manner that at least 50% of the peripheral surface area of said rigid mass

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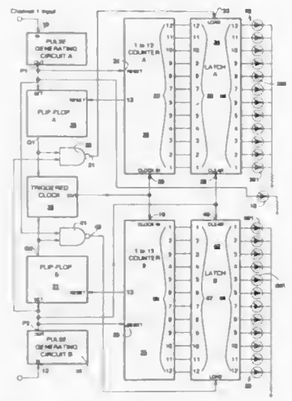
is in contact with said body and in such a manner that the resultant mass of the side of said body proximal to the strings of highest frequency is greater than that on the other side distal to said strings of highest frequency to provide asymmetric weight loading of at least 10% of the weight of the instrument prior to said embedding.

4,919,030

VISUAL INDICATOR OF TEMPORAL ACCURACY OF COMPARED PERCUSSIVE TRANSIENT SIGNALS

Marius R. Perron, III, 2815 Swandale, San Antonio, Tex. 78230

Filed Oct. 10, 1989, Ser. No. 418,654
Int. Cl.[5] G09B *15/00*
U.S. Cl. 84—470 R **3 Claims**



1. A visual indicator of temporal accuracy of compared percussive transient signals comprising:

means for receiving a reference percussive transient input signal;

means for receiving a performance percussive transient input signal;

means for determining whether said reference input signal receiving means or said performance input signal receiving means first received a first percussive transient input signal and for further determining the time difference between when said first percussive transient input signal is received and when a second percussive transient input signal is received by either said reference input signal means receiver or said performance input signal means receiver, whichever did not first receive said first percussive transient input signal; and

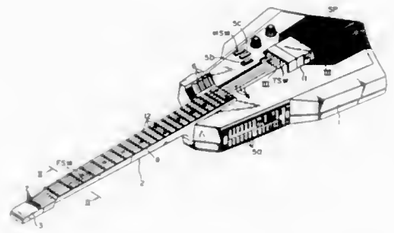
means for visually displaying whether said reference percussive transient input signal or said performance percussive transient input signal was first received and said time difference of reception of said first percussive transient input signal and said second percussive transient input signal.

4,919,031

ELECTRONIC STRINGED INSTRUMENT OF THE TYPE FOR CONTROLLING MUSICAL TONES IN RESPONSE TO STRING VIBRATION

Naoaki Matsumoto, Tachikawa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1988, Ser. No. 171,883
Claims priority, application Japan, Mar. 24, 1987, 62-67919; Mar. 24, 1987, 62-67920; Mar. 30, 1987, 62-77257; Mar. 30, 1987, 62-47616[U]; Mar. 30, 1987, 62-47617[U]; Mar. 30, 1987, 62-47618[U]; Mar. 30, 1987, 62-47619[U]; May 27, 1987, 62-80659[U]; May 27, 1987, 62-80660[U]
Int. Cl.[5] G10H *7/00, 5/00, 1/02, 1/46*
U.S. Cl. 84—601 **16 Claims**



1. An electronic stringed instrument comprising:

string triggering data output means for detecting vibration of at least one string stretched on an instrument main body and for outputting string triggering data corresponding to said vibration;

pitch designation data output means for detecting a pitch designation operation state of said string and for outputting pitch designation data corresponding to said pitch designation operation state;

sounding start instructing means for providing an instruction to start generating a musical tone with a pitch designated by said pitch designation data from said pitch designation data output means in response to said string triggering data from said string triggering data output means; and

sound-stop start instructing means for providing a sound-stop start instruction to stop generating said musical tone upon elapse of a predetermined time period from a point of time at which generation of said musical tone was started in accordance with an instruction from the sounding start instructing means.

4,919,032

ELECTRONIC INSTRUMENT WITH A PITCH DATA DELAY FUNCTION

Shigeo Sakashita, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 287,405
Claims priority, application Japan, Dec. 28, 1987, 62-200157[U]; Aug. 19, 1988, 63-108343[U]; Aug. 19, 1988, 63-204818
Int. Cl.[5] G10H *1/18, 1/42, 5/00*
U.S. Cl. 84—653 **11 Claims**

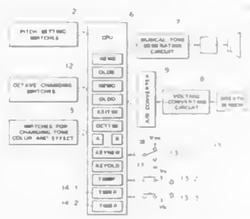
1. An electronic musical instrument, comprising:

a plurality of pitch designation means for designating a pitch of a musical tone to be generated according to combined pitch-setting operations by a player;

air flow sensor means for detecting an air flow state induced by a player and for producing a corresponding air flow sensing signal;

tone generation instructing means for instructing generation of a musical tone at a pitch set by said plurality of pitch designation means based on said air flow sense signal produced by said air flow sensor means;

change timing detection means responsive to a change in a combined pitch-setting operation of said plurality of pitch designation means, for detecting a timing of said change; and



tone control means responsive to said change timing detection means detecting a change in said combined pitch-setting operation, for controlling generation of a musical tone at a new pitch newly set by said change in said combined pitch-setting operation, upon elapse of a predetermined time from said detected timing of said change.

4,919,033

ELECTRIC VIOLIN

Alexander Markov, Rowayton, Conn., and James Remington, Jamaica Estates, N.Y., assignors to Alexander Markov, Rowayton, Conn.

Filed Jan. 4, 1989, Ser. No. 293,313
Int. Cl.[5] G10H *3/18*
U.S. Cl. 84—726 **20 Claims**

1. An electric violin comprising:

(a) a body having an upper end, a first side having upper and lower portions, a lower end and a second side having upper and lower portions, said body shaped so as to comprise a fingerboard indentation along said upper end in a location on one side of a fingerboard extending therefrom, said fingerboard indentation providing sufficient space to permit fingering over a major portion of a fingerboard; a first bow indentation along said first side sized to permit greater space for movement of a bow; and a second bow indentation along said second side sized to permit greater space for movement of a bow;

(b) an unfretted fingerboard having an upper portion and a lower portion, said lower portion mounted on said body and said upper portion extending from said upper end of said body, said fingerboard having sufficient width to accommodate a plurality of strings;

(c) a head disposed on the end of said upper portion of said fingerboard, said head comprising a plurality of pegs, each corresponding to a string;

(d) a plurality of strings, each removably attached to said body, extending along said fingerboard and removably attached to each of said pegs on said head; and

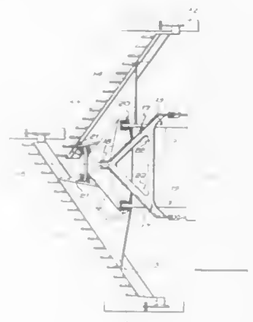
(e) a magnetic pickup connectively associated with said body and having an upper portion mounted on said body so as to be operatively connected with each of said plurality of strings to receive sounds therefrom and a lower portion mounted in said body capable of providing the sounds to a suitable amplification means.

4,919,034

MINE CLEARING APPARATUS

Charles B. Firth, Aston Works, Bramley, Leeds LS13 2BY, England

Filed Jun. 13, 1989, Ser. No. 365,534
Int. Cl.[5] F41H *11/12*
U.S. Cl. 89—1.13 **10 Claims**



1. Mine clearing apparatus for mounting on a vehicle, said apparatus comprising

a support, adapted, in use, to be supported on a vehicle,

first and second elongate plough blades,

means mounting said blades pivotally on said support such that each of said blades, in use, extends generally transversely of the path of travel of said vehicle in forward and rearward spaced relation to each other along said path of vehicle travel, said forward blade overlapping said path of vehicle travel, and said rearward blade terminating close to said path of vehicle travel and overlapping said forward blade,

said blade pivotal mounting means including means permitting pivotal movement of each blade about a first axis extending transversely to said path of vehicle travel and a second axis substantially perpendicular to said first axis and parallel to said path of vehicle travel.

4,919,035

MUZZLE BRAKE AND TOOL FOR INSTALLATION

Mark C. Pinkston, and Margarita Pinkston, both of P.O. Box 635, Kailua, Hi. 96734-0635

Filed Mar. 6, 1989, Ser. No. 319,321
Int. Cl.[5] F41C *21/18;* **B23B** *5/00, 3/02*
U.S. Cl. 89—14.3 **6 Claims**

4. A tool for forming an external thread on the muzzle end of a gun barrel comprising a handle assembly including laterally extending handles, a pilot rod mounted centrally of the handle assembly and freely slidably and rotatably received in the gun barrel for orienting and guiding the handle assembly during rotational and axial movement thereof, said handle assembly including centrally located mounting means thereon,

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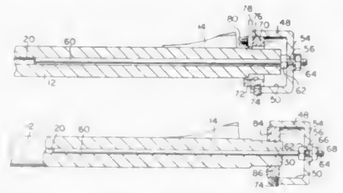
a cutter assembly mounted on said mounting means, releasable securing means removably retaining the cutter assembly on the mounting means to enable removal of the cutter assembly and a threading die assembly mounted on the mounting means subsequent to the cutter assembly to form external threads on the muzzle end of the barrel when the handle assembly is



rotated and moved axially toward the muzzle end of the barrel, said cutter assembly including a holder mounted on the mounting means and including a radially extending cutter element adjustably mounted on the holder and means securing the cutter element in radially adjusted position to engage the exterior of the muzzle end of the barrel.

4,919,036

ARRESTING APPARATUS FOR FIXATION OF AN ADJUSTED POSITION

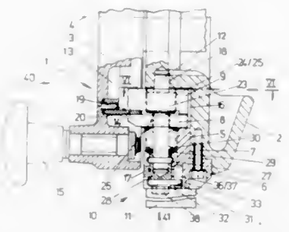
Peter Eng, Regensdorf, Switzerland, assignor to Contraves AG, Zürich, Switzerland

Filed Nov. 7, 1988, Ser. No. 267,832

Claims priority, application Switzerland, Nov. 10, 1987, 04369/87

Int. Cl.[5] F41D *11/06*

U.S. Cl. 89—37.11 **11 Claims**



1. A locking apparatus for securing an adjusted position at a device, comprising:

housing means provided for said device;

an adjustment mechanism having an axis of rotation;

said adjustment mechanism comprising a substantially cylindrical-shaped ring member arranged substantially concentrically with respect to the axis of rotation of the adjustment mechanism;

a clamping device cooperating with said substantially cylindrical-shaped ring member;

said clamping device comprising a pair of clamping jaw members;

said clamping jaw member being capable of assuming a clamping position, in which said substantially cylindrical-shaped ring member is clamped between the pair of clamping jaw members, and a released position, in which said substantially cylindrical-shaped ring member is released from both clamping jaw members of said pair of clamping jaw members;

said clamping device containing a displaceable member which is axially displaceable relative to and in said housing means and radially displaceable with respect to said substantially cylindrical-shaped ring member;

said displaceable member containing a coupling shaft section for coupling said displaceable member via a threaded bore in a clamping jaw member of said pair of clamping jaw members to said pair of clamping jaw members for displacing both said clamping jaw members of said pair of clamping jaw members in a self-positioning manner between said clamping position and said released position relative to said substantially cylindrical-shaped ring member; and

actuation means for displacing said displaceable member axially relative to and in said housing means and radially with respect to said substantially cylindrical-shaped ring member.

4,919,037

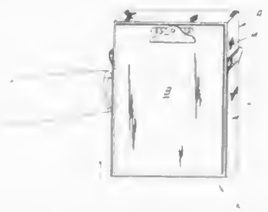
CLIPBOARD BALLISTIC SHIELD

Hal D. Mitchell, Rolla, Mo., assignor to American Protective Equipment, Inc., St. Louis, Mo.

Filed Mar. 1, 1988, Ser. No. 162,486

Int. Cl.[5] F41H *5/08*

U.S. Cl. 89—36.05 **7 Claims**



1. The combination of a clipboard and a ballistic package having a first bullet strike face, a second face and four sides, two of said sides being opposing, comprising:

hook and loop fastener means attaching said clipboard to the first face of said ballistic package;

a handling device located on the second face of said ballistic package, and handling device comprising a wrist strap and circular pocket to accept either the right or left hand of a person handling said combination clipboard and ballistic package,

said ballistic package including a fabric layer of woven nylon impregnated with urethane and a layer of ionomer foam; and

deployable strap means attached to said two opposing sides of said four sides, said deploying strap means fitting snugly at least three of said four sides when not deployed and being deployable into first position to engage the neck and a second position to engage the shoulder of a person using said combination clipboard and ballistic device.

4,919,038

ARMOURED CAR

Gert Kausträter, Augsburg, and Norbert Müller, Friedberg, both of Fed. Rep. of Germany, assignors to Kuka Wehrtechnik GmbH, Augsburg, Fed. Rep. of Germany

Filed Jul. 6, 1988, Ser. No. 215,540

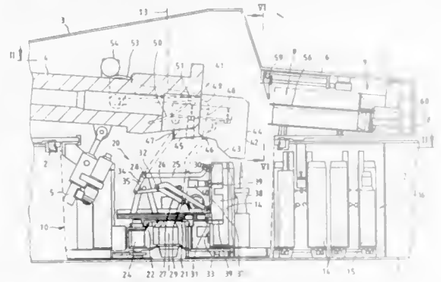
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1987, 3722353

Int. Cl.[5] F41F *9/06*; F41H *7/02*

U.S. Cl. 89—46 **33 Claims**

1. Armoured car with a rotatable turret, a weapon mounted in the turret, a magazine housed in the armoured car and receiving large calibre ammunition in an upright position in an arrangement concentric to a rotational axis of the turret, and a

loader having a loading arm engaging with the ammunition in the magazine and raising the same into a loading position aligned with a bore axis of the weapon, wherein the loader is arranged on a rotatable ring mount positioned below a weapon breach block on a turret platform, said ring mount having an



axis of rotation coincidental with the rotational axis of the turret, and wherein a multilever guide means is supported on the ring mount and is movable in a vertical plane for raising the loading arm of the loader with the upright ammunition along a steep movement path and only pivots the loading arm into the loading position towards and end of the steep movement path

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4,919,039

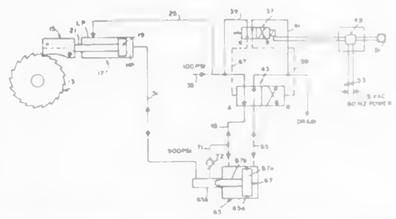
HYDRAULIC TURNING GEAR

Norman E. Nutter, Lunenburg, Mass., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 25, 1988, Ser. No. 223,850

Int. Cl.[5] F15B *21/02*

U.S. Cl. 91—40 **14 Claims**



1. A hydraulic turning gear for imparting rotational movement to a rotor comprising:

a ratchet wheel for attachment to the rotor;

a pawl mechanism for engaging the ratchet wheel;

a hydraulic cylinder connected to the pawl mechanism causing the pawl mechanism to reciprocate whereby the linear movement of the pawl mechanism causes the ratchet wheel to rotate;

a source of relatively low pressure hydraulic fluid for driving the hydraulic cylinder;

a booster cylinder for raising the pressure of the relatively low pressure fluid to a higher pressure sufficient to drive the hydraulic cylinder; the booster cylinder being connected to the hydraulic cylinder; and,

valve means for directing the relatively low pressure hydraulic fluid to drive the booster cylinder, and

wherein the hydraulic cylinder includes an arm which extends externally from the hydraulic cylinder and the pawl mechanism includes a clevis whish is mounted to the hydraulic cylinder arm and a pawl which is pivotally attached to the clevis, and

further wherein the pawl is pivotally attached to the clevis by means of a pin extending through both the pawl and the clevis, and further including means on said pin for imparting an adjustable frictional force between the pawl and the clevis whereby the pawl, once pivoted, needs a reset force to return to its original position for engaging the ratchet wheel.

4,919,040

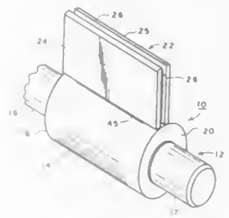
ROTOR VANE AND SHAFT ASSEMBLY

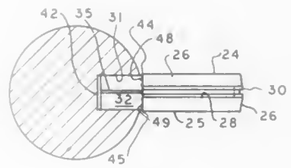
Phillip A. Sollami, 1300 E. Pine, Herrin, Ill. 62948

Filed Dec. 12, 1988, Ser. No. 283,505

Int. Cl.[5] F01C *9/00*

U.S. Cl. 92—125 **5 Claims**





1. A rotor, comprising in combination

a shaft having a longitudinally elongate radial cavity therein,

a vane having oppositely disposed planar faces and a peripheral groove disposed in the edges of said vane between said faces for receiving an elastomeric sealing member,

said vane including an integral tongue depending into said cavity with said vane extending in a radial direction from said shaft with the central longitudinal axis of said shaft lying in the plane of said vane,

said tongue including a plurality of ribs tightly fitted against said shaft at the ends of said cavity, and

an imperforate bonding material filling the space between said tongue and the surfaces of said shaft defining said cavity to bond said vane to said shaft and to prevent the passage of fluid between said tongue and shaft.

4,919,041

BREWING AND DISPENSING SYSTEM AND METHOD FOR ICED TEA

Harold F. Miller, 107 Winston Way, Goose Creek, S.C. 29445

Filed Dec. 22, 1988, Ser. No. 288,573

Int. Cl.[5] A47J *31/00*

U.S. Cl. 99—279 **16 Claims**

1. A brewing and dispensing system for presweetened iced tea including brewing means for brewing a supply of tea from fresh tea leaves, a supply of sweetener specifically formulated to remain in a liquid state when the sweetener is in a chilled condition, chiller means fluidically connected to the tea supply and the sweetener supply for maintaining the tea and the sweetener in a chilled condition, circulating means for maintaining the tea and the sweetener under constant circulation

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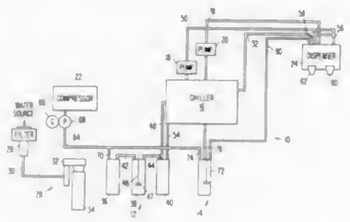
while the tea and the sweetener are in said chilled condition, dispenser means fluidically connected to said chiller means for dispensing a preselected ratio of sweetener and tea, and compressor means for propelling tea from the tea supply and sweet-



ener from the sweetener, supply to the chiller means, tea and sweetener from said chiller means to said dispenser means, and undispensed tea and sweetener from said dispenser means to each respective supply

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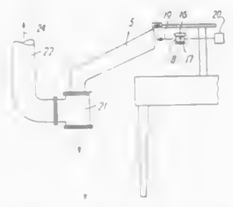
4,919,042

APPARATUS FOR THE BREAKING OF EGGS AND THEIR SEPARATION INTO YOLK AND ALBUMEN

Hans Kristian L. Rasmussen, Morud, Denmark, assignor to Sanovo Engineering A/S, Odense, Denmark

Filed Dec. 20, 1988, Ser. No. 286,729
Claims priority, application Denmark, Oct. 4, 1988, 5534/88
Int. Cl.[5] A23J *1/09*; A47J *43/14*
U.S. Cl. 99—499 4 Claims



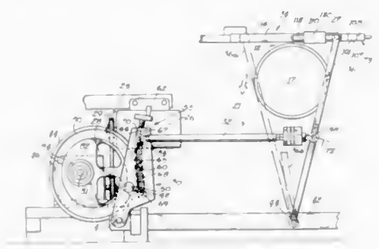
1. An apparatus for breaking eggs and separating yolk and albumen, comprising a supply conveyor, a washing and flushing system for washing eggs on the conveyor, an egg breaking mechanism at one end of the conveyor having a plurality of egg stations, each said egg station having means for receiving and holding one egg at a time, breaking the egg shell and separating yolk and albumen, means for successively passing the egg stations by the conveyor to receive eggs and continue through a closed path, and a working station along the closed path for control of the separation of yolk and albumen, separate collection of yolk and albumen and removal of empty shell fractions, wherein the working station comprises pressurized air supply means for blowing off the shell fractions from the holding means of the egg stations and a scavenging duct for receiving blown-off shell fractions, the improvement comprising the scavenging duct of the working station having an inlet end positioned near the holding means of the egg stations passing by and an outlet end, and an air sluice having one end communicating with means for providing air suction, said air sluice having another end connected to the outlet end of the scavenging duct.

4,919,043

WEB TECH DRIVE ASSEMBLY FOR STENCIL CARRIAGE

Henry J. Bubley, and Phil Motev, both of Deerfield, Ill., assignors to American Screen Printing Company, Chicago, Ill.

Filed Oct. 4, 1988, Ser. No. 253,006
Int. Cl.[5] B05C *17/04*
U.S. Cl. 101—123 10 Claims



1. In a screen printing press, the combination comprising:
a screen printing press means including a movable screen printing carriage;
a lever means connected to the screen printing carriage to reciprocate the same through a stroke of a given length;
a cam means having a predetermined profiled cam surface and a cam follower for following the cam surface and connected to the lever means to actuate the lever means to reciprocate the screen printing carriage;
adjustable stroke means in said lever means for adjusting the stroke of the lever means from said given length of stroke thereby changing the length of travel of the screen printing carriage, the cam surface providing a non-symmetrical displacement with time for the lever means and for the screen printing carriage to allow greater than fifty percent of the time of travel in one direction to be used to decelerate the screen printing carriage.

4,919,044

SIMULATED WATERMARK PRINTING SYSTEM

Robert E. Lafler, Charlton City, Mass., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 93,104, Aug. 21, 1987, Pat. No. 4,824,486, and a continuation-in-part of Ser. No. 794,391, Nov. 4, 1985, abandoned. This application Dec. 5, 1988, Ser. No. 279,856
Int. Cl.[5] B41F *9/00*; C09D *11/00*
U.S. Cl. 101—141 8 Claims

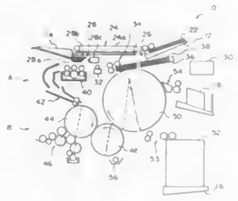
1. A method of simulating watermarked paper comprising the steps of printing a selected watermark indicia upon an uncoated paper sheet with a flexographic press having a fountain roll and an anilox roll using a solution of approximately 50% solids having a refractive index of between 1.50 and 1.54 and 50% solvent having a boiling point in excess of 290° F. wherein said solids constituent of said solution comprises about 70% to 90% soluble, oxidation resistant resin that is the hydrogenated ester of rosin having a refractive index of about 1.50 and about 10% to 30% plasticizer.

4,919,045

OFFSET PRINTER HAVING A PRESS DRUM LARGER THAN ITS RUBBER DRUM

Toshimitsu Okubo, Shibata; Kazuyoshi Kobayashi, Murata; Kohki Ohmura, Shibata; Yoshirobu Sai, Watari; Takuo Satoh; Yukihiko Yoshino, both of Shibata; Nobuyuki Hoshi, Sendai; Takayuki Onodera, Shibata; Yasuo Endoh, Shiroishi; Sigenobu Irokawa, Sendai, and Toshiaki Sannohe, Watari, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 14, 1988, Ser. No. 257,941
Claims priority, application Japan, Oct. 14, 1987, 62-156027
Int. Cl.[5] B41F *7/06*; B41C *1/10*
U.S. Cl. 101—142 11 Claims



1. An offset printer comprising:
(a) a plate making section for reading the image of documents, performing predetermined image processing, and forming images resulting from the image processing on sheet material to produce plates;
(b) a plate drum disposed beneath said plate making section;
(c) first means for feeding plates from said plate making section to said plate drum and for wrapping the plates around said plate drum;
(d) second means for supplying ink and water to the plates while they are wrapped around said plate drum;
(e) a rubber drum disposed obliquely below and in operative association with said plate drum, said rubber drum having a first diameter;
(f) a press drum:
(i) disposed obliquely above and at a predetermined angle relative to said rubber drum;
(ii) in operative association with said rubber drum at a nipping section;
(iii) disposed between said rubber drum and said plate making section; and
(iv) having a second diameter that is an integral multiple equal to or greater than two of said first diameter;
(g) third means for feeding sheets of paper to said nipping section of said press drum; and
(h) fourth means on said press drum for gripping sheets of paper at the nipping section, wrapping them around said press drum, and releasing them at a position located far enough away from said nipping section around the periphery of said press drum such that the trailing edge of each sheet of paper wrapped around said press drum has passed said nipping section before the leading edge is released by the fourth means from the press drum.

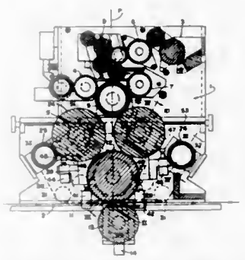
4,919,046

OFFSET PRINTING APPARATUS OPERATING IN TANDEM

Nicolas Kakko-Chiloff, Montrouge, France, assignor to Usinage Montage et Assistance Technique "U.M.A.T.", Loiret and Consell Vente Service, Seine Saint Denis, both of, France

Filed Dec. 16, 1988, Ser. No. 285,161
Claims priority, application France, Dec. 18, 1987, 87 17752
Int. Cl.[5] B41F *7/08*, *13/32*
U.S. Cl. 101—143 7 Claims

1. An offset printing apparatus operating in tandem including a frame having an upper portion on which are mounted an inking device and a moistening device for respectively applying a film of ink and a film of moistening liquid on a touching cylinder having a horizontal axis and rotatively mounted on the frame and having a lower portion on which are rotatively and tangently mounted a blanket cylinder and counter-cylinder, with a web to be printed passing therebetween, and having axes which extend horizontally and transversely and therefore perpendicularly to the web to be printed, the axis of the blanket cylinder and the axis of the touching cylinder being placed in a same vertical plane, and wherein it further includes two plate cylinders having horizontal and transverse axes placed respectively on either side of a vertical plane passing through the axes of the touching cylinder and blanket cylinder, a support mounted at a level intermediate between the touching cylinder and blanket cylinder, said support being provided for the two plate cylinders and being tiltably mounted about the axis of the blanket cylinder, two starting cylinders having horizontal and



transverse axes disposed respectively slightly below and outside with respect to each of the two plate cylinders, and control means for controlling a tilting motion of the support of the two plate cylinders for setting under pressure each of said two plate cylinders and for rotatively driving the starting cylinders in order to bring alternatively each of the two plate cylinders either in a printing position in which the plate cylinder is in contact under pressure both with the upper touching cylinder and with the lower blanket cylinder after having previously started the plate cylinder in rotation at a same peripheral speed as that of the blanket cylinder and having keyed the plate cylinder in an angular position, or in a stopped waiting position in which the pate cylinder is retracted from the touching cylinder and blanket cylinder and is bearing against a corresponding starting cylinder for enabling changing of a printing plate thereof.

4,919,047

MULTICOLOR PRINTING PRESS

Yoshinori Inoue, Ohtsu; Minoru Ueda, Koga, and Kosuke Yotsuzuka, Ohtsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Aug. 27, 1986, Ser. No. 900,794
Claims priority, application Japan, Aug. 27, 1985, 60-189096; Aug. 30, 1985, 60-192498
Int. Cl.[5] B41F *5/02*, *7/08*, *31/30*
U.S. Cl. 101—175 19 Claims

1. A multicolor printing press executing printing operations with waterless printing plates, said multicolor printing press comprising:
a printing press body;
a plurality of plate cylinders being set to predetermined positions of said printing press body;
a plurality of inking devices each commonly being compatible with each plate cylinder and installed to said printing press body so that each of said inking devices can individually and freely be mounted onto and removed from said printing press body; and
a plurality of plate feeding and discharging devices each

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commonly being compatible with each of said plate cylinders and means for installing said plate feeding and discharging devices to said printing press body so that each said plate feeding and discharging device can individually and freely be mounted onto and removed from said printing press body

wherein each said inking device includes:

a frame;

a form roller mounted on said frame;

an ink distributing roller mounted to said frame; and

a roller operating mechanism mounted to said frame for pressing said ink distributing roller against said form roller;

driving means being provided at said printing press body for driving said roller operating mechanism;

said ink distributing roller being pressed against said form roller by engaging said driving means with said roller operating mechanism in conjunction with mounting said inking device onto said printing press body, wherein

said roller operating mechanism includes:

a driving lever connected pivotally to said frame of said inking device; and

a linkage connected between said driving lever and a roller shaft of said ink distributing roller enabling said ink distributing roller to be pressed against and released from said form roller in conjunction with movement of said driving lever;

said driving means comprising a spring mounted to said printing press body,

said spring causing said driving lever to pivot from a raised position by mounting said inking device onto said printing press body.

4,919,049

WEB FEED PRINTING PRESS

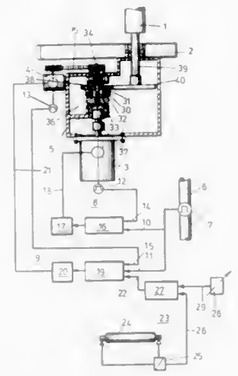
Arnold Niedermaier, Beindersheim, and Anton Weis, Lorsch, both of Fed. Rep. of Germany, assignors to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

Filed Mar. 20, 1989, Ser. No. 325,566

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1988, 3812295

Int. Cl.[5] B41F *13/54*

U.S. Cl. 101—228 **7 Claims**



4,919,048

APPARATUS FOR PREVENTING CONTACT OF WET INK SHEETS WITH PRINTING PRESS DELIVERY MECHANISM AND FOR DRYING SAID WET INK

Jack D. Tyler, 3017 Morton, Fort Worth, Tex. 76107

Continuation-in-part of Ser. No. 891,955, Aug. 1, 1986, Pat. No. 4,722,276. This application Jan. 19, 1988, Ser. No. 145,286

The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.

Int. Cl.[5] B41F *21/08, 5/22;* B41L *21/10*

U.S. Cl. 101—217 **8 Claims**

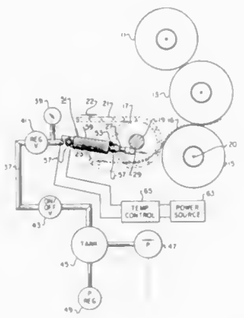
1. In a printing press having an impression cylinder and a blanket cylinder, a chain delivery means for withdrawing sheets from between the cylinders including a shaft and a pair of sprockets located adjacent the cylinders carrying a chain with an upper run leading toward the cylinders and a lower run leading away from the cylinders, the shaft carrying the sprockets, and gripping means carried by the chain for engaging leading edges of the sheets to carry them away from the cylinders, an improved means for preventing the sheets from contacting the shaft while the ink is still wet, comprising in combination:

a reservoir tank;

an air compressor for supplying pressurized air to said reservoir tank;

a pressure regulator for controlling said air compressor to maintain a constant pressure in said reservoir tank;

a conduit leading from the reservoir tank to a point adjacent the shaft;



an electrical heating element located in the conduit for heating the pressurized air to a selected temperature; and

the conduit having a nozzle mounted adjacent the shaft and the nozzle having a tip with a plurality of openings spaced horizontally apart from each other for discharging jets of heated air against the sheets to push them away from the shaft and to dry the wet ink carried by the sheets.

1. A web feed printing press comprising a longitudinal shaft for driving at least one printing unit and with a device for driving at least one web draw roll, wherein the drive means associated with each draw roll comprises a main motor and an auxiliary motor with means for regulating the speed of the two

motors and a differential drive with two inputs and an output, the speed of rotation of the main motor being able to be varied in accordance with the speed of rotation of the longitudinal shaft and the speed of rotation of the auxiliary motor being able to be varied in accordance with the speed of the longitudinal shaft and of the tension of the web to be printed and the auxiliary motor is connected with a differential element of the differential drive by means of which element a speed difference between, on the one hand, the rotation of the input of the differential drive connected with the main motor and, on the other hand, the output, connected with the draw roll, of the differential may be produced.

4,919,050

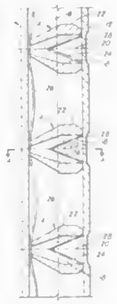
WELL PERFORATING DEVICE

John W. Dobrinski, Rt. 5 Box 125, Weatherford, Okla. 73096, and Thomas L. Elliston, 1401 Westover La., Ft. Worth, Tex. 76107

Filed Dec. 14, 1988, Ser. No. 284,190

Int. Cl.[5] F42B *1/02*

U.S. Cl. 102—307 **7 Claims**



1. In a well perforating device comprising a body member having a plurality of hole penetration areas of reduced thickness formed in an outer surface thereof, and a plurality of hole guns positioned within the body member, each of the hole guns containing a hollow cone shaped explosive charge aligned with one of the hole penetration areas so that upon detonation of the hollow cone shaped explosive charge the body member is penetrated through the aligned hole penetration area, the improvement comprising:

a plurality of inwardly tapered wall expansion zones formed in the body member so as to circumferentially extend around the body member and encompasses the hole penetration areas, each of the wall expansion zones having a wall thickness greater than the hole penetration area such that upon detonation of the hollow cone shaped charges of the hole gun the wall expansion zones are expanded to substantially correspond to the outside diameter of the body member.

4,919,051

PROXIMITY DETECTOR MINE SYSTEM

David Cohen, D. N. Emek Ayalon, Moshav Ben Nun, Israel

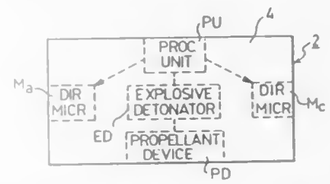
Filed May 26, 1989, Ser. No. 357,936

Claims priority, application Israel, May 27, 1988, 86525

Int. Cl.[5] F42B *23/04;* F42C *13/06*

U.S. Cl. 102—404 **18 Claims**

1. A proximity detector mine system, comprising: a mine deployable on the ground and including a porpellant device effective upon actuation to propel the mine above the ground, explosive material, a detonator for detonating the explosive material a predetermined time after the propellant has been actuated, sound sensing means producing electrical signals in response to the sound sensed thereby, and a processor for processing said electrical signals and for actuating the propellant device in response to the electrical signals received from



the sound sensing means; said sound sensing means comprising a plurality of directional microphones oriented in different directions.

4,919,052

TRACK APPARATUS FOR A TOY RACING CAR

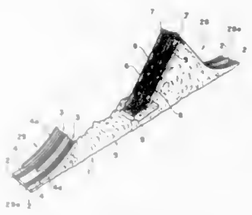
Yousuke Yoneda, and Masami Furukawa, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Jan. 10, 1989, Ser. No. 295,398

Claims priority, application Japan, Dec. 23, 1988, 63-16680[U]

Int. Cl.[5] A63G *7/00, 11/00*

U.S. Cl. 104—54 **23 Claims**



12. A track apparatus for a toy racing car comprising:

a track support body having a car-entry track portion at one end and a car-exit track portion at the opposite end; and

pivotal means disposed between the car-entry and car-exit track portions, and including:

first and second pivotal arms pivotally movable independently of each other between a first position juxtaposed the car-entry track portion and a second position juxtaposed the car-exit track portion, each pivotal arm being pivotally movable between the first and second positions by impulse imparted by a toy racing car corresponding travelling on each pivotal arm, means for stopping the car from moving on the pivotal means and for releasing the car when the pivotal arm associated with the car reaches the second position, each pivotal arm having a distal end and a proximal end pivotally connected to the track support body;

first and second stands connected respectively to the first and second pivotal arms;

means associated with each stand for transferring the momentum of a corresponding car to the first and second pivotal arms to thereby cause pivotal movement of each from the first to the second position; and

means for returning the first and second pivotal arms to the first position after pivotal movement to the second position.

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4,919,053

CONVEYOR WITH TWIN BIAS ACCUMULATION

Miguel A. Redondo, Overland Park, Kans., assignor to Mid-West Conveyor Company, Inc., Kansas City, Kans.

Filed Aug. 1, 1989, Ser. No. 388,602
Int. Cl.[5] E01B *25/22;* B61B *3/00*
U.S. Cl. 104—91 7 Claims

1. In a conveyor system having a power and free power track with a first free track having a section aligned generally parallel to said power track for bias accumulation of carriers having lead and trailing trolleys along said power track wherein the lead trolleys of said carriers are located along said power track; the improvement comprising:

(a) a second free track located so as to have a section generally parallel to the power track opposite said first free track; and including

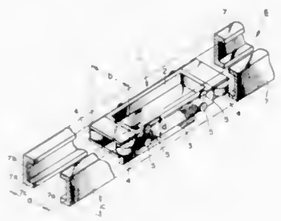
(b) switching means for switching the lead trolley of each of said carriers onto the power track while alternatively switching the trailing trolleys of said carriers to said first and second free tracks such that said carriers are twin biased banked along said power track with carriers being positioned alternatively on opposite sides of said power track.

4,919,054

CONVEYING APPARATUS

Yukito Matsuo, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 9,043, Jan. 27, 1987, abandoned, which is a continuation of Ser. No. 716,170, Mar. 26, 1985, abandoned. This application Sep. 28, 1988, Ser. No. 250,986
Claims priority, application Japan, Mar. 26, 1984, 59-58854
Int. Cl.[5] B61B *3/00*
U.S. Cl. 104—94 8 Claims



1. A conveying apparatus comprising:

a carriage comprising a casing, having at the bottom a vertically depending reaction plate, adapted to carry an object therein;

driving means, located at predetermined positions outside said carriage for imparting a propelling force to the reaction plate, the propelling force being selectively transferable between an acceleration mode and a deceleration mode;

a guide rail means for guiding said carriage, said guide rail means comprising first and second guide members in parallel with each other, each guide member comprising a first guide surface for restricting movement of said carriage in a first direction corresponding to a lateral direction with respect to the travel of said carriage, wherein said first guide surface of said first guide member is directly opposite said first guide surface of said second guide member, and a pair of oppositely facing second guide surfaces for restricting the movement of said carriage in a second direction perpendicular to said first direction;

a first guide roller group comprising two pairs of first rollers, one pair being rotatably attached to a front end and the other pair being rotatably attached to a rear end of said carriage by shafts extending in said second direction, one of each pair of said first rollers contacting only said first guide surface of said first guide member and the other of each pair of said first rollers contactable only with said first guide surface of said second guide member so as to rotate in opposite directions when said carriage is propelled, thereby restricting movement of said carriage in said first direction; and

a second guide roller group comprising at least two pairs of second rollers rotatably attached to each side of said carriage by shafts extending in said first direction and spaced apart from each other in the direction of travel, each paired roller being disposed in a straight line in said second direction, one of each pair of said second rollers contacting a portion of one of said oppositely facing second guide surfaces and the other of each pair of said second rollers contactable with a portion of the other of said oppositely facing second guide surfaces, such that said contact portions are aligned with corresponding contactable portions forming a straight line parallel to said second direction, so as to rotate in opposite directions when said carriage is propelled thereby restricting movement of said carriage in said second direction,

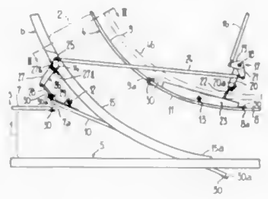
whereby said carriage is confined within said guide rail means and operable in three-dimensional travel such that said first and second rollers do not reverse their direction of rotation when said carriage is propelled in a given direction.

4,919,055

SWITCHING DEVICE FOR AN OVERHEAD CABLE TRANSPORT

Ferdinand Hora, Burgdorf, Switzerland, assignor to Von Roll Transportsysteme AG, Thun, Switzerland

Continuation of Ser. No. 142,684, Jan. 11, 1988, abandoned. This application Apr. 26, 1989, Ser. No. 342,682
Claims priority, application Switzerland, Jan. 20, 1987, 00196/87-9
Int. Cl.[5] E01B *25/26*
U.S. Cl. 104—130 28 Claims



1. A switching device for a station track system of an overhead cable transport installation containing vehicles having carriage wheels, said vehicles being of the type in which each has to one side of its said carriage wheel load suspension means including an arm extending axially of said wheel and having a guide wheel on the end of that arm, said switching device comprising:

a primary track at which travel the vehicles;

a branch track at which travel the vehicles and which branches off from said primary track;

said primary track being provided with at least one travel rail for the carriage wheels of the vehicles;

said branch track being provided with at least one travel rail for the carriage wheel of the vehicles;

said travel rails of both said primary track and said branch track comprising three stationary track sections terminating in spaced relationship from one another;

each said primary track and branch track being provided with a respective movable track section;

each said movable track section being movable between an operative travel position and an operative rest position;

a different selected two of said three stationary track sections being operatively interconnected with one another in the travel positions respectively by different ones of said movable sections;

switching means for conjointly moving both of said movable track sections to disrupt one of said tracks and to complete the other by switching both of said movable sections when either is in said operative travel position and the other is in said inoperative rest position respectively to said inoperative rest position and said operative travel position; and

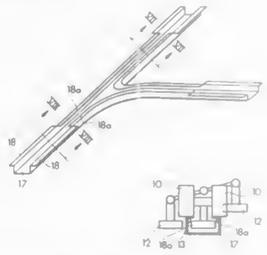
respective guide rails for and spaced from said travel rails to receive said guide wheel, the space between the said respective guide and travel rails being open along their length to accommodate said suspension means as a said vehicle travels on either of said travel rails and is guided by the respective guide rail.

4,919,056

SHELF CONVEYING SYSTEM

Christian J. Gronau, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Koettgen GmbH & Co. KG, Bergisch Gladbach, Fed. Rep. of Germany

Filed Jun. 29, 1988, Ser. No. 212,908
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1987, 3722135
Int. Cl.[5] E01B *25/12*
U.S. Cl. 104—130 4 Claims



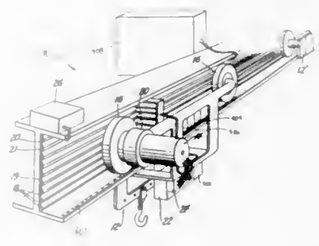
1. A shelf conveying system having a shelf conveying vehicle (1) guided within an upper track system and a ground track system having branch paths and driving bogies having track wheels engaging the rails of one of said track systems and equipped with guide rollers which laterally engage the track system and can be removed at the branches for running straight ahead or for the movement into branch paths of the track system, characterized by said ground track system (7) supporting the weight of said vehicle, said ground track system having a pair of rails arranged parallel to one another and providing a continuous support path without transition in the area of the branch paths (15, 16); each of said rails having an upstanding leg and bearing surfaces extending laterally from the top of said legs, said bearing surfaces extending only laterally inward toward one another from said legs in the area of the branch paths and said bearing surfaces extending laterally outward in areas of the ground track system other than the areas of the branch paths; each of said driving bogies (3) having two wheels (10) in load bearing engagement with said bearing surfaces; each of said driving bogies (3) having at least one pilot roller (13) which extends into the space between said legs and said guide rollers being in confronting engageable relation to the laterally outer sides of said legs and being selectively movable upward out of engagement with said legs in the areas of said branch paths.

4,919,057

CONVEYOR CONTROL THROUGH BINARY CODING

Ron J. Riley, Grand Blanc, Mich., assignor to J. N. Fauver Comany, Inc., Madison Heights, Mich.

Continuation-in-part of Ser. No. 28,793, Mar. 23, 1987. This application Jul. 1, 1988, Ser. No. 214,331
Int. Cl.[5] B60L *15/00;* B61L *21/00;* B61B *13/16;* G06G *7/76*
U.S. Cl. 104—295 54 Claims



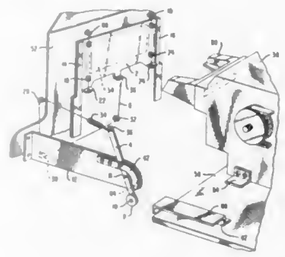
49 A conveyor control assembly including a vehicle (12) which moves along a track including conductive rail (20), wherein the vehicle (12) transmits a digital signal to the rail (20) the digital signal comprising opposite polarity half-waves wherein each polarity represents a bit of binary coding, said assembly comprising; a vehicle (12) including wheels (16) for mobility, said vehicle including transmitting means for transmitting a digital signal on a rail (20), said digital signal comprising a half-wave wherein the magnitude of said half-wave represents a bit of binary coding.

4,919,058

DOOR OPERATING MECHANISM FOR BUSINESS MACHINES

Hiromi Isozaki, Kanagawa, and Masakazu Ito, Hiratsuka, both of Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Jun. 30, 1989, Ser. No. 374,382
Claims priority, application Japan, Sep. 16, 1988, 53-230158
Int. Cl.[5] G07G *5/00;* E06B *7/32*
U.S. Cl. 109—24.1 12 Claims



1. An apparatus comprising:

a mechanism having a projecting portion;

a housing having an aperture therein through which the projecting portion of said mechanism may extend;

a door for closing said aperture when said projecting portion of said mechanism is not extending therethrough;

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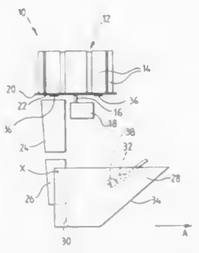
a pair of parallel tracks located at opposite sides of said aperture for mounting said door for linear sliding movement parallel to the adjacent surface of said housing;
resilient means for urging said door to a closed position in which it covers said aperture;
operating means for moving said door from closed position to open position against the influence of said resilient means;
support means fixed to said housing;
lever means pivotally mounted on said support means and having one end coupled to said operating means;
follower means mounted on the other end of said lever means; and
engaging means fixed to said mechanism and engageable with said follower means as said mechanism is moved in a first direction to a position in which said projecting portion projects through said aperture, whereby movement of said mechanism in said first direction causes said engaging means to move said lever means to cause said operating means to move said door to open position, and whereby when said mechanism is moved in a second opposite direction so that said projecting portion is withdrawn from said aperture, said engaging means is moved out of engagement with said follower means to permit said resilient means to move said door into closed position.

4,919,059
PLANTING APPARATUS
Anthony B. Windle, 'this L Do', Coneygarth Lane, Haxey, Doncaster, England (DN9 2JH)
Filed Sep. 9, 1988, Ser. No. 242,724
Claims priority, application United Kingdom, Sep. 10, 1987, 8721333
Int. Cl.[5] A01C *11/02*
U.S. Cl. 111—105 **10 Claims**



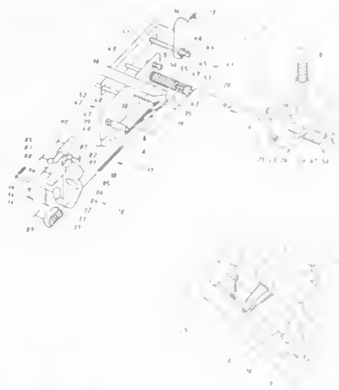
1. A planting apparatus for planting seedlings in a furrow, comprising a coulter for forming a furrow in the ground as the apparatus is towed, said coulter having a rear portion and a base portion, means for introducing a seedling into the coulter, including a rotatable carousel comprising a plurality of turrets, each said turret being adapted to receive a seedling, each said turret having a base and an openable flap at its base which allows the seedling to fall therefrom, a chute being located below said carousel such that when one of said turrets is directly above the chute the flap of said one turret automatically opens to allow the seedling to fall through said chute, a planting cup being situated below said chute substantially at the rear portion of said coulter so that the seedling comes to rest at the rear portion of the coulter, means for ejecting the seedling from the coulter into the furrow, and means for automatically delivering an intermittent jet of water to clean the apparatus and prevent the build-up of soil, said planting cup having a bottom portion and said means for ejecting the seedling from the coulter into the furrow including three wires extending from the bottom portion of the planting cup to the base of the coulter, which wires serve to push the seedling out of the coulter and also allow the passage of the jet of water.

4,919,060
SPOKED WHEEL FERTILIZER INJECTOR
William F. Cady, Colo, Iowa, assignor to Cady Systems, Inc., Ankeny, Iowa
Filed Jan. 24, 1989, Ser. No. 301,899
Int. Cl.[5] A01C *23/02*
U.S. Cl. 111—128 **10 Claims**

1. An implement attachable to a movable means for injecting a fluid like substance below the surface of the ground, said implement comprising:
(a) a cylindrically shaped hub portion including:
(1) an axle having a closed end, an open end, an axially aligned first fluid passage extending from said open end at least half the length of said axle and a radially aligned second fluid passage extending from the first fluid passage to an outlet port on the circumference of said axle;
(2) a sleeve bearing extending a major portion between the ends of the hub surrounding said axle and said sleeve having at least one radially extending throughbore; and
(3) a cylindrically shaped housing having an axially aligned open center portion in which said bearing is located to serve as a support bearing for said housing and said housing having a number of radially aligned throughbores;
(b) support means for rotatably attaching said hub portion to said movable means;
(c) a number of hollow spokes each having a hollow center portion, one open end secured in one of the radial throughbores of said housing to extend radially outward therefrom and an opposite end with an outlet passage communicating with said hollow center portion;
(d) fluid supply means connected to the open end of said axle to provide fluid thereto that enters said axle fluid passages and is sequentially metered to said spokes through the throughbores of said sleeve and said housing; and
(e) said bearing is formed a self-lubricating fluoroplastic and the clearance between said axle and said bearing is not greater than 0.0030 inches.

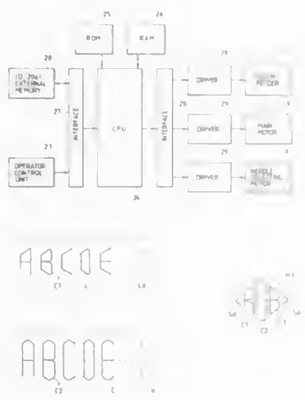
4,919,061
BUTTON-HOLE SEWING MACHINE HAVING A THREAD CUTTING AND CLAMPING DEVICE
Gerhard Riss, Bielefeld, Fed. Rep. of Germany, assignor to Durkoppwerke GmbH, Fed. Rep. of Germany
Filed Apr. 12, 1989, Ser. No. 336,822
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1988, 3812092
Int. Cl.[5] D05B *65/02, 3/06*
U.S. Cl. 112—70 **11 Claims**

1. A button-hole sewing machine for sewing a button hole consisting essentially of generally parallel first and second button-hole caterpillar patterns, comprising:
an arm; an arm stand; and a base;
means for transporting a sewing-material workpiece in a workpiece transport direction, across the base and toward the sewing needle;
a needle bar which reciprocates in a direction transverse to the workpiece transport direction and carries a sewing needle;
a material-presser basket; a presser block supported on said arm and operable to urge the basket toward said workpiece;
a thread cutting and clamping device; and



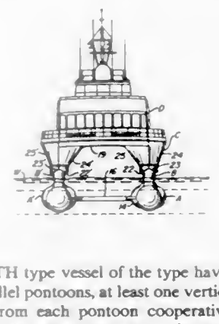
controlling means for controlling said thread cutting and clamping device, said controlling means being operable to cause the thread cutting and clamping device to move either parallel or transverse to said workpiece conveyance direction; and to catch the needle thread at the end of sewing an initial button hole, to cut said thread, and to hold it until releasing it during the sewing of a further button hole.

4,919,062
DATA PROCESSOR FOR USE IN SEWING MACHINE
Masaaki Yokoe; Tomoe Takagi, both of Nagoya; Narihiro Matsushita, Kasugai, and Yuzo Takagi, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Sep. 20, 1989, Ser. No. 409,923
Claims priority, application Japan, Sep. 22, 1988, 63-237861
Int. Cl.[5] D05B *21/00*
U.S. Cl. 112—121.12 **9 Claims**



1. A data processor for processing input data to produce stitch pattern data used for sequentially stitching letters on materials with a sewing machine, comprising:
first memory means for storing stitch pattern data regarding stitch letters, the stitch letters being classified into a plurality of groups, each containing a set of letters having essentially the same outline profile different from that of the letters in another group, and for storing character identification codes identifying the stitch letters and their outer profiles;
input means for sequentially entering letters to be stitched and outputting letter codes indicative of the entered letters;
second memory means for storing preselected outer profiles of the stitch letters in relation to a stitching sequence in which the letters are to be stitched;
readout means for reading from said first memory means the stitch pattern data identified by the character identification codes in accordance with the letter codes outputted from said input means and the outer profiles stored in said second memory means; and
third memory means for storing the character identification codes read from said first memory means by said readout means.

4,919,063
HULL CONSTRUCTION FOR A SWATH VESSEL
Nelson W. Hall, Poway, and Paul Kotzebue, San Diego, both of Calif., assignors to Swath Ocean Systems, Inc., Rancho Santa Fe, Calif.
Continuation-in-part of Ser. No. 174,286, Mar. 28, 1988, abandoned. This application Mar. 7, 1989, Ser. No. 318,263
Int. Cl.[5] B63B *1/10*
U.S. Cl. 114—56 **54 Claims**



1. In a SWATH type vessel of the type having at least two submerged parallel pontoons, at least one vertical strut extending upwardly from each pontoon cooperatively supporting above the water line a superstructure, the combination comprising:
the combined buoyancy of the two pontoons being such as to support the superstructure above the water line even while the vessel is at rest; and
at least one reserve buoyancy sponson supported by an associated strut and interposed between the underside of the superstructure and the top surface of a respective pontoon;
each sponson being vertically aligned above a respective pontoon and supported on its associated strut adjacent and above the water line while the vessel is at rest;
the said sponsons each having a relatively continuous narrow bottom surface extending substantially the length of its associated sponson and aligned with each other in substantially the same horizontal plane;
the said sponsons including said bottom surfaces thereof being shaped and configured to greatly increase the overall buoyancy of the vessel at a rapidly accelerated rate when, due to wave action, the lower extremities of the

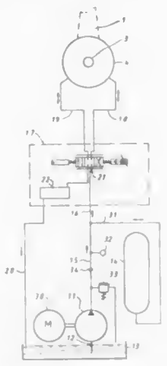
sponsons become increasingly immersed beneath the water line.

4,919,064

HYDRAULIC SYSTEM FOR SHIP RUDDER ROLL STABILIZATION AND STEERING

Heinz-Günter Ehluss, Tornesch; Erich Wessel, and Uwe Oldach, both of Hamburg, all of Fed. Rep. of Germany, assignors to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 624,045, Jun. 25, 1984, abandoned.
This application May 1, 1989, Ser. No. 348,178
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1983, 3322505
Int. Cl.[5] B63H *25/22*
U.S. Cl. 114—150 8 Claims



1. A hydraulic system for ship rudder roll stabilization and steering which comprises:

a hydraulically operated steering engine for controlling position of a rudder;

first supply means for delivering a hydraulic fluid to the steering engine, comprising a constant delivery pump and a pressure accumulator connected to the constant delivery pump and a valve gear for controlling period, direction and rate of flow of the hydraulic fluid to and from the steering engine,

and second supply means, for delivering a hydraulic fluid to the steering engine, comprising a steering pump and a slide valve for controlling period and direction of flow of the hydraulic fluid to and from the steering engine,

whereby said first and said second supply means are alternately to be utilized, and

whereby said first supply means are capable of effecting a rapid movement of the rudder over a restricted rudder angle and said second supply means are capable of effecting a movement of the rudder over the full rudder angle at a usual rudder rate.

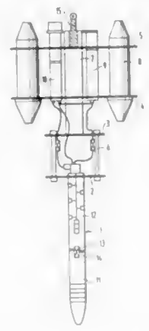
4,919,065

SUBMARINE VEHICLE INTENDED TO MEASURE DATA AT THE DEEP OCEAN SEA-BOTTOM

Charles N. Murray, Ispra, and Michel R. Jamet, Angera, both of Italy, assignors to European Atomic Energy Community (EURATOM), Luxembourg

Filed Feb. 3, 1989, Ser. No. 305,579
Claims priority, application Luxembourg, Feb. 3, 1988, 87126
Int. Cl.[5] E21B *15/02*
U.S. Cl. 114—312 4 Claims

1. A submarine vehicle intended to measure data at the deep ocean sea-bottom, comprising a penetrator conceived to penetrate by gravity into the sediments at the sea-bottom, a support structure having a vertical axis and a plurality of float clusters disposed regularly around the axis of the support structure at the upper portion thereof, the penetrator being mounted at the lower end of said support structure and coaxially therewith, the penetrator being conceived to be divided into two cylindrical parts by means of a remotely controlled discoupling means, the lower one of said parts having a rounded end portion intended to penetrate into the sea-bottom and to constitute a ballast such that the vehicle may descend by gravity and at a



given speed to the sea-bottom, whereas the upper one of said penetrator parts is conceived to receive a device for measuring data in the sediment, a transmitter/receiver for ultrasound signals being mounted between the float clusters in the upper portion of the support structure and being conceived to cooperate with a similar transmitter/receiver at the free ocean surface, in order to transmit measuring data thereto and to receive control data therefrom, for example control data for discoupling the two parts of the penetrator.

4,919,066

HYDRODYNAMIC CONFIGURATION FOR UNDERWATER VEHICLE

Calvin A. Gongwer, Glendora, Calif., assignor to Allied-Signal, Inc., Morris Township, Morris County, N.J.

Filed Jan. 19, 1989, Ser. No. 298,703
Int. Cl.[5] B63G *8/08*
U.S. Cl. 114—338 4 Claims

1. A self-propelled vehicle for efficient, high speed movement through a fluid medium including a generally cylindrical housing, a propeller external of said housing, an energy source and power means in said housing connected to said energy source for driving said propeller, said propeller being to the rear of said vehicle, and a plurality of control fins located at the rear of said housing;

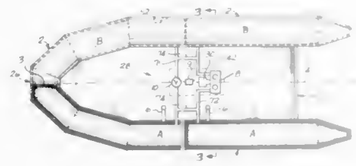
wherein the invention comprises forming said housing with a rounded bluff afterbody, forming said propeller of the actuator disc type and of approximately half to three-fourths of the diameter of said housing with a hub of substantial diameter adjacent said housing and tapering to the rear to assist in assuring attached flow over said housing, the spacing between the tips of the blades of said propeller and the nearest part of said afterbody being dimensioned such that substantially half or more of the boundary layer flow is inducted into said propeller, attaching a plurality of stator control surfaces to said afterbody between said fins and said propeller and placing said control fins just ahead of the rear surface of said housing at the shoulder of said afterbody such that they are located in an area where the free stream velocity of the surrounding fluid is essentially as high as or higher than free stream velocity.

4,919,067

SELF-RIGHTING MONOHULL VESSEL

Wayne B. Wenstob, and Kevin J. Wenstob, both of 836 Cormorant Street, Victoria, B.C., Canada (V8W 1R1)

Filed Feb. 9, 1988, Ser. No. 154,978
Claims priority, application Canada, Feb. 10, 1987, 529334
Int. Cl.[5] B64B *7/08*
U.S. Cl. 114—345 13 Claims



1. In an operatively water borne vessel whose center of gravity lies on an axis extending fore to aft thereof,

water-engaging hull-forming means defining a pair of first and second flotation chambers therewithin which are symmetrically arrayed about the aforesaid fore to aft axis of the vessel and extend on substantially parallel axes thereto in a generally horizontal plane when the vessel is disposed in the normal upright condition thereof on a body of ambient water,

said first and second flotation chambers having first and second means enclosed therewithin, respectively, for retaining gas under pressure,

means interconnected in a closed circuit with the respective first and second gas retention means. and operable to transfer gas retained in the first gas retention means to the second gas retention means, and vice versa,

the first gas retention means taking the form of a resiliently flexible gas-inflatable bag which is enclosed with the first flotation chamber to occupy alternately greater or lesser volume of the chamber, depending upon whether gas is added to or withdrawn from the bag, respectively,

means operable to control the operation of the gas transfer means in accordance with the angular orientation of the vessel about the fore to aft axis thereof,

said control means being responsive to the vessel capsizing in the body of ambient water to cause the gas transfer means to withdraw a portion of gas from the bag and add the portion to the second gas retention means,

liquid transfer means operable to open the first flotation chamber to the body of ambient water when the vessel has assumed the capsized condition thereof in the water, so that ambient water occupies that portion of the first flotation chamber evacuated by the bag when

the portion of gas is withdrawn therefrom, means closing the second flotation chamber to the body of ambient water when the portion of gas is added to the second gas retention means, so that the addition of water to the first flotation chamber shifts the center of gravity of the vessel further away from the axis of the second flotation chamber and induces the vessel to rotate about the same in the direction relatively downward from the aforesaid horizontal plane,

the control means being operable to cause the gas transfer means to return the aforesaid portion of gas to the bag in the first flotation chamber when the vessel has rotated downward about the axis of the second flotation chamber through an angle greater than 90° from the aforesaid horizontal plane, so that the water occupying the first flotation chamber is displaced from the same by the bag to induce the vessel to continue rotating about the axis of the second flotation chamber in the direction relatively upward toward the aforesaid horizontal plane, and to thereby return to the normal upright condition thereof, and

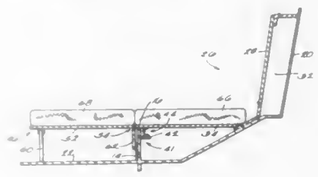
means operable to equalize the buoyancy of the respective first and second flotation chambers when the vessel has resumed the normal upright condition thereof.

4,919,068

RECREATIONAL BOAT SOFA/SLEEPER

Michael W. Lathers, Metamora, Mich., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 8, 1988, Ser. No. 216,791
Int. Cl.[5] B63B *17/00*
U.S. Cl. 114—363 15 Claims



9. A convertible sofa/sleeper comprising a seat bottom member which is movable between a horizontal position wherein said seat bottom member extends substantially horizontally and a canted position wherein said seat bottom member is inclined, and which includes a perimeter and an under surface fixed against movement with respect to said seat bottom member and located within said perimeter and adapted to removably engage a fixed supporting surface to locate said seat bottom member in said horizontal position, and a support member connected to said seat bottom member and movable between a seat supporting position wherein said support member is adapted to engage the fixed supporting surface so as to locate said seat bottom member in said canted position and a non-supporting position spaced from said seat supporting position and located wholly inwardly of said perimeter thereby facilitating engagement of said under surface with the fixed supporting surface.

4,919,069

LOGO SPRAY APPARATUS

Alfred Brault, Berwick, Me., and Roberto Rosa-Miranda, Dover, N.H., assignors to Davidson Textron Inc., Dover, N.H.

Filed Sep. 16, 1988, Ser. No. 245,212
Int. Cl.[5] B05C *1/02*; B24C *41/08*
U.S. Cl. 118—308 4 Claims

1. A spray apparatus for depositing a layer of thermoplastic material onto a recessed surface of a logo plaque mold, said spray apparatus comprising a housing, seal means secured to an end of said housing, for sealing abutment against the mold surface, a rotatable shaft operatively connected to said housing so as to be rotatably mounted along the centerline thereof, a spray gun extension, and connector means for securing said spray gun extension to a side of said rotatable shaft for rotation

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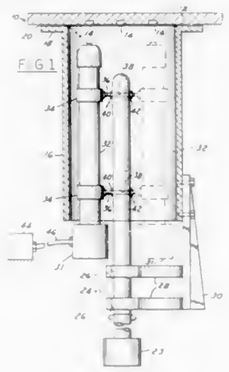
therewith such that the axis of the spray gun extension is parallel to the axis of the shaft for depositing the layer of thermo-



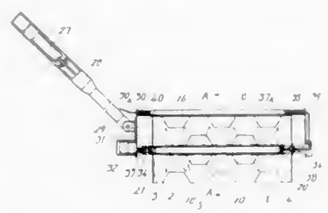
plastic material onto the mold surface in a circular path within said housing.

4,919,070

ELECTROSTATIC FLOCKING DEVICE

Satonobu Yoshikawa, c/o Mesac Co., Ltd. 12-1, Kabuto-cho, Nihonbashi, Chuo-ku, Tokyo, Japan

Filed May 23, 1989, Ser. No. 355,573
Claims priority, application Japan, Jul. 22, 1988, 63-97232
Int. Cl.[5] B05B *5/02*
U.S. Cl. 118—621 1 Claim



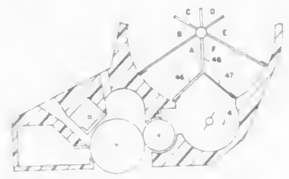
1. An electrostatic flocking device comprising a hollow handle member wherein high voltage static electricity generation means connected to a power source by a cable and a cord for drivingly connecting a second power source to a gear motor are disposed; bearing means rotatably attached to the base of said handle member and having a first support board on which said gear motor is mounted and a second support board on which a high voltage contact terminal embracing member is mounted, said first and second support boards being connected together by a plurality of circumferentially spaced and longitudinally extending support bars; a rotary horizontal casing journalled in said bearing means and having a perforated sheet extending about the periphery of said casing and end plates at the opposite ends of the casing, one of said end plates being detachable; a rotary shaft extending horizontally within said casing and having a first connector secured to one end of said shaft for connection with the rotary shaft of said gear motor by a second connector and having a rotary sleeve secured to the other end, said rotary sleeve having a high voltage contact terminal received therein; a high voltage contact terminal embracing member partially received in the opening at the outer end of said rotary sleeve and having a high voltage contact terminal therein; a plurality of partition walls extending longitudinally and radially from air rotary shaft to said perforated sheet to divide the interior of said casing into compartments and provided with notches; a plurality of conductive boards disposed between said partition walls and extending in the longitudinal direction of said rotary shaft within the casing; a plurality of triangular electrodes erecting from said conductive boards; a connector for detachably connecting between said rotary shaft within said casing and said rotary shaft of the gear motor; a high voltage cable for connecting between said high voltage static electricity generation means and said high voltage contact terminal within the high voltage contact terminal; and a synthetic resin cover covering a sector of said perforated sheet.

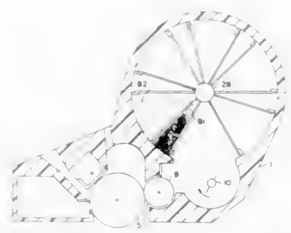
4,919,071

DRY TONER REMOVABLE DEVELOPING CARTRIDGE

Giancarlo Gatti, Varese, Italy, assignor to Bull HN Information Systems Italia S.p.A., Caluso, Italy

Filed Sep. 28, 1988, Ser. No. 250,475
Claims priority, application Italy, Nov. 5, 1987, 22525
Int. Cl.[5] G03G *15/08*
U.S. Cl. 118—653 6 Claims





1. Dry toner removable developing cartridge of the type comprising a donor sleeve, and a developing tank, further comprising:

a cylindrical housing located above said developing tank and communicating with it along a peripheral arc,

an axial shaft rotatably mounted in said housing, a plurality of diaphragms attached to said shaft and radially arranged in said housing around said shaft to form a plurality of compartments in form of cylindrical sectors,

at least one sealed opening for filling at least some of said compartments with developing material and

means to impart to said shaft and said diaphragms a rotation of predetermined angular increments so as to dispence in sequence the developing material contained in said compartments into said developing tank,

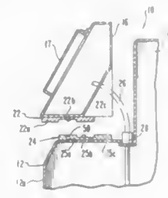
one of said radially arranged diaphragms forming a pair of wings which, for a predetermined angular position of said diaphragm, close the peripheral communication arc between said cylindrical housing and said development tank, so as to permit the filling of all said compartments through said opening, with developing material.

4,919,072

DEVICE FOR APPLYING A FLOWABLE COATING MASS

Henning J. Claasen, Läneburg, Fed. Rep. of Germany, assignor to Nordson Corporation, Westlake, Ohio

Continuation of Ser. No. 938,295, Dec. 5, 1986, abandoned. This application Feb. 6, 1989, Ser. No. 307,224
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1985, 3543485
Int. Cl.[5] B05C *11/00*
U.S. Cl. 118—666 11 Claims



1. A housing for a device for applying a flowable coating mass to a surface of a substrate, comprising:

a first housing for housing the hot-melt adhesive;

an electrical control means for controllably heating said hot-melt adhesive in said first housing;

a closed housing for accommodating said electrical control means, said closed housing being releasably mounted on said first housing, an air gap being formed between said first housing and said closed housing;

a rail-like means for releasably mounting said closed housing on said first housing and for reducing heat transfer between said first housing and said closed housing; and

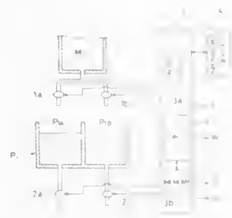
an arrestable electric plug-like connection means for connecting said electrical control means to said first housing.

4,919,073

SURFACE TREATMENT METHOD AND APPARATUS THEREOF

Atsuo Kobayashi, Hikone; Takuma Yamada, Moriyama, and Kiyoshi Akao, Hikone, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Division of Ser. No. 906,404, Sep. 9, 1986, Pat. No. 4,830,888. This application Feb. 28, 1989, Ser. No. 317,305
Claims priority, application Japan, Oct. 1, 1985, 60-219867
Int. Cl.[5] B05C *1/02*
U.S. Cl. 118—688 5 Claims



1. A surface treatment apparatus of batch type for transporting an object to be treated along a treatment bath train including a predetermined number of treatment baths and for dipping said object in a treatment liquid supplied in said treatment baths in a predetermined order, thereby to execute a surface treatment of said object, comprising:

a treatment bath train comprising a plurality of treatment baths, in which a desired treatment bath is constructed as a multi-vessel treatment bath comprising a pair of unit treatment vessels each of which contains the same treatment liquid;

means for replacing the treatment liquid in one of said unit treatment vessels every time that predetermined conditions are satisfied in such a manner that at least one of said pair of unit treatment vessels at all times contains said treatment liquid for allowing said surface treatment of said object therein;

means for transporting said object along said treatment bath train to dip said object in the treatment liquid in only one of the pair of unit treatment vessel which is not being subjected to the replacement of treatment liquid; and

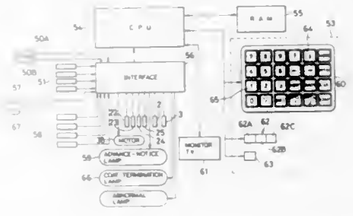
means for controlling a dipping time period in each unit treatment vessel of said multi-vessel treatment bath according to a predetermined characteristics of the treatment liquid therein.

4,919,074

APPARATUS FOR MOUNTING PARTS ONTO A PRINTED SUBSTRATE

Toshiyuki Kurihara; Benso Aomoto, both of Osaka, and Ko Nishio, Oizumimachi, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Feb. 4, 1988, Ser. No. 152,344
Claims priority, application Japan, Feb. 9, 1987, 62-27607; Aug. 28, 1987, 62-215768
Int. Cl.[5] B05C *11/00*
U.S. Cl. 118—697 18 Claims



1. An apparatus for coating adhesive for mounting parts onto a plurality of multiphase printed substrates comprising adhesive coating nozzle means arranged in correspondence to the plurality of multiphase printed substrates which are placed on an X-Y table means for effecting coating operations by coating an adhesive onto each of the printed substrates at areas on which the parts are to be mounted, timer means for counting unused time during which said coating nozzle means is unused, means for detecting an identification mark on a substrate plate of the multiphase printed substrates, means for inhibiting the coating operations by said coating nozzles in correspondence to the multiphase printed substrates when said detection means detects said mark, and control means for driving and controlling said coating nozzle means and said X-Y table in response to the passage of a predetermined time-up time counted by said timer means so as to deposit the adhesive onto the multiphase printed substrates at locations other than at said areas on which the parts are to be mounted.

4,919,075

ICE SLICER WITH SYRUP SUPPLY MECHANISM

Kobei Himi, Kuwana, Japan, assignor to Chubu Industries, Inc., Kuwana, Japan

Filed Jan. 25, 1989, Ser. No. 301,912
Claims priority, application Japan, Feb. 8, 1988, 63-15402
Int. Cl.[5] B05C *5/00*
U.S. Cl. 118—699 2 Claims

1. An ice slicer with syrup supply mechanism comprising:

a frame mounted on a base;

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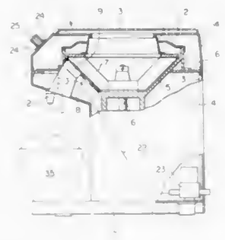
a cutter case mounted to said frame and accommodating a rotor driven for rotation by a motor;
a cutting blade so mounted as to be exposed to a slit formed in said cutter case;
at least one downward syrup discharge nozzle provided at the front of said frame;
a connecting tube for connecting said discharge nozzle to a syrup container installed separately from said ice slicer;
an electromagnetic valve provided in said connecting tube; and



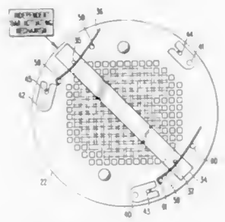
control means, provided inside said frame, for controlling said electromagnetic valve, said control means including first and second electrical switches connected in parallel with each other and connected to said electromagnetic valve, said first switch being a manual off on switch providing a variable discharge amount mode of operation and said second switch being controlled by a settable timer providing a constant discharge amount mode of operation.

4,919,076

REUSABLE EVAPORATION FIXTURE

David L. Lutz, Bealeton; Keith W. Meranda, and Russell B. Minter, both of Manassas, all of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 3, 1988, Ser. No. 252,828
Int. Cl.[5] C23C *16/04*
U.S. Cl. 118—721 **15 Claims**



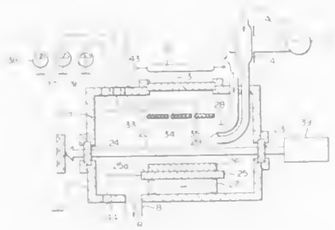
1. A reusable evaporation fixture for registering each of a plurality of individual substrates to respective sites of a plurality of contact mask sites of a single contact mask oriented in the X-Y plane comprising:
a base plate having a top face and a bottom face and having locating means mounted to said top face, for establishing a reference position in said X-Y plane;
said contact mask located over said top face of said base plate and engaged to said locating means;
a plurality of Z-spring means supported by said base plate to urge each of said plurality of individual substrates against said contact mask in the Z-direction;
a second plate over said top face of said base plate and said plurality of Z-spring means and below said contact mask, said second plate having a plurality of means to hold and align each of said plurality of individual substrates against respective X-Y alignment faces, each of said X-Y alignment faces corresponding to a respective site of said plurality of contact mask sites in said X-Y plane said second plate located between said base plate and said contact mask;
alignment means for aligning said second plate accurately to said contact mask;
a top plate supporting said contact mask in a configuration which allows deposition material to be deposited through the pattern of said contact mask.

4,919,077

SEMICONDUCTOR PRODUCING APPARATUS

Masao Oda; Toshiyuki Kobayashi, and Yoshimi Kinoshita, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

PCT No. PCT/JP87/01045, § 371 Date Aug. 23, 1988, § 102(e) Date Aug. 23, 1988
PCT Filed Dec. 26, 1987, Ser. No. 247,443
Claims priority, application Japan, Dec. 27, 1986, 61-314111; Apr. 15, 1987, 62-93521
Int. Cl.[5] C23C *16/50*
U.S. Cl. 118—723 **12 Claims**



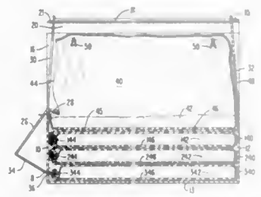
1. An apparatus for depositing a film on a surface of a substrate comprising:
a chamber;
holding means for holding a substrate disposed within said chamber;
means for heating a substrate disposed within said chamber;
a first port for introducing into said chamber a first gas including at least one of the elemental constituents of the film to be deposited;
plasma means for forming a plasma in a second gas flowing toward said chamber;
a second port for introducing into said chamber the flow of the second gas after passage through said plasma means;
first and second windows in said chamber for transmission of laser light and ultraviolet light, respectively, into said chamber;
a laser disposed outside said chamber for generating laser light transmitted into said chamber through said first window for decomposing the first gas near a substrate held by said holding means;
an ultraviolet light source disposed outside said chamber for generating ultraviolet light transmitted into said chamber through said second window for interacting with the first gas near a substrate held by said holding means;
a first electrode disposed in said chamber and electrically connected to a substrate held by said holding means;
a second electrode disposed in said chamber opposite said first electrode; and
a voltage source connected across said first and second electrodes for electrostatically urging ionized species in said chamber toward a substrate held by said holding means.

4,919,078

LITTER PACKAGING SYSTEM

Glenn E. Morrison, 1160 Francisco St., Berkeley, Calif. 94702

Filed Nov. 30, 1988, Ser. No. 277,970
Int. Cl.[5] A01K *1/01*
U.S. Cl. 119—1 **16 Claims**



1. Packaging apparatus for absorbant litter for an animal pet including:
a box having a substantially vertical front wall and having an unexpanded position;
a door in the front wall;
at least one removeable bag within the box for holding litter, the bag having a preformed bag opening; and
means for expanding the box into an expanded position and for expanding the bag to form a void within the bag of sufficient size to hold the pet, the preformed bag opening disposed within a substantially vertical plane adjacent to the door when the bag is expanded.

4,919,079

METHOD FOR TRANSPORTING LIVE FISH

Tadao Morishita, Minamatashi, Japan, assignor to Morishita Technical Laboratory, Kumamotoken, Japan

Filed Apr. 4, 1989, Ser. No. 332,962
Claims priority, application Japan, Dec. 14, 1988, 63-315330
Int. Cl.[5] A01K *61/00*
U.S. Cl. 119—3 **2 Claims**

1. A method for transporting live fish comprising grinding vegetable humus containing from 50 to 80% by weight of water, forming a ground powder contacting the said ground powder sufficiently with air to activate said ground powder, extracting the said activated powder with water and removing solid matter by filtering to obtain an extract, mixing the said activated powder or said extract in water of water-tank containing live fish and transporting said live fish containing tank.

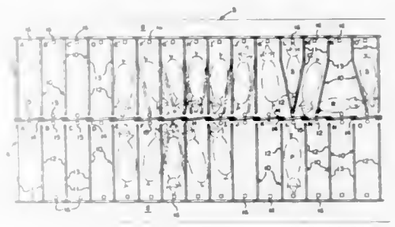
4,919,080

SYSTEM FOR CONCENTRATING ANIMALS IN INDIVIDUAL STALLS

Richard K. Balsbaugh, Quincy, Ill., assignor to Moorman Manufacturing Company, Quincy, Ill.

Filed Oct. 23, 1989, Ser. No. 425,742
Int. Cl.[5] A01K *1/02*
U.S. Cl. 119—20 **12 Claims**

1. A system for comfortably concentrating in individual stalls a group of elongated four-legged animals having as a group generally the same length and breadth comprising at least one row of elongated individual retention stalls arranged side-by-side and with each adjoining pair of stalls sharing a common vertical divider which comprises a fixed portion at one end to which a swingable portion is pivotally attached so as to be swingable from side-to-side, the width of each said stall when measured between adjacent ones of said fixed portions being sufficient to comfortably accommodate the breadths of said animals either standing or lying but insufficient to accommodate the lengths of said animals, and the length of each said stall being sufficient to comfortably lying, the swingable portions forming a widened space between adjacent ones of said swingable portions upon being forced apart by an enclosed



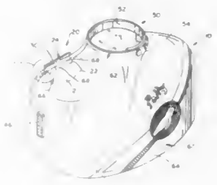
animal being sufficient to allow said animal to turn around in the stall.

4,919,081

GARMENT PROTECTOR

Jim A. Lewellen, 1017 S. McLean Dr., Santa Ana, Calif. 92704

Filed May 19, 1988, Ser. No. 195,860
Int. Cl.[5] A01K *31/12*
U.S. Cl. 119—26 **13 Claims**



1. A protective cover assembly for garments that supports a bird on a wearer's shoulder area comprising:
a first panel formed of fluid-proof material and adapted to cover the wearer's shoulder area;
a second panel formed of fluid-absorbent material and adapted in use to overlie said first panel;
a bird perching means insert securely attached to said first panel for supporting a bird on the wearer's shoulder, said bird perching means including a base means under and being secured to said first panel and being curved in shape to correspond to the curvature of the wearer's shoulder for providing a secure mount, said perching means further including a platform member upon which the bird sits, said platform member being connected to said base means to be positioned to overlie said second panel.

4,919,082

REMOTE CONTROL ANIMAL COLLAR

David M. Tsai, 124 Benedict La., Raleigh, N.C. 27614

Continuation-in-part of Ser. No. 230,957, Aug. 11, 1988. This application Nov. 22, 1988, Ser. No. 275,016
Int. Cl.[5] A01K *15/00, 27/00*
U.S. Cl. 119—29 **7 Claims**

7. An animal training collar comprising an elongated flexible strap adapted to encircle the neck of an animal and provided with means for applying pressure to the animal's neck on

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receipt of a remotely provided signal, said pressure means being one or more electrically activated solenoids disposed in

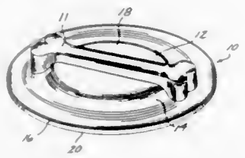
said collar and provided with piston rods which are radially displaced toward the animal's neck on receipt of said signal.

4,919,083

THROWABLE PET TOY

Herbert R. Axelrod, 211 W. Sylvania Ave., Neptune, N.J. 07753

Filed Jul. 11, 1988, Ser. No. 217,621
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—29 4 Claims



1. A flying pet toy adapted to be thrown by a human through the air for retrieval by an animal, said pet toy comprising:

a circular crown portion having a center, an intermediate circular surface portion surrounding said crown portion, and a circumferential rim portion surrounding the circular surface portion;

an animal attractant material impregnated in the material of the toy;

a radially extending upward projection formed across said crown and intermediate circular surface portions having vertically extending parallel side walls which terminate in a generally horizontally extending connecting surfaces that span the upper end of said side walls, said projection extending across the major portion of the pet toy at the mid-portion thereof, with said projection simulating a bone to provide a shape which can be readily grasped by the animal for retrieval and said projection also enhancing a gyroscopic effect of the pet toy.

4,919,084

POULTRY BROODER PILOT BURNER

Paul E. Maurice, 14 Fontaine St., Ludlow, Mass. 01056

Filed Sep. 16, 1987, Ser. No. 97,632
Int. Cl.[5] A01K *31/18*
U.S. Cl. 119—32 36 Claims

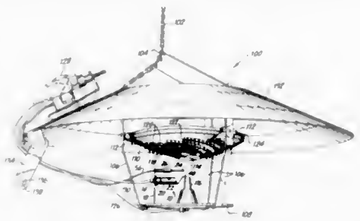
1. In a poultry brooder including a main gas burner, the improvement comprising a pilot burner having:

mounting plate means secured to said brooder;

orifice holder means for receiving and supporting an orifice, said orifice holder means being configured and dimensioned to be connected to a gas source;

a cylindrical pilot burner mounting stud attached to said mounting plate means, said mounting stud having an annular channel and being configured and dimensioned to engage and support said orifice holder means such that said orifice is exposed;

a pilot body removably attached to said mounting stud, said pilot body having at least one inwardly projecting mounting pin to engage said mounting stud annular channel, said removable pilot body being disposed over said orifice when attached to said mounting stud and extending horizontally adjacent to the main gas burner.

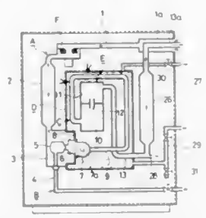


4,919,085

PULSE COMBUSTION APPARATUS

Katsusuke Ishiguro, Nagoya, Japan, assignor to Paloma Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 15, 1988, Ser. No. 285,112
Claims priority, application Japan, Jun. 4, 1988, 63-137962
Int. Cl.[5] F22B *31/00*
U.S. Cl. 122—24 2 Claims



1. A pulse combustion apparatus comprising

(a) a hot water storage tank,

(b) a combustion chamber provided in the tank,

(c) an air and fuel mixing chamber disposed outside the tank and connected to the combustion chamber,

(d) an air supply line having an air pipe, a fan, a first muffler and an air chamber which is connected to the mixing chamber, the first muffler being located between the fan and the air chamber,

(e) a fuel supply line connected to the mixing chamber,

(f) an exhaust line connected to the combustion chamber and having a greater part within the tank, the exhaust line including a second muffler which is located within the tank and comprises an expansion chamber and a noise damping chamber,

(g) a throat making the expansion chamber communicate with the noise damping, and

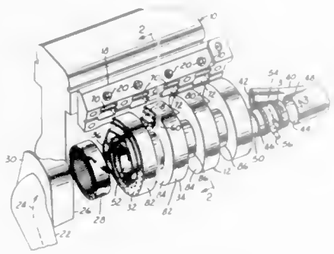
(h) a tailpipe connecting the combustion chamber to the expansion chamber.

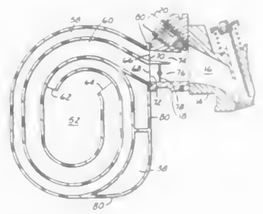
4,919,086

INTEGRATED TUNED INDUCTION SYSTEM

Ronald G. Shillington, Dover Center, Canada, assignor to Siemens-Bendix Automotive Electronics Ltd., Chatham, Canada

Filed Feb. 22, 1989, Ser. No. 313,921
Int. Cl.[5] F02M *35/10*
U.S. Cl. 123—52 MC 15 Claims





1. An induction air circuit for a multi-cylinder internal combustion engine comprising an air intake leading to a first tube that runs parallel to the engine past a bank of cylinders that is served by the induction air circuit, a second tube that creates approximately a 180 degree turn in the induction airflow after the airflow has passed through the first tube, an air body that is located after the second tube and comprises a valve for controlling the airflow, a plenum zone that lies parallel to said first tube and is located after said air body, said plenum zone passing said bank of cylinders, and spiral runners that are arranged transversely to the length of said plenum zone, each runner extending from said plenum zone to a corresponding cylinder, wherein said runners, said plenum zone, and said first tube are a single plastic part, and said first tube and said plenum zone share respective wall portions of said runners as they pass said runners.

4,919,087

INTAKE SYSTEM FOR V-TYPE VEHICLE ENGINE

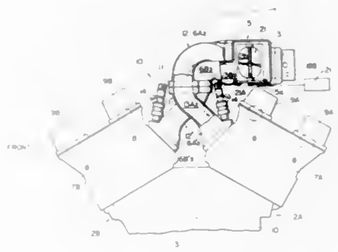
Muneyuki Ogami; Yasuhiro Kawasako; Takenori Otsuka; Tetsuo Hiraoka, and Koichi Hatamura, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 8, 1988, Ser. No. 241,727
Claims priority, application Japan, Sep. 8, 1987, 62-222976; Sep. 8, 1987, 62-222977
Int. Cl.[5] F02B *75/22*
U.S. Cl. 123—52 MV 15 Claims

1. A V-type internal combustion engine having first and second cylinder banks set at an angle to each other to define a V-shaped space therebetween, each of said cylinder banks including a plurality of cylinders arranged in a lengthwise direction in which an output shaft of the V-type engine extends, and an intake system, said intake system comprising:

generally rectangular box-shaped first and second surge tanks arranged end to end in said lengthwise direction;

a first set of intake pipes spaced in said lengthwise direction for communicating said first surge tank with said cylinders in said first cylinder bank, respectively, each of said first set of intake pipes extending from a side wall of said first surge tank adjacent said V-shaped space toward each of said cylinders in said first cylinder bank and being bent downward and toward said V-shaped space; and



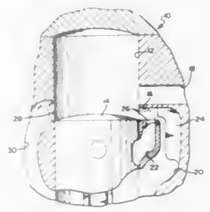
a second set of intake pipes spaced in said lengthwise direction for communicating said second surge tank with said cylinders in said second cylinder bank, respectively, each of said second set of intake pipes extending from a side wall of said second surge tank adjacent said V-shaped space toward each of said cylinders in said second cylinder bank and being bent downward and toward said V-shaped recess.

4,919,088

TWO CYCLE ENGINE SCAVENGING HEAT CONTROL

Roger B. Krieger, Birmingham, and Rodney B. Rask, Grosse Pointe Woods, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 21, 1989, Ser. No. 369,359
Int. Cl.[5] F02M *31/14*
U.S. Cl. 123—65 A 3 Claims



1. A two cycle engine having a cylinder,

a scavenging and charging intake port opening into the cylinder,

a first fluid passage connecting the port with a source of scavenging and charging air,

a second fluid passage connecting the port with said air source,

heating means in said first passage for heating the air therein, and

valve means coacting with said passages to oppositely variably restrict flow therethrough and thereby control the degree of heating of scavenging and charging air delivered to the cylinder through said intake port.

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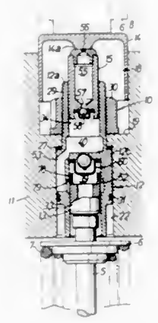
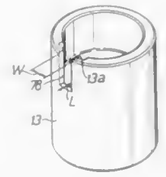
4,919,089
VALVE OPERATING SYSTEM FOR INTERNAL COMBUSTION ENGINE

Yoshihiro Fujiyoshi; Hidenobu Nagase; Koichi Fukuo, and Takatoshi Aoki, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1988, Ser. No. 273,202
Claims priority, application Japan, Nov. 19, 1987, 62-292621; Oct. 5, 1988, 63-251526
Int. Cl.[5] F01L *1/34, 1/14*
U.S. Cl. 123—90.16 16 Claims



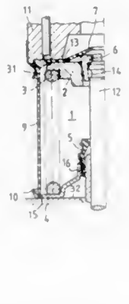


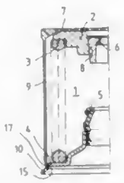
1. A valve-operating system for an internal combustion engine, comprising a valve-driving piston slidably received in a cylinder body and operatively connected at one end thereof to an engine valve which is spring-biased in a closing direction, and a check valve and an orifice means interposed between hydraulic pressure generating means of generating an oil pressure for causing opening of the engine valve and a damper chamber defined between the cylinder body and the valve-driving piston, said check valve permitting flow of a working oil only from said hydraulic pressure generating means to the damper chamber, and said orifice means restricting returning of the working oil from the damper chamber to the hydraulic pressure generating means, wherein said orifice means comprises a bole having a constant length in the direction of oil flow, said bole being made sufficiently small to substantially reduce an influence on the flow of the working oil through the hole caused by viscosity variations of the working oil.

4,919,090
MOUNTING AID FOR INSTALLING VALVE ACTUATING ELEMENTS

Hans Deuring, Burscheid; James H. Maguire, Langenfeld; Clifford R. Worsley, Leverkusen, all of Fed. Rep. of Germany, and Martin J. Whitehead, Sevenoaks, England, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed May 15, 1989, Ser. No. 351,581
Claims priority, application Fed. Rep. of Germany, May 13, 1988, 3816321; Mar. 4, 1989, 3907001
Int. Cl.[5] F01L *3/08, 3/10*
U.S. Cl. 123—90.67 22 Claims





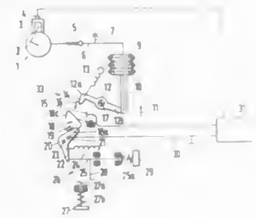
1. A mounting aid arranged for receiving a valve-actuating sub-assembly intended for installation coaxially about a valve stem, the sub-assembly including a valve coil spring, a spring retainer having a central aperture and a split collar, comprising
(a) a closing disc having an outer circumferential portion and being arranged for engaging a radially extending surface of the spring retainer coaxially therewith;
(b) an axial extension attached to said closing disc at the outer circumferential portion thereof; said axial extension having an end remote from said closing disc; and
(c) hold-back means formed on said end of said extension for releasably securing the sub-assembly to the axial extension.

4,919,091
IGNITION SWITCH ARRANGEMENT FOR AN INTERNAL COMBUSTION ENGINE HAVING AN ELECTRICAL IGNITION SYSTEM

Michael Wissmann, Schorndorf-Weiler; Harald Schleimann, Waiblingen, and Jürgen Weber, Kernen, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jun. 21, 1989, Ser. No. 369,135
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1988, 3821958
Int. Cl.[5] F02D *37/02;* F02P *3/04*
U.S. Cl. 123—179 BG 12 Claims

1. An ignition switch arrangement for a manually startable internal combustion engine equipped with an electrical ignition system, the ignition switch arrangement comprising:
a positioning member actuable in dependence upon the operating condition of the engine for movement between a first position at which the engine is not running and a second position at which the engine is running;
an ignition switch unit switchable between an ignition-enabling position wherein the ignition system is operative and an ignition-disabling position wherein the ignition system is inoperative;
a latching actuator connected to said positioning member for moving between an unlatching position and a latching position in correspondence to the movement of said positioning member between said first position and said second position; and,
said latching actuator having latch means for latching said

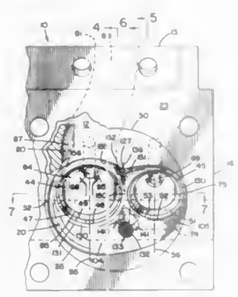


ignition switch unit in said ignition-disabling position when said latching actuator is in said latching position and when said ignition switch unit is switched into said ignition-disabling position.

4,919,092
IN-LINE CYLINDER HEAD FOR INTERNAL COMBUSTION ENGINE

Richard W. Smith, Jr., and Michael E. Smith, both of Wooster, Ohio, assignors to TFS, Inc., Wooster, Ohio

Continuation-in-part of Ser. No. 94,125, Sep. 8, 1987, Pat. No. 4,773,382, which is a continuation of Ser. No. 47,295, May 8, 1987, abandoned, which is a continuation of Ser. No. 759,747, Jul. 29, 1985, Pat. No. 4,686,948. This application Mar. 10, 1988, Ser. No. 166,521
Int. Cl.[5] F02B *23/08*
U.S. Cl. 123—188 M 5 Claims



1. A cast cylinder head for an internal combustion engine using flat head pistons, said head including a flat mounting surface and having for each of several in-line circular piston areas:
(a) a wedge shaped combustion chamber extending from said mounting surface and defined by
(i) an especially configured, closed peripheral edge surface co-planar with said mounting surface and forming the opening of said combustion chamber;
(ii) a concave, contoured first cavity area extending from a continuous first portion of said peripheral edge surface and tapering into said head and away from from said mounting surface at a generally inclined first angle;
(iii) a concave, contoured second cavity area extending from the remaining portion of said peripheral edge surface and tapering into said head and away from said mounting surface at a generally inclined second angle, said second angle greater than said first angle;
(iv) said first cavity area intersecting said second cavity area along a roof line;
(b) a frusto-conical intake valve seat in said first cavity area having a major diameter circular edge surface and a minor diameter circular edge surface concentric with an intake valve axis, said major diameter intake edge spaced closer to said mounting surface than said minor diameter intake edge, said intake valve seat further divided, approximately and for reference purposes, into adjacent sequentially numbered, first, second, third and fourth quadrants, said second and third quadrants generally adjacent said peripheral edge surface, said fourth quadrant generally adjacent said second cavity area;
(c) a frusto-conical exhaust valve seat in said first cavity area having a major diameter circular edge surface and a minor diameter circular edge surface concentric with an exhaust valve axis, said major diameter exhaust edge spaced closer to said mounting surface than said minor diameter exhaust edge, said exhaust valve seat further divided, approximately and for reference purposes, into adjacent, sequentially numbered first, second, third and fourth quadrants, said second and third quadrants generally adjacent said peripheral edge surface, said fourth quadrant generally adjacent said second cavity area and said first quadrant of said exhaust valve seat and said first quadrant of said intake valve seat generally adjacent one another;
(d) a spark plug bore in said second cavity generally between said intake valve and said exhaust valve axis;
(e) intake passage means in said head for establishing fluid communication with said intake valve seat and exhaust passage means in said head for establishing fluid communication with said exhaust valve seat;
(f) said first cavity area having an annular exhaust spacing surface concentrically extending from said major diameter exhaust edge in a plane generally perpendicular to said exhaust valve axis and a generally frusto-conical funnelling surface extending from said exhaust spacing surface to said peripheral edge surface about at least portions of said second and third quadrants for funnelling exhaust gases through said exhaust valve seat;
(g) said first cavity area having an annular intake spacing surface concentrically extending from said intake major diameter edge in a plane generally perpendicular to said intake valve axis and a generally arcuate, concave surface extending from said intake spacing surface to said peripheral edge surface about at least portions of said second and third quadrants for sucking, in an unshrouded manner, a mixture of fuel and air through said intake valve seat;
(h) said first portion of said peripheral edge surface which is generally adjacent said first quadrant of said intake valve seat and said first quadrant of said exhaust valve seat being configured as a V-shaped velocity increasing point; and
(i) said velocity increasing point defining the beginning of a ridge line extending into said first cavity area between said first quadrant portion of said intake valve seat and said first quadrant portion of said exhaust valve seat and gradually blending into and becoming co-planar with said exhaust spacing surface and said intake spacing at a point where said intake valve seat and said exhaust valve seat are closest to one another, a metal mass buildup on each side of said ridge line, said added metal mass blending from said intake spacing surface in a gradually contoured, concave manner into said ridge line over a portion of said intake valve's first and second quadrants and said added metal mass blending from said exhaust spacing surface in a frusto-conical manner into said ridge line over a portion of said exhaust valve's first and second quadrants to define a velocity increasing zone within said combustion chamber.

4,919,093
ELECTRONIC IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Yoshihiro Fujiyoshi; Hidenobu Nagase; Koichi Fukuo, and Takatoshi Aoki, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1988, Ser. No. 273,203
Claims priority, application Japan, Nov. 19, 1987, 62-292622; Oct. 5, 1988, 63-251527
Int. Cl.[5] F01L *1/34, 1/14*
U.S. Cl. 123—90.16 16 Claims

1. A valve-operating system for an internal combustion engine, comprising a valve-driving piston slidably received in a cylinder body and operatively connected at one end thereof to an engine valve which is spring-biased in a closing direction, and a check valve and an orifice means interposed between hydraulic pressure generating means of generating an oil pressure for causing opening of the engine valve and a damper chamber defined between the cylinder body and the valve-driving piston, said check valve permitting flow of a working oil only from said hydraulic pressure generating means to the damper chamber, and said orifice means restricting returning of the working oil from the damper chamber to the hydraulic pressure generating means, wherein said orifice means comprises a bole having a constant length in the direction of oil flow, said bole being made sufficiently small to substantially reduce an influence on the flow of the working oil through the hole caused by viscosity variations of the working oil.

4,919,094
ELECTRONIC IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Yoshihiro Fujiyoshi; Hidenobu Nagase; Koichi Fukuo, and Takatoshi Aoki, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1988, Ser. No. 273,204
Claims priority, application Japan, Nov. 19, 1987, 62-292623; Oct. 5, 1988, 63-251528
Int. Cl.[5] F01L *1/34, 1/14*
U.S. Cl. 123—90.16 16 Claims

1. A valve-operating system for an internal combustion engine, comprising a valve-driving piston slidably received in a cylinder body and operatively connected at one end thereof to an engine valve which is spring-biased in a closing direction, and a check valve and an orifice means interposed between hydraulic pressure generating means of generating an oil pressure for causing opening of the engine valve and a damper chamber defined between the cylinder body and the valve-driving piston, said check valve permitting flow of a working oil only from said hydraulic pressure generating means to the damper chamber, and said orifice means restricting returning of the working oil from the damper chamber to the hydraulic pressure generating means, wherein said orifice means comprises a bole having a constant length in the direction of oil flow, said bole being made sufficiently small to substantially reduce an influence on the flow of the working oil through the hole caused by viscosity variations of the working oil.

4,919,095
ELECTRONIC IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Yoshihiro Fujiyoshi; Hidenobu Nagase; Koichi Fukuo, and Takatoshi Aoki, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1988, Ser. No. 273,205
Claims priority, application Japan, Nov. 19, 1987, 62-292624; Oct. 5, 1988, 63-251529
Int. Cl.[5] F01L *1/34, 1/14*
U.S. Cl. 123—90.16 16 Claims

1. A valve-operating system for an internal combustion engine, comprising a valve-driving piston slidably received in a cylinder body and operatively connected at one end thereof to an engine valve which is spring-biased in a closing direction, and a check valve and an orifice means interposed between hydraulic pressure generating means of generating an oil pressure for causing opening of the engine valve and a damper chamber defined between the cylinder body and the valve-driving piston, said check valve permitting flow of a working oil only from said hydraulic pressure generating means to the damper chamber, and said orifice means restricting returning of the working oil from the damper chamber to the hydraulic pressure generating means, wherein said orifice means comprises a bole having a constant length in the direction of oil flow, said bole being made sufficiently small to substantially reduce an influence on the flow of the working oil through the hole caused by viscosity variations of the working oil.

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4,919,093

INTERNAL COMBUSTION ENGINE

Hikosaburo Hiraki; Toshibumi Murakami, and Akira Kusakabe, all of Tochigi, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusbo, Tokyo, Japan

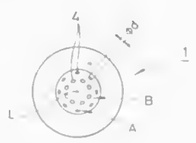
PCT No. PCT/JP88/00350, § 371 Date Dec. 5, 1988, § 102(e) Date Dec. 5, 1988, PCT Pub. No. WO88/08081, PCT Pub. Date Oct. 20, 1988

PCT Filed Apr. 7, 1988, Ser. No. 340,724

Claims priority, application Japan, Apr. 7, 1987, 62-51673[U]; Dec. 3, 1987, 62-183817[U]

Int. Cl.[5] F02M *61/04*

U.S. Cl. 123—299 4 Claims



1. An internal combustion engine including a fuel injection device for feeding fuel in the interior of a combustion chamber through an injection nozzle, characterized in that said injection nozzle is formed with a plurality of injection holes arranged in two rows concentrically relative to the center axis of the injection nozzle, the respective injection holes in the upper row being arranged in a zigzag fashion relative to those in the lower rows, radially extending center axes of the respective injection holes in the upper row are arranged on the periphery of a circle of which center is located at a position on the center axis of the injection nozzle and radially extending center axes of the respective injection holes arranged in the lower row are arranged on the periphery of a circle of which center is located at a position on the center axis of the injection nozzle, said position being spaced away from said position by a predetermined distance Z, wherein the number of injection holes arranged in both the upper and lower rows is determined in the range of 14 to 20 in total and when it is assumed that a diameter of the respective injection holes is represented by d, the following conditions are satisfactorily met among a plurality of parameters comprising said distance Z, an angle X° assumed by center axes of the injection holes in the lower row relative to the center axis of the injection nozzle, an angle Y° assumed by center axes of the injection holes in the upper row relative to the center axis of the injection nozzle and a ratio F/D of diameter F of a cavity for the combustion chamber to diameter D of a bore

(I) $d<Z<4d$

(II) $45°<X°<60°$

(III) $75°<Y°<85°$

(IV) $0.5<F/D<0.7$.

4,919,094

ENGINE CONTROL APPARATUS

Toshio Manaka, Katsuta; Masami Shida, Mito; Teruji Sekozawa, Kawasaki, and Shinsuke Takahashi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

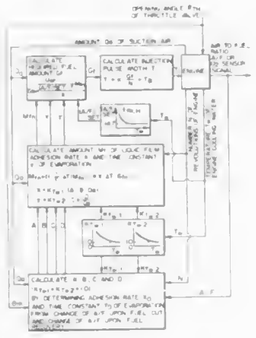
Continuation of Ser. No. 207,526, Jun. 16, 1988, abandoned.

This application Jul. 13, 1989, Ser. No. 380,729

Claims priority, application Japan, Jun. 17, 1987, 62-149224

Int. Cl.[5] F02D *41/12*

U.S. Cl. 123—326 25 Claims



1. An engine control apparatus comprising detecting means for detecting a condition of an engine, operation means for determining the adhesion rate of fuel and the time constant of evaporation of fuel in a fuel injection and suction system in a preestimating manner and determining the amount of fuel to be supplied on the basis of said adhesion rate, said time constant of evaporation and the condition of the engine detected by said detecting means, and fuel supply means for supplying fuel in accordance with the determined fuel supply amount, in which said operation means includes first operation means for calculating said time constant of evaporation on the basis of the amount of liquid film and the amount of fuel sucked into a cylinder after a fuel cut and calculating said adhesion rate on the basis of the amount of supply of fuel and the amount of fuel sucked into the cylinder after a fuel recovery.

4,919,095

DASHPOT FOR AN INTERNAL COMBUSTION ENGINE

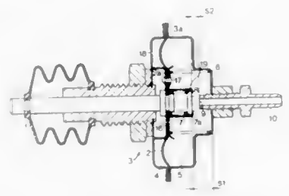
Hideshige Gomi; Shoichi Matsumoto, and Harugi Yamazaki, all of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1988, Ser. No. 233,023

Claims priority, application Japan, Sep. 7, 1987, 62-223580

Int. Cl.[5] F02B *77/00*

U.S. Cl. 123—328 8 Claims



1. A dashpot for an internal combustion engine having a throttle valve, the dashpot having a dashpot body, a diaphragm provided in the dashpot body for defining a pressure chamber and an atmospheric chamber and having an orifice therein, a first spring in a neutral condition biasing the diaphragm to a predetermined position, an actuating rod secured to the diaphragm at an end of the rod and extending opposite to the pressure chamber and operatively connected to the throttle valve at the other end when the throttle valve is closed, comprising:

a supporting member secured to the diaphragm opposite to the actuating rod, disposed in the pressure chamber;

a spring loaded valve mounted on the supporting member;

a second spring for biasing the spring loaded valve toward a projected position;

a pipe secured to the dashpot body and having an opening at an end thereof, disposed in the pressure chamber, the opening being disposed to be closed by the spring loaded valve when the diaphragm is deflected by the throttle valve;

a solenoid operated valve arranged to communicate the pressure chamber with the atmosphere through the pipe when opened; and

the diaphragm and the spring loaded valve being arranged such that the spring loaded valve closes the opening of the pipe at a smaller stroke than that of the diaphragm.

4,919,096

ELECTRONIC THROTTLE CONTROLLING APPARATUS FOR USE IN AN INTERNAL COMBUSTION ENGINE

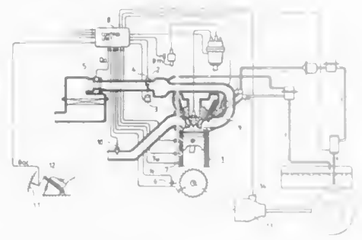
Toshio Manaka, Katsuta, and Masami Shida, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,125

Claims priority, application Japan, Dec. 28, 1987, 62-330240

Int. Cl.[5] F02D *7/00, 41/00*

U.S. Cl. 123—399 14 Claims



1. In an electronic throttle controlling apparatus for use in an internal combustion engine of a motor vehicle having detect means for detecting an operation amount of an accelerator pedal and engine speed, and actuator means for controlling an intake air flow amount of the engine in accordance with a control signal, the improvement comprising memory means for storing data indicating a driving operation condition of the engine peculiar to the driving history of the motor vehicle and at least first and second maps each providing a different predetermined control characteristic of values of actuation of said actuator means according to values of operation amount of the accelerator pedal and engine speed provided by said detect means, and control means for generating said control signal for said actuator means on the basis of a value of actuation of said actuator means read from one of said maps selected on the basis of stored values of said driving operation condition of the engine.

4,919,097

ENGINE OUTPUT CONTROL SYSTEM

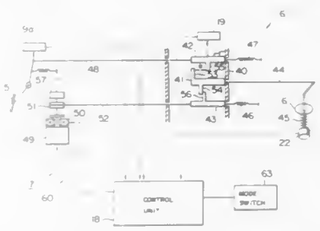
Syuzi Mitui, Hiroshima; Kouichirou Waki, Mihara, and Yasuhiro Harada, Kure, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Dec. 22, 1988, Ser. No. 288,266

Claims priority, application Japan, Dec. 23, 1987, 62-326162; Dec. 23, 1987, 62-326165

Int. Cl.[5] F02D *11/04, 11/10, 41/10*

U.S. Cl. 123—399 17 Claims



2. An engine output control system in accordance with claim 1 wherein the abnormality detecting means detects an abnormality of the electrical control means based on a voltage of a power supply applied for the electrical control means.

4,919,098

APPARATUS AND METHOD OF ELECTRONICALLY CONTROLLING ENGINE

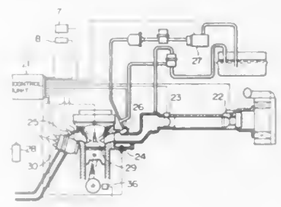
Kousaku Shimada, Katsuta; Teruji Sekozawa, Kawasaki, and Motohisa Funabashi, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 2, 1988, Ser. No. 266,075

Claims priority, application Japan, Nov. 5, 1987, 62-279874

Int. Cl.[5] F22D *1/40;* F22B *37/36*

U.S. Cl. 123—422 21 Claims



1 An electronic engine control apparatus comprising:

a plurality of sensors for detecting operating conditions of an engine which drives a vehicle;

a plurality of actuators for controlling the engine;

control means for calculating manipulated variables of said actuators on the basis of outputs of said sensors and for supplying the manipulated variables to said actuators to control the output torque of the engine;

means for measuring acceleration in the travelling directions of the vehicle;

differentiation means for calculating displacement difference per unit time of said measured acceleration to thereby detect differentiated acceleration as the longitudinal oscillation of the vehicle in the travelling direction; and

correction means responsive to said differentiation means for calculating a correction value, from the differentiated acceleration, of at least one of the manipulated variables of said actuators to correct the magnitude of the output

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torque of the engine so as to cause its phase to be opposite to the phase of magnitude of said displacement difference of acceleration and for supplying the calculated correction value to said control means to correct the at least one of said manipulated variables.

4,919,099

COMBUSTION MONITORING

Philip Extance; Roger J. Hazelden, both of Solihull, and David Nutton, Barnsley, all of Great Britain, assignors to Lucas Industries PLC, Birmingham, England

Filed Mar. 14, 1988, Ser. No. 167,694

Claims priority, application United Kingdom, Mar. 12, 1987, 8705905

Int. Cl.[5] **G01M** *15/00*; **F02D** *41/14*; **F02P** *5/145*

U.S. Cl. 123—425 **14 Claims**

1. A method of monitoring combustion within a cylinder of a reciprocating piston internal combustion engine comprising deriving first and second intensity signals representative of light intensity within the cylinder by means of first and second optical transducers of spaced spectral response, said first and second optical transducers observing the combustion event at a common location, or at closely adjacent locations, establishing a ratio signal representing the ratio of said first and second intensity signals and having a fast rising leading edge, and using said fast rising leading edge of said ratio signal as, or to obtain, a control parameter for controlling at least one engine function by an engine control system.

12. A method of monitoring the oxides of nitrogen (NOx) content of the exhaust of a reciprocating piston internal combustion engine including monitoring light intensity within the cylinder, deriving first and second electrical signals representative of light intensity within the cylinder by means of first and second optical transducers of spaced spectral response, said first and second optical transducers observing the combustion event at a common location, or at closely adjacent locations, and, establishing a signal representing the ratio of said first and second electrical signals, said ratio signal being used as, or to obtain, a control parameter for an engine control system.

4,919,100

FUEL INJECTION CONTROL SYSTEM FOR AN AUTOMOTIVE ENGINE

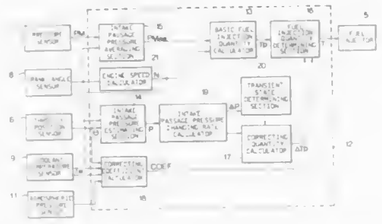
Mitsuo Nakamura, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 27, 1989, Ser. No. 344,270

Claims priority, application Japan, Apr. 30, 1988, 63-109501

Int. Cl.[5] **F02D** *41/10, 41/12*

U.S. Cl. 123—492 **4 Claims**



1. A system for controlling fuel injection of an engine for a motor vehicle having an intake passage, a throttle valve provided in the intake passage, and a fuel injector for injecting fuel, the system comprising:

an engine speed sensor producing an engine speed signal dependent on speed of the engine;

a throttle position sensor producing a throttle position signal dependent on opening degree of the throttle valve;

a pressure sensor producing a pressure signal dependent on pressure in the intake passage;

first calculator means responsive to the engine speed signal and the pressure signal for producing a basic fuel injection quantity signal;

estimating means responsive to the engine speed signal and the throttle position signal for estimating pressure in the intake passage and for producing an estimated pressure signal;

second calculator means for calculating a changing rate of the estimated pressure signal;

means responsive to the changing rate of the estimated pressure signal for producing a correcting signal;

corrector means for correcting the basic fuel injection quantity signal with the correcting signal, so as to determine the quantity of fuel to be injected.

4,919,101

FUEL SUPPLY CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Kunio Noguchi; Masayuki Ueno, and Kazushige Toshimits, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1988, Ser. No. 241,927

Claims priority, application Japan, Sep. 8, 1987, 62-224814

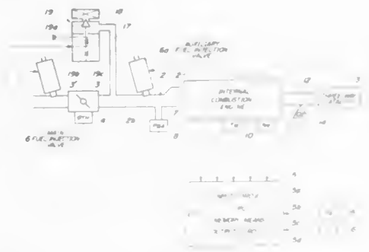
Int. Cl.[5] **F02D** *41/12*

U.S. Cl. 123—493 **13 Claims**

1. A fuel supply control system for an internal combustion engine having a plurality of cylinders, and an intake pipe connected to said cylinders and having a diversified portion and a united portion, said fuel supply control system including at least one fuel injection valve arranged in said united portion of said intake pipe, for supplying fuel to said cylinders, deceleration detecting means for detecting a predetermined decelerating condition of said engine, and fuel supply decreasing means for decreasing the supply of fuel to said engine through said fuel injection valve when said predetermined decelerating condition is detected by said deceleration detecting means, the improvement comprising:

(1) high-load detecting means for detecting whether said engine is in a predetermined high-load condition or not;

(2) first counting means associated with said high-load detecting means, for starting to count a first predetermined time period when said high-load detecting means detects that said engine has left said predetermined high-load condition; and



(3) inhibiting means associated with said first counting means and said deceleration detecting means, for inhibiting said fuel supply decreasing means from operating when said deceleration detecting means detects said predetermined decelerating condition of said engine before said first counting means completes counting said first predetermined time period.

4,919,102

FUEL PUMP DRIVING APPARATUS FOR VEHICLE

Hideo Iwabuchi, Saitama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1989, Ser. No. 360,514

Claims priority, application Japan, Jul. 15, 1988, 63-175193

Int. Cl.[5] **F02M** *39/00*

U.S. Cl. 123—499 **6 Claims**

1. A fuel pump driving apparatus for a vehicle, comprising a fuel pump, a blocking oscillator, including a transistor and a bias circuit therefor, for driving said fuel pump, and a control circuit for controlling an oscillating operation of said blocking oscillator,

said control circuit driving said blocking oscillator upon reception of an ignition pulse generated from an ignition coil in accordance with rotation of an engine,

wherein said control circuit comprises

a silicon controlled rectifier whose input side is series-connected to a bias circuit of said blocking oscillator, and

circuit means, connected to a gate of said silicon controlled rectifier and including a Zener diode, for voltage-dividing the ignition pulse, and

said bias circuit for said transistor of said blocking oscillator is designed to set a current which is flowed therethrough when the transistor is OFF to be lower than a holding current of said silicon controlled rectifier.

4,919,103

DEVICE FOR CONTROLLING EVAPORATIVE EMISSION FROM A FUEL TANK

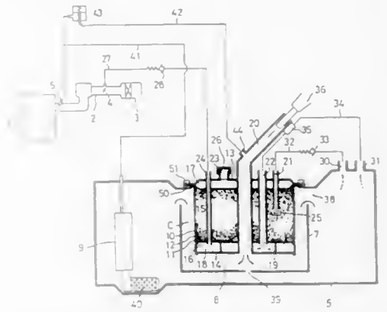
Yuji Ishiguro, Toyohashi; Hiroyuki Hosokawa, Chita; Nobuhiko Koyama, Nagoya; Eiji Hiramatsu, Anjo; Mitsunori Takao, Kariya; Tomoaki Abe, Oobu; Masashi Kiyono, Anjo; Katsuya Maeda, Kariya, and Shigeru Kamio, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 20, 1988, Ser. No. 145,909

Claims priority, application Japan, Feb. 28, 1987, 62-45825; Apr. 20, 1987, 62-96859

Int. Cl.[5] **F01M** *25/00*

U.S. Cl. 123—514 **12 Claims**



1. An apparatus for treating evaporative fuel used by an internal combustion engine, comprising:

a fuel tank;

a partitioning wall provided within the fuel tank to define a small fuel storage chamber within the tank;

a canister container housed in the small fuel storage chamber;

fuel adsorbing material stored with the canister;

a fuel feeding pipe for feeding fuel into the small fuel storage chamber; and

a fuel return pipe for introducing high temperature return fuel into the small fuel storage chamber;

the above-mentioned elements being arranged such that when fuel is introduced into the tank, it flows into the small fuel storage chamber through the fuel feeding pipe to cool the canister container whereas when the engine is operated, high temperature return fuel is introduced into the small fuel storage chamber through the fuel return pipe to heat the canister container thereby promoting an adsorbing and de-adsorbing action of fuel by the fuel adsorbing material.

4,919,104

RECIPROCATING MACHINE

Hartmut Hensel, Duvehof 1, 3000 Hannover 1, Fed. Rep. of Germany; Oliver Laing, 3970 Honeycutt St., San Diego, Calif. 92109, and Karsten Laing, Hofenerweg 37, 7148 Remseck-2, Fed. Rep. of Germany

Filed Dec. 30, 1985, Ser. No. 814,992

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1984, 3447459

Int. Cl.[5] **F02M** *23/00*

U.S. Cl. 123—533 **10 Claims**

1. A piston-type diesel engine which comprises a cylinder, a gas-lubricated piston reciprocating in the cylinder and acting via a thrust rod on kinematic means transforming the reciprocating movement into rotation, drive means for rotating the piston around its axis; and the piston being rotatably connected to the kinematic means; the cylinder and piston being made of

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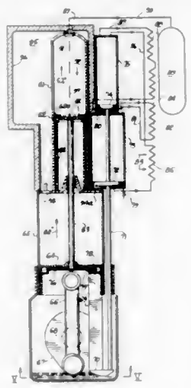
a ceramic material; means for feeding the cylinder with compressed air; and means for conveying exhaust gases to a second



cylinder of a secondary positive displacement piston-type machine.

4,919,105

DEVICE FOR IMPROVING MIXTURE DISTRIBUTION IN AN INTAKE TUBE OF A COMBUSTION ENGINE

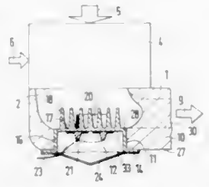
Heinz Duelli, Hohenems, Austria, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 16, 1988, Ser. No. 285,676

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1988, 3805927

Int. Cl.[5] F02M *29/00*

U.S. Cl. 123—590 **28 Claims**



1. A device for improving a fuel-air mixture distribution in a portion of an intake tube for an internal combustion engine, which comprises a fuel-air mixture distribution device (**12**) having a basic body (**17**), relatively steep, individual separately spaced upright, nail-like protrusions (**18**) protruding from said basic body (**17**) into said portion of the intake tube, a heating means connected to said fuel-air mixture distribution device for heating said protrusions and said basic body, and at least one fuel-air mixture guide wall (**20**) connected to said fuel-air mixture distribution device (**12**), said at least one fuel-air mixture guide wall protruding from said fuel-air mixture distribution device substantially in a direction of said protrusions (**18**), and disposed among and within an immediate vicinity of said protrusions (**18**) that extend into the intake tube portion.

4,919,106

IGNITION DISTRIBUTOR FOR AN INTERNAL COMBUSTION ENGINE

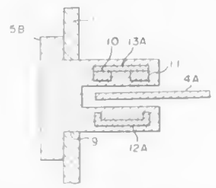
Seiki Kodama, and Shigemi Murata, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 177,044, Apr. 4, 1988, abandoned. This application Apr. 6, 1989, Ser. No. 333,809

Claims priority, application Japan, Apr. 17, 1987, 62-95827

Int. Cl.[5] F02P *7/06, 5/04*

U.S. Cl. 123—617 **2 Claims**



1. An ignition distributor for an internal combustion engine, said injection distributor comprising:

(a) a housing of a generally cylindrical form;

(b) a shaft which, in use, is rotated around a central axis by said internal combustion engine in said housing;

(c) a sensor attached to the cylindrical part of said housing; and

(d) a magnetic-permeable member fixed to said shaft and extending to face said sensor but to be spaced therefrom by a gap so that, in use, a signal for each cylinder of said internal combustion engine is generated when said shaft is rotated,

wherein:

(e) said magnetic-permeable member comprises a flat-plate-like portion having a rectangular cross-section in a plane containing said central axis, a uniform thickness in the direction parallel to said central axis, and a uniform length in the direction perpendicular to said central axis, said length being much greater than said thickness;

(f) said cylindrical part of said housing has an opening formed therein at the same level as the position of said flat-plate-like portion; and

(g) said sensor comprises:

(i) a radially outward portion having a rectangular cross-section in a plane that contains said central axis, said radially outward portion being located outside of said cylindrical part of said housing and being too large to fit through said opening;

(ii) a radially inward sensor portion which extends into said housing through said opening, said radially inward sensor portion having a uniform thickness in the direction parallel to said central axis at least approximately equal to the height of said opening and having a radially extending slot in its radially inward surface sized, shaped, and positioned so as to receive a part of said flat-plate-like portion and to divide said radially inward sensor portion into a first leg portion and a second leg portion;

(iii) a permanent magnet mounted in one of said first and second leg portions; and

(iv) a hall element mounted in the other one of said first and second leg portions, whereby:

(i) said gap can be accurately and uniformly dimensioned and stably maintained and

(ii) the shape of the signals obtained by the rotation of said magnetically-permeable member relative to said sensor is sufficiently distinct to be suitable for digital treatment.

4,919,107

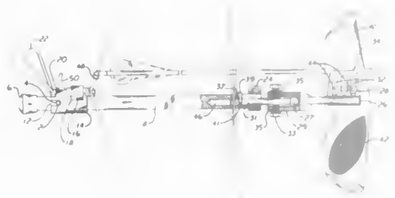
EQUALIZED FORCE SHOOTER FOR A BOW AND ARROW

Walter A. Bunts, Crystal River, Fla., assignor to Walter A. Bunts, Crystal River, Fla.

Filed Jun. 27, 1988, Ser. No. 211,975

Int. Cl.[5] F41B *5/00*

U.S. Cl. 124—24 R **3 Claims**



1. An apparatus for mechanically locating and maintaining the precise location of the tuned condition of an archers bow and arrow, comprising:

a slide rod mount having a forward and rearward end;

attachment means for rigidly fastening said forward end of said slide rod mount positioned approximately at the middle portion of the bow;

a sleeve having a forward and rearward end and a bore.

means to rigidly connect said forward end of said sleeve to said rearward end of said slide rod mount;

a ball and socket joint;

means to securely attach said ball and socket joint to said forward end of said sleeve within the bore of said sleeve;

a mounting shaft having a forward and rearward end;

a forward portion of said mounting shaft having a smaller diameter than the bore of said sleeve is located within said sleeve;

means to rigidly connect said forward end of said mounting shaft to the ball of said ball and socket joint;

said mounting shaft extends rearward out of said sleeve, and approximately perpendicular to the longitudinal axis of the bow;

a plurality of adjusting screws pass through a rearward portion of said sleeve allowing said mounting shaft to be located and to rigidly hold said mounting shaft at the proper tuned location;

a slide rod having a forward and rearward end;

said forward end of said slide rod rigidly attached to said rearward end of said mounting shaft;

a slide having a forward and rearward end;

said slide slidably surrounds said slide rod;

said slide having a guide pin locator notch at said rearward end of said slide;

means attached to said slide to rigidly hold an archers trigger release mechanism onto said slide to allow the bow string and said slide to be drawn rearward from a middle portion of the bow and parallel to the axis of said slide rod;

a guide pin located at a rearward portion of said slide rod to locate said guide pin notch to said guide pin, allowing said slide and a bow string to be drawn to its correct tuned position.

4,919,108

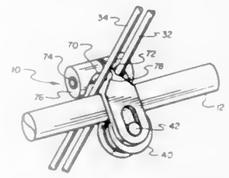
CABLE GUARD ASSEMBLY FOR COMPOUND BOWS

Marlow W. Larson, Ogden, Utah, assignor to Browning, Morgan, Utah

Filed Nov. 8, 1989, Ser. No. 434,096

Int. Cl.[5] F41B *5/00*

U.S. Cl. 124—88 **7 Claims**



1. In a compound bow of the type which includes a handle riser, a pair of opposed limbs extending from the opposite ends of said handle riser, eccentric members pivotally mounted at the distal ends of said limbs, a rigging system including said eccentrics, a central stretch including a bowstring segment and a pair of end stretches, said end stretches each extending from a said eccentric across said handle riser to the limb opposite said eccentric, and a cable guard rod cantilevered from attachment to said handle riser past and adjacent said end stretches,

a fixture reciprocally mounted to said stabilizer rod and slidably coupled to said end stretches so that as said bowstring is pulled from rest position to a drawn position, thereby flexing said limbs, said fixture is caused to move along said cable guard rod away from said handle riser by said end stretches while holding said end stretches away from the travel path of an arrow launched by said string; said fixture comprising:

a body member with a pair of legs straddling said cable guard rod, said legs each having proximal and distal ends;

structure connecting the proximal ends of said legs;

a roller rotatably mounted on an axle between the distal ends of said legs, said roller having a concave contact surface adjacent said cable guard rod; and

a cable-retaining member extending from said body member opposite said distal ends of said legs, said member including a pair of cable-receiving grooves, each said groove being configured to engage a respective said end stretch against a convex contact surface.

4,919,109

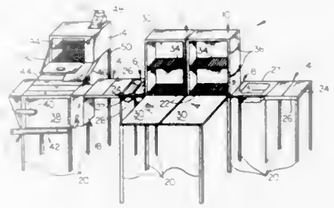
PACK KITCHEN WITH AIRTIGHT STOVE AND FLUE OVEN

M. Orville Riley, P.O. Box 817, Townsend, Mont. 59644

Filed Mar. 21, 1988, Ser. No. 170,947

Int. Cl.[5] F24C *1/16*

U.S. Cl. 126—9 R **7 Claims**



1. Portable, stowable camp kitchen apparatus comprising:

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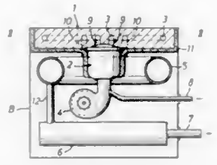
(a) a multi-walled sheet metal wood burning stove comprising;
(i) a pair of vertical side walls,
(ii) a rear end wall,
(iii) a front wall having a latchable hinged door opening to a fire box and a slidale door mounted beneath the latchable door and opening to at least a lower portion of said fire box,
(iv) an external bottom wall,
(v) an imperforate interior bottom wall defining the bottom of the firebox and dividing the fire box from an air cavity between the internal and external bottom walls,
(vi) a cook top comprised of a plurality of elongated panels assembled to form an essentially airtight cooking surface, each panel having a flat horizontal portion and formed peripheral edges, wherein one edge is bent to a U-shape and an opposite edge is bent to slip mount within the U-shaped edge of an adjacent panel and wherein others of said edges are rigidly secured to the stove walls, and including an aperture to the fire box circumscribed by a plurality of flange members; and
(b) a flue member, at least one end of which includes a flange portion transversely mating with the circumscribing flange members and whereby combustion gases are exhausted from said fire box.

4,919,110
GAS COOKING APPLIANCE
Nobuyoshi Yokoyama, Nagoya, Japan, assignor to Paloma Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Jul. 25, 1988, Ser. No. 223,366
Claims priority, application Japan, Jul. 25, 1987, 62-114402[U]
Int. Cl.[5] F24C *3/00*
U.S. Cl. 126—394 7 Claims

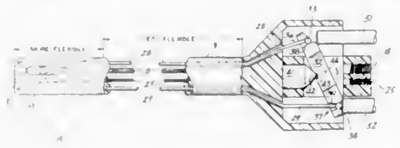


1. A gas cooking appliance for cooking chow mein, pan cakes or the like on a hot plate mounted thereon, comprising:
a pulse combustion burner, installed within an internal compartment of the appliance and having an combustion chamber coupled with a bottom portion of said hot plate suitable to effect pulse combustion of a mixture of gaseous fuel and air supplied thereinto;
wherein said hot plate is in the form of a thick metallic plate having therein a tailpipe passage which is connected at one end thereof to an exhaust port of said combustion chamber and extends outwardly through said metallic plate to permit the flow of combustion products, discharged therethrough, from said combustion chamber.

4,919,111
IGNITING APPARATUS
Jiro Ohsawa, Tokyo, Japan, assignor to Win Lighter Corporation, Tokyo, Japan
Filed Nov. 4, 1988, Ser. No. 267,298
Claims priority, application Japan, Jun. 16, 1988, 63-149024; Jul. 19, 1988, 63-95463[U]
Int. Cl.[5] A47J *37/00*; F23D *14/46*
U.S. Cl. 126—25 B 15 Claims

1. An elongated ignition apparatus comprising:
(a) a grip member, an ignition member and a middle member uniting together said grip member on one end and said ignition member on the other end,
(b) a fuel reservoir disposed in said grip member and having a gas supply valve,
(c) a burner nozzle coupled to said ignition member and being connected to the gas supply valve via a gas pipe,
(d) an electric spark generator disposed in the ignition member for generating a spark in the vicinity of the burner nozzle with electrical contact,
(e) means disposed in the ignition member for actuating the gas supply valve,
(f) the gas pipe uniting said reservoir and the said burner nozzle and
(g) release means operatively coupled to the gas supply valve for releasing gas in correspondence with actuation of said actuator means.

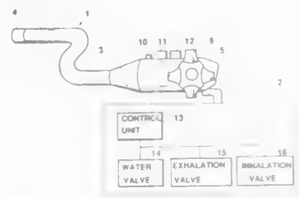
4,919,112
LOW-COST SEMI-DISPOSABLE ENDOSCOPE
Walter P. Siegmund, Windham, Conn., assignor to Schott Fiber Optics, Southbridge, Mass.
Filed Apr. 7, 1989, Ser. No. 334,335
Int. Cl.[5] A61B *1/00*
U.S. Cl. 128—4 18 Claims



1. An endoscope having a disposable shaft comprising:
a control handle,
a separable, disposable, flexible shaft having a distal end and a proximal end,
connector means for connecting the control handle and the shaft releasably,
movable means incorporated in said shaft for flexing the distal end of the shaft, and,

power means in said handle for making a separable driving connection with said movable means for articulating the distal end of said shaft.

4,919,113
METHOD OF CLEANING SCOPE END OF ENDOSCOPE AND ENDOSCOPE WITH SCOPE END CLEANING MECHANISM
Yutaka Sakamoto, Fukushima, and Ryuichi Kamaga, Tochigi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 6, 1989, Ser. No. 361,976
Claims priority, application Japan, Jun. 10, 1988, 63-141692
Int. Cl.[5] A61B *1/12*
U.S. Cl. 128—4 14 Claims

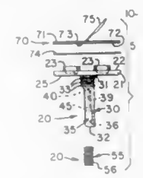


1. A method of cleaning a scope end of an endoscope, comprising the steps of:
injecting water on the scope end for washing out the scope end;
exhaling air on the scope end to blow away remaining drops on the scope end of the water injected at the injecting step, and
inhaling substantially as much an amount of air as exhaled at the exhaling step, slowly enough not to cause dew condensation due to an abrupt pressure decrease.

4,919,114
ENDOSCOPE PROVIDED WITH FLEXIBLE SIGNAL WIRES
Atsushi Miyazaki, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Jan. 9, 1989, Ser. No. 294,437
Claims priority, application Japan, Jan. 14, 1988, 63-005925
Int. Cl.[5] A61B *1/04*
U.S. Cl. 128—6 7 Claims

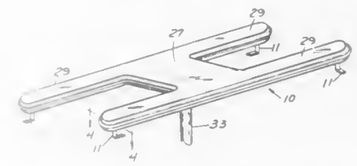
1. An endoscope including
a flexible insertable part;
a solid state imaging device obtaining an optical image of an observed part through an observing window provided in a tip part of said insertable part; and
signal wires inserted through said insertable part, electrically conducted to said solid state imaging device and said signal wires having parts with higher flexibility than other parts thereof in a lengthwise direction.

4,919,115
ARROW REST SPACER
Allen W. Miller, 32 Champagne, Lake St. Louis, Mo. 63367
Filed Sep. 11, 1989, Ser. No. 405,866
Int. Cl.[5] F41B *5/00*
U.S. Cl. 124—24 R 16 Claims



12. An arrow rest spacer for use with a bow having a riser with a handle part and a generally flat sided cut-away part extending above said handle part, a broad face of said cut-away part being oriented in a direction generally parallel to the shaft of an arrow being shot, and said cut-away part having an internally threaded passage extending entirely through it generally perpendicular to said broad face, said arrow rest spacer comprising a face plate and an elongated generally straight shaft connected at an inner end of said shaft to one side of said face plate and projecting therefrom to an outer end of said shaft, said shaft having a channel opening through and extending axially from said outer end of said shaft, said channel being open along one side of said shaft, a bottom wall of said channel being thicker at an inner part of the channel than it is at the outer end of said channel to form a shallower channel area in said inner part, and an externally threaded plug the threads of which are of the same pitch as the internal threads of said threaded passage, said shaft being of a size to fit closely but slideably in said threaded passage, said plug being of a diameter to be received into said channel at its outer end and to engage the threads of said threaded passage and to tighten the shaft securely against axial movement as said plug is screwed into said shallower channel part.

4,919,116
GAS BURNER ELEMENT WITH UNIVERSAL SUPPORTS
Earle L. Pfefferkorn, Racine, Wis., assignor to Greene Manufacturing Co., Racine, Wis.
Filed May 15, 1989, Ser. No. 352,834
Int. Cl.[5] F24C *3/00*
U.S. Cl. 126—41 R 9 Claims



1 A gas burner element adapted for mounting within a burner kettle having spaced holes formed in the floor thereof, the element including: a body member defining a diffusion

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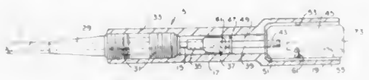
chamber and a plurality of burner arms extending from said chamber, said arms having a plurality of holes for flowing gas therethrough; a support member received in each of said arms for maintaining said element in an adjustable, spaced relationship from a burner kettle, said support member including a generally vertical shaft threadably engaged to said arm and a foot portion disposed radially to said shaft, said foot portion having a width and a length substantially greater than said width, said burner element thereby being adapted to be adjustably supportable in areas of the kettle floor which are devoid of holes, irrespective of the height at which the burner element is supported, said relationship between said burner kettle and said burner element being adjustable by rotating said vertical shaft, thereby extending or retracting said support member with respect to tis related burner arm.

4,919,117

FACIAL AND BODY MASSAGE APPARATUS AND METHOD

Thomas P. Muchisky, 26 Westwood Country Club, St. Louis, Mo. 63131, and James V. Young, University City, Mo., assignors to Thomas P. Muchisky, St. Louis, Mo.

Filed Feb. 21, 1989, Ser. No. 313,054
Int. Cl.[5] A61H *7/00*
U.S. Cl. 128—62 R **20 Claims**



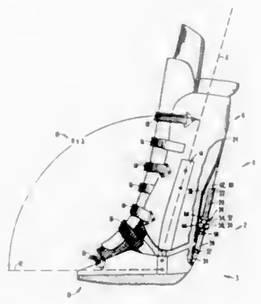
1. A facial and body massage apparatus for skin cleansing-/exfoliation comprising:
a massage applicator having a handle and a massage head;
said massage head including a body massage element for contacting the face or body of a user;
means for rotating said body massage element about an axis aligned with said handle and also for simultaneously orbiting said element in a path about said axis to continuously re-position said body massage element about said axis during rotation thereof.

4,919,118

MOTION LIMITER FOR SHORT LEG WALKER

John C. Morris, Castro Valley, Calif., assignor to Orthopedic Technology, Inc., San Leandro, Calif.

Filed Aug. 14, 1989, Ser. No. 394,398
Int. Cl.[5] A61F *5/04*
U.S. Cl. 128—88 **21 Claims**



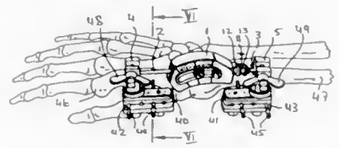
1. A motion limiter for a short leg walker of the type having an upper member joined to a lower member to permit relative movement therebetween, the motion limiter comprising:
a shaft having a first end, a second end, a length therebetween and defining a cross section, the second shaft end adapted to be pivotally attached to a chosen one of the upper and lower members;
a guide having upper and lower surfaces and defining a hole therethrough sized to accommodate the cross section of said shaft, the guide adapted to be pivotally attached to the unchosen one of the upper and lower members;
said shaft being disposed within said hole whereby a sliding movement of the shaft through said guide is permitted as the first and second members move relative to one another; and
first and second stop members positioned along the shaft on either side of the guide to limit the movement of the shaft through the guide thereby limiting the range of motion of the upper member relative to the lower member, at least said first stop member being adjustably positionable along the shaft to adjust said range of motion.

4,919,119

EXTERNAL DYNAMIC BONE FIXATION DEVICE

Ulf Jonsson, Lidingo, Sweden, and Marcel Wagenknecht, Le Lignon, Switzerland, assignors to Jaquet Orthopedie, S.A., Geneva, Switzerland

Filed May 16, 1986, Ser. No. 863,756
Int. Cl.[5] A61F *5/04*
U.S. Cl. 606—54 **16 Claims**



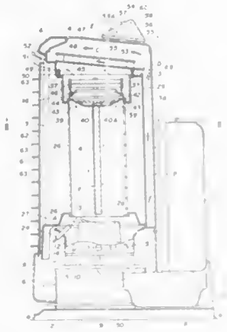
1. A dynamic external bone fixation device for the osteosynthesis of a broken joint, comprising:
(1) a first part comprising a first fixation rod having an axis a_1 for connection to bone pins introduced into the bone on one side of said joint,
(2) a second part comprising a second fixation rod having an axis a_2 for connection to bone pins introduced into the bone on the other side of said joint, and
(3) an articulating portion joining said first part and said second part, said articulating portion comprising:
(a) a first curved surface to which said first part is connected and which fits with a second curved surface to which said second part is connected so as to allow adjustably limited movement of said first part with respect to said second part, both said first curved surface and said second curved surface having a common virtual axis spaced apart from said device, and
(b) means for locating said common virtual axis so that said virtual axis may be aligned with the axis of said joint, wherein said means for locating said virtual axis is an integral element of said device.

4,919,120

RADIANT-TYPE HEATER

Tadao Horikoshi, Tatebayashi; Hisao Naganuma, Ashikaga; Minoru Sugimoto, Iwafune, and Masanobu Numao, Ashikaga, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jun. 6, 1989, Ser. No. 361,868
Claims priority, application Japan, Jun. 9, 1988, 63-142435; Jun. 10, 1988, 63-144038; Jun. 10, 1988, 63-77649[U]
Int. Cl.[5] F24C *5/00*
U.S. Cl. 126—93 **6 Claims**



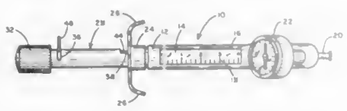
1. A radiant-type heater comprising:
an exterior case having an opening in a front surface thereof, an upper space defined in an upper portion of the case and a lower space defined in a lower portion of the case;
a deflection plate mounted in said upper space;
a burner mounted in said lower space and having a plurality of flame holes formed therein adapter to have a fuel-air mixture flow therethrough; and
a heating element suspended downwardly from said deflection plate toward said burner, said heating element including a curved portion with a concave side and a convex side, said convex side of said curved portion of said heating element facing said opening in said front surface of said exterior case.

4,919,121

INFLATION DEVICE FOR ANGIOPLASTY CATHETER

Mark A. Rydeli, Golden Valley, and Rick L. Shockey, Eagan, both of Minn., assignors to Schneider (USA) Inc., A Pfizer Company, Minneapolis, Minn.

Filed Feb. 6, 1989, Ser. No. 306,047
Int. Cl.[5] A61M *29/00*
U.S. Cl. 604—97 **8 Claims**



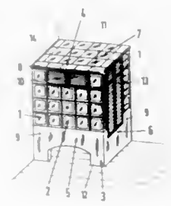
1. An inflation device for a transluminal angioplasty catheter of the type including an elongated, flexible plastic tube having a proximal end and a distal end, said distal end supporting an expander member thereat, said inflation device comprising:
(a) a syringe housing for retaining a tubular syringe body therein, said syringe body having a piston receiving bore, a fluid outlet port at its distal end, and means for coupling said oulet port to the proximal end of said catheter, said syringe housing including an internally threaded annular surface at the proximal end thereof, said annular surface being of a predetermined internal diameter;
(b) a syringe plunger having a proximal end, a distal end and a piston member on said distal end of said plunger, said plunger being insertable into said piston receiving bore of said syringe body and having a longitudinally extending bore with a longitudinal slot formed through the wall of said cylindrical plunger extending from said longitudinal bore to the exterior of said cylindrical plunger, the outer diameter of said cylindrical plunger being less than said predetermined internal diameter of said annular surface on said plunger housing and a piston member on said distal end of said plunger;
(c) an externally threaded member disposed in said longitudinal slot for radial movement between a first position wherein the threads on said externally threaded member are out of engagement with said internally threaded annular surface and a second position where said threads on said externally threaded member engage said internally threaded annular surface; and
(d) manually actuable means disposed in said longitudinal bore in said plunger for selectively moving said externally threaded member between said first and second positions, whereby rotation of said syringe plunger within said syringe housing produces axial movement of said piston within said piston receiving bore when said externally threaded member is in said second position.

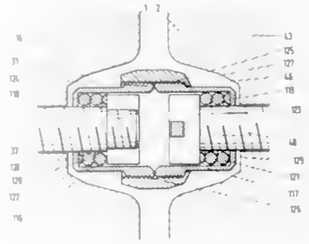
4,919,122

ELEMENT STRUCTURE AND PROCESS FOR ASSEMBLING SAME

Siegmar Kohlenbrenner, Im Wiedenberg 25, 7321 Ottenbach, Fed. Rep. of Germany

Continuation of Ser. No. 11,466, Feb. 5, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 296,836
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1986, 3603419
Int. Cl.[5] F24C *15/00*; E04B *1/00*
U.S. Cl. 126—98 **30 Claims**





1. A process for the erection of a structure made of prefabricated modular elements, comprising the steps of:
(a) providing prefabricated modular elements of appropriate

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configurations and sizes, each modular element containing a tensioning element positioned therein to be concealed from viewing upon assembly of the structure;

(b) provide tightening members and coupling pieces to cooperatively apply tension to the tensioning elements as the structure is assembled and, thereby, to relieve the modular elements from tension;

(c) placing the coupling pieces on the tightening members, the tightening members being positioned to fit between the tensioning elements;

(d) erecting the structure by individually placing the modular elements against each other in abutting relationship, the placing of each modular elements being determined by the configuration of the structure to be assembled;

(e) continually placing the tensioning elements under tension as the structure is assembled, the tensioning elements cooperating with the tightening members and coupling pieces positioned between the tensioning elements to provide said tension;

(f) creating openings within the structure exactly sized to received each modular element, including a final modular element, said openings remaining constant in size regardless of expansion or shrinking of the modular elements or the tensioning elements; and

(g) inserting the final modular element into position in the structure from any open side of the last opening.

4,919,123

FILTER BASE FOR FORCED AIR FURNACE

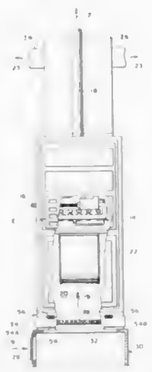
Jerry D. Jackson, 6969 Lakewood Blvd., Dallas, Tex. 75214, and Terry D. Youngblood, 10844 Waterbridge Cir., Dallas, Tex. 75218

Continuation of Ser. No. 157,604, Feb. 19, 1988, Pat. No. 4,827,901. This application Jan. 24, 1989, Ser. No. 301,613

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.[5] F24H *3/02*

U.S. Cl. 126—110 R 3 Claims



1. In a forced air system for circulating conditioned air to and from a building space, said forced air system including an air conditioning unit having a housing enclosing a heat exchanger and a blower fan disposed in said housing for inducing air flow across said heat exchanger, and return air plenum means disposed in air flow communication with said heat exchanger, said return air plenum means having an inlet opening for receiving return air from said building space and having an outlet opening through which return air is discharged into said housing and across said heat exchanger, the improvement comprising:

a modular filter assembly providing mechanical foundation support for said air conditioning unit, said modular filter assembly resting on said return air plenum means and supporting the weight load of said conditioning unit; said filter assembly having a housing including sidewall panel portions defining the boundary of an air flow passage and providing mechanical support for the weight load imposed by said air conditioning unit, said air flow passage being disposed in series air flow communication with said plenum means outlet opening and said heat exchanger; filter support means attached to said filter housing for slideably receiving and supporting a removable filter element in said air flow passage; said filter housing having an access opening through which a filter element can be loaded onto and retrieved from said filter support means; and a cover plate mounted on said filter housing for movement from a first position overlapping the filter housing wall portions surrounding said access opening to effect sealed closure thereof, to a second position removed away from and uncovering said access opening to provide access to said filter support means, said cover plate being adapted to be drawn toward said filter housing wall surface by a suction force developed by the flow of return air conducted through said air flow passage to effect sealed closure of said access opening during operation of said forced air system.

4,919,124

AIRCRAFT AIRCREW LIFE SUPPORT SYSTEMS

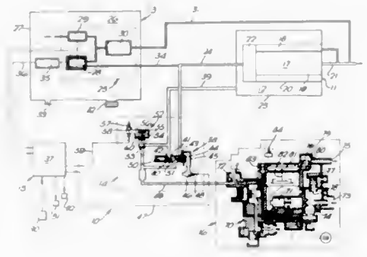
George F. Stevenson, and Ronald F. Cassidy, both of Yeovil, England, assignors to Normalair-Garrett (Holdings) Ltd., Somerset, England

Filed Dec. 12, 1988, Ser. No. 282,571

Claims priority, application United Kingdom, Dec. 18, 1987, 8729501

Int. Cl.[5] A61M *15/00*

U.S. Cl. 128—202.26 8 Claims



1. An aircraft aircrew life support system comprising an onboard oxygen generating system (OBOGS) for delivering oxygen-enriched product gas, breathing demand regulator means connected for receiving oxygen-enriched product gas, said regulator means including means for permitting aircraft cabin air to enter said regulator means and mix with said OBOGS product gas in one operating mode of said regulator means and mode switching means for switching said regulator means betwen a mode in which undiluted OBOGS product gas is delivered in response to breathing demands and a mode in which OBOGS product gas diluted with aircraft cabin air is delivered in response to breathing demands, plenum storage means connected for receiving OBOGS product gas and for supplying said gas to said regulator means, gas concentration sensor means connected for sensing concentration of oxygen in product gas delivered by said OBOGS and adapted to output oxygen concentration signals, an OBOGS product gas supply valve adapted for controlling said OBOGS product gas to be delivered to said regulator means from said OBOGS or said plenum storage means, a plenum storage charge valve adapted for controlling charging of said plenum storage means by said OBOGS product gas, and electronic control means connected for receiving oxygen concentration signals form said gas concentration sensor means and mode signals from said mode switching means and adapated to compute said signals and output control signals to said OBOGS product gas supply valve and said pelnum storage charge valve, whereby when oxygen concentration in product gas delivered by said OBOGS is sensed to have fallen below a predetermined minimum concentration percentage or on failure of OBOGS product gas supply said product gas supply valve is switched to inhibit the flow of product gas from the OBOGS to said regulator and to connect said regulator means with said plenum storage means, and when oxygen concentration is said OBOGS product gas is sensed to be above the predetermined minimum concentration percentage and said regulator means is in a mode in which OBOGS product gas diluted with aircraft cabin air is being delivered in response to breathing demands said plenum storage charge valve is switched to permit OBOGS product gas to charge said plenum storage means.

4,919,125

ANAESTHETIC VAPORISERS

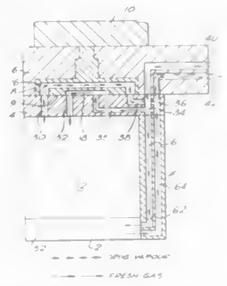
Robert A. Heaton, Skipton; Stuart C. Leach, Ilkley; Joseph Hancock, Bagslate, and Neil A. Sandy, Silsden, all of England, assignors to BOC Group PLC.

Filed Apr. 24, 1989, Ser. No. 341,984

Claims priority, application United Kingdom, Apr. 27, 1988, 8809897

Int. Cl.[5] A61M *15/00*

U.S. Cl. 128—203.14 5 Claims



1. An anaesthetic vaporiser of the by-pass type in which carrier gas is initially divided into a first stream passing through a vaporising chamber containing volatile liquid anaesthetic agent thereby entraining vapour from the volatile liquid anaesthetic agent and a second by-pass stream, the two streams subsequently recombining prior to leaving the vaporiser for delivery to a patient, comprising a thermally responsive valve located in the second, by-pass stream, the vaporising chamber including a base made from a material with a high thermal conductivity, the thermally responsive valve being located immediately below the base in the normal orientation of the vaporiser.

4,919,126

FLEXIBLE ORAL AIRWAYS AND METHODS

David E. Baildon, Callahan Rd., P.O. Box 2647, Lake City, Fla. 32056-2647

Filed May 8, 1987, Ser. No. 47,324

Int. Cl.[5] A61M *16/00*

U.S. Cl. 128—207.14 45 Claims

1. An oral airway comprising:

an airway member having dimensions generally conforming to the dimensions of human airways, said airway member formed from a plastic material which is easily molded to the configuration of a specific patient airway during insertion, said member having an air passageway extending longitudinally therethrough; and

a spine extending longitudinally through and fixed with said airway member and generally parallel with at least a portion of said air passageway, said spine formed of a material which is rigid relative to the plastic material of said airway member, said spine being sufficiently flexible to conform with said airway member to said specific patient airway during insertion, and sufficiently rigid to maintain said configuration after insertion.

4,919,127

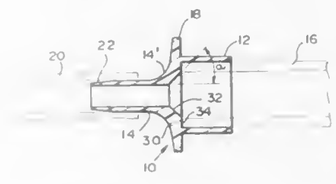
ENDOTRACHEAL TUBE CONNECTOR

Donald M. Pell, 861 Sixth Ave. S., St. Petersburg, Fla. 33701

Filed May 3, 1988, Ser. No. 189,714

Int. Cl.[5] A61M *16/00*

U.S. Cl. 128—207.14 8 Claims



1. A connector for connecting an endotracheal tube to a source of gas, comprising an annular gas inlet and an annular gas outlet sharing a common longitudinal axis with said inlet and extending downstream therefrom; said inlet having an inside diameter which is about 2½ to 3 times greater than the inside diameter of said outlet and adapted to receive a flexible tube having an outside diameter which is approximately the same as the inside diameter of said inlet therein, and an intermediate portion between said inlet and said outlet defining a radially flared outwardly extending annular passageway sharing a common longitudinal axis with said inlet and said outlet and connecting said inlet and said outlet with the smaller end of said radially flared passageway adjacent to the inside of said outlet, means to minimize turbulence and thereby reduce the work of breathing including a shoulder adjacent to the larger end of said radially flared passageway, said shoulder having a width approximately equal to the wall thickness of the flexible tube, so that, when the flexible tube is inserted into the inside of said inlet with its end abutting said shoulder, the outer edge of the large end of said radially flared passageway is flush with the interior passage provided by the flexible tube to thereby provide a smooth relatively unobstructed flow of gas through the tube and the connector, and a patient end portion of said outlet sharing a common longitudinal axis with said cylindrical outlet means and extending downstream therefrom, said patient end portions having a tapered outside diameter terminating at a thin circular leading edge so that one end of an endotracheal tube which extends outside of the patient can be forced over the tapered portion of the outlet to provide a

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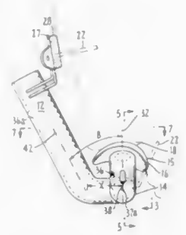
relatively smooth obstruction free passageway from and through the connector to the endotracheal tube whereby the work of inspiration by an intubated patient is minimized.

4,919,128
NASAL ADAPTOR DEVICE AND SEAL
John A. Kopala, and John E. Remmers, both of Calgary, Canada, assignors to University Technologies International Inc., Alberta, Canada
Filed Aug. 26, 1988, Ser. No. 236,941
Int. Cl.[5] A61M *15/00, 16/06*
U.S. Cl. 128—207.18 **20 Claims**

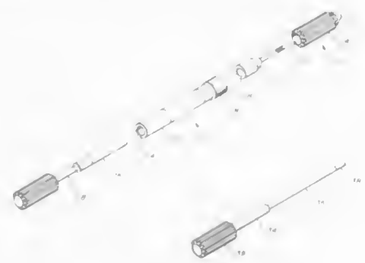


12. A nasal adaptor seal comprising a pair of flexible flange members, each having a curved surface and each having a portal therethrough for supplying air to the nasal airways, the portals being positioned to correspond to the nasal openings, the axis of each portal being positioned to substantially align with the aerodynamic air flow into and out of the nasal airways, said curved surfaces being complementary and conformed to the nares of an individual upon contacting the nares of an individual under sufficient force to form a seal between the flange members and the nares and without cannulating such nares, the perimeter of said surfaces generally corresponding to a projection of the external meatus of the nares of an individual.

4,919,129
EXTENDABLE ELECTROCAUTERY SURGERY APPARATUS AND METHOD
Jaroy Weber, Jr., Woodside; Terrance L. Kloeckl, San Francisco; Michael A. Cast, Palo Alto, and Frank T. Watkins, III, Menlo Park, all of Calif., assignors to Celebration Medical Products, Inc., Palo Alto, Calif.
Filed Nov. 30, 1987, Ser. No. 125,652
Int. Cl.[5] A61B *17/39*
U.S. Cl. 606—42 **7 Claims**

1. Surgical apparatus comprising:
an elongated body having an electrical conductor positionable along a slideable path extending substantially therethrough toward a forward end thereof, and including connector means disposed near said forward end;
said connector means being disposed to receive a conductive element therein for selective slideable positioning thereof relative to said forward end in response to slideable movement of the electrical conductor;
slider means disposed on the body and coupled to the electrical conductor for selectively altering the position thereof and of the connector means between forward and rearward positions thereof relative to said forward end;
circuit means disposed in the body to be actuated by the electrical conductor for controlling the application of electrical signal thereto in response to the position of the electrical conductor along the slideable path thereof;
said circuit means including an interlock switch operable in conductive state and in non-conductive state and disposed to be actuated for operation in the non-conductive state in response to the electrical conductor being positioned near said rearward position along the slideable path thereof; said interlock switch including auxiliary circuit means disposed in the body for grounding the electrical conductor during operation in said non-conductive state.

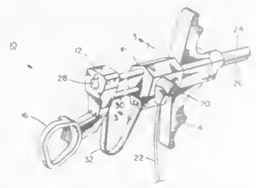
4,919,130
TOOL FOR INSERTING COMPRESSIBLE INTRAOCULAR LENSES INTO THE EYE AND METHOD
Michael A. Stoy, Redmond; Vaclav Dusek, Renton; Anilbhai S. Patel, Seattle, all of Wash., and Ray G. Herriott, Grand Island, Nebr., assignors to Nestle S.A., Switzerland
Continuation-in-part of Ser. No. 928,057, Nov. 7, 1986, abandoned. This application Nov. 2, 1987, Ser. No. 115,231
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—107 **48 Claims**



41. A method of preparing an intraocular lens formed of a compressible material for insertion into an eye, comprising the steps of:
(a) providing a loading chamber, a cannula having a proximal end communicating with said loading chamber and an opposite distal end, an extruding means for extruding a compressible intraocular lens from said loading chamber into said cannula including a first resilient pushing means for cooperating with the walls of the loading chamber to compress the lens to a smaller size as the lens is extruded, and an ejecting means for ejecting the extruded lens out said distal end including a second resilient pushing means,
(b) positioning a compressible intraocular lens into said loading chamber,
(c) extruding with said extruding means said lens from said loading chamber into said cannula through said proximal end.

4,919,131
RESECTOSCOPE WITH IMPROVED GUIDE BLOCK AND ELECTRICAL PLUG CONNECTION
Benedetto Grossi, Stamford, and Thomas W. Bracci, Norwalk, both of Conn., assignors to Circon Corporation, Santa Barbara, Calif.
Filed Jun. 2, 1988, Ser. No. 202,154
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—46 **4 Claims**

1. A urological endoscope comprising:
frame means; and
guide block means, said guide block means being movably mounted on said frame means and comprising at least one guide bar channel, an electrode proximal end channel and an electrical plug channel, said electrical plug channel having a first entry on a first lateral side and a second entry on a second lateral side, said electrical plug channel extending through said guide block means between said entries and intersecting said electrode channel, said guide block means further comprising means for limiting insertion of an electrical plug into said electrical plug channel to at least two orientations on each of said sides whereby

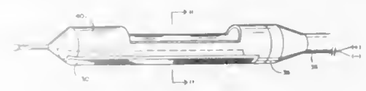


an electrical plug can be directly connected to an electrode by mounting the plug in said electrical plug channel on either said first or second side of said block to accommodate either a left or right handed operator an in at least either a first or second orientation on either of said first or second sides for allowing an operator to configure the connection of a plug to said guide block means for allowing an operator to feel comfortable and confident with the endoscope.

4,919,132
APPARATUS FOR SUPPLYING GAS TO A PATIENT
Martin G. Miser, Star Rte. 3, Box 5498, Pagosa Springs, Colo. 81147
Continuation of Ser. No. 88,128, Aug. 21, 1987, abandoned. This application Jun. 12, 1989, Ser. No. 366,233
Int. Cl.[5] A61M *16/00*
U.S. Cl. 128—205.17 **6 Claims**

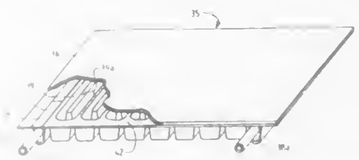
1. Apparatus for administering a predetermined gas to a patient comprising:
a main gas conduit adapted to be connected to a face mask;
a flexible gas reservoir bag having one end connected to said main gas conduit and adapted to be manually squeezed for supplying gas to said patient;
first valve means connected to the other end of said gas reservoir bag and in fluid communication with the interior of said gas reservoir bag, said valve means including a vent to atmosphere and a valve member selectively movable between predetermined positions relative to said vent for controlling the flow of gas through said vent;
means adjacent said first valve means to permit upon squeezing of said reservoir bag an indication of the internal fluid pressure of said reservoir bag corresponding to said positions of said valve member relative to said vent;
a branch gas supply conduit having one end connected to said main gas conduit and adapted to supply a predetermined gas to said main gas conduit;
second valve means associated with said branch conduit for permitting the introduction of air into said branch conduit to dilute said predetermined gas, said second valve means including a vent to atmosphere and a slidable valve member over said vent selectively movable longitudinally of said branch conduit relative to and adjacent said vent; and
means adjacent said second valve member for indicating the position of said valve member over said vent and the relative dilution of said predetermined gas corresponding to said positions of said valve member.

4,919,133
CATHETER APPARATUS EMPLOYING SHAPE MEMORY ALLOY STRUCTURES
Tien-Hon Chiang, 63 Finisterra, Irvine, Calif. 92714
Filed Aug. 18, 1988, Ser. No. 233,417
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—159 **14 Claims**



1 An improved catheter, the catheter of the type used in a human artery for removing an arterial blockage therein using a mechanical or electromechanical or electro-optical plaque removal device such as a rotating blade within a cylindrical housing adjacent an opening through the radial wall of the housing, the rotating blade cutting pieces of plaque which are received and temporarily stored in the housing; the improvement comprising:
in said housing an integral, expandable wall portion positioned substantially opposite to said opening and being formed of a mesh of shape memory alloy wire responsive to changes in temperature for selective changes in dimension;
means for remotely controlling the temperature of said mesh wire for selectively expanding and contracting said wall portion while said catheter is in said artery.

4,919,134
THERMOELECTRIC CHILLER AND AUTOMATIC SYRINGE
James M. Streeter, Highland, Utah, assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.
Continuation of Ser. No. 80,524, Jul. 31, 1987, abandoned. This application Mar. 2, 1989, Ser. No. 318,490
Int. Cl.[5] A61F *7/00*
U.S. Cl. 128—400 **9 Claims**



1. A thermoelectric device for rapidly changing injectate temperature in a cardiac output thermodilution catheter system wherein a bolus of an injectate passes through a heat exchanger comprising;
a thermoconductive means made of an energy conductor having a pair of major surfaces one of which surfaces is shaped to exchange energy and definitively configured to mount in intimate and maximum surface contact with a source of heating or cooling energy having a complimen-

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tary configuration for contact with the definitively configured major surface, the contact for uniform, rapid and efficient heat transfer through the thermoconductive means, and

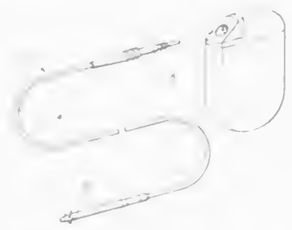
fluid path means made of a material more resistant to heat transfer and less conductive than the energy conductor of the thermoconductive means and associated with said other surface of said thermoconductive means to define a tortuous passageway thereacross for providing contact with the bolus during its passage prior to injection and for maintaining the bolus in intimate heat transfer relation with said thermoconductive means, the combination of said tortuous passageway and said thermoconductive means sufficient to change the temperature of the injectate bolus volume.

4,919,135

TRIAXIAL ELECTRODE

Richard E. Phillips, Jr., San Marcos, and Paul R. Spehr, Lake Jackson, both of Tex., assignors to Intermedics, Inc., Angleton, Tex.

Filed Dec. 14, 1988, Ser. No. 284,106
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—419 P 24 Claims



1. A cardiac pacing lead assembly comprising:

electrode means defining a longitudinal axis and a tip portion provided with an exposed surface having at least one groove extending perpendicular to said longitudinal axis therein, said groove having a linear nadir portion, said tip portion being electrically adapted to be coupled with excitable cardiac tissue of a heart when said lead assembly is implanted in a patient for stimulating the cardiac tissue when said electrode means is electrically energized; and

electrical conductor means electrically connected at one end thereof to said electrode means for delivering electrical energy thereto, said conductor means having terminal means at the other end for connection to a pulse generator of a cardiac pacemaker.

4,919,136

VENTILATION CONTROLLED RATE RESPONSIVE CARDIAC PACEMAKER

Eckhard Alt, Eichendorffstrasse 52, 8012 Ottobrunn, Fed. Rep. of Germany

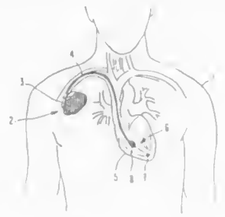
Filed Sep. 28, 1988, Ser. No. 250,060
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1987, 3732640
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—419 P 12 Claims

1. Heart measurement instrumentation comprising in combination,

measurement means for producing a measurement signal responsive to intracardiac pressure and volume of a patient,

processing means for the measurement signal including means for isolating from the measurement signal separate ventilatory function signals displaying variable amplitude and respiratory rate related to respiratory activity of a patient, and

tidal volume detection means for processing the amplitude



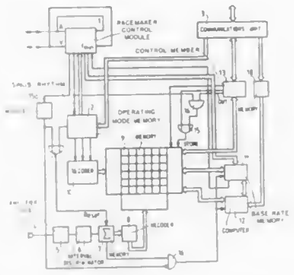
of the ventilatory function signals as a function of the respiratory rate to produce a corrected amplitude reflecting the true ventilatory tidal volume of the patient over a wide range of patient activity.

4,919,137

CARDIAC PACEMAKER WITH PHYSIOLOGICAL CONTROL

Max Schaldach, Erlangen, Fed. Rep. of Germany, assignor to Biotronik, Mess- und Therapiegeräte GmbH & Co. Ingenieurbüro Berlin, Berlin, Fed. Rep. of Germany

Filed Feb. 24, 1986, Ser. No. 832,004
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506791
Int. Cl.[5] A61N *1/36*
U.S. Cl. 128—419 PG 17 Claims



1. A cardiac pacemaker implantable in a patient, comprising:

means for applying stimulating pulses to the heart of the patient;

means for detecting at least one physiological parameter which is a function of left-ventricular systolic time intervals of the heart, and a first decoder means which receives a signal from said means for detecting at least one physiological parameter;

operating mode memory means, and a second decoder means which receives signals from said operating mode means;

memory means for storing a table of references values representing respective intervention frequency values which are retrievable as a function of both a signal from said operating mode means via said second decoder means and a signal representing said at least one physiological parameter from said means for detecting via said first decoder means;

control module means for supplying an operating mode signal and a sinus signal to said operating mode memory means, said operating mode signal corresponding to one of a plurality of operating modes which include a mode of spontaneous cardiac action and a mode of stimulated cardiac action;

communication means for selectively supplying an external signal to said operating mode memory means for selectively inputting to said operating mode memory means a signal corresponding to a physiological control mode;

circuit means connected to said detecting means for deriving a reference value from said memory means which is a function of said at least one physiological parameter detected by said means for detecting; and

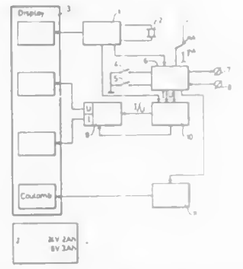
signal means connected between said circuit means and said means for applying stimulating pulses for producing stimulating pulses at a rate based on the reference value derived by said circuit means in the absence of spontaneous heart action.

4,919,138

METHOD AND APPARATUS FOR SUPPLYING ELECTRIC ENERGY TO BIOLOGICAL TISSUE FOR SIMULATING THE PHYSIOLOGICAL HEALING PROCESS

Björn Nordenstroöm, Barrtorpavägen 9, S-144 00 Rönninge, Sweden

Filed Nov. 14, 1988, Ser. No. 272,646
Claims priority, application Sweden, Nov. 13, 1987, 8704456
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—421 22 Claims



1. Apparatus for supplying electric energy to biological tissue for supporting different physiological processes and for influencing viability conditions, comprising,

at least two electrodes, a first of said at least two electrodes being adapted to be disposed in or on the biological tissue which is to be supported in a physiological or pathophysiological cycle, and a second of said at least two electrodes being adapted to be disposed in spaced-apart relationship from said first of said at least two electrodes the biological tissue in such a position that electrically conducting circuits exist between said at least two electrodes;

a voltage source coupled to said at least two electrodes for supplying electric current through said biological tissue; and

control means coupled to said voltage source for supplying to said electrodes a current whose amplitude values alternate with time for simulating a physiological healing process, said current having successive maximum amplitude values such that each maximum amplitude value of said current is lower in absolute terms than the immediately preceding maximum amplitude value; and

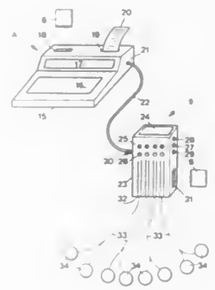
said control means causing said alternation of said current to take place a plurality of times within a cycle time interval which lies between 0.1 and 10 days.

4,919,139

ELECTRICAL NEUROMUSCULAR STIMULATION DEVICE

Roland Brodard, Villeneuve, Switzerland, assignor to Medicomex S.A., Geneva, Switzerland

PCT No. PCT/CH86/00040, § 371 Date Jan. 12, 1987, § 102(e) Date Jan. 12, 1987, PCT Pub. No. WO87/00760, PCT Pub. Date Feb. 12, 1987
PCT Filed Mar. 26, 1986, Ser. No. 345,660
Claims priority, application Switzerland, Apr. 3, 1985, 1438/85
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—421 5 Claims



1. A device for electrical neuromuscular simulation in order to cause muscle contractions and muscle exercise or training, comprising at least one autonomous portable stimulating unit (B) controlled by a removable and interchangeable information storage medium (6) programmed beforehand by a therapist by means of a programming unit (A) according to the treatment of a patient in question, for supplying trains of electrical stimulating pulses at its output, which is equipped with at least one pair of electrodes (34) to be applied to that part of the patient's body which is to be treated wherein the stimulating unit (B) comprises means for generating trains of electrical pulses whose characteristics are matched to the slow muscle fibers of the patient's body, and other trains of electrical pulses whose characteristics are matched to the two known types of quick fibers of the patient's body, wherein said stimulating unit comprises program-actuated means (9) for carrying out, under the control of a sequential program recorded on the removable information storage medium (6), a muscle treatment by said trains of electrical pulses; means for regulating the frequency and the durations of the pulses of said trains of electrical pulses, according to the characteristics of the muscles treated and of the patient, and wherein the stimulating unit (B) comprises intensity regulating means, controlled by a microprocessor and capable of being actuated by the patient, for regulating the intensity of the stimulation within predetermined programmed limits; safety means, incorporated in the same microprocessor, for maintaining the variation of the muscular contraction force to he substantially linear as a function of time, and for preventing an increase of the current intensity of the stimulating pulses to occur outside a predetermined plateau period (b) of the muscle contraction work phase, and for imposing, between at least those pulse trains intended for the quick fibers, a sufficient delay time (c) to avoid any harmful effects to said both types of fibers, so as to enable a treatment to last several hours without such harmful effects.

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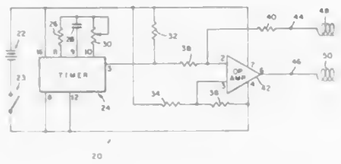
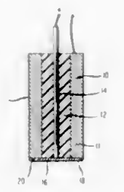
4,919,140
METHOD AND APPARATUS FOR REGENERATING NERVES
Richard B. Borgens, Delphi, and Michael E. McGinnis, West Lafayette, both of Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.
Filed Oct. 14, 1988, Ser. No. 258,142
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—422 11 Claims



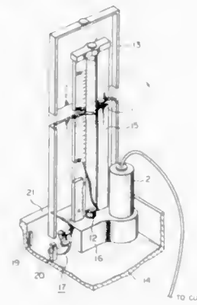
1. A method for stimulating nerves in the central nervous system of a mammal to regenerate within the central nervous system comprising the step of applying an oscillating electrical field to the spinal cord wherein the electrical field's polarity reversal period is less than about sixty minutes which is less than a die back period of anodally facing axons in the central nervous system and more than about thirty seconds which is long enough to stimulate growth of cathodally facing axons in the central nervous system.

4,919,141
IMPLANTABLE ELECTROCHEMICAL SENSOR
Horst D. Zier, Amstetten; Wolfgang Kerner, Dornstadt-Bollingen, and Ernst F. Pfeiffer, Ulm, all of Fed. Rep. of Germany, assignors to Institute für Diabetestechnologie Gemeinnützige Forschungs- und Entwicklungsgesellschaft mbH, Ulm, Fed. Rep. of Germany
Filed Jan. 4, 1988, Ser. No. 140,476
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1987, 3700119
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—635 15 Claims



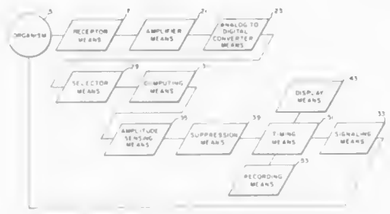
1. Implantable sensor for amperometric measurements in body liquids, such as blood or tissue liquid, comprising
a measurement electrode;
a reference electrode tubularly surrounding the measurement electrode and made of a stainless steel containing molybdenum as an alloy component; and
a layer of an immobilized enzyme being disposed on at least one end of the electrodes,
wherein said at least one end is adapted for insertion into a body liquid.

4,919,142
MECHANISM FOR OPENING AND CLOSING MERCURY SPHYGMOMANOMETER
Tsuchiyasu Yokozuka, Fujioka, Japan, assignor to Yamasu Co., Ltd., Saitama, Japan
Filed Jan. 4, 1989, Ser. No. 293,409
Claims priority, application Japan, Aug. 31, 1988, 63-217569
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—684 3 Claims



1. A mercury sphygmomanometer having a set of blood pressure measuring means mounted on the inner side of a cover pivotally attached to a cover of a casing and a lever actuated in response to an operation of pivoting said cover such that said lever selects an opening or closing position of a valve provided in between a mercury passage and a mercury reservoir in response to a operation of pivoting said cover, said lever comprising:
means for opening and closing said valve which has two abutments provided on said lever, said two abutments being disposed in a predetermined angular relation to each other with respect to the pivot point of said lever, one of said abutments being movable by a manual operation to select a valve opening or closing position.

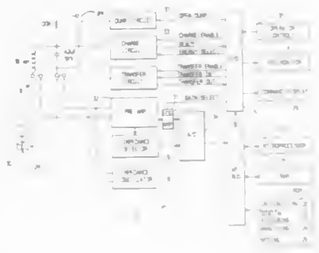
4,919,143
ELECTROENCEPHALIC NEUROFEEDBACK APPARATUS AND METHOD FOR BIOELECTRICAL FREQUENCY INHIBITION AND FACILITATION
Margaret E. Ayers, 10623 Bloomfield, Toluca Lake, Calif. 91602
Filed Jun. 14, 1989, Ser. No. 365,717
Int. Cl.[5] A61B *5/0482*
U.S. Cl. 128—732 8 Claims



1. An improved apparatus for inhibiting or producing analog bioelectrical signal frequencies in a person's body comprising:
(a) receptor means for attachment to the person's body at a location emitting an analog bioelectrical signal of interest;
(b) amplification means for amplifying said analog bioelectrical signal received from said receptor means, said receptor means conveying said analog bioelectrical signal to said amplification means;

(c) analog to digital converter means for converting said analog bioelectrical signal to digital signal representing particular analog frequencies, said analog signal having been amplified is converted to discrete digital signal representing corresponding analog frequencies;
(d) selecting means to select a particular digital signal, said selecting means including a numerical analyzer receiving said discrete digital signals allowing the selection of a particular digital signal corresponding to a particular analog bioelectrical frequency to be inhibited or accentuated and avoiding the delay and distortion of power spectral and bandpass analysis; and
(e) sensation means for giving the person a particular sensation when said particular digital signal is maintained within predetermined ranges of amplitude for a predetermined duration, thereby allowing the person to mentally concentrate so as to inhibit or produce said particular analog bioelectrical signal frequency which can be acknowledged by the person when the person receives said sensation.

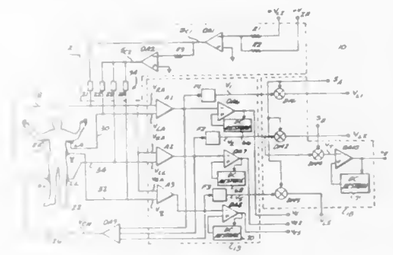
4,919,144
DEFIBRILLATOR ECG INTERPRETER
Marvin E. Vandehey, Seattle, Wash., assignor to First Medic, Bellevue, Wash.
Filed Feb. 26, 1983, Ser. No. 161,062
Int. Cl.[5] A61B *5/04*
U.S. Cl. 128—705 30 Claims



1. A system for detecting ventricular fibrillation and high rate ventricular tachycardia in a single-channel electrocardiogram produced in a pair of electrodes connected to a patient, comprising:
input means for receiving a sequence of digitized ECG samples of the ECG;
storage means for storing the sequence of digitized ECG samples received through the input means;
processing means for analyzing said sequence of ECG samples to discriminate among (1) noise, (2) ventricular fibrillation or high rate ventricular tachycardia that should be defibrillated, and (3) QRS peaks associated with ventricular contraction that should not be defibrillated; and
output means connected to the processing means for indicating when the processing means detects ventricular fibrillation or high rate ventricular tachycardia.

4,919,145
METHOD AND APPARATUS FOR SENSING LEAD AND TRANSTHORACIC IMPEDANCES
Arthur R. Marriott, Seattle, Wash., assignor to Physio-Control Corporation, Redmond, Wash.
Filed Jul. 13, 1988, Ser. No. 219,080
Int. Cl.[5] A61B *5/08*
U.S. Cl. 128—723 18 Claims

1. An apparatus for use with medical diagnostic and therapeutic apparatus employing electrodes attached to a patient's skin for sensing the integrity of lead connections and patient transthoracic impedance comprising:
(a) a carrier signal source means coupled to a first lead having a first lead impedance and coupled to a plurality of second leads having a plurality of second lead impedances:
(i) for producing a first carrier signal having a lead impedance frequency component and an impedance respiration frequency component and for applying said first carrier signal to said first lead; and,
(ii) for producing a second carrier signal having said lead impedance frequency component and said impedance respiration frequency component and for applying said second carrier signal to said plurality of second leads;
(b) a receiver means coupled to said first lead and said plurality of second leads for receiving:
(i) a first lead voltage produced by said first carrier signal and said first lead impedance; and,
(ii) a plurality of second lead voltages produced by said second carrier signal and said plurality of second lead impedances;



(c) amplifying means, coupled to receive a plurality of combinations of said first lead voltage with one of said plurality of second lead voltages, for amplifying the difference between said first and second lead voltages in each of said combinations and producing;
(i) a plurality of first stage output voltages, one of said first stage output voltages being produced for each of said combinations of said first and second lead voltages; and,
(ii) a plurality of second stage output voltages, one of said second stage output voltages being produced for each of said combinations of said first and second lead voltages; and,
(d) a signal separator means coupled to said amplifying means for receiving said plurality of first stage output voltages and for producing:
(i) a plurality of lead impedance-related voltages related to said lead impedance frequency component of said first and second carrier signals; and,
(ii) at least one impedance respiration-related voltages related to said impedance respiration frequency component of said first and second carrier signals.

4,919,146
BIOPSY DEVICE
Edward Rhinehart, Monroeville; James E. Machek, Bradfordwoods, and Michael W. Sanctis, Pittsburgh, all of Pa., assignors to Medrad, Inc., Pittsburgh, Pa.
Filed Oct. 25, 1988, Ser. No. 261,746
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—752 25 Claims

1. A device for obtaining biopsy samples, said device comprising:
a housing having proximal and distal ends and a distal tip terminating the distal end, a cannula having proximal and

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distal ends mounted at the distal end of said housing, the distal tip of said housing being open;

a drill bit/plunger component slidably mounted in said housing, said drill bit/plunger component including a plunger and a drill bit having proximal and distal ends with a cutting tip at the distal end of said drill bit, said drill bit extending through said plunger in a fluid-tight seal, said drill bit/plunger component being sized to fit within said housing such that when said drill bit/plunger component is inserted in said housing, said drill bit passes through said

cannula and such that when said plunger abuts the distal end of said housing, said cutting tip extends beyond the distal end of said cannula,

a rotational energy element for providing rotational energy to said drill bit/plunger component,

coupling means for coupling said rotational energy element to said drill bit/plunger component, and

means for actuating said rotational energy element so as to impart rotational movement to said coupling means and said component.

4,919,147

ESOPHAGUS PROBE

Josef Reinhardt, Krozingerstrasse 10, D-7801 Ehrenkirchen, and Martin Rössle, Hauptstrasse 71, D-7800 Freiburg, both of Fed. Rep. of Germany

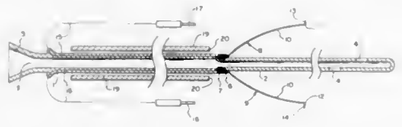
PCT No. PCT/DE87/00486, § 371 Date Jun. 1, 1988, § 102(e) Date Jun. 1, 1988, PCT Pub. No. WO88/03034, PCT Pub. Date May 5, 1988

PCT Filed Oct. 27, 1987, Ser. No. 221,457

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1986, 3636489

Int. Cl.[4] A61N *1/05*

U.S. Cl. 128—785 **14 Claims**



1. An apparatus for stopping esophageal bleeding, comprising:

an esophageal probe with a first tubus adapted for advancing into the espohagus of a patient;

an electrode pair arranged on said first tubus, said electrode pair including at least one sharp point projecting outwardly of said first tubus;

a means for penetrating a mucous membrane of the esophagus by urging said at least one point into the membrane; and

a stimulating current means for delivering an electrical stimulating current to said at least one point.

4,919,148

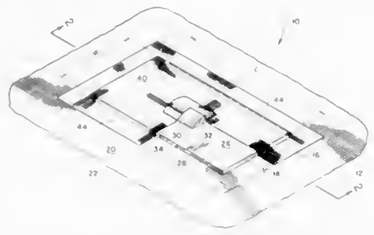
APPARATUS AND METHOD FOR TRANSCUTANEOUS ELECTRICAL STIMULATION

Philip E. Muccio, 753 Quilliams Rd., South Euclid, Ohio 44121

Filed Jun. 13, 1988, Ser. No. 218,710

Int. Cl.[5] A61N *1/04*

U.S. Cl. 128—798 **17 Claims**



1. A garment for transcutaneous neural stimulation comprising:

a non-conductive, knit fabric material defining a first layer;

at least one flexible, generally flat electrically conductive electrode having an upper surface and a generally planar lower surface in confronting relationship with said fabric material, said electrode connectable to a source of electrical stimulation;

a second layer of a non-conductive material overlying the upper surface of said electrode, said second layer dimensioned such that a portion thereof extends a predetermined distance beyond the periphery of said electrode;

a layer of adhesive material disposed between said second layer and said first layer for securing said second layer to said first layer, said electrode being confined between said first layer and said second layer wherein a generally flat pocket to receive a conductive fluid is defined between said first layer and said lower surface of said electrode;

said adhesive layer securing said first layer to said second layer defining a boundary around the entire periphery of said electrode for preventing migration of said conductive fluid beyond the periphery of said electrode.

4,919,149

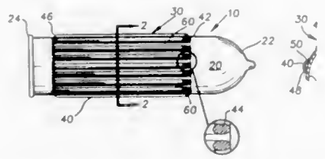
CONTRACEPTION AND FLAVOR DELIVERY SYSTEM

Michael A. Stang, 26 Stockmill Rd., Apt. F, Pikesville, Md. 21208

Filed Jul. 8, 1988, Ser. No. 216,351

Int. Cl.[5] A61F *5/00, 5/42, 5/44*

U.S. Cl. 128—842 **18 Claims**



1. A contraception and flavor delivery system, comprising:

a prophylactic element for at least partial insertion into a bodily orifice defining an extended tubular member, said tubular member having a closed distal end and an open proximal end for encompassing at least a portion of a male genital member; and,

flavor delivery means formed on an external surface of said tubular member, said flavor delivery means adapted for

dispensing an ingestible composition having a predetermined taste into said bodily orifice, said flavor delivery means including at least one tubular housing formed on said tubular member having an open first end and a closed second end, said tubular housing including closure means coupled to said open first end for releasing said ingestible composition responsive to an external stimuli.

4,919,150

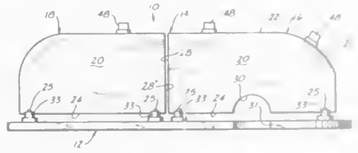
INTRAVENOUS CATHETER SHIELD AND RETAINER

Michael L. Grant, P.O. Box 95744, Oklahoma City, Okla. 73143

Filed Jun. 26, 1989, Ser. No. 378,359

Int. Cl.[5] A61M *5/00*

U.S. Cl. 128—877 **2 Claims**



1. A shield for protecting the position of an intravenous needle having a supply tube connected at one end thereto when the needle is inserted in a body part of a patient, comprising:

an elongated generally rectangular planar base for underlying the terminal end portion of a patient's limb,

said base having a plurality of elongated slots adjacent opposing longitudinal side edges;

flexible means for securing said base to the patient's limb in an immobilizing manner,

said flexible means including,

a like plurality of elongated straps respectively extending through said plurality of slots and surrounding a portion of said base and patient's limb thereon, each strap of said plurality of straps having opposing end portions disposed in overlapping relation;

self-adhering fabric material cooperatively secured to said strap opposing end portions for releasably joining said end portions together;

a rigid inverted open end channel-like transparent housing substantially U-shape in transverse cross section having coextensive depending leg portions and an arcuate bight portion longitudinally overlying the base in laterally and vertically spaced relation with respect to the surface of the patient's limb and an intravenous needle position;

means releasably securing the housing leg portions to respective side edge portions of said base,

said housing releasable means including,

an upstanding pin adjacent respective opposing longitudinal side edges of said base and, a vertically apertured lug adjacent the depending limit of the housing respective leg portion for cooperative frictional reception of said pin; and,

spring clamp means on said housing for securing one end portion of a needle supply tube to said housing.

4,919,151

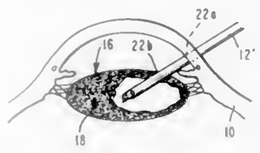
SYNTHETIC POLYMER FOR ENDOCAPSULAR LENS REPLACEMENT

Robert H. Grubbs, South Pasadena, Calif.; Robert J. Coots, Sheffield Lake, Ohio, and Stanley H. Pine, South Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation of Ser. No. 70,060, Jul. 6, 1987, abandoned. This application Sep. 1, 1989, Ser. No. 403,833

Int. Cl.[5] A61B *19/00*

U.S. Cl. 128—898 **17 Claims**



1. A method of endocapsular lens replacement by forming a synthetic polymer in the lens capsule of an eye after removal of the lens comprising:

(a) injecting a polymer composition comprising a photo-sensitive prepolymer and a photoinitiator into said lens capsule in the absence of oxygen;

(b) exposing said composition to light to form said synthetic polymer; and

(c) curing said polymer within several minutes.

4,919,152

METHOD OF CLOSING THE OPENING OF A HERNIAL SAC

Ralph Ger, 16 Oaks Hunt Rd., Lake Success, N.Y.

Continuation of Ser. No. 20,555, Mar. 2, 1987, abandoned, which is a continuation of Ser. No. 815,659, Dec. 30, 1985, abandoned, which is a continuation of Ser. No. 525,125, Aug. 22, 1983, abandoned. This application May 18, 1988, Ser. No. 195,586

Int. Cl.[5] A61C *17/10*

U.S. Cl. 128—898 **14 Claims**

8. A method for closing the opening of a hernial sac having separated tissue portions in the groin area of a patient by inserting an instrument through an incision in the abdominal wall comprising the steps of:

making a small incision through the abdominal wall of the patient at a site in the abdomen which site is remote from the opening in said hernial sac in said groin area of the patient;

inserting an elongate instrument through said abdominal incision;

moving said instrument through said abdominal incision and through the internal body cavity of the patient so that the distal end of said instrument is close to the opening in said hernial sac in said groin area of the patient while remaining on an internal side of said abdominal opening;

gripping, approximating and holding together two pieces of body tissue on opposite sides of said opening in the hernial sac from said internal side of said abdominal opening, the composite step of gripping, approximating and holding being performed remotely from tissue edges with said

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instrument by manual manipulation at a proximal end thereof; and

joining together said two pieces of body tissue from said internal side of said abdominal opening, said step of joining being performed with said instrument by manual manipulation at a proximal end thereof.

4,919,153

METHOD AND APPARATUS FOR REMOVING PRE-PLACED PROSTHETIC JOINTS AND PREPARING FOR THEIR REPLACEMENT

Albert K. Chin, Palo Alto, Calif., assignor to Origin Medsystems, Inc., San Mateo, Calif.

Filed Oct. 11, 1988, Ser. No. 255,650
Int. Cl.[5] A61F *5/04*
U.S. Cl. 606—93 23 Claims

1. A method for removing a prosthetic appliance secured in place by a mantle of hardened methylmethacrylate cement received within a bone cavity and conditioning the bone cavity for receipt of a new appliance, said method comprising:

(a) pulling the appliance from the mantle of hardened cement to leave a cement cavity within the mantle;

(b) injecting a fluid mass of methylmethacrylate cement into the cement cavity;

(c) inserting a post having an irregular exterior surface into the fluid mass of methtylemethacrylate cement;

(d) permitting said fluid mass of methylemethacrylate cement to harden and bond to the post and the hardened mantle; and,

(e) applying tension to the post to pull the post and the bonded mantle of methylemethacrylate cement from the bone cavity.

4,919,154

PIPE PURGING ASSEMBLY AND METHOD THEREFOR

Thomas B. Engle, 2135 Rosswood Dr., San Jose, Calif. 95124

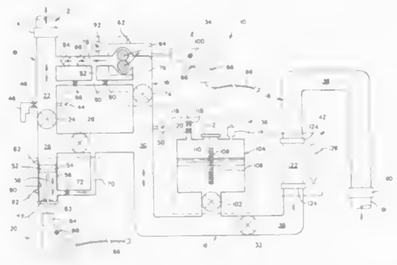
Filed Feb. 29, 1988, Ser. No. 161,745
Int. Cl.[5] B08B *9/00, 3/00*
U.S. Cl. 134—22.12 17 Claims

1. A pipe purging assembly for purging fluid flow blockage from pipe systems comprising:

coupling means for attaching the assembly to the blocked pipe system such that fluid may flow freely between the device and the pipe system;

an internal tubing system within the assembly including at least serially connected first, second, third and fourth cavities, each of which is isolatible by way of user controllable valves, the tubing system culminating at one end thereof with the coupling means and culminating at the other end thereof in outlet means for permitting fluid to flow therethrough out of the device to a destination separate from the blocked pipe system; and

a hydraulic shock producing subassembly attached to the tubing system for delivering repeated controlled hydraulic shocks to fluid contained within the tubing system; wherein



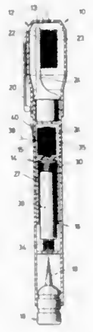
a backpump subassembly is provided to interconnect said third cavity to said first cavity, bypassing said second cavity, said backpump subassembly being utilized to pump fluid into the pipe system.

4,919,155

HAIR CLIP

Masahiro Yasuda, 22-6, Dairenminami 1-chome, Higashi Osaka-shi, Osaka, Japan

Filed Mar. 8, 1989, Ser. No. 320,565
Claims priority, application Japan, Mar. 11, 1988, 63-58695
Int. Cl.[5] A45D *8/28*
U.S. Cl. 132—278 6 Claims



1. A hair clip comprising:

a base plate including a pair of brackets at one end and a pair of ledges at the other end;

a hair retainer rotatably connected to the brackets at one end, said hair retainer having an engaging portion at the other end;

a pair of arms projecting inwards from the insides of the ledges, each arm including a leg portion capable of overlapping with the leg portion of the other arm;

said engaging portion including a central dented part and a pair of arched bridge parts at opposite sides of the dented part; and

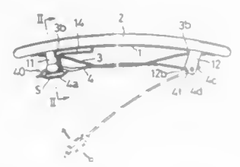
a ring placed between the central dented part and the arched bridge parts, said ring having a central opening for allowing the leg portions of the arms to fit in when they overlap with each other for unlatching.

4,919,156

COMBINATION DENTAL DEVICE

Samuel D. Gipson, 2344 Park Ave., Memphis, Tenn. 38114

Filed May 15, 1989, Ser. No. 351,535
Int. Cl.[5] A45D *44/18*
U.S. Cl. 132—309 1 Claim



1. A combination dental device having a toothbrush, a dental floss supply and dispenser, a dentifrice supply and dispenser, and an interdental gum stimulator all within a structure resembling a traditional fountain pen case, said dental device comprising:

a removable cap having a pocket clip thereon and ventilation holes therein;

an upper cylindrical section having a top end adapted to receive said removable cap; a bottom end; an integral sleeve therein which extends from a point within said upper cylindrical section to below said bottom end; an aperture and a door therefor permitting access to the interior of said upper cylindrical section; a hole adjacent said aperture; and a dental floss cutter mounted on said upper cylindrical section adjacent said aperture and said hole;

a toothbrush having bristles mounted at one end of a handle; said handle being mounted in said top end of are exposed at said top end and fit within said removable cap when said removable cap is positioned on said top end of said upper cylindrical section;

a dental floss dispenser having a supply of dental floss thereon rotatably mounted in said upper cylindrical section adjacent said aperture therein, whereby said dental floss may be threaded through said hole and cut on said cutter;

a cartridge for a supply of dentifrice, said cartridge having a cylindrical shape and being designed to fit within said sleeve in said upper cylindrical section whereby said cartridge when positioned in said sleeve is partly within and partly without said sleeve; said cartridge having a first opening and a cap therefor at one end to permit dentifrice to be admitted and a second opening and cap therefor at the other end to permit said dentifrice to be applied to said toothbrush;

a lower cylindrical section having a top end and a bottom end, said top end of said lower cylindrical section being designed to receive and form a releasable friction connection to said sleeve, whereby said dentifrice cartridge partly positioned in said sleeve extends into said lower cylindrical section;

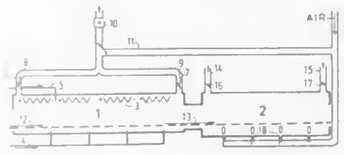
an elongated closure element having a flat surface at one end thereof and an interdental gum stimulator at the other end thereof, said closure element being capable of fitting within said bottom end of said lower cylindrical section is either of two positions, a first position whereby said flat surface faces outwardly from said lower cylindrical section and said interdental gum stimulator faces inwardly thereto and is concealed within said lower cylindrical section, and a second position whereby said flat surface faces inwardly and said interdental gum stimulator faces outwardly from said lower cylindrical section.

4,919,157

METHOD OF CLEANING METAL COMPONENTS FOR CATHODE RAY TUBES

Emil Mateias, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 240,403, Aug. 30, 1988, abandoned, and a continuation of Ser. No. 99,269, Sep. 2, 1987, abandoned. This application Jun. 14, 1989, Ser. No. 368,999
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639657
Int. Cl.[5] C23G *5/00*
U.S. Cl. 134—2 7 Claims



1 A method for cleaning a metal component for a cathode ray tube whereby oil present on the surfaces of the metal component is removed from these surfaces characterized in that:

(a) the metal component is heated at a temperature of less than 400° C. in an inert atmosphere to thereby evaporate oil from said surfaces;

(b) the surfaces are then oxidized by water vapor by heating the metal component in a weakly oxidizing atmosphere comprising 92 to 96% by volume of nitrogen, 4 to 8% by volume of hydrogen and water vapor in an amount such that the dew point is 25° C. to −10° C. at a temperature of 500° C. to 800° C.;

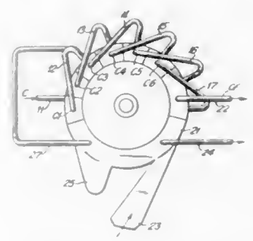
(c) and then reducing said oxidized surfaces by heating said metal component in a reducing atmosphere comprising 92 to 96% by volume of nitrogen, 4 to 8% by volume of hydrogen and water vapor in an amount such that the dew point of said reducing atmosphere is less than 0° C. at a temperature of 500° C. to 800° C.

4,919,158

METHOD AND APPARATUS FOR WASHING PULP

Seppo K. Kokkonen, and Harri T. Qvintus, both of Savonlinna, Finland, assignors to A. Ahlstrom Corporation, Karhula, Finland

Filed Mar. 20, 1987, Ser. No. 28,273
Claims priority, application Finland, Mar. 20, 1986, 861167
Int. Cl.[5] B08B *1/04, 3/02*
U.S. Cl. 134—15 6 Claims



1. A method of washing pulp utilizing a moving liquid-pervious support surface moving in a first direction past several successive washing stages, comprising the steps of:

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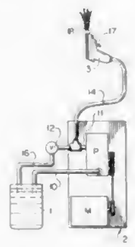
(a) feeding the pulp onto the moving liquid-pervious support surface in a substantially continuous layer, which layer then moves in the first direction;
(b) supplying washing liquid to the pulp layer and passing the washing liquid through the layer in the several successive washing stages which each have at least two washing phases in a manner so that the washing liquid flows generally in a second direction which is opposite to said first direction; and wherein
step (b) is practiced by dividing the washing liquid into at least two partial flows which pass respectively through alternate washing phases in said second direction, the washing liquid of one flow which has passed through one washing phase passing at least the second washing phase preceding said one washing phase in said first direction.

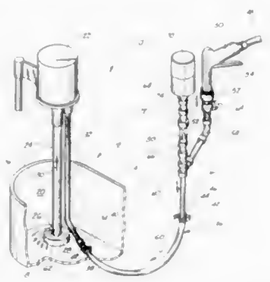
4,919,159
METHOD AND APPARATUS FOR CLEANING THE INTERIOR SURFACES OF BUILDINGS, AND ESPECIALLY CEILINGS OF OFFICE BUILDINGS
Robin J. Forrest, Toronto, and Russell C. Ward, King City, both of Canada, assignors to Ceiling Doctor International Inc., Toronto, Canada
Filed Jun. 29, 1988, Ser. No. 212,981
Int. Cl.[5] B08B *3/00*
U.S. Cl. 134—22.18 **3 Claims**



1. A process for cleaning the interior surfaces of buildings including office ceilings, wherein a fine mist of cleaning liquid droplets is sprayed into said surfaces, said fine mist being produced by pumping said liquid from a container by means of a pump which leads to a delivery tube and which produces a pressure of at least 300 psi, and atomizing said liquid by means of a spray gun having a nozzle with an oval-shaped orifice having a breadth less than 0.020 inches and which produces a fan-type spray, said fan-type spray being capable of being directed by the spray gun upwardly onto ceiling surfaces, the relationship of pressure to nozzle size being such that the amount of liquid which passes through the nozzle is less than 0.20 gall/minute, wherein the amount of liquid passing through the pump is more than 5 times the amount passing through the nozzle with the remainder of the liquid being continuously returned via a bypass line to said container, the amount of liquid being sprayed and the fineness of the droplets being produced being such that very little dripping occurs.

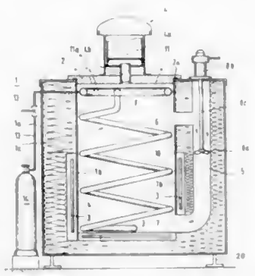
4,919,160
SYSTEM FOR CLEANING WHIRLPOOL BATHS
Joseph B. Pierce, 1811 Old Shell Rd., Mobile, Ala. 36607
Filed Sep. 12, 1988, Ser. No. 243,278
Int. Cl.[5] B08B *9/02*
U.S. Cl. 134—100 **7 Claims**

1. A system for cleaning whirlpool baths, comprising:
(a) a fluid flow line, having a first end capable of introducing a flow of water under pressure thereinto, and a second end engageable onto a flow line of a whirlpool bath;
(b) a secondary flow line forming a juncture with the first flow line, the second flow line having an end portion for adaptably engaging a measured quantity of second fluid thereinto, so that the flow of second fluid may join the flow of water through the principal flow line and into the whirlpool bath;
(c) valving means for controlling the flow of fluid both in the



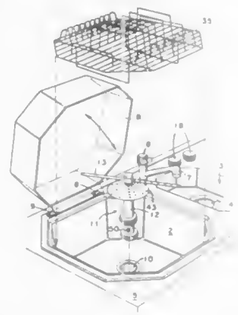
principal flow line and the secondary flow line to obtain a certain ratio of mixture between the fluids in the two lines; and
(d) means for attaching the principal flow line to the outflow end of the whirlpool bath for flushing fluids in a reverse direction as in normal operations.

4,919,161
APPARATUS FOR REMOVING RESIDUES FROM PARTS OF PLASTICS PROCESSING MACHINES
Rudolf Schmidt, Munich, Fed. Rep. of Germany, assignor to C. CHRIST Abgasfreie Werkzeugreinigungsapparate für die Kunststoffindustrie, Munich, Fed. Rep. of Germany
Filed May 19, 1989, Ser. No. 354,454
Claims priority, application Fed. Rep. of Germany, May 27, 1988, 3818144
Int. Cl.[5] B08B *3/08*
U.S. Cl. 134—108 **11 Claims**



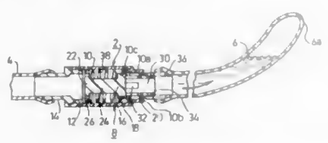
1. Apparatus for removing residues, especially plastic residues from parts of processing machines, comprising:
a vessel receiving the parts and having a closable top and a bottom, said vessel defining an interior containing a heat transfer fluid at a predetermined liquid level;
heating means for raising the temperature of said heat transfer fluid above a melting temperature of the plastic residues adhering to the parts;
filter means connected with said interior of said vessel for absorbing substances escaping from said interior of said vessel;
pump means for imparting a motion to said heat transfer fluid, said pump means having a suction side connected to said interior in vicinity of said liquid level and a delivery side connected to said interior in vicinity of said bottom of said vessel; and
means for introducing an inert gas into said interior of said vessel above said liquid level of said heat transfer fluid.

4,919,162
DISHWASHER
David Lumby, Kingsgrove, and Stephen Dawkins, Penshurst, both of Australia, assignors to McIlwraith Davey Pty. Ltd., Revesby, Australia
Filed Sep. 29, 1987, Ser. No. 102,339
Claims priority, application Australia, Sep. 29, 1986, PH8230
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—115 R **13 Claims**



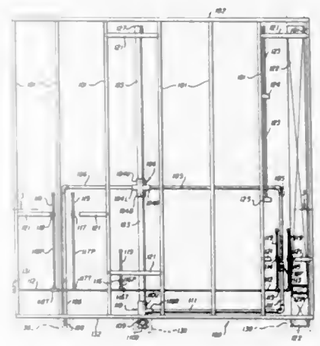
1. A sink located dishwasher having a water supply means to supply water to the sink, a rack for dishes and utensils located in the sink, a drain located in the base of the sink, a cover for the sink, a water spray arm located above the base of the sink and removably mounted above said drain, water outlet means in communication with the drain to direct water to a pump, water inlet means located in said drain to direct water from said pump to said spray arm, the water inlet means being removably insertable into the drain, and a releasable obstruction included in said drain below said water outlet means.

4,919,163
DEVICE AND METHOD FOR FLUSHING FLUID LINES
Peretz Rosenberg, Beit Shaarcem, Israel
Filed Sep. 25, 1989, Ser. No. 411,985
Claims priority, application Israel, Jan. 10, 1989, 88916
Int. Cl.[5] F16K *51/00*
U.S. Cl. 137—15 **18 Claims**



12. A method of flushing out contaminants from a section of a line conveying a pressurized fluid, comprising:
attaching a container to the end of the line section via a valve assembly which, when the line section is depressurized, connects the interior of the container to the interior of the line section, and when the line section is pressurized, disconnects the interior of the container from the end of the line section and connects the interior of the container to the atmosphere;
and applying pressurized fluid to the line section first to cause the contaminants to be received within the container and the interior of the container to be pressurized, and then to disconnect the interior of the container from the line section and to connect it to the atmosphere, whereby the contents of the container are flushed out to the atmosphere.

4,919,164
METHOD OF INSTALLING PIPING, DUCTS AND CONDUITS IN A PREFABRICATED FRAMED WALL FOR A BUILDING STRUCTURE AND PARTITION MADE THEREBY
Alexander Barenburg, 1305 W. Wolfram St., Chicago, Ill. 60657
Filed Feb. 23, 1989, Ser. No. 314,155
Int. Cl.[5] F16L *5/00;* **E04H** *1/00*
U.S. Cl. 137—15 **16 Claims**



1. A method of making a partition for a prefabricated framed wall to be mounted into a building structure under construction, said method comprising the steps of:
a. cutting at least one hole through each of a plurality of frame studs, a top frame plate, and a bottom frame plate;
b. aligning the plurality of frame studs to be oriented vertically and substantially parallel to each other;
c. securing tops of the plurality of frame studs to the top frame plate to be oriented horizontally;
d. securing bottoms of the plurality of frame studs to the bottom frame plate to be oriented substantially parallel to the top frame plate;
e. installing plumbing pipes between the plurality of frame studs, the top frame plate, and the bottom frame plate;
f. inserting a sanitary tee of the plumbing pipes through at least one hole cut in the bottom frame plate so that the sanitary tee depends therebelow for connection below a bathroom floor to one of a bathtub, a shower, and a toilet fixture; and
g. securing a removable box means for protecting the sanitary tee on an underside of the bottom frame plate so that the partition is ready to be shipped without damage to the sanitary tee depending below the bottom frame plate;
whereby a partition is made for a prefabricated framed wall to be mounted into a building structure under construction.

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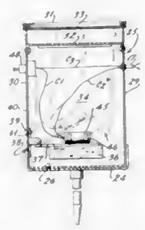
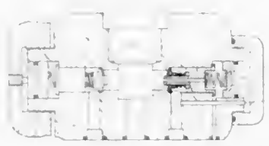
4,919,165
RAINFALL CONTROL FOR IRRIGATION SYSTEMS
Grover Lloyd, 509 W. Lee St., Osceola, Ark. 72370
Filed Jul. 7, 1989, Ser. No. 376,507
Int. Cl.[5] F16K *17/36*
U.S. Cl. 137—78.2 20 Claims



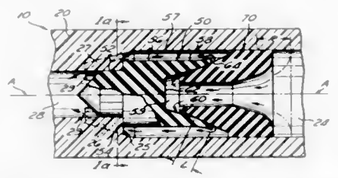
1. A control device for shutting off the motor which drives a pump for an irrigation system in response to a predetermined amount of rainfall thereby terminating the supply of water to at least one distribution outlet comprising a receptacle having upper and lower ends and side wall portions defining an enclosed chamber, an opening in said upper end of said receptacle, a float means disposed within said housing, mounting means for pivotally supporting said float means within said receptacle, said float means being pivotable from a first position to a second position as fluids are collected within said receptacle, securing means for selectively vertically adjusting the position of said mounting means with respect to said receptacle, first electrical switch means carried by said float means, electrical conductor means connecting said first electrical switch means to the motor, said first electrical switch means being operable when said float means is in said second position to shut down the motor to thereby prevent further operation of the pump in response to a predetermined accumulation of rain water within said receptacle.

4,919,166
TWO-WAY FLOW VALVE
Anthony M. Sims, Hindmarsh Rd, Murray Bridge, South Australia, Australia 5253
Filed Jun. 27, 1989, Ser. No. 372,838
Claims priority, application Australia, Jul. 5, 1988, PI9160
Int. Cl.[5] F16K *17/18*
U.S. Cl. 137—493 8 Claims



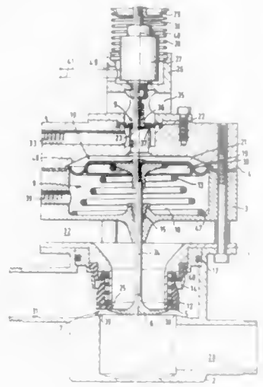
1. A two-way valve useful for inhibiting fluid flow in one direction while allowing it in a reverse direction, and vice versa, comprising:
a body having walls defining two cylinders; and
a pair of valve assemblies, each comprising a piston slidable in a respective cylinder, a spindle extending from one end of the piston, a metering valve member slidable on the spindle normally engaging a valve seat at one end of the relevant cylinder, abutment means on the spindle which engages the valve member and moves it away from the seat upon movement of the piston in one direction, and restraining means inhibiting that movement in that one direction;
said body comprising a pair of hydraulic lines communicating with respective said cylinders and opening into each of the cylinders between the piston and metering valve member therein, the piston outer diameter exceeding the outer diameter of the valve member so that fluid introduced into a said cylinder at pressure urges the piston to move in said one direction against the restraining means.

4,919,167
CHECK VALVE
Wayne E. Manska, 1921 Kellogg Dr., Anaheim, Calif. 92807
Filed Mar. 17, 1989, Ser. No. 325,551
Int. Cl.[5] F16K *15/14*
U.S. Cl. 137—512 26 Claims



1. A check valve for regulating fluid flow, said check valve having a forward flow direction in which flow through said valve occurs at a predetermined cracking pressure and a reverse flow direction in which flow through said valve is prevented, said check valve comprising:
a housing comprising a channel having an inlet section and an outlet section, said inlet and outlet sections comprising respective luer fittings for connection to medical devices;
a seat member including a seating portion, said seat member including a passageway;
a valve member, said valve member including a body portion and an elastomeric valve flange portion forming a valve cavity which receives said seating portion to form a sealing interface therebetween over a seal length L, said valve flange portion (i) being sealed to said body portion to prevent fluid flow therebetween, and (ii) being axially positioned with respect to said seating portion to provide a force which urges said valve flange portion against said seating portion to yield a predetermined cracking pressure for said check valve, said force being comprised of an axial component and a radial component, said members being configured such that said radial component is substantially greater than said axial component, said elastomeric valve flange portion expanding in response to positive fluid pressures greater than said cracking pressure at said inlet section to form an area between said valve flange portion and said seating portion for passage of fluid therebetween, said members configured to at least maintain said seal length L in response to substantial reverse pressure to prevent fluid flow in said reverse flow direction, said body portion being retained by a portion of said housing to prevent axial movement of said valve member away from said seat member in said forward flow direction.

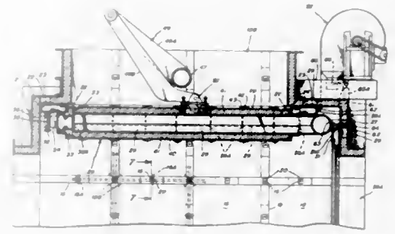
4,919,168
VALVE ARRANGEMENT
Wilfried Wagner, Huettenberg/W, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany
Filed Oct. 28, 1988, Ser. No. 264,129
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1987, 3739337
Int. Cl.[5] F15B *13/043*
U.S. Cl. 137—627.5 9 Claims



1. A valve arrangement comprising a housing, electromagnetically actuatable preliminary control valve means for controlling a differential pressure in said housing, a main valve in said housing, said main valve actuatable by the differential pressure, said main valve including a closing element for selectively connecting an outlet connection and at least one inlet connection, wherein said main valve is connected to a movable wall and is exposed to a balanced pressure thereacross in a rest condition, said wall being pressurizable by the differential pressure to change over said main valve, wherein said housing of the valve arrangement is subdivided into a valve housing, a vacuum housing and a control housing, said movable wall being arranged in a cavity which is located between said vacuum housing and said control housing, said movable wall subdividing said cavity into a vacuum chamber and a ventable power chamber, wherein said movable wall is formed by a diaphragm which is inserted in said housing between said vacuum housing and said control housing and by a diaphragm dish which is pre-tensioned by a return spring and which is engaged by a main valve actuating tappet, wherein said tappet is guided within said vacuum housing and is provided with a first valve disk at which a first sealing seat of said main valve is located, wherein said first sealing seat is arranged coaxially with a second sealing seat provided in said valve housing, said first sealing seat contacted by said closing element of said main valve in the rest position, wherein said closing element is formed by an axially symmetrical elastic valve element which is pre-tensioned in a direction toward said first and second sealing seats by means of a valve spring.

4,919,169
GAS FLOW DIVERTER
Lothar Bachmann, Box 519, and William F. Koch, R.R. 3, Box 483, both of, Auburn, Me. 04210
Continuation-in-part of Ser. No. 55,594, May 29, 1987, Pat. No. 4,821,507. This application Apr. 14, 1989, Ser. No. 338,917
Int. Cl.[5] F16K *1/00*
U.S. Cl. 137—875 12 Claims

1. In a gas flow diverter for diverting hot gases from an inlet port to either of first and second mutually spaced outlet ports of a chamber by a blade pivotally mounted to swing between two positions within the chamber in each of which one outlet port is closed by the blade and the other is opened, said blade being connected to a pivot shaft rotatably mounted within said chamber and being linked by toggle joints to an actuator shaft spaced from and parallel to said pivot shaft, the improvement comprising
a marginal frame about said blade, both sides of which comprise first ledges, and a central projection, both sides of which comprise second ledges,
a U-shaped sealing frame surrounding each outlet port, and



comprising first and second side walls, with said first side wall longer than said second side wall, each of said sealing frames secured to the chamber wall and having an open end that opens into the chamber; and
leaf spring sealing members mounted on said side walls;
the sealing members of said first and second side walls being constructed and arranged to enter into sealing engagement with said first and second ledges, respectively, on the appropriate side of said blade marginal frame when said blade is in one of said two positions and said actuator shaft being operable to adjust the position of said blade between said first and second positions.

4,919,170
FLOW DUCT FOR THE FLUE GAS OF A FLUE GAS-CLEANING PLANT
Dietmar Kallinich, Gelsenkirchen; Wolfgang Hahlert, and Peter Thom, both of Castrop-Rauxel, all of Fed. Rep. of Germany, assignors to Veba Kraftwerke Ruhr Aktiengesellschaft, Gelsenkirchen-Buer and Flachglas Aktiengesellschaft, Furth, both of, Fed. Rep. of Germany
Filed Aug. 5, 1988, Ser. No. 230,277
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1987, 3726492
Int. Cl.[5] F15D *1/04*
U.S. Cl. 138—39 6 Claims

1 A flow duct for flue gas of a flue gas cleaning plant, comprising:

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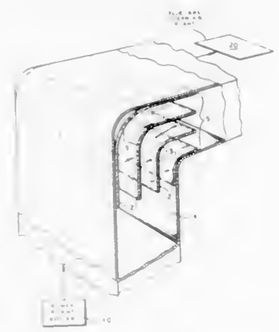
a plurality of duct walls defining an elbow connected in said plant to be traversed by a flue gas; and



a plurality of arcuately bent self-supporting plate glass flow guide elements disposed in said elbow and defining spaces between them traversed by said flue gas.

4,919,171

AIR JET WEAVING LOOM WITH AN EXPANDER HAVING AN EXTENSION

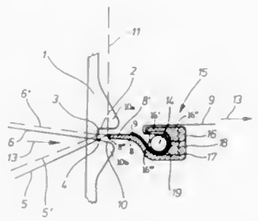
Peter Dornier, Lindau, Fed. Rep. of Germany, assignor to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

Filed Apr. 7, 1989, Ser. No. 335,043

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1988, 3811653

Int. Cl.[5] **D03D** *47/30;* **D03J** *1/22*

U.S. Cl. 139—435.1 **4 Claims**



1. An air jet weaving loom, comprising a weaving reed including reed teeth forming a weft thread insertion channel for beating-up each inserted weft thread at a beat-up point, a rod-type expander arranged alongside said weaving reed to face said weft thread insertion channel, said rod-type expander having a top section (**16**) forming fabric supporting surfaces (16′) and (16‴), and a bottom section (**17**) enclosing with said top section an expander channel (**19**) through which finished fabric is passed in a spread manner, a fabric guide rod (**14**) extending longitudinally in said expander channel (**19**) for guiding said fabric through said expander channel before said fabric can loop around said top section (**16**), said expander bottom section (**17**) having an extension (**8**) with a straight edge (8′) and a flat top surface (8″) forming an elongation of said fabric supporting surface (16‴) of said top section, said straight edge (8′) being positioned in the proximity of said beat-up point for projecting into said weft thread insertion channel during beat-up so as to positively located said beat-up point.

4,919,172

METHOD AND APPARATUS FOR PLYING A WEFT THREAD DIRECTLY IN AN AIR NOZZLE LOOM

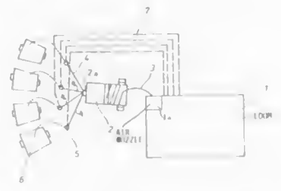
Rudolf Riezler, Nonenhorn, and Adnan Wahhoud, Lindau-Bodolz, both of Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

Filed Apr. 7, 1989, Ser. No. 335,119

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1988, 3813060

Int. Cl.[5] **D03D** *47/30, 47/34*

U.S. Cl. 139—435.1 **3 Claims**



1. An air nozzle loom, comprising weft thread insertion air nozzle means, strand plying and weft thread storing means for plying a plurality of weft thread strands into at least one multi-ply weft thread directly in said air nozzle loom and for storing a length of multi-ply weft thread, a plurality of weft thread strand supply spools for supplying the individual weft thread strands to said plying and storing means, the yarn receiving opening of said weft thread insertion air nozzle means being positioned adjacent to and facing said plying and storing means on a weft thread insertion side of said air nozzle loom for directly receiving multi-ply weft thread from said plying and storing means and to insert a multi-ply weft thread into a loom shed, said strand plying and storing means being operatively located between said strand supply spools and said air nozzle means, said length of multi-ply weft thread being sufficient to provide a smooth supply of weft thread to said air nozzle means throughout an insertion period.

4,919,173

YARN STORAGE AND FEEDING DEVICE WITH RESILIENT BLOCKING BELT

Lars H. G. Tholander, Fagelstigen 7, 56100 Huskvarna, Sweden

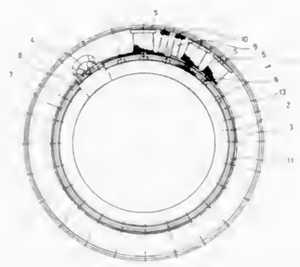
PCT No. PCT/EP87/00467, § 371 Date May 6, 1988, § 102(e) Date May 6, 1988, PCT Pub. No. WO88/01315, PCT Pub. Date Feb. 25, 1988

PCT Filed Aug. 19, 1987, Ser. No. 192,510

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1986, 3628485

Int. Cl.[5] **D03D** *47/36*

U.S. Cl. 139—452 **8 Claims**



1. A yarn storage device for a weaving loom comprising, a stationary yarn storage drum onto which a yarn supply can be wound and withdrawn from a yarn withdrawal end of said drum, a ring surrounding said yarn withdrawal end in spaced-apart relation thereto to form a gap between said ring and said drum, a belt of resilient material circumferentially mounted on said drum, a plurality of spaced-apart yarn blocking elements connected to and extending from said belt, actuating means upon selective actuation for moving radially from a yarn withdrawal position one of said blocking elements and a connected portion of said belt elastically to cause said one blocking element to extend toward said ring and into said gap to prevent yarn from being withdrawn from said drum, and said one blocking element and said elastically moved connected portion of said belt elastically returning to said yarn withdrawal position upon deactuation of said actuating means.

4,919,174

FILLING MEANS

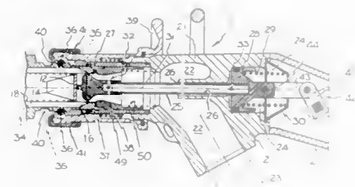
John R. Warland, 5 William St., Hamilton, N.S.W., 2303, Australia

Filed Apr. 10, 1987, Ser. No. 37,188

Claims priority, application Australia, Apr. 11, 1986, PH05426

Int. Cl.[5] **B65B** *1/30*

U.S. Cl. 141—384 **1 Claim**



1. In a vehicle servicing system having a liquid receiver (34) adapted to be mounted in the sidewall of a tank and including a hollow cylindrical portion having an outer end and an outer wall, an annular bead (35) on the outer wall, an annular groove (40) on said outer wall adjacent the annular bead (35), valve means (16) for closing the outer end, and a spring biased operculum (12) adapted to normally close the valve means (16), in combination with a nozzle;

the combination being characterized in that the nozzle comprises:

a housing (21) having a separate chamber (24) and a liquid delivery chamber (22) adapted to communicate with a hose (23) for delivery of liquid;

a muzzle portion on said housing (21) including a free end, a peripheral array of ball bearings (36) on said free end, an axially movable spring-biased collet (37) surrounding said free end and shrouding said array of ball bearings (36), said collet (37) being movable away from said free end whereby said array of ball bearings (36) are adapted to ride over said annular bead (35) on said outer wall of the receiver (34) to unlock said muzzle portion from the receiver (34), said collet (37) being movable toward said free end whereby said array of ball bearings (36) are adapted to engage said annular groove (40) on said outer wall of the receiver (34) to lock said muzzle portion to the receiver (34);

a piston assembly movable within said housing (21) including a piston rod (25) having opposite end portions, a piston head (27) on one end portion in said muzzle portion, and a large portion (28) fixed on the other end portion in said separate chamber (24) and having a sealed piston surface adapted to be pressure responsive for moving said large portion (28) in one direction, a compression spring (29) in said separate chamber (24) biasing said large portion (28) in a direction opposite said one direction along with said piston rod (25) and the piston head (27) causing displacement of the operculum (12) to an opened position, a longitudinal passageway (31) extending through said piston rod (25) between the opposite ends thereof, a first port means (32) in the one end portion of said piston rod (25) adjacent the piston head (27) to communicate with said longitudinal passageway (31), a second port means (33) in the other end portion of said piston rod (25) to communicate with said longitudinal passageway (31), said first port means (32) communicating with the delivery chamber (22) and said second port means (33) communicating with a portion of said separate chamber (24) sealed by the large portion (28) whereby back pressure in the muzzle portion when liquid fills the tank acts on the piston surface of large portion (28) causing displacement of the piston head (27) whereby the spring biased operculum (12) moves to a closed position; and,

a cocking handle (42) operatively connected to said large portion (28) on said piston rod (25) and being manually operable to move said piston rod (25) longitudinally in said housing (21) and thereby displace the operculum (12) to an opened piston after said array of ball bearings (36) engage the annular groove (40).

4,919,175

TREE DELIMBING APPARATUS

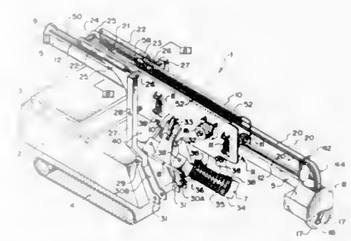
G. Leo Samson, Kamloops, Canada, assignor to Harricana Metal, Inc., Quebec, Canada

Filed Jul. 22, 1988, Ser. No. 223,234

Claims priority, application Canada, Jul. 24, 1987, 543001

Int. Cl.[5] **B27L** *1/00;* **A01G** *23/08*

U.S. Cl. 144—2 Z **9 Claims**



1. A delimbing apparatus adapted to be mounted on a supporting vehicle, comprising:

(a) a frame;

(b) a boom mounted for extension and retraction in said frame and having at one end a delimbing head including gripping jaws and delimbing knives; and

(c) driving means for grasping a log and driving said log through said delimbing head, said driving means including a first drive belt mounted on the underside of said frame, and second and third drive belts pivotally mounted below and to either side of said frame.

4,919,176

RAMPED DEVICE FOR FINITE POSITIONING OF PANEL JOINT FORMING TOOL

Benton W. Gachet; Dennis C. Hunstman; Matthew G. Popik, and Robert W. Taylor, all of Jackson, Tenn., assignors to Porter Cable Corporation, Jackson, Tenn.

Filed Apr. 17, 1989, Ser. No. 339,001

Int. Cl.[5] **B23C** *1/20*

U.S. Cl. 144—134 D **10 Claims**

1. An assembly for cutting matching panel joints which is adapted to be connected to a cutting tool that has a waveform cutting bit which repeats periodically in profile along its length, comprising:

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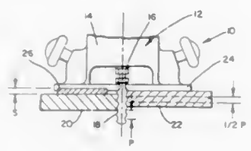
a base body having a top surface which is adapted to be secured to the cutting tool, and a lower ramped slide surface extending at a first angle with respect to said top surface;

a slide member having a top ramped bearing surface which contacts said lower ramped slide surface for sliding movement therebetween, and a lower bearing surface adapted



for contacting a work piece, said top ramped bearing surface extending at a second angle with respect to said lower bearing surface that is equal to said first angle; and

means for releasably securing said slide member at a selected position with respect to said base body, whereby the position of said lower bearing surface may be adjusted with respect to the cutting bit.

4,919,177

METHOD OF TREATING TI-NI SHAPE MEMORY ALLOY

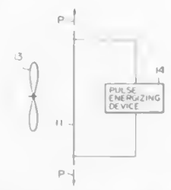
Dai Homma, Room C-103, Mezon-yokohamanobkendai, 12-72, Horiguchi, Kanazawa-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Mar. 29, 1988, Ser. No. 174,949

Claims priority, application Japan, Mar. 30, 1987, 62-73982

Int. Cl.[5] C22F *1/00, 1/10*

U.S. Cl. 148—133 5 Claims



1. A method of arranging the crystal orientation of a Ti-Ni shape memory alloy comprising the steps of:

(a) heating a wire of the Ti-Ni shape memory alloy to a high temperature with a predetermined range to turn said alloy into a solid solution, and thereafter, cooling said wire, whereby plastic strain in said wire is removed and crystals of said alloy are grown;

(b) passing current pulse through said wire to rapidly heat said wire to a temperature higher than its M*f*point to cause elongation due to transformation induced superplasticity to said wire;

(c) stopping the application of the pulse, rapidly cooling said wire to the temperature of its M*f*point or below, applying tensile load immediately after the stop of the application of the pulse to cause elongation again in a cooling process of said wire, and removing or sufficiently decreasing said tensile load to stop the deformation when the value of m with regard to said wire is sharply decreased; and

(d) repeating said steps (b) and (c) a required number of times.

4,919,178

EXPLOSIVE EMULSION

Alan T. Riga, Cleveland, and John W. Forsberg, Mentor, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 367,185, Jun. 16, 1989, which is a continuation of Ser. No. 931,377, Nov. 14, 1986, Pat. No. 4,840,687, and a continuation-in-part of Ser. No. 137,303, Dec. 23, 1987, Pat. No. 4,863,534, and a continuation-in-part of Ser. No. 265,877, Nov. 1, 1988, which is a division of Ser. No. 137,301, Dec. 23, 1987, Pat. No. 4,828,633. This application Jul. 14, 1989, Ser. No. 380,054

Int. Cl.[5] C06G *45/00*

U.S. Cl. 149—2 5 Claims

1. An explosive emulsion comprising a discontinuous oxidizer phase comprising at least one oxygen-supplying component, a continuous organic phase comprising at least one carbonaceous fuel, and an emulsifying amount of a composition comprising the reaction product of component (I) with component (II);

component (I) comprising:

(A) the reaction product of

(A)(i) at least one carboxylic acid or anhydride, or ester or amide derived from said acid or anhydride, with

(A)(ii) ammonia, at least one amine, at least one alkali metal and/or at least one alkaline-earth metal; or

(B) a composition comprising

(B)(i) the reaction product of (B)(i)(a) at least one high-molecular weight hydrocarbyl-substituted carboxylic acid or anhydride, or ester or amide derived form said high-molecular weight acid or anhydride, with (B)(i)(b) ammonia, at least one amine, at least one alkali metal and/or at least one alkaline-earth metal, component (B)(i)(a) having at least one hydrocarbyl substituent having an average of about 20 to about 500 carbon atoms; and

(B)(ii) the reaction product of (B)(ii)(a) at least one low-molecular weight carboxylic acid or anhydride, or ester or amide derived from said low-molecular weight acid or anhydride, with (B)(ii)(b) ammonia, at least one amine, at least one alkali metal and/or at least one alkaline-earth metal, component (B)(ii)(a) optionally having at least one hydrocarbyl substituent having an average of up to about 18 carbon atoms; or

(C) a composition comprising

(C)(i) the reaction product of (C)(i)(a) at least one high-molecular weight hydrocarbyl-substituted polycarboxylic acid or anhydride, or ester or amide derived from said high-molecular weight polycarboxylic acid or anhydride, with (C)(i)(b) ammonia, at least one amine, at least one alkali metal and/or at least one alkaline-earth metal, component (C)(i)(a) having at least one hydrocarbyl substituent having an average of about 20 to about 500 carbon atoms; and

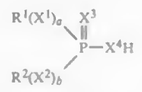
(C)(ii) the reaction product of (C)(ii) (a) at least one low-molecular weight polycarboxylic acid or anhydride, or ester or amide derived from said low-molecular weight polycarboxylic acid or anhydride, with (C)(ii)(b) ammonia, at least one amine, at least one alkali metal and/or at least one alkaline-earth metal, component (C)(ii)(a) optionally having at least one hydrocarbyl substituent having an average of up to about 18 carbon atoms;

said components (C)(i) and (C)(ii) being couples together by (C)(iii) at least one compound having (C)(iii)(a) two or more primary amino groups, (C)(iii)(b) two or more secondary amino groups, (C)(iii)(c) at least one primary amino group and at least one secondary amino group, (C)(iii)(d) at least two hydroxyl groups, or (C)(iii)(e) at least one primary or secondary amino group and at least one hydroxyl group; or

(D) mixture of two or more of (A), (B) and (C);

component (II) comprising:

(A′) at least one phosphorous-containing acid represented by the formula



wherein X^1, X^2, X^3 and X^4 are independently oxygen or sulfur; a and b are independently zero or one, and R^1 and R^2 are independently hydrocarbyl groups; or

(B′) at least one salt derived from said phosphorous-containing acid (A′) and at least one metal selected from the group consisting of magnesium, calcium, strontium, chromium, manganese, iron, molybdenum, cobalt, nickel, copper, silver, zinc, cadmium, aluminum, tin, lead, and mixtures of two or more thereof; or

(C′) mixture of (A′) and (B′); with the proviso that when component (II) is (A′), component (I) is (B), (C) or a mixture of (B) and (C).

4,919,179

WATER-IN-OIL EMULSION EXPLOSIVE

Arun K. Chattopadhyay, McMasterville, Canada, assignor to Imperial Chemical Industries PLC, London, England

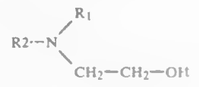
Filed Aug. 11, 1989, Ser. No. 392,367

Claims priority, application United Kingdom, Sep. 21, 1988, 8822187

Int. Cl.[5] C06G *45/00*

U.S. Cl. 149—2 7 Claims

1. A water-in-oil explosive emulsion comprising a continuous oil phase, a discontinuous aqueous phase, and a minor amount of emulsifier, wherein the emulsifier comprises a surfactant which is the reaction product formed by the esterification of polyalk(en)yl succinic anhydride by an adduct of the formula:



where

R_1 is H or $—CH_2—CH_2—OH$

and

R_2 is selected from the group consisting of an alk(en)yl or acyl group containing 8–20 carbon atoms in the backbone of the hydrocarbyl chain and a hydroxy ethyl ester of a mono- or di-carboxylic acid containing from 8–20 carbon atoms in the hydrocarbyl chain (aside from any pendant methyl groups) and not more than 6 atoms in the remaining link to the N atom.

4,919,180

FIXED OR SLEEVE-MOUNTED SPIKE, FITTED ON A VEHICLE TIRE

Unto Lindén, Hämeenlinna, Finland, assignor to Neste Oy, Finland

PCT No. PCT/FI87/00154, § 371 Date Aug. 24, 1988, § 102(e) Date Aug. 24, 1988, PCT Pub. No. WO88/03876, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 17, 1987, Ser. No. 223,236

Claims priority, application Finland, Nov. 26, 1986, 864820

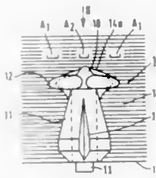
Int. Cl.[5] B60C *11/14*

U.S. Cl. 152—210 8 Claims

1. A fixed spike fitted in a vehicle tire and being shaped such that when the spike is in a state at rest, a region thereof in contact with rubber of the tire is substantially smaller than total outer surface area of the spike, wherein

the spike comprises a flange having at least one eminence forming said contact region,

whereby flow of the rubber around the fixed spike caused by viscoelastic properties of the rubber softens first contact between a tip of the fixed spike with a road surface,



wherein said flange additionally comprises at least one depression,

whereby flow of the rubber into said at least one depression produces a force rotating the spike.

4,919,181

FIXED SPIKE OR SLEEVE-MOUNTED SPIKE FITTED ON A VEHICLE TIRE

Unto Linden, Hämeenlinna, and Erkki Savanto, Porvoo, both of Finland, assignors to Neste Oy, Finland

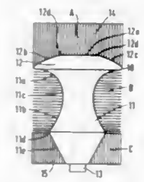
PCT No. PCT/FI87/00155, § 371 Date Aug. 17, 1988, § 102(e) Date Aug. 17, 1988, PCT Pub. No. WO88/03877, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 17, 1987, Ser. No. 223,237

Claims priority, application Finland, Nov. 26, 1986, 864821

Int. Cl.[5] B60C *11/14*

U.S. Cl. 152—210 4 Claims



1 A fixed spike fitted in a vehicle tire and comprising a body and a flange mounted on said body, a part of said body facing said flange having an inward curvature such that said flange and at least said part of said body facing said flange have no detrimental sharp discontinuities, and

rubber of the tire is arranged to flow smoothly around said spike at least in a first region between said flange and said body of the tire and in a second region of said body part facing said flange,

said flange comprising depressions arrange such that flow of the tire rubber thereinto produces a force rotating said spike,

whereby formation of air pockets and simultaneously damage to said tire rubber can be substantially avoided, and additionally, at the same time, a force can be produced which better supports said spike in said second region.

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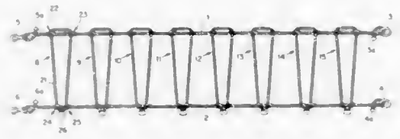
4,919,182

MOTOR VEHICLE EMERGENCY TIRE TRACTION IMPROVEMENT DEVICE CONSISTING OF POLYMERIC ROPE

Stephen Proulx, 601 Newtown Rd., Littleton, Mass. 01460, and Paul Rowe, 41 Watertown St., Lexington, Mass. 02173

Filed Jul. 28, 1988, Ser. No. 225,309
Int. Cl.[5] B60C *27/16;* E06C *5/26*
U.S. Cl. 152—221 15 Claims



1. A traction improvement device for attachment to a motor vehicle tire to improve said tire traction when the motor vehicle is driven on ice and snow or in mud, comprising:

(a) at least two longitudinally oriented lengths of multi-strand twisted rope in which the strands are made of polymeric plastic, each length of rope forming a runner and being less than the perimeter length of said tire;

(b) one or more other transversely oriented lengths of multi-strand twisted rope in which the strands are made of polymeric plastic, the transversely oriented lengths being essentially transverse to the runners and extending between said runners, each transversely oriented length having one end threaded through the strands of at least one of the runners and an opposite end threaded through the strands of at least an other runner to form slippable connections with the runners, the connections thereof to said runners being spaced along each of said runners and defining a plurality of transverse members, said transverse members being formed in pairs, each pair being formed by a single, transversely oriented length of rope threaded through one or more places of each of said runners, said runners and said transverse members defining a ladder-like arrangement of which said runners are separated by a dimension greater than the width of said tire; and

means at the ends of each of said runners for connecting said runner ends together,

such that said tire traction device is attachable to said tire with said runners on opposite sides of said tire, each runner following generally the periphery of said tire and said transverse members are arranged around the periphery of said tire each being oriented substantially perpendicular to said runners and to the direction of rotation of said tire rotation.

4,919,183

SELF SEALING PNEUMATIC TIRE

Robert L. Dobson, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 536,480, Sep. 28, 1983, abandoned. This application Jun. 21, 1985, Ser. No. 747,538
Int. Cl.[5] B60C *21/08*
U.S. Cl. 152—502 12 Claims

1. A pneumatic rubber tire having a composite of open network structure containing a sealant composition adhered to the inner liner of said tire, where said composite is enveloped by the inner liner of said tire and an outer overlaying rubber coverstrip and is comprised of (A) a three-dimensional, open network of spaced apart filamentary elements in the form of a skeletal structure comprised of (i) resilient, flexible, open cell foam, or (ii) three dimensional mat of flexible organic polymer filaments which are woven or non-woven and are bonded at least 80% of their crossings and (B) a sealant composition contained in said skeletal structure, where said coverstrip covers the outer surface of said composite, is folded around its edges to cover its two edges and a portion of the opposing surface of the composite and is integral, covulcanized and terminate with said tire inner liner; wherein said open cell foam is composed of a flexible, resilient material selected from at least one of natural rubber, synthetic rubber and polyurethane; where the filaments of said mat are composed of a flexible organic thermoset polymer or a thermoplastic polymer having a softening point of at least 200° C.; and where said sealant composite is a tacky composition comprised of (i) about 100 parts by weight of a rubber selected from uncured cis 1,4-

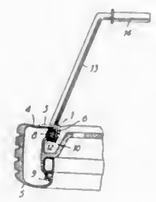
polyisoprene rubber or partially cross-linked butyl rubber, (ii) about 40 to about 300 phr of fluid polymeric material selected from at least one of rubber processing oil and polybutene having a viscosity in the range of about 25 to about 5000 centistokes at 100° C., (iii) when (i) is butyl rubber, about 40 to about 300 phr of polyisobutylene having a viscosity average weight in the range of about 8000 to about 135,000 (Staudinger), (iv) about 40 to about 140 phr of at least one of the group consisting of particulate carbon black and clay and (v) about 40 to about 120 phr of a tackifying resin.

4,919,184

LEVER FOR REMOVING MOTORCAR TIRES

Francis du Quesne, Kleistraat 138, 2630 Aartselaar, Belgium

Filed Mar. 13, 1989, Ser. No. 322,311
Claims priority, application Belgium, Mar. 14, 1988, 8800290
Int. Cl.[5] B60C *25/04*
U.S. Cl. 157—1.3 7 Claims



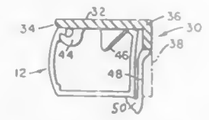
1. A lever for the removal of a tire from a wheel rim of a motorcar wheel having a tire cheek and a tire bead, said lever comprising: a support with an inverted angle-iron shape having a horizontal part cooperating with the tire cheek and a vertical part cooperating with the tire bead and the wheel rim, said vertical part being extended by a hooking element insertable between the tire bead and the wheel rim for removing the tire, an arm fixed at an angle in a vertical plane on the horizontal part of said support, and a grip fixed to the end of said arm.

4,919,185

HEADRAIL AND BRACKET COMBINATION FOR SUPPORTING BLINDS

Paul E. Comeau; John M. DeBeau, and Anthony Torti, all of Warwick, R.I., assignors to Kenney Manufacturing Company, Warwick, R.I.

Filed Mar. 21, 1988, Ser. No. 170,936
Int. Cl.[5] E06B *9/38*
U.S. Cl. 160—178.1 21 Claims



1. A headrail and mounting bracket combination for attachment to a window opening and for supporting a covering for said window, comprising:

an elongated, hollow, U-shaped main body portion having a horizontal bottom wall having longitudinally extending front and rear edges;

a front wall and a rear wall for said main body portion, said front and rear walls standing up respectively from the front and rear edges of said bottom wall, and each having longitudinally extending upper and lower edges;

a one piece bracket for supporting at least a part of said main body portion, comprising a top plate having a front and a rear edge, a rear plate extending downwardly from the rear edge of said top plate, and means associated with each of said plates for attachment to said window opening;

means associated with the top plate of said bracket for restricting said rear wall of said main body portion from forward motion when pivoted upwardly into said bracket, and

spring means associated with the rear plate of said bracket for clampingly engaging the lower edge of the rear wall of said main body portion in a locked position when the train body portion is so restricted against forward motion

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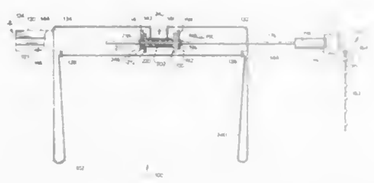
4,919,186

BLIND OPERATING DEVICE AND METHOD

William F. Uecker, 841 W. River Terr., McHenry, Ill. 60050; Earl M. Jahnke, 24 S. Pistakee Lake Rd., Fox Lake, Ill. 60020, and Kenneth Hughes, 24946 - B Lake Shore Dr., Round Lake, Ill. 60078

Filed May 24, 1989, Ser. No. 366,876
Int. Cl.[5] E06B *9/20*
U.S. Cl. 160—321 17 Claims



1. A blind assembly including a blind frame and a window covering operably mounted in said blind frame wherein:

a. said blind frame has a top portion and a bottom portion;

b. a control assembly for operating said window covering is mounted at a control end of said blind frame;

c. an idle end of said blind frame is oppositely disposed from said control end of said blind frame;

d. said top portion and said bottom portion are between said idle end and said control end;

e. a reelable roll cord supports said window covering;

f. a reel assembly is mounted in said blind frame between said idle end and said contol end to receive said reelable roll cord and move said window covering;

g. said roll cord has a first roll cord end and a second roll cord end;

h. said roll cord is secured to said reel assembly at said first roll cord end and at said second roll cord end;

j. a first loop roller aperture and a second loop roller are secured to a bottom portion of said blind frame;

k. a first roll cord holder aperture and a second roll cord holder aperture are in a top portion of said blind frame;

l. a first roller aperture and a second roller aperture are situated between said first loop roller aperture and said second loop roller aperture in said top portion adjacent said reel assembly;

l. said second loop roller aperture is closer to said idle end than said control end;

m. said first loop roller aperture is closer to said control end than said idle end; and

n. said roll cord passes from said reel assembly at said first roll cord end, upwardly through said top portion at said first roller aperture toward said control end along a top of said frame, downwardly through said top portion at said first roll cord holder aperture to said window covering, upwardly from said window covering through said first loop roller aperture on said lower portion, toward said idle end through said second loop roller aperture on said lower portion, downwardly toward said window covering, upwardly through said top portion at said second roller holder aperture, along said top portion toward said control end, and downwardly through said top portion at said second roller aperture so that said second roll cord end is secured to said reel assembly.

4,919,187

METHOD FOR MAKING ADDITIONS TO MOLTEN ALLOYS AND BODIES MOLDED FROM ALLOYING METALS

Hartwig Rapp, Frankfurt am Main, and Otto Stenzel, Grundau, both of Fed. Rep. of Germany, assignors to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany

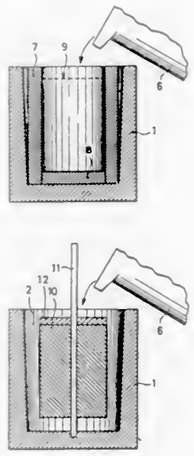
Continuation of Ser. No. 908,332, Sep. 17, 1986, abandoned. This application Aug. 9, 1988, Ser. No. 230,707
Int. Cl.[5] C22C *21/00;* B22D *19/16*
U.S. Cl. 164—57.1 10 Claims

1. A method for the charging and controlled addition of a pre-alloy casting to a batch of molten alloys comprising:

forming a batch of molten alloys of metals in a heated crucible which is contained in a nonreactive atmosphere, the metals comprising lithium and a metal that is nonreactive at room temperature;

preparing a pre-alloy composite casting having a core portion and surface layer portion, the core portion having sufficient lithium to be reactive at room temperature, and the surface layer portion being nonreactive at room temperature, the preparing step comprising the steps of forming one portion of said composite, solidifying the one portion of the composite and then adding and solidifying the other portion so as to form a pre-alloy casting having

an average content of lithium that is greater than the lithium content of the molten alloys in the crucible; and



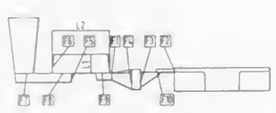
adding the pre-alloy casting to the batch of molten alloys in the crucible to add the prescribed amount of lithium to form an end product.

4,919,188

MOULD AND PROCESS FOR THE PRODUCTION OF NODULAR OR COMPACTED GRAPHITE IRON CASTINGS

Manfred Fessel, Rhede, and Gerd Trinkl, Borken, both of Fed. Rep. of Germany, assignors to Foseco International Limited, Birmingham, United Kingdom

Filed May 17, 1989, Ser. No. 353,475
Int. Cl.[5] B22C *9/00*
U.S. Cl. 164—58.1 20 Claims



1. A mould for the production of a nodular or compacted graphite iron casting the mould having parts comprising a treatment sprue, a runner, a slag trap, a filter chamber having an ingate and an outlet and having located therein a ceramic filter having an inlet and outlet, a casting cavity ingate and a casting cavity, the parts of the mould having a relationship one with another such that

F2=0.8 F1 to 1.2 F1
F3=30% F4 - 100% F4
F4≧4.5 F1
F5≧1.3 F1
F6=2 F5 - 4 F5
F7≧F5 and ≦F6
F8≧F5 and ≦F6
F9=1.2 F1 - 3 F1
F10≧F2
L2:L1=3:1 to 8:1
L1:L3=1:1 to 3:1

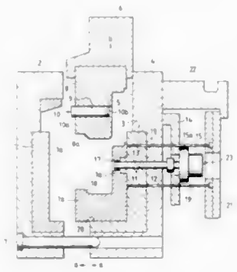
where
F1 is the cross-sectional area of the filter chamber ingate
F2 is the cross-sectional area of the casting ingate
F3 is the area of the filter outlet
F4 is the area of the filter inlet
F5 is the vertical cross-sectional area of the runner
F6 is the vertical cross-sectional area of the slag trap
F7 is the area of the interface of the reaction sprue and the runner
F8 is the area of the interface of the runner and the slag trap
F9 is the area of the interface of the slag trap and the filter ingate
F10 is the area of the interface of the filter chamber outlet and the casting ingate
L1 is the height of the slag trap
L2 is the length of the slag trap and
L3 is the width of the slag trap

4,919,189

METHOD OF FORMING AS-CAST HOLES BY USING CORES, AND APPARATUS FOR PRACTICING THE METHOD

Keiji Sato, and Yasutaka Nakatsukasa, both of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Sep. 21, 1988, Ser. No. 247,146
Claims priority, application Japan, Sep. 21, 1987, 62-237882; Dec. 16, 1987, 62-319260
Int. Cl.[5] B22D *33/04*
U.S. Cl. 164—137 13 Claims



1. An apparatus for forming a casting (1*b*) with an as-cast hole (17), the apparatus comprising:

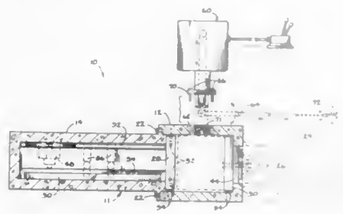
a mold comprising a stationary die (1), a movable die (3), and a core die (8) for forming a cavity;
means for opening and closing said mold by moving said movable die in first and second opposite directions (a',a), respectively; and
means for moving said core die in third and fourth opposite directions (b',b),
wherein said core die has front and side surfaces for forming said cavity and has a hole (9) formed therein, and said mold further comprises a floating core (10) disposed in said hole for movement with respect to said core die in fifth and sixth opposite directions which are transverse to said third and fourth directions.

4,919,190

RADIOACTIVE WASTE MATERIAL MELTER APPARATUS

Darrell F. Newman, and Wayne A. Ross, both of Richland, Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Aug. 18, 1988, Ser. No. 234,253
Int. Cl.[5] B22D *27/02*
U.S. Cl. 164—250.1 8 Claims



1. A radioactive waste material melting apparatus for melting metallic radioactive waste material for consolidating such material into a radioactive ingot for storage, the apparatus comprising:

a radiation shielded enclosure, the enclosure comprising at least two separate sections which are removably interconnected, transportable, and reusable, one such section comprising a process chamber, another such section comprising a mating cell;
the process chamber being sized, shaped and dimensioned to facilitate transportability of the chamber and apparatus, the process chamber including a mating cell opening;
a reusable mold received within the process chamber, and being repeatably transportable therewith, for receiving and cooling melted radioactive material to form an ingot;
a plasma torch mounted within the process chamber, and being repeatably transportable therewith, for melting the radioactive waste material into the reusable mold;
the mating cell being sized, shaped and dimensioned to facilitate transportability of the cell and apparatus, the mating cell including a process chamber opening and a transfer cask opening;
the process chamber opening of the mating cell being sized and shaped to join with the mating cell opening of the process chamber, the process chamber being removably attached to the mating cell to place the same in communication with one another through their respective mating cell opening and process chamber opening;
the transfer cask opening being sized and shaped to join with a transfer cask within which radioactive waste material is transferred to the melting apparatus; and
means for sealing the mating cell opening of the process chamber when the process chamber is removed from the mating cell for transport.

4,919,191

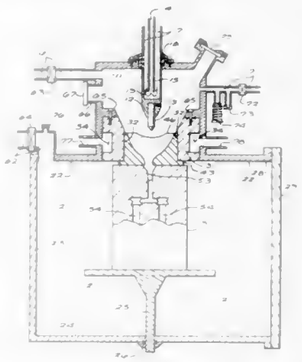
MOLTEN-METAL FORMING METHOD AND APPARATUS WHICH ARE BOTTOM-LOADING, BOTTOM-POURING AND BOTTOM-UNLOADING

Craig Brodersen, Reno, Nev., assignor to Jeneric/Pentron Incorporated, Wallingsford, Conn.

Filed May 17, 1988, Ser. No. 195,765
Int. Cl.[5] B22D *25/00*
U.S. Cl. 164—495 38 Claims

1. The combination of a furnace, a solid charge of metal, and a form for receiving molten metal; said combination comprising:

a structure defining a melting chamber that has an aperture;
a structure defining a forming chamber that is at least partially below the melting chamber and communicates with the melting chamber through the aperture;
means for receiving a solid charge of metal from below to block the aperture;
a solid charge of metal, received at the receiving means;



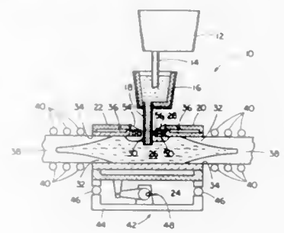
means, associated with the melting chamber, for heating the charge to melt part of the metal; and
a form, disposed in the forming chamber below the charge, to receive molten metal from the bottom of the charge.

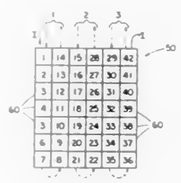
4,919,192

DISCRETE EXCITATION COIL PRODUCING SEAL AT CONTINUOUS CASTING MACHINE POURING TUBE OUTLET NOZZLE/MOLD INLET INTERFACE

Dennis Pavlik, Murrysville Boro, and Richard D. Nathenson, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 201,351, May 27, 1988, abandoned, which is a continuation of Ser. No. 50,272, May 15, 1987, abandoned. This application Mar. 10, 1989, Ser. No. 323,226
Int. Cl.[5] B22D *11/04, 27/02*
U.S. Cl. 164—502 8 Claims





1. In a continuous casting machine including a generally

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horizontal continuous casting mold having an upper inlet, an internal cavity communicating with and disposed below said inlet for receiving molten metal through said inlet into said cavity, and at least one outlet communicating with said cavity for withdrawing a strand of solidifying metal through said outlet from said cavity, and a pouring tube having a outlet nozzle portion, said pouring tube extending from above said mold downwardly through said mold inlet into said mold cavity so as to be disposed its lower outlet nozzle portion in spaced relation below said mold inlet within said mold cavity, a discrete excitation coil supported coxially about said pouring tube within said mold cavity in the space therein between said upper mold inlet and said lower pouring tube outlet nozzle portion, said coil for generating an electromagnetic levitating and stabilizing force which acts upon the meniscus of the molten metal in said mold cavity at the region of said mold inlet for counteracting the head pressure of molten metal contained within said pouring tube and thereby providing a seal in the area of an interface between said mold inlet and said pouring tube above its outlet nozzle portion, said excitation coil comprising:

(a) means defining multiple electrical conductor turns disposed in series and being capable of carrying an electrical current of adequate density to generate said electromagnetic levitating and stabilizing force; and

(b) means defining plural hydraulic fluid flow path, the number of said multiple electrical conductor turns being at least six times greater that the number of said plural hydraulic fluid flow paths, said hydraulic fluid flow paths being disposed in parallel to, but independent of, one another and in close proximity to said multiple electrical conductor turns, whereby coolant fluid circulation in each of said independent flow paths can provide sufficient cooling of said multiple turns to facilitate conduction therethrough of a high enough density electrical current to produce said required electromagnetic levitating and stabilizing force for providing said seal in the area of said interface;

(c) said means defining said multiple turns being an outer electrical conductor;

(d) said means defining said plural fluid flow paths being plural inner fluid channels being surrounded by, and in contact with, said outer conductor;

(e) said respective inner channels being separated by hydraulic outlet and inlet connections so as to provide discontinuous coolant flow paths;

(f) said outer conductor at said respective outlet and inlet connections of said inner channels having a conducting joint which ensures that the electrical path in said outer conductor is continuous even through said coolant flow paths are discontinuous.

4,919,193

MOLD CORE FOR INVESTMENT CASTING, PROCESS FOR PREPARING THE SAME AND PROCESS FOR PREPARING MOLD FOR INVESTMENT CASTING HAVING THEREWITHIN SAID MOLD CORE

Nobuyoshi Sasaki, 18-3, 1-chome, Aobadai, Midori-ku, Yokohama-shi, Kanagawa-ken, Japan

Continuation of Ser. No. 225,625, Jul. 27, 1988, abandoned, which is a continuation of Ser. No. 936,123, Dec. 1, 1986, abandoned. This application Mar. 31, 1989, Ser. No. 332,445
Claims priority, application Japan, Aug. 14, 1986, 61-189593
Int. Cl.[5] B22C *9/04*
U.S. Cl. 164—516 **1 Claim**

1. A process for preparing an investment casting mold in which molten metal is thereafter cast; said process comprising the steps of:

(a) kneading an aggregate with a first inorganic binder for increasing the strength and integrity of said aggregate for withstanding an injection molding operation for molding a lost model;

(b) molding the kneaded aggregate and first inorganic binder into a core molding mold to be solidified therein to produce a core matrix;

(c) dipping the solidified core matrix in a second inorganic binder bath so that the core matrix is impregnated with the second inorganic binder penetrating from the surface into a marginal portion of the body thereof, said second inorganic binder layer increasing the strength of said core matrix at a high temperature environment which is reached during a mold baking step and thereafter during a molten metal casting step;

(d) coating the core matrix impregnated by said step (c) with a slurry followed by drying to form a coating layer;

(e) covering said coating layer with paraffin wax to produce a core mold;

(f) placing said core mold in position within a shell mold and then pouring a lost model forming material into said shell mold to produce a lost model having therewithin said core mold;

(g) alternately coating a slurry and layer of stucco particles for a plurality of times to form a refractory layer which is then dried;

(h) allowing said lost model to vanish so as to obtain a final mold; and

(i) baking said core mold and said refractory layer simultaneously.

4,919,194

METHOD OF PUTTING A TOOL-CARRYING ROBOT INTO POSITION IN A CONTAINMENT VESSEL

Daniel E. Gery, Cormeilles En Parisis, and Philippe Meunier, L'Etang La Ville, both of France, assignors to Societe Anonyme Dite Hispano Suiza, Saint Cloud, France

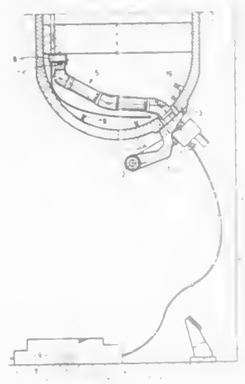
Filed Jan. 13, 1989, Ser. No. 296,695
Claims priority, application France, Jan. 14, 1988, 88 00344
Int. Cl.[5] B25J *3/00, 15/04*
U.S. Cl. 165—1 **8 Claims**

1. A method of placing in position a tool-carrying robot for carrying out operations in a containment vessel defining an operating zone in an environment which is hostile to humans, said containment vessel including an access opening to said operating zone, and said robot being of the kind comprising an articulated arm, a foot-plate provided at one end of said arm for attachment at a first point with known coordinates outside said operating zone, a head provided at the other end of said arm for receiving the tools required for said operations to be carried out, and a central logic unit for controlling said articulated arm, said method comprising the steps of:

attaching the head of said robot at a second point having known coordinates outside said operating zone;

causing said robot to move independently so as to bring said foot-plate into a working position in the vicinity of said access opening while said head remains attached at said second point and said robot remains outside said access opening;

attaching said foot-plate at said first point;



releasing said head from said second point; and

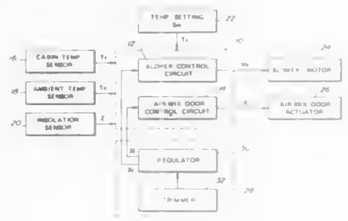
causing said robot to fold back on itself so as to bring said head to a working position within said operating zone.

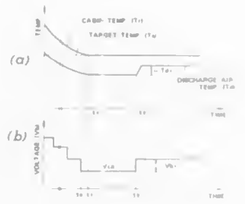
4,919,195

CONTROL SYSTEM FOR AIR CONDITIONER

Mikio Tanino, Hadano, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 15, 1988, Ser. No. 144,206
Claims priority, application Japan, Jan. 16, 1987, 62-6222
Int. Cl.[5] F25B *29/00*
U.S. Cl. 165—12 **14 Claims**





1. An air conditioner system for an automotive vehicle comprising:

conditioning air passage means which includes a cooling air source for generating a cooling air, a heating air source for generating a heating air, and a means for controlling the mixing ratio of said cooling and heating air for adjusting temperature of a conditioning air to be discharged into a vehicular cabin;

temperature setting means for allowing manual set of a desired temperature of the conditioning air in said vehicular cabin to produce a first signal having a value indicative of the set temperature;

sensor means for monitoring temperature in said vehicular cabin to produce a second signal having a value indicative of the vehicular cabin temperature;

first control means for adjusting volume flow and temperature of said conditioning air to be discharged into said vehicular cabin depending upon the difference between said first and second signal values, said first control means reducing said volume flow toward a predetermined minimum value, said first control means being active for controlling said conditioning air volume flow and temperature while a difference of said first and said second signal values is not within a predetermined range; and

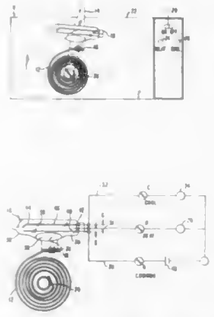
second control means for increasing volume flow and temperature of said conditioning air to be discharged into said vehicular cabin depending upon the difference between said first and second signal values, said second control means being active when said difference of said first and said second signal values is within said predetermined range, for increasing said conditioning air temperature toward said set temperature from an initial temperature upon detection of said difference within said predetermined range and correspondingly increasing said volume flow from an initial amount upon detection of said difference within said predetermined range so as to maintain a heat value of said conditioning air substantially unchanged.

4,919,196

THREE-STAGE MERCURY SWITCH FOR OPERATION BETWEEN THE HEATING AND COOLING MODE

Kalman Podlipnik, 7911 Kennedy Blvd., North Bergen, N.J. 07047

Filed Nov. 28, 1988, Ser. No. 276,652
Int. Cl.[5] G05D *23/08;* **F25B** *29/00*
U.S. Cl. 165—26 **15 Claims**



9. A thermostat control apparatus for maintaining a desired temperature of a monitored environment comprising:

temperature-responsive means for providing a mechanical displacement from an imaginary horizontal reference line according to changes in the temperature of the environment; and

a mercury switch coupled to said temperature-responsive means including a housing with at least three arcuate pockets having different elevations relative to said horizontal reference line when an upper surface of said bimetallic element is parallel to said horizontal reference line, said at least three arcuate pockets including a first arcuate

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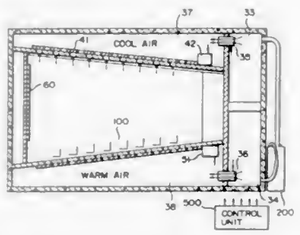
pocket located at the center of said housing having the lowest elevation among said arcuate pockets, said mercury switch further including a common electrode connected to a source of operating potential extending into said housing and across said arcuate pockets, electrodes adapted to correspond to at least two of said at least three arcuate pockets extending into said housing and terminating at said corresponding arcuate pockets, and a pool of mercury located in said housing, said mercury being contained in said first arcuate pocket when said upper surface of said bimetallic element is horizontal relative to said horizontal reference line, said mercury flowing into the arcuate pocket having the lowest elevation relative to the horizontal reference lines when said mercury switch is displaced by said temperature responsive means, said mercury providing a conducting path between said common electrode and said electrode corresponding to said arcuate pocket having said lowest elevation, whereby the difference in relative elevations between said first arcuate pocket and each other arcuate pocket creates a temperature differential between said first pocket and said each other pocket such that the desired temperature has to differ by said temperature differential before mercury flows out of said first arcuate pocket.

4,919,197

ATMOSPHERE CONTROL APPARATUS FOR THEATERS

Kanji Murakami, 7-1-12-102, Minamiaoyama, Minato-ku, Tokyo, Japan

Divisioo of Ser. No. 79,698, Jul. 30, 1987, Pat. No. 4,838,344. This application Jan. 3, 1989, Ser. No. 293,095
Claims priority, application Japan, Sep. 2, 1986, 61-206114
Int. Cl.[5] F25B *29/00*; G03B *21/32*
U.S. Cl. 165—48.1 **3 Claims**



1. An air-conditioner system for air-conditioning a movie heater or other theater, comprising:

storage means for storing temperature conditioned air produced by the operation of an air-conditioner;

blower means for sending the temperature conditioned air from the storage means into an empty space above the ceiling of the audience seating section in a movie theater or other theater;

shutter mechanism means for controlling the flow of the temperature conditioned air discharged toward the audience seating section through holes provided through the ceiling;

a shuttle control motor for driving said shutter mechanism means;

flap means for controlling the blowing direction of the temperature conditioned air, said flaps means being provided below the ceiling and driven by a flap control motor; and

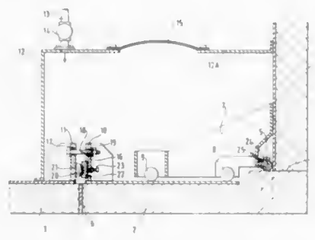
system control means which, in order for the audience to experience the same atmosphere as that in a movie theater scene or other theater scene, controls shutter control and flap control motors in sychronism with data corresponding to the atmosphere in said scene.

4,919,198

DEVICE FOR SEALING AND ABSORBING DIFFERENTIAL EXPANSION BETWEEN A CHAMBER FOR COOLING PARTICLES IN SUSPENSION AND A RECYCLING DUCT

Henri Patron, Rochefort en Yvelines, France, assignor to Societe Anonyme dite: STEIN INDUSTRIE, Velizy-Villacoublay, France

Filed Jun. 2, 1989, Ser. No. 360,817
Claims priority, application France, Jun. 8, 1988, 88 07620
Int. Cl.[5] F28F *7/00*
U.S. Cl. 165—81 **7 Claims**



1. A device for sealing and absorbing differential expansion between a cooling chamber for cooling particles in suspension in a flow of fuel gas and a duct for recycling said particles to a combustion chamber, the device comprising:

(a) a tubular expansion joint part interconnecting the wall of the cooling chamber and the recycling duct, the outside margin of one of the ends of the part being supported by the wall of an opening into the cooling chamber and the cross-section of the other end of the part being supported against the cross-section of the recycling duct;

(b) a plurality of guide plates for guiding the tubular part, said plates being fixed to the outside wall of the cooling chamber and being distributed around the tubular expansion joint part and resting thereagainst by means of rolls, and clamping a sealing ring against the join line between the tubular expansion joint part and the wall of the opening in the cooling chamber;

(c) a flat gasket disposed between the facing cross-sections of the tubular expansion joint part and of the recycling duct; and

(d) flanges for controlled mutual clamping of the facing cross-sections of the tubular expansion joint part and of the duct, said flanges being provided with oblong holes for passing clamping bolts for allowing differential expansion to take place in two perpendicular directions, one of said flanges being provided with pebble-shaped parts each having a plane slip surface on one side facing said flange, and a surface on its other side bearing against a clamping adjustment shoe controlled by a screw passing through the other flange.

4,919,199

MULTIPLE LOCKING STAKE FOR TUBE BUNDLE

Robert B. Hahn, Virginia Beach, Va., assignor to The Atlantic Group, Inc., Norfolk, Va.

Filed Jan. 13, 1989, Ser. No. 296,592
Int. Cl.[5] F28F *1/00*
U.S. Cl. 165—162 **9 Claims**

1. A multiple locking stake adapted to be driven transversely in a Lane between first and second rows of tubes within a bundle, said stake comprising an elongated metal strip having a longitudinal axis, a bend along said longitudinal axis so as to define a proximate stake midpoint and upwardly extending legs that terminate at a distal end, wherein a plurality of saddles transverse to the longitudinal axis of the stake are formed at longitudinal locations within the distal ends of the legs with each saddle being separated by a ligament portion, so as to provide spring contact areas against lower surfaces of the first row of tubes and a sliding contact between a lower surface of the stake and upper surfaces of the second row of tubes as the stake is driven along said Lane in the intended use, wherein each saddle has an upper surface with a radius of curvature equal to or greater than the outer radius of curvature of the tubes of the first row, and each saddle has a transition section between that radius of curvature and a longitudinal surface of each adjacent ligament portion.

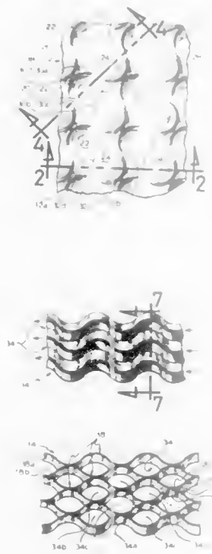
solely by protuberances and each protuberance is surrounded solely by cavities, and securing means to fixedly interconnect said sheets; wherein an upper and a lower layer of channels are defined, undulating in a direction normal to said sheets, each of said channels being of constant cross-section along its entire length.

4,919,200

HEAT EXCHANGER WALL ASSEMBLY

Stanislas Glomski, Chemin de la Rivière, Saint-Félix de Kinsey, Canada (J0B 2T0), and Patrick Roseberry, 3675 Saint-Pierre Street, Drummondville, Canada (J2B 6V2)

Filed May 1, 1989, Ser. No. 345,307
Int. Cl.[5] F28F *3/02*
U.S. Cl. 165—166 **9 Claims**



1. A wall assembly consisting of at least an upper, an intermediate and a lower sheet of a rigid material, each sheet being poked with a plurality of similar protuberances and cavities extending on opposite sides of the virtual plane defined by the sheet in alternating fashion whereby each cavity is surrounded

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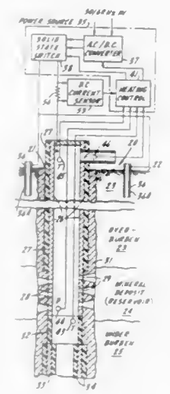
4,919,201

CORROSION INHIBITION APPARATUS FOR DOWNHOLE ELECTRICAL HEATING

Jack E. Bridges, Park Ridge; George T. Dubiel, and Thomas J. Bajzek, both of Wood Dale, all of Ill., assignors to Uentech Corporation, Denver, Colo.

Filed Mar. 14, 1989, Ser. No. 322,912
Int. Cl.[5] E21B *43/24*
U.S. Cl. 166—60 **28 Claims**



1. In an electromagnetic heating system for an oil well or other mineral fluid well, including a main heating electrode located downhole in the well at a level adjacent a mineral fluid deposit, and a return electrode located such that an electrical current between the electrodes passes through and heats a portion of the mineral fluid deposit, an electrical energizing apparatus including an A.C. power source for generating a high amplitude A.C. heating current, of at least fifty amperes, a D.C. bias source for generating a low amplitude D.C. bias current having a given polarity such as to inhibit corrosion at the main electrode, and connection means for applying both the A.C. heating current and the D.C. bias current to the electrodes of the well heating system, the improvement in which the D.C. bias source comprises a bias circuit, connected to a heating circuit that includes the A.C. power source, the bias circuit including at least one semiconductor device and developing a net D.C. voltage differential of the given polarity in response to the A.C. heating current.

4,919,202

SUCKER ROD GUIDE BEARING

Carl Clintberg, 908 - 120 Avenue SE, Calgary, Alberta, Canada (T2J 2K7)

Filed Feb. 8, 1989, Ser. No. 307,478
Int. Cl.[5] E21B *17/10*
U.S. Cl. 166—176 **5 Claims**

1. A sucker rod guide bearing, attachable at each end by means of a sucker rod coupling to an adjacent section of a sucker rod comprising:

(a) a cylindrical body shaft having a threaded stud at each end and an intermediate cylindrical body of a diameter greater than that of said threaded studs wherein a bearing

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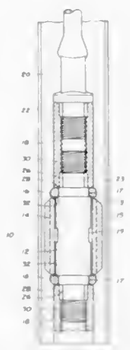
end surface is formed between each of said studs and the cylindrical surface of said body to provide a friction surface for torque transfer engagement with a sucker rod coupling end surface;

(b) a vaned cylindrical wheel slidably mountable over said body and having a length slightly less than that of said body; and



(c) wear means for acting as a sacrificial wear surface in the event said wheel is excessively worn or broken including a pair of torque transfer washers, each positionable between one of said bearing end surfaces and a corresponding sucker rod coupling end surface and having a diameter greater than that of said body but less than that of said wheel wherein the material hardness of said washers is less than that of the wall casing material so as to enable said washers to act as alternative sacrificial elements.

4,919,203

METHODS AND APPARATUS FOR FIELD BLASTING OF EARTH FORMATIONS USING INFLATABLE DEVICES FOR SUSPENDING EXPLOSIVES IN BORE HOLES

Daniel F. Fitzgibbon, Jr., Route 3, Van Dyke Mill Road, Taylorsville, Ky. 40071

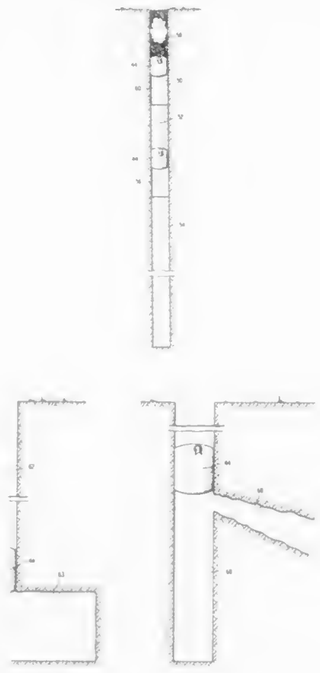
Filed Mar. 10, 1988, Ser. No. 166,542
Int. Cl.[5] E21B *33/127*
U.S. Cl. 166—187 **20 Claims**

18. A stemming construction for a borehole formed vertically or essentially vertically in the earth and extending through at least one seam of material from which earth is to be removed, comprising:

an inflatable body means comprising flexible portions for extending into contact with walls of the borehole and for transferring pressure from an inflating fluid introduced into the body means to the walls of the borehole, the inflatable body means being positioned in the borehole immediately below the seam of material;

stemming material disposed in the borehole outwardly of the inflatable body means and contacting the body means, the pressure of the inflating fluid being adequate to provide an essentially vertical force component directed against the stemming material to support said material, the stemming material extending within the borehole a distance substantially equal to the depth or height of the seam of material; and,

explosive material disposed in the borehole outwardly of the stemming material and contacting the stemming material, the explosive material being located substantially above



the seam of material, the inflatable body means supporting the stemming material and the explosive material.

4,919,204

APPARATUS AND METHODS FOR CLEANING A WELL

Walter Baker, Lewisville, and Malcolm N. Council, Richardson, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Jan. 19, 1989, Ser. No. 298,688
Int. Cl.[5] E21B *37/00*
U.S. Cl. 166—223 **14 Claims**

1. A system for cleaning the inside diameter of well tubulars comprising:

a. a work string disposed within the well tubular;

b. means for longitudinally moving the work string within the well tubular;

c. means for supplying power fluid to the work string;

d. fluid jet cleaning apparatus attached to the end of the work string within the well tubular;

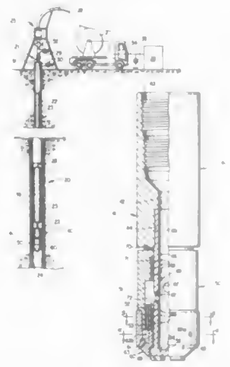
e. the jet cleaning apparatus having an inner mandrel and an adapter to connect the apparatus to the work string;

f. a housing rotatably carried on the exterior of the inner mandrel;

g. a fluid flow path from the work string to the housing via the inner mandrel;

h. a nozzle body attached to the housing and in fluid communication therewith;

i. a pair of jet nozzles machined into the nozzle body diametrically opposite from each other and oriented to project power fluid essentially tangential to the nozzle body whereby power fluid exiting from the pair of jet nozzles will cause rotation of the housing and the nozzle body to remove deposits from the inside diameter of the well tubular; and



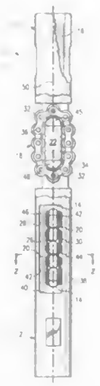
j. the longitudinal moving means comprising a coil tubing injector.

4,919,205

FRICTION-REDUCING DEVICE

William W. Dollison, 4206 Alta Vista La., Dallas, Tex. 75229

Filed Nov. 27, 1989, Ser. No. 441,827
Int. Cl.[5] E21B *17/10*
U.S. Cl. 166—241 **12 Claims**



1. A sucker rod coupling adapted to reduce friction within production tubing in a well bore, said coupling comprising a substantially cylindrical body member and a plurality of roller assemblies;

said body member comprising means at each end thereof for attaching said coupling to a sucker rod, and a plurality of axially and circumferentially spaced recesses, each recess containing a roller guide connected to said body, and each recess being further adapted to receive and support a roller assembly around said roller guide in such manner that said roller assembly can revolve around said roller guide;

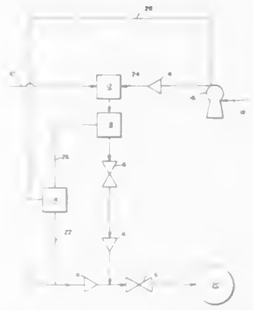
said roller assemblies each comprising a plurality of rollers rotatably mounted on and linked by a chain, said rollers being adapted to reduce frictional contact between said body member and said tubing by rotating between said roller guide and said tubing while said chain revolves around said roller guide.

4,919,206

METHOD FOR PREVENTING BITUMEN BACKFLOW IN INJECTION WELLS WHEN STEAM INJECTION IS INTERRUPTED

D. C. Freeman, Dallas, and N. F. Djabbarah, Richardson, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 19, 1989, Ser. No. 381,930
Int. Cl.[5] E21B *43/24, 47/06*
U.S. Cl. 166—252 **20 Claims**



1 A method for preventing viscous hydrocarbonaceous fluids from backflowing into a well upon interruption of a steamflood comprising:

(a) detecting a substantial reduction in steam injection pressure in at least one injection well via a pressure sensing device; and

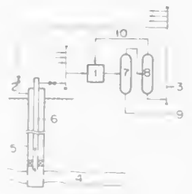
(b) causing automatically a pressurized fluid to be injected into said injection well in response to the reduction in pressure which prevents viscous hydrocarbonaceous fluids from backflowing into the injection well.

4,919,207

METHOD FOR DRAWING UP SPECIAL CRUDE OIL

Yoshiaki Ikuta; Masayuki Moriwaki, both of Tokyo, and Masato Kaneko, Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 65,786, Jun. 24, 1987, abandoned. This application May 22, 1989, Ser. No. 354,457
Claims priority, application Japan, Jun. 25, 1986, 61-146835
Int. Cl.[5] E21B *43/40*
U.S. Cl. 166—267 **5 Claims**



1. A method for drawing up a special crude oil comprising the steps of:

(1) mixing an extractant oil with a crude oil selected from the group consisting of crude oils containing a great deal of

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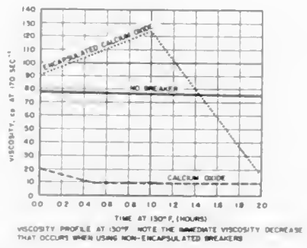
wax and high viscosity crude oils which have been drawn up from an oil well to extract a gas oil therefrom;
(2) separating the mixture from step (1) into:
(a) a mixture of gas oil and an extractant oil; and
(b) a heavy oil;
(3) separating mixture (a) obtained in step (2) into an extractant oil fraction and a gas oil fraction and injecting a part of the separated gas oil into the oil well; and
(4) recycling the extractant oil obtained from step (3) into the extractant oil of step (1).

4,919,208
METHOD AND APPARATUS FOR MANIPULATING TUBING IN A WELL
Chris K. Schneider, P.O. Box 2214, Matthews, N.C. 28106
Filed Sep. 11, 1987, Ser. No. 96,127
Int. Cl.[5] E21B *33/14*
U.S. Cl. 166—286 **16 Claims**

11. A method for cementing a tubular casing in a wellbore comprising (1) inserting said casing string in said well bore, (2) causing a section of the casing to be out of alignment with a portion of said casing and off-center relative to said wellbore independent of any axial movement of said casing or of any axial movement of any device attached to said casing to create an area of largest standoff, and (3) shifting said area of largest standoff at least partly around the circumference of the wellbore while pumping cement into the annulus between the wellbore and the casing wherein said casing is caused to be off-center as a result of at least one decentralizer secured around a section of the casing, said decentralizer having dimensions sufficient to contact the wall of said well bore and force the casing off-center relative to said well bore, said at least one decentralizer further having at least one axial opening which will allow cement to flow past said decentralizer and wherein said area of largest standoff is shifted as a result of rotation of said casing about the axis of said casing.

4,919,209
METHOD FOR TREATING SUBTERRANEAN FORMATIONS
Milton T. King, Tulsa, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.
Filed Jan. 17, 1989, Ser. No. 297,812
Int. Cl.[5] E21B *43/26*
U.S. Cl. 166—300 **14 Claims**

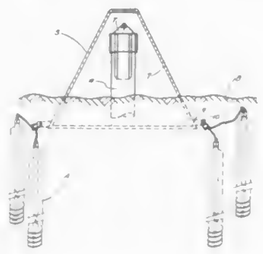
1. A method for breaking a gelled oil fracturing fluid which comprises injecting into a subterranean formation controlled release breaker capsules comprising an enclosure member enclosing a breaker for the gelled oil fracturing fluid; the enclosure member, being water-insoluble and oil-permeable, dissolving upon exposure to at least one fluid existing in the subterranean environment or injected with said controlled release breaker capsules such that the enclosure member is



VISCOSITY PROFILE AT 130°F. NOTE THE IMMEDIATE VISCOSITY DECREASE THAT OCCURS WHEN USING NON-ENCAPSULATED BREAKERS

capable of releasing the breaker upon sufficient exposure to the fluid.

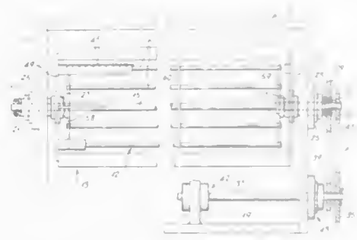
4,919,210
SUBSEA WELLHEAD PROTECTION SYSTEM
Louis E. Schaefer, Jr., 313 Wright Ave., Gretna, La. 70056
Filed Sep. 30, 1988, Ser. No. 252,502
Int. Cl.[5] E21B *33/037*
U.S. Cl. 166—356 **15 Claims**



1. An apparatus for protecting an underwater abandoned wellhead having an open top, said apparatus comprising:
a wellhead shelter,
said shelter comprising a hollow structure of a size and configuration to substantially envelope the underwater abandoned wellhead,
said shelter further comprising a base and vertically ascending exterior walls having sloping undersides capable of sheltering the wellhead from undersea commerce and preventing undersea commerce from becoming entangled in said shelter or wellhead, and
a supplemental centering cap associated with said shelter and placeable on top of the wellhead before said shelter is lowered over the wellhead, said cap having a lower portion and an upper portion, said upper portion having a base and upper sloping side edges, said lower portion having a lesser width than said base of said upper portion allowing it to be placed into the open top of the wellhead, said base of said upper portion having a greater width than the width of the top of the wellhead allowing said cap to rest on and be stably supported by the top of the wellhead with said lower portion extending into the wellhead, said upper sloping side edges being capable of engaging the sloping undersides of said walls of said shelter to cause said shelter to be centered about the top of the wellhead as said shelter is lowered down about the wellhead.

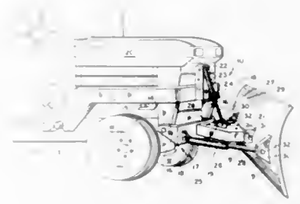
9. A method of protecting an abandoned wellhead and immediate area on a sea bottom, so that the wellhead and area do not pose a hindrance to undersea commerce, such as trawling, fishing, and the like, said method comprising the following steps:
a. prefabricating a protective structure having exterior walls designed to envelope and protect that portion of the abandoned wellhead protruding up from the surface of the sea bottom, with the walls being made of a series of separate, rigid, extended surface wall sections, which are separately made and handled during prefabrication and are ultimately used at the wellhead site to form the walls of the protective structure;
b. transporting said structure from the fabrication site to the installation, wellhead site with at least some of said separate wall sections being in unassembled, separated form,
c. assembling together the unassembled wall sections, forming the prefabricated structure at the abandoned wellhead, installation site prior to installation;
d. preparing the wellhead site, including excavating a portion of the sea bottom immediately surrounding the wellhead, so that the excavation is sufficiently large and deep enough to encompass the bottom of the protective structure, while allowing said structure to envelope said wellhead;
e. adding a rigid centering cap having downwardly sloping side edges on top of the wellhead with the centering cap being supported by and on top of the wellhead;
f. lowering the assembled structure over said wellhead and onto the base of the excavation, simultaneously centering said structure relative to said wellhead;
g. centering the structure with respect to the top of said wellhead using the engagement of the undersides of said structure bearing down against said downwardly sloping side edges as the structure is lowered; and
h. covering the bottom of said lowered assembled structure with said excavated material, anchoring and strengthening the protective structure around the wellhead, reducing the likelihood of undersea commerce being entangled with the wellhead and immediate area.

4,919,211
CLOD CRUMBLER
Richard E. Cope, Bedford, England, assignor to National Research Development Corporation, London, England
Filed Jul. 29, 1988, Ser. No. 225,895
Claims priority, application United Kingdom, Jul. 30, 1987, 8718122
Int. Cl.[5] A01B *29/06*
U.S. Cl. 172—69 **8 Claims**



1. A rotary clod crumbler device mounted for forward movement along the ground, the device comprising inner and outer soil-treatment rotors mounted for rotational movement about a common axis lying transversely to the direction of forward movement of the device, the outer rotor having elongate soil-engaging parts extending transversely to the direction of forward movement of the device, the inner rotor having soil-engaging parts extending radially of the common axis and drive means operative to drive the inner rotor in the same rotational sense as the outer rotor but at a different peripheral speed thereby to impose shearing forces on soil simultaneously engaged by the parts of the two rotors.

4,919,212
TRACTOR MOUNTING FOR A DOZER BLADE
Ronald G. McClure, R.D. #2, Box 43A, Columbia Crossroads, Pa. 16914
Filed Apr. 10, 1989, Ser. No. 335,647
Int. Cl.[5] E02F *3/76*
U.S. Cl. 172—274 **9 Claims**



1 A quickly attachable and detachable tractor mounting assembly for a dozer blade that has a pivotable lifting axis above and in front of a front wheel axis to provide undercarriage clearance and improved lift for said dozer blade, comprising:
a generally U-shaped cradle releasably mounted about front and sides of a body portion of said tractor, and substantially surrounding said body portion;
means defining a pivot supported by said cradle and disposed in front of and above said front wheel axis of a tractor to provide undercarriage clearance and improved dozer blade lift angle;
a dozer blade attachment comprising a generally U-shaped assembly pivotably supported by said U-shaped cradle about said means defining said pivot, and including a forwardly extending dozer support arm angled in a midportion thereof; and
lifting means supported by said cradle and pivotably secured to said dozer blade attachment for lifting said dozer blade attachment and a dozer blade secured thereto.

4,919,213
GARDEN ROLLER TOOL WITH ADJUSTABLE TELESCOPIC ARMS
William M. Searle, Box 67 Rte. 1, Edwards, Ill. 61528, and George Spector, 233 Broadway Rm. 3615, New York, N.Y. 10007
Filed Jan. 23, 1986, Ser. No. 821,752
Int. Cl.[5] A01B *1/20*
U.S. Cl. 172—350 **1 Claim**

1. A garden roller tool which comprises:
(a) an elongated handle having inner and outer ends;
(b) a ferrule affixed longitudinally to the outer end, said ferrule having a forked end and a generally transverse implement extending therefrom between said forked end and said outer end of said handle;
(c) a weighted roller journaled on said forked end of said ferrule outward of said implement so that in one position when said handle is tilted downwardly, said roller is elevated applying pressure on said implement as a fulcrum to push said implement into the ground and in another position when said handle is raised upwardly said roller is lowered to engage the ground, releasing pressure on said implement, whereby said roller acts as a fulcrum in raising said implement from the ground allowing said roller to roll over the ground freely, wherein said forked end of said ferrule includes a pair of adjustable telescopic arms

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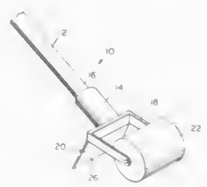
with said weighted roller journaled thereto so that movement of said telescopic arms will vary the distance of said



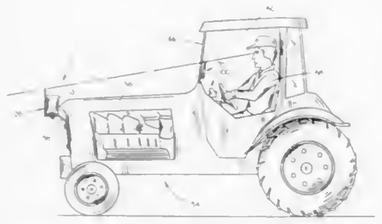
roller from said implement so that when said roller is lifted upwardly from the ground the pressure applied to said implement will vary.

4,919,214

CENTERLINE SIGHT

Sam J. Brown, Rural Route 3, Cozad, Nebr. 69130

Filed Apr. 17, 1989, Ser. No. 339,381
Int. Cl.[5] A01B *69/00*
U.S. Cl. 172—430 **6 Claims**



1. In combination:

A tractor having forward and rearward ends, and a forwardly facing operator seat mounted thereon; a centerline sight device including:

a sight arm housing mounted on the forward end of said tractor;

a sight arm operably mounted to said housing for transverse movement with respect to the longitudinal axis of the tractor;

motor means within said sight arm housing for selectively moving said sight arm in one transverse direction or the other;

a lamp assembly housing mounted on said tractor forwardly of said seat and rearwardly of said sight arm;

said lamp housing having a plurality of lamps along its top, spaced apart, and oriented transversely to the longitudinal axis of the tractor;

operable control means electrically connecting said lamps with said motor means;

switch means associated with each said lamp, electrically connected to said control means;

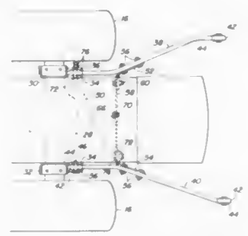
said control means adapted to operate said motor means to move said sight arm to a predetermined position, and to illuminate a predetermined lamp, upon actuation of the associated switch means, such that a line of sight through said illuminated lamp and through said sight arm will intersect a longitudinal marker aligned under the longitudinal centerline of the tractor, whereby the tractor may be maintained in centered relation over the longitudinal marker by steering the tractor to align said marker with said sight line.

4,919,215

HITCH WITH ANTI-SWAY LINK

Michael C. Lee, Beaver Dam, and Dale R. Dobberpuhl, Horicon, both of Wis., assignors to Deere & Company, Moline, Ill.

Filed Mar. 22, 1989, Ser. No. 327,282
Int. Cl.[5] A01B *59/041;* **A01D** *34/24*
U.S. Cl. 172—450 **3 Claims**



1. Lift structure for connecting an implement to a vehicle including first and second mounting arms having first ends pivotally connected to the vehicle at transversely spaced locations for vertical movement about a common axis and second ends for connection to an implement, power means acting between the vehicle and mounting arms for vertically moving the mounting arms about the common axis, and an anti-sway linkage for limiting lateral swinging movement of the mounting arms, characterized in that the anti-sway linkage is a single, one-piece, rigid link having one end secured to the first mounting arm at a location spaced from the pivotal connection between the vehicle and first mounting arm and a second end pivotally connected to the vehicle at a location closer to the location of the pivotal connection between the vehicle and second mounting arm than the location of the pivotal connection between the vehicle and first mounting arm, a portion of the single rigid link has a substantially circular cross section and extends along and moves about the common axis as the first mounting arm is moved vertically about the common axis.

4,919,216

AUTOMATIC IMPACT DRIVER

Kazunori Ikegami, 6-30, Minami-Honmachi 5-chome, Yao-shi, Osaka, Japan

Filed May 22, 1989, Ser. No. 354,555
Claims priority, application Japan, Mar. 2, 1989, 64-151433
Int. Cl.[5] B25B *21/02*
U.S. Cl. 173—93.6 **2 Claims**

1. An automatic impact driver comprising:

a cylindrical casing open at one end and closed at the other end by a cylindrical cap;

a hammer block fitted in said casing so as to be freely movable in an axial direction;

a coil spring fitted in said casing between said hammer block and said cylindrical cap so as to urge said hammer block toward said open end;

a cylindrical slider fitted in an inner peripheral surface of said casing at the open end thereof so as to be freely movable in an axial direction, said casing including rotation prevention means for preventing rotation of said slider in said casing and means for retaining said slider within said casing;

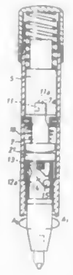
a chuck for gripping a bit fitted in an inner peripheral surface of said slider so as to be rotatable and moveable in an axial direction therein;

a cam mechanism installed between said chuck and said slider for converting axial motion of said slider relative to said chuck into rotary motion of the chuck;

a plunger disposed between said slider and said hammer block and movable in the axial direction for transmitting an impact of said hammer block to said slider;

a recessed part including a hammer face formed in a surface of said hammer block fronting on a top wall of said plunger, which top wall is formed to fit into said recessed part;

a holding mechanism between said plunger top wall and said hammer block to prevent said top wall from entering said recessed part as said casing is urged toward said hammer block to compress said coil spring thereagainst; and



a releasing mechanism for releasing said holding mechanism when the casing has moved relative to said hammer block and said plunger so as to compress said coil spring, such that said hammer block urged by said coil spring is released to impact said plunger top wall with said hammer face, said impact causing said slider to be moved axially whereby said chuck and bit are caused to rotate by said cam mechanism;

wherein a V-shaped cam groove is formed on an outer peripheral surface of the chuck, a ball holding hole is formed in the slider, a ball held rotatably in said ball holding hole is fitted in the cam groove so as to compose the cam mechanism, an eccentric coil spring is fitted onto an outer peripheral surface of the plunger so as to compose the holding mechanism, a top wall of the plunger is made to contact with a bottom face of the hammer block by said eccentric coil spring so that a holding state is created, a tapered cam surface increasing in its diameter downwardly is formed on an intermediate portion of an outer peripheral surface of the plunger, a neck for guiding said tapered cam surface is formed on an inner peripheral surface of the casing so as to compose the releasing mechanism, and the tapered cam surface is guided by an inner peripheral face of the neck as the plunger comes up within said neck so that the plunger top wall is fitted in the recessed part of the hammer block.

4,919,217

OPTICAL FIBER-CONTAINING INSULATORS AND PRODUCING PROCESS THEREOF

Toshiyuki Mima, and Hideki Shimizu, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jun. 20, 1989, Ser. No. 368,595
Claims priority, application Japan, Aug. 10, 1988, 63-197829
Int. Cl.[5] H01B *17/00;* **G02B** *6/00*
U.S. Cl. 174—139 **2 Claims**

1. An optical fiber-containing insulator comprising an insulator body having a through hole provided in a central portion thereof, an optical fiber inserted into said through hole, a stepped portion formed in the through hole at at least one end of the insulator body, a sealing section consisting of a pair of holders provided at upper and lower ends of the stepped portion and an inorganic glass layer sandwiched between the holders, and a protective layer formed on the outer holder.

4,919,218

PROCESS FOR REESTABLISHING CIRCULATION IN A LOST RETURN ZONE

James M. Williams, 404 Academy St., Houma, La. 70360

Filed Jan. 25, 1989, Ser. No. 301,624
Int. Cl.[5] E21B *7/00*
U.S. Cl. 175—72 **10 Claims**

1. A process for establishing recirculation down a borehole of drilling mud, following the collapse of the formation wall and the loss of mud into the formation to create a no return zone, the process comprising the following steps:

(a) establishing a drop of drilling mud within the annulus of the borehole, so that no drilling mud is returned to the surface during the drilling process;

(b) introducing a quantity of lighter weight fluid into the borehole, of such a reduced weight as to prevent further collapse of the formation wall, and in order to compensate for the drop of mud into the borehole, the fluid introduced substantially to the level of the surface of the borehole;

(c) closing off the upper end of the borehole, so that no fluid may flow out of the borehole;

(d) introducing additional lighter weight fluid into the borehole, so that the additional fluid will force the drilling mud into the loss return zone down the borehole;

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(e) finding the pressure differential between the level of mud in the borehole in step (a), and the amount of fluid introduced into the borehole after the closing off of the borehole;

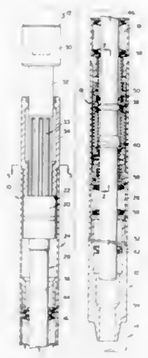
(f) calculating the weight of lighter weight fluid necessary to introduce into the borehole so as to enable the formation to hold the weight of the lighter weight fluid so that recirculation can be established within the borehole.

4,919,219

REMOTELY ADJUSTABLE FISHING JAR

William T. Taylor, P.O. Box 309, Warren, Tex. 77664

Filed Jan. 23, 1989, Ser. No. 299,227
Int. Cl.[5] E21B *31/107*
U.S. Cl. 175—299 12 Claims



1. A remotely adjustable downhole fishing jar apparatus comprising:

(a) an operating mandrel reciprocatively mounted within a housing body with said mandrel and said body adapted to be connected into a well bore operating string;

(b) said mandrel and said body forming an impact hammer and an impact anvil for creating an upwardly directed impact force;

(c) an impact release spring adapted to be compressed between said mandrel and said body responsive to tension applied to said mandrel by said operating string;

(d) a releasable lug array latching means connected between said mandrel and an adjustable loading adjustment sleeve for compressing said release spring a designated distance with a designated movement of said mandrel until said lug array is released when moved past a release position set by said loading adjustment sleeve;

(e) said sudden release of said impact release spring translating to sudden upper movement of said mandrel responsive to the tensional force in said operation string to cause impact of said hammer with said anvil;

(f) said loading adjustment sleeve being adjustably threaded into said housing body for rotation to cause designated changes in compressional force in said release spring proportionate to changes in longitudinal position of said adjustment sleeve;

(g) said adjustment sleeve forming a continuous elongated reciprocation cam slot formed to cause rotation of said adjustment sleeve responsive to longitudinal reciprocation of adjustment cam lug within said cam slot; and

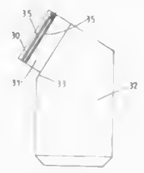
(h) a preset sleeve mouned around said mandrel and forming at least one said cam lug to cause said cam lug to reciprocate within said slot when said mandrel is longitudinally moved from a relatching and release position used to operate said jar into a separate reset position where said cam lug can be reciprocated.

4,919,220

CUTTING STRUCTURES FOR STEEL BODIED ROTARY DRILL BITS

John Fuller, Penzance, Cornwall, and Michael C. Regan, Robinswood, Gloucester, both of England, assignors to Reed Tool Company, Ltd., London, England

Continuation-in-part of Ser. No. 118,604, Nov. 9, 1987, Pat. No. 4,823,892, which is a division of Ser. No. 754,506, Jul. 12, 1985, Pat. No. 4,718,505. This application Jan. 25, 1988, Ser. No. 148,072
Int. Cl.[5] E21B *10/46*
U.S. Cl. 175—329 18 Claims



1. A rotary drill bit for use in drilling or coring holes in subsurface formations, comprising a bit body having a shank for connection to a drill string, a plurality of cutting structures mounted at the surface of the bit body, and a passage in the bit body for supplying drilling fluid to the surface of the bit body for cooling and/or cleaning the cutting structures, the bit body being formed from steel, at least one of the cutting structures comprising a cutting element, in the form of a preformed unitary layer of polycrystalline diamond material which is thermally stable up to a temperature higher than 750° C., the pre-formed layer being bonded to a carrier received in a socket in the steel body of the bit.

4,919,221

IMPACT DRILL BIT ASSEMBLY AND REPLACEABLE PARTS THEREOF

Jack H. Pascale, Bloomsbury, N.J., assignor to Numa Tool Company, Thompson, Conn.

Filed Apr. 6, 1989, Ser. No. 333,903
Int. Cl.[5] E21B *10/52*
U.S. Cl. 175—415 22 Claims

1. For use in a downhole impact drill having an elongated pneumatic impact hammer with an impact bit at one end thereof and a backhead at the other end thereof for coupling the downhole hammer to a drill string used to supply air under pressure for pneumatic operation of the hammer and to urge the hammer inwardly and rotate the hammer in one angular direction during downhole drilling, the impact bit having a drive shank with an anvil end face at one end thereof, and the hammer having an impact piston pneumatically reciprocable to impact the anvil end face at a high frequency for downhole impact drilling, an impact bit for a downhole hammer comprising an assembly of an elongated male drive shank having external, shank drive splines for rotation of the drive shank by the hammer in said one angular direction during drilling, a said anvil end face at one end thereof and an impact end face at the opposite end thereof and an enlarged female impact head mounted on said opposite end of the drive shank and engageable by the downhole hammer to be urged inwardly thereby during drilling, the impact head having an impact cap with an inner impact face engageable by the impact end face of the drive shank and an upstanding collar for receiving said opposite end of the drive shank, the drive shank and upstanding collar having cooperating annular arrangements of equiangularly spaced, external and internal, head drive splines respectively, extending generally helically away from the respective

impact faces in an angular direction opposite to said one angular direction to urge said opposing impact faces into engagement by rotation of the drive shank in said one angular direction during drilling, the collar having an internal annulus and the drive shank having a circular arrangement of locking lugs received within the annulus, the drive shank lugs cooperating with the collar for locking the head against axial withdrawal from the drive shank in one relative angular position thereof, the circumferential width and spacing of the head drive splines permitting the head to be axially inserted on the shank and then rotated to said one relative angular position, the bit assembly further comprising elongated key inserts between the enternal and internal, head drive splines to form therewith a drive coupling for rotation of the impact head by the drive shank, the key inserts being inserted between the splines in said one relative angular position of the head and shank and preventing relative rotation of the head and shank therefrom.

4,919,222

DYNAMIC PAYLOAD MONITOR

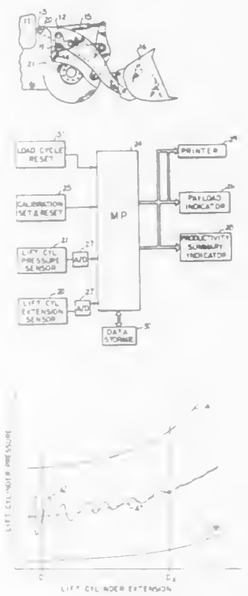
Christos T. Kyrtsos, and Dean A. Worrell, both of Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Mar. 15, 1989, Ser. No. 324,517
Int. Cl.[5] G01G *19/08, 19/10, 19/40*
U.S. Cl. 177—139 20 Claims

1. An apparatus for dynamically measuring and indicating payload weight for a vehicle having at least one implement linkage including a linkage connection pivot pin, and at least one cylinder for modifying said implement linkage geometry, said apparatus comprising:

means for delivering a first signal in response to sensing the hydraulic pressure of said cylinder;

means for delivering a second signal in response to sensing rotation of said implement linkage about said linkage connection pivot pin; and



means for deriving payload weight in response to said first and second signals.

4,919,223

APPARATUS FOR REMOTELY CONTROLLED MOVEMENT THROUGH TUBULAR CONDUIT

Shawn E. Egger, 7779 W. Dead Creek Rd., Baldwinsville, N.Y. 13027, and Harold G. Sherman, Baldwinsville, N.Y., assignors to Shawn E. Egger, Baldwinsville, N.Y.

Continuation-in-part of Ser. No. 144,118, Jan. 15, 1988, abandoned. This application Mar. 27, 1989, Ser. No. 328,685
Int. Cl.[5] B62D *57/02*
U.S. Cl. 180—8.1 10 Claims

1. Apparatus for controlled movement through the interior of an elongated, tubular conduit having both linear and curved sections, said apparatus comprising, in combinatin:

(a) first and second stepping members each including rigid frame disposed about a central axis, and frictional engagement mounted upon said frame and movable with respect thereto between outwardly expanded and inwardly retracted positions relative to said central axis;

(b) means for moving said frictional engagement means of each of said stepping members between said outwardly extended and retracted positions for frictional engagement with and disengagement from the inside surface of said conduit;

(c) axial drive means rigidly connecting said first and second stepping members in spaced relation for relative movement along said central axis;

(d) said axial drive means comprising at least one extensible and retractable member rigidly connected at opposite ends to said rigid frames of said first and second stepping members, respectively; and

(e) the frictional engagement of said engagement means with said inside surface of said conduit and the forces moving

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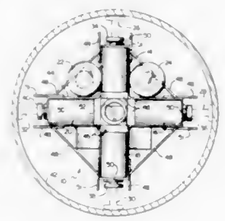
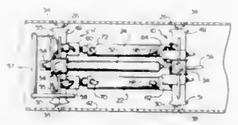
said engagement means to said outwardly extended position and moving said at least one extensible and retractable member to its extended position being such that:

(i) said frictional engagement of said engagement means of each stepping member will support the remainder of the apparatus in spaced relation to said inside surface of said conduit, without significant slippage, during movement through linear sections of said conduit; and





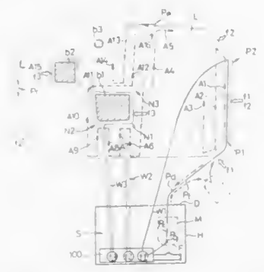
(ii) said frictional engagement permits slippage of said engagement means of each stepping member upon said inside surface of said conduit to permit limited rotation of said apparatus about an axis transverse to the axis of said conduit in response to movement of said extensible and retractable member to its extended position during movement through curved sections of said conduit.

4,919,224

AUTOMATIC WORKING VEHICULAR SYSTEM

Jia-Ming Shyu, and Chih-Li Chang, both of Hsin Chu Hsien, Taiwan, assignors to Industrial Technology Research Institute, Hsin Chu Hsien, Taiwan

Filed May 9, 1988, Ser. No. 191,974
Int. Cl.[5] B60T 7/16
U.S. Cl. 180—168 **9 Claims**



1. An automatic working vehicular system comprising:

(1) a guiding signal device comprising:

a signal generator for generating a plurality of alternating currents having at least three different frequencies;

a first wire carrying an alternating current at a first frequency, said first wire loops from said signal generator at a parking location to a first corner of a job site and along one side of the job site to a second corner thereof and back to said signal generator;

a second wire carrying an alternating current at a second frequency, said second wire loops from said signal generator at the parking location and around an external circumference of the job site and back to said signal generator;

a third wire carrying an alternating current at a third frequency, said third wire loops from said signal generator at the parking location and around an external circumference of each barrier area located within the job site; and

(2) an automatic working vehicle comprising:

a frame having a front end, a rear end, and two sides;

a travelling mechanism for turning said frame and moving said frame forwards, backwards, and sideways;

a dynamic source for driving said travelling mechanism;

an electric power source for storing and supplying a required power;

a timer for providing a starting signal enabling said vehicle to begin operating at a desired time;

a plurality of wire sensors for sensing a signal from said guiding signal device and producing a wire location signal;

a distance measuring device for measuring a distance between said vehicle and obstacles and producing an obstacle signal;

a margin sensor mounted for sensing a boundary location between an already operated area and a non-operated area and producing a boundary location signal;

a microcomputer, having stored control programs, for controlling the operation of said vehicle; wherein said vehicle starts automatically when it receives said starting signal, and according to said guiding signal device, travels from the parking location to the job site, operates over the job site in a parallel reciprocating manner, and returns to the parking location.

4,919,225

PLATFORM ORIENTED TRANSPORTATION VEHICLE

Daniel D. Sturges, 23240 Deerfield Rd., Los Gatos, Calif. 95030

Filed Mar. 31, 1988, Ser. No. 175,815
Int. Cl.[5] B62D 61/06
U.S. Cl. 180—210 **19 Claims**

1. A three wheel vehicle, comprising;

three ground engaging wheels, two of said wheels being rotatably aligned on a first horizontal axis, and said third wheel being rotatable about a second horizontal axis of rotation that is spaced from and parallel to said first axis of rotation,

a generally flat platform adapted to support a vehicle operator and having means for suspending said wheels therefrom,

a plurality of means for removably attaching elements to said platform at spaced locations around the perimeter of said platform,

a control pedestal extending generally vertically upward from said platform in a position for manual access by the operator, whether the operator is standing or sitting relative to said platform, and

means for locating and securing said control pedestal between a first position for use by a standing operator, a second position for use by a sitting operator, and a third position wherein said pedestal extends closely adjacent to and substantially parallel with said flat platform,

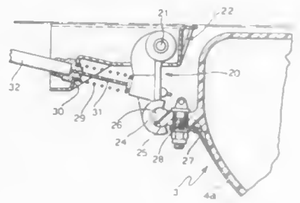
whereby the vehicle is vertically storable when said pedestal is pivoted into said third position and said flat platform is pivoted to a generally vertical position, as said platform rotates about said first axis of rotation.

4,919,226

MOTOR VEHICLE WITH A DEVICE FOR THE RELEASE OF THE FUEL TANK IN THE EVENT OF A VIOLENT IMPACT TO THE REAR

Avtar Singh Rana, Turin, and Romolo Gandiglio, Asti, both of Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Filed Nov. 2, 1988, Ser. No. 266,422
Claims priority, application Italy, Nov. 2, 1987, 67921 A/87
Int. Cl.[5] F60K 15/02
U.S. Cl. 180—274 **6 Claims**



1. A motor vehicle having a fuel tank mounted under the body, including

first support means, including at least one movable support member for the tank which can be moved between a first position in which the movable support member supports the tank and a second position in which the movable support member is disengaged from the tank, causing the tank to move downwardly,

sensor means for detecting an impact against the rear part of the motor vehicle, and

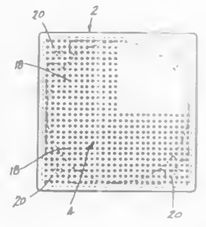
actuator means for causing diplacement of said at least one movable support member towards its second position when the sensor means detect an impact greater than a predetermined magnitude.

4,919,227

TAMPER RESISTANT SPEAKER GRILLE FOR INTERCOM MODULE

Troy R. Chicoine, New Britain, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Jun. 8, 1989, Ser. No. 363,002
Int. Cl.[5] G10K 11/00
U.S. Cl. 181—175 **7 Claims**



1. A tamper-resistant speaker grille assembly comprising:

(a) a cover member which fronts ambient surroundings of the grille assembly, said cover member being provided with a plurality of small sound transmitting holes therein;

(b) an insert member juxtaposed to said cover member, and telescoped into a recessed area in said cover member, said insert member being provided with a plurality of additional small sound transmitting holes, wherein none of the sound transmitting holes in the cover member are coaxial with any of the sound transmitting holes in the insert; and

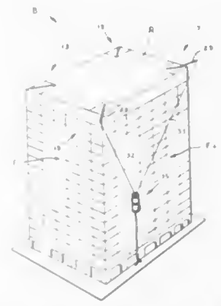
(c) a plurality of lug means equiangularly spaced about said cover member recessed area, and a plurality of locating tab means equiangularly spaced about a periphery of said insert member, said tab means being operable to engage any of said lug means to secure said insert member against angular rotation in said cover member recessed area, and said insert member being thus securable in said cover member recessed area in a plurality of different angular orientations to simplify assemblage of said grille assembly.

4,919,228

RESCUE SYSTEM FOR TALL BUILDINGS

Alexander Stefan, 216 E. Arby Ave., Las Vegas, Nev. 89119

Filed Jan. 13, 1989, Ser. No. 296,932
Int. Cl.[5] A62B 1/02
U.S. Cl. 182—14 **15 Claims**



1. System for rescuing occupants of a tall building, which building has at least a first generally planer face, said system comprising:

(a) at least a first and second boom, each mounted at an upper level of said building at opposite sides of said first building face and each being movable from a retracted position to an operative position with its outer end spaced outwardly of said first building face;

(b) a first hoist cable extending downwardly from the outer end of said operative first boom and a second hoist cable extending downwardly from the outer end of said operative second boom;

(c) collapsible, protective cage having a top wall to which is mounted means for engaging said first and second hoist cables, said cage including at least a first lower wall joined to said top wall by a plurality of flexible elongate support members extending from the periphery of said top wall to the periphery of said at least first lower wall, and flexible, heat-resistant material extending from the periphery of said top wall to the periphery of said at least first lower wall, said cage having an operational configuration in which it is suspended adjacent said building face by said first and second cables and in which said support members and flexible material are extended and said at least first lower wall lies spaced parallel to and below said top wall so as to define a heat-shielded compartment, said extended material having a collapsible doorway therein; and said cage having a collapsed configuration in which said top and said at least first lower wall lie in close proximity with

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said support members and flexible materials collapsed therebetween; and

(d) cable driving means for varying the extended lengths of said first and second hoist cables whereby said cage is maneuverable laterally, vertically and obliquely across said building face.

4,919,229

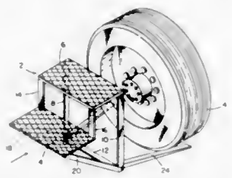
STABLE WORKING PLATFORM

David E. Wells, 1617 East Badger Rd., Everson, Wash. 98247

Continuation-in-part of Ser. No. 130,008, Dec. 8, 1987, abandoned. This application Aug. 29, 1988, Ser. No. 237,971

Int. Cl.[5] E06C *7/46*

U.S. Cl. 182—17 **9 Claims**



1. A stool for use when working upon the engine of a vehicle or the like, said stool receiving its stability from interaction with the tire of the vehicle, said stool comprising:

a substantially rectangular vertical framework wherein the uppermost framework element is horizontal and of greater depth than the remainder of the framework and serves a rigid step extending to one side of the framework,

a pair of feet, one mounted to each vertical element of the framework, adjacent to but spaced from the end opposite from the step and extending in a direction opposite the step, said feet angled outwardly and downwardly whereby when the step is placed adjacent the tire of the vehicle with the feet straddling said tire weight or movement on the step interacts immediately and directly against the tire.

4,919,230

SCAFFOLD PLATFORM SECTION

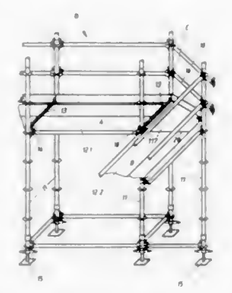
Ruth Langer, Im Weinberg 13, D-7129 Güglingen, Fed. Rep. of Germany, and Ulrich Layher, Im lailen 16, D-7129 Güglingen-Eibensbach, Fed. Rep. of Germany

Filed Sep. 23, 1988, Ser. No. 248,111

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1987, 3731945; Sep. 21, 1988, 3832066

Int. Cl.[5] E04G *1/36, 5/08*

U.S. Cl. 182—179 **17 Claims**



1. A scaffolding arrangement for enabling a set-up of scaffolding in and around irregular shaped objects with non-parallel boundaries, the scaffolding arrangement including at least one scaffolding platform section extending in a first direction, at least one further scaffolding section extending in a second direction inclined with respect to the first direction such that a corner gap is formed between adjacent ends of the scaffolding platform sections, a corner platform means for bridging the corner gap including a floor plate means for defining a walking for working surface having drop-in means provided along at least one edge thereof for securing the floor plate means to a support means, with another edge thereof being adapted to being supported by resting on one of the scaffolding platform sections, and wherein an outer peripheral edge of the floor plate means extending between the edge provided with the drop-in means and the edge supported by resting on one of the scaffolding platform sections is one of linear, bent, or rounded in dependence upon a position of the adjoining scaffolding platform sections and support means thereof whereby the floor plate means maximally covers a corner angle defined by said corner gap.

4,919,231

DEVICE WITH A LIFELINE

Per Klokseth, 6375 Hovdenakken, Norway

Filed Sep. 13, 1988, Ser. No. 243,973

Int. Cl.[5] A62B *35/00*

U.S. Cl. 182—5 **7 Claims**

1. A lifeline device for lowering persons from a burning building, the device comprising a housing with a line pulley means mounted therein and a lifeline, characterized by the line pulley means being made up of a freely rotatable friction-pulley having a grooved-shaped track, the lifeline having a first lowering end and a total length corresponding to the mounting height of the device from the ground, said lifeline being designed to slide through the friction pulley groove when locked, and the friction-pulley includes means which will cause the pulley to lock to prevent rotation when the weight of a person being lowered is applied to the lifeline.

4,919,232

COLD LUBRICANT MISTING DEVICE AND METHOD

Hugh Lofton, 3565 Linden Ave. #347, Long Beach, Calif. 90807

Filed May 12, 1989, Ser. No. 351,440

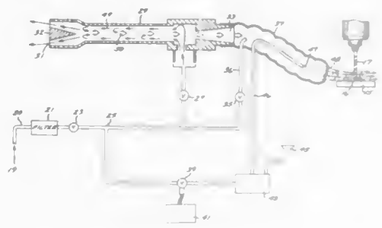
Int. Cl.[5] F01M *1/00*

U.S. Cl. 184—6.26 **8 Claims**

1. In a machining operation in which a machine tool engaged a workpiece, a method for reducing heat generated thereby, comprising the steps of:

cooling an airstream substantially below ambient temperature;

introducing lubricant into said cooled airstream at a controlled rate, whereby said lubricant is first atomized to form a fine mist and then cooled to a subambient temperature;



directing said cold lubricant mist toward the workpiecemachine tool interface.

4,919,233

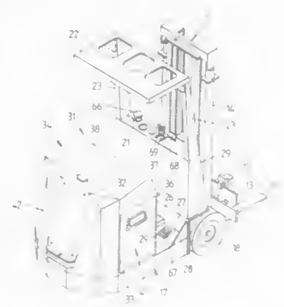
FRONT RIDER LIFT TRUCK

Kurt K. Larsen, and Pete Sartiago, both of Pell City, Ala., assignors to Blue Giant Equipment Corporation, Pell City, Ala.

Filed Jun. 3, 1988, Ser. No. 202,207

Int. Cl.[5] B66F *9/00*

U.S. Cl. 187—9 R **4 Claims**



1. A lift truck comprising:

(a) a mast assembly including a set of vertically movable lifting forks;

(b) a body assembly operatively connected to support said mast assembly,

(c) a battery compartment having a front wall extending upward from a body assembly, a rear wall extending upwardly from said body assembly, and co-extensively with said front wall, a cover member having a pair of sidewalls each of which has a non-linear upper edge and extends from a top corner of said front wall to a co-extensive top corner of said rear wall, and a top member hingedly mounted to said front wall and extending upwardly then rearwardly engaging said sidewalls along the non-linear upper edge and providing a support member against which the operator may rest, said battery compartment also having open sides perpendicular to said front and rear walls providing access to the compartment;

(d) battery means extending coextensively with said compartment for providing electric power and a counter balance to said lift forks;

(e) a shield having a console and an overhead guard supported by lateral posts; said body assembly supporting said mast assembly with said battery compartment extending transversely thereof and said shield extending transversely of said body assembly proximal said mast assembly with said battery compartment and said shield spaced apart to form a rider platform therebetween with said rider platform being accessible from either side of said body assembly;

(f) a pair of spaced apart drive wheels mounted to said body assembly beneath said forward shield;

(g) a steerable rear wheel assembly mounted to said rearwall proximal the centerline thereof rearwardly of said battery compartment;

(h) a housing extending about said steerable rear wheel assembly from said body assemble to said rear wall; and,

(i) means for steering said rear wheel assembly.

4,919,234

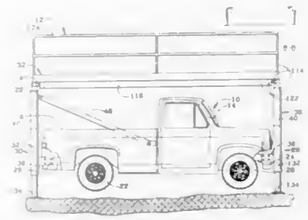
PORTABLE LIFT

Theodore S. Pearson, deceased, late of Callender, and by Diane M. Pearson, executor, 4011 Hunter St., Callender, both of Iowa 50523

Filed Nov. 9, 1988, Ser. No. 269,579

Int. Cl.[5] B66B *9/20*

U.S. Cl. 187—9 R **7 Claims**



1 A portable lift adapted to be connected to a vehicle having forward and rear ends and ground engaging wheels, said lift comprising:

a forward lift frame and a rear lift frame adapted to be connected to said forward and rear ends of said vehicle respectively;

each of said forward and rear lift frames comprising a vertical tube assembly having an upper end and a lower end and having at least two vertical tubes telescopically mounted with respect to one another for telescopic movement from a retracted position wherein said upper end of said tube assembly is at a first level to an extended position wherein said upper end of said tube assembly is located a substantial distance above said first level;

first and second hydraulic extensible power means within said tube assemblies of said forward and rear lift frames respectively for causing raising and lowering of said forward and rear lift frames between said retracted and extended positions;

an elongated support platform having a first end pivotally connected to said upper end of said tube assembly of said forward lift frame and having a second end pivotally connected to said upper end of said tube assembly of said rear lift frame;

each of said forward and rear lift frames comprising a horizontal frame member having opposite ends and being rigidly attached to said lower end of said tube assembly;

an outrigger means connected to each of said opposite ends of said horizontal frame members of said forward and rear lift frames, said outrigger means comprising a vertically movable foot and power means connected to said foot for causing vertical movement thereof to engage a supporting surface so as to permit leveling of said lift;

each of said horizontal frame members of said forward and rear lift frames including securing means thereon for

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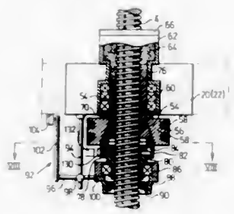
securing said forward and rear lift frames to said forward and rear ends respectively of said vehicle.

4,919,235
FIRE EXIT SYSTEM
Eugene DelSavio, 425 Boyd St., Akron, Ohio 44305
Filed Sep. 8, 1987, Ser. No. 93,988
Int. Cl.[5] E06C *9/10*
U.S. Cl. 182—18 7 Claims

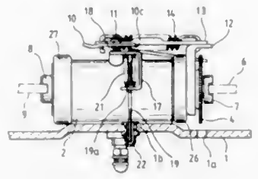
1. A building fire escape system automatically triggered by a fire, comprising a smoke detection device which upon detecting smoke, transmits a detectable signal to a windlass system that detects said signal, and in response thereto, removes a locking pin from a door latch assembly mounted on an exit door by retractably winding a cable attached to said pin on a windlass, thus permitting the exit door to be opened by a self-actuating exit door opening device selected from the group consisting of:
a device comprising a door opening spring;
a device comprising a door opening counterweight, and
a device comprising a door opening pneumatic cylinder, thereby allowing emergency egress from the building through the opened exit door.

4,919,236
SCREW LIFT
Klas Karlsson, Spånga, and Rune Bergvall, Bro, both of Sweden, assignors to NTD Hiss Nartransportdon AB, Sweden
PCT No. PCT/SE86/00248, § 371 Date Jun. 12, 1987, § 102(e) Date Jun. 12, 1987, PCT Pub. No. WO86/07041, PCT Pub. Date Dec. 4, 1986
PCT Filed May 30, 1986, Ser. No. 33,089
Claims priority, application Sweden, May 31, 1985, 8502693; Mar. 20, 1986, 8601313
Int. Cl.[5] B66B *11/04*
U.S. Cl. 187—25 18 Claims



1. A screw lift comprising a lift car which is movably supported along an upright fixed screw, said lift car carrying a drive nut in engagement with said screw and with belt drive means including at least one electric motor for rotation of said drive nut on said screw, said lift car thereby driven along said screw, and said drive nut rotatably journalled in a lubrication and bearing housing connected with said lift car, said drive nut carrying said lift car via a belt pulley driven by said belt drive means electric motor, said belt pulley disengageable from said drive nut when said lift car impacts an exterior obstacle such that when said lift car impacts an exterior obstacle at the bottom of said lift car, said lift car is displaced vertically thereby vertically displacing said belt pulley to completely disengage said belt pulley from said drive nut.

4,919,237
AUTOMATIC ADJUSTER RELEASING APPARATUS FOR DRUM BRAKE
Kimihiro Yamazaki, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan
Filed Apr. 7, 1989, Ser. No. 334,507
Claims priority, application Japan, Apr. 8, 1988, 63-46776[U]
Int. Cl.[5] F16D *65/56*
U.S. Cl. 188—79.62 5 Claims

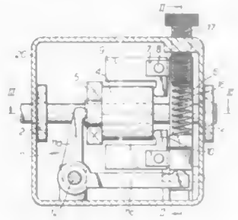


1. An automatic adjuster releasing apparatus for a drum brake having a backing plate and a wheel cylinder, comprising:
a piston slidably received in said wheel cylinder;
an adjuster nut having an adjuster gear, said adjuster nut being angularly movably received in said piston;
an adjuster screw having a brake shoe supported on a front end thereof, said adjuster screw being threaded into said adjuster nut;
adjuster lever pivotally connected at first end thereof to an outer surface of said wheel cylinder, said adjuster lever being connected intermediate opposite ends thereof to said piston, second end of said adjuster lever being resiliently engaged with said adjuster gear for allowing said adjuster gear to be rotated only in one direction;
a support member fixedly mounted on said wheel cyliner;
a pin member slidably supported by said support member, said pin member having a first end extending from an opening formed on said backing plate, a second end of said pin member facing and engageable with an inner surface of said adjuster lever, said second end of said pin member disengaging said second end of said adjuster lever from said adjuster gear when said second end of said pin member is urged against said inner surface of said adjuster lever;
a resilient member for urging said first end of said pin member to be projected from said opening on said backing plate; and
a flexible cover fitted in said opening for covering said first end of said pin member.

4,919,238
VARIABLE CENTRIFUGAL BRAKE
Hugh W. Skipper, High House, Parc-y Brian Rd., Penperllenl, Pontypool, Gwent, United Kingdom
Filed Jan. 10, 1989, Ser. No. 295,432
Claims priority, application United Kingdom, Jan. 13, 1988, 8800632; Nov. 1, 1988, 8825553
Int. Cl.[5] B60T *7/12*
U.S. Cl. 188—186 2 Claims

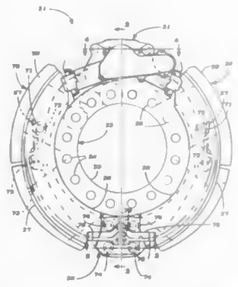
1. A variable centrifugal brake, comprising a main shaft having an axis and being connected to an external power input

which the brake is required to control, a disc means keyed to the main shaft for rotation therewith, said disc means having a circular peripheral surface, a bush fitted to the main shaft, at least one weight pivotally mounted to the disc means to transmit an axial force to the bush as the disc means rotates, the bush being free to slide on the main shaft, a first lever arm mounted on a first pivot and having a portion faced with a friction lining which is arranged to bear against the circular peripheral surface of the disc means when the first lever arm is moved in a predetermined direction about the first pivot, a second lever in



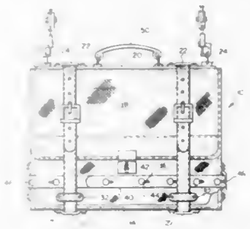
engagement with the first lever arm to move said first lever arm in said predetermined direction, said second lever being pivotally mounted on a second pivot and having a pair of forks with one fork portion at either side of the main shaft, and a thrust bearing carried on the bush to transmit the axial force from the bush to the forks to pivot the second lever and so move the second lever about the second pivot, and a spring having an adjustable anchor point and arranged to oppose movement of the lining-faced portion of the first lever arm towards the peripheral surface of the disc means.

4,919,239
SHOE RETURN SPRING
John A. Urban, Plainwell, Mich., assignor to Lucas Industries Public Limited Company, Birmingham, England
Filed Dec. 15, 1987, Ser. No. 133,005
Int. Cl.[5] F16D *65/14, 65/10*
U.S. Cl. 188—216 30 Claims



1. A return spring arrangement for a drum brake having a backing plate adapted to be affixed relative to a brake drum rotatable about an axis, a pair of brake shoes supported for movement relaltive to said backing plate from a retracted position to an engaged position with the associated brake drum, a formed leaf type return spring for urging said brake shoes to their retracted position comprising a pair of end portions each operably engaged with a respective one of said brake shoes and an intermediate position adapted to be fixed relative to said backing plate against circumferential movement, and a pair of posts affixed to said backing plate and positioned to engage and retain the flat sides of said return spring intermediate portion for retaining said return spring against circumferential movement about the brake drum axis and relative to said backing plate without interfering with the flexure of said return spring.

4,919,240
EXPANDABLE VALISE
Charles S. Tobias, Box 626, Road Town, Tortola, V.I.
Filed May 25, 1989, Ser. No. 356,722
Int. Cl.[5] A45C *7/00, 13/26, 13/30*
U.S. Cl. 190—103 4 Claims



1. A collapsible-expandable valise, comprising:
(a) enclosable top, front, rear, and side panels, and an extensible-contractible bottom panel, including flexible convolutions extending between said side panels;
(b) a rigid batten, centered adjustably upon said top panel, said rigid batten supporting top vertical strap keepers adjacent opposed ends of the batten, and two shoulder strap anchors at the ends of said batten;
(c) plural vertical straps, vertically encircling the valise, said vertical straps being adjustably secured to said batten bys aid top keepers affixed to said batten, and adjustably secured to said bottom panel by bottom keepers affixed to said bottom panel, and nadjustablys ecurd to said front and rear panels by front and rear strap guides affied respectively tos aid front and said rear panels;
(d) a horizontal encircling valise strap positioennd adjacent said bottom panela nd adjustablys ecured tos aid side panels by side keepers, said horizontals trap containing adjusting apertures wherebys aid horizontal strap is adjustable in length, relative to the overall exterior circumference of the said side panels and said front and rear panels, as defined bys aid flexible convolutions; and
(e) adjusting studs protruding from at least one of said panels, so as to complementally engage and secure said encircling valise strap adjusting apertures.

4,919,241
LOCKUP DAMPER FOR TORQUE CONVERTER
Masahiko Koshimo, Higashiosaka, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan
PCT No. PCT/JP88/00036, § 371 Date Sep. 9, 1988, § 102(e) Date Sep. 9, 1988, PCT Pub. No. WO88/05511, PCT Pub. Date Jul. 28, 1988
PCT Filed Jan. 19, 1988, Ser. No. 246,824
Claims priority, application Japan, Jan. 22, 1987, 62-8003[U]
Int. Cl.[5] F16H *45/02;* F16D *3/50*
U.S. Cl. 192—3.29 7 Claims

1. A lockup damper for a torque converter, said torque converter having a front cover with a convex portion curved toward an outside at its radially intermediate part and to which power is transmitted, a turbine and a turbine hub fixed to said turbine; said lockup damper comprising an approximately annular disc-like piston having a convex portion curved toward said front cover at its radially intermediate part adjacent said convex portion of the front cover, said piston being

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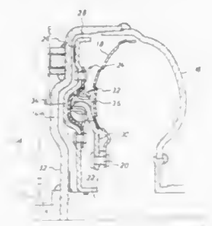
mounted on said turbine hub freely slidable in an axial direction relative to said front cover; a plurality of coil springs disposed circumferentially in said convex portion of said piston; an annular retaining plate for holding said coil springs from moving radially outward secured to said piston radially outward of said convex portion of said piston; a side plate for holding said coil springs from moving radially inward secured to said piston



radially inward of said convex portion of said piston; spring seats for compressing coil springs formed on any one or both of said retaining plate and said side plate; and a power transmitting driven plate fastened at its inner peripheral part to said turbine and having axially projecting claws extending toward said convex portion of said piston between adjacent ones of said coil springs.

4,919,242

SHIFT LEVER LOCKING APPARATUS

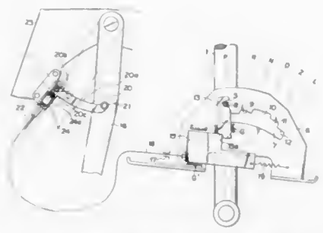
Tadao Muramatsu, Toyota, and Shinichi Yamamuro, Toyoake, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Chuo Hatsujo Kabushiki Kaisha, both of Aichi, Japan

Filed Oct. 21, 1988, Ser. No. 260,678

Claims priority, application Japan, Oct. 30, 1987, 62-166381[U]

Int. Cl.[5] B60K *41/28*

U.S. Cl. 192—4 A **8 Claims**



1. In combination with an automobile having a pivotally movable brake pedal and a shift lever adapted to be pivotally turned and set at any desired one of positions corresponding to a plurality of driving states including a parking state,

an apparatus for locking the shift lever, comprising

a detent pin associated with the shift lever so as to be moved up and down by push-button manipulation,

a ratchet plate including at least one engagement portion for engaging the detent pin to prevent pivotal turn of the shift lever when the shift lever is set at the parking state,

means for locking the detent pin, said locking means preventing the detent pin from disengaging from the engagement portion in a locking state, but allowing the detent pin to disengage from the engagement portion in an unlocking state,

a cam mounted to the brake pedal for rotation about an axis parallel to the pivotal axis of the brake pedal and having a bearing surface and a cam surface which has a varying height from the bearing surface,

a follower adapted to be moved in one direction in contact with the cam surface,

a stop disposed in consistent contact with the bearing surface of the cam for bearing the reaction of cam action, and

a wirelike member connecting said follower and said locking means,

whereby when the brake pedal is stepped down, the follower is moved in one direction through the cam to thereby change the locking means from the locking state to the unlocking state through said wirelike member.

4,919,243

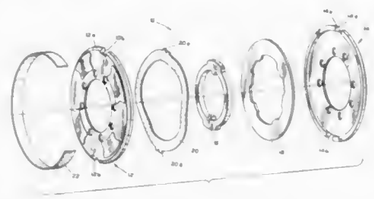
CLUTCH BRAKE HAVING SEGMENTED COVER SURFACES

Richard A. Flotow, Butler, Ind., assignor to Dana Corporation, Toledo, Ohio

Continuation of Ser. No. 28,935, Mar. 23, 1987, abandoned. This application Mar. 8, 1989, Ser. No. 320,905

Int. Cl.[5] F16D *67/02*

U.S. Cl. 192—18 R **12 Claims**



1. A clutch brake comprising:

a pair of opposed covers, each of said covers including an outer facing surface and an inner facing surface, each of said outer facing surfaces including a plurality of embossed segments separated by non-raised areas, each of said inner facing surfaces including a flat recessed portion extending throughout said inner facing surface, said covers being secured together such that said inner facing surfaces define an internal cavity;

inner and outer brake washers disposed within said cavity; and

a wave washer disposed within said cavity, said wave washer including a plurality of waves, each of which abuts one of said inner facing surfaces only opposite one of said non-raised areas of said outer facing surface.

7. A clutch brake comprising:

brake washer means adapted to be mounted on a shaft for rotation therewith;

first and second covers having respective outer circumferential surfaces and respective pluralities of embossed friction segments thereon, said friction segments adapted to be selectively engaged by a stationary member when it is desired to stop the shaft from rotating, said covers enclosing and frictionally engaging said brake washer means while being rotatable relative thereto; and

clamping band means extending over said outer circumferential surfaces to secure said covers together.

10. A method for forming a clutch brake comprising the steps of:

(a) providing a brake washer means, including means for coupling the brake washer means to a shaft for rotation therewith, for braking rotation of the shaft;

(b) providing first and second covers having respective outer circumferential surfaces and friction surfaces, the friction surfaces adapted to be selectively engaged by a stationary member when it is desired to stop the shaft from rotating;

(c) orienting the covers so as to enclose and frictionally engage the brake washer means while being rotatable relative thereto; and

(d) crimping a clamping band means over the outer circumferential surfaces to secure the covers together.

4,919,244

OIL-BATH MECHANICAL DRIVE BOX WITH INPUT AND OUTPUT SHAFTS AND WITH AUTOMATIC AND/OR DRIVEN DEVICES HOUSED THEREIN AND INSERTED IN THE DRIVE

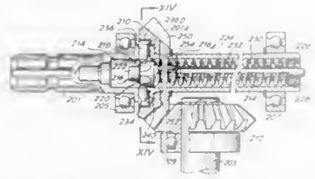
Edi Bordioli, Via Gina Bianchi, 18, 46029 Suzzara, Mantova, Italy

Filed Aug. 11, 1988, Ser. No. 231,184

Claims priority, application Italy, Aug. 13, 1987, 9458 A/87

Int. Cl.[5] F16D *43/20*

U.S. Cl. 192—56 R **13 Claims**



1. A mechanical drive box comprising at least a shaft and at least a drive member on the shaft, and a device for the transmission of motion between the shaft and the drive member, said device for the transmission of motion between said shaft and the drive member mounted thereon including: a set of pawls radially movable within seats formed in the shaft to ensure the guiding of the pawls, said pawls having inner and outer ends shaped in one of a radial and axial direction; said drive member having a shaped surface for cooperating with the outer ends of said pawls; an axial cavity defined inside said shaft for receiving an axially movable shaped core, said shaped core being connected with elastic means biasing said core into engagement with said pawls, said core having shaped inclined surfaces able to cooperate with the inner shaped ends of the pawls; the axial position of said core, and/or the force of the elastic means acting on the core and/or the pawls resistance against centripetal displacement determining the radial position of said pawls, wherein within said drive member a housing is formed, said housing defining said seats, perimetraly formed to cooperate with the shaped outer ends of the pawls, at least a second shaft with at least a gear member connected to said drive member, said drive member including a bevel gear and said housing being formed in a larger part of the body of said bevel gear, radial passages being provided between the drive member bevel teeth running as far as the axial cavity of the shaft, a manifold being provided in the cooperating surfaces of said drive member and said shaft.

4,919,245

HEAT ECONOMIZER

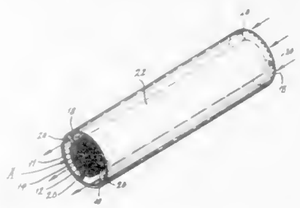
Francis A. Braden, 3627 Paule Ave., St. Louis, Mo. 63125-1715

Filed Jun. 19, 1989, Ser. No. 367,801

Int. Cl.[5] F28D *17/00*

U.S. Cl. 165—10 **5 Claims**

1. In a building heating system: a heat economizing device comprising; a perforated container having a cross-section, for filling with and retention of a material capable of storing and emitting heat, a quantity of material capable of storing and emitting heat, provided within said container and attachment means for securing the filled container within a ventilation



duct forming an elongated heat transfer space having a cross-section greater than the cross-section of said container.

4,919,246

ASSEMBLY OF TWO GENERALLY ANNULAR MEMBERS, IN PARTICULAR A DIAPHRAGM AND SECURING MEMBER FOR A CLUTCH MECHANISM, PARTICULARLY FOR AN AUTOMOBILE

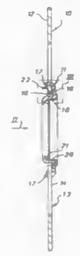
Christian Gay, Paris, and Philippe Lassiaz, Boulogne, both of France, assignors to Valeo, Paris, France

Filed Jan. 11, 1989, Ser. No. 295,544

Claims priority, application France, Jan. 13, 1988, 88 00302

Int. Cl.[5] F16D *13/44*

U.S. Cl. 192—89 B **8 Claims**



1. A clutch diaphragm assembly comprising a clutch diaphragm, said clutch diaphragm including a Belleville washer, said clutch diaphragm having a periperal portion, a central portion divided into a plurality of radial fingers alternating with openings, and a central opening, a securing member for attaching a clutch release bearing to said radial fingers of said clutch diaphragm, said securing member having a thrust portion with tabs which extend from said thrust portion, said securing member further having a sleeve portion radially offset to said tabs and extending from said thrust portion, wherein said securing member bears axially on a first side of said diaphragm in the vicinity of free ends of its radial fingers by means of said thrust portion and extending through said diaphragm by means of said tabs which are adapted to be received between adjacent pairs of radial fingers of said diaphragm, said sleeve portion received in said central opening of said diaphragm, an axially acting resilient ring of the Belleville washer type being interposed between said tabs and said diaphragm, said resilient ring being interposed at the side of said diaphragm opposite to its first side wherein said resilient ring bears through one of its peripheral zones on notches, each of which is individually formed to as to extend transversely in a respective one of the tabs of said securing member, and said resilient ring further bearing on said diaphragm through its other peripheral zone.

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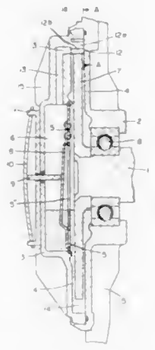
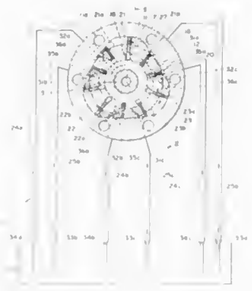
4,919,247
THERMOSENSITIVE FLUIDIZED FAN COUPLING DEVICE
Kazunori Takikawa, Sanmaibashi, and Yuichi Ono, Numazu, both of Japan, assignors to Usui Kokusai Sangyo Kaisha Ltd., Shizuoka, Japan
Filed Nov. 23, 1988, Ser. No. 275,766
Claims priority, application Japan, Dec. 1, 1987, 62-303656
The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.
Int. Cl.[5] F16D *31/00*
U.S. Cl. 192—58 B 6 Claims



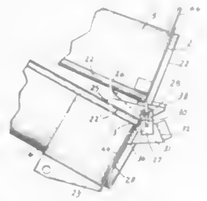
1. A thermosensitive fluidized fan coupling device, comprising: a rotatable shaft, a sealed housing rotatably mounted to said shaft, said sealed housing having an interior with an inner peripheral wall surface, a divider having an oil outflow regulating hole disposed in said sealed housing and partitioning said interior of said sealed housing into an oil reservoir and a torque transfer chamber, a driving disk provided on said shaft and disposed in the torque transfer chamber, said driving disk having an outer peripheral wall portion disposed in opposition to said inner peripheral wall surface of said sealed housing, a dam provided on a part of the inner peripheral wall surface of said sealed housing opposite to said outer peripheral wall portion of said driving disk on which an oil accumulates at the time of rotation, a circulation passage extending from a portion of said torque transfer chamber near said dam to said oil reservoir, a valve member for operating the outflow regulating hole of said divider by cooperation with a thermosensitive member provided on an exterior portion of said sealed housing according to ambient temperature change, wherein a torque transfer from said rotating shaft to said sealed housing is controlled by adjusting an effective contact area of the oil at a torque transfer gap between opposite outwardly disposed portions of said driving disk and the sealed housing, the improvement characterized in that an annular idle oil groove is formed between said outer peripheral wall portion of said driving disk and said inner peripheral wall surface on said sealed housing for a selected interval along said peripheral surfaces, said dam comprising a master dam provided in said idle oil groove in proximity to said circulation passage and spaced outwardly from said outer peripheral wall portion of said driving disk and a subsidiary dam provided projectingly from said master dam into sliding relationship with said outer peripheral wall portion of the driving disk, and further comprising an oil circulating means for allowing said oil reservoir and said torque transfer chamber to communicate with each other only at the time of stopping, said oil circulating means being provided near a central portion of said divider.

4,919,248
DRIVE COUPLING UNIT
Takeo Hiramatsu, Nagaokakyo; Kenjiro Fujita, Kusatsu; Yoshimasa Nagayoshi, Kyoto; Shuzo Hirakushi, and Yoshiaki Hamasaki, both of Osaka, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo and Koyo Seiko Kabushiki Kaisha, Osaka, both of, Japan
Filed Nov. 17, 1988, Ser. No. 272,417
Claims priority, application Japan, Dec. 8, 1987, 62-310472; Mar. 31, 1988, 63-78920
Int. Cl.[5] B60K *17/34*; F01C *21/00*
U.S. Cl. 192—61 2 Claims



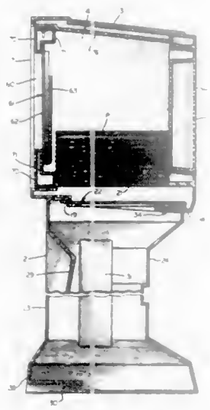
1. A drive coupling unit comprising:
a cam ring connected to a first rotating shaft;
a rotor connected to a second rotating shaft and rotatably disposed in said cam ring so as to define therebetween a plurality of pump chambers;
a multiplicity of sliding vanes mounted on an outer peripheral surface of said rotor and slidably engaging an inner Peripheral surface of said cam ring so as to divide each of said pump chambers into a discharge side compartment having a discharge port and an intake side compartment having an intake port;
a working fluid filled in said pump chambers for being compressed in said discharge said compartment and the circulated into said intake side compartment in each of said pump chambers as said cam ring and said rotor are rotated relative to one another due to a difference in rotational speed between said first rotating shaft and said second rotating shaft;
an orifice disposed in a working fluid flow passage interconnecting said discharge side compartment and said intake side compartment in which of said pump chambers;
a tank storing therein said working fluid;
a pair of working fluid supply passages extending between said tank and each said pump chambers, said pair of working fluid supply passages including a discharge fluid supply passage connected to a corresponding one of said discharge ports and an intake fluid supply passage connected to a corresponding one of said intake ports, for selectively supplying said working fluid therethrough from said tank; and
a check valve disposed in each of said working fluid supply passages, whereby each said intake/discharge port is communicated with said tank through a corresponding one of said working fluid supply passages and a corresponding one to said check valves.

4,919,249
MULTIPLE SECTION CHUTE RESTRICTOR
Dennis W. Alexander, Oak Creek, Wis., assignor to Rexworks Inc., Milwaukee, Wis.
Filed Apr. 17, 1989, Ser. No. 344,071
Int. Cl.[5] B65G *11/14*
U.S. Cl. 193—6 7 Claims



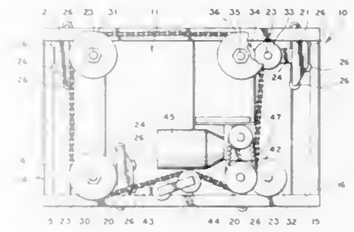
1. Apparatus for preventing hinged sections of a chute from abutting each other when the sections are aligned, comprising a set of hinges connecting the sections, a plate mounted on one of the hinges arranged when in operative position to prevent such abutment, means for moving said plate to an inoperative position enabling such abutment and cam means on said hinge arranged to restore the plate to its original position when the sections are folded out of an aligned position.

4,919,250
NEWSPAPER OR OTHER ARTICLE VENDING DEVICE
John B. Olson, Waukesha; Richard L. Jeanson, Watertown, and John D. Sinchok, Oconomowoc, all of Wis., assignors to Fortec, Inc., Waukeshi, Wis.
Filed Jun. 28, 1988, Ser. No. 212,716
Int. Cl.[5] G07F *11/04*
U.S. Cl. 194—248 36 Claims



1. A vending apparatus for newspapers or other articles comprising:
a receptacle adapted to receive said newspaper comprising a top, bottom and spaced side walls;
an access door connected to said receptacle for gaining access to said member;
access door closure means including biasing means for closing and biasing said door to be in a normally closed position;
said closure means including said biasing means being substantially enclosed within said receptacle and access door whereby said closure means including said biasing means is hidden from view and free from direct exposure to the weather elements when said access door is open and when said access door is closed.

4,919,251
CONVEYOR ESCAPEMENT
Leon A. Downing, 3011 Oak Hill Road, Peninsula, Ohio 44264
Filed Dec. 5, 1988, Ser. No. 279,828
Int. Cl.[5] B65G *37/00*
U.S. Cl. 198—463.6 6 Claims

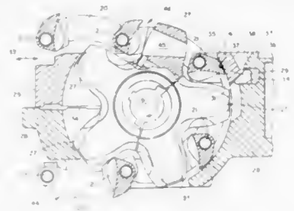


1. Apparatus for controlling the travel of articles along a conveyor track, comprising frame means positioned relative to the conveyor track, and having a downstream end and an upstream end; a first pair of gate means extending from said downstream end of said frame means into the travel path of the articles, said first pair of gate means being rotatable synchronously between a closed position and an open position; a second pair of gate means extending from said upstream end of said frame means into the travel path of the article, said second pair of gate means being rotatable synchronously between an open position and a closed position; said gate means including swing plate means rotatable about an axis substantially normal to the travel path of the articles and support plate means secured to the radially distal end of said swing plate means and movable in a plane substantially parallel to the travel path of the articles; rollers depending from said support plate means substantially lateral to the travel path of the articles and movable by said swing plate means selectively into the travel path of the asrticles, said rollers being positioned on said support plate means substantially accurately about said axis of rotation of said swing plate means; and drive means simultaneously to rotate said first pair and said second pair of gate means so that when one of said pairs of gate means is in the closed position the other of said pair of gate means is in an open position.

4,919,252
CHAIN CONVEYOR FOR MINER
Edward Wechsler, Minnamurra, Australia, assignor to Joy Technologies Inc., Pittsburgh, Pa.
Filed Mar. 3, 1988, Ser. No. 162,836
Claims priority, application Australia, Mar. 5, 1987, PI0701
Int. Cl.[5] B65G *45/00*
U.S. Cl. 198—494 5 Claims

1. An improved chain conveyor of the type having a drive sprocket at one end of the conveyor, a parallel idler sprocket at the opposite end of the conveyor, and one or more links of chain engaged over the sprockets providing a moving surface for the conveying of particulate material, wherein the improvement comprises an entry casting adjacent the drive sprocket, and wherein the drive sprocket has no more than five teeth and the chain links are accordingly sized with cavities therethrough to fit over the sprocket teeth, the entry casting having channels therethrough shaped and located to guide and support the chain links passing over the drive sprocket such that tension in the chains is reacted by the entry casting, and wherein each tooth of the drive sprocket has an aperture there-

through in the direction of rotation of that tooth, the aperture being tapered from a relatively narrow cross section at the



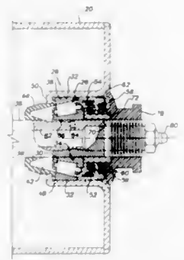
leading face of the tooth to a relatively wide cross section at the trailing face of the tooth to avoid a build-up of fine particulate material between the chain links and the sprocket teeth.

4,919,253

BEARING LUBRICATION SYSTEM

Thomas E. Morrison, Guin, Ala., assignor to Continental Conveyor & Equipment Company, Inc., Winfield, Ala.

Filed Jun. 6, 1988, Ser. No. 202,454
Int. Cl.[5] B65G *39/00*
U.S. Cl. 198—501 14 Claims



1. In an idler roll assembly for belt conveyors and the like having at least one roll mounted for rotation on a tubular shaft having an inner bore and an outer cylindrical surface by bearings, with an inner cylindrical surface of an inner race of said bearings being mounted on the outer cylindrical surface of said shaft, said tubular shaft having radially extending passages to provide a lubricant path from the inner bore of said shaft to said bearings, in combination therewith the improvement wherein said lubricant path is defined in part by said radially extending passage and is defined in part by an axially extending passage having a cross section in the shape of a circular segment which is in turn defined by a cylindrical portion of the inner surface of said bearing race and a planar portion of the surface of said shaft.

4,919,254

WALKING BEAM APPARATUS AND METHOD

Francis H. Bricmont, Pittsburgh, Pa., assignor to Bricmont & Associates, Inc., McMurray, Pa.

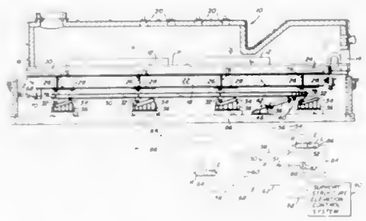
Filed Feb. 1, 1988, Ser. No. 151,027
Int. Cl.[5] B65G *25/00*
U.S. Cl. 198—751 24 Claims

1. In a walking beam apparatus which is adapted to transport articles in incremental steps through a given rectilinear path of travel, the combination comprising:

a pair of article supporting structures for alternately supporting such articles, at least one of said structures being a walking beam assembly;

drive means operatively associated with said structures to provide motive power for selectively moving each of said structures in vertical directions below a selected common vertical elevation whereat upwardly facing support portions of said structures reside substantially in a given plane;

means operable for limiting vertically upward movement of said structures to preclude movement thereof above said common vertical elevation, said means for limiting verti-



cally upward movement of said structures includes means operable to detect attainment of said selected common vertical elevation by said structures, respectively, during vertically upward movement thereof; and

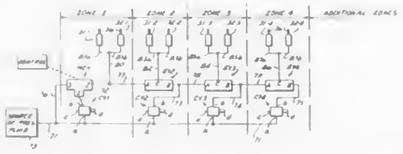
control means operable upon detecting a change in force relative to said drive means upon said attainment of said common vertical elevation by either one of said supporting structures to lower the other of said supporting structures from said common vertical elevation whereby such articles are continuously supported substantially on said given plane throughout operation of said walking beam apparatus.

4,919,255

ZERO PRESSURE ACCUMULATING CONVEYOR AND MODULE

Steven J. Morgan, Jeffersonville, Ind., and Gary L. Martin, Louisville, Ky., assignors to Figgie International Inc., Westlake, Ohio

Continuation of Ser. No. 623,371, Jun. 22, 1984, Pat. No. 4,609,098, which is a continuation of Ser. No. 356,213, Mar. 8, 1982, abandoned. This application Mar. 14, 1986, Ser. No. 839,543
Int. Cl.[5] B65G *13/06*
U.S. Cl. 198—781 2 Claims



1. In a belt driven live roller zero pressure accumulating conveyor having a plurality of load carrying rollers defining a downstream discharge zone and upstream accumulation zones, means in each zone to selectively engage with and disengage from said rollers a drive belt to drive said zones, said means including:

groups of belt supporting tensioning rollers independently reciprocably mounted under said belt,

fluid actuator means operatively mounted with each group of tensioning rollers for raising a group of said tensioning rollers upwardly in each zone to raise the belt into engagement with the load carrying rollers of that zone, and for dropping said group of tensioning rollers to disengage said drive belt from said load carrying rollers in that zone,

a source of pressurized fluid

a control valve in each zone,

a shuttle valve in each upstream accumulation zone, and the total number of shuttle valves in said conveyor being equal to the number of upstream accumulation zones exclusive of said discharge zone,

means connecting each control valve to said source of pressurized fluid,

said control valves each operated by a load sensor in the respective zone and having a fluid input connected to said source of pressurized fluid,

an output of each shuttle valve connected to actuator means for its respective zone,

said actuator means in each one upstream zone being operable to raise said tensioning rollers and to effect driving of the respective upstream zone when either the control valve of the upstream zone or that of the next downstream zone is positioned to transmit pressurized fluid to the actuator means through the shuttle valve in said upstream zone,

a single selectively operable master valve having a first inlet port connected directly to the source of pressurized fluid, a second port connected directly to the control valve of said discharge zone, and a third port connected directly to the actuator means of said discharge zone and to a shuttle valve in an adjacent zone upstream of said discharge zone,

said control valves in said upstream accumulation zones having a fluid output connected directly to both a shuttle valve in its respective zone and directly to a shuttle valve in any next upstream zone, and said control valve in said discharge zone having a fluid output selectively connectible to the shuttle valve in the next upstream zone, through said master valve,

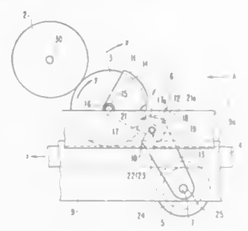
said master valve being selectively operable in one position to pass pressurized fluid or to vent fluid between the second and third ports and the discharge zone's control valve and actuator means, and in another position to pass pressurized fluid directly from said source through the first port and the third port to the actuator means in said discharge zone, and simultaneously and directly to the shuttle valve in the next upstream zone, for simultaneously actuating the actuator means in each of the discharge and next upstream zone.

4,919,256

LOADING ROLLER CONVEYOR WITH DRIVE VIA INTERMEDIATE ROLLERS

Elfriede Gebhardt, Sinsheim, Fed. Rep. of Germany, assignor to Gebhardt Fordertechnik GmbH, Sinsheim, Fed. Rep. of Germany

Filed Dec. 12, 1988, Ser. No. 282,509
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1988, 3802819
Int. Cl.[5] B65G *13/06*
U.S. Cl. 198—781 10 Claims



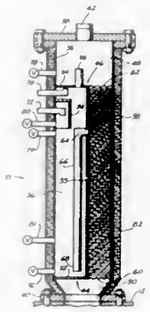
1. A loading roller conveyor with drive via intermediate rollers for conveying and transporting piece goods, comprising an actuator (1), and intermediate rollers (3) which drive support rollers (2) mounted at right angles to the direction of transportation, wherein an actuation means (4), is displaced between guide rollers (5) and intermediate rollers (3), whereby the intermediate rollers (3), which are rotated by the actuation means (4), are each mounted on an upper part of a two-part lever joint (6), a lower part of each lever joint being swivel-mounted, by means of a shaft (7) shared by the guide roller (5), on two rails (9) running parallel to a frame (8), while hinged shafts (10) connecting the upper and lower parts of each lever joint also rotatably mounted on the actuator (1) whereby the actuator by virtue of it's pivotal connection to the hinged shafts will shift the lever joints so as to cause positive engagement or disengagement of the intermediate rollers with the support rollers.

4,919,257

CONDENSATE SKIMMING REFLUX COLUMN

Leslie E. Brigham, Sr., and Leslie E. Brigham, Jr., both of 2000 Rosedale Dr., Edmond, Okla. 73013

Continuation-in-part of Ser. No. 177,108, Apr. 4, 1988, abandoned. This application Jul. 12, 1989, Ser. No. 378,723
Int. Cl.[5] B01D *3/32*
U.S. Cl. 202—158 1 Claim



1. In an apparatus for separating natural gas condensate from glycol in a gas dehydration system having a glycol reconcentration unit, the improvement comprising:

an upright elongated reflux still column open at its top end to the atmosphere and mounted on and in communication at its bottom end with the reconcentration unit;

partition means including upper and lower horizontal partitions and a diametric partition extending longitudinally of the column between said partitions for longitudinally and transversely dividing said column intermediate its ends to form upper and lower compartments at its respective end portions and a pair of juxtaposed compartments intermediate its ends,

co-operating portions of said horizontal partitions being foraminated and forming respective end limits of refluent media containing chamber,

said juxtaposed compartments forming a fluid separation reservoir and said chamber communicating at its respective ends with the upper and lower compartments;

a glycol and natural gas condensate mixture inlet port in the wall of said column adjacent the upper limit of the reservoir; a natural gas condensate outlet port spaced below said inlet port;

a gas vent port at the reservoir upper limit communicating with the column upper compartment;

liquid level control means in the reservoir communicating with a liquid level outlet port in the partition means forming the juxtaposed compartments spaced below the natu-

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ral gas condensate outlet port and communicating with the refluent media containing chamber for draining glycol from the bottom end portion of the reservoir, said level control means including an elongated conductor having one end axially connected with the liquid level output port and its other end disposed adjacent the lower limit of the reservoir; and

baffle means for preventing a direct fluid communication between the natural gas condensate outlet port and the glycol and natural gas condensate mixture inlet port.

4,919,258

PROTECTIVE CASE FOR A DIVER'S FACE MASK

Christine R. Perretta, 3250 NE 5th Dr., Boca Raton, Fla. 33431

Filed May 30, 1989, Ser. No. 358,082
Int. Cl.[5] **A45C** *11/04*; **B65D** *81/02, 85/30*
U.S. Cl. 206—5 **10 Claims**

1. A protective case for a diver's face mask, said face mask comprising a glass window; a pliable, flexible frame supporting said window around the periphery thereof; and a headband having the ends thereof attached to opposite sides of said frame, said protective case comprising:

(a) a flat base panel of foam material;

(b) a flexible peripheral wall attached to and upstanding from a major surface and having a contour with said panel adapted to house said face mask therein without play therebetween;

(c) a flat cover panel of foam material attached on one side thereof to said wall with a pair of spaced tethers; and

(d) means for detachably attaching the other side of said cover panel to said wall.

4,919,259

PORTABLE DISPLAY CASE

Bryan Beaulieu, Burnsville, Minn., assignor to Skyline Displays, Inc., Burnsville, Minn.

Filed Apr. 3, 1989, Ser. No. 335,806
Int. Cl.[5] **B65D** *5/52*
U.S. Cl. 206—45.2 **4 Claims**

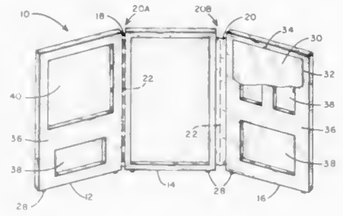
1. A portable multisectional display case for displaying and transporting information, said case comprising:

a center section having a planar front surface and a first lateral sidewall and a second lateral sidewall;

at least two adjacent sections having planar front surfaces and lateral sidewalls;

a first hinge means connecting said first lateral sidewall of said center section to a lateral sidewall of one of said adjacent sections and a second hinge means connecting said second lateral sidewall of said center section to a lateral sidewall of another adjacent section;

both of said hinge means being formed from a web material having a center line of weakness formed by a series of spaced-apart perforations, and having a parallel line of weakness equally spaced on either side of said center line of weakness, the distance between said parallel lines of



weakness being substantially equal to the thickness of said center section lateral sidewall;

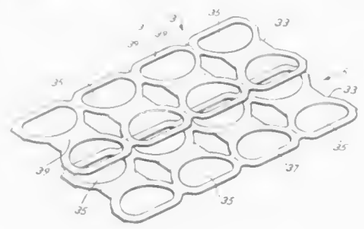
said adjacent sections being foldable about said hinge means from a carrying position wherein said two adjacent sections are folded to overlie said center section, and being unfoldable about said hinge means to form a display position wherein said two adjacent sections form a display surface in combination with said center section.

4,919,260

PACKAGE UNIT OF CAN-TYPE CONTAINERS

Ernest R. Cunningham, Libertyville, Ill., assignor to Grip-Pak, Inc., Deerfield, Ill.

Filed Feb. 10, 1988, Ser. No. 309,328
Int. Cl.[5] **B65D** *71/02*
U.S. Cl. 206—150 **5 Claims**



5. A package unit comprising: a plurality of cylindrical containers arranged in an array of rows and ranks, each of said containers having a top portion with a perimeter lip of a predetermined diameter; a first discrete packaging device formed of a resilient strip of plastic material of uniform thickness, said strip comprising a plurality of container encircling bands arranged in a connected series of rows and ranks, each of said encircling bands elastically receiving the top portion below the perimeter lip of a respective one of a first group of a plurality of said containers for connecting together adjacent rows of containers; and a second discrete packaging device formed of a resilient strip of plastic material of uniform thickness, said strip comprised of a plurality of container encircling bands arranged in a connected series of rows and ranks, each of said encircling bands of one row of said second discrete packaging device elastically receiving the top portion of a respective one of containers of one row of said first group of containers and each of the other of said encircling bands of another row of said second group elastically receiving the top portion below

the perimeter lip of a respective one of a second group of said containers.

4,919,261

BOTTOM LOADING BASKET CARRIER

Jeffrey A. Lashyro, Crosby, Minn., and Norbert Hoell, Southgate, Ky., assignors to Minnesota Automation Inc., Crosby, Minn.

Filed May 23, 1989, Ser. No. 354,339
Int. Cl.[5] **B65D** *85/72*
U.S. Cl. 206—185 **6 Claims**

1. A basket carrier comprising

opposed side walls and opposed end walls,

a center wall disposed between said side walls to provide at least two cells for said carrier,

a floor having a first panel foldably connected to one side wall and a second panel foldably connected to the other side wall, said first floor panel being of a width approximately equal to the distance between said center wall and that side wall to which said first floor panel is foldably connected, and said second floor panel being of a width greater than the distance between said center wall and that side wall to which said second floor panel is attached, said first and second panels thereby being sized to overlap one another adjacent the bottom edge of said center wall, said first and second panels being glued to one another where same overlap, and

at least one connector tab foldably connected to said center wall, said connector tab being positioned between said first and second floor panels when said floor panels are glued one to the other, each glue tab therefor being glued on a first surface to said first floor panel and being glued on a second surface to said second floor panel, said center wall thereby being securely connected to said floor which enhances the vertical support for bottles positioned within said cells and also which aids in maintenance of squared corners for said carrier during use.

4,919,262

PORTABLE CLOTHES COVER

Yoshitada Kuroishi, Tokyo, Japan, assignor to Unix Corp., Tokyo, Japan

Filed Jan. 13, 1989, Ser. No. 297,008
Claims priority, application Japan, Jan. 19, 1988, 63-4879[U]
Int. Cl.[5] **A45C** *11/00*; **B65D** *33/14, 33/24, 85/18*
U.S. Cl. 206—287.1 **7 Claims**

1. In a portable clothes cover having an upper bar formed with a suspension member on which a hanger or the like can be suspended, a cover section extending downwardly from said upper bar, a lower bar transversely disposed at the lower end of said cover section, and engagable locking means associated with said upper and lower bars for releasably locking said bars together when said cover section is folded such that the said bars are in juxtaposition to each other, the improvement comprising a sheath-like bag extending from said upper bar, wherein said bag is so configured that when said bars are locked together, the bag is disposable over substantially the

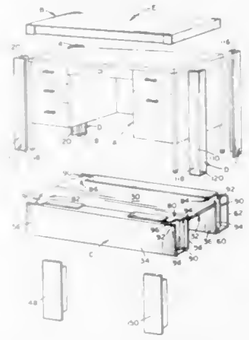
entire folded cover section by pulling the bag over the folded cover section while turning the bag inside out, whereby clothes being carried in said portable clothes cover remain in a substantially flat configuration.

4,919,263

CONTAINER PACKAGING

Donald L. Baltzer; Jack D. Kindelberger, both of Navarre, and William Bartko, Canton, all of Ohio, assignors to Vail Industries, Inc., Navarre, Ohio

Filed Oct. 17, 1988, Ser. No. 258,800
Int. Cl.[5] **B65D** *85/00*
U.S. Cl. 206—326 **16 Claims**



1. A packaging assembly adapted to protect an associated piece of furniture comprising:

a base member having

(a) an elongated, generally planar deck,

(b) a deck support member defined by a single sheet having predetermined fold lines forming first and second leg portions and a central platform disposed between said leg portions and supporting said deck;

four block members adapted to cushion legs of an associated piece of furniture received in said leg portions;

an extension member received on one end of said base member, said extension member having a predetermined conformation adapted for mating engagement with said block members;

first, second, third, and fourth corners of said base having a first end disposed at respective corners of said base member and operatively engaging one of said leg portions and extending generally perpendicularly outward from said deck; and,

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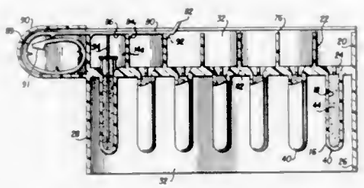
a cover member operatively engaging second ends of said corner posts and being spaced from said deck to define a cavity therebetween adapted to receive an associated piece of furniture therein.

4,919,264

MEDICAL NEEDLE REMOVING AND DISPOSING SYSTEM

Kimberly A. Shinall, 4101 Doubles Ct., Apt. 101, Virginia Beach, Va. 23462

Filed Aug. 4, 1988, Ser. No. 228,086
Int. Cl.[5] B65D *85/24, 81/18*
U.S. Cl. 206—210 8 Claims



1. A medical needle removing and disposing system for removing from injection and/or blood drawing equipment and disposing thereof a medical needle assembly having an elongated rigid shaft affixed on a mounting tube, said removing and disposing system comprising:

a first container defining a first chamber, said first container having a first-chamber opening at one end thereof but being otherwise closed, said first chamber being of a size for receiving said shaft of said medical needle assembly extending therein through said first-chamber opening;

a needle assembly remover means mounted at said first-chamber opening for gripping an outer surface of said mounting tube and thereby preventing said mounting tube from moving and for holding said needle assembly therein to dispose of said needle assembly;

second container defining a second chamber aligned with, and communicating with said first chamber at said first-chamber opening, said second chamber having a second chamber opening opposite said first chamber opening of a size sufficiently large for receiving said mounting tube of said medical needle assembly as well as said injection and/or blood drawing equipment on which said mounting tube is mounted when said injection and/or blood drawing equipment is manipulated to extend said shaft through said second chamber into said first container;

a one-way slidable cover having a racket mechanism thereon to allow said cover to close said second chamber opening, but to prevent said cover from being moved back to a position for uncovering said chamber opening;

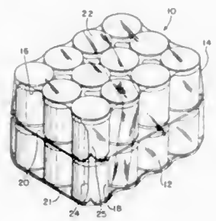
whereby, said injection and/or blood drawing equipment with a medical needle assembly mounted thereon can be manipulated to extend said shaft through said first-chamber opening into said first chamber until said mounting tube of said medical needle assembly is located at said needle assembly remover which engages said outer surface of said mounting tube, said injection and/or blood drawing equipment can then be manipulated relative to said needle assembly remover for detaching said mounting tube from said injection and/or blood drawing equipment to leave said medical needle assembly in said medical needle removing and disposing system, and said one-way slidable cover can then be closed.

4,919,265

FILM ENCASED PACKAGE

Peter Lems, 1111 Chestnut Ave., Wilmette, Ill. 60091, and Edward J. Slomski, 6106 Haligus, Woodstock, Ill. 60098

Division of Ser. No. 204,032, Jun. 8, 1988, Pat. No. 4,841,711.
This application Apr. 12, 1989, Ser. No. 321,053
Int. Cl.[5] B65D *75/00*
U.S. Cl. 206—432 6 Claims



1. A combination package for a plurality of containers including;

an array of containers arranged into a plurality of sub-packages, each sub-package including a plurality of containers integrated in rank and row configuration by an integral, thermoplastic carrier device having a plurality of bands gripping and retaining each container in the sub-package;

groups of sub-packages arranged on top of other groups of sub-packages so the containers in the top groups are aligned with the containers in the lower groups;

a planar sheet of thin, flexible material positioned between the containers of the top groups and containers of the lower groups;

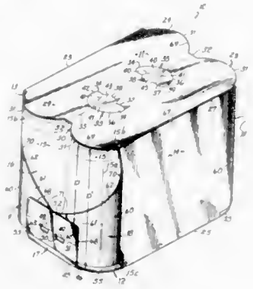
a web of stretch film wound about the groups of subpackages and sheet of flexible material, thereby creating a tightly bound, stable, integrated combination package.

4,919,266

CARTON WITH END WALL DISPLAY WINDOW

Everett L. McIntosh, Jr., Hamilton, and Charles A. Miller, Williamsburg, both of Ohio, assignors to The C. W. Zumbiel Co., Cincinnati, Ohio

Filed Jun. 9, 1989, Ser. No. 362,675
Int. Cl.[5] B65D *75/00*
U.S. Cl. 206—434 12 Claims



1. A container carton comprising

a bottom wall, two side walls connected to said bottom wall, a top wall connected to both said side walls, said top, bottom and side walls defining a wrap around type carton, and said bottom wall having a width sufficient to support at least two containers being between said side walls at each end of said bottom wall,

two wrap panels at one end of said carton, one of said wrap panels being connected to one of said side walls, and the other of said wrap panels being connected to the other of said side walls, each of said wrap panels being wrapped round a portion of the outer surface of a separate end container,

an end wall connected to said bottom wall, both of said wrap panels being connected to said end wall, said end wall being of a width greater than about one-fourth the width of said bottom wall but less than about three-fourths the width of said bottom wall,

locator structure partially carried by each wrap panel and partially carried by said end wall, said locator structure functioning to locate both said wrap panels and said end wall in final operational relation relative to said side walls and said bottom wall, said locator structure comprising at least one locator hole defined in one of each wrap panel and in said end wall, and at least one locator tab defined in the other of each wrap panel and in said end wall, said locator holes and tabs being interfitted one within the other,

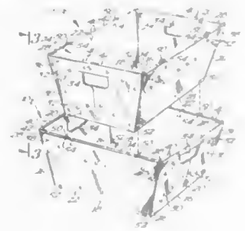
said wrap panels being configured to define a window so that at least a portion of those end containers about which they are wrapped are exposed to the sight of a casual viewer, the top edge of said window being defined by said top wall, and the side and bottom edges of said window being defined by said wrap panels, the side and bottom edges of said window being defined by a generally concave curvilinear edge which constitutes the top edge of each wrap panel, same cooperating to establish a window of generally shield-like configuration.

4,919,267

NESTABLE AND STACKABLE TOTE CONTAINERS

Mark S. Stoll, Deephaven, Minn., assignor to Liberty Diversified Industries, Minneapolis, Minn.

Filed Jul. 15, 1988, Ser. No. 219,258
Int. Cl.[5] B65D *21/04*
U.S. Cl. 206—507 13 Claims



1. A tote container which may be selectively nested or stacked in a vertical column with a like tote container, said tote container comprising:

a base panel having a first pair and a second pair of opposing edges and a length and a width, said length being greater than said width;

a pair of end wall panels, each said end wall panel extending generally upwardly from and being connected to one of said first pair of opposing edges of said base panel;

a pair of side wall panels, each said side wall panel extending generally upwardly from and being connected to one of said second pair of opposing edges of said base panel, each said side wall panel generally adjoining at least one of said end wall panels and being oriented generally perpendicular thereto such that said base panel, said side wall panels, and said end wall panels define a receptacle region having an open top and a bottom and a plurality of generally upright corners, said side wall panels and said end wall panels being generally outwardly tapered from said bottom of said receptacle region to said open top of said receptacle region such that the tote container may be nested within the like tote container and alternately the like tote container may be nested within the tote container; and

a retaining rim member, said retaining rim member being connected to said end wall panels and said side wall panels and extending in a generally continuous path peripherally around the open top of the receptacle region, said retaining rim member defining a plurality of segments, said segments being exposed and extending upwardly and being oriented in a first direction, with at least one of said base panel or said side wall panels or said end wall panels of the tote container defining a plurality of stacking apertures extending at least partially therethrough and positioned proximate to the bottom of the receptacle region and oriented in a second direction generally perpendicular to said first direction in which said segments are oriented,

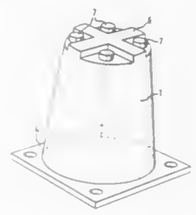
whereby the tote container may be selectively nested within the like tote container with the generally upright corners of the tote container aligned with the generally upright corners of the like tote container, and whereby the tote container may be lifted from the nested position and rotated approximately 90° such that the length of the base panel of the tote container is generally perpendicular to the length of the base panel of the like tote container, the tote container thereby being selectively stacked in a stacked position on the like tote container and disposed over the receptacle region of the like tote container with the segments of the retaining rim member of the like tote container which are exposed removably received and engaged within the stacking apertures of the tote container, such that the base panel of the tote container partially obstructs the open top of the like tote container and the receptacle region of the like tote container may be accessed without removing the tote container from the stacked position.

4,919,268

CONTAINERS

Michael E. Young, Cardiff; David M. Edwards, South Glamorgan, and Robin Lyons, Cardiff, all of Great Britain, assignors to Creative Design and Packaging Cardiff Limited, United Kingdom

PCT No. PCT/GB86/00330, § 371 Date Apr. 6, 1987, § 102(e) Date Apr. 6, 1987, PCT Pub. No. WO86/07335, PCT Pub. Date Dec. 18, 1986
PCT Filed Jun. 9, 1986, Ser. No. 10,887
Claims priority, application United Kingdom, Jun. 8, 1985, 8514554
Int. Cl.[5] B65D *81/36*
U.S. Cl. 206—509 1 Claim



1. A container, comprising opposite ends, one end of the container having a laterally extending flange plate suitable for attachment of a foil closure, a portion of the flange plate within its periphery and an opposite end of the container incorporating mutually interengageable connection parts enabling two or

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more similar containers to be interconnected with one another in a desired spatial relationship, wherein

the connection parts of said opposite end comprises a cruciform shape with a projecting plug between each adjacent pair of arms of said cruciform shape.

4,919,269

MULTIPLE COMPARTMENT CONTAINER

James W. Wright, Woodstock, and John M. Holley, Jr., Norcross, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Nov. 18, 1988, Ser. No. 273,389
Int. Cl.[5] B65D *5/48, 5/54*
U.S. Cl. 206—602 6 Claims

1. A multiple-compartment, separable container comprising:

a common top wall;

an outer side wall connected along a fold line to each opposing side edge of said top wall;

a bottom wall connected along a fold line to each outer side wall at an edge thereof opposite said top wall;

an inner side wall connected along a fold line to each bottom wall at an edge thereof opposite said outer side wall;

a lap panel having a free edge and connected opposite said free edge along a fold line to each inner side wall at an edge thereof opposite said bottom wall;

each of said lap panels being secured in underlying fashion to said top wall so that said inner side walls are disposed in face-to-face relationship;

minor end panels connected along fold lines to each end of each of said inner side walls and said outer side walls;

a major lower end panel connected along a fold line to each end of each of said bottom walls;

a major upper end panel connected along a fold line to each of said top wall;

a tear strip defined in said top panel by a pair of parallel perforated tear lines extending across said top panel parallel to the planes of said side panels;

each of said tear lines overlying one of said secured lap panels between the free edge of said lap panel and the connection between said lap panel and the adjoining one of said inner side walls; and

a web structure interconnecting along fold lines each minor end panel with adjacent ones of said lower major end panels and said lap panels, each of said tear lines overlying one of said secured lap panels between said free edge of said lap panel and the connections between said lap panel and said web structures.

4,919,270

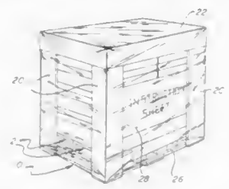
PALLET ASSEMBLY FOR PROMOTIONAL DISPLAY USE AND METHOD OF MAKING SAME

James A. Govang, Killingworth, and Mark E. Goldstein, Farmington, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Continuation of Ser. No. 21,986, Mar. 5, 1987. This application May 24, 1989, Ser. No. 356,425
Int. Cl.[5] B65D *19/00*
U.S. Cl. 206—597 8 Claims

1. An integrated assembly of package modules, comprising a rectangular skid having an upper, normally horizontal support surface; a plurality of rectangular pallets arranged in side-by-side relationship upon said support surface; a multiplicity of package modules arranged as a plurality of stacks upon said pallets, each of said stacks comprising a multiplicity of vertically disposed package modules disposed upon a pallet, horizontally adjacent package modules being elements of different stacks, each of said stacks including first synthetic resin film means extending vertically along all four sides of each of the modules and the associated pallet and engaged with all four sides of the modules of a stack and with all four sides of its associated pallet to separately secure each of said stacks of modules to be associated one of said pallets to provide a plurality of independent subassemblies separately removable from said skid with said first film means thereof substantially intact; vertically extending, relatively rigid corner protectors on the four corners of the assembly of said subassemblies on said skid extending along the corners of said pallets and skid and along the outer surface of said first film means; horizontally extending corner protectors extending about the upper periphery of said assembly; and second resin film means for extending about and engaged with and securing all of said subassemblies to said skid to provide said integrated assembly, said second film means also covering said corner protectors, said second means and corner protectors being disengageable from said subassemblies without injury to said first film means, so as to maintain said subassemblies intact and to permit their individual removal from substantially within the periphery of said skid support surface, said pallets having support surfaces which are dimensioned and configured to cumulatively occupy substantially the same area as said skid support surface.

5. A method for the assembly and bulk transport of a multiplicity of package modules, comprising the steps:



(a) stacking vertically a plurality of package modules upon each of a plurality of pallets and within the lateral bounds of the support surfaces thereof, as defined by the periphery of the pallet to produce a series of stacks; horizontally adjacent package modules being elements of different stacks;

(b) separately applying first securing means to each of said stacks to extend vertically along all four sides thereof and to secure said modules to all four sides of the associated pallet and to thereby provide a plurality of independent subassemblies;

(c) disposing said subassemblies upon the support surface of a skid within the periphery thereof, said subassemblies cumulatively substantially occupying the support surface of said skid and lying within the periphery thereof; and

(d) placing vertically extending, relatively rigid corner protectors on the four corners of the assembled subassemblies on said skid with said corner protectors extending along the corners of said pallets and skid, and horizontally extending corner protectors along the upper periphery of said assembled subassemblies;

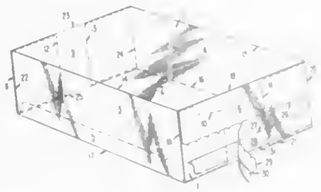
(e) applying second securing means over said subassemblies, said corner protectors and skid to engage all of said subassemblies and to secure all of said subassemblies to said skid and to thereby provide said integrated assembly, said second securing means being disengageable from said subassemblies and corner protectors without injury to said first means, said subassemblies being removable from said skid while leaving said first securing means substantially intact.

4,919,271

CARTON WITH TEAR STRIP

Morris W. Kuchenbecker, Neenah, Wis., assignor to James River Corporation, Richmond, Va.

Filed Nov. 14, 1983, Ser. No. 270,935
Int. Cl.[5] B65D *5/54*
U.S. Cl. 206—611 17 Claims



1. A carton having a tear strip opening comprising:

a plurality of wall panels with at least one of said wall panels including an inner layer and an outer layer each being hingedly connected to a respective wall panel by way of a fold line;

a cut score line of weakness formed in an inner side of said outer layer cut a predetermined depth into said outer layer extending substantially the entire length of said outer layer and substantially parallel to said fold line and spaced inwardly towards said fold line from a free edge of said outer layer;

a second line of weakness formed in said outer layer extending substantially the entire length of said outer layer and substantially parallel to said fold line and spaced inwardly from said cut score line of weakness, said cut score line of weakness and said second line of weakness defining a tear strip; and

an adhesive region formed on said inner side of said outer layer defined by said free edge and said cut score line;

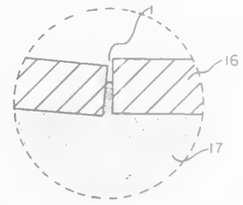
wherein said second line of weakness ruptures and a ply separation occurs in said outer layer between said cut score line of weakness and said free edge in response to an opening force being applied to said tear strip.

4,919,272

EASILY OPENABLE TIGHTLY SEALED BAG

Hisao Kai, Chiba, and Kiyoshi Nakashima, Ageo, both of Japan, assignors to Asahi Chemical Polyflex, Osaka, Japan

Continuation of Ser. No. 803,446, Dec. 2, 1985, abandoned. This application Oct. 12, 1988, Ser. No. 256,220
Claims priority, application Japan, Dec. 3, 1984, 59-254207; Dec. 14, 1984, 59-262951; Aug. 20, 1985, 60-180930
Int. Cl.[5] B65D *5/59*
U.S. Cl. 206—620 9 Claims



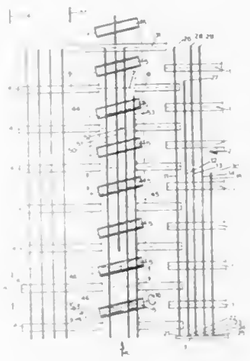
1. An easily tearing openable tightly sealed plastic bag formed of a film containing at least a substrate layer and a heat seal layer, said bag having a sealed part which is comprised of at least two substrate layers held fast to an adjacent heat seal layer, so that the heat seal layer is disposed between the substrate layers forming a sealed edge line proximate to a border end of the substrate layers, which bag is characterized by said sealed part containing in the substrate layers thereof a multiplicity of through cuts, substantially formed over a major portion of the sealed edge line and disposed at angles in the range of 70° to 110° relative to the sealed edge line, at least a significant amount of said through cuts being wholly or partially filled by the heat seal layer in such a manner that the heat seal layer penetrates into the through cuts and closes said through cuts; the tensile strength of the heat seal layer being smaller than that of the substrate layer and the tear strength of the heat seal layer being greater than that of the substrate layer.

4,919,273

APPARATUS FOR SORTING METAL BARS BY LENGTH

Jan Kruit, Slootdorp, and Joannes W. J. Knapen, Utrecht, both of Netherlands, assignors to Hoogovens Groep B.V., Ijmuiden, Netherlands

Filed Feb. 6, 1989, Ser. No. 306,166
Claims priority, application Netherlands, Feb. 19, 1988, 8800425
Int. Cl.[5] B07C *5/14*
U.S. Cl. 209—517 10 Claims



1. Apparatus for sorting elongate bars having ends by length comprising (a) a conveyor having a longitudinal direction, the bars being arranged with their lengths parallel to the longitudinal direction, said conveyor defining means for conveying the bars both longitudinally and laterally and (b) pick-up means for picking up ones of said bars having a predetermined length, said pick-up means picking up said bars at their ends and conveying said bars laterally, with respect to their lengths, thus preventing the longitudinal movement of such bars on the conveyor while bars not of said predetermined length are conveyed longitudinally at least partly past said pick-up means by said conveyor means so as to sort them from said bars having the predetermined length, said conveyor means having rotatably driven rollers of predetermined length, said rollers obliquely positioned with respect to the longitudinal direction of said conveyor to be contacted by the bars, the axis of rotation of each of said driven rollers is at a non-zero angle to the lateral direction perpendicular to the longitudinal direction of the conveyor, said obliquely positioned rollers being, over at least part of their predetermined lengths, cylindrical in shape.

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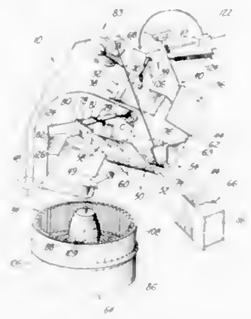
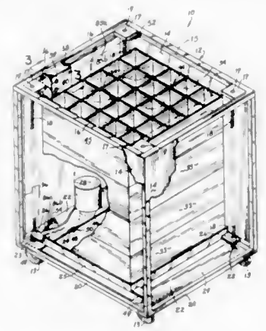
4,919,274
APPARATUS AND METHOD FOR HANDLING RETURNABLE BEVERAGE CONTAINER
Nathan J. Hammond, 885 Tanglewood, E. Lansing, Mich. 48823
Filed Mar. 31, 1988, Ser. No. 175,117
Int. Cl.[5] G07F *7/06*; B07C *5/00*
U.S. Cl. 209—583 46 Claims



1. An apparatus (10) for handling returnable beverage containers (C) of the type having a container identification code thereon identifying the origin of the container (C) for separating returnable containers from non-returnable containers, said apparatus (10) comprising: receptacle means (20) for receiving the container (C); and separation means (22) responsive to the container code and spaced from said receptacle means (20) for separating returnable containers from non-returnable containers; said apparatus (10) characterized by said receptacle means (20) including isolation chamber means (24) having an access (26) thereto and an exit (28) therefrom, said isolation chamber means comprises means for blocking off said separation means (22) from said isolation chamber means (24) and then for simultaneously blocking off said access (26) to said isolation chamber means (24) while receiving the container (C) through said access (26) and said separation means (22) from said isolation chamber means (24) and then for passing the container (C) from said exit (28) to said separation means (22) while blocking off said access (26) to said isolation chamber means (24) to continuously prevent access to said separation means (22) through said receptacle means (20).

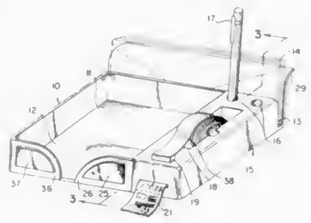
4,919,275
SELF LEVELING DISPENSER
Max G. Futch, 332 Wilton Dr., Baton Rouge, La. 70895, and Ronald H. Drusbel, Baton Rouge, La., assignors to Max G. Futch
Continuation of Ser. No. 264,089, Oct. 28, 1988, abandoned.
This application Sep. 25, 1989, Ser. No. 411,686
Int. Cl.[5] A47F *3/08*
U.S. Cl. 211—1.5 14 Claims

1. A self leveling dispenser comprising
a rack supported for vertical movement relative to ground, said rack being adapted to support a desired number of trays in stacked arrangement one on top the other,
at least one drive shaft connected to said rack for rotation with respect thereto,
a reversible motor drivably connected to said drive shaft, and
a sensor device located above said rack and operatively connected to said motor, said sensor functioning to sense the presence and absence of trays at the vertical location of said sensor to automatically and continuously raise and lower said rack upon removal or addition of a tray or trays



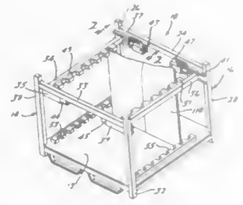
so that a top tray on said rack will be located at a desired dispensing height relative to ground.

4,919,276
PORTABLE DESK TOP TRAY
Yun S. Kim, and Mee S. Kim, both of 5702 Oak Stake Ct., Burke, Va. 22015
Filed Feb. 17, 1989, Ser. No. 311,852
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—13 4 Claims



1. A portable desk top tray for organizing and arranging a plurality of desk implements which comprises:
a main frame,
a memo sheet depression formed in said main frame for receiving memo pads,
an envelope container for containing a plurality of letters and envelopes, said envelope container being formed by extending an outward bent wall from the rear side wall of said main frame,
a hollow body extended from the one side wall of said main frame, said hollow body defining a first box, a second box, and a third box, said first box including a bottom opening and a front opening for inserting a roll of stamps into and dispensing stamps therefrom, one by one, said second box including a roll of tape disposed therein for dispensing a tape from the roll of tape through a tape cutter supported on the top of said first box, said third box including a plurality of writing device holders with a conical configuration, respectively, for receiving various types of writing devices, and
an "L" shaped envelope opener slidably engaged in an elongated channel disposed in said hollow body, said envelope opener having a blade portion and a handle with an aperture for being adapted to engage in a pin disposed on one outside wall of said main frame, whereby the desk top tray is compact and attractive and is arranged in a readily accessible manner.

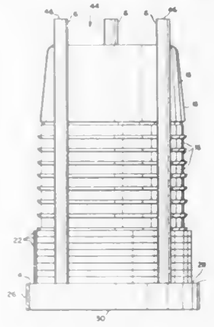
4,919,277
SHIPPING RACK INCLUDING DUNNAGE BAR LOCKING MECHANISM
Thomas M. Jeruzal, Brighton, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.
Filed Mar. 20, 1989, Ser. No. 325,798
Int. Cl.[5] A47G *19/08*
U.S. Cl. 211—41 10 Claims



1. A shipping rack comprising a bottom wall having upstanding oppositely disposed end walls and sides, channel structure provided on an inner face of each end wall, the channel structure extending laterally with respect to the rack, a dunnage bar on each side of the shipping rack, the ends of the dunnage bars being slidably received in a respective channel structure, a dunnage bar locking mechanism on each end wall adjacent each end of each dunnage bar, each locking mechanism including a housing secured to an end wall of the rack, a piston element mounted within the housing for reciprocal movement, the piston element being secured to the end of the adjacent dunnage bar, the piston element being hollow, spring means positioned within the piston element, a handle pivotally mounted to the housing, means interconnecting the handle to the spring means, the handle having an open position wherein the spring means is relaxed permitting easy dunnage bar sliding in the channel structure outwardly of the rack to facilitate loading and unloading of the rack and a closed position wherein the spring means is compressed causing the piston element to draw the dunnage bar inwardly of the rack against a rack load to stabilize the load, the piston element being thereafter movable in either direction under impact forces exerted on the attached dunnage bar to permit dunnage bar movement during absorption of the impact forces.

4,919,278
HOLDER FOR CONTAINERS AND COVERS
Phillip J. Howen, 2541 Crystal Dr., Joliet, Ill. 60435
Continuation of Ser. No. 205,971, Jun. 13, 1988, abandoned.
This application Jan. 31, 1989, Ser. No. 304,072
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—49.1 15 Claims

1. The combination of a holder for empty food containers, empty food containers stacked therein, and covers for said empty food containers also stacked therein, in which each empty food container has a first peripheral dimension and a first cross-sectional dimension at its widest point, said covers having a cross-sectional dimension corresponding to that of said food containers at said widest point to be received on said food containers, said holder comprising a base, a first upwardly extending retaining member positioned on said base at a first base position, a second upwardly extending retaining member positioned on said base at a second base position, and a third upwardly extending retaining member positioned on said base at a third base position, including said first, second and third base positions, said first, second and third upwardly extending retaining members in said first, second and third base position being spaced apart a sufficient distance to receive at least a first one of said empty food containers having said first peripheral dimension and a first one of said covers therebetween, the distances between said first base position and said second base position, between said first base position and said third base position, and between said second base position and said third



base position each respectively being smaller than said first cross-sectional dimension of said each empty food container and cover therefore, including said empty food containers stored in nesting relationship and said covers therefore stored in stacking relationship in said holder.

4,919,279
MAGNETIC GOLF CLUB HOLDING APPARATUS
Gregory A. Crump, 4100 - 65th St., Urlandale, Iowa 50322
Filed Apr. 19, 1988, Ser. No. 183,081
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—70.2 11 Claims

1 A magnetic golf club holding apparatus comprising:
a first magnet having a north pole and a south pole;
a second magnet having a north pole and a south pole;
means for holding said first and second magnet in a spaced apart relationship wherein the north pole of the first magnet is a first predetermined distance from the south pole of said second magnet and the south pole of the first magnet is a second predetermined distance from the north pole of the second magnet, said first and second predetermined distances forming a gap short enough to cause magnetic lines of flux to extend from the first magnet to the second magnet;
a golf club including a shaft attached to a golf club head, said head being constructed of a material attracted to magnetic forces, said golf club head having a top, a bottom and two sides, said bottom spanning across the top of said gap between said first and second magnets and thereby being held securely in such position whereby said handle will be

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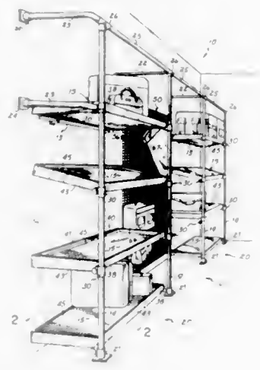
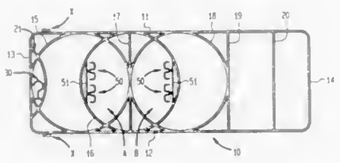
held upwardly and away from said first and second magnets in an address position.

4,919,280
MERCHANDISING SYSTEM
Kenneth A. Phillips, Warwick, R.I., assignor to American Tourister, Inc., Warren, R.I.
Filed Jan. 23, 1989, Ser. No. 299,129
Int. Cl.[5] A47F *5/08*
U.S. Cl. 211—87 4 Claims



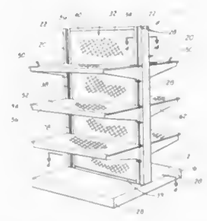
1. A merchandising system comprising,
a wall,
a first set of a plurality of brackets mounted on said wall in vertically spaced relation, each said bracket having a horizontally projecting leg,
at least two vertical poles spaced from said wall and opposite said brackets,
a plurality of cross fittings mounted on each of said poles, each said cross fitting having a horizontal cylinder, each said bracket having a pair of said cross fittings opposite each said bracket,
cylindrical horizontal sleeves in the cylinders of said cross fittings, said sleeves having slotted projecting portions,
and a shelf having a front edge mounted in each pair of said slotted portions of said sleeves and a back edge mounted on each said bracket.

4,919,281
FABRIC BOLT HANGER
Myron Ullman, Canfield, Ohio, assignor to Boardman Molded Products, Inc., Youngstown, Ohio
Filed Dec. 8, 1988, Ser. No. 283,384
Int. Cl.[5] A47F *5/08*
U.S. Cl. 211—116 9 Claims



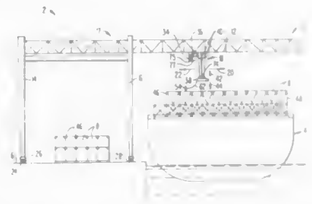
1. A rack for bolts of fabric, comprising:
a molded plastic unitary frame structure having overall length and width dimensions of a size selected to accommodate the length and width dimensions of a bolt of fabric contemplated to be formed thereon and supported thereby,
said unitary frame structure including outer perimeter slender members forming a generally rectangular support frame and including an upper shorter slender member and longer slender members, and secondary reinforcement members interconnected with one another and with said outer perimeters members, at least one of said reinforcement members having curvilinear portions, said members lying substantially in a plane,
a hanger hook member interconnected with said upper shorter slender member of the frame structure, and
fabric holders interconnected with the longer slender members of the frame structure at locations on the longer slender members adjacent said upper shorter slender member, each said fabric holder comprising:
a hook bar including a plurality of piercing hooks for attaching the fabric, said hook bar being disposed substantially perpendicular to the plane of said frame structure,
whereby when said frame structure is suspended from a support by said hanger hook, said piercing hooks extend upwardly so that fabric can be wound about and supported on said frame structure while being secured to said frame structure by hooking engagement of said fabric with said piercing hooks.

4,919,282
MOVABLE GONDOLA SHELVING WITH HIDDEN SHELF ADJUSTMENT MECHANISM
Terry L. Duff, 1201 Carson Dr., Seminole, Okla. 74868, and William R. Gundlach, 2 Seneca, Shawnee, Okla. 74801
Filed May 13, 1987, Ser. No. 50,640
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—134 16 Claims



1. A merchandise display unit positionable on a surface, comprising:
a base unit, comprising:
a platform;
a pair of spaced apart standards extending upward from the platform, each standard defining at least one strip having a thickness and characterized by a front and back surface;
at least one cantilevered shelf supportable on the standards, each shelf characterized by a pair of support members, one at each rear corner of the shelf, each having a back portion adapted for frictionally engaging the front surface of the strip, and each shelf comprising a pair of cam assemblies mounted on the shelf opposite the back portion of each support member so that a portion of the strip is receivable therebetween, wherein each cam assembly comprises:
a cam plate adapted for frictional engagement with the back surface of the strip and mounted for pivotation between an open position and a closed position, wherein in the open position the cam plate is spaced a distance from the back portion of the support member of the shelf which is greater than the thickness of the strip to permit the shelf to be moved along the strip disposed therebetween, and wherein in the closed position the cam plate is spaced a distance from the back portion of the support member which is narrower than the thickness of the strip so that as the cam plate is pivoted toward the closed position, the cam plate engages the back surface of the strip and the back portion of the support member engages the front surface and the strip thereby is gripped between the cam plate and the back portion of the support member so that the shelf is rigidly mounted on the standard at the point of engagement; and
means for continuously urging the cam plate toward the closed position.

4,919,283
CONTAINER SHIP WORKER SAFETY SYSTEM
Robert E. Riley, San Rafael, and John McNeill, Concord, both of Calif., assignors to Marine Terminals Corporation, San Francisco, Calif.
Filed Jan. 28, 1988, Ser. No. 149,344
Int. Cl.[4] B66C *13/44*
U.S. Cl. 212—160 10 Claims



8. A safety system, for use by workers on top of levels of containers on container ships, such as when the workers are used to place and retrieve stacking cones while loading and unloading the container ships, using an overhead trolley crane of the type having a frame movable in forward and aft gantry directions, an operator's station housing a crane driver and supported by the frame, an overhead track supported by the frame, and a trolley which moves along the overhead track in on shore and off shore trolley directions, the trolley including a container bridle, the bridle movable in hoist and lower directions, the movement of the bridle being controlled by the crane driver through a movement control system, the safety system comprising:
a safety line;
the safety line including a coupling for selectively connecting the worker to the bridle through the safety line;
status signaling means, coupled to the movement control system, for visually signaling at least first, second and third operational statuses of the crane to the worker;
the first, second and third operational statuses being stopped, slow speed and normal speed operational statuses of the bridle;
override means, coupled to the movement control system, for preventing movement of the bridle when actuated; and
switch means, actuated by the worker, for actuating the override means;
whereby all movement of the bridle can be at least temporarily prevented through the actuation of the switch means

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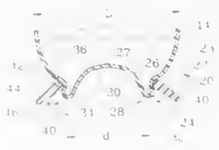
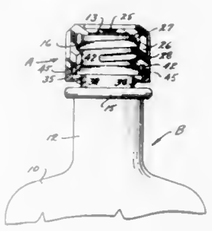
4,919,284
PLASTIC CONTAINER WITH RING STABILIZED BASE
William H. Tiedemann, Cedarburg, and Dennis L. Marshall, Wauwatosa, both of Wis., assignors to Hoover Universal, Inc., Ann Arbor, Mich.
Filed Apr. 10, 1989, Ser. No. 335,998
Int. Cl.[5] B65D *25/24*
U.S. Cl. 215—12.1 13 Claims



1. A plastic container for carbonated beverages comprising:
a tubular body having an upright sidewall and a base structure extending downwardly from said sidewall so as to close the lower end of said tubular body, said base structure including an upwardly concave bottom wall at the center of said base structure, a heel portion at the periphery of the bottom wall forming the lowermost portion of said tubular body and having a diameter less than the diameter of the sidewall and an outer wall having a lower end merging with said heel portion and an upper end merging with said sidewall, said outer wall inclined radially inwardly and upwardly from said lower end to form a radially inwardly recessed portion in said outer wall, said outer wall extending upwardly and radially outwardly from said recessed portion to said outer wall upper end; and
a stabilizing ring seated in said recessed portion and extending radially outwardly and downwardly from said outer wall, said stabilizing ring terminating at a lower end portion radially outwardly and axially downwardly of said heel portion to form a support surface for said container radially outwardly of said heel portion to stabilize said container against tipping, said outer wall being flexible so that when the container is filled, the lower end of the outer wall below said recessed portion is forced to move outwardly and prevents removal of the ring.

4,919,285
TAMPER EVIDENT CLOSURE AND METHOD OF MANUFACTURE OF THE SAME
William M. Roof; Eric J. Roberts, both of Louisville, and Dennis P. Blair, Prospect, all of Ky., assignors to Thoroughbred Plastics Corp., Louisville, Ky.
Filed May 11, 1988, Ser. No. 192,564
Int. Cl.[5] B65D *41/34*
U.S. Cl. 215—230 42 Claims



1. A tamper evident closure for use on a container having a

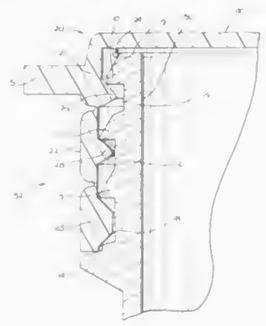
neck provided with a mouth, cap retaining means and including a shoulder disposed below the cap retaining means thereof, said closure comprising a cap, a security ring formed disjunctively from said cap, and fused bridge means for interconnecting said security ring to said cap, said cap including retaining means adapted to cooperate with the cap retaining means of the container neck thereby to retain said cap on the container neck as juxtaposed for closing the mouth thereof, said security ring including anchor means disposed to pass over and catch beneath the shoulder of the container when said cap is juxtaposed on the container neck for closing the mouth thereof, and said fused bridge means comprise frangible zones of weakness adapted to rupture during removal of said cap from said container neck whereby to enable said security ring to break away from said cap, said anchor means being engageable with the shoulder of the container neck for retaining said security ring on the container neck when said cap is removed therefrom.

4,919,286

HINGED CLOSURE AND CONTAINER

Albert J. Agbay, Sr., Worcester, Mass., assignor to Robert Linkletter Assoc., Shrewsbury, Mass.

Filed May 27, 1988, Ser. No. 199,672
Int. Cl.[5] B65D *41/34*
U.S. Cl. 215—235 10 Claims



1. A container and closure combination comprising:

a container having a neck terminating in a top rim defining a mouth with an external cap latch extending outwardly from said top rim of said neck, a cap restraint which protrudes externally from said neck below said cap latch so as to have a cavity between said cap latch and said cap restraint, a base ceiling which protrudes externally from said neck below said cap restraint so as to have a groove between said base ceiling and said cap restraint, a base rest which protrudes externally from said neck below said base ceiling so as to have a depression between said base ceiling and said base rest;

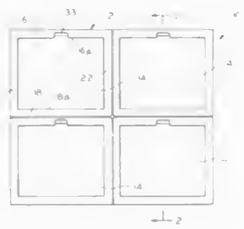
a closure having a cap cover, a tear strip, a hinge and an anchor band, said cap cover having a protruding circumferential exterior sealing flange that abuts the external circumference of the top rim, said cap cover having no other annular protrusion from the underside of the cap cover within the circumference of the top rim which serves to assist in forming a seal with said container, said cap cover having an inwardly facing sealing rib such that when said cap cover is closed on said container said sealing rib abuts and engages said cap latch to secure said cap cover on said container, said hinge connecting said cap cover to said anchor band, said anchor band being located in said depression between said base ceiling and said base rest to secure said closure to said container, said tear strip being attached to said cap cover and said anchor band over at least a portion of the circumference of said tear strip except for the portion of the circumference of said closure where a thin membrane and said hinge occurs, said tear strip having an inwardly protruding locking bead over at least a portion of the interior side of said tear strip, said locking bead cooperatively engaging said cap restraint to securely retain said cap cover on said container.

4,919,287

DISPLAY UNIT FOR CONSUMER PRODUCTS

Wayne J. Haskett, 10443 S. Natoma, Chicago Ridge, Ill. 60415; Leonard Andersen, 5361 W. Otto Pl., and John A. Andersen, 10215 S. Kildare, both of Oak Lawn, Ill. 60453

Filed Jun. 3, 1988, Ser. No. 202,216
Int. Cl.[5] A47G *19/08*
U.S. Cl. 211—41 10 Claims



1. A display unit for a plurality of consumer products, comprising:

a frame having a plurality of generally rectangular consumer product-receiving openings adapted to receive said consumer products therewithin, said openings each being defined by parallel top and bottom frame portions joined by parallel side frame portions, said frame having a front side through which said consumer products can be placed in said consumer product-receiving openings and a rear side opposite thereof;

said top and bottom frame portions of each of said consumer product-receiving openings being spaced apart by a greater distance than the corresponding vertical dimension of said consumer products and said side frame portions of each of said consumer product-receiving openings being spaced apart by a distance substantially the same as the corresponding horizontal dimension of said consumer products;

a substantially continuous inwardly projecting flange associated with each of said top and bottom frame portions of each of said consumer product-receiving openings, said substantially continuous inwardly projecting flanges being spaced apart by a lesser distance than the corresponding vertical dimension of said consumer products but being spaced apart by a distance sufficient to permit insertion of said consumer products at an oblique angle to the plane of said frame and to permit pivoting of said consumer products into said opening under said flanges and being such that said consumer products can be repeatedly inserted into said consumer product-receiving openings and removed from said consumer product-receiving openings on demand only from said front side of said frame, said substantially continuous inwardly projecting flanges also being adapted to retain said consumer products in said consumer product-receiving openings until said consumer products are removed on demand; and

barrier means integrally associated with said rear side of said frame so as to permit insertion of said consumer products into said consumer product-receiving openings only through said front side thereof, said barrier means being defined by a rear wall integral with said rear side of said frame in spaced relation to said front side of said frame by

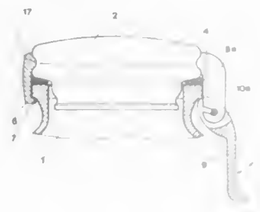
substantially the same distance as the width dimension of said consumer products.

4,919,288

HERMETIC SEAL DEVICE FOR GLASS JARS

Roberto L. Monti, Roma, Italy, assignor to Vetreria Parmense Bormioli Rocco S.p.A., Parma, Italy

Filed Apr. 18, 1989, Ser. No. 339,780
Claims priority, application Italy, Jun. 8, 1988, 40091 A/88
Int. Cl.[5] B65D *45/02*
U.S. Cl. 215—284 6 Claims



1. A hermetic seal device for glass jars, of the type designed to compress an annular sealing element (4) permanently between the glass lid (2) and the neck of the jar (1), comprising:

a collar (5), fastened stably to the periphery of the lid (2), incorporating a lip (6) shaped and positioned in such a way as to locate beneath an annular rim (7), afforded by the neck of the jar, when the assembled lid and collar are applied to the neck of the jar, and a protruberance (8) the bottom end of which extends below the level of the annular rim (7) when the assembled lid and collar are applied to the neck of the jar;

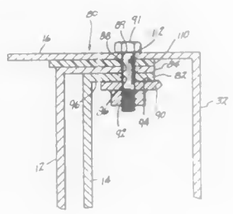
a lever (9), pivotably suspended from the bottom end of the protruberance and comprising an arm (10*a*, 10*b*) with a cam profile having a notch (11) that permits of halting the rotation of the lever on arrival at a given stable position, which, when the assembled lid and collar are applied to the neck of the jar and the lever rotated, engages with the annular rim afforded by the neck of the jar and to the protruberance a force that draws the collar and lid toward the jar.

4,919,289

PORTABLE STORAGE TANK

Peter A. Bartis, 105 East View Terr., Meriden, Conn. 06450

Continuation-in-part of Ser. No. 135,058, Dec. 18, 1987, Pat. No. 4,815,621. This application Mar. 3, 1989, Ser. No. 318,233
The portion of the term of this patent subsequent to Jan. 28, 2006, has been disclaimed.
Int. Cl.[5] B65D *90/00*
U.S. Cl. 220—1 B 15 Claims



1. A container for storing liquids which comprises:

a primary tank for holding liquid to be stored;

a secondary tank substantially surrounding said primary tank, said secondary tank containing said stored liquid in the event of the failure of said primary tank;

a cover for closing at least said secondary tank;

means for securing said cover to at least one of said tanks;

said cover securing means including a flange member associated with at least one of said tanks, at least one aperture in said flange member, at least one aperture in said cover, each said cover aperture being alignable with a flange aperture so as to form a mating set of apertures, a fastener passing through each said mating set of apertures and means for engaging said fastener so as to fix said cover in said closed position; and

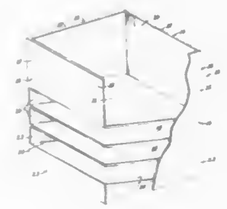
an inlet box attached to said cover, said inlet box having means for introducing liquid into and for withdrawing liquid from said primary tank and means for preventing access to said liquid introducing and withdrawing means.

4,919,290

RECYCLING WASTEBASKET

L. Kathleen Wadel Drippé, 2166 W. 58th St., Indianapolis, Ind. 46208

Filed Mar. 17, 1989, Ser. No. 325,142
Int. Cl.[5] B65D *25/04*
U.S. Cl. 220—1 T 4 Claims



1 An open-topped wastebasket for the disposal of discard items in a sorted manner for expediting reclamation thereof, the wastebasket comprising:

a bottom panel,

upstanding side walls having upwardly-extending portions extending a substantial distance upwardly of the bottom panel,

the upwardly-extending portions co-operating with the bottom panel to provide an open-topped hopper for discard items,

the wastebasket being improved by means providing for the storage of discard items in a sorted manner, and comprising the following in combination with such a wastebasket:

the provision that the wastebasket's upstanding side walls have downwardly-extending portions extending a substantial distance downwardly of the wastebasket's bottom panel,

and there is also provided a plurality of receptacle means below the said bottom panel of the wastebasket, for receiving, respectively, different types of discard items,

the said downwardly-extending portions providing a plurality of functions as follows:

(a) they provide a base for the wastebasket which supports

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the wastebasket substantially above a supporting floor, and

(b) the said downwardly-extending portions also provide means for supporting the receptacle means, and

(c) the said downwardly-extending portions also provide an enclosure for the receptacle means; and

in which the receptacle means includes receiver trays; and there are support members, which are supported by the downwardly-extending portions of the upstanding side walls, and which support the receptacle means for sliding in and out of the wastebasket; and

in which the support members provide a downwardly slanting front-to-rear support of the receiver trays, such that when installed in the wastebasket they slant downwardly from front to rear.

3. A salvage-facilitation device, in a combination including an open-topped wastebasket hopper, for providing for the disposal of a plurality of types of salvageable discard items in a sorted and sorted-storage manner for expediting the reclamation thereof, the device comprising:

a panel and upstanding side walls, the panel providing a bottom panel of the wastebasket hopper,

and the upstanding side walls having upwardly-extending portions extending a substantial distance upwardly of the panel, and also having downwardly-extending portions extending a substantial distance downwardly of the panel,

the upwardly-extending portions co-operating with the panel to provide an open-topped wastebasket hopper for discard items,

the device also providing for the sorting and sorted storage of salvageable discard items, by providing, in combination with such a wastebasket hopper, a plurality of receptacle means, below the said bottom panel of the wastebasket hopper, for receiving, respectively, different types of discard items,

the said downwardly-extending portions providing a plurality of functions as follows:

(a) they provide a base for the wastebasket hopper which supports the wastebasket hopper substantially above a supporting floor, and

(b) the said downwardly-extending portions also provide means for supporting the receptacle means, and

(c) the said downwardly-extending portions also provide an enclosure for the receptacle means; and

in which the receptacle means include receiver trays; and there are support members, which are supported by the downwardly-extending portions of the upstanding side walls, and support the receptacle means for sliding in and out of the device; and

in which the support members provide a downwardly slanting front-to-rear support of the receiver trays, such that when installed in the device they slant downwardly from front to rear.

4,919,291

METALLURGICALLY IMPROVED TIP-OFF TUBE FOR A VACUUM ENCLOSURE

Timothy S. Romano, Goleta, and Kenneth L. Gustafson, Buellton, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Nov. 23, 1987, Ser. No. 124,220

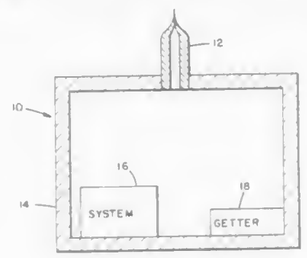
Int. Cl.[5] H01J 9/26; H01K 3/12

U.S. Cl. 220—2.2 7 Claims

1. A hollow elongated vacuum sealing member, said member being operable for having a compressive force applied thereto for crimp sealing an inner portion of said member, said member comprising:

a hollow metallic tubular substrate comprising an inner and an outer surface; and

a metallic layer comprised of a noble metal formed upon at least said inner surface of said substrate, said layer being



diffused to a predetermined depth within at least said inner surface.

4,919,292

REINFORCED JUNCTION BOX ASSEMBLY

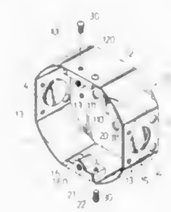
Tsui-Chen Hsu, No. 12, Alley 66, Lane 275, Nan-Tun Rd., Sec. 1., Taichung, Taiwan

Filed Feb. 10, 1989, Ser. No. 309,781

Claims priority, application Taiwan, Jan. 11, 1989, 77/200,240

Int. Cl.[5] H02G 3/08

U.S. Cl. 220—3.2 2 Claims



1. A reinforced junction box assembly having a polygonal open housing body formed with a top surface on one side thereof, a plurality of side walls vertically located along a periphery of the top surface, and at least one pair of holding flanges, each one of which has a guide opening in a middle portion thereof, integrally formed along each outer edge of two opposing side walls of the open housing body for providing an anchor position thereat; the improvement comprising:

at least one pair of mounting means, each having a reinforced ridge formed between two mounting sides thereof with a threaded bore extending through said reinforced ridge, and a plurality of screw holes formed in said mounting sides for fixing the mounting means on an interior surface of the two opposing side walls of the housing body against the holding flanges thereof, with the threaded bores of said mounting means aligned with the guide openings of the holding flanges; both of said mounting means being fixed to an interior surface of the two opposing side walls against the holding flanges, whereby safe connections between said mounting means and a suspension load can be effectively made through the guide openings of the holding flanges and the threaded bores of said mounting means.

4,919,293

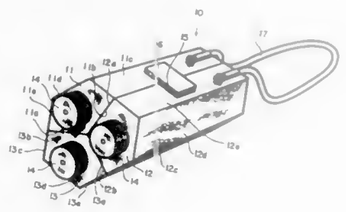
MULTI-UNIT DISPENSING CONTAINER ASSEMBLY

Paul Buckley, 78 Orchard St., Cranston, R.I. 02910

Filed Jun. 2, 1989, Ser. No. 360,427

Int. Cl.[5] B65D 37/00, 85/67

U.S. Cl. 220—23.2 10 Claims



1. A multi-unit dispensing container assembly, comprising

(a) a plurality of separate, elongate polygonal tubular dispensing containers which fit together in surface-to surface contact, each of said containers comprising a plurality of longitudinally-extending side walls, and first and second end walls on opposite ends of and integral with said side walls, and a closable opening positioned in one of said end walls, at least one of said side walls of each of said containers being adjacent to one of said side walls of another of said containers, and at least one of said side walls of each of said containers being non-adjacent to another of said side walls of another of said containers; and

(b) hinge means connecting said containers along side edges of said adjacent side walls to permit movement of said containers between a closed position in which said adjacent side walls fit flush together, and said non-adjacent side walls abut to form a single planar surface; and an open position in which said adjacent side walls are spaced from each other except at said side edges of said adjacent side walls.

4,919,294

BOTTOM STRUCTURE OF A THIN-WALLED CAN

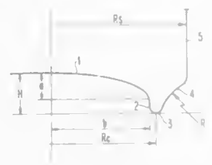
Yoji Kawamoto; Tetsuo Yuhara, both of Nagasaki; Koichi Takagi, Nagoya, and Kanji Udagawa, Sunto, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Mitsubishi Metal Corporation, both of Tokyo, Japan

Filed Apr. 6, 1989, Ser. No. 334,853

Claims priority, application Japan, Apr. 6, 1988, 63-83135; Mar. 9, 1989, 64-54874

Int. Cl.[5] B65D 7/42

U.S. Cl. 220—70 3 Claims



1. A bottom structure of a thin-walled can, said structure comprising a dome section having a cross-sectional shape formed of a curve whose radius of curvature changes substantially continuously, and a counter section contiguous to said dome section and formed so as to align with the direction of extension of said dome section.

4,919,295

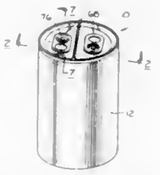
MULTI-CELL DRINK CONTAINER

Terry Hitzler, 850 Saylor, Elmhurst, Ill. 60126

Filed Aug. 21, 1989, Ser. No. 396,309

Int. Cl.[5] B65D 21/00

U.S. Cl. 220—23.83 8 Claims



1. A multi-cell container comprising,

a cylindrical can having an originally open top,

a cup shaped insert in the can, and having an open top and being otherwise continuous,

the insert defining a first space for holding a liquid, and the can defining a second space surrounding the insert, also for holding a liquid,

means mounting the insert in the container with the open top of the insert essentially in the same plane with the open top of the can, and

cover means secured to the can sealingly closing both said spaces and including separate openable closure members operably associated with respective said spaces.

4,919,296

CONTAINER

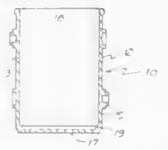
Janet A. Kirsh, Main Road; Cheryl A. Longobardi, Lot 884 Lieberts Lane, both of Brunkerville, New South Wales, 2323, and Thomas Kirsh, Brunkerville, all of Australia, assignors to Janet A. Kirsh and Cheryl A. Longobardi, both of Brunkerville, Australia

Filed Jul. 20, 1988, Ser. No. 221,861

Claims priority, application Australia, Jul. 20, 1987, PI3198

Int. Cl.[5] B65D 1/30

U.S. Cl. 220—85 H 5 Claims



1. A substantially rigid receptacle to receive a relatively flexible drink container of rectilineal form, said receptacle being hollow and integrally moulded of plastics material so as to have a base, four sides and an open top, the sides being generally normal to the base, and arranged in parallel pairs, with the sides of one pair being generally normal to the sides of the other pair, said base and side walls encompassing a hollow to receive said container so that the container can be manipulated by a user gripping the receptacle without transferring any substantial compression force to the container, and wherein at least one of the sides has a projection, and another side has a recess so that two or more receptacles may be secured together by mating engagement of one of the projections of one of the receptacles with one of the recesses of another receptacle.

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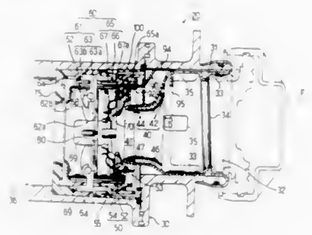
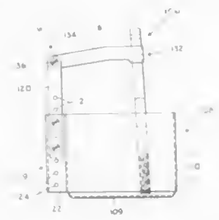
4,919,297
FUEL INJECTION PORT
Tamiyosi Ohasi, Aichi, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan
Filed Mar. 2, 1989, Ser. No. 318,182
Claims priority, application Japan, Mar. 7, 1988, 63-053383; Jun. 14, 1988, 63-146148; Oct. 17, 1988, 63-261152
Int. Cl.[5] B67D *5/04*
U.S. Cl. 220—86 R 19 Claims



1. A fuel injection port comprising:
a cylindrical casing provided with an inlet to insert a fuel injection nozzle and an outlet continuing to a fuel tank;
a nozzle guide means fixed to inner circumferential surface of said casing and having a guide port to pass said nozzle therethrough;
an annular seal means positioned to the back side of said nozzle guide means for sealing outer circumferential surface of said nozzle;
a seal means enlarging surface arranged face to said seal means;
a biasing means for making one abut on the other among said seal means and said seal means enlarging surface and for enlarging the inner circumferential surface of said seal means at least immediately before said nozzle is inserted in the furel injection port; and
a moving means for moving one in direction separating from the other among said seal means and said seal means enlarging surface in interlocking with insertion of said nozzle against biasing force of said biasing means and for releasing the enlarging of said seal means so that the inner circumferential surface of said seal means abuts on the outer circumferential surface of said nozzle.

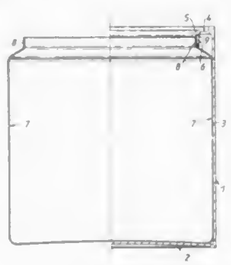
4,919,298
TRIM BUCKET
Steven R. Gregory, 1459 Palisades Dr., Pacific Palisades, Calif. 90272
Continuation-in-part of Ser. No. 67,209, Jun. 29, 1987, abandoned. This application Jul. 19, 1988, Ser. No. 221,130
Int. Cl.[5] B65D *25/28*
U.S. Cl. 220—94 R 6 Claims

1. A paint bucket for use in painting trim or the like comprising:
a cylindrical container having a bottom, a cylindrical side wall and an open top, the side wall having a height less than the diameter of the container;
handle and brush rest means connected to the side wall of the container, the handle and brush rest means including
a generally vertically extending connecting section having an upper end portion and a lower end portion, the lower end portion being rigidly interconnected to the container,
a generally horizontally extending gripping section interconnected at one end thereof to the upper end portion of the connecting section, the gripping section having a portion extending over the center of gravity of the container for gripping with a hand to transport the container, and
a pair of spaced finger members interconnected to the other end of the the gripping section and adapted to nestingly accept a handle of a paint brush therebetween when the brush is oriented bristle-end down within the container;
the handle and brush rest means being connected to the side wall of the container so that when a working amount of



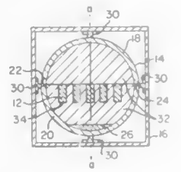
paint is placed within the container and the handle of a paint brush is operatively placed between the spaced finger members only the bristle-end of the brush will extend into the paint within the container thereby preventing the bristles from drying out while eliminating excess paint from getting onto the paint brush.

4,919,299
CONTAINER ASSEMBLY AND METHOD OF CONSTRUCTING SUCH AN ASSEMBLY
Peter R. Haines, Skelmersdale, United Kingdom, assignor to Lin Pack Mouldings Limited, Birmiogham, United Kingdom
Filed Jun. 3, 1988, Ser. No. 202,832
Claims priority, application United Xingdom, Jun. 5, 1987, 8713252
Int. Cl.[5] B65B *3/00*
U.S. Cl. 220—404 7 Claims



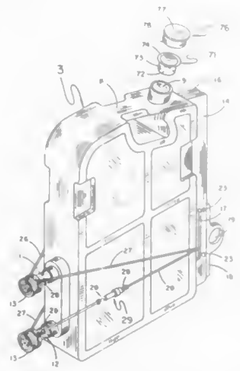
1. A container assembly comprising an outer open topped container part formed of a first plastics material having a base and an upwardly extending side wall; an open topped inner container part formed of a second plastics material and located and secured to provide a liner within the outer container part, said liner extending within the outer container part downwardly from an internal peripheral flange at the open top of the outer container part; a removable lid, said lid being fitted to said flange to form a seal with the inner container part, said lid having a closure face of the second plastics material whereby the assembly forms a sealed chamber defined by the second plastics material; said internal flange being provided on the outer container part and being of the first plastics material, said flange comprising a cylindrical skirt which extends downwardly therefrom; said inner container part having a cylindrical neck which is closely received within said cylindrical skirt, and wherein the closure face of the lid is in sealing abutment with the interior of said neck, and said neck of said liner having a rim which is closely received in an annular rebate in said flange.

4,919,300
SHIPPING DEVICE
Kristy L. Anderson, Allegheny County, and Edward R. Bollinger, Westmoreland County, both of Pa., assignors to RJ Lee Group, Inc., Monroeville, Pa.
Filed Mar. 31, 1989, Ser. No. 332,527
Int. Cl.[5] B65D *81/00*
U.S. Cl. 220—408 16 Claims



1. A device for transporting an item in a specific orientation comprising:
(a) a housing comprising a cubical frame having six faces wherein at least one face is removably fastened to said frame;
(b) a container concentrically positioned within said housing for receiving said item;
(c) means for counterbalancing said container within said housing and for at least counterbalancing a weight of said item; and
(d) bearing means to permit rotation of said container relative to said housing whereby, in use, as an orientation of said housing is altered, said container rotates within said housing responsive to said counterbalancing means to maintain said container in a specific orientation

4,919,301
FLUID RESERVOIR STRUCTURE FOR A FLUID SYSTEM
Steven L. Miller, Shelby County, Ky., assignor to Environmental Water Technology, Inc., Louisville, Ky.
Filed Feb. 13, 1989, Ser. No. 309,187
Int. Cl.[5] B65D *25/00*
U.S. Cl. 220—85 S 26 Claims



1. A fluid reservoir structure for supplying treating fluid to be circulated through a fluid system, the fluid system including quick connect fittings and having a fluid pump associated therewith to receive and circulate treating fluid from said fluid reservoir structure through said fluid system and fluid reservoir structure during a circulating mode comprising:
fluid receptacle means adapted to receive and store treating fluid from a preselected supply source to be circulated through said fluid system and said fluid receptacle means when said fluid receptacle means is connected to said fluid system;
spaced fluid inlet and outlet conduits mounted on a wall of said fluid receptacle means;
adjustable quick connect fittings on said spaced fluid inlet and outlet conduits on said fluid receptacle means to matingly engage with said quick connect fittings in said fluid system during a fluid circulating mode; and,
actuating means to remotely actuate said adjustable quick connect fittings on said spaced conduits for engagement with said quick connect fittings of said fluid system during a fluid circulating mode.

4,919,302
TISSUE BOX WITH DISPOSAL COMPARTMENT
Donald S. McPherson, P.O. Box 156, Murphy, Oreg. 97533
Filed Jan. 23, 1989, Ser. No. 299,348
Int. Cl.[5] B65H *1/04*
U.S. Cl. 221—34 5 Claims

2. A tissue box with disposal compartment, which comprises:
a. a new tissue dispensing compartment, which includes:
(1) a top wall, having a opening formed for the dispensing of tissues;
(2) a bottom wall;
(3) four side walls oriented at right angles to said top and bottom walls; and
b. a used tissue disposal compartment, integrally attached to said new tissue dispensing compartment and having, relative to said new tissue dispensing compartment, a folded position for transport and storage and an extended position for use, said used tissue disposal compartment comprising:
(1) four side walls, where:
(a) a first side wall is common to a substantial portion of one of the four side walls of said new tissue dispensing compartment;
(b) a second side wall and a third side wall which extend at right angles to the first side wall and are spaced to form opposing side walls in said extended position;
(c) said second and third side walls being foldable so as to lie in proximity to said first side wall while in the folded position;
(d) a fourth side wall connected to said second and third side walls so that, with the second and third side walls in the extended position, the fourth side wall forms a spaced and opposing side wall to said first side wall; and when the second and third side walls are in the folded position, the fourth side wall is substantially parallel to and in the proximity to the first side wall;
(2) a bottom wall which is foldingly attached to the first

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side wall lower end so that when in the folded position it lies substantially parallel to and in proximity to the first side wall, and in the extended position, unfolds to form the bottom of the used tissue disposal compartment; and

(3) means for attaching said bottom wall to said fourth wall in the extended position, which includes:

(a) a tab extending from the bottom wall;

(b) a tab opening in the lower portion of said fourth side wall, formed so that when the side walls are in extended position, and the bottom wall is unfolded to form the bottom of the compartment, the tab will engage in said tab opening.

4,919,303

METHOD FOR FEEDING PARTICULATE MATERIAL

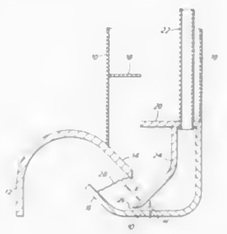
Ghislain Boudreault, Chicoutimi, Canada, assignor to Alcan International Limited, Montreal, Canada

Continuation-in-part of Ser. No. 869,007, May 30, 1986, abandoned. This application Sep. 7, 1988, Ser. No. 241,360

Claims priority, application United Kingdom, Jun. 6, 1986, 8514287

Int. Cl.[5] **B67B** *1/00, 3/00;* **B65G** *53/40;* **C25C** *3/00*

U.S. Cl. 222—1 **4 Claims**



1. A method of feeding particulate material by the use of apparatus comprising a passage having a floor, an upstream section for receiving the material and conveying it in a downward direction, and a downstream section for delivering the material, the two sections being connected by a chicane consisting of a horizontal or upwardly inclined section of the passage of sufficient length to cause the particulate material to come to rest therein in the absence of a flow of gas therethrough, a baffle system in the upstream section comprising at least two baffles mounted on opposite sides of the upstream section of the passage to cause the particulate material to follow a tortuous path round them to control the rate of flow of the material to the chicane, a pipe leading to a slot within the passage, the slot extending horizontally adjacent the floor of the passage and facing downstream near the upstream end of the chicane, which method comprises passing through the slot air compressed at a pressure below one meter of water gauge and starting and stopping the passage of air at predetermined intervals so as to start and stop the flow of the particulate material.

4,919,304

BUBBLER CYLINDER DEVICE

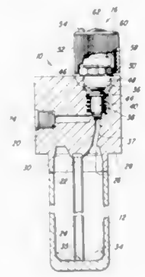
Marion Markowicz, Basking Ridge, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 761,470, Aug. 1, 1985, abandoned. This application Jun. 3, 1988, Ser. No. 202,166

Int. Cl.[5] **B67B** *7/24*

U.S. Cl. 222—3 **1 Claim**

1. A bubbler device for storage and delivery of electronic grade organometallic compounds, said device comprising a cylinder closed at its bottom and welded at its top rim to a cylindrical skirt member of a single block to form a container of which said block is the top closure portion, separate recesses in said block, each recess opening to an outer surface of said block and, within the first said recess, valve means for controlling inlet of gas into said container, and within another of said recesses valve means for controlling outlet of gas from inside said container, a first passage extending through said block from an inlet port at an outer surface of said block to said first recess and continuing from said first recess through the block to a first opening at the surface of the block inside said container, a second passage extending through said block from an outlet port at an outer surface of said block to said second recess and continuing from said second recess through the block to a second opening at the lower surface of the block inside said container, said second opening located within a recess of said lower surface such that said second opening is at



the highest point within said container, each of said valves in said first and second recesses being controllable from outside said block between open and closed positions for controlling flow of gas through said first and second passages respectively, each of said valves in its recess comprising a diaphragm which seals the recess between a valve stem outside said diaphragm and a valve plug inside said diaphragm in said recess, a dip tube inside said container fitted to said first opening in the block at the inner end of said first passage, said dip tube extending downward from said first opening to the bottom of said container and at least one slot or opening at or near the lower end of said dip tube for passage of gas from the dip tube into the container, the inner surfaces of said container and said dip tube being either electropolished or coated with a protective coating to provide a barrier to contamination of the contents by the metal of said container and dip tube.

4,919,305

FUEL DISPENSING NOZZLE WITH BUILT-IN FLOW REGULATOR

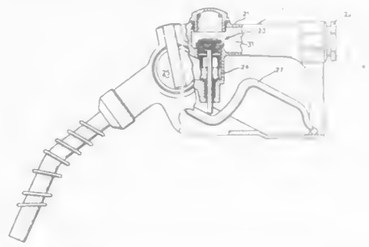
Alexander R. Podgers, Lake City, Pa., assignor to Emco Wheaton, Inc., Raleigh, N.C.

Continuation of Ser. No. 117,338, Nov. 6, 1987, abandoned. This application Apr. 4, 1989, Ser. No. 333,860

Int. Cl.[5] **B67D** *5/08, 5/16*

U.S. Cl. 222—55 **7 Claims**

1. A fuel nozzle comprising a housing having a passage therethrough from an inlet to a nozzle outlet, said passage providing a first passage portion defined by a cylindrical wall open to a lateral second passage portion, a lateral wall substantially perpendicular to said cylindrical wall and aligned therewith, an open-ended sleeve providing a cylindrical wall portion having port openings therein, a seal providing a fluidtight joint between said sleeve and said cylindrical wall of said first passage, one end of said sleeve being engageable with and closed by said lateral wall, a piston in said sleeve movable between a first position substantially clear of said port openings to operative positions in which it covers portions of said port openings and throttles flow of fuel therethrough, a spring between said lateral wall and said piston resiliently urging said piston toward said first position, and an orifice through which fuel flows operating to produce a pressure differential across



said piston causing said piston to move against the force of said spring and limit the flow of fuel through said nozzle to a predetermined maximum flow rate

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4,919,306

CONTAINER FOR FLUENT MATERIAL INCLUDING A RING-LIKE HOLDER FOR A BAG

Harry D. Heaps, Jr., and Charles E. Boy, both of Bala-Cynwyd, Pa., assignors to Connelly Containers, Inc., Bala-Cynwyd, Pa.

Continuation of Ser. No. 149,920, Jan. 25, 1988, abandoned, which is a continuation-in-part of Ser. No. 944,502, Dec. 17, 1986, Pat. No. 4,771,917. This application Mar. 31, 1989, Ser. No. 332,375

Int. Cl.[5] **B65D** *37/00*

U.S. Cl. 222—105 **38 Claims**

1. A container for non-gaseous fluent material to be transported therein comprising:

an outer wall, a bottom, a top on said outer wall,

a bag within said wall for holding non-gaseous fluent material, said bag having an upper portion including a mouth which defines a filling opening in the top of said bag, said bag having substantially the same size and shape as the interior of said container when said bag is filled with fluent material, and

means for supporting the mouth of said bag in open position for enabling filling of said bag with non-gaseous fluent material through said open mouth comprising,

a beam,

means for supporting said beam transversely of said container wall below the top of said container,

an opening in said beam,

said bag upper portion extending through said opening,

a ring-like holder independent of said beam on the top of said beam, said ring-like holder having an opening larger than said opening in said beam, and

means for securing the mouth portion of said bag to said holder without substantially reducing the size of the filling opening defined by said mouth of said bag and said opening of said ring-like holder.

4,919,307

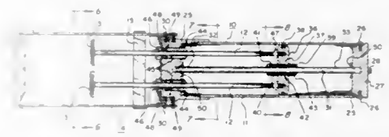
DUAL COMPONENT PNEUMATICALLY OPERATED CAULKING GUN

Franz K. Schneider, Jr., Moorestown, N.J., and Michael V. Haubert, Erdenheim, Pa., assignors to Albion Engineering Company, Philadelphia, Pa.

Filed Nov. 10, 1988, Ser. No. 269,581

Int. Cl.[5] **B67D** *5/46*

U.S. Cl. 222—137 **6 Claims**



1 In a dual component pneumatically operated caulking gun utilizing a pneumatic cylinder assembly having a pneumatic cylinder including a forward bulkhead, a rear bulkhead, a piston movable axially within the cylinder and dual piston rods carried by the piston extending through the forward bulkhead and terminating in ejector rams and a dual component cartridge assembly carried by the forward bulkhead assembly for supporting a pair of component cartridges in operable position with respect to the ejector rams, an improvement in the cylinder assembly permitting ease of piston movement and bidirectional power movement thereof comprising:

a hollow air transfer and piston guide tube having first and second ends disposed within the cylinder concentrically thereof extending through an aperture within the piston and secured at its first end by the forward bulkhead and at its second end by the rear bulkhead;

first air passage means communicating with the first end of the guide tube;

second air passage means communicating between the second end of the guide tube and the cylinder adjacent the rear bulkhead;

third air passage means communicating with the cylinder adjacent the forward, bulkhead; and

air valve means to selectively port a source of air pressure to the first and third air passage means to selectively move the piston and associated piston rods and ejector rams axially upon the piston guide tube in eject and retract directions.

4,919,308

HOT MELT DISPENSER

Gerald A. Majkrzak, Minneapolis, Minn., assignor to May Coating Technologies, Inc., St. Paul, Minn.

Continuation of Ser. No. 130,407, Dec. 9, 1987, abandoned. This application May 4, 1989, Ser. No. 351,326

Int. Cl.[5] **B67D** *5/62*

U.S. Cl. 222—146.5 **39 Claims**

1. A hot melt dispenser for dispensing a solid, unitary mass slug of hot melt from a container wherein said slug adheres to the inside surfaces of said container in its unheated condition, said container open at one end to permit said slug to slide freely out of said container when said slug is released therefrom by the lowering of the adhesion of said slug to the sides of said container, said dispenser comprising:

a hopper sized to receive said container;

melting means located in the bottom of said hopper for melting hot melt to a liquified pumpable condition;

support means for supporting said container in said hopper with said open end down and positioned above said melting means with an unobstructed path from slug between said open end and said melting means so that said slug can slide freely out of said container and into contact with said melting means once said slug is released from said container;

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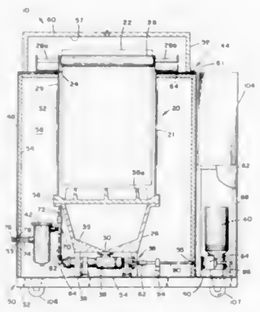
means for pumping liquified hot melt from said hopper; and auxiliary heating means for heating the walls of said container when it is supported in said hopper by said support means, said heating means providing that said container is uniformly encircled with a heat sufficient to lower the adhesion of said slug to the inside surfaces of said con-



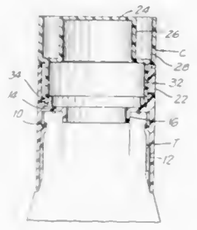
tainer to cause said slug to be released from and slide out of said container as a solid unitary mass and into contact with said melting means and further to provide that at the time said slug is released from said container it retains nearly the same shape, dimensions and solid state it possessed in said unheated condition.

4,919,309

CAP FOR COLLAPSIBLE BOTTLES AND THE LIKE

Adriano G. Arona-Delonghi, Monterrey, Mexico, assignor to Fabricacion De Maquinas, S.A., Monterrey, Mexico

Filed Feb. 15, 1989, Ser. No. 311,471
Claims priority, application Mexico, Feb. 15, 1988, 10412
Int. Cl.[5] B65D *47/00*
U.S. Cl. 222—153 **8 Claims**



1. A cap for collapsible bottles and the like comprising:

(a) a retention member body for coupling hermetrically to the mouth of the bottle,

(i) said retention member having at one end thereof a plurality of relatively flexible vertical fastening ribs which lock against the edge of the bottle's neck to prevent the cap from sliding upwardly and a plurality of vertical locking legs which hold the cap against the edge of the bottles's neck to prevent the cap from turning about the bottle;

(ii) said retention member having at its other end a detachable annular section disposed about its periphery to form at least one exit orifice when it is detached,

(iii) an annular wall connected to the internal part of the retention member body which serves as a seat on top of the mouth of the bottle,

(iv) a first retention wall attached to the internal part of the mouth of the bottle and disposed perpendicularly to said annular seating wall,

(v) a second retention wall disposed above said annular seating wall and extending perpendicularly and in a direction opposite to said first retention wall, and

(vi) said retention member body comprising a first locking means:

(b) a cover for insertion into said retention member, said cover including:

(i) a top wall for covering the exit orifice of the bottle,

(ii) at least one tubular wall attached to the top wall and disposed perpendicularly thereto,

(iii) an annular joining wall attached to the lower end of said tubular wall; and

(iv) a third retention wall located at the lower part of said annular joining wall, said third retention wall including second locking means which couple with the first locking means of the retention member body to prevent the removal of the cover from the retention member body, and having at least one exit orifice whereby when the cover is rotated in one direction the exit orifices of the retention member body and the third retention wall coincide to permit the passage of the bottle's contents and when the cover is rotated in the opposite direction the bottle is closed

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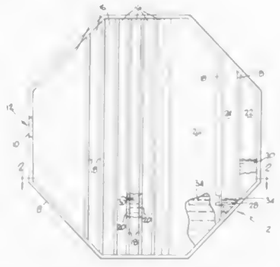
4,919,310

PRESSURE GENERATION SYSTEM FOR A CONTAINER

David C. Young, Westminster, and Mark A. Willcoxen, Lakewood, both of Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed Mar. 2, 1989, Ser. No. 318,824
Int. Cl.[5] B67D *5/54*
U.S. Cl. 222—386.5 **51 Claims**



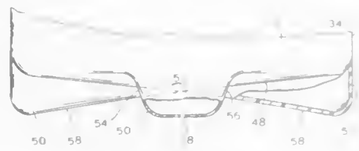
1. A self-generating gas pressure apparatus for placement within a container from which a flowable material in the container is to be dispensed under pressure exerted on the material by the gas pressure apparatus and wherein said gas pressure apparatus comprises a closed expandable vessel having a plurality of individual compartments formed by respective pressure-rupturable seal means therebetween, said compartments containing respective chemical compounds which when mixed upon the rupture of respective interfacing seal means produce a gas, and wherein at least two adjacent compartments respectively contain a first water-soluble chemical compound in aqueous solution and a second precipitated chemical compound dispersed in a water-dispersible suspension medium which, when said compounds are mixed upon the rupture of the seal means between said adjacent compartments, react with each other to produce a gas.

4,919,311

PRESSURE VESSEL FOR SPRAYERS

Gerald W. Born, Eldora, Iowa, assignor to Quality Products, Inc., Eldora, Iowa

Filed Apr. 10, 1984, Ser. No. 598,905
Int. Cl.[5] B65D *83/00*
U.S. Cl. 222—401 **11 Claims**



1. An all plastic, one-piece blow molded pressure vessel for a sprayer comprising in combination:

a substantially cylindrical side wall having a top and bottom;

a relatively reduced neck at and integral with the top of the side wall having pump coupling means for receiving a manually operated pump for pressuring the contents of the vessel;

an outwardly and upwardly flared funnel integral with the neck;

a hose coupling means near the top of the side wall for coupling with a hose for passage of the contents of the vessel under pressure;

a pressure relief valve coupling means for receiving a pressure relief valve for relieving pressure within the vessel that extends a predetermined value;

a bottom closure integral with the bottom of the side wall, the bottom closure being slightly dome-shaped to cooperate in resisting internal pressures, the bottom closure including a plurality of downwardly projecting and radially extending feet, each foot having a planar bottom face, spaced and opposed side faces and a circumferentially extending outer end face, each of the bottom faces being triangularly shaped meeting at a common location along the axis of the cylindrical wall, the bottom face being integral with the end face and extending from the end face radially inwardly and upwardly in a plane at a predetermined acute angle with a plane extending perpendicularly with the axis of the cylindrical side wall, whereby the feet cooperate in resisting internal pressures and in so doing are displaced so that the bottom face forms a smaller acute angle with the plane extending perpendicularly with the axis of the cylindrical side wall.

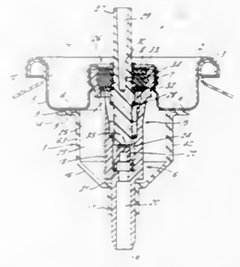
4,919,312

COLLAPSIBLE CHAMBER METERING VALVES

Walter C. Beard, Middlebury, Conn., and Michael D. Yallop, Norfolk, Great Britain, assignors to Bespak PLC, Norfolk, United Kingdom

PCT No. PCT/GB87/00062, § 371 Date Nov. 19, 1987, § 102(e) Date Nov. 19, 1987, PCT Pub. No. WO87/04685, PCT Pub. Date Aug. 13, 1987
PCT Filed Jan. 29, 1987, Ser. No. 112,604
Int. Cl.[5] B65D *83/14*; G01F *11/00*
U.S. Cl. 222—402.2 **6 Claims**

1. Dispensing apparatus (10) for use in a pressurized dispensing container and comprising a mounting cup member peripherally securable to the container, a valve mounted in the cup member such that at least a valve stem of the valve extends through an aperture defined by the cup member, which valve includes collapsible chamber means comprising an elastomeric vessel for metering a predetermined volume of fluid to be dispensed, inlet valve means admitting pressurized fluid to the chamber from the container when the valve is in a closed condition and outlet valve means releasing fluid from the chamber through the valve stem when the valve is in an open condition to thereby dispense the predetermined volume of fluid, wherein the mounting cup member includes a thermoplastic layer attached to its interior surface with respect to the container, the collapsible chamber means includes an annular bonding portion of a plastics material which is thermally



bonded to the thermoplastic layer, and wherein the annular bonding portion of the collapsible chamber means comprises a retaining ring having means for gripping an integrally formed flange of the elastomeric vessel in sealing contact with the mounting cup.

4,919,313

CARTON POURING DEVICE

Patrick J. O'Brien, Hackensack, N.J., assignor to Container Corporation of America, Clayton, Mo.

Filed Dec. 8, 1988, Ser. No. 281,272
Int. Cl.[5] B65D *47/10*
U.S. Cl. 222—541 **2 Claims**

2. A unitary, molded plastic, reclosable, pouring device adapted to be secured to an outer wall of a paperboard carton, adjacent an opening in said carton wall, to provide a tamper evident dispensing package for particulate type materials, said device comprising:

(a) a base member including:

(i) a relatively thin plate adapted to be positioned entirely within a carton and having an outer surface adhesively secured to an inner surface of said carton wall and having extending therethrough a dispensing opening that is alignable with an opening in said carton wall;

(ii) an integral closure flange projecting from said plate adjacent the periphery of said dispensing opening and adapted to extend out of said carton wall opening;

(iii) an integral sealing membrane detachably secured to to said flange within said dispensing opening and including a pair of sections hingedly connected to each other to facilitate removal of said membrane from said base member upon initial opening of said package;

(b) said cover member including:

(i) a relatively thin flat rim portion hingedly connected to

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said base member plate and adapted to overlie said plate;

(ii) an integral center portion extending outwardly from said rim portion and forming a dome-like structure operable to engage said base member sealing flange and provide a relatively tight fit therebetween upon reclosure.

4,919,314

TIME CONTROL DEVICE FOR WATER CONDITIONING APPARATUS

Masanobu Nishiyama, Ehime; Hitoshi Abe, and Yasuo Ochi, both of Matsuyama, all of Japan, assignors to Miura Co., Ltd, Matsuyama, Japan

Filed Sep. 6, 1988, Ser. No. 240,949
Claims priority, application Japan, Sep. 7, 1987, 62-224433
Int. Cl.[5] G04C *5/08*
U.S. Cl. 222—643 **18 Claims**

1. A time control device for a water conditioning apparatus, said time control device periodically changing flow conditions of a liquid in said apparatus, said time control device comprising:

a housing connected to a treatment container,

means for controlling a flow of said liquid in said water conditioning apparatus, wherein said control means has a bore formed in said housing and a main piston slidably supported in said bore, said housing being formed with an inlet port for introducing said liquid into said treatment container, an outlet port for discharging treated liquid, a first connecting port communicating with said treatment container, a second connecting port communicating with said treatment container, and a drain discharge port for discharging treated liquid outside said water conditioning apparatus, said bore being connected to said inlet port, said outlet port, said first connecting port, said second connecting port, and said discharge port, said piston moving in said bore to open and close said each port, wherein said outlet port, said inlet port, said first connecting port, said drain discharge port, and said second connecting port are located from the top side of said housing to the bottom side of said housing, and said piston moves in a predetermined direction so that the regeneration operation is carried out,

a main shaft rotatably supported by said housing, said main shaft having a mechanism for driving said control means in accordance with a rotation of said main shaft,

a main wheel rotatably supported about the axis of said main shaft,

means for rotating said main shaft and said main wheel, said rotating means constantly rotating said main wheel at a predetermined speed, and rotating said main shaft to perform a treatment,

a skipper wheel rotatably supported about the axis of said main shaft,

means for engaging said main wheel with said skipper wheel to rotate said skipper wheel through a predetermined angle,

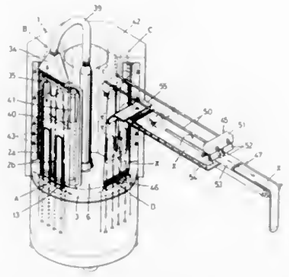
means for transmitting said predetermined angular rotation of said skipper wheel to said main shaft, so that said main shaft is rotated directly by said rotating means, whereby a treatment by and of said liquid is carried out.

4,919,315

APPARATUS FOR FINISHING PANTYHOSE

Makoto Nakano, Yamatotakada, Japan, assignor to Takatori Corporation and Takatori Hitech C., Ltd., both of Nara, Japan

Filed Mar. 30, 1989, Ser. No. 334,885
Claims priority, applicatioo Japan, Mar. 31, 1988, 63-81115
Int. Cl.[5] D06C *5/00*
U.S. Cl. 223—76 **7 Claims**



1. An apparatus for finishing pantyhose comprising:

a ring-shaped plate rotatably mounted in the apparatus;

a plurality of spaced-apart and vertically movable pairs of pattern frames mounted to said ring-shaped plate so as to be rotatable therewith in the apparatus, each of the frames of said pairs of pattern frames comprising a metal rod having a pair of leg portions extending in an inverted U-shape and adapted to receive a respective hose portion of a pair of pantyhose thereon wherein each of said pairs of frames is adapted to receive thereon a respective pair of pantyhose;

drive means operatively connected to said ring-shaped plate for rotating said plate in the apparatus and stopping the ring-shaped plate intermittently at predetermined angular intervals to progressively locate said pairs of frames rotating with said ring-shaped plate at positions defining an inspection station, a drying station and a pulling-out station in the apparatus;

elevating means engageable with said pairs of frames at the inspection station for moving said pairs of frames when at the inspection station vertically upward in the apparatus;

spreading means operatively connected to said pairs of pattern frames at the inspection station for spreading the leg portions of the frames at the inspection station;

an infrared heater disposed at the drying station for subjecting pantyhose supported on the pairs of frames at the drying station to infrared radiation;

lowering means engageable with said pairs of frames at the pulling-out station for moving said pairs of frames at the pulling-out station vertically downward in the apparatus; and

clamping means at said pulling-out station for clamping the toe portion of pantyhose on the pairs of pattern frames at the pulling-out station prior to the pairs of frames being lowered by said lowering means.

4,919,316

FISHING ROD HOLDER

Gerald D. Grauberger, Rte. 4, 13811 Beal Rd., Sterling, Colo. 80751

Filed Dec. 20, 1988, Ser. No. 287,098
Int. Cl.[5] B60R *9/08;* **A01K** *97/10*
U.S. Cl. 224—42.42 **12 Claims**

1. A fishing rod holder for removable insertion into an existing opening in a boat for the purpose of receiving and supporting the handle end of a fishing rod, said fishing rod holder comprising,

(a) a tubular cylindrical body member having upper and lower ends, wherein said upper end includes an outwardly projecting flange; wherein said tubular body member is circular in cross-section;

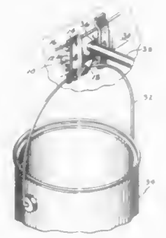
(b) a hollow tubular receiver non-movably secured within said body member, said receiver having upper and lower ends positioned adjacent the upper and lower ends of said body member, respectively, wherein said tubular receiver is sized to enable said handle end of said fishing rod to be slidingly inserted therein; wherein said tubular receiver has a circular cross-section and is tilted at an angle with respect to the longitudinal axis of said body member.

4,919,317

UTILITY BELT HOOK

Gary D. Luedtke, 2226 N. 64th St., Wauwatosa, Wis. 53213

Filed Mar. 29, 1988, Ser. No. 174,594
Int. Cl.[5] A45F *5/00;* **A46B** *17/00;* **B05C** *21/00;* **B25F** *1/00*
U.S. Cl. 224—151 **8 Claims**



1. A utility hook for a painter or the like, comprising:

a clip adapted for attachment to a belt or the like, said clip including first and second downwardly extending members connected together toward their upper ends, said first and second downwardly extending members defining a belt-receiving space therebetween;

an upwardly extending member connected to said second downwardly extending member and defining a bail-receiving area therebetween, said bail-receiving area being adapted to receive the bail of a paint bucket or the like, said upwardly extending member being provided with receiving means for receiving and retaining a paint brush or the like thereon; and

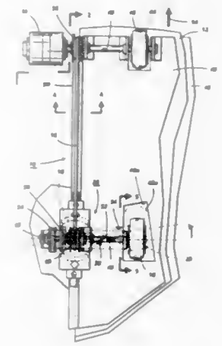
claw means for use in pulling nails or the like, said claw means comprising a substantially V-shaped slot provided at the lower end of said first downwardly extending member.

4,919,318

SWING ARM ROLLER SPEED DIFFERENTIAL WEB TRACKING SYSTEM

Lam F. Wong, Walworth, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 18, 1988, Ser. No. 182,620
Int. Cl.[5] B65H *23/038, 23/00*
U.S. Cl. 226—17 **1 Claim**



1. In a system for side registration of an elongated delicate or flimsy web sheet by driving the web sideways (transversely) in the sheet path against a side registration edge guide, while the web is being driven downstream in its primary direction of movement, by a frictional roller drive system, the improvement comprising:

downstream fixed nip roller drive means for engaging and driving the web in said primary direction of movement, at a first driving nip velocity;

upstream pivotal nip drive roller means mounted on a pivotal arm unit to simultaneously continously engage and drive the same web upstream of said downstream fixed nip roller drive means;

means for driving said upstream pivotal nip drive roller means at a second driving nip velocity which is slightly less than said first driving nip velocity of said downstream fixed nip roller drive means by a ratio of said first and second driving velocities between approximately 1.002 and 1.015;

said pivotal nip drive roller means automatically pivoting with said pivotal arm unit into an equilibrium nip position at a small, variable, angle to said side registration edge guide, with a resultant slip velocity frictional force pulling the web towards said side registration edge guide which is proportional to said equilibrium angle, which is proportional to and resulting from said slight difference between said first and second driving nip velocities, to deskew the web by driving the web sideways (transversely of) the web path against said side registration edge guide;

wherein said web sheet is a computer form web;

wherein said upstream pivotal nip drive roller means comprises a constantly mating nip of two parallel axis rollers, mounted to said pivotal arm unit to pivot therewith, which rollers do not slip relative to one another;

and wherein said pivotal arm unit is freely pivotable in a

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preset maximum range of pivotal movement limited to approximately 10 degrees, said limited range of pivotal movement being defined by limit means positioned to impede pivoting of said arm unit outside of said limited range.

4,919,319

CONTACTLESS WEB SUPPORT GUIDE

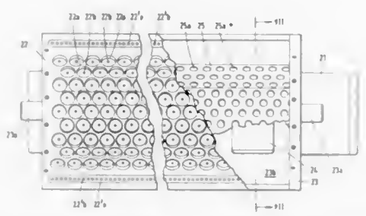
John W. Ford, 54 Chesham Rd., Kingston Upon Thames, Surrey, England (KT1 3AQ), and Maurice J. Dyer, 3 Sylvan Ave., Mill Hill, London, England (N.W. 7)

Continuation-in-part of Ser. No. 58,279, Jun. 4, 1987, Pat. No. 4,824,002. This application Mar. 22, 1989, Ser. No. 327,139

Claims priority, application United Kingdom, Jun. 6, 1986, 8613764; May 1, 1987, 8710433; May 25, 1988, 8807170

Int. Cl.[5] B65H *23/24*

U.S. Cl. 226—197 9 Claims



1. A contactless support guide for guiding a moving web of material; said guide comprising means defining an arcuate support face for controlling the moving web; a multiplicity of first pockets in the support face, the first pockets being distributed over the support face to substantially fill the face; apertures in said first pockets for emitting air; further elongate pockets provided in the support face at marginal regions where the web enters and exits the guide; a plurality of closely spaced apertures in each of the further pockets for emitting air; and air supply means, including a manifold, for receiving pressurized air and for supplying said air to the apertures of the first and further pockets to create an air cushion extending around the support face to support the moving web in a generally uniform spaced relationship relative to the support face; wherein the further pockets are angled towards the first pockets and the apertures in the further pockets are larger than the apertures in the first pockets to produce zones of higher pressure in the air cushion at said marginal regions where the web enters and exits the guide.

4,919,320

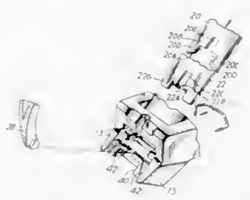
SURGICAL STAPLER

Anthony Storace, Norwalk, Conn., assignor to Technalytics, Inc., Montvale, N.J.

Filed Mar. 7, 1988, Ser. No. 164,818

Int. Cl.[5] A61B *17/00*

U.S. Cl. 227—19 12 Claims



1. In a surgical stapler which includes a housing, an anvil having a transverse lip for receiving the crossarm of a staple and carrying said staple along a delivery path, a former for driving said anvil and staple in a downstroke from an initial rest position, and spring means for biasing said anvil and former in an upstroke toward their respective rest positions, said staple being bent to a closed state about the anvil lip during said downstroke, the improvement in combination therewith of a stripper means for stripping the closed staple off the anvil lip during the upstroke of the former and anvil, said stripper means comprising a projection from said housing having an end part with a lower cam surface thereon, in operation of said stapler said stripper means being positioned such that after the downstroke said end part has its lower cam surface above the crossarm of the closed staple on the anvil lip, and during said upstroke said anvil lip urges said crossarm against said lower cam surface which surface drives said staple transversely off said anvil lip.

4,919,321

ARRANGEMENT FOR RIVETING

Sven-Olof Rydström, Sturefors, and Mikael Johansson, Linkoping, both of Sweden, assignors to Saab-Scania AB, Linkoping, Sweden

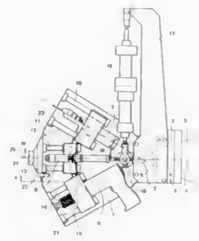
PCT No. PCT/SE87/00465, § 371 Date Apr. 5, 1989, § 102(e) Date Apr. 5, 1989, PCT Pub. No. WO88/02673, PCT Pub. Date Apr. 21, 1988

PCT Filed Oct. 14, 1987, Ser. No. 340,729

Claims priority, application Sweden, Oct. 15, 1986, 86043619

Int. Cl.[5] B27F *7/02*

U.S. Cl. 227—69 7 Claims



1. A riveting device for riveting sheet material and especially for riveting of material with a complex shape, comprising drilling means, rivet positioning means, means for repetitive striking movement and bucking bar means, characterized in that said drilling means (7), rivet positioning means (8) and striking movement means (9) are disposed for one at a time movement into the same operating position in relation to frame means (3), said frame means being carried by a first positioning robot means moveable in multiple directions in relation to said sheet material (33), on one side thereof, in conjunction with said bucking bar means (28) wherein said bucking bar means is carried by a second positioning robot means (32) moveable in multiple directions in relation to said sheet material (33), on the other side thereof from said striking means (9) so as to interact with said striking means during the riveting operation.

4,919,322

DESOLDERING TIP AND REPLACEMENT APPARATUS

William S. Fortune, 29866 Cuthbert Rd., Malibu, Calif. 90265, and Robert E. Dallons, 6625 Tamarind, Agoura, Calif. 91301

Filed Mar. 6, 1989, Ser. No. 320,085

Int. Cl.[5] B23K *3/00*

U.S. Cl. 228—20 6 Claims

1. A desoldering system comprising:

A. a desoldering implement of the character having a molded plastic body having an elongated cylindrical barrel housing a spring actuated vacuum producing piston and having molded therewith a front end cap including a forwardly protruding cylindrical nose portion formed with a central, axially aligned nozzle retaining bore therethrough of a predetermined first diameter, said nose portion having an annular retaining shoulder formed in said bore and extending radially inwardly from said first diameter to a lesser second diameter and being axially spaced rearwardly of the front end of said nose portion, said nose portion also including at least one levering fin extending radially outwardly from the outer diameter of said nose portion and extending rearwardly from the front end of said nose portion along at least a portion of the length thereof;

B. a replaceable plastic nozzle of the character to be carried by said nose portion and extend forwardly therefrom for solder removing contact with a workpiece, said nozzle being tubular with an outer diameter in its central portion approximately equal to said first diameter and having an annular retention groove formed near its rear end, the inner diameter of the groove being approximately equal to said second diameter, and the axial lengths of said groove and said retaining shoulder being approximately equal, the outer diameter of the nozzle being tapered inwardly from a point just rearwardly of said groove to a reduced diameter, approximately equal to or less than said second diameter, at the rear of said nozzle, said nozzle further including a second annular groove formed about the circumference thereof at a point axially contiguous to and forwardly of said front end of said nose portion when said retaining shoulder and first annular groove are retentively engaged; and

C. a nozzle removal tool having

1. a hollow molded plastic body,

2. a pair of flexible juxtaposed jaws carried by said body and extending away therefrom along a predetermined axis, said jaws being internally relieved to receive between them along said axis the forward portion of said replaceable nozzle, said jaws further each including an inwardly protruding gripping tab near its end and being of the character to grip said nozzle by being inserted into said second annular groove when the nozzle is received between said jaws, said jaws further having cam surfaces forming their outer ends and diverging away from said axis in a manner such that when said nozzle installed in said nose portion is received between said jaws and gripped by said gripping tabs, the front end of said levering fin engages a said cam surface and is forced away from said body of said removal tool when it is rotated, about said axis, with respect to said body, and

3. release means carried by said body for guiding said levering fin between said jaws to separate them and cause the release thereby of said nozzle.

4,919,323

DIFFUSION BONDING NICKEL BASE ALLOYS

Murray W. Mahoney, Camerillo, and Leslie M. Holmes, Jr., Simi Valley, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 5, 1989, Ser. No. 361,616

Int. Cl.[5] B23K *20/02, 20/16, 20/22, 20/24*

U.S. Cl. 228—157 12 Claims

1. A method for diffusion bonding sheets of nickel base alloy comprising the steps of:

providing a foil of type 300 series stainless steel;

providing a screen of type 300 series stainless steel;

providing sheets of a nickel base alloy;

placing the foil and the screen between the sheets in the area to be bonded;

heating the sheets and intervening foil and screen to a temperature below which rapid grain growth occurs in the sheet; and

deforming the screen to create continuous contact between the surfaces to be bonded.

4,919,324

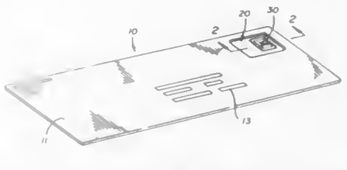
ENVELOPE

Dwight E. Hottle, 2866 Lakeland Pkwy., Stow, Ohio 44224

Filed Dec. 27, 1988, Ser. No. 289,777

Int. Cl.[5] B65D *27/00*

U.S. Cl. 229—68 R 2 Claims



1. An envelope, comprising an imperforate forward indicia receiving surface having a recessed postage receiving area formed therein; said postage receiving area including a generally rectangular perimeter wall extending inwardly from said imperforate indicia receiving surface and a bottom wall integral with said perimeter wall.

4,919,325

COMBINATION WINDOW ENVELOPE AND INSERT AND METHOD OF USING SAME

William P. Culver, P.O. Box 2236, Rancho Sante Fe, Calif. 92067

Filed Sep. 14, 1988, Ser. No. 244,816

Int. Cl.[5] B65D *27/04*

U.S. Cl. 229—71 21 Claims

1. An envelope system comprising:

a document member having a document separation tear line of perforations extending from its right side edge to its left side edge, said tear line of perforations dividing said document member into a top and bottom portion, wherein at least one of said top and bottom portions is an envelope insert member;

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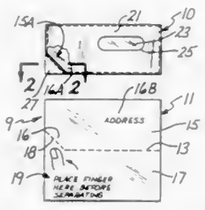
a substantially rectangular envelope having a front and back panel connected in facing relation along their lower, left and right edges; said front and back panels forming a closable opening to the interior of said envelope;

said opening being closable by an integral flap extending from the top edge of the front panel, said flap having sealing means for securing said flap to the exterior surface of said back panel;

said front panel having an opening therein defining a window for permitting at least one surface of said insert member to be viewed when said insert member is disposed within the interior of said envelope;

securing means disposed within the interior of said envelope and extending diagonally between a side edge and the bottom edge thereof for binding together a portion of the interior of said front and back panels of said envelope;



said portion defining a stop within the interior of said envelope and defining an interior envelope insert member receiving space, said space being substantially the same size as said envelope insert member;

said document member having a manually removable portion, said removable portion being defined by a tear line of perforations intersecting at least one edge of said document for enabling a user to form a stop engageable portion of said envelope insert member, said stop engageable portion being complementary shaped relative to said removable portion; and

said stop engageable portion being disposed on said envelope insert member in a similar orientation as the position of said stop member to permit said stop engageable portion to be positioned adjacent to said stop when said envelope insert member is disposed within the interior of said envelope to help cause the proper orientation of the insert member relative to the envelope window.

4,919,326

CONTAINER WITH IMPROVED RETENTION PROPERTIES AND IMPROVED CORNER STRUCTURES

Anthony J. Deiger, 2761 Riva Ridge Rd., Toledo, Ohio 43615

Filed Feb. 10, 1989, Ser. No. 310,108
Int. Cl.[5] B65D *5/56*
U.S. Cl. 229—109 25 Claims

1. A shallow container for hot food products such as pizza pies, said container comprising

a bottom panel having an inside surface and an outside surface,

a top panel having an inside and an outside surface,

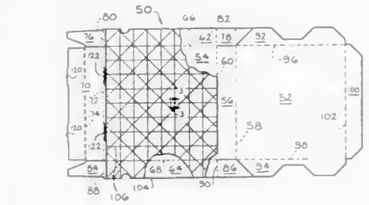
a rear wall hingedly connecting said top and bottom panels,

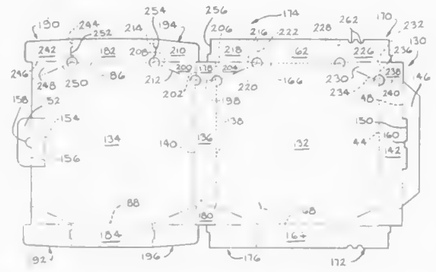
two opposed walls having inside and outside surfaces, said side walls being connected to said top or bottom panel,

a front wall connected to said top or bottom panel,

a sheet of insulative, foamed polymeric material having first and second opposed major surfaces, said first major surface being bonded to and covering substantially all of the inside surface of said bottom panel, in face-to-face relationship therewith, said inside surface of said top panel being substantially free of insulative, foamed polymeric material, and

means provided in said second opposed major surface of said sheet of insulative, foamed polymeric material for releasing moist air from between said second opposed major





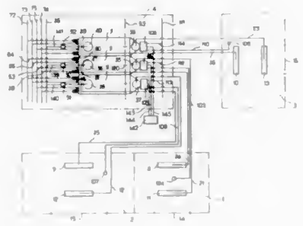
surface of said sheet of insulative, foamed polymeric material and a hot food product carried thereon.

4,919,327

AIR-PROCESSING INSTALLATION DESIGNED FOR THE VENTILATION AND AIR-CONDITIONING OF SEVERAL ROOMS AND AIR-PROCESSING MODULE DESIGNED FOR AN INSTALLATION OF THIS TYPE

Patrice Elluin, Paris; Pascal Verrecchia, Les Lilas; Georges Mauer, Evreux, and Philippe Cardon, La Boissiere-Ecole, all of France, assignors to Societe D'Administration Et De Realisations D'Investissements (SARI), Paris, France

Filed Jul. 7, 1988, Ser. No. 216,301
Claims priority, application France, Jul. 10, 1987, 87 09630
Int. Cl.[5] F24F *7/00*
U.S. Cl. 236—49.1 92 Claims



1. An air-processing installation designed for the ventilation and air-conditioning of several rooms, and comprising, to this effect, air-processing means housed in an engine room, at least one air blowing opening and at least one air suction opening in each room and conduits to connect said air blowing and air suction openings to the air-processing means.

wherein said air processing means comprises several air processing modules grouped together in said engine room and wherein said air suction and air blower conduits connect each module with a respective room independently of the other rooms and other air-processing modules:

an air suction connector connected by a respective conduit to the air suction opening of the respectively associated room,

an air blowing connector connected to the air blowing opening of the respectively associated room by a respective conduit,

an internal air circuit within each module connecting said air suction and air blowing connectors to each other,

ventilation and air-conditioning means interposed in each said internal air circuit within each module,

means for connecting the ventilation and air-conditioning means within each module to energy supply means,

adjustable means to regulate the ventilation and air-conditioning means within each module at least as regards air temperature within a respective room,

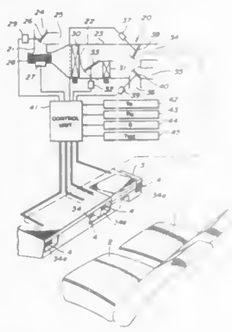
and wherein there are provided respective means for the remote control of adjustable means for the regulation of the ventilation and air-conditioning means of each air-processing module from the respectively associated room.

4,919,328

AUTOMOBILE AIR CONDITIONING SYSTEM

Junichiro Hara; Yoshiyuki Ogihara, both of Yokohama, and Akira Mochizuki, Kanagawa, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Mar. 14, 1989, Ser. No. 322,989
Claims priority, application Japan, Mar. 22, 1988, 63-67620
Int. Cl.[5] F24F *7/00*
U.S. Cl. 236—49.3 8 Claims



1. An automotive air conditioning system including a duct through which conditioned air is directed into a compartment for passengers comprising:

a control device associated with the duct for operating in a first mode discharging the conditioned air in the form of concentrated currents toward the passengers, in a second mode discharging the conditioned air in the form of diffused currents toward the passengers, and in a third mode in which switching is performed between the first and second modes at variable time intervals;

means sensitive to a temperature in the passenger compartment for producing a first sensor signal indicative of the sensed compartment temperature;

means sensitive to the intensity of insolation in the compartment for producing a second sensor signal indicative of the sensed insolation intensity; and

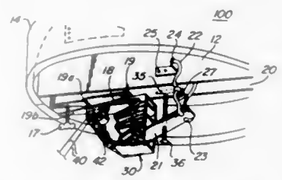
a control unit responsive to the first and second sensor signals for operating the control device in one of the first, second and third modes, the control unit including means for operating the control device in the third mode when the sensed compartment temperature is less than a reference value and when the sensed insolation intensity exceeds a reference value.

4,919,329

THERMALLY ACTIVATED AUTOMATIC DAMPER AND DAMPER OPERATOR

Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 18901

Filed Apr. 24, 1989, Ser. No. 342,496
Int. Cl.[5] G05D *23/08*
U.S. Cl. 236—93 R 6 Claims



1. For a damper having a frame and at least one reciprocal blade operatively associated therewith, an improved damper operator comprising:

a bimetallic element having a temperature movement response;

means for coupling the blade to the bimetallic element so that the temperature movement response of the bimetallic element causes the blade to move; and,

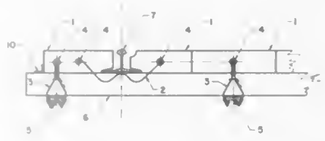
rotatably moveable hinge means for coupling the bimetallic element to the frame for biasing the bimetallic element to adjust the temperature movement response.

4,919,330

QUICK RELEASE RAILROAD HIGHWAY CROSSING

Winger, James W., 5728 E. Glen Clara Dr., Huntington, W. Va. 25705

Filed Mar. 3, 1989, Ser. No. 318,558
Int. Cl.[5] E01B *21/04*
U.S. Cl. 238—8 5 Claims



1. A railroad highway crossing panel fastening system in combination with a track assembly that includes parallel rails supported by cross-ties positioned transversely under said rails, elongated hanger bars positioned transversely below the cross-ties and highway crossing panels positioned on top of the cross-ties in a manner to establish a substantially continuous horizontal surface at substantially the level of the upper-most surface of the rails in an installed position, said crossing panels being secured on top of the cross-ties by said highway crossing panel fastening system, which fastening system includes:

at least one substantially W-shaped spring clip having one end pivotally connected to a first pin on one of said crossing panel, the opposite end hooked to a second pin on one of said crossing panel by means of a hook formed on said opposite end, and a mid-section between said ends and traversing underneath an associate rail;

a hanger having an upper end portion pivotally connected to a third pin on one of the crossing panels and a lower end

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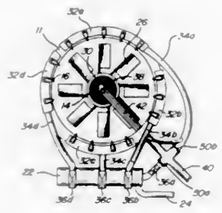
portion hooked onto one of said hanger bars by hook means formed at said lower end portion of the hanger.

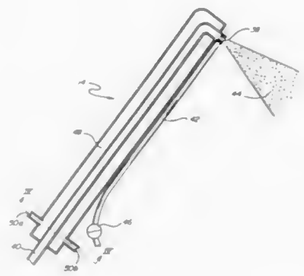
4,919,331

SNOW MAKING APPARATUS AND METHOD FOR MAKING SNOW

Joseph F. Kosik, Sr., Rochester, and Bruce M. Firestone, Grand Blanc, both of Mich., assignors to Mt. Holly, Inc., Holly, Mich.

Continuation of Ser. No. 74,547, Jul. 17, 1987, Pat. No. 4,813,598. This application Mar. 14, 1989, Ser. No. 323,303
The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.
Int. Cl.[5] A01G *15/00*
U.S. Cl. 239—2.2 12 Claims





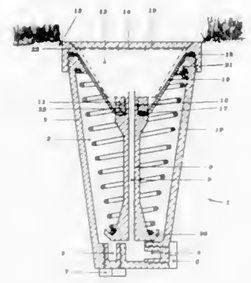
10. A method of making snow, said method comprising:
providing a blower adapted to provide a high volume stream of air;
providing a nucleator, said nucleator adapted to discharge a high pressure flow of air in a direction parallel to the stream of air, and a water inlet adapted to impinge a stream of water into said high pressure flow of air so as to produce a spray of ice crystals;
disposing said nucleator proximate the center of the high volume stream of air, so that said spray of crystals is initially projected into central portions of the stream of air; and
injecting a spray of water into the air stream from a nozzle oriented so as to initially inject said spray of water into the periphery of the air stream, so that said spray of ice crystals initially contacts the spray of water at a point at least ten feet from the nucleator so as to initiate freezing thereof.

4,919,332

RISER OR POP-UP IRRIGATION SPRINKLER

James L. Bailey, P.O. Box 119, Collarny Beach, NSW 2097, Australia, assignor to James L. Bailey, Collarny Beach, Australia

Filed Mar. 1, 1988, Ser. No. 162,735
Claims priority, application Australia, Mar. 2, 1987, 69837
Int. Cl.[5] B05B *15/10*
U.S. Cl. 239—205 2 Claims



1. A retractable sprinkler comprising a housing defining an internal cavity provided with a fluid inlet for admitting fluid to said internal cavity, a riser positioned within said cavity and spaced inwardly from said housing and defining a passage therethrough and terminating in a nozzle at an upper end thereof, a flexible diaphragm sealingly connected between an upper end of said housing and said riser contiguous to said nozzle and supporting the upper end of said riser, a coil compression spring engaged between an outwardly extending lip provided at a lower end of said riser and an inwardly extending lip integrally formed at an upper end of said housing and supporting said lower end, the outer housing being configured with an integrally formed wall at the upper end, said wall forming an opening means sized and shaped to pass said riser with said coil spring attached when said coil spring is compressed and said riser and said compressed coil spring are inserted in a generally horizontally extending position through said opening means into the cavity for rotation within said housing cavity into a generally vertically extending operative position, when rotated into a generally vertically extending position and released, said coil spring engages the underside of said upper wall for maintaining said riser in a retracted position within said housing and, upon the introduction of fluid through said fluid inlet, said coil spring yields to permit said riser to move outwardly of said housing against the compressive action of said coil spring for flow of fluid through said passage for dissipation from said nozzle.

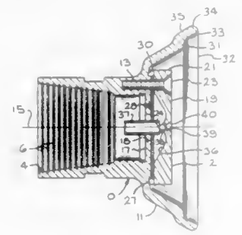
4,919,333

ROTARY PAINT ATOMIZING DEVICE

Richard Weinstein, Toledo, Ohio, assignor to The DeVilbiss Company, Toledo, Ohio

Continuation-in-part of Ser. No. 879,082, Jun. 26, 1986. This application Nov. 15, 1988, Ser. No. 271,523
Int. Cl.[5] B05B *3/10*
U.S. Cl. 239—223 24 Claims

23. An improved rotary paint atomizer device comprising a bell adapted to be rotated about an axis at high speeds, said bell having a front side defining an interior wall connecting with an interior generally conical surface, said conical surface extending symmetrical about said axis to a forward paint discharge edge, a paint receiving chamber located on said axis, said chamber having a forward surface rotated with said bell, a stationary axial paint feed tube having a forwardly directed discharge end located in said chamber on said axis, said tube directing paint along said axis at said forward surface, means for feeding paint from said chamber onto said conical bell surface, and a plurality of small straight passages extending



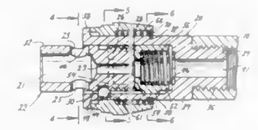
from said forward chamber surface at a location spaced from said axis to said interior wall to deliver a limited portion of the paint delivered to said chamber to flow across said interior wall and said conical surface to said discharge edge.

4,919,334

BLOW GUN ASSEMBLY

Leonard J. Hartmann, St. Louis, and Michael E. Weller, House Springs, both of Mo., assignors to Dynaquip Controls Corporation, Fenton, Mo.

Filed Jan. 19, 1989, Ser. No. 300,084
Int. Cl.[5] B05B *15/06*
U.S. Cl. 239—600 10 Claims



1. An air gun assembly having a quick-change nozzle system, comprising:
(a) an air gun including an inlet connectible to an air supply and an outlet selectively delivering a stream of pressurized air,
(b) a nozzle having an inlet end an outlet for directing the air stream, and
(c) a quick-change coupling adaptor including means at one end connectible to the outlet of the air gun and means at the other end adapted to receive the nozzle in quick-change relation,
(d) the nozzle including latch-engaging means,
(e) the adaptor including:
1. a body having a socket defining an open end receiving the nozzle in sliding relation,
2. latch means carried by the body in spaced relation from said open end,
3. a plunger slidably mounted in the socket and including means biasing said plunger outwardly toward said open end, said plunger being engageable by said latch means to limit outward movement of said plunger and being engageable by said nozzle to move said plunger inwardly out of engagement with said latch means when said nozzle is inserted within said body socket, and
4. a sleeve slidably mounted on the body and including means biasing said sleeve toward said socket open end, said sleeve being engageable with said latch means to urge said latch means into engagement with said nozzle latch-engaging means when said sleeve is in one position and said sleeve retaining said latch means when said latch means moves out of engagement with said nozzle latch-engaging means when said sleeve is in another position.

4,919,335

METHOD AND APPARATUS FOR ATOMIZATION AND SPRAYING OF MOLTEN METALS

David O. Hobson; Igor Alexeff, both of Oak Ridge, and Vinod K. Sikka, Clinton, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 19, 1988, Ser. No. 221,393
Int. Cl.[5] B05B *5/06, 7/18*
U.S. Cl. 239—3 7 Claims

1. A method for producing a directed spray of fine particulate molten metal comprising:
providing spaced apart electrodes defining an open-ended zone therebetween for receiving molten metal feed;
providing a flow of molten metal feed into said zone in contact with said electrodes, thereby creating a flow path for electric current between said electrodes;
providing a magnetic field through said zone in a direction perpendicular to said flow path for electric current through said zone; and
passing an electric current through said electrodes and said molten metal in said zone to create magnethydrodynamic forces which accelerate said molten metal within said zone in a direction perpendicular to said flow path and said magnetic field thereby causing said molten metal feed to exit said zone and disperse into fine particulate droplets; the directions of said magnetic field and electric current being selected to provide the desired direction of acceleration of said molten metal feed.

4,919,336

SHOWER PIPES

James D. Hudon, Beaconsfield, and Lionel T. Bloyce, Maidenhead, both of England, assignors to Albany International Corp., Menands, N.Y.

Filed Jul. 10, 1987, Ser. No. 73,750
Claims priority, application United Kingdom, Jul. 14, 1986, 8617100
Int. Cl.[5] D21F *1/42*
U.S. Cl. 239—11 13 Claims

1. In a papermaking machine, a shower apparatus comprising:
at least one shower pipe formed from a hollow member, the pipe being restricted at one end, the other end being arranged for connection to a liquid supply, a liquid supply passageway extending, within the pipe, from said other end to the said one end, and having a passageway cross-

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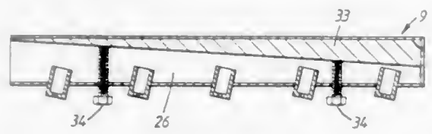
sectional area and a plurality of liquid discharge nozzles along the length of the pipe for discharging liquid flow along the passageway,



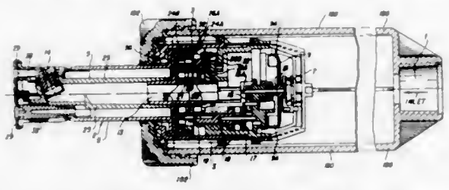
said passageway cross-sectional area decreasing toward said one end of the said pipe for increasing the minimum liquid velocity within the passageway sufficiently to substantially prevent separation of solids from the liquid within the passageway.

4,919,337

ARC ADJUSTMENT FOR IRRIGATION SPRINKLER

Timothy O. Van Leeuwen, and Billy J. Hobbs, Jr., both of Gardnerville, Nev., assignors to GardenAmerica Corporation, Carson City, Nev.

Filed Apr. 10, 1989, Ser. No. 339,203
Int. Cl.[5] B05B *3/16, 3/04*
U.S. Cl. 239—205 **10 Claims**



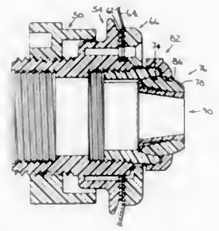
1. In a sprinkler head comprising a tubular housing having an inlet at one end, an internal assembly rotatably mounted in said housing for discharging water over a sector of land to be irrigated in response to water introduced under pressure into the housing through the inlet, said internal assembly including inner and outer tubular members rotatably mounted in said tubular housing in coaxial relationship therewith and with one another; a drive member movable between first and second positions to engage one or the other of said inner and outer tubular members to cause said internal assembly to turn in opposite directions in said housing, a reversing assembly movable between first and second positions to cause said drive member to engage one or the other of said inner and outer tubular members, a first trip tab mounted on the inner end of said inner tubular member for moving said reversing assembly to its first position, and a second trip tab mounted on the inner end of said outer tubular member for moving said reversing assembly to its second position, said tabs serving to reverse the direction of rotation of said nozzle at trip points determined by the relative angular positions of said inner and outer tubular members, the combination of: vertical teeth formed on said outer tubular member on the inner surface thereof; and an adjustable screw mounted on the end of said internal assembly and extending into said internal assembly between said inner and outer tubular members, said screw having vertical gear teeth engaging the vertical gear teeth on said outer tubular member so that rotation of said screw adjusts the relative angular positions of said inner and outer tubular members to adjust the angular displacement of said inner and outer trip tabs from one another.

4,919,338

EYEBALL ASSEMBLY FOR AN EYEBALL FITTING

Richard A. Junk, Elkhorn, Wis., assignor to Sta-Rite Industries, Milwaukee, Wis.

Filed Jan. 24, 1989, Ser. No. 301,326
Int. Cl.[5] B05B *15/08*
U.S. Cl. 239—587 **14 Claims**



1. An eyeball assembly for use in an eyeball fitting, comprising:

an eyeball having a substantially spherical outer surface;

an axial passage extending through said eyeball and being defined at least in part by a first tapered surface and a second tapered surface, said first and second tapered surfaces being oppositely oriented relative to the axis of said passage so as to form a minimum transverse dimension of said passage at the juncture of said first and second tapered surfaces; and

an axially extending insert adapted for placement within said eyeball passage, said insert including a passage therethrough having an inlet end and an outlet end, for allowing fluid to pass through said eyeball, said insert including an outer wall defined at least in part by a reducing tapered surface disposed toward said inlet end and a continuously expanding tapered surface disposed toward said outlet end, said reducing and expanding tapered surfaces being oppositely oriented relative to the axis of said insert so as to form a minimum transverse dimension of said outer wall therebetween, with said expanding tapered surface providing a transverse dimension to said insert outlet end slightly greater than the minimum transverse dimension of the axial passage through said eyeball;

said insert being adapted for push-on engagement with said eyeball by placement of said insert within the axial passage through said eyeball and forcing said outlet end of said insert through the minimum transverse dimension of said eyeball passage so as to securely engage said insert within said eyeball passage.

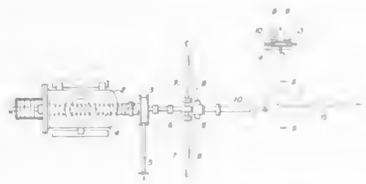
4,919,339

METHOD AND APPARATUS FOR IMPROVING THE GRINDING RESULT OF A PRESSURE CHAMBER GRINDER

Jouko Niemi, Pirkkala, Finland, assignor to Oy Finnpulva AB, Pirkkala, Finland

PCT No. PCT/FI87/00061, § 371 Date Oct. 31, 1988, § 102(e) Date Oct. 31, 1988, PCT Pub. No. WO87/06854, PCT Pub. Date Nov. 19, 1987
PCT Filed May 6, 1987, Ser. No. 267,124
Claims priority, application Finland, May 9, 1986, 861961
Int. Cl.[5] B02C *19/06*
U.S. Cl. 241—5 **5 Claims**

1. Method for improving the grinding result of a pressure chamber grinder, wherein the finely divided material to be ground is fed by means of a mechanical feeder device (1) into a pressurized equalizing tank (2), the possibly clodded material is made loose by means of a rotor in the equalizing tank, and the material thus made loose is transferred into a pre-grinder (3), wherein several grinding-gas jets are applied to the material to be ground so that the material to be ground is fluidized, the fluidized material-gas flow is passed into a bisecting device (6), wherein it is divided into two component flows of equivalent magnitude and composition, each component flow is passed into the main grinding chamber (9) through a long accelerating nozzle (8) of its own, which said nozzle is directed so that a collision zone for the two component flows is formed in the centre point of the said main grinding chamber, characterized in that a solids-gas mixture ground in the main grinding chamber (9) is passed through an acceleration tube (10) into a rotary mechanical grinder (11) in a direction corresponding to the rotation direction of the grinder rotor (13) driven by an electric motor (12), whereby pivotably mounted grinding hammers of the grinder are arranged to break up the coarser particles, moved to the outer periphery of the grinder, before their exit through a central out-flow (15) of the grinder.

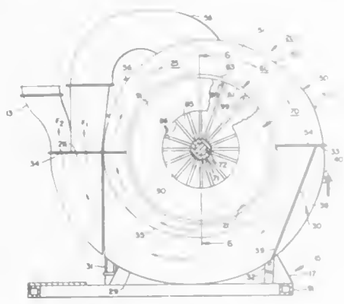


4,919,340

METHOD AND APPARATUS FOR FIBERIZING AND CELLULOSIC PRODUCT THEREOF

Milton Gerber, Offian, Ind., assignor to Advanced Fiber Technology, Inc., Bucyrus, Ohio

Filed Feb. 15, 1989, Ser. No. 311,211
Int. Cl.[5] B02C *23/34*
U.S. Cl. 241—5 **22 Claims**



1. Apparatus for fiberizing organic material to form a low density fibrous product comprising:

a housing defining;

a cylindrical rotor chamber having a central axis,

a volume-shaped passage formed around said rotor chamber,

a tangential outlet from said volute-shaped passage, and

axial inlet means for feeding said organic material into the central portion of said rotor chamber;

a discharge duct communicating with a radially outward portion of said tangential outlet for removing the fibrous product from the apparatus;

air return means communicating between a radially inward portion of said tangential outlet and said axial inlet means for recirculating a substantial portion of the air from said tangential outlet directly to said rotor chamber;

means for delivering said organic material to said axial inlet means;

a perforate cylindrical screen mounted in said housing about said axis between said rotor chamber and said volute-shaped passage;

a centrifugal blower rotor mounted in said rotor chamber for rotation about said axis and having a plurality of radial vanes with rakers mounted at the outer ends thereof, said rakers being closely spaced from the inner surface of said screen to prevent clogging of the openings in said screen; and

drive means for turning said rotor at a speed sufficient to generate a flow velocity for said air and fibrous product that is received in said volute chamber, that causes centrifugal concentration of said fibrous product in the radially outward portion of said volute chamber,

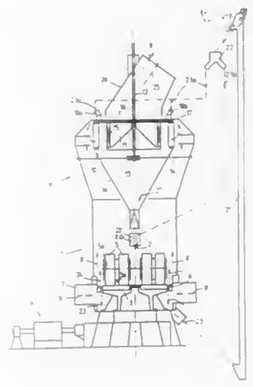
whereby said fibrous product is concentrated in the radially outward portion of the flow at the tangential outlet for delivery to said discharge duct and the radially inward portion of the flow that is received by said air return means at the radially inward portion of said tangential outlet is relatively free of said fibrous product.

4,919,341

GRINDING METHOD AND GRINDING APPARATUS

Ludger Lohmberr, Oelde-Sünninghausen, Fed. Rep. of Germany, assignor to Krupp Polysius AG, Fed. Rep. of Germany

Filed Dec. 23, 1988, Ser. No. 289,059
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1988, 3801229
Int. Cl.[5] B02C *23/12*
U.S. Cl. 241—18 **10 Claims**



1. The method of comminuting material comprising:

(a) delivering fresh material to be comminuted to a grinding plate;

(b) grinding the material on said plate;

(c) discharging combined tailings and finished ground product from said plate into an air stream flowing upwardly relative to said plate;

(d) pnuematically conveying a portion of said finished ground product upwardly into a separator by said air stream;

(e) mechanically conveying said tailings and remaining portion of said finished ground material upwardly relative to said plate into said separator;

(f) introducing said tailings and said remaining portion of said finished ground product into said air stream;

(g) discharging an additional portion of said finished ground product by means of said air stream; and

(h) reintroducing material including said tailings separated

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from said air stream onto said grinding plate along with additional fresh material to be comminuted.

4,919,342

METHOD OF PRETREATING A SAMPLE FOR X-RAY FLUORESCENCE ANALYSIS

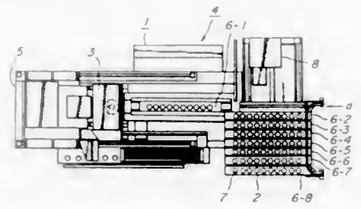
Akira Narukawa, Yokkaichi, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Aug. 24, 1988, Ser. No. 235,560

Claims priority, application Japan, Aug. 31, 1987, 62-215181; Aug. 31, 1987, 62-215182; Aug. 31, 1987, 62-215184; Aug. 31, 1987, 62-215186; Sep. 9, 1987, 62-224160; Oct. 19, 1987, 62-261769

Int. Cl.[5] **B02C** *23/00*

U.S. Cl. 241—25 3 Claims



1. A method of pretreating a sample for X-ray fluorescence analysis comprising the steps of:

adding a sample under any powdery, granular or conglomerate conditions with graphite and a forming aid simultaneously or one after another;

crushing the sample under a dried condition; and press-forming the sample.

4,919,343

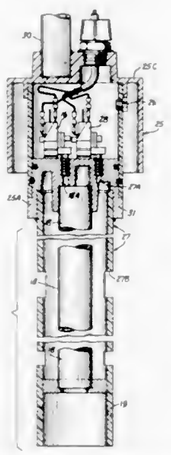
ANTI-FLOODING SEWAGE GRINDER PUMP LIQUID LEVEL CONTROL SYSTEM IN SEPARATELY MOUNTED CANISTER

Frank W. Van Luik, Jr., and Eric F. Cabahug, both of Schenectady, N.Y., assignors to Environment/One Corporation, Schenectady, N.Y.

Filed Sep. 25, 1989, Ser. No. 412,225

Int. Cl.[5] **B02C** *23/36*

U.S. Cl. 241—36 20 Claims



1. In a sewage grinder pump system having a collection tank and a sewage grinder pump driven by an electric motor disposed therein for grinding and discharging sewage collected in the tank under pressure through a pressurized sewage discharge outlet, the improvement comprising:

first pneumatically and electrically operable liquid sewage level sensing and control means calibrated for sensing a normal operating high and low liquid sewage level within the collection tank and automatically electrically exciting the sewage grinder pump electric motor to cause the pump to grind and pump down sewage collected in the tank to a normal low operating level;

second pneumatically and electrically operable alarm liquid sewage level sensing and control means calibrated for sensing an alarm high liquid sewage level within the collection tank which is higher than the normal high operating liquid sewage level and representative of overfilling of the collection tank due to a malfunction or surge overload, said second alarm liquid sewage level sensing and control means being electrically connected to and automatically providing an alarm operating condition output indication signal to an operator of the sewage grinder pump system; and

means for physically mounting both said first normal liquid sewage level sensing and control means and said second alarm liquid sewage level sensing and control means within liquid-tight and airtight diving bell-type enclosure means having an open lower end thereof exposed to and normally closed by the upper level of the collected liquid sewage contained in the sewage collection tank during both normal operating conditions and alarm high liquid sewage level operating conditions.

4,919,344

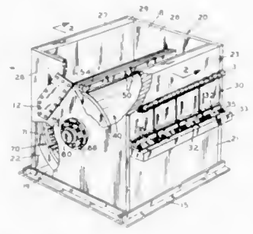
GRINDING MILL APPARATUS

Robert T. McKie, 2222 Stephen Ave., Boise, Id. 83706

Filed Jun. 5, 1989, Ser. No. 361,444

Int. Cl.[5] **B02C** *18/18*

U.S. Cl. 241—32 18 Claims



1. Grinding mill apparatus comprising:

a housing with inlet and outlet;

at least one anvils mounted within an opening of said housing, each of said anvils pivotally engaging said housing and each of said anvils provided with shear means for holding said anvils in a fixed break-away relationship with said housing;

a rotor mounted upon a shaft for rotation about a horizontal axis within said housing, said rotor comprising at least one sections, each section defining a portion of a cylinder axially offset from adjacent sections, each of said sections provided with a cutter having an orbit set at a selected distance from said anvils, and said rotor provided with at least one cavities, each of said cavities being filled with a lead-antimony alloy; and

grate means affixed to said housing for passing materials of a selected size through said housing outlet.

4,919,345

SHREDDING MACHINES

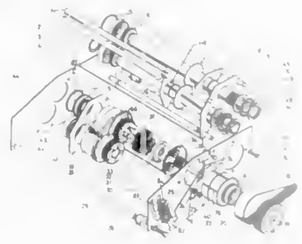
Geoffrey M. Burlington, East Sussex, and Stephen C. Watkins, Worcestershire, both of United Kingdom, assignors to Ofrex Group Holdings PLC, England

Filed Jan. 18, 1989, Ser. No. 298,030

Claims priority, application United Kingdom, Feb. 25, 1988, 8804437

Int. Cl.[5] **B02C** *25/00*

U.S. Cl. 241—36 10 Claims



1. In a shredding machine of the type including.

(A) a housing,

(B) a cutter assembly having a nip through which material to be shredded is fed, a pair of rotatable cutter shafts, and a plurality of cutter discs mounted on each shaft, the discs on one of the shafts being interleaved with the discs on the other of the shafts, and

(C) a drive for rotating the shafts in opposite directions, and for rotating the discs to cut the material fed into the nip into narrow strips,

the improvement comprising:

(a) said drive including an electric motor and an epicyclic gear mechanism having planet gears, said motor being operative for rotating the shafts through the intermediary of the gear mechanism in an operational mode, said planet gears being predominantly contained within a gear casing that has an interior toothed formation that engages the planet gears;

(b) means for constraining the gear casing against rotation relative to the housing during the operational mode, but permitting limited freedom of rotational displacement of the gear casing relative to the housing in the event that the motor is subjected to an overload; and

(c) motor overload sensing means for sensing such limited displacement of the gear casing and for changing the operational mode of the motor in response to such sensed displacement to protect the motor from damage

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4,919,346

ROTARY SCREEN DIVERTER AND SOLID WASTE HANDLING SYSTEM USING SAME

Joseph W. Chambers, Sr., Rancho LaCosta, Calif., assignor to Disposable Waste Systems, Inc. and Chambers Boyd McKinley and Associates, both of Santa Ana, Calif.

Filed Nov. 27, 1987, Ser. No. 125,951

Int. Cl.[5] **B02C** *18/22, 18/40, 23/36*

U.S. Cl. 241—46.02 22 Claims

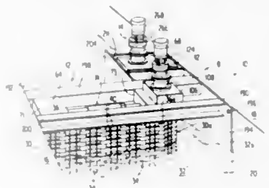
1. A solid waste handling system for screening and grinding solids entrained in an influent liquid stream flowing within a flow confining chute, said chute having a bottom wall and laterally spaced vertical sidewalls defining a flow channel for said stream, said system comprising:

at least one diverter horizontal rotating screen unit fixedly mounted within said chute, at least partially immersed in said influent liquid stream and extending transversely from one sidewall towards the other sidewall at an angle to the flow direction of said stream, said at least one screen unit comprising an elongated open frame assembly, an endless loop open mesh screen mounted for rotation on said frame assembly such that one upstream face of the screen is vertical and moves horizontally across the stream,

means for rotating said screen on said frame to divert a portion of the stream flow in the direction of screen movement, to cause solids of the influent stream larger than the mesh size of the screen to impact upon said one upstream face and to be momentarily captured thereon so as to move horizontally in the direction of screen movement, and at least one grinder unit fixedly mounted within said chute, within the flow stream and downstream of the endless loop screen, at the end of the screen unit in the direction of movement of said one upstream face,

said at least one grinder unit comprising: a grinder unit housing having an upstream facing inlet port and a downstream facing outlet port, stacked interengaging shredding members mounted within said grinder unit housing for rotation about their axes in the path of flow of said solids bearing influent through said housing from said inlet port to said outlet port, and means for rotating said shredding members such that;

the solids entrained in the diverted portion of the influent stream are driven to the end of the screen proximate to said at least one grinder unit, are automatically swept away from the screen by the diverted flow of influent passing over the end of the screen and are concentrated within the portion of the channel partially defined by the end of the screen unit and the said at least one grinder unit



and finely ground prior to discharge through said outlet port of said at least one grinder unit as waste effluent, and wherein said open frame assembly is fixedly mounted between said sidewalls of said chute, said open frame assembly including parallel upstream and downstream metal frame members fixedly mounted at least at one end to said chute and being spaced a distance on the order of the width of said screen unit and defining an elongated rectangular slot therebetween, said screen unit elongated open frame assembly mounted within said slot and being maintained in position in the path of said solids influent stream, and means including at least one short length angle bar fixedly mounted at one end to the other sidewall of said chute, and partially defining a rectangular cavity sized to and configured to said grinder unit housing and receiving the upper end of said grinder unit housing for maintaining the inlet port of said grinder unit positioned in the path of the diverted solids influent stream passing through said narrow channel portion, said laterally spaced metal frame members extend perpendicular to the direction of influent stream flow through said channel and are fixed at opposite ends to respective sidewalls of said chute, and wherein said grinder unit is supported at its upper end by two of said short length angle bars fixedly mounted, at one end, to said other sidewall, proximate to the narrow flow channel portion at the end of the screen unit, a vertical plate spans between and is fixed to respective ends of said short length angle bars remote from said other sidewall and extends parallel to said other sidewall, and wherein the end of said screen unit overlaps the end of the

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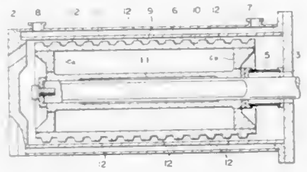
downstream grinder unit remote from each other chute sidewall, and wherein a vertical deflector wall has a downstream vertical edge fixed to the grinder unit along one side of the inlet port and extends obliquely from said grinder unit to the downstream side of said screen unit and has an upstream vertical edge at a position proximate to the downstream face of the endless loop screen so as to insure retention of solids captured on the screen within the portion of the influent passing via the narrow channel portion to the inlet port of the grinder unit.

4,919,347

DISPERSING AND GRINDING APPARATUS

Mitsuo Kamiwano, Yokohama, and Yoshitaka Inoue, Tokyo, both of Japan, assignors to Inoue Seisakusho (Mfg) Co., Ltd., Japan

Filed Dec. 27, 1988, Ser. No. 290,314
Claims priority, application Japan, Dec. 28, 1987, 62-329959
Int. Cl.[5] B02C *17/16, 17/18*
U.S. Cl. 241—65 **17 Claims**



1. A dispersing and grinding apparatus comprising: a vessel for receiving a material to be processed and a grinding medium, the vessel having an inlet at an upstream end for admitting the material into the vessel and an outlet at a downstream end for discharging processed material from the vessel; a rotor mounted to undergo rotation within the vessel and being positioned relative to the vessel to define an annular flow path between an inner wall of the vessel and the outer peripheral surface of the rotor; and guiding means disposed on one of the rotor peripheral surface and the vessel inner wall for guiding the flow of the mixture of material and grinding medium in the circumferential direction about the annular flow path in conjunction with lengthwise flow of the material along the flow path from the vessel inlet to the vessel outlet in response to rotation of the rotor to thereby attain grinding of the material by the grinding medium and uniform dispersing of the ground material, the guiding means including an array of forward guide surfaces positioned and configured to impart forward motion to the mixture in response to rotation of the rotor and an array of rearward guide surfaces positioned and configured to impart rearward motion to the mixture in response to rotation of the rotor, the forward and rearward guide surfaces being substantially linear surfaces lying along imaginary helices.

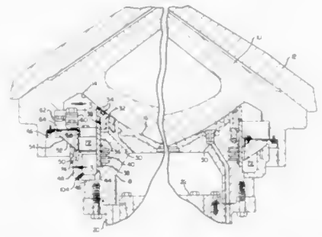
4,919,348

DUST SEAL FOR GYRATORY ROCK CRUSHERS

Louis W. Johnson, and Bruce G. Johnson, both of 2435 Prairie Rd., Eugene, Oreg. 97402

Filed Oct. 10, 1989, Ser. No. 418,857
Int. Cl.[5] B02C *2/04*
U.S. Cl. 241—215 **14 Claims**

1. A gyratory rock crusher comprising:
a base frame,
a crusher cone,
inner drive and support means on said frame moving said cone in a gyratory movement,
cooperating spherical surfaces on said base frame and cone supporting said cone in said gyratory movement,
a first annular seal member on said base frame,
a second annular seal member on said crusher cone,
said first and second seal members having cooperating spherical surfaces with slidable rubbing surface engagement with each other in the gyratory movements of said cone,
annular groove means in one of said seal members opening through said spherical rubbing surface thereof,



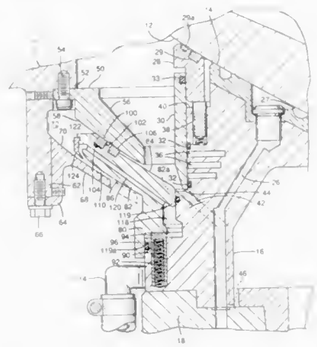
and air moving means communicating with said annular groove means directing air currents through said groove means to intercept dust moving along said spherical surfaces and to move such dust away from inner portions of said crusher.

4,919,349

DUST SEAL FOR GYRATORY ROCK CRUSHERS

Louis W. Johnson, and Bruce G. Johnson, both of 2435 Prairie Rd., Eugene, Oreg. 97402

Filed Oct. 10, 1989, Ser. No. 419,031
Int. Cl.[5] B02C *2/04*
U.S. Cl. 241—215 **17 Claims**



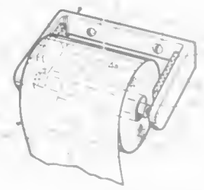
1. A gyratory rock crusher comprising a base frame,
a base frame,
a crusher cone,
inner drive and support means on said frame moving said cone in a gyratory movement,
cooperating spherical surfaces on said base frame and cone supporting said cone in said gyratory movement,
a base seal on said base frame,
a cone seal on said crusher cone,
one of said base seal and cone seal having a recessed portion and the other of said base seal and cone seal having a portion thereof projecting into said recessed portion,
said recessed and projecting portions having cooperating upper and lower spherical surfaces arranged for relative concentric movement upon gyratory movement of said cone,
said projecting portion having a thickness less than the distance between the upper and lower surfaces of said recessed portion,
forced air means forcing air into said recessed portion,
seal means between the upper surfaces of said recessed and projecting portions,
and means resiliently holding said base seal upwardly against said cone seal to provide sealing engagement between said upper surfaces of said two seal means and to provide a space between said lower surfaces whereby to form a dust seal of moving air between said base and cone seals.

4,919,350

HOLDER/DISPENSER FOR PAPER IN ROLL FORM

Norman T. Miller, 4201 Burnham, Toledo, Ohio 43612

Filed Nov. 25, 1988, Ser. No. 275,948
Int. Cl.[5] A47K *10/32, 10/04*
U.S. Cl. 242—55.2 **17 Claims**



1. In combination:
(1) a bracket/reservoir for a roll of paper, including, wall mounting means, a connected pair of parallel arms having facing surfaces and a freely rotatable spool, adapted to carry said roll of paper, carried by and between said arms,
(2) a supply roll of paper, having spaced lines of weakness, spiral wound upon itself to form said supply roll and having a central cylindrical passageway telescopically and loosely surrounding said spool, and
(3) means constructed and arranged on at least one of said facing surfaces, proximate the spiral edges of said paper in roll form, for frictional contact with said roll to resist rotation sufficient to overcome integrity of said line of weakness.

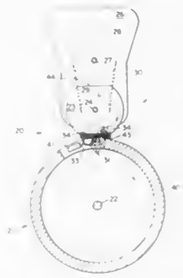
4,919,351

WEB REWINDER HAVING IMPROVED CHOP-OFF MECHANISM

Kevin B. McNeil, Maineville, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 7, 1989, Ser. No. 320,200
Int. Cl.[5] B26F *3/02;* **B65H** *35/10*
U.S. Cl. 242—56 R **7 Claims**

1. An improved chop-off means in a rewinder apparatus of the type which includes means for unwinding a parent roll of web material and forwarding unwound web through the apparatus, means for providing transverse lines of weakening in said web at sheet length intervals in the machine direction, chop-off means for breaking the web along lines of weakening at product roll length intervals, and means for winding the product roll lengths of web into product rolls, and in which the chop-off means comprises a bedroll, a chop-off roll, means for rotating the bedroll and the chop-off roll in timed relation, and a set of chop-off blades, some of which are mounted on the bedroll and some of which are mounted on the chop-off roll, and which blades are rotationally moved into and then out of a non-contacting meshed relation by simple rotational motion of the bedroll and the chop-off roll only during a web breaking, roll ending event, said improvement comprising means for continuously maintaining the chop-off blades of both the bedroll and the chop-off roll in mutually parallel relation and synchronized velocity.

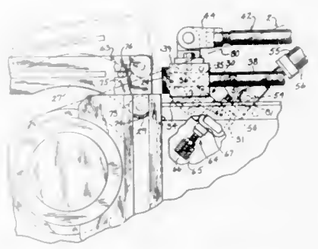


4,919,352

WEB AND TRANSFER CUTOFF APPARATUS

Gerald W. Terp, Green Bay, and Edward F. Stanek, Gillett, both of Wis., assignors to Magna-Graphics Corporation, Oconto Falls, Wis.

Filed Oct. 25, 1988, Ser. No. 262,453
Int. Cl.[5] B65H *19/20*
U.S. Cl. 242—56 A **18 Claims**



1. In a web winding apparatus having a rotating turret means including a plurality of core support means circumferentially spaced about the turret means, means for rotating said turret means to sequentially move the support means between a winding station and an unloading station, means for guiding a web about the support means at the winding station, said core support means moving vertically and laterally from said winding station to said unloading station, a knife unit having a knife support means mounted for linear movement toward and from said winding station and located in an operative cutting position adjacent said web downstream of said support means with said knife support means positioned at said winding station, said knife unit including a knife member pivotally mounted to the knife support means, and power drive means for pivoting said knife member through a cutting motion and severing said web.

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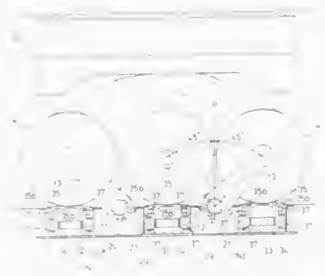
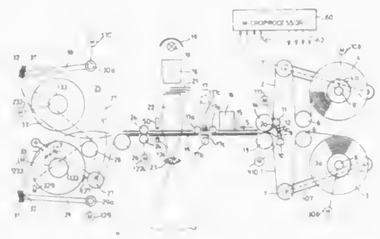
4,919,353
CARDBOARD WEB FEEDING DEVICE FOR CORRUGATOR
Eiichi Isowa, Nagoya; Hideshi Kawai; Harumi Kajita, both of Kasugai, and Hiroki Matsui, Kasugai, all of Japan, assignors to Isowa Industry Co., Ltd., Aichi, Japan
Filed Aug. 26, 1988, Ser. No. 237,223
Claims priority, application Japan, Sep. 3, 1987, 62-221623; Jul. 6, 1988, 63-90237[U]
Int. Cl.[5] B05H *19/30*
U.S. Cl. 242—58.6 10 Claims



8. A web feeding device for a corrugator comprising:
a mill roll stand consisting of two swing arm mechanisms, each having a pair of swing arms supported on a pivotal shaft which can be turned with a predetermined angle to positive and negative directions relative to a perpendicular line extending upwardly from said pivotal shaft, disposed in such a way that the pivotal shafts thereof may be parallel to each other;
a conveyor for transporting the web rolls disposed between said two swing arm mechanisms to extend parallel to said pivotal shafts, said web roll transporting conveyor disposed intermediate between said two swing arm mechanisms comprising a conveyor for carrying in web rolls; and
two web roll transporting conveyers disposed at outer areas relative to the swing arm mechanisms, respectively, to be extended parallel to said pivotal shafts, said two web roll transporting conveyors disposed at outer areas relative to the two swing arm mechanisms, respectively, comprising conveyors for carrying out web rolls.

4,919,354
APPARATUS FOR REPLACING ROLLS OF CUSTOMER FILMS IN COPYING MACHINES
Leonhard Huber, Gloan; Erich Nagel, Anzing; Bernd Payrhammer, Munich; Peter Lermann, Weyarn; Helmut Treiber, Munich, and Herbert Wilsch, Unterhaching, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Oct. 28, 1988, Ser. No. 264,311
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 3737788
Int. Cl.[5] B65H *19/28, 75/28*
U.S. Cl. 242—67.3 R 25 Claims

1. Apparatus for replacing in a copying machine rolls of photographic films which are spliced together end-to-end into elongated webs, comprising first and second supports arranged to respectively carry and pay out discrete rolls of convoluted webs and to maintain the rolls thereon in a common plane; guide means defining an elongated path which extends through the copying machine; means for advancing the leaders of webs along said path; first and second holders for rotary web collecting devices downstream of said path; means for attaching the leaders of webs to collecting devices on said holders so that the collecting devices can draw the webs from the path; means for locating the leaders of webs adjacent a portion of said path in the range of said advancing means, including a carriage which is movable between a plurality of different positions, said advancing means including at least one first portion which is supported by said carriage and at least one second portion adjacent said carriage, said first and second portions of said

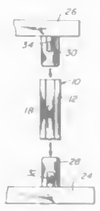


advancing means cooperating in at least one position of said carriage to hold the leader of the web between them adjacent said portion of said path; and means for actuating said advancing means so that the leader which is adjacent said portion of said path is automatically advanced along said path to said attaching means when the collecting device on one of said holders has completed the collection of a web.

4,919,355
LOCKING PAWL ACTUATING MEANS FOR EMERGENCY LOCKING SAFETY BELT RETRACTOR
Ronald Dickson, Troy, Mich., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Jul. 18, 1988, Ser. No. 220,771
Int. Cl.[5] B60R *22/40*
U.S. Cl. 242—107.4 A 11 Claims

1. In an emergency locking safety belt retractor having a safety belt storage spool, a locking ratchet turnable with the spool, a locking pawl for preventing spool rotation when engaged with said locking ratchet, a programming ratchet turnable with said spool and a locking pawl actuating means operable in response to a change in vehicle inertia sensed by a vehicle inertia sensor, the improvement in locking pawl actuating means comprising:
a flexible member having a programming ratchet engaging tooth;
member actuating means associated with said sensor and member for moving said member from a start position through an initial movement to place said tooth into engagement with said programming ratchet when a change in vehicle inertia is sensed by said sensor;
connecting means associated with said locking pawl and said member for moving said locking pawl into engagement with said locking ratchet when said member is moved through a programming movement thereof under the urging of said programming ratchet turning against said member tooth after said tooth has been placed in engagement with said programming ratchet by said initial movement of said member; and
camming means for camming said flexible member into a flexed condition and thereafter directing it out of engagement with said programming ratchet in a flexing and unflexing movement of said member under the urging of said programming ratchet turning against said tooth after said programming movement of said member has moved said locking pawl into engagement with said locking ratchet preliminary to lock up of said locking pawl and locking ratchet and while said member remains connected to said locking pawl by said connecting means.

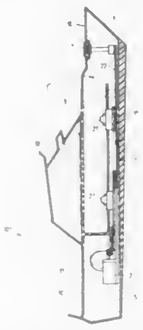
4,919,356
VIDEOTAPE TAPE GUIDE
Kiyoshi Nakagawa, Ishikawa, Japan, assignor to Fuji Kogyo Kabushiki Kaisya, Mattou, Japan
Filed Oct. 11, 1988, Ser. No. 255,378
Claims priority, application Japan, Oct. 29, 1987, 62-166174
Int. Cl.[5] B65H *23/04, 27/00*
U.S. Cl. 242—199 3 Claims



1. A videotape guide for guiding a videotape in a videocassette, said videocassette formed of a bottom case portion and a top lid portion, said videotape guide comprised of:
an elongated cylinder having a first open end and a second open end, wherein said first open end is positioned in an abutting relationship with the bottom case portion of the videocassette, and wherein said second open end is positioned in an abutting relationship with the top lid portion of the videocassette,
means forming a groove extending longitudinally from said first open end of the elongated cylinder to said second open end of the elongated cylinder, said groove defining spaced-apart surfaces extending longitudinally along the length of the elongated cylinder,
said spaced-apart surfaces being formed with a series of spaced recesses.

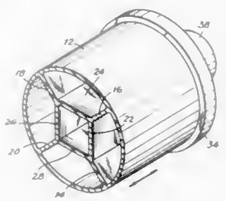
4,919,357
SHIP-SHAPED VIDEO-TAPE REWINDER
Long-Jing Lin, No. 53 Yih Yeong Rd., 80257 Lin Ya Dist., Kaohsiung, Taiwan
Filed Dec. 12, 1988, Ser. No. 283,456
Int. Cl.[5] G11B *15/32;* G02B *6/04*
U.S. Cl. 242—199 5 Claims

1. A tape cassette rewinder, comprising:
(a) a boat-shaped housing having a base, a deck above the base, a prow at the front of the housing, a stern at the rear of the housing, and a lid-like boat member pivotably mounted on the housing between the prow and the stern for movement between a lid-open position and a lid-closed position, said boat member having an upper compartment generally resembling a wheelhouse and situated above the deck in the lid-closed position, and a lower compartment in which a tape cassette is insertable in the lid-open position and in which the tape cassette is contained within the housing between the base and the deck in the lid-closed position;
(b) rewinding means mounted within the housing, and operative for rewinding the tape cassette in the lid-closed position, and for automatically terminating the rewinding when the rewinding is completed, said rewinding means including a rotary, main winding head engageable with the tape cassette in the lid-closed position, an electrically-powered motor having a drive shaft, and a gear transmission between the drive shaft and the head for rotating the same;



(c) lid-opener means for automatically opening the boat member when the rewinding is completed, including a movable swing arm pivotably mounted on the base, and having one end operatively connected to the rewinding means and movable by the rewinding means to a release position, said swing arm also having an opposite end at the prow; and
(d) means for manually opening the boat member to enable insertion of a tape cassette prior to rewinding, including a manually operable push button on the deck at the prow and operatively connected to the opposite end of the swing arm to pivot the swing arm to the release position.

4,919,358
REWIND SHELL FOR TEXTILES
Emil Innocenti, Sr., 166 Beverly Rd., Hawthorne, N.J. 07506, and Philander N. Alward, 87 E. Crescent Ave., Allendale, N.J. 07401
Continuation of Ser. No. 197,111, May 20, 1988, abandoned. This application Aug. 21, 1989, Ser. No. 396,535
Int. Cl.[5] B65H *18/08, 75/08*
U.S. Cl. 242—68.4 4 Claims



1. A rewind shell assembly, of particular utility in wet processing in the textile industries, comprised of:
a unitary extrusion of an extrudable metal providing, in transverse cross-section, radially extending webs extending in angularly spaced relation radially of a central longi-

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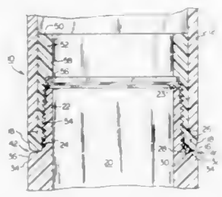
tudinal axis of said extrusion, and each interconnected with the other at a radially inner longitudinal edge of each said web;
a laterally extending flange integral with each said web at a radially outer edge of each said web, each flange being curved about a radius of said central longitudinal axis; and,
a drive member separate from said rewind shell and inserted into each axial end of said unitary extrusion, each said drive member including a radially extending flange portion, and, driving dogs formed integrally with said radially extending flange portion and respectively extending axially into said unitary extrusion, said respective driving dogs being of substantially greater axial length than the wall thickness of said respective webs and each having axially extending walls complimentary to an adjacent pair of said webs and their associated said flanges for each said driving dog to internally engage a said adjacent pair of said webs and said associated flanges in supporting and driving relationship therewith;
said driving dogs being operative to prevent movement of said webs from their radially extending orientation and being operative to prevent collapsing movement of said laterally extending flanges in directions radially inwardly of said unitary extrusion.

4,919,359

REUSABLE HIGH SPEED WINDING TUBE

Stephen S. Powel, 4305 Tallwood Dr., Greensboro, N.C. 27410, and Robert J. Darby, 2715-A Patriot Way, Greensboro, N.C. 27408, assignors to Stephen S. Powel and Robert J. Darby, both of Greensboro, N.C.

Filed Mar. 9, 1989, Ser. No. 321,279
Int. Cl.[5] B65H *75/28*
U.S. Cl. 242—125.1 **9 Claims**



1. A reusable high speed winding tube comprising:
(a) a hollow tube having an outer substantially cylindrical surface adapted to support multiple wraps of a fibrous or filamentary yarn thereon;
(b) an end cap having an outer cylindrical surface, means on said hollow tube and end cap for releasably mounting said end cap on at least one end of said hollow tube;
(c) a starting groove between said hollow tube an said end cap;
(d) said hollow tube including:
(i) a cylindrical shell of a prescribed length and an outer diameter compatible with conventional yarn carriers, having a wall thickness in the range of 0.062 inches and 0.200 inches, and being formed of a material selected from the group consisting of steel, aluminum, lightweight metallic alloys and a polymeric material reinforced with fibers selected from the group consisting of aramids, carbon, ceramic, glass and hybrids thereof;
(ii) at least one insert secured to the inner surface of the marginal end of said hollow tube adjacent said end cap;
(iii) said insert having fastening means associated therewith for receiving said end cap in secure assembled relation thereto;
(e) whereby said yarn carrier is reusable and capable of withstanding the stress imposed by winding speeds of 10,000 meters per minute and above and yet includes the same effective inner and outer diameter.

4,919,360

CLUTCH MECHANISM FOR BAIT CASTING FISHING REEL

Dennis E. Roberts, Owasso, Okla., assignor to Zebco, Corporation, Tulsa, Okla.

Filed Jul. 21, 1988, Ser. No. 222,572
Int. Cl.[5] A01K *89/015*
U.S. Cl. 242—260 **2 Claims**

2. A fishing reel, comprising:
a housing including side frame members;
a spool including a transverse spool shaft extending between the side frame members;
pinion gear means slidably mounted on the spool shaft for movement between a first position for rotating the spool shaft and a second position for rotating free of the spool shaft;
clutch means mounted on the housing for linear movement perpendicular to the spool shaft for moving the pinion gear means between said positions;
actuator means at least partially exposed exteriorly of the housing for manual engagement and mounted on the housing for linear movement oblique to the linear movement of the clutch means;
a bell crank pivotally mounted on the housing and operatively associated between the clutch means and the actuator means for moving the clutch means and, therefore, the pinion gear means from said first position to said second position in response to linear movement of the actuator means, the bell crank means having first and second angularly oriented legs and being pivotally mounted on the housing at the juncture of the legs,
said clutch means being mounted on the housing for linear movement by a pin-and-slot means, with the pin thereof defining the pivot means for the bell crank;
first means for operatively connecting between the actuator means and the bell crank; and
second means for operatively connecting between the bell crank and the clutch means.

4,919,361

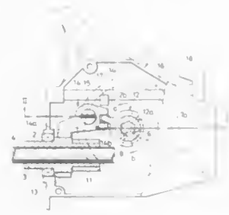
FISHING SPINNING REEL

Takehiro Kobayashi, Hiroshima, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

Continuation of Ser. No. 46,162, May 5, 1987, abandoned. This application Jan. 30, 1989, Ser. No. 304,006
Claims priority, application Japan, May 12, 1987, 61-71804[U]
Int. Cl.[5] H01K *89/02*
U.S. Cl. 242—309 **6 Claims**

1. A fishing spinning reel comprising:
(a) a reel body;
(b) a master gear shaft rotatably mounted in said reel body;
(c) a master gear attached to said master gear shaft;

(d) rotating means for rotating said master gear shaft and said master gear;
(e) a cylindrical shaft rotatably mounted in said reel body and operatively connected to said master gear;
(f) a ratchet provided integral with and rotatable together with said cylindrical shaft;
(g) an arcuate spring member rotatably mounted on and frictionally engaged with said master gear shaft, said spring member having a protrusion extending radially outward from substantially the center of the arc of said arcuate spring member, and said spring member having a



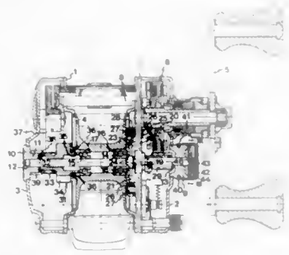
circumferential length slightly greater than the semi-circumference of said master gear shaft;
(h) a pawl member pivotally mounted on said reel body and having a substantially U-shaped recess therein, said recess being engaged with said protrusion so that said pawl member is turned clockwise or counterclockwise when said master gear shaft is rotated and said pawl member engages with said ratchet when said rotating means is turned in a reverse direction to prevent reverse rotation of said cylindrical shaft and said pawl disengages from said ratchet when said rotating means is turned in a forward direction to permit rotation of said cylindrical shaft.

4,919,362

FISHING REEL OF THE MULTIPLIER TYPE

Arne Johansson, Mörrum, Sweden, assignor to ABU Garcia Producktion AB, Svangsta, Sweden

Filed Jun. 2, 1989, Ser. No. 360,617
Int. Cl.[5] A01K *89/02*
U.S. Cl. 242—303 **3 Claims**



1. A fishing reel of the multiplier type, comprising
a frame with two side plates;
a support bearing element on each of said side plates;
a shaft which extends through said frame and the ends of which are supported by said support bearing elements;
rotary bearing means axially displaceably mounted on said shaft;
a line spool rotatably mounted on said shaft by means of said rotary bearing means;
friction brake means for braking the rotation of the line spool;
shifting means provided at one end of said shaft for axially shifting said shaft in one direction;
driver means provided on said shaft and adapted, upon axial shifting of the shaft in said one direction, to urge the line spool towards said friction brake means to increase the braking effect thereof; and
resilient means for resiliently counteracting shifting of said shaft in said one direction so as to ensure return of the shaft in the opposite direction, said resilient means having a through opening in which said shaft is inserted, and including means for retaining said shaft against rotation, said one end of said shaft having a circumferential groove which extends throughout at least a portion of the circumference of the shaft and in which said resilient means engages when said shaft is inserted in the opening of said resilient means, and said shaft being retractable from and reinsertable into said opening under resilient expansion thereof.

4,919,363

BOBBIN HANGER

Yoji Kitamura, 1-18, Deguchi 1-chome, Hirakata-shi, Osaka-fu, Japan

Filed Aug. 21, 1989, Ser. No. 396,126
Int. Cl.[5] B65H *49/00, 49/22*
U.S. Cl. 242—130.2 **7 Claims**

1. A bobbin hanger comprising:
a bobbin hanging tube having an upper expanded section and a lower reduced section extending from the expanded section;
a sliding member pivotally supporting a pair of bobbin holding fingers at a lower position thereof, pivotally supporting a retaining member integrally provided with a ratchet and retaining projections at an upper position thereof, and axially slidably inserted in the reduced section of the bobbin hanging tube;
a ratchet operating member having an operating leg for operating the ratchet of the retaining member; and
a weight axially slidably put on the reduced section of the bobbin hanging tube, said weight being capable of being pushed up by a bobbin to push up the sliding member so that the retaining member is turned substantially through an angle of 90° by the operating leg of the ratchet operating member engaging the ratchet of the retaining member to bring the retaining projections to a position for resting on the inner upper end of the reduced section of the bobbin hanging tube to retain the sliding member at a position where the bobbin holding fingers are allowed to swing outward to engage the inner surface of the bobbin;
characterized in that the position of the upper end of the weight at the completion of turning of the retaining member is 4 to 10 mm below the lower end of the expanded section of the bobbin hanging tube, and the bobbin holding fingers have a shape capable of preventing the retraction of the bobbin holding fingers into the interior of the bobbin hanging tube when acted upon by a horizontal force.

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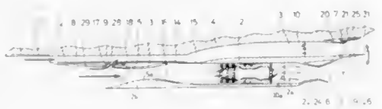
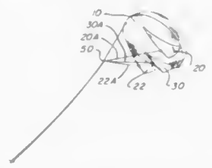
4,919,364
PROPULSION SYSTEM FOR HYPERSONIC FLIGHT
Helmut John, Munich, and Otfrid Herrmann, Hohenthann, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany
Filed Apr. 7, 1989, Ser. No. 335,053
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1988, 3811614
Int. Cl.[5] B64D *27/20*
U.S. Cl. 244—55 7 Claims



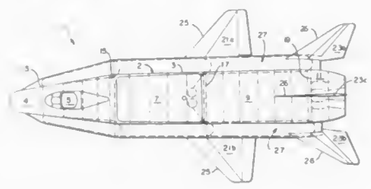
1. An air breathing propulsion system for hypersonic flight of an aircraft having a body, comprising ramjet means mounted in a location directly next to said body, turbo-jet means mounted away from said body next to said ramjet means, so that said ramjet means are located between said body and said turbo-jet means, said ramjet means and said turbo-jet means having separate thrust nozzles, common air intake means arranged for supplying air to said ramjet means and to said turbo-jet means, first flap means for controlling an air intake of said common air intake means separately for said ramjet means and for said turbo-jet means, body boundary layer guide channel means beginning upstream of said air intake means for separating a body boundary layer from an air intake for said turbo-jet means when said turbo-engine means are operating, said boundary layer guide channel means leading into said ramjet means, and second flap means arranged for opening said guide channel to lead a boundary layer through said guide channel and through said ramjet means when said ramjet means are not operating and to close said guide channel for leading a boundary layer into an air intake for said ramjet means when said ramjet means are operating while an air intake for said turbo-jet means is closed.

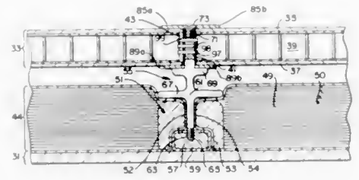
4,919,365
AIRFOIL
Arthur W. Mears, 5212 Lone Tree Dr., Loveland, Colo. 80537
Filed Jun. 6, 1988, Ser. No. 202,678
Int. Cl.[5] B64C *31/06*
U.S. Cl. 244—153 R 6 Claims



1. A lighter-than-air inflatable device comprising:
an aerodynamically shaped envelope having a horizontal and vertical axis and having a circular cross-section taken along the horizontal axis; said envelope having a upper portion and a lower portion communicating with each other in a manner that said envelope will retain a gas and its aerodynamic shape upon being inflated through a inflation means;
a guidance means mounted rearwardly on and extending below said lower portion running approximately parallel to the longitudinal axis of said envelope;
a tether line means secured to both said envelope and said guidence means for tethering said envelope and providing manuverability input to said envelope.

4,919,366
HEAT RESISTIVE WALL ASSEMBLY FOR A SPACE VEHICLE
Leonard N. Cormier, Reno, Nev., assignor to MMI Incorporated, Reno, Nev.
Filed Sep. 23, 1988, Ser. No. 248,412
Int. Cl.[5] B64C *1/38*; B64G *1/58*
U.S. Cl. 244—160 34 Claims

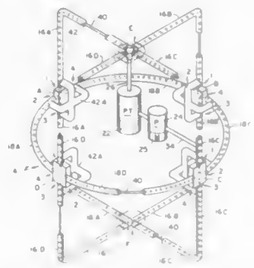




1. A heat resistive wall assembly for a space vehicle, comprising:
a. an inner wall formed from a heat resistive metal for providing both structural support for the vehicle and a heat sink for absorbing and dissipating heat applied to the outer surface of the vehicle;
b. an outer wall formed from a heat resistive metal mounted over said inner wall in spaced relation thereto for radiating away heat applied to the outer surface of the vehicle, and
c. at least a first resilient, evacuated insulator means disposed between said inner and outer walls to retard the radiant transmission of heat through said wall structure,
wherein the space between the inner and said outer wall is vented so that said outer wall bears no atmospheric pressure load, and wherein the resiliency of said insulator means causes it to define a lengthened heat path between said inner and outer wall when ambient atmospheric pressure is relieved.

4,919,367
SATELLITE ATTITUDE CONTROL
Melville T. Whitcomb, 8 Glidden St., Waldoboro, Me. 04572
Filed Feb. 29, 1988, Ser. No. 162,074
Int. Cl.[5] B64G *1/28*
U.S. Cl. 244—164 11 Claims

1. The method of controlling the attitude of a satellite in space by thruster reaction forces which comprises
discharging at least one jet of pressurized reaction mass gaseous fluid in a predetermined direction into an enclosed evacuated endless volume on board the satellite,



scavenging the discharged fluid from said volume, and compressing and storing the scavenged fluid for re-use

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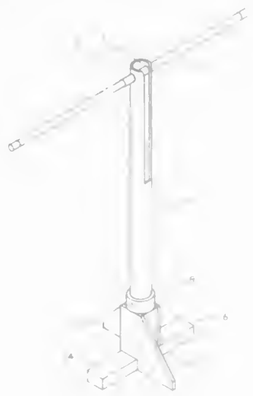
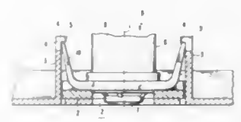
4,919,368
PORTABLE STAND WITH REMOVABLE BAR
Elmer E. Garrett, Box 40, Hut Hill Rd., Bridgewater, Conn. 06752
Filed Mar. 27, 1989, Ser. No. 329,389
Int. Cl.[5] F16L *3/00*
U.S. Cl. 248—121 1 Claim



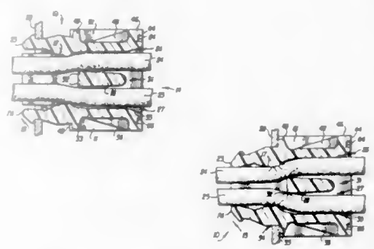
1. A portable stand comprised of a vertical member with a horizontal bar removably mounted at the upper end and with said vertical member having a pocket for holding the removed bar, and a slot extending from the top axially part way to the bottom with said slot being of width sufficient to permit entry of the bar laterally into said pocket, and with the upper end of said slot being made narrower than the diameter of said bar to provide a detent action as said bar is moved laterally into said pocket, and with said vertical member being supported by four legs two of which are fixed to said vertical member and two of which are fixed axially to said vertical member and free to rotate together between positions normal to the fixed legs and positions parallel to said fixed legs.

4,919,369
LOUDSPEAKER MOUNTING MECHANISM
Werner Stehn, Hemmingen, Fed. Rep. of Germany, assignor to Electronic-Werke Deutschland GmbH, Villingen-Schwenningen, Fed. Rep. of Germany
Filed Jun. 2, 1989, Ser. No. 363,839
Int. Cl.[5] H04R *1/02*
U.S. Cl. 248—27.3 11 Claims



1. An arrangement including a loudspeaker and a panel comprising in combination:
an opening in said panel for receiving said loudspeaker;
a plurality of arms arranged on opposite sides of said opening, the ends of said arms being angled inwardly toward said opening to form lips, and
a plurality of fingers on said loudspeaker, said fingers extending outwardly away from an axis of said loudspeaker, said fingers and said lips being resiliently engageable as said loudspeaker is inserted onto said panel and the ends of said fingers lock to said lips to attach said loudspeaker to said panel.

4,919,370
CABLE FITTING
William B. Martin, 772 Twin View Pl., Pleasant Hill, Calif. 94523; John W. Martin, 743 Santa Anna Dr., Pittsburgh, Calif. 94565, and Mark Bryan, 110 S. Cornish Ave., Lodi, Calif. 95242
Filed Feb. 17, 1989, Ser. No. 311,750
Int. Cl.[5] F16L *5/00*
U.S. Cl. 248—56 24 Claims



1 A fitting for securing cable and the like to an enclosure, comprising:
(a) housing means having a passageway therethrough, for enclosing the cable;
(b) means for longitudinally dividing said passageway into a plurality of channels, said channels being adapted for receiving at least one cable each, said means for longitudinally dividing said passageway having a rounded entry end and providing a cable clamp point at a second end thereof; and
(c) means for securing said fitting to said enclosure compris-

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ing combination positive mechanical cable clamp adapted for both securing said fitting to said enclosure and for clamping said cables in said housing in cooperation with said cable clamp point.

4,919,371

SEALING PASSAGE ARRANGEMENT FOR A PIPELINE

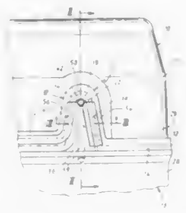
Helmut Bonfert, Böblingen; Thomas Hardt, Ostfildern; Rolf Klumpp, Kernen, and Wolf-Dietrich Wagner, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Oct. 31, 1988, Ser. No. 264,524

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1987, 3736778

Int. Cl.[5] **F16L** *5/00*

U.S. Cl. 248—56 6 Claims



1. Sealing passage arrangement for a pipeline through a wall aperture in a housing exposed to lubricant medium, said housing being attachable so as to be sealed by a housing edge delimiting an open side of the housing on a receiving surface of an internal combustion engine, having a seal element made of elastomer material which tightly closes the wall aperture and is penetrated by the pipeline connected inside the housing, wherein the wall aperture starts from the housing edge and extends into the housing wall,

wherein the seal element includes a first part and second part, said first part being retained upright on the receiving surface and being releasably in engagement with the wall aperture which receives the second part,

wherein the two mutually abutting first and second seal element parts enclose the pipeline to form a seal between themselves,

wherein side edges of the wall aperture converge in a direction opposite to the housing edge and merge into a circular arcuate edge part, and

wherein the second part of the seal element exhibits two seal members which are in engagement each with a side edge of the wall aperture on the one hand and each with a longitudinal groove of the first part of the seal element on the other hand.

4,919,372

TRANSIT FOR CABLES AND PIPES

Michael Twist, and Alan Platt, both of Manchester, England, assignors to Hawke Cable Glands Limited, England

Continuation of Ser. No. 11,588, Feb. 6, 1987, abandoned. This application Dec. 23, 1988, Ser. No. 289,448

Claims priority, application United Kingdom, Feb. 11, 1986, 863368

Int. Cl.[5] **H02G** *3/28;* **F16L** *5/00*

U.S. Cl. 248—56 18 Claims

1. A lead-through transit for cables or pipes comprising:

a rigid outer frame defining a rectangular opening having opposed frame side walls and opposed frame end walls,

a plurality of modular blocks of resilient material arranged in rows within said opening,

said rows extending between said frame side walls and partially filling said opening between said frame end walls,

each said block being of rectangular section extending through said opening, said blocks comprising cable blocks which surround a respective cable or blanking blocks which blank off a modular space,

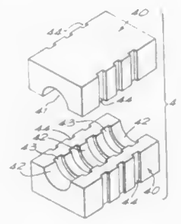
said cable blocks comprising two complementary half-blocks defining a lead-through passageway extending normal to the plane of said opening, through which passageway the cable extends between entry and exit ends of said passageway,

a compression means located between said frame side walls and completing filling of said opening between said frame end walls to compress and seal said blocks relative to one another and to said frame, and to compress and seal each cable block onto and around its respective cable,

wherein each said cable block comprises:

a plurality of axially spaced apart internal annular recesses, said recesses being spaced from said entry and exit ends of said passageway,

a series of axially spaced apart internal land portions separated by said recesses, each said land portion having an axially extending sealing face and axially spaced opposed



land side walls, the side walls, in the uncompressed state, extending generally radially from the bottoms of the recesses up to the sealing faces, and the sealing faces in the uncompressed state being cylindrical surfaces which extend axially for a distance greater than the height of their respective side walls, such that the land portions, viewed in an axial cross sectional plane are generally rectangular, each sealing face engaging a discrete outer surface of said cable, which discrete cable outer portions are spaced apart axially, by said recesses, from the other discrete outer cable surfaces which are engaged by other land portions, each said land portion engaging said cable around the entire circumference of its said discrete surface,

the land portions being of a resilience, which, upon compression onto and around its respective cable, deforms into its adjacent recesses to form a high pressure fluid tight seal between itself and the cable (1) within a finite range of cable diameters received within that passageway and (2) in the presence of certain common irregularities in the nominal diameter of the cable.

4,919,373

PUSH MOUNT TIE

Jack E. Caveney, Hinsdale, and Jeffery S. Kuzmuk, Lansing, both of Ill., assignors to Panduit Corp.

Continuation-in-part of Ser. No. 98,269, Sep. 18, 1987, abandoned. This application Dec. 29, 1987, Ser. No. 139,528

Int. Cl.[5] **B65D** *63/00;* **F16L** *3/03*

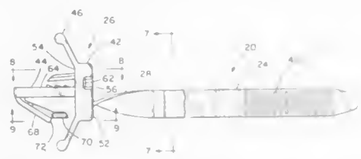
U.S. Cl. 248—74.3 22 Claims

1. A one-piece fastener for securing a plurality of elongate objects in a bundle and securing the bundle to an apertured mounting surface, comprising:

(a) an elongate flexible strap having a plurality of teeth formed along its length in a first planar strap surface;

(b) a head disposed transverse to the planar strap surface having an upper surface and a lower surface, said head having a strap accepting and positioning slot formed through the thickness thereof;

(c) strap locking means formed on the head for securing a free end of the strap to the head and aperture mounting means formed on the head for securing the fastener within an aperture in the mounting surface; and



(d) a molded spiral strap portion extending from and joining one end of the strap to the upper surface of the head whereby the structural features of the entire fastener can be molded in a conventional, simple two plate mold without side action.

4,919,374

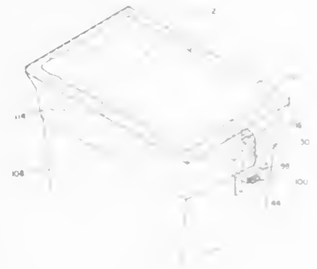
PLASTIC LINER SECURING APPARATUS

Marland R. Julian, Baker, Oreg., assignor to J - MARK Industries, Baker, Oreg.

Continuation-in-part of Ser. No. 103,902, Oct. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 39,384, Apr. 17, 1987, abandoned. This application Mar. 7, 1988, Ser. No. 164,884

Int. Cl.[5] **B65B** *7/12*

U.S. Cl. 248—95 7 Claims



1. For rigid or semi-rigid waste or storage containers which utilize flexible plastic liners, a plastic liner securing apparatus or device for securing or attaching flexible plastic liners to and holding said liners within said containers by inserting the folded over or turned down portion of the liner top directly into the open split or divided accumulator and rotating the accumulator until the liner is tightened or stretched around the top uppermost portion of the container, said apparatus comprising:

(a) a split or divided accumulator means having two or more elongated vertical portions being spaced apart and being joined together at their bases to form a common base or single base portion

(b) a rotational transmission means which is capable of rotating the split or divided accumulator

(c) a holding releasing means which is capable of holding the split or divided accumulator in a stationary position for indefinite periods and allowing the split or divided accumulator to be counter rotated

(d) a housing means which supports the split or divided accumulator and houses, supports, or contains, the rotational transmission means, and the holding releasing means

(e) said housing means is attached to or is an integral part of a mounting bracket means which is used to attach the apparatus or device to the waste or storage container.

4,919,375

SUPPORT STRUCTURE FOR A FLUID CONTAINER

Steven L. Miller, Shelby County, and Ronald L. Wathen, Jefferson County, both of Ky., assignors to Environmental Water Technology, Inc., Louisville, Ky.

Filed Apr. 5, 1989, Ser. No. 333,263

Int. Cl.[5] **A47G** *23/02*

U.S. Cl. 248—152 12 Claims

1. Support structure for a container comprising:

an outer peripheral skirt member having an upper edge sized to nestingly engage a first preselected peripheral wall portion of a container supported thereby;

an inner peripheral skirt member disposed within said outer skirt member and having an upper edge sized to nestingly engage a second preselected peripheral wall portion of said container inwardly of said first peripheral wall portion of said container said upper edge of said inner peripheral skirt member being horizontally spaced inwardly from said upper edge of said outer peripheral skirt member with said inner peripheral skirt member sloping downwardly and outwardly toward said outer peripheral skirt member with the lower edge of said inner peripheral skirt member extending adjacent to the inner face of said outer peripheral skirt member;

first structural connection means supportively connecting said upper edge of said outer peripheral skirt member to said spaced upper edge of said inner peripheral skirt member; and

second structural connection means connecting said lower edge of said inner peripheral skirt member at a location substantially adjacent said inner face of said outer peripheral skirt member.

4,919,376

COUNTER-BALANCING MECHANISM FOR CAMERA UNIVERSAL HEAD

Kenichi Uehara, Kawagoe, and Hisashi Tomioka, Asaka, both of Japan, assignors to Daiwa Manufacturing Co. Ltd., Tokyo, Japan

Filed Apr. 28, 1989, Ser. No. 344,865

Claims priority, application Japan, Nov. 25, 1988, 63-152494[U]

Int. Cl.[4] **F16M** *11/10*

U.S. Cl. 248—185 2 Claims

1. A counter-balancing mechanism for a camera universal head journaling to support vertically rotatively in both direction at two axial pieces protrudingly provided in symmetry at the inside of side plates of said head a camera mounting table on a base support formed rotatively in both direction laterally, comprising;

a box-like hollow space provided on said base support to insert a spring receiving seat into said hollow space so as

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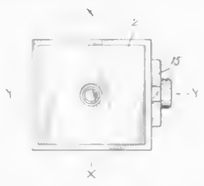
to make said seat slidable in the direction right angle in a plane to the protruding directions of said axial pieces;

each recessed portion provided on the end surface of each said axial piece to form a cam surface in eccentricity to the center of said piece on the circumferential inner surface of said recessed portion; and

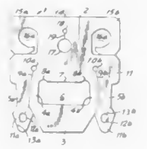


two protruding rollers provided on said spring receiving seat to be made in suppressing contact with said respective cam surfaces by said spring receiving seat energized by a spring therein.

4,919,377
SHEET DISPENSER AND DISPLAY AND HOLDER THEREFOR

Herman P. Alexander, Merrick, and John D. Langwell, Freeport, both of N.Y., assignors to Sandy Alexander, Inc., Clifton, N.J.

Filed Jan. 28, 1988, Ser. No. 149,334
Int. Cl.[5] A47B *96/06*
U.S. Cl. 248—225.1 **22 Claims**



1. A display holder for releasably supporting a pad of sheets in a price channel support having spaced inwardly facing upper and lower flanges, the pad being formed with a pair of spaced apertures therethrough, comprising:

a mounting portion adapted for coupling to the support, the mounting portion being formed with an upper first edge and a lower second projecting edge, the first and second edges of the mounting portion being spaced a distance slightly greater than the spacing between the edges of the channel of the price channel defined by the flanges for receipt therein and positioned in the channel by the flexing the mounting portion toward the channel; and

a pair of laterally spaced prongs formed with enlarged heads and shaped to permit insertion of the prongs through the apertures of said pad for retention of said pad while permitting removal of sheets therefrom, the prongs being flexibly integrally connected to the mounting portion at positions intermediate the upper and lower edges of the mounting portion and depending outside both sides of the lower second edge, said mounting portion and prongs of the holder being integral and formed from flexible sheet material.

4,919,378
SUPPORT STRUCTURE FOR BICYCLE SADDLE

Yosbihisa Iwasaki, Sakai, and Shogo Akamatsu, Izumi, both of Japan, assignors to Maeda Industries, Ltd., Osaka, Japan

Filed Feb. 27, 1989, Ser. No. 315,497
Claims priority, application Japan, Apr. 12, 1988, 63-48983[U]
Int. Cl.[5] A47F *1/10*
U.S. Cl. 248—295.1 **12 Claims**

1. A support structure for a bicycle saddle comprising:

a first seat post mountable to a seat pipe of a bicycle frame, said first seat post being provided at an upper portion thereof with a post support portion having a mounting bore which extends obliquely upwardly and forwardly of the bicycle,

a second seat post for supporting said saddle, said second seat post having a slide portion which is slidably fitted in said mounting bore and extends at an angle to said first seat post; and

a lock mechanism for locking said second seat post at an adjusted position relative to said mounting bore.

4,919,379
UNIVERSAL CLAMPING FIXTURE FOR BABY CARRIAGE UMBRELLAS

Kurt A. Goetz, Aumueble Container Terminal, D-8700 Wurzburg, Fed. Rep. of Germany

Filed Feb. 7, 1989, Ser. No. 307,774
Claims priority, application Fed. Rep. of Germany, Juo. 25, 1988, 8808262
Int. Cl.[5] A44B *21/00*
U.S. Cl. 248—231.6 **7 Claims**

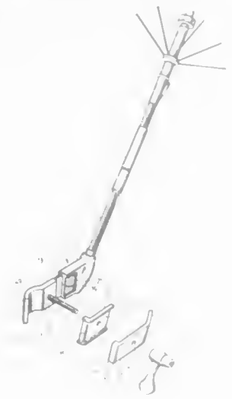
1. A universal clamping fixture for baby carriages, comprising:

a clamp body attachable to one end of a shaft;

a stationary clamp jaw having a hole therethrough, a first end, a second end, a clamping surface, and a second surface, the first end being attached to the clamp body and the second end being adapted to interchangeably receive members of round, square or rectangular cross section with equal facility and to transmit approximately equal clamping stresses to members having round, square or rectangular cross sections;

a movable clamp jaw having a hole therethrough, a first end, a second end, a clamping surface, and a second surface, the first end being angled to contact one side of the clamp body and the second end has a flat clamping surface, a retaining lip perpendicular to the flat clamping surface, and an arcuate depression in the flat clamping surface spaced from the retaining lip, said second end being adapted to interchangeably receive members of round, square or rectangular cross section with equal facility, and to transmit approximately equal clamping stresses to members having round, square or rectangular cross sections, and wherein said clamp body includes a depression

therein, said first end of said movable clamp jaw engages an edge of said depression so as to pivot thereabout; and

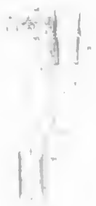


means for urging the movable clamp jaw toward the stationary clamp jaw.

4,919,380
ROTATIONALLY AND TRANSLATIONALLY PIVOTABLE BALANCING ASSEMBLY

Ralph L. Ely, Jr., Durham, N.C., assignor to Kelyx, Inc., Durham, N.C.

Filed Mar. 15, 1989, Ser. No. 324,251
Int. Cl.[5] A47K *1/08*
U.S. Cl. 248—311.2 **6 Claims**



1. A rotationally and translationally pivotable assembly comprising:

an elongate member;

a functional element mounted on said elongate member;

a counter-weight mounted on said elongate member in spaced relationship to said functional element; and

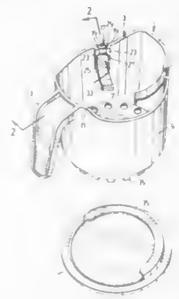
a single pivotal structure comprising (i) a single omnidirectional fulcrum with a base structure reposable on a support surface for areal contact therewith, and (ii) a support arm joined to said elongate member and operatively associated with said omnidirectional fulcrum to permit rotational and translational pivoting movement of said elongate member, and

wherein said functional element comprises a beverage container holder secured to an upper part of said elongate member, said elongate member having joined at said upper part thereof a laterally extending support arm, wherein the beverage container holder is secured to the upper part of the elongate member below the laterally extending support arm.

4,919,381
CUP HOLDER

Ronald W. Buist, 1284 Avon Crescent, Oakville, Ontario, Canada (L6J 2T6)

Filed Feb. 9, 1989, Ser. No. 308,222
Int. Cl.[5] A47J *47/16*
U.S. Cl. 248—154 **16 Claims**

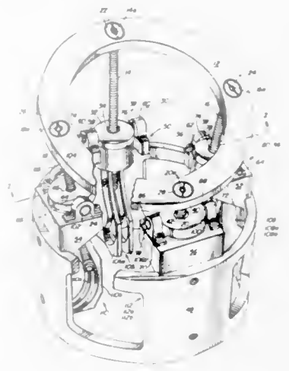


1. A cup holder for holding a cup, comprising a cup retainer including a wall dimensioned to loosely receive the cup and at least one resilient tab projecting inwardly from the wall for resiliently gripping the cup, the cup retainer further including a respective slot in the wall for each tab, each slot having substantially vertical sides and a sill and for each slot, the wall having a pair of opposing, spaced apart, L-shaped brackets providing an opening, the wall being indented between the brackets to form the slot.

4,919,382
MULTI-POST YOKE GIMBAL

Donald B. Forman, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 14, 1988, Ser. No. 244,363
Int. Cl.[5] B25J *17/02*
U.S. Cl. 248—178 **12 Claims**



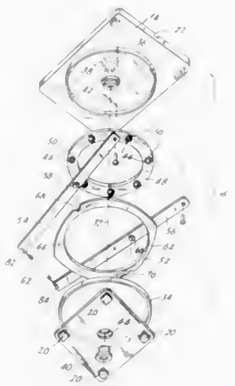
1. A multi-post gimbal mechanism for imparting motion to an object about a center of rotation comprising:

a frame for supporting said object;

a plurality of elongate posts, each coupled to said support frame at a coupling point so as to permit orbital rotation of

said frame about each said coupling point, each of said elongate posts being selectively adjustable in position;
drive means coupled to said plurality of elongate posts for selectively adjusting the position of each of said elongate posts;
a mounting base, said drive means being connected to said mounting base;
each of said elongate posts including a first end and a second end, each said first end being connected at said coupling point; and
said mounting base including a plurality of arcuate guides connected thereto, the second end of each of said elongate posts being positioned in one of said plurality of arcuate guides.

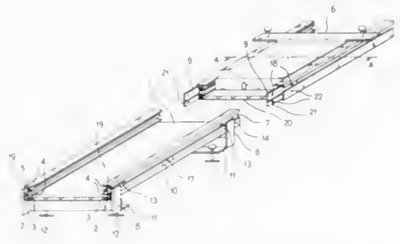
4,919,383
ROTATING DISPLAY
Olivier Benjamin, Woodcliff Lake; Robert P. Franklin, Lake Hopatcong, and John Larocca, Fairfield, all of N.J., assignors to Trans World Marketing Corp., E. Rutherford, N.J.
Filed Mar. 30, 1989, Ser. No. 330,440
Int. Cl.[5] A47B *95/00*
U.S. Cl. 248—349 15 Claims



1. A rotation mechanism comprising a turntable rotatably mounted upon a base and free to rotate about an axis of rotation to at least one predetermined equilibrium orientation relative to said base, said base having a cam with a contact surface which is non-uniform about said axis of rotation, said turntable having attached thereto, first and second pressure arms each pivotably mounted to said turntable, wherein first and second cam followers are rotatably mounted to said first and second pressure arms respectively, both cam followers being pressed against said contact surface by a single biasing means and with a force sufficient to cause, in the absence of external force or impediment, an angular acceleration of said turntable, relative to said base, in a direction toward one of said equilibrium orientations.

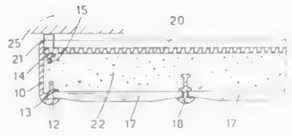
4,919,384
GUIDING DEVICE FOR A PORTABLE MACHINE
Gerard Grimberg, 28 Rue De Garches, 92210 Saint Cloud, France
Filed Jan. 27, 1989, Ser. No. 302,812
Int. Cl.[5] B27B *9/04*
U.S. Cl. 248—646 9 Claims

1. A device for supporting and guiding portable electric machines executing a rectilinear work, such as a cut, a slot, a rabbet, which includes a rectilinear rail (1) of a U-shaped section including two parallel wings (2) and a bottom (3), in which a travelling path (5) receives a mobile carrier (6) adapted for carrying the machine, the rail being fixed on a material (23) to be worked by sliding stirrups (8, 24), in slides on said wings characterized in the rail is made, at least over a



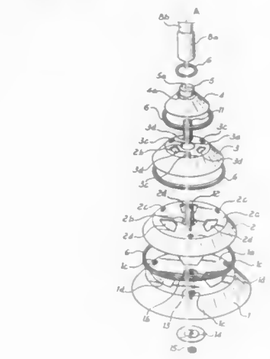
major portion of its perimeter, of a double wall, the two walls being rigidly connected to one another by braces placed in spaces between the two walls so as to form a monolithic structure, non deformable under the efforts generated by the machine in any position.

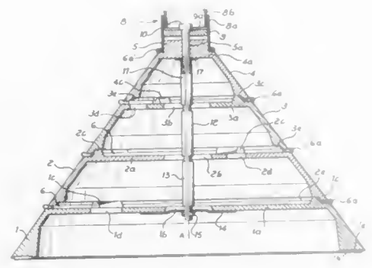
4,919,385
STRUCTURE TO SUPPORT A LARGE MIRROR, AND A LARGE MIRROR EMPLOYING THAT STRUCTURE
Dino Munini, S. Quirino, and Franco Marcorin, Cinto Caomaggiore, both of Italy, assignors to Imago Flama Sas di Pasquinelli Mauro & C., Pravisdomini, Italy
Filed Mar. 24, 1989, Ser. No. 328,321
Claims priority, application Italy, Apr. 6, 1988, 83362 A/88
Int. Cl.[5] A47F *7/14*
U.S. Cl. 248—475.1 6 Claims



1. A structure for supporting a mirror cabinet, cupboard doors, hanging cupboard doors with mirrors, or two-face partition panels with mirrors or other items, said structore comprising:
a plurality of lateral sections provided with means for supporting at least one mirror and a rear panel, wherein said lateral sections are joined by means of angular elements cooperating, respectively, with guiding means and with two adjacent lateral sections;
a volume of space being delimited by said lateral sections, at least one said mirror and said rear panel, wherein said lateral sections comprise means for supporting said rear panel, and
an injected foam material means which binds solidly together all the elements forming said mirror cabinet fills up said volume of space.

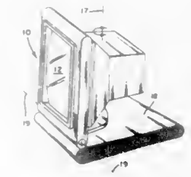
4,919,386
FOOT FOR TABLE LEG
Franco Cassina, Meda, Italy, assignor to Cassina S.p.A., Meda, Italy
Filed Mar. 10, 1987, Ser. No. 322,558
Claims priority, application Italy, Sep. 13, 1988, 21842/88[U]
Int. Cl.[5] F16M *11/24*
U.S. Cl. 248—544 9 Claims

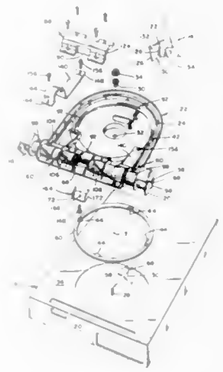




1. In combination with a leg of a table or the like, a foot comprising:
a stack of similarly upwardly tapered one-piece elements including an upper element, an intermediate element, and a lower element all centered on a common upright axis, the elements each having
a downwardly flaring skirt having an upper edge and a lower edge and
a flat plate bridging the upper edge,
the elements all being substantially free of internal structure beneath the plate and within the skirt but being of sizes decreasing incrementally from the lower element to the upper element, each plate being formed at the axis with a central hole, the lower edges of at least the upper and intermediate elements each forming a downwardly open seat, the plates of at least the lower and intermediate plates being formed offset from the respective central holes with respective upstanding centering formations complementarily engageable in the seats of the respective immediately overlying elements. the upper element having an upwardly directed centering formation fittable with the lower end of the leg to which the foot is to be attached; and
a multipart bolt extending axially through the holes and having an upper end engaged with the lower end of the leg fitted to the foot and a lower end bearing upward on the plate of the lower element.

4,919,387
TILT AND SWIVEL SUPPORT APPARATUS
Craig F. Sampson, Palo Alto, Calif., assignor to Bell & Howell Publication Systems Company, Skokie, Ill.
Filed Mar. 6, 1989, Ser. No. 319,528
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—921 66 Claims





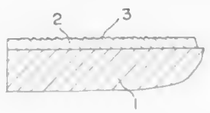
41. Apparatus for adjustably swivelling a product, comprising the combination of:
a swivel member having a plurality of spaced arcuate slots about the same axis of rotation;
a base for supporting said swivel member and for permitting said swivel member to rotate with respect to said base about said axis;
a bearing ring interposed between said swivel member and said base, said swivel member being rotatable about said axis with respect to said ring and said ring being rotatable about said axis with respect to said base, said ring including spaced fingers respectively projecting through said slots for limiting rotatability of said swivel member with respect to said ring to a first predetermined rotational angle about said axis, said ring further including a stop for cooperating with said base for limiting rotatability of said ring with respect to said base to a second predetermined rotational angle about said axis; and
mounting means for mounting the product to said swivel member.

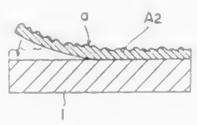
4,919,388

PLASTICS SHAPING MOLD HAVING PATTERNED RESIN LAYER

Hiroyuki Koike, Nara; Yukihiro Hata, Osaka, and Mitsushi Sogabe, Moriguchi, all of Japan, assignors to Tanazawa Hakko Sha Co., Ltd., Osaka, Japan

Continuation of Ser. No. 943,107, Dec. 17, 1986, abandoned.
This application Sep. 21, 1988, Ser. No. 247,236
Claims priority, application Japan, Dec. 20, 1985, 60-288369; Dec. 20, 1985, 60-288368; Jan. 31, 1986, 61-21074
Int. Cl.[5] B29C *33/56*
U.S. Cl. 249—115 **11 Claims**





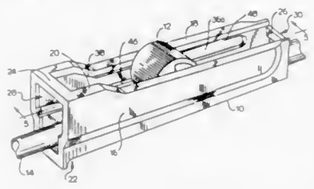
1. A mold for shaping a plastic material, which comprises a first mold portion and a second mold portion, a hardened resin layer of non-uniform thickness fixedly superposed on at least a pattern-defining portion of said first mold portion and adapted to be in contact with said plastic material, said hardened resin layer on said first mold portion having a pattern defining shaping surface of non-uniform thickness, said pattern defining shaping surface of non-uniform thickness being exposed toward said second mold portion for impressing a pattern defined surface of non-uniform thickness on said plastic material injected between said exposed pattern-defining shaping surface of non-uniform thickness and said second mold portion, said hardened resin layer has a thickness of from about 0.2 mm to about 0.6 mm with said pattern defining surface of non-uniform thickness to be impressed on said plastic material being shallower than said resin layer thickness.

4,919,389

LARGE BORE TUBING ROLLER CLAMP

Mark A. Hoekwater, Mundelein; Anthony R. Paren, Hawthorn Woods; Thomas Kasting, McHenry, and Richard Rollins, Mundelein, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Filed Mar. 17, 1989, Ser. No. 324,850
Int. Cl.[5] F16K *7/06*
U.S. Cl. 251—6 **6 Claims**



1. A large bore tubing roller clamp assembly for regulating the flow rate of a liquid through large bore tubing, said assembly comprising a substantially rigid elongated plastic frame, a generally cylindrical roller, and a length of a large bore tubing disposed within said frame,

said frame having:

a pair of side walls, a flat bottom wall, and a top wall portion defining an elongated aperture therein, said aperture being defined, in part, by a first bridge member joining said side walls at one end of said frame, and a second bridge member joining said side walls at the opposite end of said frame;

said frame further comprising means defining apertures at each end of said frame for receiving large bore tubing therethrough, wherein the aperture at one end further serves as a roller receiving aperture for receiving said roller therethrough;

said frame further having a roller track comprising a recessed pathway located along the inner surface of each of said side walls beginning from said end defined by said roller receiving aperture and extending substantially along the length of said frame, said roller track being disposed at an incline relative to said flat bottom wall;

said frame still further comprising a loading ramp for loading said roller into said roller track, said loading ramp being defined along the inner surfaces of each of said side walls and below said recessed pathways of said roller track, said loading ramp beginning from the end defined by said roller receiving aperture and extending upwardly to merge with said roller track to facilitate insertion of said roller into said frame;

said roller being disposed within said frame and being rollingly movable along said frame,

said roller having means defining an axle at the center of each face of said roller, said axle means being disposed within the recessed pathways of said roller tracks to permit movement of said roller along of said frame;

a portion of said roller protruding through said aperture of said top wall portion for manual movement of said roller;

said large bore tubing being disposed within said frame between said roller and said flat bottom wall and extending through each of said end apertures, whereby the flow-rate of a liquid therethrough is controlled by moving said roller over said tubing between a fully open position at one end of said roller track and a fully closed position spaced from the other end of said roller track, the flow rate through said tubing being substantially uninhibited when the roller is disposed in said fully open position, said flow rate decreasing as said roller is moved from said one end and gradually compresses tubing, thereby decreasing the fluid pathway through the interior of said tubing, said flow rate being defined by a flow-rate of zero when said roller is in said fully closed position; and

said frame further comprising obstruction means disposed along said roller track at said fully closed position to inhibit movement of said roller beyond said fully closed position, said obstruction means being spaced from the other end of said roller track.

4,919,390

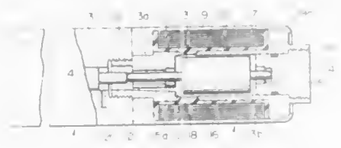
SOLENOID OPERATED VALVE APPARATUS

Ken Ichiryu, Ibaragi; Takashi Kanai, Kashiwa; Masami Ochiai, Atsugi, and Nobuhiko Ichiki, Kashiwa, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,096
Claims priority, application Japan, Dec. 29, 1987, 62-201503
Int. Cl.[5] F16K *31/06*
U.S. Cl. 251—129.15 **4 Claims**

1. A solenoid operated valve apparatus in which a solenoid device includes an inner yoke, a plunger guide disposed in opposed relationship with said inner yoke, a plunger movably accommodated in a space formed between said inner yoke and said plunger guide, a bobbin frame disposed to surround said inner yoke and said plunger guide, a coil wound around said bobbin frame, and an outer yoke disposed to surround said coil, wherein:

said bobbin frame is made of a polymeric material and is connected to said inner yoke and said plunger guide by adhering the bobbin frame with the inner yoke and



plunger guide to form a unitary structure concurrently with a molding of the bobbin frame, said inner yoke and said plunger guide having inner surfaces which define said space in which said plunger is accommodated

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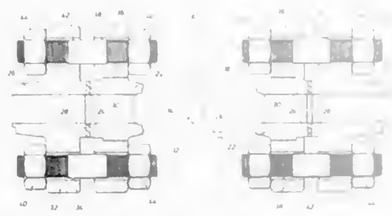
4,919,391

FLANGED CONNECTION FOR VALVES

Willard E. Kemp, Houston, Tex., assignor to Kemp Development Corporation, Tex.

Filed Oct. 31, 1988, Ser. No. 264,384
Int. Cl.[5] F16K *51/00*
U.S. Cl. 251—148 **12 Claims**



9. In combination with a valve having a valve body defining a valve chamber, an integral end hub, and a flow passage, and a valve member mounted in the chamber for movement between open and closed positions relative to the flow passage; an improved connection for connecting the integral end hub of the valve body to the flange of an associated adjacent flow line; said improved connection comprising:

an annular ring having a central opening therethrough defining an inner circular surface, said inner circular surface having an end portion thereof adjacent the valve member formed with internal screw threads and an opposed end portion thereof remote from the valve member formed with an inwardly extending flange projecting radially inwardly beyond said threaded end portion and exposed externally of the valve body, said inwardly extending flange defining an annular shoulder facing in a direction toward the valve member and a smooth inner surface at right angles to said shoulder;

the integral end hub of the valve body having an end portion thereof adjacent the valve member formed with external screw threads in mating threaded engagement with the internal screw threads of said annular ring and an opposed end portion remote from the valve member defining a smooth outer surface recessed radially inwardly of the adjacent threaded end portion, said inwardly recessed end portion defining an annular shoulder in opposed facing relation to said shoulder on said ring and adapted to abut said ring shoulder for selectively positioning said ring relative to said hub, said ring and said flow line flange having axially aligned openings therethrough;

sealing means between the flange of the adjacent flow line and the valve body about the flow passage of the valve body preventing fluid leakage thereat; and

fasteners received within said aligned openings for connecting said end hub of the valve body to the adjacent flow line.

4,919,392

VEHICLE JACK

Paul G. Minuto, 66 Mount Pleasant, P.O. Box 1004, Hudson, Quebec, J0P 1H0, Canada

Filed Dec. 5, 1988, Ser. No. 279,520
Int. Cl.[5] B66F *3/12*
U.S. Cl. 254—126 **8 Claims**

1. A cantilever vehicle jack comprising:

stand means having an upper end and a lower end, the upper end having laterally spaced legs and open back;

lift arm means having one end pivotably connected to said stand means intermediate the upper and lower ends and moveable between a first position and a second position, said lift arm means having a free end and a vehicle contact plate connected thereto;

lift drive means connected between said stand means and said lift arm means and including first and second housings and an elongate screw operative therebetween, said first housing being elongate and having an end pivotally connected to said lift arm means below the contact plate and between its ends and including thread means for operative cooperation with said screw, said second housing being pivotally connected to the spaced side legs of the upper end of said stand and adapted for pivoting between said legs, said elongate screw having an axis and having one end rotatably but non-translationally connected to said second housing for rotation about the axis, the other end of said screw threadably connected to said first housing;

motor means supported by said second housing and adapted for swinging movement within said spaced legs and back of the upper end, said motor means connectible to said screw one end through gear means in a gear housing also supported by said second housing for swinging movement for selectively causing rotation of said screw in either direction;

whereby selective actuation of said motor means causes rotation of said screw through said gear means and telescopic movement between said screw and said first housing controlling movement of said lift arm between said two positions.

4,919,393

DEEPWATER SUBSEA LOWERING/LIFTING SYSTEM

Dennis E. Calkins, Houston, Tex., assignor to McDermott International, Inc., New Orleans, La.

Division of Ser. No. 150,802, Feb. 1, 1988, Pat. No. 4,838,522.
This application Mar. 3, 1989, Ser. No. 318,287
Int. Cl.[5] B66D *1/36*; B66F *1/00*
U.S. Cl. 254—337 **11 Claims**

1. A lowering/lifting apparatus for intermittently deploying-

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/retracting a tensile member in a marine environment comprising:

(a) a support from which an elongated tensile member is suspended generally vertically into open water, said support comprising a deck elevated above the waterline;

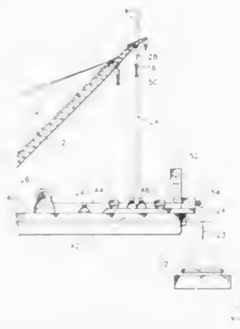
(b) an inboard grip assembly fixedly secured to said deck and configured to grip said tensile member;

(c) an outboard grip assembly fixedly secured to said support and configured to grip said tensile member;

(d) first operating means for selectively and independently operating each said inboard and said outboard grip assemblies to alternately engage or disengage said tensile member thereby alternately seizing or releasing restraint on said tensile member;

(e) a traveling sheave around which said tensile member passes, said sheave being positioned along said tensile member intermediate said inboard and said outboard grip assemblies;

(f) a crane boom for supporting said traveling sheave above said deck;



(g) a fixed block secured at a relatively fixed elevation to an upper region of said crane boom;

(h) a traveling block suspended underneath said fixed block and movable with respect to said fixed block, said traveling sheave being secured to and movable with said traveling block;

(i) a separate cable suspending said traveling block from said fixed block; and,

(j) second operating means for selectively lowering/raising said traveling sheave with respect to said deck so that when said inboard grip assembly engages said tensile member and said outboard grip assembly is disengaged from said tensile member, said tensile member suspended in open water is deployed/retracted with respect to said support upon the lowering/raising of said sheave and, so that when said outboard grip assembly engages said tensile member and said inboard grip assembly is disengaged from said tensile member, said tensile member suspended in open water remains static with respect to said support upon the lowering/raising of said sheave.

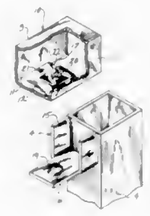
4,919,394

RAILING CONSTRUCTION

Donald R. Otte, New Berlin, and Steven E. Krueger, New London, both of Wis., assignors to Cubic Designs Inc., Milwaukee, Wis.

Filed Feb. 1, 1989, Ser. No. 304,709
Int. Cl.[5] E04H *17/14*
U.S. Cl. 256—65 **10 Claims**

8. A railing construction, comprising a plurality of upright hollow posts having a generally rectangular cross section, a hollow rail having a generally rectangular cross section connected between adjacent posts, said rail including a pair of opposed side walls, a bottom wall and a top wall, a rail supporting bracket secured to said posts, each bracket including a pair of spaced vertical side members extending outwardly from said post and disposed flatwise against the inner surfaces of the respective side walls of said rail, each bracket also including a horizontal lip extending outwardly from said post and disposed at the lower ends of said side members, said lip having a greater horizontal length than said side members and projecting beyond the outer ends of said side members, said lip being dis-



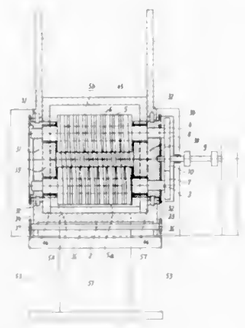
posed flatwise against the bottom wall of said rail, said bottom wall and said lip having aligned openings, said rail having an end disposed in abutting relation to a surface of a post and having a notch in said bottom wall extending from said end a horizontal distance at least as great as the horizontal length of said side members, said notch being constructed and arranged to receive said side members as the rail is slipped downwardly over the bracket, and connecting means disposed within said aligned openings for connecting said rail to said bracket.

4,919,395

APPARATUS FOR HEAT TREATING A CONTINUOUSLY MOVING METAL WIRE

Gerhard Ritter; Klaus Ritter, and Günther Stoisser, all of Graz, Austria, assignors to EVG Entwicklungs-u.Verwertungs-Gesellschaft m.b.H., Styria, Austria

Continuation of Ser. No. 135,342, Dec. 21, 1987, abandoned. This application Mar. 15, 1989, Ser. No. 325,094
Claims priority, application Austria, Jan. 9, 1987, 35/87
Int. Cl.[5] C21D *9/56*
U.S. Cl. 266—103 **14 Claims**



1. Apparatus for heat treating a single continuously moving metal wire in a heat-treatment area, comprising

first and second shafts parallel to each other,

first and second pluralities of discs mounted on said first and second shafts respectively, each disc of said first plurality of discs facing against a corresponding disc of said second plurality of discs, each of said discs having wire-guide grooves thereon, said grooves being arranged for winding a single wire in a helical manner about successive grooves

of successive discs of said first and second pluralities while alternating between said grooves of said first and second pluralities,

said first shaft being a drive shaft,

said second shaft being driven in the same direction as said first shaft,

said first plurality of discs including a first disc being driven by said first shaft, the remainder of said first and second pluralities of discs being freely rotatable on said first and second shafts, and

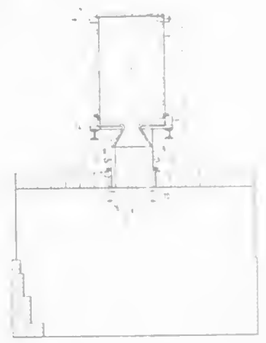
means for supplying a single wire to said discs.

4,919,396

APPARATUS FOR SMELTING MELTABLE SUBSTANCES, PARTICULARLY ORE CONCENTRATES

Walter Fritsch, Bergisch Gladbach, and Friedrich Megerle, Köln, both of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 31, 1988, Ser. No. 238,521
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, 3729798
Int. Cl.[5] F27B *15/08*
U.S. Cl. 266—182 **9 Claims**



1. An apparatuus for smelting meltable substances comprising in combination:

a furnace;

a melting cyclone arranged above said furnace out of which a melted mass is discharged into the furance via a discharge opening in the bottom of the cyclone and an opening in the roof of the furnace;

and a transfer element including a vertical pipe connecting the discharge opening of the cyclone discharge to the opening in the roof of the furnace.

4,919,397

STATIONARY INJECTION BLOCK AND INJECTION SLIDE PLATE FOR USE WITH AN INJECTION VALVE

Patrick D. King, Rantoul, Ill., assignor to Flo-Con Systems, Inc., Champaign, Ill.

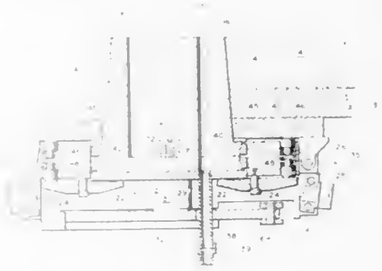
Division of Ser. No. 53,080, May 22, 1987, Pat. No. 4,771,992, which is a continuation-in-part of Ser. No. 14,999, Feb. 17, 1987, Pat. No. 4,799,649, which is a continuation-in-part of Ser. No. 885,873, Jul. 15, 1986, Pat. No. 4,824,079. This application Apr. 11, 1988, Ser. No. 179,986
The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.
Int. Cl.[5] C21C *5/48*
U.S. Cl. 266—267 **11 Claims**

1. A stationary injection block for an injection valve wherein by:

a sliding gate face at one end,

a vessel face at the opposite end,

a plurality of orifices through the block and substantially perpendicular to the faces,



an elliptical cross section,

said sidewall tapering in narrowing fashion toward the vessel face

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4,919,398

ATTACHMENT STRUCTURE MOUNTINGS FOR REFRACTORY FIBER LADLE PREHEATER SEALING RINGS

Mack A. Hounsel, Houston, Tex., assignor to J T Thorpe Company, Houston, Tex.

Division of Ser. No. 564,745, Dec. 21, 1983, Pat. No. 4,492,382. This application Oct. 29, 1984, Ser. No. 665,926
Int. Cl.[5] F16J *15/02*
U.S. Cl. 266—283 **4 Claims**

1. In a trapezoidal refractory fiber ring insulation unit adapted for mounting with a ladle preheater to seal the rim of the ladle as the ladle is positioned against the ladle preheater, said trapezoidal unit being formed from a plurality of adjacent transverse radial layers of refractory ceramic fiber insulation material having intermediate portions mounted in planes extending radially outwardly from a central portion of the ladle as the ladle is so positioned, attachment structure for mounting said insulation unit with the ladle preheater, said attachment structure comprising:

(a) mounting rod means extending transversely through said plurality of transverse layers in said intermediate portions thereof; and

(b) means for connecting said mounting support rod means to the preheater, comprising:

(1) a support channel having openings therein for receiving said mounting support rod means therein; and

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(2) means for attaching said support channel to the preheater; and

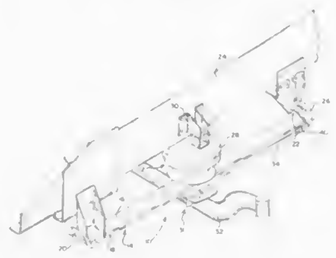
(c) a slide channel member movably mounted with said support channel for relative radial movement in the direction of said layers to resist tearing of the fiber insulating material by said support rod means during installation.

4,919,399

SUSPENSION BRAKE TORQUE REACTION LEAF

Robert J. Selzer, and Noel E. Leitzman, both of Fort Wayne, Ind., assignors to Navistar International Transportation Corp., Chicago, Ill.

Filed Apr. 10, 1989, Ser. No. 335,629
Int. Cl.[5] B60G *11/02*
U.S. Cl. 267—31 12 Claims



1. In combination with a leaf spring suspension system including leaf spring means comprising at least one leaf having its ends joined to a vehicle frame and to an axle of the vehicle at an approximate center point thereof so as to extend forwardly and rearwardly of said axle approximately equally, a brake torque reaction member for preventing excessive stress from building up during braking comprising a planar elongate member anchored at one end thereof between said axle and said centerpoint of said spring assembly and extending rearwardly therefrom in cantilever fashion to an unsupported end, said unsupported end being disposed to engage said leaf spring means only upon imposition of braking torque on said axle, wherein said brake torque reaction member does not aid in vertical suspension.

4,919,400

VIBRATION ISOLATOR OF BUSHING TYPE WITH LIQUID CHAMBERS AN ELASTIC BODY

Toshiyuki Tabata, Sagamihara, and Tatsuro Ishiyama, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Bridgestone Corporation, Tokyo, both of, Japan

Filed Jan. 12, 1989, Ser. No. 296,018
Claims priority, application Japan, Jan. 12, 1988, 63-4374
Int. Cl.[5] F16F *13/00*
U.S. Cl. 267—140.1 5 Claims

1. A vibration isolating device, comprising:

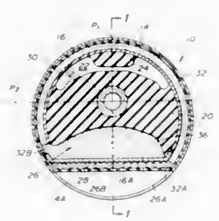
a hollow outer cylinder;

an inner cylinder which has an outer diameter smaller than the inner diameter of the outer cylinder and is disposed in and parallel to the outer cylinder, one of the outer and inner cylinders being formed to be connected with a member which vibrates and the other cylinder being formed to be connected with another membrane which is to be isolated from vibration;

an elastic body which is tightly interposed between the outer and inner cylinders and is formed with a hollow on one side of a plane containing the longitudinal axis of the inner cylinder and a radially inner first liquid chamber and a radially outer second liquid chamber on the opposite sid of said plane;

means for defining a flow restrictive passage which connect said first and second liquid chambers to each other;

a tubular elastic membrane which is tightly bonded by vul canization to the inner surface of said outer cylinder anc partly has a radially inwardly dented part such that the dented part serves as a flexible diaphragm defining the



radially outer periphery of said second liquid chamber, the cylindrical wall of said outer cylinder being formed with an opening in a region where said elastic membrane is used as said diaphragm such that said opening occupies an area opposite to the entire area of said dented part of said tubular elastic membrane; and

an incompressible liquid filled into said first and second liquid chambers and said flow restrictive passage.

4,919,401

FLUID-FILLED BUSHING HAVING RADIALLY DISPLACEABLE INTERMEDIATE SLEEVE COATED WITH SEALING RUBBER LAYER

Katsuhisa Yano, Inuyama, Japan, assignor to Tokai Rubber Industries, Ltd., Japan

Filed Feb. 2, 1989, Ser. No. 305,084
Claims priority, application Japan, Feb. 8, 1988, 63-15424[U]
Int. Cl.[5] F16F *5/00*; F16M *5/00*
U.S. Cl. 267—140.1 5 Claims

1. A fluid-filled elastic bushing, including (a) an inner sleeve, (b) an intermediate sleeve disposed radially outwardly of an coaxially with the inner sleeve, (c) an elastic rubber body connecting the inner sleeve and the intermediate sleeve and having a plurality of pockets which are exposed through a corresponding plurality of windows formed through the intermediate sleeve, (d) an outer sleeve fitted on the intermediate sleeve and closing the pockets in the rubber elastic body, so as to define a plurality of fluid chambers which are filled with a non-compressible fluid and whose volumes are changed in response to a vibrational load applied between the inner and outer sleeves in a radial direction thereof, and (e) means for defining an orifice passage for fluid communication between the fluid chambers, wherein the improvement comprises:

the intermediate sleeve having at least one axial slot formed through a thickness thereof so as to extend in an axial direction over an entire axial length thereof, in a portion thereof which does not have said windows, whereby the intermediate sleeve is cut by said at least one axial slot in a circumferential direction thereof;

the elastic rubber body having an axial cutout formed in an outer surface thereof so as to extend in an axial direction thereof over an entire axial length thereof, in a portion thereof aligned with each of said at least one axial slot in the intermediate sleeve, the rubber elastic body having portions for preventing fluid communication between the fluid chambers and the axial cutout;

a sealing rubber layer formed on an outer surface of the intermediate sleeve, the sealing rubber layer being formed integrally with the elastic rubber body, and cut by said axial cutout in a circumferential direction thereof; and

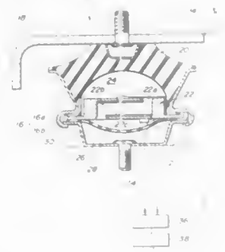
the intermediate sleeve being radially inwardly deformed by a force applied by the outer sleeve, whereby the elastic rubber body and the sealing rubber layer concurrently are radially inwardly pre-compressed.

4,919,402

VIBRATION DAMPING DEVICE UTILIZING ELECTRORHEOPECTIC FLUID

Kazuhiro Doi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Jun. 12, 1989, Ser. No. 365,260
Claims priority, application Japan, Jun. 13, 1988, 63-145092
Int. Cl.[5] F16F *15/04*; B60K *5/12*
U.S. Cl. 267—140.1 4 Claims



1. A method of operating a vibration damping device having a housing in which main and auxiliary chambers are defined, and an orifice passage which interconnects the main and auxiliary chambers and in which electrodes are disposed, comprising the steps of:

sensing the acceleration caused by a vibration which is applied to said damping device;

sensing a pressure which is indicative of the pressure prevailing in said auxiliary chamber; and

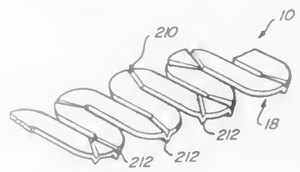
controlling the impression of a voltage on said electrodes in accordance with the product of said acceleration and said pressure.

4,919,403

SERPENTINE STRIP SPRING

Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Continuation-in-part of Ser. No. 916,155, Oct. 7, 1986, abandoned. This application Jul. 12, 1988, Ser No. 218,102
Int. Cl.[5] F16F *1/02*
U.S. Cl. 267—165 18 Claims



1 A spring comprising:

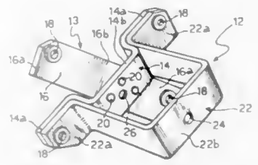
a substantially flat, elongated, strip of material having a thickness with a sufficiently large modulus of elasticity or stiffness including a resilient serpentine biasing portion integrally formed in said elongated strip, said resilient serpentine biasing portion comprised of a plurality of interconnected unitary U-shaped members having a pair of legs connected by a curved web, each alternating U-shaped member being inverted with respect to its adjacent U-shaped members, an elongated slot formed between the legs of each U-shaped member, said elongated slot extending from a lateral edge of the strip past the longitudinal axis of the strip, said resilient serpentine biasing portion enabling axial deflection along the elongated axis of said spring, said resilient serpentine biasing portion U-shaped members having an overall rectangular cross-section with a substantially constant thickness resiliently deflecting in a first direction along said elongated axis in response to a force applied on said strip and resiliently deflecting in a second direction along said thickness of said cross-section in response to continued force applied on said strip and one or more discontinuities in said resilient serpentine biasing portion for controlling said resilient deflection in said second direction, said discontinuities formed by at least one indentation along said thickness positioned substantially on at least one web portion, said strip returns to its original nondeflected position upon removal of said force.

4,919,404

LEAF SPRING ATTACHMENT

Franco Santini, Fiero, Italy, assignor to Iveco Fiat S.p.A., Turin, Italy

Filed May 11, 1989, Ser. No. 350,285
Claims priority, application Italy, May 16, 1988, 53154/88[U]
Int. Cl.[5] F16F *1/26*
U.S. Cl. 267—260 6 Claims



1 A leaf spring attachment of the type comprising a support and an omega-shaped bracket fixed to the support so as to

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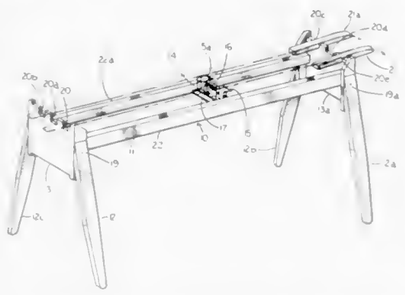
define two facing walls between which a pin for the eye of the spring is mounted, wherein the support comprises first and second metal strips joined together centrally in an X arrangement and having ends adapted for fixing to the structure of the vehicle.

4,919,405
FLETCHING TOOL
Merineth S. York, 639 S. Elm St., Mesa, Ariz. 85202
Filed Mar. 20, 1989, Ser. No. 325,904
Int. Cl.[5] B25B *1/20*
U.S. Cl. 269—38 16 Claims

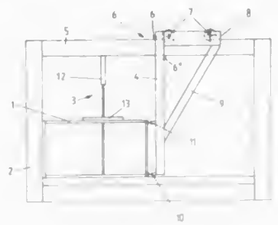
1. In a fletching tool, for precisely aligning and adhering fletching to an arrow shaft, comprising spool means for matingly receiving an arrow shaft preparatory to affixing fletching thereto, a plurality of fletching guides splayably coupled to said spool and being splayable away from an arrow shaft mated with said spool upon initiation and completion of a fletching operation and embracingly encompassing an arrow shaft while fletching is adhered to the arrow shaft, the improvement comprising:
closure means coupled to said spool means for compressively loading the embrace of said fletching about an arrow shaft adjacent said spool means; and
said spool means further comprises arrow nock engaging-/aligning means coupled internal to said spool means.

4,919,406
SKI SUPPORT AND ATTACHMENT MEANS
Dean E. Bunnell, R.R. #1, Box 63, Canaan, Vt. 05903
Filed Jul. 17, 1989, Ser. No. 380,488
Int. Cl.[5] B23Q *3/00*
U.S. Cl. 269—43 7 Claims



1. A ski support and attachment means, for providing a platform for waxing, scraping and otherwise maintaining the sliding surface of skis as well as providing a handy carrier for skis, comprising:
a horizontal support frame;
said horizontal support frame having a plurality of vertical support means;
said vertical support means having connection means to said horizontal support frame for permitting rotation of said vertical support means;
said horizontal support frame having twin vertical ski supports fastened at opposite ends of said horizontal support frame;
said ski supports having a plurality of recesses located therein;
a ski binding attachment base located at the midpoint of said horizontal support frame;
said ski binding attachment base comprising a plurality of immovable vertical extensions;
said immovable vertical extensions having twin rigid u-shaped connection means attached thereto;
said vertical extensions further having a center rigid angled extension brace;
said ski binding attachment base having base anchoring means;
said ski binding attachment base further having means for replaceable connection to said base anchoring means; and
ski tip support means.

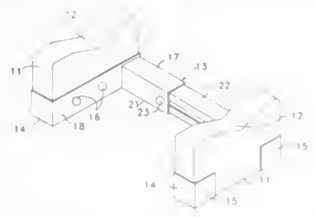
4,919,407
APPARATUS FOR GRIPPING FRAMES
Jacques Valdenaire, La Bresse, France, assignor to Martival S.A., Le Thillot, France
Filed Feb. 21, 1989, Ser. No. 313,364
Claims priority, application France, Feb. 18, 1988, 88 02100
Int. Cl.[5] B25B *5/14*
U.S. Cl. 269—118 5 Claims



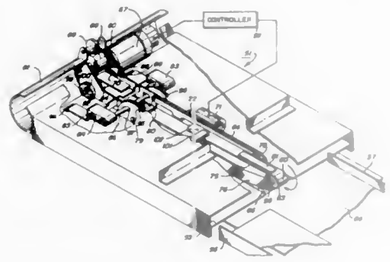
1. Apparatus for gripping members (1), comprising a construction (2) for reception of the members (1), said construction having mounted thereon means (3) for gripping horizontal edges of said members (1) and means (4) for gripping vertical edges of said members comprising an arm, said construction (2) having an upper beam (5), roller means (7) supporting said arm on said upper beam (5) for rolling movement on said upper beam (5) toward and away from said members (1), and two abutments (6', 6") carried by said arm and so disposed on opposite sides of said upper beam as to grip said upper beam when said arm presses against said members (1) thereby to lock said arm to said upper beam (5), said roller means (7) being so disposed that when said arm rests on said rollers out of contact with said members (1), said abutments (6', 6") release said upper beam (5) thereby to permit free rolling movement of said arm on said upper beam (5).

4,919,408
CRANKSHAFT STAND
Dennis M. Muir, 150 John St., Monterey, Calif. 93940
Filed Mar. 30, 1989, Ser. No. 330,500
Int. Cl.[5] B66F *5/04*
U.S. Cl. 269—296 4 Claims

1. An adjustable stand for supporting a crankshaft, comprising:
two equal supports, each support having a V-shaped notch for supporting a region of the shaft of a crankshaft, the V-shaped notch permitting free rotation of the shaft while resting in the notch;
an adjustable frame, the frame defining two arms connected by a perpendicularly mounted connecting bar disposed between and at the ends of the two arms, the connecting bar being of adjustable length to permit alteration of the distance between the two arms;
each of the two arms defining two ends having brackets for holding a support against the arm, each bracket having an extension to prevent the support from falling out of the frame arm, each arm further having at least one hole for receiving a screw to further connect the support to the frame arm;
the connecting bar defining a telescoped inner bar disposed within an outer bar, the inner bar having a longitudinally disposed slot; and
a threaded screw and nut for securing the positions of the inner and outer bars, the screw fitting through a threaded opening in the outer bar and passing through the slot in the inner bar, the nut frictionally engaging with the inner bar.

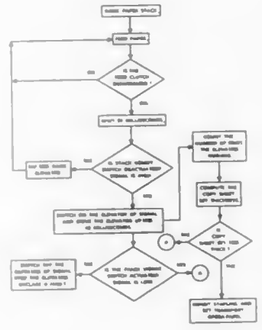


4,919,409
SHEET HANDLING APPARATUS WITH NARROW BELT HAVING RAISED FRICTIONAL CONTACT ELEMENT
Denis J. Stemmle, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Jul. 3, 1986, Ser. No. 882,120
Int. Cl.[5] B65H *3/04, 5/02, 9/04*
U.S. Cl. 271—34 15 Claims



1. Sheet handling apparatus for transporting, registering and deskewing sheets comprising a flat surface having inboard and outboard ends across which sheets may be transported, a registration stop member at the outboard end of said flat surface,
a single endless narrow width belt movably supported around at least two support means to define a belt transport run across and parallel to said flat surface, said single narrow width belt having at least one raised frictional contact element on its outer run for frictional transporting engagement with a sheet to be transported across said flat surface toward said registration stop member, said at least one raised frictional contact element on said belt having a frictional contact area very small relative to the size of the sheet to be transported to minimize frictional forces which inhibit sheet deskewing while being sufficient to provide a friction drive force to drive a sheet across the flat surface and being positioned such that a sheet being transported across said flat surface toward said registration member is transported by only one of said at least one frictional contact element thereby providing a single pivot about which a sheet may pivot when it reaches the registration stop member to be deskewed.

4,919,410
APPARATUS FOR DETERMINING COPY SHEET SET THICKNESS
Norman D. Robinson, Jr., Rochester, and Michael E. Farrell, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed May 10, 1988, Ser. No. 192,074
Int. Cl.[5] B65H *3/04*
U.S. Cl. 271—34 20 Claims



14. A method of determining the thickness of a set of copy sheets used in an electrophotographic printing machine having a plurality of processing stations to reproduce a set of original documents, including the steps of:
supporting a stack of copy sheets on a tray;
advancing successive copy sheets from the stack of copy sheets on the tray to the processing stations of the printing machine to form the set of copy sheets;
indexing periodically the tray a preselected distance each time the thickness of the stack of copy sheets decreases by a specified amount; and
calculating the approximate thickness of the set of copy sheets as a function of the number of times the tray is indexed and a constant corresponding to the preselected distance the tray indexes.

4,919,411
PAPER FEEDING DEVICE
Theodorus M. Ceelen, LaVerne, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Jul. 10, 1987, Ser. No. 71,826
Int. Cl.[5] B65H *3/52, 3/04*
U.S. Cl. 271—35 4 Claims

1. A paper feeding mechanism for feeding one sheet from a stack of sheets comprising:
a flat surface,
forward and rear rollers positioned forward and to the rear of said flat surface,
a continuous belt adapted to be driven continuously forward

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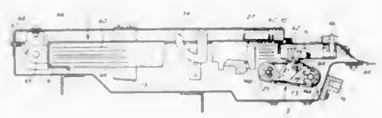
across said surface and around said rollers, said belt and rollers positioned in relation to said stack so that a forward edge of the first sheet in said stack is in contact with a rear portion of said belt adjacent said rear roller,

means for biasing a forward edge of said stack against said belt, to feed one or several sheets forward,

means adjacent said flat surface for pressing said one or several sheets against said belt, and

a stop immediately forward of said means for pressing com-



prising an edge adjacent and parallel to said flat surface defining a gap between said edge and said belt, the size of said gap being between one and two sheet widths, to prevent more than one sheet from passing through said gap, and

wherein said stop edge is rounded into an arc as viewed from the rear to create said gap that is wider at the edges of the belt than at the center of the belt to compensate for mechanical misalignments that result in said edge not being perfectly parallel to said belt.

4,919,412

CONTROL SYSTEM FOR A DRAW-OFF SYSTEM FOR SHEET MATERIAL

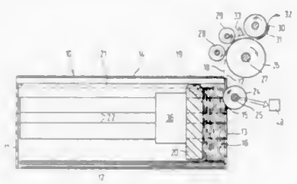
Peter Weigel, Borchen-Doerenbagen; Guenter Holland-Letz, Paderborn-Elsen; Heinz Ademmer, Geseke, and Ulrich Nottelmann, Bad Driburg, all of Fed. Rep. of Germany, assignors to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Feb. 29, 1988, Ser. No. 161,692

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1987, 3706810

Int. Cl.[5] B65H *7/08*

U.S. Cl. 271—110 14 Claims



1. For use in a system for drawing off sheets of materials from a stack thereof, of the type including a pressing device for pressing the stack of sheets against a roller system which successively draws of individual sheets from the stack and feeds each sheet to a conveyance path, an improved method of controlling the force applied to the stack of sheets by the pressing device, comprising the steps of:

(A) measuring the time period required to draw-off a sheet for a fixed predetermined distance from said stack during a draw-off operation by said roller system;

(B) comparing the time period measured in step (A) respectively for two draw-off operations; and

(C) controlling the force applied by said pressing device to said stack of sheets based on the comparison performed in step (B), where when the two time periods are equal and compared in step (B), optimum pressure of sheets against the roller system occurs and the force applied by the pressing device remains constant.

4,919,413

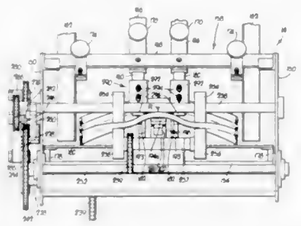
NEWSPAPER HANDLING AND COLLATING METHOD AND APPARATUS

Charles N. Hannon, Olathe, Kans., assignor to Stepper, Inc., Olathe, Kans.

Division of Ser. No. 842,535, Mar. 31, 1986, abandoned. This application Aug. 23, 1988, Ser. No. 235,209

Int. Cl.[5] B65H *3/46*

U.S. Cl. 271—133 9 Claims



7. In a method of handling a plurality of normally flat, multi-section, floppy newspapers each having a folded outer section with a transverse fold line along one extremity of said newspaper and a plurality of inner sections being tucked within said outer section, an improved method of metering newspapers from a stack thereof comprising the steps of:

(a) supporting newspapers in an upright stack thereof;

(b) confining all but the lowermost newspaper in the stack thereof against movement transversely of the stack along a feeding path for removal from said stack;

(c) moving said lowermost newspaper along said feeding path and concurrently forming at least one elongated ridge therein which extends from said fold line to an opposite extremity of said newspaper and thereby causes separation of said lowermost newspaper from the one above it; and

(d) engaging said lowermost newspaper in a clamping relationship at locations spaced rearwardly of a leading portion thereof, laterally of said elongated ridge formed therein and below the ridge for augmenting separation of said lowermost newspaper from one above it and causing ejection of said lowermost newspaper from said stack.

4,919,414

HANDLING, INCLUDING SQUARING, OF CONVEYED SHINGLED SHEETS

Carl R. Marschke; Richard H. Thomas, and William D. Wendorf, all of Phillips, Wis., assignors to Marquip, Inc., Pillips, Wis.

Filed Sep. 29, 1988, Ser. No. 251,121

Int. Cl.[5] B65H *29/22*

U.S. Cl. 271—227 11 Claims

11. A method for handling and squaring traveling sheets of paperboard or the like and wherein said sheets tend to be skewed out of line, comprising the steps of:

(a) providing

(1) a conveyor (**19**) for transporting said sheets (**6**) longitudinally in an upstream-to-downstream direction,

(2) first and second transversely opposed carriages (**24**,23) disposed respectively on each side of said conveyor,

(3) first and second motive means (**35**,**34**) connected to drive said respective first and second carriages transversely of said conveyor between outer and inner positions,

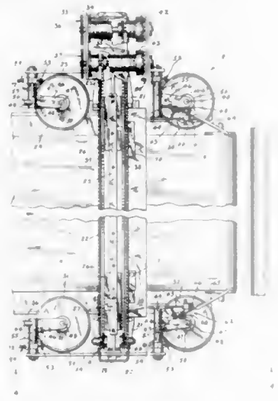
(4) an upstream and downstream sheet tamping wheel (**29**–**32**) mounted on each of said carriages,

(5) and first and second sheet sensing means (**62**,**61**) mounted on said respective first and second carriages

adjacent a respective downstream tamping wheel (**32**,**30**),

(b) causing said first and second motive means to initially drive said carriages approachingly transversely inwardly in a traveling mode toward a skewed sheet in response to said first and second sheet sensing means,

(c) deactivating said first motive means (**35**) upon sensing of a sheet edge by said first sheet sensing means (**62**) to thereby stop travel of said first carriage (**24**) and so that the latter's downstream sheet tamping wheel (**32**) is spaced a given distance from one sheet edge,



(d) subsequently deactivating said second motive means (**34**) after stopping of said first carriage and upon sensing of the other sheet edge by said second sheet sensing means (**61**) to thereby stop travel of said second carriage (**23**), and so that the latter's downstream sheet tamping wheel (**30**) is spaced from the said other sheet edge a distance essentially equal to said given distance,

(e) and thereafter re-activating both said first and second motive means (**35**,**34**) to thereby bring said downstream tamping wheels (**32**,**30**) into squaring engagement with the sheet.

4,919,415

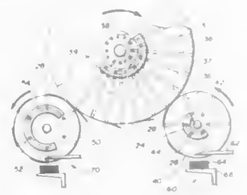
MULTIPLE DELIVERY SYSTEM

David A. Smith, Midland, and Clark M. Woody, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 23, 1988, Ser. No. 159,133

Int. Cl.[5] B65H *29/24*

U.S. Cl. 271—284 9 Claims



1. A high speed product delivery system comprising:

means for providing a series of individual flexible web products sequentially to a plurality of transfer points, said providing means including a vacuum product drum for conveying said individual products to each of said plurality of transfer points, means for rotating said drum, said vacuum product drum including a plurality of vacuum ports for securing a plurality of said individual products to said vacuum product drum during rotation thereof,

means for transferring individual ones of said products from each of said plurality of transfer points to a plurality of delivery points, said transfer means including a plurality of vacuum transfer drums, means for rotating said drums, said drums arranged such that the first of said plurality of transfer drums accepts products from said product drum at a first transfer point and each succeeding transfer drum accepts individual products from said vacuum product drum at each succeeding transfer point, said first transfer drum delivering at least a portion of said individual products to a first delivery point, and each succeeding transfer drum located at each succeeding transfer point delivering at least a portion of said individual products to succeeding delivery points, and

packing devices located adjacent each of said delivery points for removing said flexible products from said vacuum transfer drum, said packing devices including orbital packing fingers to contact and remove said flexible products.

4,919,416

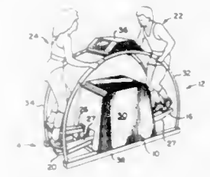
DUAL FACING AEROBIC EXERCISE MACHINE

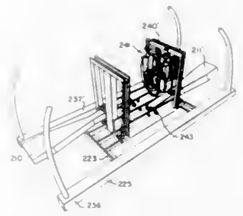
Richard J. DeCloux, 1485 Belmont St., Manchester, N.H. 03104

Filed Feb. 14, 1989, Ser. No. 311,079

Int. Cl.[5] A63B *23/06*

U.S. Cl. 272—69 3 Claims





1. A dual facing stair climbing exercise device having dual facing diametrically opposed exercising position at which users can exercise, said dual facing stair climbing exercise device comprising:

a base having upstanding longitudinally running and centrally located members;

two pairs of reciprocating pivoted stair step lever arms;

means for pivoting said two pairs of stair step lever arms on said base from a central location along the longitudinal length of said base such that each of said pairs of stair step lever arms outwardly extended in opposite directions, wherein said upstanding members having two pairs of apertures therethrough said central location and said

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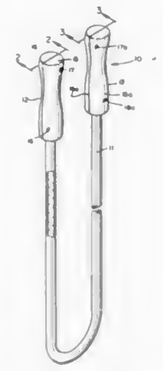
pivoting means in said apertures for pivoting said each pairs of stair step lever arms;

means connected to said base for phasing said pairs of stair step lever arms; and

a pair of spaced apart arcuate hand rails, each end of said arcuate hand rails anchored at said base such that said arcuate hand rails straddle said outwardly extended stair step lever arms to form an extremely stable hand rails and to provide a rigid structure for said dual facing stair climbing exercise device.

4,919,417
LIQUID FILLED JUMP ROPE
Peter W. Poulas, 59 Bozarthtown Rd., Tabernacle, N.J. 08088
Filed Aug. 15, 1988, Ser. No. 231,947
Int. Cl.[5] A63B *5/20*
U.S. Cl. 272—75 3 Claims



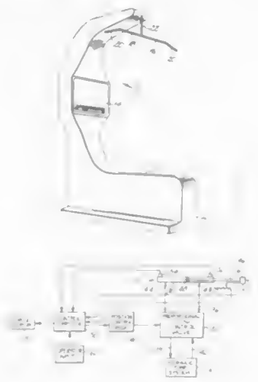
1. A jump rope comprising an elongate flexible tube of liquid impervious material, a quantity of water in said tube, an end closure sealing each end of said tube, a handle surrounding each tube end and interfitting with the adjacent end closure for securement of the received tube end, each of said handles comprising an elongate body having a bore extending longitudinally inwardly from one end, said bores each receiving one end of said tube, each bore terminating at its inner end in an enlarged chamber with an inwardly facing shoulder, each end closure including a flange in abutting engagement with the inwardly facing shoulder for tube retention in said handles, each end closure comprising a plug secured in a respective end of said tube, each plug having a lip constituting the flange of the end closure in abutting engagement with the inwardly facing shoulder, access means on one of said handles for access to the adjacent end closure, valve means on said adjacent end closure for introducing and removing water with respect to said tube.

4,919,418
COMPUTERIZED DRIVE MECHANISM FOR EXERCISE, PHYSICAL THERAPY AND REHABILITATION
Jan W. Miller, 725 N. Hite Ave., Louisville, Ky. 40206
Continuation-in-part of Ser. No. 148,881, Jan. 27, 1988, abandoned. This application Apr. 24, 1989, Ser. No. 342,015
Int. Cl.[5] A63B *21/24*
U.S. Cl. 272—129 18 Claims

1. In an exercise apparatus having a linearly extendable and retractable flexible tension transmitting device having a first end to which force may be applied by a user and a second end, a movement control system for connection to the second end of the flexible tension transmitting device comprising:

control means including a power driven linear actuator operably connected to the second end of the flexible tension transmitting device;

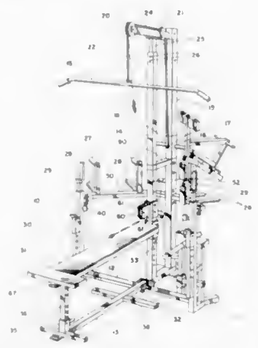
said control means regulating the extension of the second end of the flexible tension transmitting device to a first constant velocity;



said control means regulating the retraction of the second end of the flexible tension transmitting device to a second constant velocity; and

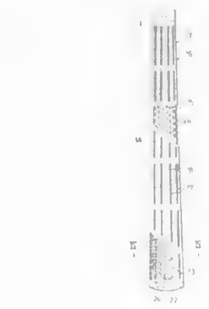
force measuring equipment operably connected to said control means to measure the force applied to the flexible tension transmitting device.

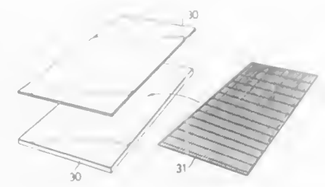
4,919,419
EXERCISE APPARATUS
Stepher R. Houston, Gaithersburg, Md., assignor to Magnaflex Associates Limited, Gaithersburg, Md.
Continuation of Ser. No. 130,604, Dec. 9, 1987, abandoned, which is a continuation-in-part of Ser. No. 88,425, Aug. 24, 1987, abandoned. This application Nov. 7, 1988, Ser. No. 270,449
Int. Cl.[5] A63B *21/00*
U.S. Cl. 272—134 1 Claim



1. An adjustable exercise device comprising a horizontal stand adapted and constructed to abut on a floor, said stand having an elongated horizontal longer piece and an elongated horizontal shorter piece at right angles to each other and together having a cruciform configuration, said longer piece having a first upright extending upwardly from one end of said longer piece, a second upright extending upwardly from said longer piece parallel and displaced from said first upright, said first upright and second upright having a brace means therebetween, a third upright extending upwardly from the other end of said longer piece, said third upright being adjustable in height and terminating in a removable bracket, an adjustable bench means positioned between said second upright and said third upright, and further extending over said bracket and hingedly attached thereto, said second upright being fitted with a vertical slide means, said second upright having a plurality of equi-spaced apertures, said apertures extending above and below the terminating end of said third upright, said vertical slide means having pin means adapted and constructed to releasably engage a selected aperture to thereby select a desired vertical position for said vertical slide means, said bench having an elongated tubular member mounted therinunder, an elongated member having a free end adapted and constructed to slide telescopingly into said elongated tubular member, said elongated member having its outer end releasibly and hingedly attached to said slide whereby said bench means may be positioned in the horizontal position, the incline position or the decline position and may be disengaged from the second upright and raised to a vertical position all as desired.

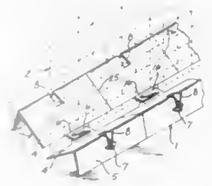
4,919,420
GRIP OF A GOLF CLUB AND A MANUFACTURING METHOD THEREOF
Koji Sato, Tokyo, Japan, assignor to Daiwa Golf Co., Ltd., Tokyo, Japan
Filed Aug. 24, 1988, Ser. No. 235,992
Claims priority, application Japan, Aug. 28, 1987, 62-132076; Aug. 29, 1987, 62-15838
Int. Cl.[5] A63B *53/14*; B32B *31/00*
U.S. Cl. 273—81 B 2 Claims





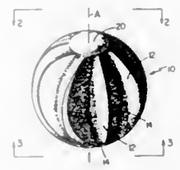
2. A golf club grip having an outer surface and characterized by being provided with an area having a plurality of projections which touch the grip grasping hand in the palm area of the respective bases of the middle finger, the ring finger and the little finger, and inwardly of the base of the little finger, and an area having a plurality of plane portions in the area where the fingers of the whip hand abut the grip, said grip being comprised of a soft synthetic material, having a fiber layer buried therein, said plane area and said area having a plurality of projections being reduced in some areas by uniformly grinding the whole outer surface of said grip to partially expose said fiber layer for comfort to the whip hand.

4,919,421
TENNIS BALL DIVERTER
Paul A. Vandeveld, 1930 N. Prospect Ave., Milwaukee, Wis. 53202
Filed Feb. 21, 1989, Ser. No. 312,933
Int. Cl.[5] A63B *61/00, 69/38*
U.S. Cl. 273—29 B 17 Claims



1. In combination, a tennis court including a court surface, a net extending across said court surface, and a tennis ball diverter comprising a foldable sheet of rigid material including an inclined first panel and a second panel, said panels being disposed at an angle to each other when the diverter is in an operative mode, each of said panels having a lower end and an upper end, said lower ends engaged with the court surface adjacent the lower end of the net when said diverter is in said operative mode and the upper end of the first panel being connected to the upper end of said second panel, and releasable locking means for connecting said panels together in said operative mode and including a tab on one of said panels and an opening to receive the tab disposed in the other of said panels.

4,919,422
CURVE BALL
Hassan Ma, Cape Elizabeth, Me., assignor to Tonka Corporation, Minnetonka, Minn.
Filed Jul. 6, 1989, Ser. No. 376,317
Int. Cl.[5] A63B *37/14*
U.S. Cl. 273—26 R 13 Claims



1. A ball for throwing in different flight paths having a generally spherical shape and balance,

the ball having an axis,

a first relatively smooth convex surface defined about said axis,

an opposite, second relatively smooth convex surface defined about said axis, and

at least one groove having a non-uniform depth defined in the surface of the ball and extending continuously from said first convex surface to said second convex surface, and through the equatorial region of said ball, said groove being spanned by peaks, the termini of which, with said convex surfaces define the generally spherical shape of the ball.

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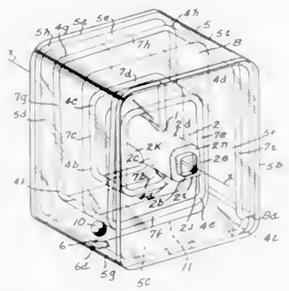
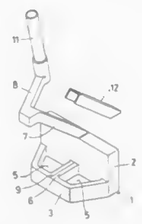
4,919,423
PSYCHOMOTRICITY TEST-TOY
André H. Colart, Chemin des Fermes, Villers sur Trie 60590 Sérifontaine, France
Continuation-in-part of Ser. No. 639,137, Aug. 6, 1984, abandoned. This application Jun. 17, 1988, Ser. No. 271,318
Int. Cl.[5] A63B 67/14
U.S. Cl. 273—109 5 Claims



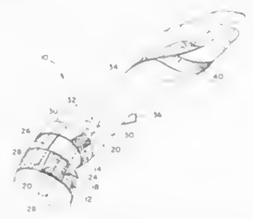
1. A toy of skill usable as a test for evaluating the psychomotricity of an individual comprising an axis to which and around which is associated at least one curved element forming a track on its inner face extending substantially parallel to said axis, and at least one ball adapted to roll on said track by exerting a rotation of the toy around said axis maintained in a substantially horizontal position; said curved element being formed from a continuous strip having portions which are substantially flat and formed to be substantially parallel to said axis with adjacent said flat portions having between them a curved portion.

4,919,424
GOLF PUTTER
Keisuke Fukumochi; Etsuko Fukumochi; Nobumoto Fukumochi; Naotoshi Fukumochi, and Kazumasa Fukumochi, all of 1-54, Sakuramachie, Nishinomiya, Japan
Filed Apr. 28, 1988, Ser. No. 187,646
Claims priority, application Japan, May 6, 1987, 62-68103[U]
Int. Cl.[5] A63B 53/02
U.S. Cl. 273—164 3 Claims



1. A golf putter comprising:
a head having a transversely extending vertical wall having first and second ends and a base attached to and projecting rearwardly from the back of said vertical wall at a lower portion thereof, a front surface of said vertical wall defining a putting surface, and said vertical wall and said base jointly defining a substantially L-shaped section;
an inclined bar having an upper and a lower end, said lower end of said inclined bar being attached to the top center of said vertical wall, said inclined bar extending rearwardly, upwardly, and obliquely, and said inclined bar being substantially perpendicular to the transverse axis of said vertical wall;
a shaft mounting bar having a first and a second end, said first end of said shaft mounting bar being attached to said upper end of said inclined bar, and said shaft mounting bar extending forwardly toward one of said first and second ends of said vertical wall;
a central rib attached to and extending rearwardly from the bottom center of said vertical wall, and said central rib being spaced below and vertically aligned with said inclined bar; and
a vertically extending shaft attached to said second end of said shaft mounting bar.

4,919,425
SHOOTING AND TRAINING AID FOR BASKETBALL PLAYERS
Jay W. Wolf, 2205 6th St., Marinette, Wis. 54143
Filed Apr. 24, 1989, Ser. No. 342,093
Int. Cl.[5] A63B 69/00
U.S. Cl. 273—1.5 A 13 Claims

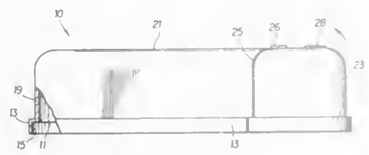


9. A training and shooting aid for basketball players comprising a first stretchable band member and a second stretchable band member, said first and second band members having free ends, at least one non-stretchable transverse strap member interconnecting said first and second band members, securing means provided on said free ends of each of said band members whereby each of said band members may be adjustably secured around the guide arm of a basketball player, said first band member being adapted to snugly encircle said arm slightly above the elbow, said second band member being adapted to snugly encircle said arm slightly below the elbow, a separable primary nonstretchable strap member having a first end terminating in a loop and having a second free end, at least a pair of ring members provided on said transverse strap member for receiving said second free end of said primary strap member, said loop being adapted to be placed upon the thumb of the guide hand of the player, said second free end of said primary strap member being adapted to be threaded through said ring members whereby the length of said strap member with respect to said second band member may be adjusted so that said thumb is pulled upward toward said elbow and positively retained in said upward position.

13. A method of using a training and shooting aid for basketball players characterized by first and second interconnected band members, each of said band members having first and second free ends, securing means associated with said free ends of each of said band members, a separable strap member having a loop at one end and a second free end, and a pair of ring members associated with said second band member, said method comprising the steps of:
(a) manually placing said first and second band members on the guide arm of a player;
(b) bringing said first and second ends of said first band member together around said arm so that said first band member snugly encircles said player's guide arm above the elbow;

(c) securing said first and second ends of said first band member together by means of said securing means;
(d) bringing said first and second ends of said second band member together around said arm so that said second band member snugly encircles said player's guide arm below the elbow;
(e) securing said first and second ends of said second band member together by means of said securing means;
(f) placing said loop of said separable strap member over the thumb of said player's guide hand;
(g) threading said second free end of said separable strap member through said ring members;
(h) manually pulling upon said second free end of said separable strap member which projects from said ring members in order to tighten said strap member, whereby said thumb is pulled upward toward said elbow.

4,919,426
DUST COVER FOR GAME BOARD
Walter S. Vieira, 370 New Boston Rd., Acusbnet, Mass. 02743
Filed Mar. 28, 1989, Ser. No. 329,544
Int. Cl.[5] A63F 3/00
U.S. Cl. 273—148 R 6 Claims



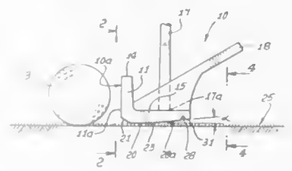
1. A cover for a game board comprising:
(a) a top portion having sides connected thereto, said sides terminating together to define and opening having a substantially continuous peripheral cover edge mountable over edges of a game board to define therewith an enclosed chamber;
(b) said top portion having a corner which in a first position thereof is substantially continuous with said top portion and cover edge and which may be selectively pivoted to a second position to thereby provide an opening;
(c) whereby said game board and cover may be assembled together and inverted so that said game board is above said cover with a playing surface of said game board facing generally downwardly, thereafter said corner may be pivoted to said second position thereof to thereby expose said opening, whereby said game pieces may be removed from said game board by poring them through said opening.

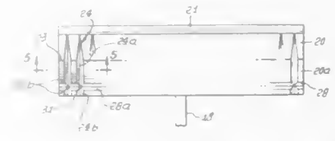
4,919,427
MOEBIUS RING PUZZLE
Itzhak Keidar, 19 Chisin Street; Asher Dromi, 11 Shderot Yotzer, both of Tel Aviv, and Menahem Tilman, 34 Shaldag Street, Hofit, all of Israel
Filed Apr. 3, 1989, Ser. No. 332,141
Int. Cl.[5] A63F 9/08
U.S. Cl. 273—155 6 Claims

1. A puzzle comprising a strip of flexible sheet material formed into a closed loop having twists to define at least two Moebius rings manually juxtapositionable with respect to each other; said strip being transparent and including opaque markings which are viewable through the transparent strips to define a predetermined pattern, representing a correct solution

of the puzzle, only when said two Moebius rings are located in a predetermined juxtaposition with respect to each other.

4,919,428
GOLF PUTTER WITH BLADE TRACKING, TWIST PREVENTION AND ALIGNMENT TRANSFER STRUCTURE, ALIGNMENT MAINTAINING STRUCTURES, AND AUDIBLE IMPACT FEATURES
Sonnie J. Perkins, 1214 169th Ave., NE., Bellevue, Wash. 98008
Filed Sep. 6, 1988, Ser. No. 240,637
Int. Cl.[5] A63B 53/00
U.S. Cl. 273—164 16 Claims





1. In a golf putter, the combination that comprises
(a) a shaft, a traversely horizontally elongated blade supported by the shaft, the blade having a substantially vertical planar front face, a turf engaging bottom face or sole which extends horizontally and is located rearwardly of the front face, a flat rearward extension of the bottom face which extends rearwardly of and upwardly at an angle relative to and above the horizontal level of the bottom face, and a rear face, that extends upwardly, and generally parallel to the front face,
(b) twist prevention and tracking grooving means provided at said bottom face to engage the turf and guide the blade if it strikes the turf when stroked forwardly, and for resisting twisting of the blade during such stroking,
(c) slip and twist prevention grooving means provided at said rearward extension of the bottom face and rear face for engaging the turf and blocking slipping of the blade as the blade is tilted rearwardly, and when the blade is returned to the normal address position, and
(d) said slip and twist prevention grooving means including a first elongated groove sunk upwardly in said rearward extension of the bottom face to extend lengthwise of the blade, said first elongated groove spaced forwardly of said rear face,
(e) said slip and twist prevention grooving means including

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additional multiple grooves sunk upwardly in said rearward extension of the bottom face to extend forwardly and rearwardly, rearwardly of said first elongated groove, and also spaced apart transversely of the blade,

(f) said additional multiple grooves having forward ends intersecting said slip prevention groove, and said rear face,

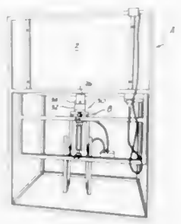
(g) said additional multiple grooves each defined by upwardly converging side surfaces which intersect said rearward extension of said bottom face at forwardly elongated edges engagable with the turf during rearward tilting of the blade for resisting blade side slip, or twist.

4,919,429

HAND SKILL AMUSEMENT GAME

Desmond T. Wittingslow, Jr., RSD 8602, Long Forest Road, Bacchus Marsh, Victoria 3340, Australia

Filed Aug. 28, 1989, Ser. No. 399,177
Int. Cl.[5] A63F *9/00*
U.S. Cl. 273—1 GG **15 Claims**



10. An amusement game device for testing the skill of a person's eye/hand coordination comprising:

a cabinet having a back side, a left side, and a right side, and a front side defining a playing compartment with an open front for access to said playing compartment;

a raised floor carried within said closed cabinet;

an aperture formed in said raised floor through which an object is extended and retracted;

a cabinet having a floor;

carrier means for releasably retaining said object having a first position in which said object may be grasped and a second position in which said object is out of the reach of said person's hand;

retraction means for moving said carrier means from said first position to said second position;

detection means for sensing the presence of said person's hand as it moves toward said object and generating a hand detection signal; and

control means for controlling said retracting means in response to said hand detection signal for retracting said carrier means to said second position after a prescribed time period following generation of said hand detection signal.

4,919,430

GOLF CLUB HEAD

Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204

Continuation-in-part of Ser. No. 25,094, Mar. 12, 1987, Pat. No. 4,826,172. This application May 1, 1989, Ser. No. 345,222
Int. Cl.[5] A63B *53/04*
U.S. Cl. 273—169 **10 Claims**

1. An iron type golf club head having an improved weighting system, said club head having a hosel, a heel, a toe, a bottom surface, an upper surface, a rear surface, a ball striking face, and a center of gravity;

a peripheral mass formed on said rear surface adjacent at least said heel, toe and bottom surface of said club head, said peripheral mass defining a cavity formed within said peripheral mass;

said weighting system including at least two opposing weight members formed within said cavity on said rear surface of the club head, the respective opposing weight members being located on the opposite sides of the center of gravity, said cavity being devoid of any weight member formed on said rear surface at the location of said centre of gravity, at least one weight member being located between and spaced from the center of gravity and the toe and at least a second opposing weight member being located between and spaced from the center of gravity and the heel;

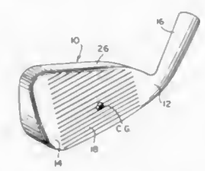
said opposing weight members being angularly disposed with respect to the longitudinal axis of said club head and said weight members being spaced a substantial distance from said center of gravity so that no portion thereof is located at said center of gravity.

4,919,431

GOLF CLUB HEAD

Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204

Continuation-in-part of Ser. No. 25,094, Mar. 12, 1987, Pat. No. 4,826,172. This application Apr. 21, 1989, Ser. No. 341,549
Int. Cl.[5] A63B *53/04*
U.S. Cl. 273—169 **4 Claims**



1. An iron type golf club head having an improved weighting system, said club head having a hosel, a heel, a toe, a bottom surface, an upper surface, a rear surface, a ball striking face, and a center of gravity;

a peripheral mass formed on said rear surface adjacent at least said heel, toe and bottom surface of said club head, aid peripheral mass defining a cavity formed within said peripheral mass;

said weighting system including at least two opposing weight members formed on said rear surface of the club head, the respective opposing weight members being located on the opposite sides of the center of gravity and on a straight line passing through the center of gravity, one weight member being located between and spaced from the center of gravity and the toe and the opposing weight member being located between and spaced from the center of gravity and the heel, and said cavity being devoid of any weight member formed on said rear surface at the location of said center of gravity;

said opposing weight members having outer peripheral edges spaced from said peripheral mass and said center of gravity and being located within said rear cavity, said weight members extending outwardly from said rear

surface into said cavity, and providing a stabilizing means on opposite sides of said center of gravity for providing improved energy transfer to a golf ball struck off the center of gravity.

4,919,432

GOLF SWING GUIDE WITH BACKSWING INDICATOR

Carlos Coggins, 509 Fayetteville Ave., Bennettsville, S.C. 29512, and Patrick O. McCauley, 1 Hidden Hills, Earlysville, Va. 22936

Filed Jun. 2, 1988, Ser. No. 201,450
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—191 A **6 Claims**

1. A golf swing training device to assist in the development of a proper golf swing comprising: a golf club guide in the form of a closed loop for engaging the shaft of a golf club and guiding the golf club during the golf swing, said golf club guide including backswing indicator means coincident with the upper limit of a proper backswing so that when the indicator means is encountered by the shaft of the golf club it can be sensed by the user through the shaft of the club, said indicator means being nonrestrictive so as to enable the golf club to be swung beyond the indicator means.

4,919,433

GOLF PUTTING TRAINER

Sol Gershon, 1363 Mercedes St., Teaneck, N.J. 07666; Charles Fox, 39-08 Tierney Pl., Fairlawn, N.J. 07410, and Norton Garfinkle, 2800 S. Ocean Blvd., Boca Raton, Fla. 33432

Filed Sep. 13, 1989, Ser. No. 406,640
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—192 **9 Claims**

1. A device for golf putting training, comprising:

a central post having upper and lower ends,

a base supporting said lower end of said post holding said post in vertically extending position such that a user can stand close to said post with the user's wrists near said upper end of said post,

a guide arm having upper and lower ends, said lower end having a pivot connection to said base and extending upward at least to said upper end of said post,

a guide track member fixed to said upper end said post and constraining said upper end of said said guide arm to move laterally in a predetermined plane, and

a club retainer pivotally attached to said upper end of said guide arm.

4,919,434

GOLF BALL

Tasuku Saito, Tokorozawa, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 53,123, May 22, 1987, abandoned. This application Jul. 25, 1988, Ser. No. 223,934
Claims priority, application Japan, May 23, 1986, 61-117160
Int. Cl.[5] A63B *37/12*
U.S. Cl. 273—235 R **10 Claims**

1. A solid golf ball comprising a solid core and a cover enclosing said solid core, characterized in that said solid core is one which contains polybutadiene rubber having more than 40% of cis-1,4 bonds and an unsaturated carboxylic acid and/or a metal salt thereof to crosslink the polybutadiene rubber and deforms 1.5 to 3.5 mm under a constant load of 100 kg, and said cover is a 0.4 to 2.2 mm thick which consists of a 0.1 to 2 mm thick inner layer and a 0.1 to 1.5 mm thick outerlayer enclosing the inner layer, both made of thermoplastic resins, said inner layer having a stress of 20 to 100 kg/cm^2 at 10% elongation measured according to ASTM 638-86 and having resilience higher than 40% measured by a Dunlop tripsometer which is defined in British Standard No. 903, and said outerlayer having flexural modulus of 2000 to 5000 kg/cm^2 measured according to ASTM D 790 and a resilience higher than 35% measured by a Dunlop tripsometer as defined above.

4,919,435

THROWING DEVICE FOR PLAYING GAMES

Gary S. McKinney, Delta, Canada, assignor to Hybos Mfg. Inc., Delta, Canada

Filed Jun. 22, 1988, Ser. No. 209,987
Int. Cl.[5] A63B *65/00, 67/00*
U.S. Cl. 273—339 **15 Claims**

1. A device for playing games comprising a body portion

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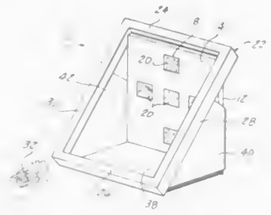
having a plurality of angularly spaced apart, generally T-shaped members extending therefrom, the members being

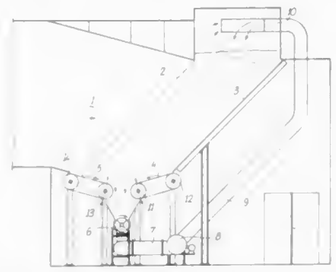
non-coplanar and being asymmetrically spaced around the body portion.

4,919,436
WALL MOUNTED DECORATIVE ART CONVERTIBLE TO A TOSS GAME WITH CATCH AREA
Oscar L. Buselli, 212 S. Sophie St., Bessemer, Mich. 49911
Filed Mar. 30, 1989, Ser. No. 331,611
Int. Cl.[5] A63F *9/02*; F41J *1/00*
U.S. Cl. 273—346 15 Claims



1. A wall hanging toss game comprising the combination of:
a generally flat, rigid member having a first surface suitable for printing, a second surface opposite from the first surface, and an outer periphery between the first and second surfaces, said first surface having a plurality of recesses formed therein spaced from one another;
a plurality of generally thin, wafer-like hook material targets adhesively secured to the rigid member in the recesses of the first surface, such that the targets appear generally flush with the first surface and appear separated from one another by open areas of the first surface;
a frame having spaced vertical frame members, an upper horizontal frame member and a lower horizontal frame member connected to one another and surrounding the periphery of the rigid member;
shock absorbing projectile means covered with loop material capable of being securely held in place when in contact with the hook material targets, said projectile means for throwing at the hook material targets from a distance; and
catch means for catching and supporting the projectile means when the projectile means hit the first surface and fall vertically downwardly, said catch means supported from said frame.

4,919,437
SELF-REGENERATION BALLISTIC PROJECTILE-ARRESTER
Mario Salabe, and Adelio Rossi, both of Rome, Italy, assignors to Impresa Costruzioni Soc. Fra.Sa. a r.l., Rome, Italy
Filed Dec. 5, 1988, Ser. No. 279,893
Claims priority, application Italy, Dec. 3, 1987, 48670 A/87
Int. Cl.[5] F14J *1/12*; G01L *5/14*
U.S. Cl. 273—410 11 Claims



1. A self-regeneration ballistic porjectile-arrester comprising a heap (2) of granulated material for taking up the kinetic energy of projectiles and a regeneration/recovery system for said granular material, comprising
(a) a plurality of means (6) for conveying said material towards a separation zone (7);
(b) means for separating said material from exploded projectiles embedded therein; and
(c) means (8, 9) for delivering said granular material, separated from said projectiles, above said heap;
(d) said projectile-arrester comprising two belts (4, 5) moving in opposite and converging directions for supporting said heap and for conveying said material form the heap towards said conveying means (6), said belts being inclinable with respect to a firing plane of said projectiles and being spaced and opposite to one another under said heap, with their longitudinal axes parallel to a firing axis.

4,919,438
TENNIS RACKET
Minoru Yoneeyama, Niigata, Japan, assignor to Yonex Kabushiki Kaisha, Niigata, Japan
Filed Jun. 10, 1988, Ser. No. 204,876
Claims priority, application Japan, Jan. 23, 1988, 63-6647
Int. Cl.[5] A63B *49/02*
U.S. Cl. 273—73 C 4 Claims

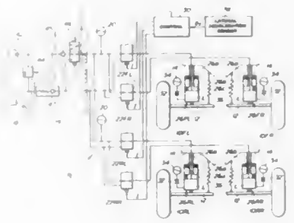
1. A tennis racket comprising a frame portion, a shaft portion having an upper end and a lower end, said frame and shaft

portions being integrally formed of a fiber-reinforced synthetic resin, a grip portion contiguous to the lower end of said shaft portion, and a throat portion provided at the inside lower end of said frame portion to define a ball striking area, wherein said shaft portion has in a direction perpendicular to said striking area a minimum thickness (T2) at a part thereof longitudinally intermediate its upper and lower ends, said minimum thickness (T2) being about 72% of the thickness (T1) at said lower end of said shaft portion, and said frame portion has in said direction a maximum thickness (T3) at side portions thereof which are located on opposite sides of a striking sweet spot at the same distance from said upper end of said shaft portion and a minimum thickness (T4) at the top thereof, said maximum thickness (T3) being about 120% of said thickness (T1) and being about 143% of said minimum thickness (T4), whereby a time elapsed until said shaft portion reaches an initial maximum amplitude value when vibrating in the ball striking direction at an impact of a ball is in the range of 90% to 110% of a time elapsed until said side portions of said frame portion reach an initial maximum amplitude value when vibrating toward the center of said striking area at the impact.

4,919,439
BALANCED RING SEAL
Gregg G. Williams, Milford, Mich., assignor to Williams International Corporation, Walled Lake, Mich.
Filed Oct. 9, 1987, Ser. No. 106,391
Int. Cl.[5] F16J *15/34*, *15/54*
U.S. Cl. 277—27 2 Claims

1. A balanced ring seal comprising
a fixed seal segment having a cylindrical radially outwardly orientated bearing surface,
a rotatable seal segment having a circular radially outwardly opening groove therein defining a pair of axially spaced oppositely axially facing bearing surfaces, and
a cylindrical axially movable seal segment of radially inwardly opening "U"-shaped cross section defined by a bight portion and a pair of axially spaced radially inwardly extending leg portions, one of said leg portions having radially extending faces on opposite sides thereof engagable, selectively, with one of the axially facing bearing surfaces of said rotatable seal segment, the other of said leg portions having an annular radially inwardly facing bearing surface engagable with the radially outwardly facing bearing surface on said cylindrical seal element.

4,919,440
ACTIVELY CONTROLLED SUSPENSION SYSTEM FOR AUTOMOTIVE VEHICLE WITH FAIL-SAFE SYSTEM IN RESPONSE TO FAILURE OF ELECTRIC CIRCUITRY
Masahiro Tsukamoto, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan
Filed Nov. 29, 1988, Ser. No. 277,376
Claims priority, application Japan, Nov. 30, 1987, 62-301726
Int. Cl.[5] B60G *17/08*
U.S. Cl. 280—707 14 Claims



1. An actively controlled suspension system comprising:
a suspension system interposed between a vehicular body and a suspension member rotatably supporting a vehicular wheel, said suspension system including a variable pressure chamber which is filled with a working fluid and variable of the pressure of said working fluid across a predetermined neutral pressure within said variable pressure chamber for varying suspension characteristics;
a fluid circuit means connected to said variable pressure chamber and to a fluid pressure source which circulates pressurized fluid in said fluid circuit;
a first valve means disposed in said fluid circuit and variable of valve position for adjusting pressure supply for said variable pressure chamber from said fluid circuit;
a second valve means disposed between said fluid circuit and said fluid pressure source, which is permitting fluid flow from said pressurized fluid source to said first valve means and blocks fluid flow in the opposite direction at first valve position, and permitting fluid flow from said first valve means to said pressurized fluid source when the fluid pressure at said second valve means is higher than a predetermined threshold level and block fluid flow in the opposite direction;
a sensor means for monitoring preselected suspension control parameter to produce a sensor signal representative thereof;
a fail detector means for monitoring control signal supplied to said first valve means and detecting abnormality of said control signal; and
a controller means for normally operating to produce said control signal on the basis of said sensor signal for adjusting pressure to be introduced in to said pressure and thus for adjusting suspension characteristics in order to suppress attitude change in said vehicular body, and said controller means being responsive to said detector means detecting abnormality of said driver signal, to output a line pressure control signal to be fed to said controller means for switching valve position from said first position to second position in order to maintain the line pressure in said fluid circuit at said neutral pressure.

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4,919,441

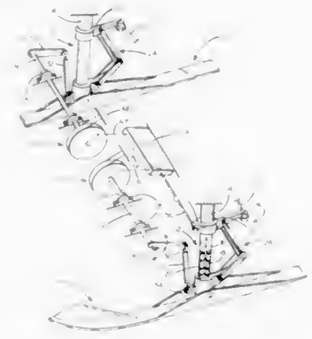
VEHICLE WITH STEERING-CONTROLLED TORSION BAR STABILIZER

Gregory J. Marier, Brooklyn Park; Wayne L. Warnke, Wayzata, both of Minn., and Tetsuo Imai, Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Division of Ser. No. 945,967, Dec. 24, 1986, which is a continuation-in-part of Ser. No. 722,950, Apr. 15, 1985, abandoned. This application Nov. 21, 1988, Ser. No. 273,583

Int. Cl.[5] B62B *9/04*

U.S. Cl. 280—21.1 7 Claims



1. An anti-sway apparatus for a recreational vehicle having a frame, first and second steerable members coupled to the frame respectively through independent first and second suspension devices having respective first and second support springs with respective first and second spring constants, each of said support springs alternatively compressible and extensible to allow reciprocating motion of its associated steerable member toward and away from said frame, and a steering means movable relative to the frame for simultaneously controlling said steerable members, comprising:

first and second auxiliary spring means, having respective third and fourth spring constants, disposed between said first and second steerable members;

a first actuatable means coupled to said first auxiliary spring means for selectively forming a coupling of the first auxiliary spring means between said frame and said first steerable member to provide a combined spring force based on the combination of said first and third spring constants in response to first steerable member displacement relative to said frame, and a second actuatable means coupled to said second auxiliary spring means for selectively forming a coupling of said auxiliary spring means between said frame and said second steerable member to provide a combined spring force based on the combination of said second and fourth spring constants in response to second steerable member displacement relative to said frame; and

a control means operatively coupled to said steering means and to said first and second actuatable means for selectively actuating only said first actuatable means responsive to movement of said steering means to a first position relative to the frame, and for selectively actuating only said second actuatable means responsive to movement of said steering means to a second position relative to the frame, said control means actuating neither of said actuatable means when said steering means is intermediate said first and second positions;

wherein each of said first and second actuatable means when actuated couples its associated auxiliary spring means between said frame and associated steerable member when its associated support spring is being compressed; wherein each said actuatable means, during the extension of its associated support spring and while it is actuated, releases its associated auxiliary spring means to prevent the associated auxiliary spring means from resisting movement of its associated steerable member away from said frame during the extension of the associated support spring.

4,919,442

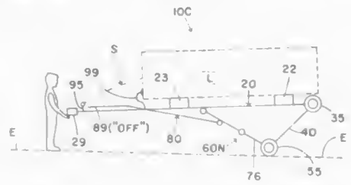
LEVERAGE LIFTING CART

Thomas F. Green, R.R. #1, Box 66B, Council Bluffs, Iowa 51501

Continuation-in-part of Ser. No. 872,026, Jun. 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 650,632, Sep. 14, 1984, abandoned. This application Sep. 6, 1988, Ser. No. 240,715

Int. Cl.[5] B62D *21/00*

U.S. Cl. 280—43.1 12 Claims



1. Leverage lifting cart having a procurement mode traversible along a substantially horizontal substrate and at said procurement mode comprises:

(A) a cargo bed extending lengthily longitudinally along a central-axis that is inclined forwardly and upwardly from a said substrate whereby said cargo bed has: a rear-end nearer to said substrate; a front-end overlying said substrate; and an inclined loadable upper-side having a lengthier forward region and also a shorter rearward region for receiving and discharging an arbitrarily selectable load;

(B) said cargo bed at the rear-end being provided with a directionally laterally extending rear-axle;

(C) said cargo bed nearer to the rear-end than to the front-end thereof being provided with a primary-pivot station, the majority of said upper-side rearward region being located rearwardly of said primary-pivot station;

(D) said cargo bed forwardly of said primary-pivot station being provided with anchoring means that permits a cargo load to be attached to the cargo bed forward region;

(E) said cargo bed between said primary-pivot station and said anchoring means being provided with a longitudinally movable and arrestable abutment means for abutting a forward portion of a said arbitrarily selectable load;

(F) a carriage means establishing a cargo bed inclination of the procurement mode and permitting it to traverse along a said substrate, said carriage means comprising:

(Fi) a controllably collapsible upright strut means including a strut upper-length that is pivotably attached to said primary-pivot station and that is pivotably attached to a strut lower-length having a directionally laterally extending front-axle,

(Fii) said rear-axle and front-axle being respectively provided with substrate-engaging means, and

(Fiii) located immediately above and extending along said substrate, laterally separated, non-linear and fixed-length bridge members respectively attached to said rear-axle and to said front-axle so that when said cargo bed is parallel to said substrate, said bridge members lie at an acute angle relative to said substrate; and

(G) control means actuatably extending forwardly upwardly from said collapsible strut means and also alongside the cargo bed, said control means having a forward terminus manually controllably movable from an off-station to an on-station that permits strut means collapsibility, and said forward terminus being manually accessible to an operator located forwardly remote of said cargo bed primary-pivot station.

4,919,443

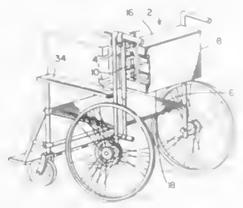
SWING-OUT BACKPACK FOR WHEELCHAIRS

Garry Kehler, Calgary, Canada, assignor to 378134 Alberta Ltd., Calgary, Canada

Filed Jul. 15, 1988, Ser. No. 219,484

Int. Cl.[5] A47C *7/62*

U.S. Cl. 280—304.1 13 Claims



1. A swing-out backpack for use on a wheel chair having an armrest provided along at least one side thereof and a side frame and back post assembly behind said armrest having upper handles extending rearwardly away from said armrest and spaced substantially vertically extending side posts connected to said upper handles at opposite sides of the back of said wheelchair comprising:

(a) a container box with sides, a back, a front, a top, and a bottom, having a pivotal door therein providing access to an interior chamber within the box;

(b) structure means releasably securing the container box to the side frame and back post assembly of the wheelchair, said structure means including:

(1) a post formed by a telescopic tube,

(2) means to secure said post to said side frame and back post assembly in vertical orientation to the wheelchair at the armrest side thereof and spaced from one of said side posts, said means to secure said post including clamp means to clamp said post to one of the upper handles of the side frame and back post assembly and a lower clamp tube secured to a lower portion of the side frame and back post assembly and extending outwardly, rearwardly in horizontal orientation therefrom, said post extending between said clamp means and lower clamp tube,

(3) and pivot means extending between said post and the container box, said container box being spaced from said post and pivotally mounted by said pivot means to swing between a first position adjacent and substantially parallel to an armrest of the wheelchair and a second position behind the side posts and the wheelchair and substantially normal to the armrest.

4,919,444

STABILIZER FOR VEHICLES

Heinz Leiber, Oberriexingen; Walter Klinkner, Stuttgart, and Robert Haid, Vöhringen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Nov. 28, 1988, Ser. No. 276,805

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1987, 3740244

Int. Cl.[5] B60G *25/00*

U.S. Cl. 280—707 20 Claims

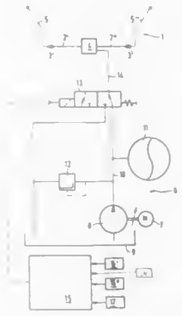
1. A stabilizer for motor vehicles comprising:

a torsion bar divided into independently rotatable first and second parts, each part having a free end and an end adjacent an end of the other part;

coupling means having an open and a closed position for decoupling and coupling, respectively, adjacent ends of the first and second parts to one another, the coupling means varying the degree of allowable rotation of the first and second parts with respect to one another;

means for determining a value of an anticipated transverse acceleration of a vehicle;

means for determining a valued of an actual transverse acceleration of a vehicle; and



control means for controlling the coupling means to couple the first and second parts together as a function of at least one of a value of an anticipated transverse acceleration of a vehicle, and a value of an actual transverse acceleration of a vehicle.

4,919,445

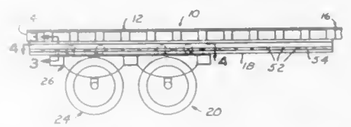
TRAILER REAR WHEEL SLIDABLE MOUNTING ASSEMBLY

Randy C. Robey, P.O. Box 972, Haskell, Okla. 74436

Filed Feb. 24, 1989, Ser. No. 315,062

Int. Cl.[5] B60P *1/04*

U.S. Cl. 280—149.2 8 Claims



1. In a tractor-trailer unit having a rearward undercarriage longitudinally slidable relative to the trailer and characterized by a pair of parallel elongated box members underlying the rearward portion of the trailer bed, the horizontal top wall of each box member end portion having pairs of longitudinally spaced openings, the improvement comprising:

a pair of elongated parallel tracks, inverted L-shape in transverse section, longitudinally underlying and secured to the respective lateral under side portion of said bed and nesting the uppermost and laterally outward surfaces of the respective said box member and normally supported by said box members;

roller carriage means including upper and lower pairs of longitudinally spaced-apart rollers disposed within each said box member for lifting and supporting said tracks relative to said box members when a circumferential portion of the uppermost pairs of rollers are disposed within the respective pairs of openings; and,

power cylinder means operatively connected with said roller carriage means for longitudinally moving the latter relative to the box members and disposing circumferential portions of the uppermost pairs of rollers within the respective pair of openings.

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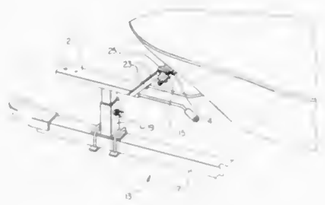
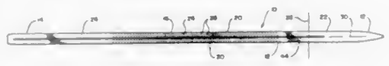
4,919,446
AUTOMATIC BOAT-TRAILER LOCKING ASSEMBLY
Carl Higgins, 2029 Spicewood, Bedford, Tex. 75021
Filed Sep. 16, 1988, Ser. No. 245,331
Int. Cl.[5] B60P *3/10*
U.S. Cl. 280—414.1 8 Claims



1. A locking assembly for securing a boat to a trailer by means of the boat's bow eye comprising: a frame mounted on the trailer and carrying a bolt which is movable between a locking position in which it engages, in use, through a bow eye of a boat securing the boat on the trailer and a withdrawn position in which the boat can be removed from the trailer; biasing means urging the bolt towards the locking position; means for restraining the bolt in the withdrawn position; trigger means for releasing the bolt from the restraining means to allow it to move toward the locking position; said trigger means comprising a member on the frame movable from a set position in which it can be contacted by the bow eye of the boat as the boat is loaded on the trailer to release the bolt.

4,919,447
CROSS COUNTRY SKI
James E. Jackson, and Denis Wardlow, both of Quebec, Canada, assignors to Allsop, Inc., Bellingham, Wash.
Filed Mar. 18, 1988, Ser. No. 169,623
Int. Cl.[5] A63C *7/06*
U.S. Cl. 280—604 27 Claims



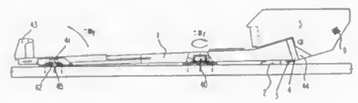
1. A cross country ski having a front end, a rear end, two side surfaces, a bottom running surface lying generally in a bottom contact plane, a forward to rear longitudinal axis, a transverse axis, and a vertical axis, said ski being characterized in that said bottom surface is formed with a plurality of grooves extending generally transversely across the bottom surface, each groove comprising:

(a) a middle groove portion extending substantially parallel to the transverse axis;

(b) two side groove portions extending from said middle portion laterally and outwardly to said side surfaces, with a moderate rearward slant at a substantially constant fixed rearward angle; and

(c) each of said grooves having a forward groove surface portion having a relatively steep vertical alignment component to form a relatively sharp lower forward edge at said bottom surface, and a main surface portion extending from an upper edge portion of said forward groove portion rearwardly at a moderate downward slant to said contact plane.

4,919,448
HEEL PIECE FOR A SAFETY SKI BINDING INCLUDING SINK AND DETENT MECHANISMS
Gerhard Nowak, Biedermannsdorf; Alfred Winter; Hans P. Morbitzer, both of Vienna; Rudolf Theuer, Trumau, and Klaus Kruschik, Gumpoldskirchen, all of Austria, assignors to TMC Corporation, Barr/Zug, Switzerland
Filed Dec. 18, 1987, Ser. No. 134,823
Claims priority, application Austria, Dec. 22, 1986, 3405/86
Int. Cl.[5] A63C *9/081*
U.S. Cl. 280—618 23 Claims



1. A heel-piece for a safety ski binding comprising:

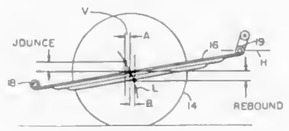
a binding plate adapted to be pivotally attached to a ski;

a sole holder pivotally movable on said binding plate from a closed position, wherein said sole holder is in operation, to an open position, wherein said sole holder is released from the binding plate in a vertical direction;

link means for connecting said sole holder to said binding plate, said link means including at least one link arm and first and second pivot pins passing through said link arm to allow rotation of the link arm about the first and second pivot pins, wherein said first pivot pin comprises the axis of rotation of the sole holder about the binding plate, said second pivot pin is held on the binding plate by a rib projecting therefrom, and said first and second pivot pins are substantially parallel to each other and substantially perpendicular to the longitudinal axis of the ski; and

detent means for holding said sole holder in said closed position, said detent means including a detent mounted on one of said binding plate and said sole holder and a detent track mounted on the other of said binding plate and said sole holder, said detent being positioned in said detent track.

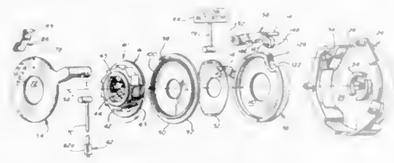
4,919,449
VEHICLE REAR SUSPENSION
Geoffrey S. Toms, Newport Pagnell, England, assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 25, 1988, Ser. No. 275,875
Int. Cl.[5] B60G *11/36*
U.S. Cl. 280—688 13 Claims



1. In a vehicle rear suspension, the combination comprising, a housing member, a mounting pivot pivotally mounting said housing member to the sprung mass of the vehicle, resilient control means between the housing member and the sprung mass subject to deflection during pivotal movement of the housing member relative to the sprung mass about said pivot, a wheel carrier for a rear wheel of the vehicle, resilient suspension means connecting the wheel carrier to the sprung mass, said suspension means being arranged to be operative to provide a rear wheel roll steer effect during cornering of the vehicle, and to that end including link means extending from the wheel carrier to the housing member at a location spaced from said pivot, and means connecting said link means to the

housing member such that reaction forces acting on the rear wheel in a generally vertical direction are transmitted by the link to the housing member to tend to cause pivotal movement of the housing member in a first rotary sense under the control of the resilient means, whereby to modify said roll steer effect, whereas obliquely rearwardly directed impact forces acting on the rear wheel are transmitted by the link means to the housing member to tend to cause pivotal movement of the housing member in a second rotary sense opposite to the first rotary sense with a consequent rearward movement of the rear wheel which is resiliently opposed by said resilient control means.

4,919,450
OVERT COMFORT SYSTEM
Gerald A. Doty, Crown Point, Ind., and Eric T. Johnson, Momence, Ill., assignors to Occupant Safety Systems Inc., Olympia Fields, Ill.
Continuation-in-part of Ser. No. 176,304, Mar. 31, 1988. This application Mar. 17, 1989, Ser. No. 325,560
Int. Cl.[5] B60R *21/10*
U.S. Cl. 280—803 36 Claims



1. In a seat belt retractor for rewinding a seat belt,

a biasing means for biasing a reel to retract and to rewind the belt on the reel,

an emergency locking means for locking the belt against protraction at the time of an accident,

a tension-relieving means for relieving a tension force applied by the belt onto the body of an occupant in a vehicle by blocking belt retraction and rewinding movement of the reel when the tension-relieving means is in a tension-relieving position,

a manual overt actuator for shifting the tension-relieving means to an activated state for allowing belt retraction to remove slack by rewinding the belt onto the reel prior to a subsequent seat belt protraction to position the tension-relieving means in a tensionless state at the tension-relieving position, and

means operable by belt protraction beyond a predetermined distance to shift the tension-relieving means from its tension relieving position to its ineffective release position allowing the biasing means to rewind the belt onto the reel.

4,919,451
AUTOMATIC SEAT BELT DEVICE
Kazuyoshi Ishiguro; Tatsuo Yamashita, and Kenji Matsui, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Niwa, Japan
Filed Aug. 2, 1988, Ser. No. 227,232
Claims priority, application Japan, Aug. 5, 1987, 62-120233
Int. Cl.[5] B60R *22/06*
U.S. Cl. 280—804 30 Claims

1. An automatic seat belt device for automatically fastening a webbing around a body of an occupant on a vehicle seat comprising:

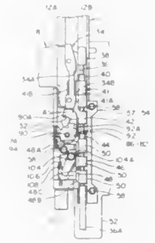
a slider connected to one end of said webbing;

a guide rail for slidably supporting and guiding said slider to forward and rearward directions with respect to a room in a vehicle;

a driving means for driving said slider by means of an elongate member;

a slider stopping mechanism for causing said driving means for stop at a near end portion of movement of said slider in said room of said vehicle including a switch disposed at said near end portion of movement so as to open and close a circuit for operating said driving means, said switch having a stationary contact and a movable contact supported by a pivotable actuator member;

a slider lock mechanism for retaining said slider in locking condition at an end portion of movement thereof in said room of said vehicle; and



a control member supported on said elongate member and being movable therewith for pivoting said pivotable actuator member and said movable contact between an active and an inactive position wherein said movable contact is in contact with said stationary contact and out of contact with said stationary contact respectively, and to control said slider lock mechanism.

4,919,452
SKI LOCATOR DEVICE UTILIZING A FOAM BALL
John J. Cimino, 408 Ridge Ave., #21-2, Evanston, Ill. 60202, assignor to John J. Cimino, Evanston, Ill.
Filed Mar. 23, 1989, Ser. No. 299,320
Int. Cl.[5] A63C *11/00*
U.S. Cl. 280—809 5 Claims

1 A device for locating a ski after the ski has become separated from a skier wearing the ski, said device comprising:

a normally closed, openable pouch, including an exit opening therein and means for attaching the pouch to a skier;

a compressible signal element confined in a compressed state within said pouch and expandable to an expanded state upon release thereof from said pouch through said exit opening in said pouch; and

tether means, having a first end, which extends through said exit opening in said pouch and is attached to said signal element and a second end which is disposed outside of said pouch and which includes means for attaching the second end of the tether means to a ski worn by the skier, for, when the ski is separated from the skier, pulling the signal element out of said pouch through said exit opening so as to permit said signal element to expand to the expanded state thereof and thereby indicate the location of the ski.

4,919,453

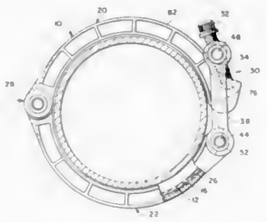
LOW PROFILE V-COUPLING

Horace P. Halling, and Thomas S. Oh, both of Laurel, Md., assignors to EG&G Pressure Science, Inc., Beltsville, Md.

Continuation of Ser. No. 62,617, Jun. 16, 1987, abandoned. This application Jun. 21, 1989, Ser. No. 371,694

Int. Cl.[5] F16L *23/00*

U.S. Cl. 285—3 25 Claims



1. A device for coupling the peripheral flanges of a pair of pipes, the combination comprising:

first and second arcuate retaining means, each of said arcuate retaining means having a first end, a second end, and an inner surface, said inner surface including a groove extending between said first and second ends and adapted to receive a portion of the peripheral flanges of the pipes;

means, coupled to said first ends of said first and second arcuate retaining means, for pivotally coupling said first ends together; and

means, coupled to said second ends of said first and second arcuate retaining means, for coupling said second ends together and for radially inwardly moving said first and second arcuate retaining means into intimate contact with the peripheral flanges of the pipes;

said means for coupling and moving comprising an over-center coupling mechanism having a compression bolt for tightening said first and second retaining means about the peripheral flanges of the pipes,

said means for coupling and moving including a primary link having opposite ends, one end being pivotally coupled to said second end of one of said retaining means and the other end being pivotally coupled to said compression bolt so that, when said coupling device is tightly secured to the flanges of the pipes, said primary link overlies a portion of the flanges of the pipes, thereby minimizing the radial size of said coupling device.

4,919,454

TIEBACK CONNECTOR WITH PROTECTIVE LANDING SLEEVE

J. Keith Caulfield; B. Lee Danner, and Lionel J. Milberger, all of Houston, Tex., assignors to Vetco Gray Inc., Houston, Tex.

Filed Feb. 14, 1989, Ser. No. 311,084

Int. Cl.[5] F16L *27/06*

U.S. Cl. 285—18 8 Claims

1. In a subsea well having a string of casing with an upper end located within a subsea wellhead, an improved tieback connector for connecting the casing to a conduit extending from the surface, comprising:

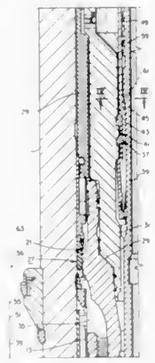
a lower tieback member extending upward from the casing and having a set of lower tieback threads;

an upper tieback member carried by the lower end of the conduit, having a set of upper tieback threads for connection to the lower tieback threads;

a lower landing shoulder located in the wellhead;

a landing sleeve carried by the upper tieback member and having an upper landing shoulder for engaging the lower landing shoulder; and

means for moving the upper tieback member from an upper position to a lower position relative to the landing sleeve by rotating the conduit after the upper landing shoulder has engaged the lower landing shoulder, the upper landing shoulder being located so as to contact the lower landing shoulder before the upper tieback threads contact the



lower tieback threads when the upper tieback connector is in the upper position, the landing sleeve being located so as to cause the upper tieback threads to engage the lower tieback threads when the upper tieback member is in the lower position.

4,919,455

JOINT MECHANISM FOR THIN-WALL STAINLESS STEEL PIPE

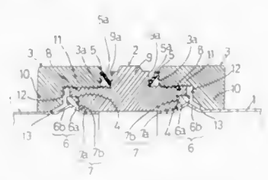
Nakamura Yoshiro, Tsuyama, Japan, assignor to O.N. Industries Co., Ltd., Okayama, Japan

PCT No. PCT/JP88/00451, § 371 Date Jan. 26, 1989, § 102(e) Date Jan. 26, 1989, PCT Pub. No. WO89/11058, PCT Pub. Date Nov. 16, 1989

PCT Filed May 9, 1988, Ser. No. 309,729

Int. Cl.[5] F16L *55/00*

U.S. Cl. 285—23 2 Claims



1. A joint mechanism for connecting a pair of thin-wall stainless steel pipes each having at an end portion V-shaped annular bead with first and second inclined faces, which comprises:

a joint sleeve having a diameter sufficiently large to receive said pipe, said joint sleeve consisting of a central enlarged collar portion with a pair of opposite abutment surfaces and a pair of externally threaded sleeve portions extending laterally from said central collar portion and each provided with a terminal abutment surface;

a pair of conical springs each fitted on said externally threaded sleeve portion of said joint sleeve and having a distinctive color on its outside except for its peripheral edge; and

a pair of coupling nuts each having a terminal end portion which defines an end face and an internally threaded portion for engagement with said externally threaded

sleeve portion and a reduced fitting portion having a diameter to fit over said pipe, so that when said coupling nut is threaded on said joint sleeve completely, each said bead is engaged by said terminal abutment surface and reduced fitting portion and said end face and said abutment surface engage said conical spring and deform said conical spring into such a configuration that said distinct color is completely covered by said end face and abutment surface and disappears from view, with only said peripheral edge exposed, thus providing a visual signal which indicates that said coupling nut is fully tightened.

4,919,456

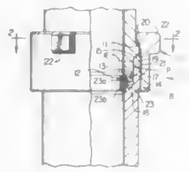
UNION FOR PIPE OR TREE WITH METAL AND RESILIENT SEALS

Kwok-Ping Wong, The Colony, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 10, 1989, Ser. No. 335,893

Int. Cl.[5] F16L *19/02*

U.S. Cl. 285—39 15 Claims



1. A union for pipe comprising:

(a) a pin portion having a resilient seal thereon and a sealing surface therein;

(b) a box portion having threads thereon, a seal bore therein for sealingly receiving said resilient seal, and a sealing surface therein below said seal bore;

(c) a metal seal ring for sealingly engaging said pin portion sealing surface and said box portion sealing surface; and

(d) connecting means for positioning said resilient seal in sealing engagement in said box portion seal bore and said metal seal ring in sealing engagement with said pin portion and box portion sealing surfaces and for connecting said pin and box portions together.

4,919,457

RELEASABLE PLUG CONNECTION

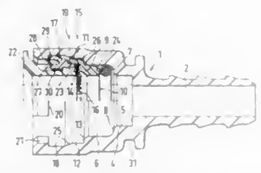
Erminio Moretti, 8, rue Clot-Bey, F-38028 Grenoble, France

Filed Feb. 24, 1989, Ser. No. 314,739

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1988, 3806404

Int. Cl.[5] F16L *37/12*

U.S. Cl. 285—39 6 Claims



1. In a releasable plug connection for semi-rigid pipes including a housing part having a passage for fluid, several cavities successively larger in steps for receiving connecting parts and an entrance for receipt of a pipe to be connected, wherein the shoulder of a first and smallest cavity serves as a stop for the pipe and the shoulder of a second larger cavity as an abutment for a sealing ring, the ring having an internal diameter less than the diameter of the pipes and being preceded in the plug-in direction by a retaining ring having inwardly projecting spring tabs which form a truncated cone pointing with its apex in the plug-in direction and capable of springing open elastically and a stop ring located between the retaining ring and the sealing ring, the side of which facing the spring tabs is shaped as a cone to limit movement of the spring tabs, there being arranged ahead of the retaining ring in the plug-in direction, a dismounting ring, axially slidable relative to the housing part, and having a conically tapered head portion that fans open the spring tabs of the retaining ring and against the side of the stop ring when the dismounting ring is pressed into the housing part to release the pipe, the improvement comprising a flanged ring portion on the stop ring of larger diameter than the cone shaped portion that rests against the shoulder of a third cavity larger than the second cavity and that serves as an abutment for the retaining ring and a supporting ring located in a fourth cavity preceding the third cavity in the plug-in direction between an end face of the flanged ring portion of the stop ring and an inwardly offset shoulder around the periphery of the entrance of the housing part to hold the retaining ring in place.

4,919,458

DEVICE FOR SEALINGLY MOUNTING TUBES WHICH PASS THROUGH A WALL

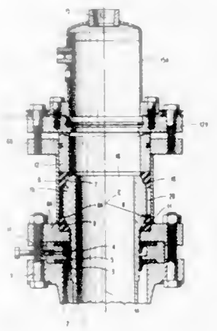
Jean-Jacques Masini, Chaponost, and René Chabidon, Saint Genis Laval, both of France, assignors to Atochem, Puteaux, France

Filed Dec. 8, 1988, Ser. No. 281,383

Claims priority, application France, Dec. 17, 1987, 87 17655

Int. Cl.[5] F16L *35/00*

U.S. Cl. 285—110 7 Claims



1. An apparatus comprising:

a vessel having a wall,

a tube extending through said wall such that an end portion of said tube is situated outside of said wall, said end portion including an enlargement having first and second outer peripheral segments spaced apart along a longitudinal axis of said tube, said first outer peripheral segment disposed farther from said wall than said second outer peripheral segment, each of said first and second outer peripheral segments being generated spherically by a common radius of generation extending from a center lying substantially on said longitudinal axis, and

means for sealingly mounting said tube comprising:

engaging means engaging said end portion and including first and second surface means engaging said first and second outer peripheral segments, respectively, of said end portion and defining therewith first and second interfaces having the shape of said first and second outer peripheral segments, respectively, said first and second surface means and said first and second outer

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peripheral segments together defining a ball joint permitting a limited pivoting motion of said tube about said center, and

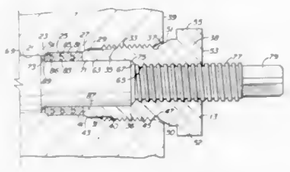
at least one elastically flexible seal disposed at a location intermediate said ball joint and said vessel and including means creating a seal between said vessel and a generally circular outer periphery of said tube and limiting said pivoting motion of said tube.

4,919,459

METAL-TO-METAL BACKSEAT LOCKDOWN SCREW

James O. Miller, Tomball, Tex., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 3, 1989, Ser. No. 389,181
Int. Cl.[5] E21B *19/10*
U.S. Cl. 285—140 **15 Claims**



1. A lockdown screw for holding down a first member within a main bore of a second member, the second member having a radial bore communicating with the main bore, comprising :

a gland nut threadedly insertable within the radial bore, the gland nut having an outer end face and a central axial bore therein, the central axial bore having a threaded portion extending inwardly from the outer end face of said gland nut part way through said gland nut;

a stem threadedly received in said threaded portion of said central axial bore for reciprocation into and out of said gland nut when said stem is rotated, the inner end of said stem projecting into said main bore and having means engageable with the first member for preventing axial movement of the first member with respect to the second member when the lockdown screw is in service;

packing means disposed between said stem and said radial bore for sealingly engaging the outer surface of said stem and the wall of said radial bore;

an annular backseat disposed in said central axial bore of said gland nut inwardly of said threaded portion; and

an annular backseat shoulder disposed on said stem and engageable with said annular backseat of said gland nut for forming a metal-to-metal backseat seal when said stem is baked sufficiently out of said gland nut.

4,919,460

WELLHEAD CASING HANGER SUPPORT MECHANISM

Lionel J. Milberger, and Herman O. Henderson, Jr., both of Houston, Tex., assignors to Vetco Gray Inc., Houston, Tex.

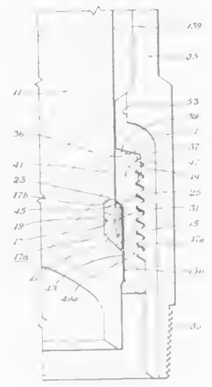
Filed Feb. 6, 1989, Ser. No. 307,412
Int. Cl.[5] E21B *33/04*
U.S. Cl. 285—141 **5 Claims**

1. In a well assembly having a wellhead housing with a bore for receiving a casing hanger, an improved means for supporting the casing hanger, comprising in combination:

an annular recess formed in the bore of the wellhead housing, having a base which is an upward facing frusto-conical shoulder having an inner diameter and a transverse dimension measured from its inner diameter to its outer extent;

the bore having an upper portion extending upward from the recess which has a greater diameter than the inner diameter of the recess shoulder;

a downward facing conical load shoulder on the casing hanger having a transverse dimension that is substantially less than the transverse dimension of the upward facing shoulder, the casing hanger having an upper portion extending above the load shoulder and a lower portion extending below the load shoulder, the casing hanger upper portion having an outer diameter greater than the inner diameter of the upward facing shoulder, the casing hanger lower portion having an outer diameter that is less than the inner diameter of the upward facing shoulder; and



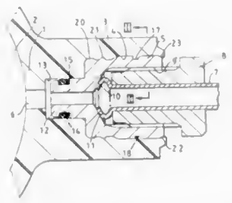
an annular insert member mounted in the recess, the insert member having a lower frusto-conical surface that mates with the upward facing shoulder and has substantially the same transverse dimension, the insert member having an inner diameter that is substantially the same as the inner diameter of the upward facing shoulder, so as to allow the lower portion of the casing hanger to be lowered through the insert member, the insert member having a frusto-conical upper shoulder which is contacted by the casing hanger load shoulder for supporting the casing hanger, the insert member being of a harder material than the material of the wellhead at the recess.

4,919,461

PRESSURE CYLINDER PIPE COUPLING

Desmond H. J. Reynolds, West Midlands, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Jul. 22, 1987, Ser. No. 76,280
Claims priority, application United Kingdom, Jul. 25, 1986, 8618235
Int. Cl.[5] F16L *55/00*
U.S. Cl. 285—174 **15 Claims**



1. A method of making a pressure cylinder having a body of plastics material, a cylindrical pressure-receiving chamber in

the body, a fluid port in the body in communication with the chamber and a socket in the body in communication with the port and having an internal seal engaging surface comprising:

providing a one-piece unitary insert having an integral seal for engagement by a corresponding seat on a pipe to be connected to the cylinder;

providing an external dimension on at least a part of said insert slightly larger than at least a cooperating part of said socket;

providing external locking formations on at least said part of said insert having said larger external dimension for preventing movement of said insert relative to said body;

placing an annular sealing element on said insert;

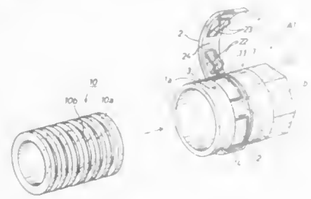
inserting said insert within the socket by urging said body and insert together axially and simultaneously applying sonic vibration to at least one of said body and insert in order to cause entry of said insert into the socket, with the seal engaging around the internal seal engaging surface of the socket, and deformation of body material into said locking formations for locking said insert axially and rotationally relative to the body.

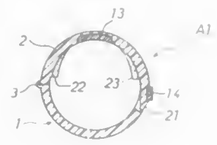
4,919,462

CONNECTION FITTING FOR A CORRUGATED TUBE

Kazuhiro Matsui, Toyoake, and Hiroji Kitagawa, Nagoya, both of Japan, assignors to Kitagawa Industries Co., Ltd., Nagoya, Japan

Filed Apr. 19, 1988, Ser. No. 183,239
Claims priority, application Japan, Apr. 28, 1987, 62-105847; Jul. 23, 1987, 62-184367
Int. Cl.[5] F16L *47/00*
U.S. Cl. 285—175 **19 Claims**





1. A connection fitting for a corrugated tube having grooves, comprising:

a cylindrical housing for receiving a corrugated tube, the housing having a pair of openings separated by a wall element;

a bow-shaped locking element for selectively closing the openings and locking in the corrugated tube inserted into the cylindrical housing;

said locking element having an inner peripheral surface with first and second sets of ribs which fit through the openings in the housing into grooves of the corrugated tube when the locking element is closed and locked, said locking element further including a recess between the sets of ribs, said recess corresponding in size to and receiving the wall element such that substantially the entire wall element surface is in contact with the recess;

a hinge portion for connecting movably the locking element with the cylindrical housing;

a hook-like element attached to an end of said locking element opposite said hinge portion; and

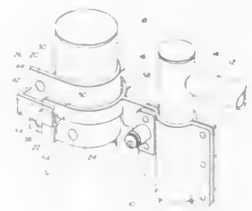
an engaging member attached to an end of said opening portion and positioned to receive said hook-like element.

4,919,463

GATE LOCKING DEVICE

Donald E. McQuade, 56 Jefferson St., Red Bank, N.J. 07701

Filed Feb. 13, 1989, Ser. No. 310,349
Int. Cl.[5] E05C *19/10*
U.S. Cl. 292—120 **8 Claims**



1 A gate locking device for connection between first and second pipes in a gate closure comprising:

a U-shaped collar having two connecting arms secured to the first pipe;

a housing formed on one of the connecting arms, the housing having an aperture formed therein;

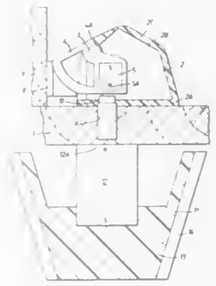
an oar lock hingeably attached to the second pipe movable between a first position where the pipes are unlocked and a second position where the pipes are locked, the oar lock having a portion formed therein for interfitting into the aperture when the oar lock is in the locked position.

4,919,464

MAGNETICALLY OPERATED LATCH

Roger C. Richards, 8 Church Street, Amersham, Buckinghamshire, Great Britain

Continuation of Ser. No. 92,942, Oct. 4, 1987, abandoned. This application May 16, 1989, Ser. No. 353,178
Int. Cl.[4] E05C *17/56*
U.S. Cl. 292—251.5 **8 Claims**



1 A latch comprising:

(1) an abutment for latching said latch;

(2) a pivotable latching means for latching engagement with

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said abutment, said latching means having an abutment engaging portion and a first permanent magnet;

(3) pivot means for pivotally mounting said latching means to a support therefor, wherein said engaging portion and said first permanent magnet are pivotable about said pivot means between a latched position where said engaging portion engages said abutment and an unlatched position where said engaging portion does not engage the abutment;

(4) magnetic material means disposed adjacent to said latching means and in a position wherein the said latching means is pivotable about said pivot means so that said first permanent magnet is attracted to said magnetic material means and placed in juxtaposition therewith, whereby the said engaging portion is maintained only in said latched position;

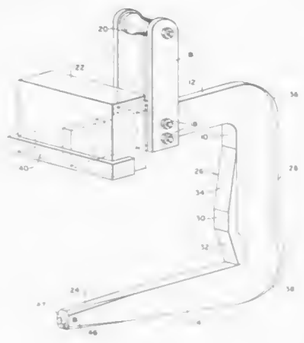
and further comprising a second magnet wherein the disposition of said first permanent magnet in said latching means is in relation to said engaging portion and said pivot means such that said second magnet is positionable to act repulsively upon said first permanent magnet to pivot said latching means to said unlatched condition and wherein in the absence of said second magnet the latching means is only in the said latched condition.

4,919,465

PROTECTOR FOR "C" HOOKS

Michael P. Gembarosky, Lower Burrell; Gary S. Clark, Pittsburgh; Howard E. Baybrook, New Kensington, and Arthur E. Trudgeon, Apollo, all of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Nov. 3, 1988, Ser. No. 266,713
Int. Cl.[5] B66C *1/54*
U.S. Cl. 294—67.2 **10 Claims**



1. A protective system for a crane "C" hook to prevent impact damage to coiled strip material lifted by the "C" hook, said protective system comprising:

a receptacle formed in a substantially vertical face at a forward end of a lower horizontal leg of the "C" hook, said receptacle extending substantially horizontally and rearwardly into said forward end; and

a plug of shock absorbing material removably insertable into said receptacle, said plug having a first portion and a second portion, said first portion being receivable in said receptacle, said second portion protruding from said forward end when said first portion is received in said receptacle, said second portion having a rearward face and a forward face, said rearward face conforming substantially in size and shape to the size and shape of said vertical face, said second portion tapering in size from said rearward face to said forward face,

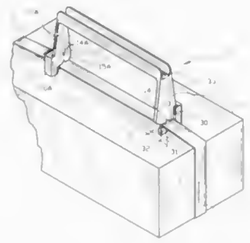
whereby the construction of said plug of shock absorbing material is such that an upper load carrying surface of the lower horizontal leg of the "C" hook is devoid of any covering by said shock absorbing material when said plug is inserted into said receptacle and wherein if the forward end of said lower horizontal leg engages a side of a coil, the shock absorbing material will prevent damage to the coil.

4,919,466

REUSABLE PACKAGE STRAP HANDLE

Donald Consler, Safety Harbor, and Joseph B. Federico, Jupiter, both of Fla., assignors to Paragon Patent Development Inc., Oldsmar, Fla.

Filed Jan. 26, 1989, Ser. No. 301,722
Int. Cl.[5] A45F *5/10*
U.S. Cl. 294—170 **18 Claims**



1 A reusable handle for use on flat lashings, said handle comprising:

a hand grippable section having a finite length, the longitudinal axis of which extends in the same direction as the longitudinal axis of said lashing;

a pair of side sections dispersed on either end of said hand grippable section, said side sections each having a proximal end attached to one end of said hand grippable section and a distal end extended away from said hand grippable section in a plane perpendicular to the longitudinal axis of said hand grippable section;

each said distal end of said side sections including a relatively flat end surface with a curved section thereof;

U-shaped members where the base of each said "U" is relatively flat, and where one side of said "U" is relatively short, said short side being disposed in relationship to said curved section so as to form an expandable slot between the top of said short side and said curved section for the insertion of said lashing; and

means, including said longer side of each of said U-shaped members, for connecting one of said U-shaped members to each of said distal ends of said side sections such that said flat base and said short side of each of said U-shaped member lie in a plane parallel to and offset from said plane of each of said distal end of said side sections, respectively.

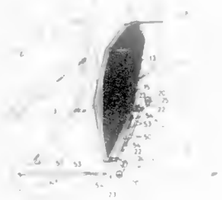
4,919,467

VEHICLE SAFETY SCREEN FIXING MEANS

Mark A. Guimelli, Moana South, Australia, assignor to Rees Operations Pty. Ltd., Pyympton North, Australia

Filed Nov. 9, 1988, Ser. No. 269,963
Int. Cl.[5] B60R *27/00*
U.S. Cl. 296—24.1 **4 Claims**

1. A load safety screen assembly comprising a safety screen including a peripheral frame adapted to be mounted in the interior of a vehicle so as to extend transversely thereof between a load carrying area and a front or rear seat and securing means for anchoring the screen when mounted in the vehicle, said securing means comprising a first pair of bracket means projecting rearwardly from and positioned one at or near each upper corner of the safety screen frame and a second pair of bracket means projecting rearwardly from and positioned one at or near each lower corner of the screen frame, each said bracket means including a fixed bracket member secured to the frame and movable connector means loosely carried by the fixed bracket member, a pair of upper short length metal securing straps pivotally attached at their forward ends to respective ones of said connector means of said upper bracket means, the rear or trailing end of each of said upper pair of straps being adapted for securement to anchorage points in a body panel in the vicinity of the vehicle roof, a pair of lower short length



metal securing straps pivotally attached at their forward ends to respective ones of said connector means of said lower bracket means, and a pair of lower relatively long length metal securing straps pivotally attached at their forward ends to respective ones of said connector means of said lower bracket means, each of said lower straps having an aperture at its rear or trailing end, and fastening means extending through the apertures for selectively securing either the pair of short length lower straps or the pair of relatively long length lower straps to a pair of opposed anchorage points fixed in a body panel in the vicinity of the vehicle floor.

4,919,468

DUAL SUN VISORS

Ibrahim K. Abu-Shumays, and Mary D. Abu-Shumays, both of 1248 Varner Rd., Pittsburgh, Pa. 15227

Continuation-in-part of Ser. No. 158,846, Feb. 22, 1988, abandoned. This application Aug. 1, 1989, Ser. No. 387,784
Int. Cl.[5] B60J *3/02*
U.S. Cl. 296—97.4 **3 Claims**

1. A sun visor for passenger cars; the visor is mounted on, and can rotate vertically with a horizontal rod axle; the end of the rod axle is surrounded by a cylindrical washer which fits sufficiently tightly and is frictionally engaged inside a cylindrical hole in a horizontal direction inside a wide vertical rod; the cylindrical washer is (a) sufficiently loose around the end of the rod axle to allow vertical rotation of the rod axle and visor with little tension, yet (b) sufficiently tight to hold the rod axle and visor in any position following partial rotations;

said wide vertical rod passes through a bracket unit fastened to a corner of a car's interior adjacent to a top corner of the front windshield; said wide vertical rod has a variable circular cross section a little wider just below the bracket unit then inside and above said bracket unit, the function of the wider part being to provide frictional engagement and prevent further movement of said wide vertical rod into the bracket unit; said wide vertical rod has yet a wider washer-like end above said bracket unit and has a spring around it between its washer-like end and the bracket unit; said wide vertical rod can be rotated horizontally in place as a result of little tension exerted on it; the arrangement makes it possible to rotate the rod axle and its associated visor in a horizontal direction;

as a consequence of the ability to rotate the visor in a vertical direction together with its rod axle and the abilitiy to rotate the rod axle together with said wide vertical rod in a horizontal direction, it is possible to position the visor at a top part of the front windshield or a top part of a front side window;

said rod axle has a narrow part near its end inside said wide vertical rod, said narrow part being a little wider than a screw which fits adjacent to it inside said wide vertical rod; the screw serves to fix the location of the rod axle relative to said wide vertical rod yet makes it possible to disassemble and reassemble the rod axle and the associated visor;

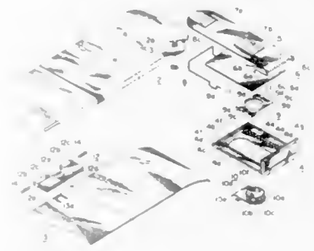
said wide vertical rod is mostly hollow inside with its said washer-like end in the form of a gear which has a motor associated with it; the motor including a combination of gears associated therewith to automate the rotation of both said wide vertical rod and said rod axle; the rotations can be conducted manually and can also be conducted automatically by (a) a motor-driven gear pressed against the outside of said washer-like end of said wide vertical rod, and (b) motor-driven gears which are associated with and can rotate the cylindrical washer surrounding the end of the rod axle inside said wide vertical rod.

4,919,469

AUXILIARY SUN VISOR FOR AUTOMOBILE

Genya Aizawa, 201 Hayashicho Mansion, 30-2, Sendagi 5 chome, Bunkyo-ku, Tokyo 113, and Kakuhisa Ono, 10-45, Chiyogaoka 6 chome, Aso-ku, Kawasaki-shi, Kanagawa 215, both of Japan

Filed Jun. 9, 1988, Ser. No. 204,390
Int. Cl.[5] B60J *3/02*
U.S. Cl. 296—97.6 **7 Claims**



1. An auxiliary sun visor for an automobile comprising a base plate removably attached to a sun visor installed against a windshield of the automobile, said base plate being formed with an elongate guide hole;

a movable member slidably mounted in said elongate guide hole; means for fixing said movable member at a suitable position along said elongate guide hole;

a colored transparent light shielding plate attached to said movable member;

a strap piece having a first end attached to said base plate and a second end including fastening means; and,

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strap folding means attached to said base plate extending from said base plate on one side of the sun visor at a lower end of the sun visor, and including a strap folding portion extending to the other side of said sun visor at an upper end, opposite said base plate, said strap folding means for engaging said strap piece as it is folded around said strap folding portion such that said fastening means on an end of said strap piece engages additional fastening means on said strap piece thereby retaining said base plate fixed to said sun visor.

4,919,470

MOTOR VEHICLE DOOR PANEL

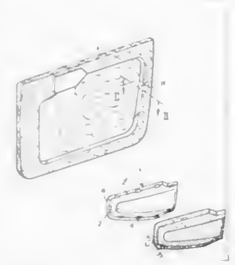
Olaf Müller, Rüsselheim, Fed. Rep. of Germany, assignor to R. Schmidt GmbH, Lennestadt, Fed. Rep. of Germany

Filed Dec. 1, 1988, Ser. No. 278,653

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1987, 3740938

Int. Cl.[5] B60J *9/00*

U.S. Cl. 296—153 11 Claims



1. In a door panel for a motor vehicle made from a shaped plate-like fiber fleece with an armrest and a cover made of a soft material when called for, the improvement wherein said armrest is a separate thermoplastic injection-molded part which has a flange which is positioned substantially parallel to an appropriate place of attachment on said door panel and said flange is heat sealed or fused with said door panel, said armrest having a plurality of recesses in a transition region of said flange to the resting surface of said arm rest, said cover made of soft material having a plurality of projections engageable and lockable in said recesses on a cover surface facing said armrest.

4,919,471

WEATHERSTRIP FOR SASHLESS DOOR IN AUTOMOTIVE VEHICLES

Hitoshi Seino; Kensuke Kondo, and Takeomi Takamiya, all of Chiba, Japan, assignors to Kinugawa Rubber Industrial Co., Ltd., Chiba, Japan

Filed Mar. 15, 1989, Ser. No. 324,216

Claims priority, application Japan, Mar. 16, 1988, 63-62506; Dec. 28, 1988, 63-332504; Feb. 28, 1989, 64-48802

Int. Cl.[5] B60J *9/00*; E06B *7/16*

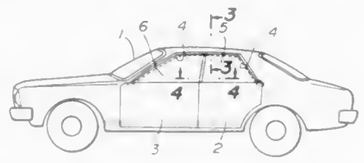
U.S. Cl. 296—154 12 Claims

1. A weatherstrip for a sashless door for automotive vehicles, comprising:

an extrusion molded member provided on a roof rail and pillars of a vehicular body, having a pair of seal lip portions through which said extrusion molded member mates with the end and the inner perimeter surface of the window of said sashless door in a water tight fashion, said pair of seal lip portions define a groove between the both top ends thereof;

an end member provided on the outer surface of the side panel of said vehicular body, said end member connected to the lower end of said extrusion molded member;

an opening provided on said end member in the vicinity of the connecting portion between said extrusion molded member and said end member, said opening being associated with said groove lying at the lower end of said extrusion molded member for permitting captured water within said groove to drain therefrom; and



a fluid passage connected to said opening for exhausting said water outside of the vehicular cabin.

4,919,472

ROOFTOP DRAG REDUCING DEVICE FOR MULTI-TRUCK SHIPMENT WHEN MOUNTED

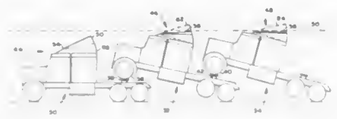
Nathaniel C. Wiley, Jr., Weston, Conn., assignor to Airshield Corporation, Bridgeport, Conn.

Continuation of Ser. No. 926,892, Nov. 4, 1986, Pat. No. 4,784,424. This application Nov. 14, 1988, Ser. No. 270,944

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.[5] B62D *35/00*

U.S. Cl. 296—180.2 17 Claims



1. A drag reducing device comprising:

(A) a bottom portion adapted for rigid mounting on the roof of a vehicle; and

(B) a top portion hingedly mounted along the front thereof to the front of said bottom portion and adapted to be articulated into said bottom portion.

4,919,473

STRUCTURAL SHAPE (BEAM) ESPECIALLY FOR RAMMING PROTECTION IN SIDE DOORS AND WALLS OF MOTOR-VEHICLE BODIES

Johann Laimighofer, Braunau; Peter Garnweidner, Salzburg; Peter Üblacker, Dürmoss, and Johann Luttinger, Schalchen, all of Austria, assignors to Austria Metall Aktiengesellschaft, Braunau am Inn, Austria

Filed Nov. 10, 1987, Ser. No. 119,138

Claims priority, application Austria, Nov. 10, 1986, 2983/86

Int. Cl.[5] B60R *27/00*

U.S. Cl. 296—188 17 Claims

1. A collision-resistant reinforcement for a side wall or side door of a motor vehicle comprising a beam composed of a rectangular cross section one-piece tube having a pair of parallel spaced-apart webs and a respective pair of flanges bridged

by said webs, each of said flanges projecting laterally beyond said webs along opposite sides of said beam, said beam being supported so as to constitute one of said flanges as a compression flange on a side of potential impact and the other of said flanges as a tension flange, said compression flange being provided with openings over a central portion thereof and having said compression flange cut away at opposite ends of said beam, so that said compression flange remains generally intact between said ends, said compression flange being formed with overhangs projecting laterally beyond said webs, said overhangs being formed with respective pair of spaced apart edges and said overhangs being formed with at least some of said openings.

4,919,474

AUTOMOBILE FRONT BODY STRUCTURE

Ryoichi Adachi, and Shyuji Murasoka, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 27, 1989, Ser. No. 343,598

Claims priority, application Japan, Apr. 27, 1988, 63-106021

Int. Cl.[5] B62D *25/08*

U.S. Cl. 296—194 6 Claims

1. A front body structure of an automobile body having a front wheel apron constituting a side wall of an engine room, comprising:

front frame means extending in a lengthwise direction of said front body structure and connected to a lower portion of said front wheel apron;

side extension means laterally overhanging from an upper portion of said front wheel apron and extending in said lengthwise direction, said side extension means being formed therein with an intermediate space adjacent to a portion of said front wheel apron where a suspension assembly is supported;

stiffener means disposed in said space of said side extension means and secured to said side extension means, said stiffener means having a rigidity higher than said wheel apron, and

reinforcement means extending in a lengthwise direction of said front body structure over said upper portion of said front wheel apron and connected to said side extension means and said stiffener means to form a closed cross-section in cooperation therewith.

4,919,475

SLIDING ROOF OR SLIDING LIFTING ROOF FOR MOTOR VEHICLES

Albert Schlapp, Dreieich, and Norbert Kunz, Maintal, both of Fed. Rep. of Germany, assignors to Rockwell-Golde G.m.b.H., Fed. Rep. of Germany

Filed May 10, 1989, Ser. No. 349,738

Claims priority, application Fed. Rep. of Germany, May 31, 1988, 3818476

Int. Cl.[5] B60J *7/02*

U.S. Cl. 296—213 18 Claims

1. A sliding roof or sliding lifting roof for a motor vehicle, with a rigid cover and also provided with an intermediate frame in the case of the sliding lifting roof, the rigid cover being displaceably guided on lateral guide rails, optionally together with the intermediate frame, which guide rails are fixed to a roof frame, which surrounds a roof cutout of the fixed vehicle roof, and the rigid cover being driven by a drive cable guided in the guide rails and engaging on guide parts connected thereto; the guide rails are arranged entirely below the fixed vehicle roof and are fixed to the roof frame, which is

closely adjacent to the fixed vehicle roof and fitted thereto, being set back with respect to the roof cutout edge; a water channel is provided below the guide rails and at a limited distance therefrom, the water channel being elastically deformable from above at least on its edge adjacent to the roof cutout edge and the guide parts connecting the cover and optionally the intermediate frame to the guide rails passing through the elastically expandable gap between the roof cutout edge and the elastically deformable water channel edge.

4,919,477

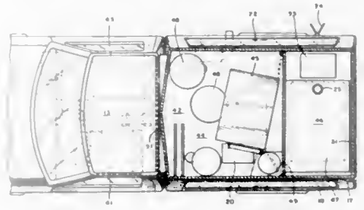
COMPACT PIZZA PREPARATION AND DELIVERY VEHICLE

Lynn R. Bingham, Tulsa, Okla., and Jerome R. Henke, Rose Hill, Kans., assignors to Pizza Hut, Inc., Wichita, Kans.

Filed Oct. 17, 1988, Ser. No. 258,969

Int. Cl.[5] B60P *3/00*

U.S. Cl. 296—24.1 35 Claims



1 A compact pizza preparation and delivery vehicle comprising:

a self-propelled vehicle comprising a driver's compartment with a driver's seat and a cargo compartment behind the driver's compartment;

a refrigerated case located in the driver's compartment within access of a driver in the driver's seat for storing pizza shells and pizza toppings;

an assembly table located on top of the refrigerated case upon which a pizza shell is placed while pizza toppings are applied thereto;

a pizza oven in the cargo compartment which is adapted and positioned so that, while sitting in the driver's seat, a

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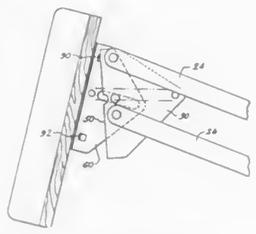
driver can insert an unbaked assembled pizza into the oven and remove a baked pizza from the oven.

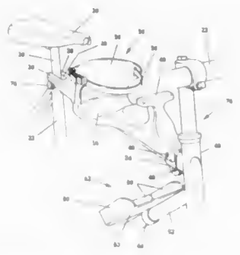
4,919,478
SAFETY OTTOMAN
Bill D. Tacker, Okolona, Miss., assignor to Super Sagless Corporation, Tupelo, Miss.
Filed May 22, 1989, Ser. No. 354,830
Int. Cl.[5] A47C *1/034*
U.S. Cl. 297—85 16 Claims



1. A safety ottoman assembly movable between extended and retracted positions comprising
a pair of spaced apart and parallel side brackets for mounting on a mechanism to move the assembly including the brackets between the retracted and extended positions,
a pair of ottoman angles each having a plate essentially parallel to the brackets with one angle being associated with each bracket, each angle also having a flange substantially perpendicular to the plate and lying forward of the bracket with which it is associated, said flanges being provided for supporting an ottoman board,
a slot provided in the plate of each angle and a pin mounted on each bracket and extending into the slot of the associated angle for supporting the angles on the brackets and enabling the angles to move rearwardly and forwardly on the brackets and also permitting the tops and bottoms of the angles to pivot away from the brackets,
a pair of stops carried on each angle plate, one adjacent to the top and the other adjacent the bottom thereof and limiting the rearward travel of the angles on the brackets,
and a spring joining the associated angles and brackets and biasing the angles to a rearward position on the brackets.

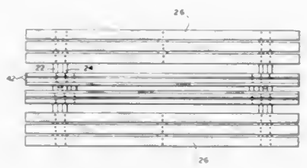
4,919,479
APPARATUS FOR CARRYING A PASSENGER ON A BICYCLE
Eunice R. Loewke, 1307 Jasmine Cir., Rohnert Park, Calif. 94928, and Daniel D. Loewke, 3060 N.E. Wheeler St., Poulsbo, Wash. 98370
Filed Aug. 19, 1988, Ser. No. 233,817
Claims priority, application Australia, Aug. 20, 1987, 77264/87
Int. Cl.[5] B62J *1/28*
U.S. Cl. 297—195 7 Claims

1. An apparatus for carrying a passenger on a bicycle having a seat supported on a seat post and a forward frame portion for supporting a handle bar and front fork assembly, including: a passenger seat for supporting a passenger, carrier means extending from the seat post substantially to the forward frame portion for supporting said passenger seat, said carrier means including a generally rigid support member extending generally along a longitudinal axis and having a proximal end and a distal end, first means disposed at said proximal end of said rigid support member for releasably receiving the seat post of the bicycle, said first means engaging the seat post in rotationally immobile fashion about said longitudinal axis, and second means disposed at said distal end of said rigid support member for releasably engaging the forward frame portion of the bicycle;
said second means for releasably engaging the forward frame portion of the bicycle including a bracket assembly secured to said forward frame portion of the bicycle, and



means for releasably securing said distal end of said support member to said bracket assembly;
said distal end of said support member including a recess formed in a lower end surface thereof, said recess being dimensioned to receive a portion of said bracket assembly therein.

4,919,480
SECTIONAL BENCH
James H. Drew, III, P.O. Box 5536, Augusta, Ga. 30916
Filed Sep. 22, 1989, Ser. No. 410,754
Int. Cl.[5] A47C *11/00*
U.S. Cl. 297—244 18 Claims



9. The sectional bench of claim 1 wherein each of said A-shaped support sections further comprises a second horizontal brace fixed to and spanning each joined pair of upright members, said second horizontal brace being opposite and parallel to said first horizontal brace, whereby, upon assembly, the two rails of each rail pair rest on said first and second horizontal braces, respectively.

4,919,481
MULTIPLE POSITIONABLE CHAIR CONSTRUCTION
Edward A. Garabedian, 4151 Arch Dr., #311, Studio City, Calif. 91604
Filed Jan. 3, 1989, Ser. No. 292,997
Int. Cl.[5] A47C *3/02*
U.S. Cl. 297—258 6 Claims

1. A chair construction, comprising:
first and second side frames, each including, a continuously curved support element having one concave portion and one convex portion, the convex side being adapted for contacting a ground plane,
a tubular side member arranged within a support element concave portion having its ends and a central point secured to the said support element, each tubular side member having a first bend at the central point secured to a support element, a second bend above the first bend approximately at shoulder height for a seated chair user, and a third bend substantially behind the knees of a seated chair user;
a plurality of equilength rodlike braces each having its two ends respectively secured to the first and second side frames forming a unitary framework; and

a flexible sheet of material having opposite end portions connected to two of the braces leaving the central part thereof unsupported providing a seating surface.

4,919,482
INERTIA LATCH FOR VEHICLE SEATS
David E. Landis, Oxnard, Calif., and Douglas G. Del Grosso, Canton, Mich., assignors to Lear Siegler Seating Corp., Southfield, Mich.
Filed Jan. 20, 1987, Ser. No. 4,961
Int. Cl.[5] B60N *1/04*
U.S. Cl. 297—379 17 Claims

1. A seat assembly (10) having a forward folding back for use in a vehicle and comprising;
a support frame (12) for fixed support in a vehicle,
a back frame member (18) pivotally supported by said support frame (12) for forward pivoting movement between an upright seating position and a forwardly folded position,
an inertia latch member (22) rotatably mounted on said back frame member (18) to coact in a first position with said support (12) frame for limiting forward pivoting movement of said back frame member (18) from said upright position only when the initial forward movement thereof exceeds a predetermined acceleration, said assembly (10) characterized by said support frame (12) including locking means to automatically coact with said inertial latch member (22) in a second position in said forwardly folded position for automatically locking said back frame member (18) in said forwardly folded position

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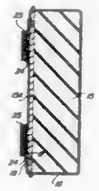
4,919,483
COLLAPSIBLE AND REFORMABLE HEADREST FOR VEHICLES
Gregory R. Horkey, P.O. Box 3035, Monterey, Calif. 93942
Filed Jun. 16, 1989, Ser. No. 367,240
Int. Cl.[5] A47C *7/38*
U.S. Cl. 297—395 3 Claims



1. A headrest comprising:
a cushion,
said cushion comprising a body of plastic foam containing a plurality of air filled pores and a casing of substantially nonporous material surrounding said body of plastic foam,
a port extending from atmosphere through said casing into contact with said pores,
a flap valve for controlling said port,
said flap valve comprising a resilient strip of material adhesively attached at one end to said casing and covering said port at its other end,
said valve opening under pressure of air being expelled from said pores of said cushion to atmosphere upon a compression force being applied to said cushion and rapidly closing said port when air under vacuum conditions is drawn from atmosphere into said pores of said cushion through said port upon cessation of the compression force, thereby causing said cushion to gradually return to its original configuration, and
hook and loop fastening means mounted on said cushion,
said fastening means comprising a first member secured to said cushion and providing a first surface for interlockingly engaging a second surface of a second member when an opposed surface thereof is adhesively attached to a window of a vehicle.

4,919,484
ANTI-CINCH SEAT BELT SYSTEM
Jerry D. Bougher, Lebanon; James R. Anthony, Carmel; Jeffrey L. Williams, Zionsville; Ronald F. Homeier, Plainfield, and Allan R. Lortz, Carmel, all of Ind., assignors to Indiana Mills & Manufacturing, Inc., Westfield, Ind.
Continuation-in-part of Ser. No. 111,182, Oct. 22, 1987. This application Jan. 26, 1989, Ser. No. 302,788
The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.
Int. Cl.[5] A47C *31/00*
U.S. Cl. 297—474 18 Claims

1. A seat belt assembly which comprises:
a first belt connector;
a retractor assembly;
linking means between said first belt connector and said retractor assembly;
a mounting bracket;
a second belt connector lockable with said first belt connector to form a tongue-buckle combination;
a first connecting member connectable with said bracket;
first connecting means for connecting said first connecting member with said bracket;
a second connecting member connectable with said second belt connector;

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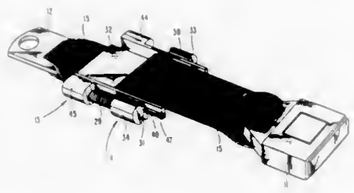
second connecting means for connecting said second connecting member with said second belt connector;

said first connecting member being coupled with said second connecting member and being movable relative said second connecting member between first and second positions, said second belt connector being retracted relative said bracket in the first position, said second belt connector being extended relative said bracket in the second position; and,

maintaining means composed of at least one biasing member and being for normally maintaining said second belt con-



nector and said bracket in the first position and for exerting a predetermined force to retain said first connecting member and said second connecting member in the first position, said maintaining means also being for permitting said second belt connector and said bracket to move under resistance from the first position to the second position in response to an external force exceeding the predetermined force, said maintaining means also being for returning said second belt connector and said bracket from the second position to the first position upon decrease of the external force below the predetermined force.

4,919,485

SEATS CONSTRUCTED OF INTERLOCKING ELEMENTS

Jean-Paul Guichon, Pratz, France, assignor to Grosfillex S.A.R.L., Arbent, France

Filed Jun. 20, 1988, Ser. No. 208,750
Int. Cl.[5] A47C *4/02*
U.S. Cl. 297—443 **15 Claims**

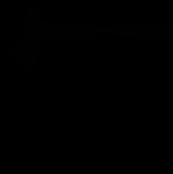
1. A chair having assemblable components comprising a seat, a back and a pair of spaced sides, said seat having front and rear portions, said sides having a front portion and a rear portion, said back having upper and lower portions, a pair of oppositely oriented first locking studs extending outwardly of said front portion of said seat, said first locking studs having an irregularly shaped portion, a first opening in each of said front portions of said sides, said first openings being profiled so as to cooperatively receive said first locking studs therein when said seat and said sides are aligned in a non-use position and for cooperatively retaining said first locking studs when said seat and said sides are a proper alignment for use, a pair of second locking studs extending outwardly on opposite sides of said back and intermediate said upper and lower portions of said back, said second locking studs having an irregularly shaped portion, a second opening in each of said rear portions of said sides, said second opening being profiled so as to cooperatively receive said second locking studs when said back and said sides are aligned in a non-use position and for cooperatively retaining said second locking studs when said seat and said sides are in a proper alignment for use, a pair of lugs extending outwardly from said rear portion of said seat, a bearing member on each of said sides and adjacent said rear portions thereof, said lugs being cooperatively seated within said bearing members when said seat and said sides are aligned in a use position, and said sides have opposing stop members extending outwardly therefrom, said stop members being spaced adjacent to said bearing members and in spaced relationship below said second openings, said lower portion of said back abutting said stop members when said back is moved to a use position whereby said back and said seat may be cooperatively interlocked with said sides for assembled use.

4,919,486

VEHICULAR SEAT

Isamu Chinomi, and Yuji Tanaka, both of Kanagawa, Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Apr. 20, 1989, Ser. No. 340,683
Claims priority, application Japan, Sep. 24, 1988, 63-125012
Int. Cl.[5] A47C *7/00*
U.S. Cl. 297—443 **3 Claims**



1. A vehicular seat comprising:

a rectangular seatback frame;

a side plate secured to one side lower portion of the seatback frame;

a hook member integral with and raised from said side plate;

a reclining device having a pivotal arm;

first means defining at a leading free end of said pivotal arm a rectangular recess, said rectangular recess being so sized and constructed as to make a latching engagement with said hook member;

second means defining in said side plate and said pivotal arm first and second pairs of mated openings;

first and second bolts passing through said first and second pairs of mated openings respectively; and

first and second nuts operatively engaged with said first and second bolts respectively;

wherein said rectangular recess is above said openings of said pivotal arm in the direction to said leading free end of said pivotal arm.

4,919,487

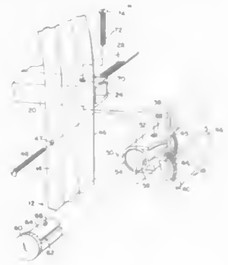
CHAIRS HAVING CROSS BAR SEAT SUPPORT

Terence Gibbs, Nyack, N.Y., assignor to Omni Products International, Inc., Fairfield, N.J.

Filed Sep. 5, 1989, Ser. No. 402,832
Int. Cl.[5] A47C *1/12*
U.S. Cl. 297—445 **12 Claims**

1. In a chair structure having a chair seat section including first and second transversely spaced legs, a transverse cross brace fixed to and rigidly interconnecting said legs, first and second transversely spaced seat side support members having respective first and second end portions, and means extending between said seat side support members for forming a seat

therebetween, the improvement wherein said cross brace comprises an elongate member having an outer side, first and second spaced apart end sections and an inner side, said inner side including support means thereon for supporting said end por-



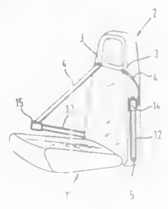
tions of said seat side support members on said end sections of said elongate cross brace member, with said end portions of said seat side support members being substantially shielded from view, in front elevation, by said outer side.

4,919,488

VEHICLE SEAT WITH A SAFETY BELT SYSTEM

Elmar Deegener, Stelzenberg; Harald Wolsiefer, and Heinz P. Cremer, both of Kaiserslautern, all of Fed. Rep. of Germany, assignors to Keiper Recaro GmbH & Co., Fed. Rep. of Germany

Filed May 17, 1989, Ser. No. 352,890
Int. Cl.[5] A47C *31/00*
U.S. Cl. 297—468 **10 Claims**



1. A vehicle seat having a seat portion supported on slide rails, a back rest, and a safety belt system having a belt closure with two closure elements, the belts of which are connected in the area of the upper end section of the back rest to two upper connection points lying spaced from each other in the lateral direction of the seat, and in the area of the rear end of its seat portion, are connected to one of the lower ends of the back rest, said seat portion, or said slide rails, at two lower connecting points provided on the respective sides of the seat, one of said respective sides of the seat being an access side, comprising:

two lap belts (6) each running from one of the respective lower connecting points (5) to said closure elements (14, 15), respectively, of said belt closure;

two shoulder belts (4), each running from one of the respective upper connecting points to one of said closure elements (14, 15) of the belt closure, each of said lap belts (6) being guided by one of said shoulder belts (4);

first and second pivot arms (12, 12'), each defining a respective pivot plane for guiding the respective lap belts (6), said pivot arms (12, 12') being connected with the seat frame in the area of one of the lower connecting points (5) respectively, so as to pivot about respective axes (8, 11) extending in the lateral direction of the seat;

said two pivot arms (12, 12') being formed so as to resist bending in their respective pivot planes and to be elastically flexible laterally thereto;

said first pivot arm (12) being connected with the other pivot arm (12') by gear means (8, 9, 10), the output of which is opposite to the input pivot movement;

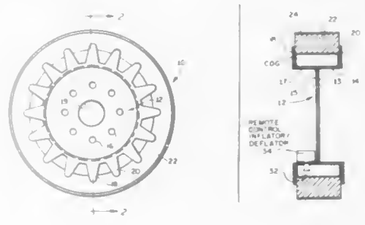
wherein said second pivot arm (12') is arranged on the access side of the seat and lies upright at the side of the seat adjacent to the back rest (2) in its stowed position, and said first pivot arm (12) extends forward and holds the shoulder belt (4) connected therewith at least nearly tensed when said second pivot arm is in its stowed position.

4,919,489

COG-AUGMENTED WHEEL FOR OBSTACLE NEGOTIATION

M. Alan Kopsco, Wantagh, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Apr. 20, 1988, Ser. No. 183,953
Int. Cl.[5] B60B *15/26*
U.S. Cl. 301—44 T **3 Claims**



1. A wheel adapted for overcoming obstacles and comprising:

a hub;

a foam annulus means circumferentially mounted to the hub for normally rolling over a contacted surface and yielding in areas encountered by obstacles; and

cog means coaxially located on both sides of the annulus means and normally extending less radially outwardly than the annulus means for engaging the obstacle and rolling the wheel thereover.

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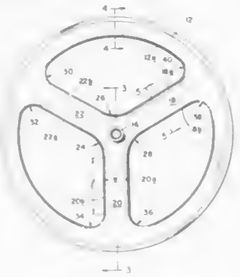
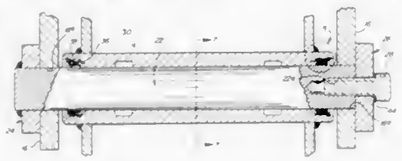
4,919,490
VEHICLE WHEEL
Mark W. Hopkins, Newark, and Frank S. Principe, Hockessin, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 12, 1988, Ser. No. 258,312
Int. Cl.[5] B60B *5/02*
U.S. Cl. 301—63 PW 16 Claims



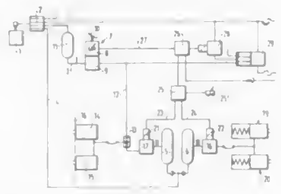
1. A wheel comprising: a circular member, a hub concentric with said circular member, and a plurality of elongated spokes connected between said hub and said circular member, each of said spokes having a leading and a trailing edge, an aerodynamic profile, and an aspect ratio greater than about 3.0 said aspect ratio being constant throughout the length of the spoke.

4,919,491
WHEEL ASSEMBLY
Robert J. Heideman, 34316 Barton, Westland, Mich. 48185
Filed Feb. 26, 1988, Ser. No. 160,921
Int. Cl.[5] B60B *37/10*
U.S. Cl. 301—124 R 19 Claims



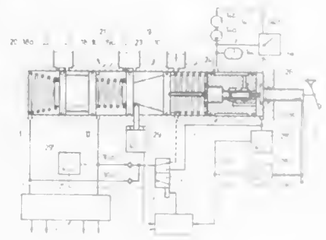
1. A wheel assembly for use at the four corners of a cart to rollably support the cart, said wheel assembly comprising:
(A) a pair of flange mounting plates adapted to be rigidly secured to a respective corner of the cart and extend downwardly from the main body of the cart in parallel spaced relation;
(B) an aperture in the lower end of each mounting plate;
(C) an axle passing slidably through said apertures in said mounting plates and presenting a journal portion of round cross section between said plates;
(D) a wheel comprising a tubular hub positioned between said mounting plates and journalled on said axle journal portion, a rim, and means rigidly interconnecting said rim and said hub in concentric relation;
(E) means defining an annular lubricant reservoir along the annular journal interface of said hub and said axle journal portion; and
(F) an elastomeric annular seal at each end of said interface at opposite sides of said annular lubricant reservoir.

4,919,492
MULTIPLE-CIRCUIT BRAKE SYSTEM
Hakan Samuelson, Enhörna; Eric Thoms, Akers Styckebruk, both of Sweden; Ingolf Grauel, Vaihingen/Enz, Fed. Rep. of Germany; Werner Stumpe, Kornwestheim, Fed. Rep. of Germany, and Franz Maurer, Schwieberdingen, Fed. Rep. of Germany, assignors to SAAB-Scania AB, Sodertalje, Sweden and Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jun. 3, 1983, Ser. No. 500,720
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1982, 3230970
Int. Cl.[5] B60T *13/66, 8/02*
U.S. Cl. 303—3 2 Claims



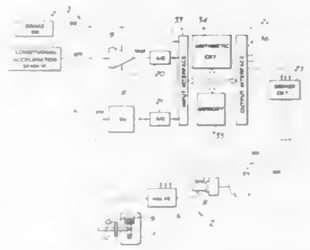
1. A multiple-circuit brake system for motor vehicles including front and rear wheel axles, equipped with front and rear brake cylinders thereon, comprising a multiple-circuit braking value transducer, said multiple-circuit braking value transducer including a variable electrical control section which varies electric-current intensities and a fluid-medium control section, which for brake actuation simultaneously controls at least one fluid pressure-medium brake circuit and one electrically triggered brake circuit, said electrically triggered brake circuit being equipped with at least one electronic switching member and first and second electrically triggered fluid-medium control valves for respectively controlling fluid-medium flow to said front and rear brake cylinders, said fluid medium control section of said brake value transducer including an input and an output, said at least on fluid pressure-medium brake circuit comprising a first fluid-medium supply line connected to said input of said fluid medium control section and a first fluid pressure-medium brake line connected to said output of said fluid medium control section, a first fluid medium reservoir disposed in said first fluid medium supply line to said input of said braking value transducer associated with the at least one fluid pressure-medium brake circuit, at least one two-way check valve, said at least one two-way check valve includes a first inlet side connected to said first fluid pressure medium brake line connected to said output of said fluid-medium control section of said braking value transducer and an outlet side connected to a second fluid pressure medium brake line connected to at least one of said front brake cylinders for controlling fluid pressure to the front brake cylinder, said two-way check valve further including a second inlet side which is connected to a third fluid pressure-medium brake line connected to said first electrically triggered fluid medium control valve which controls a fluid-medium under pressure from a second fluid-medium supply line via a first branch line to said second inlet side of said two way check valve and then out through the outlet side of said two-way check valve to said front brake cylinder, said two-way check valve being triggered directly by pressure from said first electrically triggered fluid medium control valve, said second electrically triggered fluid medium control valve being connected to said fluid medium supply line via a second branch line for controlling fluid under pressure in said second fluid medium supply line to said rear brake cylinders, a second reservoir connected to said first branch line and connected to said first electrically triggered fluid control valve and a third reservoir connected to said second branch line and connected to said second electrically triggered fluid control valve whereby said front brake cylinders may be controlled electrically as well as by fluid pressure and said rear brake cylinders may be operated electrically

4,919,493
METHOD AND APPARATUS FOR CONTROLLING BRAKE PRESSURE IN VEHICLE BRAKE SYSTEMS
Heinz Leiber, Theodor-Heuss Str. 34, D-7141 Oberriexingen, Fed. Rep. of Germany
Continuation of Ser. No. 828,791, Feb. 12, 1986, abandoned. This application May 13, 1988, Ser. No. 196,843
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3511579
Int. Cl.[5] B60T *8/00*
U.S. Cl. 303—15 18 Claims



1. An apparatus for controlling brake pressure in brake circuits of a vehicle brake booster including a booster piston, a booster pressure chamber (29*a*) and an associated pedal-actuated brake valve (15) operatively contained within said booster piston for feeding a pressure medium from a pressure medium supply means into said booster pressure chamber, a master brake cylinder (16) and first and second master brake pistons (18, 19), and first and second master piston pressure chambers, the master brake cylinder being connected to the brake circuits (I, II) including wheel brakes, a feed valve (13) connected to said booster pressure chamber and to each of said brake circuits (I, II), at least one pressure transducer means (28', 29') connected to one of said master piston pressure chambers of said booster pressure chamber for producing an output signal (S1, S2'), and at least one travel transducer means (28, 29) operatively connected to said vehicle brake booster for producing an output signal (S1', S2), and an electronic logic circuit means connected to receive each said signal output of each of said at least one pressure transducer means and at least one travel transducer means for generating a feed valve actuating signal by comparing variable signals transferred from said at least one pressure transducer means and said at least one travel transducer means for actuating said feed valve to change a pedal characteristic curve course to another pedal characteristic curve course in accordance with a predetermined correction range beginning preferably immediately after a start of a pedal travel out of a rest position of said pedal by delivering booster pressure emanating from said booster pressure chamber directly into said brake circuits while said first and second master brake pistons are actuated by said pedal actuated hydraulic brake booster.

4,919,494
ANTI-SKID BRAKE CONTROL SYSTEM WITH AVOIDANCE OF ABRUPT AND SUBSTANTIAL VARIATION OF WHEEL SLIPPAGE
Akira Higashimata, and Yoshiki Yasuno, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan
Filed Apr. 27, 1989, Ser. No. 343,992
Claims priority, application Japan, Apr. 28, 1988, 63-107270
Int. Cl.[5] B60T *8/32*
U.S. Cl. 303—100 11 Claims



1. An anti-skid brake control system for controlling a braking pressure for maintaining a wheel slippage in the vicinity of a predetermined optimum level said anti-skid control system comprising:
a braking circuit connecting a pressurized fluid source to a wheel cylinder for each of said front and rear wheels for building up braking pressure in the latter;
a pressure control valve means, disposed in said braking circuit, for controlling braking pressure in said wheel cylinder, said pressure control valve means operable for increasing braking pressure in said wheel cylinder in a first mode, decreasing braking pressure in said wheel cylinder in a second mode, and to hold the braking pressure in said wheel cylinder constant in a third mode;
first sensor for monitoring rotation speed of associated one of the front and rear wheels for producing a wheel speed indicative signal;
second means for deriving a wheel slippage on the basis of said wheel speed indicative signal and producing a wheel slippage data;
control means for producing a first control signal for controlling operation mode of said pressure control valve means for switching operation mode between said first, second mode and third mode in order to maintain wheel slippage in the vicinity of said predetermined optimum value, said control means measuring a period in which said pressure control valve means is maintained at said third mode subsequently of said first mode operation so that increasing rate of braking pressure is varied according to said period.

4,919,495
ANTI-SKID CONTROLLED HYDRAULIC BRAKE SYSTEM
Dieter Kircher, Dortelweil, and Paul Schwarzer, Hofheim, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany
Filed Dec. 20, 1988, Ser. No. 287,307
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744070
Int. Cl.[5] B60T *11/10, 8/50*
U.S. Cl. 303—113 1 Claim

1. In an anti-skid controlled hydraulic brake system including a master cylinder, a pressure medium storage reservoir, at least one hydraulically controlled wheel brake connected to said master cylinder via a brake line and to said reservoir via a

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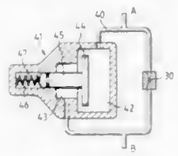
relief line, pressure modulation means in each of said brake and relief lines for modulating the pressure applied to said brake in response to pressure control signals, a pump having an intake connected to said reservoir and an outlet connected via a pressure line to said brake line at a location between said modulation means and said master cylinder;

the improvement comprising means defining a restricted orifice in said brake line between said master cylinder and



said pressure line, a bypass line connected to said brake line in parallel to said orifice, valve means in said bypass line normally biassed by a spring to an open position accommodating substantially unrestricted flow of pressure medium through said bypass line and movable to a closed position blocking flow through said bypass line when the pressure in that portion of said brake line between said master cylinder and said orifice exceeds a preselected pressure.

4,919,496

PROCESS OF MONITORING AND CONTROLLING AN ANTI-LOCKING AUTOMOTIVE BRAKE SYSTEM FOR CARRYING OUT THE SAID PROCESS

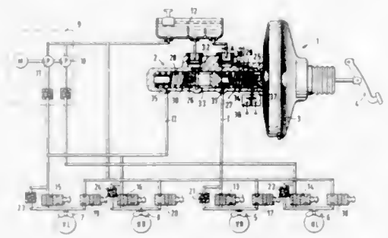
Jochen Burgdorf, Offenbach-Rumpenheim, and Lutz Weise, Mainz, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 23, 1988, Ser. No. 248,508

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1987, 3732162

Int. Cl.[5] B60T *8/44, 13/16*

U.S. Cl. 303—114 **16 Claims**



1. A process of monitoring and controlling an anti-lock automotive brake system having a brake pressure generator comprising a tandem master cylinder, with a primary and an intermediate piston disposed in working chambers therein, and an auxiliary pressure source operable during anti-lock regulation to supply a pressure medium to said working chambers of said master cylinder, to restore said primary piston, said auxiliary source operable through a central valve in said master cylinder to discharge excess pressure medium from said working chambers through said central valve to a pressure medium reservoir in proportion to a pedal force, comprising the steps of:

turning said auxiliary pressure source on and off in response to the postion of said primary piston disposed within said tandem master cylinder;

determining the maximum distance between said primary and said intermediate pistons wherein said maximum distance is determined when a bolt, which is axially displaceable within a sleeve of said intermediate piston, is positioned outside of said sleeve to an extent necessary to allow said central valve to open; and

opening said central valve, upon exceeding said maximum distance, to connect said working chamber, and its associated brake circuit, to said pressure medium thereby advancing said primary piston and thereby turning on said auxiliary pressure source.

4,919,497

TESTS OF ELECTROHYDRAULIC SWITCHING VALVES WITH FLUIDIC BALL ELEMENTS

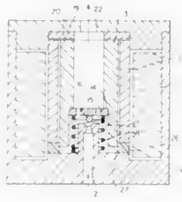
Guenter Kaes, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 3, 1988, Ser. No. 227,398

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1987, 3725810

Int. Cl.[5] B60T *8/36;* **F16K** *31/02*

U.S. Cl. 303—119 **5 Claims**



1. A magnetic valve with self regulation of a flow medium for use in anti-skid brake systems (ABS), having large flow cross section for normal braking and a reduced flow cross section in ABS operation, comprising a valve housing (**10**), a control coil (**11**) in said valve housing, a tubular armature (**13**) displaceably supported within said control coil, a valve body (**17**) in said housing, a stationary valve seat on said valve body (**17**), a sealing element holder (**15**) in said valve housing which is carried by said armature, a sealing element (**16**) on said sealing element holder which is moved by the armature relative to said stationary valve seat, a valve opening spring which applies a valve opening force on said sealing element holder to slowly enlarge an opening cap between said valve body (**17**) and the sealing element (**16**), said armature having a bottom portion (**27**) that communicates with an inflow region of said valve housing, said inflow region encompassing said sealing element (**16**) associated with said sealing element holder (**15**), the sealing element (**16**) and the stationary valve seat being formed and disposed such that within a predetermined stroke and flow ranges, an aspiration effect due to the flowing medium ensues due to fluid flow from an inlet in said valve body via said valve seat through said gap to an outlet (**22**), and a retaining means adapted to act upon the armature (**13**) counter to suction forces created by said aspiration effect, which after termination of an electrical excitation of said control coil of the magnetic valve, forces emanating from strong aspiration effects are overcome due to increasing flow rates and said retaining means is able to move said armature and said sealing element (**16**) a full stroke away from said stationary valve seat when strong aspiration effects disappear below a pre-set limit.

4,919,498

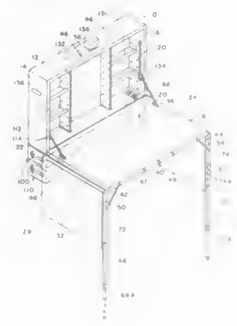
COLLAPSIBLE DESK

De Maris C. Turner, 7471 S. Marion, Tulsa, Okla. 74136

Continuation-in-part of Ser. No. 144,048, Jan. 14, 1988, abandoned. This application Nov. 17, 1988, Ser. No. 273,370

Int. Cl.[5] A47B *85/00*

U.S. Cl. 312—241 **13 Claims**



1. A collapsible wall supported convertible desk assembly which comprises:

a box-like storage cavity having a first and second side frame, a top frame, a bottom frame, each having a back edge, a back member mounted to said first and second side frame, said top frame and said bottom frame, at a distance from the back edge of each such that said top frame has a top overhang and said bottom has a bottom overhang;

first attachment bracket means attached to the underside of said top overhang member and to the top side of said bottom overhang for attachment to said wall;

a single piece planar desk member having a flat work surface on one side and a flat opposite side, two side edges and a front and back edge, said back edge hingedly mounted to a front edge of said bottom frame;

a first and second door, each said first and second door having a top edge, each door hingedly secured to one of said side edges of said desk top and foldable between a first position in which it is parallel with said desk member and a second position which is at least about 90° therefrom; and first and second latching bracket means to selectively retain said respective first and second doors in said first position or said second position.

4,919,499

OPTICAL PRINTER OF SCANING TYPE

Masahiko Aiba, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 15, 1988, Ser. No. 206,734

Claims priority, application Japan, Jun. 15, 1987, 62-148808

Int. Cl.[5] G02B *26/10;* **G01D** *15/06*

U.S. Cl. 350—6.6 **8 Claims**

1. An optical printer of the scanning type comprising:

a light emitting element drivable in accordance with printing data for emitting light;

an optical system to focus said light from said light emitting element onto a photosensitive member;

mirror means, movably interposed between said optical system and said photosensitive member, for deflecting the focused light from said optical system to cause the focused light to scan said photosensitive member at a high speed; and

driving means for pivotally movably supporting said mirror means so as to direct a reflecting surface of said mirror means toward said light emitting element and simple harmonic motion within a specified range of angles, thereby minimizing variations in scanning velocity.

4,919,500

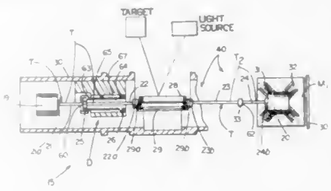
TORSION BAR SCANNER WITH DAMPING

Dean R. Paulsen, Watertown, Mass., assignor to General Scanning, Inc., Watertown, Mass.

Filed Sep. 9, 1988, Ser. No. 242,789

Int. Cl.[5] G02B *26/10*

U.S. Cl. 350—6.6 **26 Claims**



1 A scanner comprising:

a first spring,

at least one node point R defined on said first spring for a rotational frequency f_R,

at least one node point V defined on said first spring for a vibrational frequency f_V, and

at least one first damper, said damper located on said first spring at point R at some distance from point V, said damper configured to substantially impede transmission of vibrations at said frequency f_V.

4,919,501

OPTO-MECHANICAL DEFLECTOR

Michael Plaot, Eschborn, Fed. Rep. of Germany, assignor to Linotype AG, Eschborn, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 136,736, Dec. 22, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,250

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644124

Int. Cl.[5] G02B *26/10, 3/06*

U.S. Cl. 350—6.8 **7 Claims**

1 Opto-mechanical deflector with at least one rotatable or slewable scanning mirror arranged to be struck by a substantially parallel beam bundle which is focused onto a flat image lane by way of a first plano-convex lens arranged near it, the convex face of which is traversed substantially at right angles by the reflected beam, thereby forming a—second—aplanatory system, and by way of a concave mirror arranged near the image plane,

characterized in that a first aplanatic system is provided between the first plano-convex lens (**8**) and the scanning mirror (**1**) and that the first aplanatic system (**49** consists of

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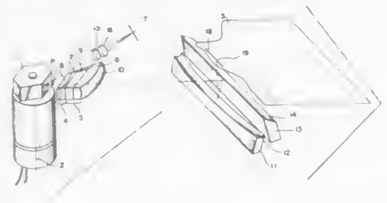
a plano-concave lens (7), having a refractive index substantially identical to that of the first plano-convex lens (8), and of a second plano-convex lens (6), cemented to the

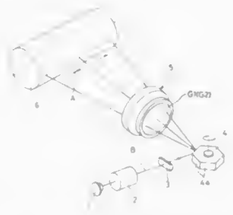


concave face of the plano-concave lens (7) and having a refractive index substantially less than that of said plano-concave lens (7).

4,919,502
TILT ERROR CORRECTIVE SCANNING OPTICAL SYSTEM

Kazuo Yamakawa, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 13, 1987, Ser. No. 72,723
Claims priority, application Japan, Jul. 14, 1986, 61-165125; Aug. 21, 1986, 61-196209; Aug. 21, 1986, 61-196210; Aug. 22, 1986, 61-197850
Int. Cl.[5] G02B *26/10*
U.S. Cl. 350—6.8 **31 Claims**



1. A tilt error corrective scanning optical system for a system having deflecting means for deflecting and reflecting a beam of light, comprising:

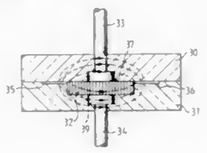
a linear image forming optical device for causing a beam emitted from a light source to form a linear image on a deflecting and reflecting surface of said deflecting means, and

a scanning image forming optical device for causing the beam reflected and deflected by said deflecting means to form an image on a scanned object, said scanning image forming optical device consisting of a first lens disposed between said deflecting means and said scanned object, and a second lens disposed at a side of said first lens opposed to said scanned object, wherein said first lens includes a cylindrical surface, and said second lens includes a toric surface.

4,919,503
OPTICAL COMPONENT FOR FIBER-OPTICAL TRANSMISSION SYSTEMS

Gerd Mroynski, Paderborn, Fed. Rep. of Germany, assignor to Krone Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Dec. 27, 1988, Ser. No. 291,536
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1988, 3804822
Int. Cl.[5] G02B *6/36*
U.S. Cl. 350—96.2 **15 Claims**



1. An optical component for two or more optical fibers, comprising: a first support guide plate; a second support guide plate cooperating with said first support guide plate to form a guide space positioned between said first and second guide plates; an adjustment plate with optical portions having different optical properties formed of dielectric material displaceably positioned in said guide space, said guide space having a length which is greater than the length of said adjustment plate; electrode means associated with at least one of said first and second support guide members, said electrode means generating at least one electric field acting to position said adjustment plate, formed of dielectric material, in said guide space whereby the build-up of an electric field causes the dielectric adjustment plate and optical portions to move relative to the support guide plate; and, terminal means connected to said electrode means for applying voltage to said electrode means for controlled positioning of said optical portions having different optical properties.

4,919,504
GRADED-INDEX WAVEGUIDES

Etienne G. Colas, Ashury Park, and Alfredo Yi-Yan, Eatontown Boro, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

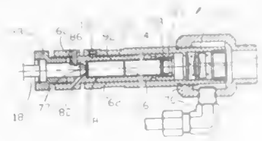
Filed May 17, 1989, Ser. No. 353,407
Int. Cl.[5] G02B *6/10*
U.S. Cl. 350—96.12 **10 Claims**

1. An optical waveguide having a graded index of refraction comprising a semiconductor substrate having one or more grooves extending along a surface thereof, and means, over and within said grooves, for providing a graded effective index of refraction including a region having an increasing effective index of refraction extending upwardly toward the surface of the waveguide, said means extending beyond the top of the groove to form a planar surface having refractive index cusps over the grooves wherein the effective refractive index of the material adjacent the cusps is less than the effective refractive index of the material forming the cusps.

4,919,505
INFRARED THERMOMETER WITH FIBER OPTIC REMOTE PICKUP

George Bartosiak, Naperville, Christopher Siskovic, Libertyville; Henry H. Tap, Algonquin; Sam Paris, Chicago, and Arthur E. Goldberg, Evanston, all of Ill., assignors to Square D Company, Palatine, Ill.

Filed Jan. 12, 1989, Ser. No. 296,225
Int. Cl.[5] G02B *6/32*; H01J *5/16*; G01J *5/00*
U.S. Cl. 350—96.18 **28 Claims**



1. In a remote infrared thermometer for sensing temperature from a remote target physically unconnected with the remote infrared thermometer having a sensing head for converting light signals applied to a light input port thereof to corresponding electrical output signals representative of temperature and an analyzer for converting the electrical signals to an indication of temperature, the improvement being a remote pickup assembly, comprising:

a fiber optic cable assembly including

a fiber optic cable having an input end and an output end for transmitting light therebetween,

a first connector for mechanically connecting the output end of the fiber optic cable to the light input port of the sensing head, and

a second connector at the input end of the fiber optic cable; and

a remote, focusable, reimaging lens assembly including

a protective lens housing having an input end for gathering light directly from the remote physically unconnected target and a lens for focusing said gathered light,

an output port housing having a light output port for receipt of light focused thereon by the lens mechanically attached through means of the second connector to the input end of the fiber optic cable;

means mounted within the output port housing for defining a fixed aperture intermediate the lens and the light output port at a substantial and fixed distance from the output port; and

means for mounting said light output port to said protective lens housing for substantial movement relative to said lens to change the distance between the input end of the fiber optic cable connected thereto and the lens without movement of the lens relative to the physically unconnected remote target to proportionately change the distance between the input end and the physically unconnected, remote target upon which the lens is focused.

4,919,506
SINGLE MODE OPTICAL FIBER COUPLER

Robert L. Covey, Hightstown, N.J., assignor to General Electric Company, Schenectady, N.Y.

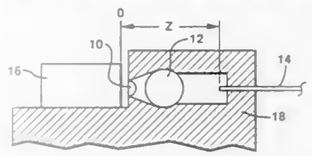
Filed Feb. 24, 1989, Ser. No. 314,854
Int. Cl.[5] G02B *6/32*
U.S. Cl. 350—96.18 **14 Claims**

1. An optical coupling device for coupling a substantially point source of light to a single mode light conducting fiber having a first optical axis, said device comprising:

a hemispherical lens having a planar surface and a spherical surface, said lens having a second optical axis normal to said planar surface;

a spherical lens having a given optical axis; and

means adapted for positioning said planar surface facing said source of light and said spherical lens spaced between the spherical surface of said hemispherical lens and said fiber, said first, second and given axes being substantially aligned with said point source, said lenses being so dimen-

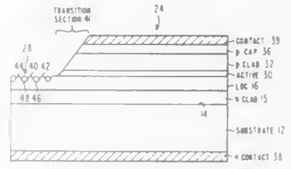


sioned and spaced relative to said source and fiber so as to focus light from said source for reception by said fiber, said hemispherical lens being so dimensioned and so positioned relative to said source of light such that the angle of incidence of light onto said hemispherical lens and the angle of the light refracted from the hemispherical lens are substantially the same.

4,919,507
SEMICONDUCTOR RADIATION COUPLING SYSTEM

Gary A. Evans, West Windsor Township, Mercer County, and Jay B. Kirk, Hamilton, both of N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed May 10, 1989, Ser. No. 349,607
Int. Cl.[5] G02B *6/34*
U.S. Cl. 350—96.19 **26 Claims**



26. An optical grating comprising:

a planar substrate; and

a grid of spaced nodular optical elements on the substrate adapted to receive semiconductor laser emitted radiation in a direction parallel to the plane of the substrate and adapted to deflect the received radiation to a direction different than the received direction.

4,919,508
FIBEROPTIC COUPLER

Kenneth P. Grace, Woodland Park, and Facundo Aparicio, Colorado Springs, both of Colo., assignors to The Spectranetics Corporation, Colorado Springs, Colo.

Filed Aug. 4, 1988, Ser. No. 228,278
Int. Cl.[5] G02B *6/42*
U.S. Cl. 350—96.20 **11 Claims**

11. A fiberoptic coupler for connecting a fiber optic catheter to a laser light source comprising:

a male plug portion, the male plug having an enlarged handle region for supporting an end of an optical fiber catheter, the handle region having a plurality of relief openings located at selected ones of a plurality of positions within said handle region, said openings being indicative of the diameter of the optical fiber being coupled to the laser light source;

a female receptacle portion removably connected to said male plug portion; and

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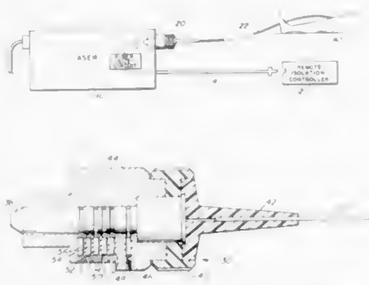
sensing means, disposed in said female receptacle portion, for sensing the location of said openings in the male plug handle region, said sensing means including microswitches located at predetermined positions in said recep-



tacle portion, said receptacle portion positions corresponding to said plurality of positions within said handle region, said microswitches sensing which of said position in said handle region openings, are provided.

4,919,509

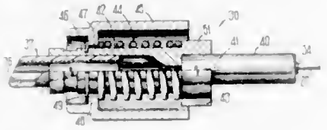
MECHANICAL CONNECTION FOR POLARIZATION-MAINTAINING OPTICAL FIBER AND METHODS OF MAKING

Calvin M. Miller, Duluth; David N. Ridgway, Conyers, and Frederick M. Sears, Norcross, all of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 3, 1989, Ser. No. 306,414

Int. Cl.[5] G02B *6/38*

U.S. Cl. 350—96.21 **23 Claims**



1. A connection between polarization-maintaining fibers, said connection including:

first and second ferrules each having an associated passageway extending therethrough and opening to an end face of a ferrule, each said passageway having a cross section transverse to a longitudinal axis of the associated ferrule which is defined by at least one substantially straight side;

two polarization-maintaining optical fibers each having an end portion disposed in the passageway of one of said ferrules, each said optical fiber having an outer cladding layer which in a cross section transverse to the longitudinal axis is defined by at least one substantially straight side that is substantially parallel to said substantially straight side of said passageway of the ferrule in which the end portion is disposed and to one of orthogonal polarization axes of said each optical fiber;

marking means being associated with each said ferrule and being disposed in a predetermined orientation with respect to said substantially straight side of said outer cladding layer of said fiber end portion disposed in the passageway of said each ferrule; and

supporting means for holding said first and second ferrules to cause said marking means of said ferrules to be aligned longitudinally and hence to cause the polarization axes of one fiber end portion to be aligned with the polarization axes of the other fiber end portion.

4,919,510

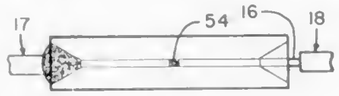
OPTICAL FIBER CONNECTOR AND METHOD

Duane E. Hoke, Corning; Ronald L. Kimball, and David E. Quinn, both of Painted Post, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed May 4, 1989, Ser. No. 344,611

Int. Cl.[5] G02B *6/38*

U.S. Cl. 350—96.21 **58 Claims**



36. An optical fiber splice comprising

a tube having first and second opposite ends and a bore which extends longitudinally therethrough, at least a portion of said tube being sufficiently transparent to permit the viewing of said bore therethrough, mean at both ends of said bore for facilitating the insertion of optical fibers into said bore, and liquid residue venting means associated with said bore,

first and second optical fibers disposed substantially coaxially within said tube with their endfaces adjacent one another, and

index matching substance disposed between said optical fibers and in said venting means, said index matching substance containing a visibility enhancing agent.

4,919,511

FIBRE-TYPE LIGHT CONVERSION DEVICE

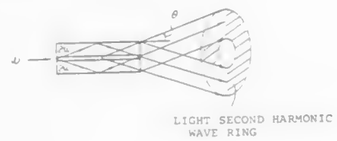
Seiichi Ohsawa, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

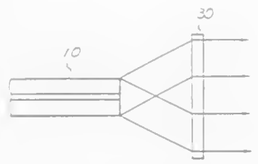
Filed Aug. 24, 1989, Ser. No. 397,912

Claims priority, application Japan, Feb. 3, 1989, 1-26477; Feb. 13, 1989, 1-34643

Int. Cl.[5] G02F *1/37*

U.S. Cl. 350—96.29 **8 Claims**





1. A fibre-type light conversion device comprising a fibre-type light conversion element for converting the wavelength of an incident light beam, and a converting means for converting said incident light into a parallel light, said incident light having been converted in frequency by said fibre-type light conversion element, wherein a holographic element having a complex transparency varying periodically with respect to the distance from its optical axis, is used as said converting means.

4,919,512

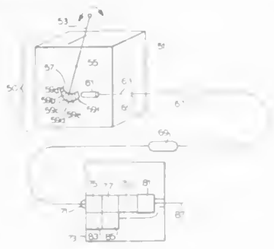
WAVELENGTH SHIFT SWITCH AND SENSING SYSTEM

Bruce W. Flaherty, Hemlt, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Oct. 17, 1988, Ser. No. 258,557

Int. Cl.[5] G02B *6/02*

U.S. Cl. 350—96.29 **30 Claims**



1. A wavelength shift switch and sensing system comprising:

a optic fiber having a first end and a second end;

a fluorescent surface optically aligned and controllably and relatively movable with respect to said first end of said optic fiber;

an optical transmitter connected to, and in optical alignment with said second end of said optical fiber; and,

an optical sensor connected to, and in optical alignment with said second end of said optical fiber.

4,919,513

PLASTIC OPTICAL FIBER

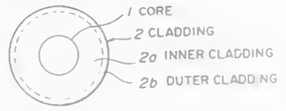
Noboru Nakakuki; Kazuhide Oda; Masatoshi Tagami; Kouichi Okino; Tomiya Abe, and Takanobu Ishibashi, all of Ibaraki, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Filed Nov. 3, 1988, Ser. No. 266,707

Claims priority, application Japan, Mar. 9, 1988, 63-55605

Int. Cl.[5] G02B *6/22*

U.S. Cl. 350—96.33 **5 Claims**



2. A plastic optical fiber, comprising:

a transparent core of a thermosetting resin having a first refractive index;

a transparent inner cladding layer of a first thermoplastic resin formed on the outer periphery of said core and having a second refractive index which is lower than said first refractive index;

a non-transparent outer cladding layer of a second thermoplastic resin including a coloring and opaque material, formed on the outer periphery of said inner cladding layer and having a third refractive index which is lower than said first refractive index, said inner and outer cladding layers being formed by simultaneous extrusion of said first and second thermoplastic resins to provide a composite cladding tube having a firmly unified interface between said inner and outer cladding layers with said core being formed by pressure-charging of said thermosetting resin in liquidized form into said composite cladding tube and polymerization thereafter of said thermosetting resin in the same composite cladding tube.

4,919,514

OPTICAL FIBRES BASED ON POLYCARBONATE FIBRES, AND A PROCESS FOR THE PRODUCTION THEREOF

Wolfgang Ebert, Krefeld; Wilfried Haese, Monchen-Gladbach; Roland Vogelsgesang, Leverkusen, and Rolf Dhein, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 5, 1989, Ser. No. 294,079

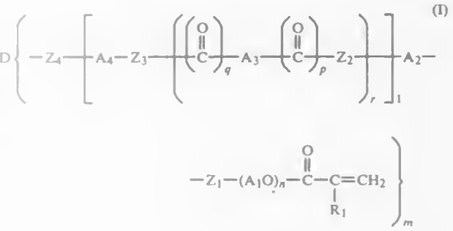
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1988, 3801576

Int. Cl.[5] G02B *1/04*

U.S. Cl. 350—96.34 **10 Claims**

6. An optical fibre based on an aromatic polycarbonate comprising a polycarbonate fibre coated by an irradiation polymerized mixture of

(A) 25 to 75% by weight, based on the total weight of the polymerisable compounds, of a polyfunctional (meth)acrylic acid derivative of the formula



(I)

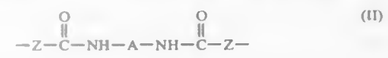
in which

m is 2, 3 or 4,

D is the m-valent radical of an aliphatic or aromatic hydrocarbon,

R_1 is hydrogen or methyl,

Z_1, Z_2 and Z_3, independently of one another, are oxygen, sulphur, the —N(R)— group (in which R is hydrogen, alkyl, substituted alkyl, aralkyl, substituted aralkyl, aryl or substituted aryl or a divalent radical of the formula



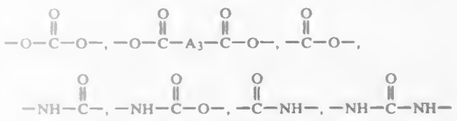
(II)

in which

Z is oxygen, sulphur or the —N(R)— group, and

A is a divalent radical of an aliphatic, cycloaliphatic, araliphatic or aromatic hydrocarbon or a substituted divalent radical of an aliphatic, cycloaliphatic, araliphatic or aromatic hydrocarbon,

Z_4 is oxygen, the divalent radical of the formula (II) or one of the following divalent radicals



A_1, A_2, A_3 and A_4, independently of one another, are a divalent radical of an aliphatic, cycloaliphatic, araliphatic or aromatic hydrocarbon or a substituted divalent radical of an aliphatic, cycloaliphatic, araliphatic or aromatic hydrocarbon,

n is zero or an integer from 1 to 20,

p, q and r, independently of one another, may adopt the value zero or 1, and

l has a numerical value such that the molecular weight of the

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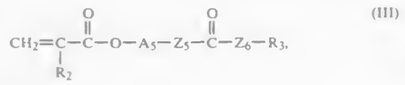
polyfunctional (meth)acrylic acid derivative of the formula (I) is 450 to 5000,

(B) 75 to 25% by weight, based on the total weight of the polymerisable compounds, of a monofunctional (meth)acrylate of the formula



(III)

in which

R_2 is hydrogen or methyl,

A_5 is a divalent radical or a substituted divalent radical of an aliphatic or cycloaliphatic hydrocarbon,

Z_5 and Z_6, independently of one another, are oxygen, sulphur or the —N(R')—group in which R' is H or alkyl, substituted alkyl, aralkyl, substituted aralkyl, aryl or substituted aryl, and

R_3 is alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, aralkyl or substituted aralkyl, and

(C) 0.1 to 10% by weight, based on the total weight of the polymerisable compounds, of a photoinitiator.

4,919,515

SCREEN FOR A REAR PROJECTION TYPE TELEVISION SET

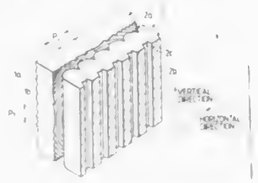
Shinichi Hasegawa, and Masaaki Hanyu, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,948

Claims priority, application Japan, Feb. 19, 1988, 63-35364

Int. Cl.[5] G03B *21/60*

U.S. Cl. 350—128 **12 Claims**



1. A screen for a rear projection type television set, comprising:

a Fresnel sheet for receiving a projection image from a projector, said Fresnel sheet including a plurality of first lenticular lenses, spherical or aspherical in profile, formed on an incident surface of said Fresnel sheet and arranged in a first direction, and a Fresnel lens formed on an emergent surface of said Fresnel sheet;

a lenticular sheet, disposed adjacent to said Fresnel sheet, including a plurality of second lenticular lenses formed on an incident surface of said lenticular sheet and arranged in a second direction perpendicular to said first direction, and a plurality of black stripes arranged on an emergent surface of said lenticular sheet and having the same pitch and being arranged in the same direction as said second lenticular lenses; and

said first lenticular lenses meeting the following conditions:

$$0.10 \leqq Z/H \leqq 0.37$$

where Z/H is a ratio of a half period (H) of said first lenticular lenses to a lenticular depth (Z) of said first lenticular lenses.

4,919,516

OPTICAL TANDEM SCANNING SYSTEM USING A KOESTERS REFLECTING PRISM FOR LIGHT SPLITTING

Mojmir Petrán, and Milan Hadravsk , both of Plzen, Czechoslovakia, assignors to Jednotne Zemedelske Druzstvo "Vitezny Unor" Se Sidlem V Komorne, Blovice, Czechoslovakia

Filed Jul. 18, 1988, Ser. No. 220,172

Claims priority, application Czechoslovakia, Jul. 24, 1987, 5595-87

Int. Cl.[5] G02B *23/04*

U.S. Cl. 350—171 **5 Claims**

1. In a device for optical tandem scanning of an object having an arrangement for illumination and scanning of an object by means of a rotating scanning disk having diametrically opposed, spirally arranged elementary openings and an axis of rotation, and a light splitting system, and wherein an illuminating light ray is passed through a first elementary opening in said rotating disk and passed into said light splitting system whereby a portion of said light ray is passed therethrough and through an objective to the object, and an image light ray is reflected from said object back through said objective to said light splitting system wherein said light splitting system will reflect a portion of said image light ray through a second elementary opening on said disk, and then passed to where an image of said object can be viewed;

the improvement comprising a light splitting system comprising a Koesters reflecting prism of the type having an interface between a first and second component part thereof, wherein each component part has a first surface perpendicular to said interface and a second surface at an acute angle to said interface, said prism having a semi-transparent mirror coating at said interface and oriented such that said interface is parallel to said axis of rotation of said disk, and said illuminating light rays enter said first component part of said prism through said first surface thereof and parallel to said interface, and then reflected from said second surface and out of said prism and through said objective and to said object, and the image light rays are reflected from said object back through said objective and into said second component part of said prism through said second surface thereof and a portion thereof reflected from said interface back to said second surface of said second component part, and there reflected to pass parallel to said interface and emerge from said prism through said first surface of said second component part, and such that all light rays entering and emerging from said prism enter and emerge perpendicularly through said first and second surfaces.

4,919,517

IMAGE-REPRODUCING ARRANGEMENT FOR MOTOR VEHICLES INCLUDING LENS MEANS FORMING A REAL IMAGE ADJACENT AN UPPER EDGE OF A WINDSHIELD TO WHICH AN INSTRUMENT PANEL MIRROR REFLECTS TO FORM A VIRTUAL IMAGE

Michael Jost, Unterschleissheim, and Walter Weishaupt, Munich, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 17, 1988, Ser. No. 258,852

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1987, 3735124

Int. Cl.[5] G02B *27/10, 17/08*

U.S. Cl. 350—174 **19 Claims**

1. An image-reproducing arrangement for motor vehicles with a windshield and an instrument panel, in which a real image is represented as a virtual image in the field of vision of a vehicle user, comprised of lens means forming said real image, the real image and the lens being located adjacent the upper edge of the windshield, and mirror means for reflecting the real image to the windshield to provide said virtual image, said mirror means being arranged within an area of a surface of the vehicle's instrument panel between the lens means and the windshield.

4,919,518

MULTI-SCREEN PROJECTOR

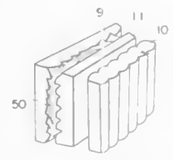
Masanori Ogino, Yokohama; Hiroshi Kaiwa, Tokyo; Yoshiaki Iwahara, Yokosuka; Yuzo Tamura, and Akio Yamamoto, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 14, 1989, Ser. No. 338,208

Claims priority, application Japan, Apr. 15, 1988, 63-91369

Int. Cl.[5] G03B *21/60*

U.S. Cl. 350—128 **45 Claims**



1. A multi-screen projector comprising

a plurality of unit module projectors piled up one upon another at least in the vertical direction, each of said unit module projector comprising:

light projection means for projecting a light;

a screen including Fresnel lens means and lenticular means, said light projected from said light projection means being incident to said Fresnel lens means and outputted from said lenticular means; and

control means for controlling the vertical directivity range of said light to be outputted from said screen so as to match a view point of an audience viewing said screen at the position remote from said screen by a predetermined distance,

wherein said control means includes prism means having a predefined prism angle, said prism means being mounted between said Fresnel lens means and lenticular means, and said prism angle being set larger for said screen which is required to be viewed from said view point at a larger angle of elevation or depression than that for said screen which is required to be viewed at a smaller angle of elevation or depression.

4,919,519

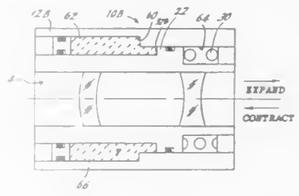
FLUID THERMAL COMPENSATION SYSTEM

Louis R. Fantozzi, Pelham, and James P. Hopkins, Nashua, both of N.H., assignors to Diversified Optical Corp., Farmingdale, N.Y.

Filed Sep. 29, 1988, Ser. No. 250,865

Int. Cl.[5] G02B *7/02*

U.S. Cl. 350—253 **11 Claims**



8. A system for adjustably locating a lens as a function of an ambient temperature of the lens, comprising:

a housing which defines a radial direction and an axial direction;

a lens mount which is movable in an aperture in said housing in said axial direction, said lens being mounted in said lens mount;

an axially extending chamber defined between a radial surface of a radially extending portion of said housing and a radial surface of a radially extending portion of said lens mount; and

a fluid accommodated in said chamber, said fluid having variable volume as a function of said temperature, such that the distance between said two radial surfaces, and thereby the location of said lens, is variable as a function of the temperature of said fluid.

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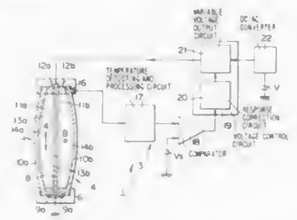
4,919,520

LIQUID CRYSTAL EYEGLASS

Takao Okada, Hachioji; Takeaki Nakamura, Hino; Kazuo Nakamura, Hachioji; Kimihiko Nishioka, Hachioji; Toshihito Kouchi, Tama; Hiroyuki Yamamoto, Hachioji, and Hideo Tomabechi, Higashiyamato, all of Japan, assignors to Olympus Optical Company, Japan

Continuation of Ser. No. 770,051, Aug. 27, 1985, Pat. No. 4,795,248. This application Nov. 18, 1988, Ser. No. 273,238
Claims priority, application Japan, Aug. 31, 1984, 59-183087; Aug. 31, 1984, 59-183088; Aug. 31, 1984, 59-183091; Aug. 27, 1985, 60-219839
The portion of the term of this patent subsequent to Jan. 3, 2006, has been disclaimed.
Int. Cl.[5] G02F *1/13*
U.S. Cl. 350—331 T 23 Claims



1. A liquid crystal eyeglass comprising:
an eyeglass frame having a frame portion for at least partially surrounding a lens;
at least one lens assembly supported within said frame portion having a predetermined effective aperture and including a liquid crystal having a refractive index which varies as a result of a change in the orientation of molecules of a liquid crystal responsive to the application of an external voltage;
means for detecting the temperature of the liquid crystal comprising a temperature sensor disposed upon the portion of the frame surrounding said lens assembly and outside of said predetermined effective aperture, said detecting means further including temperature detecting and processing means for generating a compensating signal;
comparison means for generating a differential signal representing a deviation of said compensating signal from a known signal value; and
voltage control means for controlling the voltage applied to the liquid crystal responsive to a control output from the comparison means, for controlling the orientation of the liquid crystal to compensate for a change in the refractive index of the liquid crystal due to a change in temperature.

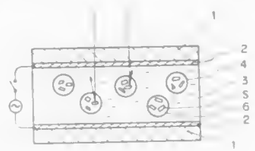
4,919,521

ELECTROMAGNETIC DEVICE

Hiroaki Tada, Nishinomiya; Harunobu Yoshida, Amagasaki; Hideo Kawahara, Mino, and Kunio Miyata, Nishinomiya, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Jun. 2, 1988, Ser. No. 203,797
Claims priority, application Japan, Jun. 3, 1987, 62-139450; Aug. 4, 1987, 62-195061; Aug. 28, 1987, 62-214643; Nov. 11, 1987, 62-284990
Int. Cl.[5] G02F *1/01*
U.S. Cl. 350—362 4 Claims

1. An electromagnetic device comprising:
(a) a solid matrix layer;
(b) micro-capsules containing a suspension of anisotropic particles being dispersed in the solid matrix layer;
(c) a means for applying an electric field or a magnetic field to the anisotropic particles, said means comprising a pair of electrodes, at least one of which is a transparent electrode; and
(d) the surface of the anisotropic particles being made of a



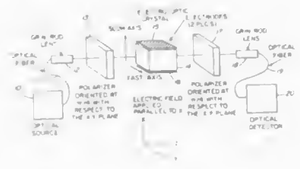
mixed valence complex represented by the general formula of $M_{1x}[M_2(CN)_6]_y$ wherein M_1 and M_2 are at least one transition metal, and x and y satisfy the relationship of $3 \leqq x \leqq 4$ and $2 \leqq y \leqq 3$ respectively.

4,919,522

OPTICAL SWITCH HAVING BIREFRINGENT ELEMENT

Bruce N. Nelson, South Boston, Mass., assignor to Geo-Centers, Inc., Newton Centre, Mass.

Filed Feb. 25, 1988, Ser. No. 160,126
Int. Cl.[5] G02F *1/03;* G02B *5/30*
U.S. Cl. 350—389 18 Claims



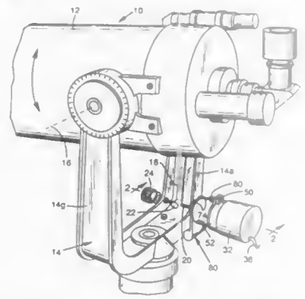
1. An electrically controlled optical switch comprising:
(i) an electro optical crystal of the kind exhibiting birefringence in each of two different light paths when disposed in angularly oriented electric fields and wherein each light path is sensitive to a different one of the two electric fields and has its own set of fast and slow axes,
(ii) means for separately establishing each of the angularly oriented electric fields with the crystal within the influence of the established electric field,
(iii) first and second polarizer means disposed at opposite ends of the crystal in alignment with one of the light paths in the crystal,
(iv) third and fourth polarizer means disposed at opposite ends of the crystal in alignment with the other light path in the crystal,
(v) a beam splitter disposed adjacent one end of the crystal in alignment with one of the light paths in the crystal, one of the polarizer means being disposed between the crystal's end and the beam splitter, and
(vi) an angular reflector disposed in alignment with the other light path in the crystal, the angular reflector being adjacent the beam splitter and at the same end of the crystal therewith, the angular reflector being disposed to reflect light into the beam splitter and the beam splitter being arranged to reflect light toward the angular reflector, and one of the polarizers in said other light path being disposed between the crystal's end and the angular reflector.

4,919,523

TELESCOPE MOTORIZED DRIVE ATTACHMENT

James D. Burr, 1960 Jefferson Co. Rd. 23, Evergreen, Colo. 80439

Filed Apr. 17, 1989, Ser. No. 339,083
Int. Cl.[5] G02B *23/16, 7/00;* H02R *5/02*
U.S. Cl. 350—567 5 Claims



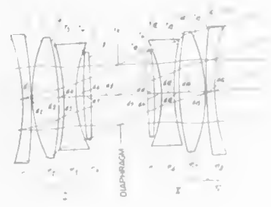
1. A motorized drive attachment for installation with the rotatable control shaft of a telescope, the shaft protruding from a frame portion of the telescope and the attachment comprising:
a motor and a motor housing enclosing the motor, the motor including a drive shaft projecting from the housing,
a bracket and means for securing the bracket to the frame portion of the telescope,
a pair of mounting elements with axially extending hollow centers, one being slidably and removably mounted on the other for relative movement in a path extending axially of the elements, one mounting element being secured to the motor housing with said drive shaft extending through its hollow center and the other mounting element being secured to said bracket with the control shaft extending through its hollow center, and
a coupler mountable on one of the shafts for engagement with the other of the shafts for rotatably coupling the two shafts.

4,919,524

VARIABLE FOCUS LENS FOR IMAGE REPRODUCTION

Hiroichi Shinohara, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 13, 1989, Ser. No. 337,555
Claims priority, application Japan, Apr. 13, 1988, 63-90894
Int. Cl.[5] G02B *9/00*
U.S. Cl. 350—450 1 Claim



1. A variable focus lens for use in image reproduction, comprising:
first, second, third, and fourth lens groups arranged successively from an object to an image; and
a diaphragm disposed between the second and third lens groups;
said first lens group comprising a concave meniscus lens with its concave surface facing the object;
said second lens group comprising a double convex lens with the larger absolute value of the radius of curvature of its surface facing the image, a double concave lens with the larger absolute value of the radius of curvature of its surface facing the object, and a double convex lens, said lenses of the second lens group being arranged successively in the order named from the object;
said third lens group being of the same construction as the second lens group except that the lenses of the third lens group are arranged and faced in the opposite direction to said second lens group, said second and third lens groups being positioned symmetrically with respect to said diaphragm;
said fourth lens group comprising an lens identical to the lens of said first lens group and faced in the opposite direction to said first lens group, said first and fourth lens groups being positioned symmetrically with respect to said diaphragm;
said first and fourth lens groups and the diaphragm being fixed, said second and third lens groups being movable, said first through fourth lens groups being positioned symmetrically with respect to said diaphragm at an equal-size magnification ratio;
said second and third lens groups being movable symmetrically or asymmetrically for varying the magnification ratio to move the lenses along an optical axis thereby to keep an object-to-image distance constant;
said variable focus lens meeting the following conditions:

$$0.56f < f_2 = f_3 < 0.91f \quad \text{(I)}$$

$$44.8 < \nu_1 = \nu_8 < 62.0 \quad \text{(II)}$$

$$0.28f < r_6 < 0.34f \quad \text{(III)}$$

$$0.0155f < d_6 < 0.0261f \quad \text{(IV)}$$

$$1.40 < b/a < -0.67 \quad \text{(V)}$$

where f represents the combined focal length of the variable focus lens, f_2, f_3 the focal lengths of the second and third lens groups, respectively, ν_j $(j=1\sim8)$ the Abbe number of the jth lens from the object, r_i $(i=1\sim17)$ the radius of curvature of the ith surface from the object (with the diaphragm surface counted), d_i $(i=1\sim16)$ the ith surface-to-surface distance from the object, and a, b the distances, respectively, that the second and third lens groups move from the equal-size magnification ratio position to the minimum magnification ratio position (the movement toward the image is positive and the movement toward the object is negative).

4,919,525

BREAK-AWAY MIRROR MECHANISM

Robert Gilbert, Lonsdale, Australia, assignor to Britax Rainsfords Pty. Ltd., Lonsdale, Australia

Filed May 5, 1989, Ser. No. 347,989
Claims priority, application Australia, May 5, 1988, PI8062
Int. Cl.[5] B60R *1/06*
U.S. Cl. 350—604 5 Claims

1. A rear vision mirror of a motor vehicle, comprising:
(a) a mounting bracket having:
(i) an outer face with a front edge and a rear edge with respect to said vehicle,
(ii) a pair of vertically spaced guide projections projecting from the outer face near said rear edge,
(iii) a hinge member which has a hinging axis near said front edge and spaced outwardly away from the outer face, and
(iv) a ramp surface adjacent the hinge member, and
(b) a mirror assembly including a mirror case having:

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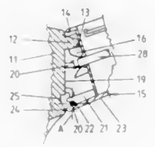
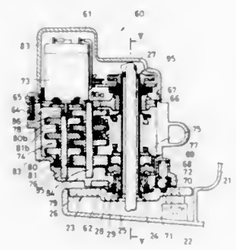
(i) a front wall with an inner surface and an outer surface, the front wall having a support projection which rides over the ramp surface upon forward break-away,
(ii) hinging means adjacent said front wall inner surface, said hinging means having notches defined by surfaces thereof which engage over the hinge member, and



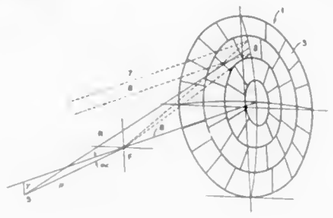
(iii) pivoting surfaces so located as to engage said guide projections upon rearward break-away of the mirror assembly from the mounting bracket,
wherein the mirror assembly breaks away from the mounting bracket upon impact, in a direction which is either forward or rearward with respect to the vehicle.

4,919,526
ELECTRICALLY SWINGABLE DOOR MIRROR
Akihiko Umekawa, Sagamihara, and Yoshihiko Ishiyama, Isehara, both of Japan, assignors to Ichikoh Industries Ltd., Tokyo, Japan
Filed Oct. 27, 1988, Ser. No. 263,313
Claims priority, application Japan, Oct. 27, 1987, 62-163208; Nov. 30, 1987, 62-181161; Nov. 30, 1987, 62-181162; Nov. 30, 1987, 62-181163; Nov. 30, 1987, 62-181164
Int. Cl.[5] G02B *5/08*
U.S. Cl. 350—604 **6 Claims**



1. A door mirror of the electrically swingable type comprising a base fixed to a door of a vehicle, a center shaft nonrotatably attached to the base, a mirror housing pivoted on and rotated round the center shaft, a mirror housed in the mirror housing in such a way that its angle can be adjusted in the mirror housing, a sun gear attached to the center shaft, and a driver system having a planet gear engaged with the sun gear to swing the mirror housing relative to the base through the sun gear;
wherein said mirror housing is supported at both ends of the center shaft by intermediate and bottom walls of a case in which the drive system in the mirror housing is housed;
wherein said case in which the driver system is housed has a cylindrical bearing section which is projected from the bottom of the case and rotatably fitted onto a cylindrical shaft section erected from the base, a ring-shaped groove is formed on the inner face of the cylindrical bearing section at the lower end thereof, an O-ring is fitted into the groove, closely contacting the outer circumference of the cylindrical shaft section, and a washer is then attached to the open side of the groove from below.

4,919,527
SOLAR RADIATION CONCENTRATOR
Nurmamed Saiylov, ulitsa Kotovskogo, 19, Korpus, 2, kv. 35, and Shaakhmed A. Nazarov, ulitsa 50 let TSSR, 23a, kv. 40, both of Ashkhabad, U.S.S.R.
PCT No. PCT/SU86/00029, § 371 Date Nov. 19, 1987, § 102(e) Date Nov. 19, 1987, PCT Pub. No. WO87/06012, PCT Pub. Date Oct. 8, 1987
PCT Filed Mar. 31, 1986, Ser. No. 163,976
Int. Cl.[5] G02B *5/08*
U.S. Cl. 350—613 **1 Claim**



1. A solar radiation concentrator comprising a supporting frame (1) and facets (2) having a toroidal reflecting surface and arranged in annular zones (3), the reflecting surfaces of the toroidal annular zones (3) being formed by turning arcs of a circle 4 about an optical axis (6) of the concentrator upon rotation of the arc of the circle (4) by an angle $0.5|\psi|$ in a meridian plane, the geometrical coordinates of the center of a curvature (5) of the said circle (4) arc being determined in space by the parameters α, ρ which are calculated by the formulae

$$\tan\alpha = \frac{(1 + 2\cos\Delta)\sin W_c - \sin 3W_c + 2|\psi|\cos 3W_c}{(1 + 2\cos\Delta)\cos W_c - \cos 3W_c - 2|\psi|\sin 3W_c}$$

$$\rho = M \cdot R$$

wherein:

$$M = \frac{\sqrt{\cos^2\Delta + (1 + 2\cos\Delta)(\sin^2 W_c - |\psi|2W_c}}{2\cos\Delta\cos\frac{\Delta}{2}}$$

and wherein the parameters of the toroidal annular zones 3 W_b, W_h, R, Δ are calculated by the formulae

$$W_b = \frac{Um + |\psi|}{2}$$

$$W_H = W_b - \left(K + \frac{1 + T^2}{4T} + \frac{15 - 7T^2 + 3T^4}{96T^2} \cdot K^3 + \frac{(1 + T^2)(12 - 17T^2)}{96T^3} \cdot K^4 \right)$$

wherein:

$$T = \tan(W_b - |\psi|);\ K^2 = \frac{8|\psi|}{3T}$$

-continued

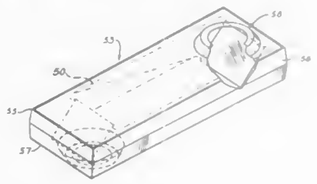
$$\Delta = W_b - W_H;\ R = \frac{rb}{\sin W_b - M\sin\alpha};\ rb = \frac{D_k}{2}$$

ensure the focusing of two beams (7, 8) from the center of the solar disk to the projected focus F and the rest of beams—below and above the projected focus F—within the limits of allowance $|\psi|$,
wherein, the parameters ρ, α, R, Y, W_h, W_b, K, T. $r_b\Delta$, and M stand for:
ρ is the distance from the focus F of the concentrator to the center of curvature 5 of the circle 4 arc;
R is the radius of curvature of the facet in the meridian plane;
M is the value of ρ/R;
Y is the distance from the optical axis 6 to the center of curvature 5 of the circle 4 arc;
α is the angle between the optical axis of the concentrator and ρ;
W_b, W_b are respectively the lower and upper boundaries of the annular zones 3;
K is a coefficient

$$\frac{8|\psi|}{3T};$$

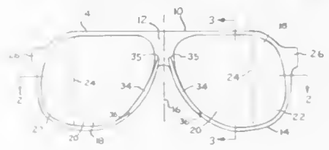
T is the parameter $T=\tan(W_b - |\psi|)$;
Δ is the difference of W_b and W_h;
D_k is diameter of concentrator,
whereby a maximum concentration in the focus of the concentrator is obtained with the maximum width of the annular zones (3).

4,919,528
BORESIGHT ALIGNMENT VERIFICATION DEVICE
Stephen K. Pitalo, Huntsville; Donnie T. Walden, Cullman, and Henry P. Lay, Huntsville, all of Ala., assignors to The Boeing Company, Seattle, Wash.
Division of Ser. No. 97,331, Sep. 11, 1987, Pat. No. 4,762,411. This application Jul. 29, 1988, Ser. No. 225,939
Int. Cl.[5] G02B *5/10, 23/08*
U.S. Cl. 350—620 **8 Claims**



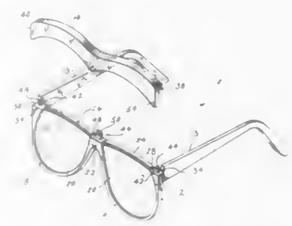
1. A reflective periscope for two-way light transmission comprising:
a one-piece reflector set including an elongated base having opposed ends, a flange extending from each side end generally perpendicular to said base, each said flange including a reflective surface in opposed, substantially parallel relation to the reflective surface of the other flange and defining an optical path for translating light between substantially parallel paths proximate respective ends of said base, said base having an opening proximate one end for passage of one of said parallel paths of light; and
a cover enclosing said reflector set, said cover including opposed generally planar plates disposed in generally parallel relation on opposite sides of said reflector set and a side wall extending around the periphery of said reflector set and joining said plates, each said plate having an opening for passage of a respective one of said parallel paths of light.

4,919,529
REAR VIEW MIRROR SUNGLASSES
Kwang H. Hyun, 914 S. Ardmore Ave., Los Angeles, Calif. 90006
Filed Feb. 24, 1989, Ser. No. 314,774
Int. Cl.[5] G02C *7/14*
U.S. Cl. 351—50 **10 Claims**



1 A pair of eyeglasses comprising:
an eyeglass frame having a central bridge section, and two lens-support sections extending in opposite directions from said bridge section;
a lens supported on each support section, each lens having a transparent forward-viewing section in near proximity to the central bridge section, and a rearward-viewing mirror section located outboard from the associate forward-viewing section;
said frame having two forwardly-extending walls located at the inboard edges of the two lenses:
whereby when the person wearing the glasses is viewing one of the mirror sections the other forwardly-extending wall blocks the person's view through the other forward-viewing.

4,919,530
EYEGLASS ASSEMBLY
Roger L. Hyman, 5249 N. 35th St., Milwaukee, Wis. 53209
Filed Jan. 25, 1989, Ser. No. 301,820
Int. Cl.[5] G02C *1/00, 5/02*
U.S. Cl. 351—85 **3 Claims**



1. An eyeglass assembly comprising:
a lower lens holding frame member having a pair of lens receiving members connected at and disposed on each side of a centrally located nose piece, said lens receiving members defining an upwardly extending opening through which the lens may be inserted into said frame
a pair of bridge pieces spanning each of said openings and connecting said nose piece to an outer portion of said lens receiving member
an upper brow member provided with a groove for receiving said bridge pieces
connector means for releasably connecting said brow member to said lower lens holding frame, said connector means

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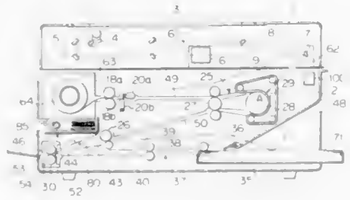
comprising a plurality of pin receiving holes in one of said upper brow member or said lower frame member and a plurality of pins extending from the other of said members
a right temple piece extending rearwardly from the right edge portion of one of said upper brow member or lower frame member and
a left temple piece extending rearwardly from the left edge portion of one of said upper brow member or lower frame member.

4,919,531
IMAGE REPRODUCING DEVICE

Harumitsu Mashiko, Tokyo; Takashi Seto, Ayase, and Shigeru Suzuki, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 277,948
Claims priority, application Japan, Dec. 1, 1987, 62-301603
Int. Cl.[5] G03B *27/32*
U.S. Cl. 355—27 **25 Claims**



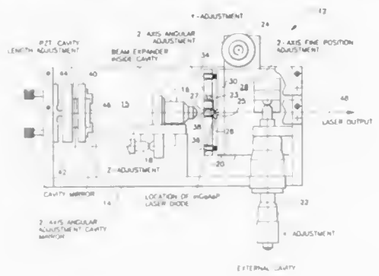
1 A control device for an image reproducing device wherein said reproducing device includes a photosensitive film cartridge, a transfer sheet cassette and a developer pod receptacle, each mounted separately, and where a peel-apart type film is used, said control device comprising:
a first sensor for sensing a first code indicative of the type of the photosensitive film and applied to the photosensitive film or the photosensitive film cartridge;
a second sensor for sensing a second code indicative of the kind of the transfer sheet and applied to the transfer sheet or the transfer sheet cassette;
a third sensor for sensing a third code indicative of the kind of the pod and applied to the pod or the pod receptable; and
means for inhibiting the operation of the device when at least two of the sensed first, second and third codes do not agree with each other.

4,919,532
HIGH ACCURACY SEMICONDUCTOR LASER DOPPLER VELOCIMETER

Hans W. Mocker, 2215 Newton Ave. S., Minneapolis, Minn. 55405, and Paul E. Bjork, 358 Flowerfield Rd., Circle Pines, Minn. 55014

Filed Aug. 15, 1988, Ser. No. 232,406
Int. Cl.[5] G01P *3/36*; H01S *3/082*
U.S. Cl. 356—28.5 **12 Claims**

1. A high accuracy semiconductor laser Doppler velocimeter comprising:
an external cavity semiconductor laser for generating a first light beam, wherein said external cavity semiconductor laser comprises:
an active internal cavity having first partially reflecting mirror means at a first end of said internal cavity, having second partially reflecting mirror means at a second end of said internal cavity, and having said first and second partially reflecting mirror means parallel to each other; and
a passive external cavity having said active internal cavity at a first end and having a fully reflecting mirror at a second end of said external cavity, wherein said active internal cavity and the fully reflecting mirror are positionally alignable for generating the first light beam having a narrow linewidth;
a polarized beam splitter for passing said first light beam;
a dual-functional fractional wavelength plate for receiving said first light beam, reflecting a second light beam, transmitting a third light beam to a target, receiving said third light beam from the target and transmitting a fourth light beam;

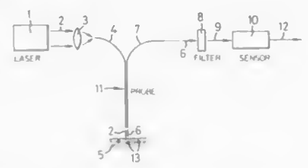


said polarized beam splitter for receiving and reflecting said second and fourth light beams; and
a detector for receiving said second and fourth light beams, comparing said fourth light beam with said second light beam, and determining a velocity of the target.

4,919,533
METHOD FOR DETECTING DIAMONDS IN REMOTE LOCATIONS

Heather J. Bowley, Middlesex; Donald L. Gerrard, Surrey, and John E. Preedy, Kent, all of England, assignors to The British Petroleum Company plc, London, England

PCT No. PCT/GB88/00187, § 371 Date Nov. 15, 1988, § 102(e) Date Nov. 15, 1988, PCT Pub. No. WO88/07213, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 10, 1988, Ser. No. 275,146
Claims priority, application United Kingdom, Mar. 18, 1987, 8706421
Int. Cl.[5] G01V *9/04*; G01N *21/65*
U.S. Cl. 356—30 **15 Claims**

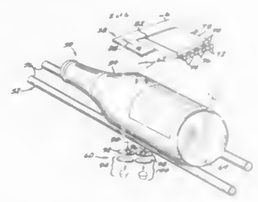


1. A method for detecting diamonds in locations which are not easily accessible, the method comprising (a) irradiating material suspected of containing diamonds in a location which is not easily accessible, with laser radiation at a pre-determined wavelength, the laser radiation being provided by irradiating means which is adapted for access to the location and the laser radiation being capable of causing Raman radiation to be scattered from diamonds in the material, (b) collecting the scattered Raman radiation by a collecting means adapted for access to the location, (c) passing the collected Raman radiation through a filtering means adapted to pass only Raman radiation characteristic of diamonds, and (d) sensing the filtered Raman radiation by a sensing means adapted to produce a signal whenever radiation characteristic of diamonds is sensed, whereby the absence or the presence of diamonds in the location is indicated.

4,919,534
SENSING OF MATERIAL OF CONSTRUCTION AND COLOR OF CONTAINERS

Michael A. Reed, Greenland, N.H., assignor to Environmental Products Corp., Del.

Filed Sep. 30, 1988, Ser. No. 251,559
Int. Cl.[5] G01J *3/50*; G01N *21/21, 21/27*
U.S. Cl. 356—73 **17 Claims**

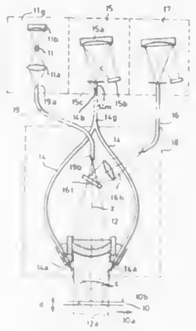


1. Apparatus for analyzing the character of a light transmitting container, comprising:
a container support adapted for supporting a container;
a first source of beam of polarized light of a first wavelength disposed to direct the beam of polarized light through the container supported in the container support;
a second source of a beam of polarized light of a second wavelength disposed to direct the beam of polarized light through the container supported in the container support;
a first light analyzer having
a parallel polarizer relative to the polarization of the light from the first source, the parallel polarizer being disposed to intercept a first portion of the beam from the first source of polarized light after the beam has passed through the container,
a cross polarizer relative to the polarization of the light from the first source, the cross polarizer being disposed to intercept a second portion of the beam from the first source of polarized light after the beam has passed through the container,
a first detector that measures the intensity of a light beam, the first detector being disposed to detect the first portion of the beam from the first source, after the beam has passed through the parallel polarizer, and
a second detector that measures the intensity of a light beam, the second detector being disposed to detect the second portion of the beam from the first source, after the beam has passed through the cross polarizer;
a second light analyzer having
a parallel polarizer relative to the polarization of the light from the second source, the parallel polarizer being disposed to intercept a first portion of the beam from the second source of polarized light after the beam has passed through the container,
a cross polarizer relative to the polarization of the light from the second source, the cross polarizer being disposed to intercept a second portion of the beam from the second source of polarized light after the beam has passed through the container,
a first detector that measures the intensity of a light beam, the first detector being disposed to detect the first portion of the beam from the second source, after the beam has passed through the parallel polarizer, and
a second detector that measures the intensity of a light beam, the second detector being disposed to detect the second portion of the beam from the second source, after the beam has passed through the cross polarizer;
means for analyzing the character of the container using the intensities measured by the first light analyzer and the second light analyzer.

4,919,535
REFLECTANCE MEASURING APPARATUS FOR MAKING CONTACTLESS MEASUREMENTS

Gerhard Hohberg, Aalen-Dewangen, and Hermann Gerlinger, Aalen-Ebnat, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Jan. 22, 1988, Ser. No. 147,226
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1987, 3701721
Int. Cl.[5] G01N *21/86, 21/47*
U.S. Cl. 356—429 **27 Claims**



1. A reflectance measuring apparatus for making contactless measurements on a surface of a structured sample moving in a given direction past the apparatus and disposed at a spacing from the apparatus, the level of the surface of the sample fluttering within a predetermined distance range (d) by which said spacing is increased or decreased, the apparatus comprising:
an illuminating device disposed at an optically unobstructed spacing from the sample for illuminating an irradiated area on said surface of the sample;
a measuring device for detecting radiation reflected from said surface;
said illuminating device and said measuring device cooperatively defining a common central axis transverse to said surface;
said measuring device including at least three radiation receivers having respective optical axes and mounted to cause said optical axes to lie on at least one conical surface concentric with said central axis with each two mutually adjacent ones of said receivers being spaced from each other by a predetermined azimuth angle whereby the contactless measurement is independent of the orientation of the structured sample with respect to said measuring apparatus;
said illuminating device including parallel beam means for producing and directing a bundle of parallel illuminating rays onto said surface so as to define an optically unobstructedly illuminated core area (k) wherein the intensity of illumination is independent of the spacing of said surface from said illumination device within said distance range (d); and,
said radiation receivers including aperture means for limiting the bundle of said rays detected by said receivers to those rays which are received in a spatial angle defining a detected region (m) on said surface smaller than said core

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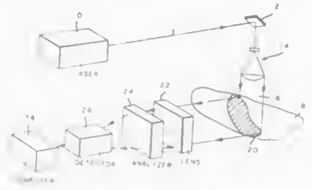
area (k) for movements of said sample within said predetermined distance range (d), said spatial angle being constant thereby causing the received radiation to be independent of said spacing so long as the movement of said sample remains within said distance range (d).

4,919,536

SYSTEM FOR MEASURING VELOCITY FIELD OF FLUID FLOW UTILIZING A LASER-DOPPLER SPECTRAL IMAGE CONVERTER

Hiroshi Komine, Torrance, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Jun. 6, 1988, Ser. No. 203,360
Int. Cl.[5] G01P *3/36;* **G01N** *21/00*
U.S. Cl. 356—28.5 **32 Claims**



1. A system for measuring the velocity of a fluid flow field comprising:
- laser means for generating a monochromatic laser beam;
- a member for supporting said fluid flow field;
- a plurality of particles seeded into the fluid flow field and having the property that they flow along therewith;
- means for directing said laser beam to said fluid flow field in a manner such that a plane of said fluid flow field is illuminated by a light beam of a predetermined thickness and width, the illuminated plane yielding scattering due to those of said particles in the illuminated plane, said scattered light yielding a frequency shift relative to the frequency of said laser beam due to the Doppler effect;
- optical means positioned outside of the region of said fluid flow field for collecting scattered light therefrom and for producing an image whose frequency spectrum contains two-dimensional velocity field information;
- detector means responsive to said image for providing a radiation intensity output which corresponds to said image; and
- an analyzer disposed between the optical means and the detector means and including a frequency-to-intensity converter for converting Doppler frequency shifted frequencies received from the moving particles into intensity variations in said image said analyzer containing a medium including a uniformly dispersed atomic or molecular species the absorption of which varies significantly as a function of frequency over the range of frequency shifts which result from the Doppler effect caused by movement of said particles so that the image intensity in said image is caused to vary by said absorption as a unique function of the velocity of movement of said particles.

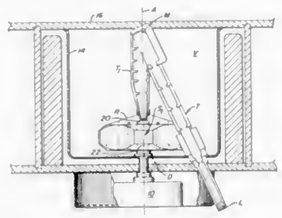
4,919,537

UV SCANNING SYSTEM FOR CENTRIFUGE

Robert Giebeler, Cupertino, Calif., assignor to Beckman Instruments Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 115,023, Oct. 29, 1987, Pat. No. 4,830,493. This application Feb. 10, 1989, Ser. No. 309,507
Int. Cl.[5] G01J *3/24, 3/42*
U.S. Cl. 356—328 **7 Claims**

1. A method for optically detecting stratification in a sample while said sample is being spun in a centrifuge, said method comprising the steps of:
- placing said sample in a chamber in a centrifuge rotor spun about an axis, said chamber in said rotor having at least two windows for permitting light to pass through the sample parallel to centrifuge produced stratification at a point of observation;
- providing a light source for observing said sample through said windows while said sample is being spun by said centrifuge rotor;
- providing a toroidal mirror having a first substantially cylindrical radius of curvature for collimating light from said light source parallel to the axis of said rotor only whereby the collimated light passes parallel to said strata and a second radius of curvature intersecting said first radius of curvature;



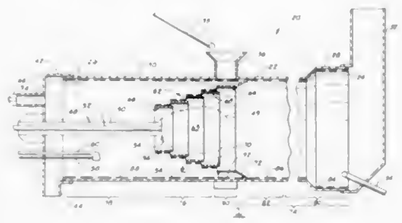
- ruling said toroidal mirror with respect to said second radius of curvature to chromatically classify light to differing frequencies at differing angularities from said mirror;
- rotating said mirror with respect to said first radius of curvature to maintain collimation and select color of light incident upon said sample;
- providing an optical head for receiving an image of said sample parallel to the axis of said rotor and normal to the radius of said rotor at said chamber;
- providing relay optics for relaying an image of said sample to the optical head;
- providing a slit parallel to the plane of said image;
- and detecting and receiving said light after passage through said chamber at said slit to determine location of stratification by optical absorption in said sample.

4,919,538

DRUM MIXER HAVING A COMBINED MIXING AND HEATING ZONE

George W. Swisher, Jr., 1500 Dorchester Dr., Oklahoma City, Okla. 73120

Filed Jul. 26, 1989, Ser. No. 385,556
Int. Cl.[5] B28C *5/46*
U.S. Cl. 366—4 **34 Claims**



21. In a method for continuously producingan asphaltic composition comprising the following steps:

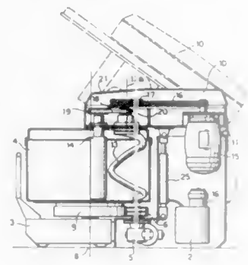
- creating a flame in a combustion chamber within an inclined rotating drum between a first end and a second end of the drum for generating a first stream of hot gases therein and for generating radiant heat within the combustion chamber;
- creating an annulus within the drum substantially overlying the combustion chamber such that a portion of the radiant heat generated within the combustion chamber enters the annulus;
- introducing a first volume of material into the first end of the drum, wherein the first volume of material flows through the annulus towards the second end of the drum;
- heating the first volume of material with the first stream of hot gases;
- introducing a second volume of material into the annulus;
- mixing the first and second volumes of material within the annulus; and
- discharging the mixture of the first and second volumes of material at the secondn end of the drum.

4,919,539

KNEADING MACHINE, PARTICULARLY FOR FOOD PRODUCTS

Amabile Drocco, Alba, Italy, assignor to Jacobacci-Casetta & Perani, Turin, Italy

Filed Jul. 5, 1989, Ser. No. 375,734
Claims priority, application Italy, Jul. 5, 1988, 53277/88[U]
Int. Cl.[5] B28C *1/16*
U.S. Cl. 366—94 **4 Claims**



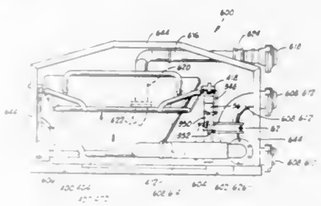
1. Kneading machine for food products, particularly flour mixtures, comprising:
- a kneading bowl (4) which is rotatable about a first substantially vertical axis (8),
- a kneading tool (13) which is rotatable within the kneading bowl (4) around a second substantially vertical axis (12a), spaced from the first axis (8),
- a counter-member (14) supported within the bowl (4) and separated therefrom, for creating a dough-free space in the center of the bowl (4) when the dough is rotated by the bowl (4), characterized by the combination of the following features:
  - the counter-member (14) has a body having a continuous peripheral wall and is rotatable around a third substantially vertical axis, said kneading machine further comprising means for rotating the counter-member (14) so that the peripheral velocity of the counter-member (14) is equal to the peripheral velocity of the bowl (4) in correspondence with the part of the counter-member (14) which is farthest from the axis of rotation (8) of the bowl (4),
  - the kneading machine comprises at least one further kneading tool (13) which is rotatable around a forth substantially vertical axis.

4,919,540

SELF-LEVELING MIXER APPARATUS

Calvin L. Stegemoeller, and Gail F. Davis, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed May 27, 1988, Ser. No. 199,983
Int. Cl.[5] B01F *15/02, 5/16;* **B28C** *7/04;* **G05D** *9/02*
U.S. Cl. 366—132 **13 Claims**



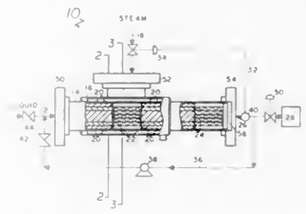
1 A self-leveling mixer apparatus, comprising:
- a base;
- a generally downwardly tapered, movable mixing tub supported from said base in a manner such that said tub is movable between first and second positions relative to said base, said generally downwardly tapered tub having a generally oval-shaped upper end and a generally circular-shaped lower end and said tub being tapered around at least most of a perimeter thereof along at least most of a vertical height thereof;
- leveling valve means for controlling a level of fluid in said movable mixing tub; and
- connector means, operably associated with said mixing tub and said leveling valve means, for adjusting said leveling valve means in response to movement of said mixing tub relative to said base.

4,919,541

GAS-LIQUID MASS TRANSFER APPARATUS AND METHOD

Fritz Groez-Roell, Zurich, Switzerland; Michael Mutsakis, Brooklyn, N.Y., and Robert G. Rader, Wichita, Kans., assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 7, 1986, Ser. No. 849,002
Int. Cl.[5] B01F *3/04, 5/06;* **G05D** *11/02*
U.S. Cl. 366—136 **24 Claims**



1. A direct contact gas-liquid mass transfer apparatus, which apparatus comprises:
- (a) a housing;
- (b) a conduit within said housing which conduit defines an axial flow path for a liquid stream, the conduit having an inlet, an outlet and a plurality of peripherally spaced openings positioned generally perpendicular to and along the length of the axial flow path;
- (c) motionless mixing means composed of one or more mixing elements in the said axial flow path;
- (d) means to introduce a liquid stream into the inlet;

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(e) means to introduce the gas stream through the plurality of openings and into and generally peripherally about the motionless mixing means and along substantially the length of the motionless mixing means and radially into the axial flow path containing the liquid stream for a rapid mixing of the gas and liquid streams to provide a mixed liquid product stream, the gas stream introduced at a gas-liquid volume ratio of about 2 to 1 or greater; and

(f) means to withdraw a mixed liquid product stream from the outlet.

10. A direct contact method for the rapid mixing of a liquid and gas stream in a conduit having a motionless mixer, which method comprises:

(a) flowing a liquid stream along a defined axial flow path in a conduit;

(b) introducing a gas stream into the liquid stream at a gas-liquid volume ratio of greater than 2 to 1 generally perpendicularly and peripherally about the axial flow path of the liquid and the motionless mixer in the conduit; and

(c) continuously subdividing the gas and liquid steam in the conduit and along the axial flow path by said motionless mixer to provide for the rapid mixing of said gas and liquid streams in the axial flow path; and

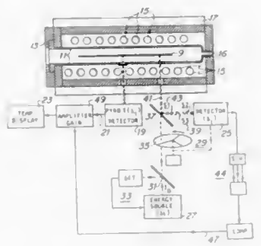
(d) withdrawing from the axial flow path a mixed product stream.

4,919,542

EMISSIVITY CORRECTION APPARATUS AND METHOD

Jaim Nulman, Palo Alto; Nick J. Bacile, San Jose, and Wendell T. Blonigan, Sunnyvale, all of Calif., assignors to AG Processing Technologies, Inc., Sunnyvale, Calif.

Filed Apr. 27, 1988, Ser. No. 186,558
Int. Cl.[5] G01J *5/10*; G01N *25/00*
U.S. Cl. 374—9 6 Claims



1. A method for measuring the emissivity of a remote object within a chamber including a boundary wall of quartz in the presence of ambient radiation supplied thereto through the quartz boundary wall, the method comprising the steps of:

detecting through the quartz boundary wall the radiation within a selected waveband from a selected location on the remote object that is heated to elevated temperature by the radiation supplied thereto through the quartz boundary wall;

supplying radiation within the selected waveband through the quartz boundary wall to the selected location on the object;

measuring the radiation reflected through the quartz boundary wall from the selected location on the object of the supplied radiation; and

logically combining indications of the detected radiation and the measured reflected radiation to provide an output indication of the emissivity of the remote object.

5. Apparatus for measuring the emissivity of a remote object that is within a chamber including a boundary wall of quartz and that is heated to elevated temperatures by radiation supplied thereto through the quartz boundary wall, the apparatus comprising:

first detection means disposed to detect through the quartz boundary wall the spectral radiation emanating from a selected location on the remote object at elevated temperature for generating output signals representative of the detected radiation within a selected waveband;

source means of radiation disposed to supply radiation of selected intensity within the selected waveband through the quartz boundary wall to the selected location on the object;

second detection means disposed for measuring the intensity of the radiation from the source means reflected from the selected location on the object; and

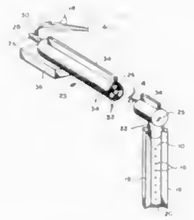
circuit means coupled to receive the output signals from said first and second detection means for producing therefrom an output that is representative of the emissivity at elevated temperature of the remote object.

4,919,543

MOLTEN METAL TEMPERATURE PROBE

Dennis W. Davis, Lawrence County, Tenn.; Ray D. Peterson, Florence, and Walter Posey, Jr., Lauderdale County, both of Ala., assignors to Reynolds Metals Company, Richmond, Va.

Filed Jun. 20, 1988, Ser. No. 208,612
Int. Cl.[5] G01K *13/00*
U.S. Cl. 374—139 10 Claims



1. A temperature probe for use in molten metal comprising a refractory body, said refractory body having a surface along its length, a plurality of thermocouple wire pairs cast in place within said refractory body as said refractory body is formed, said wire pairs having their first ends protruding from the surface of said refractory body and formed into thermocouple junctions at varying points along the length of said probe and outside of the surface of said probe, said junction being in direct contact with said molten metal during use to thereby provide a plurality of temperature measurement points along the length of said probe, said wire pairs having their other ends protruding from said refractory body thereby providing a plurality of temperature inputs to a temperature measuring means, and boom means for positioning said probe comprising a pipe embedded in said refractory body, a support pipe to which said pipe is connected and a positioning means.

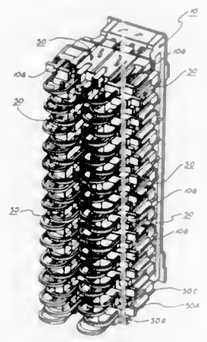
4,919,544

RETROFIT TELEPHONE NETWORK INTERFACE APPARATUS

Thomas G. Graham, Ocean, N.J., assignor to Keptel, Inc., Tinton Falls, N.J.

Filed Jan. 5, 1989, Ser. No. 293,948
Int. Cl.[5] H04M *1/00*
U.S. Cl. 379—399 13 Claims

1. Retrofit apparatus for being mounted on a telephone terminal block previously mounted at a subscriber's premises and for providing at least one demarcation point at said telephone terminal block between an incoming telephone line and a subscriber premises line previously interconnected through first terminal means provided on said telephone terminal block, said terminal block provided with a plurality of said first terminal means disposed in a row, comprising telephone jack means for being connected to said first terminal means; second terminal means for being connected to said subscriber premises line upon said subscriber premises line being disconnected from said incoming telephone line; telephone plug means connected to said second terminal means and for being plugged into said telephone jack means to interconnect said incoming telephone line and said subscriber premises line and for being unplugged from said telephone jack means to provide said demarcation point and permit the plug of an operating telephone to be plugged into said telephone jack means to facilitate determination of whether a fault exists on said incoming telephone line or said subscriber premises line; said telephone plug means having a predetermined width and said retrofit apparatus having a width substantially equal to said predetermined width of said telephone plug means, said telephone jack means having opposed open sides, said retrofit apparatus having predetermined portions whereby upon a plurality of said retrofit apparatus being mounted on said telephone terminal block in a row with adjacent ones thereof being displaced laterally with respect to each other, said predetermined portions of said retrofit apparatus close said opposed open sides of said jack means to protect telephone plug means plugged therein against disturbance.

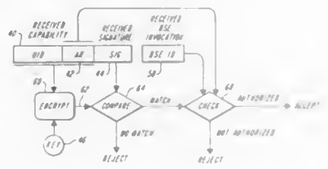


4,919,545

DISTRIBUTED SECURITY PROCEDURE FOR INTELLIGENT NETWORKS

Che-Fn Yu, Chelmsford, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 22, 1988, Ser. No. 288,779
Int. Cl.[5] H04K *1/00*; G07D *7/00*
U.S. Cl. 380—25 7 Claims



5. In an intelligent network having at least two nodes, a method for maintaining security when a process in a first node requests access to an object located in a second node, comprising the steps of:

transmitting a request for access to the object from the first node to the second node with a capability and a signature, said capability including a unique identifier of the object and access rights to the object;

at the second node, encrypting the capability received from the first node with an encryption key associated with the first node to form a test signature; and

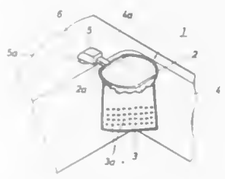
authorizing access to the object only when the test signature matches the signature received from the first node.

4,919,546

TRASH BAG WITH HOLDER AND DISPOSABLE REFILL TRASH BAG

Yukio Imazeki, Tokyo, and Hideo Yamaguchi, Chiba, both of Japan, assignors to D-Three Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1988, Ser. No. 227,669
Claims priority, application Japan, Aug. 4, 1987, 62-119553[U]; Sep. 4, 1987, 62-221447; Nov. 26, 1987, 62-298372
Int. Cl.[5] B65D *33/14*
U.S. Cl. 383—33 19 Claims



1. A trash bag and support in combination, comprising:

said support having an open fixed shape frame having a bag engaging periphery of a first perimeter from engaging an interior wall portion of the bag;

said bag having a non-elastic bag body having a first circumference greater than said first perimeter and an opening of a fixed second circumference less than said first circumference;

said frame including means for passing said frame through said opening into the bag interior, said means being portions of said frame oppositely disposed along said periphery having a fixed minimum dimension extending therebetween;

said perimeter of said bag engaging periphery being greater than said second circumference of said bag opening for supporting the bag adjacent said opening from the wall portion of the bag when said frame is disposed in the interior of the bag; and

said bag being a trash bag having a number of perforations formed therein, and said bag support frame having means for fixing said support frame to a sink.

4,919,547

DYNAMICALLY SELF-ADJUSTED FLUID BEARING

Everett H. Schwartzman, Plaza Del Amo, Unit #309, Torrance, Calif. 90503

Continuation-in-part of Ser. No. 301,459, Jan. 25, 1989, which is a division of Ser. No. 35,627, Apr. 3, 1987, abandoned. This application May 5, 1989, Ser. No. 347,996
Claims priority, application European Pat. Off., Mar. 31, 1988, 88302975.3; Japan, Apr. 4, 1988, 63-82826
Int. Cl.[5] F16L *32/06*
U.S. Cl. 384—110 12 Claims

1. A self-adjusting fluid operating bearing system for operation at relatively high rotational speeds, comprising:

housing means containing rotatingly driven shaft means,

at least first and second spaced bearing elements each having an outer conical surface thus forming an end having a major and a minor diameter and mounted for rotation with said driven shaft means,

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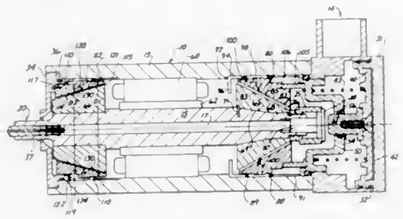
shell means cooperating with each of said first and second conical bearing elements and being mounted within said housing means and each including an outer surface, and an inner conical surface facing the outer conical surface of the associated bearing elements and forming a gap therebetween,

low friction seal means cooperating with said shell means for resiliently mounting said shell means with respect to said bousing means,

means to effect flow of fluid into said gap between each said bearing element and the associated shell means,

means biasing one of said shell means towards the major diameter of the associated bearing element,



the other shell means including at least a portion of the outer surface which has a differential diameter so as to provide an area on which fluid may act to create a force urging said other shell axially in said housing,

means to flow fluid into contact with said portion of the outer surface of said shell which has said differential diameter, and

said force operating on the said area of said other shell means being operative to urge the latter in an axial direction towards the major diameter of the cone associated with said associated shell means whereby the said gaps between said shell means and the associated bearings are automatically self-adjusting in gap dimension.

4,919,548

DRAWER GUIDE

Lautenschläger Horst, Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschläger GmbH & Co. KG, Reinheim, Fed. Rep. of Germany

PCT No. PCT/EP88/00077, § 371 Date Sep. 23, 1988, § 102(e) Date Sep. 23, 1988, PCT Pub. No. WO88/05639, PCT Pub. Date Aug. 11, 1988

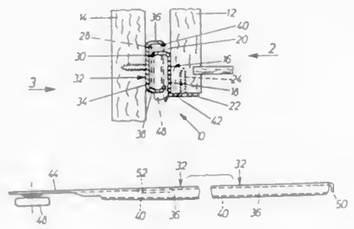
PCT Filed Feb. 3, 1988, Ser. No. 274,057

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1987, 3703051

Int. Cl.[5] A47B *88/14*

U.S. Cl. 384—19 7 Claims

1. A drawer guide for drawers and other such extendable furniture parts, having a guide rail adapted to be fastened to a wall of a cabinet carcase, and a runner rail adapted to be fastened to an extendable furniture part, said rails being displaceable lengthwise relative to one another on two wheels, one of said wheels being mounted on a front end of the guide rail and running on the runner rails the other wheel being mounted on a back end of the runner rail and running on the guide rail, the guide rail being in the form of a channel with a web affixed to a cabinet wall and having two flanges projecting away from the web beyond the wheel of the runner rail and curling slightly around the safe to form two edges, while a flange forming a track of the runner rail overreaches and slightly curls around the top of the wheel of the guide rail, the free width measure between the web and the edges curling around the runner rail wheel of at least one of the flanges the guide rail, gradually diminishing outwardly from the carcase interior toward the fully extended position of the drawer guide in an



area thereof traveled by the runner rail wheel as the same approaches the fully extended position.

4,919,549

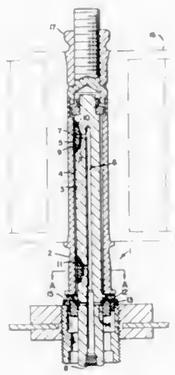
HYDROSTATIC SPINDLE

James L. Lawson, Simsbury, and Ronald A. Peterson, Norfolk, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Jan. 30, 1989, Ser. No. 303,371

Int. Cl.[5] F16C *32/06*

U.S. Cl. 384—113 10 Claims



1. A spindle comprising:

an outer sleeve;

a non-rotating shaft disposed within said outer sleeve;

swing-type bearing pads made of metal-elastomer laminated structure containing a metal layer and an elastomeric layer disposed between said outer sleeve and said non-rotating shaft, said bearing pads being attached to said non-rotating shaft; and

a lubricating means for introducing a lubricant between said outer sleeve and said bearing pads, said lubricating means comprising a primary lubricating hole disposed in said non-rotating shaft and secondary lubricating holes disposed between said primary lubricating hole and said bearing pads, such that a lubricant may pass from said primary lubricating hole through said secondary lubricating holes to a clearance space formed between said outer sleeve and said bearing pads.

4,919,550

BEARING ASSEMBLY

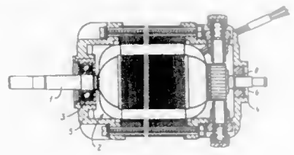
Herman Lankamp, Bunnik, Netherlands, assignor to SKF Industrial Trading & Development Company, B.V., Vinhaan, Netherlands Antilles

Continuation-in-part of Ser. No. 92,122, Sep. 2, 1987, abandoned. This application Oct. 20, 1988, Ser. No. 260,405

Claims priority, application Netherlands, Sep. 16, 1986, 8602343

Int. Cl.[5] F16C *33/82*

U.S. Cl. 384—133 1 Claim



1. The combination of an electric motor having a housing and a shaft rotatably mounted in the housing and a bearing means for rotatably supporting the shaft comprising means defining a bearing sleeve made predominantly of a non-magnetic synthetic material circumscribing the shaft and forming the running surface of the bearing and a small quantity of lubricant film between the running surface of the sleeve and the shaft, means for retaining the lubricant comprising magnetic means consisting of particles of magnetic material embedded in the sleeve in a predetermined array so that the force of attraction for the lubricant is greater at the shaft than in the magnetically permeable environment structure surrounding the sleeve, whereby a lubricant film of relatively small axial width relative to the width of the sleeve is supported in place and the sleeve forms a barrier between the lubricant and the outside environment tending to influence the lubricant.

4,919,551

BEARING WITH IMPROVED LUBRICATION SEALS

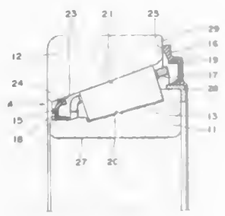
Masao Nunotani, and Masaaki Matsumoto, both of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Jan. 26, 1989, Ser. No. 301,941

Claims priority, application Japan, Jan. 26, 1988, 63-15586

Int. Cl.[5] F16C *33/78*

U.S. Cl. 384—482 4 Claims



1. A tapered roller bearing, comprising:

an inner ring having a race surface comprised of a tapered face and a small diameter portion and a large diameter portion;

an outer ring having a race surface comprised of a tapered face;

a plurality of tapered rollers which roll on said race surface of said inner ring and said race surface of said outer ring;

a cage which retains said tapered rollers at even intervals in the circumferential direction of said bearing;

a first seal comprised of a lip and a lip supporting element, said lip supporting element being mounted on the small diameter end portion of said inner ring, said lip being urged in an axial outward direction of said bearing against said outer ring and separated from said outer ring when said lip is forced in the axial inward direction; and

a second seal comprised of a further lip and a further lip supporting element, said further lip supporting element being mounted on the large diameter end portion of said inner ring, said further lip being urged in the axial inward direction of said bearing against said outer ring and separated from said outer ring when said lip is forced in the axial outward direction.

4,919,552

MACHINE BEARING

Rua H. Ongari, Sao Paulo, Brazil, assignor to Industria Plastica Ramos S.A., Brazil

Filed Jun. 27, 1988, Ser. No. 211,979

Int. Cl.[5] F16C *33/32*

U.S. Cl. 384—492 1 Claim

1. A low maintenance machine bearing which does not use grease or any lubricants and is suitable for use in the submarine, chemical, photographic or other industries, said bearing comprising:

A. a nylon, PTFE, or acetalic resin central shaft which defines an inner bearing race;

B. a nylon, PTFE, or acetalic resin external cover means which defines an outer bearing race;

C. a circular array of unlubricated glass balls regularly positioned in said races between said shaft means and said cover means; and

D. polyamide or polyacetate spacer means located between said shaft means and said cover means for spacing said balls regularly along said races.

4,919,553

PRINTER HAVING HEAD RELEASE MECHANISM RESPONSIVE TO SPACE COMMANDING CODES

Hideo Ueno, Nagoya; Satoshi Shibata, and Keiko Yamada, both of Aichi, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed May 16, 1988, Ser. No. 194,279

Claims priority, application Japan, May 19, 1987, 62-122223

Int. Cl.[5] B41J *3/20*

U.S. Cl. 400—120 4 Claims

1. A printing apparatus comprising:

a print head movable between a printing position thereof in which the print head is in pressed contact with a recording medium via a print ribbon, and a release position thereof in

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which the print head is spaced apart from the recording medium;

ribbon feeding means including a ribbon supply section and a ribbon take-up section, said ribbon feeding means being operable while said print head is placed in said printing position, for feeding an active portion of said print ribbon past said print head from said ribbon supply section toward said ribbon take-up section, said ribbon feeding means being inoperable while said spring head is placed in said release position;

data input means including a space key for feeding said print head by a distance equal to a printing pitch, without a printing action, when said space key is held in an operated position for less than a predetermined operating time, and for feeding said print head continuously by a distance equal to a multiple of said printing pitch, without the printing action, while said space key is held in said operated position for more than said predetermined operating time;

head release means for moving said print head from said printing position to said release position; and

head-release control means for inhibiting said head release means from operating to move said print head to said release position if said space key is held in said operated position for less than said predetermined operating time, and for commanding said head release means to operate to move said print head to said release position to thereby disable said ribbon feeding means, if said space key is held in said operated position for more than said predetermined operating time wherein said head-release control means comprises:

a print buffer for temporarily storing data as the data is entered through said data input means, and outputting said data in the order of entry thereto;

memory control means responsive to an operation of said space key, for storing a space code in said print buffer, and storing a self-repeat code in said print buffer if said operation of the space key continues for more than said predetermined time; and

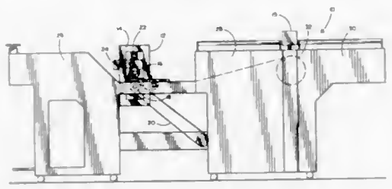
executing means for sequentially executing codes stored in said print buffer, said executing means executing said space code without commanding said head release means to move said print head to said release position, and executing said self-repeat code while commanding said head release means to move said print head to said release position.

4,919,554

CRUSH ROLLER ASSEMBLY FOR A SCREEN PROCESS PRINTING MACHINE

George H. Force, Huntington Beach, Calif., assignor to Ernst W. Dorn Co., Inc., Gardena, Calif.

Filed Feb. 13, 1989, Ser. No. 309,140
Int. Cl.[5] B41K *35/00*
U.S. Cl. 400—419 6 Claims



1. In a screen process printing machine a crush roller apparatus comprising:

a pair of selectively engageable adjacent crush roller oriented on parallel axes;

a pair of brush rollers, each such brush roller having brush bristles in contact with the radial surface of a respective crush roller for wiping the surface of the crush roller,

a housing for enclosing said crush rollers and said brush rollers,

a frame supporting said housing, said crush rollers and said brush rollers on said screen process printing machine in a location for crushing agglomerated powder on sheets being fed to said machine for printing;

a pair of fixed blocks supporting the axial ends of one of said crush rollers and a pair of slideable blocks supporting the axial ends of the other of said crush rollers for sliding engagement with said frame; and

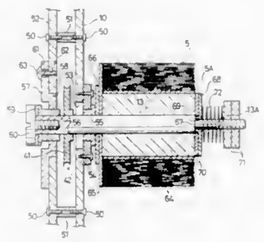
a selectively enabled actuator for sliding said slideable blocks toward and away from said fixed blocks whereby said crush rollers are selectively engaged and disengaged with respect to one another.

4,919,555

CARBON RIBBON SUPPLY APPARATUS FOR A PRINTER

Hidenori Kikuchi, Iwate, Japan, assignor to Kabushiki Kaisha Sato, Japan

Filed Jun. 3, 1988, Ser. No. 202,704
Claims priority, application Japan, Jun. 9, 1987, 62-88128[U]
Int. Cl.[5] B41J *33/56*
U.S. Cl. 400—224.2 12 Claims



1. A printer, comprising:

a frame;

a print head and a platen for urging a carbon ribbon against the print head;

means for supplying a carbon ribbon and for guiding the carbon ribbon against the print head, the carbon ribbon supplying means including a carbon ribbon supply spindle defined about an axis and mounted to and extending generally perpendicularly to the frame;

means for supporting the spindle cantileverly on the frame, the frame including a first frame part and a second frame part generally parallel to and spaced from the first frame part, the spindle being supported at a first predetermined location in the first frame part and at an adjustable location on the second frame part; and

means for adjusting the orientation of the axis of the carbon ribbon supply spindle relative to the frame in a manner which is effective for preventing wrinkling of the carbon ribbon, the spindle adjusting means being located on the second frame part and including a rotatable adjusting plate disposed on and extending generally parallel to the second frame part and a spindle bearing mounted to the adjustment plate, a distal end of the spindle being received in the spindle bearing and the spindle bearing being so located on the adjusting plate that the rotation of the adjusting plate is effective to vary the orientation of the axis of the spindle relative to the first frame part.

4,919,556

WRITING IMPLEMENT HAVING SIMPLIFIED LEAD-FEEDING MECHANISM

Chun-Liang Kuo, Taipei, Taiwan, assignor to Pencell Co., Ltd., Taipei, Taiwan

Continuation-in-part of Ser. No. 144,814, Jan. 15, 1988. This application Sep. 29, 1988, Ser. No. 252,567
Int. Cl.[5] B43K *21/16*
U.S. Cl. 401—57 5 Claims

1. A writing implement comprising an elongated annular outer casing (1), an inner tube (2) slidably mounted within said outer casing, and a plurality of pre-sharpened leads (3) stacked in axial alignment within said tube;

said outer casing comprising an annular molded plastic member having first and second end sections; said first end section being configured as a frusto-conical head; a V-shaped slot extending through the wall of said head to form an axially elongated resilient leg (12) integral with the head; said resilient leg having a cantilever connection with the associated head wall, and a free end spaced a short distance axially from the end edge of the head; and a hook section (121) extending generally radially inwardly from the free end of said leg, said hook section being integral with the leg;

said resilient leg having a normal unstressed position wherein its outer side surface lies in the outer surface plane of the frusto-conical head, with the hook section extending radially inwardly to the casing axis; said resilient leg having a stressed position wherein its outer side surface projects outwardly beyond the outer surface plane of the frusto-conical head;

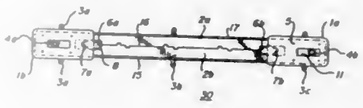
said inner tube having a led-gripper end section adapted to move between a retracted position extending a relatively short distance out of said frusco-conical head, and an extended position projecting a relatively great distance beyond said frusto-conical head; a relatively long axial slot (23) formed in said tube end section; and a relatively short axial groove (24) formed in the outer surface of said tube end section at a point diammetrically opposite said axial slot; said groove having sufficient depth as to permit the semi-circular wall sections formed by said groove to resiliently deflect for gripment of a sharpened lead projecting beyond the tube end section; said tube being oriented within said casing so that the hook section of the resilient leg extends into the slot when said tube lead-gripper end section is in its retracted position whereby said hook section is located between the projecting and the remaining leads within the tube

4,919,557

LOOSELEAF BINDER WITH SLIDING LOCK MECHANISM

Edward Podosek, Wilbraham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Oct. 14, 1988, Ser. No. 257,658
Int. Cl.[5] B42F *13/20, 3/04, 13/16, 5/00*
U.S. Cl. 402—41 20 Claims



1. A loose-leaf binding mechanism, of the type affixed to covers and a backbone structure, comprising:

a coverplate adapted to be affixed to a backbone structure and having an upper wall extending the length of said coverplate and spaced apart from the backbone structure;

a pair of hook plates, each hook plate pivotally coupled to said coverplate for movement between a first position with said hook plates positioned in proximity to said coverplate and a second position with said hook plates positioned distally from said cover plate, said hook plates including an aperture;

ring binding means having two opposing portions, each of said opposing portions affixed to opposite hook plates in cooperating relationship to open and close with the movement of said hook plates;

locking slide slidably affixed in said coverplate, movable between a first locking slide position at which the locking slide projects from one end of the backbone, and a second locking slide position at which the locking slide does not substantially project from such end;

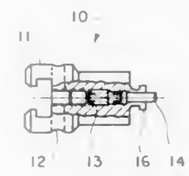
wherein said locking slide includes a body portion which is slidable between the hook plates and the backbone, and a cam arm which extends through the hook plate aperture as the locking slide moves between the first locking slide position and the second locking slide position, said cam arm having a wedge portion which is configured to wedge between the hook plates and the coverplate when the hook plates are in their second position only when the locking slide is at or near its first locking slide position, to prevent the pivotting of said hook plates to their first position and the opening of the ring binding means.

4,919,558

PIPE CLEANING HEAD ADAPTER

Edmund J. Mascitelli, 601 SE. 23 Ave., Pompano Beach, Fla. 33062, and Douglas J. Riggs, 1731 Mistletoe, Sebastain, Fla. 32958

Filed Jan. 3, 1989, Ser. No. 293,016
Int. Cl.[5] B25G *3/00*
U.S. Cl. 403—9 2 Claims



1. An adapter for connecting a pipe cleaning cable to a cleaning head of differing size including:

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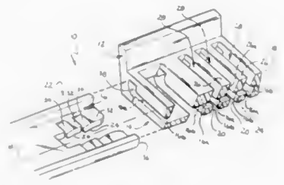
a generally tubular member having an cable retaining end and an opposite cleaning head retaining end;
said cleaning head retaining end having a spring loaded axially aligned retaining pin that mates with a corresponding passage in said cleaning head;
said retaining pin being rigidly surrounded by a T-shaped retainer bar, said T-shaped retainer bar mating with a corresponding slot on said cleaning head; and
said cable retaining end is wider than said cleaning head retaining end and has an open-ended slot that runs normal to the axis of said tubular member, said open-ended slot accepting in a mating fashion a T-shaped bar on the end of said cleaning cable, said cable retaining end having an axially aligned depression disposed on the surface of said open-ended slot to accept in mating fashion a retaining pin on said cleaning cable.

4,919,559
LOCKING ASSEMBLY
Ernest L. Belleville, Barrington, N.H., assignor to Davidson Textron Inc., Dover, N.H.
Filed Jan. 5, 1989, Ser. No. 293,763
Int. Cl.[5] B25G *3/14*; F16D *1/10*
U.S. Cl. 403—13 14 Claims



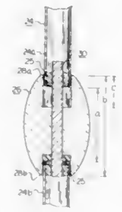
1. A locking assembly (**10**) comprising;
a female member (**12**) having a receiving cavity (**14**) formed by first and second spaced walls (**16***a*, **16***b*) extending along a receiving axis (**18**),
said female member defining a plurality of locking recesses (**20**) spaced along said axis on said first spaced wall (**16***a*) of said cavity (**14**),
a male member (**22**) having a plurality of tines (**24**) spaced apart longitudinally therealong for snapping into said recesses (**20**) to retain said male member (**22**) in said cavity (**14**),
said assembly (**10**) characterized by said female member (**12**) having a plurality of biasing means (**26**) independent from one another and axially spaced from each other along said second spaced wall of said cavity (**14**) and separated by spaced openings through said second spaced wall for locating each of said biasing means to respectively engage only one of said tines (**24**) when the male member is fully inserted to retain each tine (**24**) locked in one of said recesses (**20**).

4,919,560
OIL WELL SUCKER ROD
Woodrow T. Rutledge, Jr.; Russell P. Rutledge; T. Mike Jones; Don E. McCown, and J. Tom Hodnett, all of Big Spring, Tex., assignors to Fiberglass Technologies, Inc., Big Spring, Tex.
Filed Apr. 28, 1989, Ser. No. 344,673
Int. Cl.[5] F16B *11/00*
U.S. Cl. 403—268 9 Claims

1. An oil well sucker rod, comprising:
an elongated, cylindrical rod;
a connector attached to one end of the rod for connecting the rod to another rod and having a rod-receiving receptacle, the receptacle having an open end, a closed end, and a plurality of axially spaced, annular, tapered surfaces;
an annular, tapered centering surface within the receptacle in engagement with the end of the rod for centering the rod axially within the connector;

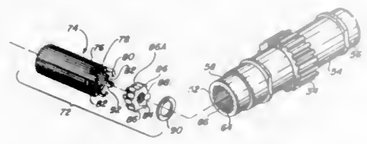
a plurality of dimples on the connector extending into the receptacle to contact the rod for centering the rod within the connector at a point spaced from the centering surface; and
an adhesive bonding material within the receptacle for securing the connector to the rod.

4,919,561
CERAMIC FITTING FOR TUBULAR FURNITURE CONSTRUCTION
Peter M. Y. Kee, Flat 1002, Block A, 10th Floor, Lotto Villa 18 Broadwood Road, Happy Valley, Hong Kong
Filed Mar. 20, 1989, Ser. No. 325,669
Int. Cl.[5] A47C *19/00*; F16D *1/00*
U.S. Cl. 403—305 8 Claims



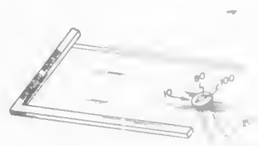
1. An ornamental knob-like fitting adapted to be attached to and removed from a seated position between two axially aligned, substantially fixed, confronting tubular members without disassembly of the fitting itself, said tubular members being spaced apart a distance less than the axial length of said knob-like fitting, at least one of said tubular members being capable of flexing to a position where said members are not axially aligned, whereby, when finally seated and connected between the tubular members, the knob-like fitting envelops both ends of the confronting tubular members, said knob-like fitting comprising:
(a) a unitary body member of a prescribed shape having a first end and a second end and an axial dimension extending collinearly with the longitudinal axis of said two confronting tubular members and a diameter greater than the diameter of said tubular members;
(b) a rod member extending axially through said unitary body member and secured therein;
(c) a first and second well surrounding said rod in said first and second ends of said body member respectively;
(d) said first well having a depth dimension at least as great as the difference between the axial dimension of said fitting and said distance between said confronting tubular members, whereby said first end may be positioned on the corresponding end of one of said tubes and moved to a point which exceeds its final seated position by a distance sufficient to allow the other of said tubes to be placed in position aligned with said second end.

4,919,562
TORQUE TRANSMITTING MEMBER
William M. Anthony, Scottsdale, and Hans R. Ringger, Mesa, both of Ariz., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Division of Ser. No. 74,755, Jul. 17, 1987, Pat. No. 4,828,422.
This application Nov. 17, 1988, Ser. No. 272,612
Int. Cl.[5] B25G *3/00*
U.S. Cl. 403—16 7 Claims



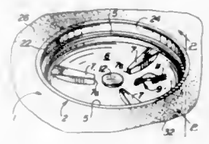
1. Apparatus comprising an elongate, tubular insert member, said insert member defining on an outer surface thereof an axially extending male spline shape, and on an inner surface thereof also defining an axially extending female spline shape, at one end thereof said insert member defining a plurality of circumferentially spaced apart axially extending portions, said axially extending portions cooperatively defining a plurality of circumferentially spaced apart, equiangularly extending crenels, and a annular washer star member, said star member defining a plurality of circumferentially spaced apart, radially outwardly extending, and equiangularly extending arm portions, said star member being received in said insert member such that said arm portions are received in said crenels and positioned between said axially extending portions, said arm portions and said insert member cooperatively defining opposed, contacting thrust surfaces for transferring axially directed force from said star member to said insert member.

4,919,563
VEHICLE PARKING OR PASSAGEWAY SECURITY BARRIER
David L. Stice, 4625 Applewood, Odessa, Tex. 79761
Filed Aug. 14, 1989, Ser. No. 393,127
Int. Cl.[5] E01F *13/00*
U.S. Cl. 404—6 12 Claims



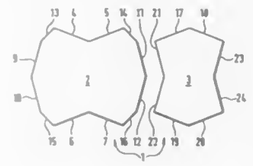
3. A vehicular barrier system for restricting movement in a vehicle way, placed below the surface of such vehicle way including a bollard selectively protuberant above the surface of such vehicle way comprising:
a casing implanted below such vehicle way;
an electromechanical drive mechanism including a reversible motor retained as a unit within said casing and coupled to the bollard for erecting or retracting the bollard to or from a protuberant position obstructing movement in such vehicle way;
a bezel surrounding the bollard and releasably secured to said casing for restricting access to the electromechanical drive mechanism;
a locking assembly means integral with the bollard permitting limited rotation for access to the bollard for replacement, adjustment or repair;
an electronic control means associated with the motor of the electromechanical drive mechanism for activating the motor to operate the electromechanical drive mechanism for erecting or retracting the bollard.

4,919,564
MANHOLE INSERT
David L. Neathery, Shreveport, and Harold E. Owen, II, Keithville, both of La., assignors to David L. Neathery, Shreveport, La.
Filed Dec. 15, 1988, Ser. No. 284,620
Int. Cl.[5] E02D *29/14*
U.S. Cl. 404—25 41 Claims



1. A manhole insert for location in a manhole beneath a manhole cover, said manhole insert comprising a dish-shaped body having a curved bottom terminated by an upward-standing side wall; at least one bottom rib provided in said bottom for strengthening said bottom; a pressure relief valve provided in said bottom for releasing pressure in the manhole; and a rim shaped in the top edge of said side wall for supporting said manhole insert in the manhole.

4,919,565
COMPOSITE STONE SET
Reinhard Göpfert, Hannoversche Str. 156, D-3070 Nienburg, Fed. Rep. of Germany
Filed Oct. 21, 1988, Ser. No. 267,312
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1987, 3735865
Int. Cl.[5] F01C *5/06*
U.S. Cl. 404—41 3 Claims



1. A set of stones for the production of an interlocking stone formation for the surface reinforcement of roads, public squares, walks and the like from a dodecagonal stone and an octagonal stone which engages the same, characterized in that four oppositely disposed sides (**4**, **5**, **6**, **7** and **21**, **22**, **23**, **24**) on each of the dodecagonal stone (**2**) and the octagonal stone (**3**) define two corners pointing towards the center of the stone.

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4,919,566

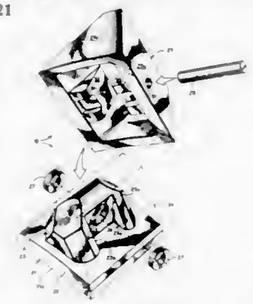
FILL AND COMPACTION ROLLER USING READILY REPLACEABLE CLEAT ASSEMBLIES

James O. Caron; Kenneth H. Pratt, both of Modesto, and Richard D. Genger, Alameda, all of Calif., assignors to Caron Compactor Co., Modesto, Calif.

Continuation of Ser. No. 215,758, Sep. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 19,791, Feb. 27, 1987, abandoned, which is a continuation-in-part of Ser. No. 798,464, Nov. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 639,848, Aug. 13, 1984, abandoned. This application Sep. 1, 1989, Ser. No. 403,904

Int. Cl.[5] E01C *19/26*

U.S. Cl. 404—121 23 Claims



1. A fill and compaction roller of a type having a rigid cylindrical body supported for rotation from a vehicle chassis and having cleat assemblies carried by the body, the cleat assemblies each comprising a rigid mounting pad assembly having a base portion welded to said body and a bracket integral to said base portion protruding generally radially outwardly therefrom, a coupling opening extending transversely through said bracket, a detachable cap unit readily releasably coupled to said base portion, said cap unit having a generally hollow body including sloping upwardly converging outer side walls extending radially outwardly sufficiently in a given direction to substantially meet and define a longitudinal blade therebetween, and transverse end walls extending between the end edges of said side walls, a length of coiled spring wire disposed within and along the axial length of said coupling opening, said coiled spring wire having a central opening axially thereof, said wire being coiled to lie within an imaginary cylindrical configuration, both ends of said wire lying within said imaginary cylinder to permit said spring to be easily slidably inserted into said coupling opening in closely spaced relation therearound, a pair of aligned openings respectively formed through the side walls and aligned with said coupling opening and said central opening of said coiled spring wire for receiving a coupling pin therethrough, a coupling pin disposed through said coupling opening, said coiled spring wire, and said aligned openings to cause said length of coiled spring wire to engage said pin in a manner to retain said cap unit to said mounting pad assembly, said coiled spring wire readily releasably locking said pin in said openings to prevent decoupling of said cap unit from said pad assembly, while permitting the spring to elongate when said pin is struck by a hammer, such elongation serving to break up caked soil thereon otherwise inhibiting removal of said cap unit.

4,919,567

SUBSURFACE DUNE RESTORATION SYSTEM AND METHOD

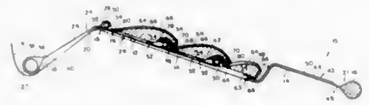
Jay W. Sample, 2119 Longview Dr., Tallahassee, Fla. 32303

Filed Jun. 1, 1989, Ser. No. 359,795

Int. Cl.[5] E02B *3/12*

U.S. Cl. 405—19 14 Claims

1. A subsurface dune restoration system comprising an underlay of filter cloth positioned upon a prepared dune surface having a predetermined slope, a least one sand-filled geotextile container arranged in a row forming a course along the dune generally parallel to the shoreline, a plurality of courses of said sand-filled containers placed upon the dune surface, each of said courses being elevated a predetermined distance relative to an adjacent seaward course as they progress landward up said sloped dune surface forming a soft revetment presenting a specific wave impact surface, said containers being formed of a material having specific flexibility and permeability characteristics, and filling means extending the length of each con-



tainer, said filling means operable from either end of said container facilitating filling of the containers in their assembled position, wherein said courses terminate in gentle relatively wide sweeping curves preventing turbulent rotor currents and consequent aggravated erosion at the ends of said dune restoration system, said containers normally being covered with a layer of sand whereby a relatively soft subsurface dune restoration system effective to deplete wave energy is formed.

4,919,568

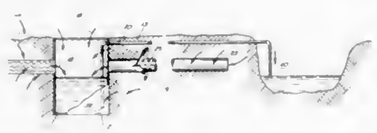
SYSTEM FOR DRAINING LAND AREAS THROUGH SIPHONING FROM A PERMEABLE CATCH BASIN

Dennis Hurley, P.O. Box 702, Marrero, La. 70073

Filed Apr. 27, 1988, Ser. No. 187,022

Int. Cl.[5] C02F *9/00*

U.S. Cl. 405—43 18 Claims



1. A method of establishing a continuous siphon in the draining of land areas the system comprising:

(a) providing a water collection basin having fluid permeable walls and a top portion, the basin positioned in the ground to a level of the top portion, for receiving aboveground or underground water flow into the basin, and blocking the flow of solid material into the basin;

(b) providing means for receiving the water collected in the basin at an exit point distant from the basin;

(c) providing a fluid flow line between the water collection basin and the exit point;

(d) establishing an uninterrupted siphon of water through the flow line between the collection basin and the receiving means; and

(e) positioning the collection basin at a level in the ground so that the lowest point of water that can be collected through siphon from the basin is below the lowest most point of water in the receiving means.

4,919,569

PROCESS FOR DISPOSING OF WASTE

Siegfried Wittenzelliner, 24 Florgate Road, Farmingdale, N.Y. 11735

Filed Nov. 10, 1988, Ser. No. 269,575

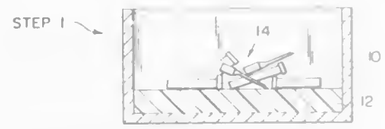
Int. Cl.[5] E02D *3/12*

U.S. Cl. 405—128 7 Claims

1. A process for disposal of medical waste comprising the steps of:

(a) providing a container, partially filling said container with a fluid, hardenable water insoluble epoxy resin which is noncohesive with said container and disposing medical waste in the fluid, hardenable resin disposed in said container;

(b) substantially filling said container with additional fluid,



hardenable epoxy resin to combine with the initial resin and encasing said medical waste therein;

(c) hardening said resin until said resin comprises a rigid non-soluble block;

(d) removing the hardened epoxy resin block from said container having said medical waste encased therein; and

(e) thereafter dumping or using said block

4,919,570

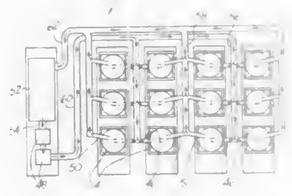
PORTABLE ON SITE SOIL TREATMENT SYSTEM

Frederick C. Payne, Charlotte, Mich., assignor to Midwest Water Resource, Inc., Charlotte, Mich.

Filed Nov. 28, 1988, Ser. No. 276,650

Int. Cl.[5] B01D *13/00*

U.S. Cl. 405—128 9 Claims



1. Apparatus for treating contaminated earth, said apparatus comprising containment means for holding said contaminated earth during treatment, said containment means comprising one or more treatment vessels, each treatment vessel containing a quantity of contaminated fluid permeable earth and having an inlet port and an outlet port, means for sealing each treatment vessel against leakage of said earth, a first conduit connecting each treatment vessel inlet port in flow communication with a pumping station which pumps fluid through each treatment vessel, a second conduit connected in flow communication between each treatment vessel outlet port and a fluid treatment station, and a third conduit connecting said pumping station in flow communication with said fluid treatment station wherein said fluid is recirculated through said conduits and through said treatment vessels to provide for continuous treatment of said contaminated earth while in said treatment vessels.

4,919,571

ORIENTATABLE BLOCKING UNIT WITH CARDAN JOINT FOR SUPPORTING STRUCTURES ON CYLINDRICAL ELEMENTS

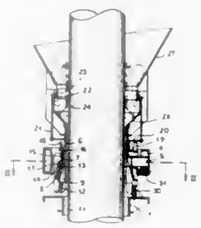
Oneglio Sala, and Paolo Montanari, both of Bologna, Italy, assignors to Riva Calzoni S.P.A., Milan, Italy

Filed Sep. 29, 1988, Ser. No. 252,070

Claims priority, application Italy, Oct. 5, 1987, 22145 A/87

Int. Cl.[5] E02B *17/08*

U.S. Cl. 405—199 9 Claims



1. An orientatable blocking unit for securing a structure on a cylindrical post, comprising:

a lower annular body surrounding said post with play and carrying said structure;

an intermediate annular body surrounding said post with all-around clearance;

an upper annular body surrounding said post with play and having a portion interposed between said post and said intermediate body;

a first pair of axially aligned pins articulatingly connecting said lower annular body to said intermediate annular body;

a second pair of axially aligned pins extending perpendicular to but coplanar with said first pair of pins articulatingly connecting said upper annular body at said portion to said intermediate annular body;

means on said portion of said upper annular body defining a plurality of upwardly converging slide seats angularly equispaced around said post and having respective cone generatrices;

respective upwardly tapering wedge-shaped jaws having inwardly turned frictional surfaces confronting said post and frictionally engageable therewith upon an upward movement of said jaws relative to the respective seats, said jaws being slidable on the respective seats along said generatrices;

respective elastic means bearing upon said jaws and urging same upwardly along the respective seats from a lower unblocking position into an upper blocking position in which said jaws fix said unit to said post;

detent means engageable with said jaws for releasably retaining same in said lower positions; and elastic connection means interposed between said lower annular body and said upper annular body and between said intermediate annular body and said upper annular body for yieldably urging said body into axial alignment and enabling angular orientation of said upper body relative to said lower body.

4,919,572

FENDER PILE

Jurgen Bergfelder, Cologne, Fed. Rep. of Germany, assignor to Strabag Bau-AG, Koln-Deutz, Fed. Rep. of Germany

Filed Sep. 12, 1988, Ser. No. 243,408

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731262

Int. Cl.[5] E02B *3/22*

U.S. Cl. 405—212 4 Claims

1. A prestressed concrete fender pile comprising: an elon-

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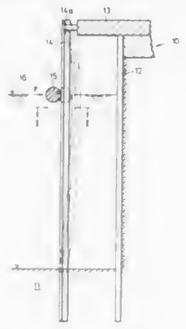
gated concrete pile member having a T-shaped cross section including a flange and a web; prestressing members comprising a plurality of embedded, elongated, prestressed glass fiber composite elements extending longitudinally within said pile



member, said member including a first set of said elements arranged within said flange and prestressed to a degree closely approaching their elastic tensile limit, and a second set arranged within said web and prestressed substantially less than said degree of prestressing of said first set.

4,919,573

BALL END MILL

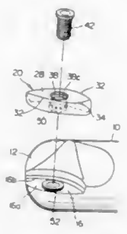
Osamu Tsujimura, Kawasaki; Tatsuo Arai, Kitamoto, and Masayuki Okawa, Kawasaki, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1988, Ser. No. 246,639

Claims priority, application Japan, Sep. 22, 1987, 62-237943; Nov. 30, 1987, 62-182165; Mar. 1, 1988, 63-27300

Int. Cl.[5] B23C *5/10, 5/14*

U.S. Cl. 407—40 7 Claims



1. A ball end mill comprising:

an end mill body including an axis of rotation therethrough and an insert receiving recess formed in a forward end portion thereof and having a bottom face;

an indexable cutter insert having a front face, a rear face and at least two convexly curved side faces lying between said front and rear faces, said insert having at least two convexly curved main cutting edges each defined by the intersection of a respective one of said convexly curved side faces with said front face, said insert being received in said insert receiving recess with said rear face mated with said bottom face of said recess in such a manner that one of said main cutting edges is indexed in a cutting position, said front face serving as a rake surface for said indexed main cutting edges;

clamp means for releasably securing said cutter insert to said insert receiving recess; and

shift preventing means for preventing said cutter insert from being shifted during a cutting operation of the ball end mill, said shift preventing means comprising a surface defining a shouldered engaging recess formed in one of the bottom face of said insert receiving recess and the rear face of said insert and an engaging projection complementary to said engaging recess and provided on the other of the bottom face of said insert receiving recess and the rear face of said insert so as to be brought into engagement with said shouldered engaging recess with said surface of said shouldered engaging recess being in circumferential surrounding relationship with said engaging projection said bottom face of said insert receiving recess facing generally in the direction of rotation of said body, said insert receiving recess having a generally arcuate side wall facing axially forwardly and radially outwardly of said end mill body, said insert being of a generally ellipsoidal shape having a pair of said convexly curved side faces, one of said side faces cooperating with said front face to define the other main cutting edge, said other main cutting edge being held in abutment with said side wall, said cutter insert having a centrally located aperture therethrough with said shouldered engaging recess surrounding said aperture in said cutter insert so as to be coaxial therewith, said clamp means comprising a screw and said insert receiving recess having a threaded bore receiving said screw when said screw is passed through said aperture in said cutter insert.

4,919,574

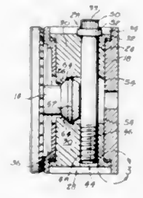
TOOL HOLDER RETENTION SYSTEM

Russell H. Samyn, Rolling Meadows, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Mar. 31, 1989, Ser. No. 331,196

Int. Cl.[5] B23B *31/02*

U.S. Cl. 409—219 16 Claims



1. A holder retention mechanism for a tool holder or workpiece holder which creates a holder clamping force and a self-centering meshing force, said holder including a holder retention portion operatively retainable by said retention mechanism and a coupling portion attached to said holder retention portion for engaging a surface of said holder retention mechanism when said holder is in one of a plurality of rotary positions, said holder retention mechanism comprising: clamping means for retainably engaging said holder retention portion; a mechanism housing positioned about an axis and being formed with a first bore and a second bore, said first bore and said second bore forming a cavity at an intersection of said bores, said first bore being dimensioned and shaped for receiving said clamping means and said second bore being dimensioned and shaped for receiving said holder retention portion, a holder coupling surface formed on said mechanism housing extending radially with respect to said axis, spiral surface means formed on said holder coupling surface in an annular path, said annular path being generally concentric with said axis, said spiral surface means being formed for cooperatively engaging complementary surface means on said coupling portion of said holder; a clamping means engaging member operatively coupled with said clamping means for creating a clamping force in said clamping means when said holder retention portion is inserted into said second bore and said clamping means engaging member is actuated, whereupon said spiral surface means cooperatively engage said coupling portion of said holder for retaining and centering said holder in said holder retention mechanism.

4,919,575

APPARATUS FOR COMPENSATING FOR THE THERMAL DISPLACEMENT OF THE MAIN SPINDLE OF A MACHINE TOOL

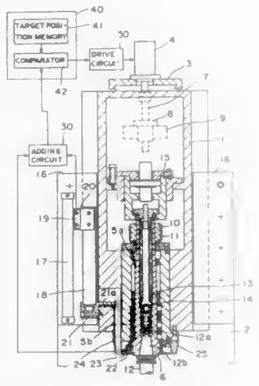
Takaki Yoshimi, Gamagori; Akihiro Matsuura, Chiryu; Toshiharu Takashima, Kariya, and Hiroyuki Nakano, Tokai, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed May 16, 1989, Ser. No. 352,470

Claims priority, application Japan, May 20, 1988, 63-123567; May 20, 1988, 63-123568

Int. Cl.[5] B23C *1/06;* **B23B** *39/08;* **G05B** *19/18*

U.S. Cl. 409—231 10 Claims



1. A compensating apparatus capable of compensating for the thermal displacement of a main spindle supported on a spindle head which is movably guided on a frame of a machine tool, and is moved by a servomotor, wherein said compensating apparatus comprises:

a feed back scale and a measuring head disposed between said frame and the front end portion of said spindle head, said measuring head electrically engaging with said feed back scale and outputting a signal which indicates the present position of said front end portion of said spindle head;

thermal displacement measuring means attached to said front end portion of said spindle head for detecting the thermal displacement of the front end portion of said main spindle with respect to said spindle head;

numerical control means for comparing the present position of said front end portion of the spindle head detected by said measuring head with a command target position, and for driving said servomotor in accordance with the difference between the present position of the front end portion of said spindle head and said target position so that the front end portion of said spindle head is moved to a final position corresponding to said commanded target position; and

compensating means for shifting said final position depending upon the thermal displacement of said main spindle so as to move the front end portion of said main spindle to said commanded target position.

4,919,576

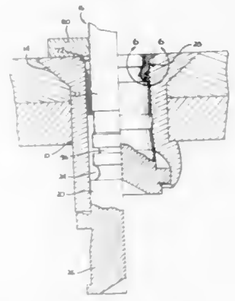
LOCKING APPARATUS FOR BLIND FASTENERS

John A. Louw, Temecula; William H. Owens, Fontana, and Ralph Luhm, La Habra, all of Calif., assignors to Allfast Fastening Systems, Inc., Industry, Calif.

Continuation-in-part of Ser. No. 56,067, Jun. 1, 1987, abandoned, which is a continuation of Ser. No. 766,039, Aug. 16, 1985, abandoned, which is a continuation-in-part of Ser. No. 646,766, Sep. 4, 1984, abandoned. This application Jan. 26, 1988, Ser. No. 148,678

Int. Cl.[5] F16B *13/04*

U.S. Cl. 411—34 28 Claims



17. In a blind rivet assembly having:

a tubular rivet sleeve having a cylindrical opening therethrough, and an expandable sleeve tail on the other end thereof,

a stem extending through said sleeve and said head,

a tail former at the tail end of the stem adjacent said sleeve tail for expanding said tail,

a pulling portion on a pulling end of the stem adapted to be engaged by a tool for pulling the stem,

a plug portion of the stem adjacent said tail former,

a locking groove in the stem adjacent said plug portion,

the portion of the stem between said locking groove and said pulling portion being of smaller diameter than the interior diameter of said sleeve and head,

the improvement comprising

a locking collar positioned over said stem and within the cylindrical opening of said tubular rivet sleeve between said plug portion and said pulling portion, said locking collar having a body portion defining an inner diameter to slide over the portion of said stem between said locking groove and said pulling portion, and an outer diameter to slide within said interior diameter of said sleeve, said body portion having a first locking collar portion and a second locking collar portion, said first locking collar portion having an outer diameter slidable within said cylindrical opening in said tubular rivet sleeve and being slidable along said stem to abut said plug portion of said stem, said second locking collar portion having an outer diameter also slideable within said cylindrical opening in said tubular rivet sleeve and an inner diameter slideable along said stem, the region of said first locking collar portion adjacent said second locking collar portion and the region of said second locking collar portion adjacent said first locking collar portion being cooperatively shaped to deform, relative to said first locking collar portion, the region of said second locking collar portion adjacent said first locking collar portion tightly into said locking groove during pulling when said first locking collar portion is restricted to movement with said stem by engagement with said plug portion,

wherein said preformed head of said rivet sleeve has an annular recess in the face thereof a diameter larger than the inner diameter of said tubular rivet sleeve and deeper

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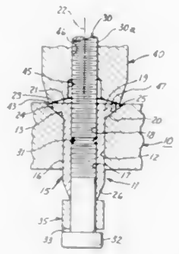
than the radial thickness of said locking collar, and wherein the end of said second locking collar portion opposite said first locking collar portion has an internal relief whereby forceful engagement of the end of said locking collar portion having said internal relief with a surface substantially prependicular with the axis of said blind rivet assembly will cause, as pulling progresses, said second locking collar portion to partially flare outward in the region of said relief, and to thereafter yield in compression to substantially fill said annular recess in said performed head.

4,919,577
BLIND FASTENER
Lloyd S. Binns, Harbor City, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.
Filed Feb. 13, 1989, Ser. No. 310,298
Int. Cl.[5] F16B *13/04, 13/06*
U.S. Cl. 411—43 **15 Claims**



1. In a blind fastener of the type having a central axis and an axially extending sleeve with an axially extending internally threaded passage therethrough, a head at one end having an axially facing surface thereon with a periphery which is centered on said axis; a mandrel including an axially extending threaded shank threaded into and through said passage, a torque-off groove on said shank, and torque tool engaging means accessible at the head end of said sleeve, and blind upsetting means axially movable by rotating said mandrel to form an enlarged body at the unheaded end of said sleeve; and a nut threaded to said mandrel with a bearing face facing toward said surface of the head of said sleeve, the improvement comprising:

said bearing face of said nut being concavely shaped so as to make contact with and thereby a retention engagement with at least some points around said periphery to hold the sleeve against rotation relative to the nut when the mandrel is drawn into the sleeve with the nut pressed against said head.

4,919,578
RIVETLESS NUT PLATE AND FASTENER
Henry J. Zeigler, Orlando, and Bruce L. Frisinger, Windermere, both of Fla., assignors to Martin Marietta, Bethesda, Md.
Filed Jun. 9, 1988, Ser. No. 204,285
Int. Cl.[5] F16B *37/04, 39/28*
U.S. Cl. 411—113 **9 Claims**

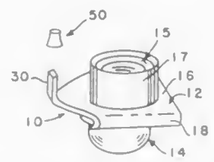
1. A nut plate for use with a threaded fastener, the nut plate comprising:

a generally flat portion having a passageway therethrough;

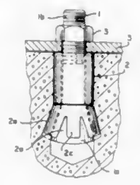
means for securing said nut plate to a mounting plate, said means for securing including a tubular portion which is integral with said generally flat portion and which extends generally perpendicularly to said flat portion;

means for floatingly securing a threaded fastener to said nut plate adjacent said passageway whereby a threaded member may be received by said threaded fastener; and

means for preventing relative rotation between said nut plate and said mounting plate, said means for preventing relative rotation including a projection which extends generally perpendicularly from said flat portion, said projection being provided on the same side of said flat portion as the tubular portion of said means for securing.



4,919,579
ANCHOR CONSTRUCTION AND METHOD OF MANUFACTURE
Masaaki Miyanaga, Hyogo, Japan, assignor to Kabushiki Kaisha Miyanaga, Hyogo, Japan
Continuation-in-part of Ser. No. 204,224, Jun. 9, 1988, Pat. No. 4,865,246. This application Aug. 22, 1988, Ser. No. 234,420
Claims priority, application Japan, Aug. 24, 1987, 62-128454[U]; Dec. 18, 1987, 62-321735
Int. Cl.[5] F16B *13/06*
U.S. Cl. 411—55 **17 Claims**



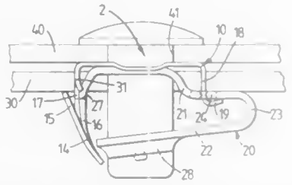
1. An anchor bolt comprising a bolt including a lower conical head, said conical head including an outer peripheral wall having a radius of curvature which gradually increases from one end to the other end thereof, and a sleeve for surrounding said bolt, said sleeve comprising an annular expander, said expander having multiple slits therein which open to the bottom end and extend substantially axially, said slits forming expansion pieces therebetween having radius of curvatures which, before expansion of said pieces, are substantially the same as the radius of curvature at the corresponding positions of said outer peripheral wall of said conical head, which said pieces contact after expansion and the outer surfaces of said expansion pieces forming a conical shape after expansion of said pieces.

4,919,580
RECEPTACLE FOR QUICK-RELEASE FASTENER
Andrew C. W. Wright, 4a Green Lane, Farnham, Surrey, England
Filed May 31, 1989, Ser. No. 359,163
Claims priority, application United Kingdom, Jun. 17, 1988, 8814488
Int. Cl.[5] F16B *37/02*
U.S. Cl. 411—173 **6 Claims**

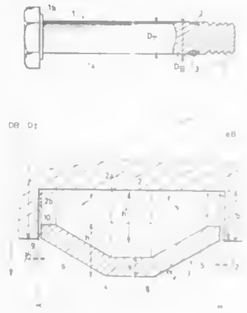
1. A two-part front mounted receptacle for a quick-release fastener including a stud, said receptacle being mountable in a support provided with an aperture and having a front and a back;

said receptacle having a body part having a first, substantially planar, front element, said front element having first and second ends and being formed with an aperture therethrough, said body part having a leg element depending from each of said ends of said front element, a first one of said leg elements having at least one sprung barb for engaging a rear face of said aperture in said support; and,

a substantially U-shaped spring retainer having first and second sides, each of which has first and second ends, said first side being arranged to be engaged and held to each of said leg elements of said body part and projecting beyond an end of said body part remote from said first leg element, said second side having a retention mechanism for engaging and retaining in use said stud connected therewith, said second side being spaced on an opposite side of said first side from said front element of said body part, and said first side having an aperture aligned with said aperture in said body part and said retention mechanism to allow said stud to pass therethrough.

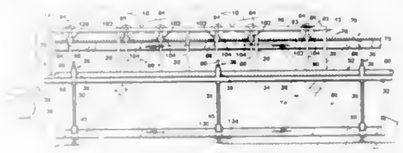


4,919,581
LOSS-PROOF FASTENER AND CONSTITUENT PART
Gérard Dubech, Toulouse, France, assignor to MECAERO, S.A., Muret, France
Continuation of Ser. No. 724,247, Apr. 17, 1985, abandoned. This application Jul. 28, 1986, Ser. No. 889,837
Claims priority, application France, Apr. 25, 1984, 84 06904
Int. Cl.[5] F16B *21/18*
U.S. Cl. 411—353 **15 Claims**



1. A loss-proof fastener of the type capable of repeated insertion through and withdrawal from a passageway formed in a workpiece without significant damage to the fastener and comprising a fastener member including a shank portion having an annular groove (2) and a ring (3) in said groove and transversely split (7) so as to provide an elastic deformation in the direction of the circumference, said ring having a cross-section such that said ring is elastically deformable so as to be capable of transverse elongation and radial contraction when said ring is subjected to a radial compressive force, and said ring having lateral edges lying within said groove around the circumference of said ring both in a rest condition and in a compressed condition and a portion between said radial edges extending radially beyond said shank portion in said rest condition whereby in a rest condition said portion of said ring projects beyond the shank portion surface and in a compressed condition is retracted within said groove, and said ring when positioned in said groove having a lateral play to permit the cross-section thereof to freely deform when compressed between the rest and the compressed conditions.

4,919,582
METHOD AND APPARATUS FOR LOADING AUTOMOBILES INTO A CARGO CONTAINER
H. John Bates, Yorba Linda; Kermit L. Achterman, La Canada, both of Calif.; Peter Gearin, Portland, and Terence Halpin, West Linn, both of Oreg., assignors to Greenbrier Intermodal, Inc., Lake Oswego, Oreg.
Filed Apr. 14, 1988, Ser. No. 181,684
Int. Cl.[5] B60P *1/64;* **B65G** *67/02*
U.S. Cl. 414—233 **40 Claims**



1 An apparatus for loading or unloading a lightweight sleeve which is capable of carrying a plurality of automobiles and being placed into an enclosed container, said apparatus comprising:

(a) means for supporting a sleeve;

(b) means, independent of said means for supporting a sleeve, for supporting a plurality of automobiles;

(c) means for imparting relative movement to said sleeve supporting means and said automobile supporting means such that said automobiles are inserted into or removed from said sleeve from the bottom thereof;

(d) means for attaching the automobiles to said sleeve so that after automobiles have been inserted into said sleeve said automobile supporting means can be separated from said sleeve supporting means;

(e) means for moving the sleeve onto and off of said sleeve supporting means so that said sleeve and said automobiles can be placed into or removed from a container as a unit; and

(f) wherein both said sleeve supporting means and said automobile supporting means are movable.

4,919,583
TRAILER
William J. Speakman, Jr., 6525 Millstone Ave., Baton Rouge, La. 70808
Filed Oct. 3, 1988, Ser. No. 252,108
Int. Cl.[5] B60P *1/36;* **E01C** *19/20*
U.S. Cl. 414—528 **6 Claims**

1 A towing vehicle and an attached trailer for dumping a

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loose, solid material while said towing vehicle and said attached trailer are in a forward motion, said trailer comprising:

(a) an elongated frame having (i), adjacent one of its ends, attaching means for attaching said frame to said towing vehicle, and (ii), adjacent the other of its ends, at least one axle and wheel set;

(b) a bin carried by said frame, said bin having side walls which downwardly converge towards one another at their lower extent, and a bottom wall connected to said side walls at their lower edges, said bin being dimensioned to have a depth sufficient to hold the desired amount of solid material;

(c) a discharge means associated with said bin to effect discharge of said solid material from said bin when desired; and

(d) conveying means to convey said solid material, as it is discharged from said bin, along a path which is substantially in the vertical plane of the long axis of said trailer and which extends from the discharge means, over at least a portion of said towing vehicle, to a dumping point whereby said dumping point is in front of said towing vehicle when said towing vehicle and trailer are being driven forward and when the vertical planes of the long axis of said towing vehicle and said trailer are in substantial alignment

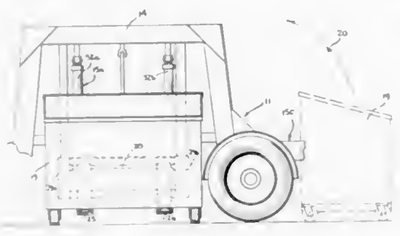
(e) wherein said trailer is a semitrailer and said attaching means is a fifth wheel.

4,919,584

TRASH BIN VEHICLE TRANSPORTER

Roland D. Bouchard, Box 7069, Hemet, Calif. 92343

Filed Jul. 22, 1988, Ser. No. 222,892
Int. Cl.[5] B65G *67/02*
U.S. Cl. 414—540 3 Claims



1. A bin transporter system for use in lifting a plurality of bins onto a vehicle for transportation and subsequent unloading from said vehicle comprising:

a main frame mounted on said vehicle,

a plurality of lift systems mounted on said frame,

each of said lift systems comprising:

a cross bar,

lift arm means mounted on said cross bar,

a pair of support bars mounted on said main frame in spaced apart relationship,

a support frame slidably supported on each of said support bars,

a bracket connected between said support frames, said cross bar being supported between said support frames,

drive means for driving said support frames slidably along said support bars to lift said lift arm means upwardly to a predetermined raised position and to lower said lift arm means downwardly to a predetermined lowered position,

means for mechanically latching said bracket to retain the lift arm means in the predetermined raised position comprising a latching arm pivotally supported on said main frame, said latching arm having an elongated notch formed therein, the bracket being retained in said notch when the lift arm means is in the raised position, said latching arm further having a cam surface, and spring means for urging said latching arm against said bracket, and

means for withdrawing said latching arm from engagement with said notch comprising a handle and means for coupling said handle to the latching arm,

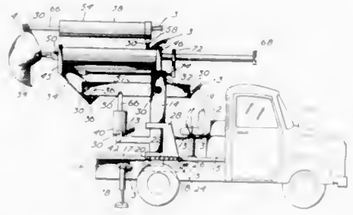
whereby as the lift arm means approaches the predetermined raised position, the bracket rides along the latching arm cam surface and is finally driven into latching engagement with said notch by said spring means and when said handle is actuated, the latching arm is withdrawn from said bracket against the action of said spring means to unlatch the bracket.

4,919,585

VEHICULAR MOUNTED EXCAVATOR

Peter L. Ruiz, 2233 Wyandotte Ave., Oroville, Calif. 95966

Filed Sep. 5, 1989, Ser. No. 402,753
Int. Cl.[5] B66C *3/00*
U.S. Cl. 414—718 7 Claims



1. A vehicular mounted excavator adapted for both horizontal trenching and vertical shaft digging, comprising;

an elongated boom support attached to said vehicle, said boom support adapted to be rotated by hydraulically powered means, said boom support further adapted to be used in a generally vertical position;

a boom having a first and second end, said boom pivotally attached at said first end to an upper end of said boom support;

hydraulically powered means adapted for raising and lowering said second end of said boom relative to said first end of said boom;

a digging arm structured of an elongated main tubular housing, a first longitudinal slot through said main tubular housing, a second longitudinal slot through said main tubular housing and oppositely disposed from said first slot, a first and second slidable member each slidably housed within said main tubular housing, said boom at said second end thereof extending through said second slot and attaching to said second slidable member, a pivot point in said second end of said boom adjacent said second slidable member, means for locking said pivot point temporarily rigid, a digging arm tilting hydraulic ram attached at a first end thereof to said first end of said boom, said digging arm tilting hydraulic ram attached at a second end thereof to said digging arm, said digging arm tilting hydraulic ram adapted to allow altering angles between said boom and said digging arm, one end of said first slidable member extending beyond a bottom end of said main tubular housing pivotally attaching generally centrally to a digging bucket member adapted to scoop earth, a bucket repositioning hydraulic ram having a first and second end with said first end pivotally attached to a rearward end of said digging bucket member, said second end of said bucket repositioning hydraulic ram attached by pivotal attachment means to one end of a connecting arm, an opposite end of said connecting arm extending through said first slot in said main tubular housing and attaching to said first slidable member, said bucket repositioning hydraulic ram

adapted to cause pivoting of said digging bucket member, a first slidable member repositioning hydraulic ram attached to said first slidable member adapted to raise and lower said first slidable member relative to said main tubular housing, a second slidable member repositioning hydraulic ram adapted to raise and lower said main tubular housing relative to said second slidable member with attached boom relative;

powering means for said hydraulic rams and said hydraulically powered means of said boom and said boom support;

controls adapted to be manually activated to actuate said hydraulic rams and said hydraulically powered means of said boom and said boom support;

said digging arm adapted for vertical positioning providing for digging generally straight side walled vertical shafts, said boom attached to said second slidable member of said digging arm adapted for placement at an upper end of said digging arm when said digging arm is in said vertical position allowing digging said vertical shafts to a maximum depth;

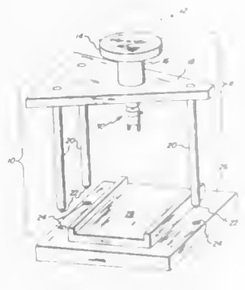
said digging arm adapted for angled positioning providing for digging said horizontal trenches.

4,919,586

MECHANICAL CLOSED LOOP ROBOTIC ARM END EFFECTOR POSITIONING SYSTEM

Stephen J. Derby, Brunswick, N.Y., assignor to Grasp, Inc., Troy, N.Y.

Filed May 25, 1988, Ser. No. 198,478
Int. Cl.[5] B66C *1/00*
U.S. Cl. 414—735 23 Claims



1. A mechanical closed loop system for translationally locating along X, Y, Z axes and rotationally locating about each of said X, Y, Z axes the distal end of a robotic arm relative to a workpiece fixture, the distal robotic arm end having an independently operated micro-robotic manipulator affixed thereto for performance of high precision tasks on a workpiece positioned on said fixture, said system comprising:

a wrist assembly mountable to the robotic arm, said assembly having a compliant member and a first positioning member connected to the compliant member, said first positioning member including a first docking means;

a second positioning member associated with the workpiece fixture, said second positioning member including a second docking means;

said first docking means and said second docking means comprising:

(i) a first positioning leg connected to one of said first positioning member and said second positioning member and a first positioning port associated with the other of said first positioning member and said second positioning member, said first positioning port having a tapered lead in configured to engagably receive and position said first positioning legs free end as the robotic arm attains a target position relative to the workpiece fixture;

(ii) a second positioning leg connected to one of said first positioning member and said second positioning member and a second positioning port associated the other of said first positioning member and said second positioning member, said second positioning port having a tapered lead in configured to engagably receive and position said second positioning leg's free end as the robotic arm attains its target position relative to the workpiece fixture;

(iii) a third positioning leg connected to one of said first positioning member and said second positioning member, said third positioning leg being sized and configured such that its free end engages the other of said first positioning member and said second positioning member when the robotic arm attains its target position relative to the workpiece fixture;

said compliant member providing rotational and translational freedom of movement for said first docking means to precisely position itself with respect to and interlock with said second docking means to ensure that the robotic arm attains the desired three-dimensional coordinates and three-dimensional rotational orientation relative to the workpiece fixture; and

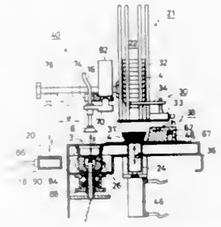
said micro-robotic manipulator being located intermediate said first positioning member and said second positioning member when said first docking means and said second docking means are interlocked, whereby docking of said first and second positioning members produces a translational and rotational six-degree of freedom mechanical closed loop reference frame which separates operation of the independent micro-robotic manipulator from gross movement inaccuracies and vibrations of the robotic arm.

4,919,587

APPARATUS FOR SEPARATING AND TRANSFERRING SOFT CUPS

Yasunori Tashiro, and Yuji Suzuki, both of Tochigi, Japan, assignors to Rheon Automatic Machinery Co., Ltd., Utsunomiya, Japan

Filed Nov. 4, 1988, Ser. No. 267,068
Claims priority, application Japan, Nov. 7, 1987, 62-281648
Int. Cl.[5] B65G *59/10*
U.S. Cl. 414—795.8 8 Claims



1. An apparatus for separating a stack of cups, made of soft material such as paper or aluminum foil, from each other, and transferring them comprising:

(a) a continuously rotating holder means on which a stack of said cups is placed, and

(b) a vertically and horizontally movable non-rotating suction means arranged to be lowered and pressed against the cup at the top of said stack on said rotating holder, suck a cup out of and separate said cup from said stack of cups and, after being raised, to be horizontally moved to transfer said cup to a preselected position.

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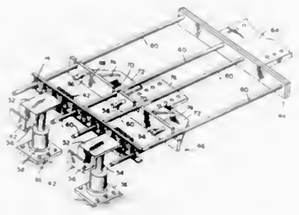
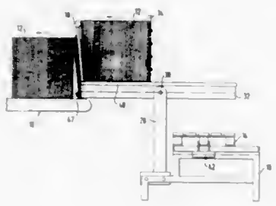
4,919,588
SWEEP STACKER
Charles J. Brun, Xenia, Ohio, assignor to Kindex, Inc., Laura, Ohio
Filed Feb. 13, 1989, Ser. No. 309,178
Int. Cl.[5] B65G *57/16*
U.S. Cl. 414—798.4 **10 Claims**



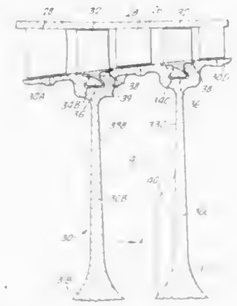
1. Apparatus for stacking a plurality of elements, each element formed to nest with other similar elements, the apparatus comprising:
a base, first track means fixed to the base, and suspending means movable along the first track means with respect to the base into engagement with a plurality of elements for suspending the elements in spaced relation to each other and above the base, the first track means defining the direction and limits of movement of the suspending means;
second track means fixed to the base, and sweeping means comprising at least one stub shaft movable along the second track means in a path parallel to said first track means from a first position adjacent to the elements through a second position engaging all the suspended elements for movement of the elements toward a third position free from the suspending means and into a nesting relation to each other, the second track means defining the direction and limits of movement of the sweeping means, and
abutment means fixed with respect to the base and providing a stop towards which the elements are swept by the sweeping means for accumulating the elements in an accumulated, stacked relationship.

4,919,589
APPARATUS FOR SUPPLYING A STACK OF CARTON BLANKS FORM A PALLET TO THE MAGAZINE OF A CARTON-PACKING MACHINE
Heinz Krappitz, Bredenborn; Herbert Wölfel, Bayreuth, and Johannes Wolfrum, Himmelkron, all of Fed. Rep. of Germany, assignors to B.A.T. Cigarettenfabriken GmbH, Hamburg, Fed. Rep. of Germany
Filed Nov. 16, 1988, Ser. No. 271,683
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1987, 3739659
Int. Cl.[5] B65G *57/01*; B65H *1/02*
U.S. Cl. 414—798.9 **12 Claims**



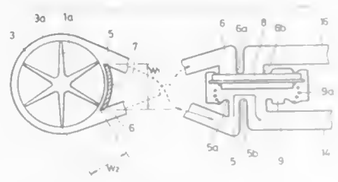
1. An apparatus for supplying a stack of carton blanks from a pallet to the magazine of a carton-packing machine in which the carton blanks are arranged vertically adjacent to each other, in particular for the tobacco industry, comprising
an unloading carriage pivotable about a horizontal axis out of a substantially vertical position into a substantially horizontal position and having an unloading fork with prongs movable along the unloading carriage,
a base member which is reciprocatable by means of a chain drive parallel to a direction in which the pallet is conveyed and in the direction of the gaps between boards at the upper side of the pallet and which comprises vertical supports on which the unloading carriage is pivotally mounted,
the prongs of said fork in the vertical position of the unloading carriage and thus in the horizontal position of the unloading fork being insertable beneath the stack into the gaps between boards at the upper side of the pallet,
a conveying means integrated into the unloading carriage for the transfer of the individual blanks from the unloading carriage to the magazine.

4,919,590
COMPRESSOR AND AIR BLEED ARRANGEMENT
Brian S. Stratford; Edward S. Hadaway; John Chew, and Howard G. Hartland, all of Derby, England, assignors to Rolls-Royce plc, London, England
Continuation of Ser. No. 201,740, Jun. 3, 1988, abandoned. This application Jul. 7, 1989, Ser. No. 376,149
Claims priority, application United Kingdom, Jul. 18, 1987, 8717015
Int. Cl.[5] F04D *31/00*
U.S. Cl. 415—116 **12 Claims**



1. An axial flow compressor comprising a rotor and a casing, the rotor having a plurality of stages of circumferentially spaced radially outwardly extending rotor blades, the rotor comprising at least two axially adjacent rotor discs, the rotor discs being axially spaced and defining a chamber therebetween each rotor disc carrying one of the plurality of stages of rotor blades,
the casing surrounding and being spaced from the rotor and rotor blades,
air bleed means integral with the rotor arranged to bleed a portion of air from the compressor and supply the portion of air radially inwardly to said chamber,
said two axially adjacent rotor discs having opposed radially extending surfaces, at least one of the opposed radially extending surfaces being contoured, the contouring extending axially from the at least one of the opposed radially extending surfaces up to six times the width of a boundary layer formed on the at least one of the opposed radially extending surfaces, the contouring of the at least one of the opposed radially extending surfaces directing the bleed air radially inwardly to prevent the formation of a free vortex within said chamber and thereby reduce pressure losses in the bleed air flowing through the chamber.

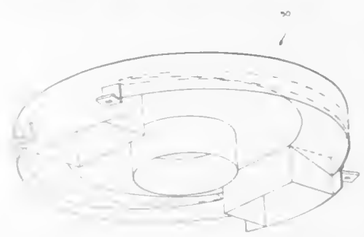
4,919,591
WASHER PUMP FOR AUTOMOBILES
Takeshi Kamimura, Hamamatsu, and Toshihiro Satoh, Toyohashi, both of Japan, assignors to ASMO Co., Ltd., Kosai, Japan
Filed Jun. 2, 1989, Ser. No. 360,463
Claims priority, application Japan, Jun. 3, 1988, 63-73429[U]
Int. Cl.[5] F01D *1/30*
U.S. Cl. 415—152.1 **6 Claims**



1. A centrifugal washer pump for an automobile for supplying a cleaning fluid selectively to first and second washer nozzles of the automobile, comprising:
(a) an impeller having a plurality of radially extending vanes circumferentially spaced at equal intervals;
(b) a substantially circular centrifugal pump chamber receiving concentrically therein said impeller and having an inlet disposed in alignment with a central axis of said impeller for supplying the cleaning fluid to the center of said impeller, and first and second outlets defined in a sidewall of said centrifugal pump chamber and extending tangentially to said sidewall, said first and second outlets being subjected to different positive pressures when said impeller is rotating;
(c) a directional control valve including a valve chamber connected in fluid communication with said pump chamber through said first outlet and also through said second outlet, and a valve element movably disposed in said valve chamber for selectively connecting said first and second outlets, respectively, to the first and second washer nozzles; and
(d) a projection disposed between said first and second outlets and projecting inwardly from said sidewall of said centrifugal pump chamber toward said impeller for substantially blocking the flow of the cleaning fluid between said first and second outlets to thereby increase the pressure difference between said first and second outlets.

4,919,592
RADIALLY COMPACT FLUID COMPRESSOR
Stephan B. Sears, and Dan M. Pomeroy, both of Menlo Park, Calif., assignors to Superstill Technology, Inc., Redwood City, Calif.
Filed Jan. 18, 1989, Ser. No. 298,552
Int. Cl.[5] F04D *29/42*
U.S. Cl. 415—207 **1 Claim**

1. A centrifugal type of fluid compressor, comprising:
an impeller assembly including a horizontally extending impeller having an outermost edge defining an outermost horizontal, circumferential path of movement and means for rotating said impeller in a given direction so as to drive its outermost edge through said circumferential path, and
a compressor housing surrounding said impeller and together with the impeller defining a fluid collection chamber extending between a first upstream end and a second fluid exiting downstream end, said collection chamber progressively enlarging vertically from its upstream end to its downstream end, whereby fluid passing through said collection chamber from its upstream end to its downstream end progressively decreases in velocity and therefore progressively increases in static pressure,
wherein said collection chamber does not enlarge horizontally outward relative to said outermost horizontal path of movement of said impeller at any point between its entry and exit end, whereby to minimize the maximum horizontal dimensions of the overall compression housing,
wherein said collection chamber as it approaches its downstream exit end includes a section which extends vertically beyond said impeller,
wherein said section of said collection chamber extending vertically beyond said impeller includes a segment thereof extending horizontally inward of said impeller,



wherein said collection chamber defines a downwardly and inwardly spiralling path from its upstream end to its downstream exit end,
wherein said upstream and downstream ends of said collection chamber are spaced about 180 degrees from one another about said outmost circumferential path of said impeller, wherein said collection chamber extends between said ends on one side of said path and wherein said compressor housing and said impeller together define a second substantially identical collection chamber on the opposite side of said path, between said ends, said second collection chamber spiralling downwardly and inwardly from said downstream end to said upstream end, whereby the upstream end of one collection chamber serves as the downstream end of the other and vice versa.

4,919,593
RETROFITTED ROTOR BLADES FOR STEAM TURBINES AND METHOD OF MAKING THE SAME
Wilmott G. Brown, Winter Park, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Aug. 30, 1988, Ser. No. 238,439
Int. Cl.[5] F04D *29/38*
U.S. Cl. 416—223 A **7 Claims**

1. A steam turbine rotor assembly, comprising:
a rotor rotatable at a predetermined running speed which determines a harmonic series of vibratory frequencies;
at least one row of retrofitted rotor blades mounted on the

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rotor and vibrating at running speed in a plurality of directions, each direction of vibration having a corresponding natural resonant frequency, and each retrofitted rotor blade having a length greater than that of the rotor blades which were originally designed for the same row;

a lower lashing wire and an upper lashing wire for lashing the retrofitted rotor blades together in groups of at least three adjacent retrofitted rotor blades per group, the upper and lower lashing wires extending between each two adjacent retrofitted rotor blades of a group;

each retrofitted rotor blade having a root portion of substantially the same size and shape as the original rotor blade, a platform portion, and an airfoil portion, the airfoil portion having a leading edge, a trailing edge, a pressure-side surface, a vacuum-side surface, a proximal end base, and a distal end tip, the configuration of the airfoil portion being defined in accordance with a plurality of equidistantly spaced plane slices transverse to the length thereof beginning at the base and ending at the tip, the area between two adjacent plane slices defining a plurality of sections, each having a center of gravity, the centers of gravity for all sections being vertically aligned;

the lower lashing wires of the retrofitted rotor blades being positioned to tune the resonant frequency of the blades with respect to one of the vibrational directions and the upper lashing wire being positioned to tune the resonant frequency of the rotor blade with respect to another of the vibrational directions, the lower lashing wire of the retrofitted rotor blades having an increased thickness compared to the lower wire of the original rotor blades;

at least one of the sections of the airfoil portion of the retrofitted rotor blade nearest the root having an increased width compared to correspondingly located sections of the original rotor blade, at least one of the sections of the airfoil portion of the retrofitted rotor blade nearest the distal end tip having a decreased width compared to correspondingly located sections of the original rotor blade;

the distal end tip of the retrofitted rotor blade being profiled;

the section next to the distal end tip of the airfoil portion of each retrofitted rotor blade and the section adjacent thereto having pressure-side and vacuum-side surfaces which are convex, and the remaining sections having concave pressure-side surfaces and convex vacuum-side surfaces; and

the position and thickness of the lower lashing wire, the number of blades in a lashed group, the width of the airfoil sections, and the profiling of the tip combining to increase the rotor blade natural resonant frequencies for the plurality of vibrational directions to frequency levels which fall between, but not in proximity to, the frequencies of the harmonic series, thereby compensating for a decrease in resonant frequency associated with the lengthening of the retrofitted rotor blade.

4,919,594

COMPOSITE MEMBER, UNITARY ROTOR MEMBER INCLUDING SAME, AND METHOD OF MAKING

E. Scott Wright, Mesa, and James G. Kenehan, Phoenix, both of Ariz., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 51,000, May 15, 1987. This application Mar. 8, 1989, Ser. No. 320,744

Int. Cl.[5] F23C *11/00;* **B23P** *17/00*

U.S. Cl. 416—230 **14 Claims**

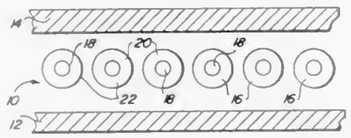
1. The method of making a ceramic fiber/metal matrix composite member of desired annular configuration including the steps of:

providing an elongate unidirectional mat of ceramic filaments;

laminating said unidirectional mat of ceramic filaments between a pair of elongate metallic foils;

consolidating said laminated unidirectional ceramic filament mat with said pair of metallic foils to form an elongate unitary composite ceramic fiber/metal matrix ribbon;

circumferentially winding said elongate ceramic fiber/metal matrix ribbon to define an annular hoop form having multiple layers of said ribbon;



enclosing said annular hoop form in a closed metallic can;

consolidating said hoop form and said metallic can to form a unitary composite workpiece; and

forming said workpiece to said desired annular configuration.

4,919,595

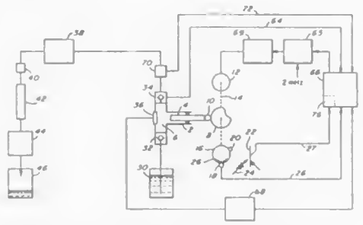
FLUID DELIVERY SYSTEM WITH DEFICIT FLOW COMPENSATION

Robert K. Likuski, Castro Valley, and Scott N. MacDonald, Pleasant Hill, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 3, 1987, Ser. No. 21,389

Int. Cl.[5] F04B *49/00;* **B01D** *15/08*

U.S. Cl. 417—18 **61 Claims**



1. A fluid delivery apparatus for delivering fluid to a fluid receiving system comprising:

(a) at least one pump having a piston for reciprocation within a pump chamber, said pump having a fluid inlet and a fluid outlet;

(b) isolating means for periodically isolating the outlet of said pump from the remainder of the fluid system for a period of time thereby creating a deficit flow period;

(c) refill means for refilling said pump chamber during said deficit flow period;

(d) variable piston drive means for driving said piston at various velocities;

(e) control means connected to said drive means for controlling the speed of said drive means;

(f) said control means including means for driving said drive means at a first predetermined speed during a normal delivery period to deliver fluid to said system at a normal delivery rate;

(g) deficit flow determining means for determining the quantity of fluid which would have been delivered during said deficit flow period had said pump been delivering fluid to said system at said normal delivery rate;

(h) said control means further including compensation means for driving said drive means at a second predetermined speed during a compensation period for a time sufficient to compensate for the deficiency in flow during said deficit flow period.

4,919,596

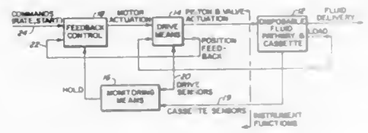
FLUID DELIVERY CONTROL AND MONITORING APPARATUS FOR A MEDICATION INFUSION SYSTEM

John B. Slate, Studio City, and James L. Henke, Simi Valley, both of Calif., assignors to Pacesetter Infusion, Ltd., Sylmar, Calif.

Continuation of Ser. No. 128,973, Dec. 4, 1987, abandoned. This application Apr. 26, 1989, Ser. No. 344,494

Int. Cl.[5] F04B *23/06*

U.S. Cl. 417—18 **14 Claims**



12. The apparatus of claim 1 wherein said encoding means comprise a disk mounted to rotate with said drive means, said disk having a plurality of indicia located at selected points about its periphery for indicating rate of movement of the drive means.

4,919,597

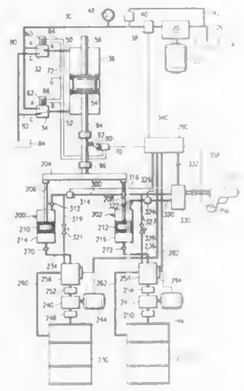
PUMP APPARATUS FOR MULTIPLE COMPONENT FLUIDS

Kenneth J. Kistner, Midlothian, Tex., assignor to Specified Equipment Systems Co., Inc., Dallas, Tex.

Filed Jun. 15, 1988, Ser. No. 206,658

Int. Cl.[5] F04B *9/08, 23/04*

U.S. Cl. 417—403 **6 Claims**



1. A system for pumping one or more fluids comprising:

a drive piston for movement in a drive cylinder;

valve means for controlling the reciprocation of said drive piston by controlling the application of fluid on opposite sides of said piston, said valve means comprising two selectively controllable two-position, three port valves, the three ports being a port to inlet pressure, a port to the drive piston and a port to the non-pressurized tank, said valves being switchable between first and second positions, wherein in the first position, pressurized fluid is communicated above the piston and fluid below the piston is opened to a non-pressurized tank thereby driving said piston in a first direction and wherein in the second position, pressurized fluid is communicated below the piston and fluid above the piston is opened to a non-pressurized tank thereby driving said piston in a second direction;

pump piston means driven by the reciprocating movement of said drive piston for pumping said one or more fluids to a discharge; and

switch means for simultaneously switching both said valves to their off position wherein the drive cylinder port is connected to the tank port and wherein in said off position, spring means switches said valves to connect the cylinder port to the tank port.

4,919,598

VACUUM PUMPS

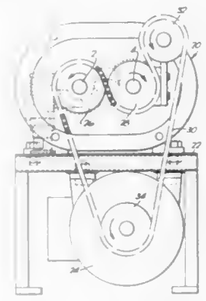
Henryk Wycliffe, Crawley, England, assignor to The BOC Group, Inc., Murray Hill, New Providence, N.J.

Filed Jul. 15, 1988, Ser. No. 219,620

Claims priority, application United Kingdom, Jul. 18, 1987, 8717006

Int. Cl.[5] F04B *9/00*

U.S. Cl. 417—362 **3 Claims**



1. In an oil free mechanical vacuum pump including a pair of rotatable shaft supporting at least one pair of intermeshing rotors, the improvement comprising: a pair of spaced apart, rotatable driven means attached to the shafts and each having a circumference adapted to be driven for rotating the shafts; and flexible, band-like drive means passing between the driven means and on opposite sides thereof circumferentially engaged with the pair of driven means for driving the driven means and therefore, the shafts and rotors for rotation in opposite angular directions; the drive and pair of driven means having coating means for preventing slippage therebetween.

4,919,599

PUMPING SYSTEM FOR A LEAK DETECTING DEVICE

Gunter Reich, Cologne, Fed. Rep. of Germany, and William Worthington, Syracuse, N.Y., assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Jun. 1, 1989, Ser. No. 359,587

Claims priority, application European Pat. Off., Jun. 1, 1988, 88108769.6

Int. Cl.[5] F04D *19/04;* **G01M** *3/20*

U.S. Cl. 417—423.4 **9 Claims**

1. Pumping system for a leak detecting device for detecting a gas leaking from test piece by means of a gas detector and operating on the counter current principle, said system comprising

a shaft;

a first turbomolecular pumping stage on said shaft and having an inlet, to which said test piece is connected;

a first molecular pumping stage on said shaft downstream of said first turbomolecular pumping stage and connected thereto by a first passage and having an outlet;

a second turbomulecular pumping stage on said shaft and having an inlet, to which said gas detector is connected;

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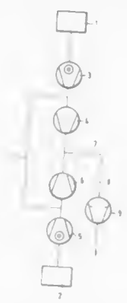
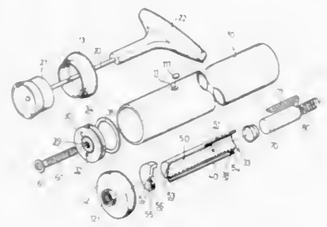
a second molecular pumping stage on said shaft downstream of said second turbomolecular pumping stage and connected thereto by a second passage and having an outlet in common with the outlet of the first molecular pumping stage;



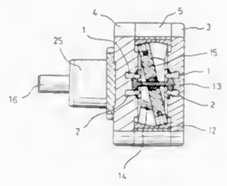
a connection between said first and second passages;
a pre-vacuum pump having an inlet connected to the common outlet of the molecular pumping stages.

4,919,600
TIRE PUMP WITH A PRESSURE GAGE
Shia K. Yang, No. 20, Lane 164, Yang Ming St., Pan Chiao City, Taipei Hsien, Taiwan
Filed Jun. 29, 1989, Ser. No. 373,798
Int. Cl.[5] F04B *33/00*
U.S. Cl. 417—63 5 Claims



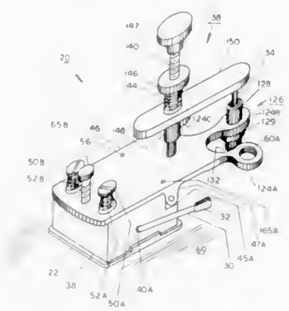
1. A tire pump with a pressure gage comprising generally a cylinder having a piston rod and a piston head slidably provided therein; a handle being fixed on a free end of said piston rod; a peep hole being formed in said cylinder; an outlet being formed at a front end of said cylinder; a pressure measuring device with a pressure indicating element being disposed at a front end of said cylinder, said pressure measuring device including a disc having a through hole, said disc being fixed within said cylinder at a substantially intermediate position thereof, said through hole being aligned with said bypass tube, a second cylinder with a second piston slidably provided therein being clamped within said front end of said cylinder by said disc, said pressure indicating element being integrally disposed on said second piston and aligned with said peep hole, and a spring member bearing between said second piston and said disc; a first air hole formed at a front end of said second piston being aligned with said outlet of said cylinder; and a bypass tube with a check valve being disposed beside said pressure measuring device such that air pressurized by said piston head flows out from said outlet through said bypass tube; said pressurized air also flowing through said first air hole so that pressure within a pumped tire is readable from said pressure indicating element of said pressure measuring device through said peep hole.

4,919,601
WAVEFORM ACTUATING AIR COMPRESSOR
Jong D. Kim, 362, Chongdang-dong, Chonan-shi, Chungchongnam-do, Rep. of Korea
Filed Feb. 14, 1989, Ser. No. 310,745
Claims priority, application Rep. of Korea, Feb. 15, 1988, 19881581
Int. Cl.[5] F01C *3/06*
U.S. Cl. 418—51 10 Claims



1. A waveform actuating machine comprising:
a main casing having a cylindrical cavity in which a liner having a band-like spherical surface is inserted;
a left casing having a conical surface which forms a bearing bore with an inner partial spherical surface;
a right casing symmetrical to said left casing having a conical surface which forms a bearing bore with an inner partial spherical surface, said main casing and said left and right casings being bolted to form an air chamber;
an intake port and an exhaust port formed at concave grooves of said left and right casings; and
a tilting disc having a bearing dome on each side, said disc being inserted in said liner, journaled to an eccentric shaft, and provided with a slot for inserting a compartment plate,
wherein said compartment plate is H-shaped, having two wings formed with rectangular bores facing said intake and exhaust ports.

4,919,602
APPARATUS FOR REPAIRING WINDSHIELDS
Arthur W. Janszen, 9730 Grenadier, Houston, Tex. 77089
Continuation-in-part of Ser. No. 135,585, Dec. 21, 1987, abandoned. This application Feb. 28, 1989, Ser. No. 316,654
Int. Cl.[5] B29C *31/04, 73/24;* B32B *35/00*
U.S. Cl. 425—12 28 Claims



1. An apparatus to make in situ repairs with liquid resin to damage at or proximal to the surface of a shatterproof windshield, comprising:

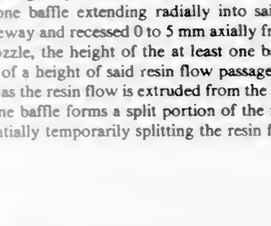
securing means for releasably attaching said apparatus to said windshield surface,
an injector assembly for transporting said resin to said damage,
adapting means pivotally interconnecting said injector assembly with said securing means,
housing means fixedly interconnecting said securing means and said adapting means,
said adapting means having support means disposed at one end portion thereof to receive said injector assembly and having control means disposed at the other opposite end portion to control the disposition of said injector assembly with respect to said damage, and
said securing means including a substantially flat membrane comprising the bottom portion of said housing means and adapted to engage said windshield surface by creating a vacuum within said housing means.

4,919,603
DEVICE FOR REPAIRING WINDSHIELDS
Wolf-Dietrich Herold, Seefeld, and Peter Koran, Weilheim, both of Fed. Rep. of Germany, assignors to ESPE Stiftung & Co. Produktions - und Vertriebs KG, Seefeld, Fed. Rep. of Germany
Filed May 3, 1989, Ser. No. 346,733
Claims priority, application Fed. Rep. of Germany, May 11, 1988, 8806284[U]
Int. Cl.[5] B32B *35/00*
U.S. Cl. 425—12 10 Claims

1. A device for repairing a damaged portion caused by a stone on a windshield by means of a liquid clear-curing synthetic resin, comprising
a syringe composed of a cylindrical casing with a discharge opening and a vent hole penetrating a wall of the casing, and a plunger movable withing said casing from a forward to a rearward position, and
sealing means for hermetically sealing said discharge opening and said damaged portion relative to the ambient atmosphere,
wherein said vent hole is disposed near the rear end of said casing remote from said discharge opening so as to communicate with the interior space of the casing between said plunger and said discharge opening when said plunger is retracted to said rearward position.

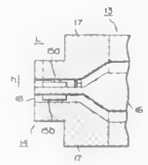
4,919,604
FINISHING TOOL
Jim Wilson, 20987 Turner Dr., Tulare, Calif. 93274
Filed Sep. 16, 1988, Ser. No. 245,040
Int. Cl.[5] E04F *21/06, 21/16*
U.S. Cl. 425—458 8 Claims

1. A tool for finishing drywall surfaces in areas where there is a joinder of surfaces at an oblique angle, comprising:
a blade having an arcuate leading edge, a top surface and a bottom surface, said blade being formed of a relatively flexible material so that said blade is deformable to assume the contour of an area being finished;
a finishing surface formed about the periphery of said blade, said finishing surface being tapered from said top surface to said arcuate leading edge;



a handle attached to said blade to permit manipulation of said blade; and
a rigid spine means secured to said blade along a longitudinal axis thereof for rigidly supporting said blade, said rigid spine means extending from said handle to a point in proximity of said finishing surface.

4,919,605
EXTRUSION APPARATUS FOR MOLDING GUIDING TUBE FOR MEDICAL INSTRUMENTS
Tadashi Kousai; Yousuke Morinchi, and Toshinobu Ishida, all of Fujisomiya, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 48,675, May 11, 1987, Pat. No. 4,830,805. This application Nov. 9, 1988, Ser. No. 269,727
Claims priority, application Japan, May 14, 1986, 61-109922
Int. Cl.[5] B29C *47/20*
U.S. Cl. 425—467 2 Claims



1. An extruder for producing a synthetic resin tube for guiding rod-like medical instruments into a living body, said tube having a tubular body with a circular hollow transverse cross section of a uniform thickness and being capable of positioning the rod-like medical instruments, and having at least one brittle portion and another portion, said at least one brittle portion being formed so that the splitting strength thereof is smaller than the splitting strength of said other portion over at least the entire length of the tubular body except the end thereof, said at least one brittle portion being formed of the same material as the other portion, said extruder comprising:
a die including a nozzle having means for defining a resin flow passageway of annular cross-section;
at least one baffle extending radially into said resin flow passageway and recessed 0 to 5 mm axially from an end of said nozzle, the height of the at least one baffle being at least ½ of a height of said resin flow passageway;
whereby as the resin flow is extruded from the nozzle, the at least one baffle forms a split portion of the resin flow by substantially temporarily splitting the resin flow which is

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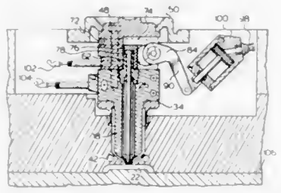
then recombined to form the brittle portion of the resin tube at the split portion of the resin flow.

4,919,606

INJECTION MOLDING RACK AND PINION VALVE PIN ACTUATING MECHANISM

Jobst U. Gellert, 7A Prince Street, Georgetown, Ontario, Canada (L7G 2X1)

Filed Dec. 21, 1988, Ser. No. 287,161
Int. Cl.[5] B29C *45/20*
U.S. Cl. 425—549 **13 Claims**



1. In a valve gated hot runner injection molding apparatus having a heated nozzle which is seated in a cavity plate and secured to a heated manifold, a pneumatically activated elongated valve pin which reciprocates longitudinally between a retracted open position and a forward closed position in a central bore in the nozzle which is in alignment with a gate extending through the cavity plate to a cavity, the valve pin having a driven end and a tip end which seats in the gate in the closed position, a melt passage to convey pressurized melt from an inlet in the manifold to the gate which extends through the manifold and along the valve pin in the central bore of the nozzle, and a valve pin bushing which is seated in the nozzle with a rearwardly extending portion which projects into the manifold, the valve pin bushing having a valve pin bore extending therethrough in alignment with the central bore of the nozzle to receive the valve pin therethrough to prevent substantial leakage of the pressurized melt around the reciprocating valve pin, the improvement wherein;

(a) a rack member is longitudinally slidably received in a radial opening in the manifold to engage the driven end of the valve pin, the rack member having a toothed portion with a longitudinal row of teeth which face outwardly in the radial opening;

(b) a pivotally mounted pinion member with a plurality of teeth which engage the teeth of the rack member, and

(c) double acting pneumatic actuating means connected to pivot the pinion member through a predetermined angle according to a predetermined cycle whereby the rack member and the valve pin are reciprocated longitudinally between the open and closed positions, wherein the rack member has an inward surface which abuts against a matching surface of the radial opening in the manifold to retain the rack member in longitudinal alignment with the valve pin and absorb substantially all lateral forces received from the pinion member as the rack member and valve pin are reciprocated between the open and closed positions.

4,919,607

ROTARY BLOW MOLDING MACHINE HAVING MOLD STATION BLOWING/NECK FINISHING MECHANISMS

M. Warren Martin, Saline, and Lawrence H. Weber, Ypsilanti, both of Mich., assignors to R & B Mchine Tool Company, Saline, Mich.

Filed Oct. 3, 1988, Ser. No. 252,741
Int. Cl.[5] B29C *49/58*
U.S. Cl. 425—531 **26 Claims**

1. A rotary blow molding machine comprising:

(a) a base,

(b) a carousel rotatably supported on the base,

(c) means for rotating the carousel,

(d) a plurality of mold stations carried on the carousel in circumferentially spaced apart relation thereon, said mold stations each comprising a pair of mold sections openable and closeable to define, when closed, a blowing cavity and a mold mouth communicating with the blowing cavity and opening outside the closed mold sections, and

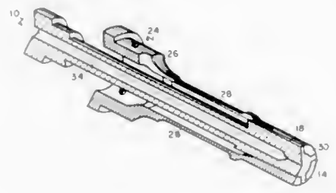
(e) blowing mechanism cooperatively associated with each mold station, said blowing mechanism having a blow pin movable between a retracted position external of the mold mouth and a blowing position inserted in the mold mouth, means for moving the blow pin in an arcuate path from the retracted position to the blowing position to insert the blow pin in the mold mouth to blow a parison received in the blowing cavity and from the blowing position to the retracted position to withdraw the blow pin from the mold mouth, and means for supplying fluid pressure to the blow pin at the blowing position.

4,919,608

MOLDING APPARATUS WITH COLLAPSIBLE CORE

Paul Catalanotti, West Newton, and Ali Lotfi, Quincy, both of Mass., assignors to Roehr Tool Corporation, Hudson, Mass.

Filed Oct. 4, 1988, Ser. No. 253,127
Int. Cl.[5] B29C *33/48*
U.S. Cl. 425—556 **10 Claims**



1. An injection mold apparatus which comprises:

(a) a mold having a mold cavity therein and a plastic injection inlet into the mold cavity for injection of a plastic to form a plastic article;

(b) a core assembly which comprises in combination:

(i) an axially-retractable center core pin having a first and second end and having at the first end a pin face, said axially-retractable center core pin having a plurality of elongated, equally radially-spaced apart, raised, non-collapsible segments extending to and forming part of the pin face at the first end;

(ii) a core sleeve positioned about the center core pin and having a first and a second end, said core sleeve having a core face at the first end and a base at the second end of the core sleeve and, said core sleeve further having extending from said base a plurality of elongated, equally radially-spaced apart, flexible, collapsible segments extending to the core face, the collapsible segments each having concentric, arcuate interior and exterior surfaces with radial extending side surfaces, the number of collapsible and non-collapsible segments are equal;

(iii) the collapsible segments and the non-collapsible segments in the expanded, non-collapsed position are arranged in a close, mating, alternating relationship to form a generally circular pin and core face assembly; and

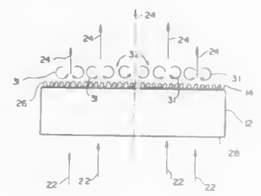
(iv) the collapsible and non-collapsible segments in the collapsed position are arranged wherein the non-collapsible segments are in an axially retracted position and the collapsible segments are in a radially inwardly collapsed relationship with the side surfaces at the core face of the collapsible segments in a close, parallel, non-touching relationship to each other, thereby permitting molding of a plastic article with a deep undercut section and non-undercut section.

4,919,609

CERAMIC TILE BURNER

Paul H. Sarkisian, Watertown, and Frederick E. Becker, Reading, both of Mass., assignors to Gas Research Institute, Chicago, Ill.

Filed May 2, 1989, Ser. No. 346,588
Int. Cl.[5] F23D *3/40, 14/12*
U.S. Cl. 431—7 **9 Claims**



1. A method of generating high specific heat output in a natural gas-fueled burner comprising:

providing a high-porosity ceramic body having an input surface, an output surface, and a multiplicity of channels substantially normal to said surfaces;

positioning a coarse metal mesh parallel to an abutting said output surface of said high-porosity ceramic body;

pumping a pressurized mixture of fuel gas and air through said high-porosity ceramic body from said input surface to said output surface;

generating with said coarse metal mesh turbulent flow of the pressurized mixture of fuel gas and air as it leaves the high-porosity ceramic burner;

igniting said pressurized mixture on said metal mesh to generate a flame; and allowing said coarse metal mesh to stabilize the flame resulting from the ignition of said pressurized mixture.

4,919,610

GAS LIGHTER

Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Yokohama, Japan

Filed Dec. 16, 1988, Ser. No. 285,456
Claims priority, application Japan, Dec. 28, 1987, 62-197399[U]
Int. Cl.[5] F23Q *1/02*
U.S. Cl. 431—274 **1 Claim**

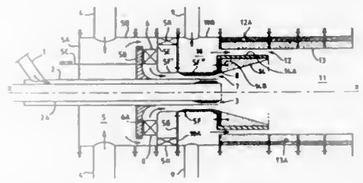
1. A gas lighter comprising a main body having a gas well, a gas-ejection valve means fixed to the ceiling of the gas well and including a vertical gas-ejection nozzle, a cap operatively connected to the gas-ejection nozzle to open and close the valve means, a fire-striking unit fixed to the top of the main body and having a rotatable file adapted to rotate in a horizontal plane, and a separate connecting pipe assembly fixed to an underside of the fire-striking unit and including a pipe having a rear end and a top end, the pipe being fitted onto and communicating with the gas-ejection nozzle at its rear end and being open at its top end in the vicinity of the rotatable file.

4,919,611

FLUID FUEL COMBUSTION PROCESS AND TURBULENT-FLOW BURNER FOR IMPLEMENTING SAME

Gérard Flament, Douai, France, assignor to Charbonnages de France, Paris, France

Division of Ser. No. 96,306, Sep. 8, 1987, Pat. No. 4,838,185, which is a continuation of Ser. No. 856,975, Apr. 29, 1986, abandoned. This application Apr. 17, 1989, Ser. No. 338,700
Claims priority, application France, May 3, 1985, 85 06750
The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.
Int. Cl.[5] F23D *14/46, 1/02*
U.S. Cl. 431—350 **4 Claims**



1. Turbulent-flow burner comprising a burner outlet, a coaxial cylindrical combustion chamber delimited by a refractory

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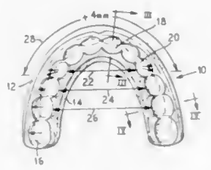
material lined confinement wall which extends downstream, a refractory material frustoconical throat, having a downstream and an upstream end, linking said burner outlet to said chamber, said frustoconical throat extending outwardly downstream at a half angle of about 10°–35°, a pipe for feeding fuel and primary air along an axis through the burner outlet, a feed device for injecting secondary air in a helical path around said axis through said burner outlet, injection means, disposed as a ring along a plane defined by said downstream end of said frustoconical throat, for injecting unheated tertiary air downstream therefrom as a continuous air jacket adjacent to extending along and confined by said confinement wall downstream of said downstream end of said frustoconical throat, means for supplying unheated tertiary air to said injecting means, said air jacket also extending substantially parallel to the direction in which the fuel is injected, said injecting means being situated coaxial with the wall of the cylindrical combustion chamber, said injecting means having between 1.8 and 3.6 times the diameter of the burner outlet and said coaxial cylindrical combustion chamber extending downstream over a length between 0.2 and 1 times its diameter, the injecting means being positioned to discharge in a plane perpendicular to said axis and being situated at a distance downstream from the burner outlet between 0.5 and 1.5 times the diameter of the burner outlet, said jacket of unheated tertiary air defining means for cooling the wall of the cylindrical combustion chamber during combustion to stabilize a flame therein.

4,919,612

DENTAL-FORM EXPANSION APPLIANCE

Earl O. Bergersen, 950 Green Bay Rd., Winnetka, Ill. 60093

Filed Nov. 6, 1987, Ser. No. 117,565
Int. Cl.[5] A61C 7/00
U.S. Cl. 433—6 13 Claims



1. An orthodontic appliance of the type which is generally U-shaped in plan view and which includes a tooth receiving trough for at least one of the upper or lower row of a patient's teeth, said trough being formed between a labial-buccal flange and a lingual flange,

said appliance being preformed with individual tooth receiving sockets for each of the canine and posterior teeth and said sockets being positioned with a lateral spacing in excess of the normal lateral tooth spacing of the patient.

4,919,613

METHOD AND APPARATUS FOR CALCINATION

David W. Watkins, Nottingham, United Kingdom, assignor to BPB Industries Public Limited Company, Slough, United Kingdom

Filed Feb. 7, 1989, Ser. No. 307,251
Claims priority, application United Kingdom, Feb. 8, 1988, 8802765
Int. Cl.[5] F27B 15/00; B01J 8/18
U.S. Cl. 432—58 5 Claims

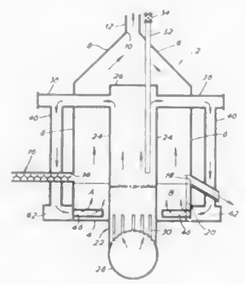
1. An apparatus for calcining calcium sulphate dihydrate or other heat-reactive material, which comprises:

a series of containers for containing respective beds of material, each of said containers having upper and lower regions;

means for feeding untreated material into a first of said containers;

means for transferring partly calcined material from said first container to a second of said containers;

means for removing calcined material from the last container of said series;



a supply of hot gas;

ducting for bringing said hot gas into indirect heat exchange relationship with said containers;

and means for introducing said hot gas from said ducting into said lower regions of said containers for fluidization of the beds therein.

4,919,614

APPARATUS FOR HEAT TREATMENT OF A SUBSTRATE

Kunio Kitagawa; Akira Maeda, and Yoshio Matsumura, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Continuation of Ser. No. 197,692, May 23, 1988, abandoned. This application Jun. 19, 1989, Ser. No. 368,923
Claims priority, application Japan, May 30, 1987, 62-85298[U]
Int. Cl.[5] F27D 5/00
U.S. Cl. 432—259 3 Claims

1. An apparatus for the heat treatment of a substrate for heating or cooling the substrate, comprising:

a heat treating plate having either heating or cooling means, a main surface and a plurality of through-holes arranged spaced apart from each other by a prescribed internal;

three concave portions provided in spaced relationship with each other on a surface of said heat treating plate and each having the same depth, the positions of said three concave portions being selected so as to place said substrate a predetermined spacing above said main surface to facilitate heat exchange between said substrate and said main surface;

three balls respectively and detachably retained in said three concave portions and having the same diameter which is larger than the depth of said concave portions for placing said substrate on the top portion thereof and thereby defining said predetermined spacing; and

substrate elevating means capable of being protruded to said main surface of said heat treating plate and being retracted from said main surface through said through-holes with said means provided with a placing portion for placing said substrate on the upper portion thereof;

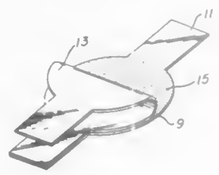
said substrate elevating means comprising a plurality of pins which are raised and lowered through said plurality of through-holes and having their upper end portions maintained at the same height, with the upper end of said plurality of pins constituting said placing portions.

4,919,615

ORTHODONTIC BAND CAP

Theodore P. Croll, 4242 Mechanicsville Rd., Mechanicsville, Pa. 18934

Filed Apr. 28, 1989, Ser. No. 344,382
Int. Cl.[5] A61C 3/00
U.S. Cl. 433—3 2 Claims



1. In dentistry, a cap for an orthodontic band to facilitate cementation thereof, comprising:

a. a thin, flat base element having a substantially circular central portion containing a surface adhesive;

b. two or more tabs extending from the edge of said central portion, said tabs not containing any surface adhesive and being part of said base element; and,

c. a peel-off cover at least co-extensive with said surface adhesive applied to the top surface of said central portion for isolating the adhesive until it is ready for use.

4,919,616

DENTAL SPATULA WITH DISPLAY POSTS

Theodore P. Croll, 4232 Mechanicsville Rd., Mechanicsville, Pa. 18934

Filed Aug. 25, 1989, Ser. No. 398,524
Int. Cl.[5] A61C 19/10, 3/00
U.S. Cl. 433—26 4 Claims

1. A dental spatula for mixing and displaying composite resin samples, comprising:

a. an elongate body which includes a plurality of laterally projecting display posts; and

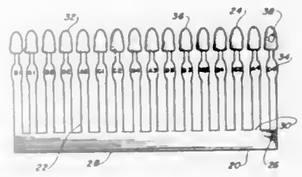
b. a spatula head at one end opposite said elongate body, said spatula head angled approximately 120 degrees with respect to said elongate body.

4,919,617

DISPOSABLE TOOTH COLOR SHADE GUIDE

Peter Antons, and Samra L. Antons, both of 2 Oak Grove, Irvine, Calif. 92714

Filed Apr. 7, 1989, Ser. No. 334,364
Int. Cl.[5] A61C 19/10
U.S. Cl. 433—26 11 Claims



1. A disposable tooth color shade guide for identifying the industry standard color of teeth comprising:

(a) a flat thin body having a front and a back;

(b) at least one finger formed integral with said body having an extended end and an attached end;

(c) a base portion, formed integrally with said body, having perforations dividing the base from each finger at the attached end such that the finger may be removed by tearing, allowing an individual finger of the guide to be used and discarded thereafter;

(d) a distinct color shade specimen disposed upon the front extended end of each finger, each specimen having a different hue severally matching the industry standard for the majority of human teeth;

(e) an opaque outline on the periphery of each color shade specimen distinctly defining the contrast over the true tooth color; and,

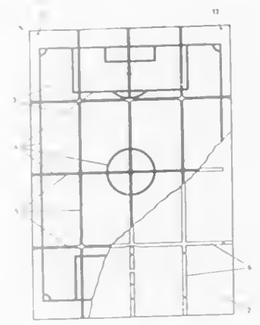
(f) indicia residing on each finger connotating the customary standard shade of each specimen allowing a tooth to be matched in color when being replaced by a dental prosthesis.

4,919,618

GAME BOARD WITH PLAYER FIGURES FOR TEACHING TEAM SPORTS

Ole Andersen, Oberstmuhle 3, CH-6370 Stans, Switzerland

Filed Feb. 22, 1989, Ser. No. 313,528
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1988, 8813456[U]
Int. Cl.[5] G09B 1/06
U.S. Cl. 434—251 7 Claims



1. A game board with player figures for teaching team sports, said board comprising:

field markings of a playing field drawn thereon at a reduced

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scale and wherein the figures can be disposed removably on the board;

a foldable, flat support;

rectangular plastic plates, glued on the support at a distance from each other forming gaps on the support between the plates, the gaps between the plates forming fold lines in the support along which the game board can be folded, said plates being rigid in comparison with the support and having smooth surfaces on which the field markings are disposed; and

wherein the figures consist of a laminate of a thin adhesive foil at a back side thereof and a thicker plastic foil laminated on the adhesive foil.

4,919,619

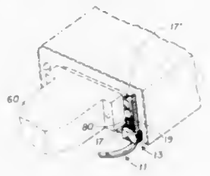
LOCAL AREA NETWORK TRANSCEIVER CABLE LOCK

Conrad Chompff, Concord, Calif., assignor to A 'n D Cable Products, Inc., Concord, Calif.

Filed Mar. 29, 1989, Ser. No. 330,146

Int. Cl.[5] H01R *13/639*

U.S. Cl. 439—371 **11 Claims**



1. A device for preventing the accidental release of the electrical connection between a multihole female electrical connector from its counterpart multipin male connector, which connection is to be maintained by the disposition of an IEEE 802.3 standard slidelock, which slidelock includes a side mounted U-shaped flange on each side thereof, a bigger one and a smaller one and which slidelock is disposed on one of said connectors in engagement with one of a pair of spaced posts disposed spaced from the connector not having the slidelock thereupon;

which device comprises a slidelock retention means which engages said slidelock and is interposed between the smaller of said U-shaped flange and one of either the top or bottom flanges and one of said studs,

wherein the slidelock retention means comprises:

a head section which may be generally rectangular and which is attached to the main body portion, extending axially therefrom are a spaced pair of parallel locking fingers, an inner finger and an outer finger.

4,919,620

CONNECTOR DEVICE FOR A STEERING SYSTEM

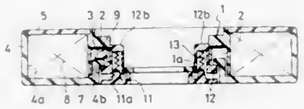
Xiichi Yamaguchi, and Takehiko Itoh, both of Toda, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1989, Ser. No. 332,633

Claims priority, application Japan, Jun. 20, 1988, 63-80572[U]

Int. Cl.[5] H01R *35/04*

U.S. Cl. 439—15 **4 Claims**



1. A connector device for a steering system comprising an inner compartment and an outer compartment formed between a movable member and a fixed member which are rotatably connected to each other, said inner compartment accommodating a conductor plate and a scraper electrically engaged with said conductor plate, whereas said outer compartment accommodates a cable wound in a plurality of turns, said conductor plate and said scraper being moved relative to each other as the movable member is rotated and at the same time said cable is being wound or unwound according to the direction of rotation of said movable member, wherein said device further comprises a partition wall provided on said fixed member projecting into said inner compartment for rigidly fixing either said conductor plate or said scraper to an upper surface of said partition wall, an anchoring member located along the inner periphery of said partition wall, a stopper member provided on said movable member and resiliently biased against said anchoring member to prevent movement between said fixed and movable members, and an unlocking member being provided on said stopper member for releasing said stopper member from said anchoring member as external equipment presses against said unlocking member.

4,919,621

PLUG AND SOCKET TYPE CONNECTOR FOR CONNECTING AN ENDOSCOPE TO SUPPLY UNITS

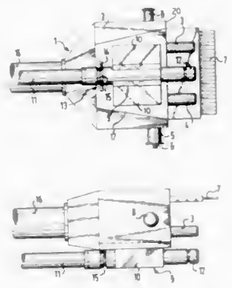
Felix Ams, Kämpfelbach, Fed. Rep. of Germany, assignor to Richard Wolf, GmbH, Fed. Rep. of Germany

Filed Nov. 16, 1988, Ser. No. 271,924

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1987, 3738633

Int. Cl.[5] A61B *1/06*

U.S. Cl. 439—191 **8 Claims**



1. A plug and socket type connector for connecting an endoscope to supply units including light projectors, pumps and electrical generators, said connector comprising a casing incorporating at least one connection for coupling to at least one corresponding connection of at least one supply unit, and a reception device having means for releasably clamping a plug connection of a light conductor cable on one side of the casing, said reception device being releasably connected to said one side of the casing.

4,919,622

INSULATION DISPLACING TERMINAL

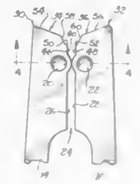
Louis Suffi, Westchester, Ill., assignor to Reliance Comm/Tex Corporation, Cleveland, Ohio

Filed Mar. 30, 1989, Ser. No. 330,621

Int. Cl.[5] H01R *4/24*

U.S. Cl. 439—395 **6 Claims**

1. A clip-type electrical terminal comprising a base, at least two substantially parallel resilient cantilever beam members attached to the base and longitudinally projecting outwardly therefrom, said beam members being elongated in the direction of their projections from the base; means for separating said beam members to form a gap therebetween and to define facing inner edges thereof; said beam members defining outer ends of the terminal, which outer ends form a notch having a first pair of beam member edge portions that form a funnel-like angle; a guide channel defined by said gap extending inwardly from said notch and between said facing inner edges of said beam members, a second pair of beam member edge portions comprising parts of said facing inner edges of said beam members bordering said guide channel portion being substantially parallel with each other and spaced apart and contiguous with the first-mentioned edge portions, such that said guide channel is coextensive with at least a portion of the gap formed between said beam members by said separating means; said second pair of beam member edge portions defining a wire-insulation slicer having sharp edges at the intersection of said second beam member edge portions and the first beam member edge



portions such that an insulated wire, upon entering said notch, is guided by the notch and guide channel to the insulation slicer so as to have the insulation sliced therefrom as the wire passes through the guide channel; said base and said beam members being formed as a one-piece, substantially flat structure of substantially constant thickness; wherein said separating means comprises a pair of aligned bosses formed repectively in said two beam members adjacent said facing inner edges thereof so as to deform material of each said beam member toward the other to thereby cause said resilient beam members to spread apart to define said gap therebetween; said bosses being formed at an area of said beam members between said guide channel portion and a remaining portion of said gap in which said wire is held following the slicing of insulation therefrom.

4,919,623

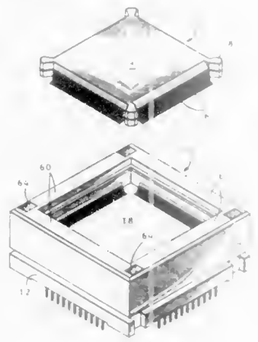
BURN-IN SOCKET FOR INTEGRATED CIRCUIT DEVICE

Timothy B. Billman, King, and Joseph R. Goodman, Walkertown, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 13, 1989, Ser. No. 310,254

Int. Cl.[5] H01R *9/09*

U.S. Cl. 439—70 **24 Claims**



1. A socket for establishing electrical interconnection to an electrical component having a plurality of contact leads protruding from the body of the component; comprising an insulative housing, a cap shiftable relative to the insulative housing, and a plurality of contact terminals mounted in the housing, the cap engaging the contact terminals during movement of the cap relative to the insulative housing to shift the terminal from a first to a second position to permit insertion of the electrical component into the socket, each terminal having outwardly facing contact means for engaging a corresponding contact lead on an inner surface of the contact lead adjacent to the component body when the contact terminal is in the first position, movement of the terminal from the first to the second position being accompanied by corresponding movement of said outwardly facing contact means.

4,919,624

CONNECTION TERMINAL STRUCTURE OF ELECTRONIC EQUIPMENT

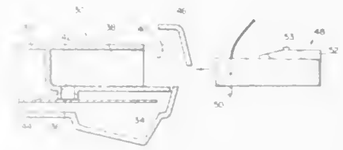
Hitoshi Masuda, Tokyo, Japan, assignor to NEC Corporation, Japan

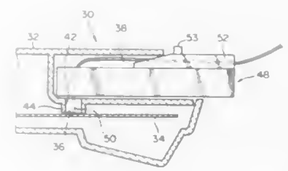
Filed May 26, 1989, Ser. No. 357,360

Claims priority, application Japan, May 31, 1988, 63-71981[U]

Int. Cl.[5] H01R *23/72;* **H05K** *1/18*

U.S. Cl. 439—76 **9 Claims**





1. A connection terminal structure of electronic equipment having a casing, a printed circuit board mounted in said casing, and a battery containing section formed in said casing and having a battery inlet/outlet, comprising:

an opening formed through a part of the casing which constitutes a bottom wall of the battery containing section and being covered by another part of said casing which constitutes an upper wall of said battery containing section; and

conductive terminal members provided on the printed circuit board which is spaced apart from said bottom wall by a predetermined distance and being so positioned as to face said opening.

4,919,625

TRACK LIGHTING APPARATUS

Leonard J. Coutre, Chicago, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Apr. 29, 1988, Ser. No. 187,808

Int. Cl.[5] H01R *25/14*

U.S. Cl. 439—118 **41 Claims**

1. Track lighting apparatus comprising in combination,

a longitudinal track section having a body with a right end and a left end and having a lateral cross section defined by

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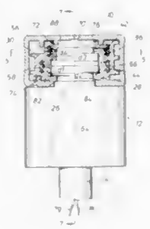
first and second lateral sides, a top side of top width and a bottom side having a slot of width smaller than said top width, said sides defining a channel within said track which is open from beneath said track via said slot,

a first insulator structure disposed within said channel adjacent said first lateral side, said first insulator structure carrying a neutral bus facing inwardly of said channel at a first lateral distance from said first lateral side and carrying a ground bus facing inwardly of said channel at a second lateral distance from said first lateral side, said ground bus being vertically separated from said neutral bus,

a second insulator structure disposed within said channel adjacent said second lateral side, said second insulator structure carrying vertically separated first and second voltage busses which face inwardly of said channel at substantially identical lateral distances from said second lateral side; and

a plug box with a contact head having a lateral width smaller than said slot of said track and adapted for insertion into said channel of said track via said slot in said bottom side of said track section,

said contact head carrying a neutral electrical contact on one longitudinal side, a voltage electrical contact on an opposite longitudinal side, and a ground electrical contact on



said one longitudinal side on which said neutral electrical contact is carried, said ground electrical contact being vertically separated from said neutral electrical contact by a distance corresponding to the vertical separation between said ground bus and said neutral bus of said track section,

said voltage electrical contact being moveable between a first fixed vertical position and a second fixed vertical position, the distance between said first vertical position and said second vertical position corresponding to the vertical separation of said first and second voltage busses of said track,

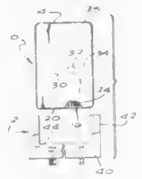
whereby on insertion of said contact head of said plug box into said slot with longitudinal alignment of said head with said track, and after ninety degree rotation of said head within said channel such that said neutral contact and said ground contact of said head turns toward said neutral bus and said ground bus and said voltage contact turns toward said first and second voltage busses, electrical contact is established between said neutral contact of said head and said neutral bus of said track, between said ground contact of said head and said ground bus of said track, and between said voltage contact of said head and either of said first or second voltage busses of said track, depending upon whether said voltage contact is in its first fixed vertical position or its second fixed vertical position.

4,919,626

CONNECTOR FOR IC CARD

John W. Anhalt, Orange, and David S. Goodman, Mission Viejo, both of Calif., assignors to ITT Corporation, New York, N.Y.

Filed Apr. 14, 1989, Ser. No. 338,030
Int. Cl.[5] H01R *13/15*
U.S. Cl. 439—260 4 Claims



1. A connector for receiving an IC card having an edge on a side of the card formed with an elongated slot containing a substrate having a row of spaced conductors thereon adjacent to the edge of the substrate, comprising:

an insulative housing having an upper surface and a lower surface, a channel in said housing opening at said upper surface and adapted to slidably receive therein the side of said card with its edge adjacent to the bottom of said channel;

a row of contacts mounted in said housing having spring sections spaced apart a distance corresponding to the spacing of the conductors on said card and extending upwardly into said channel for insertion into said slot;

each of said spring sections being reversely bent to form an inner arm and an outer arm joined by a nose portion;

said nose portion of each said contact being curved and joined to said outer arm by a relatively short inwardly and rearwardly extending connecting segment;

said inner arms being positioned in said channel so as to be out of the path of said substrate when the card is initially inserted into the connector;

said outer arms of said contacts extending toward one side of said channel; and

said outer arms being engageable by the card to cam said outer arms, and hence said inner arms, inwardly into engagement with the conductors on the substrate, after said nose portions of said contacts pass a border region of the substrate adjacent to the edge of the substrate when the card is inserted into the connector.

4,919,627

ELECTRICAL CONNECTOR

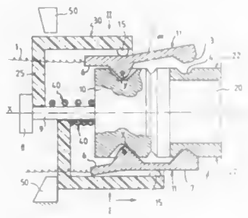
Neil Cable, Leiden, Netherlands, assignor to Agence Spatiale Europeenne, Paris, France

Filed Nov. 17, 1988, Ser. No. 272,668
Claims priority, application France, Dec. 2, 1987, 8716706
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—263 4 Claims

1. An electrical connector having circular symmetry about a longitudinal axis, comprising first and second insulating supports each equipped with at least two terminals, said first support having first terminals and said second support having second terminals, said terminals being connected to electrical conductors, said first and second insulating supports being intended to be assembled and disassembled by being moved axially towards each other and away from each other in order respectively to make and to break electrical contacts between corresponding first and second terminals by mutual engagement or disengagement thereof, said connector including the improvements whereby said first terminals are mounted for pivoting movement relative to said first support while said second terminals are fixed relative to said second support, and whereby said connector includes actuator means responsive to

the application of an axial force to cause said first terminals to pivotally move:

in response to an axial force in a first direction, from a first position in which both insulating supports are axially aligned and are assembled to each other, with the first terminals being held intimately engaged with said second terminals, to a second position in which both supports are still assembled to each other while the first terminals are pivoted away from said second terminals to completely disengage from the fixed terminals; and



vice versa, from said second position to said first position, on application of an axial force in a second direction opposite to said first direction;

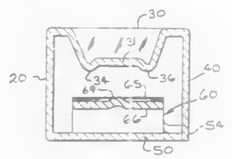
thereby enabling the two supports, when axially aligned, to be disassembled by being moved axially away from each other and to be assembled by being moved axially towards each other without any friction forces being generated between said first terminals and said second terminals during the axial disassembly and assembly movements, which movements take place while said first terminals and second terminals are fully disengaged.

4,919,628

TAB RECEPTACLE WITH FIXED BEAM CONTACTS

Dewey F. Mobley, Lake Orion; Robert G. Peterson, Sr., Canton, and James E. Mergless, Utica, all of Mich., assignors to Interlock Corporation, Westland, Mich.

Continuation-in-part of Ser. No. 110,225, Oct. 19, 1987, abandoned. This application Apr. 18, 1989, Ser. No. 340,132
Int. Cl.[5] H01R *11/22*
U.S. Cl. 439—858 7 Claims



1. A tab receptacle fabricated by bending a single sheet of metal comprising:

a rectangular receptacle box having a closed continuous wall forming an end opening through which a male tab terminal is inserted so as to make contact with said receptacle box, said receptacle box including a bottom, a top, and sides;

fixed beams formed in said top extending toward said bottom for engagement with one side of said male tab terminal, said fixed beams lying parallel to the axis of male tab terminal insertion;

a cantilever supported movable beam member formed between said top and said bottom by a portion of said sheet of metal folded into the interior of said box for engagement with the other side of a male tab terminal, said beam member including a front end portion located adjacent said end opening, a middle portion, and a rear portion attached to said box;

said rear portion being inclined upward toward said top of said box, said middle portion being substantially parallel to said bottom, and said front end portion being inclined downward toward said bottom;

said beam member having contact with said male tab terminal at spaced points along said beam member when said male tab terminal is inserted into said box; and

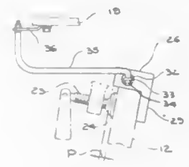
said front end portion of said beam member coacting with said bottom when said male tab terminal is inserted so as to fix said beam member is opposition to said fixed beams in said top.

4,919,629

STEERING DEVICE FOR MARINE PROPULSION

Atsushi Isogawa, and Yukio Sumigawa, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 1, 1988, Ser. No. 150,548
Claims priority, application Japan, Jan. 31, 1987, 62-19665
Int. Cl.[5] B63H *21/26*
U.S. Cl. 440—62 11 Claims



1 A steering device for a marine propulsion device affixed relative to the transom of a watercraft, said propulsion device comprising a drive shaft housing rotatably journaling an engine driven shaft, a swivel bracket journaling said drive shaft housing for steering movement about a generally vertically extending steering axis, a generally "C" shaped clamping bracket adapted to receive the upper end of the transom for affixing said propulsion device to the transom, pivot pin means interconnecting said swivel bracket and said clamping bracket for pivotal movement about a generally horizontally extending tilt axis, and a steering arm affixed to said drive shaft housing, the improvement comprising a steering bracket affixed between a downwardly extending face of said clamping bracket and an upwardly extending face of the transom, said clamping bracket extending over said steering bracket for direct attachment to the transom, said steering bracket defining a bore extending generally parallel to and offset from said tilt axis, a steering rod slidably supported in said bore for reciprocation relative thereto, means for affixing an operator controlled steering cable to said steering rod for effecting operator controlled reciprocation of said steering rod, and means connecting said steering rod to said steering arm for steering of said drive shaft housing upon reciprocation of said steering rod.

4,919,630

INBOARD DRIVE SYSTEM FOR A MARINE CRAFT

Adam Erdberg, 3205 N.E.188 St., North Miami Beach, Fla. 33180

Continuation-in-part of Ser. No. 613,441, May 24, 1984, abandoned. This application Jun. 26, 1989, Ser. No. 371,140
Int. Cl.[5] B63H *21/26*
U.S. Cl. 440—79 6 Claims

1. An inboard drive system for a marine craft comprising in combination:

(a) two drive engines mounted inboard of said craft in spaced relation from a stern portion thereof and in speed and

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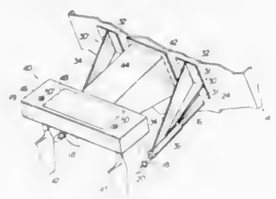
substantially adjacent relation to a center of gravity of said craft,

(b) a power take-off coupling mounted on each of said drive engines on substantially one end thereof, said power take-off coupling and said one end of said drive engines disposed in facing relation to the stern portion of the craft,

(c) drive shaft means for drivingly interconnecting a propeller means to said drive engines and comprising two drive shafts of one piece construction , each connected at one proximal inboard end thereof to a respective one of said power take-off couplings associated with said respective drive engines when extending outwardly therefrom through a transom of the craft,

(d) said propeller means comprising two drive propellers each secured to a distal end of a different one of said drive shafts, said drive shafts each disposed at an angular orientation relative to a longitudinal axis of the craft sufficient to dispose said propellers in a surface piercing orientation during travel of the craft,

(e) support means comprising two support struts each fixedly secured to and extending outwardly from the transom of the craft and outboard thereof in substantially



depending position, each of said support struts rotatably supporting one of said distal ends of one of said respective drive shafts substantially adjacent said propeller means,

(f) steering strut means mounted to the transom of the craft outboard thereof for support of a steering assembly and a rudder assembly thereon and including a support arm disposed between said two support struts and spaced therefrom and a housing secured to one end of said support arm and disposed in transverse relation thereto,

(g) said housing substantially enclosing said steering assembly and having said rudder assembly depending downwardly therefrom, said rudder assembly comprising two rudders each disposed in spaced relation to one another and in aligned relation to one of said drive propellers and operatively connected to said steering assembly, and

(h) said support strut means secured to the transom in spaced apart relation to said housing and structured independently of said steering strut means for independent and aligned placement of said propeller means relative to said two rudders and for independent securement of said support struts in relation to said steering strut means on said transom.

4,919,631

UNDERWATER DIVING SYSTEM

Michael V. Stafford, 419 Main St., Suite 212, Placerville, Calif. 95667

Filed May 5, 1988, Ser. No. 190,631
Int. Cl.[5] B63C *11/20*
U.S. Cl. 441—40 27 Claims

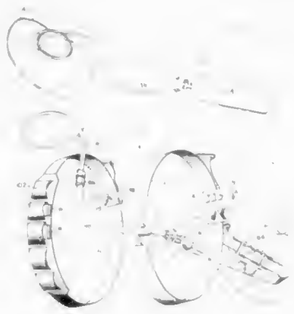
1. An underwater diving system, comprising in combination:

a light-weight raft,

a source of compressed gas embodied as a scuba type tank of compressed gas normally carried on the back of a diver carried on said raft,

a gas line from said source to an underwater diver,

and harness means connecting an end of said line, remote from said gas source, to the diver,



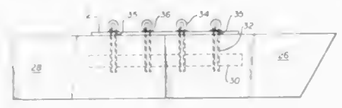
whereby while the diver explores underwater, said raft is towed along and forces associated with towing are dissipated by said harness.

4,919,632

COLLAPSIBLE ONE-MAN PONTOON FISHING RAFT

Richard L. Smith, 1800 Bancroft, Missoula, Mont. 59801; Frederick Wallner, 40 Scovel La., Kalispell, Mont. 59901, and Alvern C. Weed, 412 Boston Ct., Davenport, Iowa 52806

Filed Jan. 17, 1989, Ser. No. 297,932
Int. Cl.[5] B63B *7/04*
U.S. Cl. 441—44 6 Claims



1. A collapsible one-man pontoon fishing raft comprising:

at least two, spaced, flotational pontoons, said pontoons being of solid construction,

means for maintaining the spaced relation between pontoons comprising a one-piece seat having at least two holes near each end which, when said seat is placed on the top surface of said pontoons, will mate with corresponding holes and sleeves in the top surface of the pontoons,

securing pins adapted to pass through the holes in the seat and into the holes in the pontoons, said securing pins being of such dimension that they will frictionally engage the sleeves in the holes in the top surface of the pontoons and such that the top of said pin will not pass through the holes in the seat.

4,919,633

LIQUID CRYSTAL DEVICE WITH A FERROELECTRIC FILM AND METHOD FOR MANUFACTURING THE SAME

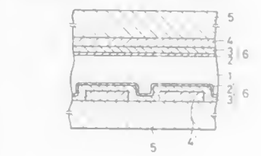
Shumpei Yamazaki, Tokyo; Masashiko Sato, Atsugi, and Hiroyuki Sakayori, Machida, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Division of Ser. No. 94,872, Sep. 10, 1987. This application Apr. 20, 1988, Ser. No. 184,009
Claims priority, application Japan, Sep. 19, 1986, 61-221180; Dec. 2, 1986, 61-288527
Int. Cl.[5] H01J *9/00*
U.S. Cl. 445—24 5 Claims

1. A method of manufacturing a liquid crystal device comprising: preparing a substrate;

coating said substrate with a ferroelectric material film consisting of a mixture of a ferroelectric material and a organic resin;

applying an electric field to said ferroelectric film in a direction perpendicular to said substrate;



curing said ferroelectric film;

mating said substrate with an opposite substrate; and

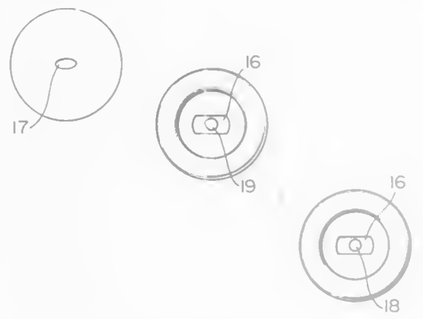
disposing a liquid crystal layer between said substrates.

4,919,634

METHOD OF FABRICATING ELECTRODE OF COLOR PICTURE TUBE ELECTRON GUN

Masahiro Ito, Chiba, and Satoru Endo, Mobara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 94,698, Sep. 9, 1987, abandoned. This application May 15, 1989, Ser. No. 352,607
Claims priority, application Japan, Sep. 12, 1986, 61-213838
Int. Cl.[5] H01J *9/02*
U.S. Cl. 445—49 20 Claims



1. A method of fabricating an electrode of a color picture tube electron gun, said electrode having an aperture for passing an electron beam and a single focusing recess associated with the aperture and having a predetermined width a depth formed in a surface of a single metal plate, said single focusing recess having a predetermined length extending in a predetermined direction substantially symmetrically with respect to an axis of said electron beam pass aperture comprising the steps of:

forming in said metal plate a laterally elongated through hole of substantially ellipitical configuration being substantially symmetrical with the axis of said electron beam pass aperture and having a major diameter in a longitudinal direction of said recess, before said recess is formed;

forming said single focusing recess at a peripheral wall area of said laterally elongated through hole through a coining process; and

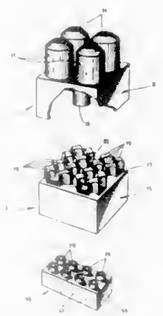
forming said electron beam pass aperture by removing a wall portion of said through hole existing after completion of the coining process to form a through hole of a predetermined shape.

4,919,635

TOY CONSTRUCTION ASSEMBLY

Vic Bertrand, Ile Bizard, Canada, assignor to The Ritvik Group Inc., Dorval, Canada

Filed Dec. 19, 1988, Ser. No. 286,852
Int. Cl.[5] A63H *33/08*
U.S. Cl. 446—128 11 Claims



1. A toy construction kit comprising;

a first block having a hollow box-like first base defined by sidewalls, a top wall and an open end facing said top wall; an even number of at least four identical primary cylindrical coupling studs projecting upwardly from said top wall, each group of four of said primary coupling studs adjacent each other having axes disposed at the four corners of a first square; and at least one secondary cylindrical coupling stud projecting downwardly from said top wall within said first base, each secondary stud being coaxial with the center of each first square;

a second block having a hollow box-like second base defined by sidewalls, a top wall and an open end facing said top wall; at least one group of four identical primary coupling elements projecting upwardly from said second top wall and disposed around a central axis normal to said top wall, each of said coupling elements having an outer configuration o in the form of a polygonal figure comprising one inner concave wall and at least three outer concave walls, said inner wall located proximally with respect to said central axis and said outer walls located distally with respect to said central axis, said inner concave walls of each group o four coupling elements defining four arcs of a common circle the diameter of which is equal to the outer diameter of said secondary stud of said first block;

wherein said second block is constructed so that said secondary stud of said first block is capable of being gripped between said primary coupling elements of said second block, said outer walls of said primary coupling elements defining lengthwise ridges, and adjacent sidewalls of said first base having lengthwise corner ribs spaced apart a distance suitable for said ribs to slide along said ridges of

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said elements when said secondary stud of said first block is gripped between said coupling elements; and

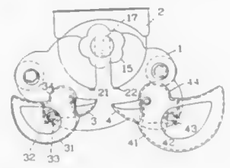
a third block having a hollow box-like third base defined by sidewalls, a top wall and an open end facing said top wall; an even number equal to at least four of identical primary cylindrical coupling pugs projecting upwardly from said third base top wall, the primary coupling plugs of each group of four of said primary coupling plugs adjacent each other having their axes disposed at the four corners of a third square, and a secondary cylindrical coupling plug projecting downwardly from said top wall within said third base, said secondary plug being coaxial with the center of said third square; and

wherein said second hollow base is sized from fitting snugly over at least one of said primary plugs of said third block.

4,919,636
WATER TOY

Lennart Dahlgren, Askims Utsiktsväg 10, S-436 00 Askim, Sweden

Filed Feb. 6, 1989, Ser. No. 306,935
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1988, 3803306
Int. Cl.[5] A63H *23/00, 29/10, 3/18*
U.S. Cl. 446—159 24 Claims



1. A water toy, comprising:

(A) a base which includes a pivot member;

(B) a main tank connected to the base, the tank including: (1) a first outlet for draining water from the tank at a first flow rate and (2) a second outlet for draining water from the tank at a second flow rate, the second flow rate being different from the first flow rate;

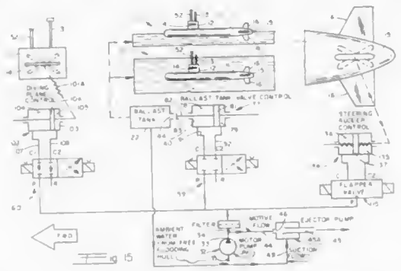
(C) a first pivotable object, including: (1) a main body, (2) a first collecting tank for collecting water drained through the first outlet, and (3) bearing means for pivotably supporting the object on the pivot member, the bearing means being located within the main body so that (a), when the collecting tank is empty, the object is balanced with the collecting tank in position to collect water drained through the first outlet and (b), as the collecting tank collects water, the object becomes unbalanced and pivots by gravity around the pivot member to an unbalanced position in which water is emptied from the collecting tank, the bearing means cooperating with the pivot member so that, as the object pivots around the pivot member, a surface of the bearing means slides across the pivot member to further unbalance the object to increase the abruptness of the pivoting of the object; and

(D) a second pivotable object which includes a second collecting tank for collecting water drained through the second outlet, the second object being pivotably supported with respect to the base so that (a), when the second colleting tank is empty, the second object is balanced with the second collecting tank in position to collect water drained through the second outlet and (b), as the second collecting tank collects water, the second object becomes unbalanced and pivots by gravity to an unbalanced position in which water is emptied from the second collecting tank.

4,919,637
MODEL SUBMARINE

Lewis W. Fleischmann, Randallstown, Md., assignor to Leonard Bloom, Towson, Md., a part interest

Continuation-in-part of Ser. No. 865,790, May 22, 1986, Pat. No. 4,826,465. This application Dec. 12, 1988, Ser. No. 285,655
The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.
Int. Cl.[5] A63H *23/04, 27/06;* B63G *8/22*
U.S. Cl. 446—162 38 Claims

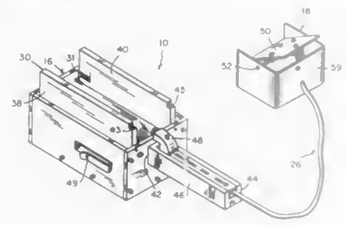


1. A model submarine comprising a hull provided with a sail and a periscope, the hull having a plurality of apertures formed therein, such that ambient water may enter through the apertures, and such that the interior of the hull is free-flooding, a sealed battery within the hull, a single submersible motor-pump unit within the hull and adapted to be energized by the battery, the motor pump-unit having an intake means in communication with the interior of the hull and further having a pressurized discharge means; whereby the motor-pump unit, when energized, continually draws ambient water out of the free-flooding hull, and whereby the ambient water is replenished in the hull through the apertures therein, an ejector pump carried by the hull, the ejector pump having an inlet port connected to the pressurized discharge means of the motor-pump unit and further having a discharge nozzle communicating with the ambient water externally of the hull, such that the continuous discharge of the ambient water out of the hull through the discharge nozzle of the ejector pump facilitates the forward propulsion of the submarine in the water, a ballast tank within the hull, conduit means communicating the ballast tank with the ejector pump and including a vacuum port, whereby when the ejector pump discharges pressurized water through its discharge nozzle and out of the hull, a suction is created in the vacuum port, thereby causing the ejector pump to aspirate fluid out of the ballast tank, a selectively-operable flood control valve means including a first diaphragm actuator for communicating the ballast tank with the interior of the free-flooding hull upon a given command; wherein when the flood control valve means is actuated, water flows into the ballast tank at a faster rate than the rate at which water is aspirated out of the ballast tank by the ejector pump, such that the ballast tank becomes completely filled with ambient water, buoyancy means within the free-flooding hull and adapted to trim the submarine to a slightly positive buoyancy when the ballast tank is fully flooded, such that the submarine is still slightly buoyant and is adapted to partially submerge to a periscope depth just under the surface with only its periscope above the water, articulatable diving planes carried by the submarine externally thereof and adapted to have a neutral position defined by a substantially zero angle of attack, selectively-operable diving actuating means including a second diaphragm actuator communicating with the pressurized discharge of the motor-pump unit for articulating the diving planes to a negative angle of attack to cause the submarine to dive below periscope depth upon another given command, means responsive to ambient water pressure for sensing the depth to which the submarine has submerged, thereby providing a force which increases at greater depths for countering the second diaphragm actuator and causing the diving planes to again assume a substantially neutral position when the desired depth has been obtained, such that the submarine will substantially level off and maintain its submerged depth until a new command is given to the articulatable diving planes, a rudder on the hull, selectively-operable steering control means including a third diaphragm actuator in communication with the pressurized discharge of the motor-pump unit for controlling the rudder upon a further command; each of the first, second and third diaphragm actuators having respective sides; the respective selectively-operable flood control valve means, diving initiating means, and steering control means being adapted to admit pressurized water from the discharge means of the motor-pump unit to one side or the other of the first, second and third diaphragm actuators, respectively, for selectively controlling the submerging, diving and steering of the submarine, respectively; and a receiver means on the submarine for receiving the command signals from a remote transmitter for selectively controlling the flood control valve means, diving initiating means, and steering means, respectively; whereby the submersible motor-pump unit, supplying the pressurized water, constitutes the sole power source for forward propulsion of the submarine, for taking on and discharging water ballast for surfacing, and for diving and steering, respectively; and whereby if the submarine engages an obstruction, or if the motor-pump unit fails, or if the battery becomes discharged while the submarine is fully submerged within the water, the submarine is adapted to automatically rise within the water to its periscope depth, thereby providing a fail-safe feature and enabling the submarine to be retrieved conveniently.

4,919,638
REMOTELY CONTROLLED TOY FOR CAPTURING APPARITIONS

Jeffrey L. Long, 30 Celeste Ave., Holbrook, N.Y. 11741

Filed Jun. 19, 1989, Ser. No. 367,762
Int. Cl.[5] A63H *33/00*
U.S. Cl. 446—490 13 Claims



1. A remotely controlled toy for capturing apparitions, comprising:

(a) containment means having an opened position and a closed position, said containment means include a containment box, said containment box has a top that is a pair of pivotally mounted doors for providing said opened position and said closed position;

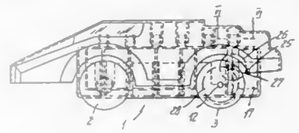
(b) activating means disposed a distance from said containment means, said activating means include a step box; and

(c) means for connecting said containment means to said activating means so that

4,919,639
TOY VEHICLE

Kurt Hease, Waldstrasse 36, 8510 Furth, Fed. Rep. of Germany

PCT No. PCT/EP87/00752, § 371 Date Nov. 9, 1988, § 102(e) Date Nov. 9, 1988, PCT Pub. No. WO88/05327, PCT Pub. Date Jul. 28, 1988
PCT Filed Dec. 3, 1987, Ser. No. 271,778
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1987, 3702043; Jan. 24, 1987, 3702040
Int. Cl.[5] A63H *17/00, 17/267*
U.S. Cl. 446—462 8 Claims



1 A toy vehicle comprising:

a chassis which is adapted to travel by means of wheels on a driving surface;

a body is adapted to be fastened on the chassis the vehicle chassis comprising a plurality of first pegs fixed on the side towards the body at a distance adjacent to each other;

the vehicle body comprising a plurality of first sleeves fixed on the side towards the chassis at the same distance and in relation to the plurality of first pegs which can be pushed onto the plurality of first pegs of the vehicle chassis so they are frictionally engaged;

the vehicle chassis being formed boxlike by two vehicle chassis parts disposed on top of each other and connectable in a plane parallel to the plane of a driving surface, both of which are connected by means of second pegs disposed on one chassis part and second sleeves provided on the other chassis part which can be pushed on the second pegs, wherein the one chassis part comprises a reception chamber containing a low voltage power source and a reception space containing a drive motor and the other chassis part comprises electric conductors extending into said reception chamber and a switching device providing or interrupting electrical contact between the drive motor and one of said electric conductors.

4,919,640
AUTO TUNING APPARATUS

Masami Yanagibori, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 21, 1988, Ser. No. 247,377
Claims priority, application Japan, Sep. 22, 1987, 62-238254
Int. Cl.[5] H04B *11/16, 1/26*
U.S. Cl. 455—164 4 Claims

1. Auto tuning apparatus for automatically determining a correct tuning point of an intermediate frequency carrier of a received signal, said apparatus comprising:

a local oscillating circuit for adjusting the IF carrier of the received signal having a phase locked loop configuration and including a variable frequency-dividing circuit having a frequency dividing ratio 1/N, where N is a positive integer, and means for sequentially varying the value of N;

detecting means for detecting a plurality of tuning points of said intermediate frequency carrier;

scanning means responsive to said detecting means for carrying out a scan of said plurality of tuning points by varying a tuning detecting threshold value relative to a level of said received signal;

means responsive to said scanning means for determining said correct tuning points and causing the sequential variance of N; and

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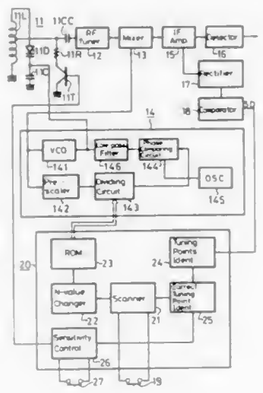
sensitivity adjusting means responsive to said detecting means for adjusting the signal level of said received signal



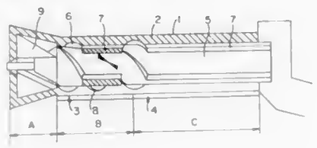
when a number of said plurality of tuning points is detected.

4,919,641

AXIAL THRESHING AND SEPARATING MEANS

Jury N. Yarmashev; Vladimir A. Zapandi; Valentin N. Tkachev, and Olev I. Peder, all of Taganrog, U.S.S.R., assignors to Spetsializirovannoe Konstruktorskoe Bjuro No Komplexam Machin Dlya Dvukhfaznoi Uborki, Taganrog, U.S.S.R.

Filed Oct. 7, 1988, Ser. No. 255,108
Int. Cl.[5] A01F *12/20*
U.S. Cl. 460—69 5 Claims



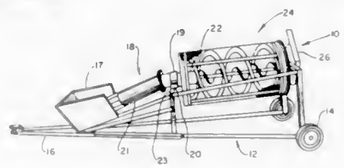
1. An axial threshing and separating means having receiving, threshing and separating zones and comprising:
- a housing having helical guide ribs on its internal surface;
- a threshing concave and separating grate arranged in a lower part of said housing;
- a rotor mounted for rotation in said housing;
- threshing and separating elements positioned in said threshing and separating zones and mounted on a surface of said rotor and disposed thereon in steps so that each step includes conjugated helical and straight portions;
- conveying elements disposed between said threshing and separating elements at an angle relative to an axis of said rotor and spaced apart with respect to each other along the length of the rotor, each said conveying element having a forward end and a rearward end;
- each of said conveying elements connected by the forward end thereof to one straight portion, and the rearward end thereof is spaced from a straight portion that follows said one straight portion with respect to the direction of rotation of said rotor.

4,919,642

ROTARY GRAIN SCREENER

Eugene G. Sukup, Hampton; Charles E. Sukup, and Steven Sukup, both of Dougherty, all of Iowa, assignors to Sukup Manufacturing Company, Sheffield, Iowa

Filed Nov. 30, 1988, Ser. No. 278,048
Int. Cl.[5] B02S *3/06*
U.S. Cl. 460—80 17 Claims



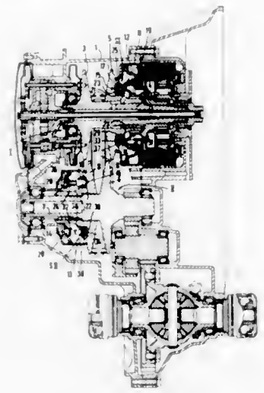
1. A rotary grain screener comprising a screener drum including a cylindrical mesh screen, a plurality of axially spaced rim means supporting said mesh screen, frame means supporting said drum, drive means for rotating said drum, and a first conveying means for advancing the grain in the screener drum, a second conveying means within and disposed along a common axis with the screener drum for advancing the grain in the screener drum, said first conveying means comprising flighting adjacent to the inner peripheral surface of said screener drum, said flighting being rotatable with said drum and of a pitch to advance grain therein as the drum and flighting are rotated.

4,919,643

DEVICE FOR SETTING A GEAR RATIO IN A CONTINUALLY VARIABLE BELT-DRIVE TRANSMISSION

Josef Fuss, Elsdorf, and Gerd Adams, Leichlingen, both of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1988, Ser. No. 290,338
Claims priority, application Fed. Rep. of Germany, May 13, 1988, 3816357
Int. Cl.[5] F16H *55/56*
U.S. Cl. 474—46 8 Claims



1. In a continuously variable transmission adapted to produce stepless gear ratios between its input and output, a device for setting a predetermined gear ratio, comprising:
- a first shaft mounted for rotation, supporting a pulley fixed to said shaft and a pulley axially displaceable thereon;

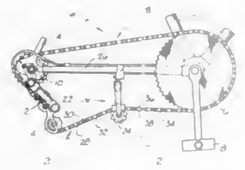
- servo means, including a piston for moving the displaceable pulley with respect to the fixed pulley;
- spring means for biasing the displaceable pulley toward the associated fixed pulley;
- means responsive to the position of the servo means piston for preventing the spring means from moving the displaceable pulley and for releasing the spring means to move the displaceable pulley.

4,919,644

CHAIN CONTROL APPARATUS

James P. Carlyle, 3153 Ames, Deaver, Colo. 80214

Filed Oct. 27, 1988, Ser. No. 263,348
Int. Cl.[5] F16H *11/08*
U.S. Cl. 474—80 20 Claims



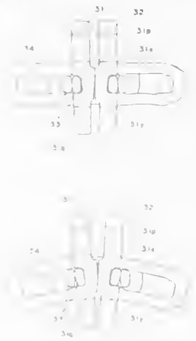
1. Apparatus for use with a bicycle to control undesirable chain travel comprising:
- a bicycle frame;
- a plurality of gear means for rotating at least one driven wheel means at different speeds;
- driving means rotatably mounted on said bicycle frame for rotating said at least one driven wheel means and having at least one gear means mounted thereon for rotation therewith;
- support means mounted on said driving means so that a user may contact said support means and rotate said driving means;
- at least one chain drive journaled around at least one of said plurality of gear means and said at least one gear means of said driving means so that said at least one chain drive has an upper run and a lower run;
- said upper and lower runs lying generally in the same plane;
- chain tensioning means for maintaining the proper tension on said chain drive;
- chain control guide means for guiding said chain and having an opening extending therethrough;
- mounting means for securely mounting said chain control guide means on said bicycle frame so that said lower run passes through said opening.
- at least a portion of said lower run being in contact with and supported by at least a portion of said chain control guide means;
- said chain control guide means providing a positive, relatively fixed support to prevent contact of said lower run with the terrain over which the bicycle is operating;
- said chain control guide means dividing said lower run into a first section having upper and lower sides and having at least a portion thereof next adjacent to its contact with said chain control guide means extending generally in a linear direction and a second section having upper and lower sides and having at least a portion thereof next adjacent to its contact with said chain control guide means extending generally in a linear direction; and
- said lower side of said first section meeting with said lower side of said second section to form an included angle of less than 180 degrees.

4,919,645

ENDLESS TRANSMISSION BELT

Shiro Sakakibara; Yoshinori Miyaishi, both of Aichi, and Yoshiaki Kano, Gifu, all of Japan, assignors to Aisin-Aw Kabushiki Kaisha, Japan

Filed Dec. 21, 1988, Ser. No. 287,115
Claims priority, application Japan, Dec. 29, 1987, 62-335987
Int. Cl.[5] F16G *1/24*
U.S. Cl. 474—245 8 Claims



1. An endless transmission belt comprising:
- a plurality of sets of link plates;
- a plurality of pin pairs, each pair of pins linking one end of one set of link plates to an adjacent end of another set of link plates to form the endless belt; said pins being oblong in cross-section, said pins of each pair canting by rotation against each other, about their longitudinal axes during passage around a pulley;
- a plurality of blocks mounted on and extending around the circumference of the belt, each of said blocks having a pair of generally parallel surfaces transverse to said belt, at least one of said generally parallel surfaces having a pin engagement groove, said groove entrapping a pin pair in cooperation with a mating pin engagement groove of an adjacent block and said groove having a recess for accommodating the canting of said pins during travel around a pulley.

4,919,646

SYSTEM FOR AUTOMATICALLY BALANCING A CENTRIFUGE IN OPERATION

Jacques Perdriat, Maule, France, assignor to Acutronic France, Les Clayes-Sous-Bois, France

Filed Jan. 13, 1989, Ser. No. 297,060
Claims priority, application France, Jan. 18, 1988, 88 00506
Int. Cl.[5] B04B *9/14*
U.S. Cl. 494—1 13 Claims

1. A system for automatically balancing a centrifuge in operation, the centrifuge including a rotary arm including at least one horizontal tube mounted on a turret for rotation about a vertical axis relative to a stand, the balancing system comprising a system for selectively displacing a mass of fluid inside said hollow horizontal tube, and a circuit for measuring any unbalance of the rotary arm which may be out-of-balance, and the circuit for measuring the unbalance comprising sensors disposed on the centrifuge, circuits for processing the signals delivered by the sensors in order to deliver alarm signals or rebalancing control signals in the event of unbalance being detected, and control means for controlling said system for selectively displacing a mass of fluid, said control means responding to rebalancing control signals delivered by the unbal-

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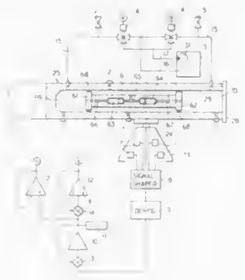
ance measuring circuit in order to give rise to selective real time displacement inside said hollow horizontal tube of a mass



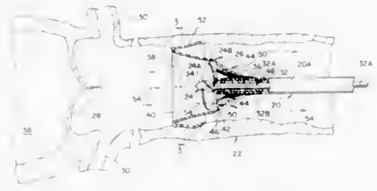
of fluid for dynamically rebalancing the rotating arm of the centrifuge.

4,919,647

AORTICALLY LOCATED BLOOD PUMPING CATHETER AND METHOD OF USE

John Nash, Downingtown, Pa., assignor to Kensey Nash Corporation, Exton, Pa.

Filed Oct. 13, 1988, Ser. No. 257,489
Int. Cl.[5] A61M *1/03*
U.S. Cl. 600—16 22 Claims



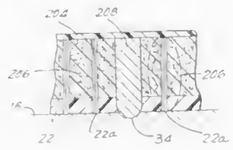
1. Apparatus for disposition within the aorta of a living being to effect the pumping of blood through at least a portion of the being's vascular system, said apparatus comprising an elongated catheter having a distal end portion, said catheter being of sufficiently small diameter to enable it to be freely located within the aorta so that its distal end portion is at a predetermined position spaced away from and not in contact with the aortic valve, said apparatus comprising pump means located at said distal end portion, barrier means located at said distal end portion, and drive means coupled to said pump means for operating said pump means, whereupon blood is made to flow through said aorta, said distal end portion of said apparatus comprising an inlet in fluid communication with said aorta distally of said pump means and an outlet in fluid communication with said aorta proximally of said pump means, said barrier means comprising conformable wall means for closely engaging the inner periphery of said aorta at said predetermined position to ensure that substantially all of the blood flowing through the aorta flows into said inlet to said pump means and out said outlet from said pump means and not around the exterior of the distal end portion of said apparatus.

4,919,648

HIGH TACK DRUG PATCH

Dan Sibalis, Stony Brook, N.Y., assignor to Drug Delivery Systems Inc., New York, N.Y.

Division of Ser. No. 922,296, Oct. 23, 1986, abandoned, which is a division of Ser. No. 839,050, Mar. 12, 1986, Pat. No. 4,640,689, which is a continuation of Ser. No. 702,486, Feb. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 660,192, Oct. 12, 1984, Pat. No. 4,622,031, which is a continuation-in-part of Ser. No. 524,252, Aug. 18, 1983, Pat. No. 4,557,723. This application May 20, 1988, Ser. No. 196,663
Int. Cl.[5] A61N *1/30*
U.S. Cl. 604—20 10 Claims



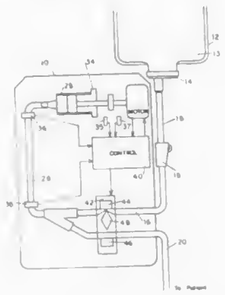
1. A transdermal drug patch for delivering at least one drug to a patient through the skin comprising:
at least two electrodes forming said patch and separated from each other, each electrode including a conductive element;
drug reservoir means, in at least one of said electrodes;
a circuit, including a power source, for supplying power to and connected to said electrodes at such conductive elements and said reservoir means; and
adhesive means for affixing said patch to the skin, this adhesive means augmented by a plurality of isolated spots of high tack gel traversing the drug reservoir means extending from the bottom of the patch to at least one electrode above the drug reservoir means, whereby the patch is more easily removed and replaced than if the adhesive means were homogeneous, and whereby upon adherence the drug is delivered through the skin.

4,919,649

FLUID DELIVERY SYSTEM

Earle J. Timothy, Clinton; Edward W. Jackson, Northford; Joseph A. Mingrone; Jeffrey W. Jolie, both of New London; Dennis L. Nudelman, Waterford, and John F. Howard, Brookfield, all of Conn., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Sep. 30, 1987, Ser. No. 103,437
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—65 16 Claims



1. A delivery set for a medical fluid delivery system comprising an inlet fluid conduit for connection to a supply of fluid, a first compressible valve section in said inlet fluid conduit, an outlet fluid conduit, a second compressible valve section in said outlet fluid conduit, a fluid column having a selected length and cross-section corresponding to an incremental fluid volume and connected at its lower end to said fluid inlet and outlet conduits, and means for varying air pressure in said fluid column, said means being connected to said fluid column, wherein said fluid supply and said fluid conduits are formed between plastic films.

4,919,650

INFUSION PUMP

Vladimir Feingold, Cherrybrook, and Peter C. Allworth, Wollstonecraft, both of Australia, assignors to Bionica Pty. Limited, Castle Hill, Australia

Filed Mar. 29, 1988, Ser. No. 174,770
Claims priority, application Australia, Mar. 30, 1987, PI1140
Int. Cl.[5] A61M *5/00*; F04B *49/06*
U.S. Cl. 604—67 25 Claims

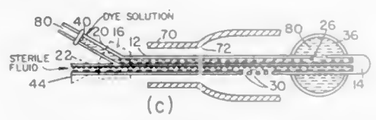
1. A method of controlling an infusion pump, said pump including a motor adapted to impart continuous rotary motion via an output shaft, said pump further including encoding means adapted to provide data indicative of rotational motion of said output shaft, said data being proportional to the angular displacement of said output shaft; said method comprising providing power to said motor only for a first period of time within a time window during which first data is produced from said encoding means; monitoring second data received from said encoding means during a second period of time immediately following said first period of time during said time window; comparing said first and second data with desired data corresponding to a predetermined volume feed rate of said infusion pump and, on the basis of said comparison, determining whether and for how long to energize said motor during subsequent window periods.

4,919,651

CATHETER HAVING A DOUBLE LUMEN AND A BALLOON AND METHOD OF USING THE SAME FOR CONTROLLED OPERATIVE CHOLANGIOGRAPHY

Wilton A. Doane, Santa Barbara, Calif., assignor to Santa Barbara Medical Foundation Clinic, Santa Barbara, Calif.

Continuation of Ser. No. 183,408, Apr. 15, 1988, abandoned, which is a continuation of Ser. No. 729,977, May 1, 1985, abandoned. This application Jan. 9, 1989, Ser. No. 296,360
Int. Cl.[5] A61M *29/00*
U.S. Cl. 604—96 7 Claims



1. A system for controllably filling a natural passageway terminating in a passageway opening in a human body with a dye fluid which is adapted to be responsive to x-rays during operative cholangiography, said system comprising

a cholangiography catheter comprising
a flexible double lumen tubing having at one end thereof a first opening extending from the interior of one lumen of the double lumen tubing to the exterior thereof and at the other end thereof a plurality of second openings located a predetermined distance from the first opening, said plurality of second openings extending from the interior of the other lumen of the double lumen tubing to the exterior thereof;
a closed, fluid tight distal tip located at said one end of the double lumen tubing;
a bifurcated connector located at said other end of the double lumen tubing, said bifurcated connector having two separate passageways therethrough so as to communicate with the two tubing members and lumens respectively;
a first elongated tubing member operatively coupled to said bifurcated connector which communicates with said one lumen and a second elongated tubing member operatively coupled to said bifurcated connector which communicates with said other lumen;
a balloon having opposed ends surrounding said one end of said double lumen tubing and enclosing said first opening;
means for securing the opposed ends of the balloon to said double lumen tubing exterior with the balloon material stretched longitudinally between said securing means over said first openings and snugly against the double lumen tubing exterior when the balloon is deflated; and
a valve having an open and closed position operatively coupled to said first elongated tubing member, said valve when in said open position enables a fluid to be transported therethrough into said first elongated member, through said first opening into expandable engagement with said balloon, said valve when actuated from said open position to said closed position occludes fluid in said one lumen and to hold said balloon at a selected expanded direction;
an inlet operatively coupled to the elongated tubing member and which enables a fluid to be passed therethrough into said other lumen, through said second openings, to the exterior of said double lumen tubing and into a natural passageway;
a removable elongated stylet positioned to extend through said second elongated tubing communicating with the second passageway through said bifurcated connector, through said second passageway and through said other lumen, said stylet having a length to enable the end thereof to extend into said other lumen to the distal tip to stiffen said flexible double catheter and render the same relatively rigid without stretching the same, said stylet being insertable into the catheter stiffening the same when the catheter is inserted into and proceeded along the common bile duct to the ampulla of vater within the human body and being removeable when the catheter is in the ampulla of vater;
a source of sterile fluid alternatively attached to said inlet to urge a sterile fluid through said second elongated tubing member and said bifurcated connector into said other lumen and through said second openings to remove any bubbles therefrom;
a source of a dye solution alternatively coupled to said valve for selectively urging a dye solution into said one lumen and through said first opening to expand said balloon to a selected expanded diameter and into said other lumen through said second openings and into the natural passageway to inflate the same; and
a source of x-rays for imaging the inflated natural passageway with x-rays.

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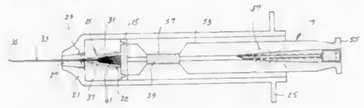
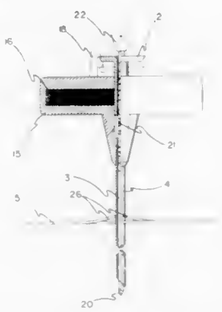
4,919,652
SYRINGE
Konrad G. Alter, Maylands, and Jennifer D. Griffiths, West Leederville, both of Australia, assignors to Nujenko Pty. Ltd., Welshpool, Australia
Filed Oct. 28, 1988, Ser. No. 263,705
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—110 15 Claims



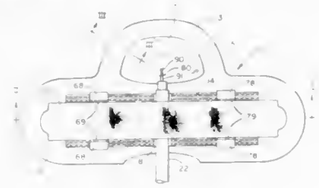
1. A syringe comprising a barrel, a plunger receivable in the barrel and movable therealong, the plunger including a shank, said shank having a selectively deformable portion for rendering said plunger inoperable, and said barrel including a side wall having an aperture opening onto an end of the barrel beyond which the shank extends, said aperture being adapted to receive said deformable portion of said shank upon lateral deflection of the outer end portion of said shank during deformation.

4,919,653
DEVICE FOR LOCATING THE EPIDURAL SPACE
Antonio E. Martinez, and Eduardo C. Garcia, both of Cea Bermudez 31 - 50B, 28001 Madrid, Spain
Filed Jul. 13, 1988, Ser. No. 219,219
Claims priority, application Spain, Jul. 28, 1987, 8702216
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—117 6 Claims



1. A device for locating the epidural space, for introducing into it anesthetics, analgesics, narcotics, and the like, by injection with a needle or a catheter, essentially characterized by comprising a canula provided with a duct therethrough and a handle inside which an electromagnet is situated and at the rear part of which there is a retaining element that also works as a stop of a sleeve axially situated in the handle, the inner surface of the sleeve being considerably corrugated; the canula further including a fixation element adjustable along the canula in order to prevent the canula from penetrating beyond the yellow ligament, thereby allowing the axial and comfortable introduction through the sleeve and the canula duct of a conically pointed needle with lateral outlet, the needle having a corrugated outer surface portion capable of being inserted into the sleeve by the electromagnet action, which is activated by a circuit operatively connected to the device capable of detecting the depression existing in the epidural space by the use of a pressure sensor operatively connected to the needle, which transforms the pressure signal into an electric signal, which is passed on to an electric circuit, so that, if there is a difference between the atmospheric pressure and the detected one, a transistorized switch will close the circuit and the above mentioned electromagnet and one or both of a sound and visual alarm will be activated.

4,919,654
IV CLAMP WITH MEMBRANE
Glenda G. Kalt, Boca Raton, Fla., assignor to Kalt Medical Corporation, Boca Raton, Fla.
Filed Aug. 3, 1988, Ser. No. 227,784
Int. Cl.[5] A61M 25/02
U.S. Cl. 604—180 19 Claims

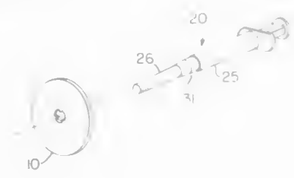


1. A clamp for holding an IV device, comprising:
base means having an arch portion defining a window opening;
membrane means covering said window opening and having a slot therein for allowing a needle of said IV device to puncture a patient's skin at a point located under said membrane means;
flap means for covering a tube of said IV device; and
securing means for securing said flap means to said base means.

4,919,655
SINGLE USE SYRINGE
Jack B. Cline, 12827 Bromwich St., Arleta, Calif. 91331, and Stephen W. Ammerman, 619 Resolano, Pacific Palisades, Calif. 90272
Filed Jul. 19, 1988, Ser. No. 221,220
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—110 16 Claims

1. A single use syringe comprising:
an elongated barrel having an internal chamber, said barrel having an outlet opening at one end and an inlet opening at the opposite end, said outlet opening being part of an outlet chamber;
a plunger movably mounted within said internal chamber, a portion of said plunger extending exteriorly of said inlet opening, said plunger terminating in an inner end defining a tip, said tip being located within said internal chamber in a snug fitting manner closing said inner end from the ambient;
a needle assembly attached to said barrel at said outlet opening, said needle assembly having an interior chamber, said interior chamber being part of said outlet chamber, the improvement comprising:
a valve system mounted within said outlet chamber, said valve system including a valve body, said valve system including a passage arrangement formed within said valve body, said passage arrangement permitting flow of liquid from said internal chamber to said needle assembly only a predetermined number of times, upon said predetermined number of times having occurred said passage arrangement closes preventing flow of liquid from said internal chamber to said needle assembly; and
said valve system including at least one movable member, said member being movable from an open position to a closed position, said member being moved solely by liquid pressure as liquid is drawn into said internal chamber and as liquid is expelled from said internal chamber.

4,919,656
SAFETY DEVICE FOR HYPODERMIC SYRINGE TO PREVENT STICK INJURIES
Jeffrey Bracker, Rochester; Karl D. Kirk, III, and Douglas M. Spranger, both of New York, all of N.Y., assignors to BioSurge, Inc., Rochester, N.Y.
Filed Apr. 11, 1988, Ser. No. 179,947
Int. Cl.[5] A61M 5/32
U.S. Cl. 604—192 6 Claims



1. For use with a hypodermic syringe of the type having a cylindrical body with a needle having a sharp point and a base supported on an extension of the body and communicating with an interior of the cylindrical body, a separate cap for said needle, said cap having a cylindrical shell and a mouth supported by said extension when the cap is engaged by the extension so that the shell portion encloses said needle, a safety device for protecting a user from accidental stick injuries on recapping said hypodermic syringe comprising:
a rigid plastic disk having a central aperture, a generally planar region surrounding said central aperture and ridge means forming an outer annular region of increased thickness,
said central aperture including a plurality of radially projecting inflexible teeth for biting into and displacing material of the shell portion of the cap as the shell portion of the cap is inserted into said aperture and said disk is forced toward the mouth portion of said cap by a user on installing said disk onto said cap,
said ridge means engaging a point of said needle in order to tend to stop motion of the needle, if on an attempt to insert the needle into the mouth portion of the cap the point of the needle is misdirected and engages that surface of the disk facing away from the users fingers.

4,919,657
DENTAL SYRINGE HAVING A MEDICATION FILLED CARPULE AND A RETRACTABLE NEEDLE CANNULA
Terry M. Haber, El Toro, and Cark B. Foster, Laguna Niguel, both of Calif., assignors to Habley Medical Technology Corporation, Laguna Hills, Calif.
Filed Nov. 14, 1988, Ser. No. 270,094
Int. Cl.[5] A61M 5/245
U.S. Cl. 604—232 16 Claims

1. A syringe including a hollow syringe cylinder having an open distal end and comprising:
a fluid filled carpule;
a hollow carpule adapter having forward and rearward ends and a needle carrier located at the forward end of and movable through said adapter, said carpule adapter receiving at least some of said carpule therewithin and said needle carrier having means to engage said carpule at the forward end of said adapter, said syringe cylinder being sized so that said combination carpule and carpule adapter can be loaded therein;
a double ended needle cannula to be attached to the needle carrier of said carpule adapter such that one end of said cannula penetrates said carpule and the opposite end of said cannula projects through the open distal end of said syringe cylinder for injecting the fluid contents of said carpule; and
means for moving said carpule towards the rearward end of said carpule adapter for correspondingly relocating said needle carrier and retracting said cannula rearwardly within said carpule adapter so as to be surrounded and shielded to thereby avoid an accidental needle stick.

4,919,658
CONNECTION FOR CATHETERS, PERFUSION UNITS AND FLASKS OF LIQUID TO BE PERFUSED
Marcelo S. Badia, Barcelona, Spain, assignor to Institute Municipal D'Assistencia Sanitaria, Barcelona, Spain
Filed Jun. 3, 1988, Ser. No. 201,756
Claims priority, application Spain, Jun. 5, 1987, 8701910[U]
Int. Cl.[5] A61M 25/00
U.S. Cl. 604—265 7 Claims

1. Connection means for connecting catheter units to perfusion units or perfusion units to container units containing liquids to be perfused, especially liquids used for parenteral administration, comprising:
wall means defining a chamber containing an antimicrobial product adapted to be connected between two of said units, i.e. between the outlet of the container and a perfusion unit or between the latter and the inlet of a catheter,

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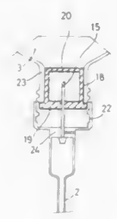
said wall means having opposed portions sealingly penetrable by a hollow needle, said wall means being attached to one of said two units with one of said wall portions being exposed to the interior of said one unit;

rigid coupling means detachably connectable to said wall means and extending over the other of said wall portions, said coupling means being adapted to be connected to the other of said two units; and



means defining a flow path through said coupling means for flow of liquid between said two units, said path including a hollow needle having its base secured to said coupling means, the length of said needle being greater than the distance between the outer sides of said opposed wall portions, and said needle being positioned to penetrate both of said wall portions when said coupling means is connected to said wall means.

4,919,659

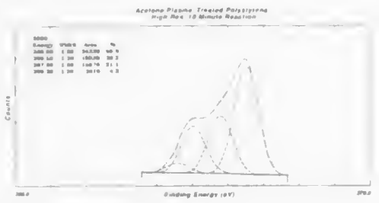
RADIO FREQUENCY PLASMA DEPOSITED POLYMERS THAT ENHANCE CELL GROWTH

Thomas A. Horbett; Buddy D. Ratner; Joseph A. Chinn, all of Seattle, Wash., and Yasmeen Haque, Pasadena, Calif., assignors to The Board of Regents for the University of Washington, Seattle, Wash.

Continuation of Ser. No. 809,927, Dec. 16, 1985, abandoned. This application Dec. 21, 1987, Ser. No. 136,457

Int. Cl.[5] A61F *2/06*

U.S. Cl. 623—1 15 Claims



11. A biological implant article that promotes endothelial cell growth and heparin binding, said article consisting essentially of:

a porous polymer material selected from the group consisting of polyester, tetrafluoroethylene and polyurethane; and

an overcoated surface layer covalently bound to said porous polymer material and comprising a plasma gas discharge layer of gas polymer selected from the group consisting of acetone, methanol, ethylene oxide, gluteraldehyde and mixtures thereof.

4,919,660

PROSTHETIC KNEE JOINT WITH ROLLER BEARINGS

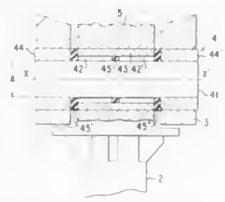
Fernand Peilloud, Alby-Cheran, France, assignor to S. N. R. Roulementsi, France

Filed Oct. 13, 1987, Ser. No. 106,862

Claims priority, application France, Oct. 14, 1986, 86 14251

Int. Cl.[5] A61F *2/38, 2/30*

U.S. Cl. 623—20 12 Claims



1. A prosthetic knee joint comprising:

(a) a first element sized and shaped to be fastened in the medullary canal of tibia;

(b) a second element sized and shaped to be fastened in the medullary canal of a femur;

(c) a clevis having two spaced legs carried by one of said first and second elements;

(d) an eye carried by the other one of said first and second elements and received by the two spaced legs of said clevis; and

(e) a pivot shaft projecting through said eye and received in the two spaced legs of said clevis, said pivot shaft comprising:

(i) a ring mounted in said eye;

(ii) at least one rolling body mounted in said ring;

(iii) a lateral stop received in a bore in each one of the two spaced legs of said clevis;

(iv) a pin received in said at least one rolling body so as to roll without sliding therein and in each one of said lateral stops; and

(v) two separation washers mounted on said pin, one of said two separation washers being located between and in axial engagement with each end of said ring and the adjacent one of said lateral stops.

4,919,661

AUTOGENEOUS PUMPING CHAMBER AND PROCEDURES THEREFOR

John Gibney, 6236 E. Montecito, Scottsdale, Ariz. 85251

Filed Jul. 9, 1987, Ser. No. 71,422

Int. Cl.[5] A61F *2/22*

U.S. Cl. 623—3 10 Claims

1. The method of producing an autogeneous pumping chamber having a preselected volume within a host comprising the steps of opening the abdomen of a host and locating therein a major muscle or muscle group selected from the group consisting of rectus abdominus, latissimus dorsi, pectoralis major, the quadricep, and the diaphragm; wrapping said muscle or said muscle group about a pouch-shaped implant formed of a pharmacologically acceptable plastic and having body portion and a fill port defined therein in communication with the interior of said body portion; partially filling said interior of said body portion with isotonic saline; thereafter periodically injecting additional isotonic saline into said interior of said body portion until said preselected volume is obtained; waiting for an additional period of time while said body portion is filled to its preselected volume until said muscle or muscle group forms an integral liquid-tight scar chamber thereabout; withdrawing said saline from within said implant; and withdrawing said pouch-shaped implant from within said scar chamber.

4,919,662

HYDROGEL IMPLANT LENS CONSTRUCTION RECONFIGURED DEHYDRATED RE-HYDRATED IN SITU

Randall L. Knoll, Stillwater; Wilhelm Lewon, St. Paul, and Ronald Ofstead, Maplewood, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 16, 1988, Ser. No. 245,407

Int. Cl.[5] A61F *2/16*

U.S. Cl. 623—6 10 Claims

1 A method of preparing an artificial intraocular lens for implantation within the eye comprising the steps of:

(a) providing an intraocular lens which consists of an optic and at least one haptic, both made of the same hydrogel material which material Las prescribed shape, dimension and physical characteristics such that it can be

(i) folded, stretched, rolled, compressed or otherwise reconfigured to a configuration such that the profile of the lens is reduced in at least one dimension,

(ii) dehydrated so that the lens will substantially retain the configuration which provides the reduced profile,

(iii) inserted through a relatively small incision made in the ocular tissue, and

(iv) allowed to rehydrate by the natural fluid present in the eye and expand to provide an optically correct lens, wherein the haptic is oriented radially outward in a conventional haptic position;

(b) applying force to the haptic or haptics radially inward so that the haptics are reconfigured to a position in front of or in back of the optic of the lens; and

(c) dehydrating the lens sufficiently so that the haptic or haptics substantially retain their position.

4,919,663

LAMINATED ZONE OF FOCUS ARTIFICIAL HYDROGEL LENS

Dennis T. Grendahl, 2070 Shoreline Dr., Orono, Minn. 55391

Continuation-in-part of Ser. No. 88,428, Aug. 24, 1987, Pat. No. 4,798,609. This application Oct. 17, 1988, Ser. No. 258,028

The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.

Int. Cl.[5] A61F *2/16*

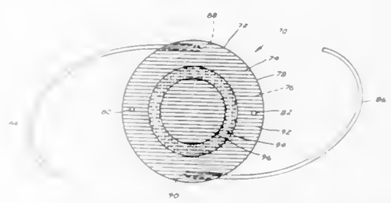
U.S. Cl. 623—6 8 Claims

1. A laminated zone of focus hydrogel lens for use with an eye comprising:

a. a first lamination hydrogel element encompassing a first area of said lens;

b. a second lamination hydrogel element encompassing a second area of said lens;

c. said first lamination element, in combination with said second lamination element serving to create an image of a first distinct portion of the retina; and,



d. said second lamination element serving to simultaneously create an image on a second distinct portion of the retina which is, different from said first portion; wherein

e. at least two of said laminated elements are of different colors.

4,919,664

STIMULATION OF HAIR GROWTH

Roy F. Oliver, and Colin A. B. Jahoda, both of Department of Biological Sciences University of Dundee, Dundee, Great Britain (DD1)

Filed Feb. 19, 1987, Ser. No. 16,224

Claims priority, application United Kingdom, Feb. 21, 1986, 8604360

Int. Cl.[5] A61F *2/10*

U.S. Cl. 623—15 14 Claims

1 A method of inducing hair follicle development and hair growth of a desired hair type in part of the skin of a mammal said skin having an outer epidermis layer and an inner dermis layer, which method comprises the steps of: selecting at least one lower follicular dermal cell to provide selected dermal cell, culturing the selected dermal cell so as to produce cultured dermal cells; forming an opening in the outer epidermis layer of said part of the mammal; and introducing cultured dermal cells through said opening in the epidermis layer into contact with the dermis layer in proximity to the epidermis and with at least some of said cultured dermal cells in contact with epidermal cells.

4,919,665

IMPLANTATION OF ARTICULATING JOINT PROSTHESIS

Charles A. Homsy, 11526 Raintree Cir., Houston, Tex. 77024

Continuation of Ser. No. 815,394, Dec. 31, 1985, Pat. No. 4,851,004, which is a continuation of Ser. No. 476,117, Mar. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 369,731, Apr. 19, 1982, abandoned. This application Jan. 23, 1989, Ser. No. 300,029

Int. Cl.[5] A61F *2/30*

U.S. Cl. 623—18 5 Claims

1. An intramedullary prosthesis device comprising:

a tapered elongate stem having distal and proximal ends and adapted to be forcibly inserted within an elongated stem socket having its inner periphery defined by compact bone formed by cortical bone or dense cancellous bone of a long bone in a human body, said stem having transverse sectional dimensions along substantially its entire length adapted to be undersized with respect to corresponding transverse sectional dimensions of said socket;

a layer of soft, resilient, fibrous tissue-ingrowthpromoting porous coating material of around two millimeters in

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thickness surrounding the undersized stem over its entire length including said distal and proximal ends, said coating material having a relatively low modulus of elasticity generally similar to the modulus of elasticity of fibrous tissue;

said layer of resilient porous coating material being of a generally uniform thickness along the entire length of the stem sufficient to provide improved load transfer between the stem and the adjacent compact bone formed by hard cancellous bone and hard cortical bone, said tapered stem being of minimal cross-sectional area adjacent said distal

end and of maximum cross-sectional area adjacent said proximal end with said generally uniform thickness coating material progressively increasing in cross-sectional area from said distal end to said proximal end of said stem, the thickness of said coating material relative to the diameter of said stem adjacent said distal end of said stem being of a maximum of around 25% of said diameter, the thickness of said coating material relative to the minimum cross sectional dimension of the stem adjacent said proximal end being of a maximum of around 25% of said minimum cross sectional dimension.

4,919,666

IMPLANT HAVING RECESSES FOR THERAPEUTICALLY EFFECTIVE SUBSTANCES

Ursula Buchhorn, and Hans B. Willert, both of Göttingen, Fed. Rep. of Germany, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Continuation of Ser. No. 40,929, Apr. 21, 1987, abandoned. This application Dec. 14, 1988, Ser. No. 284,094

Claims priority, application Switzerland, May 5, 1986, 01834/86

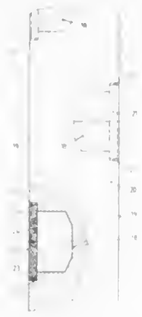
Int. Cl.[5] A61F *2/28, 5/04*

U.S. Cl. 623—16 **14 Claims**

1. A bone implant for insertion into a bone cavity comprising

a body configured for implanting into a bone cavity and having at least one recess in a surface thereof, said recess being sized to receive a therapeutically effective substance for subsequent release into surrounding tissue in said cavity; and

a separate porous cover separately secured in said body from the therapeutically effective substance to close over said recess, said cover having a porosity sufficient to be permeable to the substance received in said recess and to fluids



having the substance dissolved therein while being impermeable to the ingrowth of bone tissue.

4,919,667

IMPLANT

James W. Richmond, Kalamazoo, Mich., assignor to Stryker Corporation, Kalamazoo, Mich.

Filed Dec. 2, 1988, Ser. No. 279,558

Int. Cl.[5] A61F *2/30*

U.S. Cl. 623—18 **10 Claims**

1. A soft tissue implant in the form of meniscus cartilage replacement for a patient, comprising:

a woven cloth bottom layer;

at least one felt intermediate layer lying atop said bottom layer;

a woven cloth top layer lying atop said at least one felt layer;

at least one coating of a resilient bonding material coating said layers, said bonding material being interposed between said layers and fixing same together to form a laminated body, said layers being generally C-shaped in plan, so as to have a concave perimeter edge and an oppositely facing convex perimeter edge spaced across the width of said generally C-shaped body, the convex perimeter edge defining the ends of the generally C-shaped body, said at least one felt intermediate layer having a width less than that of said woven top and bottom layers, and therewith having its concave perimeter edge and ends retracted inboard of the corresponding concave perimeter edge and ends of said woven top and bottom layers, and therewith making the body taper in central cross-section from a thin concave perimeter edge to a much thicker convex perimeter edge, said convex perimeter edge tapering to reduce its thickness toward said ends, said body thus having a generally wedge shaped central cross-section, said woven top layer thereby being distorted to a three dimensional generally bowl shape.

4,919,668

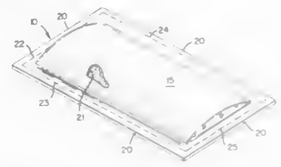
TEMPOROMANDIBULAR JOINT DISC IMPLANT

Robert S. Rosenbaum, 69 Greyfield Ave., West Roxbury, Mass. 02132, and Noshir R. Menta, 50 Maugus Hill Rd., Wellesley, Mass. 02181

Filed Aug. 8, 1988, Ser. No. 229,243

Int. Cl.[5] A61F *2/30, 2/12*

U.S. Cl. 623—18 **9 Claims**



1. A prosthetic temporomandibular (TM) joint disc comprising an envelope composed of a compressible biocompatible material and being sized to be positioned within the joint

said envelope having a first surface adapted to engage the articular surface of the temporal bone and a second surface adapted to contact the mandibular condyle

said envelope enclosing a fluid-filled medium containing a liquid-filling solution, with at least a portion of said liquid-filling solution being introduced or withdrawn from said envelope to adjust the size of said joint disc upon surgically implanting said joint disc

said envelope further having at least one flap extending from said envelope composed of expanded polytetrafluoroethylene, with said flap adapted to be sutured in situ solely to soft tissue to secure said envelope within said joint.

4,919,669

SHOULDER PROSTHESIS

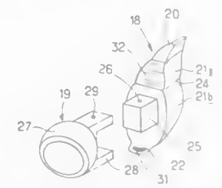
Jean Lannelongue. 2, rue Ferdinand Dubreuil, 37000 Tours, France

Filed Feb. 8, 1988, Ser. No. 153,384

Claims priority, application France, Feb. 9, 1987, 87 01524

Int. Cl.[5] A61F *2/40, 2/30*

U.S. Cl. 623—19 **18 Claims**



1. A shoulder prosthesis, comprising a humeral piece (7) intended to be fixed in a humerus (1) to replace at least the head thereof and comprising a hollow tubular element (9) which must be fixed in the humerus (1) substantially along the longitudinal axis thereof and a cylindrical rod (10), the upper end of which carries a ball (16) cooperating with a glenoid bearing surface to form a shoulder joint and the lower end of which is disposed in said tubular element (9), this and the rod (10) being able to slide relative to each other, the glenoid bearing surface consisting of a glenoid piece (8) which comprises an anchoring element intended to be inserted into a cavity formed in the scapula (2) and a female hemispherical element (19), this latter cooperating with the male ball (16) of the humeral piece (7), wherein the anchoring element (18) contains, on the one hand, in its upper part, a stabilizer (20) intended to be introduced into the base of the coracoid process (4) of the scapula (2) and, on the other hand, in its lower part, an orifice (22) for the passage of a fixation means (23) into the spine of the scapula (2), and wherein the cylindrical rod (10) has a straight cross section substantially equal to that of the housing (11) which constitutes the hollow in the interior of the tubular element (9), said anchoring element (18) further comprising a solid member (21), having an upper part (21*a*) and a lower part (21*b*), the horizontal cross sections of which are substantially isosceles triangles.

4,919,670

MODULAR HUMERAL PROSTHESIS

James L. Dale, Austin; Brain D. Burkinshaw, Pflugerville, and Wayne Z. Burkhead, Dallas, all of Tex., assignors to Intermedics Orthopedics, Inc., Austin, Tex.

Filed Feb. 3, 1988, Ser. No. 151,896

Int. Cl.[5] A61F *2/40*

U.S. Cl. 623—19 **21 Claims**

16. A modular humeral prosthetic device comprising:

a humeral stem having a substantially cylindrical distal end and a widened proximal end;

the proximal end having a proximal end surface which is angled relative to the axis of the distal end;

a male taperlock means protruding from the center of the proximal end surface;

a head means having a substantially spherically shaped outer surface for engagement within the glenoid cavity of a human scapula, the head means including a central female taperlock means for receiving and engaging the male taperlock means in a rigid mechanical coupling engagement;

the outer surface of the spherically shaped head means comprising less than half the surface of a complete sphere, the theoretical center of the spherically shaped head means being disposed at or below the proximal end surface when the male and female taperlocks are lockably engaged.

4,919,671

METAL ANCHORING PART FOR A KNEE JOINT ENDOPROSTHESIS

Kurt Karpf, Holderbank, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 13, 1988, Ser. No. 181,079

Claims priority, application Switzerland, May 15, 1987, 1888/87

Int. Cl.[5] A61F *2/38*

U.S. Cl. 623—20 **12 Claims**

1. A metal anchoring part for a knee joint endoprosthesis having a tibia bearing surface on one side, a tibial plateau on an

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opposite side from said bearing surface and disposed on an inclined plane and hollow anchoring rails extending from said

plateau in a ventral to dorsal direction to permit sliding in said direction relative to a prepared recess in a tibia.

4,919,672
HIP JOINT AUGMENTATION

Edward A. Millar, Box 30, St. Mary's Rd., Libertyville, Ill. 60048; Gerald F. Harris, 3107 S. 122nd St., #7, West Allis, Wis. 53227, and Roy G. Fink, 1320 Badgley Rd., Jackson, Mich. 49203

Filed Jan. 23, 1989, Ser. No. 300,041
Int. Cl.[5] A61F *2/34, 2/30*
U.S. Cl. 623—22 **5 Claims**

1. An extracapsular prosthesis designed to serve as an adjunct to an existing natural socket comprising:

a curvilinear shell configured to extend laterally, posteriorly and superiorly beyond the acetabulum including an elongated base having a concave inner surface and an outer surface, a flange extending substantially along the outer surface and outwardly from said base to overlap the natural ilium, said flange adapted to receive means for attaching the shell to the ilium exterior adjacent to the natural socket, a lip extending from said base opposite said flange, said lip having an inner concave surface extending posteriorly and superiorly beyond the acetabular rim wherein the combination of said lip and said base form a substantially continuous concave inner surface which is complimentary to the surface configuration of the natural socket thereby defining an extracapsular extension to retain the femoral head within the natural socket.

4,919,673
PROSTHESIS FOR A FEMORAL HEAD

Hans-Georg Willert, Gottingen, Fed. Rep. of Germany, and Manfred Semlitsch, Winterthur, Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

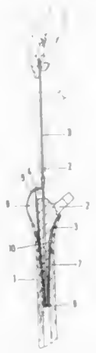
Filed Feb. 24, 1989, Ser. No. 315,731
Claims priority, application Switzerland, Feb. 29, 1988, 00746/88
Int. Cl.[5] A61F *2/36*
U.S. Cl. 623—23 **4 Claims**

1. In combination

a centering rod for disposition in a bone cavity of a femur;

a bond marrow cavity barrier detachably secured to a distal end of said rod; and

a prosthesis for a femoral head having a longitudinally ex-

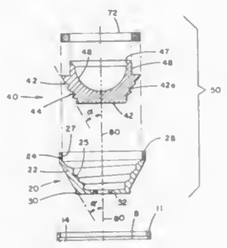


tending stem having a bore extending along a longitudinal axis of said stem, said bore having a diameter for slidably receiving said rod therein to guide said stem into the bone cavity.

4,919,674
HIP CUP FOR A HIP JOINT ACETABULAR PROSTHESIS

Klaus-Dieter Schelhas, Bremen, Fed. Rep. of Germany, assignor to Orthoplant Endioprothetick GmbH, Bremen, Fed. Rep. of Germany

Filed Jan. 19, 1988, Ser. No. 145,289
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1987, 3701381
Int. Cl.[5] A61F *2/34*
U.S. Cl. 623—22 **10 Claims**



1. An acetabular prosthesis comprising an outer metallic shell having an outer bone engaging surface and a conically shaped inner surface defining shell cavity;

an insert including, in combination, a metallic jacket, a plastic liner and a threaded ring;

said jacket having an outer surface configured to engage said shell cavity and an inner jacket surface forming a jacket cavity defining a crown end and an opposite open end, and wherein the inner jacket, at a peripheral edge adjacent the open end, has internal threads to mate with aid threaded ring; and

said plastic liner having a part spherical inner liner surface adapted to engage an articulating joint element and an outer liner surface configured to be pressure clamped within the jacket cavity and locked therein upon securing the threaded ring to the internal threads of the jacket, and

wherein the insert, in combination, is then fixedly secured within the metallic shell by a retaining means.

4,919,675
HEMISPHERICAL PROSTHETIC ACETABULUM

Carlo Dietschi, Lugano, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 23, 1989, Ser. No. 315,560
Claims priority, application Switzerland, Feb. 26, 1988, 718/88
Int. Cl.[5] A61F *2/34*
U.S. Cl. 623—22 **12 Claims**

1. A hemispherical prosthetic acetabulum comprising

a metal shell structure of hemispherical shape having a meridian-disposed elongated slot extending from a equatorial edge thereof and a fixing tab extending therefrom diametrically opposite said slot for affixation to a pelvic bone; and

a plastic cup disposed in said shell structure, said cup having a meridian-disposed elongated slot coinciding with said slot in said shell structure and defining a cavity for receiving a femoral head, said cavity having a first spherical surface area of a first radius corresponding to a radius of a femoral head with a first center disposed on an equatorial plane of said cup and a second spherical surface area of a second radius larger than said first radius with a second center disposed on said equatorial plane of said cup, said second center being displaced from said first center in a direction toward said slot in said cup.

4,919,676
METAL SHELL FOR AN ARTIFICIAL HIP JOINT SOCKET

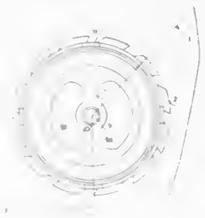
K. Zweymuller, Vienna, Austria, and Rudolf Koch, Berlingen, Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 15, 1988, Ser. No. 207,290
Claims priority, application Switzerland, Jun. 25, 1987, 2398/87
Int. Cl.[5] A61F *2/34*
U.S. Cl. 623—22 **6 Claims**

1. An outer metal shell for an artificial hip joint socket, said shell comprising

a peripheral wall defining a cavity for receiving a plastic socket element and having an opening in an apical region and a self-cutting thread on an exterior surface of said wall; and

bridging means extending across said apical region to subdivide said opening into a plurality of subopenings to permit the introduction and compaction of bone material into a surgically produced recess in a pelvic bone, said means

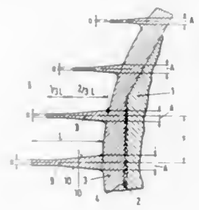


including a centrally disposed threaded bore for threadably receiving an insertion instrument.

4,919,677
PROSTHETIC ACETABULUM

Karl-Gerhart Stubmer, Ravensburg, Fed. Rep. of Germany; Rudolf Koch, Berlingen, and Otto Frey, Winterthur, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 11, 1989, Ser. No. 392,709
Claims priority, application Switzerland, Aug. 25, 1988, 3168/88
Int. Cl.[5] A61F *2/32*
U.S. Cl. 623—22 **10 Claims**



6. A one-piece metal hemispherical shell for an acetabulum, said shell having a constant-pitch self-tapping screwthread on an outer peripheral surface, said thread having a cross-sectional shape of constant thickness from a free end over a portion of the cross-sectional length thereof and an increasing thickness towards said surface over the remainder thereof.

4,919,678
HIP JOINT PROSTHESIS HAVING A CYLINDRICAL SHAFT PORTION

Curt Kranz, Berlin, Fed. Rep. of Germany, assignor to MECRON medizinische Produkte GmbH, Berlin, Fed. Rep. of Germany

Filed Jun. 13, 1988, Ser. No. 205,883
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1987, 8708500[U]
Int. Cl.[5] A61F *2/32*
U.S. Cl. 623—23 **15 Claims**

1. A hip joint prosthesis, comprising:

a first member having a shaft portion having a longitudinal axis, said first member having a lateral arm extending at an angle relative to said longitudinal axis, said lateral arm having a terminal end adapted for receiving a joint ball, wherein in a region adjacent said shaft portion said lateral arm has a length in a direction parallel to said longitudinal axis and a width in a direction tangential to said shaft

as a hook having a surface facing the other end of said

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portion, said length being substantially larger than said width;

a second member having a substantially tubular body which has a proximal end having a hollow interior, said proximal end of said second member having a generally longitudinally disposed slit therein, said slit portion being relatively narrow in width relative to a peripheral circumferential extent of said substantially tubular body adjacent said slit, said hollow interior of said proximal end of said second member being adapted for receiving said shaft portion of said first member such that said lateral arm projects through said slit in said second member;

in an assembled condition, said shaft portion of said first member being substantially completely disposed within said hollow interior of said proximal end of said second member and being substantially completely surrounded by said tubular body, and said region of said lateral arm adjacent said shaft portion being disposed in said slit; and

connecting means for fixedly connecting a proximal end of said shaft portion to a proximal end of said second member while said first and second members are in said assembled condition.

4,919,679

FEMORAL STEM SURGICAL INSTRUMENT SYSTEM

Robert G. Averill, Ringwood; Alfred J. Zarnowski, North Plainfield, and Matthew V. Lyons, Hoboken, all of N.J., assignors to Osteonics Corp., Allendale, N.J.

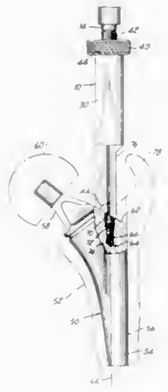
Filed Jan. 31, 1989, Ser. No. 304,782

Int. Cl.[5] A61F *2/36;* **A61B** *17/00, 17/18*

U.S. Cl. 623—23 **15 Claims**

9. The improvement in a femoral stem surgical instrument system for use in connection with manipulating, impacting and extracting a femoral stem during procedures involving the placement of the femoral stem relative to a femur, the femoral stem extending in an axial direction and including a proximal surface transverse to the longitudinal direction and making an acute angle with the longitudinal direction, and a recess extending in the axial direction from the proximal surface distally into the femoral stem, the femoral stem surgical instrument system including a handle component having a coupling projection for selective engagement with the recess to couple the handle component with the femoral stem for manipulation of the femoral stem in direct response to manipulation of the handle component, the improvement comprising:

a bore portion extending in an axial direction along the recess, the bore portion being spaced distally from the proximal surface and including a first coupling configuration therein;



the coupling projection including a second coupling configuration complementary t the first coupling configuration;

the handle component including a coupling sleeve carried by the handle component for relative movement between the coupling sleeve and the coupling projection in axial directions, a coupling surface on the coupling sleeve, the coupling surface making an acute angle with the axial direction for matching the acute angle of the proximal surface so as to enable selective coupling of the coupling surface with the proximal surface, and locking means on the handle component for locking the coupling sleeve against axial movement relative to the proximal surface of the femoral stem when the first and second coupling configurations are coupled together and the coupling surface is in engagement with the proximal surface of the femoral stem.

4,919,680

HIGH-EXTRACTION CHROME TANNING PROCESS

Bernhard Wehling; Bernd Makowka, both of Bergisch-Gladbach; Heinz-Günter Klein, deceased, late of Bergisch-Gladbach; Gertrud Klein, beir, Cologne, and Helga Rosentreter, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 11, 1988, Ser. No. 231,233

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1987, 3726796

Int. Cl.[5] *C14C 3/06*

U.S. Cl. 8—94.27 **6 Claims**

1. In an improved process for the chrome tanning of pickled hides with a tanning agent comprising a reaction product of a basic chromium (III) sulfate and aliphatic C_4–C_6 dicarboxylic acids or salts thereof,

the improvement comprises preparing said reaction product in an aqueous solution from basic chromium (III) sulfate and 0.2 to 0.8 mol of the aliphatic dicarboxylic acids per mol chromium oxide of the basic chromium sulfate to 50° to 100° C. over a period of 30 to 180 minutes with subsequent adjustment of the theoretical basicity to 0 to 50% with alkali metal hydroxide or carbonate,

the reaction product being added to a hide pickling liquor in the form of an aqueous solution having a chromium oxide content of at least 5% or in powder form in a quantity of 0.9 to 1.5% chromium oxide, based on hide weight, the liquor volume comprising less than 100%, based on hide weight, the final pH value being above 4.0 and the final temperature above 40° C.

4,919,681

METHOD OF PREPARING CELLULOSIC FIBERS HAVING INCREASED ABSORBENCY

Robert A. Tyler, Candler; Henry C. Ramsey, and Robert N. Armstrong, both of Asheville, all of N.C., assignors to BASF Corporation, Williamsburg, Va.

Filed Feb. 16, 1988, Ser. No. 156,391

Int. Cl.[5] D06M *1/00;* **B32B** *23/04*

U.S. Cl. 8—116.1 **22 Claims**

1. A method of increasing the absorbency of cellulosic fibers comprising:

contacting said cellulosic fibers with an aqueous acidic solution having a pH value of no more than 4;

and thereafter treating the cellulosic fibers with water for about ten seconds to about five minutes; whereby the resulting cellulosic fibers consist essentially of cellulose

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4,919,682

METAL CLAMP FOR JOINING PIPES

Emilio Bellazzi, Milan, Italy, assignor to Arcelli & Bernacchi Srl., Milan, Italy

Filed May 25, 1989, Ser. No. 356,919

Claims priority, application Italy, May 26, 1988, 20739 A/88

Int. Cl.[5] B65D *63/02*

U.S. Cl. 24—20 R **2 Claims**

1. A metal clamp for joining radially inner and outer axially aligned conduits wherein the outer conduit is made from a deformable material comprising:

an elongate base strap having two ends with one end formed as a hook having a surface facing the other end of said strap and overlapping the other end of said strap to provide a substantially cylindrical shaped metal clamp,

a non-radial bend folded in said base strap adjacent said other end and providing a surface extending outwardly at an angle diverging away from said one overlapping end,

a second bend folded in said base strap adjacent said one end of said base strap,

a straight section of said base strap between said hook and said second bend,

at least two wave-shaped bends in said base strap adjacent said second bend, and

a central lengthwise slit traversing said wave-shaped bends, whereby said one end of said base strap is movable relative to said other end to engage said hook and said non-radial bend with said surface of said hook opposed to and substantially co-planar with said surface of said non-radial bend and said straight section of said base strip extending substantially tangential relative to said metal clamp.

4,919,683

STABLE MIDDLE DISTILLATE FUEL-OIL COMPOSITIONS

Theodore E. Nalesnik, Beacon, and Sheldon Herbstman, New City, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 22, 1988, Ser. No. 288,201

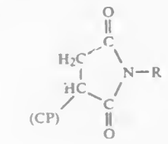
Int. Cl.[5] C10L *1/72*

U.S. Cl. 44—62 **5 Claims**

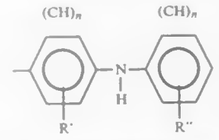
1. A stable middle distillate fuel-oil composition comprising:

(a) a major portion of a middle distillate fuel-oil; and

(b) a minor amount of, as a storage stabilizing additive, copolymer having grafted thereon an aromatic polyamine succinimide of the formula



wherein (CP) is a copolymer of ethylene and a (C_1–C_{18}) alpha-monoolefin and R is



where R', R'' are each aryl, alkylryl, HN-Aryl, alkoxyl or H and n=0 or 6.

4,919,684

STABLE MIDDLE DISTILLATE FUEL-OIL COMPOSITIONS

Theodore E. Nalesnik, Beacon, and Sheldon Herbstman, New City, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 22, 1988, Ser. No. 288,206

Int. Cl.[5] C10L *1/22*

U.S. Cl. 44—62 **5 Claims**

1. A stable middle distillate fuel-oil composition comprising:

(a) a major portion of a middle distillate fuel-oil; and

(b) a minor amount of, as a storage stabilizing additive, a hydroxy aromatic or alkyl phenol succinimide of grafted onto a copolymer of the formula

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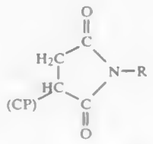
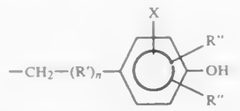


where (CP) is a copolymer of ethylene and a (C_3–C_{18}) alpha monoolefin, and R is



wherein R' is an alkyl, alkoxyl, alkylaryl or aryl group; X is a hydroxy aromatic amine SH, OH, OR, or H; and R'' is H, alkyl, an alkoxyl or an aryl group and n=0–6.

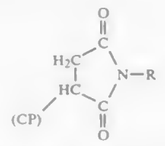
4,919,685

STABLE MIDDLE DISTILLATE FUEL-OIL COMPOSITIONS

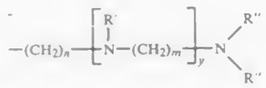
Sheldon Herbstman, New City, and Theodore E. Nalesnik, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 22, 1988, Ser. No. 288,209
Int. Cl.[5] C10L *1/22*
U.S. Cl. 44—62 6 Claims

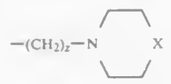
1. A stable middle distillate fuel-oil composition comprising:
(a) a major portion of a middle distillate fuel-oil; and
(b) a minor amount of, as a storage stabilizing additive, an aliphatic succinimide and/or aliphatic polyamine succinimide of a copolymer of the formula



wherein (CP) is copolymer of ethylene and a (C_3–C_{18}) alpha monoolefin, R is an aryl group, a (C_3–C_{18}) alkyl group, a (C_2–C_{10}) alkenyl group, or an alkyl polytertiary amine including



wherein R' and R'' are each an alkyl, alkenyl or aryl group, n=1–4, m=1–4 and y=1–4 or



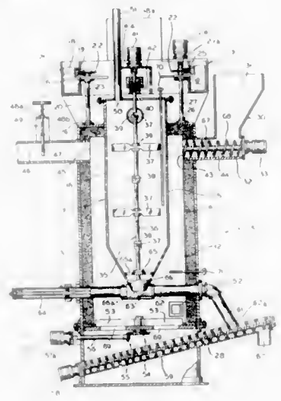
wherein X is O, S or N-R' and z=1–6.

4,919,686

PROCESS FOR THE PYROLYTIC PRODUCTION OF SYNTHETIC GAS

Raymond S. Edwards, Scottsdale, Ariz., assignor to Co-Gen Power Corporation, Phoenix, Ariz.

Continuation-in-part of Ser. No. 918,310, Oct. 14, 1986, abandoned. This application Sep. 30, 1987, Ser. No. 102,838
Int. Cl.[5] C10J *3/00*
U.S. Cl. 48—197 R 52 Claims



1. A method for the pyrolytic production of synthetic gas from components of solid, light unit density materials of less than 30 lb/ft^3 and high unit density materials of more than 30 lb/ft^3, including selected segregated postconsumed waste materials, within a pyrolytic gasifier operably heated by an associated furnace, said method comprising the steps of:
preparing said materials for use as pyrolytically decomposable gasifier fuel by physically fragmenting same through material preparation means;
conveying said materials from said material preparation means to material segregation means by material conveying means operably associated therebetween;
segregating said materials into separately and physically distinct homogenous ones of stored segregated components of said gasifier fuel by said material segregation means;
delivering from said material segregation means said components of gasifier fuel formulation into a desired gasifier fuel component ratio by gasifier fuel delivery means to compacting means, as a formulated gasifier fuel mixture;
compacting said gasifier fuel mixture by said compacting means operably connected to said gasifier fuel delivery means, so as to substantially eliminate entrapped oxygen and nitrogen within said gasifier fuel mixture and to prevent the potential for oxygenated combustion thereof;
heating the interior of said gasifier means by furnace means operably positioned adjacent said gasifier means for, in turn, heating said gasified fuel mixture to a desired temperature of between 700 degrees Fahrenheit and 900 degrees Fahrenheit;
transporting said gasifier fuel mixture from said compacting means to gasifier fed means by said material conveying means operably associated therewith;
feeding said desired ratio of densified gasifier fuel formula mixture into said gasifier means at a minimum unit density of 60 lb/ft^3;
directing said gasifier fuel mixture within said gasifier means towards the exterior periphery of said gasifier means to facilitate the formation of said synthetic gas through the pyrolytic decomposition of said gasifier fuel formula mixture therewith; and

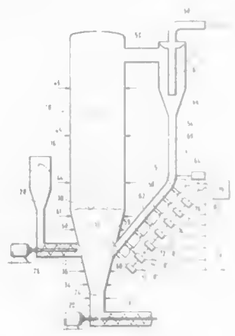
collecting said synthetic gas formed within said gasifier means by said pyrolytic decomposition of said gasifier fuel formula mixture by gas collection means operably associated with said gasifier means, said gas collection means channeling said gas component to gas collection means.

4,919,687

APPARATUS FOR THE PRODUCTION OF GAS CONTAINING HYDROGEN AND CARBON MONOXIDE FROM SOLID FUEL

Johannes Lambertz, Kerpen; Wolfgang H. Adlhoch, Swistal; Alfred G. Mittelstädt, Hürtz-Berrenrath, and Wolfgang Hermann, Erftstadt-Gymnich, all of Fed. Rep. of Germany, assignors to Rheinische Braunkoblenwerke A.G., Cologne, Fed. Rep. of Germany

Division of Ser. No. 53,447, May 22, 1987, Pat. No. 4,852,994. This application May 17, 1989, Ser. No. 353,132
Int. Cl.[5] C10J *3/56*
U.S. Cl. 48—62 R 4 Claims



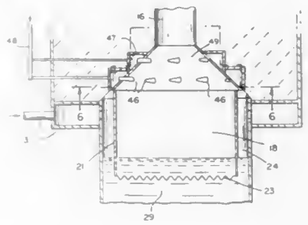
1. Apparatus for the production of a gas containing hydrogen and carbon monoxide from a solid fuel material comprising:
(a) a gasification reactor constructed to operate under an elevated internal pressure and providing a fluidized bed portion for accommodating a fluidized bed of said solid fuel material and a post-reaction chamber above said fluidized bed portion for post-gasification reaction of material leaving said fluidized bed portion of said reactor;
(b) means for introducing said solid fuel material into said reactor;
(c) means for producing said fluidized bed of said solid fuel material in said fluidized bed portion of said reactor and for effectuating gasification of said solid fuel material in said fluidized bed;
(d) means for separating from product gas produced in said reactor at least a portion of solid particle material entrained by the flow of said product gas upwardly from said fluidized bed portion through said post-reaction chamber;
(e) means for discharging said product gas from said separating means;
(f) a recycling conduit having a first end communicating with said separation means and a second end communicating with said reactor, for recycling said separated-off solid material from said separating means to said reactor;
(g) means for introducing gas into said recycling conduit at a plurality of spaced apart locations along a portion of said recycling conduit including a plurality of nozzles, each said nozzle being spaced apart from the next nozzle along a longitudinal axis of said conduit, said plurality of nozzles beginning at a location adjacent said second end of said recycling conduit to loosen up said separated-off solid material therein, thereby maintaining a flow of said separated-off solid material through said recycling conduit; and
(h) means for controlling the injection of gas into said recycling conduit and constructed to provide for successive pulse-wise injection of said gas such that an initial pulse of gas begins at a location adjacent said reactor at said second end of said recycling conduit and successively runs along said plurality of said spaced apart nozzles to an upstream location remote from said reactor.

4,919,688

GASIFIER WITH GAS SCROURED THROAT

Robert M. Suggitt, Wappingers Falls, and Mitri S. Najjar, Hopewell Junction, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 914,847, Oct. 3, 1986, abandoned. This application Jan. 20, 1988, Ser. No. 147,090
Int. Cl.[5] C10J *3/48, 3/82*
U.S. Cl. 48—69 3 Claims



1. A gasifier (**10**) for combusting a particulated carbonaceous fuel mixture to produce a usable gas and residual solids, comprising:
a shell (**11**),
means forming a combustion chamber (**13**) in said shell (**11**) in which said carbonaceous fuel mixture is combusted,
injector means (**26**) connected to a supply means of a particulated fuel (**25**) and to a combustion supporting gas (**27**) to form said carbonaceous fuel mixture and to direct said mixture into the means forming said combustion chamber (**13**),
means forming a quench chamber (**24**) in said shell holding a liquid bath (**29**) beneath the combustion chamber,
means forming a throat (**16**) interconnecting said means forming said combustion chamber and said means forming said quench chamber, and having an outwardly divergent wall defining a passage (**17**) to conduct said usable gas and residual solids from the means forming said combustion chamber toward said liquid bath,
nozzle means having nozzle discharge openings aligned contiguous with said outwardly divergent wall to direct pressurized streams of a scouring gas along said divergent wall to contact and dislodge residual solids which have become deposited thereon,
said nozzle means including a plurality of discrete nozzles arranged in spaced apart layers along said outwardly divergent wall to direct said scouring gas, each of said spaced apart layers of nozzles having an individual manifold carrying said pressurized scouring gas.

4,919,689

SELF-REINFORCED SILICON NITRIDE CERAMIC OF HIGH FRACTURE TOUGHNESS

Aleksander J. Pyzik; Douglas B. Schwarz, both of Midland; William J. Dubensky, Traverse City, and Donald R. Beaman, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 148,748, Jan. 27, 1988, Pat. No. 4,883,776.
This application Feb. 28, 1989, Ser. No. 290,720
Int. Cl.[5] C04B *35/58*
U.S. Cl. 51—309 12 Claims

I. A silicon nitride ceramic body having a fracture toughness greater than about 6 MPa $(m)^{\frac{1}{2}}$, as measured by the Chevron notch technique at about 23° C., consisting essentially of

(a) a crystalline phase of β-silicon nitride of which at least about 20 volume percent, as measured in a plane by scanning electron microscopy, is in the form of whiskers having an average aspect ratio of at least about 2.5; and

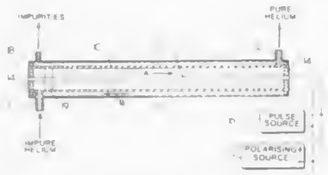
(b) a glassy phase in an amount not greater than about 35 weight percent of the total weight comprising magnesium oxide in a range from about 15 percent to about 51 percent, yttrium oxide in a range from about 36 percent to about 63 percent, calcium oxide in a range from about 0.1 percent to about 15 percent, and silica in a range from about 3 percent to about 30 percent by weight.

4,919,690

METHOD FOR PURIFYING A CONTINUOUS FLOW OF HELIUM AND/OR NEON GAS

James E. Lovelock, St. Giles on the Heath, Great Britain, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 18,144, Feb. 24, 1987, abandoned. This application Dec. 17, 1987, Ser. No. 133,231
Claims priority, application United Kingdom, Apr. 16, 1986, 8609325
Int. Cl.[5] B03C *1/00*
U.S. Cl. 55—2 3 Claims



1. A method for removing any atoms or molecules which are not either helium or neon from a continuous flow of helium or neon gas, or a mixture of said gases, said method involving the operations of:

passing a stream of the helium or neon gas along a predetermined flow path;

generating a corona discharge across the stream by applying a series of high frequency, high potential, short duration pulses sufficient to raise the mean energy of the stream to between 21 eV and 24 eV, wherein, metastable helium or neon atoms are produced, said metastable atoms serving to ionize other atoms or molecules which are not either helium or neon by losing energy thereto; and

removing the ionized atoms or molecules from the main gas stream by setting up a polarizing field across said stream to cause migration of said other ions out of the stream.

4,919,691

PAINT DETACKIFICATION USING AN IMPROVED OIL-IN-WATER EMULSION WITH DIBASIC ESTER

Robert R. Patzelt, Bloomfield Hills, Mich.; Robert J. Meade, Naperville, and Morris Mindick, Downers Grove, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Apr. 17, 1989, Ser. No. 338,820
Int. Cl.[5] B01D *21/01*
U.S. Cl. 55—45 6 Claims

1. In a method of recovering volatile organic paint carrier from paint spray booths and also collecting, detackifying, and dispersing paint solids obtained from paint overspray in said paint spray booths, which paint spray booths are of the type comprising a chamber, a duct system for passing air through said chamber, an exhaust system connected to said duct system, a sump containing a circulating hydrophilic liquid which is pumped onto a means for forming a liquid curtain of said hydrophilic liquid, said liquid curtain being contacted by oversprayed paint and volatile organic paint carrier; the improvement which comprises using as the hydrophilic liquid an improved oil-in-water emulsion maintained at a pH value ranging from 7.5–11.0, which emulsion consists essentially of the ingredients:

(a) from 5–50 weight percent of an organic hydrocarbonaceous liquid having a boiling point of at least 150° C.;

(b) from 0.5–20 weight percent, based on the organic hydrocarbonaceous liquid of an oil-in-water emulsifier;

(c) from 5–100 weight percent, based on the organic hydrocarbonaceous liquid, of a polar organic solvent, which polar organic solvent has a water solubility of less than 10 weight percent (based on total solution), a vapor pressure less than 0.5 Torr at 20° C., a Tag closed cup flash point of at least 90° C., and is easily admixed with said organic hydrocarbonaceous liquid; and

(d) water, the remainder;

and wherein said improved emulsion, or portions thereof, (v) are collected periodically or continuously, (w) broken into separate organic, aqueous, and solid phases by adjusting the pH of the collected portion to a pH of from about 3.0 to about 6.5, and (x) recovering from said aqueous, organic, and solid phases some portion, or all of said paint solids and volatile organic paint carriers; and (y) further recovering said organic hydrocarbonaceous liquid, said polar organic solvent, said emulsifiers and said water, and then;

(z) reforming a recycled improved emulsion by using said recovered organic hydrocarbonaceous liquid, said recovered polar organic solvent, said recovered emulsifiers and water by admixing same and adjusting the pH to a range between 7.5–11.0, and then reusing the recycled improved emulsion as the hydrophilic liquid in the paint spray booth, and then repeating steps v, w, x, y, and z.

4,919,692

PROCESS FOR REMOVING SOLVENTS AND OTHER CONTAMINANTS FROM AN INLET SOLVENT LADEN AIR PATH

Tomas E. Vara, and Clyde Anderson, both of Vero Beach, Fla., assignors to Vara International, Inc., Vero Beach, Fla.

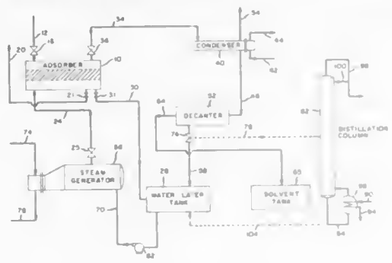
Filed Dec. 19, 1988, Ser. No. 286,655
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—59 3 Claims

1. A process for regenerating adsorbents used to remove solvents from an inlet solvent laden air (SLA) path, said solvents being at least partially miscible in water, comprising the steps of:

(i) passing steam through the adsorbent to desorb solvents from the adsorbent;

(ii) condensing the steam and solvents leaving the adsorbent to produce a condensate;

(iii) distilling the condensate into at least one solvent-rich fraction and a water fraction;



(iv) generating steam from the water fraction of the distillation step (iii); and,

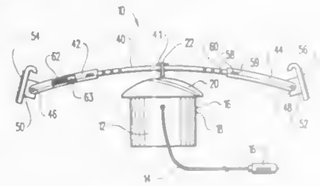
(v) recycling the steam of step (iv) to the desorption step (i)

4,919,693

ELECTROSTATIC AIR CLEANER

Richard A. Olney, P.O. Box 534, O'Neill, Nebr. 68763

Filed Mar. 29, 1989, Ser. No. 330,066
Int. Cl.[5] B03C *3/00*
U.S. Cl. 55—124 10 Claims



I. An electrostatic air cleaner for use in vehicles, comprising:

a hollow housing defining an interior air flow path;

an air inlet opening in a bottom of said housing;

an electrostatic precipitator in said housing;

a charcoal filter in said housing;

an air outlet opening adjacent a top portion of said housing, on a downstream side of said charcoal filter for returning purified air to said vehicle interior;

a fan in said housing for inducting air from a vehicle interior through said air inlet opening, said electrostatic precipitator, said charcoal filter, and exhausting air through said air outlet opening; and

a telescoping rod connected to said housing and having frictional pads for engagement with opposite side walls of a vehicle for securing said housing adjacent an interior ceiling of a vehicle.

4,919,694

SELECTIVE GAS PERMEATION MEMBRANES AND METHOD OF MANUFACTURING THEM

Yasuo Hata, and Kenkichi Takahashi, both of Sodegaura, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Dec. 27, 1988, Ser. No. 290,342
Claims priority, application Japan, Dec. 28, 1987, 62-332783; Apr. 11, 1988, 62-88481; Apr. 11, 1988, 62-88482
Int. Cl.[5] B01D *53/22*
U.S. Cl. 55—158 6 Claims

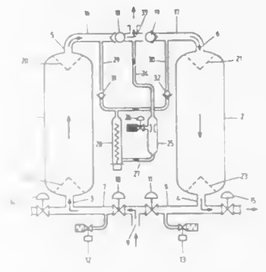
1. A selective gas permeation membrane, comprising a porous substrate the inner walls of the pores of which are coated with a crosslinked organosiloxane polymer having a penetration degree of about 20 to 150 and containing voids in the central portion of at least a substantial number of said pores.

4,919,695

APPARATUS FOR DRYING GAS

Pierre Trepaud, 17, rue Legendre, 75017 Paris, France

Filed Apr. 24, 1989, Ser. No. 342,161
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—179 5 Claims



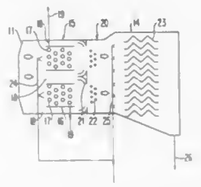
1. Apparatus for drying gas comprising an entry and an exit, two adsorbers mounted in parallel between the entrance and the exit by inlet and exit conduits; a jet pump having an inlet, suction means and delivery means; heating means mounted on the delivery means; means which put selectively only one of the exit conduits in communication with the delivery means; means which put the inlet in communication only with the other of the exit conduits; and a valve mounted on the suction means.

4,919,696

SUPERCOOLING TYPE MIST ELIMINATOR APPARATUS

Tsuneo Higashi, Mihara, and Akio Izuwa, Hiroshima, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1988, Ser. No. 262,877
Claims priority, application Japan, Oct. 30, 1987, 62-273464
Int. Cl.[5] B01D *35/18, 46/40*
U.S. Cl. 55—269 4 Claims



1. A supercooling type mist eliminator apparatus, comprising:

a gas passageway adapted to have flowing therethrough a wet exhaust gas containing particles of dust and mist;

a crimped-plate mist eliminator in said gas passageway for removing by inertial collision the particles of dust and mist contained in the wet exhaust gas;

an exhaust gas cooling means disposed upstream of said crimped-plate mist eliminator, said exhaust gas cooling means including supercooling elements and non-cooling sections alternately disposed adjacent to one another along a plane perpendicular to the direction of gas flow in said gas passageway, said supercooling elements and said

noncooling sections being separated by gas passageway partition plates; and

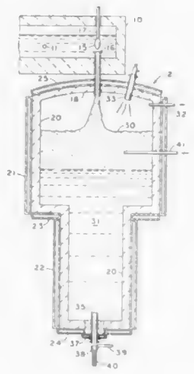
an exhaust gas mixing means disposed upstream of said crimped-plate mist eliminator and just downstream of and adjacent to said exhaust gas cooling means.

4,919,697

VACUUM REFINING OF GLASSY MATERIALS WITH SELECTED FOAMING RATE

George A. Pecoraro, Lower Burrell; Larry J. Shelestak, Bairdford, and Joseph E. Cooper, Natrona Heights, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 3, 1989, Ser. No. 292,971
Int. Cl.[5] C03B *5/225*
U.S. Cl. 65—134 **17 Claims**



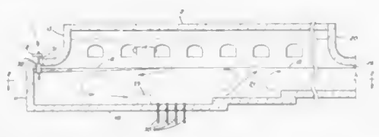
1. In a method of refining glassy material wherein batch material is melted and a stream of the resulting molten material is foamed as it passes into a vessel in which subatmospheric pressure is maintained to remove gases from the molten material, the improvement comprising increasing the foaming by adding to the material upstream from the foaming step a sufficient amount of a volatile substance to produce at least an eight-fold volume increase as the material is foamed, whereby removal of the gases from the molten material is increased.

4,919,698

AVOIDANCE OF NICKEL SULFIDE STONES IN A GLASS MELTING OPERATION

Leonard A. Knavish, Plum Borough, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 21, 1989, Ser. No. 369,450
Int. Cl.[5] C03B *5/16*
U.S. Cl. 65—134 **8 Claims**



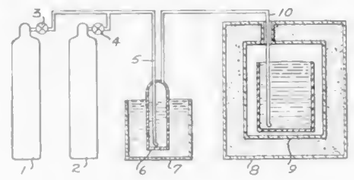
1. In a method of melting glass wherein relatively cold feed material is fed onto a pool of melting glass at an upstream end of a furnace, molten glass is withdrawn at a downstream end of a furnace longitudinally spaced from the upstream end, and heat for melting is provided to the furnace whereby a spring zone of rising glass currents is established in the pool at an intermediate location spaced from the upstream end and the downstream end, the improvement comprising applying direct current to the pool of molten glass by means of at least one anode and at least one cathode, with the at lease one anode being located closely adjacent to the bottom of the pool of melting glass in the region of the furnace upstream from the spring zone of rising currents, so as to maintain oxidizing conditions in the bottom region of the pool upstream from the spring zone of rising currents to suppress the presence of nickel sulfide stones in the glass.

4,919,699

PROCESS OF REMOVING PLATINUM INCLUSIONS FROM LASER GLASS

Michimasa Matsukawa; Tetsuro Izumitani, and Kunio Takeuchi, all of Tokyo, Japan, assignors to Hoya Corporation, Tokyo, Japan

Continuation of Ser. No. 894,058, Aug. 7, 1986, abandoned. This application Jul. 21, 1988, Ser. No. 222,286
Claims priority, application Japan, Aug. 9, 1985, 60-174024
Int. Cl.[5] C03B *5/225, 5/235*
U.S. Cl. 65—134 **7 Claims**



1. A process for forming a laser glass by removing platinum inclusions from the laser glass, said inclusions having been formed while said laser glass was in a molten state, said process comprising the following steps:

placing glass, having a composition which permits it to be used as a laser glass in a vessel, said vessel having at least an interior surface of platinum, said glass contacting at least a portion of said platinum;

heating said glass in said vessel, so that said glass is heated at least to the point of said glass being molten and a portion of said platinum, which remains in contact with the glass is eluted into said glass, said glass having sufficiently reduced viscosity to enable a gas to bubble through;

bubbling PCl_3 or $POCl_3$ vapors and an O_2 carrier gas which contains N_2 gas so as to prevent coloration and ultraviolet ray absorption of said laser glass, through said molten glass for a time period sufficient to remove said platinum inclusions by reacting said platinum inclusions with PCl_3 or $POCl_3$ to ionize said platinum inclusions in the form of a complex ion of platinum and chlorine resulting in said molten glass being substantially free of platinum inclusions; and

forming a laser glass from said molten glass.

4,919,700

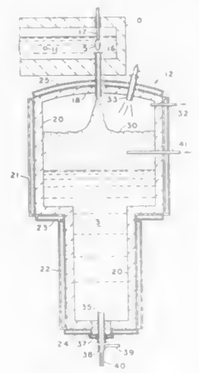
VACUUM REFINING OF GLASSY MATERIALS WITH SELECTED WATER CONTENT

George A. Pecoraro, Lower Burrell; Larry J. Shelestak, Bairdford, and Joseph E. Cooper, Natrona Heights, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 3, 1989, Ser. No. 292,718
Int. Cl.[5] C03B *5/225*
U.S. Cl. 65—134 **10 Claims**

1. In a method of refining glassy material wherein batch material is melted and a stream of the resulting molten material is foamed as it passes into a vessel in which subatmospheric pressure is maintained to remove gases from the molten material, the improvement comprising increasing the foaming by controlling the amount of water to at least 0.05 percent by

weight in the molten material upstream from the foaming step so that vaporization of water in the subatmospheric pressure



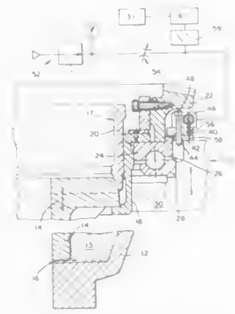
vessel enhances volume expansion during the foaming, whereby removal of gases from the molten material is increased.

4,919,701

FEEDER ASSEMBLY FOR A GLASS CONTAINER MANUFACTURING MACHINE

Alan W. Menard, Bolton; John E. Snomala, Simsbury, and Richard A. Walker, North Granby, all of Conn., assignors to Emhart Industries, Inc., Hartford, Conn.

Filed Jul. 21, 1989, Ser. No. 383,950
Int. Cl.[5] C03B *7/08*
U.S. Cl. 65—158 **2 Claims**



1. A feeder assembly for delivering molten glass to an individual section machine comprising:

a spout bowl,

a tube for defining with said spout bowl a selected opening through which molten glass may flow for delivery to the individual section machine,

an annular thrust bearing having an upper race and a lower race

unitary tube chucking means for supporting said tube including

a tube support for supporting said tube,

a tube clamp for clamping said tube on said tube support,

the upper race of said thrust bearing extending around said tube support, and

annular bevel gear means on top of said upper race, and

jack means for supporting said tube chucking means for vertical displacement, said jack means including said lower race of the thrust bearing,

jack housing means for supporting said lower race, and

motor means for displacing said jack housing means,

said jack housing means having a flat annular horizontal surface,

annular ring means including a selected plurality of flat pads for matingly resting on said flat annular horizontal surface,

said annular ring means including portions projecting over said upper race and having a selected vertical spacing therefrom, so that once the tube is lowered into engagement with said spout bowl, continued lowering of said jack housing means will result in at least one of said projecting portions engaging said upper race and lifting at least on of said flat pads off of said flat annular horizontal surface,

air conduit means extending through each of said pads and through the adjacent ring portion to said flat annular surface, and

pressurized air supply means for supplying air under pressure to each of said air conduit means and including means for signalling a drop of pressure which occurs whenever one of said pads is lifted away from said annular surface to indicate that said tube has engaged said spout bowl and

motor control means for receiving said signal and stopping the operation of said motor responsive thereto.

4,919,702

FERTILIZER AND/OR SOIL AMENDMENT

Robert F. Weltzien, and Graeme Berlyn, both of Hamden, Conn., assignors to Soilizer Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 191,954, May 9, 1988, Pat. No. 4,846,870. This application May 3, 1989, Ser. No. 345,521
Int. Cl.[5] C05F *11/02*
U.S. Cl. 71—24 **9 Claims**

1. A solution suitable for use as a fertilizer, said solution consists essentially of from about 0.1% to about 10% L ascorbic acid, from about 10% to about 50% marine algae, from about 3.0% to about 20% nitrogen, from about 3.0% to about 20% phosphorous, from about 3.0% to about 20% potassium, and the balance humic acid in a water solution.

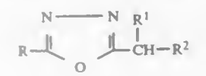
4,919,703

METHOD OF STIMULATING THE GROWTH OF PLANTS EMPLOYING SUBSTITUTED OXADIAZOLES

Allen R. Blem, Cheshire; Howard L. Plant, Milford, and Richard R. Regis, Harwinton, all of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Filed Aug. 19, 1988, Ser. No. 234,439
Int. Cl.[5] A01N *43/82, 57/16*
U.S. Cl. 71—86 **3 Claims**

1. A method for stimulating the growth of plants, which method comprises applying directly to plant seeds prior to germination an effective plant growth stimulatory amount of a compound having the structural formula:



(I)

wherein:

R is

C_1–C_{12} alkyl,

C_3–C_6 cycloalkyl,

C_3–C_6 cycloalkyl substituted with one or more members selected from the group consisting of halogen and C_1–C_3 alkyl,

allyl,

C_3–C_5 alkoxycarbonylmethyl,

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C_7–C_9 aralkyl,
styryl,
phenyl,
naphthyl,
furanyl,
pyridyl,
thienyl,
phenyl substituted with halogen C_1–C_4 alkyl, trihalomethyl, C_1–C_4 alkoxy, trihalomethoxy, trihalomethylthio, C_1–C_4 alkylthio, phenyl, phenoxy, cyano or nitro; or
C_7–C_9 aralkyl substituted with halogen C_1–C_4 alkyl, trihalomethyl, C_1–C_4 alkoxy, trihalomethoxy, trihalomethylthio, C_1–C_4 alkylthio, phenyl, phenoxy, cyano or nitro;

R^1 is
hydrogen,
C_1–C_3 alkyl,
C_7–C_9 aralkyl,
phenyl,
C_7–C_9 aralkyl substituted with halogen, C_1–C_4 alkyl, trihalomethyl, C_1–C_4 alkoxy, trihalomethoxy, trihalomethylthio, C_1–C_4 alkylthio, phenyl, phenoxy, cyano or nitro, or
phenyl substituted with halogen, C_1–C_4 alkyl, trihalomethyl, C_1–C_4 alkoxy, trihalomethoxy, trihalomethylthio, C_1–C_4 alkylthio, phenyl, phenoxy, cyano or nitro;

R^2 is halogen or a radical of the formula:

wherein R^3 and R^4 are each independently C_1–C_4 alkyl; and A, Y and Z are each independently oxygen or sulfur.

4,919,704

4,5,6,7-TETRAHYDROISOINDOLE-1,3-DIONES

Hans Moser, Rheinfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

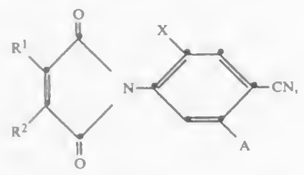
Filed Aug. 1, 1988, Ser. No. 226,701

Claims priority, application Switzerland, Aug. 14, 1987, 3132/87-9

Int. Cl.[5] **A01N** *37/32;* **C07D** *209/48*

U.S. Cl. 71—96 **7 Claims**

1. A compound of formula I



(I)

wherein
R^1 and R^2, taken together, are a $(CH_2)_4$ chain which may be substituted by one or two (C_1–C_4)-alkyl groups;
X is halogen;
A is O—R^4;
R^4 is (C_1–C_8)-alkyl.

4,919,705

TRIFLUOROMETHANESULFONAMIDE DERIVATIVE, A METHOD FOR THE PREPARATION THEREOF AND A HERBICIDE CONTAINING THE SAME

Mitsuru Shibata; Yoshiyuki Hiramatsu; Ryoichi Adachi, and Kenichiro Mitsutake, all of Sodegaura, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

PCT No. PCT/JP88/00104, § 371 Date Jun. 6, 1988, § 102(e) Date Jun. 6, 1988, PCT Pub. No. WO88/06155, PCT Pub. Date Aug. 25, 1988

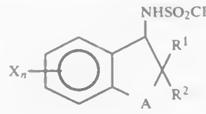
PCT Filed Feb. 4, 1988, Ser. No. 254,935

Claims priority, application Japan, Feb. 10, 1987, 62-27127; Jul. 27, 1987, 62-185380

Int. Cl.[5] **A01N** *42/72;* **C07D** *279/02*

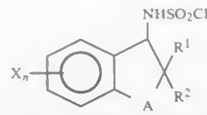
U.S. Cl. 71—90 **7 Claims**

1. A trifluoromethanesulfonamide derivative represented by the general formula



wherein X is a hydrogen atom, a halogen atom, an alkyl group having 1 to 4 carbon atoms or a haloalkyl group having 1 to 4 carbon atoms, n is 1, 2 or 3 and A is —SO_2—NR^3— and R^1, R^2, R^3, and R^4 are each a hydrogen atom or an alkyl group having 1 to 4 carbon atoms.

5. A herbicide comprising a carrier and a trifluoromethanesulfonamide derivative represented by the general formula



wherein X is a hydrogen atom, a halogen atom, an alkyl group having 1 to 4 carbon atoms or a haloalkyl group having 1 to 4 carbon atoms, n is 1, 2 or 3 and A is —SO_2—NR^3— and R^1, R^2, R^3 and R^4 are each a hydrogen atom or an alkyl group having 1 to 4 carbon atoms.

4,919,706

THIAZOLE DERIVATIVES

James V. Hay, Newark, Del., and Anthony D. Wolf, Elkton, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 609,695, May 14, 1984, which is a continuation of Ser. No. 479,363, Apr. 4, 1983, abandoned. This application Oct. 3, 1985, Ser. No. 783,921

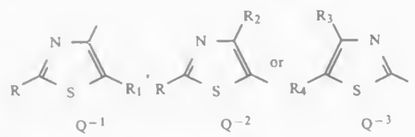
Int. Cl.[5] **C07D** *417/12;* **A01N** *47/36*

U.S. Cl. 71—90 **12 Claims**

1. A compound of the formula:

$QSO_2NHCONHA$

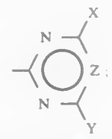
where
Q is



Q^{-1} Q^{-2} Q^{-3}

R is H, C_1–C_3 alkyl or $CH_3C(O)NH$;

R_1 is H, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 alkylthio or C_1–C_3 alkoxycarbonyl;
R_2 is H, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 alkylthio, C_1–C_3 alkoxycarbonyl, NO_2, Cl, Br or CF_3;
R_3 is H, Cl or CH_3;
R_4 is H, Cl or CH_3;
A is



X is CH_3, OCH_3, OC_2H_5 or CH_2OCH_3;
Y is CH_3, or OCH_3; and
Z is N;
provided that R_3 and R_4 are not simultaneously Cl, and agriculturally suitable salts thereof.

4,919,707

DERIVATIVE OF 1,5-DIPHENYL-1H-1,2,4-TRIAZOLE-3-CARBOXAMIDE AND HERBICIDAL COMPOSITION CONTAINING THE SAME

Takafumi Shida; Hideo Arahori; Takeo Watanabe; Yohichi Kanda; Shiro Yamazaki, and Hiroyasu Shinkawa, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1987, Ser. No. 42,321

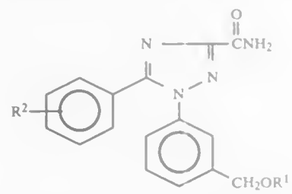
Claims priority, application Japan, Mar. 19, 1987, 62-65274

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.[5] **A01N** *43/653;* **C07D** *249/10*

U.S. Cl. 71—92 **17 Claims**

1. A derivative of 1,5-diphenyl-1H-1,2,4-triazole-3-carboxamide represented by the formula (I):



(I)

wherein R^1 represents a straight-chain alkyl group of 2 to 10 carbon atoms; a branched-chain alkyl group or cycloalkyl group of 3 to 10 carbon atoms; a (cycloalkyl)alkyl group of 4 to 10 carbon atoms; a non-substituted- or halogen-substituted phenyl group; an aralkyl group of 7 to 9 carbon atoms; an alkenyl group of 3 to 6 carbon atoms or an alkyl group of 2 to 10 carbon atoms, which has been substituted by 1 to 19 fluorine atoms, and R^2 represents a fluorine atom.

4,919,708

HALOALKYL TRIAZOLINONES AND HERBICIDAL USE THEREOF

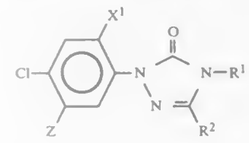
Lester L. Maravetz, Westfield, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 102,303, Sep. 25, 1987, abandoned, which is a continuation of Ser. No. 825,520, Feb. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 697,619, Feb. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 655,960, Sep. 28, 1984, abandoned, which is a continuation-in-part of Ser. No. 541,596, Oct. 13, 1983, abandoned, which is a continuation-in-part of Ser. No. 650,755, Sep. 13, 1984, abandoned, which is a continuation-in-part of Ser. No. 533,013, Sep. 15, 1983, abandoned, which is a continuation-in-part of Ser. No. 666,933, Oct. 31, 1984, abandoned. This application Jan. 26, 1989, Ser. No. 372,207

Int. Cl.[5] **A01N** *43/36;* **C07D** *249/12*

U.S. Cl. 71—92 **5 Claims**

1 An herbicidal compound of the formula



in which
X^1 is F or Cl;
Z is nitro or a group of the formula —OR, —CO—R^6, —CH_2CO—R^6, or —$CH(CH_3)$CO—R^6;
R is alkyl of 1 to 6 carbon atoms which is unsubstituted or is substituted with cycloalkyl or 3 to 7 carbon atoms, cycloalkyl of 3 to 7 carbon atoms which is unsubstituted or is substituted with alkyl of 1 to 6 carbon atoms, alkoxyalkyl of 2 to 8 carbon atoms, cyanoalkyl of 2 to 7 carbon atoms, alkenyl of 2 to 5 carbon atoms, alkynyl of 2 to 5 carbon atoms, haloalkyl of 1 to 5 carbon atoms, haloalkenyl of 2 to 5 carbon atoms, haloalkynyl of 2 to 5 carbon atoms, alkylsulfonyl of 1 to 6 carbon atoms (wherein the alkyl moiety is unsubstituted or is substituted with F, Cl, CN, alkoxy or alkylthio of 1 to 4 carbon atoms, or alkylamino or dialkylamino in which each alkyl is of 1 to 4 carbon atoms), alkylaminosulfonyl or dialkylaminosulfonyl in which each alkyl is of 1 to 4 carbon atoms, alkylcarbonyl of 2 to 7 carbon atoms, or a group of the formula —$C(R^3)$ (R^4) (CH_2)$_n$—CO—Q^1R^5 or —$C(R^3)$ (R^4) (CH_2)$_n$—CO—$N(R^7)$ (R^8) in which n is 0 to 2;
R^3 and R^4 are independently H, alkyl of 1 to 4 carbon atoms, or alkoxy of 1 to 4 carbon atoms;
Q^1 is O or S;
R^5 is H, alkyl of 1 to 6 carbon atoms, alkoxyalkyl or alkylthioalkyl of 2 to 6 carbon atoms, haloalkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, cycloalkenyl of 5 to 7 carbon atoms which is unsubstituted or is substituted with alkyl of 1 to 4 carbon atoms, cyclohexenylalkyl of 6 to 10 carbon atoms, phenyl or benzyl (which may be ring-substituted with fluorine, chlorine, bromine, or alkyl, alkoxy, or alkylthio of 1 to 4 carbon atoms), cyanoalkyl of 2 to 7 carbon atoms, alkynyl of 2 to 5 carbon atoms, alkylideneamino of 1 to 6 carbon atoms which is unsubstituted or is substituted with cycloalkyl 3 to 7 carbon atoms, or cycloalkylideneamino of 5 to 7 carbon atoms, which is unsubstituted or is substituted with alkyl of 1 to 4 carbon atoms;
R^6 is hydroxy, alkoxy or alkylthio of 1 to 6 carbon atoms, alkoxyalkoxy of 2 to 6 carbon atoms, amino, or alkylamino or dialkylamino wherein each alkyl is of 1 to 6 carbon atoms and is unsubstituted or is substituted with alkoxy of 1 to 4 carbon atoms;
R^7 is H or alkyl of 1 to 6 carbon atoms;
R^8 is R^5 or alkoxy of 1 to 6 carbon atoms, alkylthio of 1 to 6

carbon atoms, alkylsulfonyl of 1 to 6 carbon atoms, phenylsulfonyl, or phenylalkylsulfonyl of 1 to 3 alkyl carbon atoms;

R^1 is alkyl of 1 to 4 carbon atoms or haloalkyl of 1 to 3 carbon atoms; and

R^2 is fluoroalkyl of 1 to 4 carbon atoms.

4. An herbicidal composition comprising an herbicidally effective amount of a compound of claim 1 in admixture with a suitable carrier.

5. A method for controlling undesired plant growth which comprises applying to the locus where control is desired an herbicidally effective amount of the composition of claim 4.

4,919,709

N-(1'-METHYL-2'-METHOXYETHYL)-N-CHLOROACETYL-2,6-DIMETHYLANILINE AS HERBICIDE

Hans Moser, Magden, and Christian Vogel, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 570,709, Jan. 13, 1984, abandoned. This application Dec. 7, 1984, Ser. No. 679,438

Claims priority, application Switzerland, Jan. 25, 1983, 399/83

Int. Cl.[5] A01N *37/22*

U.S. Cl. 71—118 **1 Claim**

1. The method of selectively combating *Echinochloa crus galli* in rice crops under flooded conditions which comprises applying post-emergently to said crops or the environs of their growth S(−)-(1'-methyl-2'-methoxyethyl)-N-chloroacetyl-2,6-dimethylaniline, substantially free of its R anantiomer, at a rate of from about 0.125 to about 0.5 kg/ha.

4,919,710

CONDENSATE DRAINAGE APPARATUS

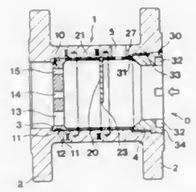
Masao Seki, Chiba, and Hiroki Higashino, Tokyo, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd. and Cilnck Co., Ltd., both of Tokyo, Japan

Filed Feb. 19, 1988, Ser. No. 157,618

Claims priority, application Japan, Feb. 20, 1987, 62-22653[U]; Jun. 23, 1987, 62-154513; Jun. 23, 1987, 62-154514

Int. Cl.[5] B01D *35/02*

U.S. Cl. 55—417 **7 Claims**



1. An apparatus for draining condensate from vapor equipment comprising:

a cylindrical casing having two ends and defining a flow communication path for conveying condensate, wherein one end is connected in fluid communication with the vapor equipment and the other end drains the condensate;

an orifice disk disposed in said casing to traverse the flow path and having a plurality of orifices formed therein;

at least one partition disposed in said casing upstream of said orifice disk with a predetermined spacing therefrom, said partition covering a predetermined portion of the flow path; and

a combination of the at least one partition and the orifice disk wherein the condensate and the vapor are separated by the combination, which generally presents further downstream flow of the vapor while allowing the condensate to be drained through the orifice disk, separation of condensate and vapor utilizing gravity.

4,919,711

BINDER FOR METAL-CONTAINING ORES

Bruce E. Banyai, Hockessin; Denis E. LaSota, and Dennis L. Struck, both of Wilmington, all of Del., assignors to Aqualoo Company, Wilmington, Del.

Continuation-in-part of Ser. No. 67,753, Jun. 29, 1987, Pat. No. 4,863,512. This application May 1, 1989, Ser. No. 347,114

Claims priority, application European Pat. Off., Jun. 29, 1988, 88.110395.6

Int. Cl.[5] C22B *1/16*

U.S. Cl. 75—321 **20 Claims**

1. A process for agglomerating a concentrated ore, which process comprises:

(a) preparing a mixture comprising a binding amount of a binder composition containing a binding amount of (i) water-soluble polymer selected from the group consisting of alkali metal salts of carboxymethyl cellulose and carboxymethyl hydroxyethyl cellulose and (ii) sodium tripolyphosphate, the concentrated ore and water, said water-soluble polymer and said sodium tripolyphosphate being added simultaneously, successively, or alternatively;

(b) agglomerating the mixture into wet balls; and

(c) drying the wet balls and then firing the resultant dry balls at a temperature of at least about 2200° F.,

wherein the mixture contains from about 0.022% to about 0.067% of the binder composition, by weight of the dry mixture, and from 5% to about 20% water, based on total weight of the moist mixture, and the binder composition contains from about 10% to about 90% of the water-soluble polymer and from about 5% to about 90% of the sodium tripolyphosphate, by weight of the total dry binder composition.

4,919,712

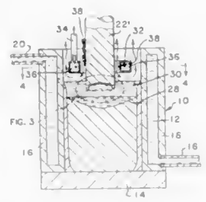
METHOD AND APPARATUS FOR ADJUSTING ELECTRODE ISOTHERMS WITHIN ELECTRO-SLAG REMELTING

Raymond J. Roberts, West Berlin, N.J., assignor to Consarc Corporation, Rancocas, N.J.

Filed May 15, 1989, Ser. No. 351,757

Int. Cl.[5] C22B *4/00*

U.S. Cl. 75—10.24 **7 Claims**



1. A method of electro-slag remelting comprising the steps of:

providing a consumable electrode,

establishing a slag layer in a mold cavity,

resistance heating the slag layer by passing an electric current between the electrode and the base of the mold cavity,

immersing one end of the electrode into the slag layer,

progressively melting the end of the electrode and forming a molten metal pool in the mold cavity under the slag layer,

cooling the mold cavity to continuously solidify the molten metal pool, and

controlling the melting pattern of the electrode by intensely cooling the circumferentially exposed surface of the electrode adjacent its immersion into the slag layer such that the end of the electrode immersed in the slag layer is caused to maintain a concave shape during said progressive melting.

4,919,713

PROCESS FOR PRODUCING CHROMIUM CONTAINING MOLTEN IRON

Sumio Yamada; Chikashi Tada; Keizo Taoka, and Hajime Bada, all of Chiba, Japan, assignors to Kawasaki Steel Corp.

Filed Feb. 23, 1989, Ser. No. 315,407

Claims priority, application Japan, Feb. 24, 1988, 63-39719

Int. Cl.[5] C21C *7/00*

U.S. Cl. 75—532 **17 Claims**

1. A process for producing chromium containing molten iron, wherein

a chromium containing iron scrap and molten pig iron are charged into a top and bottom-blown converter for forming a molten iron bath the separate steps (a) and (b) which comprise:

(a) performing a scrap melting and heating step comprising top and bottom blowing of oxygen while charging a carbon containing material and a slag forming agent through the top of said converter for melting said chromium containing iron scrap and heating ssaid molten iron bath to a predetermined temperature; and

(b) performing a reduction step subsequent to said scrap melting and heating step, said reduction step comprising top and bottom blowing of oxygen while charging carbon containing material and chromium oxide through the top of said converter for reducing chromium and thus forming a chromium containing molten iron.

4,919,714

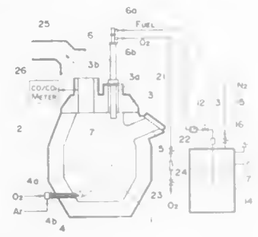
METHOD AND APPARATUS FOR REFINING STEEL

Saburo Sugiura; Senji Fujita, both of Nagoya; Hiroya Nakata; Tetsuo Okamoto, both of Chita; Yoshio Inagaki, Aichi; Keiichi Mizuguchi, and Atsushi Ishii, both of Tokai, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 14, 1988, Ser. No. 270,859

Int. Cl.[5] C21C *7/00*

U.S. Cl. 75—529 **16 Claims**



1. A method of refining steel which comprises carrying out the refining while stirring molten steel in a furnace by injecting gas thereinto, and while supplying heat by a burner equipped at the top of the furnace to the molten steel through the surface thereof enlarged due to the stirring.

4,919,715

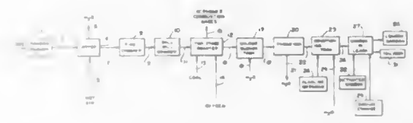
TREATING REFRACTORY GOLD ORES VIA OXYGEN-ENRICHED ROASTING

Jay C. Smith, Pearl River; Thomas H. McCord, Harvey, both of La., and Gregory R. O'Neil, Marmion, Australia, assignors to Freeport McMoRan Inc., New Orleans, La.

Filed Jun. 3, 1988, Ser. No. 201,952

Int. Cl.[5] C22B *11/00*

U.S. Cl. 75—423 **19 Claims**



1. A method for treating refractory gold-containing ores, said ores having a concentration of substances selected from the group consisting of refractory sulfidic matter, carbonaceous matter and mixtures thereof, to make said ores amenable to gold recovery processes comprising roasting said ores with pure oxygen at a temperature of about 1000° F. to about 1200° F.

4,919,716

METHOD FOR DISSOLUTION OF METAL

Yukimichi Nakao; Kyoji Kaeriyama, and Aizo Yamauchi, all of Tsukuba, Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Mar. 7, 1989, Ser. No. 319,720

Claims priority, application Japan, May 19, 1988, 63-122852

Int. Cl.[5] C22B *3/00*

U.S. Cl. 423—658.5 **10 Claims**

1. A method for dissolving a metal in a halogenated hydrocarbon, which method consists essentially of causing said metal to contact at least one liquid halogenated hydrocarbon in the presence of a cationic surfactant.

4,919,717

SINTERED COMPOSITE MATERIAL FOR ELECTRICAL CONTACT

Jean Ambier, Grenoble; Marie-Jo Francillon; Colette Allibert, both of St. Martin D'Heres, and Catherine Laugee, Paris, all of France, assignors to Merlin Gerin, France

Filed Apr. 25, 1988, Ser. No. 185,980

Claims priority, application France, May 4, 1987, 87 06286

Int. Cl.[5] B22F *7/00*

U.S. Cl. 75—228 **3 Claims**

1. A sintered copper-based composite material for electrical contacts, comprising 80-95% by weight copper, 2-15% by weight nickel, and 2-5% by weight graphite, wherein said material is obtained from copper powder of a spongy form, said powder having an average diameter of less than 24μm, an oxygen content of lower than 2000 ppm and a purity in metallic elements of 99.5%.

VOL 1113 ISS 4 AP 24 1990 UMI

4,919,718

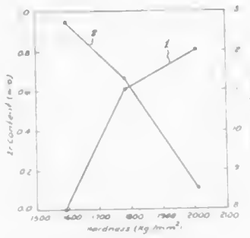
DUCTILE Ni_3AL ALLOYS AS BONDING AGENTS FOR CERAMIC MATERIALS

Terry N. Tiegs, Lenoir City, Tenn., and Robert R. McDonald, Traverse City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 22, 1988, Ser. No. 146,992

Int. Cl.[5] C22C *29/12*

U.S. Cl. 75—232 **18 Claims**



1. A composition consisting essentially of a ceramic material and a ductile metal alloy selected from the group consisting of alloys of Ni_3Al, $TiSi_2$, NiSi, $MoSi_2$, and mixtures thereof.

4,919,719

HIGH TEMPERATURE WEAR RESISTANT SINTERED ALLOY

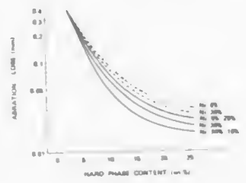
Makoto Abe; Ichiro Tanimoto, both of Yokohama; Akira Fujiki, Yokosuka; Keitaro Suzuki; Hiroyuki Endo, both of Abiko, and Yutaka Ikenoue, Matsudo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Hitachi Powdered Metals Co., Ltd., Matsndo, both of, Japan

Filed Aug. 29, 1988, Ser. No. 237,038

Claims priority, application Japan, Sep. 10, 1987, 62-225196

Int. Cl.[5] C22C *29/00*

U.S. Cl. 75—243 **7 Claims**



1. A high temperature wear resistant sintered alloy comprising a matrix consisting essentially of carbon ranging from 0.45 to 1.15% by weight, nickel ranging from 5.4 to 27% by weight, molybdenum ranging from 0.4 to 2.7% by weight, cobalt ranging from 4.2 to 7.2% y weight, and balance substantially iron, said matrix comprising a mixture of at least one of sorbite structure and bainite structure and austenite structure, said matrix having a hard phase ranging from 5 to 25% by weight and dispersed in said matrix.

4,919,720

ELECTROLESS GOLD PLATING SOLUTIONS

Robert Stavitsky, Bronx, N.Y., assignor to LeaRonal, Inc., Freeport, N.Y.

Filed Jun. 30, 1988, Ser. No. 213,382

Int. Cl.[5] C23C *3/02, 16/00*

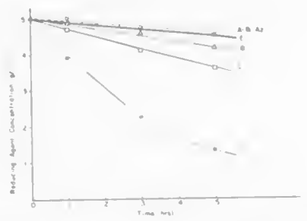
U.S. Cl. 106—1.26 **30 Claims**

1. An electroless or autocatalytic gold plating solution comprising:

a source of cyanide ions;

a soluble gold compound capable of forming a gold cyanide complex in the solution;

a reducing agent; and



a solvent for the preceding components comprising between at least 50 to 100% by weight of a water soluble organic glycol which enables the solution to remain stable in the presence of nickel ions, with the balance, if any, being water.

4,919,721

AIR-DRYING STAINS AND FINISHING COATS FOR WOOD FOR EXTERIOR AND INTERIOR FINISHES

Siegbert Hermann, Everswinkel, Fed. Rep. of Germany, assignor to Ostermann & Scheiwe GmbH & Co. KG, Muenster, Fed. Rep. of Germany

Filed May 19, 1988, Ser. No. 196,033

Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717099

Int. Cl.[5] C09K *3/00*; C08L *91/00*

U.S. Cl. 106—34 **2 Claims**

1. A non-aqueous composition for an air-dryable stain and finishing coat for wood for exterior and interior finishes, which comprises a nonvolatile mixture of chemically modified natural oils, together with pigments, extenders and varnish additives, and further comprising a

volatile low-boiling petroleum hydrocarbon, which is suitable as a solvent and is present in an amount of less than or equal to 15% by weight, based on the total amount, and

a mixture of chemically modified natural oils having a consistency whereby the efflux time from a DIN 53 211 4 mm viscosity cup or the equivalent No. 4 Ford Cup-ASTM 1200-58 of said chemically modified natural oils is between 28 and 35 seconds and is present in an amount of from 35–65% by weight, and

wherein the extender comprises a fine, cryptocrystalline, amorphous silicon dioxide wherein more than 95% of the silicon dioxide particles have a particle size of less than 40 micrometer, and is present in an amount of from 15–30 per cent by weight, and

wherein the composition results in a smooth one-coat stain and finish.

4,919,722

METHOD OF MANUFACTURING A GRANULAR BUILDING MATERIAL FROM REFUSE

Fernando Trivino Vazquez, Madrid, Spain, and Roger J. Clenin, Puplinge, Switzerland, assignors to S.A. Societe d'Etudes et d'Applications Industrielles, Geneva, Switzerland

Filed Dec. 29, 1987, Ser. No. 139,308

Claims priority, application Switzerland, Mar. 19, 1987, 1046/87

Int. Cl.[5] C04B *7/00, 18/18*

U.S. Cl. 106—97 **10 Claims**

1. A method of manufacturing a granular building material being from refuse comprising the steps of:

(a) providing a crushed refuse material substantially free of metallic constituents and containing water;

(b) mixing the refuse material with a mineral material containing calcium oxide in the free or combined state, whereby a first homogeneous powder mixture is formed;

(c) granulating the first powder mixture under pressure;

(d) heating the first granules to between about 130° and 230° C. for a length of time sufficient to reduce their water content to between about 0.1 and 1% by weight;

(e) crushing the first granules to form a granule powder,

(f) mixing the granule powder with hydraulic cement and a quantity of water sufficient to set the cement, whereby a second powder mixture is produced;

(g) granulating the second mixture under pressure; and

(h) allowing the hydraulic cement to set, whereby second granules of a granular building material are produced.

4,919,723

RUTILE MIXED PHASE PIGMENTS WITH IMPROVED COLORISTIC PROPERTIES

Volker Wilhelm, Bergisch-Gladbach, and Manfred Mansmann, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 21, 1988, Ser. No. 273,838

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1987, 3740635

Int. Cl.[5] C04B *31/02*

U.S. Cl. 106—441 **9 Claims**

1. Mixed phase colored pigment which is a combined lithium-containing chromium oxide-antimonyoxide-rutile mixed phase pigment containing from 0.01 to 0.25% by weight of combined lithium.

4,919,724

STABLE AQUEOUS EMULSIONS OF KETENE DIMER/NONREACTIVE HYDROPHOBE

Marco F. Cenisio, Milan, Italy, and Vido J. Varelka, Newark, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Jan. 17, 1989, Ser. No. 297,650

Claims priority, application United Kingdom, Jan. 18, 1988, 88001004

Int. Cl.[5] D21D *3/00*; C08L *3/00*

U.S. Cl. 106—199 **13 Claims**

1. An aqueous emulsion comprising

(a) ketene dimer having the general formula

$$[RCH=C=O]_2$$

wherein R is an alkyl radical having from 6 to 22 carbon atoms, a cycloalkyl radical having at least 6 carbon atoms, an aryl, aralkyl or alkaryl radical;

(b) nonreactive hydrophobe is selected from the group consisting of crude and refined paraffin waxes, hydrocarbon resins, terpene resins, synthetic waxes, naturally occurring waxes, fatty acid amides and mixtures thereof; and

(c) stabilizer selected from the group consisting of starch, cationic starch, anionic starch, amphoteric starch, water soluble cellulose ethers, polyacrylamides, polyvinyl alcohol, polyvinyl pyrrolidone and mixtures thereof.

4,919,725

NOVEL DISPERSIBLE ACTIVE SIZING COMPOSITION

Mervyn F. Jones, Bristol, England, assignor to Albright & Wilson Limited, Warley, England

Continuation of Ser. No. 102,773, Sep. 23, 1987, abandoned, which is a continuation of Ser. No. 907,628, Sep. 15, 1986, abandoned. This application Jul. 26, 1988, Ser. No. 225,608

Claims priority, application United Kingdom, Sep. 16, 1985, 8522844

Int. Cl.[5] C08L *89/00*

U.S. Cl. 106—218 **23 Claims**

1. In a water dispersible sizing composition consisting essentially of an active sizing agent and an effective proportion of a dispersant therefor, the improvement which consists in using as said dispersant a polyoxalate of a fortified rosin with a polyalkylene glycol in a proportion up to stoichiometric per mole of fortified rosin acid such that the resultant product is essentially free from terminal hydroxyl groups and has a formula $H(_{n-a})R(X_mR^1)_a$ wherein R is selected from the group consisting of laevopimarate and partially and wholly fortified laevopimarate groups; each X is selected from the group consisting of ethyleneoxy and propyleneoxy groups; R^1 is selected from the group consisting of hydrogen and saturated and unsaturated hydrocarbon and carboxylate groups having from 1 to 20 carbon atoms and such groups optionally substituted with at least one group selected from carboxyl, carboxylic anhydride and hydroxyl groups; v is the average valency of R and has a value of from 1 to 3; n has an average value of from 1 to v; and m has an average value of from 4 to 30.

4,919,726

PROCESS FOR THE PRODUCTION OF RUTILE MIXED-PHASE PIGMENTS

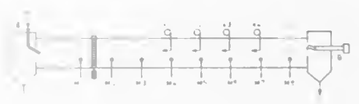
Jakob Rademachers, Krefeld, and Volker Wilhelm, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 18, 1989, Ser. No. 298,382

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1988, 3802469

Int. Cl.[5] C09C *1/36*

U.S. Cl. 106—428 **12 Claims**



1. A process for the production of rutile mixed-phase pigments comprising calcinating of a solid mixture of titanium dioxide or titanium oxide hydroxide with a dye-producing compound of a metal, in one or more directly heated, continuously operated rotary kilns, wherein in terms of material flow, air is introduced into the kiln atmosphere countercurrently to the direction of flow of the solids in the second half of the rotary kiln.

4,919,727

NEW OXIDATION RESISTANT, HEAT RESISTANT IRON OXIDE BLACK PIGMENTS, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Wilfried Burow, Krefeld; Gerd-Hermann Schulten, Duisburg, and Peter Kiemle, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 30, 1989, Ser. No. 303,298

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1988, 3803940

Int. Cl.[5] C04B *14/00*

U.S. Cl. 106—456 **15 Claims**

1. Isometric oxidation resistant and heat resistant iron oxide black pigments having a foreign metal content of less than 5 parts per million of each of As, Pb and Ba.

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4,919,728
METHOD OF MANUFACTURING NONMAGNETIC DRILLING STRING COMPONENTS

Heinz Kohl, Ternitz; Helmut Pohl, Neunkirchen, and Alois Püchl, Grimmenstein, all of Austria, assignors to Vereinigte Edelstahlwerke AG (VEW), Vienna, Austria

Continuation-in-part of Ser. No. 866,940, May 27, 1986, abandoned. This application Jul. 15, 1988, Ser. No. 219,216
Claims priority, application Austria, Jun. 25, 1985, 1879/85
Int. Cl.[5] C21D *8/00*
U.S. Cl. 148—12 B 38 Claims

1. A method manufacturing nonmagnetic heavy duty drilling string components for exploratory and directional bores for crude oil and natural gas deposits, comprising the steps of:
melting and allowing to solidify an alloy consisting essentially of, each in percent by weight:
carbon in a maximum of about 0.15;
silicon in a maximum of about 1.0;
manganese about 11.0 to about 25.0;
chromium about 10.0 to about 20.0;
molybdenum about 0.1 to about 1.0;
nickel about 0.1 to about 6.0;
nitrogen about 0.05 to about 0.5;
the remainder being iron and other impurities resulting from manufacturing conditions;
subjecting the alloy to a hot-working operation;
solution heat-treating the alloy at temperatures of about 1,020° C. to about 1,070° C.;
subsequently quenching the alloy;
subjecting the quenched alloy to a cold-working operation at a temperature in the range of above 350° C. to below about 750° C.; and
said step of cold-working said alloy entails cold-working to at least 5% deformation.

4,919,729
SOLDER PASTE FOR USE IN A REDUCING ATMOSPHERE

Peter J. Elmgren, Derry, N.H.; Alan J. Emerick, Warren Center, Pa.; Dennis L. Rivenburg, Sr., Endicott, N.Y.; Mukund K. Saraiya, Endwell, N.Y., and David W. Sissenstein, Jr., Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 203,965, Jun. 8, 1988, abandoned. This application May 2, 1989, Ser. No. 346,241
Int. Cl.[5] B23K *35/34*
U.S. Cl. 148—24 18 Claims

1. A fluxless solder paste heated in a reducing atmosphere for use in a soldering process comprising:
a solder powder; a binder comprising at least one alcohol, and
said binder having a boiling temperature within the pasty region of a phase diagram of said solder powder,
said boiling temperature being determined by said alcohol, said boiling temperature of said binder reducing splattering associated with said soldering process.

4,919,730
BRAZING PASTE

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jul. 21, 1989, Ser. No. 382,923
Int. Cl.[5] B23K *35/34*
U.S. Cl. 148—24 8 Claims

1. A screening paste comprising a liquid vehicle containing finely dispersed metal powder, the vehicle consisting essentially of hydroxylpropylcellulose and 1,2-propanediol, the paste having leveling characteristics so as to fill gaps resulting from application through a screen.

4,919,731
BRAZING PASTE

Kiyoshi Iyogi; Takaaki Yasumoto, both of Kawasaki; Toshirou Yanazawa, Yokohama; Nobuo Iwase, Kamakura; Masako Nakahashi, and Hiromitsu Takeda, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 154,273, Feb. 10, 1988, Pat. No. 4,835,344. This application Feb. 10, 1989, Ser. No. 308,450
Claims priority, application Japan, Feb. 10, 1987, 62-27122; Apr. 24, 1987, 62-100050; Apr. 24, 1987, 62-100051; May 30, 1987, 62-136265
Int. Cl.[5] B23K *35/34*
U.S. Cl. 148—24 9 Claims

1. A brazing paste, comprising:
(i) metal brazing powder containing at least one of the Group 1Va elements;
(ii) 3–15 parts by weight relative to 100 parts by weight of the metal brazing powder of an acrylic binder with a carboxyl group as a substituent group; and
(iii) an organic solvent.

4,919,732
IRON-NEODYMIUM-BORON PERMANENT MAGNET ALLOYS WHICH CONTAIN DISPERSED PHASES AND HAVE BEEN PREPARED USING A RAPID SOLIDIFICATION PROCESS

Choong-Jin Yang, Lowell, and Ranjan Ray, Andover, both of Mass., assignors to Kubota Ltd., Osaka, Japan

Filed Jul. 25, 1988, Ser. No. 223,624
Int. Cl.[5] H01F *1/02*
U.S. Cl. 148—103 2 Claims

1. A method for preparing a fine grained iron-neodymium-boron bulk-shaped alloy comprising the steps of:
forming an alloy melt having the following composition: $Fe_aCo_bNd_cR_dN_eB_f$ wherein Fe, Co, Nd and B are iron, cobalt, neodymium and boron respectively, and R is an element selected from the group consisting of lanthanum, yttrium, cerium, dysprosium, terbium, gadolinium, and praseodymium and mixtures thereof, and N is an element selected from the group consisting of aluminum, silicon, germanium, niobium and gallium and mixtures thereof, wherein a=60–80, B=0–20, c=5–20, d=0–10, e=0–5 and f=3–10 respectively with the proviso that the sum (a+b+c+d+e+f)=100,
adding 0.3 to 3 weight percent of at least one diboride selected from the group consisting of hafnium diboride, zirconium diboride tantalum diboride and titanium diboride, to said melt of alloy,
depositing said melt against a rapidly moving quench surface adapted to quench said melt at a rate in the range of approximately between $10^{5°}$ to $10^{7°}$ C./second and form a rapidly solidified filament, ribbon or particulate of said alloys characterized predominantly by a single amorphous structure,
comminuting said ribbon, filament or particulate into a powder, said powder having an average particle size of less than 60 mesh and consisting of platelets having a thickness of less than 0.1 millimeter, each platelet being defined by an irregularly shaped outline resulting from fracture,
heat treating said powder by annealing the powder above the crystallization temperature in a vacuum or inert gas atmosphere,
comminuting said heat treated powder under the vacuum or inert atmosphere to provide an ultrafine crystalline powder having an average size of 5 microns or less,
subjecting said ultrafine crystalline powder to cold compaction under an applied magnetic field so that a majority of the crystalline powder becomes oriented so as to allow a large fraction of magnetic domains to be aligned parallel to the direction of the applied magnetic field, and
sintering the magnetically aligned powder into a bulk shape.

4,919,733
METHOD FOR REFINING MAGNETIC DOMAINS OF ELECTRICAL STEELS TO REDUCE CORE LOSS

James A. Salsgiver, Sarver; Randal K. Knipe, and Carl P. Stroble, both of Natrona Heights, all of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Mar. 3, 1988, Ser. No. 163,448
Int. Cl.[5] H01F *1/04*
U.S. Cl. 148—113 14 Claims

1. A method for improving the core loss properties of an electrical sheet product, the method comprising:
annealing an electrical metal sheet to obtain its magnetic properties;
thereafter subjecting at least one surface of the sheet to an electron beam treatment to produce narrow substantially parallel bands of treated regions separated by untreated regions substantially transverse to the direction of strip manufacture without substantially changing the sheet shape;
the electron beam treatment including generating an electron beam with a voltage of 20 to 200 kilovolts, and providing an energy density sufficient to solely and directly effect a refinement of magnetic domain wall spacing and reduced core loss without damaging the surface, the energy density ranging from about 60 Joules per square inch or more.

4,919,734
COMPRESSED MAGNETIC POWDER CORE

Kumi Ochiai, Yokohama; Hiromichi Horie, Yokosuka; Itsuo Arima, Kawasaki, and Mikio Morita, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 780,303, Sep. 26, 1985, abandoned. This application Sep. 14, 1987, Ser. No. 97,402
Claims priority, application Japan, Sep. 29, 1984, 59-204870; Dec. 27, 1984, 59-274096
Int. Cl.[5] H01F *1/04*
U.S. Cl. 148—306 3 Claims

1. A compressed magnetic powder core comprising a compressed body of an iron-based metallic magnetic powder having an average particle size of not less than 10 μm and not more than 300 μm, each particle surface of said metallic powder having been covered with an insulating layer consisting of a material which is a decomposition product of a metal alkoxide selected from the group consisting of alkoxides of lithium, sodium, potassium, beryllium, magnesium, calcium, strontium, barium, titanium, zirconium, niobium, tantalum, manganese, iron, cobalt, copper, zinc, cadmium, aluminum, gallium, indium, silicon, germanium, tin, lead, arsenic, bismuth, tellurium, yttrium, lanthanum, neodymium, samarium, europium and gadolinium, and a mixture thereof, and is a corresponding metal hydroxide, said insulating layer having a thickness of not more than 10 μm.

4,919,735
KHARE PIPE MOLD STEEL

Ashok K. Khare, Warren, Pa., assignor to National Forge Company, Irvine, Pa.

Filed Dec. 29, 1988, Ser. No. 291,509
Int. Cl.[5] C22C *38/44*
U.S. Cl. 148—334 13 Claims

1. A pipe mold for centrifugally casting pipe formed from a ferritic alloy in weight percentage consisting essentially of from about 0.12% to about 0.22% carbon, about 0.40% to about 0.80% manganese, about 0.025% maximum phosphorus, about 0.025% maximum sulphur, about 0.15% to about 0.40% silicon, about 0.00% to about 0.55% nickel, about 0.80% to about 1.20% chromium, about 0.15% to about 0.60% molybdenum, about 0.03% to about 0.08% vanadium, and balance essentially iron.

4,919,736
ALUMINUM ALLOY FOR ABRASION RESISTANT DIE CASTINGS

Naomi Nishi, and Yosuke Takahashi, both of Tokyo, Japan, assignors to Ryobi Limited, Hiroshima, Japan

Filed Jul. 29, 1988, Ser. No. 226,011
Claims priority, application Japan, Jul. 30, 1987, 62-188744
Int. Cl.[5] C22C *21/02*
U.S. Cl. 148—416 4 Claims

1. An aluminum alloy for abrasion resistant die casts consisting essentially of by weight, 6.0 to 9.0% Cu, 0.5 to 2.0% Mn, 1.6 to 3.0% Fe, 3% or less Mg, together with 13.5 to 20.0% Si, 0.5% or less Ni, inevitable impurities and the remainder being Al, prepared by crystallizing out primary Si crystals of Si and Al-Fe-Mn-Si compounds, and by forming a solid solution with Cu and Mg in the alloy's matrix.

4,919,737
THERMOPLASTIC ELASTOMER-BASED LOW VULNERABILITY AMMUNITION GUN PROPELLANTS

Richard A. Biddle, Elkton, Md., and Rodney L. Willer, Newark, Del., assignors to Morton Thiokol Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 229,032, Aug. 5, 1988. This application Jan. 6, 1989, Ser. No. 294,321
Int. Cl.[5] C06B *45/50*
U.S. Cl. 149—19.5 9 Claims

1. A low vulnerability ammunition gun propellant composition comprising from about 60 to 85 wt. percent of particulates of a high-energy oxidizer and between about 15 wt. percent and about 40 wt. percent of a thermoplastic, elastomeric binder system, said binder system being substantially free of metallic particulates and materials which leave a solid residue, said binder system comprising a non-cross-linked, thermoplastic, elastomeric polymer in which at least one pair of crystalline A

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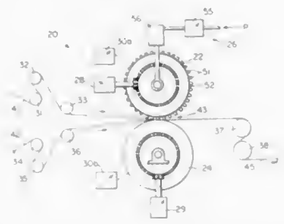
blocks flanks at least one amorphous B block and from 0 to about 80 wt. percent of a plasticizer, wherein said non-cross-linked, elastomeric polymer comprises crystalline polyester A blocks and an amorphous polyether B block.

4,919,738

DYNAMIC MECHANICAL BONDING METHOD AND APPARATUS

W. Kenneth Ball; David J. K. Goulait, and James E. Zorb, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 64,896, Jun. 19, 1987, Pat. No. 4,854,984. This application May 25, 1989, Ser. No. 357,373
Int. Cl.[5] B29C *65/18;* B32B *31/20*
U.S. Cl. 156—73.5 9 Claims



1. A method of dynamically bonding plural lamina together, at least one of which laminae comprises thermoplastic material, said method comprising the steps of:

forwarding said laminae at a velocity of about 300 to about 600 per feet minute, with portions thereof in face to face relation, through a pressure biased nip between a relief patterned nip defining member having pattern element segments, and a nip defining anvil member;

biasing said nip defining members towards each other with a predetermined pattern-element loading that is between about 68,000 psi and about 113,000 psi; and

sufficiently heating each said nip defining member to enable dynamically thermobonding said laminae together.

4,919,739

PRODUCTION OF IMPROVED PREIMPREGNATED MATERIAL COMPRISING A PARTICULATE THERMOSETTING RESIN SUITABLE FOR USE IN THE FORMATION OF A SUBSTANTIALLY VOID-FREE FIBER-REINFORCED COMPOSITE ARTICLE

Robert Dyksterhouse; Joel A. Dyksterhouse, both of Marathon, Fla.; Alan C. Handermann, Matthews, N.C., and Edward D. Western, Fort Mill, S.C., assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 928,917, Nov. 7, 1986, abandoned. This application Mar. 3, 1988, Ser. No. 157,836
The portion of the term of this patent subsequent to Jan. 16, 2007, has been disclaimed.
Int. Cl.[5] B29B *15/12;* B29C *67/14;* C08J *5/00*
U.S. Cl. 156—181 91 Claims

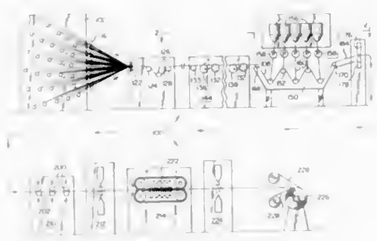
1. A method for the production of an improved fibrous material suitable for the formation of a substantially void-free composite article comprising a plurality of adjoining substantially parallel reinforcing filaments in association with a matrix-forming thermosetting resin comprising:

(a) preparing a dispersion of solid particles of a thermosetting resin in an aqueous medium which contains an effective amount of a dissolved polymeric binding agent,

(b) substantially increasing the viscosity of said dispersion to form an improved impregnation bath whereby the viscosity of the resulting bath becomes at least 50,000 cps. and said impregnation bath has a plastic flow characteristic with shear-thinning behavior which is sufficient to substantially uniformly suspend said particulate thermosetting resin within said bath,

(c) impregnating said adjoining substantially parallel reinforcing filaments with said bath under conditions wherein said bath is caused to flow between said adjoining filaments by the application of work wherein said bath flow inherently results in a reduction of the viscosity of said bath which aids in the incorporation of said particulate thermosetting resin between adjoining filaments, and

(d) controlling the content of said aqueous medium in the resulting fibrous material to provide a product having said



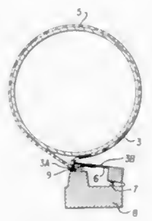
particles of matrix-forming thermosetting resin substantially uniformly dispersed between adjoining filaments in the absence of fusion bonding which inherently (1) is drapable and tacky at ambient conditions, (2) is handleable without segregation of said particles within the fibrous material, and (3) which upon the application of heat and pressure can be transformed into a substantially void-free fiber-reinforced composite article of a predetermined configuration wherein said thermosetting resin becomes substantially completely cured and forms the matrix phase.

4,919,740

METHOD AND APPARATUS FOR FORMING FIN-TYPE BACK SEALS

William D. Kreager, Jr., Dallas, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Continuation of Ser. No. 82,415, Aug. 6, 1987, abandoned. This application Mar. 7, 1989, Ser. No. 319,845
Int. Cl.[5] B32B *31/14*
U.S. Cl. 156—203 9 Claims



1. An apparatus for providing uniform fin-type back seals of flexible packaging material in conjunction with form-fill-and-seal machines of the type that utilize a filling tube, mate the edges of the flexible packaging material, fold the mated edges in one direction against the body of the packaging material, and move the packaging material intermittently through forming and filling stages, the apparatus comprising:

(a) a movable platen having a sealing surface which extends parallel to said filling tube;

(b) a movable tucker plate positioned about parallel to the sealing surface of said platen, pivotally mounted on and supported by said platen, and disposed between the platen and the filling tube, wherein the folded, mated edges of flexible packaging material are disposed between the movable platen and the tucker plate and wherein the body of said packaging material is disposed between the tucker plate and the filling tube;

(c) separation means for maintaining said tucker plate at a fixed distance from said sealing platen when not under sealing pressure; and,

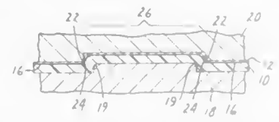
(d) means for applying intermittent sealing pressure so as to rigidly hold said body of said packaging material between said filling tube and said tucker plate, and to compress and seal the mated edges between said tucker plate and said sealing platen.

4,919,741

METHOD FOR MAKING EMBOSSED INFORMATION PLATE HAVING RETROREFLECTIVE SHEETING ON THE SURFACE THEREOF

Dennis J. Chlrhart, West St. Paul; Michael P. Daniels, Hastings, and Kenneth G. Krelpp, Maplewood, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 99,641, Sep. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 844,532, Jul. 11, 1986, abandoned. This application Mar. 3, 1989, Ser. No. 318,737
Int. Cl.[5] B31F *1/00;* B32B *31/00*
U.S. Cl. 156—223 25 Claims



1. A method for producing an information plate having desired indicia embossed on the front surface thereof in relief fashion and having a reflective sheeting adhered to the background portions of said front surface, wherein said method comprises:

(1) tacking a reflective sheeting comprising a low-tack, heat-activated adhesive on the back side thereof to the front surface of a plate blank, the surface of said plate blank being essentially planar in the interior regions thereof;

(2) embossing said plate blank and reflective sheet according to said indicia with a dual-die press, wherein a male die is pressed to the back surface of said blank, and a female die is pressed to the front surface of said blank upon which said reflective sheeting is tacked, said female die being adapted to shear said reflective sheet along the contours of said indicia, whereby said reflective sheeting is cut out along the relief outline of said indicia;

(3) removing the cut-out portions of said reflective sheeting from said indicia; and

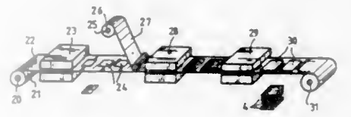
(4) moving said embossed plate and the trimmed reflective sheeting which is tacked thereto through a series of at least two pairs of co-acting, resilient lamination rollers, wherein the roller of each pair which contacts the front surface of said plate is heated with heating means, whereby said adhesive is activated and effectively wets the surface of said plate and said reflective sheeting is laminated to the front surface of said plate.

4,919,742

METHOD FOR MANUFACTURING A LID FOR CLOSING A CONTAINER COMPRISING A THERMOPLASTIC MATERIAL SEALING ZONE

Robert A. Rebischung, Selestat, France, assignor to Societe Alsacienne d'Aluminium, France

Division of Ser. No. 195,871, May 19, 1988, Pat. No. 4,830,215. This application Mar. 23, 1989, Ser. No. 328,093
Claims priority, application France, May 20, 1987, 87 07077
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—269 2 Claims



1. A method for manufacturing a lid for closing a container having a thermoplastic material sealing zone defined by an inner and outer edge, said lid having a layer of closure material, a varnish applied to one face of the closure material and a thermoplastic material layer fixed to and covering at least a part of the varnish which is intended to face the sealing zone of the container to be closed, comprising successively forming in a strip of thermoplastic material a series of openings whose periphery corresponds substantially to the inner edge of the sealing zone of the containers, thereafter fixing a closure material strip having a layer of varnish on one side thereof on one side of the thermoplastic material strip with the varnish lying adjacent the thermoplastic material strip and cutting out from the complex thus obtained a series of the lids whose periphery corresponds substantially to the outer edge of the sealing zone of the containers, the lids being formed so that the openings are closed by the closure material.

4,919,743

METHOD OF LAYING CARPET TO AVOID SEAM PEAKING AND APPARATUS THEREFOR

Wayne R. Johnston, 1114 Harwich Dr., San Marcos, Calif. 92069, and Alan G. Johnston, #8 Spencer Dr., Nashua, N.H. 03062

Continuation-in-part of Ser. No. 819,804, Jan. 16, 1986, Pat. No. 4,749,433. This application Nov. 23, 1987, Ser. No. 123,781
Int. Cl.[5] B29C *65/18, 65/50*
U.S. Cl. 156—304.4 14 Claims

1. A method for laying multiple layer, tufted carpet to substantially reduce seam peaking which tends to occur in such carpeting after abutting edges of the carpet are secured together by means of hot-melt adhesive coated normal seaming tape normally having a width of approximately three inches and the carpet is finally stretched, said method comprising the steps of:

cutting and fitting the carpet to the floor area with two abutting carpet edges forming a carpet seam;

laying a hot-melt adhesive coated enhanced width seaming tape beneath said carpet seam, said enhanced width seaming tape being configured with its composite modulus of elasticity varying laterally across its width, said enhanced width seaming tape having a width of approximately

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twice the width of said normal seaming tape, said enhanced width seaming tape underlying the carpet sections substantially equally on either side of said seam, there being meltable adhesive on the side of said enhanced width seaming tape facing upward and engaging the carpet at said carpet seam;

heating the adhesive on said enhanced width seaming tape with a carpet seaming iron of a width sufficient to simultaneously heat the full width of said enhanced width seaming tape to make the adhesive molten;

forcing the adjacent carpet edges down onto the molten adhesive side of said enhanced width seaming tape; and

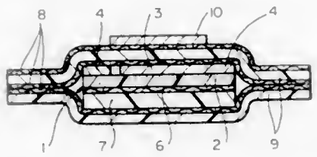
then stretching the carpet to the floor periphery in conventional manner.

4,919,744

METHOD OF MAKING A FLEXIBLE HEATER COMPRISING A CONDUCTIVE POLYMER

Keith G. Newman, Sunnyvale, Calif., assignor to Raychem Corporation, Menlo Park., Calif.

Filed Sep. 30, 1988, Ser. No. 252,237
Int. Cl.[5] B32B *31/20*
U.S. Cl. 156—308.2 **14 Claims**



1. A method of laminating layers to form a heater comprising a conductive polymer heating element, said method comprising

(A) positioning a layer of nonwoven cloth between (1) a first layer which (a) comprises a laminar heating element which exhibits PTC behavior and which comprises a conductive polymer composition and (b) further comprises at least two electrodes which are positioned so that when current passes between the electrodes a substantial proportion of the current through the laminar element is parallel to the faces of the laminar element and (2) a second layer which comprises a polymeric insulating material; and

(B) exposing the layers to sufficient temperature and pressure to achieve a bond between the layers.

4,919,745

APPARATUS AND METHOD FOR PLASMA TREATMENT OF RESIN MATERIAL

Kenji Fukuta; Takaoki Kaneko, and Yoshinobu Takahashi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Division of Ser. No. 817,115, Jan. 8, 1986, abandoned, which is a division of Ser. No. 772,208, Sep. 5, 1985, abandoned, which is a continuation of Ser. No. 583,181, Feb. 24, 1984, abandoned. This application Feb. 8, 1989, Ser. No. 307,509
Claims priority, application Japan, Feb. 25, 1983, 58-29371; Feb. 25, 1983, 58-29372; Mar. 10, 1983, 58-38204
Int. Cl.[5] C23C *16/50*; B01J *19/08*
U.S. Cl. 156—345 **3 Claims**

1. An apparatus providing a substantially uniform density of microwave discharge plasma on resinous objects comprising:

a reaction chamber having an inner wall and a plurality of ports spaced along said inner wall;

a pair of disc plates for rotation about a common axis, said pair of disc plates being horizontally spaced and vertically aligned;

mounting members for supporting said objects, said mounting members being rotatably mounted on said pair of disc plates to rotate about said common axis and to rock freely about independent axes of each of said mounting members;

injecting means for injecting said plasma into said reaction chamber, and

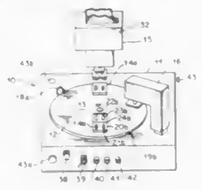
diffusing means mounted on said inner wall for diffusing said injected plasma within said reaction chamber to distribute a uniform density of plasma on exterior surfaces of said objects, said diffusing means including a plurality of deflecting plates mounted along said inner wall.

4,919,746

APPARATUS FOR BONDING A LOW DENSITY MATERIAL TO A PLASTIC SUBSTRATE

Wayne M. Celia, 242 Purdue Ct., Paramus, N.J. 07652

Division of Ser. No. 206,709, Jun. 15, 1988, Pat. No. 4,854,993, which is a division of Ser. No. 97,655, Sep. 17, 1987, Pat. No. 4,794,030. This application Feb. 10, 1989, Ser. No. 308,532
Int. Cl.[5] B32B *31/16*
U.S. Cl. 156—359 **8 Claims**



1. An apparatus for bonding a low density material to a thermoplstic plastic substrate comprising,

a. a base;

b. a rotary turntable rotatably connected to the base;

c. at least one workpiece holder on the turntable to secure at least one thermoplastic plastic substrate to the turntable;

d. a conductive heating assembly including,

i. at least one descendible and retractable welding iron for contacting the plastic substrate,

ii. a heating element for heating said at least one welding iron to a predetermined temperature; and

iii. means for actuating the descending movement of the at least one welding iron to melt the plastic substrate only at the points of contact;

e. a compression assembly including at least one descendible and retractable compression platen to emboss the low density material into the melted areas of plastic;

f. means for controlling the rotation of the turntable; and

g. means for controlling the descending and retracting movement of the at least one welding iron and at least one compression platen.

4,919,747

LABEL APPLYING DEVICES FOR APPLYING ADHESIVE LABELS TO ARTICLES

Christopher R. Eagle, Harwich, United Kingdom, assignor to Portais Engineering Limited, Harwich, United Kingdom

Filed Nov. 15, 1988, Ser. No. 271,315
Int. Cl.[5] B65C *9/14, 9/28*
U.S. Cl. 156—497 **7 Claims**

1. A label applying device for applying adhesive labels to articles comprising; label holding means, means to supply labels one-by-one to the holding means oriented in one direction, a pad having a surface to receive a label, means to draw vacuum at the surface to hold a label on the surface and means to apply air pressure to the surface to propel the label from the pad onto a surface of an article, reciprocating support means to support the pad and to move the pad between a label receiving position adjacent the label holding means to receive a label to a label discharging position to discharge a label onto an article and means to rotate the pad with respect to the support means through a predetermined angle about an axis extending normal to the surface of the pad to enable a label received from the holding means to be positioned in the required orientation on said article, wherein the means to rotate the pad comprise a spindle having the pad mounted at one end thereof and mounted for rotation on the support means about an axis extending longitudinally of the spindle, pneumatically operated ram means drivingly engaged with the spindle to rotate the spindle in either direction about said axis and thereby re-orient a label received on the pad before delivering the label at said discharging position, said pneumatically operated ram means for rotating the spindle including a pair of pneumatically operated racks mounted in the support means, and a pinion provided on the spindle with which the racks are in driving engagement to rotate the spindle and with it the pad in opposite directions.

4,919,748

METHOD FOR TAPERED ETCHING

Craig N. Bredbenoer, Lehighton, Pa.; Troy A. Giniecki, South Plainfield, N.J.; Nur Selamoglu, Philadelphia, Pa., and Hans J. Stocker, Austin, Tex., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

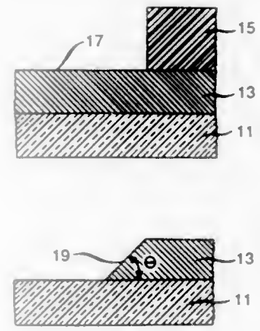
Filed Jun. 30, 1989, Ser. No. 374,408
Int. Cl.[5] C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—643 **6 Claims**

1. A method of semiconductor device fabrication comprising:

forming a first layer upon a substrate;

forming a second layer containing aluminum upon said first layer;

etching both said first and said second layer with a gas mixture, characterized in that said gas mixture contains



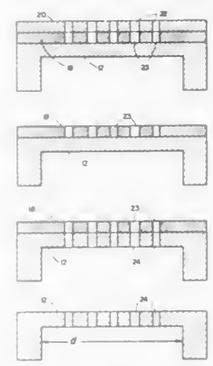
chlorine and trifluoromethane and said etching step produces a tapered profile.

4,919,749

METHOD FOR MAKING HIGH RESOLUTION SILICON SHADOW MASKS

Philip E. Mauger, Santa Clara; Alex R. Shimkunas, Palo Alto, and Junling J. Yen, Cupertino, all of Calif., assignors to Nanostructures, Inc., Mountain View, Calif.

Filed May 26, 1989, Ser. No. 357,481
Int. Cl.[5] H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—643 **28 Claims**



1. A method of forming a silicon shadow mask having a pattern of etched through apertures comprising the steps of:

(a) forming a silicon membrane having a selectively controlled predetermined stress characteristic and a thickness of less than approximately 25 microns;

(b) applying a masking layer to an upper surface of said silicon membrane;

(c) patterning said masking layer with a pattern corresponding to said pattern of etched through apertures;

(d) etching away said masking layer in regions corresponding to said pattern of etched through apertures;

(e) etching away said silicon membrane in said regions corresponding to said pattern of etched through apertures, thereby creating said etched through apertures;

(f) removing remaining portions of said masking layer.

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4,919,750

ETCHING METAL FILMS WITH COMPLEXING CHLORIDE PLASMA

Robert C. Bausmith, Glastonbury, Conn.; William J. Cote, Essex Junction, Vt.; John E. Cronin, Milton, Vt.; Karey L. Holland, Essex, Vt.; Carter W. Kaanta, Colchester, Vt.; Pei-Ing P. Lee, and Terrance M. Wright, both of Williston, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 96,578, Sep. 14, 1987, abandoned. This application Apr. 24, 1989, Ser. No. 342,616

Int. Cl.[5] C23F *1/00*; H01L *23/306*

U.S. Cl. 156—643 7 Claims

1. A method of etching a surface of a layer made up of a metal M or an alloy having the metal M as its majority component by weight percent. the metal M being selected from the group consisting of cobalt, copper, or nickel, said layer being disposed on a workpiece positioned within a RIE reaction chamber, comprising the steps of inserting the workpiece into the RIE reaction chamber and exposing the layer to a reactive ion etch in a chlorine-based plasma in the presence of a source of a metal Z spaced apart from the workpiece to provide Z-Cl gaseous reaction products which serve as the principal complexing agent with said cobalt, copper, or nickel to form volatile M-based M-Z-Cl reaction products and continuing said exposure until said layer is etched by the removal of M-Z-Cl based reaction products formed during the reactive ion etching.

4,919,751

METHOD FOR PRODUCING POROUS SINTERED APATITE MATERIAL

Masaya Sumita, and Hitoshi Akiyama, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1989, Ser. No. 304,446

Claims priority, application Japan, Feb. 1, 1988, 63-21691; May 31, 1988, 63-134188

Int. Cl.[5] B44C *1/22*; C03C *15/00, 25/06*; C04B *35/00*

U.S. Cl. 156—646 11 Claims

1. A method for producing a porous sintered apatite material comprising the steps of:

sintering a calcium-excess apatite at a temperature of at least 800° C. so as to form a sintered apatite material having a calcium oxide content of from 0.5 to 60 wt % by phase separation of calcium oxide; and

removing said calcium oxide from said sintered apatite material by contacting the sintered apatite material with a liquid or a vapor so as to form a porous sintered apatite material.

4,919,752

BATH SOLUTION AND PROCESS FOR THE REMOVAL OF LEAD/TIM, LEAD OR TIN COATINGS FROM COPPER OR NICKEL SURFACES

Genter Mika, Geldern, Fed. Rep. of Germany, assignor to Kollmorgen Corporation, Simsbury, Conn.

Filed Nov. 10, 1988, Ser. No. 269,582

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1987, 3738307

Int. Cl.[5] C23F *1/00*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—656 12 Claims

1. Process for the removal of lead/tin, lead or tin coatings applied to nickel or copper surfaces, by contacting the coatings with an aqueous stripping solution for a period sufficient to remove the coatings from the nickel or copper surfaces, said aqueous stripping solution being characterized in that the stripping solution contains nitric acid and one or several inhibitor(s) selected from the group of block copolymers of propylene oxide and ethylene oxide, fluorocarbon surfactants, polyethylene glycols with a molecular weight more than 2000, and polyols.

4,919,753

NONWOVEN FABRIC-LIKE PRODUCT USING A BACTERIAL CELLULOSE BINDER AND METHOD FOR ITS PREPARATION

Donald C. Johnson, Auburn, and Amar N. Neogi, Seattle, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation of Ser. No. 849,982, Apr. 10, 1986, abandoned.

This application Jan. 23, 1989, Ser. No. 299,691

Int. Cl.[5] D21H *5/12*

U.S. Cl. 162—116 20 Claims

1. A method of bonding a fibrous wet laid nonwoven paper or fabric-like product which comprises adding to the fibers thereof as a binder prior to wet forming the product a minor portion of an aqueous dispersion of a bacterial cellulose essentially free of bacterial cells, said bacterial cellulose having a reticulated structure formed by a substantially continuous network of branching interconnected cellulose strands, said bacterial cellulose being produced by a microorganism of the genus Acetobacter cultured under agitated aerobic conditions, said microorganism being selected from a stable strain resistant to mutation to non-cellulose producing types under said culturing conditions.

4,919,754

COMPOSITION WHEREIN RECYCLED CELLULOSIC PULP IS DEINKED

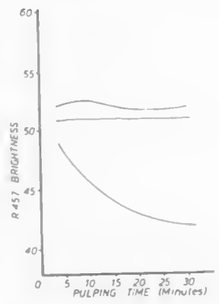
Christopher C. Mollett, Brighton, and Gordon R. Sneddon, Farncombe, both of England, assignors to Albright & Wilson Limited, Warley, United Kingdom

Division of Ser. No. 731,527, May 7, 1985, abandoned. This application Mar. 18, 1987, Ser. No. 28,017

Claims priority, application United Kingdom, May 10, 1984, 8411888; Aug. 24, 1984, 8421546

Int. Cl.[5] D21C *5/02*

U.S. Cl. 162—5 20 Claims



1. A composition comprising:

(i) an aqueous, recycled cellulosic fibre pulp;

(ii) print pigments contaminating said pulp;

(iii) dispersed in said contaminated pulp, from 0.1% to 10% based on the weight of the pulp solids of a curable precursor of a solid polymer resin which is not substantive to the cellulosic fibres of said pulp; and

(iv) a catalyst capable of curing said precursor in said dispersion; wherein

(a) said resin precursor consists essentially of a mixture of a fluid prepolymer having at least two reactive functional groups per molecule and a cross-linking agent capable of reacting with said functional groups;

(b) said catalyst is present in an amount effective to cure said resin precursor in said dispersion and thereby to form agglomerates comprising cured resin and at least some of said contaminating pigment; and

(c) said agglomerates can be separated from said dispersion to effect deinking of said pulp.

4,919,755

PROCESS FOR BLEACHING

Inge Mansson, Kungälv, Sweden, assignor to Eka Nobel AB, Sweden

PCT No. PCT/SE88/00320, § 371 Date Feb. 13, 1989, § 102(e) Date Feb. 13, 1989, PCT Pub. No. WO88/10334, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 14, 1988, Ser. No. 317,473

Claims priority, application Sweden, Jun. 24, 1987, 8702616

Int. Cl.[5] D21C *3/04*

U.S. Cl. 162—83 16 Claims

1. Process for bleaching of materials with a dithionite solution, characterised in that an aqueous borohydride solution containing borohydride corresponding to from 15 to 35 percent by weight of sodium borohydride and containing hydroxylic ions corresponding to not more than 10 percent by weight of NaOH is brought to react with a bisulfite solution, after which the dithionite solution thus obtained is added to the material to be treated.

4,919,756

METHOD OF AND APPARATUS FOR COMPENSATINGLY ADJUSTING DOCTOR BLADE

Albert H. Sawdai, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 26, 1988, Ser. No. 236,951

Int. Cl.[5] D21G *3/00*

U.S. Cl. 162—111 6 Claims

1. A method of reducing deleterious effects of doctor blade wear on material impacting the doctor blade in an apparatus wherein the doctor blade is so mounted that doctor blade wear progressively precipitates change in the impact angle of the doctor blade and a directly related change in a physical property of said material, said method comprising the steps of:

a. empirically ascertaining a time rate of change function of said impact angle of said doctor blade due to progressive wear of said doctor blade;

b. empirically ascertaining the functional relation between said impact angle of said doctor blade and said physical property of said material; and

c. continually adjusting the angular position of the doctor blade in accordance with said function and said functional relation to substantially reduce the deleterious effect on said physical property of said material which would otherwise be precipitated by doctor blade wear.

4,919,757

AQUEOUS DISPERSION OF CATIONIC POLYMER

Tadayuki Ohmae; Kentaro Mashita; Noboru Yamaguchi; Kouichiro Asao, all of Chiba; Norio Kondo, Osaka, and Tadashi Sakurai, Chiba, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

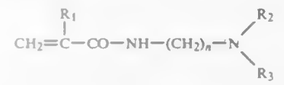
Division of Ser. No. 119,448, Nov. 12, 1987. This application Aug. 26, 1988, Ser. No. 236,809

Claims priority, application Japan, Nov. 11, 1986, 61-268900

Int. Cl.[5] D21H *3/36*

U.S. Cl. 162—164.3 4 Claims

1. Paper obtained by adding to a pulp slurry an aqueous dispersion of a cationic polymer obtained by reacting an ethylene copolymer comprising from 40 to 80% by weight of ethylene and from 20 to 60% by weight of at least one aminoalkyl acrylamide comonomer represented by formula (I):



(I)

wherein R_1 represents a hydrogen atom or a methyl group; R_2 and R_3 each represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms; and n represents an integer of from 2 to 4, and having a melt index, as measured in accordance with JIS K-6760, of from 10 to 1,000 g/10 min with hydrochloric acid in water to from a quaternary salt and subsequently reacting the resulting quaternary salt with an epihalohydrin compound through addition reaction, and drying, wherein at least 50 parts by mole of the epihalohydrin compound is used per 100 parts by mole of the amino group in the ethylene copolymer.

4,919,758

HEAT TREATMENT OF PAPER PRODUCTS HAVING STARCH ADDITIVES

Dinkar G. Wagle, Monroe, and Vacheslav M. Yasnovsky, Orangeburg, both of N.Y., assignors to International Paper Company, Purchase, N.Y.

Continuation-in-part of Ser. No. 768,784, Aug. 23, 1985, abandoned. This application Sep. 30, 1987, Ser. No. 102,699

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[5] D21H *3/28*

U.S. Cl. 162—175 2 Claims

1 A method of improving the stiffness and wet strength of a kraft paper product comprising steps of:

incorporating a starch preparation consisting essentially of starch in aqueous solution into the paper product, the amount of starch added being in the range of 0.2% to 10% the weight of the paper product,

adjusting the moisture content of the paper product to within the range of 1% to 20% by weight,

heat treating said paper product at a temperature in the range of 284° F. to 482° F. for a period of time in the range of 0.5 to 120 seconds, and then

applying water to the product while the product remains at a temperature above 212° F., immediately after the heat treating step, to produce a final moisture content in the range of 1% to 20% by weight of the paper product.

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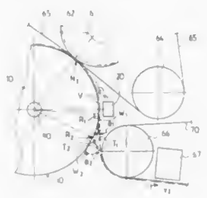
4,919,759

CONTROL OF DETACHMENT OF A PAPER WEB FROM A ROLL USING HEAT

Antti Ilmarinen; Veijo Miihkinen, both of Jyväskylä , and Jorma Laapotti, Palokka, all of Finland, assignors to Valmet Paper Machinery Inc., Finland

Filed Jan. 25, 1988, Ser. No. 147,457
Claims priority, application Finland, Jan. 23, 1987, 870308
The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.
Int. Cl.[5] D21F *3/02*
U.S. Cl. 162—206 23 Claims



1. Method for detaching a moist paper web from a roll, comprising the steps of

detaching the web from said roll,

adjusting temperature of a surface of said roll, whereby adhesion between said web and said roll surface is affected, and

setting at least one of a detaching angle of said web off said roll and detaching tension of said web as a result of said temperature adjustment,

comprising the additional steps of

pre-selecting at least one of said detaching tension and detaching angle,

then determining at least one of surface tension and viscosity of water in the web,

then selecting desired temperature of said roll surface based upon at least one of said determined viscosity and surface tension, and

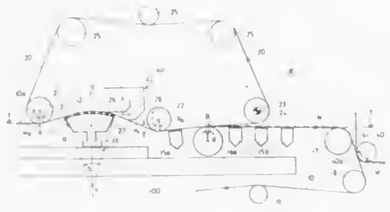
then carrying out said temperature adjustment step, whereby at least one of said detaching tension and angle are set.

4,919,760

WEB FORMER FOR A PAPER MACHINE

Reima Kerttula, Charlotte, N.C., assignor to Valmet Paper Machinery Inc., Finland

Filed Jul. 13, 1988, Ser. No. 218,833
Claims priority, application Finland, Jul. 13, 1987, 873076
Int. Cl.[5] D21F *1/36*
U.S. Cl. 162—300 27 Claims



1. A web former for a paper machine, comprising a combination of

a lower wire loop forming an initial single wire part of a dewatering zone on which water is removed through the lower wire out of a web being formed by at least one dewatering member,

an upper wire unit including an upper wire loop guided by guide rolls and a web-forming roll,

the upper and lower wires forming a twin-wire part of the dewatering zone in which dewatering takes place substantially upwardly through the upper wire, and the web-forming roll being a first forming roll in a direction of web run, being provided with an open hollow face, and being fitted inside the upper wire loop,

the twin-wire dewatering zone part beginning at the first forming roll and curving upwardly over a sector of this roll,

a forming shoe fitted inside the lower wire loop and after the first forming roll in the web run direction, and guiding the twin-wire dewatering zone part,

the forming shoe having a curved deck for guiding the lower wire loop with a center of curvature situated on a side of the lower wire loop,

a second forming roll fitted inside the upper wire loop and after the forming shoe in the web run direction, and guiding the twin-wire part over a sector thereof, a lowest point of which is situated at a lower level than a level of the initial, single-wire dewatering part,

a guide roll situated inside the lower wire loop after said second forming roll and guiding the twin-wire part over a sector of said guide roll to substantially the level of the initial, single-wire dewatering zone,

means for collecting water being fitted inside the upper wire loop and between said forming shoe and second forming roll, said means operating without any external suction source and the water collecting thereof being based upon at least one of kinetic energy of water being removed and gravity, and

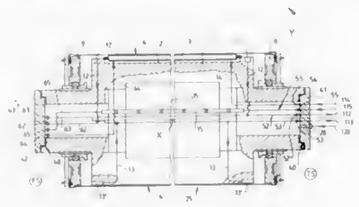
said twin-wire part being arranged over said first and second forming rolls and said forming shoe therebetween, to effect dewatering in two directions over said sector of said first forming roll through both the upper and lower wires, both upwardly and downwardly over the curved deck of said forming shoe, and reversing principal dewatering direction of said shoe over said sector of said second forming roll, with dewatering pressure being increased thereat, after the initial dewatering has taken place through the lower wire on the initial single-wire part to an appropriate extent.

4,919,761

LONG NIP PRESS ROLL WITH INTERNAL LINE COUPLINGS AT BOTH AXIAL ROLL ENDS

Christian Schiel; Hans Flämig, both of Heidenheim, and Andreas Schütte, Steinheim, all of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Sep. 22, 1989, Ser. No. 411,407
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1988, 3832324
Int. Cl.[5] D21F *3/08*
U.S. Cl. 162—358 11 Claims



1. A long nip press roll comprising:

a stationary support member; two axially spaced apart supporting discs mounted for rotation on the support member;

a press shoe disposed on and supported on the support member, and means in the support member for displacing the press shoe radially parallel to the press plane of the press roll and against another counter roll;

a flexible, tubular, inflatable press shell extending around the support member, affixed to the supporting discs and extending around the press shoe for forming an areal press nip between the exterior of the press shell at the press shoe and the counter roll in the press plane for treating a web to be passed through the nip;

the press roll having opposite axial ends; the press roll further having respective internal lines located between the axial ends of the roll for at least some of the supply and discharge of pressure oil, for lubricating and cooling oil, and for compressed air for pressurizing the press shell;

each internal line having one of a first set of corresponding couplings for receiving a respective external line located outside one axial end of the press roll, the first set of couplings being located at one axial end of the press roll; each internal line having one of a second set of corresponding couplings for receiving a respective external line located outside the other axial end of the press roll, the second set of couplings being located at the other axial end of the press roll, the couplings providing connections from the internal lines to the respective external lines.

4,919,762

PRESS SECTION AND PRESS SECTION/FRAME CONSTRUCTION COMBINATION IN A PAPER MACHINE

Jorma Laapotti, Palokka, and Olli Tapio, Jyväskylä, both of Finland, assignors to Valmet Paper Machinery Inc., Finland

Filed Jun. 17, 1988, Ser. No. 209,080
Claims priority, application Finland, Jun. 17, 1987, 872693
Int. Cl.[5] D21F *3/04*
U.S. Cl. 162—360.1 20 Claims

1. A press section-frame construction combination in a paper machine, said paper machine including a forming section having a forming wire, comprising:

a first upper fabric;

a pick-up press-suction roll within a loop of said first upper fabric situated proximate to a run of the forming wire for transferring a web from the forming wire onto said first upper fabric;

a first lower fabric;

a first lower press roll within a loop of said first lower fabric situated in nip-defining relationship with said pick-up suction roll to form a first double-felted press nip;

a smooth-surfaced center roll;

a second press roll situated within the loop of said first upper fabric situated in nip-defining relationship with said center roll to form a second single-felted nip directly, consecutively following said first double-felted nip and through which only said first upper fabric passes;

said upper fabric having a substantially straight upwardly inclined run between said first double-felted nip and said second single-felted nip;

a frame construction on which said pick-up press-suction roll, said first and second press rolls, and said center roll are mounted, and wherein

the web is transferred by said pick-up press-suction roll from the forming wire onto said first upper fabric and is carried on lower surface of said first upper fabric into said first double-felted nip wherein the web is dewatered through both of its faces, whereupon the web is carried supported on said first upper fabric over said substantially straight run into said second, single-felted nip whereupon the web separates from said first upper fabric and is carried on the surface of said smooth-surfaced center roll,

a third press roll mounted on said frame construction and situated in nip-defining relationship with said center roll to form a third single-felted nip;

a second upper fabric passing through said third single-felted nip, wherein

after separation from said first upper fabric, the web is carried on the surface of said smooth-surfaced center roll into said third single-felted nip, and

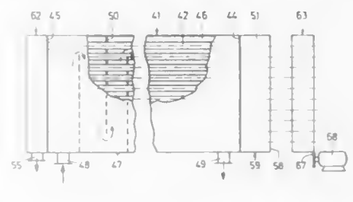
wherein said second nip is located at a point above a horizontal plane passing through an axis of rotation of said center roll and on a side of a vertical plane passing through an axis of rotation of said center roll closer to said first nip, and wherein said third nip is located on the opposite side of said vertical plane.

4,919,763

APPARATUS FOR CONVERTING SEWAGE SLUDGE FILTER CAKE BY PYROLYSIS

Klaus-Jürgen Hinger, Stuttgart, Fed. Rep. of Germany, assignor to Werner & Pfleiderer GmbH, Fed. Rep. of Germany

Filed Jul. 15, 1987, Ser. No. 73,816
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1986, 3624877; May 29, 1987, 3718133
Int. Cl.[5] C10B *1/02, 1/06*
U.S. Cl. 202—113 12 Claims



1. An apparatus for converting sewage-sludge filter cakes to coke by pyrolysis which comprises a comminuter, a preliminary evaporating means, a residual evaporating means and a coke converting means, each of said preliminary evaporating means, said residual evaporating means, and said coke converting means being constructed with at least one module;

each of said modules having walls to define a central heat transfer tube chamber, a transfer chamber connected to the tube chamber at one end of the tube chamber and an upper feed chamber and a lower delivery chamber connected to the tube chamber at the other end of the tube chamber;

a plurality of first tubes and a plurality of second tubes mounted in and extending through said tube chamber, each first and second tubes having a first end and a second end, said first ends of said first tubes connected to and opening into said transfer chamber, said second ends of said first tubes connected to and opening into said upper feed chamber;

said first ends of said second tubes connected to and opening into said transfer chamber, said second ends of said second tubes connected to and opening into said lower delivery chamber;

a first coreless screw conveyor member mounted in each of

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said first tubes to deliver material by said first tubes from said upper feed chamber to said transfer chamber;

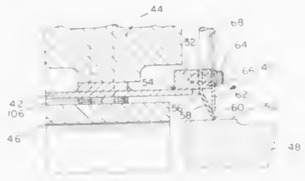
a second coreless screw conveyor member mounted in each of said second tubes to deliver material by said second tubes from said transfer chamber to said delivery chamber; wherein said first and second tubes mounted in and extending through said tube chamber are spaced apart so as to permit passage of a heat transfer medium around said first and second tubes to provide heat exchange between the medium and said first and second tubes, and said tube chamber includes a heat transfer medium inlet and a heat transfer medium outlet.

4,919,764

RETROFIT COKE OVEN DOOR SEAL

William R. Baird, and Billy C. Baird, both of Sturgis, Ky., assignors to Saturn Machine & Welding Co., Inc., Sturgis, Ky.

Filed Feb. 13, 1989, Ser. No. 309,223
Int. Cl.[5] C10B *25/16*
U.S. Cl. 202—248 3 Claims



1. A retrofit coke oven door seal assembly in combination with a coke oven door having a diaphragm plate supported from a door body, said plate having an interior surface with refractories supported therefrom and a peripheral edge, said seal assembly comprising a support member mounted peripherally around the peripheral edge of the diaphragm plate, a pressure leaf spring and a seal attached to the support member for engagement with a door jamb surface peripherally of the coke oven door, said seal including an angled portion for engaging a door jamb surface in angular relation to enable flexing of the angled portion without maintaining the plane of the angled portion while maintaining sealing engagement with a door jamb, said angled portion including an inclined outer surface, said pressure leaf spring including an edge engaging the outer surface of the angled portion of the seal to provide continual pressure against the angled portion of the seal, said coke oven door including plungers engaging the seal assembly and providing pressure against the seal assembly, said pressure leaf spring being straight throughout its length and width, said seal and pressure leaf spring having parallel opposed surfaces spaced from each other, a spacer bar positioned between and engaged with the opposed surfaces on said seal and pressure leaf spring, and fastener bolts extending through the seal, pressure leaf spring and spacer bar into the support member to removably secure the seal, pressure leaf spring and spacer bar to the support member.

4,919,765

PROCESS FOR THE PURIFICATION OF TETRAHYDROFURAN

Peter R. Wilkes, Rickmansworth; John Scarlett, Spennymoor, and George E. Harrison, Billericay, all of England, assignors to Davy McKee (London) Limited, London, England

Filed Jul. 22, 1988, Ser. No. 222,727
Claims priority, application United Kingdom, Jul. 29, 1987, 8717993
Int. Cl.[5] B01D *3/34*
U.S. Cl. 203—64 18 Claims

1. A continuous process for the separation of tetrahydrofuran from a crude reaction product containing, in addition to tetrahydrofuran, ethanol, water, and n-butanol, and high boiling materials including butane-1,4-diol and gamma-butyrolactone, which process comprises:

(a) supplying the crude reaction product to a first distillation zone;

(b) recovering a vaporous first overhead product from the first distillation zone containing tetrahydrofuran, ethanol and water;

(c) redistilling the overhead product from the first distillation zone in a second distillation zone;

(d) supplying to an upper part of the second distillation zone a hydroxylic solvent containing at least two hydroxyl groups;

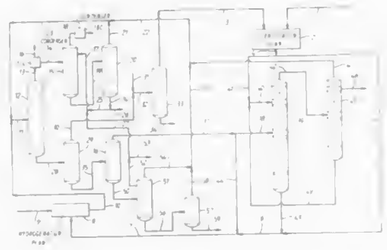
(e) recovering an overhead product from the second distillation zone consisting essentially of tetrahydrofuran;

(f) recovering a bottom product from a lower part of the second distillation zone comprising hydroxylic solvent, tetrahydrofuran, ethanol and water;

(g) stripping tetrahydrofuran, ethanol and water from the bottom product of step (f) by distillation in a third distillation zone; and

(h) recycling stripped bottom product of step (g) to the second distillation zone.

12. A continuous process for the separation of tetrahydrofuran in a distillation plant from a crude reaction product containing, in addition to tetrahydrofuran, dissolved hydrogen, ethanol, water and n-butanol, and high boiling materials including butane-1,4-diol and gamma-butyrolactone, which process comprises:



(i) supplying the crude reaction product to a first distillation zone which is operated substantially at atmospheric pressure;

(ii) recovering a vaporous first overhead product from the first distillation zone containing hydrogen, tetrahydrofuran, ethanol and water;

(iii) cooling said vaporous first overhead product to effect separation by condensation of a first condensate from a gaseous stream containing hydrogen, said first condensate containing tetrahydrofuran, ethanol and water;

(iv) purging the gaseous stream of step (iii) from the distillation plant;

(v) redistilling the first condensate in a second distillation zone which is operated substantially at atmospheric pressure;

(vi) supplying to an upper part of the second distillation zone a hydroxylic solvent containing at least two hydroxyl groups;

(vii) recovering a second overhead product from the second distillation zone consisting essentially of tetrahydrofuran;

(viii) condensing said second overhead product;

(ix) recovering a bottom product from a lower part of the second distillation zone comprising hydroxylic solvent, tetrahydrofuran, ethanol and water;

(x) stripping tetrahydrofuran, ethanol and water from the bottom product of step (ix) by distillation in a third distillation zone; and

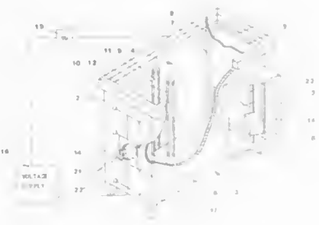
(xi) recycling stripped bottom product of step (x) to the second distillation zone.

4,919,766

INSPECTION OF ELECTRODES HAVING ACTIVATED LAYERS

Stephan Kotowski, Seligenstadt; Bernd Busse, Darmstadt, and Bernd Donnerhak, Maintal, all of Fed. Rep. of Germany, assignors to Heraeus Elektroden GmbH, Hanau am Main, Fed. Rep. of Germany

Filed Sep. 6, 1989, Ser. No. 403,671
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1988, 3837290
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—153.1 7 Claims



1. Process for identifying deactivated surface areas of an activated surface layer of a basically flat electrode for use in electrochemical processes, said process comprising the following steps:

providing an electrolytic test cell having an anode and a cathode,

inserting said electrode between said anode and said cathode so that said activated surface layer faces said cathode,

applying a voltage between said anode and said cathode, and

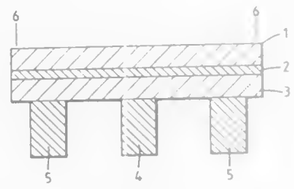
visually inspecting said activated layer for development of gas bubbles, whereby deactivated surface areas may be identified by the absence of gas bubbles.

4,919,767

SENSOR AND METHOD FOR ANALYTE DETERMINATION

Pankaj M. Vadgama, Salford, and Lian X. Tang, Newcastle-upon-Tyne, both of England, assignors to Imperial Chemical Industries PLC, London, United Kingdom

Filed Aug. 4, 1988, Ser. No. 228,153
Claims priority, application United Kingdom, Aug. 4, 1987, 8718430
Int. Cl.[5] C12Q *1/00*
U.S. Cl. 204—153.1 13 Claims



1. A sensor of the enzyme-electrode type for the determination of an analyte in a sample, which analyte is convertible in the presence of an enzyme into a species which is detectable by the sensor, which sensor comprises an electrode and a membrane permeable to liquids and solutes which is positioned between the electrode and a specimen containing the analyte, which membrane comprises a first layer containing at least one enzyme and a second layer positioned between the enzyme-containing layer and the specimen, wherein said second layer contains an area through which analyte can pass, in the form of a liquid membrane formed from a porous material of which the pores have been at least partially filled with a liquid having the ability to pass the analyte while rejecting other species in the sample.

13. A method for determining an analyte in a specimen which comprises contacting the specimen with the outer layer of a membrane, permeable to liquids and solutes and comprising one or more enzymes, in the presence of which the analyte is convertible into a species detectable by a sensor which incorporates the membrane, and one or more layers of material, and measuring the response of the sensor to the species, characterized in that a layer in the membrane between the enzyme and the specimen contains an area through which analyte can pass formed from a porous material which has been treated to fill its pores wholly or partially with a liquid which has the ability to pass the analyte while rejecting other species in the specimen.

4,919,768

ELECTROPLATING PROCESS

John J. Bladon, Wayland, Mass., assignor to Shipley Company Inc., Newton, Conn.

Filed Sep. 22, 1989, Ser. No. 410,907
Int. Cl.[5] C25D *5/54*
U.S. Cl. 204—15 22 Claims

1. A method for electroplating an article of manufacture comprising an electrically nonconductive body portion, said method comprising the steps of:

(a) treating the surface of said nonconductor with a solution of a stannous salt;

(b) treating the surface of the nonconductor with a solution containing a dissolved sulfide capable of combining with said stannous salt;

(c) treating the surface of the nonconductor with a solution containing a dissolved platinum family metal; and

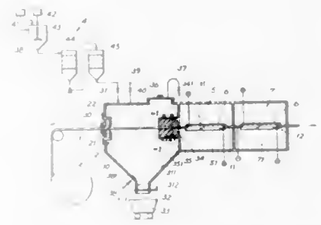
(d) metal plating the surface of the article by passing a current between electrodes immersed in an electrolyte containing dissolved plating metal, one of said electrodes comprising said nonconductor to be plated, said nonconductor having at least a portion of its surface coated with the coating formed by steps (a) through (c) herein.

4,919,769

MANUFACTURING PROCESS FOR MAKING COPPER-PLATED ALUMINUM WIRE AND THE PRODUCT THEREOF

Mei-Mei Lin, P.O. Box 10160, Taipei, Taiwan

Filed Feb. 7, 1989, Ser. No. 307,368
Int. Cl.[5] C25D *7/06*
U.S. Cl. 204—28 4 Claims



1. A process for making a copper-plated aluminum wire comprising:

A. Passing an aluminum core wire in a deaeration tank filled

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with a deaeration medium selected from a deaerated water and an inert gas in said tank;

B. Scraping an outer surface of the aluminum core wire to form a clean mirror surface of the aluminum wire by a scraping means provided in said deaeration tank;

C. Leading the scraped aluminum core wire into a primary electroplating bath filled with a first electrolyte and provided with a copper positive electrode disposing around said scraped aluminum core wire serving as a negative electrode, and conducting a primary electroplating of a pure copper onto the scraped aluminum core wire for forming a coarse copper-plated aluminum wire; and

D. Electroplating a pure copper onto the coarse copper-plated aluminum wire in a secondary electroplating bath using a second electrolyte in said secondary electroplating bath for forming a fine copper-plated aluminum wire,

the improvement which comprises:

said first electrolyte being a copper phosphate solution and said second electrolyte being a copper sulfate solution,

said deaeration tank including:

a tank body for filling deaeration fluid therein having a front packing formed on a front portion of said tank body for passing an aluminum core wire therethrough, a cone-shaped bottom portion having a drain pipe and a slide valve provided on a lower portion of the tank body, a scrap collecting car positioned under said drain pipe for collecting aluminum scraps, a rear packing formed on a rear portion of the tank body for passing a scraped aluminum wire therethrough, a wire-scrubbing means provided before the rear packing for removing scraps accumulated on the scraped aluminum wire, an overflow pipe formed on a top portion of the tank body, a vent formed on a top portion of the tank body for forming vacuum of a drained tank body, and a recirculating pipe formed on a lower portion of the tank body for recirculating a deacration fluid and filtering the fluid through a filter formed in the recirculating pipe for reusing the fluid; and

said wire-scrubbing means including two scrubbing elements having their lower portions pivotally secured to a hinge formed on a rear portion of said tank body and having their upper portions locked by a butterfly nut and screw, and a scrubbing material clamped in the two elements for removing scraps of aluminum wire.

4,919,770

METHOD FOR DETERMINING THE CONCENTRATION OF ELECTRO-CHEMICALLY CONVERTIBLE SUBSTANCES

Walter Preidel, Erlangen, and Konrad Mund, Uttenreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 515,759, Jul. 21, 1983, abandoned. This application Dec. 19, 1986, Ser. No. 945,065

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1982, 3228542

Int. Cl.[5] G01N *27/52*

U.S. Cl. 204—153.1 1 Claim

1. A method for determining the concentrations of glucose, urea and/or amino acids in the presence of each other in a solution by means of an electrochemical sensor comprising a membrane-covered platinum test electrode and a counter electrode, comprising:

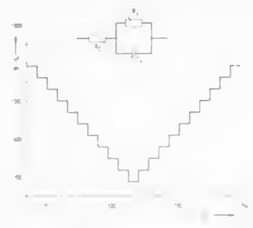
contacting the platinum test electrode with a physiological solution which contains glucose, urea and amino acids;

impressing a potential varying with time on the platinum test electrode in potential steps within a potential interval;

superimposing AC voltage of predetermined amplitude and predetermined different frequencies on the potential during at least one potential step;

establishing the real and imaginary portions of the impedance during said at least one potential step; and

determining the concentration of glucose, urea and/or amino acids from the real and imagmary portions of the



impedance established during said at least one potential step.

4,919,771

PROCESS FOR PRODUCING ALUMINUM BY MOLTEN SALT ELECTROLYSIS

Siegfried Wilkening, Alfter-Oedekoven, Fed. Rep. of Germany, assignor to VAW Vereinigte Aluminium-Werke AG, Bonn, Fed. Rep. of Germany

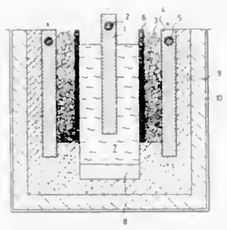
PCT No. PCT/DE79/00007, § 371 Date Oct. 9, 1979, § 102(e) Date Sep. 20, 1979, PCT Pub. No. WO79/00606, PCT Pub. Date Aug. 23, 1979

PCT Filed Jan. 24, 1979, Ser. No. 143,139

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1978, 2805374

Int. Cl.[5] C25C *3/06*

U.S. Cl. 204—67 8 Claims



1. The process of producing aluminum from aluminous material by molten salt electrolysis in a cell having anodic and cathodic bodies and an electrolyte including an aluminum halide salt at a temperature above the melting temperature of aluminum, comprising the steps of:

(a) providing a mixture of aluminous material and a carbon source with a conductor of higher conductivity than the mixture,

(b) providing a bipolar electrode with two surfaces respectively acting as cathode and anode, and covering the anode surface only with said mixture,

(c) subjecting the mixture to electrolytic reaction to an anodic body reaction site in the electrolyte with said conductor extending below the electrolyte surface to convert the aluminous material to an aluminum ionic condition migratory through the electrolyte to the cathodic body and to convert carbon to a carbon oxide gas,

(d) producing an electrolytic reaction at a temperature of the order of 680° to 850° C. for consuming at least part of the anodic body to produce aluminum and substantially CO_2 output products.

4,919,772

ELECTROLYTIC CELL/PROCESS FOR THE REDUCTION OF TITANIUM/IRON SOLUTIONS

Jean Bachot, Bourg/La/Reine, and Olivier Le Roux, Paris, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed May 16, 1988, Ser. No. 194,165

Claims priority, application France, May 15, 1987, 87 06818

Int. Cl.[5] C25C *1/00, 1/06*

U.S. Cl. 204—96 18 Claims

1. An electrolytic cell adapted for the reduction of a solution containing titanium and ferric ions, comprising an anode compartment, a cathode compartment, a cationic exchange membrane separating said anode and cathode compartments and means for circulating said solution containing titanium and ferric ions in said cathode compartment, wherein said ferric ions are reduced to ferrous ions in said cathode compartment

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4,919,773

METHOD FOR IMPARTING EROSION-RESISTANCE TO METALLIC SUBSTRATES

Subhash K. Naik, Milford, Conn., assignor to Avco Corporation, Providence, R.I.

Division of Ser. No. 864,995, May 20, 1986, Pat. No. 4,761,346, which is a continuation-in-part of Ser. No. 672,912, Mar. 19, 1984, abandoned. This application Jun. 8, 1988, Ser. No. 204,070

Int. Cl.[5] C25D *5/00;* C23C *16/00*

U.S. Cl. 204—38.4 21 Claims

1. A method for imparting erosion-resistance to a metallic substrate without an attendant loss in the fatigue life of the substrate which comprises applying to the substrate a first ductile barrier layer having a thickness between about 0.1 and 1.5 mils comprising a metal selected from the noble metal group of elements, in direct contact with the substrate, applying a second layer of pure metal selected from Group III to Group VI elements having a thickness between about 0.2 and 1.5 mils to said first layer, and then applying at substantially low temperatures, above about 400° F., a third layer which overcoates the second layer, the third layer having a thickness between about 0.2 and 2.5 mils and comprising a hard material formed of a boride, carbide, nitride or oxide of a metal selected from Group III to Group VI elements, the first layer being capable of retaining substrate integrity and preventing diffusion of material from the second layer into the substrate.

4,919,774

ELECTROLYTICALLY TREATING METHOD

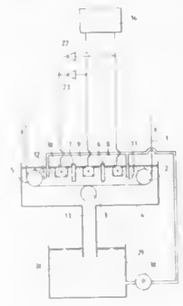
Shinichiro Minato, and Atsuo Nishino, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 22, 1988, Ser. No. 234,860

Claims priority, application Japan, Aug. 21, 1987, 62-206584

Int. Cl.[5] C25F *3/00, 1/00*

U.S. Cl. 204—129.4 4 Claims



1. A method of continuously electrolytically treating a metal web, comprising the steps of:

conveying said web in an electrolytic liquid;

supplying an alternating waveform current to said electrolytic liquid via a pair of main electrodes such that a surface of said metal web experiences an anode reaction and a cathode reaction;

controlling a current value contributing to said anode reaction acting on said metal web surface and a current value contributing to said cathode reaction acting on said metal web surface so as to control the ratio thereof by supplying a direct current to an auxiliary anode electrode, said auxiliary anode electrode being separate from said main electrodes.

4,919,775

METHOD AND APPARATUS FOR ELECTROLYTIC TREATMENT OF SLUDGE

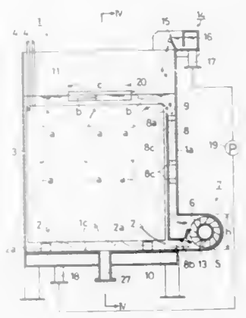
Eiichi Ishigaki, Sakaide, Japan, assignor to Ishigaki Kiko Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,136

Claims priority, application Japan, Sep. 28, 1987, 62-245219

Int. Cl.[5] C02F *1/00, 11/00*

U.S. Cl. 204—149 4 Claims



1. A method for electrolytic treatment of sludge wherein the sludge is electrolytically treated in an electrolytic tank

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equipped with a multiplicity of electrode plates, anodic and cathodic, in which the anodic and cathodic plates are alternatively arranged side-by-side at short intervals in a row, said method comprising the steps of:

supplying sludge into said electrolytic tank through a sludge inlet port formed in one side wall of the tank which is parallel to the electrode plates;

producing a circulating current of the sludge being treated within said electrolytic tank, said circulating current including

an upward current flowing upward between individual electrode plates,

a surface current flowing above the row of electroplates in the tank and near the surface level of the sludge along the top edges of the electroplates, in a specified direction,

a downward current flowing downward within the tank and along one side of the row of the electroplates, and

a bottom current flowing under the row of the electroplates in the tank and along the lower edges of the electroplates in a direction opposite to the direction of the surface current,

so that gas bubbles produced between the individual electroplates and flocs present between the electroplates are removed from their inter-plate locations and carried to the surface of the tank by said upward current, the surfaced bubbles and flocs being then carried by said surface current to a location which is outside the surface area above the electrode plates;

sprinkling sludge over the bubbles carried to said location to knock down and dissolve the bubbles; and

withdrawing the sludge electrolytically treated within the tank from the tank through a sludge outlet port formed in another side wall of the tank which is parallel to the electroplates.

4,919,776

FERROMAGNETIC POWDER AND METHOD FOR PRODUCING THE SAME

Mikio Kishimoto; Tomoji Kawai, and Shichio Kawai, all of Osaka, Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Division of Ser. No. 145,878, Jan. 20, 1988, abandoned, which is a continuation of Ser. No. 751,726, Jul. 3, 1985, abandoned. This application May 24, 1989, Ser. No. 356,207

Claims priority, application Japan, Jul. 6, 1984, 59-141033

Int. Cl.[5] B01J *19/08;* **B05D** *3/06*

U.S. Cl. 204—157.4 17 Claims

1. A method for producing ferromagnetic powder comprising metal oxide magnetic particles and a magnetic metal layer of at least one metal selected from the group consisting of iron, cobalt and nickel which is formed on surfaces of the metal oxide magnetic particles and has a magnetic easy axis of magnetization in substantially the same direction as that of the metal oxide magnetic particles, which comprises dispersing metal oxide magnetic particles in a liquid medium containing a reducing agent and at least one metal ion selected from the group consisting of iron ion, cobalt ion and nickel ion to form a dispersion, irradiating the dispersion with light having energy which is larger than the band gap energy between the valence band and the conduction band of the metal oxide magnetic particles to reduce the ion and forming a magnetic metal layer on the surfaces of the metal oxide magnetic particles.

4,919,777

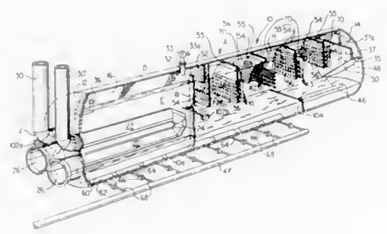
ELECTROSTATIC/MECHANICAL EMULSION TREATING METHOD AND APPARATUS

Hendrix R. Bull, P.O. Box 271203, Escondido, Calif. 92027

Continuation-in-part of Ser. No. 35,554, Apr. 7, 1987. This application Jun. 25, 1987, Ser. No. 66,770

Int. Cl.[5] B01D *19/00*

U.S. Cl. 204—188 21 Claims



11. A method of continuously treating a flow of an emulsion of oil, gas and brine in order to separate said emulsion into its components including the steps of:

(i) directing said continuous flow of emulsion sequentially through at least two heating zones and a treatment zone;

(ii) heating said emulsion when in said first heating zone only to the extent that the viscosity thereof is lowered sufficiently to permit entrained gas and brine to separate therefrom;

(iii) further heating said emulsion when in each of said additional heating zones in order to further lower the viscosity thereof to permit additional gas and brine to separate therefrom;

(iv) directing said de-gassed emulsion from the last heating zone to the treatment zone by passing said emulsion through diffusion and distribution means in said treatment zone in order to control the flow thereof;

(v) directing said diffused emulsion through an electrostatic field in said treatment zone in order to induce an electrical charge on the brine droplets comprising said brine emulsion;

(vi) directing said emulsion, with said electrically charged brine droplets, in said treatment zone to brine coalescing means comprising a plurality of electrically grounded elongated open-ended metal flow tubes positioned in downstream relationship to said diffusion and distribution means and passing said emulsion through said electrically grounded elongated flow tubes, thereby to collect and coalesce emulsified brine remaining in the emulsion on said coalescing means, causing the emulsified brine to coalesce into drops that flow by gravity to the bottom of said treatment zone, with the de-emulsified oil rising to the top of the emulsion in said treatment zone to float as a strata thereon;

(vii) continuously accumulating and removing the gas accumulated in said heating zones;

(viii) continuously accumulating and removing the brine upon separation from the emulsion in said heating zones and said treatment zone; and,;

(ix) continuously accumulating and removing the oil upon separation from the emulsion in said treatment zone.

4,919,778

PROCESS FOR THE PRODUCTION OF CURVE GLAZING WITH A HIGH TRANSMITTANCE IN THE VISIBLE SPECTRAL RANGE AND A HIGH REFLECTANCE FOR THERMAL RADIATION

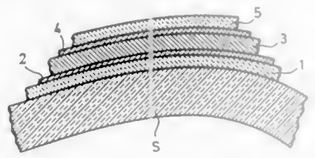
Anton Dietrich, Wiesenfelden; Klaus Hartig, Rosneburg, and Joachim Szczyrbowski, Regensburg, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 881,704, Jul. 3, 1986, abandoned. This application May 19, 1989, Ser. No. 356,668

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1985, 3543178

Int. Cl.[5] C23C *14/34*

U.S. Cl. 204—192.27 10 Claims



1. Process for the production of curved glazing with a high transmittance in the visible range and a high reflectance for thermal radiation, comprising the following steps:

(a) coating a mineral glass substrate with a first layer of at least one oxide selected from the group consisting of stannic oxide, silicon dioxide, aluminum oxide, tantalum oxide, and zirconium oxide,

(b) coating the first layer with a second layer of at least one metal selected from the group consisting of tantalum, tungsten, nickel, and iron or alloys with at least fifty percent by weight of one of these metals, the thickness of this layer being selected to have a lower transmittance of visible light than desired in the finished glazing,

(c) coating the second layer with a third layer selected from the group consisting of silver and a silver alloy with at least fifty percent silver by weight,

(d) coating the third layer with a fourth layer of a metal selected from the group forming the second layer, the thickness of said fourth layer being selected to have a lower transmittance of visible light than desired in the finished glazing,

(e) coating the fourth layer with a fifth layer of at least one oxide selected from the group forming the first layer,

(f) heating the coated substrate in an oxidizing atmosphere at least to the softening temperature of the glass until the second and fourth layers are oxidized sufficiently to increase the average transmittance by at least 5 percent,

(g) bending the substrate during said heating in said oxidizing atmosphere.

4,919,779

METHOD FOR PRODUCING ELECTRICALLY CONDUCTIVE CARBON FILM

Akira Mizoguchi; Jun Shioya; Yoichi Yamaguchi, and Yoshinobu Ueba, all of Osaka, Japan, assignors to Director-General, Agency of Industrial Science and Technology, Tokyo, Japan

Filed Aug. 17, 1988, Ser. No. 233,415

Claims priority, application Japan, Aug. 21, 1987, 62-206263

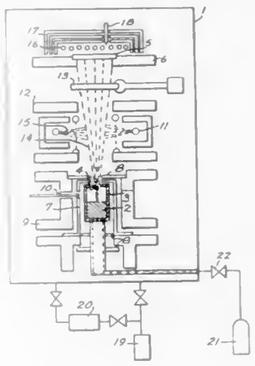
Int. Cl.[5] C23C *14/00;* **B05D** *3/06*

U.S. Cl. 204—192.31 3 Claims

1. A method for forming an electrically conductive carbon film on a substrate comprising the steps of:

maintaining a substrate at substantially room temperature; and

ionizing an organic compound having at least one substituent selected from the group consisting of a carbonyl group, an aldehyde group, an acyl group, an acid anhydride group, an amino group, a nitro group, a hydroxyl group, an alkoxyl group, a thiol group and a halogen or a cluster of said organic compound with an ion beam which accelerates ionized species towards the substrate by an electric field thereby forming a carbon film on the substrate.



4,919,780

METHOD OF MAKING SELF-ALIGNED APERTURES

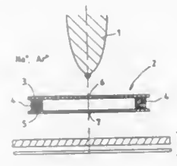
Hans-Werner Fink, Gattikon; Roger Morin, Marseille; Heinz Schmid, Oberrieden, and Werner Stocker, Wadenswil, all of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 3, 1989, Ser. No. 333,386

Claims priority, application European Pat. Off., Jul. 22, 1988, 88111803.8

Int. Cl.[5] B23K *28/00*

U.S. Cl. 204—192.34 11 Claims



1 Method for making self-aligned apertures in a lens structure (2) for use in ion or electron microscopy, characterized by the steps of placing a sharply pointed electrically conductive tip (1) in front of said lens structure (2) consisting at least of first and second metal foils (3, 5; 11 . . . 13) held in a parallel arrangement at a distance determined by a plurality of insulating media (4; 9, 10), said tip having a surface and an apex on the surface of the tip, said apex being located at a point on the surface of the tip which is closest to the metal foils, said tip having from one to three atoms on the surface of the tip at the apex of the tip, bombarding said foils (3, 5; 11 . . . 13) with heavy ions at a narrowly confined area thereof, sputtering holes (6, 7; 14) through said foils (3, 5; 11 . . . 13), monitoring the arrival of the first ions passing through said holes (6, 7; 14) by detector means (8) arranged on the side of said lens structure (2) facing away from said tip (1), and terminating the sputtering operation upon the arrival of the first ions at said detector means (6).

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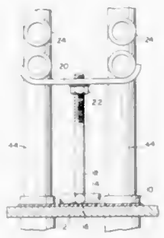
4,919,781

FLUORINE GENERATING ELECTROLYTIC CELLS

Roland Leeming, Preston, United Kingdom, assignor to British Nuclear Fuels plc, Risley, England

Filed Nov. 7, 1988, Ser. No. 268,284
Claims priority, application United Kingdom, Nov. 20, 1987, 8727188
Int. Cl.[5] C25B 9/00
U.S. Cl. 204—241 8 Claims



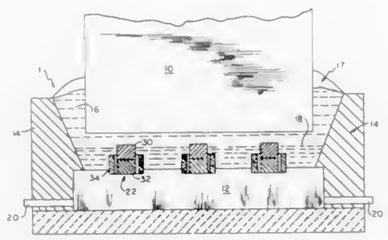
1. A fluorine-generating electrolytic cell having a base, cooling coils in the cell for cooling the electrolyte and being displaced from the base, a layer of material disposed on the base to electrically insulate the base, and means bridging the space between the cooling coils and an upwardly presented face of the layer so as to hold the layer against the base.

4,919,782

ALUMINA REDUCTION CELL

Douglas V. Stewart, Florence, Ala., assignor to Reynolds Metals Company, Richmond, Va.

Filed Feb. 21, 1989, Ser. No. 312,833
Int. Cl.[5] C25C 3/08
U.S. Cl. 204—243 R 16 Claims



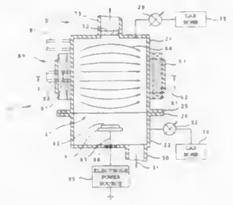
1. In an alumina reduction cell having an anode, a carbonaceous cathode, a plurality of refractory hard metal (RHM) shapes, said RHM shapes having a height sufficient to extend vertically upwardly through a molten aluminum pad and into an alumina-cryolite bath, and a plurality of inert refractory stabilizing sleeves for said RHM shapes, said sleeves being fixedly mounted to said cathode, said sleeves extending vertically into said molten aluminum pad but not into said alumina-cryolite bath, the improvement comprising means for supporting said RHM shapes within said sleeves to thereby permit a reduction in the volume of RHM material in said RHM shapes, said means comprising platforms of carbonaceous material extending upwardly from said cathode and positioned within said sleeves, said platforms having a height less than said sleeves to permit said RHM shapes to rest upon said platforms and within said sleeves without becoming dislodged from said sleeves during movements of said molten aluminum pad.

4,919,783

APPARATUS FOR PROCESSING AN OBJECT BY GAS PLASMA WITH A REDUCED DAMAGE

Tatsuo Asamaki; Hideo Mito; Yukito Nakagawa, and Atsushi Sekiguchi, all of Tokyo, Japan, assignors to Anelva Corporation, Tokyo, Japan

Filed Dec. 4, 1987, Ser. No. 128,775
Claims priority, application Japan, Dec. 5, 1986, 61-289920
Int. Cl.[5] C23C 13/08, 14/00
U.S. Cl. 204—298.16 17 Claims



1. An apparatus operable in an electron cyclotron resonance mode to process an object by using plasma generated by interaction of a magnetic field, an electromagnetic wave, and a predetermined gas, said apparatus comprising:

a reaction vessel defining a hollow space and having a vessel axis and first and second parts which define first and second spaces, respectively, by spatially dividing said hollow space in a direction orthogonal to said hollow space, said first and said second parts being attached to each other through an interface;

means for introducing said predetermined gas at least into said first space;

holding means for holding an object to be processed in said second space at a state transverse to said vessel axis;

magnetic field generating means adjacent to said first part for generating a magnetic field which is confined substantially within said first space and which has lines of magnetic force transverse to said vessel axis and substantially parallel to said interface to prevent charged particles from passing through said interface; and

means for supplying said electromagnetic wave into said first space to produce said gas plasma by making said predetermined gas, said electromagnetic wave, and said magnetic field interact with one another.

4,919,784

ELECTROPHORRESIS CASSETTE SPACER

David S. Yetman, Merrimack, Mass., assignor to EG&G, Inc., Wellesley, Mass.

Filed Aug. 16, 1989, Ser. No. 394,554
Int. Cl.[5] G01N 27/28, 27/26; B01D 57/02
U.S. Cl. 204—299 R 12 Claims

1. An electrophoresis cassette, comprising:

a first flat plate having two sides which are substantially parallel to each other and having top and bottom edges;

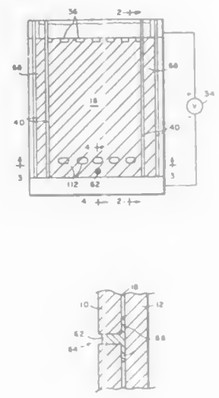
a second flat plate having two sides which are substantially parallel to each other and having top and bottom edges;

means for holding the first and second plate in a fixed relationship with each other wherein the sides of the first plate are substantially parallel to the sides of the second plate and the opposing faces of the plates are separated by a predetermined distance to form a space therebetween, the sides, bottom edges and top edges of the plates corresponding to the sides, bottom edge and top edge of the assembled cassette;

the space between the plates being adapted for filling with a gel in which an electrophoresis separation may be performed;

the means for holding including means for providing a seal between the first and second plates along each of the sides of the cassette;

at least one spacer located between the first and second plates and between the seals along each of the cassette sides and including a flat portion, the thickness of which is



equal to the predetermined distance between the plates, and a protrusion which extends from the flat portion;

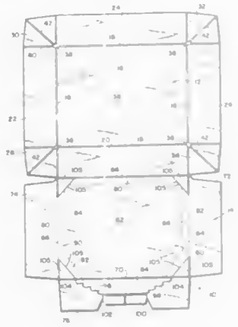
one of the front and back plates including an opening on the inside surface thereof for receiving the protrusion to maintain the spacer in a fixed position.

4,919,785

MICROWAVE CARTON

Monroe J. Willey, East Brunswick, and Daniel D. Evert, Englishtown, both of N.J., assignors to Kraft General Foods, Inc., Glenview, Ill.

Filed Apr. 28, 1988, Ser. No. 192,262
Int. Cl.[5] B65D 5/24, 5/40, 5/54
U.S. Cl. 206—625 6 Claims



1. A microwave carton which is constructed from a unitary carton blank, said carton comprising:

a carton bottom structure including a substantially rectangular bottom panel, side panels extending from the periphery of said bottom panel and web corners extending between the side panels, crease lines formed along the periphery of said bottom panel, at the intersection of the web corners with the sides and centrally along the web corners to enable folding of the side panels normally of the bottom panel so as to provide a liquid-containing carton bottom structure;

a substantially rectangular carton top structure including a top panel which is integrally connected along a first edge with an outer edge of one of said side panels and being dimensioned to overlie the bottom structure;

a front flap extending from a second edge of said top panel opposite said first edge;

side flaps foldably connected to side edges of said top panel along crease lines located between said first and second edges;

tearable joints extending along said top panel, with first and second upper score lines extending along the crease lines which foldably connect the side flaps to the top panel, then being angled towards each other as they approach the side panel which connects the top panel to the bottom panel, then along a crease which foldably connects said top panel to the side panel which connects the top panel to the bottom panel where the first and second upper score lines connect, said upper score lines extending along said foldable connections in a non-continuous fashion in the form of perforated cut scores and generally parallel to and spaced apart from third and fourth lower cut score lines over a major portion of the top panel, said upper and lower score lines also being angled towards each other towards said front flap, said upper score lines meeting foraminations in the front flap, and wherein said angled score lines are continuous, said spacing apart of the upper and lower score lines forming a tearing distance therebetween over a portion of said top panel; and wherein,

the front flap, which is integral with and hinged to the second edge of said top panel, includes a lifting tab, which is formed centrally at the free edge of said front flap, and includes said foraminations which extend between said lifting tab and said tearable joints in said top panel.

4,919,786

PROCESS FOR THE HYDROISOMERIZATION OF WAX TO PRODUCE MIDDLE DISTILLATE PRODUCTS

Glen P. Hamner, deceased, late of Baton Rouge, La. (by Nita A. M. Hamner, executrix); Willard H. Sawyer, Baton Rouge, La., and Heather A. Boucher, Point Edward, Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 134,960, Dec. 18, 1987, abandoned. This application Dec. 13, 1988, Ser. No. 283,681
Int. Cl.[5] C10G 65/12, 67/02, 73/38
U.S. Cl. 208—27 26 Claims

13. A process for producing middle distillate fuel products from a Fischer-Tropsch wax containing oxygenate compounds, which process comprises:

(1) separating the Fischer-Tropsch wax into (a) a low-boiling fraction which contains most of the oxygenate compounds and (b) a high-boiling fraction which is substantially free of water and oxygenate compounds;

(2) reacting the high-boiling fraction from step (1) with hydrogen in a hydroisomerization zone in the presence of a fluorided Group VIII metal-on-alumina catalyst to convert from about 50 to about 95 percent of the 700° F.+ material present in the high-boiling fraction thereby maximizing the production of middle distillate product boiling in the range about 320° F. to 700° F., said catalyst having (a) a bulk fluoride concentration ranging from about 2 to about 10 weight percent, wherein the fluoride concentration is less than about 3.0 weight percent at the outer surface layer to a depth less than one one hundredth of an inch, provided the surface fluoride concentration is less than the bulk fluoride concentration, (b) an aluminum fluoride hydroxide hydrate level greater than about 60 where an aluminum fluoride hydroxide hydrate level of 100 corresponds to the X-ray diffraction peak height at

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5.66 Å for a Reference Standard and (c) a N/Al ratio less than about 0.005; and

(3) separating the product from step (2) into at least one fraction having a final boiling point below about 320° F. at atmospheric pressure, a middle distillate fraction boiling in the range of about 320°–700° F. at atmospheric pressure and a residual fraction having an initial boiling point above 700° F. at atmospheric pressure.

4,919,787

METAL PASSIVATING AGENTS

Arthur W. Chester, Cherry Hill; Pochen Chu, West Deptford, both of N.J.; Albin Huss, Jr., Chadds Ford, Pa., and Garry W. Kirker, Sewell, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 138,002, Dec. 28, 1987, abandoned. This application Apr. 7, 1989, Ser. No. 335,069

Int. Cl.[5] C10G *11/05*

U.S. Cl. 208—52 CT **37 Claims**

1. Method for passivating metals in a hydrocarbon feedstock contaminated with said metals, which comprises contacting the feedstock under passivating conditions with an effective amount of a precipitated, porous, passivating agent comprising rare earth oxide-aluminum oxide-aluminum phosphate.

4,919,788

LUBRICANT PRODUCTION PROCESS

Nai Y. Chen, Titusville; William E. Garwood, Haddonfield; Tracy J. Huang, Lawrenceville; Quang N. Le, Cherry Hill, and Stephen S. Wong, Medford, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 793,937, Nov. 1, 1985, abandoned, and a continuation-in-part of Ser. No. 821,125, Jan. 22, 1986, abandoned, which is a continuation-in-part of Ser. No. 685,089, Dec. 21, 1984, abandoned. This application Oct. 21, 1988, Ser. No. 260,857

Int. Cl.[5] C10G *67/02, 69/02*

U.S. Cl. 208—59 **30 Claims**

1. A process for producing a lubricating oil of improved pour point and viscosity index which comprises

(i) catalytically dewaxing a lube feed stock having an initial boiling point of at least 650° F. containing waxy, paraffinic components in an initial catalytic dewaxing step with a dewaxing catalyst comprising zeolite beta having a silica:alumina ratio of at least 10:1 and a hydrogenation-dehydrogenation component, in the presence of hydrogen under dewaxing conditions of elevated temperature from 480° to 850° F. and pressure of up to 1000 psig and at a contact time between the feed and the catalyst which effects a partial removal of the waxy components by isomerization of the waxy paraffinic components to less waxy iso-paraffinic components, to increase the content of iso-paraffinic components in the stock relative to the content of iso-paraffinic components in the feed; and

(ii) subjected the effluent from the initial catalytic dewaxing step to a selective dewaxing operation in which straight chain, waxy paraffinic components are removed in preference to iso-paraffinic components, to lower the pour point of the stock to produce a dewaxed lubricant product having a targeted pour point and viscosity index.

4,919,789

PRODUCTION OF HIGH OCTANE GASOLINE

Ronald H. Fischer, Cherry Hill; Rene B. LaPierre, Medford; Peter J. Owens, Mantua, and Philip Varghese, Voorhees, all of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Continuation of Ser. No. 178,157, Apr. 6, 1988, which is a continuation of Ser. No. 940,382, Dec. 10, 1986, Pat. No. 4,738,766, which is a continuation-in-part of Ser. No. 825,294, Feb. 3, 1986, Pat. No. 4,676,887, which is a continuation-in-part of Ser. No. 740,677, Jun. 3, 1985, abandoned. This application Oct. 18, 1988, Ser. No. 259,211

The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.

Int. Cl.[5] C10G *65/12, 69/10*

U.S. Cl. 208—61 **23 Claims**

20. A process for the production of a high octane gasoline, having an octane number not less than 87 (RON+0), from a substantially dealkylated hydrocarbon feedstock comprising not less than 50 vol % aromatic content, an API gravity between 5 and 25, a nitrogen content between 50 and 650 ppm, and a hydrogen content between 8.9 and 12.5 wt %, comprising:

hydrotreating said substantially dealkylated feedstock in the presence of a hydrotreating catalyst comprising a hydrogenation/dehydrogenation metal on a support, under hydrotreating conditions, including a pressure not greater than 1200 psig, liquid hourly space velocity between 0.25 and 5, and temperature between 600° and 800° F.;

contacting said hydrotreated substantially dealkylated feedstock with a catalyst comprising a silica matrix and a crystalline silicate zeolite having a Constraint Index less than 2, said contacting being conducted at hydrogen partial pressure between 600 and 1000 psi, temperatures not less than 700° F., LHSV between 0.25 and 2.5, and a conversion per pass to 385° F. end point gasoline no greater than 50% to form a product comprising a 385° F. end point gasoline and an unconverted, upgraded bottom fraction; and

passing said unconverted, upgraded bottom fraction to a fluid catalytic cracking (FCC) unit for further processing.

4,919,790

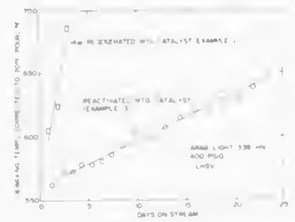
METHOD FOR HYDROCARBON DEWAXING UTILIZING A REACTIVATED SPENT MTG ZEOLITE CATALYST

Robert P. L. Absil, Mantua; Clarence D. Chang, Princeton; Cynthia T-W. Chu, Princeton Junction, and Donald J. Klocke, Somerdale, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 145,438, Jan. 19, 1988, abandoned. This application Oct. 31, 1988, Ser. No. 264,766

Int. Cl.[5] C10G *57/00, 11/05;* **B01J** *29/38, 38/64*

U.S. Cl. 208—78 **10 Claims**



1. A method for hydrocarbon dewaxing, utilizing a reactivated acidic zeolite catalyst deactivated from converting methanol to gasoline by framework dealuminization and deposition of coke on the catalyst, which comprises:

(a) subjecting the deactivated catalyst to a burning operation in the presence of an oxygen containing gas to remove at least a major part of the accumulated coke from the catalyst;

(b) contacting the burned catalyst with an aqueous solution of an alkali metal carbonate and/or an alkaline earth metal carbonate at a temperature of from about 1° to about 370° C. for from about 1 to about 100 hours employing from about 0.001 to about 1 molar aqueous carbonate;

(c) converting the catalyst from step (b) to the catalytically active hydrogen form;

(d) steaming the reactivated catalyst of step (c) at a temperature and for a time period sufficient to reduce its alpha value to a level which is substantially equal to that of a fresh hydrocarbon dewaxing acidic zeolite catalyst; and

(e) using the reactivated catalyst of step (d) in hydrocarbon dewaxing processes.

4,919,791

CONTROLLED OPERATION OF HIGH CURRENT DENSITY OXYGEN CONSUMING CATHODE CELLS TO PREVENT HYDROGEN FORMATION

Ronald C. Miles; David D. Justice, and Kenneth E. Woodard, Jr., all of Cleveland, Tenn., assignors to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 727,171, Apr. 25, 1985, Pat. No. 4,578,159. This application Oct. 9, 1985, Ser. No. 785,686

Int. Cl.[5] C25B *1/16, 1/26*

U.S. Cl. 204—98 **18 Claims**

1. A process for the electrolysis of an alkali metal halide brine in an electrolytic cell having an anode compartment containing at least one anode, a cathode compartment containing at least one hydrophilic porous cathode, and a cation exchange membrane separating the anode compartment from the cathode compartment, the process which comprises:

(a) feeding the alkali metal halide brine to the anode compartment;

(b) electrolyzing the alkali metal halide brine at a current density of at least about 2 kiloamperes per square meter to produce a halogen gas and alkali metal ions in the anode compartment;

(c) passing the alkali metal ions and water through the cation exchange membrane into the cathode compartment wherein contact is maintained between the cation exchange membrane and the hydrophilic porous cathode;

(d) passing the alkali metal ions and water through the hydrophilic porous cathode;

(e) feeding an oxygen-containing gas to the hydrophilic porous cathode in the cathode compartment;

(f) producing a concentrated alkali metal hydroxide solution;

(g) regulating the cell voltage to limit the formation of hydrogen; and

(h) removing the concentrated alkali metal hydroxide solution from the cathode compartment to prevent an accumulation of concentrated alkali metal hydroxide in the cathode compartment.

4,919,792

CLARIFICATION OF SLURRY OIL

Billy K. Hub, Lawrenceville, N.J., and Tsoung Y. Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 10, 1988, Ser. No. 206,238

Int. Cl.[5] C10G *67/02*

U.S. Cl. 208—99 **8 Claims**

1. A process for clarifying slurry oil withdrawn from a fractionator associated with a catalytic cracking unit characterized by adding a settling reagent having a particle size of 20–5000 microns and a particle density of 0.6–4 g/cc which to the slurry oil at a temperature of 250–450 C., separating the settling reagent and catalyst fines from the slurry oil by a physical means within 10–300 minutes, to produce a clarified slurry oil product and settled fines and settling reagent and

recycling at least a portion of the settled fines and settling reagent to the catalytic cracking unit.

4,919,793

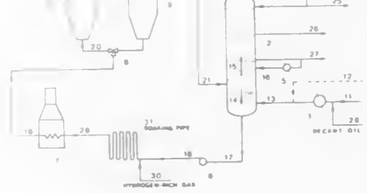
PROCESS FOR IMPROVING PRODUCTS' QUALITY AND YIELDS FROM DELAYED COKING

Renato M. Mallari, 6403 Teal Run Dr., Houston, Tex. 77035

Filed Aug. 15, 1988, Ser. No. 232,761

Int. Cl.[5] C10G *9/14*

U.S. Cl. 208—131 **5 Claims**



1. In a delayed coking process comprising of a coker fractionator, coker heater and coke drums wherein a coker fresh feed consisting of petroleum hydrocarbon derivatives from various refining processes is thermally processed in said heater and coke drums producing green coke, hydrocarbons and gases, the improvement comprising

adding hydrogen-rich gas in the absence of a catalyst to the coker heater charge material in a soaking pipe with a fluid residence time in the range of about 10 to 90 minutes in an amount in the range of about 30 to 300 SCF per barrel of the heater charge material under an inlet hydrogen partial pressure in the range of about 200 to 650 psig from an inlet operating temperature in the range of about 400° F. to 650° F. to an outlet operating temperature in the range of about 50° F. to 250° F. cooler than said inlet operating temperature range to minimize a formation of converted asphaltenes and feeding the coker heater feed material thus hydrogenated directly into said coker heater without separating any constituents from said heater feed material thereby improving the quality and yields of products from the process.

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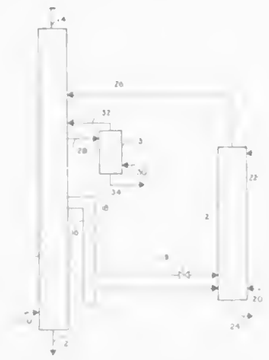
4,919,794

PROCESS FOR SEPARATING HYDROCARBONS

Gregory M. Lipkin, Secaucus, and Joseph L. Niedzwiecki, Fanwood, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 17, 1988, Ser. No. 258,341
Int. Cl.[5] C10G *7/00*
U.S. Cl. 208—354 11 Claims



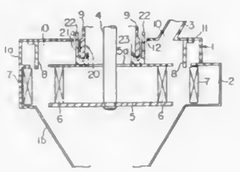
1. A process for separating a fluid hydrocarbon mixture which comprises the steps of:
(a) separating said hydrocarbon mixture into at least a vapor phase fraction, a liquid fraction and a bottoms fraction having a higher boiling point than said liquid fraction in a distillation zone;
(b) introducing said liquid fraction and a portion of said vapor phase fraction into a separation zone;
(c) introducing a stripping gas into said separation zone to remove the lightest components from said liquid and vapor fractions introduced therein; and
(d) passing the stripped vapor stream resulting from step (b) to said distillation zone of step (a).

4,919,795

LEAKAGE PREVENTION APPARATUS FOR A CLASSIFIER

Satoru Fujii, Onoda; Hiroaki Tanaka, Funabashi; Takeshi Furukawa; Masaaki Muraoka, both of Onoda; Ryosuke Narishima, Kawasaki, and Takamiki Tamashige, Tokyo, all of Japan, assignors to Onoda Cement Company, Ltd., Japan

Filed Jan. 13, 1989, Ser. No. 297,552
Claims priority, application Japan, Jan. 18, 1988, 63-6776; May 19, 1988, 63-120617
Int. Cl.[5] B07B *4/02, 7/00*
U.S. Cl. 209—135 7 Claims



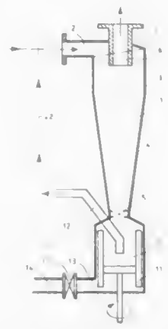
1. A leakage prevention apparatus for a classifier having a casing which defines an outlet a first inlet, through which said casing receives air and a second inlet through which said casing receives raw material, said classifier also having a rotary classifying impeller disposed in the casing for dispersing the raw material which the casing receives and for moving a fine powder component of the raw material and discharging said fine powder component through said outlet, said apparatus comprising:
a rotary seal member mounted on the rotary classifying impeller; and
a fine powder discharge duct in communication with said outlet of said casing for receiving the fine powder component of the raw material which discharges from the casing, said duct and the portion of the casing disposed around said outlet defining an opening;
said seal member including one end portion secured to the impeller and a second distal end disposed outwardly of the impeller, said second end extending into said opening between said casing and said duct and closing a substantial portion of said opening to prevent leakage of the coarse material into the duct.

4,919,796

METHOD AND APPARATUS FOR GRADING FIBER SUSPENSION

Pentti A. Vikiö, Kerimäki, Finland, assignor to A. Ahlstrom Corporation, Noormarkku, Finland

Filed Aug. 23, 1988, Ser. No. 235,080
Claims priority, application Finland, Sep. 1, 1987, 873780
Int. Cl.[5] B04C *5/10*
U.S. Cl. 209—211 17 Claims



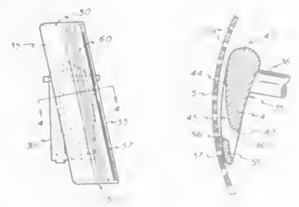
1. A method of grading a fiber suspension having a consistency of 0.5% or more utilizing a centrifugal separator having an accepts outlet and rejects outlet, a secondary stage having a second accepts outlet and a second rejects outlet, and mechanical means for increasing the rotational speed of suspension carried to the secondary stage, comprising the steps
feeding the suspension with a consistency of 0.5% or more to the centrifugal separator;
effecting separation of the suspension into an accepts fraction and a rejects fraction;
discharging the accepts fraction through the accepts outlet of the separator;
discharging the rejects fraction through the rejects outlet of the separator and feeding it to the secondary stage;
increasing the rotational speed of the rejects fraction of the suspension during discharge to the secondary stage utilizing the mechanical means;
effecting further separation of the rejects fraction in the secondary stage to produce a second accepts fraction and a second rejects fraction;
returning the second accepts fraction to the suspension prior to the suspension being fed into the centrifugal separator through the second accepts outlet;
discharging the secondary rejects from the secondary stage through the second rejects outlet; and
preventing the secondary rejects from interfering with the secondary accepts stream, and from blocking discharge of the secondary rejects from the secondary stage, by maintaining the rejects at a substantial rotational speed utilizing the mechanical means.

4,919,797

SCREENING APPARATUS FOR PAPER MAKING STOCK

David E. Chupka, Middletown, and Irenee J. Phillippe, Monroe, both of Ohio, assignors to The Black Clawson Company, Middletown, Ohio

Filed Feb. 9, 1989, Ser. No. 308,338
Int. Cl.[5] B07B *1/04*
U.S. Cl. 209—273 8 Claims



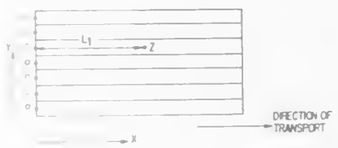
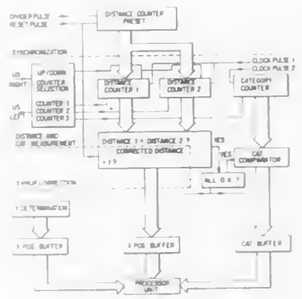
1. Screening apparatus for paper making stock comprising:
(a) a pressure housing,
(b) a cylindrical screening member having screening perforations therethrough and dividing the interior of said housing into a supply chamber and an accepts chamber on opposite sides of said screening member,
(c) a rotor mounted for rotation in said supply chamber and including a plurality of vanes having a solid periphery of generally airfoil shape in cross section mounted thereon in angularly spaced relation with each other and in relatively closely spaced relation with said screening member,
(d) each of said vanes being oriented with the leading edge thereof closest to said screening member and with the surface portion thereof trailing said leading edge to the trailing edge of said vane diverging from said screening member to create a positive pressure force along said leading edge thereof followed by a negative pressure force between said trailing portion and said screening member, and
(e) means carried by each of said vanes in trailing relation with said trailing edge thereof for substantially containing said negative pressure force in the space between said trailing portion of said vane and said screening member and thereby concentrating said force on the surface portion of said screen member within said space while providing for direct flow from said space to the interior of sad supply chamber.

4,919,798

METHOD AND AN APPARATUS FOR SORTING AND EJECTING ARTICLES

Peter A. von Asselt, and Jan Hord k, both of Aalten, Netherlands, assignors to Staalkat B.V., Netherlands

Filed Feb. 9, 1989, Ser. No. 308,279
Claims priority, application Netherlands, Feb. 15, 1988, 8800365
Int. Cl.[5] A01K *43/00*; B07C *5/36*
U.S. Cl. 209—510 13 Claims

1. In a method of sorting a plurality of articles which are continuously moved past an inspection station on a moving conveyor means for removing selected ones of the articles from the conveyor means, where the position of the selected article on the moving conveyor means is indicated by a signal generated from a movable means placed in close proximity to the selected article and the signal is process to operate an ejector associated with the conveyor means for removing the selected article, the improvement comprising providing at least one fixed ultrasonic signal processing means disposed about the inspection station and at least one movable ultrasonic signal processing means which is manually movable over the inspection station, wherein the said fixed signal means and the said movable signal means are combinations of ultrasonic transmitters and receivers, determining a selected article on the conveyor means to be removed therefrom, placing the movable



signal means in close proximity to said selected article, activating the movable signal means to transmit to or receive from the said fixed signal means an ultrasonic signal, measuring the time lapse of the ultrasonic signal transmission between the said movable signal means and the fixed signal means, whereby the position of the selected article on the conveyor means is determined, moving the conveyor means sufficiently that the position of the selected article is adjacent to the ejector and operating the ejector to remove the selected article from the conveyor means.

4,919,799

OPTICAL CODE READER SORTING APPARATUS CONDITIONED BY TRIGGER INDICIA

Elaine A. Menardi, Westminster; Terrence E. Rhodes, Broomfield, and David R. Siemer, Golden, all of Colo., assignors to Adolph Coors Company, Golden, Colo.

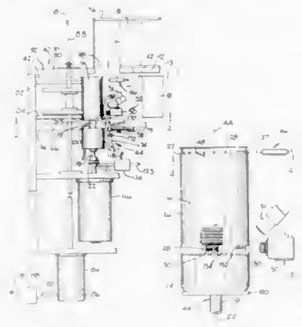
Filed Dec. 14, 1988, Ser. No. 285,518
Int. Cl.[5] B07C *5/02*; G06K *7/016*
U.S. Cl. 209—538 32 Claims

1. An apparatus for distinguishing between generally identically shaped objects having a first end, a second end, a central longitudinal axis and a longitudinally extending sidewall based upon code indicia provided on a predetermined, relatively small surface area portion on the sidewall of each object, comprising:
(a) transfer means for moving said objects in single file relationship along a transfer path extending substantially perpendicular to the longitudinal axes of the objects being moved therealong;
(b) spinning means for engaging an object in said transfer path and for spinning said engaged object about its longi-

VOL 1113 ISS 4 AP 24 1990 UMI

tudinal axis during a relatively short duration spinning period without removing said object from said transfer path;

(c) trigger means for sensing the passage of a trigger indicia, located at a predetermined circumferential position on the surface of said object relative to said code indicia, during the spinning of said object by said spinning means and for generating a trigger signal responsive thereto;



(d) code indicia reading means for reading said code indicia printed on said object and for generating an indicia reading signal indicative of indicia read thereby; and

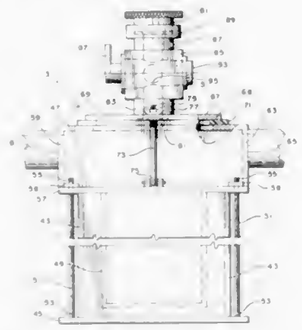
(e) reading actuation means responsive to said trigger signal for actuating said code indicia reading means for a short duration period during the spinning of said object at a time when said code indicia on said object is positioned in readable relationship with said reading means.

4,919,800

FLUSHING MEANS FOR A MARINE ENGINE

Todd Vinoski, 537 NE. 137th St., North Miami, Fla. 33161

Filed Sep. 26, 1988, Ser. No. 248,595
Int. Cl.[5] B01D *35/00*
U.S. Cl. 210—94 6 Claims



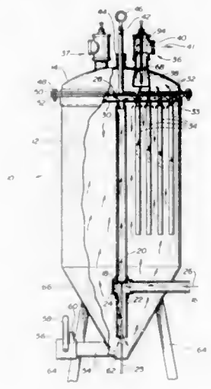
1. A cooling system for a liquid-cooled internal combustion marine engine, said cooling system comprising a coolant intake pipeline connected at one end thereof to the engine block of said engine, a coolant strainer in said intake pipeline, said strainer comprising a container having a removable metal cover, an improvement comprising means for controllably introducing flushing liquid into said strainer through said cover.

4,919,801

CONTROL SYSTEM FOR PUMP CYCLING

Russell Hobson, Jr., Rte. 1, Box 30, Old Fort, N.C. 28752

Filed Jan. 7, 1988, Ser. No. 141,650
Int. Cl.[5] B01D *29/28, 29/32*
U.S. Cl. 210—104 6 Claims



1. A filter for filtering fluid flowing therethrough, comprising:

a casing;

at least one tube sheet dividing said casing into a lower chamber and an upper chamber and being vertically movable within said casing, said tube sheet having openings therethrough;

a filter unit in each said opening in said tube sheet;

at least one fluid outlet in said filtered chamber;

fluid inlet means in said unfiltered chamber;

tube sheet movement means external to said casing for moving said tube sheet, said means being disposable between at least a first position permitting said movement of said tube sheet and at least a second position prohibiting said movement of said tube sheet; and

sensor means to determine the position o said movement means, for respectively prohibiting and permitting fluid flow through said filter when said movement means is respectively in said first and said second position.

4,919,802

BLOOD FILTER

Yoshiro Katsura, Fuji, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 278,001
Claims priority, application Japan, Dec. 4, 1987, 62-307032
Int. Cl.[5] B01D *19/00, 35/30*
U.S. Cl. 210—188 8 Claims

1. A blood filter, comprising:

a filter housing;

said housing forming a bubble separating section including

a chamber defined by said housing and having a generally circular cross section for allowing bubbles to separate from blood when introduced into said chamber,

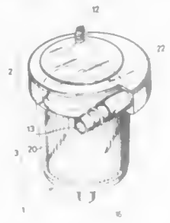
a vent formed at upper end of the housing to communicate with the chamber for discharging air from said bubbles,

an inlet conduit horizontally extending from the housing for introducing blood into the chamber, the axis of said inlet conduit extending substantially parallel to a tangent line of the generally circular chamber in the vicinity of the connection between the chamber and the inlet conduit, the inlet conduit axis being outside said chamber and being offset a certain distance from said tangent line in a plane perpendicular to the axis of said chamber, and

said housing defining an inflow portion merging the inlet conduit to the chamber, and

said housing forming a blood filter section disposed below said bubble separating section, including

an outlet disposed at a lower end of the housing for discharging blood, and



a filter member disposed in said housing between the inlet conduit and the outlet,

wherein said inflow portion is contoured so that said inflow portion introduced incoming blood from the inlet conduit to flow as a substantial laminar flow up to an existing swirl blood flow in the chamber, and to merge with the swirl blood flow without substantial disturbance of the swirl blood flow.

4,919,804

ULTRASOUND DRIVEN SYNTHESIS OF REVERSED AND NORMAL PHASE STATIONARY PHASES FOR LIQUID CHROMATOGRAPHY

John G. Dorsey; Karen B. Sentell, both of Gainesville, Fla., and Karen W. Barnes, Verona, N.J., assignors to University of Florida, Gainesville, Fla.

Continuation of Ser. No. 162,515, Mar. 1, 1988, abandoned. This application May 1, 1989, Ser. No. 346,286
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—198.2 8 Claims

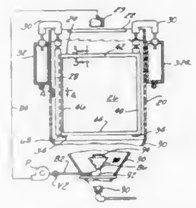
1. In a method for the production of a reversed phase bonded metal oxide particularly adapted for use as a packing in high performance liquid chromatography, said method comprising reacting said metal oxide, in which at least some of the oxide groups have been converted to hydroxyl groups, with a substituted or unsubstituted alkyl silane reactive with said hydroxyl groups to produce a silyated derivative of said metal oxide, the improvement comprising conducting said reaction in the presence of ultrasonic waves at a temperature below about 20° C.

4,919,805

VERTICAL LEAF FILTER FLUSH

Willard L. Johnson, 12923 Lincoln Ave., Huntington Woods, Mich. 48070

Division of Ser. No. 932,010, Nov. 26, 1986, Pat. No. 4,790,935. This application Jan. 3, 1988, Ser. No. 202,149
Int. Cl.[5] B01D *29/32*
U.S. Cl. 210—332 5 Claims



1. In a leaf filter apparatus including an open topped tank for receiving a continuous flow of contaminated liquid to be filtered, a plurality of panel-like filter leafs mounted within said tank in closely spaced adjacent parallel relation with said leafs disposed in vertical general planes, said leafs being operable to separate particles from said liquid by collecting said particles on the exterior surfaces of said leafs while passing said liquid into a filtrate discharge system;

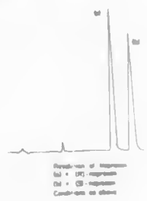
the improvement comprising pump means operable to pump contaminated liquid from an intake in communication with the spaces between the filter leaves adjacent the bottom of said tank at a location below said filter leafs and to discharge said liquid back into the top of said tank to thereby induce an increased downward flow of liquid across the exterior surfaces of said filter leafs to flush collected particles therefrom toward the bottom of said tank while filtering.

4,919,803

LIQUID CHROMATOGRAPHIC CHIRAL STATIONARY PHASE

Thomas D. Doyle, Burke; Charlotte A. Brunner, Alexandria, both of Va., and Edward Smith, Rockville, Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Dec. 9, 1988, Ser. No. 281,778
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—198.2 8 Claims



1. A packing material for chromatographic use which comprises a chiral stationary phase formed from a silica support bonded to the (R)- or (S)-form of 6-methoxy-α-methyl-2-naphthaleneacetic acid via an amide linkage.

4,919,806

CROSS-FLOW TYPE FILTER SYSTEM

Aisaburo Yagishita, Aichi, Japan, assignor to Goshi Kaisha Yagishita, Aichi, Japan

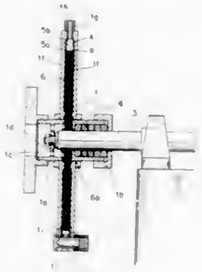
Filed Aug. 24, 1988, Ser. No. 235,503
Claims priority, application Japan, Aug. 28, 1987, 62-213098
Int. Cl.[5] B01D *25/38*
U.S. Cl. 210—334 4 Claims

1. A cross-flow type filter apparatus comprising:

a filter body divided into at least one primary chamber and

at least one pair of secondary chambers, each of said at least one primary chambers being positioned between and spaced apart from pair members of said at least one pair of secondary chambers by porous support means which support filter media;

a disc shaped rotor positioned within each of said at least one primary chambers adjacent and parallel to facing surfaces of said filter media which are supported on pair members of said at least one pair of secondary chambers by said porous support means, sad rotor being rotatably mounted on a rotor shaft which extends through the center of said rotor, said rotor shaft extending perpendicular to said surfaces of said filter media, said rotor having through-holes therein adjacent said rotor shaft for allowing fluid to flow therethrough and in a direction parallel to said rotor shaft;



feed inlet passage means located in a portion of said filter body which houses said rotor shaft, said feed inlet passage means being positioned adjacent one end of said rotor shaft and;

fluid outlet passage means located on a peripheral surface of a portion of said filter body which houses said at least one primary chamber and said at least one pair of secondary chambers, both said inlet and outlet passage means being in fluid communication with each of said at least one primary chambers,

said fluid inlet passage means, said fluid outlet passage means and said through-holes being positioned so that fluid entering said fluid inlet passage means flows radially outward from said rotor shaft in each of said at least one primary chambers and is substantially uniformly distributed to flow parallel to each filter media and out said fluid outlet passage means.

4,919,807

ULTRASONIC VIBRATOR TRAY APPARATUS

William E. Morton, Bridgeport, W. Va.; Harold V. Fairbanks; James Wallis, both of Morgantown, all of W. Va.; Raymond L. Hunicke, Roxbury, and Joseph Krenicki, Danbury, both of Conn., assignors to Heritage Industries, Inc., Bridgeport, W. Va.

Continuation-in-part of Ser. No. 886,010, Jul. 7, 1986, Pat. No. 4,741,839. This application May 2, 1988, Ser. No. 189,361

Int. Cl.[5] C02F *1/34*

U.S. Cl. 210—388 **20 Claims**

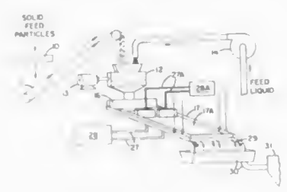
1. Vibratory tray apparatus for the treatment of a flowable slurry of a particulate material mixed in a liquid, comprising

a laterally extended and downwardly slanting elongated flat tray having upturned flange means formed along its upper end and along its lateral side edges,

suspension means dependingly supporting the tray from above for unrestrained free vibratory and undulatory flexing movement,

laterally extended header means positioned above said upper tray end, connected to receive the slurry and deliver it in a thin laterally extended stream substantially evenly distributed across the upper tray end, forming a shallow slurry layer confined by the upturned flanges of the tray and flowing along its downwardly slanted elongated length,

transducer means securely mounted on the underside of the tray to induce vibrations in the slurry at a frequency between about 10 kHz and about 50 kHz,



a generator operatively connected to energize said transducer means upon command,

and conduit means positioned to receive the flowing slurry exiting from the tray at its lower end and to deliver it to separator means for further processing,

whereby the shallow flowing slurry is exposed to vibratory energy produced by the transducer means during its flowing passage along the vibrator tray.

4,919,808

SEMIPERMEABLE MEMBRANE COMPOSITIONS

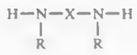
Raymond J. Swedo, Mt. Prospect, and Joseph J. Zupancic, Bensenville, both of Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Oct. 21, 1985, Ser. No. 789,682

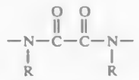
Int. Cl.[5] B01J *13/00*

U.S. Cl. 210—490 **27 Claims**

1. A semipermeable membrane composition comprising a porous support backing material having composited thereon an interfacial polymerized condensation reaction product resulting from the reaction of a hydrazine compound and an aromatic polycarboxylic acid chloride, said hydrazine compound being defined by the formula



where X may be a bond between the nitrogen atoms or defined by the formula



where R is selected from the group consisting of hydrogen, alkyl radicals having from 1 to 10 carbon atoms, aralkyl, alkaryl and cycloalkyl radicals.

4,919,809

HOLLOW FIBER MEMBRANE

Takuya Yamamoto; Fumiyoshi Fushimi, and Jyoji Nishikido, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 18, 1989, Ser. No. 381,253

Claims priority, application Japan, Jul. 20, 1988, 63-179153; Oct. 14, 1988, 63-257080; Mar. 17, 1989, 61-63880; Jun. 6, 1989, 142222; Jun. 9, 1989, 145145; Jun. 13, 1989, 148306

Int. Cl.[5] B01D *13/01*

U.S. Cl. 210—500.23 **6 Claims**

1. A regenerated cellulose hollow fiber membrane comprising a hollow portion continuously penetrating in the direction of the fiber axis, having properties of a wet porosity of 60 to 95%, and an albumin sieving coefficient not larger than 0.15 at hemofiltration, said properties being sufficient for providing properties for the diffusion removal of substances ranging from low molecular weight substances to high-molecular weight substances.

4,919,810

POROUS MEMBRANE

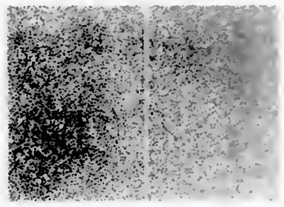
Hajime Itoh, Hiroshima; Hiroshi Takahashi, Otake; Kouji Ohbori, Otake, and Hideaki Habara, Otaka, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed May 28, 1987, Ser. No. 54,894

Claims priority, application Japan, May 30, 1986, 61-126543

Int. Cl.[5] B01D *13/04*

U.S. Cl. 210—500.34 **9 Claims**



1. A porous membrane having a surface pore density greater than 20% per unit of membrane area to enhance fluid permeability, consisting of a acrylic ester polymer or a polymer blend containing a acrylic ester polymer, wherein:

(a) said membrane has a first major surface which consists of pores extending in a direction substantially perpendicular to said membrane first major surface and are present at a surface pore density of 35 to 75%, said pores having an average pore diameter within the range of 0.01 to 10 micrometers, a ratio of major to minor axes within the range of 1.0 to 2.0, a coefficient of variation of pore diameters within the range of 0 to 50%;

(b) said membrane has another major surface which consists of a void layer which comprises voids having a diameter larger than that of said pores; and

(c) wherein the overall porosity of said porous membrane is within the range of 50 to 80%.

4,919,811

AFFINITY MEMBRANES HAVING PENDANT HYDROXY GROUPS AND PROCESSES FOR THE PREPARATION AND USE THEREOF

James C. Davis, Hudson, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 14, 1988, Ser. No. 144,312

Int. Cl.[5] B01D *13/00*

U.S. Cl. 210—500.36 **6 Claims**

1. A polymeric affinity membrane comprising:

a structure for binding a preselected biological material consisting essentially of a hydrophilic precursor filtration membrane comprising a water-insoluble polymer matrix and a matrix-compatible copolymer; and

a plurality of reaction sites provided on the surface of said membrane selective to bind a specific biological material, said reaction sites being selected from the group consisting of organic adducts synthesized from hydroxyl groups supplied by said matrix-compatible copolymer.

4,919,812

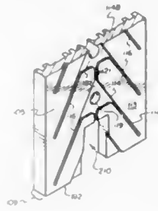
CLARIFIER ASSEMBLY

Alan R. Lasson, Salt Lake City, Utah, assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Sep. 28, 1988, Ser. No. 250,441

Int. Cl.[5] B01D *43/00*

U.S. Cl. 210—519 **25 Claims**



1. A clarifier separator for use in a vessel having an inlet and an outlet for receiving a stream of mixture containing a carrier fluid and solids suspended therein, said vessel defining a flow path between said inlet and said outlet, said clarifier separator comprising:

a pair of supports positioned upright and spaced apart from each other, at least one of said supports having a plurality of generally inverted "V"-shaped recesses defined within an exterior surface and along a height of said support, each said recess including a bottom and two sidewalls, one of said supports having a pair of spacedly positioned, elongate flange-like members mounted thereon defining an elongate, open-ended channel therebetween which extends along a height of said support, said channel fitted support defining a plurality of openings therein;

a plurality of lengthwise elongate carrier chambers, each of said carrier chambers having a sidewall and two opposing open ends, said sidewall defining a hollow interior channel and at least one orifice which communicates with said hollow interior channel, each said carrier chamber having a generally inverted "V"-shaped flow-directing member, said interior channel being defined proximate an apex region of said "V"shaped flow-directing member, each said flow-directing member having wing members which extend outwardly from said interior channel, each said carrier chamber being mounted to each said support thereby extending between said supports, at least one of said ends of each chamber including an end of each of its said wing members being positioned within a respective said recess, each said support opening communicating with a said interior channel of a said carrier chamber;

a plurality of projecting tubular extensions, each of said extensions being sealedly mounted on said channel fitted support circumscribing a respective support opening and extending outwardly into said open-ended channel to form a solid walled conduit communicating with a respective support opening; and

an elongate strip having a plurality of apertures therein, said strip being positioned within said open-ended channel of said support, each said aperture of said strip being positioned to register with a respective opening of said channel fitted support, wherein said tubular extensions are positioned between said strip and said channel fitted sup-

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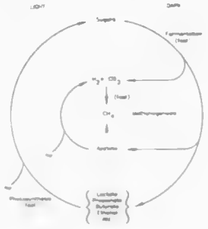
port to form a sealed solid-walled conduit between each such support opening and a respective strip aperture.

4,919,813

PHOTOENHANCED ANAEROBIC DIGESTION OF ORGANIC ACIDS

Paul F. Weaver, Golden, Colo., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Aug. 25, 1989, Ser. No. 398,604
Int. Cl.[5] C02F *3/28*
U.S. Cl. 210—603 **19 Claims**



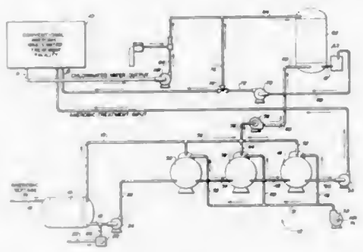
1. A method for converting organic acids or alcohols to hydrogen and carbon dioxide under anaerobic conditions in an aqueous medium comprising the steps of:
(a) adding to said medium photosynthetic bacteria; and
(b) exposing said bacteria to radiant energy for a time sufficient to cause said bacteria to convert said acids or alcohols to hydrogen and carbon dioxide.

4,919,814

SYSTEM AND METHOD FOR TREATING WASTEWATER COLLECTED FROM SEPTIC TANKS AND SIMILAR INSTALLATION

Robert P. Carnahan, and Robert J. Murphy, both of Temple Terrace, Fla., assignors to Hydro Systems, Inc., Tampa, Fla.

Filed Apr. 13, 1989, Ser. No. 337,264
Int. Cl.[5] B01D *3/30*
U.S. Cl. 210—603 **13 Claims**



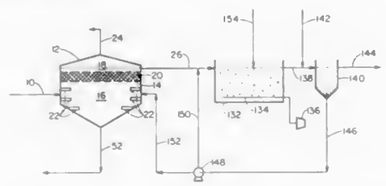
1. A method for treating anaerobic wastewater collected from septic tanks for rendering the anaerobic wastewater suitable for input into a conventional aerobic wastewater treatment facility, the method comprising the steps of:
placing the anaerobic wastewater into a reactor tank;
treating the anaerobic wastewater with an oxygen-containing fluid while in the reactor tank so as to substantially increase the dissolved oxygen content in the wastewater and thereby render the wastewater aerobic;
drawing off volatile gases from the reactor tank and placing the gases in a treatment tank;
treating the volatile gases to reduce the bacterial and odor level; and
pumping the converted aerobic wastewater into the head end of an aerobic wastewater treatment facility.

4,919,815

TWO-STAGE ANAEROBIC/AEROBIC TREATMENT PROCESS

William M. Copa, Wausau, and Thomas J. Vollstedt, Schofield, both of Wis., assignors to Zimpro/Passavant Inc., Rothschild, Wis.

Filed Feb. 6, 1989, Ser. No. 306,195
Int. Cl.[5] C02F *3/30*
U.S. Cl. 210—603 **27 Claims**



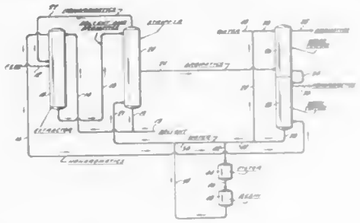
1. A two-stage process for treating wastewater containing a COD of 5,000–50,000 mg/l comprising the steps;
(a) contacting said wastewater with anaerobic biosolids and powdered adsorbent in an anaerobic first treatment zone to form an anaerobic mixed liquor and remove a substantial portion of the COD from said wastewater;
(b) separating a fuel gas from said anaerobic mixed liquor within said first treatment zone;
(c) separating a substantial portion of the anaerobic biosolids and powdered adsorbent from said anaerobic mixed liquor by separating means within said first treatment zone to produce a first solids phase and a first aqueous phase;
(d) transferring said first aqueous phase from said first treatment zone to a second aerobic treatment zone.
(e) aerating and mixing said first aqueous phase with an oxygen-containing gas in said second treatment zone containing aerobic mixed liquor solids, composed of aerobic biosolids and powdered adsorbent, to remove a substantial portion of the remaining COD from said first aqueous phase;
(f) separating said aerobic mixed liquor solids from said thus-treated liquid to produce a second settled solids phase and a second aqueous phase;
(g) discharging said second aqueous phase to the environment or to reuse;
(h) transferring a portion of the second settled solids phase from the second treatment zone to the first treatment zone, thereby maintaining the desired concentration of aerobic biosolids and powdered adsorbent within the second treatment zone;
(i) adding sufficient powdered adsorbent to said second treatment zone to compensate for powdered adsorbent transferred to said first treatment zone in step (h); and
(j) removing a sufficient amount of anaerobic mixed liquor from said first treatment zone to control solids concentration therein.

4,919,816

REMOVAL OF ACIDIC IMPURITIES IN PROCESSES FOR SOLVENT EXTRACTION OF AROMATICS FROM NONAROMATICS

Hsiang-Wei Tsao, West Chester, Pa., assignor to Sun Refining and Marketing Company, Philadelphia, Pa.

Filed Jan. 31, 1989, Ser. No. 304,090
Int. Cl.[5] B01D *11/04*; C02F *1/42*
U.S. Cl. 210—638 **4 Claims**



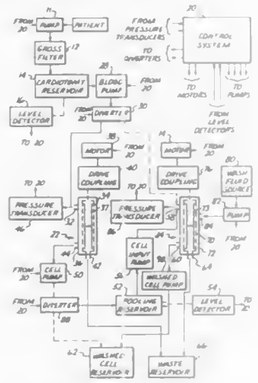
1. In a process wherein aromatics are extracted from nonaromatics by a selective solvent, extracted aromatics are separated from the bulk of the solvent and washed with water in a washing zone to remove residual solvent, and said water is withdrawn from said washing zone, the improvement which comprises reducing corrosion in the system by contacting said water after said withdrawal with an anion exchange resin to remove acidic components.

4,919,817

BLOOD CELL WASHING SYSTEMS AND METHODS

Donald W. Schoendorfer, Santa Ana, and Lee H. Williamson, Huntington Beach, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 895,505, Aug. 11, 1986, abandoned. This application Feb. 18, 1988, Ser. No. 159,446
Int. Cl.[5] B01D *13/00*
U.S. Cl. 210—639 **24 Claims**



10. A method of washing shed blood constituents to derive red cell concentrate comprising the steps of:
passing the blood constituents in a Couette flow, having Taylor vortices, longitudinally along a gap area bordered by a filter membrane having a pore size of less than about 1.2 microns;
feeding a wash solution capable of passing through the pores of the filter membrane into the Taylor vortices at a rate which is at least about twice greater than the flow rate of the blood constituents; and
filtering foreign matter of less than about 1.2 microns size together with the wash solution from the blood constituents at downstream portions of said filter membrane.

4,919,818

PROCESS FOR EXTRUDING AND TREATING CLAY FOR IMPROVED FILTRATION

William Alexander, Naperville, Ill., assignor to American Colloid Company, Arlington Heights, Ill.

Division of Ser. No. 7,713, Jan. 28, 1987, Pat. No. 4,847,226. This application Mar. 6, 1989, Ser. No. 319,119
The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.
Int. Cl.[5] B01D *15/00*
U.S. Cl. 210—660 **15 Claims**

1. A method of removing oil-soluble colorant compounds from oil comprising:
extruding clay through one or more die openings;
grinding the extruded clay prior to adding the clay to an aqueous acid solution;
adding the extruded clay to an aqueous acid solution to form a clay slurry;
agitating the clay slurry for a time sufficient and at a temperature sufficient so that the acid interacts with the clay to beneficiate the contaminant filtration characteristics of said clay to form an acid treated clay;
separating the acid treated clay from a majority of the acid solution;
washing the acid treated clay with a suitable acid-diluting liquid to remove most of the acid solution from the clay and form a washed, acid treated clay;
filtering the washed, acid treated clay to remove a portion of the diluting liquid from the clay;
drying the acid treated clay to a liquid content less than about 20% by weight;
adding the extruded, acid treated clay to oil containing oil soluble colorant compounds for a time sufficient for the clay to absorb some of the colorant compounds from the oil; and
separating the clay from the oil.

4,919,819

METHOD FOR REMOVING AND DECOMPOSING HYDROCARBON COMPOUNDS FROM WATER CONTAMINATED THEREWITH

Marguerite Robinson, Malvern, and Manuel Holcomb, Carlisle, both of Ark., assignors to Gem, Inc., Little Rock, Ark.

Continuation-in-part of Ser. No. 227,192, Aug. 3, 1988, abandoned. This application Feb. 6, 1989, Ser. No. 307,536
Int. Cl.[5] B01D *15/00*; C02F *1/28*
U.S. Cl. 210—662 **18 Claims**

1. A purification process for removing toxic hydrocarbon compounds from waste water, said process comprising the steps of:
(a) creating s slurry mixture from rehydratable alumina and a predetermined quantity of said waste water causing said hydrocarbon compounds to be adsorbed on the surface of said alumina;
(b) after adsorption, filtering the slurry mixture of step (a) to yield treated water and contaminated alumina;
(c) monitoring the quality of said treated water;
(d) subjecting said contaminated alumina to a high-temperature oven to recover recyclable alumina while concurrently separating and substantially incinerating waste gases;
(e) scrubbing all waste gases remaining after said step (d);
(f) when said water monitored in accordance with step (c) achieves a desired predetermined purity, returning said recyclable alumina of step (d) for slurrying in accordance with step (a); and,

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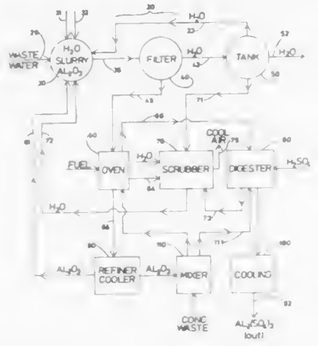
(g) when water monitored in accordance with step (c) fails to achieve said desired predetermined purity, digesting the alumina outputted by step (d) to yield a disposable aluminum compound.

17. A process for converting concentrated contaminated toxic hydrocarbon compounds which have been separated from a watse phase by other extractive methods to non-hazardous waste, said process comprising the steps of:



(a) mixing a predetermined quantity of said contaminated hydrocarbon compounds with rehydratable alumina in a mixer;

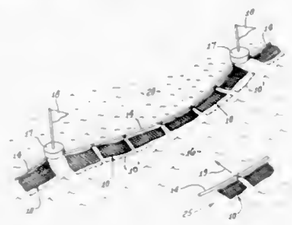
(b) chemically treating the mixture produced by step (a) in a high temperature and pressure digester wherein the hydrocarbon compounds are decomposed and converted to non-toxic compounds in a pressure bath of sulfuric acid at a temperature of 200–400 degrees C., and at a pressure of between 800–1000 PSI.

4,919,820

OIL ABSORPTION METHOD

William T. Lafay, 2629 Manhattan Ave., Hermosa Beach, Calif. 90254, and William F. Meistrell, 669 Seventeenth St., Manhattan Beach, Calif. 90266

Filed Apr. 17, 1989, Ser. No. 339,259
Int. Cl.[5] C02F *1/28*; E02B *15/04*
U.S. Cl. 210—671 **3 Claims**



1. The method of removing oil from a body of water that includes:

(a) providing multiple flexible mesh containers, and filling duck feathers into each container, the mesh size of the container being about 3/16 inch, the duck feathers packed against the mesh at the inside of the container, and interconnecting said containers in series and connecting float means to the series of containers, in series therewith,

(b) introducing the feather filled mesh containers into the water body for deployment into contact with the oil near or at the surface of the water body, and advancing the series of containers as a front, toward and into an oil slick on the body of water,

(c) allowing absorption of the oil through the mesh into the feathers in each container,

(d) removing each container from the body of water, for disposition of the absorbed oil,

(e) and including squeezing each container and feathers therein to separate oil from the feathers, and collecting the separated oil,

(f) and including reusing said feather-filled containers from which oil has been squeezed, by reintroducing the series of containers into oil at or near the surface of the water body for oil absorption by the feathers, and again removing the containers from the body of water for disposition of the absorbed oil,

(g) each container provided to be between 12 and 24 inches long, and between 24 and 40 inches wide.

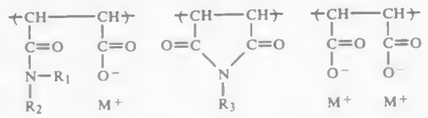
4,919,821

MODIFIED MALEIC ANHYDRIDE POLYMERS AND THE LIKE FOR USE AS SCALE INHIBITORS

Dodd W. Fong; John E. Hoots; Donald A. Johnson, all of Naperville, and James Kneller, LaGrange Park, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Division of Ser. No. 934,598, Nov. 25, 1986, Pat. No. 4,801,388, which is a continuation-in-part of Ser. No. 842,568, Mar. 21, 1986, abandoned. This application Aug. 31, 1988, Ser. No. 239,137
Int. Cl.[5] C02F *5/12*
U.S. Cl. 210—698 **6 Claims**

1. A method of controlling scale deposits by adding to waters having a tendency to form scale, a scale-inhibitorily effective amount of a derivatized maleic anhydride polymer having N-substituted maleamic units, N-substituted maleimide units and maleic acid (and salts) units, said units having respectively structures as follows:



wherein R_1, R_2 and R_3 are each independently chosen from the group consisting of hydrogen, sulfonic acid substituted phenyl, and linear or branched sulfonic acid substituted alkyl of from one to ten carbon atoms and combinations thereof, wherein at least one of R_1, R_2 and R_3 is sulfophenyl or sulfoalkyl, and wherein M^+ is H^+, alkali metal ion, alkaline earth metal ion, ammonium ion or zinc ion, and wherein the total moles of N-substituted maleamic units, N-substituted maleimide units and maleic acid (and salts) units in said derivatized maleic anhydride polymer is n, wherein n is a number in the range of from 10 to about 1200,

wherein the total moles of said N-substituted maleamic units in said derivatized maleic anhydrided polymer is xn, wherein x is a number from about 0.5 to about 0.95 and n is as defined above;

wherein the total moles of said N-substituted maleimide units in said derivatized maleic anhydride polymer is yn, wherein y is a number from about 0.05 to about 0.95, and n is as defined above;

wherein the total moles of said maleic acid and salts units in said derivatized maleic anhydride polymer is zn, wherein z is a number from about 0.05 to about 0.95 and n is as defined above; and

wherein $x+y+z=1$.

4,919,822

METHOD OF CONFINING WASTES UNDERGROUND IN A CAVITY LEACHED OUT OF SALT

Alain Boulanger, Levallois-Perret, France, assignor to Geostock S.A.R.L. and ESYS S.A., France

Filed Dec. 12, 1988, Ser. No. 282,798
Claims priority, application France, Dec. 11, 1987, 8717347
Int. Cl.[5] B65G *5/00*
U.S. Cl. 210—747 **10 Claims**

1. A method of geologically confining toxic industrial waste, the method comprising:

using a cavity previously leached from a mass of rock salt, said cavity being initially filled with brine;

incorporating said waste in a pumpable waste-containing mixture of density greater than the density of said brine which is prepared so that setting occurs once said waste is inserted in said cavity;

inserting a predetermined quantity of a buffer liquid into the bottom of said cavity by means of a dip tube positioned in a well so as to establish a communication with a portion of the brine between the ground surface and the bottom of the cavity, the buffer liquid being immiscible both with said brine and with said waste-containing mixture, the density of the buffer liquid lying between the density of said brine and the density of said waste-containing mixture, and the buffer liquid including one or more halogen-containing solvents;

inserting said waste-containing mixture into said cavity by means of said dip tube while the bottom end of said dip tube is maintained within said previously inserted buffer liquid; and

removing said brine at the surface as it is displaced by said waste-containing mixture being inserted into said cavity.

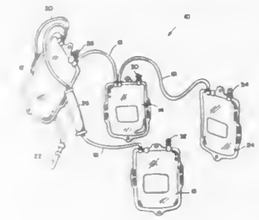
4,919,823

BLOOD BAG SYSTEM WITH INTEGRAL FILTERING MEANS

Leonard A. Wisdom, West Pymble, Australia, assignor to Miles Inc., Elkhart, Ind.

Continuation of Ser. No. 864,229, May 19, 1986, Pat. No. 4,767,541, which is a division of Ser. No. 385,167, Jun. 4, 1982, Pat. No. 4,596,657. This application Jul. 25, 1988, Ser. No. 223,977
The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.
Int. Cl.[5] B01D *21/26*, *36/00*
U.S. Cl. 210—749 **6 Claims**

1. A method for filtering a red cell concentrate in a closed multiple blood bag system consisting of at least two blood bags and an intermediate filtering means, the method comprising the steps of providing a first blood bag having in closed sealed flow communication therewith an integral filtering means, the blood bag containing an aqueous solution which can be passed through the filtering means into a second bag containing a red cell concentrate, contacting the filtering means with the aqueous solution by passing it from the first bag to the second bag prior to filtration of the red cell concentrate and then passing the red cell concentrate and the solution through the filtering means by gravity.

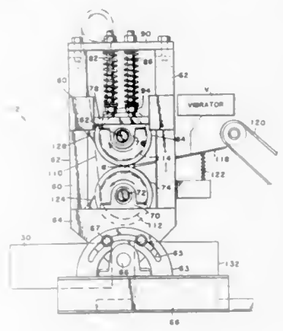


4,919,824

ROLLER/SQUEEZSER DELIQUIFIER

John L. Creps, Rudolph, and Matthew O. Kelley, Findlay, both of Ohio, assignors to Henry Filters, Inc., Bowling Green, Ohio

Filed Jun. 29, 1988, Ser. No. 213,226
Int. Cl.[5] B30B *9/20*
U.S. Cl. 210—770 **21 Claims**



1. A method for deliquifying machine tool swarf having liquid entrained therewith comprising the steps of:

passing the swarf into the nip of a pair of rollers;

said rollers having centers disposed along a vertical axis;

pressing at least one roller toward the other roller along the vertical axis to exert pressure on the swarf entering the nip;

pulling the swarf through the nip of the roller such that the rollers squeeze the swarf separating the swarf from the liquid entrained therein thereby producing deliquified swarf;

removing the deliquified swarf passed through the nip from the rollers;

collecting the deliquified swarf; and

collecting the liquid.

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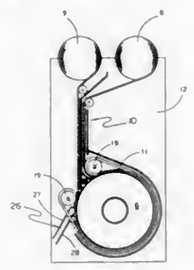
4,919,825

FILTER APPARATUS AND METHOD FOR SEPARATING CONTAMINANTS FROM LIQUIDS

Frank M. Croket, Jefferson County, Ky., assignor to Hallco Fabricators, Inc., Louisville, Ky.

Filed Mar. 20, 1989, Ser. No. 325,867
Int. Cl.[5] B01D *33/02, 33/12*
U.S. Cl. 210—783 23 Claims



17. A method of separating contaminants from liquids comprising:

passing said contaminated liquids through a flow-through liquid treating zone having a perforated filter media support journaled for rotation and at least partially disposed and submerged therein;

passing and guiding filter media by means including a longitudinally extending guide assembly to enter into said liquid treating zone around and in optimum contact with the greater portion of said perforated support, and then exit from said liquid treating zone with the filter media engaging and leaving said perforated support in guided proximate, closely spaced substantially parallel, vertical planes;

sealing any unsubmerged portion of said perforated support and that portion not contacted by the guided filter media from fluid passage therethrough; and,

pumping filtered liquid from said submerged filtering zone to a preselected location remote from said liquid treating zone.

4,919,826

PROCESS AND APPARATUS FOR SEPARATING SOLIDS AND LIQUIDS FROM AN EFFLUENT STREAM

Edgar Alzner, Gardeo City, N.Y., assignor to Air Techniques, Incorporated, Hicksville, N.Y.

Filed Dec. 20, 1988, Ser. No. 287,987
Int. Cl.[5] A61C *17/04;* **B01B** *49/12;* **B01D** *21/00*
U.S. Cl. 210—788 11 Claims

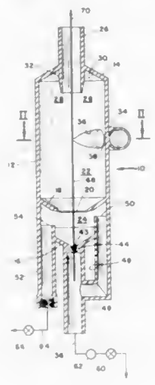
9. A process for separating a multi-component stream comprising water, gases, lighter than water particles and heavier than water particles, which comprises:

introducing said multi-component stream into a cylindrically-shaped gas-liquid separation zone to form a gaseous stream and a liquid stream including particles;

introducing said liquid stream including particles into a liquid-liquid separation zone including a pool of liquid disposed below said gas-liquid separation zone and separated therefrom by an intermediate plate member extending into said zone;

withdrawing a liquid stream including lighter than water particles overflowing said pool of liquid and shielded by said intermediate plate member;

withdrawing a liquid stream which is relatively free of particles from an intermediate of said pool of liquid and shielded by said intermediate plate member; withdrawing a liquid stream including heavier than water particles from a lower portion of said pool of liquid; and



controlling flow of liquid from said liquid-liquid separation zone to establish said pool of liquid.

4,919,827

MULTICOMPONENT ORGANIC LIQUID AND USE THEREOF IN TREATING WELLS AND SUBTERRANEAN FORMATIONS

Susan D. Harms, Houston, Tex., assignor to Amoco Corporation, Chicago, Ill.

Filed May 5, 1988, Ser. No. 187,637
Int. Cl.[5] E21B *43/27*
U.S. Cl. 252—8.553 25 Claims

16. A high flash point multicomponent liquid consisting of ethylene glycol monobutyl ether, hereinafter referred to as EGMBE, and octyl alcohol in an amount in the range of about 5 to about 20 percent by weight of the multicomponent liquid, optionally in a mixture of C_6–C_{10} alcohols, and isopropyl alcohol up to about 10 weight percent based on the total weight of said multicomponent liquid, and an organic liquid selected from the group consisting of benzene, toluene, xylene, and alkylated naphtha dissolved in kerosene, in proportions effective for having a flash point of at least about 100° F. and for forming a substantially clear single phase solution with aqueous acid comprising 5–30% by weight of acid selected from the group consisting of hydrochloric acid, formic acid, acetic acid, and hydrofluoric acid, said multicomponent liquid being substantially free of surfactant.

4,919,828

FIBER LUBRICANTS CONTAINING HIGH MOLECULAR WEIGHT POLYACRYLAMIDO ALKANE SULFONIC ACID ADDITIVES

John Childers, Monroe, N.C., assignor to Henkel Corporation, Ambler, Pa.

Continuation of Ser. No. 115,234, Oct. 30, 1987, abandoned. This application Apr. 10, 1989, Ser. No. 336,589
Int. Cl.[5] D06M *15/00*
U.S. Cl. 252—8.75 22 Claims

1. A fiber lubricant consisting essentially of a low-friction lubricating component and an acrylamido-C_1–C_6-alkane sulfonic acid polymer or salt thereof having an average molecular weight of at least about 500,000.

4,919,829

ALUMINUM HYDROXIDES AS SOLID LUBRICANTS

Richard S. Gates, Germantown, and Stephen M. Hsu, Gaithersburg, both of Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Dec. 30, 1988, Ser. No. 292,176
Int. Cl.[5] C10M *173/02, 103/06*
U.S. Cl. 252—25 21 Claims

1. A lubricant for lubricating aluminum oxide layers, aluminum containing materials, ceramics and other oxide materials consisting essentially of one member selected from the group consisting of aluminum oxide hydroxides and aluminum trihydroxides dispersed in water and present in a concentration of up to about two percent by weight.

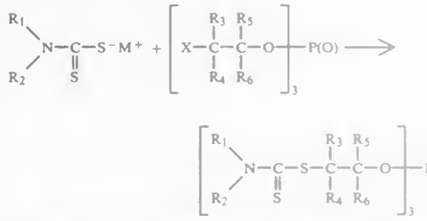
4,919,830

DITHIOCARBAMATE-DERIVED PHOSPHATES AS ANTIOXIDANT/ANTIWEAR MULTIFUNCTIONAL ADDITIVES

Liehpao O. Farng, Lawrenceville, and Andrew G. Horodysky, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1988, Ser. No. 292,064
Int. Cl.[5] C10M *137/04*
U.S. Cl. 252—327 E 33 Claims

1. A N,N-dihydrocarbyl dithiocarbamate-derived organic phosphate product of reaction prepared as in the following generalized equation:



where R_1 and R_2 are each individually hydrogen or C_1 to about C_{60} hydrocarbyl, R_3, R_4, R_5 and R_6 are each individually hydrogen or C_1 to about C_{30} hydrocarbyl and each of said R_1, R_2, R_3, R_4, R_5 and R_6 can optionally contain sulfur, nitrogen and/or oxygen; M^+ represents the cationic moiety of the dithiocarbamate salt and X is halide selected from chloride, bromide or iodide.

4,919,831

MULTIFUNCTIONAL ESTER-TYPE ADDITIVES

Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 11, Jan. 2, 1987, abandoned. This application Sep. 30, 1988, Ser. No. 253,306
Int. Cl.[5] C10M *135/12*
U.S. Cl. 252—47.5 11 Claims

1. A composition comprising an oil of lubricating viscosity or grease prepared therefrom and a minor dispersant/detergent and/or antioxidant amount of an additive consisting of a polymeric, oligomeric or hydrocarbyl ester containing integral sulfur-ester moieties prepared by reacting (1) a polycarboxylate ester made by the reaction of a C_{20} to about a C_{200} alkyl succinic anhydride or acid and a polyol having from about 6 to about 30 carbon atoms and from about 3 to about 6 hydroxyl groups, and containing at least one free hydroxyl group and having at least about 30 carbon atoms and (2) a sulfur-containing carboxylic acid or carboxylic acid generating species selected from the group consisting of thiodipropionic acid, dithiopropionic acid, thiodibutanoic acid, anhydrides thereof or mixtures thereof in a polymeric, oligomeric or hydrocarbyl ester to sulfur species molar ratio of from about 1:1 to about 1:0.001 at temperatures of from about 80° to about 200° C.

4,919,832

N-SUBSTITUTED TETRAHYDROQUINOLINES FOR USE AS ANTIOXIDANTS IN LUBRICANTS

Hans R. Meier, and Samuel Evans, both of Marly, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

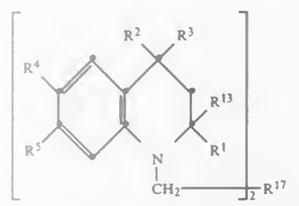
Division of Ser. No. 135,964, Dec. 21, 1987, Pat. No. 4,828,741. This application Feb. 2, 1989, Ser. No. 305,037
Int. Cl.[5] C10M *133/40*
U.S. Cl. 252—50 3 Claims

1. A composition which comprises

(a) at least one lubricant, hydraulic oil or metal-working fluid based on mineral oil or synthetic oil, and

(b) 0.05–5% by weight, based on the total weight of the lubricant, hydraulic oil or metal-working fluid composition, of at least one compound of formula V

(V)



in which R^1 and R^2 are independently of each other C_1–C_8-alkyl, unsubstituted or C_1–C_{12}-alkyl-, Cl-, Br-, I-, NO_2-, OH- or C_1–C_{12}-alkoxy-substituted phenyl or naphthyl, or benzyl, R^3 is hydrogen or methyl, R^4 and R^5 are independently of each other hydrogen, methyl, methoxy, -Cl or -NO_2, R^{13} is hydrogen or methyl, and R^{17} is $-C_xH_{2x}-$, where x is 0 to 10, or R^{17} is —CH=CH—.

4,919,833

FUNCTIONAL FLUIDS

Peter Miles, Stockport, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 9, 1988, Ser. No. 192,054
Claims priority, application United Kingdom, May 21, 1987, 8712091; Feb. 17, 1988, 8803645
Int. Cl.[5] C10M *105/56, 125/20, 133/02*
U.S. Cl. 252—77 7 Claims

1. A functional fluid comprising:

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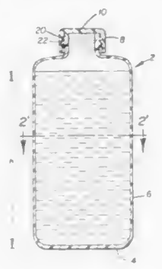
(a) a base fluid selected from one or more of (i) a phosphate fluid and (ii) a carboxylic acid ester; and
(b) as hydrolytic stabiliser phenylurea.

4,919,834
PACKAGE FOR CONTROLLING THE STABILITY OF A LIQUID NONAQUEOUS DETERGENT

Loren Chen, Pleasanton; Gregory van Buskirk, Danville; David Peterson, Pleasanton, and Robert J. Iliff, Oakley, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Sep. 28, 1988, Ser. No. 251,646
The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.
Int. Cl.[5] C11D *1/66, 3/34, 17/04, 17/08*
U.S. Cl. 252—90 **8 Claims**



1. A package for a phase stable, liquid nonaqueous detergent composition, comprising:
a plastic, relatively thin-walled container, said container having an end wall and a circumscribing side wall which narrows to a finish, and a liquid detergent composition contained in said container, said detergent composition comprising:
(a) 20–90% of a liquid portion which comprises an alkoxylated nonionic surfactant;
(b) 5–50% of a solids portion which comprises:
(i) a builder;
(ii) 0–20% of an oxidant; said solids being stably suspended in said liquid portion, by means of
(c) 0.5–20% of a sulfonated, lower alkylated condensed ring aryl compound; and
(d) 0–5% of a hydrolytic enzyme;
whereby the phase stability of said liquid detergent composition in storage in said container is controlled, by the selection of either:
(1) said container being constructed of a homopolymeric resin, said container having a minimum average cross-sectional dimension r/2 of at least about 6.8 millimeters in order to minimize interaction with said plastic;
(2) said container being constructed of a heteroatom-containing polymer; or
(3) a combination thereof.

4,919,835
POWDER-COATED LAUNDRY DETERGENT SHEET

Wayne C. Sigl, Neenah, and Frank C. Murray, Appleton, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 3, 1988, Ser. No. 189,934
Int. Cl.[5] C11D *11/00, 17/00, 17/02, 17/06*
U.S. Cl. 252—91 **17 Claims**

1. A cleaning product comprising a nonwoven web containing at least 1 gram of active liquid detergent solids per gram of untreated base web, said active liquid detergent solids being selected from the group consisting of anionic, nonionic, cationic, and amphoteric surfactants, and said nonwoven web having a surface coating of at least one dry powdered detergent ingredient selected from the group consisting of sodium citrate, a salt of ethylenediaminetetraacetic acid, and carboxymethyl cellulose.

4,919,836
PROCESS FOR THE PREPARATION OF DIPEROXYDODECANEDIOIC ACID-CONTAINING AGGLOMERATES AND COMPOSITIONS IN WHICH THESE AGGLOMERATES ARE USED AS BLEACHING COMPONENT

John Meijer, Deventer; Reinder Torenbeek, Terwolde, and Rolf H. van den Berg, Kring Van Dorth, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Continuation of Ser. No. 51,752, May 20, 1987, Pat. No. 4,818,425. This application Nov. 10, 1988, Ser. No. 269,595
Claims priority, application Netherlands, May 28, 1986, 8601361; Jan. 19, 1987, 8700107
Int. Cl.[5] C11D *3/395;* **C01B** *15/00;* **C07C** *179/10*
U.S. Cl. 252—94 **15 Claims**

1. Shaped particles containing agglomerates obtained by the successive steps of agitating an aqueous suspension of 1,12-diperoxydodecanedioic acid in the presence of a water-impermeable material which is solid at room temperature in an amount of at least 25% by weight and at most 100% by weight, calculated on the acid, for a time sufficient to agglomerate the suspended acid particles and at a temperature above the melting point of the water-impermeable material and below the decomposition temperature of the acid, cooling with continued agitation of the suspension of the agglomerated particles thus obtained to a temperature at which the water-impermeable material turns solid, and isolating the resulting agglomerates and a hydratable material which is non-alkaline in aqueous solution.

4,919,837
ANTISEPTIC CLEANSING COMPOSITION COMPRISING A WATER-SOLUBLE SALT OF CHLORHEXIDINE

Bruno A. Gluck, 20 King Avenue, Balgowlah, New South Wales 2093, Australia

PCT No. PCT/AU85/00238, § 371 Date May 23, 1986, § 102(e) Date May 23, 1986, PCT Pub. No. WO86/02090, PCT Pub. Date Apr. 10, 1986
PCT Filed Sep. 24, 1985, Ser. No. 876,876
Claims priority, application Australia, Sep. 26, 1984, PG7325
Int. Cl.[5] C11D *1/72*
U.S. Cl. 252—106 **13 Claims**

1. An antibacterial composition comprising a water-soluble salt of chlorhexidine, a nonionic surfactant and an inert diluent or carrier wherein the nonionic surfactant is at least one compound having the formula

$$R—O—(—CH_2CH_2O—)_nH$$

wherein R is the residue of an alkylphenol or a fatty alcohol and n is a number sufficiently high to assure water solubility between ambient temperatures and 45° C., the chlorhexidine salt being present at a concentration of from 0.1 to 10.0% w/v and the nonionic surfactant being present at a concentration of not greater than 25% w/v wherein the weight ratio of the chlorhexidine salt to the nonionic surfactant is not more than 1:7, and the composition does not contain a polyoxyethylene-polyoxypropylene condensate or an amphoteric surfactant.

4,919,838
BAR SHAMPOO AND SKIN SOAP

Hubert M. Tibbetts, 137 Pecksland Rd., Greenwich, Conn. 06830, and Mukat Gupta, South Burlington, Vt., assignors to Hubert M. Tibbetts, Greenwich, Conn.

Filed Sep. 30, 1988, Ser. No. 252,167
Int. Cl.[5] C11D *9/00, 15/00;* **A61K** *7/06*
U.S. Cl. 252—117 **28 Claims**

1. A composition suitable for molding into a solid product useful both as a shampoo for the hair or scalp and as a cleansing agent for the skin or body comprising:
(A) from about 70% to about 90% by weight of the composition of a soap base selected from a natural soap base or a mixture of a natural soap base and a synthetic detergent soap base wherein the synthetic detergent soap base may be present in an amount up to about 60% by weight based on the combined weight of the natural and synthetic detergent soap bases, and
(B) from about 5 to about 25% by weight of the composition of:
(1) a compound selected from the group consisting of disodium lauryl sulfosuccinate, sodium cocyl isethionate or sodium lauryl sulfate, and
(2) a compound selected from the group consisting of cocoamide monoethanolamide, cocoamide diethanolamide or lauramide diethanolamide,
wherein the weight ratio of the compounds from Components (1) and (2) in the composition is about 3:2.

4,919,839
LIGHT DUTY MICROEMULSION LIQUID DETERGENT COMPOSITION CONTAINING AN ANIOCIC/CATIONIC COMPLEX

Patrick Durbut, Verviers, Belgium; Ammannel Mehreteab, Piscataway, N.J.; Myriam Moadin, Seraing, and Guy Broze, Grace-Hollogne, both of Belgium, assignors to Colgate Palmolive Co., Piscataway, N.J.

Filed Feb. 21, 1989, Ser. No. 313,664
Int. Cl.[5] C11D *1/65, 3/43, 17/08, 11/00*
U.S. Cl. 252—153 **6 Claims**

1. A light duty microemulsion liquid detergent composition which is useful for removal of greasy soils from substrates, both in neat form and when diluted with water, which comprises 1 to 10% of a complex of sodium C_{12-18} alkyl diethoxy ether sulfate and C_{12-14} alkyl-bis(2-hydroxyethyl) methylammonium halide, in which such anionic and cationic surfactants are in essentially equivalent proportions, 20 to 40% of an anionic detergent, which is a mixture of sodium C_{12-18} paraffin sulfonate and sodium C_{12-18} alkyl diethoxy ether sulfate, in which the proportion of such paraffin sulfonate to such alkyl diethoxy ether sulfate is in the range of 2:1 to 4:1, 1 to 5% of a co-solvent which is dipropylene glycol monomethyl ether, 1 to 5% of an organic solvent which is a C_{10-12} isoparaffin, and 30 to 70% of water, in which composition the ratio of anionic detergent to complex is in the range of 2:1 to 25:1.

4,919,840
UNCLOUDED METALS PASSIVATION ADDITIVE

Ernest B. Boston, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 151,356, Feb. 2, 1988, Pat. No. 4,830,730. This application Feb. 16, 1989, Ser. No. 311,487
Int. Cl.[5] C10G *11/00*
U.S. Cl. 252—182.3 **29 Claims**

1. A composition comprising an antimony hydroxyhydrocarbylthiolate and a compound of the formula $NR_1R_2R_3$ where R_1, R_2 and R_3 may be the same or different and are selected from the group consisting of hydrogen, alcohol, alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, aralkyl and alkenylaryl.

16. A process for making a metals passivation additive which comprises reacting an antimony oxide with a hydroxyhydrocarbylthiol in the presence of a compound of the formula $NR_1R_2R_3$ where R_1, R_2 and R_3 may be the same or different and are selected from the group consisting of hydrogen, alcohol, alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, aralkyl and alkenylaryl.

4,919,841
WAX ENCAPSULATED ACTIVES AND EMULSION PROCESS FOR THEIR PRODUCTION

Ahmed Kamel, Valley Cottage, N.Y.; Lisa C. Hurckes, Short Hills, and Monica M. Morelli, North Arlington, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Jun. 6, 1988, Ser. No. 202,853
Int. Cl.[5] B01J *13/02;* **C07D** *251/00;* **B32B** *27/14;* **C01B** *15/00*
U.S. Cl. 252—186.26 **9 Claims**

1. A process for preparing particles of encapsulated active material comprising:
(i) selecting a mixture of waxes wherein one wax of said mixture has a melting point different from another of said waxes, said mixture having a melting point between 50°–80° C., and melting said mixture to obtain a melted wax;
(ii) dispersing said active material in said melted wax to form an active material/wax dispersion, said active material being selected from the group consisting of chlorine or oxygen bleaching agents and bleach precursors;
(iii) adding said dispersion to water containing at least one surfactant and emulsifying the active material/wax dispersion for no longer than 4 minutes therein to form capsules;
(iv) cooling immediately thereafter said capsules;
(v) retrieving said cooled capsules from said water; and
(vi) annealing said retrieved capsules for a period between 4 and 24 hours.

4,919,842
CHEMICAL FOR BLEACHING TEXTILES

Glen A. Dickson, and Donnie R. Gray, both of P.O. Box 18006, Dilley, Tex. 78017

Division of Ser. No. 117,664, Nov. 5, 1987. This application Feb. 1, 1989, Ser. No. 269,890
Int. Cl.[5] D06L *3/00*
U.S. Cl. 252—186.43 **6 Claims**

1. A method for preparing a powdered bleaching composition for fading a dyed denim fabric comprising the steps of:
first mixing a first batch by combining a first diatomaceous earth powder carrier and a dry potassium permanganate bleaching agent;
second mixing of the first batch with a liquid, wherein the liquid is water, the liquid of said second mixing being added in an amount not greater than the maximum amount that can be added while still maintaining a powder consistency to the first batch; and
third mixing the first batch after all the liquid has been added, said third mixing continued until the liquid is uniformly distributed throughout the first batch.

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4,919,843

ANTIFOAM COMPOSITIONS

Ernst Innertsberger, Burghausen; Jakob Schmidlkofer, Mehring-Öd; Peter Huber, Burghausen; Willibald Burger, Burghausen, and Joachim Schulze, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 22, 1988, Ser. No. 222,866

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725322

Int. Cl.[5] C09K *13/00*

U.S. Cl. 252—358 7 Claims

1. An antifoam composition containing (a) an essentially linear organopolysiloxane, (b) a silicone resin, consisting essentially of traiorganosiloxy and $SiO_{4/2}$ units, and (c) a filler, in which at least part of the essentially linear organopolysiloxane contains SiC-bonded monovalent hydrocarbon radicals, and SiOC-bonded organic radicals selected from the group consisting of radicals containing carbon and hydrogen atoms, radicals containing carbon, hydrogen and at least 2 oxygen atoms per radical and radicals containing carbon, hydrogen and at least 2 oxygen atoms and at least one Si atom, in which the SiOC-bonded organic radicals have at least 6 carbon atoms per radical and (d) up to 10 percent by weight of 2,2,4- trimethyl-1,3diisobutyryloxypentane, based on the weight of the essentially linear organopolysiloxane, the silicone resin and filler.

4,919,844

ENHANCED HEAT TRANSFER REFORMER AND METHOD

Shoou-I Wang, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 16, 1984, Ser. No. 641,819

Int. Cl.[5] C10B *3/36*

U.S. Cl. 252—373 5 Claims

1. A method for reforming hydrocarbons in a plural stage reformation wherein a first reformation of a first reactant stream occurs in a first reforming zone heated by combustion furnace gases and a second reformation of a second reactant stream occurs in a second reforming zone which second reformation comprises the steps of:

(a) introducing said second reactant stream of hydrocarbons and steam at elevated temperature and pressure into said second reforming zone;

(b) passing said second reactant stream through a plurality of reaction tubes while contacting said second reactant stream with reforming catalyst packed in said tubes;

(c) introducing a reformed reaction product at elevated temperature and pressure into said second reforming zone but outside said tubes at a temperature substantially above the temperature of said second reactant stream at the latter's introduction into said second reforming zone;

(d) mixing the reformed reaction product with similar product produced from said second reactant stream passing through said reaction tubes;

(e) heating said second reactant stream to reaction temperature and reforming it in said reaction tubes by heat exchange of said mixed reaction product with said second reactant stream, and

(f) removing a mixed reaction product of reformed fluid from said second reforming zone.

4,919,845

PHOSPHATE-FREE DETERGENT HAVING A REDUCED TENDENCY TOWARDS INCRUSTATION

Guenther Vogt, Toenisvorst; Hans Andree, Leichlingen, and Gertrud Nienhaus, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 195,996, May 19, 1988, abandoned. This application Jul. 7, 1989, Ser. No. 378,447

Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717227

Int. Cl.[5] C11D *3/08, 3/12, 3/30, 3/36*

U.S. Cl. 252—526 10 Claims

1. A detergent composition consisting of:

(a) from about 5 to about 35% by weight of at least one water-soluble surfactant selected from the group consisting of an anionic and a nonionic compound,

(b) from about 10 to about 40% by weight of a finely crystalline synthetic zeolite NaA,

(c) from about 4 to about 20% by weight of a washing alkali selected from the group consisting of an alkali metal silicate and carbonate,

(d) the following compounds in the form of their alkali metal salt; based on free acid,

(d1) from about 0.1 to about 1% by weight of an aminoalkane polyphosphonic acid,

(d2) from about 0.5 to about 5% by weight of a linear polymer or copolymer of acrylic acid or methacrylic acid and maleic acid, and

(e) from about 0.5 to about 1% by weight, based on free acid, of 1-hydroxyethane-1,1-diphosphonate in the form of its alkali metal salt, with the proviso that the ratio by weight of component (d1):(e) is from about 40:1 to about 2:1, all weights being based on the weight of said detergent composition.

4,919,846

DETERGENT COMPOSITION CONTAINING A QUATERNARY AMMONIUM CATIONIC SURFACTANT AND A CARBOXYLATE ANIONIC SURFACTANT

Yasunari Nakama; Fuminori Harusawa; Kyoko Otsubo; Tsunehiko Iwai; Shuya Tamaki, and Masahiro Ohkoshi, all of Yokohama, Japan, assignors to Shiseido Company Ltd., Tokyo, Japan

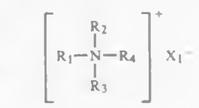
Continuation-in-part of Ser. No. 54,342, May 26, 1987, abandoned. This application Sep. 23, 1988, Ser. No. 249,047

Claims priority, application Japan, May 27, 1986, 61-121962; Sep. 24, 1987, 62-239717; Nov. 19, 1987, 62-292933; Nov. 30, 1987, 62-302791; Nov. 30, 1987, 62-302792

Int. Cl.[5] C11D *1/10, 1/65*

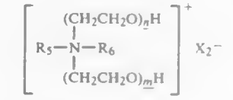
U.S. Cl. 252—542 24 Claims

1. A detergent composition comprising, in an aqueous medium, (i) at least one quaternary ammonium cationic surfactant selected from the group consisting of (a) monoalkyl quaternary ammonium salt cationic surfactants having the formula (I):



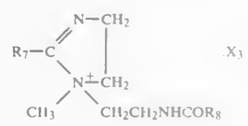
(I)

wherein R_1 represents an alkyl or alkenyl having 12 to 22 carbon atoms, R_2, R_3, and R_4 independently represent methyl or ethyl, and X_1 represents a halogen atom or a methylsulfate residue, (b) ethylene oxide addition quaternary ammonium salt cationic surfactants having the formula (II):



(II)

wherein R_5 represents an alkyl having 16 to 22 carbon atoms, R_6 represents methyl, ethyl, or an alkyl having 16 to 22 carbon atoms, X_2 represents a halogen atom or a methylsulfate or ethylsulfate residue, m and n are independently an integer of at least 1, provided that the sum of m and n is 2 to 30, and (c) imidazoline quaternary ammonium salt cationic surfactants having the formula (III):



(III)

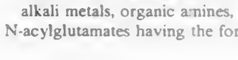
wherein R_7 and R_8 independently represent an alkyl or alkenyl having 12 to 22 carbon atoms, and X_3 represents a halogen atom or a methylsulfate or ethylsulfate residue;

(ii) at least one carboxylate anionic surfactant selected from the group consisting of:

N-acylsarcosinate anionic surfactants having the formula

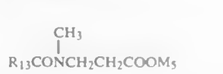
wherein R_{11} represents an alkyl or alkenyl group having 8 to 18 carbon atoms and M_3 represents one or more of alkali metals, organic amines, and basic amino acids,

N-acylglutamates having the formula:



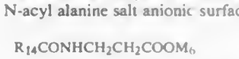
wherein R_{12} represents an alkyl or alkenyl group having 8 to 18 carbon atoms and M_4 independently represents one or more of alkali metals, organic amines, and basic amino acids;

N-acyl-N-methyl-β-alanine salt anionic surfactants having the formula:



wherein R_{13} represents an alkyl or alkenyl group having 8 to 18 carbon atoms and M_5 represents one or more of alkali metals, organic amines, and basic amino acids; and

N-acyl alanine salt anionic surfactant having the formula:



wherein R_{14} represents an alkyl or alkenyl group having 8 to 18 carbon atoms and M_6 represents one or more of alkali metals, organic amines, and basic amino acids; and

(iii) at least one amphoteric surfactant, the mole ratio of the components (i)/(ii) being within the range of from 4/6 to 8/2.

4,919,847

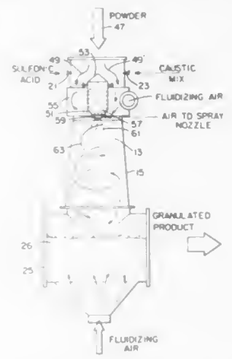
PROCESS FOR MANUFACTURING PARTICULATE DETERGENT COMPOSITION DIRECTLY FROM IN SITU PRODUCED ANIONIC DETERGENT SALT

Gualtiero Barletta, and Antonio Bianchi, both of Rome, Italy, assignors to Colgate Palmolive Co., Piscataway, N.J.

Filed Jun. 3, 1988, Ser. No. 202,773

Int. Cl.[5] C11D *1/22, 11/04, 13/10*

U.S. Cl. 252—558 11 Claims



1. A process for manufacturing a particulate detergent composition which comprises reacting an anionic synthetic organic detergent acid with a neutralizing agent for it in a reaction vessel in sufficient proportion to produce a corresponding neutralized detergent salt in liquid or slurry state, removing the neutralized detergent salt from the reaction vessel in such state and directly transferring it to a walled absorption zone interiorly of a particular carrier for it, so that the carrier helps to prevent contact of the detergent salt liquid or slurry with the surrounding absorption zone walls, and mixing the resulting particulate carrier containing absorbed detergent salt liquid or slurry, to produce a detergent salt-carrier composition in particulate form.

4,919,848

PROCESS FOR THE QUENCHING OF FLUORESCENCE, AND NEW CATIONIC NAPHTHALENE-PERI-DICARBOXYLIC ACID IMIDE DERIVATIVES

Horst Harnisch, Much, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 30, 1986, Ser. No. 913,888

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1985, 3535496

Int. Cl.[5] G03C *1/00*; D06L *3/00*

U.S. Cl. 252—600 5 Claims

1. A process for the quenching of the fluorescence created by anionic optical brighteners said process comprising adding a substrate containing said optical brighteners virtually colorless, water-soluble, cationic compounds, wherein said compounds contain at least one cationic group per molecule and at least two naphthalene-peri-dicarboxylic acid imide groups which are nitro group free per molecule.

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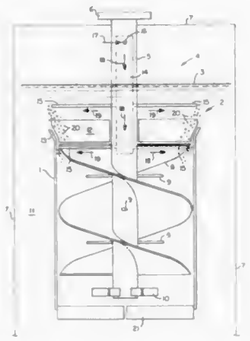
4,919,849

GAS-LIQUID MIXING PROCESS AND APPARATUS

Lawrence M. Litz, Pleasantville, and John J. Santalone, Jr., White Plains, both of N.Y., assignors to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.

Filed Dec. 23, 1988, Ser. No. 289,265
Int. Cl.[5] B01F 3/04
U.S. Cl. 261—36.1 20 Claims



1. A process for mixing a gas and a liquid subject to change in liquid levels during the mixing operation in a mixing vessel having a hollow draft tube with an axial flow, down-pumping impeller means positioned thereon for vortex development and the ingestion of gas from an overhead gas space within the mixing vessel into the body of liquid therein, comprising:

(a) rotating said impeller means to create a recirculation flow pattern within the mixing vessel, with liquid passing downward inside the draft tube and upward in the annular space between said draft tube and the walls of the mixing vessel, so as to develop a vortex and to draw gas from the overhead gas space by gas ingestion at an operating liquid level within the mixing vessel;

(b) continuing to rotate said impeller means to create a recirculation flow pattern within the mixing vessel as the liquid level increases during the gas-liquid mixing operation such that vortex formation and gas ingestion become less favorable than occurs at said particular operating liquid level; and

(c) establishing fluid communication between said overhead gas space and gas ingestion tube means connected to the shaft of said impeller means that extend upward from said hollow draft tube through said overhead gas space, said gas ingestion tube means extending outward into the surrounding liquid, said gas ingestion tube means including a plurality of tubes positioned below the maximum liquid level and at least some of said tubes being positioned above said draft tube within the mixing vessel and having openings at the ends of said tubes facing outwardly away from said shaft, and being positioned such that the pressure reduction in the body of liquid adjacent the openings at the ends of the gas ingestion tube means upon continued rotation of said impeller means exceeds the hydrostatic head of liquid pertaining in the draft tube upon operation at liquid levels above said operating level for gas ingestion by vortex development, so that liquid present in the gas ingestion tube means and in the means for establishing fluid communication with the overhead gas space at the start of the gas-liquid mixing operation are drawn out through the gas ingestion tube means into the body of liquid, with gas from the overhead gas space likewise being drawn into the body of liquid through said fluid communication means and said gas ingestion tube means as said liquid level increases during continuation of said gas-liquid mixing operation, whereby the gas-liquid mixing operation can be effectively combined over a range of liquid levels within the mixing vessel.

9. An apparatus for mixing a gas and a liquid subject to change in liquid levels during the mixing operation comprising:

(a) a mixing vessel having a hollow draft tube with an axial flow, down-pumping impeller means positioned thereon and capable of creating a recirculation flow pattern within the mixing vessel, with liquid being passed downward inside the draft tube and upward in the annular space between the draft tube and the walls of the mixing vessel, thereby developing a vortex and drawing gas from the overhead gas space within the mixing vessel at an operating liquid level within said mixing vessel;

(b) gas ingestion tube means connected to the shaft of said impeller means, said impeller shaft extending upward from said hollow draft tube through said overhead gas space in the mixing vessel, said gas ingestion tube means extending outward into the surrounding liquid in the mixing vessel below the maximum liquid level to be employed in the mixing vessel, and said gas injection tube means including a plurality of tubes positioned below the maximum liquid level and at least some of said tubes being positioned above said draft tube within the mixing vessel and having openings at the ends of said tubes facing outwardly away from said shaft providing for fluid communication with the liquid in said mixing vessel when the liquid level is above the positioning of said gas ingestion tube means, said gas ingestion tube means being positioned such that pressure reduction in the body of liquid adjacent the openings at the ends of the gas ingestion tubes means upon rotation of said impeller means exceeds the hydrostatic head of liquid upon operation at liquid levels above said operating level for gas ingestion by vortex development; and

(c) fluid communication means between said overhead gas space and said gas ingestion tube means, said gas ingestion tube means thereby providing fluid communication between the overhead gas space and the body of liquid at the openings at the ends of said gas ingestion tube means, so that liquid present in the gas ingestion tube means and in the means for establishing fluid communication with the overhead gas space are drawn out through the gas ingestion tube means into the body of liquid, with gas from the overhead space likewise being drawn into the body of liquid through said fluid communication means and said gas ingestion tube means as said liquid level increases during continuation of the gas-liquid mixing operation, whereby the gas-liquid mixing operation can be effectively continued over a range of liquid levels within the mixing vessel.

4,919,850

METHOD FOR CURING PLASTIC LENSES

Ronald D. Blum, 5320 Silver Fox Rd., Roanoke, Va. 24014; Scott Reid, 24 Tanglewood Dr., Irvine, Calif. 92714, and Howard P. Silverman, 140 E. Duarte Rd., Monrovia, Calif. 91016

Filed May 6, 1988, Ser. No. 190,856
Int. Cl.[5] B29D 11/00
U.S. Cl. 264—1.4 24 Claims

1. A method for molding and curing plastic lenses comprising the steps of:

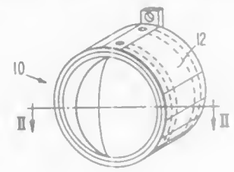
(a) arranging a first mold form and a second mold form in a spaced relationship to form a mold apparatus with a cavity therebetween for receiving lens molding material and for forming a lens of selected configuration, and sealing said first and second mold forms in said spaced relationship, said first and second mold form corresponding to surfaces of a prescription lens;

(b) injecting lens molding material comprising a liquid monomer, a thermal initiator, and a photosensitive initiator into said cavity between said mold forms;

(c) subsequent to said injecting step, heating throughout said mold apparatus sufficiently to activate said thermal initiator to form said lens molding material into a gel;

(d) subsequent to said heating step, subjecting said mold apparatus to ultraviolet light for a period of time sufficient to completely cure said lens molding material within said cavity from a gel into a hardened lens of optical quality, and

(e) subsequent to said step of subjecting said mold apparatus to ultraviolet light, removing said hardened lens from said mold apparatus.



4,919,851

PROCESS FOR PRODUCING AN OPTICAL COUPLER FOR POLYMER OPTICAL WAVEGUIDES

Jochen Coutandin, Bretzenheim; Jürgen Theis; Werner Groh, both of Frankfurt am Main, and Peter Herbrechtsmeier, Königstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 4, 1988, Ser. No. 267,030
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1987, 3737930
Int. Cl.[5] B29D 11/00
U.S. Cl. 264—1.5 6 Claims

1. A process for producing an optical coupler for polymer optical waveguides comprising the steps of unidirectionally arranging and bundling two to 10^5 optical waveguides, placing the optical waveguides within a shrink sleeve of thermoplastic material, and heating the shrink sleeve and waveguides to a temperature above the shrink temperature of the sleeve and higher than the softening temperature of the polymer optical waveguides, such temperature being in the range of 50° to 330° C., to thereby shrink the sleeve, and press and fuse the waveguides together to form a rod.

4,919,852

LIGHTWEIGHT CERAMIC INSULATION AND METHOD

David J. Green, State College, Pa., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 30, 1988, Ser. No. 213,392
Int. Cl.[5] B29B 33/02
U.S. Cl. 264—6 6 Claims

1. A method for making a ceramic comprising the steps of:

(a) dissolving at least one water soluble salt which after heating or chemical conversion can become a high temperature ceramic in water such that after dissolution the solution contains 75% to 99.5% water by volume;

(b) spraying the salt and water solution prepared in step (a) into a cryogenic liquid;

(c) evaporating the water of the solution under vacuum below the freezing point of the solution to produce a powder;

(d) forming the powder material; and

(e) sintering the formed material at greater than 800° C.

4,919,853

APPARATUS AND METHOD FOR SPRAYING LIQUID MATERIALS

Joseph L. Alvarez, Idaho Falls, and Lloyd D. Watson, Rigby, both of Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 21, 1988, Ser. No. 146,631
Int. Cl.[5] B29B 9/10
U.S. Cl. 264—12 6 Claims

1. An apparatus for spraying liquids comprising:

a nozzle of certain dimensions having a converging gas inlet portion;

a choke portion;

a divergent spray outlet poriton, said choke portion being intermediate and connecting said converging gas inlet portion with said divergent spray outlet portion, said nozzle being formed by an iterative procedure in successive steps to change the nozzle dimensions and thereby form a desired spray pattern and particle size beginning with the equation

$$\frac{A}{A^*} = \frac{1}{M}\left[\frac{2}{\gamma+1} + \frac{\gamma-1}{\gamma+1}M^2\right]^{(\gamma+1)/(2(\gamma-1))}$$

wherein the area A is the area of the nozzle measured at a selected distance downstream the area A* is the area of the nozzle throat, M is the ratio of the speed of the gas flow to speed of sound, and γ is a function of the specific heats of the two-phase gas mixture; and

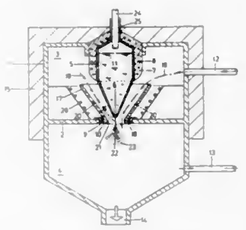
a liquid inlet means, said liquid inlet means terminating in the region of said choke portion to permit the feeding of a liquid into the region of the choke point for mixing with a gas from said gas inlet to form a two-phase mixture.

4,919,854

METHOD FOR PRODUCING SUPERFINE POWDER IN SPHERICAL FORM

Alfred Walz, Emmendingen, Fed. Rep. of Germany, assignor to Dr.-Ing. Luder Gerking, Berlin, Fed. Rep. of Germany

Continuation of Ser. No. 25,649, Mar. 13, 1987, abandoned, which is a division of Ser. No. 906,018, Sep. 11, 1986, abandoned. This application Oct. 11, 1988, Ser. No. 257,957
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1985, 3533954
Int. Cl.[5] B22F 9/08
U.S. Cl. 264—12 7 Claims



1. A method for producing superfine powder in spherical form with a diameter up to about 30 μm from metal, metal alloy or ceramic melts in a rotationally symmetrical Laval nozzle system having a gas feeder funnel with a narrow neck forming a Laval nozzle through which a laminar flow of a propellent gas passes, emitting the melt as a molten stream from an aperture in a reservoir within the Laval nozzle system and passing said molten stream through said narrow neck superheating said molten stream before said stream emerges

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from said neck and prior to stream separation into molten threads, said superheating being effected by the heating of said gas feeder funnel which focuses radiant heat on the axis of rotation of said funnel, said molten stream emerging from said Laval nozzle as molten threads which break down into powder, and said break down being regulated by said radiant heating.

4,919,855

PROCESS FOR PRODUCING A BLOW-MOLDED CONTAINER

Alfred Thomas, Hennef-Dambroich, Fed. Rep. of Germany, assignor to Kautex Werke Reinold Hagen AG, Fed. Rep. of Germany

Filed Apr. 21, 1988, Ser. No. 184,515

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1987, 3729571; Oct. 26, 1987, 3736164

Int. Cl.[5] B29C *49/04, 49/78, 49/80*

U.S. Cl. 264—21 **26 Claims**

1. In a process for producing a hollow, blow-molded container having at least one wall portion which is a co-extruded, multilayer laminate of at least predominantly thermoplastic materials and in which at least one layer of said multilayer laminate must have integrity throughout said one layer, comprising first plasticizing the materials for forming the respective layers of the laminate in at least first and second extruders, passing the materials into a common extrusion head in which they are combined and from which the laminate is extruded, and blow molding the laminate to form said hollow container, the improvement comprising adding to the material from which said at least one layer is formed a substance which makes it possible for the integrity of said at least one layer in said container to be detected by at least one detection means which interacts with said substance.

4,919,856

PROCESS FOR PRODUCING MEMBRANES FOR USE IN GAS SEPARATION

Takanori Anazawa, Sakura; Kazuo Hasumi, Odawara, and Yoshiyuki Ono, Sakura, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Feb. 23, 1988, Ser. No. 159,301

Int. Cl.[5] B29C *67/20*

U.S. Cl. 264—22 **87 Claims**

1. A method for producing a gas separation membrane comprising a microporous support having provided thereon a non-porous coating layer, comprising:

(1) melt-extruding a thermoplastic crystalline polymer under the conditions of a melt-extrusion temperature, T_{EX}, which is between Tm°C. and (Tm+100)°C. where Tm designates the crystalline melting point of the polymer and a draft ratio, Df, satisfying the relationship:

$$5 \leqq Df \leqq 10{,}000$$

to form a precursor in the form of a hollow fiber or flat film;

(2) coating said precursor as a support with a coating substance composed of a natural or synthetic substance capable of forming a polymeric layer which layer does not form pinholes upon subsequent drawing process after solidification to form a coating layer on the surface of said support;

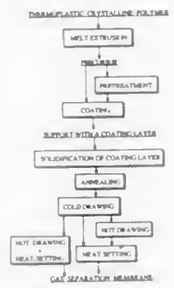
(3) solidifying said coating layer;

(4) annealing said support at an annealing temperature, T_{AN}, which is between (Tg+20)°C. and (Tm−5)°C. where Tg indicates the glass transition temperature of said support and Tm has the same meaning as defined above;

(a) after said coating process (2) above, or

(b) prior to said coating process (2) above;

(5) cold drawing the thus-treated support with said coating



layer at cold drawing temperature, T_{CD}, which is between (Tg−50)°C. and (Tm−10)°C. where Tg and Tm have the same meanings as defined above; and

(6) heat-setting said support with said coating layer at a heat-setting temperature, T_{HS}, which is between (the drawing temperature used in the step (5) above+10)°C. and Tm°C. where Tm has the same meaning as defined above to form micropores only in said support;

thus forming a composite membrane comprising a microporous support having laminated thereon a non-porous coating layer.

4,919,857

METHOD OF MOLDING A PIN HOLDER ON A LEAD FRAME

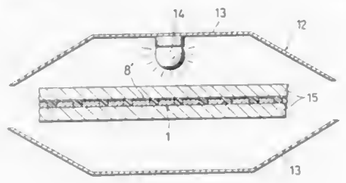
Tetsuya Hojyo, No. 33-6, 3-cho, Wakamatsudai, Sakai-shi, Osaka, Japan

Division of Ser. No. 102,585, Sep. 29, 1987, abandoned. This application Aug. 25, 1988, Ser. No. 237,406

Claims priority, application Japan, Mar. 11, 1987, 62-55808

Int. Cl.[5] B29C *35/08, 39/10*

U.S. Cl. 264—22 **9 Claims**



1. A pin holding method for a lead frame having a plurality of inner lead pins associated with an island, the method comprising:

applying a fluid resin material directly through a dispenser across successive ones of said inner lead pins so that said resin material flows into a gap between each adjacent two of said successive inner lead pins, said resin material being high in heat resistance as well as in purity, electrically non-conductive, and low in linear expansibility;

causing said resin material to harden; and

wherein said lead frame together with said resin material is interposed under pressure between a pair of flat presser plates while said resin material is hardened.

4,919,858

PROCESS FOR THE PRODUCTION OF A BONDED MAGNET

Thomas H. Newton, Cheshire, England, and Tatsuya Shimoda, Nagano, both of Japan, assignors to Imperial Chemical Industries PLC, London, England and Seiko Epson Corporation, Tokyo, Japan

Filed Nov. 28, 1988, Ser. No. 276,842

Claims priority, application United Kingdom, Nov. 27, 1987, 8727851

Int. Cl.[5] B29C *41/04, 71/00*

U.S. Cl. 264—24 **29 Claims**

1. A process for the production of a shaped article having magnetic properties from a shaped composition which comprises a mixture of a cross-linkable organic material and a particulate magnetic material, which process comprises

(1) placing the shaped composition in a mold,

(2) rotating the mold about an axis thereof,

(3) cross-linking the organic material in the shaped composition while rotating the mold, and

(4) recovering from the mold a shaped article which comprises a mixture of a cross-linked organic material and a particulate magnetic material.

4,919,859

PROCESS OF MAKING AN ACOUSTIC CARBON DIAPHRAGM

Yoshihisa Suda, Maebashi, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan

Filed Sep. 1, 1988, Ser. No. 239,266

Int. Cl.[5] C01B *31/02*

U.S. Cl. 264—29.5 **13 Claims**

1. A process for producing an acoustic diaphragm of carbonaceous material comprising the steps of:

impregnating a member selected from the group consisting of nonwoven fabric of carbon fiber having high elasticity and woven fabric of carbon fiber having high elasticity with thermosetting resin to form an impregnated carbon fiber fabric;

thermally molding said impregnated carbon fiber fabric into a diaphragm shape to form a molding,

calcining said molding in an inert gas atmosphere to obtain a porous carbon molding made of carbonized fiber and carbonized thermosetting resin,

heating said porous carbon molding to a uniform temperature, and

depositing vapor phase carbon upon a surface of said porous carbon molding, said carbon being generated by thermal decomposition of a hydrocarbon-containing material introduced together with a carrier gas, to produce an acoustic diaphragm having a surface comprising a dense layer of carbonized fiber-carbonized thermosetting resin carbon-thermally decomposed carbon, and an interior comprising a porous material of carbonized fiber bonded to the carbonized thermosetting resin carbon and the thermally decomposed carbon.

4,919,860

MANUFACTURE OF POROUS CARBON MEMBRANES

Erich Schindler, and Franz Maier, both of Obernburg, Fed. Rep. of Germany, assignors to Akzo NV, Arnhem, Netherlands

Filed Jul. 13, 1988, Ser. No. 218,280

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1986, 3621257

Int. Cl.[5] B29C *67/20, 71/02*

U.S. Cl. 264—29.1 **11 Claims**

1. A process for making porous carbon membranes having a porosity of from 10 to 90% and having maximum pore diameter of from 0.005 to 3 microns in the form of capillary, tubular, or flat membranes and comprising more than 75 weight percent of carbon, comprising:

pretreating a porous membrane from an acrylonitrile polymer in an aqueous hydrazine solution containing at least 40 weight percent of hydrazine,

washing and drying said membrane,

heat treating said membrane in a temperature range of 180° to 350° C., and

carbonizing said membrane in a temperature range of 600° to 3000° C., whereby clogging of the pores in said membrane is prevented.

4,919,861

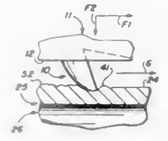
METHOD FOR CONDITIONING GOLF CLUB GRIP

Delvin D. Schutes, 1919 S. Los Altos, Mesa, Ariz. 85202

Filed May 30, 1989, Ser. No. 357,803

Int. Cl.[5] B32B *1/00, 35/00*

U.S. Cl. 264—36 **8 Claims**



1. A method for conditioning and increasing the tackiness of a used grip on the upper end of a handle of a golf club so a golfer can more readily grasp and control the grip during a golf stroke, said grip having an outer surface and a longitudinal axis and being substantially comprised of an elastic rubber material, said method including the steps of

(a) contacting said outer surface with at least one ruffling edge portion of each of a plurality of spaced apart teeth attached to and outwardly projecting from a backing, said ruffling edge portion on any one of said teeth being spaced apart from ruffling edge portions on the remaining ones of said teeth, said backing having an axis; and,

(b) drawing said ruffling edge portions over said grip to frictionally engage and resiliently compress and ruffle said surface to produce raised protuberances on said surface and increase the tackiness of said grip.

4,919,862

PROCESS AND APPARATUS FOR MARKING ARTICLES OF FOAM MATERIAL WHEN PRODUCED IRREGULARLY

Pier E. Gilardi, Robbio, Italy, assignor to Gestioni Riunite Toscana Gomma S.p.A., Robbio, Italy

Filed Jan. 31, 1989, Ser. No. 304,192

Claims priority, application Italy, Feb. 10, 1988, 67096 A/88

Int. Cl.[5] B29C *67/22*

U.S. Cl. 264—40.1 **10 Claims**

1. In a process for the production of a molded article of foam material which process includes the steps of mixing reactive components in a metering head to prepare a reactive mixture, delivering said reaction mixture from said metering head to a cavity of a lower shell of an open mold, closing said mold by lowering an upper shell thereon, and forming said molded article within said closed mold, the improvement comprising

monitoring operational parameters of said process to determine the existence of irregularities in said parameters which may result in the production of a defective molded article, and

upon determining the existence of an irregularity in said parameters, subsequent to introduction of said reactive

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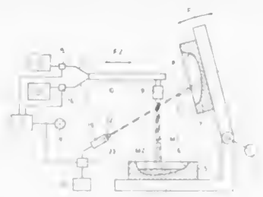
material into said lower shell portion of said mold and while said mold is still open, applying a mark to an inside surface of said upper shell portion, which mark is transferable to said molded article upon being formed in said mold



to identify said article as being produced as a result of irregular operational parameters, and transferring said mark onto said molded article upon being formed in said mold.

4,919,863

FILTER FOR SMALL PARTICLES

Friedrich Behr, Krefeld, Fed. Rep. of Germany, assignor to Thyssen Edelstahlwerke AG, Krefeld, Fed. Rep. of Germany

Division of Ser. No. 229,524, Aug. 8, 1988, Pat. No. 4,859,338.
This application Mar. 3, 1989, Ser. No. 317,837
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1987, 3726076
Int. Cl.[5] B01D *13/04*
U.S. Cl. 264—42 11 Claims

1. A method comprising manufacturing a material for use in a filter body for filtering solid particles with diameters generally smaller than 5 μm from flowing fluids, said body having pores and columnar and/or platelet-shaped oxides at least in and around the pores, said filter body comprising at least one steel foil (2) which is provided with an oxidic covering layer (3) containing columnar and/or platelet-shaped oxides (4,6) said by forming an oxidic covering layer containing columnar and/or platelet-shaped oxides at least in and around the pores of a porous steel foil.

4,919,864

METHOD FOR MAKING MULTICOLORED FOAM

Dennis A. Knaus, West Barnstaple, Mass., assignor to Packaging Industries Group, Inc., Hyannis, Mass.

Filed Feb. 26, 1988, Ser. No. 162,792
Int. Cl.[5] B29C *47/04*
U.S. Cl. 264—45.9 4 Claims

1. A process for making a foam product comprising selected portions possessing different properties, said process comprising:

passing a first foamable thermoplastic material into a first means for extruding plastic material;

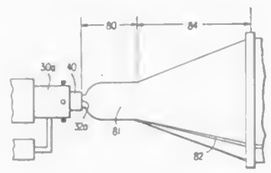
passing a second foamable thermoplastic material into a second means for extruding plastic material;

passing said first material into a passage for conveying material to an exit orifice;

passing said second material into said passage from at least one position at the perimeter of the passage closely adjacent said exit orifice, said second material passing onto a selected portion of a surface of said first material flowing longitudinally through the exit orifice, concurrently with said first material;

continuously extruding said two materials in tubular form through the exit orifice concurrently without substantial mixing;

foaming the two materials to form a tube comprising a first foamed material and a second foamed material, said second foamed material covering only said selected portion of the surface of the first foamed material, leaving substan-



tial portions of the surface of the first foamed material uncovered; and

slitting the tube to provide a sheet of foamed material thereby forming a predetermined pattern of second foamed material on the surface of the sheet of first foamed material;

whereby the resulting sheet of foamed material includes defined portions of said first and second foamed materials in a predetermined pattern in which the second foamed material extends transversely over only said selected portion of the surface of the first foamed material in said predetermined pattern in the same longitudinal direction of flow as the first foamed material leaving substantial portions of the surface of said first foamed material uncovered.

4,919,865

COMPOSITE MEMBRANES OF POLY (METHYL METHACRYLATE) BLENDS, THEIR MANUFACTURE AND THEIR USE

Joyce K. Nelson, Lexington, Mass., assignor to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.

Filed Nov. 5, 1987, Ser. No. 117,639
Int. Cl.[5] E01D *13/00, 13/04*
U.S. Cl. 264—45.1 60 Claims

1. A composite membrane capable of selectively permeating at least one more readily permeable gaseous component from a gaseous feed mixture containing said component, and utilizing the high selectivity characteristics of poly(methyl) methacrylate) without the corresponding low permeability characteristics thereof, comprising:

(a) a porous support layer that serves to provide support for a thin separation layer positioned thereon, said porous substrate having substantially no gas separation characteristics with respect to said gaseous feed mixture; and

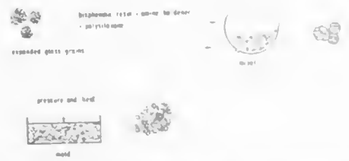
(b) an essentially non-porous gas separation layer positioned on said porous support layer, said separation layer that substantially determines the separation characteristics of the composite gas membrane being comprised of a mixture of poly(methyl methacrylate) or a copolymer thereof containing at least 50% by weight of poly(methyl methacrylate) and at least one cellulosic derivative, the proportions of said materials being selected so as to match the high separation characteristics provided by said poly(-methyl methacrylate) and the high permeation characteristics provided by said cellulosic derivative to provide a particular, uniquely complementing combination of high gas separation and permeability for the separation of a particular gaseous feed mixture, whereby said composite membrane exhibits an enhanced combination of gas separation and permeability characteristics.

4,919,866

MANUFACTURE OF LIGHTWEIGHT STRUCTURAL ELEMENTS

Albert F. Kubbutat, Wihslingen, Fed. Rep. of Germany, assignor to Sto Aktiengesellschaft, Stuhlingen, Fed. Rep. of Germany

Filed May 5, 1988, Ser. No. 190,650
Claims priority, application Fed. Rep. of Germany, May 9, 1987, 3715487
Int. Cl.[5] B29C *67/20, 67/24*
U.S. Cl. 264—45.3 10 Claims



1. A method for manufacturing lightweight structural elements using blown glass spheres and a foamed organic binder, in which the blown glass spheres are mixed with the binder, which foams up and hardens and thus forms a matrix, comprising the steps of mixing

(a) 70–95 parts by weight open porous blown glass spheres having a grain fraction of 0.2 to 20 mm and a gross density between 0.2 and 0.55 g/c^3,

(b) 4–30 parts by weight of a liquid epoxy binder consisting of bisphenolic resin and an amine hardener, and

(c) 0.5–5 parts by weight of a liquid polysiloxane

to wet the surface of the blown glass spheres,

pouring the mixture into a mold corresponding to the shape of the lightweight structural element, and

adding heat,

whereby a reaction of the amine hardener with the polysiloxane and with the epoxy resin occurs to form a foam structure of the binder in voids between and surrounding the blown glass spheres.

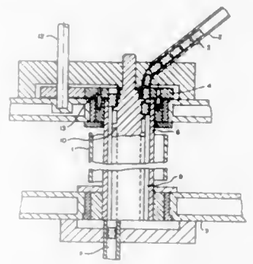
4,919,867

METHOD FOR SINTERING HIGH TEMPERATURE CERAMICS

Wilhelm Königs, and Milan Hrovat, both of Rodenbach, Fed. Rep. of Germany, assignors to NUKEM GmbH and ALKEM GmbH, Hanau, Fed. Rep. of Germany

Filed Nov. 9, 1987, Ser. No. 118,035
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641253
Int. Cl.[5] C04B *35/64*
U.S. Cl. 264—57 1 Claim

1. A method for the continuous sintering of ceramic shaped articles in a furnace which comprises guiding the shaped articles vertically through a furnace along a helical rib of a stationary, vertically positioned helix by rotating a tube around and adjacent to the helix, the tube being provided with vertically-extending longitudinal ribs and providing heat to the furnace, the sintering time being regulated by the rotation speed of the



tube and/or by selecting a replaceable helix to provide the desired sintering time.

4,919,868

PRODUCTION AND SINTERING OF REACTION BONDED SILICON NITRIDE COMPOSITES CONTAINING SILICON CARBIDE WHISKERS OR SILICON NITRIDE POWDERS

Jow-Lay Huang, Troy, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Mar. 31, 1988, Ser. No. 175,905
Int. Cl.[5] C04B *35/58*
U.S. Cl. 264—65 2 Claims

1. A method for producing a sintered reaction bonded silicon nitride composite which contains silicon nitride, is reinforced with silicon carbide whiskers, or both, which method comprises mixing powdered silicon having an average particle size not greater than 5 μm with a suitable amount of a sintering aid and

(a) from 10 to 35 percent of silicon carbide whiskers,

(b) from 15 to 50 percent of silicon nitride, or

(c) from 10 to 35 percent of silicon carbide whiskers and from 15 to 50 percent of silicon nitride,

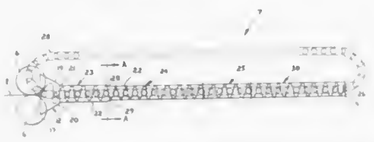
pressing a shape from the resulting mixture, heating the shape in a nitrogen atmosphere at a pressure of about 1 atmosphere absolute, and controlling the heating rate:

(d) until a predetermined temperature is reached, so that reaction between nitrogen and the shape is substantially complete at any given temperature before the shape is heated above that temperature, the predetermined temperature being one at which it has previously been determined that the consumption of nitrogen by reaction between silicon of the shape and nitrogen is complete when the heating is conducted so that reaction between nitrogen and the shape is substantially complete at any given temperature before the shape is heated above that temperature, and

(e) thereafter heating the shape rapidly from said predetermined temperature to a temperature sufficiently high to produce, by reaction involving the sintering aid, a sufficient amount of a glass to produce a Si_3N_4 body having from 65 to 85 percent of theoretical density,

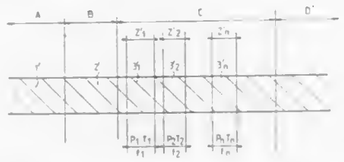
wherein the suitable amount of a sintering aid is from 3 to 7 percent each of MgO and CeO_2, 2 to 8 percent of Y_2O_3, 6 percent of Y_2O_3 and 2 percent of Al_2O_3, 2 to 8 percent of MgO, BeO, HfO_2 or ZrO_2, or 1 to 5 percent of CaO.

4,919,869
APPARATUS FOR AND PROCESS OF TREATING SHRINKABLE FIBERS
Tony D. Zatkulak, Midlothian; David J. Rodini, Richmond, and James D. Hodge, Midlothian, all of Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 55,394, May 29, 1987, abandoned. This application Mar. 22, 1989, Ser. No. 326,443
Int. Cl.[5] D01F *6/60*; D06P *3/24*; D06B *3/04*
U.S. Cl. 264—78 19 Claims



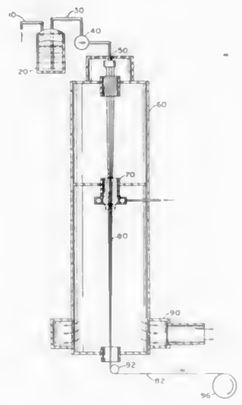
1. A process of treating a tow of shrinkable fibers including the steps of:
moving the tow in folds through a plug section operatively connected by a restricted opening to a treatment section, said plug section having an entrance opening larger than the restricted opening of the treatment section, and
heating the tow with steam in the treatment section
wherein sufficient steam migrates through the restricted opening from the treatment section to the plug section to cause shrinkage of the tow in the plug section, and
wherein the tow has a cross-sectional area substantially the same as the cross-sectional area of the entrance opening of the plug section as it moves through said opening and
wherein the tow has a smaller cross-sectional area as it leaves the plug section and moves through the entrance opening of the treatment section, due to shrinkage, and
wherein the cross-sectional area of the shrunken tow as it enters the smaller entrance opening of the treatment section is substantially the same as the cross-sectional area of this opening and
wherein the tow moving in folds in the plug section substantially prevents the loss of steam through the entrance opening of the plug section.

4,919,870
PROCESS OF AND APPARATUS FOR TREATING A SHAPED PRODUCT
Jean-Pierre Ibar, Avenue de la Division-Leclerc, F-91100 Ballainvilliers, France
PCT No. PCT/FR87/00501, § 371 Date Oct. 15, 1988, § 102(e) Date Oct. 15, 1988, PCT Pub. No. WO88/04606, PCT Pub. Date Jun. 30, 1988
PCT Filed Dec. 15, 1987, Ser. No. 246,396
Claims priority, application France, Dec. 15, 1986, 86 17472
Int. Cl.[5] B29C *71/00*
U.S. Cl. 264—70 15 Claims



1. A method of rheological treatment of a cylindrical product, comprising the steps of:
moving the cylindrical product longitudinally through a sequence of zones;
in each zone, applying to the cylindrical product a combination of a preselected temperature, pressure against at least one surface of the cylindrical product, and vibrational frequency; and
applying the combinations of the temperature, the pressure, and the vibrational frequency applied to the cylindrical product in each of the sequence of zones according to a predetermined program.
2. Apparatus for rheological treatment of a cylindrical product, comprising:
a plurality of independently controllable stages, each stage adapted for accepting the cylindrical product to pass therethrough;
in each stage, means for applying to the cylindrical product a preselected temperature, pressure, and vibrational frequency; and
means for moving the cylindrical product longitudinally through the stages in series,
wherein the preselected conditions of the temperature, the pressure, and the vibrational frequency in each of the plurality of zones correspond to a predetermined program.

4,919,871
FORMING GLASS FIBERS FROM SOL-GEL COMPOSITIONS
Chia-Cheng Lin, Hampton Township, Allegheny County, and Roger C. Milliron, Jr., Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Jan. 4, 1989, Ser. No. 293,403
Int. Cl.[5] D01F *9/08*
U.S. Cl. 264—82 10 Claims

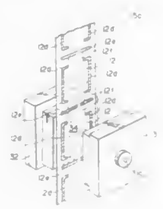


1. A method for producing solid inorganic oxide fibers from a liquid metal alkoxide sol-gel composition comprising the steps of:
a. forming a liquid sol of an alkoxide compound having the general formula $M(OR)_x$ wherein M is an element which forms hydrolyzable alkoxides, R is an organic radical which forms hydrolyzable alkoxides and x is the valence of M;
b. hydrolyzing said alkoxide compound to a sufficient degree to provide a liquid sol of sufficient concentration and viscosity for fiber-forming;
c. passing said sol through an orifice to form a fiber; and
d. passing said fiber through a gaseous atmosphere to dry, wherein said gaseous atmosphere comprises ammonia in sufficient concentration such that the fiber may be wound without self-sticking.

4,919,872
PROCESS FOR METERING COLOR CONCENTRATES TO THERMOPLASTIC POLYMER MELTS
William A. Fintel, Lewes, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 186,010, Apr. 25, 1988, Pat. No. 4,848,915.
This application Feb. 16, 1989, Ser. No. 311,515
Int. Cl.[5] B29C *47/92*
U.S. Cl. 264—103 1 Claim

1. In a process for forming a color concentrate including the steps of compounding a pigment with a thermoplastic polymer melting said compounded material and extruding said melted compounded material as a continuous strand, the improvement comprising: winding said continuous strand in a constant weight-per-unit-length ratio onto a spool after extrusion.

4,919,873
METHOD OF MOLDING MAGNETIC TAPE CASSETTE BODY HALF
Kengo Oishi, and Osamu Suzuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Division of Ser. No. 76,636, Jul. 23, 1987, Pat. No. 4,825,320.
This application Mar. 25, 1988, Ser. No. 172,833
Claims priority, application Japan, Jul. 23, 1986, 61-112889
Int. Cl.[5] B29C *45/14*
U.S. Cl. 264—130 6 Claims

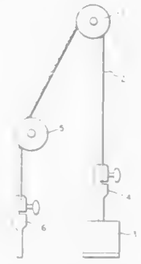


1. A method of manufacturing half of a cassette body, two of which are used to house a pair of reels and a magnetic tape wound around the reels comprising the steps of: positioning between open mold halves a protective film strip consisting of a series of protective film units connected to each other near the edge of the protective film strip by connecting portions, each protective film unit defined by a pair of elongated openings on opposite sides of the film strip; closing the mold halves while one of the protective film units is positioned in the cavity defined by the thus closed mold halves with the connecting portions adjacent to the protective film unit sandwiched between the mold halves; injecting molding material into the cavity such that said protective film unit will become adhered to an outer surface of said cassette body half; and wherein upon closing of the mold halves the protective film strip is cut at opposite sides of the said connecting portions of the said protective film strip to sever the one protective film unit from the said protective film strip.

4,919,874
PROCESS FOR PREPARING A NYLON FIBER WITH REDUCED SPHERULITES
William T. Windley, Seaford, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 860,251, May 6, 1986, Pat. No. 4,729,923.
This application Sep. 11, 1987, Ser. No. 95,234
Int. Cl.[5] D01F *1/00, 6/60*
U.S. Cl. 264—168 7 Claims

1. A process for preparing a nylon 66/6 copolymer fiber with reduced spherulites from a nylon 66/6 salt solution comprising the steps of:
(a) adding 1–6% caprolactam and 0.001–2% water-soluble inorganic calcium salt to 94–99% nylon 66 salt to form a nylon 66/6 salt solution;
(b) polymerizing the salt solution to form a polymer; and
(c) extruding the polymer into filaments.

4,919,875
ORIENTED POLYMERIC TAPE PREPARATION
Teh-Chuan Wang, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 165,229, May 9, 1988, which is a continuation-in-part of Ser. No. 823,656, Jan. 29, 1986, abandoned. This application Apr. 6, 1989, Ser. No. 334,240
Int. Cl.[5] B29C *47/80*
U.S. Cl. 264—171 6 Claims



1. A process for the preparation of polymeric tape which comprises melt blending about from 90 to 50 weight percent copolyetherester and, complement ally, about from 10 to 50 weight percent polyethylene terephthalate at a temperature which is about from 25 to 65 centigrade degrees above the higher crystalline melting point of the two polymeric components for a melt residence period of about from 70 to 225 seconds, extruding the polymer blend through a die orifice in the form of tape, and orienting the tape to provide an increase in the longitudinal dimension of about from 2.2 to 4.0 times the original extruded dimension of the tape, the blending temperatures and melt residence period being sufficient to change the appearance of the melt blend from opaque to translucent

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4,919,876

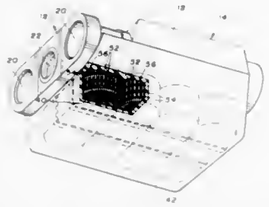
METHOD FOR MAKING COMPOSITE TREAD FOR TRACK-LAYING VEHICLES

Russell C. Savage; Gary P. Zeller, and Martin D. Skirha, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 141,965, Jan. 11, 1988, Pat. No. 4,880,283. This application Oct. 14, 1988, Ser. No. 257,590

Int. Cl.[5] **B29C** *45/14*

U.S. Cl. 264—258 2 Claims



1. A method for making a composite tread member having a metal support member embedded in an abrasion resistant fiber reinforced polymeric material by a reaction injection molding process in a matched upper and lower mold members having interior mold surfaces defining a mold cavity therein comprising the steps of:

positioning a multiplicity of an abrasion resistant fiber bundles in the lower mold member in an orientation such that said fiber bundles being in an about perpendicular relationship to said interior mold surface of said lower mold member,

said multiplicity of fiber bundles being arranged in elongated rolls formed by rolling narrow webbing of polyaramid fiber bundles interwoven with polyester fiber bundles with the polyaramid fiber bundles running in the transverse direction,

placing a metal support member on top of said fiber bundles,

closing said upper mold member onto said lower mold member forming a mold cavity therein,

injecting a quantity of a reaction injection moldable polymeric material into said mold cavity and thus embedding said fiber bundles and said metal support member, and

demolding said composite tread member after said polymeric material is cured in said mold cavity.

4,919,877

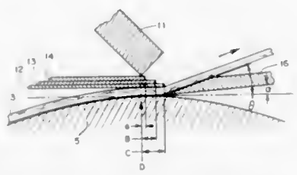
PROCESS FOR SOFTENING WEBS

Mark N. Parsons, and Rodney L. Abba, both of Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 111,473, Dec. 3, 1987, abandoned, which is a continuation of Ser. No. 908,498, Sep. 17, 1986, abandoned. This application Sep. 8, 1989, Ser. No. 404,916

Int. Cl.[5] **B31F** *1/14*

U.S. Cl. 264—282 15 Claims



1. In a continuous process for softening a web wherein the web is supported on the surface of a rotating drum and lengthwise compressed in a treatment cavity defined by the surfaces of the rotating drum, a rigid primary blade which presses the web against the rotating drum, and an inclined rigid retarder blade having an operating face angle in the range of 5° to 15° and which is positioned on the side of the web not facing the primary blade and which retards the forward movement of the web and dislodges the web from the surface of the rotating drum, the improvement comprising dislodging the web from the rotating drum with a retarder blade having a razor edge wherein the edge of the retarder blade is directly below or overlapped by the end of the rigid primary blade and wherein the operating face of the retarder blade is an uninterrupted surface.

4,919,878

PROCESS FOR THE PRODUCTION OF POLYURETHANE-AND/OR POLYUREA-BASED MOLDINGS

Friedhelm Pilger; Richard Kopp, both of Cologne, and Otto Ganster, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Fed. Rep. of Germany

Filed Aug. 3, 1987, Ser. No. 81,043

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1986, 3627078

Int. Cl.[5] **B29C** *45/00*

U.S. Cl. 264—300 6 Claims

1. A process for the production of a molding having a compact surface by reacting in a closed mold a reaction mixture comprising

(a) an organic polyisocyanate,

(b) a compound containing isocyanate-reactive groups and having a molecular weight of 62 to about 10,000 and

(c) a mold release agent comprising a salt of

(i) a compound containing (on a statistical average) at least 8 carbon atoms per molecule and comprising a member selected from the group consisting of saturated aliphatic carboxylic acids, uusaturated aliphatic carboxylic acids, saturated cycloaliphatic carboxylic acids, unsaturated cycloaliphatic carboxylic acids and mixtures thereof and

(ii) at least one tertiary amine corresponding to the formula

$$R_1-N(R_2)-R_3$$

wherein

R_1 comprises a member selected from the group consisting of saturated, aliphatic hydrocarbon radicals containing at least 12 carbon atoms and unsaturated, aliphatic hydrocarbon radicals containing at least 12 carbon atoms and

R_2 comprises a member selected from the group consisting of saturated, aliphatic hydrocarbon radicals containing from 1 to 18 carbon atoms, unsaturated, aliphatic hydrocarbon radicals containing from 1 to 18 carbon atoms, C_2–C_{40} hydroxyalkyl radicals, C_2–C_{40} hydroxyalkyl radicals containing ether bridges and mixtures thereof and

R_3 comprises a member selected from the group consisting of saturated, aliphatic hydrocarbon radicals containing from 1 to 18 carbon atoms, unsaturated, aliphatic hydrocarbon radicals containing from 1 to 18 carbon atoms; C_2–C_{40} hydroxyalkyl radicals, C_2–C_{40} hydroxyalkyl radicals containing ether bridges and mixtures thereof.

4,919,879

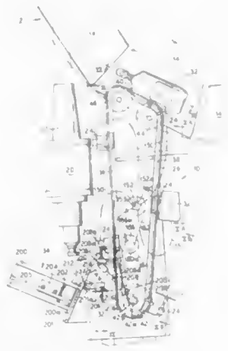
METHOD FOR IN-MOLD LABELING OF A BLOW MOLDED ARTICLE

Frank T. Keyser, Sycamore, Ill., assignor to Liquid Container Corporation, West Chicago, Ill.

Division of Ser. No. 137,182, Dec. 23, 1987, Pat. No. 4,834,641. This application Feb. 21, 1989, Ser. No. 312,717

Int. Cl.[5] **B29C** *49/24*

U.S. Cl. 264—509 1 Claim



1. The method of blow molding which includes the steps of continuously and sequentially moving a plurality of molds through a first closed circuit;

at one point in said first closed circuit continuously forming a parison of moldable plastic material;

each mold being open at said one point in the first closed circuit;

drawing off a portion of the parison into a cavity of each respective mold at said one point in the first closed circuit to charge each mold;

thereafter closing each mold;

introducing a gaseous medium into each parison portion within each charged mold to expand each parison portion against walls of each respective mold cavity to form a hollow object corresponding in size and shape to the mold cavity;

at a second point in the first closed circuit opening each mold and ejecting the hollow object therefrom to condition the mold for repeating the cycle;

continuously and sequentially moving a plurality of carriages through a second closed circuit;

at one point in the second closed circuit picking up one or more labels from a label supply station for transport on each carriage;

intersecting the two closed circuits at a matched segment in both circuits with the molds open following ejection of the hollow objects and prior to said one point in said first closed circuit;

moving each open mold and a carriage through the matched segment in unison at zero relative velocity;

transferring said one or more labels from each carriage to a corresponding mold during the unison movement through the matched segment; and

synchronously driving both of said first and second circuits in unison from a common power source;

thereby to continuously effect in-mold labeling of all of the articles molded in the first closed circuit.

4,919,880

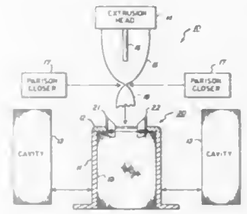
CORE PINCH-OFF FOR BLOW MOLDING PARISON

George F. Arp, 27 Terrace Villa Cir., Fairport, N.Y. 14450

Continuation-in-part of Ser. No. 868,294, May 28, 1986. This application Aug. 11, 1986, Ser. No. 895,329

Int. Cl.[5] **B29C** *49/18, 49/30, 49/04*

U.S. Cl. 264—536 10 Claims



1 Apparatus for pinching off a blow molding parison, said apparatus comprising:

a. a core arranged between openable and closeable blow mold parts, which blow mold parts, upon closing around said core, form a cavity in which said parison can be blown in a double-walled form conforming to an outside surface of said core and an inside surface of said cavity;

b. said core having a hollow interior arranged under said parison for receiving a leading end of said parison;

c. a top region of said core having a pinch-off means including clamp jaws that are mounted on said core for movement relative to said core between an open and a closed position of said clamp jaws;

d. means for directing said leading end of said parison through said clamp jaws and into said hollow interior while said clamp jaws are in said open position;

e. means for moving said clamp jaws relative to said core from said open position to said closed position for closing said clamp jaws to pinch off and hold said leading region of said parison at said top region of said core while a following region of said parison lowers over said top region of said core; and

f. said pinch-off clamp jaws being arranged in said closed position to form an upper portion of said outside surface of said core, against which said parison conforms when blown.

5. A method of pinching off and holding a leading region of a blow molding parison, said method comprising:

a. arranging on a top region of a hollow core a pinch-off clamp including clamp jaws movable away from and toward each other between respective open and closed positions relative to said top region of said hollow core disposed between openable and closeable blow mold parts, which blow mold parts, upon closing around said core, form a cavity for blow molding said parison to conform to an outer surface of said core and an inner surface of said cavity;

b. directing a leading end of said parison into said pinch-off clamp while said pinch-off clamp is in an open position;

c. moving said clamp jaws toward each other on said top region of said core for closing said pinch-off clamp jaws against said leading region of said parison for closing and holding said parison at said top region of said core while a succeeding region of said parison lowers over said outer surface of said top region of said core; and

d. forming said pinch-off clamp so that, in a closed position, said pinch-off clamp forms an upper portion of said outer surface of said core.

4,919,881

METHOD FOR MAKING A PLASTIC CONTAINER

Jean-Claude Boeckmans, Ghent, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Filed Jan. 19, 1988, Ser. No. 145,222

Claims priority, application Belgium, Jan. 20, 1987, 8700060

Int. Cl.[5] **B29C** *49/22*

U.S. Cl. 264—516 10 Claims

1. A method for making a plastic container comprising a body and a neck, said method comprising:

(a) introducing a parison of a thermoplastic material into a mold having a cavity corresponding to the body of the container and a cavity corresponding to the neck of the container, the cavity corresponding to the neck of the container having a diameter smaller than the diameter of the cavity corresponding to the body of the container,

(b) closing the mold around the parison,

(c) blowing the parison with a gas to form the body of the container,

(d) cooling the body of the container,

(e) opening the mold,

(f) withdrawing the body of the container from the mold,

(g) introducing a mandrel into the neck of the container, the mandrel having a diameter smaller than the diameter of the neck of the container,

(h) heating the neck of the container by means of a heating element,

(i) withdrawing the heating element from the neck of the container,

(j) introducing a sizing device into the neck of the container, the sizing device having a diameter greater than the diameter of the mandrel and smaller than the diameter of the neck of the container,

(k) withdrawing the mandrel from the neck of the container,

(l) withdrawing the sizing device from the neck of the container.

4,919,882

METHOD OF MAKING A PLASTIC CONTAINER

Jean-Claude Boeckmans, Ghent, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Filed Jan. 19, 1988, Ser. No. 145,221

Claims priority, application Belgium, Jan. 20, 1987, 8700059

Int. Cl.[5] **B29C** *49/22*

U.S. Cl. 264—516 10 Claims

1. A method for making a plastic container comprising a body and a neck, said method comprising:

(a) introducing a parison of a thermoplastic material into a mold having a cavity corresponding to the body of the container and a cavity corresponding to the neck of the container, the cavity corresponding to the neck of the container having a diameter smaller than the diameter of the cavity corresponding to the body of the container,

(b) closing the mold around the parison,

(c) blowing the parison with a gas to form the body of the container,

(d) cooling the body of the container,

(e) opening the mold,

(f) withdrawing the body of the container from the mold,

(g) introducing a mandrel into the neck of the container, the mandrel having a diameter smaller than the diameter of the neck of the container,

(h) heating the neck of the container by means of a heating element,

(i) withdrawing the heating element from the neck of the container,

(j) introducing a sizing device into the neck of the container, the sizing device having a diameter greater than the diameter of the mandrel and smaller than the diameter of the neck of the container,

(k) withdrawing the mandrel from the neck of the container,

(l) withdrawing the sizing device from the neck of the container.

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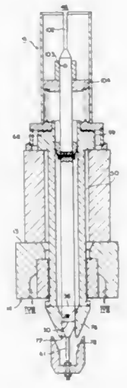
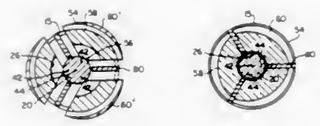
4,919,881

REACTOR INTERNALS THROUGH-HOLE GRAPPLE

Michael F. Hankinson, Monroeville; Kenneth J. Swidwa, North Versailles, and Robert B. Salton, Plum Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 5, 1988, Ser. No. 215,116
Int. Cl.[5] G21C *19/20*
U.S. Cl. 376—260 41 Claims





24. An improved reactor internals lifting rig including a reactor internals through-hole grapple device for lifting and transporting an internals structure of a nuclear reactor, the internals structure including a radial flange thereon having a top and bottom surface with a plurality of holes therebetween, said internals throughhole grapple device comprising:

a generally vertically disposed cylindrical housing adapted to be secured to the lifting rig;

a generally vertically oriented grapple assembly having its upper end partially disposed within the housing and the lower and projecting substantially below the housing and the lifting rig, the lower end of the grapple assembly having an outwardly directed annular shoulder with an upper surface thereon which is adapted to pass through one of said holes and adjacent to the bottom surface of the radial flange, the grapple assembly having a retracted position and an expanded position wherein when in the retracted position the annular shoulder is smaller in diameter than said hole and when in the expanded position the annular shoulder is larger in diameter than said hole such that the upper surface of the annular shoulder is in abutting contact with the bottom surface of the radial flange of the internals structure, wherein the grapple assembly further comprises:

(i) a plurality of circumferentially disposed fingers each having a first inner arc segment on one end and a second inner arc segment at the opposite end with a tapered transition zone therebetween, and a first outer arc segment adjacent the tapered transition zone and a second outer arc segment adjacent the first inner arc segment, said first inner and outer arc segments being formed with respect to a first axis, and said second inner and outer arc segments being formed with respect to a second axis offset from the first by a predetermined distance and parallel thereto so that said first and second outer arc segments are not concentric with respect to each other, whereby said fingers cooperate to provide a first inner diameter formed by said first inner arc segments, a second inner diameter formed by said second inner arc segments, the annular shoulder having a first outer diameter smaller than that of the hole when in the retracted position and having a top surface with an outer boundary being formed by said first outer arc segments, a second outer diameter formed by said second outer arc segments and forming an inner boundary of the annular shoulder; and

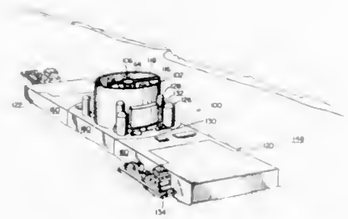
(ii) actuating means engaging said fingers to radially expand said fingers into abutting contact with the bottom surface of the radial flange.

4,919,882

MODULAR NUCLEAR STEAM SUPPLY SYSTEM AND METHOD OF CONSTRUCTING A NUCLEAR REACTOR USING A MODULAR NUCLEAR STEAM SUPPLY SYSTEM

Raymond J. Aul; Robert L. Howell, and Lawrence W. Ramsey, all of Jacksonville, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 21, 1983, Ser. No. 544,193
Int. Cl.[5] G21C *13/00*
U.S. Cl. 376—293 17 Claims



1. A method of fabricating a nuclear reactor comprising the steps of:

manufacturing, at a manufacturing site, a nuclear steam supply system (NSSS) module comprising a barge having a bulkhead with means for reinforcing said bulkhead, an NSSS portion, and a reactor safeguards portion;

constructing, at a reactor site remote from said manufacturing site and in parallel with said manufacturing step, a containment building have at least one construction opening sized to pass said NSSS portion, a base mat for supporting said NSSS portion, and means for reinforcing said containment building, said bulkhead having a generally complementary geometry with respect to said construction opening;

transporting said module to said reactor site; and

installing at least the NSSS portion of said module in said containment building by passing said NSSS portion through said opening, anchoring said NSSS portion to said base mat, at least partially closing said opening with said bulkhead, and coupling said bulkhead reinforcing means to said containment building reinforcing means, with at least a portion of said reactor safeguard portion being disposed outside said containment building.

9. A nuclear steam supply system (NSSS) module comprising:

a low draft barge having an NSSS portion and an associated reactor safeguards system portion, said NSSS portion being adapted to fit within a preformed containment building having a liner with at least one construction opening dimensioned to pass said NSSS portion therethrough;

said badge having at least one bulkhead separating said NSSS portion from said reactor safeguards systems, said bulkhead having a generally complementary geometry with respect to said construction opening and being formed to cooperate with said liner to close said construction opening;

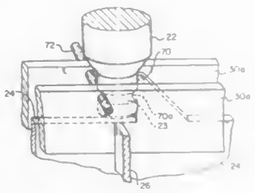
said bulkhead containing preformed containment penetrations for communicating with said reactor safeguard system portion.

4,919,883

LOWER END FITTING DEBRIS COLLECTOR AND END CAP SPACER GRID

William J. Bryan, Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 14, 1988, Ser. No. 284,018
Int. Cl.[5] G21C *19/30, 3/32*
U.S. Cl. 376—352 1 Claim



1. In a nuclear reactor having fuel assemblies including an upper end fitting and spaced nuclear fuel rod spacer grids for supporting and spacing a plurality of elongated nuclear fuel rods, each of which includes a hollow active portion of nuclear fuel filled cladding intermediate the rod ends and tapering end cap of solid material with a circumferential groove on the rod end which first encounters reactor coolant flow, a lower end filtering debris collector and end cap spacer grid for capturing and retaining deleterious debris carried by reactor coolant before it enters the active region of a fuel assembly and creates fuel rod cladding damage, comprising in combination:

a polygonal perimeter member,

a plurality of debris trapping compartments defined by a plurality of parallel first slotted bars and parallel second slotted bars intersecting and slottedly interlocked with said first bars in a grid-forming arrangement in which the bars are attached to said perimeter member and to each other,

a first plurality of parallel strips mounted on said second bars and between said first bars on a first side of said grid,

a second plurality of parallel strips mounted on said first bars and between said second bars on the side thereof opposite said first side of said grid in an orientation normal to said first plurality of parallel strips,

at least some of said bars including projecting portions engaging said end caps at a first circumferential location thereof,

spring means secured to said grid formed by said bars by means of at least some of said strips and engaging the circumferential grooves at a second circumferential location opposite said first,

said spring means securing strips projecting upwardly adjacent the end caps to provide end cap lateral movement restraining walls and to define an end cap spacer grid compartment with the circumferentially opposite bar projecting portions and spring means.

4,919,884

MODULAR NUCLEAR FUEL ELEMENT, MODULAR CAPSULE FOR SUCH ELEMENT AND METHOD FOR SUCH ELEMENT AND METHOD FOR MANUFACTURING SUCH MODULAR CAPSULE

Alain Chotard, Neuville sur Saone, France, assignor to Framatome, Courbevoie and Cogema, Velizy Villacoublay, both of, France

Filed Jun. 23, 1988, Ser. No. 210,443
Claims priority, application France, Jun. 25, 1987, 87 08988
Int. Cl.[5] G21C *3/00*
U.S. Cl. 376—419 11 Claims

1. A nuclear fuel element comprising a tubular sheath having opposite ends and composed of a material resisting creep and corrosion under the action of a coolant at high pressure and high temperature of a nuclear reactor means closing said opposite ends pellets enclosed in the sheath and composed of a material having an influence on the nuclear reaction in a reactor, at least a part of which material is of fuel material, said element further comprising a plurality of modular capsules arranged one after the other axially within the sheath, each of the modular capsules comprising a tubular case having opposite ends, a porous element closing each of said opposite ends of the case and a stack of said pellets inserted without radial clearance inside the case, the case having an outside diameter which is such that, the radial clearance between the outer surface of the capsule and the inner, surface of the sheath is in the range between 0.02 and 0.2 millimeter

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4,919,885

CORROSION RESISTANT STEEL STRUCTURAL MEMBER

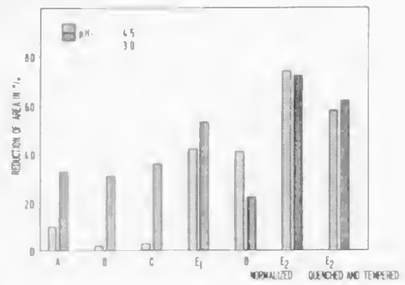
Lutz Meyer, Voerde; Ludwig Hachtel, Wesel-Büderich, and Günter Robusch, Essen, all of Fed. Rep. of Germany, assignors to Thyssen Stahl AG, Duisburg, Fed. Rep. of Germany

Continuation of Ser. No. 81,505, Aug. 4, 1987, abandoned. This application Sep. 28, 1988, Ser. No. 252,006
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1986, 3627668
Int. Cl.[5] C22C *38/14*
U.S. Cl. 420—104 6 Claims

1. In a structural member of hot blast stoves, heat exchangers, furnaces, boilers, tanks, vessels and pipes exposed to intergranular stress corrosion cracking in nitrate-containing solutions, constructed of a weldable structural steel, wherein the improvement comprises that the structural steel having high resistance to intergranular stress corrosion cracking in nitrate-containing solutions and good weldability, consists essentially in % by mass, of

0.01 to 0.04 % carbon
up to 0.012 % nitrogen
0.08 to 0.22 % titanium with Ti equal or greater than 3.5 (carbon + nitrogen)
0.2 to 2.5 % manganese

2.0 to 5.5 % chromium
0.01 to 0.10 % aluminium
up to 0.5 % silicon
up to b 1.0 % nickel



up to 0.02 % phosphorus
up to 0.02 % sulphur,
the residue being iron and unavoidable impurities.

4,919,886

TITANIUM ALLOYS OF THE Ti_3AL TYPE

Ganapathy Venkataraman, Fairborn, and Francis H. Froes, Xenia, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 10, 1989, Ser. No. 335,631
Int. Cl.[5] C22C *14/00*
U.S. Cl. 420—420 5 Claims

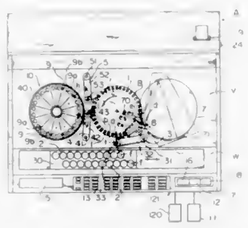
1. A titanium alloy consisting essentially of about 20 to 30 atomic percent aluminum, about 3 to 5 atomic percent niobium, about 3 to 5 atomic percent vanadium and about 3 to 5 atomic percent molybdenum, balance titanium.

4,919,887

AUTOMATIC ANALYZER

Koichi Wakatake, Koganei, Japan, assignor to Nittec Co., Ltd., Tokyo, Japan

PCT No. PCT/JP87/00679, § 371 Date Apr. 20, 1988, § 102(e) Date Apr. 20, 1988, PCT Pub. No. WO88/02120, PCT Pub. Date Mar. 24, 1988
PCT Filed Sep. 16, 1987, Ser. No. 184,637
Claims priority, application Japan, Sep. 16, 1986, 61-216011; Sep. 19, 1986, 61-219174; Oct. 3, 1986, 61-234295; Jan. 19, 1987, 62-8112; Feb. 12, 1987, 62-17750
Int. Cl.[5] G01N *35/00*
U.S. Cl. 422—67 3 Claims



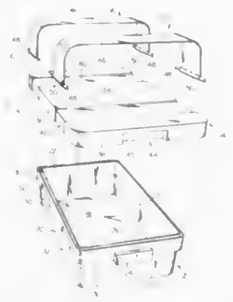
1. A multi-item automatic analyzer which comprises:
a reaction cell table holding a plurality of reaction cells;
means for repetitively rotating said table for moving each cell from a sampling position successively through a reagent dispensing position and an optical measuring position to a washing position;
a sampling mechanism at said sampling position for placing a sample to be analyzed into a reaction cell;
a reagent dispensing mechanism at said reagent dispensing position for dispensing a reagent into a reaction cell;
an optical measuring mechanism at said optical measuring position for making optical measurements of samples in the reaction cells passing said optical measuring position;
a washing mechanism at said washing position for washing reaction cells;
a control device connected to said table rotating means, said sampling mechanism, said reagent dispensing mechanism, said optical measuring mechanism and said washing mechanism for operating said means and said mechanisms for carrying out a desired analysis on the respective samples in the respective reaction cells;
an initiating IC card processing means for reading a predetermined analysis operation for a particular sample to be analyzed which has been stored on an initiating IC card which is insertable into said initiating IC card processing means;
a memory IC card processing means for recording data on a memory IC card which is insertable into said memory IC card processing means;
said initiating IC card processing means being connected to said control device for causing said control device to control said table rotating means and said mechanisms to carry out the predetermined analysis and being connected to said memory IC card processing means for recording the predetermined analysis operation on a memory IC card; and
said memory IC card processing means further being connected to said control device and said optical measuring means for recording the actual analysis operation carried out by said analyer and the results of the optical measurements on the same memory IC card.

4,919,888

SEALS AND METHOD OF SEALING FOR A STERILIZATION CONTAINER SYSTEM

Jerry L. Spence, Kirkland, Wash., assignor to InstruMed, Inc., Kirkland, Wash.

Filed Sep. 6, 1988, Ser. No. 240,820
Int. Cl.[5] A61L *2/04*
U.S. Cl. 422—26 17 Claims



1. A method of using at least one seal means for sealing a sterilization container system means, wherein said at least one seal means comprises a pair of anchor means and a belt means of shrinkable material having a pair of belt ends, wherein each of said anchor means is secured to a respective one of said belt ends;
wherein said sterilization container system means is for holding at least one object while said at least one object is being sterilized; wherein said sterilization container system means comprises a base means, a lid means and a gasket means adapted to provide a selectively releaseable seal between said base means and said lid means; wherein said base means has a bottom wall means, a pair of opposed side wall means extending upwardly from said bottom wall means, and a pair of opposed end wall means extending upwardly from said bottom wall means; wherein each of said side wall means includes an anchor engaging means for selectively engaging a respective one of said anchor means;
wherein said method comprises the steps of:
a. engaging a first one of said anchor means in a respective first one of said anchor engaging means;
b. passing said belt means across a top surface of said lid means of said sterilization container system means while said first one of said anchor means is engaged in said respective first one of said anchor engaging means;
c. engaging a second one of said anchor means in a respective second one of said anchor engaging means, while said first one of said anchor means is engaged in said respective first one of said anchor engaging means;
d. placing said sterilization container system means bearing said at least one seal means into a device for sterilizing said sterilization container system means and said at least one object;
e. exposing said sterilization container system means bearing said at least one seal means to at least one sterilizing means. within said device for sterilizing until said sterilization container system means and said at least one object is sterilized and until said belt means shrinks to the point that said at least one seal means urges said base means, said lid means and said gasket means firmly together to provide a selectively releaseable microorganism proof seal between said base means, said lid means and said gasket means to prevent microorganisms from entering an interior space of said sterilization container system means; and wherein said at least one sterilizing means within said device for sterilizing acts to sterilize said sterilization container system means and said at least one object and acts to simultaneously shrink said belt means of said at least one seal means.

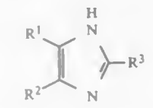
4,919,890

DRY TYPE ANALYSIS ELEMENT

Fuminori Arai, Saitama, and Fusae Osada, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 4, 1988, Ser. No. 177,287
Claims priority, application Japan, Apr. 2, 1987, 62-82061; Apr. 3, 1987, 62-82285
Int. Cl.[5] G01N *1/48*
U.S. Cl. 422—56 17 Claims

1. A dry type analysis element for detecting a specific constituent in a liquid which comprises a light-transmissive support having thereon at least one water-penetrative layer and at least one of said water-penetrative layer(s) containing a composition capable of interacting with said specific constituent in said liquid, wherein said composition contains salts of a leuco dye comprising at least one compound selected from the group consisting of compounds represented by formula (I)



(I)

wherein
R^1 represents a substituted or unsubstituted aryl group,
R^2 represents a substituted or unsubstituted alkyl group, and
R^3 represents a substituted or unsubstituted aryl group, said salts being salts of at least two acids
and said salts of said leuco dye being dissolved in a hydrophobic solvent to form a solution that is contained in said water-penetrative layer as a dispersion in a hydrophilic medium.

4,919,889

SAMPLE COLLECTION AND TRANSPORT FLUID COMPOSITION

Lynn A. Jones, Mountain View; Lloyd H. Smith, Davis, and Nelson N. H. Teng, Hillsborough, all of Calif., assignors to Aspen Diagnostics Corporation, Sunnyvale, Calif.

Filed Sep. 15, 1988, Ser. No. 244,984
Int. Cl.[5] B01J *11/18*, G01N *1/00*; A01N *1/02*
U.S. Cl. 422—40 16 Claims

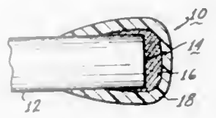
1. An aqueous solution for preserving sensitive proteins in human biological secretion samples consisting essentially of
(a) from 0.05 to 0.5 M of a buffer which is effective to maintain the solution pH within the range of from 6.5 to 8.0;
(b) from 0.1 to 10 wt. % of a non-immune animal protein selected from the group consisting of albumin, ovalbumin, casein, glycoprotein and mixtures thereof;
(c) from 40 to 2000 kallikrein units/mL of an enzyme inhibitor of trypsin, chymotrypsin, kallikrein or plasmin; and
(d) from 0.01 to 0.1 wt. % of a bacteriostatic agent.

4,919,891

SENSOR WITH OVERCOATING AND PROCESS FOR MAKING SAME

Masao Yafuso, El Toro; Henry K. Hui; Cheng F. Yan, both of Irvine, and William W. Miller, Santa Ana, all of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 853,460, Apr. 18, 1986, abandoned, and a continuation-in-part of Ser. No. 917,912, Oct. 10, 1986, Pat. No. 4,824,789, and a continuation-in-part of Ser. No. 917,913, Oct. 10, 1986, Pat. No. 4,798,738. This application May 15, 1987, Ser. No. 49,844
Int. Cl.[5] G01N *21/64*
U.S. Cl. 422—58 39 Claims



1. A sensor comprising a sensing element capable of sensing a component in an aqueous medium and an overcoating at least partially covering said sensing element, said overcoating comprising a water insoluble, component permeable cellulosic material cross-linked with one or more multi-functional cross-linking agents and an effective amount of an opaque agent.

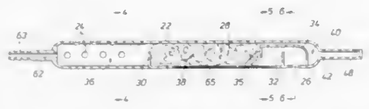
VOL 1113 ISS 4 AP 24 1990 UMI

4,919,892

APPARATUS FOR DETECTING OIL AND OTHER LIGHTER-THAN-WATER CONTAMINANTS IN AN EFFLUENT STREAM

Arnold D. Plumb, P.O. Box 35646, Tulsa, Okla. 74153

Continuation-in-part of Ser. No. 203,416, Jun. 7, 1988, Pat. No. 4,863,692. This application Jun. 22, 1989, Ser. No. 369,770
The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.
Int. Cl.[5] G01N *33/28*
U.S. Cl. 422—58 15 Claims



1. An apparatus for continuously detecting the presence of oil and other contaminants in an effluent stream passing through a pipeline comprising:

a housing having an inlet and an outlet;

oleophilic means supported within said housing and positioned so that at least a portion of the effluent stream enters said housing through said inlet and passes through said oleophilic means;

means for directing the flow of the effluent stream within said housing; and

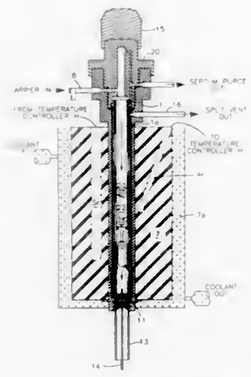
a tube having one end in fluid communication with the interior of said housing and having another end substantially restricted, said tube positioned to collect and display the presence of oil absorbed by said oleophilic means.

4,919,893

THERMAL EXTRACTION/PYROLYSIS GAS CHROMATOGRAPH

Eric L. Bandurski; Phach F. N. Vu, and Gary D. Bruce, all of Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed May 31, 1988, Ser. No. 201,132
Int. Cl.[5] G01N *31/12*
U.S. Cl. 422—78 2 Claims



1. A method for converting a nonthermal extraction pyrolysis gas chromatograph into a thermal extraction pyrolysis gas chromatograph,

the nonthermal extraction pyrolysis gas chromatograph comprising an inlet assembly with a sample flow path comprising an insert chamber for receiving a sample insert having a sample therein and flow defining means for directing flow of gas through the insert chamber to a gas chromatographic column, and the inlet assembly further comprising a heater for controlling the temperature of the inlet assembly,

the method comprising:

adapting a temperature control assembly for replacing the heater in the nonthermal extraction gas chromatograph and for receiving the insert chamber of the nonthermal extraction pyrolysis gas chromatograph without modifying the sample flow path of the nonthermal extraction pyrolysis gas chromatograph, the temperature control assembly comprising a furnace for controllably heating the sample insert to thermal extraction and pyrolysis temperatures and a cooling means for controlling the temperature of the inlet assembly and for returning the temperature of the inlet assembly to initial state conditions following use of the apparatus,

replacing the heater with the thus-adapted temperature control assembly, and

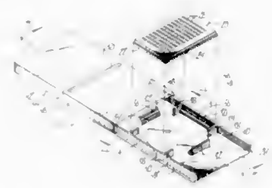
maintaining the sample flow path of the nonthermal extraction pyrolysis gas chromatograph substantially without modification.

4,919,894

MULTIPLE SAMPLE HOLDER INDEXING MEANS AND METHOD OF USING SAME

Robert Daniel, 805 NW. Greenwood, Ankeny, Iowa 50021

Filed May 23, 1988, Ser. No. 197,619
Int. Cl.[5] B01C *9/00*
U.S. Cl. 422—104 5 Claims



1. An indexing means for a sample container having multiple sample holders comprising:

a cover having a top and two opposite sidewalls extending downwardly from the top;

said cover sidewalls of a distance opposite one another to allow said cover to slide over a sample container having multiple sample holders;

a base plate having first and second sidewalls of a distance opposite one another narrower than the distance between said cover sidewalls, said second sidewalls wider than said sample container and allowing said cover to slide along said second sidewalls;

a pair of supports located on said base plate opposite each other, said supports of a height and distance from one another to support said sample container;

said supports having multiple stepped ledges so that said sample containers of various sizes can be supported;

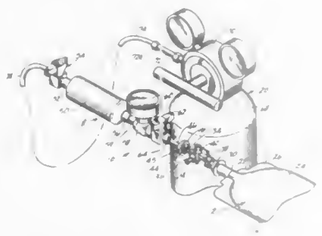
an opening within said top allowing access to at least a portion of said sample holders when said cover is placed over said sample container, so that said cover may slide back and forth over said sample container allowing selective covering of a portion of said sample holders while allowing access to another portion of said sample holders.

4,919,895

APPARATUS FOR OXYGENATION OF LIQUID STATE DISSOLVED OXYGEN-CARRYING FORMULATION

Charles M. Heldebrant, Arcadia; Kim C. Crowe, Northridge; George R. Groveman, Clairmont, and Charles H. Davis, Jr., Mission Viejo, all of Calif., assignors to Alpha Therapeutic Corporation, Los Angeles, Calif.

Division of Ser. No. 910,521, Sep. 23, 1986, Pat. No. 4,769,241.
This application Jun. 18, 1987, Ser. No. 64,344
Int. Cl.[5] A61M *37/00*
U.S. Cl. 422—129 14 Claims



1. An oxygenation system for the oxygenation of a perfluorocarbon emulsion formulation comprising:

(a) a sealed container having an interior chamber containing a perfluorocarbon emulsion formulation, the container having a sealed multi-purpose port;

(b) a three-way valve having one inlet and at least one outlet, with at least one outlet being connected to the multi purpose port of the container for communication with the interior chamber of the container;

(c) a filter having an inlet and an outlet, the outlet being connected to the inlet of the three-way valve; and

(d) a gas reservoir assembly including a gas reservoir of known volume for containing an oxygen-containing gas and having at least one port connected to the inlet of the filter.

4,919,896

MULTISTAGE CATALYTIC REACTOR SYSTEM FOR PRODUCTION OF HEAVY HYDROCARBONS

Mohsen N. Harandi, Lawrenceville; Hartley Owen, Belle Mead, and Samuel A. Tabak, Wenonah, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 137,913, Dec. 28, 1987, Pat. No. 4,788,366. This application Oct. 20, 1988, Ser. No. 260,348
Int. Cl.[5] B01J *8/04, 8/18*
U.S. Cl. 422—142 6 Claims

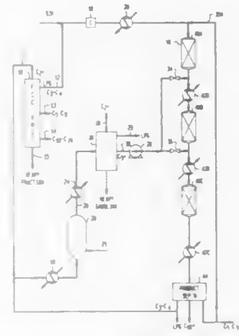
1. A multistage catalytic system for conversion of light olefinic gas feedstock to distillate range hydrocarbons rich in $C_{10}+$ aliphatics and alkylated aromatics, comprising:

(a) first reactor means for maintaining a fluidized bed of hydrocarbon conversion catalyst particles in a primary reaction stage in a turbulent reactor bed maintained under reaction severity conditions effective to convert a primary light olefin feedstream including means for passing hot feedstock vapor upwardly through the fluidized catalyst bed at reaction severity conditions sufficient to convert light olefins substantially to C_5+ hydrocarbons, including intermediate range olefins and aromatics;

(b) fractionation means operatively connected to receive effluent from the primary reaction stage for separating and recovering primary stage effluent to provide a liquid stream containing a major amount of said C_5+ hydrocarbons;

(c) second reactor means for contacting a secondary olefinic feedstream in a secondary catalytic reactor stage with oligomerization catalyst in a series of fixed catalyst bed high pressure reactors under distillate mode oligomerization conditions; and

(d) fluid handling means for mixing at least a portion of said liquid C_5+ stream recovered from the primary stage effluent with at least one hot inter-reactor stream containing partially upgraded olefins between at least two reactors of said series of fixed catalyst reactors in the secondary stage, thereby quenching said inter-reactor stream and coreacting said mixed stream containing partially upgraded olefins and intermediate primary stage hydrocarbons in at least one secondary stage reactor to provide distillate range hydrocarbon product.

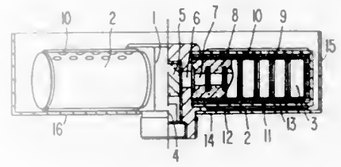


4,919,897

GAS GENERATOR FOR AIR BAG

Richard Bender, Lauf, and Gerrit Scheiderer, Furth, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisorf, Fed. Rep. of Germany

Filed May 23, 1988, Ser. No. 197,272
Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717249; Dec. 16, 1987, 3742656
Int. Cl.[5] B60R *21/26*
U.S. Cl. 422—165 9 Claims



1. A gas generator for an air bag, comprising a plurality of pressure tanks in communication with an igniter element wherein, after initiation of the igniter element, a gas-releasing material is burnt up in the pressure tanks and the gas flows through filter-covered apertures in the wall of the pressure tanks into an air bag inverted thereover, characterized in that at least two tubular pressure tanks are attached radially to a central member containing the igniter element, the gas-releasing material, in the form of stackable moldings in each tank, substantially fill out a tubular cross section of the tank and are arranged to form a columnar packing, and at least one gas channel is present in each columnar packing.

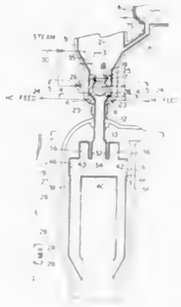
VOL 1113 ISS 4 AP 24 1990 UMI

4,919,898

PARTICULATE SOLIDS CRACKING APPARATUS

Robert J. Gartside, Wellesley, and Richard C. Norton, Boston, both of Mass., assignors to Stone & Webster Engineering Corp., Boston, Mass.

Division of Ser. No. 84,328, Aug. 11, 1987, Pat. No. 4,814,067. This application Sep. 12, 1988, Ser. No. 243,462
Int. Cl.[5] B01J *8/08*
U.S. Cl. 422—219 6 Claims



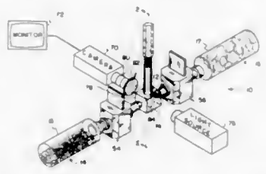
1. A cracking reactor comprising:
(a) centrally offset orifices for delivery of particulate solids to the reactor;
(b) at least two hydrocarbon feed inlet nozzles located in the reactor sidewall in the same plane;
(c) a centrally disposed plug member in the reactor for the particulate solids to flow around upon entry into the reactor, the bottom of which plug member is at the elevation at which the hydrocarbon feed nozzles are located; and
(d) a venturi shaped section between the solids orifices and the hydrocarbon feed inlets.

4,919,899

CRYSTAL GROWTH APPARATUS

Frederick T. Herrmann, 10006 Covington Dr., Huntsville, Ala. 35803, and Blair J. Herren, 109 9th Pl. N.E., Arab, Ala. 35016

Filed Feb. 29, 1988, Ser. No. 161,681
The portion of the term of this patent subsequent to Dec. 12, 2006, has been disclaimed.
Int. Cl.[5] C30B *35/00, 23/00, 29/54, 7/02*
U.S. Cl. 422—245 11 Claims



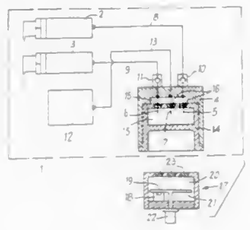
1. An apparatus for growing crystals comprising:
a sealable enclosure having first and second openings;
infinitely variable valve means coupled to said openings and disposed for controlling passage of gases therethrough;
fluid support means positioned in said enclosure, said fluid support means having a surface disposed for supporting a drop of fluid, said drop including a crystalline material dissolved therein;
a source of solvent vapor coupled via said valve means to said first opening, for selectively supplying solvent in a vapor phase to said drop, decreasing concentration of said dissolved crystalline material; and
a source of desiccant coupled via said valve means to said second opening, for selectively removing solvent in a vapor phase from said drop, increasing the concentration of said dissolved crystalline material.

4,919,900

SYSTEM FOR CRYSTAL GROWTH, PARTICULARLY FOR SPACE VESSEL

Gérard M. Martin, Valenciennes; Manuel P. Claramonte, Chaville; Jean-Claude Auffret, Chapet; Guy M. Bonnet, Poissy, and Jean-Jacques Delarue, Velizy Villa-Coublay, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

PCT No. PCT/FR88/00121, § 371 Date Oct. 3, 1988, § 102(e) Date Oct. 3, 1988, PCT Pub. No. WO88/06648, PCT Pub. Date Sep. 7, 1988
PCT Filed Mar. 3, 1988, Ser. No. 274,052
Claims priority, application France, Mar. 4, 1987, 87 02947
Int. Cl.[5] B01D *9/00*; C30G *29/54, 35/00*; C30B *7/00*
U.S. Cl. 422—245 18 Claims



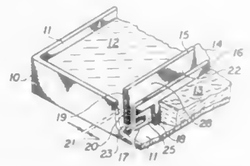
1. System of crystal growth by diffusion, in which a substance to be crystallized, contained in a crucible, is brought into the presence of a precipitating agent, comprising:
(a) at least one receptacle provided with first and second needles;
(b) supply means for a precipitating agent and connected to said first needle;
(c) evacuating means for said precipitating agent and connected to said second needle;
(d) at least one removable capsule having septa and enclosing at least one crucible for receiving a precipitating agent and a substance to be crystallized, said capsule being introduced into said receptacle in such a way that said first and second needles perforate said septa such that said supplying and evacuating means are so connected to the interior of said capsule via said first and second needles;
(e) a removable plug introduced into said receptacle in place of said capsule, said plug comprising a septa and a spongy body imbibed with precipitating agent, said septa and spongy body pierced by said first and second needles; and
(f) a first controllable obturator provided inside said capsule to selectively obturate said crucible to isolate contents from an interior cavity of said capsule, or to open said crucible and place the contents in communication with the cavity of the capsule.

4,919,901

BARRIER DESIGN FOR CRUCIBLES FOR SILICON DENDRITIC WEB GROWTH

Raymond G. Seidensticker, Forest Hills; Edgar L. Kochka, Greentree, and Charles S. Duncan, Penn Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 31, 1987, Ser. No. 140,071
Int. Cl.[5] C30B *35/00*
U.S. Cl. 422—249 20 Claims



1. A crucible for growing silicon dendritic web crystals, said crucible including a feed region and a growth region, said crucible further including a barrier separating said feed region from said growth region, said barrier comprising a primary and a secondary barrier, said secondary barrier being separated from, and substantially parallel to, said primary barrier, said primary and secondary barriers each including a flow opening through which liquid silicon may flow from said feed region to said growth region.

4,919,902

CATALYST FOR TREATMENT OF EXHAUST GASES FROM INTERNAL COMBUSTION ENGINES

Maureen L. Bricker, Buffalo Grove, and R. Joe Lawson, Palatine, both of Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 102,967, Sep. 30, 1987, Pat. No. 4,791,091. This application Nov. 9, 1988, Ser. No. 269,389
Int. Cl.[5] B01D *53/36*
U.S. Cl. 423—213.5 11 Claims

1. A process for the treatment of exhaust gases which comprises contacting said gases with a catalytic composite comprising a support which is a refractory inorganic oxide selected from the group consisting of alumina, silica, titania, zirconia, aluminosilicates and mixtures thereof, having dispersed thereon lanthanum oxide, the lanthanum oxide being dispersed on said support by the method of commingling a solution of a lanthanum salt with a hydrosol of the metal precursor of said support, forming particles from said lanthanum containing hydrosol, calcining said particles to form a particulate support containing lanthanum oxide, having an average crystallite size of less than 25 Angstroms, at least one other rare earth oxide and at least one noble metal component selected from the group consisting of platinum, palladium, rhodium, ruthenium and iridium.

4,919,903

METHOD OF CATALYTICALLY OXIDIZING METHANOL VAPOR ACCOMPANIED BY LITTLE OR NO EXCESS OXYGEN

Haren S. Gandhi, and Eugene C. Su, both of Farmington Hills, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 20, 1986, Ser. No. 921,027
Int. Cl.[5] B01D *53/36*
U.S. Cl. 423—213.5 8 Claims

1. A method of substantially completely catalytically oxidizing methanol vapor and/or formaldehyde vapor contained in a carrier gas heated to a temperature of 85°–200° C. and having excess oxygen in an amount less than 0.5% by weight of the stoichiometric oxygen required for complete oxidation of said methanol vapor, comprising the treatment of said gas mixture by means of a dispersed catalyst consisting of palladium and of (i) rhodium in a weight ratio of Rh/Pd of 0–0.3, and/or (ii) CeO_2 in a weight ratio of CeO_2/Pd of 0–50, said treatment converting at least 96% of the methanol to CO_2 and water vapor and yielding less than 1% of converted methanol as aldehydes.

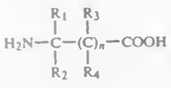
4,919,904

PRIMARY HINDERED AMINOACIDS FOR PROMOTED ACID GAS SCRUBBING PROCESS

Larry J. Shulik, Somerville; Guido Sartori; W. S. Winston Ho, both of Annandale; Warren Thaler, Flemington, and George E. Milliman, Fanwood, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 93,734, Sep. 8, 1987, Pat. No. 4,759,866, which is a continuation of Ser. No. 852,322, Apr. 15, 1986, abandoned. This application Apr. 11, 1988, Ser. No. 179,995
Int. Cl.[5] C01B *17/16, 31/20, 17/00*; C01C *3/00*
U.S. Cl. 423—225 12 Claims

1. A process for removing CO_2 and other acid gases from a normally gaseous mixture, which process comprises:
(a) contacting the normally gaseous mixture under absorption conditions with an aqueous scrubbing solution comprising:
(i) one or more alkali metal salts; and
(ii) as he sole sterically hindered amino compound acid gas absorption promoters, one or more primary sterically hindered aminoacids represented by the formula:



wherein R_1 and R_2 are independently selected from CH_3, C_2H_5, and C_3H_7; R_3 and R_4 are independently selected from hydrogen and CH_3; and n is 0, 2 or 3; and
(b) desorbing at least a portion of the absorbed CO_2 from the solution.

4,919,905

PROCESS FOR THE SYSTEMATIC TREATMENT OF EXHAUST GASES

Mitsuhiro Horaguchi; Shigechika Tomizawa, and Yuji Kaihara, all of Yokohama, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 913,476, Sep. 30, 1986, abandoned. This application Aug. 9, 1988, Ser. No. 230,700
Claims priority, application Japan, Sep. 30, 1985, 60-214468
Int. Cl.[5] B01J *21/04*; B01D *46/00, 53/04*
U.S. Cl. 423—239 7 Claims

1. A systematic process for purifying and treating exhaust gases containing acidic gases and dust which comprises the steps of

providing a filtering dust collector inclusive of a bag filter pre-coated with an auxiliary agent which forms a protective coating on said filter;

injecting a neutralizing absorbent into an exhaust gas containing acidic gas components and dust so as to fix said acidic gas components therein;

further injecting an auxiliary agent of the nature of said coated auxiliary agent into said exhaust gas subsequent to the injection of said neutralizing absorbent;

passing said exhaust gas containing said neutralizing absorbent and said auxiliary agent, through said precoated dust collector filter such that said neutralizing absorbent and auxiliary agent are deposited as a layer on said precoated filter whereby said fixed acidic gas components and dust, which are present in said exhaust gas, are collected on said filter as said exhaust gas is passed through and emitted from said filter; and

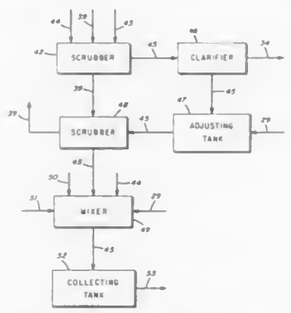
blowing ammonia into said filtered emission gas in the presence of a denitrating catalyst so that residual nitrogen oxides present in said filtered emission gas are reduced to nitrogen gas to produce a purified gas.

4,919,906

PROCESSES AND EQUIPMENT FOR PRODUCTION OF ELEMENTAL PHOSPHORUS AND THERMAL PHOSPHORIC ACID

James C. Barber, Florence, Ala., assignor to James C. Barber and Associates, Inc., Florence, Ala.

Filed Jun. 3, 1988, Ser. No. 201,747
Int. Cl.[5] C01B *25/01*
U.S. Cl. 423—323 **34 Claims**



1. A process for production of elemental phosphorus, said process comprised of the following steps:

(a) agglomerating phosphate ore by tumbling with binder formed by reacting acidic phosphorus compounds with alkaline substances;

(b) smelting agglomerated phosphate ore in step (a) with reducing carbon and silica in a submerged-arc electric furnace to generate a mixture of gases, said gas mixture containing carbon monoxide, hydrogen, and elemental phosphorus;

(c) cooling gases in step (b) by contacting said gases with water;

(d) collecting mixture of elemental phosphorus, phosphorus-containing solids, and water from step (c) in a sump;

(e) recycling water from step (d) to step (c);

(f) bleeding off a stream of water from step (e);

(g) removing phosphorus-containing solids from stream of water bled off in step (f);

(h) pumping mixture of elemental phosphorus and phosphorus-containing solids from said sump in step (d) to a tank having submerged pump in a well;

(i) pumping bottom layer to product storage;

(j) pumping phosphorus-containing solids from step (g) and step (i) to fluidizer;

(k) fluidizing mixture of phosphorus-containing solids in step (j);

(l) feeding fluidized mixture from step (k) to a burner;

(m) oxidizing mixture from step (l) to form phosphorus oxides;

(n) reacting phosphorus oxides in step (m) with water to form acidic phosphorus compounds; and

(o) pumping acidic phosphorus compounds in step (n) to step (a).

22. A process for upgrading phosphorus furnace feedstock, said process comprised of the following steps:

(a) mining phosphate ore;

(b) drying phosphate ore obtained in step (a);

(c) reacting acidic phosphorus compounds with alkaline substances to obtain a reaction product;

(d) drying reaction product prepared in step (c);

(e) mixing dried reaction product prepared in step (d) with phosphorus furnace feedstock; and

(f) smelting mixture prepared in step (e) in submerged arc electric furnace.

4,919,907

CRYSTALLINE GALLIOSILICATE WITH THE ZEOLITE L TYPE STRUCTURE

Mario L. Occelli, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 945,092, Dec. 22, 1986, abandoned. This application Nov. 22, 1988, Ser. No. 274,621
Int. Cl.[5] C01B *33/28*
U.S. Cl. 423—326 **18 Claims**

1. A crystalline, galliosilicate molecular sieve containing less than about 0.2 weight percent alumina having the following composition expressed in terms of oxide mole ratios in the anhydrous state:

$$Ga_2O_3{:}xSiO_2{:}yM_2O{:}zK_2O$$

where M is an alkali metal other than potassium, x equals at least 3.0, y equals 0 to 0.9, z equals 0.1 to 1.0 and y+z equals about 1.0, said crystalline galliosilicate molecular sieve having an X-ray powder diffraction pattern comprising at least the d-spacings set forth in Table 1.

4,919,908

CRYSTALLINE ALUMINOSILICATE AND A METHOD FOR ITS PREPARATION

Niels J. Blom, Hillerod, Denmark, assignor to Haldor Topsoe A/S, Denmark

Continuation of Ser. No. 102,141, Sep. 22, 1987, abandoned. This application Apr. 20, 1989, Ser. No. 341,231
Claims priority, application Denmark, Jan. 24, 1986, 374/86
Int. Cl.[5] B29C *53/00*
U.S. Cl. 423—328 **13 Claims**

1. A synthetic layered crystalline aluminosilicate comprising, when disregarding the presence of crystal water, the general formula expressed as moles of oxides ratios:

$$(M_{2/n}O)_x{\cdot}(SiO_2)_y{\cdot}(Al_2O_3)_z$$

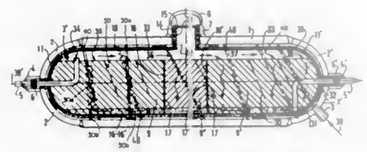
where M represents one or more n-valent cations selected from the group consisting of sodium, potassium, and any other cation capable of replacing sodium or potassium by ion-exchange, where the ratio y/z is between 15 and 300, where the ratio x/z is determined from the criterion of electron neutrality between anions and cations, and in which the structural aluminum is tetrahedrally coordinated in the crystalline framework, and where the aluminosilicate has an X-ray diffraction pattern which exhibits a sharp diffraction maximum at about 3.45 Å and a further diffraction maximum at about 3.65 Å, the intensity of the further diffraction maximum being not more than 80% of the first diffraction maximum.

4,919,909

REACTOR FOR CATALYTIC SYNTHESIS AND PROCESS FOR USING THE REACTOR

Pierre Lesur, Paris; Christian Faury, Vanves; Guy Lafleur, Les Essarts, and André Papillon, Saint-Maur-Des-Fosses, all of France, assignors to Societe Chimique de la Grande Paroisse, Paris, France

Continuation of Ser. No. 804,505, Dec. 4, 1985, abandoned. This application Jan. 7, 1988, Ser. No. 145,631
Int. Cl.[5] C01C *1/04*; B01J *8/02*
U.S. Cl. 423—360 **21 Claims**



1. A reactor for catalytic synthesis under pressure comprising:

an outer shell capable of being pressurized including a cylindrical wall with a main horizontal axis and having two hemispherical ends, and an inner shell concentric with said outer shell, defining an enclosed space for holding a catalyst;

a single layer catalyst concentric with said inner shell and within said enclosed space, an external surface of said inner shell being covered with and supported by compression resistant insulation in contact therewith, a space being located between an internal surface of said outer shell and the covered external surface of the inner shell, protective perforated ring supports concentric with said inner shell enclosing said inner shell and supporting said insulation, said protective perforated ring supports having openings for the passage therethrough of gases, and a helical baffle wrapped about said inner shell, and extending from one end of said inner shell to the other, defining a generally horizontally disposed helical flow path for gases between said inner and outer shells, said helical flow path including said openings in said perforated ring supports;

the outer shell and the inner shell being provided with means for introducing and withdrawing gas streams into said inner shell, located at the ends of the main horizontal axis of the reactor and facing each other on the hemispherical ends;

the inner shell being connected to a vertical pipe for filling and emptying the catalyst.

9. In a process for synthesizing a gas selected from the group consisting of ammonia and methanol in a catalytic reactor by passing reactive pressure gases through said reactor, the improvement comprising the steps of;

providing a reactor comprising a shell capable of being pressurized including a cylindrical wall with a main horizontal axis and having two hemispherical ends, and an inner shell concentric with said outer shell defining an enclosed space for holding a catalyst; a single catalyst concentric with said inner shell and within said enclosed space, an external surface of said inner shell being covered with and supported by compression resistant insulation in contact therewith, a space being located between an internal surface of said outer shell and the covered surface of the inner shell, protective ring supports concentric with said inner shell enclosing said inner shell and supporting said insulation, said protective ring supports having openings extending therethrough for the passage of gases, therethrough and a helical baffle wrapped about said inner shell and extending from one end of said inner shell to the other, defining a generally horizontally disposed helical flow path for gases between said inner and outer shells, said helical flow path including said openings of said ring supports; and

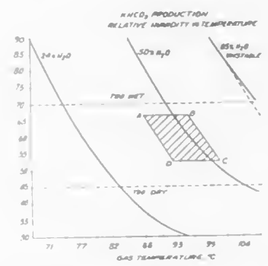
passing a protective gas along said generally horizontally disposed helical flow path and through said opening in said support rings to prevent overheating of said outer shell.

4,919,910

PROCESS FOR THE PRODUCTION OF POTASSIUM BICARBONATE

Andrew D. Kurtz, Somerville, and Anthony E. Winston, East Brunswick, both of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Filed Aug. 17, 1988, Ser. No. 233,330
Int. Cl.[5] C01D *7/10*
U.S. Cl. 423—422 **7 Claims**



1. A process for the production of substantially dry potassium bicarbonate, which process comprises feeding dry potassium carbonate into admixture with carbon dioxide gas and water vapor at rates so that the reaction zone has temperatures of from 70° to 110° C. and relative humidities of from 40% to 75% and reacting the potassium carbonate, carbon dioxide, and water vapor at atmospheric pressure, under turbulent mixing conditions, and in the substantial absence of liquid water to produce substantially dry bicarbonate product without the need for a separate drying step.

4,919,911

METHOD OF RECOVERING A LITHIUM CHLORIDE

Daigo Shirota; Masao Onori, both of Ichihara; Hiroyasu Yamato, and Norio Ogata, both of Sodegaura, all of Japan, assignors to Idemitsu Petrochemical Company Limited, Tokyo, Japan

Filed Dec. 16, 1988, Ser. No. 285,031
Claims priority, application Japan, Dec. 19, 1987, 62-322494; Nov. 1, 1988, 63-276745
Int. Cl.[5] C01D *3/04*; C08G *75/16*
U.S. Cl. 423—499 **10 Claims**

1. A method of recovering lithium chloride, comprising reacting a dihalogenated aromatic compound and an alkali metal sulfide and/or alkali metal hydrogen sulfide in a polar solvent in the presence of lithium chloride, separating a solvent insoluble component from the resultant reaction mixture to obtain a solution and calcinating a residue obtained by removing volatile substances from the solution.

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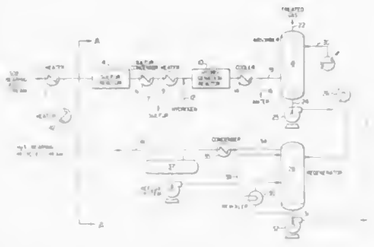
4,919,912

PROCESS FOR THE TREATMENT OF SULFUR CONTAINING GASES

George W. Taggart, Dallas; Lawrence T. Denk, Garland, and J. Michael Lawrence, Plano, all of Tex., assignors to Ford, Bacon & Davis Incorporated, Richardson, Tex.

Filed Oct. 18, 1985, Ser. No. 788,818
Int. Cl.[5] C01B *17/04*
U.S. Cl. 423—574 R 32 Claims



1. In the treatment of a feed gas stream containing sulfur dioxide in an amount in excess of the stoichiometric equivalent for the Claus reaction with hydrogen sulfide to produce elemental sulfur, the process comprising:

(a) passing said sulfur dioxide containing feed gas stream to a reaction zone for the production of elemental sulfur by the Claus reaction and an off-gas stream containing sulfur dioxide;

(b) passing said off-gas stream to a hydrogenation zone in which the sulfur dioxide in said off-gas stream is hydrogenated to produce hydrogen sulfide which is contained in an effluent gas stream from said hydrogenation zone;

(c) passing the effluent gas stream from said hydrogenation zone to a hydrolysis zone and within said hydrolysis zone hydrolyzing reduced sulfur values in said effluent stream to produce hydrogen sulfide;

(d) extracting hydrogen sulfide from said effluent gas to produce a hydrogen sulfide containing recycle stream which is distinct from said feed gas stream;

(e) passing said extracted hydrogen sulfide in said recycle stream to said reaction zone in addition to said feed gas stream; and

(f) concomitantly with step (e) continuing to pass said feed gas stream to said reaction zone, said feed gas stream continuing to contain sulfur dioxide in an amount in excess of the stoichiometric equivalent for the Claus reaction.

4,919,913

PROCESS FOR THE PRODUCTION OF SOLAR SILICON

Günter Kurz, Duesseldorf; Martin Abels, Krefeld; Ingo Schwirtlich, Krefeld, and Peter Woditsch, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Jul. 3, 1989, Ser. No. 375,281
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1988, 3824065
Int. Cl.[5] C01B *33/02*; C01F *3/00*
U.S. Cl. 423—348 9 Claims

1. In an improved process for the production of silicon by reacting aluminum with gaseous silicon compounds having the formula

$$SiH_nX_{4-n}$$

where X is halogen and n is a value from 0 to 3, the improvement comprising intensively contacting the molten surface of dispersed particles of pure aluminum or an Al-Si alloy with the gaseous silicon compound during the reaction.

4,919,914

REMOVAL OF HYDROGEN SULPHIDE FROM GASEOUS STREAMS

James W. Smith, Toronto; Robert A. Barton, Downsview, both of Canada, and Cyril H. Knight, deceased, late of Kleinburg, Canada (by Leslie James), assignors to 780863 Ontario Limited, Toronto, Canada

Continuation-in-part of Ser. No. 11,425, Feb. 3, 1987, abandoned, which is a continuation of Ser. No. 867,631, May 27, 1986, abandoned, which is a continuation of Ser. No. 573,389, Jan. 24, 1984, abandoned. This application Jul. 14, 1988, Ser. No. 218,924
Claims priority, application United Kingdom, Jan. 25, 1983, 8301968
Int. Cl.[5] B01D *53/36*; C01B *17/05, 17/10*
U.S. Cl. 423—576.2 10 Claims

1. A process for the removal of hydrogen sulphide from a hydrogen sulpide-containing gas stream which comprises:

continuously feeding the hydrogen sulphide-containing gas stream to a reaction zone in an agitated flotation cell containing an aqueous medium and a hydrogen sulphide-oxidizing catalyst which is chelated ferric hydroxide dissolved in the aqueous medium, said aqueous medium having a pH of about 7 to about 11.5 and a temperature of about 10° to about 80° C.,

continuously feeding an oxygen-containing gas stream to said reaction zone in said agitated flotation cell at a rate to provide at least sufficient oxygen to effect complete oxidation of the hydrogen sulphide in said hydrogen sulphide-containing gas stream to sulphur,

continuously distributing said gas streams in the aqueous medium at substantially the same submerged location as fine bubbles and permitting the bubbles to rise from said submerged location towards the upper surface of the aqueous medium while intimate contact between the hydrogen sulphide, catalyst and oxygen in the aqueous medium is achieved, so as to cause rapid catalytic oxidation of hydrogen sulphide during a residence time of less than about 2 seconds in the aqueous medium to form fine sulphur particles and formation of bubbles of hydrogen sulphide-depleted gas stream,

continuously transporting the fine sulphur particles to the upper surface of the aqueous medium by the rising of said bubbles of hydrogen sulphide-depleted gas stream so as to collect the fine sulphur particles on the surface of the aqueous medium, whereby the operations of hydrogen sulphide oxidation to sulphur and recovery of the sulphur so produced are both effected continuously in a single aqueous reaction medium contained in said agitated flotation cell from the hydrogen sulphide-containing gas stream and the oxygen-containing gas stream fed thereto, and

removing sulphur from the upper surface of the aqueous

4,919,915

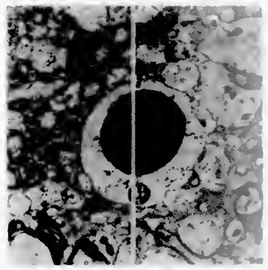
METHOD FOR DETECTING THE ABILITY TO PREVENT RED-TO-GREEN CONGOPHILIC BIREFRINGENCE

Paul Averback, 180, 4[e] Rang, St. Liguori, Quebec, Canada (J0K 2X0)

Continuation-in-part of Ser. No. 21,242, Mar. 3, 1987, Pat. No. 4,816,416, which is a continuation-in-part of Ser. No. 901,007, Aug. 27, 1986, abandoned. This application Feb. 27, 1989, Ser. No. 315,796
Int. Cl.[5] G01N *21/78*
U.S. Cl. 424—7.1 13 Claims

1. A method for detecting the ability of a compound to prevent red-to-green congophilic birefringence as a possible indication of the compound's ability to impede amyloid formation comprising the steps of

(i) contacting a compound with a reagent in a first sample, wherein the reagent consists essentially of dense microspheres which are derived from mammalian brain tissue and which, when disrupted, display red-to-green congophilic birefringence upon standing with Congo Red dye,



under conditions such that said dense microspheres are disrupted in said first sample; thereafter

(ii) staining a test material selected from the group consisting of the first sample or a portion thereof which contains at least some of the disrupted dense microspheres with Congo Red dye; and

(iii) detecting any development of red-to-green congophilic birefringence in the stained test material.

4,919,916

TREATMENT OF NEUROTRANSMITTER-LINKED DRUG ABUSE

Daniel H. Golwyn, 701 E. Semoran Blvd., Altamonte Springs, Fla. 32715

Continuation-in-part of Ser. No. 88,830, Aug. 24, 1987, Pat. No. 4,786,653. This application Nov. 21, 1988, Ser. No. 273,777
The portion of the term of this patent subsequent to Nov. 22, 2005, has been disclaimed.
Int. Cl.[5] A61K *27/00*
U.S. Cl. 424—10 5 Claims

1. A method of treating abusers of a drug likely to enhance neurotransmitter activity in the short term and to depress such activity over a longer term, comprising administering to them substantially daily an effective amount of a pharmacuetical composition comprising a phenylalkylhydrazine, for a minimum period of about several weeks to about a half dozen weeks.

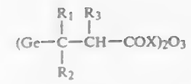
4,919,917

AGENT FOR REDUCING NEPHROTOXICITY CAUSED BY CYCLOSPORIN ADMINISTRATION

Norihiro Kakimoto, Machida; Kazuo Kumano, Yamato, and Kunie Nakamura, Sagamihara, all of Japan, assignors to Asai Germanium Research Institute Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1988, Ser. No. 261,406
Claims priority, application Japan, Oct. 29, 1987, 62-273746
Int. Cl.[5] A61K *31/28*
U.S. Cl. 424—10 6 Claims

1. A method for reducing the nephrotoxicity caused by cyclosporin adminstration, said method comprising administering to a mammalian organism in need of such treatment, an effective amount to reduce nephrotoxicity caused by cyclosporin administration of an organogermanium compound represented by the formula (I)



(I)

wherein R_1 to R_3 are each a hydrogen atom or a lower alkyl group which may be the same or different, or a phenyl group, and X is a hydroxyl group, a lower alkoxy group, an $—NH_2$ group of O^-Y^+ where Y is selected from the group consisting of a metal, lysozyme and a basic amino acid.

4,919,918

NON-ALCOHOLIC MOUTHWASH

B. Harrison Cole; Donald C. Kroeger, and Mark E. Wilson, all of Houston, Tex., assignors to Spectrum Consumer Products Co., Inc., Houston, Tex.

Filed Mar. 14, 1988, Ser. No. 167,504
Int. Cl.[5] A61K *9/16, 9/18, 9/46*
U.S. Cl. 424—44 8 Claims

1. A dry non-alcoholic mouthwash compound in tablet or in dry granular form adapted to be dissolved in water for cleaning and disinfecting an individual's mouth, teeth, gums and breath, comprising:

(a) at least one solid, pharmaceutically acceptable acid and at least one solid, pharmaceutically acceptable base, which are adapted to react to produce carbon dioxide when dissolved in water causing effervescence;

(b) about 38% by weight of at least one additive consisting of a volatile oil in spray-dried form for use as a flavoring agent;

(c) an effective amount of one or more of the following surface acting agents selected from a group consisting essentially of sodium laurylsulfate, sodium n-laurylsarcosinate, sodium alkylsulfoacetate, sulfocolaurate, sulfated monoglyceride, and sodium monoglyceride, the surface acting agent acting as a solvent in water to reduce surface tension between the additive and the water, to disperse the flavoring agent, and to render the use of alcohol in the mouthwash unnecessary.

4,919,919

NITROGLYCERIN SPRAY

Yukio Aouda, Tokyo; Hiroshi Ninomiya, Sayama; Genichi Izu, Saitama; Yuichi Yazawa, and Megumi Tachibana, both of Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1988, Ser. No. 244,487
Claims priority, application Japan, Sep. 30, 1987, 62-244259
Int. Cl.[5] A61K *9/08, 9/12, 9/72, 31/21*
U.S. Cl. 424—45 2 Claims

1. A nitroglycerin spray prepared by filling a solution having a pH of about 3.0 to about 6.0 and consisting essentially of the following components (a), (b) and (c) and substantially free from other components:

(a) about 0.5 to about 1 w/v %, based on the whole solution, of nitroglycerin,

(b) about 50 to about 70 v/v %, based on the whole solution, of ethanol, and

(c) the balance of water, into a container.

4,919,920

METHOD OF HARDENING AND STRENGTHENING KERATIN AND COMPOSITION

John B. Devos, 117 Lake St., Libertyville, Ill. 60048

Filed Mar. 15, 1989, Ser. No. 323,974
Int. Cl.[5] A61K *7/04, 33/16*
U.S. Cl. 424—61 35 Claims

10. An aqueous composition for hardening and strengthening a keratinized appendage of a mammal comprising a cosmetically-acceptable aqueous vehicle having dissolved therein

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a physiologically tolerable keratin hardening and strengthening agent including an effective amount of fluoride ion, the composition having a pH of about 3.5 to about 8.

4,919,921

COMPOSITIONS FOR TOPICAL USE HAVING MELANIN SYNTHESIS-INHIBITING ACTIVITY

Shinkichi Hatae, Onojo, Japan, assignor to Sansho Seiyaku Co., Ltd., Onojo, Japan

Filed Sep. 23, 1988, Ser. No. 248,684

Claims priority, application Japan, Sep. 25, 1987, 62-241965

Int. Cl.[5] A61K *7/48*

U.S. Cl. 424—62 **5 Claims**

1. A composition for topical use which has a melanin synthesis-inhibiting activity, comprising kojic acid or an ester of kojic acid and vitamin C or or a derivative of vitamin C.

4,919,922

POLYOLEFIN-TREATED PIGMENT AND COSMETICS CONTAINING THE SAME

Ryota Miyoshi, Yono; Isao Imai, Kuki, and Tadashi Sugaya, Iwatsuki, all of Japan, assignors to Miyoshi Kasei Co. Ltd., Urawa, Japan

Continuation of Ser. No. 146,670, Jan. 21, 1988, abandoned. This application Aug. 21, 1989, Ser. No. 396,822

Claims priority, application Japan, Jan. 21, 1987, 62-012044

Int. Cl.[5] A61K *7/021, 31/74;* **C08K** *9/00;* **C08J** *39/00*

U.S. Cl. 424—63 **4 Claims**

1. A surface-treated pigment having excellent spreadability and feeling, said pigment consisting essentially of pigment particles, wherein the surfaces of the pigment particles are coated with a coating consisting essentially of a polyolefin which contains —COOR groups, wherein R is a metal atom selected from the group consisting of Al, Mg, Ca, Zn, Zr and Ti, said polyolefin containing —COOR groups having a molecular weight in the range from 500 to 20,000, and an acid value in the range from 5 to 100, the amount of said polyolefin containing —COOR groups being in the range from 0.5 to 10% by weight based on the weight of pigment.

4,919,923

COSMETIC EMULSIONS HAVING IMPROVED FLOW BEHAVIOR

Horst Hoeffkes, Duesseldorf; Fritz Lange, Essen, and Achim Ansmann, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 112,798, Oct. 23, 1987. This application Jan. 5, 1989, Ser. No. 293,733

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, 3636256

Int. Cl.[5] A61K *7/06, 7/09, 7/48*

U.S. Cl. 424—70 **18 Claims**

1. An oil in water cosmetic emulsion comprising about 70 to about 99% by weight of aqueous phase and between about 0.5 and about 5.0% by weight, based on the total composition, of at least one dialkyl ether of the formula $R^1—O—R^2$, wherein R^1 and R^2 each are, independently, a linear or single-branch C_{6-22} alkyl.

4,919,924

USE OF THIOREDOXIN, THIOREDOXIN-DERIVED, OR THIOREDOXIN-LIKE DITHIOL PEPTIDES IN HAIR CARE PREPARATIONS

Vincent P. Pigiet, Winchester, Mass., assignor to Repligen Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 674,893, Nov. 26, 1984, abandoned. This application Aug. 28, 1985, Ser. No. 770,498

Int. Cl.[5] A61K *7/09*

U.S. Cl. 424—72 **9 Claims**

1. A composition of matter for waving, or straightening human hair which comprises a thioglycolic acid compound at a concentration of about 0.01M to about 0.2M, and thioredoxin or a thioredoxin-derived, or thioredoxin-like, dithiol peptide at a concentration of about 1 nmole/ml to about 100 nmole/ml.

4,919,925

DEODORANT, DEODORIZING COMPOSITE MATERIAL, DEODORIZING RESIN COMPOSITION, DEODORIZING RESIN ARTICLES AND DEODORIZING FOAM

Tsunehisa Ueda; Kouji Miyazaki, both of Kawasaki, and Tadao Natsuume, Yokosuka, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1988, Ser. No. 218,551

Claims priority, application Japan, Jul. 17, 1987, 62-178663; Sep. 11, 1987, 62-228052

Int. Cl.[5] A61L *2/16*

U.S. Cl. 424—76.1 **4 Claims**

1. A method for deodorizing malodorous components which comprises exposing the malodorous components or the atmosphere in which said malodorous components are present to a deodorant effective amount of an adduct of an alpha,beta-unsaturated dicarboxylic acid anhydride and an olefin or a derivative of said adduct as a deodorant active ingredient, said adduct being a Diels-Alder reaction product of an alpha,beta-unsaturated dicarboxylic acid anhydride and a diolefin hydrocarbon or an ene reaction product of an alpha,beta-unsaturated dicarboxylic acid anhydride and an olefinic hydrocarbon.

4,919,926

INSECT ATTRACTION PREVENTER

Yosuke Watanabe, Chiba; Yuji Kawakami, Kodaira; Koichiro Kikuchi, Tokorozawa; Yoshiyuki Ogawa, Chiba, and Hiroshi Sato, Funabashi, all of Japan, assignors to Ikari Corporation and Taisei Kako Co., Ltd., both of Tokyo, Japan

Filed Nov. 23, 1987, Ser. No. 124,082

Claims priority, application Japan, Nov. 27, 1986, 61-280873

Int. Cl.[5] A61K *31/78, 31/74;* **F21V** *19/00;* **B32B** *17/10*

U.S. Cl. 424—81 **10 Claims**

1. A method for preventing insect attraction, said method comprising

preventing attraction of insects to a light source by locating a transparent synthetic resin which contains a light shielding agent therein absorbing light in the range from 200 to 500 nm wavelength relative to the light source so that the light transmitted by the light sources passes through said synthetic resin and light having a wavelength of 200 to 500 nm is prevented from passing through said transparent synthetic resin by said light shielding agent thereby preventing the attraction of insects towards the light source.

4,919,927

PROCESS FOR THE POTENTIATION OF IMMUNOTOXINS

Pierre Casellas; Pierre Gros, both of Montpellier, and Franz Jansen, St Mathieu de Treviers, all of France, assignors to Sanofi, Paris, France

Continuation-in-part of Ser. No. 438,037, Nov. 1, 1982, Pat. No. 4,643,895. This application Aug. 31, 1988, Ser. No. 239,071

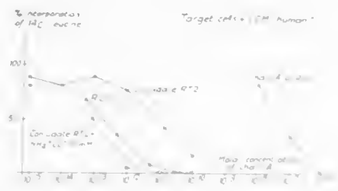
Claims priority, application France, Nov. 20, 1981, 81 21836

The portion of the term of this patent subsequent to Feb. 17, 2004, has been disclaimed.

Int. Cl.[5] A61K *39/395*

U.S. Cl. 424—85.91 **1 Claim**

1. In a process for preparing a composition comprising a conjugate of the chain A of ricin coupled by means of a disulfide bridge with an antibody directed against human T cells, the improvement comprises adding to said conjugate an amount of ammonium chloride effective to increase the cytotoxic activity of said conjugate.



4,919,928

CONJUGATES IN WHICH A MONOVALENT CARBOXYLIC IONOPHORE IS ASSOCIATED BY MEANS OF A COVALENT BOND WITH A MACROMOLECULE, THEIR USE AS IMMUNOTOXIN POTENTIATORS AND THE INTERMEDIATE ACTIVATED IONOPHORES

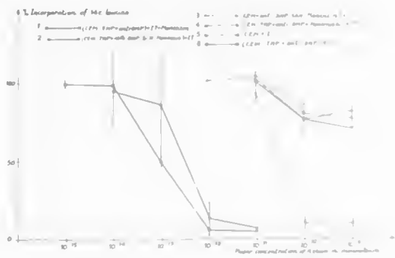
Franz Jansen, Castries, and Fierre Gros, Montpellier, both of France, assignors to Sanofi, Paris, France

Continuation of Ser. No. 733,660, May 13, 1985, abandoned. This application Apr. 6, 1987, Ser. No. 34,712

Claims priority, application France, May 23, 1984, 84 08073; Jul. 13, 1984, 84 11208

Int. Cl.[5] A61K *39/395, 39/39, 37/00*

U.S. Cl. 424—85.91 **27 Claims**



1. A conjugated which is an in vivo potentiator for immunotoxins and which comprises a monovalent carboxylic ionophore coupled by means of a covalent bond to a macromolecule.

4,919,929

MAMMAL IMMUNIZATION

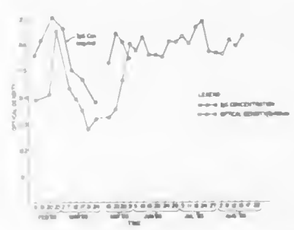
Lee R. Beck, Birmingham, Ala., assignor to Stolle Research & Development Corporation, Birmingham, Ala.

Continuation of Ser. No. 576,001, Feb. 1, 1984, abandoned. This application Sep. 17, 1986, Ser. No. 910,297

Int. Cl.[5] A61K *39/00*

U.S. Cl. 424—88 **14 Claims**

1. A method for providing milk having an elevated IgG antibody level comprising implanting intramuscularly or subcutaneously within a bovid mammal an antigenic substance in an amount effective to elicit a hyperimmunization response, said antigenic substance being incorporated within shaped microparticles of a biocompatible matrix material which causes controlled release of said antigen, thereby prolonging anti-



genic activity within said bovid mammal, and recovering milk having an elevated, higher than normal level of IgG antibody.

4,919,930

SYNTHETIC M PROTEINS-STREPTOCOCCI TYPE 5

Edwin H. Beachey, and James B. Dale, both of Memphis, Tenn., assignors to University of Tennessee Research Corporation, Knoxville, Tenn.

Continuation-in-part of Ser. No. 739,963, May 31, 1985, abandoned, and a continuation-in-part of Ser. No. 700,625, Feb. 12, 1985, Pat. No. 4,597,967, which is a division of Ser. No. 503,273, Jun. 10, 1983, Pat. No. 4,521,334. This application May 1, 1986, Ser. No. 858,436

Int. Cl.[5] A61K *39/09, 37/02;* **C07K** *7/08, 7/10*

U.S. Cl. 424—88 **28 Claims**

1. A synthetic polypeptide which elicits opsonobactericidal antibodies against pep M5 and which is not serologically cross-reactive with tissue antigens of the heart, which polypeptide has the amino acid sequence

X-Glu-Ala-Leu-Asp-Lys-Tyr-Glu-Leu-Glu-Asn-His-Y

wherein

X is Lys- or A-Val-Thr-B-Gly-Thr-Ile-C-Asp-Pro-Gln-D-Ala-Lys wherein

A is Ala or Thr,

B is Lys or Arg,

C is Asn or Ser, and

D is Ala or Arg; and

wherein

Y is

-Asp,

-Asp-Cys or

-Asp-Leu-Lys-Thr-E-Asn-Glu-Gly-Leu-Lys

wherein E is Asn or Lys.

4,919,931

METHOD FOR PRODUCING OSSEIN HYDROXYAPATITE COMPOUND

Thea Rosenberg née Göldner, Basel, Switzerland, assignor to Robapharm AG, Switzerland

Filed Feb. 5, 1987, Ser. No. 11,504

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1986, 3626414

Int. Cl.[5] A61K *35/32, 37/02*

U.S. Cl. 424—95 **5 Claims**

1. A method for producing an ossein hydroxyapatite compound comprising the steps of:

(a) crushing the bones of a mammal aged from prenatal to approximately 12 months old to produce bone particles of about 1 cm in size;

(b) acidifying said bone particles of step (a) to pH 5.0 to 5.5 with an acid;

(c) dehydrating and degreasing said acidified bone particles

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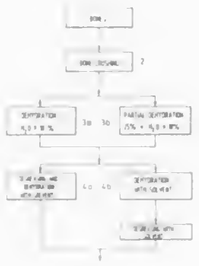
with a hydrophilic and lipophilic solvent to a residual water and residual fat content of about 5%;
(d) drying said dehydrated and degreased bone particles at reduced pressure at 20° to 80° C. to a solvent content of about 1%;



(e) pulverizing said bone particles to a particle size of about 50 to 300 micrometers; and
(f) sterilizing said bone particles such that an ossein hydroxyapatite compound is produced,
wherein said compound has the following dry substance analytical characteristics:

Organoleptic Test	Fine to slightly granular, beige-gray powder with faint natural odor
Identity	Calcium and phosphatase identified Collagen identified
Water Content	<7%
Total ash	51.3–62.7%
Calcium	19.2–23.6%
Phosphorus	8.9–10.9%
Collagen	23.4–28.6%
Non-collagenic Proteins/ Peptides	7.2–10.8%
Trace Elements	F, Na, K, Mg, Fe, Zn, Cu and Ni identified
Phosphatase Activity	0.5–15 mE/mg
Anomalous Toxicity	No signs of intolerance
Total Microbial Content	$<10^4$/g
Yeasts	$<10^2$/g
Enterobacteriaceae	$<10^2$/g
Specific Microbe Species	Absent/g

and said compound is characterized by the following biological activities:
(i) stimulation of DNA synthesis in osteoblasts, chondrocytes, and fibroblasts,
(ii) stimulation of protein synthesis in chondrocytes and fibroblasts,
(iii) selective stimulation in chondrocytes of collagen synthesis, as a fraction of total protein synthesis,
(iv) induction of the synthesis of proteins x and y in chondrocytes, and
(v) promotion of differentiation of non-specific mesenchymal cells to chondrocytes or osteoblasts.

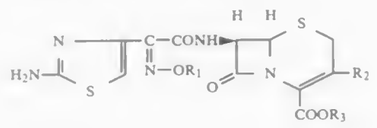
4,919,932

PHARMACEUTICAL FORMULATION FOR THE TREATMENT OF BACTERIAL INFECTIONS

Michael Limbert, Taunus; Elmar Schrinner, Wiesbaden, and Gerhard Seibert, Darmstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

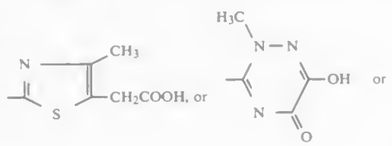
Filed Jun. 2, 1987, Ser. No. 56,712
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1986, 3618813
Int. Cl.[5] A61K *35/00, 31/345, 31/395*
U.S. Cl. 424—114 **2 Claims**

1. A pharmaceutical formulation having a synergistic antibacterial activity, comprising
(a) a cephalosporin derivative of the formula I

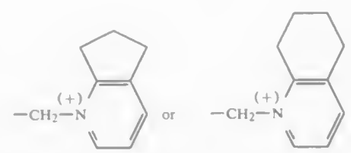


(I)

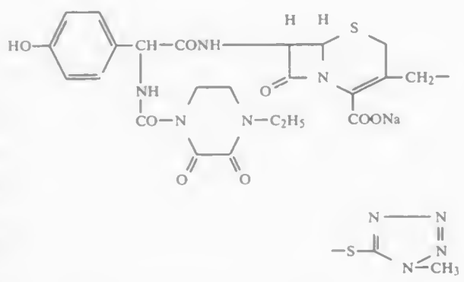
in which
R_1 can be C_1–C_4-alkyl and the =N—OR_1 group is in the synposition,
R_2 can have the meaning of acetoxymethyl, of —CH_2S—X, with x=



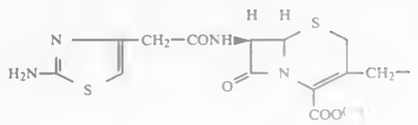
or

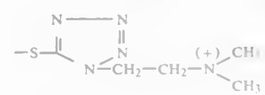


and
R_3 is hydrogen, a physiologically acceptable cation, a physiologically acceptable ester radical or, if the structure —CH_2—($^-$) appears in R_2, can represent a negative charge, or
(b) a cephalosporin derivative of the formula

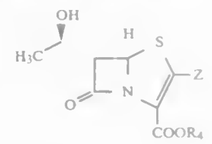


or
(c) a cephalosporin derivative of the formula



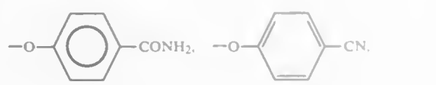


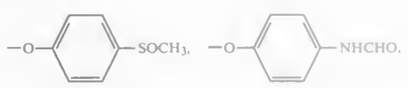
and
(d) a penem antibiotic of the formula II

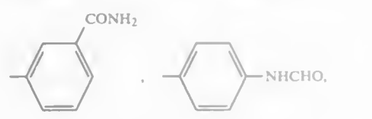


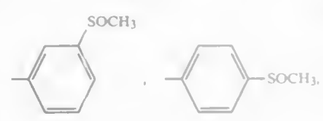
(II)

in which Z can be









—CH_2—O—$CONH_2$, —S—$(CH_2)_2$—O—$CONH_2$ or —S—$(CH_2)_3$—SO_2NH_2 and
R_4 can be a physiologically acceptable cation or a physiologically acceptable ester radical, and wherein the ratio of cephalosporin to penem antibiotic is between 1:9 and 9:1

4,919,933

METHOD FOR THE TREATMENT OF DENTAL DISEASE

Hae-chul Park; Young-cha Choi; Kyung-dong Park; Mi-ae Park, and Kyu-dong Park, all of 144-16, Wooam-dong, Chungju-si, Choongbuk-do, Rep. of Korea

Filed Nov. 10, 1988, Ser. No. 269,591
Int. Cl.[5] A61K *32/20, 35/04*
U.S. Cl. 424—196.1 **3 Claims**

1. A method of preventing inflammation and pain associated with dental disease in the oral cavity of a patient not suffering from disease in the oral cavity which exhibits inflammation and pain by topically applying to the teeth and associated areas within the oral cavity which may exhibit inflammation and pain an effective amount of a composition consisting essentially of pine resin and table salt in a ratio of about 1:1 to 5 parts by weight, respectively, and which is prepared by mixing pine resin and table salt in the ratio mentioned above, heating the above mixture while stirring, cooling the mixture to room temperature, and grinding the resulting solid to a powder form.

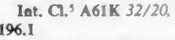
4,919,934

COSMETIC STICKS

George E. Deckner, Trumbull, and Rupali A. Kulkarni, Huntington, both of Conn., assignors to Richardson-Vicks Inc., Shelton, Conn.

Filed Mar. 2, 1989, Ser. No. 317,773
Int. Cl.[5] A61K *7/00, 7/32, 7/42, 7/44*
U.S. Cl. 424—401 **10 Claims**

1. A cosmetic stick composition comprising:
(a) from about 10% to about 50% of a wax-type solidifying agent selected from the group consisting of beeswax, spermaceti, carnauba, baysberry, candelilla, montan, ozokerite, ceresin, paraffin, hydrogenated castor oil, Fisher-Tropsch waxes, microcrystalline waxes, ethylene glycol diesters, triglyceride waxes and ethylene/vinyl acetate copolymers, and mixtures thereof;
(b) from about 5% to about 90% of one or more of a polyalphaolefin of the formula:



wherein R_1 and R_2 are independently C_{20} to C_{70} alkyl and wherein said polyalphaolefin has an average molecular weight of from about 300 to about 800 daltons and a viscosity of from about 2 to about 10 centistokes at 100° C.;
(c) from about 1% to about 40% of an active component selected from the group consisting of sunscreens, analgesics, moisturizers, antiperspirants and deodorants and mixtures thereof;
(d) from about 10% to about 50% of an emollient; and
(e) from about 0.01 to about 15% of an emulsifier.

4,919,935

INSECTICIDAL COMPOSITIONS

Silvia Dorn, Dielsdorf, Switzerland, assignor to R. Maag AG, Dielsdorf, Switzerland

Filed Sep. 15, 1988, Ser. No. 245,691
Claims priority, application Switzerland, Sep. 30, 1987, 3810/87
Int. Cl.[5] R01N *25/00*
U.S. Cl. 424—405 **7 Claims**

1. An insecticidal composition wherein the insecticidally active substances consist essentially of:
(a) ethyl[2-(4-phenoxyphenoxy)ethyl]carbamate and
(b) 2,3-isopropylidenedioxyphenyl methylcarbamate or 2-isopropoxyphenyl methylcarbamate or 2-(1,3-dioxolane-2-yl)phenyl methylcarbamate and, optionally, inert carrier material, and the weight ratio of component (a) to component (b) lies in the range of about 10:0.01 to 1:10.

4,919,936

FEEDS

Takefumi Iwanami, Kanagawa; Kiyoshi Maruta, Tokyo; Ichiya Murota, Kanagawa, and Hiroshi Miyazaki, Tokyo, all of Japan, assignors to The Calpis Food Industry Co., Ltd., Tokyo, Japan

Filed May 1, 1987, Ser. No. 44,477
Claims priority, application Japan, Feb. 25, 1987, 62-40097
Int. Cl.[5] A23K *1/17;* **C12R** *1/07*
U.S. Cl. 424—442 **2 Claims**

1. A method for increasing the weight gain in animals comprising feeding to said animals a food which is supplemented with an amount effective to increase the weight of a probiotic comprising a carrier and *Bacillus subtilis* C-3102 (FERM BP-1096).
2. A method for increasing the weight of eggs comprising

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feeding to laying hens a food which is supplemented with an effective amount to increase the weight of said eggs of a probiotic comprising a carrier and *Bacillus subtilis* C-3102 (FERM BP-1096).

4,919,937

PERCUTANEOUS ADMINISTRATION OF TAMOXIFEN

Pierre Mauvais-Jarvis, 12, Parc de Bearn, F-92210 Saint Cloud, and Frédérique Kuttenn, 6, Avenue des Gobelins, F-75008 Paris, both of France

PCT No. PCT/EP84/00436, § 371 Date Sep. 13, 1985, § 102(e) Date Sep. 13, 1985, PCT Pub. No. WO85/03228, PCT Pub. Date Aug. 1, 1985

PCT Filed Dec. 21, 1984, Ser. No. 777,786

Claims priority, application France, Jan. 20, 1984, 84 00927

Int. Cl.[5] A01N *33/02*; A61K *31/135*

U.S. Cl. 424—449 2 Claims

1. A method of treating conditions of the breast including the steps of:

forming an aqueous alcoholic gel in which the active ingredient consists of

1-[4-(2-N-dimethylaminoethoxy)phenyl]-1-(4-hydroxyphenyl)-2-phenylbut-1-(Z)-ene; and

administering percutaneously said aqueous alcoholic gel as an anti-estrogen drug to a breast.

4,919,938

SUSTAINED RELEASE PHARMACEUTICAL COMPOSITIONS IN ORAL DOSAGE FORM

Claire J. Lovegrove, Ware; David A. Rawlins, Tewin; Anthony J. Phillips, Little Hadham, and David A. Tainsh, Buntingford, all of England, assignors to Merck Sharp & Dohme Ltd., Hoddesdon, England

Continuation of Ser. No. 68,986, Jul. 1, 1987, abandoned. This application Oct. 4, 1989, Ser. No. 418,821

Claims priority, application United Kingdom, Jul. 9, 1986, 8616669

Int. Cl.[5] A61K *9/36, 9/16*

U.S. Cl. 424—480 3 Claims

1. A sustained release pharmaceutical composition in tablet form consisting essentially of:

(1) a core matrix containing 20% to 60% w/w of a hydroxypropylmethylcellulose gelling agent, the remainder of the core matrix containing 0.41% to 20% w/w of (+)-trans-1a,2,3,4a,5,6-hexahydro-9-hydroxy-4-(1-propyl)-4H-naphth[1,2-b]-1,4-oxazine hydrochloride and 2.08 to 12.5% w/w of buffering agent homogeneously dispersed therein, plus suitable pharmaceutically acceptable excipients; and

(2) A coating layer surrounding the core matrix, the coating being a slowly soluble, water permeable ethyl cellulose polymer.

4,919,939

PERIODONTAL DISEASE TREATMENT SYSTEM

Richard W. Baker, Palo Alto, Calif., assignor to Pharmetrix Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 856,961, Apr. 29, 1986, Pat. No. 4,780,320. This application Jul. 8, 1988, Ser. No. 216,802

Int. Cl.[5] A61L *15/03*

U.S. Cl. 424—493 47 Claims

1. A controlled drug delivery system for placement in a periodontal pocket, comprising:

(a) a plurality of discrete microparticles, between 10 and 500 microns in diameter, comprising a drug and a polymer containing said drug, wherein when said microparticles are placed in an environment of use, said drug is released at a controlled rate by a combination of diffusion of said drug through said polymer and erosion of said polymer; and

(b) a fluid suspending medium for said microparticles; said drug delivery system remaining active in the periodontal pocket for a period of between one and thirty days.

4,919,940

RUMINANT ANIMAL FEED SUPPLEMENT

Fred H. Wellons, Greensboro, N.C., assignor to CBP Resources, Inc., Greensboro, N.C.

Filed Nov. 16, 1988, Ser. No. 272,095

Int. Cl.[5] A23K *1/00*

U.S. Cl. 426—2 4 Claims

1. A process for supplying fatty acids containing at least 10 carbon atoms to ruminant animals while protecting the microorganisms in the animal's rumen from attack by the fatty acids comprising feeding highly saturated fatty acids to said animals in the form of triglycerides along with the dry matter content of said animal's feed, wherein said triglycerides are present in an amount effective to protect the microorganisms in the animals rumen from attack by the fatty acids and wherein the iodine value of said triglycerides is no greater than 25.

4,919,941

CHEWING GUM CONTAINING DELAYED RELEASE PROTEIN SWEETENER AND METHOD

Steven E. Zibell, Blue Island, Ill., assignor to Wm. Wrigley Jr. Company, Chicago, Ill.

Continuation-in-part of Ser. No. 134,948, Dec. 18, 1987, which is a continuation-in-part of Ser. No. 921,754, Oct. 22, 1986, abandoned. This application May 24, 1988, Ser. No. 198,138

Int. Cl.[5] A23G *3/30*

U.S. Cl. 426—5 25 Claims

1. A method of producing chewing gum containing a delayed release protein sweetener comprising the following steps:

forming an aqueous solution f gelatin and a protein sweetener selected from the group consisting of thaumatin and monellin as well as mixtures thereof, wherein the gelatin is present at between about 1 and about 60 percent by weight of the water;

drying said aqueous solution of protein sweetener and gelatin;

particle sizing said dried protein sweetener and gelatin to produce particles of a sweetener-containing gelatin matrix;

mixing a quantity of said sweetener-containing particles with a zein solution with a zein content between about 5 and about 50 percent by weight, the quantity of the zein solution being limited to that amount which will produce a damp mix which is dust free, non-flowing, and crumbly;

drying the damp mix;

particle sizing said dried mix to thereby obtain zein-coated sweetener-containing particles within a particle size range suitable for chewing gum; and

adding a quantity of said zein-coated sweetener-containing particles to a chewing gum formulation.

4,919,942

METHOD OF MANUFACTURING CHEESE

Douglas L. Willrett, Sioux Falls, S. Dak., and Michael Comotto, Green Bay, Wis., assignors to Nordica International, Inc., Sioux Falls, S. Dak.

Division of Ser. No. 52,254, May 20, 1987, Pat. No. 4,851,347. This application May 15, 1989, Ser. No. 351,214

Int. Cl.[5] A23C *19/02*

U.S. Cl. 426—38 2 Claims

1. A method of manufacturing cheese from ultrafiltration retentate having a solids content of from about 30% to about 40% comprising the steps of:

inoculating the retentate with a culture grown in a medium containing from about 15% to about 40% by weight of the following composition:

about 45% to about 50% carbohydrates not fermentable by the culture selected;

about 20% to about 40% milk protein sources;

about 2% to about 10% growth stimulant;

up to about 5% phosphate salts, citrate salts and mixtures thereof;

up to about 2% sodium chloride; and

up to about 1% stabilizer;

for a sufficient period of time to achieve a predetermined pH, and recovering a solid cheese.

4,919,943

PASTA FILATA-TYPE CHEESE PROCESS

Jeng-Jung Yee, and Rajagopalan Narasimhan, both of Green Bay, Wis., assignors to Schreiber Foods, Inc., Green Bay, Wis.

Filed Oct. 16, 1987, Ser. No. 109,821

Int. Cl.[5] A23C *9/14, 19/02*

U.S. Cl. 426—39 33 Claims

1. A process for making a pasta filata-type cheese with casein having bound calcium in the range from about 1000 mg to about 3000 mg per 100 g of casein and soluble proteins said process comprising the following steps:

(a) modifying soluble proteins to reduce reactivity of said proteins toward casein so as to produce modified soluble proteins, reactivity of said soluble proteins toward casein being reduced sufficiently to produce cheese having stringy structure and stretchy characteristics of pasta filata type cheese;

(b) combining said casein said modified soluble proteins and cheese ingredients which comprise fat to form a mixture;

(c) plasticizing the mixture to form said pasta filata-type cheese.

4,919,944

PROCESS FOR MANUFACTURING SOFT CHEESES

Guy Bussiere, Ramonville, and Jean Lablee, Mamirolle, both of France, assignors to Roquette Feres, Lestrem, France

Continuation of Ser. No. 942,581, Dec. 17, 1986, abandoned. This application Jan. 18, 1989, Ser. No. 298,303

Claims priority, application France, Dec. 17, 1985, 85 18688

The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.

Int. Cl.[5] A23C *19/05, 19/068*

U.S. Cl. 426—39 12 Claims

1. A process for manufacturing soft cheeses from milk wherein the milk is acidified in a reproducible and reliable manner for renneting, comprising the steps of:

providing a given volume of milk from which the soft cheese is to be prepared; p1 measuring the initial pH and the temperature of said milk;

selecting a period of time within which the pH of the milk will be brought from the initial pH to a renneting pH, said renneting pH being between 6.0 and 6.6 and said renneting pH being the required renneting pH for the type of soft cheese being manufactured;

acidifying the milk for renneting solely by adding an acidogen to the milk, said acidogen being selected from the group consisting of gluconolactones and glucoheptonolactones and said acidogen being added to the milk in an amount which is the minimum amount required to bring the initial pH of the milk to the renneting pH within the selected period of time, said minimum amount of acidogen being determined based on the kinetics of transformation of the acidogen at said temperature of the milk and as a function of the volume of the milk and the selected period of time, whereby the milk is acidified for renneting and brought from the initial pH to the renneting pH solely by the acidogen;

renneting the prepared milk by adding coagulating enzymes to the prepared milk; and then

coagulating;

forming; and

ripening.

4,919,945

USE OF AQUEOUS L-LYSINE SOLUTIONS FOR SUPPLEMENTING FEEDS AND INDISTRIALLY PRODUCED MIXED FEEDS WITH L-LYSINE

Manfred Spindler, Kurfürstenstrasse, and Herbert Tanner, Wildenstrasse, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 552,101, Nov. 16, 1983, abandoned. This application Feb. 16, 1988, Ser. No. 158,096

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1982, 3242501

Int. Cl.[5] A23K *1/00, 1/22*

U.S. Cl. 426—69 9 Claims

1. A method of supplementing feed with L-lysine without increasing the chloride content thereof, comprising the steps of:

(a) providing a mixed fodder; and

(b) supplementing said fodder with an effective amount sufficient to enhance the nutritional value thereof of an aqueous solution consisting essentially of free L-lysine in a concentration of between 30 and 80% by weight, whereby a supplemented fodder is produced.

4,919,946

EDIBLE FOOD PRODUCT

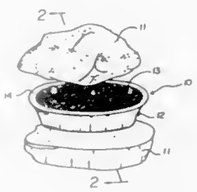
Toag S. Pak, and Tae S. Pak, both of Rt. 15, Box 115, Oak Grove Cir., Statesville, N.C. 28677

Filed Jun. 26, 1989, Ser. No. 371,036

The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.

Int. Cl.[5] A23L *1/00*

U.S. Cl. 426—89 16 Claims



1. A sandwich comprising:

two slices of bread, and

an edible container inserted between said two slices of bread, said edible container housing a food therein and structured to have a V-shaped configuration and contain an outward bent circumferential end edge disposed along the top and a plate bottom thereof for causing the edible container to tightly adhere to the inner surfaces of two slices of bread wherein the food is a food selected from the group consisting of noodles, hot dog, cooked vegetable, fresh salad, cooked or fresh mushroom, barbecue foods, fruit jam, gel butter, and a mixture thereof, whereby the food is contained in a sufficient quantity therein while at the same time it is prevented from falling from the sandwich.

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4,919,947

HIGH SOLIDS FILLING MATERIAL AND COMESTIBLE PRODUCT

David L. Barry, Lewisville; Mark L. Dreher, Highland Village; Alan A. Johnson, Irving, and Otto E. Schroeder, Dallas, all of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Continuation of Ser. No. 911,358, Sep. 25, 1986, Pat. No. 4,824,684. This application Jan. 5, 1989, Ser. No. 293,982

The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.

Int. Cl.[5] A21D *13/08;* A23G *3/00*

U.S. Cl. 426—94 14 Claims

1. A pumpable, edible filling composition comprising vegetable shortening and solid particles:

(a) said vegetable shortening making up from about 40% to about 60% by weight of said composition, said vegetable shortening having a Wiley melt point from about 90° F. to about 120° F. and a solid fat index from about 1% to about 6% at 92° F. and at 100° F.;

(b) said solid particles making up at least about 40% by weight of said composition, the solid particles comprising solids extender and solid flavoring material, the solids extender making up from about 10% to about 40% by weight of said composition; and said solid flavoring material making up from about 1% to about 50% by weight of said composition,

wherein substantially all of the solid particles of said composition have a particle size from about 20 microns to about 100 microns and are uniformly dispersed throughout the vegetable shortening.

4,919,948

PROLONGING THE SHELF LIFE OF FRESH ROOT VEGETABLES

Avigdor Orr, Highland Park; John O. Spingler, Plainsboro, and Seymour G. Gilbert, Piscataway, all of N.J., assignors to DNA Plant Technology Corporation, Cinnaminson, N.J.

Continuation of Ser. No. 930,503, Nov. 12, 1986, Pat. No. 4,808,420, which is a continuation of Ser. No. 650,776, Sep. 13, 1984, Pat. No. 4,670,275. This application Jan. 23, 1989, Ser. No. 300,871

The portion of the term of this patent subsequent to Jun. 2, 2004, has been disclaimed.

Int. Cl.[5] A23B *7/148*

U.S. Cl. 426—106 4 Claims

1. The product prepared by a process of maintaining a fresh root vegetable in viable form which comprises:

(a) peeling the surface of a fresh root vegetable having endogenous microflora present therein;

(b) providing the vegetable in uniform sized pieces,

(c) subjecting the vegetable having endogenous microflora present therein to elevated temperature and time conditions effective to reduce the endogenous microflora concentration in colony forming units (CFU)/g by a factor greater than 10^2 while maintaining the vegetable in a viable form and substantially maintaining the sensory qualities of color, taste and texture of the fresh root vegetable,

(d) rapidly cooling the heat treated vegetable to below about 25° C. in less than about two minutes,

(e) subjecting the vegetable to a vacuum of about 1 to about 12 inches Hg absolute for about 2 to about 10 minutes,

(f) breaking the vacuum in the presence of water,

(g) removing surface water from the vegetable, and

(h) providing the vegetable in a sealed container effective to prevent microbial recontamination of the vegetable and having a gas permeability effective to maintain the vegetable in a viable condition.

4,919,949

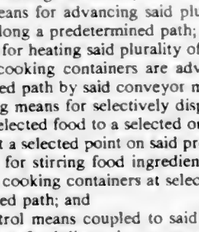
REFRIGERATED DOUGH CONTAINER

Joseph Miltz, Haifa, Israel; Robert A. Strange, Crystal, and Joseph C. McDilda, Brooklyn Park, both of Minn., assignors to The Pillsbury Co., Minneapolis, Minn.

Filed Oct. 6, 1988, Ser. No. 254,072

Int. Cl.[5] B65D *85/36*

U.S. Cl. 426—128 16 Claims



1. A food storage system for the storage and distribution of food products, said system comprising:

a thermoplastic tubular sidewall having a major first region and an integral second fracture region extending generally between opposite ends of said tubular sidewall said second fracture region having a tear initiation strength at least about 4 times greater than a tear propagation strength being operable to control the course of a fracture after initiation:

end closure means secured to said sidewall and closing said opposite ends of said tubular sidewall; and

a pressurized food product contained in said container.

4,919,950

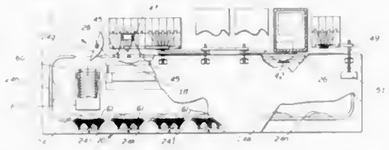
COMPUTER CONTROLLED, FULLY AUTOMATIC, SHORT-ORDER WOK COOKING SYSTEM FOR PREPARING STIR-FRIED CHINESE FOOD

Stephen M. Mak, Los Angeles, Calif., assignor to Larry B. Harvey, Los Angeles, Calif.

Filed Jul. 27, 1988, Ser. No. 224,740

Int. Cl.[5] A23L *1/01;* A47J *27/00*

U.S. Cl. 426—233 18 Claims



1. An apparatus for fully automatic cooking of short order meals comprising:

a plurality of cooking containers;

a conveyor means for advancing said plurality of cooking containers along a predetermined path;

heating means for heating said plurality of cooking containers as said cooking containers are advanced along said predetermined path by said conveyor means;

food dispensing means for selectively dispensing a selected amount of selected food to a selected one of said cooking containers at a selected point on said predetermined path;

stirring means for stirring food ingredients within selected ones of said cooking containers at selected points on said predetermined path; and

computer control means coupled to said conveyor means, heating means, food dispensing means and stirring means for controlling operation of each of said means according to an arbitrarily selected customer order selectively assigned to each one of said cooking containers as said cooking container is advanced along said predetermined path,

whereby cooked meals are automatically prepared according to a short order selection entered through said computer control means.

4,919,951

METHOD FOR THE HEAT CURING OF RAW MEAT PRODUCTS

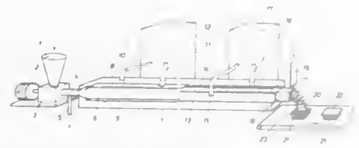
Hans C. S. Jensen, Vejle, and Henning Pedersen, Borkop, both of Denmark, assignors to Tulip Slagterierne A.M.B.A., Vejle, Denmark

PCT No. PCT/DK87/00119, § 371 Date Jun. 2, 1988, § 102(e) Date Jun. 2, 1988, PCT Pub. No. WO88/02222, PCT Pub. Date Apr. 7, 1988

PCT Filed Oct. 2, 1987, Ser. No. 203,087

Claims priority, application Denmark, Oct. 2, 1986, 4718/86

Int. Cl.[5] A23L *3/22*

U.S. Cl. 426—241 10 Claims

1. A method for heat curing a raw meat medium, the method comprising:

conveying the meat medium through a pipe, and

passing at least one electromagnetic field through the pipe into the meat medium, the electromagnetic field having a frequency of less than 300 MHz, whereby meat medium is heat cured.

4,919,952

PROCESS FOR THE PRODUCTION OF LIGHT COLORED FOOD GRADE PROTEIN AND DIETARY FIBRE FROM GRAINBY-PRODUCTS

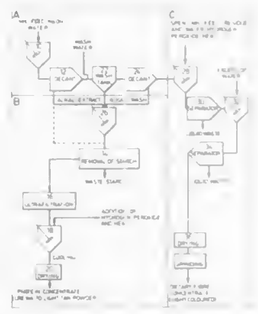
Gobind T. Sadaranganey, Mississauga; Wendy Zellen, Weston, and John Michaelides, Mannheim, all of Canada, assignors to Robin Hood Multifoods Inc., Rexdale, Canada

Continuation of Ser. No. 927,363, Nov. 6, 1986, abandoned. This application Feb. 8, 1989, Ser. No. 309,903

Claims priority, application Canada, Nov. 3, 1986, 522084

Int. Cl.[5] A21D *6/00;* A23L *1/277*

U.S. Cl. 426—254 10 Claims



1. An integrated process for preparing food grade bleached purified stable protein and dietary fibre concentrates from wheat millfeed comprising the steps of:

(a) mixing wheat millfeed of particle size less than 1680 μm with an alkali solution to produce a slurry with solvent-/millfeed ratio in the range of 7:1 to 10:1 v/w and having pH in the range of pH 9–11;

(b) separating the slurry to remove the alkali liquid to isolate alkali extract and form a millfeed residue;

(c) removing starch and fat from the alkali extract;

(d) ultrafiltration of the alkali extract to form a retantate using a semi-permeable membrane;

(e) bleaching the retantate by adding hydrogen peroxide and heating;

(f) cooling and drying the bleached retantate to provide a protein concentrate;

(g) adding water and 35–70% v/v hydrogen peroxide to said millfeed residue to produce a slurry;

(h) heating said slurry containing millfeed residue to a temperature of 50°–100° C.; and

(i) decanting liquid from the slurry and drying the residue to produce a dietary fibre concentrate.

4,919,953

PROCESS FOR PREPARING A ROOT VEGETABLE COATED AND FRIED FOOD PRODUCT

Peter Palmlin, and Marianne Rudberg, both of Helsingborg, Sweden, assignors to Nestec S.A., Vevey, Switzerland

Filed Mar. 9, 1989, Ser. No. 321,364

Claims priority, application European Pat. Off., Mar. 19, 1988, 88104427.5

Int. Cl.[5] A23L *1/214, 1/217, 1/314, 1/325*

U.S. Cl. 426—273 14 Claims

1. A process for preparing a frozen food product comprising pre-frying individual particles of fresh root vegetables to a moisture content of from 20% to 50% by weight based on the total weight of the pre-fried particles and then freezing the pre-fried particles, coating a foodstuff with an edible heat-settable adhesive fluid and then coating the adhesive-coated foodstuff with the frozen, pre-fried particles, frying the particles-coated foodstuff and then deep-freezing the fried, coated foodstuff.

4,919,954

COMPOSITIONS AND METHODS OF DECORATING FIRM-RINDED FRUIT

McShane James E., Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.

Filed Dec. 20, 1988, Ser. No. 287,196

Int. Cl.[5] A23L *1/27;* A23P *1/08*

U.S. Cl. 426—308 7 Claims

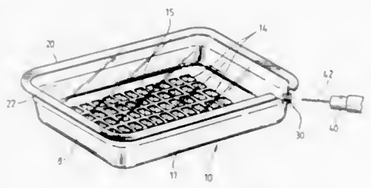
1. A method of decorating the outside surface of a firm-rinded fruit of vines of the genus Cucurbita with a non-toxic, peelable film of predetermined design which comprises the steps of (1) applying to substantially the entire outer surface of said fruit a first coating comprising a homogeneous colorant-free film-forming composition containing a film-forming amount of polyvinyl alcohol, a volatile solvent, a viscosity enhancing agent and at least one preservative; (2) allowing the volatile solvent to evaporate to form a first coating of a non-toxic peelable film on substantially the entire outer surface of said fruit; (3) applying to the surface of said first coating at least one homogeneous film-forming composition containing a film-forming amount of a polyvinyl alcohol, a plasticizer, a volatile solvent and an amount of a colorant or a mixture of colorants sufficient to mask the color of said fruit; and (4) allowing the solvent to evaporate thereby forming a non-toxic, peelable film of predetermined design on the first coating on the outer surface of said fruit.

4,919,955

METHOD FOR PACKAGING PERISHABLE PRODUCTS

Jerry L. Mitchell, P.O. Box 667, Livingston, Tex. 77351

Division of Ser. No. 94,384, Sep. 8, 1987, abandoned. This application Jun. 27, 1988, Ser. No. 214,195
Int. Cl.[5] B65B *31/04*
U.S. Cl. 426—394 12 Claims



1. A method for processing a perishable fresh meat product for controlled aging and subsequent presentation to the consumer, comprising the sequential steps of:
positioning the product on a gas impermeable package tray;
sealing said product on said tray in a non-inert atmosphere with a gas impermeable cover so as to form a gas tight package;
inserting an atmosphere exchange apparatus through a septum valve disposed in the tray
removing the non-inert gas from within the package through said valve disposed in said package;
filling the interior of the package through said valve with a first gas capable of forming an anaerobic atmosphere in said package;
aging said product in the anaerobic atmosphere in said package;
removing said first gas from said package though said valve;
filing the interior of said package with a second gas conducive to the formation of oxymyoglobin in said meat product;
maintaining said meat product in said package in said second gas for at least a time sufficient to product a bloom in said meat product;
removing said second gas from the package through said valve; and
freezing said product while in said package.

4,919,956

METHODS FOR DRYING HONEY AND MOLASSES

George F. Bateson, Roseville; Charles A. Morris, Brooklyn Park, and Glenn C. Heuer, St. Paul, all of Minn., assignors to Ogilvie Mills, Inc., Keokuk, Iowa

Filed Jan. 17, 1985, Ser. No. 692,609
Int. Cl.[5] A23P *1/12*
U.S. Cl. 426—465 9 Claims

1. A method for drying a liquid selected from the group consisting of liquid honey and liquid molasses, and liquid mixtures of at least one of liquid honey and liquid molasses with any one or more of a starch carrier, corn syrup in an amount of from up to 15% by weight of the total liquid mixture; hydroxylated lecithin up to about 3% by weight of the total liquid mixture; soya flour in an amount of up to about 15% by weight of the total liquid mixture; high fructose corn syrup in an amount up to about 33% by weight of the total liquid mixture; water in an amount of up to 20% by weight of the total liquid mixture, the method comprising extruding the liquid, without any substantial predrying thereof, in an extrusion dryer at a sufficient temperature to remove moisture from the liquid to yield a cooled, dried, low moisture product, and collecting the low moisture product.

4,919,957

METHOD FOR MAKING SHRIMP-SHAPED FOOD PRODUCTS

Horoji Ikeuchi, and Kiyoaki Ikeuchi, both of Akashi, Japan, assignors to Kabushiki Kaisha Ikeuchi Tekkosho, Akashi, Japan

Continuation-in-part of Ser. No. 75,575, Jul. 20, 1987, Pat. No. 4,748,039. This application May 5, 1988, Ser. No. 190,369
Claims priority, application Japan, Jan. 22, 1987, 62-13104; May 6, 1987, 62-111519
The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.
Int. Cl.[5] A23L *1/325;* A23P *1/00*
U.S. Cl. 426—513 4 Claims

1. A process for making a food product, comprising the steps of
1. combining edible material including ground fish meat;
2. molding said material to the shape of the torso of a shrimp;
3. cutting a continuous groove along the back of said torso and forming ridges on both sides of said groove; and
4. heating and solidifying said torso and swelling said ridges to cause said ridges to extend outwardly from said groove.

4,919,958

FLAN-TYPE PUDDING

Ranjit S. Kadan, New Orleans, and George M. Ziegler, Jr., Harahan, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 30, 1989, Ser. No. 303,328
The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.
Int. Cl.[5] A23C *9/154;* A23L *1/04, 1/187*
U.S. Cl. 426—573 16 Claims

1. An egg-free composition comprising a mixture of: milk, sweetener, rice flour, carrageenan, tetra potassium pyrophosphate, pectin, locust bean gum, and at least one material selected from the group consisting of cheese whey protein isolate and xanthane gum

4,919,959

METHOD OF PRODUCING A TEXTURIZED MATERIAL OF A MARINE PRODUCT FROM SURIMI OF THE SAME

Hideaki Hosaka, Fukuyama; Noboru Nakatani, Saeki; Kiyotaka Aoki, Hiroshima, and Koichi Shimaoka, Osaka, all of Japan, assignors to Ajikan Co. Ltd., Japan

Continuation of Ser. No. 14,714, Feb. 13, 1987, abandoned. This application Aug. 22, 1988, Ser. No. 235,718
Claims priority, application Japan, Feb. 17, 1986, 61-032553
Int. Cl.[5] A23L *1/325*
U.S. Cl. 426—574 1 Claim

1. A method of producing a texturized material of a marine product from surimi of the same, comprising the steps of:
pretreating said surimi by one of heat-treating said surimi, adding and mixing additional raw material to and into said surimi and subsequently heat-treating the resulting mixture, drying by means of dehydration said surimi so that the water content thereof is between 25 and 70 percent,

and gelling said surimi through the setting of the same, so as to form a pretreated material;
feeding to a twin-screw extruder at least one said pretreated material; and
pressurizing said at least one pretreated material under pressure of 7 to 30 kg/cm^2 while simultaneously heating said at least one pretreated material to a temperature of 150° to 190° C., by means of said twin-screw extruder, thereby processing it into a texturized material.

4,919,960

PROCESS OF MAKING A CARBONATED LIQUID DAIRY PRODUCT

Salah H. Ahmed, Elk Grove Village; John D. Kadlec, North Aurora, and Anthony J. Luksas, Downers Grove, all of Ill., assignors to Dairy Research, Inc., Rosemont, Ill.

Continuation-in-part of Ser. No. 94,304, Sep. 8, 1987, Pat. No. 4,804,552. This application Sep. 26, 1988, Ser. No. 248,742
The portion of the term of this patent subsequent to Feb. 14, 2006, has been disclaimed.
Int. Cl.[5] A23C *9/133, 9/14, 9/154*
U.S. Cl. 426—580 39 Claims

1. A method for carbonating a composition containing a liquid dairy product, to a high level of carbonation, while not destabilizing the composition, comprising:
(1) heating a composition containing a liquid dairy product within a temperature/time range of at least 160° F. for a time not in excess of 30 minutes to 200° F. for a time not in excess of 5 seconds and whereby the indigenous protein and ash in the liquid dairy product are at least partially denatured to form a buffer thereof;
(2) cooling the denatured composition to a temperature of less than 50° F.;
(3) subjecting the cooled composition to pressurized carbon dioxide at sufficient pressures and for a sufficient time such that the taste and mouth feel of the composition has substantially no taste and mouth feel of the liquid dairy product contained in the composition, provided that at least 1.5 volumes of carbon dioxide are dissolved in the carbonated composition;
(4) before, during or after either of steps 1, 2 or 3, adding to said composition an other liquid food ingredient; and
(5) packaging the carbonated composition in closed containers capable of retaining the said degree of carbonation;
and wherein the amount and extent of the heat denatured protein and ash in the carbonated composition is sufficient that the composition is buffered to a pH of at least about 3.8 and up to 5.7 and the carbonated composition is not destabilized.

4,919,961

LACTO-N-TETRAOSE CONTAINING FOOD-STUFF AND A PROCESS FOR ITS PREPARATION

Arne Lundblad, Bytaregatan, Sweden, assignor to Biocarb AB, Sweden

Filed Oct. 19, 1988, Ser. No. 259,745
Claims priority, application Sweden, Oct. 22, 1987, 8704115
Int. Cl.[5] A23C *9/13;* A23L *1/30*
U.S. Cl. 426—580 12 Claims

1. Food-stuff having added thereto Lacto-N-tetraose in an amount effective to stabilize bacterial flora in faeces, said lacto-N-tetraose being of syathetic origin or isolated from human milk, said food-stuff not being human milk.

4,919,962

COFFEE FLAKES AND PROCESS

Vijay K. Arora, Montvale, N.J.; Gary V. Jones, Bremen, Fed. Rep. of Germany; John M. Kovtun, Rahway, and Lawrence S. Brandlein, Englishtown, both of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 231,811, Aug. 12, 1988, abandoned. This application Sep. 22, 1988, Ser. No. 247,982
Int. Cl.[5] A23F *5/38*
U.S. Cl. 426—594 7 Claims

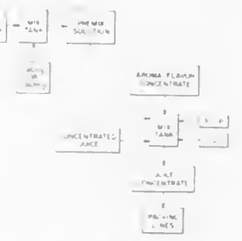
1. A method of forming a transparent, stable coffee glass comprising:
(a) preparing a mixture of 100% coffee derived solids comprising about 4%–12% water and 88% to less than 96% coffee solids, said mixture having a glass transition temperature of 30° C. to 80° C.;
(b) heating the mixture to a temperature of 60° C. to 130° C.;
(c) blending to form a uniform and homogeneous mixture;
(d) forcing said mixture through a restricted area to shape it;
(e) pulling the mixture at a rate of speed greater than the shaped mixture exits the restricted area to stretch and cool the mixture to form a thin, continuous, homogeneous, solid, transparent, film of coffee glass exhibiting luster on both the top and bottom surface of the film;
(f) breaking the film; and
(g) recovering the broken film at a stable moisture content of 6% water or less.
7 The product produced by the process of claim 1.

4,919,963

METHOD OF PREPARING FRUIT JUICE BEVERAGES AND JUICE CONCENTRATES NUTRITIONALLY SUPPLEMENTED WITH CALCIUM

David C. Heckert, Oxford, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 860,607, May 7, 1986, Pat. No. 4,722,847. This application Dec. 11, 1987, Ser. No. 131,956
Int. Cl.[5] A23L *2/02*
U.S. Cl. 426—599 19 Claims



1 A method for preparing a calcium-supplemented fruit juice product which comprises the steps of:
(a) forming an at least meta-stable aqueous premix solution of solubilized calcium comprising:
(i) from about 0.05 to about 0.26% by finished, single-strength fruit juice product weight, solubilized calcium, wherein the source of said solubilized calcium is selected from the group consisting of calcium carbonate, calcium oxide and calcium hydroxide;
(ii) from about 0.4 to about 4.0% by finished, single-strength fruit juice product weight, of an acid component consisting essentially of citric acid and malic acid in a weight ratio of from about 5:95 to about 90:10; and
(iii) water; and
(b) combining said premix solution of solubilized calcium with fruit juice material comprising concentrated fruit juice having a sugar content from about 20° to 80° Brix, to provide a finished, single-strength, calcium supplemented fruit juice product having: (1) at least about 45% fruit

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juice; and (2) a sugar content of from about 2° to about 16° Brix.

4,919,964

SHELF STABLE, HIGHLY AERATED REDUCED CALORIE FOOD PRODUCTS

Keith D. Adams; Dana P. Gruenbacher, and Kathleen H. Noble, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 22, 1988, Ser. No. 288,846
Int. Cl.[5] A23D *3/00, 5/00*
U.S. Cl. 426—564 21 Claims

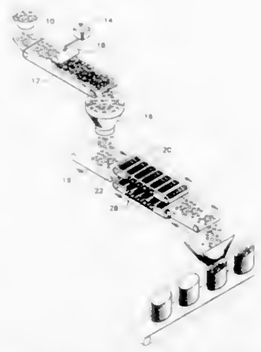
1. A fatty composition comprising:
(a) at least about 20% by weight fat substitute selected from the group consisting of sugar fatty acid polyesters and sugar alcohol fatty acid polyesters, and mixtures thereof, wherein the sugars and sugar alcohols contain from 4 to 8 hydroxyl groups, wherein the polyesters contain at least four fatty acid ester groups, and wherein each fatty acid group has from about 2 to about 24 carbon atoms;
(b) not more than about 80% by weight fatty composition ingredients selected from the group consisting of triglyceride fats, fat substitutes other than the sugar fatty acid polyesters and sugar alcohol fatty acid polyesters of part (a) hereinabove, emulsifiers, flavorings, colorings, anti-spattering agents, anti-sticking agents, anti-oxidants, an mixtures thereof;
(c) wherein the fatty composition additionally comprises from about 25% to about 75% by volume edible gas dispersed uniformly in the fatty composition; and
(d) wherein the fat substitute of part (a) hereinabove has a viscosity of at least about 0.5 poise at 100° F. (37.8° C.) after 10 minutes of steady shear at a shear rate of 10 seconds^{-1}, and a liquid/solid stability at 100° F. (37.8° C.) of at least about 30%.

4,919,965

METHOD OF TOASTING SLICES OF POTATO AND OTHER PRODUCE

Melvin D. Childers, Jr., 7112 Baltusrol La., Charlotte, N.C. 28210

Filed Nov. 21, 1988, Ser. No. 273,980
Int. Cl.[5] A23L *1/217*
U.S. Cl. 426—615 10 Claims



1. A process of preparing toasted slices of agricultural produce to produce in a single cooking step a crisp chip snack food product essentially free of added oils and fats and directly edible without further preparation which consists essentially of the steps of:
washing raw agricultural produce,
slicing the washed raw agricultural produce into thin slices,
applying seasoning to the thin slices of raw agricultural produce and allowing the seasoning to dwell on the raw slices for a sufficient period of time to allow it to be absorbed into the raw slices, and
cooking the seasoned raw slices under heat and pressure imposed between an opposing pair of heated cooking surfaces so as to drive out moisture from the slices and toast the slices.

4,919,966

COVERING SUCH AS A GLOVE, CONDOM OR SHEATH FOR INHIBITING THE SPREAD OF CONTAGIOUS DISEASES AND METHODS OF MAKING AND USING THE SAME

Robin R. T. Shlenker, 2165 E. Alameda Ave., Denver, Colo. 80209

Continuation-in-part of Ser. No. 74,679, Jul. 17, 1987, Pat. No. 4,771,482. This application Jan. 13, 1988, Ser. No. 143,184
Int. Cl.[5] A01N *1/02;* **A41D** *19/00*
U.S. Cl. 427—2 86 Claims

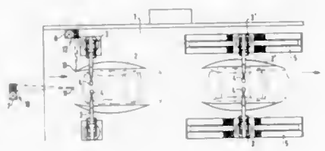
44. A method of making a covering for inhibiting the spread of a contagious disease comprising the steps of:
providing a layer of sponge-like material possessing a plurality of chambers numbering at least two hundred and wherein the volume of substantially each chamber is less than two cubic millimeters;
providing a sterilizing fluid capable of substantially immediately sterilizing the microbes causing the disease;
applying the sterilizing fluid to the sponge-like material layer such that the sterilizing fluid is contained with the chambers; and
sealing the surfaces of the sponge-like material layer to substantially retain the sterilizing fluid within the sponge-like material layer.

4,919,967

METHOD AND APPARATUS FOR COATING PARTS IN SERIES

Heinz Handke, Gemmrigheim; Thomas Zink, Stuttgart, and Vasilios Sougioltzis, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to Behr Industrieanlagen GmbH & Co., Ingersheim, Fed. Rep. of Germany

Filed Jun. 30, 1988, Ser. No. 213,351
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1987, 3722734
Int. Cl.[5] B05D *1/04, 5/02, 12/08*
U.S. Cl. 427—8 10 Claims



1. A method for serially coating parts moved along a predetermined path in a stationary spray booth including an adjustable spraying device, the method comprising the steps of moving a first part through the spray booth; measuring the distance between a point in the spray booth and a point on the first part to establish a first reference distance; storing the first reference distance value in a processing program of an operation controlling a computer as a standard first reference distance; moving the first part out of the spray booth; moving a second like part through the spray booth (1); remeasuring the first reference distance between the point in the spray booth and the point on the second part by measuring the time lapse between the emission and reception of a signal reflected by the second part; comparing positional deviations between the remeasured first reference distance value and the stored first reference value; and adjusting the spraying device for optimum coating of the part in response to the compared positional deviations.

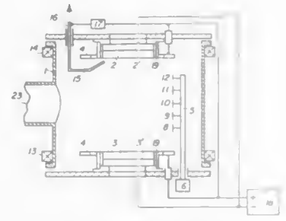
8. A coating apparatus for serially coating parts moved along a predetermined path, said apparatus comprising: a stationary spray booth; conveyor means for moving a part through said spray booth along a predetermined path; at least one adjustable spraying device disposed in said spray booth and supplied with coating material for automatically depositing the coating material on the part; means for establishing a predetermined reference distance between a point on a first part and a point in said spray booth; and characterized by including comparator means for remeasuring said predetermined reference distance between a second and successive parts and said spray booth by measuring the time lapse between the emission and reception of a signal reflected by the second and each successive part and comparing positional deviations between said remeasured reference distance and said predetermined reference distance, and adjusting said spraying device for optimum coating of the second and each successive part in response to said deviations.

4,919,968

METHOD AND APPARATUS FOR VACUUM VAPOR DEPOSITION

Rainer Buhl, Sargans, Switzerland, and Christof Peyer, Schaan, Liechtenstein, assignors to Balzers Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Mar. 2, 1988, Ser. No. 163,296
Claims priority, application Switzerland, Mar. 6, 1987, 00841/87
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—37 8 Claims



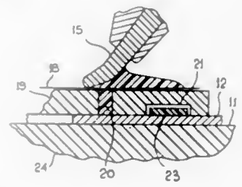
1. A method for vacuum coating a substrate, comprising the steps of:
generating a first evaporation by at least one electric arc discharge between an anode and a cathode in a vacuum chamber, said electric arc discharge evaporating material comprising a metal from the cathode, at least one arc spot moving along a surface of said cathode;
exposing said substrate to a vapor comprising at least a part of said material evaporated from said cathode; and,
reducing the occurrence of emitted droplets at said at least one moving arc spot by
generating a second evaporation of a material during the generation of said first evaporation,
coating said surface of said cathode with a coating comprising said material evaporated by said second evaporation, said coating of said surface being disruptable by said electric arc,
so as to prevent said electric arc from directly hitting material of which said cathode is made as said arc spot moves along said cathode surface.

4,919,969

METHOD OF MANUFACTURING A SEAL

Robin A. Walker, Tewkesbury, England, assignor to Dowty Seals Limited, England

Filed Mar. 26, 1987, Ser. No. 30,888
Claims priority, application United Kingdom, Apr. 1, 1986, 8607976
Int. Cl.[5] B05D *5/12, 1/32, 3/02*
U.S. Cl. 427—58 6 Claims



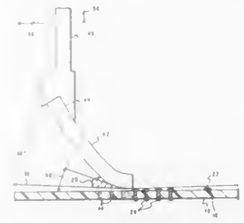
1. A method of manufacturing a seal which includes at least a first and a subsequent layer of seal material, which method comprises:
(a) printing the first layer of seal material onto a substrate using a stencil;
(b) printing the subsequent layer of seal material onto the substrate using a further stencil; and
(c) curing, at least partially, the first and the subsequent layer of seal material printed onto the substrate;
wherein the further stencil has a recess pattern formed in a surface thereof which co-operates with the substrate so as to accommodate the first layer of seal material printed onto the substrate.

4,919,970

SOLDER DEPOSITION CONTROL

Karl G. Hoebener, Georgetown, and John J. Stankus, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 15, 1986, Ser. No. 907,265
Int. Cl.[5] B05D *5/12*
U.S. Cl. 427—96 7 Claims



1. A single step process for depositing solder through a mask, using a resilient blade, onto pads for surface mountable components and into plated through holes for leaded compo-

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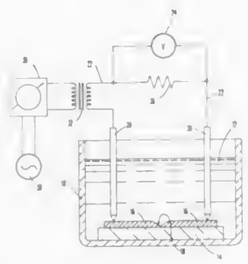
nents said pads and plated through holes being provided on and in a printed circuit substrate, comprising the steps of:
controlling the amount of solder deposited on the surface mount lands as a function of mask thickness; and
simultaneously and independently controlling the amount of solder deposited into the plated through holes as a function of the hardness of the blade and an angle between the blade and mask surface.

4,919,971
SELF-INDUCED REPAIRING OF CONDUCTOR LINES

Chengjun J. Chen, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 23, 1988, Ser. No. 248,889
Int. Cl.[5] B05D *5/12*
U.S. Cl. 427—98 26 Claims



1. A method for repairing partially defective conductor lines, wherein said defect is formed by thinning of a portion of said line, comprising the steps of,
selectively heating at least one partially defective site in said conductor line by passing a high current, and,
inducing deposition of a conductive material at said partially defective site, thereby repairing said conductor line.

4,919,972
PROCESS FOR SURFACE MODIFICATION OF POLYMER ARTICLES

Neal Conrad, Trenton; Michael T. Burchill, Cranbury; Joseph Silbermann, Old Bridge; Thomas Hoffman, Brick, all of N.J., and Maurice Bourrel, Pau, France, assignors to M & T Chemicals Inc., Woodbridge, N.J.

Continuation-in-part of Ser. No. 945,595, Dec. 23, 1986, Pat. No. 4,770,905. This application Jul. 28, 1988, Ser. No. 225,448
Int. Cl.[5] B05D *5/00*
U.S. Cl. 427—160 18 Claims

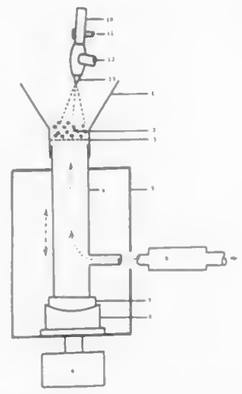
1. A modifier composition for incorporating a modifier ingredient into the surface region of a resinous article, consisting essentially of:
(a) about 1–60% by weight of a U.V. stabilizer dissolved in,
(b) a resin-swellable organic solvent, and
(c) about 0.1–6% by weight of a surfactant additive.

15. A process according to claim **14** wherein said liquid is water present as an upper layer, and said modifier composition is present as a lower layer, wherein said modifier composition is pumped from said lower layer into said upper layer and directed onto the surface of said article which is immersed in said upper layer whereby said modifier ingredient is incorporated into the contacted surface.

4,919,973
COATING APPARATUS FOR SMALL-SCALE PROCESSING

M. Hayat Alkan, Chicago, and Michael J. Groves, Lincolnshire, both of Ill., assignors to Board of Trustees of the University of Illinois, Chicago, Ill.

Filed Oct. 16, 1987, Ser. No. 109,229
Int. Cl.[5] B05D *1/22*
U.S. Cl. 427—213 3 Claims



1. In a method for coating variously shaped particles and comprising the steps of:
fluidizing said particles,
spraying coating materials onto said particles to form coated particles, and
subjecting said particles to gas flow to dry said coated particles,
the improvement comprising:
the step of fluidizing said particles solely through application of vibratory energy of varying amplitude and frequency, and
the step of directing downwardly said gas flow to dry said coated particles.

4,919,974
MAKING DIAMOND COMPOSITE COATED CUTTING TOOLS

Robert C. McCune, Birmingham, and Ronald J. Baird, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 12, 1989, Ser. No. 296,263
Int. Cl.[5] C23G *16/00*
U.S. Cl. 427—249 22 Claims

1. A method of making a composite coated article by the steps of:
(a) initiating chemical vapor deposition of separated diamond or diamond-like particles onto a nondiamond or nondiamond-like substrate surface by use of low pressure metastable deposition of carbon in the presence of atomic hydrogen and at a temperature that favors the nucleation of such particles, the substrate being selected to facilitate such diamond or diamond-like deposition and to retain its strength related properties after said chemical vapor deposition;
(b) substantially suppressing nucleation of additional particles before formation of a contiguous film of said particles while permitting the existing particles to grow to a predetermined maximum crystal size consistent with separated crystals; and
(c) adhering a mechanically tough diamond and substrate-wetting, metal binding material onto and across said separated particles and exposed substrate surface to form the

composite coated article with little or no graphitization or dissolution of said particles.

4,919,975
METHOD OF PRODUCING A PAINTED MARBLEIZED FINISH ON AN EXPOSED SURFACE

Evan W. Jones, Surfside, assignor to BPMF, Inc., Miami, Fla.

Filed Dec. 3, 1987, Ser. No. 128,232
Int. Cl.[5] B05D *5/00, 1/28, 1/36*
U.S. Cl. 427—260 12 Claims

1. A method of producing a painted marbleized finish on an exposed surface such as a wall or a ceiling, said method comprising the steps of:
(a) preparing the exposed surface by at least insuring that the exposed surface is substantially clean and free of contaminants;
(b) placing a supply of base coat paint on an outer applicator surface of a hand-held applicator;
(c) applying the base coat paint by forming a plurality of overlapping application marks of the base coat paint on the exposed surface by patting the applicator surface of the applicator repeatedly over at least one designated portion of the exposed surface;
(d) placing a supply of an accent coat paint of a different, contrasting color than the base coat paint on the same applicator and while the applied base coat paint is still wet on the exposed surface, applying the accent coat paint by forming a plurality of application marks of the accent coat over the base coat paint on the on designated portion of the exposed surface;
(e) positioning the application marks of the accent coat in spaced relation to one another;
(f) subsequently patting the exposed surface within the designated portion with the applicator surface of the applicator and thereby performing an initial blending of the plurality of application marks of the accent coat toward one another from their original spaced apart locations until each of the plurality of application marks of the accent coat is blended into one another and is substantially indistinguishable from one another;
(g) performing a subsequent blending of the accent coat into the still wet base coat by continuously patting the applied accent coat with the applicator surface and allowing small portions of the base coat as well as small quantities of the accent coat to be viewable through the blended exposed surface; and
(h) performing a final blending of the accent coat into the base coat by additional continuous patting by the applicator surface of the accent coat and base coat until a desired depth of color having a painted marbleized finish in appearance is achieved over the one designated portion of the exposed surface.

4,919,976
INSULATING ADHESIVE TAPE COMPOSITION AND COMPOSITES THEREOF

Frank C. Cesare, Woodbury; Robert G. Davis, and William D. Sigworth, both of Naugatuck, all of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Continuation of Ser. No. 88,495, Aug. 17, 1987, abandoned, which is a continuation of Ser. No. 769,208, Aug. 23, 1985, abandoned. This application May 8, 1989, Ser. No. 348,840
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—373 9 Claims

1. A method of insulating a plurality of rigid panels which are subjected to a high temperature paint treatment, said method comprising the steps of:
adhering to said plurality of rigid panels an uncured insulating tape composed of (a) a major amount of an ethylene/-propylene nonconjugated polyene terpolymer having a number average molecular weight of between about 500 and about 14,000 (b) between about 0.5 and about 5.0 parts by weight of curative, based upon the weight of said terpolymer, (c) between 0.1 and about 10.0 parts be weight of a blowing agent based upon the weight of said terpolymer, and (d) between 0 and about 200 parts by weight of a filter based upon the total weight of said terpolymer, to form an uncured insulated composite;
conveying said uncured insulated composite into said high temperature paint treatment;
heating said uncured insulated composite at temperatures high enough to activate said curative;
curing and adhering said uncured insulating tape to said plurality of rigid panels, to form a cured composition; and
cooling said plurality of rigid panels.

4,919,977
COATING METHOD

Takakazu Yamane; Yoshio Tanimoto; Tadamitsu Nakahama; Makoto Aizawa, and Tsuneo Kishimoto, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 153,669, Feb. 8, 1988, abandoned. This application Mar. 15, 1989, Ser. No. 323,237
Claims priority, application Japan, Feb. 10, 1987, 62-27390; Feb. 10, 1987, 62-27392; Feb. 10, 1987, 62-27393; Feb. 13, 1987, 62-29873; Apr. 1, 1987, 62-77528
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—379 59 Claims

1. A coating method for coating a vehicle body in a coating line, comprising:
a first step of spraying an intercoating paint containing a volatilizable solvent over a surface of an undercoated vehicle body to form an intercoat layer thereon, wherein the intercoating paint is sprayed so that the intercoat layer has a film thickness which is greater than a thickness at which intercoating paint sags at least on a surface of the undercoated vehicle body extending in a substantially vertical direction;
a second step of drying the intercoat layer formed in the first

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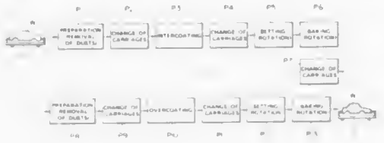
step, the second step comprising sequential setting and baking steps wherein the vehicle body is held at a first ambient temperature during the setting step and a second ambient temperature during the baking step, wherein the first ambient temperature is lower than the second ambient temperature, wherein the vehicle body is rotated about its substantially horizontal axis, and wherein the



rotation of the vehicle body is carried out at least in the setting step at a speed which is high enough to rotate the body before the paint coated thereon substantially sags due to gravity yet which is low enough so as to cause no sagging as a result of centrifugal force;

a third step of spraying an overcoating paint over said intercoat layer to form an overcoat layer; and

a fourth step of drying said overcoat layer.

4,919,978

PRODUCTION OF FIBER COMPOSITES

Matthias Winkler, Lenningen; Peter Ittemann, and Hans G. Matthies, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 16, 1988, Ser. No. 285,746

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1987, 3742833

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—381 5 Claims

1. A process for producing a unidirectionally or multiaxially reinforced fiber composite by impregnating parallel reinforcing fibers with a solution of a thermoplastic polymer in an organic solvent, evaporating the solvent, and making up, which comprises employing the reinforcing fibers in the form of a woven fabric in which the parallel reinforcing fibers are held together by thermoplastic filament yarns and subsequently passing this woven fabric through a bath containing from 0 to 50% by weight of a thermoplastic and from 100 to 50% by weight of a solvent for the thermoplastic.

4,919,979

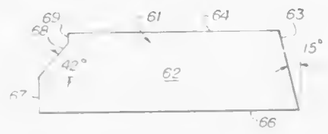
COMPACTED BALE

Peter Gardella, San Francisco, Calif., and Kevin L. Wood, West Linn, Oreg., assignors to Norcal Solid Waste Systems, Inc., San Francisco, Calif.

Division of Ser. No. 848,031, Apr. 3, 1986, Pat. No. 4,729,304. This application Aug. 14, 1987, Ser. No. 85,364

Int. Cl.[5] B30B *15/06, 15/32*

U.S. Cl. 428—2 3 Claims



1. A bale of compacted material of substantially rectangular transverse cross-section having parallel sides and parallel top and bottom, a forward end inclined upwardly-rearwardly and a rearward end have a vertical lower stretch extending upward from the bottom about half the height of said bale, an upwardly-forwardly inclined stretch above said lower stretch and a short vertical stretch above said inclined stretch.

4,919,980

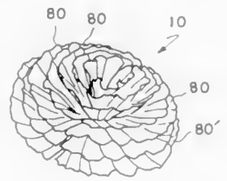
DECORATIVE ORNAMENT AND METHOD OF MAKING SAME

Arla Pirkey, 105 Bond St., Travis Air Force Base, Calif. 94535-1514

Filed Sep. 19, 1988, Ser. No. 245,678

Int. Cl.[5] D04D *7/10*

U.S. Cl. 428—4 7 Claims



1. A method of making a decorative ornament from an elongated continuous loop of sheet material, comprising;

(a) collapsing said elongated continuous loop of sheet material laterally to form a narrow continuous loop;

(b) imparting a 180 degree twist and coiling at least once said narrow continuous loop to form a plurality of coiled concentric loops;

(c) twisting said coiled concentric loops about a central point;

(d) affixing a tying member to affix said central point of said coiled concentric loops to a backing sheet; and

(e) cutting the distal ends of said coiled concentric loops to form a plurality of radially extending folds.

4,919,981

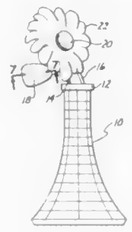
ARTIFICIAL HORTICULTURAL PRODUCT AIR FRESHENER

John Levey, and Idelle B. Levey, both of 4059 Mariner's Cir., Westlake Village, Calif. 91361

Filed Jul. 21, 1989, Ser. No. 383,855

Int. Cl.[5] A41G *1/00;* **B65D** *1/04*

U.S. Cl. 428—26 12 Claims



1. An artificial horticultural product air freshener combination comprising:

(a) a first outer vessel, said first vessel being in the form of a vase having a base portion from which upwardly and inwardly tapers a neck portion which neck portion defines an open passageway, said passageway having a predetermined diameter and open at its upper extremity;

(b) a second inner vessel, said second vessel being closed at its bottom and having a lower portion and an upper portion, said second vessel being disposable within the first vessel and having an outer diameter for its upper portion which is less than said predetermined diameter of the passageway defined by the neck portion of said first vessel, said second vessel containing a volatile fluid, the vapor of which, when allowed to dissipate into the atmosphere, produces a desired olfactory effect, said second vessel having an opening at the top of its upper portion and a removable first closure for said opening;

(c) a second orificed closure to replace the first closure upon its removal;

(d) a decorative artificial horticultural product, said product including a sponge-like element, said element having an opening into its interior; and

(e) an elongated wick, said wick being in a form simulating a plant or leaf stem, one end of said wick being removably insertable in said opening in said element and the other end of said wick being passed through the orifice in the second closure to extend down through the said opening in the second vessel and into contact with the fluid container therein.

4,919,982

THREE DIMENSIONAL TOY STRUCTURE

George K. C. Hayes, 2308 Schader Dr. #218, Santa Monica, Calif. 90404

Filed May 12, 1989, Ser. No. 351,089

Int. Cl.[5] B65D *5/00*

U.S. Cl. 428—34.2 11 Claims

1. A foldable structure in which children play comprising:

(a) a single blank having a plurality of score and reverse score lines for folding therealong to define foldable flaps,

(b) a bottom panel having a single thickness with first foldable flaps along score lines on either side such that when said flaps are folded onto said bottom panel they double the thickness of said panel,

(c) a rear panel having a single thickness with second foldable flaps along score and reverse score lines such that when said second flaps are folded onto said rear panel it will treble the thickness of said rear panel,

(d) a first tab extending from and foldable onto said rear panel to form a slot therein,

(e) a front panel having a pair of side panels extending therefrom and foldable along score lines,

(f) a second tab extending from one end of said front panel and foldable along score lines,

(g) means for latching together the top edges of the front and rear panels by inserting said second tab into said slot,

(h) said single blank having an ornamental design such that when said front and rear panels are latched together, said side panels are folded to form a structure for a child to play inside.

4,919,983

THERMOCHROMATIC INFANT FEEDING CONTAINER

Kit C. Fremin, 25652 Rimgate #2G, El Toro, Calif. 92630

Filed Apr. 4, 1988, Ser. No. 177,144

Int. Cl.[5] A61J *9/02;* **G01K** *11/12*

U.S. Cl. 428—35.7 12 Claims

1. A thermochromatic infant feeding container changing color in the presence of heat comprising,

a cylindrically shaped container body formed by blow molding having an opening on one end with threads formed integrally therewith in such a manner as to receive a threaded cap,

said body synthesized of a thermoplastic material having the characteristics of allowing light to be transmitted therethrough permitting the level of any contents to be visually observed, and

said body having the thermoplastic material including a thermochromatic microcapsular composition relating to from 5 to 10 percent, by weight, of said thermoplastic material, formulated such that the container undergoes a distinct change in color at a temperature range from between 36 degrees celsius and 38 degrees celsius, with a first color below this thermochromatic transition and a second visually different color thereabove providing a conspicuous indication to one feeding an infant the temperature of the contents are not in excess of the human temperature zone of comfort.

4,919,984

MULTILAYER PLASTIC CONTAINER

Yoshitsugu Maruhashi; Tamio Asai; Setsuko Iida, all of Yokohama, and Sadao Hirata, Kamakura, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 93,130, Sep. 2, 1987, abandoned, which is a continuation of Ser. No. 746,026, Jun. 18, 1985, abandoned. This application Oct. 7, 1988, Ser. No. 256,146

Claims priority, application Japan, Jun. 21, 1984, 59-126371; Apr. 30, 1985, 60-91128

Int. Cl.[5] B65D *81/26;* **B32B** *27/14*

U.S. Cl. 428—36.4 16 Claims

1. A multilayer plastic container for packaging formed of a coextruded laminate comprising a gas-barrier layer containing

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an ethylene/vinyl alcohol copolymer and inner and outer surface layers of a moisture-resistant thermoplastic resin provided so as to sandwich the gas-barrier layer, said laminate further comprising intermediary layers between the gas-barrier layer and each of said moisture-resistant resin layers, each said intermediary layer containing from about 2 to 40% by weight, based on the total weight of said layer, of particles of cross-linked polyacrylic acid or its salt as a highly water-absorbing resin dispersed in a thermoformable thermoplastic resin medium wherein the highly water-absorbing resin is essentially water-insoluble and has the ability to absorb 20 to 1000 times its own weight of water.

4,919,985

COATED STYRENE RESIN CONTAINER AND PROCESS FOR PRODUCTION THEREOF

Tamio Asai, and Yoshitsugu Maruhashi, both of Yokohama, Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

PCT No. PCT/JP88/00041, § 371 Date Sep. 22, 1988, § 102(e) Date Sep. 22, 1988, PCT Pub. No. WO88/05409, PCT Pub. Date Jul. 28, 1988

PCT Filed Jan. 21, 1988, Ser. No. 294,637

Claims priority, application Japan, Jan. 22, 1988, 62-11243

Int. Cl.[5] B65D *23/08;* B05D *3/00*

U.S. Cl. 428—36.6 **6 Claims**

1. A coated styrene resin container comprising a container body composed of a styrene resin and having applied to at least one surface of the container body, a coated layer of a vinylidene chloride resin, the vinylidene chloride resin coated layer being composed of a copolymer containing 96 to 70 mole % of vinylidene chloride units, 3 to 30 mole % of vinyl chloride units and 3 to 20 mole % of lower alkyl acrylate or methacrylate units based on the three components, and the coated layer being intimately bonded to the container body via a layer of an oxidation product of the styrene resin which has O_{1S} peaks at a bond energy of 532.5 to 533.6 eV when measured by X-ray photoelectron spectroscopy.

4,919,986

PLASTIC SUCTION CUP ARRANGEMENT FOR LAMINATD GLASS PANE REPAIR

Kurt Lay, and Erwin Sailer, Alfdorf, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

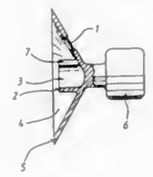
Filed Jun. 9, 1989, Ser. No. 363,714

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1988, 3819622

Int. Cl.[5] F16B *47/00*

U.S. Cl. 428—43 **4 Claims**

1. A plastic suction cup made of a flexible transparent material which can be placed in a sealing manner on a glass pane and, in a vacuum-tight manner, can be pierced with a hollow needle for pane repair operations and the like, wherein a wall of the plastic suction cup has a spot which is thinner than its remaining wall thickness for accomodating the piercing by the hollow needle, and wherein a collecting pocket is provided in the interior of the plastic suetion cup which can be reached by the hollow needle, which collecting pocket is open in the same direction as the suction cup itself and the front edge of which collecting pocket is set back with respect to a contact edge of the plastic suction cup and which, at its circumference, has an



opening pointing to the thin spot for the passage of the hollow needle.

4,919,987

PROCESS FOR THE JOINING OF POLYAMIDE PARTS BY FRICTION WELDING

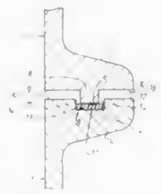
Walter Manner, Garmisch-Partenkirchen, Fed. Rep. of Germany, assignor to Verwaltungsgesellschafft Geiger Plastic GmbH & Co. KG, Garmisch-Partenkirchen, Fed. Rep. of Germany

Filed Jan. 14, 1988, Ser. No. 143,934

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1987, 3700981

Int. Cl.[5] B29C *65/06*

U.S. Cl. 428—60 **6 Claims**



4. A friction welded joint structure produced by:

providing a first polyamide piece, said first polyamide piece containing a groove having a bottom weld surface;

providing a second piece, said second polyamide piece having a tongue portion;

introducing a plastic or elastic material into said groove between said bottom weld surface and a lower weld surface on said tongue portion;

bringing said lower weld surface of said tongue portion of said seond polyamide piece into contact with said bottom weld surface of said groove all remaining paired opposing surfaces of said first and second polyamide pieces being spaced apart from each other thereby creating gaps, said elastic or plastic material being forced from between said bottom weld surface of said groove and said lower weld surface tongue portion and into said gaps;

imparting a rotary or oscillating movement to said second polyamide piece;

capturing turnings produced by said rotary or oscillating movement in said elastic or plastic material previously displaced into said gaps; and

bonding said lower weld surface of said tongue portion of said second polyamide piece to said bottom weld surface of said groove of said first polyamide piece by continued rotary or oscillating movement of said second polyamide piece.

4,919,988

INFORMATION RECORDING MEDIUM AND PROCESS FOR PRODUCING THE SAME

Toshiyuki Masuda, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigari, Japan

Filed Mar. 28, 1988, Ser. No. 173,814

Claims priority, application Japan, Mar. 26, 1987, 62-72764; Apr. 6, 1987, 62-84114

Int. Cl.[5] B32B *3/02*

U.S. Cl. 428—64 **8 Claims**

1. An information recording medium having such a structure that a disc-shaped substrate is provided with a hole at its central part, an inner-side non-recording zone is provided around the periphery of said hole, an outer-side non-recording zone is provided inside the outer periphery of the substrate, a recording zone is provided between both non-recording zones on the substrate, and flexible disc-shaped resin film having a hole at its central part is joined to each of the non-recording zones on the substrate in such a state that the resin film is spaced away from and does not contact the recording zone on the substrate to form a gas layer over the recording zone.

4,919,989

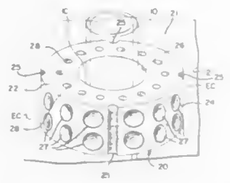
ARTICLE FOR SEALING WELL CASTINGS IN THE EARTH

Robert V. Colangelo, Chicago, Ill., assignor to American Colloid Company, Arlington Heights, Ill.

Filed Apr. 10, 1989, Ser. No. 335,808

Int. Cl.[5] E21B *43/00*

U.S. Cl. 428—65 **22 Claims**



1. An article of manufacture for sealing around an elongated casing extending into a borehole in the earth; comprising:

an annular disk formed of relatively dry, compacted, liquid-swellable and absorbent, material including bentonite, said disk having a pair of generally flat, spaced apart, opposite faces and a central hole extended through said disk between said opposite faces, said hole having a cross-section greater than that of said casing, to permit said disk to be mounted on and move along said casing in guided, generally centered position thereon into said borehole;

said disk having an outer periphery spaced radially outwardly around said central hole extending between said opposite faces outwardly of and smaller than said borehole for permitting said disk to move along said casing to form a stack of said disks thereon for substantially filling said borehole around said casing.

4,919,990

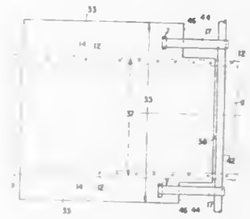
PAPER BUSTER

Gregory E. Davis, 2010 Holt Ave., #3, Los Angeles, Calif. 90034

Filed Jul. 27, 1988, Ser. No. 224,807

Int. Cl.[5] B32B *3/06;* B42F *3/00*

U.S. Cl. 428—100 **2 Claims**



1. In association with a computer printer designed to use paper having spaced perforations along its side edges, wherein said printer has a horizontal paper in-feed surface, and a paper drive mechanism that includes movable lugs adpated to engage the perforations in the paper to return the outgoing paper back toward the incoming paper; said printer further comprising a crossbar in near adjacency to the drive mechanism above the paper in-feed surface, the improvement comprising means for separating the outgoing paper from the incoming paper, said separating means including a flexible sheet that is wider than the paper; said separating sheet extending over the incoming paper and underneath the outgoing paper, with its downstream edge in near abutment to the printer crossbar; said sheet having its downstream corners cut away to form shoulder edges spaced opstream from the crossbar; and two laterally spaced attachment straps connected to said sheet near its side edges, said straps extend around the crossbar; said straps having mating ends that can be disengaged from each other to install or remove the flexible sheet.

4,919,991

HYBRID CERAMIC MATRIX COMPOSITE ARTICLES COMPRISING PARTICULATE ADDITIVES AND METHOD

Kishor P. Gadkaree, Big Flats, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed May 23, 1988, Ser. No. 197,296

Int. Cl.[5] C03C *10/06, 10/08, 14/00;* B32D *18/00*

U.S. Cl. 428—113 **11 Claims**

1. A laminar ceramic matrix composite article comprising:

(a) a matrix consisting essentially of a ceramic material selected from the group consisting of alkaline earth aluminosilicate glasses and alkaline earth aluminosilicate glass-ceramics;

(b) inorganic reinforcing fibers disposed in multiple layers in the matrix, said layers comprising fiber arrays wherein the fibers are disposed in substantially parallel alignment; and

(c) a particulate additive dispersed in the matrix, said additive comprising particles having aspect ratios below 2:1

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and an average particle size of at least about one micron, and said additive being present in a proportion at least effective to increase the interlaminar shear strength, transverse flexural strength, or fracture toughness of the article, but not exceeding about 10% by weight of the combined weight of the particulate additive and alkaline earth aluminosilicate ceramic matrix.

4,919,992

PROCESS FOR MAKING MICROPOROUS PRODUCTS AND THE PRODUCTS THEREOF

David J. Blundell, Middlesbrough; Frederic N. Cogswell, and Peter J. Meakin, both of Guisborough, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jul. 1, 1988, Ser. No. 214,391

Claims priority, application United Kingdom, Jul. 2, 1987, 8715530

Int. Cl.[5] B32B *3/26, 31/00*

U.S. Cl. 428—131 19 Claims

1. A process of producing an open cell structure network from a semicrystalline, melt crystallisable polyarylene ether or polyarylene thioether comprising providing a molten mixture of at least one such semicrystalline polymer in the presence of a melt plasticiser for the polymer which melt contains at least some polymer entities having a crystalline form, the total polymer concentration being between 5 and 50% by weight of the mixture of polymer and melt plasticiser and heating the mixture of polymer and melt plasticiser at a heating rate of between 1° C. and 1000° C./hour, until the mixture is at a temperature in the range 10° C. below to 20° C. above its clearing point and cooling the mixture until it solidifies, whereby an open cell structure essentially free from granular superstructure is obtained.

4,919,993

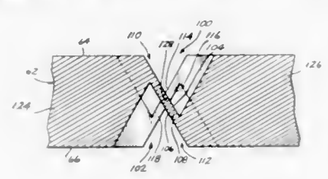
FLEXURES AND METHOD FOR CREATING FLEXURES IN A WAFER

James R. Woodruff, Redmond, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Feb. 27, 1989, Ser. No. 317,159

Int. Cl.[5] H01L *21/306;* B44C *1/22*

U.S. Cl. 428—134 11 Claims



1. In a sensor fabricated from a wafer having upper and lower surfaces, the sensor comprising a first member pivotally connected to a second member, the improvement comprising first and second flexures connecting the first member to the second member, the flexures permitting rotation of the second member with respect to the first member about a common hinge axis, the first flexure being connected to the first member at a position closer to the upper than to the lower surface of the wafer and being connected to the second member at a position closer to the lower than to the upper surface of the wafer, the second flexure being connected to the first member at a position closer to the lower than to the upper surface of the wafer and being connected to the second member at a position closer to the upper than to the lower surface of the wafer.

4,919,994

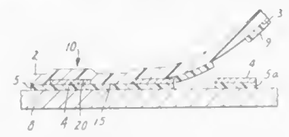
DRY TRANSFER GRAPHICS ARTICLE AND METHODS OF PREPARATION AND USE THEREOF

Joseph H. Incremona, Stillwater, and Richard H. Lundeen, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 846,755, Apr. 1, 1986, abandoned. This application Mar. 20, 1987, Ser. No. 25,117

Int. Cl.[5] B41M *5/00*

U.S. Cl. 428—141 22 Claims



1. A dry transfer article for application to a substrate to provide a design thereon comprising:

(1) a continuous carrier film presenting a major surface having first and second surface portions thereon;

(2) a graphic pattern in the shape of said design, said graphic pattern comprising at least one layer and being clingingly bonded to said first surface portions of said major of said carrier film; and

(3) at least one continuous adhesive layer having first segments covering said graphic pattern and bonded thereto, and second segments covering said second surface portions of said major surface of said carrier and bonded thereto;

said major surface of said carrier film exhibiting sufficiently high compatibility with said adhesive to provide a strong bond therebetween;

said major surface of said carrier film exhibiting sufficiently low compatibility with said graphic pattern to provide at most a clinging bond therebetween;

said graphic pattern having been formed from at least one layer of an imaging material applied to said adhesive before said carrier was contacted thereto;

wherein the work to fracture of said adhesive layer is sufficiently low that, upon application of a peel force to said carrier, said adhesive will preferentially fracture according to the edges of said graphic pattern while the bond between said second segments of said adhesive and said second surface portions of the carrier and the bond between said first segments of said adhesive and said graphic pattern will remain intact; and

wherein said major surface of said carrier film is primed with at least one of the following: bohmite, sputter etch, oxygen plasma treatment, or modified sol gel, such that said major surface is capable of providing an adhesive bond to said second segments of said adhesive layer which is greater than the applied adhesive bond between said adhesive layer and said substrate;

whereby, upon adhering said article to said substrate, application of a peel force to said carrier film allows selective separation from said substrate of said carrier film together with said second segments of said adhesive along the edge of said graphic pattern, leaving on said substrate said graphic pattern, and said first segments of said adhesive in registry therewith.

4,919,995

HEAT-INSULATING DEVICE COMPRISING RADIATION-REFLECTING MATERIALS AND A CONDUCTION-INSULATING MATERIAL

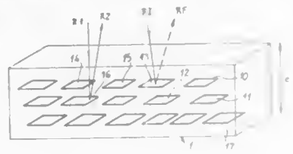
Claude Joly, Puteaux, France, assignor to Bronzavia Aeronautique, Nanterre, France

Filed Feb. 9, 1988, Ser. No. 154,044

Claims priority, application France, Feb. 13, 1987, 87 01866

Int. Cl.[5] B32B *3/22, 5/16;* B64C *1/40;* F16L *59/08*

U.S. Cl. 428—189 14 Claims



1. A light-weight, heat-insulation device for aeronautical use which protects a surface from an incident radiation with efficiency at temperatures in the range of at least 800° C., consisting of:

a conduction-insulating material, and

a plurality of reflecting flakes inserted into and distributed through the conduction-insulating material, the plurality of reflecting flakes being juxtaposed and overlapping each other so as to conceal the surface from the incident radiation.

4,919,996

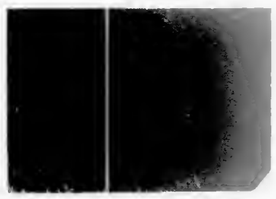
FILMS AND TAPES

Colin A. Dewar, Hucclecote, and Kevin J. Artus, Barnwood, both of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Filed Mar. 11, 1988, Ser. No. 167,160

Int. Cl.[5] D03D *3/00*

U.S. Cl. 428—221 3 Claims



1. A method of producing a film or tape characterised in that a blend of from 30 to 70 parts by weight of a first thermoplastic fibre-forming polymeric component and from 70 to 30 parts by weight of a second, immiscible, thermoplastic fibre-forming polymeric component is spun into a film or tape wherein each component is present in the film or tape as fibrils which are substantially aligned to the longitudinal axis of the film or tape, such aligned fibrils of one polymeric component being interconnected to each other in a random manner, such interconnections penetrating through the fibrils of the other polymeric component such that both components exist in the film or tape as interpenetrating networks and then, using a solvent for the second polymeric component, leaching away from the film or tape the second fibre-forming polymer leaving a low density, porous film or tape of the first fibre-forming polymer.

4,919,997

MELT-BLOWN WATER-ABSORBING TISSUES AND MATTS

Ian C. Twilley, Chester, and Robert A. Lofqnist, Richmond, both of Va., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Nov. 6, 1987, Ser. No. 117,790

Int. Cl.[5] B32B *17/00;* D01G *3/00;* D03D *3/00*

U.S. Cl. 428—227 7 Claims

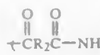
1. A melt-blown water-absorbing matt of fibers comprising a block copolyetheramide having a number average molecular weight of from about 10,000 to about 35,000 and having polymer segments of the following structure:

(A) a polyether segment consisting predominantly of

where c is at least 1, (a+c) is at least 1 but less than 10 and b is at least 10 but less than 150;

(B) a polyamide segment consisting of at least one of the following:

(1)



(2)

where R_1, R_2 and R_3 are each selected from the same or different alkylene or substituted alkylene moieties of from 4 to 11 carbons and difunctional aromatic moieties; wherein the concentration of segment A in the copolymer is between from about 10 to about 50 percent by weight of copolyether amide.

4,919,998

WOVEN MEDICAL FABRIC

Conrad D. Goad, Greensboro, N.C., and Jeffrey L. Taylor, Cincinnati, Ohio, assignors to Precision Fabrics Group, Greenboro, N.C. and Standard Textile Co., Inc., Cincinnati, Ohio

Continuation of Ser. No. 293,462, Jan. 4, 1989, abandoned, which is a continuation-in-part of Ser. No. 164,197, Mar. 4, 1988, Pat. No. 4,822,667. This application Sep. 14, 1989, Ser. No. 407,705

Int. Cl.[5] B32B *7/00*

U.S. Cl. 428—265 10 Claims

1 A process of imparting water-resistent, flame-resistant, low linting and antimicrobial properties to a tightly woven medical fabric comprising the steps of:

(1) applying to a woven polyester fabric, constructed from polyester yarn of about 50 to about 150 denier with the sum of ends and picks of at least 100 per linear inch, an aqueous finish composition containing a fluorocarbon water repellent, a flame retardant, and an antimicrobial agent, and

(2) drying the fabric,

the resulting medical fabric having the following properties initially and following 100 laundering cycles:

	Initial	After 100 Cycles
linting (INDA 160-0-83) particles	at most 5,000	at most 2,000

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-continued

	Initial	After 100 Cycles
flammability (NFPA 702)	Class II	Class II
antimicrobial activity (CTM-0923) for *Klebsiella pneumoniae*	no growth	no growth
Suter hydrostatic resistance (AATCC-127) centimeters	at least 20.0	at least 10.0
spray rating (AATCC-22-1980)	at least 70.0	at least 50.0
air permeability (FTM 5450, Frazier method)	at most 20	at most 20

4,919,999

WELDABLE MICROPOROUS NON-WOVEN TAPE FOR MEDICAL APPLICATIONS

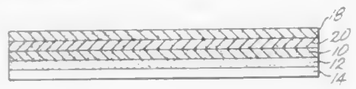
Petrus L. A. Maria Van Soom, Vosselaar, Belgium, assignor to Avery International Corporation, Pasadena, Calif.

Filed May 20, 1988, Ser. No. 197,032

Claims priority, application Netherlands, May 22, 1987, 8701228

Int. Cl.[5] C09J 7/02

U.S. Cl. 428—284 15 Claims



1. A laminated product comprising a porous, woven or non-woven web of paper, synthetic or natural fibers, said web having on one surface thereof a porous pressure sensitive adhesive coating layer and said web providing at the surface opposed to the adhesive coating a thermoplastic material which is weldable to another thermoplastic material said laminated product having a moisture vapor transmission rate of at least 150 g/m^2/24 hr at 37° C. while withstanding a hydrostatic column of a 0.9% NaCl-H_2O solution of 11.5 cm height for at least 20 seconds without leakage.

4,920,000

BLEND OF COTTON, NYLON AND HEAT-RESISTANT FIBERS

James R. Green, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 343,391, Apr. 28, 1989. This application Jun. 29, 1989, Ser. No. 371,578

Int. Cl.[5] D04H 1/58

U.S. Cl. 428—288 9 Claims

1. An intimate blend of staple fiber comprising 5–20% nylon staple fibers, 15–50% of heat resistant fibers which have a Heat Resistance Time of at least 0.018 sec/g/m^2 and a Limiting Oxygen Index of at least 25 and at least 30% of cotton fibers.

4,920,001

POINT-BONDED JET-SOFTENED POLYETHYLENE FILM-FIBRIL SHEET

Chi-Chang Lee, Richmond, Va., and Penny C. Simpson, Derwood, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 259,224, Oct. 18, 1988. This application Jul. 24, 1989, Ser. No. 367,353

Int. Cl.[5] D04H 1/58

U.S. Cl. 428—289 3 Claims

1. A process for preparing a dyed nonwoven fabric that is particularly useful in a disposable protective garment of the type worn by asbestos workers comprising forming an aqueous mixture of a disperse dye and a hydrophilic finish and contacting the nonwoven fabric produced by passing a lightly consolidated, flash-spun polyethylene plexifilamentary film-fibril sheet having a unit weight in the range of 25 to 50 grams per square meter through two successive nips, each nip being formed between two rolls, one of which is a heated metal roll having hard bosses on its surface and the other roll having a resilient surface the Shore A durometer hardness of which is in the range of 60 to 70, the heated metal roll of the first nip contacting one surface of the sheet and the heated roll of the second nip contacting the other surface of the sheet, the bosses of the heated metal rolls forming a repeating regular polygon pattern in which the bosses are spaced in the range of from 4.8 to 7.1 bosses per centimeter and number in the range of 29 to

62 bosses per square centimeter, the bosses having a height that is in the range of 1.2 to 1.8 times the thickness of the sheet being contacted and having a total cross-sectional area at their tips equal to about 4 to 7 percent of the sheet area being treated, the bosses of the second nip being out of register with the bosses of the first nip, each nip applying a load in the range of 9 to 21 kilograms per centimeter of width to the sheet, to form a point-bonded sheet that is then subjected to high energy jets of water supplied from multiple closely spaced orifices having diameters in the range of 0.08 to 0.18 mm to impart to the sheet an energy-impact product in the range of 0.26 to 0.8 megaJoule-newtons per kilogram with the mixture and drying the fabric.

4,920,002

COLORED AND WEAR-RESISTANT DECORATIVE COATING BASED ON EPOXY RESIN AND FOR USE ON FLOORS AND ON PANELS, AND METHOD OF OBTAINING IT

Christian Cussot, Cleres, and Jean-Didier Delage, Sartrouville, both of France, assignors to Societe Francaise Bitumastic, Petit Quevilly, France

Filed Jun. 24, 1988, Ser. No. 210,835

Claims priority, application France, Jun. 26, 1987, 87 09016

Int. Cl.[5] B32B 18/00

U.S. Cl. 428—325 11 Claims

1. A colored, wear-resistant, decorative coating based on epoxy resin applied to a substrate, wherein the coating is constituted by a uniform mixture including solvent-free epoxy resin, solid glass microbeads and pigment-colored aluminum flakes, said coating thus being bulk-pigmented, translucent, and glittering in a durable manner.

4,920,003

DI-TRIDECYL SEBACATE TIRE YARN FINISH

Fleming H. Day, Greenville, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 15, 1987, Ser. No. 73,531

Int. Cl.[5] B32B 9/00; D02G 3/02

U.S. Cl. 428—391 6 Claims

1. A fiber finish especially suitable for tire yarns comprising 50–95 wt. % of the finish being lubricants having a melting point not greater than about 12° C. wherein at least 40 wt. % of the lubricants is ditridecyl sebacate, 5–50 wt. % of the finish being a total antistat and surfactant, 0–5 wt. % of the finish being antioxidant and 0–2 wt. % of the finish being a polysiloxane.

4,920,004

GELATIN-GRAFTED POLYMER PARTICLES

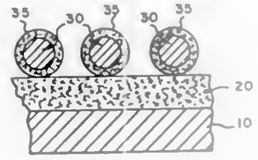
Pranab Bagchi, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 98,245, Sep. 28, 1987, abandoned. This application Feb. 7, 1989, Ser. No. 307,393

The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.

Int. Cl.[5] B32B 42/02

U.S. Cl. 428—407 5 Claims



1. A particle comprising polymer core having a mean diameter of from about 10 to 10^6 nm covered with a gelatin shell about 10 to 60 nm thick, said gelatin being covalently bonded to the said polymer core.

4,920,005

AROMATIC POLYMER COMPOSITIONS

Frank Mercer, Belmont, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 7,295, Jan. 27, 1987, Pat. No. 4,835,197, which is a continuation-in-part of Ser. No. 815,523, Dec. 31, 1985, abandoned, which is a continuation-in-part of Ser. No. 688,794, Jan. 24, 1985, abandoned. This application May 23, 1989, Ser. No. 355,937

Int. Cl.[5] B32B 27/34, 27/36, 27/06

U.S. Cl. 428—411.1 26 Claims

1. An article comprising a substrate having on a surface thereof at least one layer of a curable composition comprising:

(a) a first component comprising an aromatic polymer having a first preponderant repeat unit selected from the group consisting of

(i) poly(sulfone)

(ii) poly(aryl ether ketone)

(iii) poly(carbonate)

(iv) poly(arylate)

(v) poly(imide)

(vi) poly(benzimidozopyrolone), and

(v) poly(imide isoindoquinazolinedione), said aromatic polymer being substantially free of acetylene, maleimide, or vinyl terminal groups, and

(b) a second component comprising an acetylene, maleimide, or vinyl terminated poly(imide) or poly(isoimide) or precursor thereof, which second component is compatible with the first component, has 1 to 300 second preponderant repeat units which are different from the first preponderant repeat units, is substantially free of elemental sulfur and reactive divalent sulfur, and is present in an amount effective to substantially cure the composition to a gel content of at least about 10%, as measured by percent insolubles in chloroform.

4,920,006

COLORED METAL ALLOY/OXYNITRIDE COATINGS

Frank H. Gillery, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 26, 1987, Ser. No. 31,315

Int. Cl.[5] B32B 15/00

U.S. Cl. 428—432 10 Claims

1. An article of manufacture comprising:

a. a transparent substrate;

b. a titanium oxynitride film deposited on one surface of said substrate of sufficient thickness to produce a colored reflectance from the uncoated surface of said substrate; and

c. deposited on said titanium oxynitride film and as the exposed layer of a multilayer coating a metal film which controls the transmittance of said article.

4,920,007

MAGNETO-OPTICAL RECORDING MEDIUM WITH 9:1-1:9 ALUMINUM OR SILICON OXIDE AND ALUMINUM OR SILICON NITRIDE MIXTURE

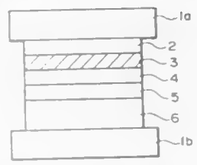
Mitsuharu Sawamura; Kazuoki Hongu, both of Yokohama, and Kazuhiko Kikuchi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 32,998, Mar. 30, 1987, abandoned, which is a continuation of Ser. No. 688,430, Jan. 2, 1985, abandoned. This application Sep. 12, 1988, Ser. No. 244,541

Claims priority, application Japan, Jan. 10, 1984, 59-1406

Int. Cl.[5] B32B 15/04; G11B 5/66

U.S. Cl. 428—457 9 Claims



1. A magneto-optical recording medium, comprising:

a magneto-optical recording layer; and

a mixture film formed on at least one side of said magneto-optical recording layer, said mixture film comprising a mixture layer of aluminum oxide or silicon oxide and aluminum nitride or silicon nitride wherein the weight ratio of the nitride to the oxide in the mixture film is between about 1:9 to 9:1.

4,920,008

POWDER COATING COMPOSITIONS

Robert B. Barbee, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 20, 1989, Ser. No. 325,847

Int. Cl.[5] C08L 67/02; B32B 15/08

U.S. Cl. 428—458 21 Claims

9. A thermosetting coating composition according to claim 7 containing about 15 to 25 weight percent, based on the total weight of the amorphous polyester, the polyether-ester and the blocked polyisocyanate, of a blocked polyisocyanate.

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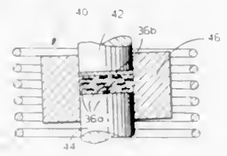
4,920,009

METHOD FOR PRODUCING LAMINATED BODIES COMPRISING AN RE-FE-B TYPE MAGNETIC LAYER AND A METAL BACKING LAYER

Robert W. Lee, Troy, and Earl G. Brewer, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 5, 1988, Ser. No. 233,699
Int. Cl.[5] B22F 3/00
U.S. Cl. 428—552 20 Claims



1. A method of making a laminated magnetic article comprising a magnetic layer comprising iron, neodymium and/or praseodymium, and boron and a supportive metal layer bonded to the magnetic layer, said method comprising:

providing particulate material that is magnetically isotropic and characterized by a microstructure that is either amorphous material or of generally spherical crystal grains of an average size no greater than about 500 nm; and of a composition comprising a transition metal (TM) taken from the group consisting of iron and mixtures of iron and cobalt, one or more rare earth metals (RE) including neodymium and praseodymium, and boron, the proportions of such constituents being sufficient to form a product that upon crystallization consists essentially of the tetragonal crystalline compound having the empirical formula $RE_2TM_{14}B$;

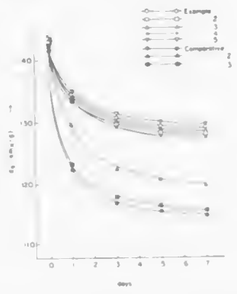
hot pressing a layer of the particulate material against a layer of chemically compatable, different metal composition at a temperature and pressure to consolidate the particulate layer into a fully densified layer and to bond it to the metal backing to produce a resultant layer of magnetic material on a metallic backing.

4,920,010

FERROMAGNETIC METAL POWDER

Yasuo Kadono; Masaaki Koga, and Yoshio Aoki, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Sep. 2, 1988, Ser. No. 239,752
Claims priority, application Japan, Sep. 2, 1987, 62-219784; Mar. 1, 1988, 63-48488
Int. Cl.[5] H01F 1/11
U.S. Cl. 428—570 4 Claims



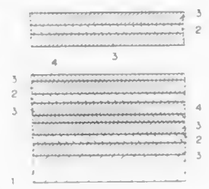
1. A ferromagnetic metal powder comprising a ferromagnetic metal particle composed mainly of iron, a silicon compound layer formed on the surface of the ferromagnetic metal particle in such an amount that the amount of silicon is 0.1 to 1% by weight based on the weight of iron in the ferromagnetic metal particle, and a layer containing a nonferrous transition metal element compound in an amount of from 2 to 15% by weight based on the weight of iron in said ferromagnetic particle, which is formed on the silicon compound layer.

4,920,011

MAGNETIC FIELD SHIELD INCLUDING A SUPERCONDUCTIVE FILM

Souichi Ogawa, Hyogo; Takao Sugioka, and Masaru Inoue, both of Osaka, all of Japan, assignors to Osaka Prefecture and Koatsu Gas Kogyo Co. Ltd., both of Osaka, Japan

Filed Oct. 20, 1988, Ser. No. 260,604
Claims priority, application Japan, Feb. 9, 1988, 63-28174; Aug. 10, 1988, 63-200795
Int. Cl.[5] H05K 9/00
U.S. Cl. 428—596 6 Claims



4. A magnetic field shield including a superconductive film wherein said magnetic field shield comprises:

a metal substrate of copper, aluminum, nickel, stainless steel, titanium, niobium or niobium-titanium alloy; and

a plurality of laminated sandwiches each of which consists essentially of a niobium-titanium alloy layer, a superconductive film layer consisting essentially of a mixed crystalline body of niobium nitride and titanium nitride;

another niobium-titanium alloy layer; and a metal layer in that order;

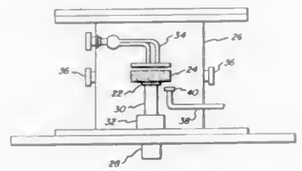
wherein the upmost sandwich layer does not include said metal layer.

4,920,012

ARTICLES HAVING COATINGS OF FINE-GRAINED AND/OR EQUIAXED GRAIN STRUCTURE

David W. Woodruff, Clifton Park, N.Y., and Joan M. Redwing, Madison, Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 9, 1989, Ser. No. 363,833
Int. Cl.[5] H01J 35/10
U.S. Cl. 428—634 9 Claims



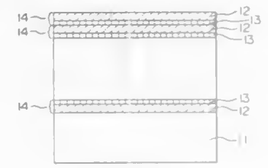
1. An article comprising a substrate, a diffusion barrier of rhenium directly bonded thereto and a coating of tungsten or a tungsten-rhenium combination directly bonded to said diffusion barrier, said coating being free from columnar grain structure and having an average grain size in the range of about 400–10,000 Angstroms.

4,920,013

MAGNETIC MULTILAYER STRUCTURE

Toshio Kobayashi, Tokyo; Shigekazu Otomo, Sayama; Ryoichi Nakatani, Akigawa, and Noriyuki Kumasaka, Ome, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 23, 1987, Ser. No. 100,231
Claims priority, application Japan, Sep. 24, 1986, 61-223704
Int. Cl.[5] B32B 9/00; G11B 5/66
U.S. Cl. 428—694 9 Claims



1. A magnetic multilayer structure having an increased permeability and an increased saturation magnetic flux density, the structure comprising a plurality of magnetic layers and a plurality of intermediate layers, each of said intermediate layers being formed between adjacent two of said magnetic layers, wherein

each of said magnetic layers is crystalline and is made of a magnetic material selected from the group consisting of Fe, Co, Ni and an alloy containing as its main component at least one of said elements, Fe, Co and Ni, and

each of said intermediate layers is made of a material which forms an interstitial solid solution with said material of said magnetic layers.

4,920,014

ZIRCONIA FILM AND PROCESS FOR PREPARING IT

Toshio Hirai, Izumi, and Hisanori Yamane, Sendai, both of Japan, assignors to Sumitomo Metal Mining Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 161,101
Claims priority, application Japan, Feb. 27, 1987, 62-44687; Feb. 27, 1987, 62-44688; Feb. 27, 1987, 62-44689; Sep. 18, 1987, 62-235896
Int. Cl.[5] C03C 17/25, 18/12
U.S. Cl. 428—698 6 Claims

1. A zirconia film, comprising:

a zirconia film formed on a substrate, said film having substantially only one or two kinds of particular crystal planes oriented parallel to the surface of said substrate.

4,920,015

ELECTROCHEMICAL H_2S CONVERSION

Anthony F. Sammells, Naperville, Ill., assignor to Gas Research Institute, Chicago, Ill.

Filed Sep. 29, 1988, Ser. No. 250,940
Int. Cl.[5] H01H 8/06
U.S. Cl. 429—17 29 Claims

1. A process for electrochemical H_2S conversion comprising:

passing H_2S containing gas in contact with an electrocatalytic anode comprising an $A_{1+x}B_{2-x}S_4$ thiospinel wherein A and B are metallic, $0<X<0.2$ and S is sulfur, thermally stable at cell operating temperatures of about 650° to about 1050° C.;

passing O_2 containing gas in contact with a cathode comprising strontium doped lanthanum manganite forming ionic oxygen;

passing said ionic oxygen from said cathode through an adjacent solid oxygen ion conducting electrolyte to said anode adjacent an opposite side of said solid electrolyte;

oxidizing said H_2S to S and H_2O at said electrocatalytic anode.

4,920,016

LIPOSOMES WITH ENHANCED CIRCULATION TIME

Theresa M. Allen, Edmonton, Canada, and Alberto Gabizon, San Francisco, Calif., assignors to Linear Technology, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 946,415, Dec. 24, 1986, abandoned. This application Dec. 18, 1987, Ser. No. 132,136
Int. Cl.[5] A61K 37/22, 9/66; B01J 13/02
U.S. Cl. 424—450 11 Claims

1. A composition comprising liposomes which contain an entrapped pharmaceutical agent and are characterized by:

(a) liposome sizes predominantly between about 0.05 and 0.5 microns,

(b) liposomes having substantially homogeneous-phase bilayers composed at at least about 50 mole percent of a membrane-rigidifying lipid selected from the group consisting of sphingomyelin and neutral phospholipids with predominantly saturated acyl chains, and

(c) between about 5–20 mole percent saturated phosphatidylinositol.

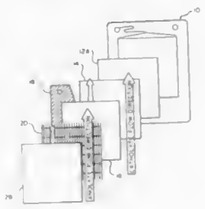
5. In a therapeutic drug treatment in which a drug is administered intravenously in a suspension of liposomes in which the drug is entrapped and whose sizes are predominantly between about 0.05–0.5 microns, a method of extending the lifetime of liposomes in the bloodstream which comprises preparing the liposomes to contain:

(a) substantially homogeneous-phase bilayers containing at least about 50 mole percent of a membrane-rigidifying lipid selected from the group consisting of sphingomyelin and neutral phospholipids with predominantly saturated acyl chains, and

(b) between about 5–20 mole percent saturated phosphatidylinositol.

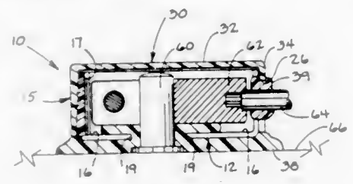
VOL 1113 ISS 4 AP 24 1990 UMI

4,920,017
POROUS AND POROUS-NONPOROUS COMPOSITES FOR BATTERY ELECTRODES
Calman Herscovici, Chappaqua, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.
Division of Ser. No. 934,168, Nov. 20, 1986, Pat. No. 4,818,741.
This application Nov. 23, 1988, Ser. No. 275,219
Int. Cl.[5] H01M *4/86*; B01J *21/18*
U.S. Cl. 429—42 5 Claims



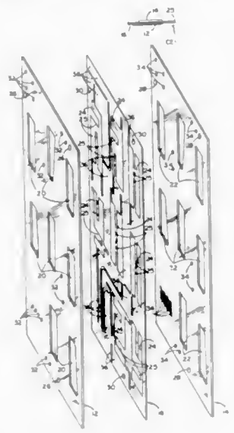
1. In a zinc-bromide electrochemical cell, the improvement comprising a cathode element comprising a pressure-molded porous composite comprising electrically conductive particulate carbon selected from the group consisting of carbon black, graphite and mixtures thereof having a particle size distribution of 0 to 45μm and a thermoplastic resin, said carbon and said resin being in a weight ratio from about 1:5 to 1:1; said composite characterized by 80–95% porosity by volume and a pore size diameter distribution from about 5 microns to about 200 microns.

4,920,018
BATTERY TERMINAL SEAL
William C. Turner, 1020 N. 23rd St., Coeur d'Alene, Id. 83814
Filed Jun. 28, 1989, Ser. No. 373,109
Int. Cl.[5] H01M *2/00*
U.S. Cl. 429—65 17 Claims



1. A cover for a battery terminal and connector with a cable extending therefrom, the cover comprising:
a pair of base sections each including a terminal receiving recess therein;
connector means joining the base sections for movement between open positions wherein the base sections are separated and closed positions wherein the base sections are positioned adjacent one another to form a base plate with the terminal receiving recesses forming a terminal receiving opening;
a cap receivable over the base plate, adapted to cover the battery terminal cover;
a side wall extending between the cap and base plate, forming an enclosure with the base and cap, the enclosure being adapted to receive a battery terminal and connector;
the side wall including a cable receiving receiving opening adapted to receive a battery cable;
a first flexible seal for substantially sealing the terminal receiving opening about the terminal; and
a second flexible seal for sealing the battery cable opening about the battery cable.

4,920,019
BATTERY PACK ASSEMBLY HAVING A CIRCUIT BOARD
David P. Stoklosa, Webster, N.Y.; Christopher S. Pedicini, and Imre A. Pattantyus, both of North Olmsted, Ohio, assignors to Eveready Battery Company, Inc., St. Louis, Mich.
Filed Mar. 24, 1989, Ser. No. 328,550
Int. Cl.[5] H01M *2/22*
U.S. Cl. 429—122 8 Claims



1. A battery pack assembly comprising:
at least one galvanic cell having a pair of terminals;
a circuit board over said terminals, said circuit board including at least one insulator sheet adjacent said cell, having an opening at said terminals, and including a thin metal layer preperforated to form a pattern, said pattern including an opening at said terminals and a pair of integral metal tabs generally coplanar with the remainder of said metal sheet and extending into said openings to lie adjacent said terminals;
said insulator sheet and metal layer being laminated together; and
said tabs being secured to said terminals for electrical conductance.

4,920,020
ZINC POWDER FOR ALKALINE BATTERIES
Ivan A. Strauven, Neerpelt, and Marcel L. Meeus, Lommel, both of Belgium, assignors to Metallurgie Hoboken-Overpelt, Hoboken, Belgium
Filed Jan. 4, 1989, Ser. No. 293,445
Int. Cl.[5] H01M *4/42*; C22C *18/00*
U.S. Cl. 429—230 24 Claims

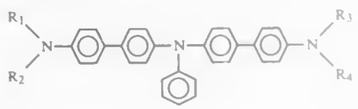
1. A zinc base powder for alkaline batteries consisting of 0.05 to 3% of mercury, 0.003 to 0.045% of bismuth, 0.01 to 0.08% of lead, the rest being zinc.

4,920,021
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER
Tomohiro Kimura, Kawasaki, and Yoichi Kawamorita, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 18, 1988, Ser. No. 220,165
Claims priority, application Japan, Jul. 20, 1987, 62-178946
Int. Cl.[5] G03G *5/05*
U.S. Cl. 430—56 12 Claims

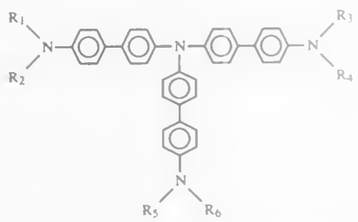
1. An electrophotographic photosensitive member comprising a photosensitive layer on an electroconductive substrate, the surface layer of said photosensitive layer containing lubricating resin powder and a silicone type graft polymer containing silicone in the side chain.

4,920,022
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER COMPRISING ARYL AMINE CHARGE TRANSPORT MATERIAL
Teigo Sakakibara, Tokyo; Kiyoshi Sakai, Chofu; Harumi Sakoh, Tokyo, and Shoji Amamiya, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 1, 1989, Ser. No. 345,236
Claims priority, application Japan, May 7, 1988, 63-111250; May 7, 1988, 63-111255
Int. Cl.[5] G03G *5/14*
U.S. Cl. 430—59 6 Claims

1. An electrophotographic photosensitive member comprising a conductive support and provided thereon a photosensitive layer, wherein said photosensitive layer contains an amine compound represented by the following Formula (I) or Formula (II)



Formula (I)



Formula (II)

wherein R_1, R_2, R_3, R_4, R_5 and R_6 each represent an alkyl group, an aralkyl group, or an aryl group.

4,920,023
STABLE COLOR DEVELOPER COMPOSITIONS AND PROCESS FOR THE PREPARATION THEREOF
Ronald J. Koch, Webster; John F. Knapp, Fairport, and Robert J. Gruber, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Jun. 2, 1988, Ser. No. 201,657
Int. Cl.[5] G03G *13/22*, *9/10*
U.S. Cl. 430—126 22 Claims

1. A process for the preparation of stable developer compositions, which comprises treating coated carrier particles with metal salts, or metal salts of fatty acids, and thereafter admixing these particles with a colored toner composition containing metal salts or metal salts of fatty acids, and comprised of resin particles and colored pigment particles; and wherein the salts are present on the carrier particles in an amount of from about 0.01 to about 1 percent by weight.

4,920,024
PHOTORECEPTOR EDGE ERASE SYSTEM FOR TRI-LEVEL XEROGRAPHY
James E. Williams, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Sep. 30, 1988, Ser. No. 252,097
Int. Cl.[5] G03G *13/01*
U.S. Cl. 430—45 4 Claims

1. The method of forming discharged area images on a charge retentive surface without developing the edges of the charge retentive surface outside the image areas, said method including the steps of:
uniformly charging a charge retentive surface substantially across its entire width including the edges thereof beyond the image areas thereof:
forming a discharged image area on said charge retentive surface intermediate said edges; and
presenting developer material to said charge retentive surface that is attracted to said discharged image area and repelled by said charged edges.

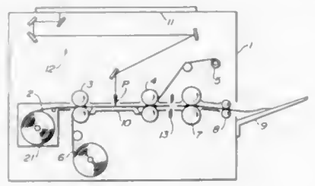
4,920,025
CONTROL OF SELENIUM ALLOY FRACTIONATION
Gerald H. Sweatman, Harpenden; Roy Hodgson, Huntingdon, and Robert H. Haste, Stevenage, all of England, assignors to Xerox Corporation, Stamford, Conn.
Division of Ser. No. 179,193, Apr. 8, 1988, Pat. No. 4,859,411.
This application Mar. 23, 1989, Ser. No. 328,829
Int. Cl.[5] G03G *5/08*
U.S. Cl. 430—128 15 Claims

1. A process for preparing an electrophotographic imaging member comprising providing pellets of an alloy comprising amorphous selenium and an alloying component selected from the group consisting of tellurium, arsenic, and mixtures thereof, said pellets having an average weight between about 50 mg and about 1000 mg, exposing said pellets to an ambient temperature of between about 114° C. and about 190° C. until an exotherm occurs in said pellets at between about 104° C. and about 180° C., carrying said exotherm through to substantial completion, grinding said pellets into fresh powder having an average particle size of less than about 200 micrometers, and compressing said fresh powder into fresh pellets having an average weight between about 50 mg and about 1000 mg, and heating said fresh pellets to a temperature between about 300° C. and about 350° C. in a vacuum coater to vacuum deposit said alloy onto an adjacent substrate.

4,920,026
IMAGE FORMATION METHOD AND APPARATUS USING LIGHT AND PRESSURE SENSITIVE SHEETS
Hideaki Hagihara, and Iwakazu Honda, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jul. 12, 1988, Ser. No. 218,577
Claims priority, application Japan, Jul. 17, 1987, 62-179805; Jul. 23, 1987, 62-184348
Int. Cl.[5] G03C *1/72*
U.S. Cl. 430—138 4 Claims

1. An image formation method comprising the steps of
superposing a light-accepting sheet formed by coating a transparent colorless base sheet with microcapsules encapsulating a colorless dye and a photopolymerizing agent on top of an image transfer sheet coated with a developing agent having a chromagenic effect on said colorless dye, coated surfaces of said sheets contacting each other,
forming an image on said transparent colorless base sheet by selective hardening of said microcapsules by an image forming beam of light made incident on and through said transparent colorless base sheet of said light-accepting

sheet while said light-accepting sheet and said image transfer sheet remain in contact with each other, and



forming a visible image on said image transfer sheet by applying a pressure on said superposed light-accepting and image transfer sheets together.

4,920,027

LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE, REDUCING AGENT AND POLYMERIZABLE COMPOUND

Fujio Kakimi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 66,273, Jul. 8, 1987, abandoned, and a continuation-in-part of Ser. No. 101,459, Sep. 28, 1987, abandooed. This application Jul. 5, 1988, Ser. No. 214,961
Claims priority, application Japan, Jun. 25, 1986, 61-150080; Sep. 26, 1986, 61-227767
Int. Cl.[5] G03C *5/54, 1/68, 1/06*
U.S. Cl. 430—138 12 Claims

1. A light-sensitive material comprising a light-sensitive layer containing silver halide grains, a reducing agent and a polymerizable compound provided on a support, said silver halide grains and polymerizable compound being contained in microcapsules which are dispersed in the light-sensitive layer, wherein the microcapsules have an average particle size of 8.5 to 20 μm in terms of volume-average particle diameter and such a particle size distribution that the amount of the microcapsules having a particle size of not larger than one sixth part of the average particle size is not more than 1 volume % of the total amount of the microcapsules and the amount of the microcapsules having a particle size of not smaller than twice as large as the average particle size is not more than 1 volume % of the total amount of the microcapsules.

4,920,028

HIGH CONTRAST HIGH THERMAL STABILITY POSITIVE PHOTORESISTS WITH MIXED CRESOL AND HYDROXYBENZALDEHYDE PREPARED NOVOLAK AND PHOTOSENSITIVE DIAZOQUINONE

Richard M. Lazarus, Mission Viejo; Randall Kautz, Irvine, and Sunit S. Dixit, Mission Viejo, all of Calif., assignors to Morton Thiokol, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 175,473, Mar. 31, 1988, abandoned. This application Aug. 2, 1988, Ser. No. 227,404
Int. Cl.[5] G03C *1/60, 1/54*
U.S. Cl. 430—192 6 Claims

1. In a positive photoresist comprising an admixture of a bindingly effective amount of a novolak resin and a photoimaging amount of diazoquinone photosensitizer the improvement comprising employing as the novolak resin the condensation product of (a) a mixture of m- and p-cresol and (b) a mixture of aldehydes comprising formaldehyde or a formaldehyde precursor and a monohydroxy aromatic aldehyde selected from the group consisting of 2-hydroxybenzaldehyde, 3-hydroxybenzaldehyde and 4-hydroxybenzaldehyde, wherein the cresol and aldehyde components of the novolak resin are present in the following amounts:

$$\frac{\text{moles total aldehyde}}{\text{moles total cresol}} \times 100 = \text{about 60\% to about 95\%},$$

$$\frac{\text{moles monohydroxy aromatic aldehyde}}{\text{moles total aldehyde}} \times 100 = \text{about 15\% to about 95\%},$$

and wherein the m- and p-cresol are present in the following amounts:

$$\frac{\text{moles m-cresol}}{\text{moles total cresol}} \times 100 = \text{about 30\% to about 75\%}.$$

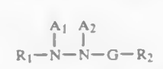
4,920,029

SILVER HALIDE PHOTOGRAPHIC MATERIAL AND METHOD FOR FORMING SUPER HIGH CONTRAST NEGATIVE IMAGES THEREWITH

Nobuaki Inoue; Senzo Sasaoka; Yoshio Inagaki; Tetsuro Kojima, and Morio Yagihara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 906,465, Sep. 12, 1986, abandoned. This application Aug. 23, 1988, Ser. No. 235,805
Claims priority, application Japan, Sep. 18, 1985, 60-206093
Int. Cl.[5] G03C *1/06*
U.S. Cl. 430—264 18 Claims

1. A negative type silver halide photographic material comprising a support having provided thereon at least one silver halide emulsion layer which has a substantial influence upon image density and at least one light-insensitive hydrophilic colloid layer, wherein a hydrophilic colloid layer other than said silver halide emulsion layer contains a hydrazine derivative in a non-diffusing condition, wherein the hydrophilic colloid layer which contains the hydrazine derivative in a non-diffusing condition is a light-insensitive layer which does not have a substantial influence on image density, and wherein said hydrazine derivative is represented by formula (I):



(I)

wherein A_1 and A_2 both represent hydrogen atoms, or one of A_1 and A_2 represents a hydrogen atom and the other represents a sulfinic acid residue; R_1 represents an aliphatic group, an aromatic group, or a heterocyclic group; R_2 represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, or a substituted or unsubstituted aryloxy group; and G represents a carbonyl group, a sulfonyl group, a sulfoxy group, a phosphoryl group, or an N-substituted or unsubstituted iminomethylene group, provided that at least one of R_1 and R_2 contains at least one group having a pKa of from 8 to 13 which is capable of dissociating into an anionic ion.

4,920,030

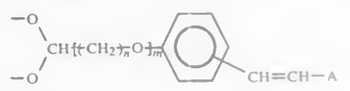
PHOTOSENSITIVE COATING EMULSION FOR PLASTIC FILMS

Kunihiro Ichimura, Yatabemachi, and Keiji Kubo, Hyogo, both of Japan, assignors to General Director of the Agency of Industrial Science and Technology, Tokyo and Daicel Chemical Industries, Ltd., Osaka, both of, Japan

Continuation of Ser. No. 30,835, Feb. 4, 1987, abandoned. This application Jan. 19, 1989, Ser. No. 298,855
Int. Cl.[5] G03C *1/76*
U.S. Cl. 430—270 8 Claims

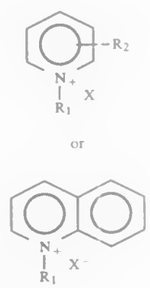
1. A photosensitive coating emulsion consisting essentially of a film-forming polymer and a photocrosslinkable polyvinyl alcohol having a degree of saponification of 75 molar % or

above and an average degree of polymerization of 300 to 3000 and containing at least one photocrosslinkable constituent unit present in an amount of 0.5 to 10 molar % based on said photocrosslinkable polyvinyl alcohol, and selected from the group consisting of units represented by the general formula (I):



(I)

wherein A is a group represented by the general formula (II) or (III):



(II)

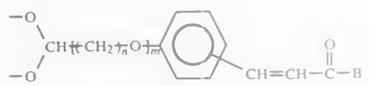
or

(III)

wherein:

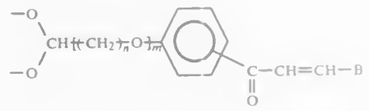
R^1 represents a hydrogen atom, an alkyl group or an aralkyl group which may contain a hydroxyl, a carbamoyl group, an ether or an unsaturated bond,

R^2 represents a hydrogen atom or a lower alkyl group, X^- represents an anion, m represents 0 or 1, and n represents a positive number of 1 or 6, and units represented by the general formula (IV):



(IV)

or the general formula (V):



(V)

wherein B represents an aromatic or a heterocyclic group having at least one polar group and m and n are as defined above,

dispersed in a dispersion medium

which comprises 95 to 50% by weight of water and 5 to 50% by weight of at least one lower aliphatic alcohol as an anti-foaming agent where672 in said lower aliphatic alcohol is present in an amount of 0.001 to 0.01% by weight based on the amount of said photosensitive emulsion and is selected from the group consisting of methyl, ethyl, n-propyl and i-propyl alcohols, said photocrosslinkable constituent unit is present in an amount of from 0.5 to 10 molar % based on said constituent unit of said polyvinyl alcohol, and wherein the weight ratio of said emulsion containing said film forming polymer to said photocrosslinkable polyvinyl alcohol is between 100:10 and 100:200.

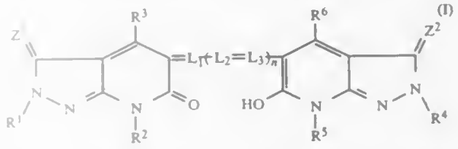
4,920,031

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENTS CONTAINING WATER SOLUBLE DYESTUFFS

Shigeru Ohno; Yoshio Inagaki; Keiichi Adachi, and Yasuhito Momoki, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 20, 1988, Ser. No. 208,608
Claims priority, application Japan, Jun. 19, 1987, 62-153132
Int. Cl.[5] G03C *1/84*
U.S. Cl. 430—522 13 Claims

1. A silver halide photographic light-sensitive element comprising a support, at least one silver halide emulsion layer and at least one dyestuff represented by the general formula (I), wherein the content of the dyestuff is from 0.05 to 3.0 in terms of optical density:



(I)

wherein R^1 and R^4 each represent a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group or a substituted or unsubstituted heterocyclic group; R^2 and R^5 each represent a substituted or unsubstituted aryl group, a substituted or unsubstituted heterocyclic group, $—COR^7$ or $—SO_2R^7$; R^3 and R^6 each represent a hydrogen atom, a cyano group, a hydroxyl group, a carboxylic acid group, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, $—COOR^7$, $—OR^7$, $—NR^8R^9$, $—N(R^8)COR^9$, $—N(R^8)SO_2R^9$, $—CONR^8R^9$ or $—N(R^8)CONR^8R^9$ (wherein R^7 represents a substituted or unsubstituted alkyl group or a substituted or unsubstituted aryl group, and R^8 and R^9 each represent a hydrogen atom, a substituted or unsubstituted alkyl group or a substituted or unsubstituted aryl group); Z^1 represents an oxygen atom or $=NR^{10}$; Z^2 represents an oxygen atom or $=NR^{11}$ (wherein R^{10} and R^{11} represent nonmetal atomic groups necessary for forming a five-membered ring, which may have substituent(s) with linkage to R^1 and R^4 respectively); L_1, L_2 and L_3 each represent a substituted or unsubstituted methine group, or L_1, L_2 and L_3 as a whole represent a substituted or unsubstituted cyclic group where methine groups are linked together; and n represents 0, 1 or 2; provided that at least one of R^1, R^2, R^3, R^4, R^5, R^6, L_1, L_2 and L_3 represents a group having at least one carboxylic acid group or at least one sulfonic acid group.

4,920,032

SILVER HALIDE PHOTOSENSITIVE MATERIAL

Ichizo Toya, and Masakazu Yoneyama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 7, 1988, Ser. No. 280,841
Claims priority, application Japan, Dec. 7, 1987, 62-309345
Int. Cl.[5] G03C *1/06*
U.S. Cl. 430—536 11 Claims

1. A silver halide photosensitive material comprising at least one silver halide photographic emulsion layer provided on at least one side of a support, said photosensitive material containing in the photographic emulsion layer and/or another component layer (i) a polymer having repetitive units represented by formula (II), dextran or mixtures thereof, and (ii) at least one cationic compound containing quaternary nitrogen:

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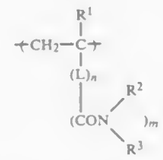


(II)

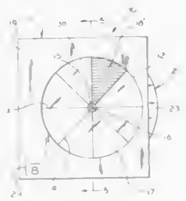
wherein R_1 represents hydrogen or an alkyl group with 1 to 6 carbon atoms; R^2, and R^3 each represents hydrogen, or an unsubstituted or substituted alkyl, aryl or aralkyl group having up to 10 carbon atoms, or R^2 and R^3 are bonded to each other to form a nitrogen-containing heterocyclic ring; m represents 1 or 2; n represents 0 or 1; and L represents a linking group of the valence m + 1.

4,920,033

ROTATABLE DISK TEACHING APPARATUS

John E. Cress, 2833 Cambridge, Chicago, Ill. 60657

Filed Jan. 29, 1988, Ser. No. 150,208
Int. Cl.[5] G09B *1/22, 23/02*
U.S. Cl. 434—198 **26 Claims**



1. A demonstrative teaching apparatus for disclosing relationships between variable pie-shaped segments on a first surface and indicia corresponding to same on a second surface opposite to said first surface, said apparatus comprising:

apparatus housing means having a front side with front side viewing means through which said variable pie-shaped segments on said first surface may be viewed, together with a rear side with rear side viewing means through which said corresponding indicia on said second surface opposite to said first surface may be viewed;

circular disk means operably positioned for rotation within said apparatus housing means and on which first and second surfaces are respectively positioned,

said circular disk means including, on said first surface aligned with said front side viewing means, proximate to the front side of said apparatus housing means, helical disk means substantially concentric with said circular disk means and operably attached thereto, for portraying said variable pie-shaped segments,

said circular disk means further including, on said second surface aligned with said rear side viewing means, proximate to the rear side of said apparatus housing means, a plurality of said indicia correspondingly displaying, through said rear viewing means, values associated with the amount and position of said variable pie-shaped segments disclosed through said front viewing means;

slotted plate means operably positioned between said helical disk means on said first surface of said circular disk means and, said front side viewing means in said front side of said apparatus housing means, for operable disclosure of said variable pie-shaped segments,

said slotted plate means including helical disk slot means through which the outermost free end of said helical disk means protrudes in juxtaposed fashion to disclose, as desired, said variable pie-shaped segments advanced by said helical disk means, while said slotted plate means masks the remainder of said juxtaposed helical disk means and said circular disk means from view through said front side viewing means,

said disclosed variable pie-shaped segments of said helical disk means being extendably and retractably propelled through said helical disk slot means in said slotted plate means, through the forward and rearward rotation, respectively, of said circular disk means, and in turn, said helical disk means which are operably attached to said circular disk means within said apparatus housing means;

circular disk rotation means for enabling said forward and rearward rotation of said circular disk means, as desired, by a user to, in turn, enable variations in the amount and position of said disclosed variable pie-shaped segments displayed through said front side viewing means of said apparatus housing means, simultaneous with the disclosure of said indicia corresponding thereto, as displayed through said rear side viewing means of said apparatus housing means;

said invention further comprising reverse rotation stopping means for limiting the extent to which said circular disk means and, in turn, said helical disk means may be reversably rotated;

said reverse rotation stopping means comprising stop tab means having a first end operably secured to said second side of said circular disk means and a second end emanating angularly outwardly therefrom, and

radially positioned stop arm means having a first end operably juxtaposed to and emanating from the center of the second side of said circular disk means and a second end operably affixed to said slotted plate means,

said stop arm means engaging said stop tab means to limit the reverse rotation of said circular disk means to preclude against the inadvertent unthreading of said helical disk means from within said helical disk slot means in said slotted disk means.

4,920,034

SILVER HALIDE PHOTOGRAPHIC MATERIAL AND IMAGE FORMING METHOD USING THE SAME

Senzo Sasaoka, and Nobuaki Inoue, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 918,443, Oct. 14, 1986, abandoned.
This application May 15, 1989, Ser. No. 352,613
Claims priority, application Japan, Oct. 17, 1985, 60-232086
Int. Cl.[5] G03C *1/06*
U.S. Cl. 430—264 **18 Claims**

1. A silver halide photographic material comprising a surface latent image type silver halide emulsion layer unit on a support, and containing a hydrazine compound in at least one of said emulsion layer unit and other constituent layers, said emulsion layer unit being composed of at least two layers, one of which is a fine-grained low sensitivity emulsion layer and one of which is a coarse-grained high-sensitivity emulsion layer, with the silver halide emulsion present in the fine-grained low sensitivity emulsion layer having an average grain size of not more than 80% of the average grain size of the coarse-grained high-sensitivity silver halide emulsion in the coarse-grained high-sensitivity emulsion layer, and said silver halide photographic material attains a contrast of 10 or more in terms of gamma value when a developer containing at least 0.15 mole/liter of sulfite ions and having a pH of from 9.5 to 12.3 is used, wherein the hydrazine compound is represented by formula (I):

$$R_1—NHNH—G—R_2$$

wherein R_1 is an aliphatic group or an aromatic group; R_2 is a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group; or a substituted or unsubstituted aryloxy group; and G represents a carbonyl group, a sulfonyl group, a sulfoxy group, a phosphoryl group, or an N-substituted or unsubstituted iminomethylene group, said silver halide photographic material consisting essentially of said surface latent image type silver halide emulsion layer unit.

4,920,035

IMAGE FORMING METHOD

Katsumi Hayashi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 19, 1987, Ser. No. 109,379
Claims priority, application Japan, Oct. 17, 1986, 61-247242; Oct. 20, 1986, 61-249305
Int. Cl.[5] G03C *1/06*
U.S. Cl. 430—267 **21 Claims**

1. A method for forming an image, comprising the steps of:

(a) imagewise exposing a photographic silver halide light-sensitive material comprising at least a silver halide, a hydrazine derivative as a contrast enhancing agent, and a substantially water-insoluble metal compound,

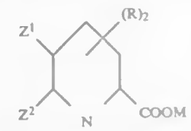
(b) developing the exposed material with a treating solution

(i) containing a complexing compound capable of water-mediated complexing reaction with the metal ion of said substantially waterinsoluble metal compound, and

(ii) being free of a phosphate buffer, and

(c) treating the developed material with a fixer solution containing a water soluble aluminum salt as a hardening agent.

8. The image forming method of claim 1 wherein said complexing compound is selected from compounds having the general formula:



wherein R represents an electron donative substituent selected from the group consisting of hydrogen, an aryl group, a halogen atom, an alkoxy group, a —COOM group, a hydroxycarbonyl group, an amino or substituted amino group, and an alkyl group, the two R's may be the same or different,

Z^1 and Z^2 are as defined for R and may be combined together to form a ring fused to the pyridine ring, and

M is an alkali metal ion, substituted or unsubstituted guanidinium ion, amidinium ion, or quaternary ammonium ion.

4,920,036

PHOTOSENSITIVE RECORDING ELEMENT HAVING PIGMENTED PHOTOPOLYMER LAYER

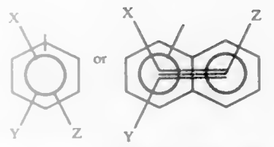
Mikio Totsuka; Fumiaki Shinozaki; Yuichi Wakata, and Tomizo Namiki, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 211,147, Jun. 22, 1988, abandoned, which is a continuation of Ser. No. 908,732, Sep. 18, 1986, abandoned. This application Sep. 7, 1989, Ser. No. 404,068
Claims priority, application Japan, Sep. 20, 1985, 60-207979
Int. Cl.[5] G03C *1/76*
U.S. Cl. 430—270 **3 Claims**

1. In a photosensitive recording material comprising a support, an intermediate layer and a coated photopolymer-containing layer which comprises a photopolymer developable with an alkaline solution, a photosensitive agent selected from the group consisting of an azide-type photosensitive agent, Michler's Ketone and a quinonediazide-type photosensitive agent, and a pigment, wherein said pigment is a compound having the formula (I):

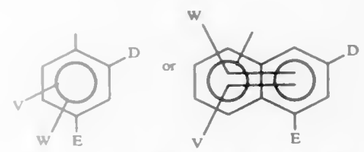
$$[A—N=N—B]^{n-}\ M^{n+} \qquad (I)$$

wherein A is



wherein each of X, Y and Z is any one of a carboxylic acid group, sulfonic acid group, an alkyl group having 1–12 carbon atoms, an alkoxyl group having 1–12 carbon atoms, a nitro group, a halogen atom and a hydrogen atom;

B is



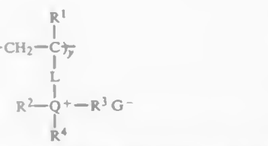
wherein each of V and W is any one of a caboxylic acid group, a sulfonic acid group, and a hydrogen atom; and each of D and E is a hydrogen atom or a hydroxyl group, and at least one of D and E is a hydroxyl group; and

at least one of X, Y, Z, V and W is a carboxylic acid group or a sulfonic acid group;

M is a metal atom; and

n is an integer of from 1–5; and

said photopolymer containing layer contains a compound having the formula (II):



(II)

wherein U is an ethylenic unsaturated monomer; L is a divalent group having 1–12 carbon atoms; Q is a nitrogen atom or a phospborous atom; R^1 is a hydrogen atom or an alkyl group having 1–6 carbon atoms; each of R^2, R^3 and R^4 independently is an alkyl group having 1–12 carbon atoms or an already group having 7–20 carbon atoms; G^- is a monovalent anion; x is number in the range of 0–90 molar %; and Y is a number in the range of 10–100 molar %;

said pigment of the formula (I) being contained in the photopolymer containing layer in an amount within the range of 1–30% by weigh based on the solid component of the photopolymer containing layer and said compound of the formula (II) and said pigment of the formula (I) being contained in the photopolymer containing layer in a weight ratio of from 1:99 to 70:30.

4,920,037

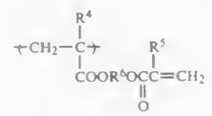
PHOTOPOLYMERIZABLE COMPOSITION

Noriaki Takahashi, Yokohama, and Noriko Watanabe, Machida, both of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

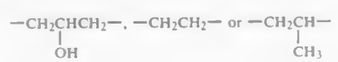
Continuation of Ser. No. 62,077, Jun. 10, 1987, abandoned. This application Sep. 13, 1989, Ser. No. 406,180
Claims priority, application Japan, Jun. 10, 1986, 61-134532
Int. Cl.[5] G03C *1/76*
U.S. Cl. 430—287 7 Claims

1. A photopolymerizable composition, comprising:

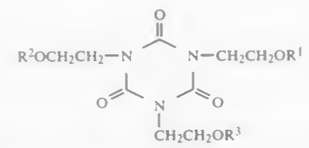
(a) about 10–80% by weight of a diallyl phthalate polymer having a weight-average molecular weight not less than 10,000 or a (meth)acrylic polymer having a weight-average molecular weight of not less than 10,000 and having repeating units therein of the formula:



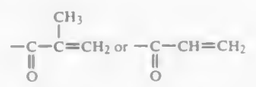
wherein R^4 and R^5 are the same or different and represent a hydrogen atom or a methyl group, and R^6 represents a group of the formula:



(b) a compound having the formula:



wherein R^1, R^2 and R^3 represent a hydrogen atom, or a group of the formula:



with the proviso that not more than one of R^1, R^2 or R^3 is a hydrogen atom at the same time; and

(c) an effective amount of a photoinitiator.

4,920,038

PRINTED CIRCUIT MANUFACTURE EMPLOYING A RADIATION CROSS-LINKABLE PHOTO-POLYMER SYSTEM

Klaus Budde, Unterhaching; Oskar Nuyken, and Walter Melchior, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich

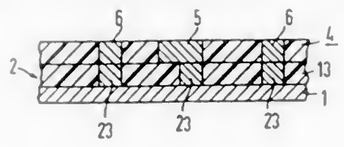
Continuation of Ser. No. 858,920, May 2, 1986, abandoned. This application Nov. 3, 1988, Ser. No. 267,677
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520277
Int. Cl.[5] G03C *5/16, 1/94, 5/00*
U.S. Cl. 430—315 8 Claims

1. A method for the manufacture of a printed circuit comprising the steps of successively

(a) coating a metal foil with a layer comprised of a photosensitive furyl acrylic acid esterified epoxy resin having a molecular weight below approximately 15,000, the resin being produced by reacting a bisphenol A-epichlorohydrin-phenoxy resin with 3-(2-furyl)-acrylic acid chloride the layer including a photo-initiator;

(b) exposing said layer to imaging irradiation, thereby to produce a latent image of a desired wiring structure, the exposing being accomplished by light radiation having a wavelength of approximately 150 to about 400 nm without subsequent hot-hardening;

(c) washing the resulting so irradiated layer with a solvent to dissoive away unexposed portions thereof, thereby to



produce a developed image of such desired wiring structure in the resulting so washed layer through which areas of said metal foil are exposed;

(d) metallizing the resulting so washed, irradiated layer to deposit metal in said layer portions wherein said metal foil areas were so exposed; and

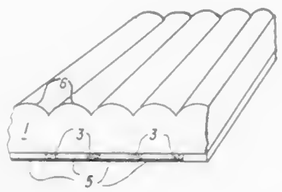
(e) producing further successive layers upon said resulting so exposed and so washed layer of said furyl acrylic acid esterified epoxy resin, each such successive layer being produced by the successive repetition of said steps (a), (b), (c), and (d) without the need for grinding the further successive layers.

4,920,039

MULTIPLE IMAGING

Richard A. Fotland, Holliston; Gary V. Grosclaude, Wayland, both of Mass., and Richard L. Briere, decesased, late of Hopkinton, Mass. (by Eleanor L. Briere, Administrator), assignors to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 225,505, Jul. 28, 1988, which is a continuation of Ser. No. 816,497, Jan. 6, 1986, abandoned. This application Dec. 6, 1988, Ser. No. 280,373
Int. Cl.[5] G03C *5/16*
U.S. Cl. 430—324 10 Claims



1. An imaging method which comprises the steps of:

(a) embossing a plastic film to produce an array of lenticles on said film,

(b) printing an image with a visible light absorbing UV sensitive imaging layer on the side of the film opposite the array of lenticles;

(c) exposing portions of the printed image to collimated ultraviolet radiation by passing said ultraviolet radiation through said lenticles,

(d) rinsing the imaging layer with an aqueous media thereby rinsing away said unexposed portions of the image, resulting in a film product whereby an image can be made to appear and disappear by viewing the lenticular side of the film and changing the viewing angle in relation to the plane of the film.

4,920,040

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL FOR A LASER LIGHT EXPOSURE

Kouzi Ono, Tokyo, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Dec. 1, 1988, Ser. No. 278,318
Claims priority, application Japan, Dec. 3, 1987, 62-307208
Int. Cl.[5] G03C *7/00, 5/24, 1/02*
U.S. Cl. 430—363 10 Claims

1. A silver halide light-sensitive photographic material for a laser light exposure, comprising:

a support having thereon at least one light-sensitive silver halide emulsion layer containing silver halide grains; and

a layer adjacent to said at least one light-sensitive silver halide emulsion layer, wherein said silver halide grains are spectrally sensitized with a dye represented by formula I and at least one layer of said at least one silver halide emulsion layer and said adjacent layer contains a fluorine-containing ionic surfactant, a non-ionic surfactant and an inorganic salt, wherein said inorganic salt is a halide, a phosphate or a thyocyanate of alkali metal, alkali earth metal or ammonium;

wherein

Z_1 and Z_2 independently represent an atomic group needed for completing a five- or six-membered nitrogen-containing heterocycle;

R_1 and R_2 independently represent a saturated or unsaturated aliphatic group;

Q_1 and Q_2 independently represent an atomic group needed for completing a 4-thiazolidinone, a 4-oxazolidinone, a 4-imidazolidinone, a 5-thiazolidinone, a 5-oxazolidinone or a 5-imidazolidinone ring;

L_1, L_2 and L_3 independently represent a methin group or a substituted methin group

wherein R_3 represents a methyl group, an ethyl group, an ethoxy group or an aryl group;

X represents an inorganic or organic acid anion; and

m and n independently represent an integer of 0 to 3.

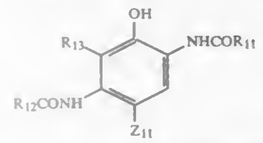
4,920,041

METHOD FOR PROCESSING A SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL USING A DEVELOPER SUBSTANTIALLY FREE OF BENZYL ALCOHOL AND SULFITE

Nobutaka Ohki; Kazuto Andoh, and Takatoshi Ishikawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

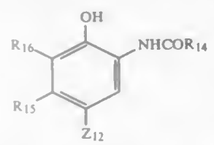
Continuation of Ser. No. 82,455, Aug. 7, 1987, abandoned. This application Jan. 12, 1989, Ser. No. 296,238
Claims priority, application Japan, Aug. 7, 1986, 61-184328
Int. Cl.[5] G03C *7/30, 7/00*
U.S. Cl. 430—380 26 Claims

1. A method for processing a silver halide color photographic material containing a reflective support having thereon at least one light-sensitive silver halide emulsion layer, comprising: providing at least one light-sensitive silver halide emulsion layer which contains at least one cyan coupler represented by formula (C-I) or (C-II):



(C-I)

wherein R_{11} is selected from the group consisting of an alkyl group, a cycloalkyl group, an aryl group, an amino group and a heterocyclic group; R_{12} is selected from the group consisting of an alkyl group and an aryl group; R_{13} is selected from the group consisting of a hydrogen atom, a halogen atom, an alkyl group and an alkoxy group; or R_{13} may be bonded to R_{12} to form a ring; and Z_{11} is selected from the group consisting of a hydrogen atom, a halogen atom and a group capable of being released by the reaction with the oxidation product of an aromatic primary amine color developing agent;



(C-II)

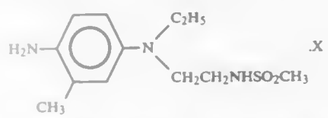
wherein R_{14} is selected from the group consisting of an alkyl group, a cycloalkyl group, an aryl group and a heterocyclic group; R_{15} represents an alkyl group having two or more carbon atoms; R_{16} is selected from the group consisting of hydrogen atom, a halogen atom and an alkyl group; and Z_{12} is selected from the group consisting of a hydrogen atom, a halogen atom and a group capable of being released by the reaction with the oxidation product of an aromatic primary amine color developing agent;

and, after image-wise exposing, developing said silver halide color photographic material with a color developing solution which

(a) does not substantially contain benzyl alcohol,

(b) contains sulfite in an amount of from about 0 g/l to about 1 g/l,

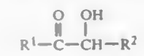
(c) contains an aromatic primary amine color developing agent represented by formula (A):



(A)

wherein X represents a compound capable of forming a salt with a primary amine, and

(d) contains a compound represented by formula (I):



(I)

wherein R^1 is selected from the group consisting of a hydrogen atom, an alkyl group which may be substituted, an aryl group which may be substituted, an alkoxy group which may be substituted, an aryloxy group which may be substituted, and an amino group which

may be substituted; and R^2 is selected from the group consisting of a hydrogen atom, an alkyl group which may be substituted and an aryl group which may be substituted; or R^1 and R^2 may be bonded to each other to form a carbon ring or a hetero-ring.

4,920,042

COLOR IMAGE FORMING PROCESS COMPRISING DEVELOPING WITH SUBSTANTIALLY NO BENZYL ALCOHOL A MATERIAL HAVING SPECIFIC SENSITIZING DYES

Kokichi Waki; Masahiro Asami, and Yoshinori Shibata, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 124,799, Oct. 20, 1987, abandoned. This application Aug. 10, 1989, Ser. No. 394,301

Claims priority, application Japan, Feb. 20, 1986, 61-35748

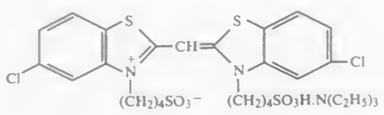
Int. Cl.[5] G03C *7/30, 7/32, 1/12, 1/14*

U.S. Cl. 430—380 **20 Claims**

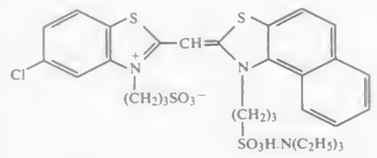
1. A color image-forming process, which comprises, after imagewise exposing a silver halide color photographic material having on a reflective support at least one each of a blue-sensitive emulsion layer, a green-sensitive emulsion layer and a red-sensitive emulsion layer.

said blue-sensitive emulsion layer containing a monodisperse silver chlorobromide emulsion spectrally sensitized by Compound I-1, I-2 or I-10,

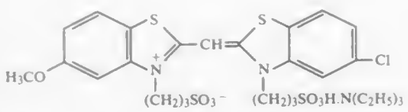
(I-1)



(I-2)

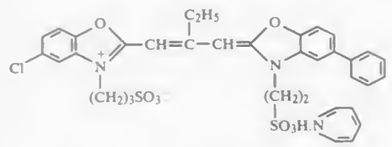


(I-10)

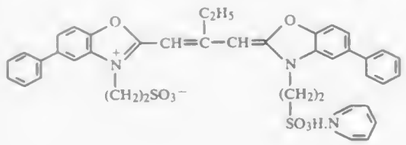


said green sensitive emulsion layer containing a monodispersed silver chlorobromide emulsion spectrally sensitized by Compound II-2, II-3 or II-8, and

(II-2)



(II-3)



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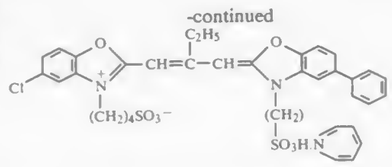
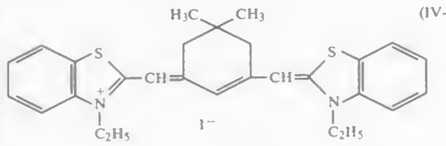
(II-8)

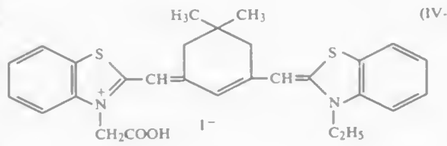


said red-sensitive emulsion layer containing a monodispersed silver chlorobromide emulsion spectrally sensitized by Compound IV-1 or IV-2

(IV-1)



(IV-2)



and

these layers each containing substantially no silver iodide, containing silver chloride in an amount of from 60 mol % to less than 80 mol % of the total silver halide amount and having a coefficient of deviation of not more than 20%, developing the color photographic material using a color developer wherein the concentration of benzyl alcohol is 1 ml/l or less within a development time of 2 minutes and 30 seconds.

4,920,043

METHOD FOR PROCESSING SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Minoru Ohashi, and Shoichi Horii, both of Nagaokakyo, Japan, assignors to 501 Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Mar. 15, 1989, Ser. No. 323,873

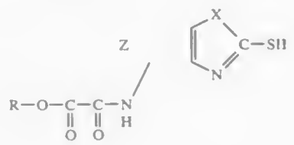
Claims priority, application Japan, Mar. 18, 1988, 63-66186; Mar. 22, 1988, 63-68452; Oct. 12, 1988, 63-257638

Int. Cl.[5] G03C *1/34*

U.S. Cl. 430—611 **9 Claims**

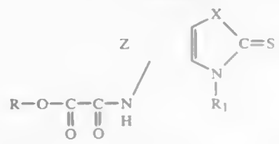
1. A method for photographic processing of a silver halide photographic light-sensitive material which comprises imagewise exposing a silver halide photographic light-sensitive material and then developing the exposed light-sensitive material in the presence of at least one compound selected from the group consisting of the compounds represented by the following formulas (I)–(IV):

(I)

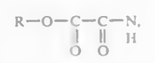


-continued

(II)

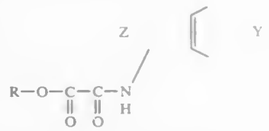


wherein Z represents a group of atoms necessary to form a condensed aromatic ring which may have a substituent in addition to

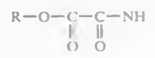


R represents a hydrogen atom or a monovalent organic group, R_1 represents a hydrogen atom or a substituted or unsubstituted alkyl group and X represents an oxygen atom, a sulfur atom, selenium atom or $>N—R_2$ wherein R_2 represents a hydrogen atom or a substituted or unsubstituted alkyl group;

(III)

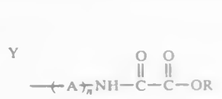


wherein Y represents a group of atoms necessary to form a heterocyclic ring having two or more nitrogen atoms, Z represents a group of atoms necessary to form a condensed aromatic ring which may have a substituent in addition to



and R represents a hydrogen atom or a monovalent organic group; and

(IV)



wherein Y represents a group of atoms necessary to form a nitrogen-containing heterocyclic ring containing no condensed aromatic ring, R represents a hydrogen atom or a monovalent organic group, A represents an arylene group and n is 0 or 1.

4,920,044

INTRACELLULAR FLUSH SOLUTION FOR PRESERVING ORGANS

Peter D. Bretan, Jr., Novato, Calif., assignor to The Cleveland Clinic Foundation, Cleveland, Ohio

Filed Nov. 8, 1988, Ser. No. 268,809

Int. Cl.[5] A01N *1/02*

U.S. Cl. 435—1 **17 Claims**

1. An intracellular flush solution for preserving an organ for transplantation, comprising:

(a) between about 1.54 and 2.56 grams per liter of KH_2PO_4;
(b) between about 7.38 and 12.2 grams per liter of K_2HPO_4;
(c) between about 0.84 and 1.40 grams per liter of KCl;
(d) between about 0.63 and 1.05 grams per liter of $NaHCO_3$;
(e) between about 0 and 2.87 grams per liter of $KHCO_3$;
(f) between about 20 and 37 grams per liter of mannitol;
(g) between about 0 and 4.62 grams per liter of $MgSO_4$;
(h) between about 0 and 0.4 meq/ml of $MgCl_2$;
(i) between about 0.75 and 1.25 grams per liter of adenosine;
(j) between about 0 and 0.125 grams per liter of allopurinol; and,
(k) between about 0 and 1.0 grams per liter of verapamil.

4,920,045

DETECTION OF OCCULT BLOOD IN FECES

Shoji Okuda, Nagaokakyo, and Kazuo Uchida, Kobe, both of Japan, assignors to Kyoto Medical Science Laboratory, Kyoto, Japan

Filed Sep. 22, 1988, Ser. No. 247,616

Int. Cl.[5] G07N *53/00;* **C07G** *15/00;* **C07K** *3/00;* **G01N** *33/72*

U.S. Cl. 435—7 **4 Claims**

1. A method for detection of occult blood in a fecal sample comprising simultaneously reacting said fecal sample with antibodies to hemoglobin and antibodies to transferrin and determining the presence of immunologic reaction products of said hemoglobin and transferrin as an indication of the presence of occult blood.

4,920,046

PROCESS, TEST DEVICE, AND TEST KIT FOR A RAPID ASSAY HAVING A VISIBLE READOUT

Edward McFarland, Baltimore; Keith Uithoven, West Friendship, both of Md., and Jeffrey Carlson, Mountain View, Calif., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation-in-part of Ser. No. 16,846, Feb. 20, 1987, abandoned. This application Oct. 8, 1987, Ser. No. 106,757

Int. Cl.[5] G01N *33/53, 33/543, 33/544, 1/48*

U.S. Cl. 435—7 **20 Claims**

1. A device for use in an assay for detecting the presence of an analyte using a tracer having a particulate label comprising:

a porous support having upper and lower surfaces and a test area on its upper surface;
a binder attached to the test area;
an absorptive layer in fluid communication with the porous support; and
a porous flow control layer positioned between the lower surface of the porous support and the absorptive layer;
wherein:
the porous support has pore sizes sufficient to allow passage of liquid and any analyte and tracer not bound to the test area,
the support area does not specifically bind the tracer,
the test area has a surface area sufficiently large to support binder in a concentration whereby tracer specifically bound to the test area under assay conditions is visible,
the porous flow control layer has unidirectional channels with their pore sizes smaller than those of the porous support and large enough to allow passage at controlled rates of liquid and any analyte and tracer not bound at the test area, and
the porous support, the porous flow control layer and the absorptive layer cooperate to control flow of reagents through the porous support and to receive liquids and any analyte and tracer not specifically bound at the test area in absorptive layer.

4,920,047

ELECTRICAL DETECTION OF THE IMMUNE REACTION

Ivar Giaever, Schenectady, and Charles R. Keese, Schoharie, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 20, 1988, Ser. No. 196,718

Int. Cl.[5] G01N *33/53*

U.S. Cl. 435—7 **9 Claims**

1. A method for determining the presence of, the concentra-

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tion of, or the absence of, a first immunologically-active substance in a liquid medium, said method comprising the steps of:

(i) providing an electrode comprising a plurality of metal film in a small area, in the range of from about 10^{-10} cm^2 to about 10^{-2} cm^2, on a substrate;

(ii) adsorbing a second immunologically-active substance capable of binding said first immunologically-active substance to said electrode;

(iii) contacting said electrode having said second immunologically-active substance adsorbed thereon with a liquid medium to be analyzed for said first immunologically-active substance;

(iv) contacting said electrode with a liquid medium comprising a third immunologically-active substance linked to an enzyme and capable of binding with said second immunologically-active substance and incapable of binding with said first immunologically-active substance;

(v) contacting said electrode with a liquid medium comprising an enzyme substrate capable of reacting with said enzyme linked to said third immunologically-active substance;

(vi) immersing said electrode into a measuring solution; and

(vii) measuring electrical impedance of said electrode whereby no change or only a slight change in impedance indicates the presence of said first immunologically-active substance and a larger change indicates the absence of said first immunologically-active substance, the degree of change being proportional to the concentration of said first immunologically-active substance in said liquid medium.

4,920,048

METHOD FOR STABILIZING EXTRA-CHROMOSOMAL ELEMENTS IN BACTERIA DURING CULTIVATION

Borge K. Diderichsen, Hellerup, Denmark, assignor to Novo Industri A/S, Denmark

Filed Dec. 10, 1985, Ser. No. 807,483

Claims priority, application Denmark, Dec. 12, 1984, 5940/85

Int. Cl.[5] C12P *21/00;* **C12N** *15/00, 9/90, 1/20*

U.S. Cl. 435—69.1 **10 Claims**

10. A method for the production of a protein or polypeptide in transformed Bacillus or Escherichia bacteria which comprises:

(a) inserting a dal gene capable of expressing active D,L-alanine racemase bacteriophage wherein said palsmid or bacteriophage also contains a gene for a protein or polypeptide to be produced;

(b) transforming a bacterial host cell selected from the group consisting of Bacillus and Escherichia, said bacterial host cell having a defect in the chromosomal dal gene for D,L-alanine racemase, with said plasmid or bacteriophage;

(c) culturing the transformed bacterial host cell of step (b) in a nutrient medium wherein the D-alanine requirement of said transformed bacterial host cell caused by its chromosomal gene defect is complemented by the dal gene contained in said plasmid or bacteriophage, and under conditions wherein said protein or polypeptide is produced; and

(d) recovering said protein or polypeptide produced in step (c).

4,920,049

PROCESS FOR THE CONTINUOUS PRODUCTION OF FRUCTOSE-1,6-DI-PHOSPHATE BY EMPLOY OF IMMOBILIZED YEAST

Guglielmo M. Bisso, Via A.G. Barriti, and Federico Melelli, Via Domodossola 26, both of Rome, Italy

Filed Jul. 15, 1987, Ser. No. 73,451

Claims priority, application Italy, Aug. 6, 1986, 21422 A/86

Int. Cl.[5] C12P *19/02;* **C12N** *11/04*

U.S. Cl. 435—105 **7 Claims**

1. A process for the continuous production of fructose-1,6-diphosphate, which comprises phosphorylating dextrose by means of glutaraldehyde-treated yeast continuously supplied with a nutrient mixture and continuously recovering fructose-

1,6-diphosphate by permeation across a hollow fiber ultrafiltration unit.

4,920,050

ACIDIC POLYCYCLIC ETHER ANTIBIOTIC

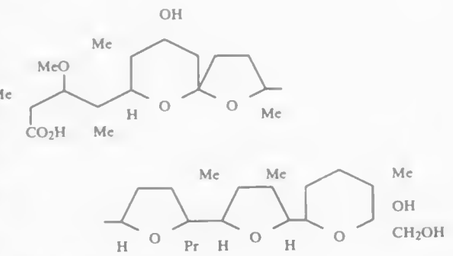
Walter P. Cullen; James R. Hauske, both of East Lyme; Gloria J. Kostek, Preston, all of Conn.; Hiroshi Maeda, Aichi, and Junsuke Tone, Chita, both of Japan, assignors to Pfizer Inc., New York, N.Y.

Filed Feb. 27, 1989, Ser. No. 315,953

Int. Cl.[5] C12P *17/18, 17/06;* **C12N** *1/20;* **C07D** *317/00*

U.S. Cl. 435—119 **6 Claims**

1. A process for the preparation of a compound of the formula



wherein Me is CH_3 and Pr is $CH_3CH_2CH_2$, or a pharmaceutically acceptable salt thereof, which comprises fermentation of Streptomyces sp. ATTC 53862 under submerged aerobic conditions in an aqueous nutrient medium comprising an assimilable source of carbon and nitrogen until a recoverable amount of said compound is formed.

4,920,051

RECOVERY OF UROKINASE COMPOUNDS

Timothy Edmunds, Weymouth, and Susan F. Foley, Brighton, both of Mass., assignors to Damon Biotech, Inc., Needham Heights, Mass.

Continuation-in-part of Ser. No. 151,707, Feb. 3, 1988. This application Jun. 10, 1988, Ser. No. 205,437

Int. Cl.[5] C12N *9/72*

U.S. Cl. 435—215 **14 Claims**

1. A method for extracting a urokinase compound from a solution of urokinase compounds and other proteins, said method comprising the steps of:

(a) contacting a urokinase compound-containing protein solution with a particulate, silicaceous matrix under conditions in which a urokinase compound in said solution binds to said matrix, said matrix comprising the covalently bound, carboxylated reaction product of said particulate, silicaceous matrix with polyethyleniminopropyl trimethoxy silane;

(b) separating unbound protein from said matrix; and

(c) releasing a urokinase compound from said matrix.

4,920,052

PROCESS FOR PRODUCING GLUCOSE ISOMERASE

Graham S. Byng, Elkhart, Ind., assignor to Miles Inc., Elkhart, Ind.

Filed Feb. 5, 1988, Ser. No. 152,481

Int. Cl.[5] C12N *9/92;* **C12R** *1/01*

U.S. Cl. 435—234 **10 Claims**

1. A process for the production of a glucose isomerase which comprises growing a culture of a Microbacterium species selected from the group consisting of *M. lacticum, M. imperiale, M. ammaniaphilum, M. laevaniformans* and glucose isomerase-producing mutants thereof in a medium containing appropriate nutrients for a sufficient time to produce a recoverable quantity of the enzyme and recovering the enzyme from the culture.

4,920,053

METHOD FOR MICROMANIPULATING CELLS BY MOVING CELL-CONTAINING VESSEL ON STAGE OF INVERTED MICROSCOPE WHILE PRICKING CELLS WITH TIP OF STYLUS

Yasuo Inoue, and Itaru Endo, both of Hachiouji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

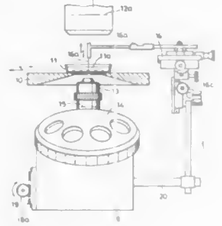
Continuation of Ser. No. 42,519, Apr. 27, 1987, Pat. No. 4,762,405, which is a continuation of Ser. No. 717,091, Mar. 28, 1985, abandoned. This application Apr. 28, 1988, Ser. No. 190,814

Claims priority, application Japan, Mar. 29, 1984, 59-061769

The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.

Int. Cl.[5] G12M *1/00;* **G02B** *21/32*

U.S. Cl. 435—240.1 **1 Claim**



1. A method of a micromanipulation of some cells by pricking said cells with the tip of stylus under an inverted microscope for observation, comprising:

supporting some cells within a vessel placed on a stage of an inverted microscope;

supporting a stylus by an adjustable-length arm attached to an objective holder provided as a revolver on which at least one objective is mounted, so that said stylus is positioned above a respective said objective selected for observation in focus, by adjusting the length of said arm along the optical axis of said objective; and

driving said objective holder to move vertically toward said cells for focusing and pricking of a sample, while moving said vessel to locate said cells consecutively one by one under said stylus.

4,920,054

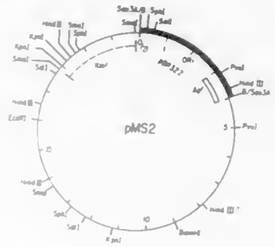
SHUTTLE VECTORS FROM RHODOCOCCUS EQUI

Maya Kozlowski, Brampton, and Wayne Glasse-Davies, Limehouse, both of Canada, assignors to Allelix, Inc., Mississauga, Canada

Filed Jul. 25, 1986, Ser. No. 889,204

Int. Cl.[5] C12N *1/20, 15/00, 7/00*

U.S. Cl. 435—252.31 **18 Claims**



1. A plasmid which comprises:

(a) a first minimal genetic region encoding an origin of plasmid replication functional in Rhodococcus; and

(b) a second minimal genetic region, encoding an origin of plasmid replication functional in at least one selected from the group consisting of *E. coli, Bacillus subtilis,* Corynebacterium, and *Staphylococcus aureus.*

11. A host transformed with a plasmid wherein said plasmid comprises:

(a) a first minimal genetic region, encoding an origin of plasmid replication functional in Rhodococcus; and

(b) a second minimal genetic region, encoding an original of plasmid replication functional in at least one selected from the group consisting of *E. coli, Bacillus subtilis,* Corynebacterium, and *Staphylococcus aureus.*

4,920,055

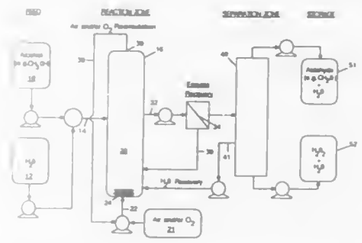
CONVERSION OF ALCOHOLS TO ALDEHYDES AND HYDROGEN PEROXIDE BY SUBSTRATE AND PRODUCT TOLERANT METHANOL OXIDASES

Dane A. Holberg, San Clemente; G. Wesley Hatfield, Corona del Mar; Harris S. Moyed, and Janice A. Sharp, both of Irvine, all of Calif., assignors to American Biogenetics Corporation, Davis, Calif.

Filed Feb. 4, 1986, Ser. No. 825,856

Int. Cl.[5] C12P *7/24, 3/00;* **C12N** *9/04, 1/32*

U.S. Cl. 435—147 **47 Claims**



1. A process for the enzymatic conversion of alcohol to aldehyde and hydrogen peroxide in vitro, comprising the steps of:

introducing water, lower alkyl alcohol or lower alkenyl alcohol, and extracellular methanol oxidase into a reaction

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zone to form a reaction mixture, wherein said reaction mixture is substantially free from catalase activity;

oxygenating said reaction mixture by contacting at least some of the water in the reaction mixture with an oxygen-containing gas at a pressure greater than atmospheric pressure; and

enzymatically converting said alcohol in said reaction mixture into an aldehyde and hydrogen peroxide, wherein the concentration of hydrogen peroxide in said reaction mixture after said enzymatic conversion of said alcohol is greater than about 0.5% weight/volume, wherein said methanol oxidase enzyme has an amino acid sequence that is substantially the same as that of the methanol oxidase produced by *Hansenula polymorpha* ATCC 34438 and having substantially the same product and substrate tolerance properties.

4,920,056

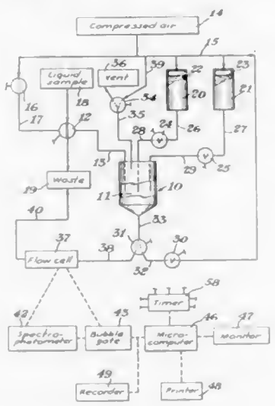
APPARATUS AND METHOD FOR AUTOMATED MICROBATCH REACTION

Purnendu K. Dasgupta, Lubbock, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 19, 1988, Ser. No. 158,181

Int. Cl.[5] G01N *35/00, 31/16*

U.S. Cl. 436—50 **17 Claims**



1. Apparatus for automatic microbatch reaction, comprising;

(a) a reactor defining a reaction chamber;

(b) an automatic liquid sample injection valve in fluid communication with the reaction chamber;

(c) means for automatically flowing a time - controlled variable-sized microvolume of a liquid reagent into the reaction chamber; and

(d) means for supplying gas under pressure in fluid communication with the injection valve so that a preselected microvolume of sample can be blown by said gas into the reaction chamber.

11. The apparatus of claim 10, wherein the means for mixing a liquid in the reaction chamber comprises a magnetic stirring bar positioned within the reaction chamber.

4,920,057

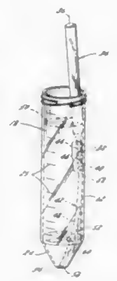
METHOD FOR COLORIMETRIC ANALYSIS OF METALS

Henry B. Castaneda, Woodbridge, Va., assignor to Chemetrics, Inc., Calverton, Va.

Division of Ser. No. 318,903, Mar. 3, 1989. This application Jun. 2, 1989, Ser. No. 360,256

Int. Cl.[5] G01N *33/20*

U.S. Cl. 436—77 **3 Claims**



1. A colorimetric method useful in the field for the analysis of trace levels of a dithizonate-complexing metal cation in an aqueous sample, said method comprising

extracting said metal cation from a relatively larger volume of an aqueous sample, into a relatively smaller volume by use of an organic extractant for an extractable, metal cation-dithizonate complex, of greater density than water;

allowing the resulting biphasic mixture to separate into an upper aqueous layer and a colored, lower layer of organic liquid;

while maintaining positive pressure in a hollow tubular body, passing an open end of said hollow tubular body through said upper aqueous layer into said lower organic layer;

4,920,058

METHOD OF PREDETERMINING THE WEIGHT RATIO OF ALKENYL SUCCINIMIDE REACTANTS

Frank J. DeBlase, Hopewell Junction; Daniel T. Daly, Brewster; Rodney L. Sung, and Clifton W. Wetherbee, both of Fishkill, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 13, 1989, Ser. No. 322,796

Int. Cl.[5] G01N *33/44*

U.S. Cl. 436—85 **7 Claims**

1. A method of predetermining the exact weight ratio of the reactants polyethoxy polypropoxy polybutoxy diamine and an alkenyl succinic anhydride to provide a maximum ORI additive alkenyl succinimide, said method comprising:

(a) determining by spectrometry the characteristic IR absorption of the functional groups of each reactant and that of the product desired;

(b) establishing the weight ratio to the IR absorption ratio of the reactants to produce the desired product whereby a first curve is formed of the reactant IR absorption ratio versus the reactant weight ratio;

(c) varying the weight ratio of the reactants in simulated small scale reactions of the method to produce the product and using the product characteristic IR absorption to form a second curve of the product IR absorption versus the reactant weight ratio, thereby determining the reactant weight ratio necessary to produce the maximum amount of said product;

(d) using the reactant weight ratio determined from the second curve, determine from said first curve the optimum IR absorption ratio of the functional groups of said reactants; and

(e) comparing the prior measured IR absorption ratio of the reactant mixture being charged with said determined optimum reactant IR absorption ratio, whereby the exact weight ratio of the reactants is measured prior to heating and, if necessary, corrected to produce the maximum amount of the product.

4,920,059

STAINING METHOD FOR PROTEINS AND NUCLEIC ACIDS

Marc K. J. J. Moeremans, Mol; Guido F. T. Daneels, Gierle; Marc C. De Raeymaeker, Mechelen, and Jan R. De Mey, Turnhout, all of Belginm, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Filed Jun. 12, 1985, Ser. No. 744,091

Claims priority, application United Kingdom, Jun. 22, 1984, 8415998

Int. Cl.[5] G01N *33/50, 33/68*

U.S. Cl. 436—86 **17 Claims**

I. A process for staining nucleic acids in or on a solid support which comprises:

(i) applying to nucleic acids which are in or on a solid support a suspension consisting essentially of colloidal metal particles, the concentration and pH of such suspension being chosen so as to provide full color saturation within an incubation time of up to one day;

(ii) allowing the colloidal metal particles to bind to the nucleic acids thereby forming stained nucleic acids having colloidal metal particles attached to binding sites thereon; and

(iii) visualizing or quantitatively determining said stained nucleic acids as a colored signal localized at said binding sites.

4,920,060

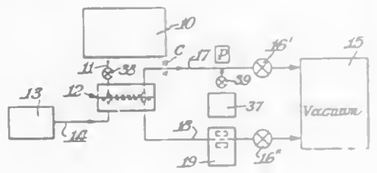
DEVICE AND PROCESS FOR MIXING A SAMPLE AND A DILUENT

George B. Parrent, Jr., Chelmsford, Mass., and Harold Haner, Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 918,704, Oct. 14, 1986, abandoned. This application Apr. 3, 1988, Ser. No. 180,729

Int. Cl.[5] G01N *37/00*

U.S. Cl. 436—178 **11 Claims**



1. A method of controlling dilution of a sample in a measurement of the characteristics of a sample liquid in an analytical detector,

comprising the steps of

providing a supply of sample liquid,

providing a cavity having a non-wetting porous membrane and having a supply chamber on one side of said membrane and a dilution chamber on the other side of said membrane,

and having a first conduit from the sample liquid to the supply chamber and from the supply chamber to a discharge,

transporting the sample liquid through the first conduit to a first surface of said membrane at said supply chamber and from the supply chamber to the discharge,

restricting the flow of said transported sample liquid through said first conduit and supply chamber by a plurality of valve means positioned between said sample supply and the supply chamber and the supply chamber and the discharge,

controllably operating and adjusting said valve means to constrict the sample liquid to form a reservoir of sample liquid contained in the first conduit and supply chamber between said plurality of valve means,

providing means at said reservoir for variably applying pressure on said contained sample liquid in said reservoir,

controlling application of variable pressure on the sample liquid contained in the reservoir to vary and control the amounts of sample liquid transported through the membrane which is equal to or in excess of the minimum liquid entry pressure for the transport through the membrane,

passing a stream of diluent through the dilution chamber across a second surface of the membrane and a second conduit to an analyzer for sensing the properties and composition of the sample liquid in the diluent,

and said diluent stream drawing not more than minute amounts of sample through said membrane,

and applying said pressure on said sample contained in said reservoir to produce a pressure differential between pressure on the sample liquid at the first surface of the membrane and the pressure in the flowing diluent stream across the other surface in excess of the maximum liquid entry pressure differential to pass sample liquid through the membrane so that the amount of dilution of the sample liquid in the diluent is a function of said applied pressure.

4,920,061

BIOLOGICAL MAGNETIC COLLOIDS

Christopher H. Poynton, London, England, and Christopher L. Reading, Kingwood, Tex., assignors to The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 585,888, Mar. 2, 1984, abandoned. This application Jul. 8, 1986, Ser. No. 883,359

Int. Cl.[5] G01N *33/553, 33/543;* **B01F** *3/00*

U.S. Cl. 436—526 **15 Claims**

1. A colloidal biological magnetic fluid comprising a colloidal dispersed phase further comprising colloidal-sized substantially spherical paramagnetic cobalt particles coated with affinity ligands directly adsorbed to the particle surface, said colloidal dispersed phase distributed through an aqueous dispersion medium.

4,920,062

MANUFACTURING METHOD FOR VERTICALLY CONDUCTIVE SEMICONDUCTOR DEVICES

Tetsujiro Tsunoda, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed May 16, 1989, Ser. No. 352,538

Claims priority, application Japan, Oct. 19, 1988, 63-263148

Int. Cl.[5] H01L *21/223, 21/265*

U.S. Cl. 437—6 **9 Claims**

1. A method for manufacturing a vertical conducting power semiconductor device having cathode, anode and gate electrode, comprising the steps of:

preparing a highly doped semiconductor substrate of a first conductivity type;

forming a first semiconductor layer on said semiconductor substrate which has a lower impurity concentration than that of said semiconductor substrate;

forming a highly doped second semiconductor layer of a second conductivity type in said first semiconductor layer;

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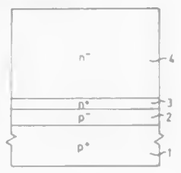
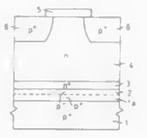
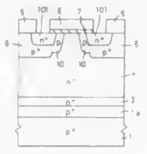
forming a lightly doped third semiconductor layer of said second conductivity type on said second semiconductor layer;

forming a first impurity doped region of said first conductivity type in said third semiconductor layer which is diffused from a surface of said third semiconductor layer by a heating process; and







diffusing impurities of first conductivity type of said semiconductor substrate into said first semiconductor layer when said impurity doped region is diffused by said heating process, so as to maintain the impurity concentration of said second semiconductor layer at a constant level and substantially maintain the same thickness.

4,920,063

PROCESS FOR DETECTION OF SELECTED MOTILE ORGANISMS

N. Robert Ward, Jr., Seattle, Wash., assignor to BioControl Systems, Inc., Bothell, Wash.

Continuation-in-part of Ser. No. 621,182, Jun. 15, 1985, Pat. No. 4,563,418, which is a continuation of Ser. No. 366,978, Apr. 9, 1982, abandoned. This application Sep. 9, 1985, Ser. No. 663,201

The portion of the term of this patent subsequent to Jan. 7, 2003, has been disclaimed.

Int. Cl.[5] **G01N** *33/00;* **C12Q** *1/20*

U.S. Cl. 435—7 **21 Claims**

1. A method for detecting the presence of a particular motile organism within a sample, comprising:

inoculating a selective enrichment medium containing at least one chemotactic attractant with a sample containing the particular motile organism and one or more motile competitors, said chemotactic attractant causing motility cessation of the particular motile organism and the motile competitors within the selective enrichment medium, said enrichment medium being selective for the growth of the particular motile organism relative to the growth of the motile competitors;

contacting the selective enrichment medium containing the motile organisms with a nonselective semisolid motility medium having a gel matrix, said semisolid motility medium containing said chemotactic attractant in a concentration which is less than said initial chemotactic attractant concentration in the selective enrichment medium, and wherein the gel matrix of the semisolid motility medium remains substantially intact;

incubating the sample/selective enrichment medium under conditions which permit the motile organisms to metabolize said chemotactic attractant in said selective enrichment medium to a level which is less than said chemotactic attractant concentration in the semisolid motility medium, thereby allowing the motile organisms to move into the semisolid motility medium, said semisolid motility medium further containing antibodies specific for the particular motile organism, said antibodies being restricted to essentially unidirectional diffusion within the semisolid motility medium from a position distal to the position of the motile organisms and present in sufficient quantity to produce a persistent immobilization band upon interaction of the particular motile organism with the antibodies; and

observing the formation of the immobilization band.

4,920,064

METHOD OF MANUFACTURING AN INSULATED GATE FIELD EFFECT TRANSISTOR DMOS

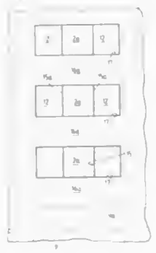
Kenneth R. Whight, Cowfold, England, assignor to U.S. Philips Corporation, New York, N.Y.

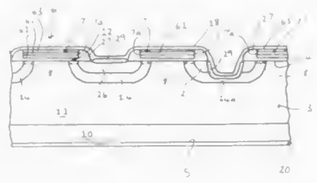
Continuation of Ser. No. 68,599, Jun. 30, 1987, abandoned. This application Apr. 18, 1989, Ser. No. 339,939

Claims priority, application United Kingdom, Aug. 8, 1986, 8619426; Dec. 20, 1986, 8630814

Int. Cl.[5] **H01L** *21/312, 21/283*

U.S. Cl. 437—41 **17 Claims**





1. A method of manufacturing an insulated gate field effect transistor comprising the steps of

providing an insulating layer on one surface of a semiconductor body, said semiconductor body being of a first conductivity type;

providing a conductive gate layer on at least portions of said insulating layer to form an insulated gate structure having at least one conductive gate region;

introducing impurities into said semiconductor body through said insulating layer in areas adjacent said insulative gate structure to form at least one source region at

said one surface within at least one body region of said semiconductor body, said source region being of a second conductivity type opposite to said first conductivity type;

forming at least one channel region below said gate region;

covering said insulated gate structure with another insulating layer by growing insulating material on said one surface of said semiconductor body;

opening at least one contact window in said another insulating layer to said one surface to expose a surface of said source region,

providing a resist layer on said another insulating layer, and patterning said resist layer to form a plurality of masking regions on said one surface over at least a portion of said source region, said masking regions extending completely across said contact window in a first direction, and said masking regions only partly covering said contact window in a second direction, said source region having at least one exposed portion defined partially by said contact window and partially by said masking regions;

etching away said exposed portion of said source region to expose underlying portions of said body region;

removing said masking regions; and

providing metallisation within said contact window to short said exposed underlying portions of said body region to said source region.

4,920,065

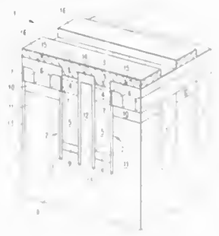
METHOD OF MAKING ULTRA DENSE DRAM CELLS

Daeje Chin, Seoul, Rep. of Korea, and Sang H. Dhong, Mahopac, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 264,418, Oct. 31, 1988, Pat. No. 4,894,697. This application Oct. 27, 1989, Ser. No. 428,100

Int. Cl.[5] **H01L** *21/265*

U.S. Cl. 437—52 **16 Claims**



1. A process for fabricating an ultra dense DRAM memory array comprising the steps of

forming a first plurality of trenches in a semiconductor substrate which is spaced from an underlying substrate by an insulating layer which extends through said semiconductor substrate and said insulating layer into said underlying substrate said trenches having a given depth and extending in a given direction,

refilling said plurality of trenches with an insulating material,

forming a second plurality of trenches in said semiconductor substrate through said semiconductor substrate and said insulating layer into said underlying substrate to said given depth leaving a plurality of active device regions and simultaneously excavating portions of said insulating material from said first plurality of trenches between said second plurality of trenches to a depth less than said given depth,

refilling said second plurality of trenches and said excavated portions of said first plurality of trenches with a conductive material, removing said conductive material from said excavated portions of said first plurality of trenches to expose the surfaces of said insulating material therein and from selected of said second plurality of said refilled trenches to a depth below said depth less than said given depth to form a plurality of flat topped regions of said conductive and said insulating materials which extend in a direction orthogonal to said given direction,

oxidizing said plurality of flat topped regions of conductive material such that the tops of the resulting insulating oxide are at the same level as the tops of said flat topped regions of insulating material forming a plurality of gate conduits extending in a direction orthogonal to said given direction,

forming a pair of conductive gate elements in each of said gate conduits each of said conductive gate elements being disposed in insulted spaced relationship with adjacent active device regions of said plurality of active device regions.

4,920,066

PROCESS FOR FABRICATING A HIGH-SPEED CMOS TTL SEMICONDUCTOR DEVICE

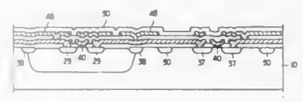
Pil-Young Hong, Einchun; Tae-Yup Oh; Chun-Joong Kim, both of Seoul, and Sang-Suk Kang, Kyoungsangbuk, all of Rep. of Korea, assignors to Samsung Electronic Co. Ltd., Suwon, Rep. of Korea

Filed Dec. 30, 1988, Ser. No. 292,106

Claims priority, application Rep. of Korea, Dec. 31, 1987, 1987-15551

Int. Cl.[5] **H01L** *21/265*

U.S. Cl. 437—57 **10 Claims**



1. A process for fabricating a semiconductor device, comprising the steps of:

forming a second conductivity type well region over a first conductivity type silicon semiconductor substrate;

forming successively a first oxide layer and a nitride layer over said substrate;

selectively removing portions of said nitride layer over a first MOS transistor region on said well region, a second transistor region on said substrate, and channel-stop regions around said second transistor region;

forming a field oxide layer in the first MOS transistor, second transistor and channel-stop regions exposed by said step of selectively removing portions of said nitride layer,

forming drain and source of said first MOS transistor over said well region, and stop-channel regions in said substrate;

forming ohmic contact regions in an edge of said well region, and drain and source of said second MOS transistor between said stop-channel regions over said substrate;

forming a second oxide layer on the whole surface of said substrate to form a gate oxide layer after removing said nitride layer and said first oxide layer of the gate regions of said first and second MOS transistors;

forming contact windows for contacting the source and drain of said first and second MOS transistors;

forming a pattern of a first metal layer to form electrodes of said first and second MOS transistors;

forming a pattern of low temperature oxide layer over said first metal layer to insulate a specified portion;

forming a pattern of a second metal layer connected with first metal layer through said contact windows, being insulated from said first metal layer by said low temperature oxide layer; and

forming a protection layer over said second metal layer.

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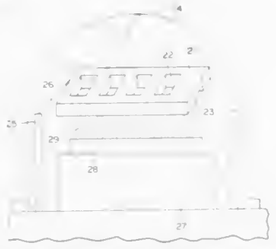
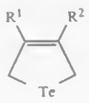
4,920,067
PROCESS FOR II-VI COMPOUND EPITAXY
Jamie Knapp, 3909 E. Hampton Pl., Tuscon, Ariz. 85712
Filed Oct. 5, 1988, Ser. No. 253,609
Claims priority, application Israel, Oct. 7, 1987, 84118
Int. Cl.[5] H01L *21/20, 21/203, 21/205, 21/208*
U.S. Cl. 437—81 8 Claims



1. A process for the production of epitaxial layers of II-VI compound semiconductors on suitable substrates, wherein the epitaxial growth from a melt is effected on such substrates using graphite susceptor devices, where the surfaces of the graphite exposed to the reactants are coated with an essentially pure and uniform layer of essentially silicon mono-oxide applied to such graphite by plasma sputtering.

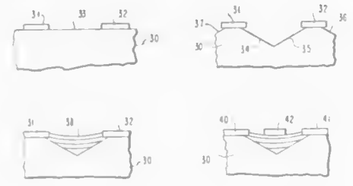
4,920,068
METALORGANIC VAPOR PHASE EPITAXIAL GROWTH OF GROUP II-VI SEMICONDUCTOR MATERIALS
Donald Valentine, Jr., Ridgefield, and Duncan W. Brown, Wilton, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.
Filed Apr. 2, 1986, Ser. No. 847,370
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—81 2 Claims

1. In a method for growing in a reactor a Group II-VI epitaxial layer over a crystalline substrate or over a crystalline substrate having one or more epitaxial layers thereon, said method comprising the steps of:
(i) placing said substrate on a susceptor which is heated to a temperature in the range from about 220° C. to about 300° C.;
(ii) directing a flow of at least one vaporized Group II component toward said substrate;
(iii) directing a flow of a vaporized Group VI metal-organic toward said substrate; and
(iv) reacting the directed flows of Group II component and Group VI metalorganic to form the epitaxial layer, the improvement which comprises using as said Group VI metalorganic a tellurium compound of the formula:



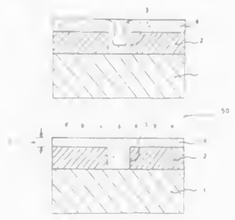
wherein R^1 and R^2 are, independently hydrogen or alkyl of from 1 to about 4 carbon atoms.

4,920,069
SUBMICRON DIMENSION COMPOUND SEMICONDUCTOR FABRICATION USING THERMAL ETCHING
Eric R. Fossum, Yorktown Heights; Peter D. Kirchner, Garrison; George D. Pettit, Mahopac; Alan C. Warren, Peekskill, and Jerry M. Woodall, Bedford Hills, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 12,463, Feb. 9, 1987, abandoned. This application Apr. 15, 1988, Ser. No. 183,489
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—90 12 Claims



1. A method for fabricating semiconductor devices comprising the steps of:
providing a compound semiconductor substrate the surface of which has a given crystallographic orientation,
aligning mask portions on the surface of said substrate such that their edges are aligned in a direction parallel to the line of intersection of intersecting planes obtained by the more rapid erosion of said substrate in the vertical direction than in the lateral direction and such that portions of said surface are exposed, and,
anisotropically etching said exposed surface portions by vapor chemical erosion such that at least a portion of each of said planes is exposed to form at least a portion of a v-grooved channel.

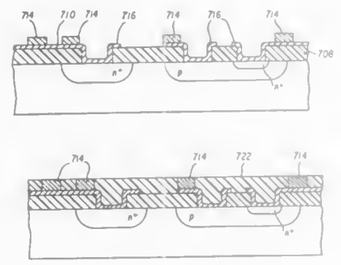
4,920,070
METHOD FOR FORMING WIRINGS FOR A SEMICONDUCTOR DEVICE BY FILLING VERY NARROW VIA HOLES
Ryoichi Mukai, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Nov. 27, 1987, Ser. No. 127,042
Claims priority, application Japan, Feb. 19, 1987, 62-036303; Feb. 27, 1987, 62-046031
Int. Cl.[5] H01L *21/268, 21/283*
U.S. Cl. 437—173 26 Claims



1. A method for fabricating a semiconductor device, comprising the steps of:
(a) forming an insulating layer on a semiconductor substrate;
(b) forming a recess, having a width of less than 1.0 micrometer and an aspect ratio of more than 1.0, in the insulating layer;

(c) depositing metal material by sputtering on the insulating layer and in the recess for forming a layer of the metal material having a first thickness; and
(d) irradiating a pulsed energy beam over the layer of the metal material on the insulating layer for melting the metal material to form a planarized metal layer extending from the metal material filled in the recess over the insulating layer, the first thickness being such that the planarized metal layer has a thickness more than 0.5 micrometers in the vicinity of the recess.

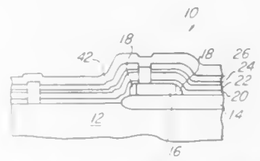
4,920,071
HIGH TEMPERATURE INTERCONNECT SYSTEM FOR AN INTEGRATED CIRCUIT
Michael E. Thomas, Cupertino, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.
Continuation of Ser. No. 712,589, Mar. 15, 1985, abandoned. This application Aug. 18, 1987, Ser. No. 86,200
Int. Cl.[5] H01L *21/283*
U.S. Cl. 437—188 4 Claims



1. A method of inhibiting silicon transport from a doped silicon junction to a refractory metal contact in a semiconductor device by interposing a diffusion barrier layer of material selected from the group consisting of refractory metal nitrides, refractory metal borides and refractory metal carbides, between said doped silicon junction and said refractory metal contact, said method comprising the steps of:
(a) forming a metal disilicide region in a contact region of said semiconductor device including the steps of:
(i) depositing a layer of refractory metal into said contact regions; and
(ii) heating said device; and
(b) forming said diffusion barrier layer by converting at least a portion of said metal disilicide region to said barrier layer material including the steps of:
(i) removing substantially all unreacted refractory metal; and
(ii) heating said device in a gaseous element bearing ambient, said element selected from the group consisting of nitrogen, boron and carbon.

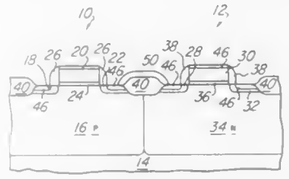
4,920,072
METHOD OF FORMING METAL INTERCONNECTS
Stephen A. Keller; Piper A. Spry, both of Sugar Land; Martha S. Adams, Roseoberg, and Ralph G. Harper, Guy, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Oct. 31, 1988, Ser. No. 265,157
Int. Cl.[5] H01L *21/285*
U.S. Cl. 437—192 5 Claims

1. A method of forming metal interconnects comprising the steps of:
providing a non planarized semiconductor body having active devices formed thereon;
depositing spin-on-glass on said semiconductor body;
depositing a barrier layer material over said spin-on-glass;
depositing a metal layer over said barrier layer;
forming a photoresist layer over said metal layer and patterning said photoresist for contact formation;
etching said contact pattern into said barrier and metal layers;
removing said photoresist;



further etching said contact pattern to the underlying devices;
depositing a conformal layer of CVD tungsten over said semiconductor body to fill said contact openings;
etching back said tungsten without photoresist using said metal layer as an etch stop to prevent over etching;
stripping said metal layer; and
depositing a metalization layer.

4,920,073
SELECTIVE SILICIDATION PROCESS USING A TITANIUM NITRIDE PROTECTIVE LAYER
Che-Chia Wei, Plano; Thomas E. Tang, Dallas; James G. Bohlman, Forney, and Monte A. Douglas, Coppell, all of Tex., assignors to Texas Instruments, Incorporated, Dallas, Tex.
Filed May 11, 1989, Ser. No. 350,429
Int. Cl.[5] H01L *21/283*
U.S. Cl. 437—200 8 Claims



1. A method for forming high conductivity regions in selected regions of a silicon integrated circuit, comprising the steps of:
depositing a layer of titanium overall said silicon integrated circuit;
depositing a layer of titanium nitride on said layer of titanium;
heating said integrated circuit to a temperature sufficient to cause said layer of titanium to react with said selected regions of said silicon integrated circuit to form titanium silicide;
patterning and etching said layer of titanium nitride to provide conductive titanium nitride connection between elements of said integrated circuit said etching removing said layer of titanium nitride from above said titanium silicide where said silicide is not in contact with said conductive connection;

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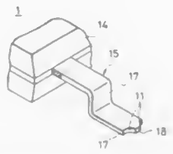
4,920,074

SURFACE MOUNT PLASTIC PACKAGE SEMICONDUCTOR INTEGRATED CIRCUIT, MANUFACTURING METHOD THEREOF, AS WELL AS MOUNTING METHOD AND MOUNTED STRUCTURE THEREOF

Ichio Shimizu, Tamamura; Akio Hoshi, Isesaki; Sumio Okada, Takasaki, and Soichiro Nakamura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 25, 1988, Ser. No. 160,177
Claims priority, application Japan, Feb. 25, 1987, 62-40267; Aug. 20, 1987, 62-207163
Int. Cl.[5] H01L *29/78*
U.S. Cl. 437—211 15 Claims



1. A process for manufacturing a surface mount resin-encapsulated semiconductor device using a lead frame formed from a metal film into a predetermined shape, wherein the process comprises the steps of:

(a) forming a plurality of resin encapsulating bodies, each having paired main upper and lower surfaces, each resin encapsulating body encapsulating a corresponding semiconductor device, the plurality of resin encapsulating bodies being formed at a plurality of predetermined locations of a lead frame comprising a frame member and leads, each of the leads having a lead part, including a free end, protruding out from a resin encapsulating body, the frame member and leads being connected via connecting portions extending between the frame member and leads, each of the leads and the connecting portions having a cross-sectional area, the cross-sectional area of the connecting portions being smaller than the cross-sectional area of the leads;

(b) forming a soldering layer on the surface of said lead frame subsequent to forming the plurality of resin encapsulating bodies;

(c) disconnecting each lead and the frame member at the connecting portions between said frame member and each of the leads, subsequent to the step of forming the soldering layer; and

(d) shaping the free end, and the vicinity thereof, of each of the leads into such a shape that the free end and vicinity thereof is situated at a position below the main lower surface of the resin encapsulating body from which the respective lead protrudes, substantially in parallel with the main surface of the resin encapsulating body and extending away from said encapsulating body.

4,920,075

METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE HAVING A LENS SECTION

Shigeru Morita, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

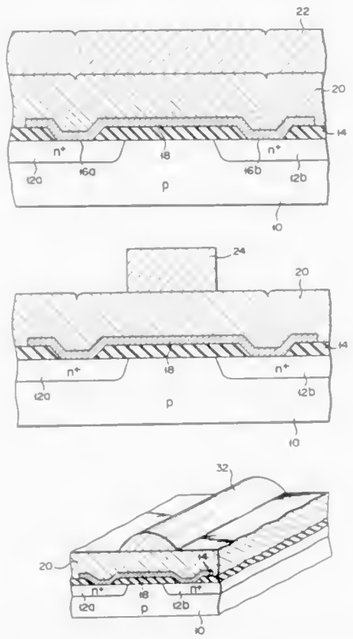
Continuation of Ser. No. 504,123, Jun. 14, 1983, abandoned. This application Jan. 7, 1987, Ser. No. 4,759
Claims priority, application Japan, Jun. 15, 1982, 57-102831
Int. Cl.[5] H01L *21/08*
U.S. Cl. 437—228 8 Claims

1. A method for manufacturing an integrated semiconductor device with a lens section comprising the steps of:

forming a semiconductor element in a semiconductor substrate;

forming a transparent layer over said semiconductor element;

etching said transparent layer to form a block structure over said semiconductor element; and



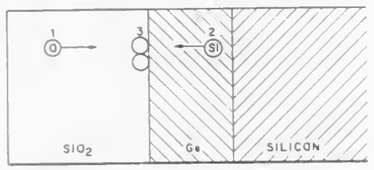
thermally treating said block structure to form said lens section therefrom to a predetermined curvature.

4,920,076

METHOD FOR ENHANCING GROWTH OF SiO_2 IN SI BY THE IMPLANTATION OF GERMANIUM

Orin W. Holland, Oak Ridge; Dariush Fathy, Knoxville, and Clark W. White, Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 15, 1988, Ser. No. 181,899
Int. Cl.[5] H01L *21/473*
U.S. Cl. 437—238 11 Claims



PROCESS
(1) OXYGEN DIFFUSION THROUGH OXIDE
(2) SILICON DIFFUSION THROUGH Ge
(3) FORMATION OF SiO_2 AT THE INTERFACE

1. A process for enhancing the thermal oxidation rate of a selected surface portion of a silicon substrate, comprising the steps of:

providing a substrate consisting essentially of a single crystal of silicon and having a surface portion to be oxidized;

forming a surface epitaxial layer consisting essentially of germanium for providing a concentration of germanium in a near surface region in said silicon substrate at said surface portion to be oxidized sufficient to form at least one uniform monolayer of germanium coextensive with said surface portion to be oxidized during a subsequent heating step; and

heating said substrate in an oxidizing atmosphere containing H_2O for effecting thermal oxidation of said surface portion and forming an essentially uniform epitaxial layer of germanium at least one monolayer in thickness at an interface between said substrate and a layer of silicon dioxide formed by said oxidation and with continuing heating of said substrate in said oxidizing atmosphere containing H_2O for providing enhanced growth rate of said silicon dioxide layer at said surface portion due to the presence of the underlying uniform layer of germanium.

4,920,077

METHOD OF MANUFACTURING MONOLYTHIC INTEGRATED CIRCUITS

Marco Mora, Bergamo, Italy, assignor to SGS-Thomson Microelectronics S.r.L., Milan, Italy

Filed Sep. 27, 1988, Ser. No. 249,788
Claims priority, application Italy, Oct. 9, 1987, 22216 A/87
Int. Cl.[5] H01L *21/00, 21/02, 21/285, 21/90*
U.S. Cl. 437—240 7 Claims

1. A method of manufacturing monolythic integrated circuits, comprising a process step of aluminum annealing and a process step of final passivation, characterized in that said steps are carried out at least in part simultaneously at a pressure of 1 to 1.5 Torr and a temperature of about 450° C.

4,920,078

ARSENIC SULFIDE SURFACE PASSIVATION OF III-V SEMICONDUCTORS

Brian G. Bagley, Watchung; Thomas J. Gmitter, Lakewood, and Eli Yablonovitch, Leonardo, all of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Jun. 2, 1989, Ser. No. 360,414
Int. Cl.[5] H01L *21/00, 21/02, 21/302;* B05D *5/12*
U.S. Cl. 437—243 21 Claims

1. A method for passivating a semiconductor, comprising:

coating a film of a chalcogenide glass on a semiconductor substrate, said coating step including cleaning said substrate with a basic solution, wherein said film is coated on said substrate in a form of a precursor of said chalcogenide glass while said substrate is at a coating temperature below a melting temperature of said chalcogenide glass; and

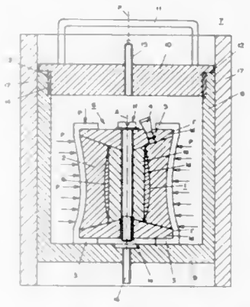
heating said precursor coated substrate at an annealing temperature above a glass transition temperature of said chalcogenide glass.

4,920,079

PROCESS FOR ISOSTATICALLY PRESSING EXPLOSIVE CHARGES

Rudolf Kaeser, Thun, and Jurg Meister, Steffisburg, both of Switzerland, assignors to Schweizerische Eidgenossenschaft Vertreten Durch: Eidg. Munitionsfabrik Thun Der Gruppe Fur Rustenedienste, Thun, Switzerland

Filed Jun. 8, 1988, Ser. No. 204,004
Claims priority, application Switzerland, Jun. 17, 1987, 02270/87
Int. Cl.[5] C06B *21/00*
U.S. Cl. 264—3.1 9 Claims



1 A process for isostatically pressing high-performance explosive bodies of high dimensional stability and high degree of homogeneity, said process comprising sealingly engaging an elastic sleeve to the largest edge zone of a mold member to define a loadable compression mold cavity therebetween, said mold member being a dimensionally stable body having a high quality surface thereof and at least in part being rotationally symmetric and having a finite slope relative to the axis of rotation of the rotationally symmetric part of the body, filling the cavity of the compression mold with powdered explosive, evacuating gas from the filled compression mold and while the cavity is evacuated sealing the cavity against the passage of gas thereinto, subjecting the exterior of the sealed, evacuated, filled compression mold to fluid pressure at a pressure which is increased continuously until a predetermined value of explosive density is achieved to form a pressed explosive body, returning the pressurized compression mold to ambient pressure by continuous pressure relief, and removing the pressed explosive body from the compression mold.

4,920,080

METHOD OF MAKING GLASS WITH PRELIMINARY REACTION OF BATCH MATERIALS

Henry M. Demarest, Jr., Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 19, 1988, Ser. No. 233,707
Int. Cl.[5] C03C *6/04*
U.S. Cl. 501—31 10 Claims

1. A method of making glass from batach materials including a silica source material, sodium carbonate, and a source of calcium, comprising:

contacting a first portion of the silica sosurce material with the sodium carbonatae in a first pre-reaction zone at a sufficient temperature for a sufficient time to form a product consisting predominantly of sodium silicate;

heating a second portion of the silica source with a carbonate source of calcium in a second pre-reaction zone to at least a temperature sufficient to render the calcium source substantially free of carbonates;

bringing the products at elevated temperataures from the first and second pre-reaction zones into contact with each

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other and heating the combined products in a third zone so as to initiate melting of glass.

4,920,081

R_2O-AL_2O_3/B_2O_3-P_2O_5 GLASSES

George H. Beall, Big Flats, and Candace J. Quinn, Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Oct. 17, 1988, Ser. No. 258,674
Int. Cl.[5] C03C *3/16, 3/17, 3/19, 3/21*
U.S. Cl. 501—47 1 Claim

1. A glass exhibiting a transition temperature below 350° C., a working temperature below 450° C., and excellent resistance to attack by water and mild aqueous alkaline solutions, said glass consisting essentially, expressed in terms of mole percent on the oxide basis, of:

P_2O_5	41–57	Li_2O	0–21
Al_2O_3	0–5	$Na_2O + Li_2O$	13.8–43
B_2O_3	0–9	Cu_2O	0–12
$Al_2O_3 + B_2O_3$	3–9.5	$Li_2O + Cu_2O$	10–29
Na_2O	15–24	ZrO_2	0–2.8
CaO	0–8	F_2	0–5.5
MgO	0–2	K_2O	0–5.5

$P_2O_5 + Al_2O_3 + B_2O_3 + Na_2O + Li_2O + Cu_2O > 90$.—

4,920,082

GLASSES EXHIBITING CONTROLLED FLUORIDE RELEASE

Paul S. Danielson, Corning, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Continuation-in-part of Ser. No. 304,014, Jan. 30, 1989, abandoned. This application Oct. 25, 1989, Ser. No. 427,181
Int. Cl.[5] C03C *3/118*
U.S. Cl. 501—59 6 Claims

1. A translucent, phase separated, fluoride-containing glass wherein the phase separated droplets do not exceed about 1400Å in size and wherein, upon exposure to an aqueous environment, fluoride ions will be released therefrom at a controlled, relatively constant rate over a substantial period of time, but with essentially no development of porosity or other physical breakdown effect, and which can be melted and formed with relatively low volatilization of fluorine, said glass being essentially free of alkali metal oxides and heavy toxic metals and consisting essentially, expressed in terms of weight percent of:

SiO_2: 41.4–55.9
BaO: 24.7–33.6
Al_2O_3: 5.6–11
B_2O_3: 6.5–10.3
F: 3–6.

4,920,083

NOVEL PROCESS FOR THE PRODUCTION OF CERAMIC FLAKES

Venugopal B. Menon, Chapel Hill, N.C., assignor to Research Triangle Institute, Research Triangle Park, N.C.

Filed May 18, 1988, Ser. No. 195,649
Int. Cl.[5] C04B *35/48*
U.S. Cl. 501—84 20 Claims

1. A method for the production of ceramic oxide flakes, comprising the steps of:

(i) preparing a colloidal foam by blowing a gas into an aqueous solution comprising a precursor salt of said ceramic oxide flake and a surfactant;

(ii) precipitating flakes of said precursor salt in said colloidal foam; and

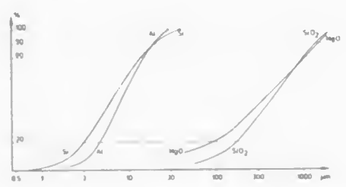
(iii) drying and calcining said precipitated flakes to produce said ceramic oxide flakes.

4,920,084

FORMING REFRACTORY MASSES AND COMPOSITION OF MATTER FOR USE IN FORMING SUCH REFRACTORY MASSES

Pierre Robyn, Nivelles; Léon-Philippe Mottet, Tarcienne, and Pierre Deschepper, Marcinelle, all of Belgium, assignors to Glaverbel, Brussels, Belgium

Division of Ser. No. 803,782, Dec. 2, 1985, Pat. No. 4,792,468. This application Oct. 6, 1988, Ser. No. 239,175
Claims priority, application United Kingdom, Jan. 26, 1985, 8502008
Int. Cl.[5] C04B *35/00, 35/62*
U.S. Cl. 501—94 16 Claims



1. A composition of matter for spraying against a surface to form a refractory mass, such composition being a mixture comprising refractory particles, together with particles of exothermically oxidisable material, wherein the exothermically oxidisable particles are present in an amount between 5% and 30% by weight of said mixture and the granulometry of said particles is such that the mean of the 80% and 20% grain sizes of the refractory particles is greater than the mean of the 80% and 20% grain sizes of the oxidisable particles and that the size range spread factor, f(G), of the refractory particles is at least 1.2 wherein the % grain size of the particles of material denotes that % proportion by weight of the particles which will pass a screen having a mesh of that size, and the mean of two % grain sizes refers to half of the sum of those grain sizes, and

$$f(G) = \frac{2(G_{80} - G_{20})}{G_{80} + G_{20}}$$

where G_{80} denotes the 80% grain size of particles of that species and G_{20} denotes the 20% grain size of particles of that species.

4,920,085

SILICON NITRIDE SINTERED BODY AND PROCESS FOR PREPARATION THEREOF

Makoto Yoshida; Masahiro Sato; Kazunori Koga; Kazumi Osamura; Shoji Kousaka; Tatsumi Maeda; Kiyoshi Yokoyama, and Masafumi Matsunaka, all of Koknbu, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Apr. 1, 1988, Ser. No. 176,605
Claims priority, application Japan, Apr. 2, 1987, 62-82077; Apr. 2, 1987, 62-82078; Apr. 9, 1987, 62-87842; May 9, 1987, 62-113104; May 20, 1987, 62-124663; Jun. 2, 1987, 62-138782; Aug. 31, 1987, 62-218341; Nov. 30, 1987, 62-304135
Int. Cl.[5] C04B *35/58*
U.S. Cl. 501—97 12 Claims

1. A silicon nitride sintered body comprising 85 to 99 mole % of β-Si_3N_4, 1 to 5 mole % of at least one oxide (M_2O_3) of an element (M) selected from the group consisting of Sc, Yb, Er, Ho and Dy and less than 10 mole % of excessive oxygen (O_2), in the form of SiO_2, based on the three components, the excessive oxygen in the form of SiO_2/M_2O_3 molar ratio being lower than 2, wherein said body comprises grains of Si_3N_4 and a grain boundary comprising a vitreous phase and a crystal phase consisting of $M_4Si_2O_7N_2$ or a major amount of $M_4Si_2O_7N_2$ and a minor amount of at least one of $MSiO_2N$ and $M_{10}Si_7O_{23}N_4$.

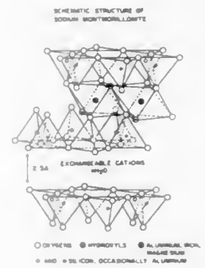
3. A silicon nitride sintered body comprising 85 to 99 mole % of β-Si_3N_4, 1 to 5 mole % of at least one oxide (M_2O_3) of an element (M) selected from the group consisting of Sc, Yb, Er, Ho and Dy and less than 10 mole % of excessive oxygen (O_2) in the form of SiO_2 based on the three components, the excessive oxygen in the form of SiO_2/M_2O_3 molar ratio being lower than 2, wherein said body comprises grains of Si_3N_4 and a grain boundary comprising a vitreous phase and a crystal phase comprising a major amount of $MSiO_2N$.

4,920,086

MIXED PILLARED CLAY REDUCTION PRODUCTS AND METHOD OF PREPARATION

Rasik H. Raythatha, 329 Franklin St., Tennille, Ga. 31489; Bruce Tatarchuk, Rte. 2, Box 189F, Auburn, Ala. 36830, and Woo Y. Lee, 500 Northside Cir., Apt. Q9, Atlanta, Ga. 30309

Continuation-in-part of Ser. No. 70,433, Jul. 7, 1987, abandoned. This application Apr. 11, 1988, Ser. No. 180,342
Int. Cl.[5] B01J *29/06, 21/16*
U.S. Cl. 502—63 15 Claims



1. A method of making a catalytic composition which comprises preparing a mixed pillared clay by steps including forming an aluminum hydroxy polymer and forming a transition metal hydroxy polymer, in the liquid phase, and mixing said liquid phase polymers with a swelling clay to form a mixed pillared clay, using a proportion of each individual polymer that will satisfy a selected percentage of the cation exchange capacity of the clay, and subjecting the mixed pillared clay to a reducing atmosphere to produce metallic transition metal domains.

4,920,087

VANADIUM SCAVENGING COMPOSITIONS

Richard F. Wormsbecher, Baltimore, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation of Ser. No. 739,645, May 31, 1985, abandoned, which is a continuation-in-part of Ser. No. 487,165, Apr. 21, 1983, abandoned, and Ser. No. 689,280, Jan. 7, 1985, abandoned. This application Mar. 9, 1988, Ser. No. 165,696
Int. Cl.[5] B01J *21/08, 21/10*
U.S. Cl. 502—68 12 Claims

1. A composition for scavenging vanadium during the catalytic cracking of hydrocarbons comprising a magnesia-silica gel having the weight composition 30 to 80 percent MgO and a pore volume of at least 0.1 cc/g in intra-particle pores having an average pore diameter greater than about 600 Å in pores ranging from about 200 to 10,000 Å in diameter.

3. In a catalyst for the catalytic cracking of vanadium containing hydrocarbons wherein said catalyst comprises synthetic faujasite dispersed in an inorganic oxide matrix and a composition for scavening vanadium, the improvement comprising from about 5 to 80 percent by weight expressed as the oxides of a composition for scavenging vanadium which comprises a magnesia-silica gel having the weight composition 30 to 80 percent MgO, and a pore volume of at least 0.1 cc/g in intra-particle pores having an average pore diameter greater than about 600 Å in pores ranging from about 200 to 10,000 Å in diameter.

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4,920,088

CATALYST FOR THE OXIDATION OF CARBON MONOXIDE

John W. Kolts, Ochelata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 94,467, Sep. 21, 1987, abandoned. This application May 6, 1988, Ser. No. 192,264

Int. Cl.[5] B01J *21/06, 23/42, 23/44, 23/89*

U.S. Cl. 502—326 87 Claims

1. A composition of matter consisting essentially of (i) a support material consisting essentially of titania, (ii) platinum metal and (iii) iron oxide,

wherein said composition of matter is active as a catalyst for the oxidation of carbon monoxide with free oxygen to carbon dioxide at about 10°–50° C., and said composition of matter contains components (ii) and (iii) in amounts such that said iron oxide is effective as copromoter for said platinum metal on said support material in said oxidation at about 10°–50° C.

4,920,089

HYDROGENATION CATALYST

Wilhelmus P. Van Beek, Vlaardingen; Wilma Den Hoed, Papendrecht; Willem A. Van Leeuwen, Vlaardingen; Eduard K. Poels, Leyden, and Cornelis Visser, Zwijndrecht, all of Netherlands, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Filed May 3, 1988, Ser. No. 192,217

Claims priority, application European Pat. Off., May 8, 1987, 87200855.2

Int. Cl.[5] B01J *21/04, 23/74*

U.S. Cl. 502—335 5 Claims

1. A nickel upon transition alumina catalyst containing 5–40% ww of nickel, with an active nickel surface area between 80 and 300 m^2/g of Ni, characterized in that the transition alumina is substantially free for pores with a radius below 2.0 nm, has a pore size distribution substantially between 3.5 and 30 nm, and satisfies the following x-ray diffraction pattern:

d (10^{-10} m)	I/Io
1.39	100
2.85	75–85
2.72	60–80
2.43	70
2.01	45–80

4,920,090

PROCESS FOR THE FORMATION OF SHAPED AGGLOMERATES FROM PARTICULATE SOLIDS

Wolfgang Ritter, Haan; Hans-Peter Handwerk, Duesseldorf, and Franz-Josef Carduck, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 193,973, May 13, 1988, Pat. No. 4,866,023. This application Dec. 5, 1988, Ser. No. 280,400

Claims priority, application Fed. Rep. of Germany, May 15, 1987, 3716286; Dec. 7, 1987, 3741337

Int. Cl.[5] B01J *32/00*

U.S. Cl. 502—439 20 Claims

1. A process for making a shaped agglomerate from finely divided solid particles, comprising the steps of:

(a) mixing the solid particles with a first carrier liquid phase comprising a solution of binder precursor polymer molecules that contain anhydrides of dicarboxylic acids, said solid particles being less than fully soluble in and chemically non-reactive with said first carrier liquid phase;

(b) shaping the dispersion formed in step (a) into the desired shape for the final agglomerate; and

(c) reacting the shaped body formed in step (b) with an effective quantity of anhydride-reactive polyamine molecules to harden at least a surface zone of the shaped body formed in step (b) by converting the binder precursor polymer molecules in this zone to binder polymer molecules, said binder polymer, as a result of reaction between the anhydride and the polyamine, containing sufficient cyclic imide groups and being present in sufficient amount so that the shaped body as a whole detectably absorbs infrared light selectively at about 1770 and about 750 wave numbers.

4,920,091

RECORDING MATERIAL

Ken Iwakura; Shojiro Sano; Masato Satomura; Koreshige Ito, and Katsumi Matsuoka, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

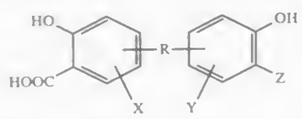
Filed Dec. 27, 1988, Ser. No. 290,669

Claims priority, application Japan, Dec. 25, 1987, 62-329268; Mar. 14, 1988, 63-59919; Mar. 14, 1988, 63-59920; Jul. 8, 1988, 63-170546

Int. Cl.[5] B41M *5/16, 5/18, 5/20*

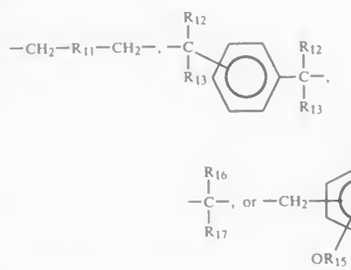
U.S. Cl. 503—211 13 Claims

1. A recording material comprising a support having thereon at least one electron donating colorless dye and at least one electron accepting compound, wherein the electron accepting compound is a salicylic acid compound represented by formula (I):

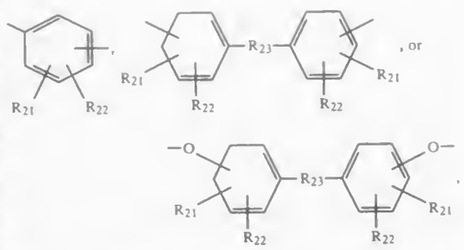


(I)

wherein R represents



wherein R_{11} represents



wherein R_{21} and R_{22}, which may be the same or different, each represents a hydrogen atom, an alkyl group, an alkoxy group, a halogen atom, an aryl group, or a hydroxyl group; and R_{23} represents an alkylene group or an aralkylene group; R_{12} and R_{13} each represents a hydrogen atom, an alkyl group, or an aryl group, provided that R_{12} and R_{13} do not simultaneously represent a hydrogen atom; R_{16} and R_{17} each represents a hydrogen atom, an alkyl group, or an aryl group, provided that at least one of them is an aryl group and that the sum of the carbon atom number of R_{16} and R_{17} is 7 or more; R_{14} represents a hydrogen atom or an organic residual group; and R_{15} represents a hydrogen atom, an alkyl group, an alkoxy group, or a halogen atom; X and Y, which may be the same or different, each represents a hydrogen atom, an alkyl group, an aryl group, an alkoxy group, or a halogen atom; and Z represents a hydrogen atom, a carboxyl group, an alkyl group, an aryl group, an alkoxy group, or a halogen atom, or a metal salt thereof.

4,920,092

DYESHEETS

Roger J. Davey, Hoole Chester, and Duncan H. MacKeron, Frodsham, both of England, assignors to Imperial Chemical Industrices PLC, London, England

Filed Jun. 6, 1988, Ser. No. 202,588

Claims priority, application United Kingdom, Jun. 5, 1987, 8713242

Int. Cl.[5] B41M *5/035, 5/26*

U.S. Cl. 503—227 5 Claims

1. A thermal transfer dye sheet, comprising a supportive based material coated with a composition of a thermally transferable dye dispersed uniformly throughout a polymeric binder matrix, wherein the composition also contains a crystallisation inhibitor having a molecular structure consisting essentially of a polymer backbone to which are chemically bonded a multiplicity of groups which have one of (a) essentially the same chemical structure as the individual thermally transferable dye molecules and (b) a chemical structure which represents a substantial portion of the individual thermally transferable dye molecules, said substantial portion being sufficient to mimic the crystallisation behavior of said thermally transferable dye.

4,920,093

FABRICATION OF SUPERCONDUCTING OXIDE THIN FILMS BY SOL-GEL METHOD

Toshihisa Nonaka, Osaka; Keisuke Kobayashi, Shiga; Hiroyuki Igaki, Shiga, and Michiyasu Matsuki, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 26, 1988, Ser. No. 200,515

Claims priority, application Japan, May 29, 1987, 62-131093; Jul. 24, 1987, 62-186304; Jan. 25, 1988, 63-14009

Int. Cl.[5] B05D *5/12;* C01F *17/00;* C04B *35/05*

U.S. Cl. 505—1 32 Claims

1. A method of forming a superconductive thin film comprising:

a step of preparing a solution containing an amount (a) of mols of at least one compound selected from the group A consisting of methoxide, ethoxide, propoxide, butoxide, methoxyethoxide and ethoxyethoxide of La; an amount (b) of mols at least one compound selected from the group B consisting of methoxide, ethoxide, propoxide, butoxide, methoxyethoxide and ethoxyethoxide of a metal selected from Ba, Sr and Ca; an amount (c) of mols of at least one compound selected from the group C consisting of methoxide, ethoxide, propoxide, butoxide, methoxyethoxide and ethoxyethoxide of Cu; an amount (d) of mols for inhibiting hydrolysis of at least one compound selected from the group D consisting of monoethanolamine, diethanolamine, triethanolamine, mono-2-propanolamine, di-2-propanolamine, acetylacetone, ethylene glycol, diethylene glycol, propylene glycol and dipropylene glycol; and an amount (e) of liters of at least one compound selected from the group E consisting of methanol, ethanol, propanol, butanol, methoxyethanol and ethoxyethanol; said amounts (a)–(e) satisfying the following equations:

$0.1 \times (a+b+c) \leqq d \leqq 3 \times (a+b+c)$ and

$0.01 \leqq \{(a+b+c)/e\} \leqq 3$;

a step of forming a thin film of the solution as prepared above on a heat-resistant substrate;

a step of drying the film thus formed; and

a step of calcining said film in an oxidative atmosphere at 350° to 1,150° C. to make said film superconductive.

4,920,094

PROCESS FOR PRODUCING SUPERCONDUCTING THIN FILMS

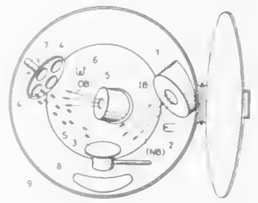
Shuichi Nogawa, and Eiji Kamijo, both of Kyoto, Japan, assignors to Nissin Electric Co., Ltd., Kyoto, Japan

Filed Mar. 25, 1988, Ser. No. 173,565

Claims priority, application Japan, Mar. 27, 1987, 62-75583

Int. Cl.[5] C23C *14/46;* B05D *5/12*

U.S. Cl. 505—1 8 Claims



1. A process for producing a superconducting thin film on a surface of a substrate, comprising the steps of:

sputtering a target made of a group IIIa metal and/or an oxide thereof, a group IIa metal and/or an oxide thereof and copper and/or an oxide thereof with an ion beam or a neutral beam to allow particles sputtered from the target to be deposited on the substrate, said group IIIa metal being selected from scandium, yttrium, and lanthanide elements and said group IIa metal being selected from magnesium, calcium, strontium, and barium; and impinging an oxygen neutral beam on the substrate, to thereby form a thin film of a IIa-IIa-Cu oxide.

4,920,095

SUPERCONDUCTING ENERGY STORAGE DEVICE

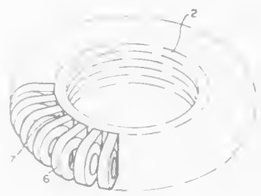
Yukio Ishigaki, Hitachi, and Tadasi Sonobe, Iwaki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 223,640

Claims priority, application Japan, Jul. 29, 1987, 62-187571; Jul. 29, 1987, 62-187572

Int. Cl.[5] H01F *7/22;* H01L *39/14;* H02J *15/00*

U.S. Cl. 505—1 28 Claims



1. A superconducting energy storage device for storing electric energy in the form of magnetic energy by passing an electric current through superconducting magnets for the purpose of releasing the magnetic energy in the form of elec-

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tric energy as occasion demands, said superconducting magnets comprising a superconducting toroidal magnet and a superconducting solenoid magnet inside of said superconducting toroidal magnet, said magnets being connected electrically in series to each other.

4,920,096

METHOD FOR EXTRACTING CEDAR WOOD OIL

Paul Z. Bedoukian, 96 Warncke Rd., Wilton, Conn. 06897

Filed Oct. 6, 1988, Ser. No. 255,356
Int. Cl.[5] C11B *9/00;* C07C *35/18*
U.S. Cl. 512—5 9 Claims

1. A method for extracting cedar wood oil from raw cedar wood comprising the steps of:

A. obtaining a batch of raw cedar wood;

B. covering the raw cedar wood with a water insoluble solvent having a boiling point lower than the cedar wood oil components and maintaining the raw cedar wood in this configuration for a predetermined time period;

C. removing the processed cedar wood from the resulting extract; and

D. removing the solvent from the extract to obtain the purified cedar wood oils.

4,920,097

IMMUNOSUPPRESSOR AND METHOD OF EXTRACTION THEREOF FROM LEUKOCYTES

A. Arthur Gottlieb; Robert C. Sizemore, and Sudhir K. Sinha, all of New Orleans, La., assignors to Imreg, Inc., New Orleans, La.

Continuation of Ser. No. 867,564, May 28, 1986, abandoned. This application Oct. 12, 1988, Ser. No. 256,581
Int. Cl.[5] A01N *37/18;* A61K *35/14*
U.S. Cl. 514—2 20 Claims

1. In a method of extracting a suppressor from an extract of leukocytes and purifying it whereby said suppressor is separated from extraneous materials in said extract, comprising the

(1) size fractionating said extract, thereby producing a first dialysate having a nominal M.W. cutoff of approximately 12,000;

(2) size fractionating said first dialysate, thereby producing a seond dialysate and a retentate, separated from one another at a nominal M.W. cutoff of approximately 3500;

(3) applying said retentate to a reverse phase octadecylsilane HPLC column;

(4) eluting said column with a solvent system;

the improvement comprising: eluting said column with an acetonitrile in dilute aqueous trifluoroacetic acid gradient, said gradient including a range of acetonitrile concentration from approximately 70% to approximately 80%, thereby producing elutants associated with different portions of said gradient; and collecting the elutant associated with the zone of said gradient wherein acetonitrile concentration is between approximately 75% and approximately 80%, whereby material designated herein as L-4 suppressor is provided.

5. A material having a M.W. between 3500 and 12,000, and further characterized by having the following properties:

(a) being substantially entirely chromotographically elutable from octadecylsilane by acetonitrile in dilute aqueous trifluoroacetic acid gradient, in the portions of said gradient between approximately 70% and approximately 85% acetonitrile concentration;

(b) being substantially not so elutable in the portions of said gradient below approximately 70% acetonitrile concentration; and

(c) being substantially free of material that is so elutable below said concentration and of material that is so elutable only above 90% acetonitrile concentration;

(d) not being chromotographically elutable from hydroxylapatite by aqueous ammonium bicarbonate gradient, in the portions of said gradient between approximately 0.1 M and 0.15 M; and

(e) nonspecifically causing a lessening of the magnitude or rate of an immune system reaction when administered to a human or other mammalian subject.

10. A method of decreasing the speed or magnitude of a person's immune system response comprising administration to said person of an effective dosage amount of material of claim 5.

4,920,098

NUTRITIONAL SUPPORT OR THERAPY FOR INDIVIDUALS AT RISK OR UNDER TREATMENT FOR ATHEROSCLEROTIC VASCULAR, CARDIOVASCULAR, AND/OR THROMBOTIC DISEASES

Richard Cotter, Libertyville; Robert C. Johnson, Westchester; Michael Ward, McHenry; David C. Madsen, Libertyville; Anthony J. Valicenti, Deerfield; Michael P. Menard, Grayslake, and Hugh N. Tucker, Barrington, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 908,447, Sep. 17, 1986, abandoned. This application Aug. 28, 1989, Ser. No. 403,849
Int. Cl.[5] A61K *37/02, 31/195, 31/715*
U.S. Cl. 514—2 14 Claims

1. A method for providing cardiac therapy to an individual in need of same through a parenteral regimen comprising:

a. a therapeutically effective amount of a protein source which includes a high biological value protein, amino acids including branched-chain amino acids and L-carnitine;

b. a therapeutically effective amount of a polysaccharide source supplemented with ribose and/or xylitol; and

c. a therapeutically effective amount of a lipid emulsion consistently essentially of a natural oil containing unsaturated fatty acids of 11 to 26 carbons in length, and an emulsifier.

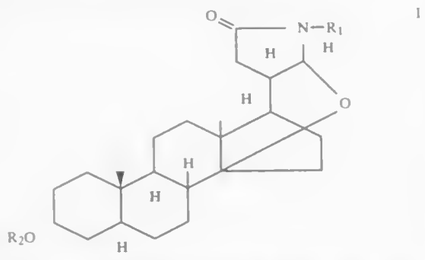
4,920,099

AMINOGLYCOSIDE STEROIDS, A PROCESS FOR THEIR PREPARATION, THEIR USE AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Laura Chiodini, Busto Arsizio; Mauro Gobbini, Sesto Calende; Sergio Mantegani, Milan; Daniela Ruggieri, Milan; Aldemio Temperilli, Milan; Gabriella Traquandi, Cornate d'Adda, and Patrizia Ferrari, Varese, all of Italy, assignors to Farmitalie Carlo Erba S.p.A., Milan, Italy

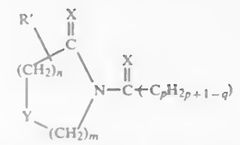
PCT No. PCT/EP87/00005, § 371 Date Oct. 29, 1987, § 102(e) Date Oct. 29, 1987, PCT Pub. No. WO87/04168, PCT Pub. Date Jul. 16, 1987
PCT Filed Jan. 7, 1987, Ser. No. 123,855
Claims priority, application United Kingdom, Jan. 9, 1986, 8600490
Int. Cl.[5] A61K *31/705*
U.S. Cl. 514—26 6 Claims

1. A compound and the pharmaceutically acceptable salts of said compound having the general formula I



I

wherein R_1 represents a hydrogen atom, an alkyl group having from 1 to 3 carbon atoms or an alkyl group substituted by an amino, methylamino, dimethylamino, carbamoyl, carboxy or carboxy-C_1–C_4 alkyl group; and R_2 represents an aminodeoxy, aminodideoxy, or aminotrideoxy mono- or di-saccharide of the D or L series, or a C_1–C_4 alkyl substituted aminodeoxy, aminodideoxy or aminotrideoxy mono- or di-saccharide, of the D or L series.



wherein X may represent sulfur, oxygen or 2 hydrogen radicals; Y may represent —CH_2—, —NH— or oxygen; n and m are integers of from 1 to 3; p is an integer of from 3 to 17; q is 2, 4, 6 or 8; wherein p≧9; and R, is selected from the group consisting of H, a lower alkyl group having from 1 to 4 carbon atoms, phenyl, lower alkyl or halogen substituted phenyl, acetamido, halogen, piperidinyl, lower alkyl or halogen substituted piperidinyl, carbalkoxy, carboxamide, and alkanoyl.

4,920,100

ALKYL GYLCOSIDES AS POTENTIATING AGENTS IN ANTISEPTIC COMPOSITIONS

Rudolf Lehmann, Leichlingen; Klaus Hachmann, Hilden; Manfred Biermann, Muehlheim/Ruhr, and Harald Schnegelberger, Leichlingen, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Filed Jul. 9, 1987, Ser. No. 60,137
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1986, 3619375
The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.
Int. Cl.[5] A01N *61/00, 31/02;* A61L *2/16*
U.S. Cl. 514—23 31 Claims

1. A bactericidally active composition comprising:

A. a bactericidal quantity of at least one bactericidally active alcohol or carboxylic acid or its water-soluble salt; and

B. an activity potentiating quantity of at least one alkyl glycoside.

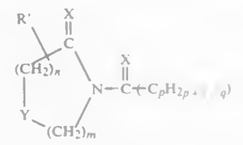
4,920,101

COMPOSITIONS COMPRISING 1-OXO- OR THIOHYDROCARBYL SUBSTITUTED AZACYCLOAKLKANES

Gevork Minaskanian, Irvine, and James V. Peck, Costa Mesa, both of Calif., assignors to Nelson Research & Development Co., Irvine, Calif.

Filed Sep. 30, 1987, Ser. No. 103,445
Int. Cl.[5] A01N *31/19, 31/40, 43/36*
U.S. Cl. 514—24 33 Claims

1. A composition comprising an effective amount of a physiologically active agent and a non-toxic, effective penetrating amount of a compound represented by the general formula



wherein X may represent sulfur, oxygen or 2 hydrogen radicals; Y may represent —CH_2—, —NH— or oxygen; n and m are integers of from 1 to 3; p is an integer of from 3 to 17; wherein p>9; q is 2, 4, 6 or 8; and R' is selected from the group consisting of H, a lower alkyl group having from 1 to 4 carbon atoms, phenyl, lower alkyl or halogen substituted phenyl, acetamido, halogen, piperidinyl, lower alkyl or halogen substituted piperidinyl, carbalkoxy, carboxamide, and alkanoyl.

18. A method for enhancing topical penetration of an effective amount& of a physiologically active agent through the skin or other membrane of a human or animal and retaining said active agent in the underlying body tissues, which method comprises contacting said physiologically active agent with said skin or other membrane in the presence of an effective topical penetrating amount of a compound of the general formula

wherein X may represent sulfur, oxygen or 2 hydrogen radicals; Y may represent —CH_2—, —NH— or oxygen; n and m are integers of from 1 to 3; p is an integer of from 3 to 17; q is 2, 4, 6 or 8; wherein R_1 is —$N(CH_3)_2$ or —$[N(CH_3)_2R]^+X^-$;

R is C_1–C_6-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkynyl, benzyl or benzyl substituted by form 1 to 3 substituents selected from fluoro, chloro, C_1–C_4-alkyl, C_1–C_4-alkyl, C_1–C_4-alkoxy, nitro, C_1C_4-alkoxycarbonyl, —$N(C_1$–C_4-alkyl$)_2$ or cyano;

each one of R_2 and R_3 is H, or together R_2 and R_3 form a second single bond to make a double bond;

R_4 and R_5 independently are H or C_1–C_4-acyl, or together with a carbonyl group form a five-numbered cyclic carbonate;

R^6 is H or C_1–C_4-acyl; and

X^- = halide, hydroxide, carboxylate, sulfate, phosphate, nitrate, C_1-C_4-alkylsulfonate or arylsulfonate;

or, when R_1 = —$N(CH_3)_2$, a pharmaceutically acceptable salt thereof; which is effective to enhance gastrointestinal motility.

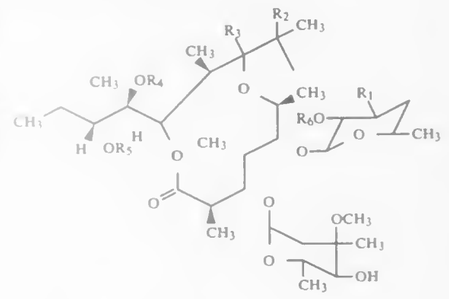
4,920,102

METHOD FOR TREATING GASTROINTESTINAL DISORDERS

Jaswant S. Gidda, Carmel; Herbert A. Kirst, Indianapolis, and David W. Robertson, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 18, 1988, Ser. No. 182,645
Int. Cl.[5] A61K *31/70;* C07H *17/08*
U.S. Cl. 514—28 24 Claims

1 A method for treating gastrointestinal motility disorders in animals which comprises administering to the animal an amount of a compound of the formula



wherein

R_1 is —$N(CH_3)_2$ or —$[N(CH_3)_2R]^+X^-$;

R is C_1–C_6-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkynyl, benzyl or benzyl substituted by form 1 to 3 substituents selected from fluoro, chloro, C_1–C_4-alkyl, C_1–C_4-alkyl, C_1–C_4-alkoxy, nitro, C_1C_4-alkoxycarbonyl, —$N(C_1$–C_4-alkyl$)_2$ or cyano;

each one of R_2 and R_3 is H, or together R_2 and R_3 form a second single bond to make a double bond;

R_4 and R_5 independently are H or C_1–C_4-acyl, or together with a carbonyl group form a five-numbered cyclic carbonate;

R^6 is H or C_1–C_4-acyl; and

X^- = halide, hydroxide, carboxylate, sulfate, phosphate, nitrate, C_1-C_4-alkylsulfonate or arylsulfonate;

or, when R_1 = —$N(CH_3)_2$, a pharmaceutically acceptable salt thereof; which is effective to enhance gastrointestinal motility.

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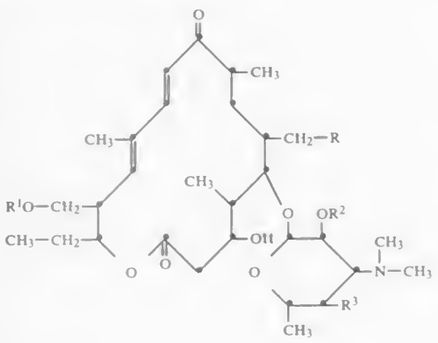
4,920,103

MODIFICATIONS OF MYCINOSE AND 3-O-DEMETHYLMYCINOSE IN TYLOSIN-TYPE MACROLIDES

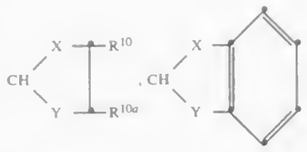
Herbert A. Kirst, and James P. Leeds, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 29, 1986, Ser. No. 912,891
Int. Cl.[5] A61K *31/70;* **C07H** *17/08*
U.S. Cl. 514—30 **31 Claims**

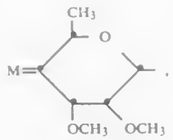
1. A compound of the formula:



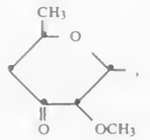
wherein
R is CH_2Z,



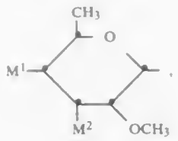
Z is hydrogen, halo, OR^4, SR^5, N_3 or NR^6R^7;
X and Y independently represent O, S, N-CH_3, N-phenyl or N-benzyl;
W is O(C_1–C_4-alkyl), S-phenyl or S-(R^{11}-substituted-phenyl);
R^1 is



(a)



(b)



(c)

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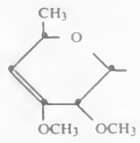


(d)

wherein
M is O, NOR^{1a} or NH;
M^1 is halo, N_3, $NR^{12}R^{13}$, NH(C_1–C_4-alkanoyl), pyridinium, pyrrolyl, C_1–C_4-alkoxy, ($C_{1'}$–$_{C3}$-alkoxy)-($C_{1'}$–$_{C3}$-alkoxy), OSO_2R^{1b} or imidazolyl-thiocarbonyloxy;
M^2 is hydroxy or methoxy;
R^{1a} is hydrogen, C_1–C_4-alkyl or C_1–C_4-alkyl having a C_1–C_3-alkoxy, (C_1–C_3-alkoxy)-(C_1–C_3-alkoxy), NR^8R^9 or (R^8R^9N)-(C_1–C_3-alkoxy) substituent;
R^{1b} is C_1–C_4-alkyl, halo-substituted-C_1–C_4-alkyl, phenyl, benzyl, or phenyl or benzyl having from one to three C_1–C_3-alkyl, C_1–C_3-alkoxy or halo substituents;
R^2 is hydrogen, C_1–C_5-alkanoyl, halo-substituted-C_1–C_5-alkanoyl, or benzoyl, phenylacetyl or phenylpropionyl, each of which may have an R^{11} substituent on the phenyl ring;
R^3 is hydrogen, OR^2 or mycarosyloxy;
R^4 is C_1–C_4-alkyl; C_1–C_4-alkanoyl; cyclohexyl; phenyl, benzyl, phenethyl or phenoxyethyl each of which may have an R11 substituent on the ring; or a heteroaryl group selected from pyridinyl, pyrimidinyl, pyridazinyl or pyrazinyl;
R^5 is C_1–C_4-alkyl; cyclohexyl; phenyl, benzyl or phenethyl, each of which may have an R^{11} substituent on the phenyl ring; or a heteroaryl group selected from pyridinyl, tetrazolyl, oxazolyl or thiazolyl;
R^6 and R^7 independently are hydrogen, C_1–C_8-alkyl or a group of the formula:

$(CH_2)_n$(Cyc)

where n is 0, 1 or 2, and Cyc is C_3–C_8-cycloalkyl, phenyl or R^{11}-substituted phenyl; or taken together with the adjacent nitrogen atom form a saturated or unsaturated heterocyclic monocyclic ring containing from 5 to 16 ring atoms or a bicyclic or tricyclic ring system containing from 8 to 20 ring atoms wherein one or more of the ring atoms may be substituted by C_1–C4-alkyl, C_1–C4-alkoxy, C_1–C4-alkoxycarbonyl, hydroxy, C_1–C4-alkanoyloxy, halo, NR^8R^9, phenyl or R^{11}-substituted phenyl;
R^8 and R^9 independently are C_1–C_4-alkyl or $(CH_2)_n$(Cyc); or taken together with the adjacent nitrogen atom form a saturated heterocyclic monocyclic ring containing from 5 to 8 ring atoms;
R^{10} and R^{10a} independently are hydrogen, methyl, phenyl, methoxycarbonyl, ethoxycarbonyl or phenoxycarbonyl; and
R^{11} is halo, C_1–C_3-alkyl, C_1–C_3-alkoxy, nitro or hydroxy; and
R^{12} and R^{13} independently are hydrogen, cyanomethyl, C_1–C_4-alkyl or $(CH_2)_n$(Cyc); or taken together with the adjacent nitrogen atom form a saturated heterocyclic monocyclic ring containing from 5 to 8 ring atoms;
and the acid addition salts of these compounds.

29. A composition useful for treating susceptible bacterial infections and infections caused by susceptible Mycoplasma species comprising an effective amount of a compound of claim 1 and a suitable pharmaceutical vehicle.

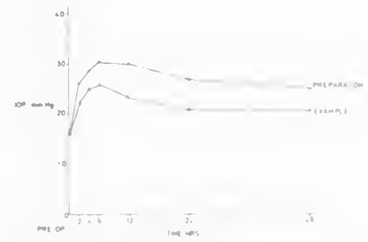
30. A method for treating infections caused by susceptible bacteria which comprises administering an effective amount of a composition of claim 29 to an animal.

4,920,104

SODIUM HYALURONATE COMPOSITION

Dale P. DeVore, Chelmsford; David A. Swann, Lexington, and Bernard P. Sullivan, Andover, all of Mass., assignors to Med-Chem Products, Inc., Acton, Mass.

Filed May 16, 1988, Ser. No. 194,187
Int. Cl.[5] A61K *31/715, 31/73*
U.S. Cl. 514—54 **4 Claims**



3. In a method of protecting mammalian eye tissue and structures during ophthalmological surgery by introducing into the anterior segment of the eye, a viscoelastic solution of sodium hyaluronate, the improvement which comprises; using as the solution one having a k nematic viscosity of from 45,000 to 64,000 cSt. and wherein the weight average molecular weight of the sodium hyaluronate is within the range of from 1 to 2 million Daltons.

4,920,105

MEMBRANE POUCH

Allen Zelman, Vienna, Va., assignor to Rensselaer Polytechnic Insitute, Troy, N.Y.

Filed Jul. 9, 1987, Ser. No. 71,666
Int. Cl.[5] A61J *1/00*
U.S. Cl. 514—59 **24 Claims**

1. A membrane pouch for producing a sterile solution from non-sterilized fresh water, the pouch comprising:
a first closed bag of semipermeable membrane material, said membrane material being permeable to water molecules and impermeable to viruses, bacteria and pyrogens;
a second, waterproof bag substantially enclosing said first bag;
first sealable port means for providing access to a first compartment within said first bag;
second sealable port means for providing access to a second compartment, said second compartment lying between said first bag and said second bag; and
a sterile solute to be hydrated located in one of said first and second compartments, said solute comprising a large molecular weight osmotic agent which is impermeant to said membrane material and an osmotic accelerator, said osmotic accelerator comprising a non-toxic, water soluble, low molecular weight substance which is permeant to said membrane member and possesses a high osmotic pressure, said accelerator serving to initiate and accelerate hydrating of the osmotic agent, whereby fresh water placed in the other of said compartments is transferred by accelerated osmosis to said one of said compartments containing said solute while the membrane material precludes passage of bacteria, viruses and pyrogens therethrough.

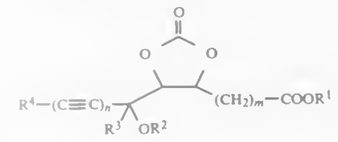
4,920,106

ACETYLENIC CYCLIC CARBONATES

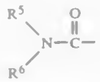
Michael N. Chang, Westfield; Yuan-Ching P. Chiang, Piscataway; James V. Heck, Scotch Plains; Michael D. Lewis, Rahway, and Shu S. Yang, Bridgewater, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 156,111, Feb. 16, 1988, abandoned.
This application Aug. 1, 1989, Ser. No. 388,716
Int. Cl.[5] A61K *31/695;* **C07D** *317/20*
U.S. Cl. 514—63 **23 Claims**

1. A compound of the formula:



wherein
R^1 is:
(a) hydrogen;
(b) C_1–C_6 alkyl;
(c) C_7–C_{14} aralkyl;
(d) tris(C_1–C_6 alkyl)silyl; or
(e) a pharmaceutically acceptable cation;
R^2 is
(a) hydrogen;
(b) C_1–C_6 alkyl;
(c) C_7–C_{14} aralkyl;
(d) tris(C_1–C_6 alkyl)silyl;
(e) C_2–C_6 alkanoyl;
(f) C_2–C_7 alkoxycarbonyl; or
(g)



wherein R^5 and R^6 are independently:
(i) hydrogen;
(ii) C_1–C_6 alkyl; or
(iii) phenyl;
R^3 is:
(a) hydrogen; or
(b) C_1–C_6 alkyl;
R^4 is:
(a) C_1–C_6 alkyl;
(b) C_7–C_{14} aralkyl; or
(c) tris(C_1–C_6 alkyl)silyl;
m is an integer of from about 2 to 8; and
n is an integer of from about 1 to 4.

22. A pharmaceutical composition useful in the treatment of fungal diseases or hypercholesterolemic conditions comprising a therapeutically effective amount of at least one compound according to claim 1, together with one or more non-toxic pharmaceutically acceptable carriers.

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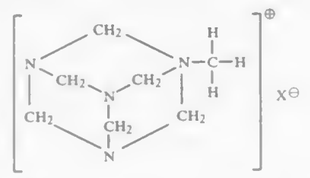
4,920,107

1-METHYL-3,5,7-TRIAZA-1-AZONIATRICYCLODECANE COMPOUNDS, A METHOD FOR PREPARING THESE COMPOUNDS, AND THEIR USE IN THE CONTROL OF MICROORGANISMS IN AQUEOUS SYSTEMS

John D. Pera, Cordova, and S. Rao Rayudu, Germantown, both of Tenn., assignors to Buckman Laboratories International, Inc., Memphis, Tenn.

Filed Mar. 29, 1988, Ser. No. 174,812
Int. Cl.[5] C07D *487/18;* A01N *43/90;* C10M *105/58;* C09D *5/14*
U.S. Cl. 514—244 25 Claims

1. A method of preserving an aqueous system which is susceptible to microbiological degradation, comprising the step of adding to said system a compound having the formula



wherein X is an anion selected from the group consisting of sulfate, acetate and citrate groups, and wherein said compound is added in an amount sufficient to inhibit the growth and proliferation of at least one microorganism in said aqueous system.

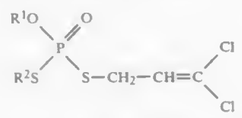
4,920,108

BISTHIOLPHOSPHATES AS PESTICIDES

Rainer Bürstinghaus, Heidelberg, and Peter Hofmeister, Neustadt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 27, 1988, Ser. No. 149,111
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1987, 3704123
Int. Cl.[5] A01N *57/10;* C07F *9/173*
U.S. Cl. 514—134 7 Claims

1. Bisthiolphosphates of the formula I



where R^1 is ethyl or isopropyl and R^2 is branched or straight-chain C_1–C_4-alkyl.

3. A process for combating pests, wherein the pests and/or the areas and/or spaces to be kept free from pests are treated with a pesticidally effective amount of a bisthiolphosphate of the formula I as set forth in claim 1.

4,920,109

ANTIFUNGAL COMPOSITIONS AND METHOD OF CONTROLLING MYCOTIC INFECTIONS

Janet C. Onishi, Mountainside, and Arthur A. Patchett, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 18, 1988, Ser. No. 182,615
The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.
Int. Cl.[5] A61K *31/58, 31/335, 31/35*
U.S. Cl. 514—171 20 Claims

1. A method for potentiating the antifungal properties of an antifunga agent comprising coadministering a 25-azasterol compound with a non-steroidal antifungal agent.

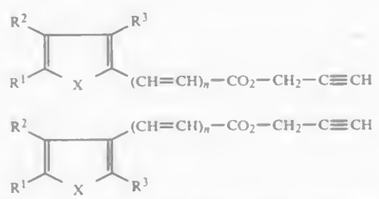
4,920,110

PROPARGYL FURAN- AND THIOPHENECARBOXYLATES

Hans-Jürgen Neubauer, Mannbeim; Wolfgang Seppelt, Bobenheim-Boxheim; Rainer Bürstinghaus, Heidelberg; Peter Hofmeister, Neustadt, and Christoph Kuenasi, Waldsee, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 90,446, Aug. 28, 1987, abandoned. This application Apr. 14, 1989, Ser. No. 338,562
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1986, 3629584; Nov. 29, 1986, 3640878
Int. Cl.[5] A01N *43/02, 43/08;* C07D *333/38, 333/32*
U.S. Cl. 514—438 6 Claims

1. Propargyl furan- and thiophenecarboxylates of the formulae Ia and Ib



where R^1, R^2 and R^3 are each hydrogen, chlorine, bromine, C_1–C_4-alkyl, C_2–C_4-alkenyl, C_1–C_4-haloalkyl, C_2–C_4-haloalkenyl, or phenyl which is unsubstituted or substituted by halogen, C_1–C_4-alkyl, or C_1–C_4-alkoxy, X is oxygen or sulfur, n is the integer 1, and, if X is sulfur, R^1, R^2 and R^3 may furthermore be fluorine, cyano, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_2–C_4-alkenyloxy or C_2–C_4-haloalkenyloxy.

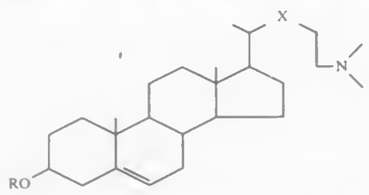
4,920,111

FUNGICIDAL COMPOSITIONS AND METHODS UTILIZING 25-AZASTEROL AND HMG-COA REDUCTASE INHIBITORS

Janet C. Onishi, Mountainside, and Arthur A. Patchett, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 18, 1988, Ser. No. 182,605
The portion of the term of this patent subsequent to Apr. 24, 2007, has been disclaimed.
Int. Cl.[5] A01N *45/00, 43/16*
U.S. Cl. 514—171 5 Claims

1. A fungicidal composition comprising
(1) a 25-azasterol compound having the formula



wherein R is hydrogen or lower acyl, X is CH, CH_2 or O; and the on the side chain indicates that the bond may be a single or a double bond provided that when X is O, or CH_2, it is a single bond; and
(2) a HMG-CoA reductase inhibitor compound in admixture with a pharmaceutically acceptable carrier.

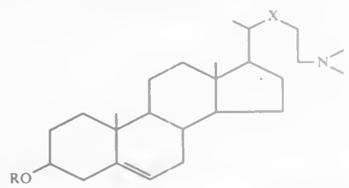
4,920,112

FUNGICIDAL COMPOSITIONS AND METHOD

Janet C. Onishi, Mountainside, and Arthur A. Patchett, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 18, 1988, Ser. No. 182,536
Int. Cl.[5] A61K *31/56, 31/135*
U.S. Cl. 514—171 5 Claims

1. A fungicidal composition comprising
(1) a 25-azasterol compound having the formula



wherein R is hydrogen or lower acyl, X is CH, CH_2 or O, the on the side chain indicates that the bond may be a single or a double bond provided that when X is O, or CH_2, it is a single bond; and
(2) a squalene epoxidase inhibitor compound in admixture with a pharmaceutically acceptable carrier.

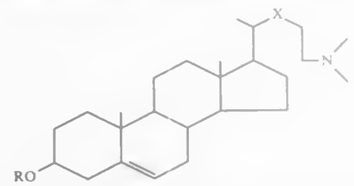
4,920,113

FUNGICIDAL COMPOSITIONS AND METHODS UTILIZING 25-AZASTEROL AND HMG-COA SYNTHASE INHIBITORS

Janet C. Onishi, Mountainside, and Arthur A. Patchett, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 18, 1988, Ser. No. 182,616
Int. Cl.[5] A01N *45/00, 43/02*
U.S. Cl. 514—171 5 Claims

1. A fungicidal composition comprising
(1) a 25-azasterol compound having the formula



wherein R is hydrogen or lower acyl, X is CH, CH_2 or O; the on the side chain indicates that the bond may be a single or a double bond provided that when X is O, or CH_2, it is a single bond; and
(2) a HMG-CoA synthase inhibitor compound in admixture with a pharmaceutically acceptable carrier.

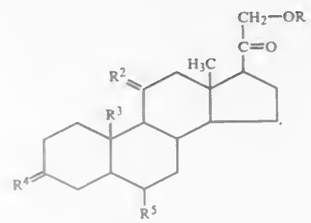
4,920,114

19-FLUORO- OR CYANO-21-HYDROXYPROGESTERONE DERIVATIVES USEFUL AS 19-HYDROXYLASE INHIBITORS

Gene W. Holbert, Loveland, and J. O'Neal Johnston, Milford, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Jun. 28, 1988, Ser. No. 212,410
Int. Cl.[5] C07J *1/00;* A61K *31/56*
U.S. Cl. 514—177 4 Claims

1. A compound of the formula



wherein R is hydrogen or

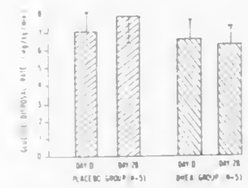
R^2 is (H)(H), (H)(OH) or O; R^3 is difluoromethyl, cyanomethyl, or cyano; R^4 is =O, (H)(OH), (H)(OR[8]), or $=CH_2$; R^5 is hydrogen, amino, hydroxy, oxo or methylene; R^6 is C_{1-6} alkyl, C_{5-7} cycloalkyl or phenyl; R^8 is C_{2-10} alkanoyl; and each of the dotted lines indicate the optional presence of a double bond with the proviso that a 5,6-(double bond) is present only when R_4 is (H)(OH) or when there is no double bond at the 4,5-position or 6,7-position and with the proviso that a 9,11-double bond can be present only when R^2 is (H)(H).

4,920,115

METHOD OF LOWERING LDL CHOLESTEROL IN BLOOD

John E. Nestler, Richmond, Va.; Cornelius O. Bariascini, Columbus, Ga.; John N. Clore, and William G. Blackard, both of Richmond, Va., assignors to Virginia Commonwealth University, Richmond, Va.

Filed Dec. 28, 1988, Ser. No. 291,149
Int. Cl.[5] A61K *31/56*
U.S. Cl. 514—178 8 Claims



1. A method of lowering low density lipoprotein cholesterol concentrations in human beings, comprising a step of administering a therapeutic dose of dehydroepiandrosterone to a patient to lower said low density lipoprotein cholesterol concentration in said patient.

4,920,116

N-(AMINOALKYL)-SUBSTITUTED(N OR C ALKYL)-ARYL-4(METHYLSULFONYLAMINO)BENZAMIDES

Thomas K. Morgan, Jr., Morris Plains, N.J., and Klaus Nickisch, West Berlin, Fed. Rep. of Germany, assignors to Schering A.G., Berlin, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 914,216, Oct. 2, 1986, abandoned. This application Dec. 13, 1988, Ser. No. 283,712
Int. Cl.[5] C07C *143/74*
U.S. Cl. 514—210 24 Claims

1. A member selected from the group consisting of a compound of the formula:

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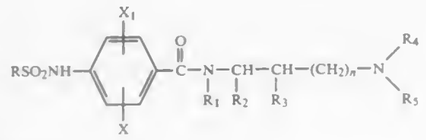


wherein

R is a C_1–C_4 straight chain alkyl;

two of R_1, R_2 and R_3 are hydrogen and the other is phenyl, substituted phenyl, naphthalenyl and substituted naphthalenyl;

R_4 and R_5 are hydrogen, C_1–C_8 straight or branched chain alkyl, allyl, cycloalkyl, cycloalkyl(lower)-alkyl, phenyl(lower)alkyl, substituted phenyl(lower)alkyl or together with the amino nitrogen atom form a saturated heterocyclic ring of from 4 to 8 ring members or a corresponding ring which contains a —O— or

linkage;

R_6 is hydrogen, C_1–C_8 straight or branched chain alkyl, phenyl or substituted phenyl,

X,X_1 are the same or independently hydrogen and C_1–C_4 straight or branched chain alkyl; and

n is the integer 0 or 1; the word substituted in each occurrence means bearing 1 to 3 substituents selected from the group consisting of C_1–C_4-alkyl, C_1–C_4-alkoxy, trifluoromethyl, fluorine, chlorine and bromine, and the pharmaceutically acceptable salts thereof; with the proviso that only one of R_4 and R_5 can be hydrogen.

4,920,117

4,5,5A,6-TETRAHYDRO-3H-ISOXAZOLO(5,4,3-KL)ACRIDINES, PHARMACEUTICAL COMPOSITIONS AND USE

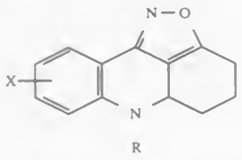
Gregory M. Shutske, Somerset, N.J., assignor to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Jun. 9, 1989, Ser. No. 364,420

Int. Cl.[5] A61K *31/435, 31/535;* **C07D** *498/04*

U.S. Cl. 514—212 **16 Claims**

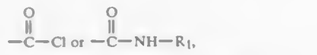
1. A compound of the formula



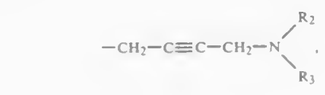
where

X is hydrogen, loweralkyl, loweralkoxy, halogen or trifluoromethyl, and

R when present is hydrogen, loweralkyl, allyl, arylloweralkyl,

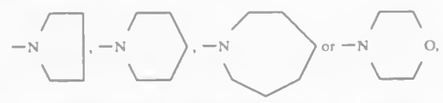


wherein R_1 is loweralkyl, $—CH_2C{\equiv}CH$,



n being 2, 3 or 4 and R_2 and R_3 being independently loweralkyl, or the group

taken as a whole constituting



or a pharmaceutically acceptable acid addition salt thereof.

14. A pharmaceutical composition comprising a compound as defined in claim 1 in an amount effective for alleviating pain or a memory dysfunction characterized by a decreased cholinergic function and a suitable carrier therefor.

4,920,118

AROMATIC 2-AMINOALKYL-1,2-BENZOISOTHIAZOL-3-(2H)ONE-1,1-DIOXIDE AND THEIR USE AS ANXIOLYTIC AND ANTI-HYPERTENSIVE AGENTS

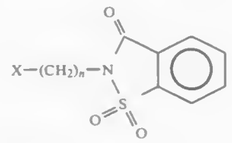
Marcel Hilbert, Strasbourg, and Maurice W. Gittos, Plobsheim, both of France, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 244,894, Sep. 12, 1988, Pat. No. 4,857,526, which is a division of Ser. No. 158,432, Feb. 22, 1988, Pat. No. 4,789,676, which is a division of Ser. No. 836,276, Mar. 5, 1986, Pat. No. 4,748,182. This application Jun. 15, 1989, Ser. No. 366,824

Int. Cl.[5] A61K *31/38;* **C07D** *279/12, 295/00*

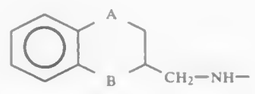
U.S. Cl. 514—224.2 **13 Claims**

1. An aromatic 2-aminoalkyl-1,2-benzoisothiozol-3(2H)one-1,1-dioxide derivative having the formula



wherein n is an integer of from 2 to 5;

X is



wherein one of A and B is a sulfur and the other is =NR'

wherein R' is hydrogen or methyl; or a pharmaceutically acceptable acid addition salt thereof.

10. A method for relieving the symptoms of anxiety in a patient in need thereof, which comprises the administration to said patient of an anxiolytic effective amount of a compound of one of claims 1–9.

4,920,119

TRIAZINE DERIVATIVES

Michael R. Attwood, Hitchin; Peter H. Crackett, Baldock, and Geoffrey Lawton, Hitchin, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

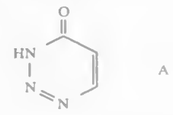
Filed Nov. 24, 1987, Ser. No. 124,750

Claims priority, application United Kingdom, Dec. 12, 1986, 8629711; Sep. 14, 1987, 8721564

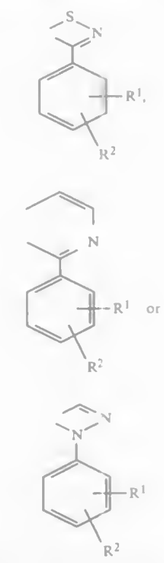
Int. Cl.[5] C07D *471/04, 487/04, 513/04;* **A61K** *31/53*

U.S. Cl. 514—243 **17 Claims**

17. A method of treating ischemia or gout in an afflicted mammal comprising administering to the mammal a compound of the formula



wherein A is a grouping of the formula



in which R^1 and R^2 each individually is hydrogen, halogen, trifluoromethyl, nitro amino, cyano, C_1–C_6-alkyl, C_1–C_6-alkoxy, C_3–C_6-alkenyloxy, C_1–C_6-alkylthio, C_1–C_6-alkanoylamino, aryloxy, aryl-(C_1–C_6-alkyl), aryl-(C_1–C_6-alkoxy), aryl-(C_1–C_6-alkoxy)carbonylamino or —O—CH_2—R^3, or R^1 and R^2 on adjacent carbon atoms together are —CH=CH—CH=CH' or —CH_2—CH_2—O—, and R^3 is hydroxy-(C_1–C_4-alkyl) or vicinal dihydroxy-(C_2–C_5-alkyl), and pharmaceutically acceptable acid addition salts of those compounds of formula I in which at least one of R^1 and R^2 is amino, or tautomers thereof, in an amount which is effective in treating ischemia or gout.

4,920,120

ANTIBACTERIAL AGENTS

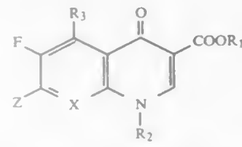
John M. Domagala; Susan E. Hagen, both of Canton, and John S. Kiely, Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 147,462, Jan. 25, 1988. This application Dec. 9, 1988, Ser. No. 280,924

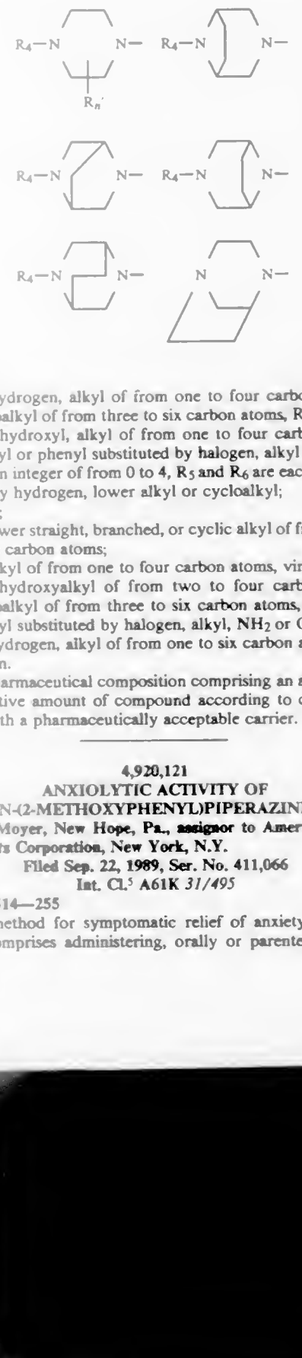
Int. Cl.[5] A61K *31/495;* **C07D** *401/04*

U.S. Cl. 514—254 **9 Claims**

1 A compound of formula



or a pharmaceutically acceptable acid addition or base salt thereof wherein Z is



wherein

R_4 is hydrogen, alkyl of from one to four carbon atom, a cycloalkyl of from three to six carbon atoms, R' is hydrogen, hydroxyl, alkyl of from one to four carboo atoms, phenyl or phenyl substituted by halogen, alkyl or alkoxy, n is an integer of from 0 to 4, R_5 and R_6 are each independently hydrogen, lower alkyl or cycloalkyl;

X is N,;

R_3 is lower straight, branched, or cyclic alkyl of from one to three carbon atoms;

R_2 is alkyl of from one to four carbon atoms, vinyl, haloalkyl, hydroxyalkyl of from two to four carbon atoms, cycloalkyl of from three to six carbon atoms, phenyl or phenyl substituted by halogen, alkyl, NH_2 or OH; and

R_1 is hydrogen, alkyl of from one to six carbon atoms, or a cation.

8. A pharmaceutical composition comprising an antibacterially effective amount of compound according to claim 1 together with a pharmaceutically acceptable carrier.

4,920,121

ANXIOLYTIC ACTIVITY OF N-(2-METHOXYPHENYL)PIPERAZINE

John A. Moyer, New Hope, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Sep. 22, 1989, Ser. No. 411,066

Int. Cl.[5] A61K *31/495*

U.S. Cl. 514—255 **3 Claims**

1. A method for symptomatic relief of anxiety disorders which comprises administering, orally or parenterally, to a

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patient suffering from anxiety, an antianxiety amount of N-(2-methoxyphenyl)piperazine or a pharmaceutically acceptable salt thereof.

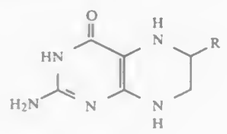
4,920,122

PHARMACEUTICAL COMPOSITION AND METHOD FOR THE TREATMENT OF INFANTILE AUTISM

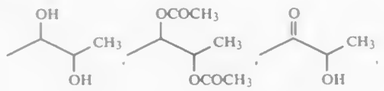
Hiroshi Naruse, Tokyo; Masashi Takesada, Hyogo; Osamu Hayaishi, and Yasuyoshi Watanabe, both of Kyoto, all of Japan, assignors to Suntory Limited, Osaka, Japan

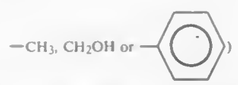
Division of Ser. No. 870,495, Jun. 4, 1986, Pat. No. 4,778,794. This application Jun. 23, 1988, Ser. No. 210,312
Claims priority, application Japan, Jun. 4, 1985, 60-121347
Int. Cl.[5] A61K *31/50, 31/495*
U.S. Cl. 514—254 **8 Claims**

1. A method for ameliorating infantile autism in a child comprising administering to said child an effective amount of a compound of the formula:



(wherein R is





or a salt thereof as a major effective ingredient and at least one auxiliary effective ingredient selected from 5-hydroxytryptophan and L-DOPA, at a ratio of the major and auxiliary effective ingredients of 1:0.1 - 10 by weight.

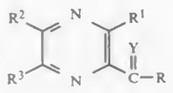
4,920,123

METHOD FOR CONTROLLING AND/OR LOWERING SERUM TRIGLYCERIDE AND/OR CHOLESTEROL LEVELS IN MAMMALS

Karl H. Beyer, Jr., 1001 Gypsy Hill Rd., Penllyn, Pa. 19422

Filed Oct. 21, 1988, Ser. No. 260,947
Int. Cl.[5] A61K *31/495*
U.S. Cl. 514—255 **6 Claims**

1. A method for controlling or lowering a patient's serum cholesterol concentration, comprising administering to a patient an effective amount of a compound of the formula (I)



wherein
Y is O or NH,
R is OH, NHCONR[4]R[5]; or N=C(NR[4]R[5])[2]; where R[4] and R[5] are each independently selected from the group consisting of hydrogen; C_{1-10} alkyl, straight or branched chain; aryl C_{1-4} alkyl; mono- or di-substituted aryl C_{1-4} alkyl where the substituents are fluoro, chloro, bromo, iodo, or C_{1-10} alkyl, straight or branched chain;
R^1 and R^2 are each independent selected from the group consisting of hydrogen, amino, and mono- or di-substituted amino where the substituents are C_{1-10} alkyl, straight or branched chain, or C_{3-8} cycloalkyl; provided that R^1 and R^2 may not both be amino or substituted amino; and
R^3 is hydrogen, trifluoromethyl; fluoro; chloro; bromo; or iodo; or a pharmaceutically acceptable salt thereof.

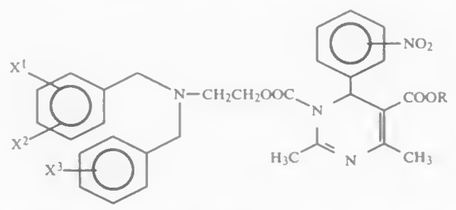
4,920,124

N-SUBSTITUTED 3,4-DIHYDROPYRIMIDINE COMPOUNDS AS AGENTS FOR TREATING DISORDERS OF CARDIOVASCULAR SYSTEM

Hidetsura Cho, Osaka, and Masaru Ueda, Saitama, both of Japan, assignors to Suntory Limited, Osaka, Japan

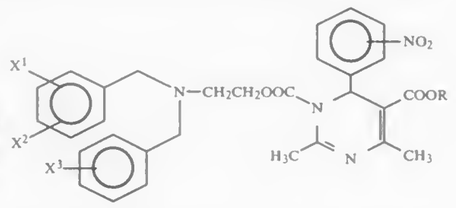
Filed Feb. 19, 1988, Ser. No. 157,777
Claims priority, application Japan, Feb. 21, 1987, 62-38345
Int. Cl.[5] A61K *31/505;* **C07D** *239/02*
U.S. Cl. 514—256 **5 Claims**

1. A N substituted 3,4-dihydropyrimidine compound of the formula:



wherein R is a straight or branched cyclic or cyclo straight alkyl having from one to three carbon atoms, and X^1, X^2 and X^3 are the same or different and are hydrogen, halogen, lower alkyl having from one to four carbon atoms, lower alkoxy having from one to four carbon atoms, nitro, trifluoromethyl, hydroxy, or t-butyldimethylsilyloxy with the proviso that the case where X^1, X^2 and X^3 are all hydrogen is not applicable.

5. A composition for treating disorders of the cardiovascular system selected from the group consisting of hypertension, cerebral circulation disorders and angina, comprising a N-substituted 3,4-dihydropyrimidine compound of the formula:



wherein X^1, X^2, X^3 and R as defined in claim **1**, in an amount effective for treating said disorders of the cardiovascular system, and a pharmaceutically acceptable carrier.

4,920,125

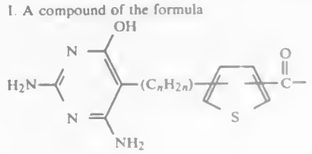
L-GLUTAMIC ACID DERIVATIVES

Edward C. Taylor, Princeton, N.J.; Philip M. Harrington, Plainwell, Mich., and Chuan Shih, Indianapolis, Ind., assignors to The Trustees of Princeton University, Princeton, N.J.

Filed Aug. 29, 1989, Ser. No. 399,993
Int. Cl.[5] C07D *239/48, 239/49;* **A61K** *31/505*
U.S. Cl. 514—272 **7 Claims**

1. A compound of the formula:

1. A compound of the formula



in which n has a value of 2 to 6; and the configuration about the carbon atom designated * is L; and the pharmaceutically acceptable salts thereof.

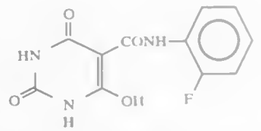
4,920,126

BARBITURIC ACID DERIVATIVE AND TREATMENT OF LEUKEMIA AND TUMORS THEREWITH

Arthur D. Brewer, Puslinch, Canada, assignor to Uniroyal Chemical Ltd/Uniroyal Chemical Ltee, Don Mills, Canada

Filed May 10, 1988, Ser. No. 192,459
Int. Cl.[5] A61K *31/505;* **C07D** *239/60*
U.S. Cl. 514—274 **3 Claims**

1. A compound of the formula:



or the pharmacologically acceptable addition salts thereof

3. A method for inducing regression or inhibiting the growth of lymphoid leukemia in mammals which comprises administering a therapeutically effective amount of the compound of claim 1 to mammals.

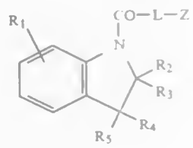
4,920,127

SUBSTITUTED INDOLES AND THEIR USE AS 5-HT[1] RECEPTOR ANTAGONISTS

Francis D. King, and Karen A. Joiner, both of Harlow, England, assignors to Beecham Group p.l.c., England

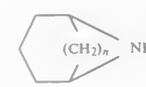
Filed Feb. 16, 1988, Ser. No. 155,756
Claims priority, application United Kingdom, Feb. 18, 1987, 8703815; May 28, 1987, 8712492; Aug. 8, 1987, 8718844
Int. Cl.[5] A61K *31/395;* **C07D** *213/00, 221/02, 453/02*
U.S. Cl. 514—278 **9 Claims**

1. A compound of the formula (I), or a pharmaceutically acceptable salt thereof:

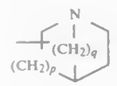


(I)

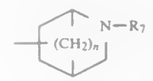
wherein
L is NH or O;
R_1 is hydrogen, fluoro or choloro;
R_2 and R_5 are independently hydrogen or C_{1-6} alkyl or together are a bond; or one or both of R_2 and R_3, and R_4 and R_5, together are C_{2-7} polymethylene or $-(CH_2)_m-O-(CH_2)_x-$ where m and x are 1 to 5 such that m+x is 2 to 6;
R_3 is hydrogen;
R_4 is C_{1-7} alkanoyl, C_{1-6} is alkoxycarbonyl, hydroxycarbonyl, aminocarbonyl optionally substituted by one or two C_{1-6} alkyl groups, CF_3, C_{1-6} alkyl substituted by C_{1-6} alkoxy, C_{1-6} alkylthio or by C_{1-6} alkoxycarbonyl, or R_4 is phenyl or phenyl-C_{1-4} alkyl optionally substituted in the phenyl ring by one or two of halogen, C_{1-6} alkyl or C_{1-6} alkoxy;
Z is a group of formula (a), (b), or (c)



(a)



(b)



(c)

wherein
n is 2 or 3;
p is 1 or 2;
q is 1 to 3;
r is 1 to 3; and
R_6 or R_7 is C_{1-4} alkyl.

7. A compound selected from the group consisting of (endo)-N-(8-methyl-8-azabicyclo(3,2,1)oct-3-yl)-N-(spiro(cyclohexyl-3-indolin-1-yl))urea,
(endo)-N-(8-methyl-8-azabicyclo(3.2.1)oct-3-yl)2,3-dihydro-3-ethoxycarbonylindol-1-yl-urea,
(endo)-N-(8-methyl-8-azabicyclo(3.2.1)oct-3-yl)2,3-dihydro-3-ethoxycarbonyl-3-methylindol-1-yl urea,
(endo)-N-(8-methyl-8-azabicyclo(3.2.1)oct-3-yl)2,3-dihydro-3-hydroxycarbonyl-3-methylindol-1-yl urea,
(endo)-N-(8-methyl-8-azabicyclo(3.2.1)oct-3-yl)2,3-dihydro-3-N,N-dimethylaminocarbonyl-3-methylindol-1-yl urea,
(endo)-N-(8-methyl-8-azabicyclo(3.2.1)oct-3-yl)-N'-[spiro(cyclopropyl-3-indolin-1-yl)]urea,
(endo)-N-(8-methyl-8-azabicyclo(3.2.1)oct-3-yl)2,3-dihydro-3-phenylindol-1-yl urea,
N-(1-azabicyclo(2.2.2)oct-3-yl)2,3-dihydro-3-phenylindol-1-yl urea,
(endo)-N-(8-methyl-8-azabicyclo(3,2,1)oct-3-yl)-3-phenylindol-1-yl urea,
(endo)-N-(8-methyl-8-azabicyclo(3.2.1)oct-3-yl)-N'-(spiro(cyclopentyl-3-indolin-1-yl))urea,
and pharmaceutically acceptable salts of any of the foregoing.

4,920,128

PYRAZOLO[3,4-B]QUINOLINES AND THEIR USE AS ANTIVIRAL AGENTS

Malcolm R. Bell, East Greenbush, and James H. Ackerman, Albany, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 71,110, Jul. 8, 1987, abandoned. This application May 20, 1988, Ser. No. 196,598
Int. Cl.[5] A61K *31/415, 31/435;* **C07D** *413/00, 471/00*
U.S. Cl. 514—293 **12 Claims**

1. A compound of the formula

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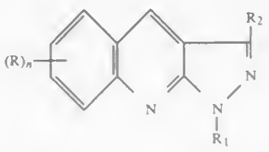


wherein:
R is hydrogen or one or two substituents selected from hydroxy and lower-alkoxy wherein n is 1 or 2;
R_1 is a member of the group consisting of hydrogen, lower-alkyl, phenyl, and —Y—R_3, wherein Y is lower-alkylene of 1–4 carbon atoms and R_3 is selected from the group consisting of lower-alkylamino, di(lower-alkyl)amino, 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, lower-alkoxycarbonyl, lower-alkylaminocarbonyl and di(lower-alkyl-)aminocarbonyl;
R_2 is F, Cl, Br, CN, $CONH_2$ COOH, COO-lower-alkyl or $(CH_2)_mNH_2$ where m is 0 or 1;
or a pharmaceutically accentable acid-addition salt thereof.

9. A composition for combating viruses which comprises an antivirally effective amount of a compound according to claim 1, in admixture with a suitable carrier or diluent.

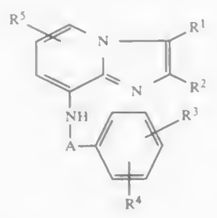
4,920,129

ANTI-ULCERATIVE IMIDAZOPYRIDINE COMPOUNDS

Youichi Shiokawa, Ibaraki; Masanobu Nagano, Kawanishi, and Hiromichi Itani, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

Filed Sep. 22, 1988, Ser. No. 247,657
Claims priority, application United Kingdom, Sep. 24, 1987, 8722488
Int. Cl.[5] A61K *31/44;* C07D *471/04*
U.S. Cl. 514—300 14 Claims

1. An imidazopyridine compound of the following formula:



(I)

wherein
R^1 is lower alkynyl,
R^2 is lower alkyl,
R^3 is lower alkyl,
R^4 is amino or acylamino,
R^5 is hydrogen; lower alkyl which may be substituted by halogen; nitro; amino; acylamino; esterified carboxy; or N,N-di (lower)alkylsulfamoyl, and
A is lower alkylene,
and a pharmaceutically acceptable salt thereof.

14. A method for the treatment of ulcers which comprises administering an effective amount of a compound of claim 1 or a pharmaceutically acceptable salt thereof to a human or animal.

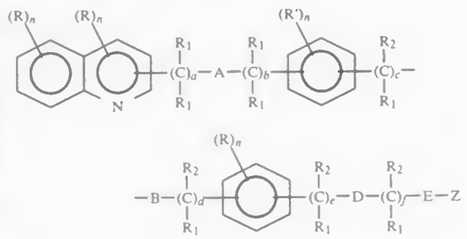
4,920,130

QUINOLINE DERIVATIVES AND USE THEREOF AS ANTAGONISTS OF LEUKOTRIENE D_4

Fu-chi Huang, Gwynedd; Robert A. Galemmo, Jr., Ambler, and Henry F. Campbell, North Wales, all of Pa., assignors to Rorer Pharamceutical Corp., Fort Washington, Pa.

Filed Nov. 3, 1987, Ser. No. 116,597
Int. Cl.[5] C07D *215/12, 215/14, 403/02;* A61K *31/47*
U.S. Cl. 514—311 22 Claims

1. A compound of the formula



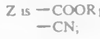
where:
A is O or S;
B is

D is O, S, NR_1,

or a chemical bond;
E is a chemical bond or

a is 0–2;
b is 0–1;
c is 0–2;
d is 0–3;
e is 0–4;
f is 0–5;
n is 0–2;
R is independently
hydrogen,
alkyl having 1 to 6 carbon atoms,
hydroxy,
alkoxy having 1 to 6 carbon atoms,
carboxy,
carbalkoxy wherein alkoxy has 1 to 6 carbon atoms,
halo,
nitro,
trifluoromethyl,
cyano,
acetyl,
propionyl or
benzoyl;
R' is independently
hydrogen,
alkyl having 1 to 6 carbon atoms,
hydroxy,
alkoxy having 1 to 6 carbon atoms,
halo or
trifluoromethyl;

R_1 is independently
hydrogen,
alkyl having 1 to 6 carbon atoms,
benzyl or
phenethyl;
R_2 is $—(CH_2)_x—X$;
where x is 0–3 and
X is hydrogen,
alkyl having 1 to 6 carbon atoms,
alkenyl having 2 to 6 carbon atoms,
cycloalkyl having 3 to 6 carbon atoms,
phenyl,
benzyl,
phenethyl,
hydroxy,
alkoxy having 1 to 6 carbon atoms,
aralkoxy wherein aryl is phenyl and alkoxy has 1 to 6 carbon atoms,
amino,
mono- and di-alkylamino having 1 to 6 carbon atoms,
benzylamino,
phenethylamino,
acetylamino,
propionylamino,
benzoylamino,
carbamyl,
carboxy,
carbalkoxy wherein alkoxy has 1 to 6 carbon atoms,
tetrazolyl,
N-acetylsulfonamido,
N-propionylsulfonamido or
N-benzoylsulfonamido;
vicinal R_2 groups together may be $(CH_2)_y—$ where y is 1–4, thus forming a 3–6 membered ring;
geminal R_1 and R_2 groups may together form a spiro substituent, $—(CH_2)_z—$, where z is 2 to 5;
geminal R_1 or R_1 and R_2 groups may together form an alkylidenyl substituent,



Z is $—COOR_1$;
—CN;

where R_3 is hydrogen, alkyl having 1 to 6 carbon atoms, trifluoromethyl, phenyl or benzyl;

$—OR_1$ or
tetrazolyl or substituted tetrazolyl where the substituent may be alkyl having 1 to 6 carbon atoms,
carboxyalkyl wherein alkyl has 1 to 6 carbon atoms, or
carbalkoxyalkyl wherein alkoxy has 1 to 6 carbon atoms and alkyl has 1 to 6 carbon atoms; and
pharmaceutically acceptable salts thereof.

21. A method for the treatment of hypersensitive ailments in a patient requiring such treatment which comprises administering to such patient an effective amount of a compound of the formula according to claim 1

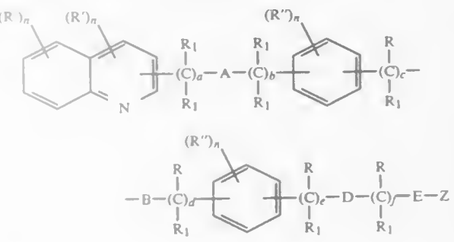
4,920,131

QUINOLINE DERIVATIVES AND USE THEREOF AS ANTAGONISTS OF LEUKOTRIENE D_4

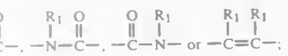
Fu-Chi Huang, Gwynedd; Robert A. Galemmo, Jr., Ambler, and Henry F. Campbell, North Wales, all of Pa., assignors to Rorer Pharmaceutical Corp., Ft. Washington, Pa.

Continuation-in-part of Ser. No. 116,420, Nov. 3, 1987, and a continuation-in-part of Ser. No. 116,428, Nov. 3, 1987, and a continuation-in-part of Ser. No. 116,597, Nov. 2, 1987. This application Jun. 21, 1988, Ser. No. 209,428
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Int. Cl.[5] C07D *215/12, 215/14, 403/02;* A61K *31/47*
U.S. Cl. 514—311 19 Claims

1. A compound of the formula



where:
A is O or S;
B is a chemical bond, O, S, SO, SO_2, NR_1,



D is O, S, NR_1,

or a chemical bond;
E is a chemical bond or

a is 0–2;
b is 0–1;
c is 0–4;
d is 0–5;
e is 0–4;
f is 0–5;
n is 0–2;
R' is independently
hydrogen,
alkyl having 1 to 6 carbon atoms,
hydroxy,
alkoxy having 1 to 6 carbon atoms,
carboxy,
carbalkoxy wherein alkoxy has 1 to 6 carbon atoms,
halo,
nitro,
trifluoromethyl,
cyano,
acetyl,
propionyl or
benzoyl;
R'' is independently
hydrogen,

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hydroxy,
alkoxy having 1 to 6 carbon atoms,
halo,
trifluoromethyl,
$-CH_2R$,
$-CH_2-O-(CH_2)_x-X$ or
R;
R_1 is independently
hydrogen,
alkyl having 1 to 6 carbon atoms,
benzyl or
phenethyl;
R is
$-(CH_2)_x-X$,
$-O-(CH_2)_x-X$ (when not geminal to A or B when A or B is O);
$-S-(CH_2)_x-X$ or
$-NR_1-(CH_2)_x-X$ where x is 0–3; and
X is
hydrogen,
alkyl having 1 to 6 carbon atoms,
alkenyl having 2 to 6 carbon atoms,
cycloalkyl having 3 to 6 carbon atoms,
phenyl,
benzyl,
phenethyl,
hydroxy,
alkoxy having 1 to 6 carbon atoms,
aralkoxy wherein aryl is phenyl and alkoxy has 1 to 6 carbon atoms,
amino,
mono- and di-alkylamino having 1 to 6 carbon atoms,
benzylamino,
phenethylamino,
acetylamino,
propionylamino,
benzoylamino,
$-CONR_1R_1$,
—COOR,
—CN,
tetrazolyl,
acetylsulfonamido,
propionylsulfonamido or
benzoylsulfonamido;
vicinal R groups together may be $(CH_2)_y$— where y is 1–4, thus forming a 3–6 membered ring;
geminal R_1 and R groups may together form a spiro substituent, $-(CH_2)_z-$, where z is 2 to 5;
geminal R_1 or R_1 and R groups may together form an alkylidenyl substituent,

$$-CHR_1:$$

Z is $-COOR_1$;
—CN;

$$-CNHSO_2R_3$$

where R_3 is
hydrogen,
alkyl having 1 to 6 carbon atoms,
trifluoromethyl,
phenyl or
benzyl;

$$-CN(R_1)_2;$$

$-OR_1$ or
tetrazolyl or substituted tetrazolyl where the substituent may be alkyl having 1 to 6 carbon atoms,
carboxyalkyl wherein alkyl has 1 to 6 carbon atoms, or
carbalkoxyalkyl wherein alkoxy has 1 to 6 carbon atoms and alkyl has 1 to 6 carbon atoms; and
pharmaceutically acceptable salts thereof.

18. A method for the treatment of hypersensitive ailments in a patient requiring such treatment which comprises administering to such patient an effective amount of a compound of the formula according to claim 1.

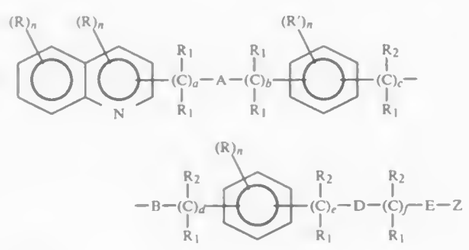
4,920,132

QUINOLINE DERIVATIVES AND USE THEREOF AS ANTAGONISTS OF LEUKOTRIENE D_4

Fu-chi Huang, Gwynedd; Robert A. Galemmo, Jr., Ambler, and Henry F. Campbell, North Wales, all of Pa., assignors to Rorer Pharmaceutical Corp., Ft. Washington, Pa.

Filed Nov. 3, 1987, Ser. No. 116,420
Int. Cl.[5] C07D *215/12, 215/14, 403/02;* **A61K** *31/47*
U.S. Cl. 514—314 **43 Claims**

1. A compound of the formula



where:
A is O or S;
B is O, S, SO, SO_2, NR_1,

$$-\overset{O}{\overset{\|}{C}}-,\quad -N-\overset{O}{\overset{\|}{C}}-\text{ or }-\overset{O}{\overset{\|}{C}}-N-;$$

D is O, S, NR_1,

$$-\overset{R_1}{\underset{}{C}}=\overset{R_1}{\underset{}{C}}-,$$

or a chemical bond;
E is a chemical bond or

$$-\overset{R_1}{\underset{}{C}}=\overset{R_1}{\underset{}{C}}-;$$

a is 0–2;
b is 1–1;
c is 0–4;
d is 0–5;
e is 0–4;
f is 0–5;
n is 0–2;
R is independently
halogen,
alkyl having 1 to 6 carbon atoms,
hydroxy,
alkoxy having 1 to 6 carbon atoms,
carboxy,
carbalkoxy wherein alkoxy has 1 to 6 carbon atoms,

halo,
nitro,
trifluoromethyl,
cyano,
acetyl,
propionyl or
benzoyl;
R′ is independently
hydrogen,
alkyl having 1 to 6 carbon atoms,
hydroxy,
alkoxy having 1 to 6 carbon atoms,
halo or
trifluoromethyl;
R_1 is independently
hydrogen,
alkyl having 1 to 6 carbon atoms,
benzyl or
phenethyl;
R_2 is $-(CH_2)_x-X$;
where x is 0–3 and
X is hydrogen,
alkyl having 1 to 6 carbon atoms,
alkenyl having 2 to 6 carbon atoms,
cycloalkyl having 3 to 6 carbon atoms,
phenyl,
benzyl,
phenethyl,
hydroxy,
alkoxy having 1 to 6 carbon atoms,
aralkoxy wherein aryl is phenyl and alkoxy has 1 to6 carbon atoms,
amino,
mono- and di-alkylamino having 1 to 6 carbon atoms,
benzylamino,
phenethylamino,
acetylamino,
propionylamino,
benzoylamino,
carbamyl,
carboxy,
carbalkoxy wherein alkoxy has 1 to 6 carbon atoms,
tetrazolyl,
acetylsulfonamido,
propionylsulfonamido or
benzylsulfonamido;
vicinal R_2 groups together may be $(CH_2)_y$—where y is 1–4, thus forming a 3–6 membered ring;
geminal R_1 and R_2 groups may together form a spiro substituent, $-(CH_2)_z-$, where z is 2 to 5; geminal R_1 or R_1 and R_2 groups may together form an alkylidenyl substituent,

$$-CHR_1;$$

Z is
—$COOR_1$;
—CN;

$$-CNHSO_2R_3$$

where R_3 is hydrogen,
alkyl having 1 to 6 carbon atoms,
trifluoromethyl,
phenyl or
benzyl;

$$-CN(R_1)_2;$$

—OR_1,
tetrazolyl or substituted tetrazolyl where the substituent may be alkyl having 1 to 6 carbon atoms,
carboxyalkyl wherein alkyl has 1 to 6 carbon atoms, or
carbalkoxyalkyl wherein alkoxy has 1 to 6 carbon atoms and alkyl has 1 to 6 carbon atoms; and
pharmaceutically acceptable salts thereof.

41. A method for the treatment of hypersensitive ailments in a patient requiring such treatment which comprises administering to such patient an effective amount of a compound of the formula according to claim 1.

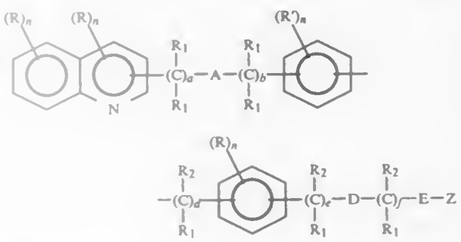
4,920,133

QUINOLINE DERIVATIVES AND USE THEREOF AS ANTAGONISTS OF LEUKOTRIENE D_4

Fu-chi Huang, Gwynedd; Robert A. Galemmo, Jr., Ambler, and Henry F. Campbell, North Wales, all of Pa., assignors to Rorer Pharmaceutical Corp., Fort Washington, Pa.

Filed Nov. 3, 1987, Ser. No. 116,428
Int. Cl.[5] C07D *215/12, 215/14, 403/07;* **A61K** *31/47*
U.S. Cl. 514—314 **22 Claims**

1. A compound of the formula



where:
A is O or S;
D is O, S, NR_1,

$$-C=C-$$

or a chemical bond;
E is a chemical bond or

$$-C=C-;$$

a is 0–2,
b is 0–1;
d is 1–5;
e is 0–4;
f is 0–5;
n is 0–2;
R is independently hydrogen, alkyl having 1 to 6 carbon atoms, hydroxy, alkoxy having 1 to 6 carbon atoms, carboxy, carbalkoxy wherein alkoxy has 1 to 6 carbon atoms, halo, nitro, trifluoromethyl, cyano, acetyl, propionyl or benzoyl;
R′ is independently hydrogen, alkyl having 1 to 6 carbon atoms, hydroxy, alkoxy having 1 to 6 carbon atoms, halo or trifluoromethyl;
R_1 is independently hydrogen, alkyl having 1 to 6 carbon atoms, benzyl or phenethyl;

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R_2 is $-(CH_2)_x-X$; where x is 0–3 and
X is hydrogen, alkyl having 1 to 6 carbon atoms, alkenyl having 2 to 6 carbon atoms, cycloalkyl having 3 to 6 carbon atoms, phenyl, benzyl, phenethyl, hydroxy, alkoxy having 1 to 6 carbon atoms, aralkoxy wherein aryl is phenyl and alkoxy has 1 to 6 carbon atoms, amino, mono- and di-alkylamino having 1 to 6 carbon atoms, benzylamino, phenethylamino, acetylamino, propionylamino, benzoylamino, carbamyl, carboxy, carbalkoxy wherein alkoxy has 1 to 6 carbon atoms, tetrazolyl, acetylsulfonamido, propionylsulfonamido or benzoylsulfonamido;
vicinal R_2 groups together may be $(CH_2)_y$—where y is 1–, thus forming a 3–6 membered ring;
geminal R_1 and R_2 groups may together form a spiro substituent, $-(CH_2)_z-$, where z is 2 to 5;
geminal R_1 or R_1 and R_2 groups may together form an alkylidenyl substituent,

Z is $-COOR_1$;
—CN;

where R_3 is hydrogen, alkyl having 1 to 6 carbon atoms, trifluoromethyl, phenyl or benzyl;

—OR_1 or tetrazolyl or substituted tetrazolyl where the substituent may be alkyl having 1 to 6 carbon atoms, carboxyalkyl wherein alkyl has 1 to 6 carbon atoms, or carbalkoxyalkyl wherein alkoxy has 1 to 6 carbon atoms and alkyl has 1 to 6 atoms; and
pharmaceutically acceptable salts thereof.

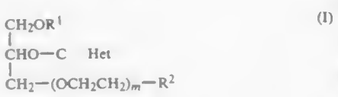
4,920,134

2-O-PYRIMIDINYL GLYCEROL DERIVATIVES

Keizo Inoue, Tokyo; Hiroaki Nomura, and Eiko Imamiya, both of Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Aug. 3, 1988, Ser. No. 227,550
Claims priority, application Japan, Aug. 7, 1987, 62-198455; Mar. 23, 1988, 63-70338
Int. Cl.[5] C07D *239/34*
U.S. Cl. 544—316 12 Claims

1. A compound having the formula:



(I)

wherein

represents pyrimidinyl, which is unsubstituted or substituted by halogen, C_{1-6} alkyl, C_{1-6} alkylthio, N-C_{1-6} alkylamino, N,N-di-C_{1-6} alkylamino, C_{1-6} alkoxy, hydroxy, hydroxy-C_{1-6} alkyl, amino-C_{1-6} alkyl, carbamoyl or ureido;
R^1 represents C_{10-20} alkyl which is unsubstituted or substituted by C_{3-8} cycloalkyl or up to 7 halogen atoms;
R^2 represents (i) a tertiary amino group of the formula:

wherein R^3 and R^4 independently represent C_{1-6} alkyl, or both, taken together with the adjacent nitrogen atom, form 1-pyrrolidinyl, piperidino, morpholino or 1-piperazinyl, each of said groups being unsubstituted or substituted by C_{1-6} alkyl, carboxy, C_{1-6} alkoxycarbonyl, mercapto, hydroxy, hydroxy-C_{1-6} alkyl, amino-C_{1-6} alkyl, carbamoyl or ureido, (ii) a quaternary ammonium group of the formula:

wherein R^3, R^4 and R^5 independently represent C_{1-6} alkyl, or R^3, R^4 and R^5, taken together with the adjacent nitrogen atom, form 1-pyridino, 3-oxazolio, 3-thiazolio, 1-C_{1-6} alkyl-3-imidazolio, 1-pyrimidino, 1-pyridazinio, 1-quinolinio, 2-isoquinolinio, 1-C_{1-6} alkyl-1-pyrrolidinio, 1-C_{1-6} alkyl-1-piperidinio, 4-C_{1-6} alkyl-4-morpholinio or 1-C_{1-6} alkyl-1-piperazinio, each of said groups being unsubstituted or substituted by C_{1-6} alkyl, carboxy, C_{1-6} alkoxycarbonyl, mercapto, hydroxy, hydroxy-C_{1-6} alkyl, amino-C_{1-6} alkyl, carbamoyl or ureido, (iii) a heterocyclic group containing a tertiary nitrogen atom selected from the class consisting of 1-(C_{1-6} alkyl)pyrrolidin-2- or 3-yl, 1-(C_{1-6} alkyl)piperidin-2-, -3- or -4-yl, 4-(C_{1-6} alkyl)morpholin-2- or -3-yl and 1-(C_{1-6} alkyl)piperazin-2- or -3-yl, each of said groups being unsubstituted or substituted by C_{1-6} alkyl, carboxy, C_{1-6} alkoxycarbonyl, mercapto, hydroxy, hydroxy-C_{1-6} alkyl, amino-C_{1-6} alkyl, carbamoyl or ureido, or (iv) a heterocyclic group containing a quaternary nitrogen atom selected from the class consisting of 1-(C_{1-6} alkyl)-2-, -3- or -4-pyridinio, 3-(C_{1-6} alkyl)-2-, -4- or -5-oxazolio, 3-(C_{1-6} alkyl)-2-, -4- or -5-thiazolio, 1-(C_{1-6} alkyl)-2-, -3-, -4-, -5-, -6-, -7- or -8-quinolinio, 2-(C_{1-6} alkyl)-1-, -3-, -4-, -5-, -6-, -7- or -8-isoquinolinio, 1,1-di(C_{1-6} alkyl)-2- or -3-pyrrolidinio, 1,1-di(C_{1-6} alkyl)-2-, -3- or -4-piperidinio, 4,4-di(C_{1-6} alkyl)-2- or -3-morpholinio and 1,1,4-tri(C_{1-6} alkyl)-2 or -3-piperazinio, each of said groups being unsubstituted or substituted by C_{1-6} alkyl, carboxy, C_{1-6} alkoxycarbonyl, mercapto, hydroxy, hydroxy-C_{1-6} alkyl, amino-C_{1-6} alkyl, carbamoyl or ureido; and
m represents 2 or 3; or a pharmaceutically acceptable salt thereof, wherein said compound represented by the formula (I) can be in the form of a pharmaceutically acceptable salt with an anion or an intramolecular salt with an anion in the molecule of said compound when R^2 represents a quaternary ammonium group or a heterocyclic group containing a quaternary nitrogen atom.

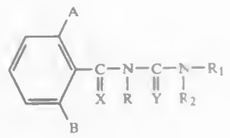
4,920,135

INSECTICIDAL UREAS AND THIOUREAS

Kobus Wellinga, and Rudolf Wulder, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

Division of Ser. No. 867,695, May 28, 1986, Pat. No. 4,833,151, which is a continuation of Ser. No. 665,508, Oct. 30, 1984, Pat. No. 4,607,044, which is a continuation of Ser. No. 302,591, Sep. 15, 1981, abandoned, which is a continuation of Ser. No. 35,978, May 4, 1979, abandoned, which is a division of Ser. No. 717,633, Aug. 26, 1976, Pat. No. 4,166,124, which is a division of Ser. No. 522,058, Nov. 8, 1974, Pat. No. 3,989,842, which is a division of Ser. No. 354,393, Apr. 25, 1973, Pat. No. 3,933,908, which is a division of Ser. No. 143,668, May 14, 1971, Pat. No. 3,748,356.
This application Feb. 7, 1989, Ser. No. 306,928
Claims priority, application Netherlands, May 15, 1970, 7007040
The portion of the term of this patent subsequent to Feb. 24, 1993, has been disclaimed.
Int. Cl.[5] A01N *43/30, 47/28*
U.S. Cl. 514—344 3 Claims

1. An insecticidal composition comprising an inert carrier and an insecticidally effective amount, as active ingredient, of a compound of the formula



wherein
A is a hydrogen atom, a halogen atom, a methyl group, or a methoxy group;
B also is a hydrogen atom, a halogen atom, a methyl group, or a methoxy group, with the proviso that A and B are not both a hydrogen atom;
R is a hydrogen atom, an alkyl group, a hydroxy group, an alkoxy group, an alkoxymethyl group, an acyl group, or an alkoxycarbonyl group;
X and Y each are an oxygen atom or a sulfur atom;
R_1 is a hydrogen atom, an alkyl group that may be substituted with halogen, with alkoxy, with alkylthio, or with cyano, a 1-cycloalkenyl group, a benzyl group that may be substituted with halogen, a hydroxy group, an alkoxy group, an acyl group, an alkoxycarbonyl group, an alkoxythiocarbonyl group, an alkylsulfonyl group, or a phenylsulfonyl group; and
R_2 is substituted or non-substituted phenyl group or a pyridyl group that may be substituted with halogen, with nitro, with cyano, or with halogenated alkyl;
with the proviso that the active ingredient comprises a compound that is not included in any of the following paragraphs:
(1) N-(2,6-dichlorobenzoyl)-N'-(4-cyanophenyl) urea;
(2) N-(2-monochlorobenzoyl)-N'-(3,4-dichlorophenyl) urea.

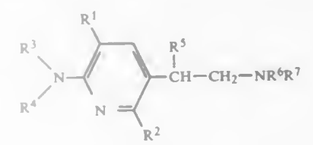
4,920,136

SUBSTITUTED PYRIDYLETHANOLAMINE LIVESTOCK PRODUCTION PROMOTERS

Hans Lindel, Leverkusen; Werner Hallenbach, Langenfeld, and Friedrich Berschauer, Woppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 13, 1988, Ser. No. 218,740
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1987, 3725084
Int. Cl.[5] A61K *31/44;* C07D *213/84, 413/00*
U.S. Cl. 514—344 13 Claims

1. A substituted pyridylethanolamine derivative of the formula



in which
R^1 represents CN, $COOR^8$ or $CONR^9R^{10}$
R^2 represents C_{1-4}-alkyl,
R^3 represents hydrogen or C_{1-4}-alkyl,
R^4 represents hydrogen or C_{1-4}-alkyl,
R^5 represents OH, C_{1-6}-alkoxy, C_1–C_6-alkylcarbonyloxy, phenylcarbonyloxy, C_1–C_6-alkylsulphonyloxy, or phenylsulphonyloxy,
R^6 represents hydrogen or C_{1-6}-alkyl,
R^7 represents hydrogen, C_{1-6}-alkyl, C_{3-6}-cycloalkyl, C_{1-6}-alkylphenyl or phenyl each of which is optionally substituted by 1 to 5 halogen atoms, C_{1-6}-alkyl-phenyl which can optionally be substituted by halogen, C_{1-4}-alkyl, hydroxyl, C_{1-4}-alkoxy, or optionally halogen-substituted methylenedioxy or ethylenedioxy; C_{1-6}-alkyl-phenoxy which can optionally be substituted by halogen, C_{1-4}-alkyl, hydroxyl, C_{1-4}-alkoxy, or optionally halogen-substituted methylenedioxy or ethylenedioxy,
R^8 represents C_{1-6}-alkyl, and
R^9 and R^{10}, independently of one another, represent hydrogen or C_{1-4}-alkyl.

10. A livestock promoting composition comprising an amount effective therefor of a compound, salt or N-oxide according to claim 1 and a diluent.

4,920,137

METHOD FOR STABILIZING ISOTHIAZOLINONES

Jeane Segall, and Leonard M. Shorr, both of Haifa, Israel, assignors to Bromine Compounds Limited, Israel

Filed Jul. 21, 1988, Ser. No. 222,130
Claims priority, application Israel, Jul. 23, 1987, 83305; Jul. 15, 1988, 87111
Int. Cl.[5] A61K *31/425;* C07D *275/02*
U.S. Cl. 514—372 22 Claims

1. A method for stabilizing compositions comprising one or more 3-isothiazolinones, said method comprising
adding to a composition comprising said one or more 3-isothiazolinones, an amount effective to stabilize said one or more 3-isothiazolinones of one or more stabilizing compounds having the formula:

$$[R_xA\text{-}C_6H_2R^1R^2]_yZ$$

wherein Z is selected from the group consisting of AR_x, R^1, R^2, alkoxymethylene, methylene and alkylidene; R, R^1 and R^2 are independently selected from the group consisting of hydrogen, straight-chained, branched and cyclic alkyl, aryl and arylalkyl; A is oxygen or nitrogen, provided that when A is oxygen, x is 0 or 1 and when A is nitrogen, x is 1 or 2; and y is

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1 or 2, so that degradation of said one or more 3-isothiazolinones is inhibited.

16. In combination, a composition comprising one or more 3-isothiazolinones, and an amount effective to stabilize said one or more 3-isothiazolinones, of one or more stabilizing compounds having the formula:

$$[R_xA\text{-}C_6H_2R^1R^2]_yZ$$

wherein Z is selected from the group consisting of AR_x, R^1, R^2, alkoxymethylene, methylene and alkylidine; R, R^1 and R^2 are independently selected from the group consisting of hydrogen, straight-chained, branched and cyclic alkyl, aryl and arylalkyl; A is oxygen or nitrogen, provided that when A is oxygen, x is 0 or 1 and when A is nitrogen, x is 1 or 2; and y is 1 or 2, so that degradation of said one or more 3-isothiazolinones is inhibited.

4,920,138

2(4-CHLOROBENZYL)1(1H-1,2,4-TRIAZOL-1-YL-METHYL-1-CYCLOHEPTANOL AND CYCLOHEXANOL

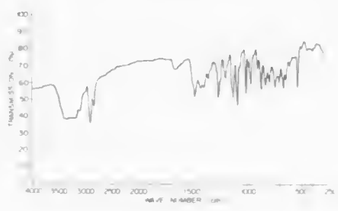
Atsushi Ito; Satoru Kumazawa; Nobuo Sato, and Toshihide Saishoji, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaishi, Chuo, Japan

Filed Jan. 10, 1989, Ser. No. 295,404

Claims priority, application Japan, Jan. 14, 1988, 63-6054

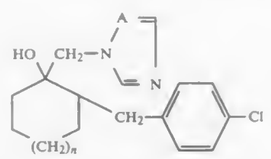
Int. Cl.[5] A01N *43/653;* **C07D** *249/12*

U.S. Cl. 514—383 **6 Claims**



1. An azole-substituted cycloalkanol derivative represented by the formula (I):

(I)



wherein n is an integer of 1 or 2 and A represents a nitrogen atom.

4,920,139

ALPHA-ALKYL-ALPHA-(4-HALOPHENYL)-1H-1,2,4-TRIAZOLE-1-PROPANENITRILE

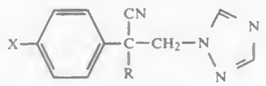
Ted T. Fujimoto, Churchville, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 551,732, Nov. 10, 1983, abandoned. This application Jan. 27, 1988, Ser. No. 211,957

Int. Cl.[5] A01N *43/653;* **C07D** *249/08*

U.S. Cl. 514—383 **15 Claims**

1. A compound of the formula



wherein X is a fluoro, chloro or bromo atom, R is $(C_3\text{-}C_8)$alkyl group wherein when R is branched, the branching does not occur at the alpha carbon of the R substituent and the agronomically acceptable enantiomorphs, acid addition and metal salt complexes thereof.

4,920,140

BENZIMIDAZOLE DERIVATIVES AND THEIR THEREAPEUTIC AND COSMETIC USE

Braham Shroot, Antibes; Jacques Eustache, Grasse, and Jean-Michel Bernardon, Le Rouret, all of France, assignors to Centre International de Recherches Dermatologiques C.I.R.D., Valbonne, France

Division of Ser. No. 839,269, Mar. 13, 1986, Pat. No. 4,740,519, which is a continuation-in-part of Ser. No. 777,728, Sep. 19, 1985, abandoned. This application Mar. 24, 1988, Ser. No. 172,494

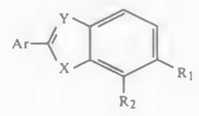
Claims priority, application Luxembourg, Sep. 19, 1984, 85544

Int. Cl.[5] A61K *31/41;* **C07D** *487/00*

U.S. Cl. 514—394 **15 Claims**

1. An aromatic heterocyclic compound having the formula

(I)



wherein

R_1 represents (i) $-CH_3$, (ii) $-CH_2OH$ or (iii)

R_3 represents hydrogen, $-OR_4$ wherein R_4 represents hydrogen, alkyl having 1–20 carbon atoms, mono- or polyhydroxyalkyl, or R_3 represents

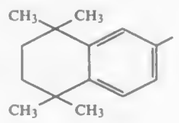
wherein r'and r'' represent hydrogen, lower alkyl or r' and r'' together with the nitrogen atom to which they are attached form a pyrrolidino group,

R_2 represents hydrogen or $-CH_3$,

Ar represents an aromatic radical having one of the following formulas

(A)

(a)



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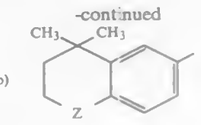
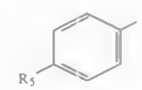
(b)



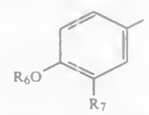
wherein Z is O or S,

(c)



wherein R_5 represents lower alkyl, and

(d)



where R_6 represents hydrogen or alkyl having 1–10 carbon atoms and R_7 represents branched alkyl having 4–12 carbon atoms or cycloalkyl,

Y represents a nitrogen atom, and

X represents —N—R_8 wherein R_8 represents hydrogen, lower alkyl or lower alkoxycarbonyl.

14. A pharmaceutical composition for enteral, parenteral, topical or ocular administration for the treatment of dermatologic ailments linked to a keratinization disorder comprising in a pharmaceutically acceptable vehicle an amount of the compound of claim 1 effective to treat said dermatologic ailments.

4,920,141

SYNERGISTIC BIOCIDES OF CERTAIN NITROIMIDAZOLES AND ALDEHYDES

Dennis G. Horstmann, St. Louis, and Douglas S. Jones, Kirkwood, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 916,761, Oct. 5, 1986, abandoned. This application Feb. 24, 1988, Ser. No. 159,793

Int. Cl.[5] A01N *35/00, 35/02, 43/50*

U.S. Cl. 514—398 **8 Claims**

1. A bactericidal composition useful in treating industrial process water to inhibit and control the growth of sulfate-reducing bacteria comprising a synergistic bactericidally effective amount of a mixture of (a) a water-soluble salt of metronidazole, dimetridazole, secnidazole or ipronidazole and (b) glutaraldehyde, the weight ratio of component (a) to component (b) being between about 1:2 to 1:100.

4,920,142

FUNGICIDAL IMIDAZOLE DERIVATIVES

Tetsuya Imai, Naruto, and Hiroshi Takao, Tokushima, both of Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

Filed Feb. 1, 1989, Ser. No. 304,630

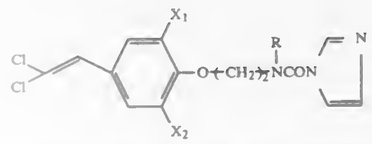
Claims priority, application Japan, Feb. 5, 1988, 63-26274

Int. Cl.[5] A01N *43/50;* **C07D** *233/56*

U.S. Cl. 514—399 **7 Claims**

1. An imidazole derivative represented by the formula

(B)



(C)

wherein R is lower alkyl, lower alkoxyalkyl, lower alkoxycarbonylmethyl or cyanomethyl, and X^1 and X^2 are each a hydrogen atom or halogen atom.

7. A fungicidal composition for agricultural and horticultural uses comprising an inert carrier and a fungicidally effective amount of an imidazole derivative defined in claim 1 as an active component thereof.

(D)

4,920,143

HYDRO-MONOBENZOPORPHYRIN WAVELENGTH-SPECIFIC CYTOTOXIC AGENTS

Julia G. Levy; David Dolphin, both of Vancouver; Jack K. Chow, Burnaby, and Ethan Sternberg, Vancouver, all of Canada, assignors to University of British Columbia, Vancouver, Canada

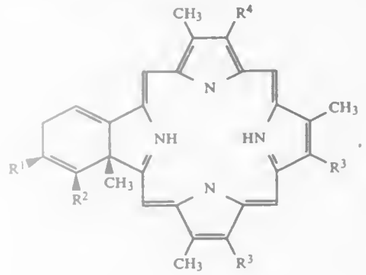
Continuation-in-part of Ser. No. 41,680, Apr. 23, 1987, which is a continuation-in-part of Ser. No. 5,204, Jan. 20, 1987. This application Jul. 19, 1988, Ser. No. 221,161

Int. Cl.[5] A61K *31/40;* **C07D** *437/22*

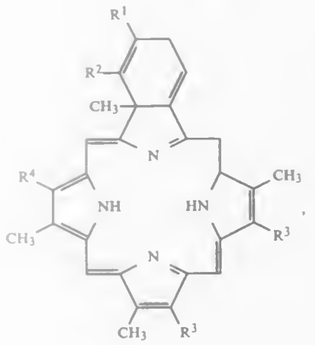
U.S. Cl. 514—410 **11 Claims**

1. A compound of the formula

1



2



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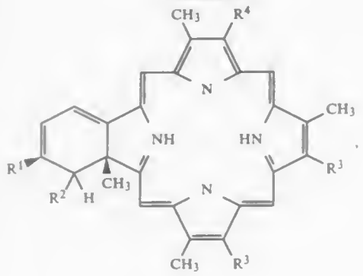
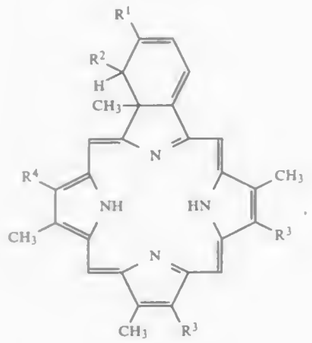
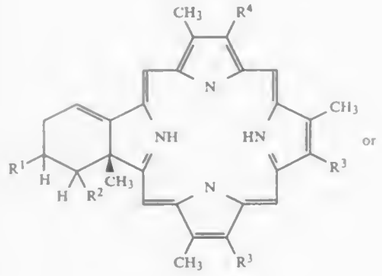
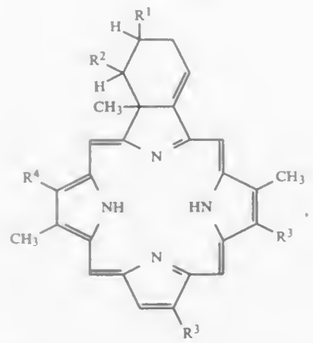






or



wherein

each R^1 and R^2 is independently selected from the group consisting of carbalkoxy (1–6C), alkyl (1–6C) sulfonyl, aryl sulfonyl, and aryl, and

each R^3 is independently $CH_2CH_2COOR^{3'}$ where $R^{3'}$ is H or alkyl (1–6C); and

R^4 is $CHCH_2$, $CH_2OR^{4'}$, $CH(OR^{4'})CH_3$, $CH(OR^{4'})CH_2OR^{4'}$, $—CH(SR^{4'})CH_3$, $—CH(NR^{4'}{}_2)CH_3$, $—CH(CN)CH_3$, $—CH(COOR^{4'})CH_3$, $—CH(OOCR^{4'})CH_3$, $—CH(halo)CH_3$, and $—CH(halo)CH_2(halo)$, wherein $R^{4'}$ is H, alkyl (1–6C), with the proviso that if R^4 is $CHCH_2$, both $R^{3'}$, cannot be alkyl.

8. A pharmaceutical composition which is useful in targeting specific biological material which composition comprises an effective amount of the compound of claim 1 in admixture with at least one pharmaceutically acceptable excipient.

4,920,144

DERIVATIVES OF BICYCLIC AMINO ACIDS, AGENTS CONTAINING THEM AND THEIR USE AS HYPOTENSIVES

Hansjörg Urbach, Kronberg/Taunus; Rainer Henning, Hattersheim am Main, and Reinhard Becker, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 865,479, May 21, 1986, abandoned. This application Apr. 3, 1989, Ser. No. 332,338

Claims priority, application Fed. Rep. of Germany, May 23, 1985, 3518514

Int. Cl.[5] A61K *31/40, 31/465;* C07D *403/12, 209/02*

U.S. Cl. 514—412 12 Claims

1. A compound of the formula I or a physiologically acceptable salt thereof

(I)

in which

n denotes 0, 1 or 2,

R denotes hydrogen, (C_1 to C_6)-alkyl or aralkyl having 7 to 9 carbon atoms,

R^1 denotes hydrogen or (C_1 to C_6)-alkyl which can optionally be substituted by amino, (C_1 to C_4)-acylamino or benzoylamino, (C_2 to C_6)-alkenyl, (C_5 to C_9)-cycloalkyl, (C_5 to C_9)-cycloalkenyl, (C_5 to C_7)-cycloalkyl-(C_1 to C_4)-alkyl, aryl or partially hydrogenated aryl, each of which can be substituted by (C_1 to C_4)-alkyl, (C_1 or C_2)-alkoxy or halogen, aryl-(C_1 to C_4)-alkyl or aroyl-C_1-alkyl, both of which can be substituted in the aryl radical as defined previously, or a side chain of a naturally occurring amino acid,

R^2 denotes hydrogen, (C_1 to C_6)-alkyl, (C_2 to C_6)-alkenyl or aryl-(C_1 to C_4)-alkyl,

X denotes (C_1 to C_6)-alkyl, (C_2 to C_6)-alkenyl, (C_5 to C_9)-cycloalkyl, aryl which can be monosubstituted, disubstituted or trisubstituted by (C_1 to C_4)-alkyl, (C_1 to C_4)-alkoxy, hydroxyl, halogen, nitro, amino, (C_1 to C_4)-alkylamino, di-(C_1 to C_4)-alkyl-amino or methylenedioxy, or 3-indolyl.

11. Method of treating high blood pressure which comprises administering an effective amount of a compound as or a salt thereof claimed in claim 1.

4,920,145

WATER-SOLUBLE COMPLEXES OF WATER-INSOLUBLE PHARMACEUTICAL COMPOUNDS AND PREPARATION THEREOF

James R. Cho, Oakland; Terry E. Smith, Morristown, and Ian W. Cottrell, Kinnelon, all of N.J., assignors to GAF Chemical Corporation, Wayne, N.J.

Filed Feb. 29, 1988, Ser. No. 161,881

Int. Cl.[5] A61K *31/405, 31/41;* C07D *209/28, 207/267*

U.S. Cl. 514—420 18 Claims

1. An adduct of a substantially insoluble organic compound selected from the group consisting of indomethacin, dapsone, furosemide, and chlorhexidine and a liquid oligomer of N-vinyl-2-pyrrolidone, the water solubility of the adduct being at least about 25-fold that of the organic compound itself.

7. A method for preparing the adduct of claim 1 comprising preparing a suspension of an insoluble organic compound selected from the group consisting of indomethacin, dapsone, furosemide, and chlorhexidine in a liquid oligomer of N-vinyl-2-pyrrolidone, and heating the suspension at a temperature and for a period of time sufficient to dissolve the organic compound.

13. A method for preparing the adduct of claim 1 comprising preparing a suspension of an insoluble organic compound selected from the group consisting of indomethacin, dapsone furosemide, and chlorhexidine in an aqueous solution of a liquid oligomer of N-vinyl-2-pyrrolidone and heating the suspension at a temperature and for a time sufficient to dissolve the organic compound.

4,920,146

CARBAMOYLOXYLABDANE COMPOUNDS USEFUL IN REDUCING INTRAOCULAR PRESSURE

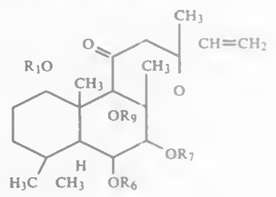
Raymond W. Kosley, Jr., Bridgewater; Robert J. Cherill, Somerset, both of N.J., and Gerard O'Malley, Newtown, Pa., assignors to Hoechst Roussel Pharmaceuticals Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 947,070, Dec. 29, 1986, abandoned. This application Dec. 28, 1987, Ser. No. 137,998

Int. Cl.[5] C07D *311/92*

U.S. Cl. 514—437 49 Claims

1. A compound of the formula



wherein:

(a) R_1 is hydrogen; (b) R_9 is hydrogen;

(c) R_6 and R_7 independently are hydrogen, a group of the formula

wherein R_{20} is hydrogen or loweralkyl of 1 to 6 carbon atoms, or a group of the formula

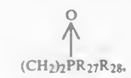
wherein R_{13} is hydrogen, loweralkyl of 2 to 6 carbon atoms, hydroxyloweralkyl of 1 to 6 carbon atoms, loweralkoxyloweralkyl having 1 to 6 carbon atoms in the alkoxy group and 2 to 6 carbon atoms in the alkyl group; or a group of the formula $HOCH_2CH(OH)CH_2—$; R_{14} is hydrogen, hydroxyl, loweralkoxy of 1 to 6 carbon atoms, loweralkyl of 1 to 6 carbon atoms, hydroxyloweralkyl of 2 to 6 carbon atoms, loweralkoxyloweralkyl of 1 to 6 carbon atoms in alkoxy group and 2 to 6 carbon atoms in the alkyl group, loweralkanoyl of 2 to 6 carbon atoms, loweralkanoyllooeralkyl of 2 to 6 carbon atoms in the alkanoyl group and 1 to 6 carbon atoms in the alkyl group,

a group of the formula $—(CH_2)_tNR_{21}R_{22}$ wherein R_{21} and R_{22} are independently loweralkyl of 1 to 6 carbon atoms and t is 0, or 2 to 6,

a group of the formula OR_{23} wherein R_{23} is hydrogen, loweralkyl of 1 to 6 carbon atoms, a group of the formula $(CH_2)_{t'}NR_{21}R_{22}$ wherein t' is 2 to 6, R_{21} and R_{22} are as above, a group of the formula

wherein R_{24} is hydrogen, loweralkyl of 1 to 6 carbon atoms, lowercycloalkyl of 3 to 6 carbon atoms, loweralkenyl of 2 to 6 carbon atoms, haloloweralkenyl of 2 to 6 carbon atoms, loweralkanoylloweralkyl of 2 to 6 carbon atoms in the alkanoyl group and 1 to 6 carbon atoms in the alkyl group, loweralkoxyloweralkyl of 1 to 6 carbon atoms in each group, loweralkoxycarbonylloweralkyl of 1 to 6 carbon atoms in each group, loweralkylamino of 1 to 6 carbon atoms, lowerdialkylamino of 2 to 6 carbon atoms,

a group of the formula $(CH_2)_uN(R_{25})COR_{26}$ wherein u is 1, 2 or 3 and R_{25} and R_{26} are independently hydrogen or loweralkyl of 1 to 6 carbon atoms, a group of the formula



wherein R_{27} and R_{28} are loweralkyl of 1 to 6 carbon atoms, with the provisos:

(e) that R_1, R_6 and R_7 are not simultaneously hydrogen,

(f) that when R_1 and R_6 are hydrogen, R_7 is not

(g) that R_6 and R_7 are not simultaneously

(h) that when r is 1, either R_6 or R_7 is

(i) that when R_1 and R_6 are hydrogen, R_{13} or R_{14} are not simultaneously loweralkyl of 1 to 6 carbon atoms, and

(h) that when R_1 and R_9 taken together from a group of the formula CO, SO, or $CHNR_{11}R_{12}$, R_6 and R_7 are not simultaneously hydrogen; the optical or geometric isomers thereof; or the pharmaceutically acceptable salts thereof.

17. A method of reducing intraocular pressure in mammals effective comprising administering to a mammal requiring intraocular pressure reduction, an intraocular pressure reducing effective amount of a compound of claim 1.

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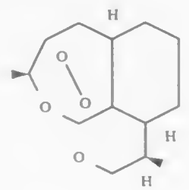
4,920,147

DEOXOARTEMISININ: NEW COMPOUND AND COMPOSITION FOR THE TREATMENT OF MALARIA

James D. McChesney, Rte. 1, Box 340, Etta, Miss. 38627, and Mankil Jung, 81 Jeff St., Oxford, Miss. 38655

Filed Mar. 28, 1989, Ser. No. 329,669
Int. Cl.[5] A61K *31/335;* C07D *321/02*
U.S. Cl. 514—450 3 Claims

1. The compound deoxoartemisinin having the formula:



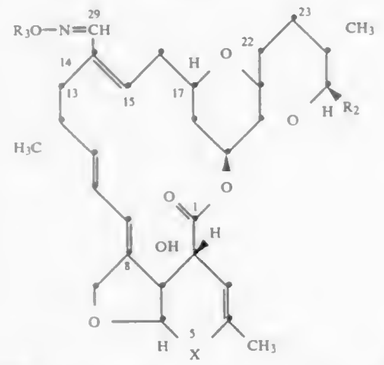
4,920,148

INSECTICIDES AND PARASITICIDES

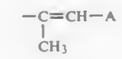
Jean-Claude Gehret, Aesch, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 160,237, Feb. 25, 1988, Pat. No. 4,855,317. This application Jun. 21, 1989, Ser. No. 369,436
Claims priority, application Switzerland, Mar. 6, 1987, 847/87
Int. Cl.[5] A61K *31/365;* C07D *493/22*
U.S. Cl. 514—450 11 Claims

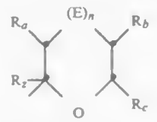
1. A compound of the formula



wherein
X is a group selected from —C(O)— and —C(=N—OR)—,
R is hydrogen, a OH protective group, an alkyl, cycloalkyl or acyl group,
R_2 is methyl, ethyl, isopropyl, sec-butyl or the



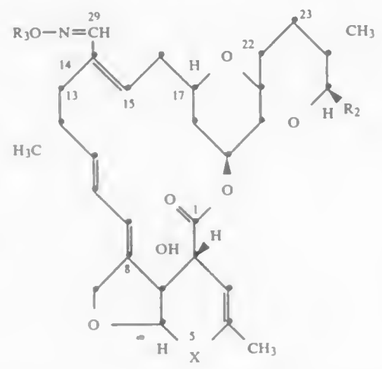
group, wherein
A is methyl, ethyl or isopropyl; and
R_3 is hydrogen, C_1–C_6alkyl, C_2–C_6alkenyl, a radical selected from the group consisting of phenyl and benzyl which is unsubstituted or substituted by one or more members selected from the group consisting of halogen, C_1–C_3alkyl, C_1–C_3alkoxy, C_1–C_3alkylthio, C_1–C_3haloalkyl, nitro or cyano, or is the group U



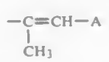
(U)

wherein n is 0, 1, 2, 3, 4 or 5, E is oxygen or —CH(R_d)—, R_z is hydrogen, R_a is hydrogen, halogen, C_1–C_3alkyl, C_1–C_3alkoxy or 2-tetrahydropyranyl, and R_b, R_c and R_d are each independently hydrogen, halogen, C_1–C_3alkyl or C_1–C_3alkoxy, which group U may also be in unsaturated form.

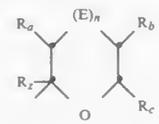
9. A method of controlling parasites of animals or harmful insects, which comprises applying to said parasites, to said insects or to the locus thereof, an insecticidally effective amount of a compound of the formula



wherein
X is a group selected from —C(O)— and —C(=N—OR)—,
R is hydrogen, a OH protective group, an alkyl, cycloalky or acyl group,
R_2 is methyl, ethyl, isopropyl, sec-butyl or the



group, wherein
A is methyl, ethyl or isopropyl, and
R_3 is hydrogen, C_1–C_6alkyl, C_2–C_6alkenyl, a radical selected from the group consisting of phenyl and benzyl which is unsubstituted or substituted by one or more members selected from the group consisting of halogen, C_1–C_3alkyl, C_1–C_3alkoxy, C_1–C_3alkylthio, C_1–C_3haloalkyl, nitro or cyano, or is the group U



(U)

wherein n is 0, 1, 2, 3, 4 or 5, E is oxygen or —CH(R_d)—, R_z is hydrogen, R_a is hydrogen, halogen, C_1–C_3alkyl, C_1–C_3alkoxy or 2-tetrahydropyranyl, and R_b, R_c and R_d are each independently hydrogen, halogen, C_1–C_3alkyl or C_1–C_3alkoxy, which group U may also be in unsaturated form.

4,920,149

COUGH/COLD MIXTURES COMPRISING NON-STEROIDAL ANTI-INFLAMMATORY DRUGS

Abraham Sunshine, New York; Eugene M. Laska, Larchmont, and Carole E. Siegel, Mamaroneck, all of N.Y., assignors to Analgesic Associates, Larchmont, N.Y.

Division of Ser. No. 887,205, Jul. 21, 1986, Pat. No. 4,738,966, which is a division of Ser. No. 752,546, Jul. 8, 1985, Pat. No. 4,619,934, which is a division of Ser. No. 598,502, Apr. 9, 1984, Pat. No. 4,552,899. This application Jan. 15, 1988, Ser. No. 144,099
Int. Cl.[5] A61K *31/19, 31/20*
U.S. Cl. 514—557 19 Claims

1. A method for the treatment of cough, cold, cold-like and/or flu symptoms in a mammalian organism in need of such treatment, comprising administering to such organism a pharmaceutical composition comprising (i) an analgesically and anti-inflammatory effective amount of a non-narcotic analgesic constitunt consisting essentially of at least one of the propionic acid NSAID's, benoxaprofen, flurbiprofen, fenoprofen, fenbufen, ketoprofen, indoprofen, pirporfen carprofen, oxaprozn, pranoprofen, microprofen, tioxaprofen, suprofen, alminoprofen, tiaprofenic acid, fluprofen, bucloxic acid or pharmaceutically acceptable salt thereof, in combinatory immixture with (ii) an antitussive effective amount of at least one of the antitussives caraminophen and dextromethorphan, or pharmaceutically acceptable salt thereof.

4,920,150

METHOD FOR PRODUCTION OF STABILIZED SODIUM ASCORBATE POWDER

Tadashi Hanaoka, Toyonaka; Yoshimi Kondo, Kudamatsu, and Ikuo Isobe, Hikari, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 17, 1988, Ser. No. 258,862
Claims priority, application Japan, Oct. 15, 1987, 62-261277
Int. Cl.[5] A61K *31/34*
U.S. Cl. 514—474 4 Claims

1. A method for production of stabilized sodium ascorbate powder, which comprises pulverizing crystals of sodium ascorbate, immediately followed by drying said crystals to a powder temperature of 40°–80° C.

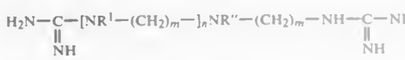
4,920,151

MICROBICIDAL AGENTS BASED ON ALKYL-DI-GUANIDINIUM SALTS

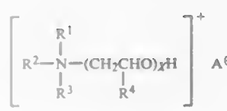
Karl H. Wallhäusser, Hofheim am Taunus; Martin Hille, Lieferbach; Hans-Walter Bücking, Kelkheim, and Manfred Hofinger, Burgkirchen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 902,166, Aug. 29, 1986. This application Feb. 2, 1988, Ser. No. 157,068
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1985, 3531356
Int. Cl.[5] A01N *33/12, 37/52*
U.S. Cl. 514—634 2 Claims

1. A microbicidal agent consisting essentially of 5 to 50% by weight of the salt of a mono- or polybasic inorganic or organic acid selected from the group consisting of sulfuric acid, nitric acid, phosphoric acid, formic acid, hydrochloric acid, acetic acid, propionic acid, lactic acid, lauric acid, stearic acid, and oleic acid and an alkyl-di-guanidine of the formula



in which R′ and R″ denote hydrogen or C_8–C_{18}-alkyl, and R′ and R″ may not simultaneously be hydrogen, m denotes a number from 2 to 6 and n denotes 0 or 1, 5 to 50% by weight of a quaternary ammonium compound of the formula



in which R^1 denotes C_8–C_{22}-alkyl or C_8–C_{22}-alkenyl, R^2 and R^3 denote C_1–C_4-alkyl or C_2–C_3-hydroxyalkyl and R^4 denotes hydrogen or methyl, or R^1 and R^2 denote C_8–C_{12}-alkyl, R^3 denotes C_1–C_4-alkyl or C_2–C_3-hydroxyalkyl and R^4 denotes hydrogen or methyl, X denotes a number from 1 to 3, and A^- denotes an anion of a carboxylic acid selected from the group consisting of propionic acid, lactic acid, glycolic acid, tartronic acid, malic acid, tartaric acid, citric acid, maleic acid and benzoic acid, and, as the remainder, water, a lower alcohol, and a water-soluble glycol.

4,920,152

REVERSED-PHASE PACKING MATERIAL AND METHOD

Frederick E. Regnier, West Lafayette, Ind., and William Kopaciewicz, Ipswich, Mass., assignors to Purdue Research Foundation, West Layfayette, Ind.

Filed May 13, 1986, Ser. No. 862,750
Int. Cl.[5] C08F *8/46;* B01D *15/08*
U.S. Cl. 521—31 41 Claims

1. A process for producing a reversed-phase material comprising the steps of:
(a) providing a support material having a surface with an affinity for an adsorbate;
(b) contacting the surface of said support material with an adsorbate comprising reactive primary and/or secondary amine groups such that a pellicular coating of said adsorbate is adsorbed to said surface by electrostatic forces;
(c) crosslinking said adsorbed coating by reacting a portion of said reactive amine groups of said coating with a first hydrophobic reagent; and
(d) producing a reversed-phase material by reacting at least one remaining reactive amine group of said crosslinked adsorbed coating with an amount of a second hydrophobic reagent sufficient to render the amine neutral at acidic pH

4,920,153

EXPANDABLE THERMOPLASTIC RESIN BEADS

Richard B. Allen, Pittsfield, Mass.; William E. Gibbs, Chesapeake, Va., and Lynn M. Hans, Pittsfield, Mass., assignors to General Electric Company, Selkirk, N.Y.

Division of Ser. No. 232,900, Aug. 16, 1988, Pat. No. 4,874,796, which is a division of Ser. No. 62,004, Jun. 12, 1987, Pat. No. 4,782,098. This application Jul. 24, 1989, Ser. No. 384,774
Int. Cl.[5] C08J *9/18, 9/22*
U.S. Cl. 521—60 7 Claims

1. A composition comprising discrete particles of an interpolymer of from 1 to 50 parts by weight of a polyphenylene ether resin and from 99 to 50 parts by weight a polymerized vinyl aromatic monomer per 100 parts by weight of resin and monomer imbibed under pressure with an easily volatilizable hydrocarbon or halogenated hydrocarbon blowing agent, said blowing agent being present in an amount sufficient to foam said interpolymer to a density less than about 20 lbs./ft^3.

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4,920,154

SUBSTANTIALLY CLOSED CELL SHAPED HARD PHENOL FOAM AND METHOD FOR PREPARING THAT PHENOL FOAM

Joost Monstrey, Knokke-Heist, and Bart Wallaeys, Gent, both of Belgium, assignors to Recticel, Brussels, Belgium

Filed Apr. 14, 1989, Ser. No. 338,072
Claims priority, application Belgium, Jan. 3, 1989, 08900003
Int. Cl.[5] C08J 9/14
U.S. Cl. 521—131 8 Claims

1. In a method for preparing a substantially closed cell shaped foam which comprises a condensation product between an unsubstituted phenol or a phenol derivative and an aldehyde using a blowing agent for forming the rigid phenolic resin foam, the improvement wherein the blowing agent comprises chloropropane.

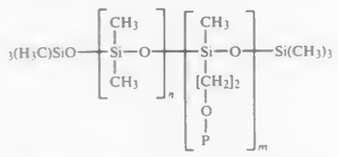
4,920,155

ORGANOMINERAL FOAMED MATERIALS AND PROCESSES FOR THEIR PREPARATION

Harald Bode, Kamen, Fed. Rep. of Germany, assignor to F. Willich Berg-und Bautechnik GmbH & Co., Fed. Rep. of Germany

Filed Jul. 22, 1987, Ser. No. 76,305
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1986, 3625278
Int. Cl.[5] C08G 77/00
U.S. Cl. 521—154 8 Claims

1. A process for preparing organomineral foamed materials by reacting a polyisocyanate with an alkali silicate solution in the presence of a catalyst, characterized by carrying out the reaction in a molar ratio of NCO groups in the polyisocyanate to Me_2O groups in tha alkali silicate solution of >2 in the presence of a hydrophobic polysiloxane and polyether block copolymer of general formula I



where P means a group of the formula

$$-(C_2H_4O)_x(C_3H_6O)_y-R$$

in which R represents a hydrogen atom or an alkyl group and n, m, x and y are integers giving the respective degree of polymerization, the polysiloxane block being linked to the polyether block by a non-hydrolysable SiC bond and the proportion of ethylene oxide units in the polyether block being 30 to 80%; wherein the process is carried out without the addition of a physical foaming agent.

4,920,156

BLENDS OF CYCLIC VINYL ETHER CONTAINING COMPOUNDS AND URETHANE ACRYLATES

Joseph V. Koleske, and Claiborn L. Osborn, both of Charleston, W. Va., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Mar. 23, 1984, Ser. No. 592,838
Int. Cl.[5] C08F 2/50, 220/58, 232/04, 232/06
U.S. Cl. 522—31 18 Claims

1. A photocurable coating composition comprising a dihydropyranyl or di(dihydropyranyl) compound; a urethane acrylate prepared by reacting a polyol and a multi-functional isocyanate with a lactone-acrylate adduct or hydroxyalkyl acrylate or mixture thereof; and a photoinitiator selected from the group consisting of aromatic iodonium salts of halogen-containing complex ions, and aromatic onium salts of Group IIIA, VA and VIA elements.

4,920,157

RADIATION-CURABLE CONTACT ADHESIVES BASED ON POLYURETHANE ACRYLATES

Günther Schulz, Ludwigshafen; Wolfgang Druschke, Dirmstein, and Helmut Jaeger, Bobenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 15, 1988, Ser. No. 168,464
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1987, 3709920
Int. Cl.[5] C08F 20/34, 20/56
U.S. Cl. 522—96 12 Claims

1. A radiation-curable contact adhesive, comprising:
(A) an oligomeric or polymeric reaction product having a molecular weight of from about 500 to 100,000 of:
(a) a diisocyanate;
(b) from 20–99 equivalent %, based on component (a), of a polyesterol or polyetherol or a combination thereof;
(c) from 0–60 equivalent %, based on component (a), of a diol of 2 to 50 carbon atoms;
(d) a hydroxyalkyl (meth)acrylate of 2 to 20 carbon atoms in the alkyl radical; and
(e) a monohydroxyalkylcarboxylic acid having substantially no tendency to form a lactone; and
(B) from 2–90% by weight, based on the total amount of components A and B, of at least one monovinyl compound selected from the group consisting of monovinyl compounds which are capable of being self-polymerized to form a polymer having a glass transition temperature below about 20° C.;
and wherein the total amount of components (b), (c), (d) and (e) is equivalent in terms of OH groups to the amount of component (a), the amount of components (d) and (e) together is from 1 to 50 equivalent %, based on component (a), and the equivalent ratio of components (d):(e) is from about 1:9 to 9:1.

4,920,158

HYDROGEL-FORMING WOUND DRESSING OR SKIN COATING MATERIAL

Douglas G. Murray, Willowdale; Dennis C. Smith, Toronto, and James E. Guillet, Don Mills, all of Canada, assignors to Medipro Sciences Limited, Ontario, Canada

Filed Aug. 22, 1988, Ser. No. 234,726
Int. Cl.[5] C08L 13/00
U.S. Cl. 523—111 25 Claims

1. A hydrogel-forming wound dressing of skin coating material suitable for household, clinical and veterinary use, consisting substantially entirely of wound and skin compatible ingredients and comprising a first, hydrophilic polymer selected from the group consisting of polymers or copolymers of acrylic acid, polymers or copolymers of methacrylic acid, polymers or copolymers of itaconic acid, polymers or copolymers of maleic acid and polymers or copolymers of 3-butene-1,2,3-tricarboxylic acid, and combinations thereof; a second hydrophilic polymer which is selected from the group consisting of polyethylene oxide and copolymers of ethylene oxide and propylene oxide; a crosslinking agent for the first hydrophilic polymer to effect crosslinking thereof on drying; and water; the material forming a croslinked hydrogel of improved water resistance on drying; the material being film forming and substantially transparent, although capable of being made opaque.

4,920,159

FRICTION RESISTANT COMPOSITION

Sajal Das, Parsippany; Dusan C. Prevorsek, Morristown, both of N.J.; Seong K. Rhee, Northville, Mich., and William J. Bulger, Clifton Park, N.Y., assignors to Allies-Signal Inc., Morristown, N.J.

Continuation of Ser. No. 138,734, Dec. 28, 1987, abandoned.
This application Jan. 11, 1989, Ser. No. 296,420
Int. Cl.[5] C08K 3/36; C08J 5/14
U.S. Cl. 523—153 25 Claims

1. A composition comprising friction resistant filler; and at least a sufficient amount of phenolic cyanate resin to bind the friction resistant filler, the resin having substantially no smoke generation during gel time measurement at 155° C.

4,920,160

POLYMERIC PARTICLES AND THEIR PREPARATION

Gerald K. Chip, Scarborough, and Alfred Rudin, Waterloo, both of Canada, assignors to Tioxide Group PLC, London, England

Division of Ser. No. 218,271, Jul. 13, 1988, Pat. No. 4,863,973.
This application Jul. 10, 1989, Ser. No. 377,253
Claims priority, application United Kingdom, Jul. 30, 1987, 8718036
Int. Cl.[5] C08J 9/28; C08F 265/04
U.S. Cl. 523—201 14 Claims

1. A process for the preparation of core/sheath polymer particles which comprises establishing a monomer system of at least one ethylenically unsaturated monomer with acid functionality, polymerising said system in the form of an aqueous emulsion to form core particles, establishing an aqueous dispersion of said core particles and a nonionic monoethylenically aromatic substituted monomer or a mixture of monomers containing more than 25 mole per cent of said nonionic monomer and said nonionic monomer or mixture of monomers being free of polymerisable acid groups and effecting polymerisation of said nonionic monomer or monomer mixture to deposit on said core particles a hard sheath free of acid groups, mixing said core/sheath particles so formed with a non-volatile fixed or permanent base in the absence of organic solvent to swell said cores to generate therein one or more voids.

4,920,161

HIGH STRENGTH EPOXY TOOLING COMPOSITIONS

Chen-Shih Wang, Troy; Richard P. Atkins, Utica; Elio Eusebi, and Thomas J. Dearlove, both of Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 24, 1988, Ser. No. 243,888
Int. Cl.[5] C08L 63/02; C08K 7/00
U.S. Cl. 523—220 5 Claims

1. A high strength, low shrinkage, room temperature curable epoxy tooling composition for use in cast-to-size forming tools for metal sheets comprising a bisphenol A epoxy, a polyoxypropylene amine catalyst, and a filler system containing no less than three different sized particulate fillers of which the average size of the smaller filler is about six to ten times smaller than the average size of the next size larger filler, said composition being fully curable into a rigid article having a tensile strength of at least 40 MPa and a compressive strength of at least 100 MPa.

4,920,162

ELECTROCOATING COMPOSITION OF A POLYAMINE SELF-CONDENSED EPOXY ADDUCT AND COATINGS PRODUCED THEREBY

Peter D. Clark, 25888 Rutledge Crossing, Farmington Hills, Mich. 48331; John A. Gilbert, 32855 Bellvine Trail, Beverly Hills, Mich. 48010; Gunther Ott, Van-Holte-Strasse 101 a, 4400 Munster, Fed. Rep. of Germany; Dieter Rühl, Hittorfstrasse 57, 4400 Munster, Fed. Rep. of Germany, and David J. Santure, Hummelbrink 13, 4400 Munster, Fed. Rep. of Germany

Filed Dec. 22, 1988, Ser. No. 288,327
Int. Cl.[5] C08L 63/00
U.S. Cl. 523—400 26 Claims

1. A coating composition comprising:
a principal resin comprising a self-addition epoxide resin-polyamine adduct with pendant alkylphenoxy groups;
a cross-linker comprising a blocked polyisocyanate compound;
a grind resin comprising the reaction product of an aromatic diepoxide, a bis (aromatic alcohol), a polyglycolamine, a diamine and an alkaryl monoepoxide;
a plasticizer; and
pigments selected from a group consisting of inorganic, organometallic and organic compounds.

4,920,163

IONIZABLE PAINTS FOR USE ESPECIALLY AS ANTI-LIGHTNING PAINTS

Jean-Claude Guillaumon, Ayguesvives, and Louis J. C. Blet, Corronsac, both of France, assignors to Centre Nationale d'Etudes Spatiales, France

Filed Jul. 22, 1988, Ser. No. 222,750
Claims priority, application France, Jul. 24, 1987, 87 10536
Int. Cl.[5] C08K 3/24
U.S. Cl. 523—440 18 Claims

1. An ionizable paint comprising a film-forming binder and an ionizable pigment comprising at least one of an alkali metal salt and an alkaline earth metal salt of a mono- or polyfunctional organic acid, said salt having a first ionization potential between 3.89 and 6.2 volts and said ionizable pigment comprising 20 to 100% by weight of total pigment in said paint.

4,920,164

EPOXY RESIN COMPOSITION

Yukio Sasaki, Roslyn, N.Y.; Takayuki Watanabe, Matsudo, Japan; Hiroshi Takamiya, Kamisu, Japan; Kazuo Watanabe, Osaka, Japan, and Yoko Yamazaki, Nagaeyama, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jul. 20, 1988, Ser. No. 221,914
Claims priority, application Japan, Jul. 20, 1987, 62-179184
Int. Cl.[5] C08L 63/00
U.S. Cl. 523—466 8 Claims

1. An epoxy resin composition consisting essentially of
(A) an epoxy resin,
(B) a curing agent,
(C) 0.01 to 10 parts by weight of a curing promoter per 100 parts by weight of the epoxy resin (A),
(D) 1 to 100 parts by weight of a polyphenylene ether resin per 100 parts by weight of the epoxy resin (A) and the curing agent (B) combined, said polyphenylene ether resin being a homopolymer or copolymer composed essentially of at least one kind of recurring units of the formula

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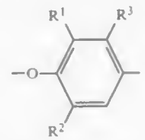


in which R^1, R^2 and R^3 are identical or different and each represents hydrogen or alkyl having 1 to 3 carbon atoms, provided that R^1 and R^2 are not hydrogen at the same time, and

(E) 50 to 1,000 parts by weight of a silica powder per 100 parts by weight of the epoxy resin (A), the curing agent (B) and the polyphenylene ether resin (D) combined, said filler being at least one silica selected from the group consisting of crystalline silica and amorphous silica.

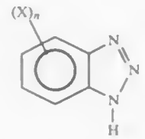
4,920,165

SCORCH RETARDER FOR HALOGENATED ELASTOMERS

Wolfgang Warrach, Cannonsburg, and Mark S. Reed, Zelienople, both of Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Jul. 7, 1987, Ser. No. 71,123
Int. Cl.[5] C08K *5/34*
U.S. Cl. 524—91 **11 Claims**

1. A vulcanizable composition comprising a halogenated butyl rubber compound and a sufficient amount of triazole to retard the scorch of said composition, said triazole conforming to



wherein

X is a C_1-C_6 alkyl and

n is 0 to 4.

4,920,166

FLAME-RESISTANT, ANTISTATIC POLYCARBONATE MOLDING COMPOSITIONS

Hans-Josef Buysch; Norbert Schön, both of Krefeld, Fed. Rep. of Germany; Hans-Jürgen Kress, Pittsburgh, Pa.; Herbert Eichenauer, Dormagen, and Josef Buekers, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 175,343, Mar. 31, 1988, abandoned. This application May 8, 1989, Ser. No. 348,397
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1987, 3713164; Apr. 17, 1987, 3713157; Aug. 15, 1987, 3727251
Int. Cl.[5] C08K *5/53, 5/52*
U.S. Cl. 524—141 **10 Claims**

1. Thermoplastic molding composition containing

A. 20 to 90 parts by weight of a thermoplastic aromatic polycarbonate,

B. 0 to 50 parts by weight of a graft polymer of

B.1. 5 to 90 parts by weight of a mixture of

B.1.1. 50 to 95% by weight styrene, α-methyl styrene, nucleus-substituted styrene, methyl methacrylate or mixtures thereof and

B.1.2 50 to 5% by weight (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleic imide or mixtures thereof, on

B.2 95 to 10 parts by weight of a rubber having a glass transition temperature T_G of ≦10° C.,

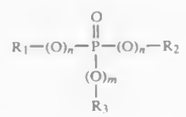
C. 5 to 70 parts by weight of a thermoplastic copolymer

C.1. 50 to 95% by weight styrene, α-methyl styrene, nucleus-substituted sytrene, methyl methacrylate or mixtures thereof and

C.2. 50 to 5% by weight (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleic imide or mixtures thereof,

D. 0 to 15 parts by weight of a low molecular weight or high molecular weight bromine compound, based on 100 parts by weight of A.+B+C. and D. selected from the group consisting of decabromodiphenylether, octabromodiphenyl, octabromodiphenylether, tribromotetrachlorotoluene, oligocarbonates based on tetrabromobisphenol-A, high molecular weight polycarbonates based on tetra bromobisphenol-A and nucleus brominated polyphenylene oxides, the bromine content resulting from components A.+D. being between 3 and 10% by weight, based on the total weight of components A.+D.,

E. 1 to 20 parts by weight, based on 100 parts by weight A.+C. and, optionally, B. and/or D., of a phosphorus compound corresponding to the following formula



in which R_1, R_2 and R_3 independently of one another are an optionally halogenated C_1–C_8 alkyl or an optionally halogenated C_6–C_{20} aryl and n and m independently of one another have the value 0 or 1,

F. 0.05 to 1.0 part by weight, based on 100 parts by weight A.+C. and, optionally, B. and/or D., of a tetrafluoroethylene polymer having average particle sizes or 0.05 to 1000 μm and a density of 1.2 to 2.3 g/cm^3 and

G. 0.2 to 5.0 parts by weight, based on 100 parts by weight of the sum of A. to G. of a modified polyalkylene ether which comprises reacting a starting polyalkylene glycol ether with an average molecular weight of 500 to 15,000 with a peroxide or azo radical former in a quantity of 5 to 0.05% by weight based on the quantity of starting polyalkylene glycol ether by stirring the radical former with the starting polyalkylene glycol ether at temperature of 50° to 150° C., until a medium to high viscosity substantially clear liquid or colorless suspension is obtained, wherein the starting polyalkylene glycol is the reaction product of ethylene glycol, 1,2-propylene glycol, trimethylol-propane, glycerol, pentaerythritol, sorbitol or mannitol and alkylene oxide comprising ethylene oxide or propylene oxide.

4,920,167

ANTISTATIC POLYURETHANE-UREA DISPERSIONS

Sven H. Ruetman, Walnut Creek; Joginder N. Anand, Clayton, and G. Robert Collins, Walnut Creek, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 10, 1988, Ser. No. 269,506
Int. Cl.[5] C08G *18/06*
U.S. Cl. 524—155 **17 Claims**

1. A dispersion of a polyurethane-urea polymer in a continuous aqueous phase, said dispersion containing about 0.1 to about 5 parts by weight of an alkali metal or alkaline earth metal salt of a thiocyanate ion, fluorinated alkyl sulfonate ion or tetraorganoboron ion per 100 parts by weight of polyurethane-urea polymer.

4,920,168

STABILIZED SILOXANE-CONTAINING MELT-EXTRUDABLE THERMOPLASTIC COMPOSITIONS

Ronald S. Nohr, Roswell, and J. Gavin MacDonald, Decatur, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 14, 1983, Ser. No. 181,352
Int. Cl.[5] C08K *5/54*
U.S. Cl. 524—188 **30 Claims**

1. A stabilized surface-segregatable, melt-extrudable thermoplastic composition which comprises:

(A) at least one thermoplastic polymer;

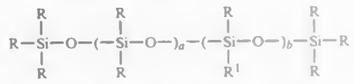
(B) at least one siloxane-containing primary additive having at least two moieties, A and B, in which:

(1) said primary additive is compatible with said polymer at melt extrusion temperatures but is incompatible at temperatures below melt extrusion temperatures, but each of moiety A and moiety B, if present as separate compounds, would be incompatible with said polymer at melt extrusion temperatures and at temperatures below melt extrusion temperatures;

(2) moiety B has at least one functional group which is a poly(oxyalkylene) moiety; and

(3) the molecular weight of said primary additive is in the range of from about 400 to about 15,000;

with the proviso that said primary additive cannot be a compound having the general formula,



in which each R independently is an alkyl group; R^1 is a monovalent inorganic group containing at least one ethyleneoxy group, vicinal epoxy group, or amino group; and a and b, which can be the same or different, each have a value of at least 1; and

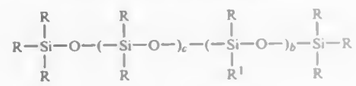
(C) at least one siloxane-containing stabilizing additive having at least two moieties, A′ and B′, in which:

(1) said stabilizing additive is compatible with said polymer at melt extrusion temperatures but is incompatible at temperatures below melt extrusion temperatures, but each of moiety A′ and moiety B′, if present as separate molecular compounds, would be incompatible with said polymer at melt extrusion temperatures and at temperatures below melt extrusion temperatures;

(2) moiety B′ has at least one functional group which is an aliphatic or cycloaliphatic amino group; and

(3) the molecular weight of said stabilizing additive is in the range of from about 400 to about 15,000;

with the proviso that said stabilizing additive cannot be a compound having the general formula,



in which each R independently is an alkyl group; R^1 is a monovalent organic group containing at least one amino group; and a and b, which can be the same or different, each have a value of at least 1;

in which thermoplastic composition:

(1) said primary additive is present at a level in the range of from about 0.1 to about 50 percent by weight, based on the weight of said polymer; and

(2) said stabilizing additive is present at a level in the range of from about 0.1 to about 5 percent by weight, based on the weight of said primary additive.

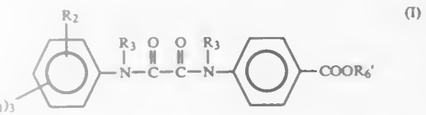
4,920,169

OXALIC ACID DI(PHENYLAMIDES) AND USE THEREOF AS UV ABSORBERS

Lajos Avar, Biel-Benken, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 126,647, Dec. 1, 1987, abandoned. This application May 26, 1989, Ser. No. 357,572
Claims priority, application United Kingdom, Dec. 2, 1986, 862870; Jan. 21, 1987, 8701273
Int. Cl.[5] C08K *5/20*
U.S. Cl. 524—219 **20 Claims**

1. A compound of formula I



(I)

in which

each R_1, independently, is selected from hydrogen, $C_{1\text{-}12}$alkyl, $C_{1\text{-}12}$alkoxy and halogen;

R_2 is $C_{1\text{-}4}$alkoxy;

R_3 is hydrogen or methyl; and

R_6' is unsubstituted $C_{6\text{-}18}$alkyl, uninterrupted or interrupted by one —O— group or $C_{1\text{-}18}$alkyl mono-substituted by OH and uninterrupted or interrupted by 1 or 2 —O— groups.

19. A polymeric material to which a light-stabilizing amount of a compound of formula I defined in claim 1, has been added.

4,920,170

PROCESS FOR PRODUCING FLUORINE-CONTAINING ELASTIC COPOLYMER

Masatoshi Abe; Shin Okamoto, and Akihiro Naraki, all of Kitaibaraki, Japan, assignors to Nippon Mektron Limited, Tokyo, Japan

Filed Jun. 28, 1988, Ser. No. 212,587
Claims priority, application Japan, Jul. 17, 1987, 62-177089
Int. Cl.[5] C08F *16/24*
U.S. Cl. 526—247 **9 Claims**

1. A process for producing a fluorine-containing elastic copolymer comprising (a) 30 to 80% by mole of tetrafluoroethylene (b) 26 to 60% by mole of perfluoro (lower alkyl vinyl ether) and (c) 3 to 50% by mole of a perfluoroether compound represented by the following general formula:

$$CF_2{=}CFOCF_2CFXORf$$

wherein X is a fluorine atom or a trifluoromethyl group and Rf is a perfluoroalkyl group, which comprises copolymerizing the (a) component, the (b) component and the (c) component in the presence of a radical polymerization initiator.

4,920,171

WATER-RESISTANT, WATER-FLUSHABLE PAPER COMPOSITIONS

Alexander E. Hutton, Jr., Peterborough; Richard E. Burke, Amherst, and Stanley P. Wheeler, Jr., Peterborough, all of N.H., assignors to Monadnock Paper Mills, Inc., Bennington, N.H.

Filed Feb. 24, 1987, Ser. No. 17,910
Int. Cl.[5] C08K *3/36*
U.S. Cl. 524—446 **3 Claims**

1. A coating composition for application to a flushable cellulosic based waterleaf sheet and for imparting transitory water repellency to at least one surface of said flushable cellulosic waterleaf sheet when applied on said waterleaf sheet at a coverage of from about three pounds to about 10 pounds of coating for every 3,000 square feet of waterleaf sheet, said coating composition consisting essentially of between 20% by weight

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to about 70% by weight of relatively large particle size delaminated clay, with the balance being a polyethylene based resin composition produced by the drying of a colloidal polyethylene in water composition together with said clay; whereby the resultant surface coating provides surface water repellency without impairing the ability of the waterleaf sheet to be disposed of by flushing.

4,920,172

HYDROPHILIC POLYURETHANE EMULSIONS AND MATERIALS PRODUCED THEREFROM

Sami Daoud, Flemington, N.J., assignor to Tyndale Plains-Hunter Ltd., Princeton, N.J.

Filed Jan. 30, 1989, Ser. No. 303,812

Int. Cl.[5] C08L *75/08*

U.S. Cl. 524—502 31 Claims

1. An aqueous emulsion of a hydrophilic polyurethane produced by the steps of:

a. dissolving a water insoluble hydrophilic polyurethane in a water immiscible, organic solvent having a boiling point below 100° C.;

b. forming a dispersion of the solution from a. in water by adding the solution to water in the presence of a surfactant while maintaining sufficient agitation to effect dispersal of the solution; and

c. evaporating the organic solvent component of the dispersion, thereby forming a solvent-free emulsion of the polyurethane in the aqueous medium.

4,920,173

PUR POWDER PAINTS FOR MATT COATINGS

Rainer Gras, Bochum, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 15, 1988, Ser. No. 244,348

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1987, 3739479

Int. Cl.[5] C08L *75/02*

U.S. Cl. 524—590 23 Claims

1. A PUR powder paint for matt coatings, comprising:

(i) a partially or completely blocked polyisocyanate-urea adduct obtained from the reaction of a partially blocked polyisocyanate obtained by adding one mole of a blocking agent to from 5 to 20 moles of a polyisocyanate and then reducing the amount of said polyisocyanate to less than 6.5 weight % of said partially blocked polyisocyanate by thin film evaporation, with a polyamine wherein said polyisocyanate-urea adduct contains a total amount of NCO groups of from 8 to 15 weight % and an amount of free NCO groups up to 4 weight %; and

(ii) a hydroxyl group containing polymer with more than two hydroxyl groups per molecule.

4,920,174

IMPACT-RESISTANT POLYESTER MOLDING COMPOUNDS

Wilfried Bartz, Marl, Fed. Rep. of Germany, assignor to Huels Aktiengesselichaft, Marl, Fed. Rep. of Germany

Filed Jun. 17, 1987, Ser. No. 63,057

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1986, 3620432

Int. Cl.[5] C08L *67/02*

U.S. Cl. 525—66 16 Claims

1. An impact-resistant polyester molding composition, comprising an intimate mixture of

A. 60 to 98% by weight of a polyester having a viscosity number greater than about 80 cm^3/g,

B. from about 2 to 40% by weight of a polyalkenamer having a viscosity number in the range of from about 50 to about 250 cm^3/g, and

C. 0.1 to 5% by weight of an isocyanate having an average of from 1.8 to 4 NCO groups per mole,

said mixture having been treated with from about 0.05 to about 5% by weight, relative to the sum of components A and B, of an organic free-radical former at a temperature sufficient to cause said free-radical former to decompose into free radicals.

4,920,175

MICROPARTICLES HAVING CROSSLINKING REACTION PROMOTOR FUNCTION AND METHOD OF USE

Kazunori Kanda, Yao; Shinichi Ishikura, Tsuzuki; Keizou Ishii, Ashiya, and Akio Kashihara, Hirakata, all of Japan, assignors to Nippoo Paint Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 21,000, Mar. 2, 1987, Pat. No. 4,777,213, which is a continuation of Ser. No. 745,983, Jun. 18, 1985, abandoned. This application Jul. 28, 1988, Ser. No. 225,119

Claims priority, application Japan, Jun. 18, 1984, 59-126225

Int. Cl.[5] C08L *63/00*

U.S. Cl. 525—110 6 Claims

1. A coating system comprising a film-forming polymer capable of curing through a self-crosslinking reaction or a crosslinking reaction with a separate crosslinker and a catalytic amount of an agent for promoting the crosslinking reaction, wherein said agent is bound to polymer microparticles having a diameter of 0.01 to 6 microns present in said system, said polymer microparticles being prepared by polymerizing a mixture of ethylenically unsaturated monomers, said agent being an $—SO_3H$ or $—PO_4H_2$ group bearing proton donor having a pKa less than 3.0, said coating system containing an aminoplast resin, or a combination of an aminoplast resin with a hydroxy group, carboxyl group or mixture thereof containing alkyd or acrylic resin or a combination of an epoxy resin with a hardener having amino, carboxyl or hydroxyl groups.

4,920,176

NITRILE EMULSION POLYMERS HAVING IMPROVED ADHESION PROPERTIES

August H. Jorgensen, Jr., Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 5, 1988, Ser. No. 279,680

Int. Cl.[5] C08L *91/02*

U.S. Cl. 525—185 5 Claims

1. A dried nitrile rubber composition, comprising:

a nitrile rubber composition, said nitrile rubber composition containing a reacted anionic emulsifying aid dispersed therein, said anionic emulsifying aid having been reacted with a cationic polymeric coagulant, said cationic polymeric coagulant being a quaternized poly (alkylene polyamine), a quaternized poly(hydroxy-alkylene polyamine), a quaternized poly(carabonyl-alkylene polyamine, or a quaternized polymer made from epichlorohydrin and a dialkylamine having from 1 to 5 carbon atoms, and wherein the amount of said cationic polymeric coagulant is from about 0.75 weight equivalents to about 1.5 weight equivalents for every weight equivalent of said emulsifying aid.

4,920,177

ACCELERATED CURE OF THERMOPLASTIC COMPOSITIONS

Daniel E. George, Chadds Ford, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 20, 1989, Ser. No. 368,690

Int. Cl.[5] C08L *23/26, 23/04, 23/10*; C08J *3/24*

U.S. Cl. 525—195 13 Claims

1. A process for accelerating the cure rate of a thermoplastic composition comprising blending 5–95 parts by weight of a crystalline polyolefin resin of a substantially saturated homopolymer or copolymer of a C_2–C_8 alpha monoolefin and 5–95 parts by weight of a crosslinkable ethylene-containing terpolymer comprising ethylene, an alkyl acrylate or alkyl methacrylate wherein the alkyl group contains 1–6 carbon atoms or a vinyl ester of a monocarboxylic acid having 2–6 carbon atoms,

and glycidyl acrylate or glycidyl methacrylate, and mixing and shearing the composition while crosslinking the ethylene-containing terpolymer with a crosslinking agent that is a combination of (a) from about 1.5–9 parts by weight per 100 parts ethylene-containing terpolymer of an organic aliphatic or aromatic polycarboxylic acid or anhydride thereof containing 3–18 carbon atoms and (b) from about 0.3–8 parts by weight per 100 parts ethylene-containing terpolymer of a divalent tin halide salt or a stannous acylate having the formula

where R is an aliphatic hydrocarbyl radical having from 1–18 carbon atoms.

4,920,178

SEEDED EMULSION POLYMERIZATION OF α-METHYLSTYRENE AND ACRYLONITRILE

Karl Zabrocki, Buettgen; Christian Lindner, Cologne; Otto Koch, Cologne, and Hans-Eberhard Braese, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 21, 1989, Ser. No. 312,725

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1988, 3807233

Int. Cl.[5] C08F *2/26*

U.S. Cl. 525—262 4 Claims

1. A process for the production of copolymer which comprises the polymerisation of from 30 to 32 parts by weight, of acrylonitrile and from 68 to 70 parts, by weight, of α-methylstyrene, the monomers being introduced into a seed latex comprising an (α-methyl)-styrene/acrylonitrile copolymer and the polymerization being effected in the presence of a radical water-soluble initiator and a carboxyl group-containing emulsifier at a temperature of from 75° to 82° C., such that the molar ratio of emulsifier:initiator is from 4:1 to 6:1.

4,920,179

SULFONOMALEATION OF ORGANIC MOLECULES AND POLYMERS

Warren A. Thaler, Flemington; Stanley J. Brois, Westfield, both of N.J., and Henry K. Hall, Tucson, Ariz., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

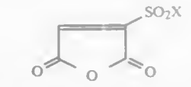
Continuation-in-part of Ser. No. 911,761, Sep. 26, 1986, Pat. No. 4,737,303, which is a continuation-in-part of Ser. No. 809,030, Dec. 16, 1985, Pat. No. 4,652,600, which is a continuation-in-part of Ser. No. 778,269, Sep. 20, 1985, Pat. No. 4,587,304. This application Mar. 28, 1988, Ser. No. 174,380

The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.

Int. Cl.[5] C08F *267/04*

U.S. Cl. 525—285 1 Claim

1. A sulfone adduct which comprises the reaction product of:



and an unsaturated hydrocarbon polymer wherein X is an alkyl group selected from the group consisting of C_nH_{2n+1}, wherein n=1 to 18; X is an aryl group consisting of C_mH_{m-1} wherein m=6 and $C_mH_{m-2}Z$ wherein m=6 and Z is selected from the group consisting of OR', R", COOR"', NO_2, Cl, Br, F and I where R', R" and R"' having about 1 to about 18 carbon atoms; wherein said unsaturated hydrocarbon polymer is selected from the group consisting of ethylene propylene terpolymers, ethylene diene copolymers, propylene diene copolymers, polyisoprene, Butyl rubber, polybutadiene and styrenebutadiene, and styrene-isoprene random and block copolymers, polypropylenes and polyisobutylenes.

4,920,180

HIGHLY WATER-ABSORPTIVE OCULAR LENS MATERIAL

Nobuyuki Toyoshima; Takanori Shibata, and Atsushi Hirashima, all of Nagoya, Japan, assignors to Menicon Co., Ltd., Nagoya, Japan

Filed Mar. 8, 1989, Ser. No. 320,598

Claims priority, application Japan, Mar. 9, 1988, 62-55708; Dec. 10, 1988, 62-312719

Int. Cl.[5] C08F *216/12, 16/12*

U.S. Cl. 525—328.9 12 Claims

1. A highly water absorptive ocular lens material obtained by saponification for hydrophilic treatment of a copolymer composed essentially of:

(A) from 2 to 30 parts by weight of a (meth)acrylate polymer having at least one polymerizable group per molecule on an average obtained by copolymerizing (a) an alkyl (meth-)acrylate monomer and (b) a monomer having at least two polymerizable groups per molecule, as the main components;

(B) from 70 to 98% by weight of a fatty acid vinyl ester; and

(C) from 0.02 to 3.0 parts by weight of a cross linking agent which is a compound of the formula:

(II)

wherein each of R_6 and R_7 which may be the same or different, is $—CH=CH_2$ or $—CH_2—CH=CH_2$, and each of a and b is an integer of from 0 to 5, provided that when a is 0, b is 0; or the formula:

(III)

wherein R_6 and R_7 are as defined above, R_8 is $—CH=CH_2$ or $—CH_2—CH=CH_2$, each of R_9 and R_{10} which may be the same or different, is a hydrogen atom, $—CH_3$, $(CH_2)_g—OH$ wherein g is an integer of from 1 to 5, $(CH_2CH_2O)_h R_{11}$ wherein R_{11} is a hydrogen atom or $—CH_3$, and h is an integer of from 0 to 12, or $—COOR_{11}$ wherein R_{11} is as defined above, c is an integer of from 0 to 3, is an integer of from 0 to 500, e is an integer of from 1 to 10,000, and f is an integer of from 0 to 3,

provided that the total amount of polymer (A) and monomer (B) is 100 parts by weight.

4,920,181

POLYMERIC EMULSIFIERS BASED ON AMINO TELECHELATIC VINYL OLIGOMERS II

Adolf Schmidt, Cologne; Udo Hendricks, Odenthal; Bruno Bömer, Bergisch Gladbach; Karl-Heinz Ott, Leverkusen; Herbert Eichenauer, Dormagen, and Alfred Pischtschan, Kuerten, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 16, 1987, Ser. No. 133,551

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1986, 3643818

Int. Cl.[5] C08F *8/34*

U.S. Cl. 525—327.5 8 Claims

1. Sulphosuccinamide acids and their salts corresponding to the formula

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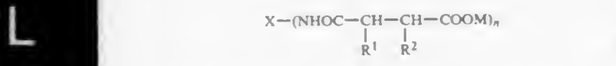


wherein

X denotes the residue of a hydrophobic vinyloligomer having an average molecular weight $\overline{M}_n$ of from 200–5,000, one of R^1 and R^2 is hydrogen and the other is $-SO_3M$, n represents a number with a value of from 1.4–3.0, and M denotes hydrogen, an alkali metal, ammonium, C_1–C_4-alkylammonium, or C_2–C_3-hydroxy alkyl-ammonium.

4,920,182

EPOXY RESIN COMPOSITIONS CONTAINING POLYESTER FLEXIBILIZER AND METALLOCENE COMPLEX INITIATOR

Aloysius H. Manser, Allschwil, Switzerland; Dieter Strasilla, Weil am Rhein, Fed. Rep. of Germany, and Rolf Mülhaupt, Marly, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 5, 1988, Ser. No. 279,884

Claims priority, application Switzerland, Dec. 18, 1987, 4957/87

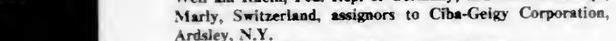
Int. Cl.[5] C08L *63/02*

U.S. Cl. 525—438 **8 Claims**

1. A composition containing

(A) An epoxy resin having on average at least two 1,2-epoxy groups per molecule or a mixture of these epoxy resins,

(B) a compound of formula I or a mixture of these compounds



(I)

in which a and b independently of one another are 1 or 2, R^1 is a pi-arene, R^2 is a pi-arene or a cyclopentadienyl anion, X^- is $[LQm]^-$ or an anion of a partially fluorinated or perfluorinated aliphatic or aromatic sulfonic acid, L is B, P, As or Sb, Q is fluorine or fluorine in combination with hydroxyl groups, and m corresponds to the valence of L increased by one, and

(C) a flexible polyester which is terminated by, on average, at least two carboxyl groups and which is derived from an aliphatic or cycloaliphatic polyol or a mixture of such polyols and from an aliphatic, cycloaliphatic or aromatic polycarboxylic acid or a mixture of such polycarboxylic acids.

4,920,183

METHOD FOR MAKING SILICONE-POLY(ARYLCARBONATE) BLOCK COPOLYMERS

Thomas L. Evans, Clifton Park, and John C. Carpenter, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 158,411, Feb. 22, 1988. This application Feb. 8, 1989, Ser. No. 307,707

Int. Cl.[5] C08F *283/02*

U.S. Cl. 525—464 **9 Claims**

1. A method for making silicone-poly(arylcarbonate) block copolymers which comprises

(1) polymerizing a cyclic aryl carbonate in the presence of a phenol or bisphenol-A- to provide a hydroxylaryl terminated polyarylcarbonate oligomer having an average of about 2 to 1000 chemically combined arylcarbonate units,

(2) intercondensing the hydroxylaryl terminated polycarbonate oligomer and chlorine terminated polydiorganosiloxane having an average of about 2 to 1000 chemically combined units in the presence of an organic solvent and an acid acceptor, and

(3) recovering silicone-poly(arylcarbonate) block copolymer from the mixture of (2).

4,920,184

HYDROPHILIC SILICONE RUBBER ARTICLE AND PROCESS FOR ITS PREPARATION

Horst Schäfer, Aschaffenburg; Gerhard Kossmehl, Berlin, and Walter Neumann, Königsbronn, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 133,236, Dec. 16, 1987, abandoned, which is a continuation of Ser. No. 863,139, May 14, 1986, abandoned. This application Aug. 5, 1988, Ser. No. 228,867

Claims priority, application Fed. Rep. of Germany, May 15, 1985, 3517615

Int. Cl.[5] C08L *43/04*

U.S. Cl. 525—477 **12 Claims**

1. An improved process for hydrophilizing the surface of a molded silicone rubber article in which the silicone rubber at its surface is reacted in a catalyzed equilibration reaction with an organosiloxane, wherein the improvement comprises

using as the organosiloxane a preformed organosiloxane containing hydroxyalkyl or protected hydroxyalkyl moieties, synthesized by reacting a siloxane containing a Si—H group with an allyloxy compound in the presence of a catalyst.

4,920,185

COLOR DEVELOPER FOR PRESSURE-SENSITIVE RECORDING PAPER AND PRODUCTION THEREOF USING A PHENOL-XYLENE-FORMALDEHYDE RESIN

Yukio Tokunaga, and Yukio Saeki, both of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Jan. 27, 1989, Ser. No. 302,242

Claims priority, application Japan, Jan. 29, 1988, 63-16841

Int. Cl.[5] C08G *8/28, 8/32*

U.S. Cl. 525—506 **9 Claims**

1. A color developer for pressure sensitive recording paper comprising a polyvalent metal-bound carboxyl-modified p-substituted phenol-xylene-formaldehyde co-condensate containing a carboxyl group, wherein the co-condensate is formed by condensing p-substituted phenol and a xylene-formaldehyde resin in the ratio 10–100 parts p-substituted phenol to 100 parts xylene-formaldehyde resin, adding a carboxyl group to said co-condensate and bonding with the polyvalent metal.

4,920,186

COLOR DEVELOPER FOR PRESSURE SENSITIVE RECORDING PAPER AND PRODUCTION THEREOF USING PHENOL-MESITYLENE-FORMALDEHYDE RESIN

Yukio Tokunaga, and Yukio Saeki, both of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Jan. 12, 1989, Ser. No. 296,091

Int. Cl.[5] C08G *8/28, 8/32*

U.S. Cl. 525—506 **7 Claims**

1. A color developer for pressure sensitive recording paper comprising a polyvalent metal-bound carboxyl-modified p-alkylphenol-mesitylene-formaldehyde co-condensate containing a carboxyl group, wherein the co-condensate is formed by condensing p-alkylphenol and a mesitylene-formaldehyde resin in the ratio 10–100 parts p-alkylphenol to 100 parts mesitylene-formaldehyde resin and wherein the p-alkylphenol contains an alkyl group of 1 to 12 carbon atoms.

4,920,187

PROCESS FOR PREPARING PARTICLES HAVING MONODISPERSE PARTICLE SIZE

Akio Kashihara, Hirakata; Chikayuki Otsuka, Kadoma, and Katsukiyo Ishikawa, Kuze, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jan. 4, 1988, Ser. No. 140,663

Claims priority, application Japan, Jan. 12, 1987, 62-5283; Jan. 12, 1987, 62-5284; Oct. 30, 1987, 62-277067

Int. Cl.[5] C08F *2/00*

U.S. Cl. 526—193 **19 Claims**

1. A process for preparing polymer particles having a narrow particle size distribution range comprising:

adding a dispersion stabilizer, a polymerizable monomer and a polymerization initiator to an organic solvent to conduct polymerization such as to produce polymer particles dispersed in the organic solvent, wherein said organic solvent has a solubility parameter (SP value) higher than that of the resultant polymer by at least 1.0 and wherein said dispersion stabilizer is soluble in said organic solvent and has a free radical reactive group at a concentration within the range of 10^{-3} to 1 mmol/g based on the dispersant solid contents and which dispersion stabilizer functions by producing a stable dispersion of the polymer in said organic solvent said free radical reactive groups including a polymerizable double bond or a thiol group, which free radical groups react with said polymerizable monomer such as to chemically bond the dispersion stabilizer onto the polymer particles thus-produced; and

removing said organic solvent to produce the polymer particles.

4,920,188

CURABLE COMPOSITIONS

Takeshi Sakashita, Iwakuni; Narimichi Honda, Yamaguchi, and Masami Arata, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP88/00661, § 371 Date Mar. 3, 1989, § 102(e) Date Mar. 3, 1989, PCT Pub. No. WO89/00170, PCT Pub. Date Jan. 12, 1989

PCT Filed Jul. 1, 1988, Ser. No. 334,105

Claims priority, application Japan, Jul. 3, 1987, 62-166736

Int. Cl.[5] C08F *4/52*

U.S. Cl. 526—196 **2 Claims**

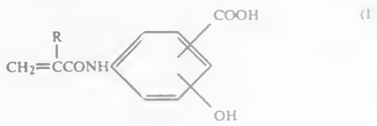
1. A curable composition comprising,

(A) a monofunctional (meth)acrylate monomer,

(B) a polyfunctional (meth)acrylate monomer,

(C) a (meth)acrylate monomer containing an acidic group and at least one (meth)acryloyloxyl group in its molecule,

(D) a monofunctional (meth)acrylamide monomer of the general formula (I):



(I)

wherein R is H or CH_3, and

(E) a trialkylboron and/or a partial oxide thereof.

4,920,189

PROCESS FOR THE PRODUCTION OF TOLUENE-SOLUBLE, SULPHUR-MODIFIED CHLOROPRENE POLYMERS

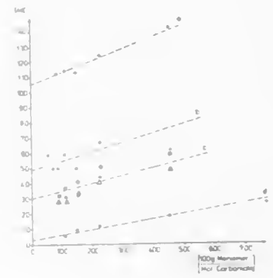
Werner Obrecht, Moers; Peter Wendling; Wilhelm Göbel, both of Leverkusen, and Eberhard Müller, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 831,866, Feb. 24, 1986, abandoned. This application Aug. 25, 1987, Ser. No. 89,934

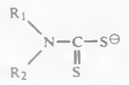
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1985, 3507825

Int. Cl.[5] C08F *2/26*

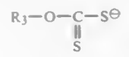
U.S. Cl. 526—204 **7 Claims**



1. A process for the production of toluene-soluble, sulphur-modified polychloroprene by emulsion polymerization of chloroprene, 0.05 to 1% by weight sulphur and up to 20% by weight of further monomers which are copolymerizable with chloroprene and sulphur selected from the group consisting of 2,3-dichlorobutadiene, 1-chlorobutadiene, butadiene, isoprene, acrylic acid, methacrylic acid, acrylonitrile and methacylonitrile, using a peroxy activator and subsequent working-up by stabilizing, stopping, degassing and isolating without separate peptization, characterised in that polymerization is carried out in the presence of dithiocarbamates or xanthogenates and the activator is metered in continuously or batch-wise during the course of polymerization, wherein said dithiocarbamates have an anion of the formula



and the xanthogenates have an anion of the formula



wherein R_1, R_2 and R_3 are each independent of one another unsubstituted or substituted alkyl. cycloalkyl or aryl, or R_1 and R_2 together form a ring structure with the nitrogen atom to which they are bonded.

4,920,190

FLUORINATED CARBAMATE POLYMERS AS HYDROPHOBIC AND OLEOPHOBIC AGENTS

Marie-Jose Lina, Tassin La Demi Lune, and Andre Dessaint, Clermont, both of France, assignors to Atochem, Puteaux, France

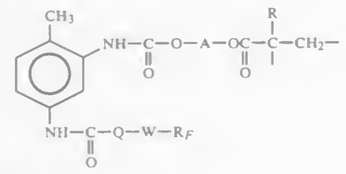
Division of Ser. No. 932,807, Nov. 19, 1986. This application Jun. 21, 1988, Ser. No. 209,388

Claims priority, application France, Dec. 3, 1985, 85 17882

Int. Cl.[5] C07C *155/02, 125/06;* C08F *12/30, 26/02*

U.S. Cl. 526—288 11 Claims

1. Fluorinated acrylic polymers comprising repeating units of the general formula:



(VIII)

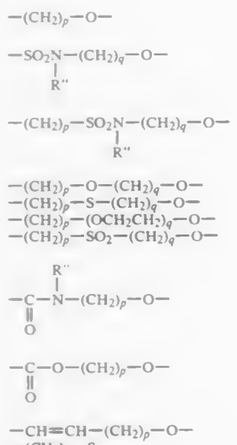
in which

R_F denotes a perfluoroalkyl radical having a straight or branched chain and containing from 2 to 20 carbon atoms,

R denotes hydrogen or a methyl radical,

A denotes a divalent linkage which has 2 to 9 carbon atoms and can contain one oxygen atoms or two uncontiguous oxygen atoms, and

—W—Q— is:



in which R" is hydrogen or a methyl radical and the symbols p and q, which may be identical or different, each denote an integer ranging from 1 to 20.

4,920,191

LIQUID CRYSTALLINE POLYESTER SILOXANES

Matthew E. Langer, Guilderland; Peter P. Policastro, Niskayuna, and Allan R. Sbultz, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 6, 1989, Ser. No. 319,028

Int. Cl.[5] G08G *77/04*

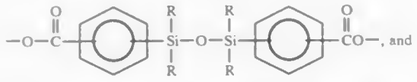
U.S. Cl. 528—26 5 Claims

1. Liquid crystalline polyester-siloxanes selected from the class consisting of

(1) a composition comprising

(A) 20 to 90 mole percent of hydroxybenzoic acid units,

(B) 5 to 50 mole percent of tetraorganodisiloxanebisbenzoic acid units of the formula



(C) 0 to 50 mole percent of terephthalic acid units, condensed with

(D) 5 to 50 mole percent of biphenol units and

(2) a composition comprising (A) and (B) condensed with a member selected from the class consisting of

(E) 5 to 50 mole percent of hydroquinone units, and

(F) 5 to 50 mole percent of diphenyletherbishydroxy units,

where the mole percents of the individual condensed units of the respective liquid crystalline polyester-siloxanes ABCD, ABD, ABE and ABF are based on the total moles of the condensed units in the respective liquid crystalline polyester-siloxanes of (1) and (2) and R is a member selected from the class consisting of the same or different $C_{(1-13)}$ monovalent hydrocarbon radicals and $C_{(1-13)}$ monovalent hydrocarbon radicals substituted with radicals inert during condensation.

4,920,192

POLYURETHANE QUASI PREPOLYMER FOR PROPPANT CONSOLIDATION

Robin Wiser-Halladay, McKinney, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 31, 1989, Ser. No. 304,325

Int. Cl.[5] C08G *18/75*

U.S. Cl. 528—48 11 Claims

1. A method for forming a quasi prepolymer containing polyurethane linkages comprising:

a. forming said quasi prepolymer by reacting in intimate admixture a diol and in stoichiometric excess methylene diphenylene diisocyanate, all in the presence of a diluent; and

b. allowing the reactants to stand in intimate admixture for a time sufficient to form oligmers containing polyurethane linkages.

4,920,193

MEMBRANES

Richard A. Hann; David R. Holmes, both of Frodsham, and John W. Smith, Liverpool, all of England, assignors to Imperial Chemical Industries PLC, London, United Kingdom

Division of Ser. No. 865,831, May 22, 1986, abandoned. This application Jul. 19, 1988, Ser. No. 221,434

Claims priority, application United Kingdom, May 23, 1985, 8513114

Int. Cl.[5] C08J *3/08;* C08L *81/06*

U.S. Cl. 528—171 8 Claims

1. A sulphonated polyarylethersulphone containing repeat units of the formula:

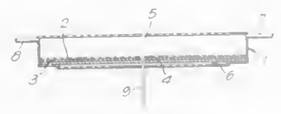
$$—Ph^1—O—Ph^3—O—Ph^1—SO_2—$$ (V)

together with repeat units of the formula:

$$—Ph^1—O—Ph^1—SO_2—$$ (III)

wherein

Ph^1 is a phenylene residue;



Ph^3 is a phenylene residue having one or two groups $—SO_3M^1$, wherein in some $—SO_3M^1$ groups M^1 is hydrogen and in other $—SO_3M^1$ groups M^1 is barium the proportion of the groups $—SO_3M^1$ in which M^1 is barium being at least 85% and not more than 91% of the total of the $—SO_3M^1$ groups.

4,920,194

BLOOD SUBSTITUTE

Wolfgang Feller, Ernstbergstrasse 30; Norbert Macht, Hessenwinkel 26, both of Melsungen, and Johannes G. Böttrich, Talstrassse 6, Kirtorf-Lehrbach, all of Fed. Rep. of Germany

Filed Oct. 19, 1987, Ser. No. 110,013

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, 3636590

Int. Cl.[5] C07K *15/22;* A61K *37/14*

U.S. Cl. 530—385 18 Claims

1. A stroma-free blood substitute consisting essentially of an aqueous medium containing the covalently linked adducts of sulfated glycosaminoglycan fragments having molecular weights from 1000 to 10,000 daltons with hemoglobin, the proportion of said fragments and of said hemoglobin being such that the oxygen binding property of said adducts is from 4.79 kPa to 9.33 kPa partial pressure of oxygen.

4,920,195

FLUORESCENT LANTHANIDE CHELATES

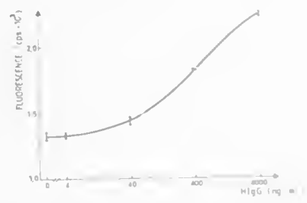
Jouko Kankare, Paljaspää 8E3, SF-206 10 Turku 61; Harri Takalo, Ursininkatu 13A4, SF-20100 Turku 10, and Paavo Pasanen, Menninkaisenkatu 10E37, SF-20640 Ravattula, all of Finland

Continuation-in-part of Ser. No. 863,047, May 14, 1986, abandooed. This application Jan. 25, 1988, Ser. No. 149,980

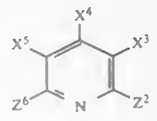
Claims priority, application Sweden, May 23, 1985, 8502573

Int. Cl.[5] C07F *5/00;* G01N *33/533;* C07D *213/38, 213/55*

U.S. Cl. 534—16 12 Claims



1. A fluorescing lanthanide chelate of a lanthanide cation and a compound having the structure:



wherein each of X^3, X^4 and X^5, that can be the same or different, denotes a substituted ethynyl group directly attached to the pyridine ring, a hydrogen, an alkyl group, an aryl group, a hydroxyl group, an alkoxyl group or an amino group, wherein at least one of X^3, X^4 and X^5 denotes the substituted ethynyl group, and each of Z^2 and Z^6, that can be the same or different, denotes a chelating group that together with the pyridine nitrogen chelates the lanthanide cation.

4,920,196

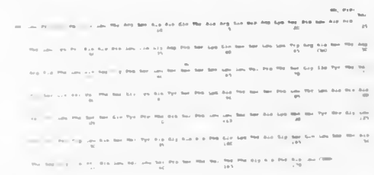
HUMAN LYMPHOTOXIN

Bharat B. Aggarwal, San Mateo, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 608,316, May 7, 1984, abandoned, which is a continuation-in-part of Ser. No. 403,671, Jul. 30, 1982, abandoned. This application Feb. 6, 1987, Ser. No. 11,448

Int. Cl.[5] C07G *7/00;* A61K *45/05;* C12N *5/00*

U.S. Cl. 530—351 28 Claims



1. A composition suitable for administration as an anti-tumor agent comprising a substantially homogeneous lymphotoxin having a molecular weight by SDS-PAGE of about 25,000 daltons and the amino acid sequence

NH_2—Leu Pro Gly Val Gly Leu Thr Pro Ser Ala Ala—
Gln Thr Ala Arg Gln His Pro Lys Met His Leu Ala—
His Ser Thr Leu Lys Pro Ala Ala His Leu Ile Gly—
Asp Pro Ser Lys Gln Asn Ser Leu Leu Trp Arg—
Ala Asn Thr Asp Arg Ala Phe Leu Gln Asp Gly—
Phe Ser Leu Ser Asn Asn Ser Leu Leu Val Pro—
Thr Ser Gly Ile Tyr Phe Val Tyr Ser Gln Val—
Val Phe Ser Gly Lys Ala Tyr Ser Pro Lys Ala—
Thr Ser Ser Pro Leu Tyr Leu Ala His Glu Val—
Gln Leu Phe Ser Ser Gln Tyr Pro Phe His Val—
Pro Leu Leu Ser Ser Gln Lys Met Val Tyr Pro—
Gly Leu Gln Glu Pro Trp Leu His Ser Met Tyr—
His Gly Ala Ala Phe Gln Leu Thr Gln Gly Asp—
Gln Leu Ser Thr His Thr Asp Gly Ile Pro His—
Leu Val Leu Ser Pro Ser Thr Val Phe Phe Gly—
Ala Phe Ala Leu,

to pharmaceutically acceptable derivates prepared from the functional groups on the side chains of amino acids, or the N- or C- terminal groups; to enzymatic or chemically hydrolyzed fragments; to aggregates which are the result of lymphotoxin trimers; or to pharmaceutically acceptable salts, wherein such derivatives, fragments, aggregates and salts maintain the biological activity of mature lymphotoxin and which do not confer toxic properties to the composition; said lymphotoxin having a specific activity of greater than about 10×10^6 units/mg of protein.

14. A process for preparing human lymphotoxin having a molecular weight by SDS-PAGE of about 25,000 daltons and the amino acid sequence

VOL 1113 ISS 4 AP 24 1990 UMI

NH_2—Leu Pro Gly Val Gly Leu Thr Pro Ser Ala Ala—
Gln Thr Ala Arg Gln His Pro Lys Met His Leu Ala—
His Ser Thr Leu Lys Pro Ala Ala His Leu Ile Gly—
Asp Pro Ser Lys Gln Asn Ser Leu Leu Trp Arg—
Ala Asn Thr Asp Arg Ala Phe Leu Gln Asp Gly
Phe Ser Leu Ser Asn Asn Ser Leu Leu Val Pro—
Thr Ser Gly Ile Tyr Phe Val Tyr Ser Gln Val—
Val Phe Ser Gly Lys Ala Tyr Ser Pro Lys Ala—
Thr Ser Ser Pro Leu Tyr Leu Ala His Glu Val—
Gln Leu Phe Ser Ser Gln Tyr Pro Phe His Val—
Pro Leu Leu Ser Ser Gln Lys Met Val Tyr Pro—
Gly Leu Gln Glu Pro Trp Leu His Ser Met Tyr—
His Gly Ala Ala Phe Gln Leu Thr Gln Gly Asp—
Gln Leu Ser Thr His Thr Asp Gly Ile Pro His—
Leu Val Leu Ser Pro Ser Thr Val Phe Phe Gly—
Ala Phe Ala Leu.

and fragments thereof, which process comprises

(a) obtaining an extract, supernatant or filtrate from a cell culture which produces lymphotoxin;

(b) treating said extract, supernatant, or filtrate with a lentil lectin adsorbent; and

(c) selectively eluting the lymphotoxin from the adsorbent.

4,920,197

POLYESTER RESIN EXHIBITING OPTICAL ANISOTROPY IN MOLTEN STATE WHICH CONTAINS A LOW CONCENTRATION OF 6-OXY-2-NAPHTHOYL UNITS AND COMPOSITION THEREOF

Noriyuki Hayashi, Fuji, and Kenji Hijikata, Mishima, both of Japan, assignors to Polyplastics Co., Ltd., Japan

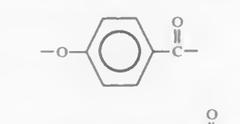
Filed Apr. 10, 1989, Ser. No. 335,504

Claims priority, application Japan, Apr. 13, 1988, 63-90891

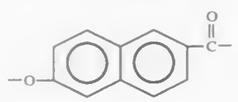
Int. Cl.[5] C08G *63/02*

U.S. Cl. 528—190 **6 Claims**

1. A polyester resin which comprises 35 to 90 mole percent of the unti (I), 0.5 to 4 mole percent of the unit (II), 0.5 to 30 mole percent of the unit (III), and 0.5 to 30 mole percent of the unit (IV), exhibiting the anisotropy in its molten state.

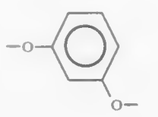


(I)



(II)

(III)



(IV)

4,920,198

BRANCHED POLYCARBONATE FROM HYDROXY-NAPHTHOIC ACID OR DERIVATIVE, AND PROCESS FOR PREPARING

Alberto Petri, Milan, Italy, assignor to Enichem Tecnoresine S.p.A., Palermo, Italy

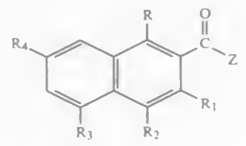
Filed Jun. 7, 1988, Ser. No. 203,425

Claims priority, application Italy, Jun. 17, 1987, 20929 A/87

Int. Cl.[5] C08G *63/62*

U.S. Cl. 528—201 **4 Claims**

1. A blow moldable branched polycarbonate comprising units derived from phosgene, at least one aromatic dihydroxy-compound and a hydroxy-naphthoic acid compound having the formula:



(I)

wherein:

Z represents OH or Cl;

R, R_1, R_2, R_3, and R_4, are the same or different from one another, and represent H, OH, alkyl groups containing from 1 to 4 carbon atoms, and at least two thereof are OH.

4,920,199

WATER-REDUCIBLE COATING COMPOSITION

Richard E. Jarzombek, Munster; Raymond J. Moeller, Jr., Cedar Lake, both of Ind., and Merrill L. Pruitt, Lansing, Ill., assignors to Bee Chemical Company, Lansing, Ill.

Filed Nov. 10, 1988, Ser. No. 269,824

Int. Cl.[5] C08G *63/02*

U.S. Cl. 528—272 **24 Claims**

1. A clear, homogeneous coating binder solution comprising:

I. an organic component binder mixture comprising

(A) between about 25 and about 95 wt. percent of a polymer which is a polyether or has both ether and ester linkages, said polymer having an acid number below about 15 and an hydroxyl value in the range of between about 100 to about 1000,

(B) between about 2.5 and about 50 wt. percent of an amine-formaldehyde resin, and

(C) up to about 50 wt. percent of an organic solvent;

said components (A), (B), and (C) being mutually compatible so as to form a clear, homogeneous organic component binder mixture in the absence of water; said organic component binder mixture being sufficiently compatible with a volume of water equal to at least about one fifth the total volume of said organic component binder mixture and with sufficient additional water to achieve a thinned viscosity of less than about 250 cps so as to remain a clear homogeneous solution, plus

II. a volume of water equal to at least about one fifth the volume of said organic component binder mixture plus sufficient additional water to achieve a thinned viscosity of less than about 250 cps.

4,920,200

HYDROQUINONE-BISPHENOL CYCLIC COPOLYCARBONATE OLIGOMER

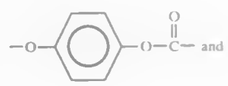
Daniel J. Brunelle, Scotia, and David K. Bonauto, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 27, 1988, Ser. No. 290,053

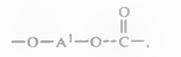
Int. Cl.[5] C08G *63/62*

U.S. Cl. 528—370 **6 Claims**

1. A composition consisting essentially of cyclic copolycarbonate oligomers having structural units of the formulas

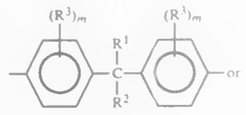


(I)

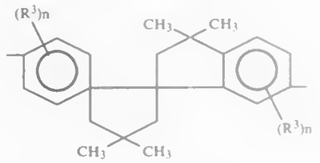


(II)

wherein A^1 is



(III)



(IV)

each of R^1 and R^2 is a c_{1-4} primary or secondary alkyl or C_{6-10} aromatic hydrocarbon radical, R^3 is C_{1-4} primary or secondary alkyl or halo, m is 0–4 and n is 0–3; at least 40% of the structural units in said oligomers having formula I.

4,920,201

ISOLATION OF PURIFIED SOLID POLYARYLENE SULFIDE DIRECTLY FROM POLYMERIZATION SOLUTION

Wolfgang Jakob, Moers; Erhard Tresper, and Wolfgang Alewelt, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 18, 1988, Ser. No. 233,669

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1987, 3728703

Int. Cl.[5] C08G *75/02*; C08J *11/04*

U.S. Cl. 528—486 **4 Claims**

1. Process for the isolation of purified polyarylenesulphide as a solid polymer phase directly from a polymerization solution, the process characterized in that after termination of polymerization, salts of carboxylic acids are added to the polymerization solution with or without cooling or stirring and the resulting suspension is filtered at elevated temperatures to isolate the purified solid polymer from the polymerization solution.

4,920,202

METHOD FOR PRODUCTION OF HYDROPHILIC POLYMER FROM HYDRATED GEL POLYMER

Yoshio Irie; Kaoru Iwasaki; Takumi Hatsuda, all of Himeji; Kazumasa Kimura, Osaka; Nobuyuki Harada; Kunihiko Ishizaki, both of Suita; Tadao Shimomura, Toyonaka, and Teruaki Fujiwara, Himeji, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Apr. 29, 1988, Ser. No. 187,866

Claims priority, application Japan, Apr. 30, 1987, 62-104764

Int. Cl.[5] C08F *6/00*

U.S. Cl. 528—500 **17 Claims**

1. A method for the production of a hydrophilic polymer having a small residual monomer content from a hydrated gel polymer, which method comprises drying said hydrated gel polymer by contact thereof with a gas containing at least steam and having a dew point in the range of 50° to 100° C. at a temperature in the range of 80° C. to 250° C.

4,920,203

MEDICAL DEVICES FABRICATED FROM HOMOPOLYMERS AND COPOLYMERS HAVING RECURRING CARBONATE UNITS

Reginald T. Tang, Warren; Frank Mares, Whippany; William J. Boyle, Jr., Parsippany; Tin-Ho Chiu, Millburn, and Kundabhai M. Patel, Landing, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

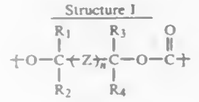
Continuation-in-part of Ser. No. 134,290, Dec. 17, 1987, and a continuation-in-part of Ser. No. 134,321, Dec. 17, 1987, Pat. No. 4,891,263, and a continuation-in-part of Ser. No. 134,339, Dec. 17, 1987. This application Aug. 2, 1988, Ser. No. 227,386

Int. Cl.[5] C08L *71/02*

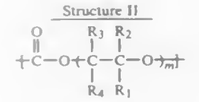
U.S. Cl. 525—409 **38 Claims**

1. A medical device formed totally or in part of one or more biopolymers selected from the group consisting of block copolymers having at least one type of recurring monomeric unit of the following General Structures I and II:

Structure I



Structure II



wherein

Z is $—C(R_5R_6)—$, $—NR_5—$, —O— or a combination thereof, where Z is selected such that there are no adjacent heteroatoms;

n is from 1 to about 8;

m is from 1 to about 8;

R_1, R_2, R_3, and R_4 are the same or different at each occurrence and are hydrogen, aryloxyalkyl, alkyoxyaryl, aryloxyaryl, arylalkyl, alkylarylalkyl, arylalkylaryl, alkylaryl, arylcarbonylalkyl, alkyl, aryl, alkylcarbonylalkyl, cycloalkyl, arylcarbonylaryl, alkylcarbonylarly, alkoxyalkyl, or aryl or alkyl substituted with one or more substituents selected from the group consisting of alkyl, aryl, alkoxy, aryloxy, dialkylamino, diarylamino, and alkylarylamino; and

R_5 and R_6 are the same or different and are R_1, R_2, R_3, R_4, dialkylamino, diarylamino, alkylarylamino, alkoxy, aryloxy, alkanoyl, or arylcarbonyl, or any two of R_1 to R_6 together may form an alkylene chain completing a 3, 4, 5, 6, 7, 8 or 9 membered alicyclic fused, spiro, bicyclic or tricyclic ring system or a combination thereof, which system may optionally include one or more non-adjacent carbonyl, oxa, alkylaza or arylaza groups;

with the proviso that when said biopolymers are copolymer having recurring units of the Structure I derived from trimethylene carbonate, the other recurring monomeric units of the copolymer are not derived from gylcolide or glycolic acid.

4,920,204

CERIC HYDROCARBYLOXY NITRATES AND THEIR USE IN ORGANIC SYNTHESIS

Peter S. Gradeff, Pottersville; Fred G. Schreiber, Highland Park, both of N.J.; Jean Grosbois, L'Isle Adam, France, and Heiko Mauermann, New Brunswick, N.J., assignors to Rhone-Poulenc Inc., New Brunswick, N.J.

Filed Nov. 12, 1987, Ser. No. 120,054

Int. Cl.[5] C07F *5/00*

U.S. Cl. 534—15 13 Claims

1. Ceric hydrocarbyloxy nitrates having the general formula:

wherein x is 1, 2 or 3 and R is selected from the group consisting of aliphatic, cycloaliphatic and aromatic hydrocarbyl groups having from two to about twenty carbon atoms.

4,920,205

PROCESS FOR MAKING AZO PIGMENTS

Heinrich Rehberg, Brühl, and Hartmut Behringer, Erftstadt, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 40,338, Apr. 20, 1987, abandoned. This application Mar. 28, 1989, Ser. No. 329,647

Int. Cl.[5] C09B *29/38, 35/08, 37/00, 41/00*

U.S. Cl. 534—582 6 Claims

1. A process for mixing azo pigments by subjecting a diazo component to an azo coupling reaction with the equivalent quantity of a coupling component difficultly soluble at less than 65° C. in the aqueous/acid and aqueous/neutral pH-ranges, which comprises: continuously mixing, in a first reaction step, an aqueous/alkaline solution of the coupling component with an aqueous solution of an acid selected from the group consisting of acetic acid, boric acid, phosphoric acid, hydrochloric acid or sulfuric acid at a temperature lower than 65° C. and within a period of less than 1 minute, during which the coupling component commences precipitating at least partially as reactive matter; continuously mixing, in a second reaction step immediately following the first reaction step, the suspension obtained with an aqueous/acid solution of the diazo component and with a recycled aqueous suspension of produced azo pigment at a temperature of less than 65° C. within a period of less than 6 seconds, and establishing a predetermined pH between 2 and 9 by controlling the flow of the mass streams of the diazo component and coupling component and thereby causing a portion of the coupling component to undergo immediate reaction to the azo pigment to be made; and reacting the balance portion of the coupling component in a post-reaction phase with unreacted diazo component to the azo pigment to be made.

4,920,206

PROCESS FOR MAKING AZO PIGMENTS

Hartmut Behringer, Erftstadt, and Heinrich Rehberg, Hürth, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 40,295, Apr. 20, 1987, abandoned. This application Mar. 29, 1989, Ser. No. 329,953

Claims priority, application Fed. Rep. of Germany, May 3, 1986, 3615099

Int. Cl.[5] C09B *29/38, 35/08, 37/00, 41/00*

U.S. Cl. 534—582 6 Claims

1. A process for making azo pigments by subjecting a diazo component to an azo coupling reaction with the equivalent quantity of a coupling component difficultly soluble at less than 65° C. in the aqueous/acid and aqueous/neutral pH-ranges, which comprises: continuously mixing, an aqueous/acid solution of the diazo component at a temperature of less than 65° C., within a period of less than 6 seconds with the aqueous/alkaline solution of the coupling component and with a recycled aqueous suspension of produced azo pigment and establishing a predetermined pH between 2 and 9 by controlling the flow of the mass streams of the diazo component and coupling component and thereby causing a portion of the coupling component to undergo immediate reaction to the azo pigment to be made and simultaneously causing the balance portion of the coupling component to commence precipitating as finely crystalline reactive matter, and reacting the latter in a post-reaction phase with unreacted diazo component to the azo pigment to be made.

4,920,207

SELECTED REMOVAL OF TRITYL GROUPS FROM TRISPA

George H. Sankey, and Nigel J. Homer, both of Reading, Great Britain, assignors to Tate & Lyle Public Ltd. Co., United Kingdom

Filed Sep. 17, 1987, Ser. No. 98,023

Claims priority, application United Kingdom, Sep. 17, 1986, 8622342

Int. Cl.[5] C07H *1/00, 5/02, 13/02*

U.S. Cl. 536—124 13 Claims

1. A process for the preparation of 2,3,4,3',4'-penta-O-acetyl sucrose by the selective removal of trityl groups from 6,1',6'-tri-O-trityl-penta-O-acetyl sucrose (TRISPA), comprising hydrogenating a solution of TRISPA and about 0.05 to 0.2 moles of aralkyl chloride (per mole of TRISPA) in an inert organic solvent in the presence of palladium or platinum as the catalyst.

4,920,208

BASIC AZO DYESTUFFS

Aloysius Engel, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

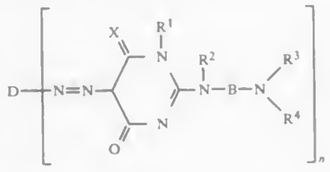
Filed Sep. 28, 1988, Ser. No. 250,572

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1987, 3735276

Int. Cl.[5] C09B *29/52, 31/14, 32/215, 35/26*

U.S. Cl. 534—753 5 Claims

1. A basic azo dyestuff of the formula



or tautomers thereof, in which

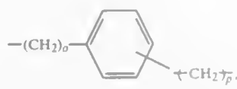
D is the radical of a diazo or tetrazocomponent free of anionic groups,

X is O or NH,

R^1, R^2 are independently of each other hydrogen, unsubstituted C_1–C_8- alkyl, C_1–C_8-alkyl substituted with halogen, hydroxyl, cyano, amino, monoalkylamino, dialkylamino or C_1–C_4-alkoxy; unsubstituted phenyl or phenyl substituted with halogen, hydroxyl, cyano, amino, monalkylamino, dialkylamino, C_1–C_4-alkoxy or C_1–C_4-alkyl,

B is a —O—, —S—,

interrupted C_2–C_4-alkylene, in which R^5 is hydrogen, methyl, unsubstituted C_2–C_4-alkyl, C_2–C_4-alkyl substituted with chlorine, bromine, hydroxy, cyano, C_1–C_4-alkoxy, amino, mono-C_1–C_4-alkylamino or di-C_1–C_4-alkylamino or fluorine-, chlorine-, bromine-, C_1–C_4-alkyl- or C_1–C_4-alkoxy-substituted aryl or B is



wherein o is zero, 1, 2 or 3, P is 1, 2 or 3 and $(CH_2)_p$ is bonded to the

R^3, R^4 are independently of each other hydrogen, unsubstituted C_1–C_8-alkyl, C_1–C_8-alkyl substituted with halogen, hydroxyl, cyano, amino, monoalkylamino, dialkylamino or C_1–C_4-alkoxy; C_2–C_4-alkenyl; unsubstituted benzyl, unsubstituted phenylethyl or benzyl or phenylethyl substituted with fluorine, chlorine, bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy, nitro, cyano, amino, mono-C_1–C_4-alkylamino or di-C_1–C_4-alkylamino or

R^2 and R^3 together with B and the two nitrogen atoms to which they are bonded form a 5- or 6-membered heterocyclic ring and in this case

B also stands for a direct bond,

R^3 and R^4 together with the nitrogen atom to which they are bonded form a 5- or 6-membered heterocyclic ring, and

n is 1 or 2.

4,920,209

ORAL VACCINES

Alan R. Davis, Wayne, and Paul P. Hung, Bryn Mawr, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 782,638, Oct. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 667,233, Nov. 1, 1984, abandoned. This application Jun. 4, 1987, Ser. No. 58,002

Int. Cl.[5] C12N *7/00. 15/00*; C12P *21/00*

U.S. Cl. 435—235 1 Claim

1. A recombinant adenovirus containing a gene coding for an antigen produced by a disease-causing organism said recombinant adenovirus being of type 7; the gene codes for hepatitis-B surface antigen; and the gene is located at delected early region 3; said recombinant adenovirus being ATCC VR2167

4,920,210

2,6-DIAMINOPURINE-9-β-D-2',3'-DIDEOXYRIBOFURANOSIDE

George W. Koszalka, Apex, and Thomas A. Krenitsky, Chapel Hill, both of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed May 15, 1986, Ser. No. 863,923

Claims priority, application United Kingdom, May 15, 1985, 8512330

Int. Cl.[5] C07H *19/04*

U.S. Cl. 536—24 1 Claim

1. 2,6-diaminopurine-9-β-D-2',3'-dideoxyribofuranoside or a pharmaceutically acceptable salt thereof.

4,920,211

MUTATED ADENOVIRUS E1A GENE FOR E1A PROMOTER STIMULATION

Clark Tibbetts, Nashville, Tenn., and Pamela L. Larsen, Brookline, Mass., assignors to Vanderbilt University, Nashville, Tenn.

Filed Jan. 4, 1988, Ser. No. 140,625

Int. Cl.[5] C12N *15/00*; C12P *21/00*; C07H *15/12*

U.S. Cl. 536—27 12 Claims

1. An isolated functional mutated E1A gene of human adenovirus subgroup B:1 having a modified autorepression functional domain including an in frame deletion in the region corresponding to the adenovirus wild type 3 (Ad3) DNA sequence between nucleotides 956 and 1024, said modified autorepression domain upon expression producing E1A products which stimulate in trans without net repression of an Ad3 promoter of the adenovirus subgroup B:1 E1A gene.

4,920,212

PROCESS FOR THE PREPARATION OF (ARYL)-(DIMETHYL)-(3-(4-FLUORO-3-ARYLOXY-PHENYL)PROPYL)SILANES

Hans H. Schubert, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

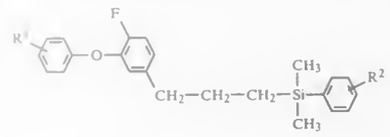
Filed Sep. 16, 1988, Ser. No. 245,404

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1987, 3731609

Int. Cl.[5] C07F *7/08*

U.S. Cl. 549—214 6 Claims

1. A process for the preparation of a compound of formula I



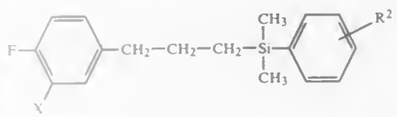
(I)

in which:

R^1 is hydrogen, halogen, $(C_1$–$C_4)$-alkyl or $(C_1$–$C_4)$-alkoxy; and

R^2 is hydrogen, halogen, $(C_1$–$C_4)$-alkyl, $(C_1$–$C_4)$-alkyl-thio, $(C_1$–$C_4)$-alkoxy or the bivalent group 3,4-O—CH_2—O;

which comprises reacting a compound of formula II



(II)

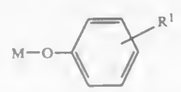
in which:

X is chlorine, bromine or iodine; and

VOL 1113 ISS 4 AP 24 1990 UMI

R^2 has the meaning as in formula I;
in the presence of a copper catalyst with an alkali metal phenolate or alkaline earth metal phenolate of formula III

(III)

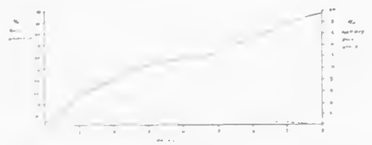


in which:
M is an alkali metal or an alkaline earth metal; and
R^1 has the meaning as in formula I.

4,920,213
METHOD AND COMPOSITIONS USEFUL IN PREVENTING EQUINE INFLUENZA
Beverly Dale, Mt. View, and Barbara Cordell, San Francisco, both of Calif., assignors to Biotechnology Research Partners, Ltd., Mountain View, Calif.
Continuation-in-part of Ser. No. 747,020, Jun. 20, 1985, Pat. No. 4,361,191. This application Jul. 21, 1986, Ser. No. 888,250
Int. Cl.[5] C12P *21/00, 21/02;* **C07H** *15/12*
U.S. Cl. 536—27 **2 Claims**

1. A recombinant DNA sequence encoding equine hemagglutinin H7 as depicted in FIG. 1.

4,920,214
PROCESS FOR PRODUCING MODIFIED CYCLODEXTRINS
Robert B. Friedman, Chicago, Ill., assignor to American Maize-Products Company, Stamford, Conn.
Filed Apr. 16, 1986, Ser. No. 852,630
Int. Cl.[5] A61K *1/00*
U.S. Cl. 536—103 **18 Claims**

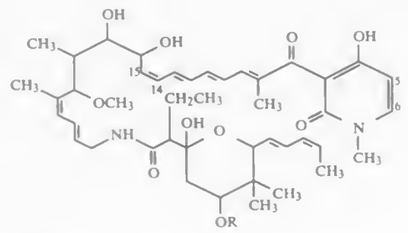


1. The process of modifying cyclodextrins to produce hydroxy ethers which comprises the steps of forming a substantially anhydrous mixture of one or more alpha, beta and gamma cyclodextrins and a selected alkylene carbonate in a basic environment in absence of a quaternary ammonium halide catalyst and heating the resulting mixture to a temperature of at least about 100° C. to initially produce visible bubbles coming off the mixture and to modify the one or more cyclodextrins and form an ether derivative.

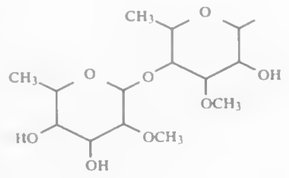
4,920,215
ANTIBIOTIC PRODUCED BY FERMENTATION
Kelvin S. Holdom, Ramsgate; John C. Ruddock, Canterbury, both of England; Junsuke Tone; Hiroshi Maeda, both of Chita, Japan, and Martin R. Jefson, Stonington, Conn., assignors to Pfizer Inc., New York, N.Y.
Filed Dec. 16, 1987, Ser. No. 133,752
Claims priority, application United Kingdom, Jan. 9, 1987, 8700513
Int. Cl.[5] C07G *11/00, 3/00;* **A61K** *35/00;* **C12R** *1/365*
U.S. Cl. 536—16.8 **6 Claims**

1. The antibiotic compound of the formula:

(I)



wherein R is



or a salt thereof.

4,920,216
SELECTIVE CHLORINATION OF STEROIDS AND OTHER SUBSTRATES DIRECTED BY COVALENTLY LINKED PYRIDINE DERIVATIVES ACTING AS TEMPLATES
Ronald Breslow, Englewood, N.J.; Michael Brandl, New York, N.Y.; Alan D. Adams, New York, N.Y., and Jurgen Hunger, New York, N.Y., assignors to The Trustees of Columbia in the City of New York, New York, N.Y.
Filed May 28, 1987, Ser. No. 55,139
Int. Cl.[5] C07J *43/00, 1/00*
U.S. Cl. 540—110 **24 Claims**

1. A method of substituting a chlorine atom for a predetermined hydrogen atom attached at the carbon-6, -9, -14, -17, or -20 position of a steroid, which steroid is selected from the group consisting of steroids of the cholestane, androstane, and pregnane series and has a hydroxyl group, comprising (a) reacting the steroid with an esterifying agent under suitable conditions so as to produce an ester, the esterifying agent comprising a pyridine ring or a substituted or fused ring derivative of a pyridine ring; and (b) treating the resulting ester with a chlorinating agent in an organic solvent under conditions such that the chlorine atom is substituted for the predetermined hydrogen atom.

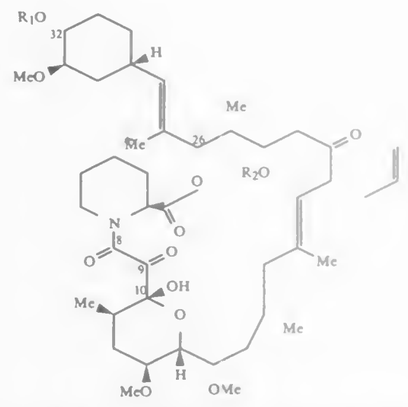
4,920,217
PRODUCTION OF DIMETHYLAMINOMETHYL COPPER PHTHALOCYANINE
Ian A. Lambie, Glasgow; Paul I. W. Yarrow, Paisley; Robert Langley, Glasgow, and Colin D. Campbell, Beith, all of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Sep. 19, 1988, Ser. No. 245,490
Claims priority, application United Kingdom, Oct. 3, 1987, 8723258
Int. Cl.[5] C09B *47/16*
U.S. Cl. 540—135 **4 Claims**

1. A process for the production of dimethylaminomethyl copper phthalocyanine having an average of 1 to 4 dimethylaminomethyl groups per molecule which comprises reacting aminomethyl copper phthalocyanine having an average of 1 to 4 aminomethyl groups per molecule with formaldehyde and aqueous formic acid at a concentration of 5 to 25%, at atmospheric pressure, and at an elevated temperature.

4,920,218
NOVEL HYDROXIDE MEDIATED FK-506 REARRANGEMENT PROCESS
David Askin; Todd K. Jones, both of Edison; Robert A. Reamer, Bloomfield; Ralph P. Volante, East Windsor, and Ichiro Shinkai, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.
Continuation of Ser. No. 256,784, Oct. 12, 1988, abandoned. This application Sep. 5, 1989, Ser. No. 403,794
Int. Cl.[5] C07D *498/16, 498/18*
U.S. Cl. 540—456 **10 Claims**

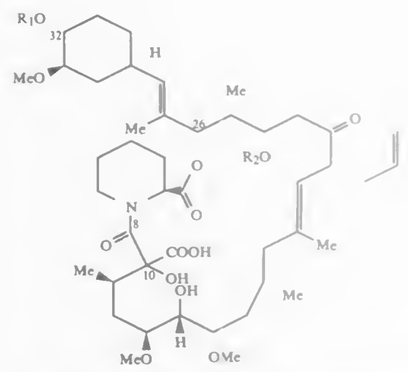
1. A process comprising the steps of:
(a) contacting compound 2:

2



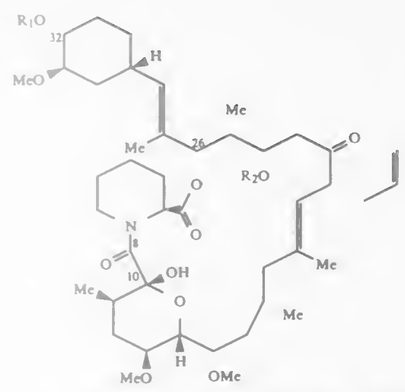
wherein R_1 and R_2 are independently H, or an easily removable hydroxy protecting group, with a hydroxide base in an inert aqueous/organic solvent mixture at room temperature in the range of about 0°–25° C. for a sufficient time to form 3;

3



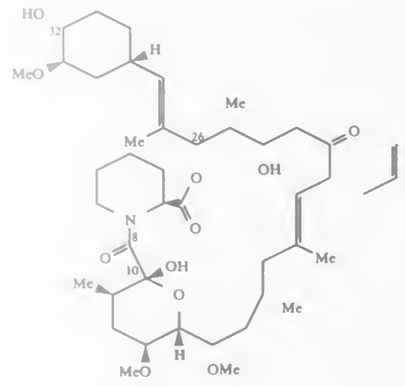
(b) contacting 3 obtained above with an oxidizing agent in an inert organic solvent at 0°–50° C. for a sufficient time to form 4;

4



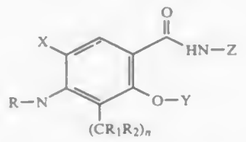
(c) contacting the above-obtained 4 under mild acidic hydrolysis conditions for a sufficient time to remove R_2 and/or R_1 if either are present, to yield the immunosuppressant 5:

5

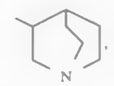


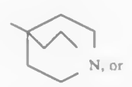
4,920,219
SUBSTITUTED SATURATED AND UNSATURATED INDOLE QUINOLINE AND BENZAZEPINE CARBOXAMIDES AND THEIR USE AS PHARMACOLOGICAL AGENTS
Jeffrey C. Pelletier, Lansdale, Pa.; Raymond D. Youssefyeh, Princeton Junction, N.J., and Henry F. Campbell, North Wales, Pa., assignors to Rorer Pharmaceutical Corp., Ft. Washington, Pa.
Filed Nov. 29, 1988, Ser. No. 277,582
Int. Cl.[5] C07D *453/02, 215/00, 209/34*
U.S. Cl. 540—523 **7 Claims**

1. A compound of the formula



wherein:
X is hydrogen, hydroxy, amino, mono- and di-loweralkylamino, halo, trifluoromethyl, sulfamyl, mono- and di-loweralkylsulfamyl or loweralkylsulfonyl;
R is hydrogen or loweralkyl;
R_1 and R_2 are independently hydrogen or loweralkyl;
vicinal R_2 groups together may be, $—(CH_2)_d—$ where a is 1 to 4, thus forming a 3 to 6 membered ring;
n is 2 to 4;
Y is loweralkyl, $—(CR_1R_2)_b$-SO-loweralkyl or $—(CR_1R_2)_b$-CO-loweralkyl;
b and d are 1 to 3; and
Z is $—(CR_1R_2)_d—NR_1R_2$,

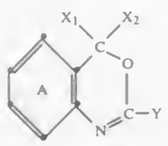




or a pharmaceutically acceptable salt thereof.

4,920,220
CHROMOGENIC 1-HETEROCYCLIC SUBSTITUTED 2,4-BENZOXAZINES
Rox Phaff, Rheinfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Nov. 1, 1988, Ser. No. 265,645
Claims priority, application Switzerland, Nov. 12, 1987, 4418/87
Int. Cl.[5] C07D *413/04*
U.S. Cl. 544—90 12 Claims

1. A chromogenic 1-heterocyclic substituted 2,4-benzoxazine of formula



(I)

wherein X_1 and X_2 are identical or different heteroaromatic radicals selected from the group consisting of pyrrolyl, thienyl, indolyl, benzofuranyl, benzothienyl and naphthothienyl, wherein said radicals are unsubstituted, C-substituted by halogen, hydroxyl, cyano, nitro, lower alkyl, lower alkoxy, lower alkoxycarbonyl, C_1–C_8-acyl, amino, lower alkylamino, di-lower alkylamino, C_5–C_6-cycloalkyl, benzyl or phenyl, or N-substituted by C_1–C_{12}-alkyl, C_2–C_{12}-alkenyl, C_1–C_8-acyl, benzyl or phenethyl, each of which is unsubstituted or substituted by cyano, halogen, nitro, hydroxy, lower alkyl, lower alkoxy or lower alkoxycarbonyl, said heteroaromatic radicals being bonded to the oxazine ring through a carbon atom of a heterocyclic ring of said heteroaromatic radical, and X_2 is also an aryl radical, Y is hydrogen, alkyl, cycloalkyl, aryl, aralkyl or a heterocyclic radical selected from the group consisting of furyl, thienyl, pyrrolyl, pyrazolyl, imidazolyl and pyridyl, and the benzene ring A is substituted by halogen, cyano, nitro, lower alkyl, lower alkoxy, lower alkylthio, lower alkylcarbonyl, lower alkoxycarbonyl or $—NR_1—R_2$, in which R_1 and R_2 are each independently of the other hydrogen, alkyl of not more than 12 carbon atoms which is unsubstituted or substituted by halogen, hydroxy, cyano or lower alkoxy, or are cycloalkyl of 5 to 10 carbon atoms, or phenalkyl or phenyl, each unsubstituted or ring-substituted by halogen, cyano, lower alkyl or lower alkoxy, or $—NR_1R_2$ is a 5- or 6-membered heterocyclic radical.

4,920,221
SUBSTITUTED DECAHYDRO-1H-PYRIDO[1,2-F]PHENANTHRIDINES AND DECAHYDROPYRROLO[1,2-F]PHENANTHRIDINES
James F. Eggler, Stonington; Michael R. Johnson, Gales Ferry, and Lawrence S. Melvin, Jr., Ledyard, all of Conn., assignors to Pfizer Inc., New York, N.Y.
Division of Ser. No. 628,543, Jul. 6, 1984, Pat. No. 4,642,373, which is a division of Ser. No. 358,765, Mar. 16, 1982, Pat. No. 4,473,704. This application Oct. 16, 1986, Ser. No. 919,912
Int. Cl.[5] C07D *221/18*
U.S. Cl. 544—125 18 Claims

1. A compound having the stereochemical formula

in either racemic or optically active form, wherein
n is 1 or 2;
A is OH, $(C_1$–$C_5)$alkanoyloxy, $(C_1$–$C_5)$alkanoylamino or $(C_1$–$C_4)$alkanesulfonamido;
R is H, benzoyl, $(C_1$–$C_5)$alkanoyl or $—CO(CH_2)_mY$, wherein m is 1, 2, 3 or 4, Y is —COOH, or $—NR'R''$, R' and R'' when taken separately are each independently H or $(C_1$–$C_4)$alkyl, and R' and R'' when taken together with the nitrogen to which they are attached are piperidino, pyrrolo, pyrrolidino, morpholino or N-[$(C_1$–$C_4)$alkyl]-piperazino; and
Z is $(C_5$–$C_{13})$alkyl, $(C_5$–$C_{13})$alkoxy, $(C_5$–$C_{13})$alkoxyalkyl, $(C_8$–$C_{13})$pyridylalkyl, $(C_8$–$C_{13})$pyridylalkoxy, $(C_8$–C_{13}-)pyridyloxalkyl, $(C_8$–$C_{13})$pyridylalkoxyalkyl, $(C_9$–$C_{14})$-phenylalkyl, $(C_9$–$C_{14})$phenylalkoxy, $(C_9$–$C_{14})$phenoxyalkyl, or $(C_9$–$C_{14})$phenylalkoxyalkyl, wherein said phenyl groups are optionally substituted with a chloro or a fluoro;
a pharmaceutically-acceptable acid addition salt thereof; or
a pharmaceutically-acceptable cationic salt thereof when R is $—CO(CH_2)_mY$ and Y is —COOH.

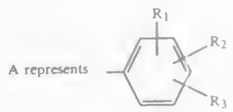
4,920,222
PREPARATION OF 3,3-DIARYLACRYLIC ACID AMIDES
Jürgen Curtze, Johannisberg; Ludwig Schröder, Ingelheim, both of Fed. Rep. of Germany, and Paul H. Briner, Faversham, England, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands
Filed Jan. 30, 1989, Ser. No. 302,938
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1988, 3805235
Int. Cl.[5] C07C *103/58, 102/00*; C07D *295/18*
U.S. Cl. 544—158 7 Claims

1. A process for the preparation of a 3,3-diaryl acrylic acid amide of general formula I

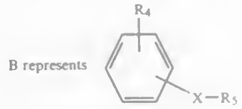
(I)

wherein

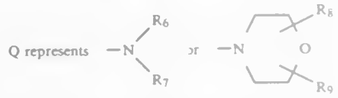
A represents



B represents



Q represents



in which
R_1 is C_{1-4}-alkyl, C_{1-4}-alkoxy, NH_2, NHC_{1-4}-alkyl, $N(C_{1-4}$-alkyl)$_2$, C_{3-4}-alkenyl, C_{3-4}-alkynyl, C_{3-4} alkenyloxy, C_{3-4}-alkynyloxy, or C_{3-6}-cycloalkyl;
R_2 is C_{1-4}-alkyl, C_{1-4}-alkoxy or halogen;
R_3 is hydrogen or halogen;
R_4 is hydrogen, halogen, C_{1-4}-alkyl or C_{1-4}-alkoxy;
R_5 is hydrogen, a phenyl group optionally substituted by one or more substituents selected from C_{1-4}-alkyl, C_{1-4}-alkoxy and halogen moieties, a C_{1-12} alkyl group optionally substituted by one or more halogen atoms, a C_{3-7}-cycloalkyl, phenylphenyl, or phenoxyphenyl group, a C_{2-6}-alkenyl or C_{2-6}-alkynyl group each optionally-substituted by a phenyl group, or a naphthyl or C_{5-8}-cycloalkenyl group;
X is a single bond, —O—, $—S(O)_p—$, —N=N—, —CH-R_9O—, $—OCHR_9—$, $—CHR_9S(O)_p—$, $—S(O)_pCHR_9—$ $—(CH_2)_n—$, —HC=CH—, or —C≡C—;
R_6 is C_{1-4}-alkyl, C_{3-7}-cycloalkyl, benzyl, C_{3-4}-alkenyl or C_{3-4}-alkynyl;
R_7 is C_{1-4} alkyl;
R_8 is hydrogen, C_{1-4}-alkyl or C_{1-4}-alkoxy;
R_9 is hydrogen or C_{1-4}-alkyl;
p is 0, 1 or 2; and
n is an integer from 1 to 10
provided that when X is —N=N— R_5 is other than hydrogen
by reacting a benzophenone of formula II

(II)

in which A and B have the meanings given above, with an acetamide of formula III

(III)

in which Q has the meaning given above, in the presence of a base characterised in that the base employed is a sodium tertiary alcoholate.

4,920,223
AMINOPYRAZINONES AND AMINOTRIAZINONES
Beat Bölmer, Binningen, and Willy Meyer, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Division of Ser. No. 260,643, Oct. 21, 1988, Pat. No. 4,871,852, which is a division of Ser. No. 99,036, Sep. 21, 1987, Pat. No. 4,795,486. This application Jul. 25, 1989, Ser. No. 384,956
Claims priority, application Switzerland, Sep. 26, 1986, 3871/86
Int. Cl.[5] C07D *253/08*; A01N *43/48, 43/64*
U.S. Cl. 544—182 2 Claims

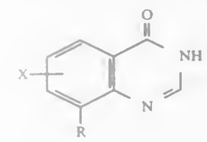
1. A compound of the formula II

(II)

in which E is nitrogen, R^1 is C_1–C_4-alkyl, R^2 is hydrogen, C_1–C_3-alkyl, C_1–C_3-halogenoalkyl, C_1–C_3-alkoxy, C_1–C_3-halogenoalkoxy, C_1–C_3-alkylthio, C_1–C_3-alkylsulfinyl, C_1–C_2-alkoxyethoxy, C_1–C_3-alkylsulfonyl, halogen or $—NR^5R^6$, R^3 is hydrogen or C_1–C_3-alkyl, and R^5 and R^6 independently of one another are hydrogen or C_1–C_3-alkyl, with the proviso that R^3 is C_1–C_3-alkyl if R^1 is methyl and R^2 is methyl or methylthio.

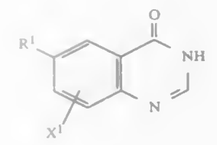
4,920,224
QUINAZOLIN-4(3H)-ONE DERIVATIVES AS ANTICOCCIDIAL AGENTS
Edward A. Glazer, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.
Division of Ser. No. 173,207, Mar. 24, 1988, Pat. No. 4,849,518, which is a division of Ser. No. 67,766, Jun. 22, 1987, Pat. No. 4,762,838. This application Mar. 13, 1989, Ser. No. 322,736
Int. Cl.[5] C07D *401/12*
U.S. Cl. 544—284 1 Claim

1. A compound having the formula



(V)

or



(VI)

wherein
X is fluoro, chloro, bromo or iodo substituted at the 6- or 7-position;
R is $(C_1$–$C_4)$alkylthio;

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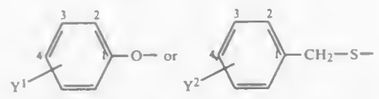
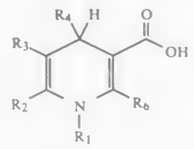
X^1 is hydrogen or fluoro, chloro, bromo, iodo or methoxy substituted either at the 7- or at the 8-position;
R^1 is cyano, trifluoromethyl, (C_1–C_4)alkylthio 4-picolylthio, 3,5-dichlorophenoxy,



where Y^1 is hydrogen, fluoro, chloro, bromo or phenoxy; and Y^2 is chloro or bromo; with the proviso that Y^1 is other than hydrogen when X^1 is other than hydrogen.

4,920,225
RESOLUTION OF 1,4-DIHYDROPYRIDINE DERIVATIVES
Gilles Genain, Issy-les-Moulineaux, France, assignor to Laboratoires Syntex S.A., Puteaux, France
Filed Dec. 22, 1986, Ser. No. 945,760
Int. Cl.[5] **C07F** *9/06, 9/22, 9/28;* **C07D** *215/36, 413/00, 215/16, 215/20, 213/72*
U.S. Cl. 546—21 **3 Claims**

1. A process for preparing the optical isomers of a compound of formula 1

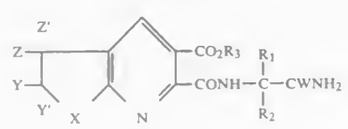


(1)

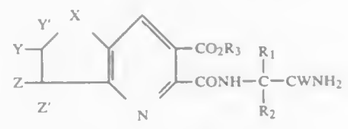
wherein
R_1 is H or lower alkyl;
R_2 and R_6 are each independently lower alkyl, aryl, or arylalkyl;
R_3 is CN, NO_2, CO_2R_5, $CONHR_5$, SO_2R_5, or $P(O)(OR_5)_2$, where R_5 is lower alkyl, lower alkoxyalkyl, alkoxyalkyl, aryl, or arylalkyl;
R_4 is aryl, heterocyclyl, or fused-ring heterocyclyl, optionally substituted with one, two, or three substituents independently selected from halo, NO_2, CN, lower alkyl, lower alkoxy, lower alkylamino, CF_3, OCH_2F, and OCF_3; which process comprises:
dissolving said compound of formula 1 and an optically active amine base in a ratio of about 1:2 to about 2:1, wherein said amine is cinchonidine, quinidine, strychnine, brucine, morphine, d-α-phenylethylamine, l-arginine, dehydroabietylamine, cinchonicine, cinchonine, 1-2-amino-1-propanol, d-amphetamine, glucosamine, conessine, or anabasine in a mixture of water and a solvent selected from dimethyl formamide, ethanol, and acetonitrile at a temperature between about 50° C. and the reflux temperature of said solvent for about 2 to about 30 minutes to form a racemic salt solution which is about 10% to about 50% water; and
allowing one optically active salt of said compound of formula 1 to crystallize.

4,920,226
INTERMEDIATES FOR THE PREPARATION OF (2-IMIDAZOLIN-2-YL)THIENO- AND FURO(2,3-B) AND (3,2-B) PYRIDINES
Marinus Los, Pennington; David W. Ladner, Hamilton Square, and Barrington Cross, Rocky Hill, all of N.J., assignors to American Cyanamid, Stamford, Conn.
Continuation of Ser. No. 176,542, Apr. 1, 1988, abandoned, which is a division of Ser. No. 929,681, Jan. 21, 1987, Pat. No. 4,752,323, which is a division of Ser. No. 676,133, Nov. 29, 1984, Pat. No. 4,650,514, which is a continuation-in-part of Ser. No. 611,191, May 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 500,219, Jun. 2, 1983, abandoned. This application May 30, 1989, Ser. No. 358,926
Int. Cl.[5] **C07D** *491/048, 495/04*
U.S. Cl. 546—80 **2 Claims**

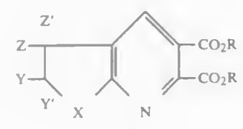
1. A compound having the structure:



(e)

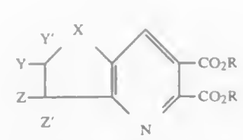


(f)



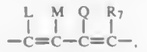
(g)

or



(h)

wherein represents a single or a double bond; R is hydrogen or C_1–C_4 alkyl; R_1 is C_1–C_4 alkyl; R_2 is C_1–C_4 alkyl or C_3–C_6 cycloalkyl; and when R_1 and R_2 are taken together with the carbon to which they are attached they are attached they may represent C_3–C_6 cycloalkyl optionally substituted with methyl; R_3 is hydrogen; W is O or S; X is O, S, or, where is a single bond S=O; Y and Y', Z and Z' are hydrogen, halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 alkanoyloxy, C_1–C_4 alkylthio, phenoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, nitro, cyano, C_1–C_4 dialkylamino or phenyl optionally substituted with one or two C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen, or any combination of two of these groups with the proviso that when Y and Z are the same group they are H, halogen, alkyl or alkoxy, and when Y and Y' or Z and Z' are the same group they are hydrogen or alkyl; and, when taken together, Y and Z may form a ring in which YZ are represented by the structure $—(CH_2)_n—$, where n is an integer of 3 or 4, or

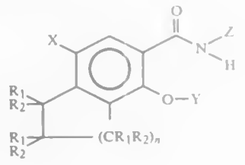


where L, M, Q and R_7 each represent hydrogen, halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy, with the proviso that only one of

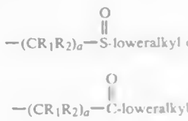
L, M, Q or R_7, may represent a substituent other than hydrogen;
the pyridine N-oxides thereof;
when R_1 and R_2 are not the same, the optical isomers thereof; and,
the acid addition salts thereof.

4,920,227
BENZOBICYCLIC CARBOXAMIDE 5-HT3 ANTAGONISTS
Jeffrey C. Pelletier, Lansdale, Pa.; Raymond D. Youssefyeh, Princeton Junction, N.J., and Henry F. Campbell, North Wales, Pa., assignors to Rorer Pharmaceutical Corp., Fort Washington, Pa.
Filed Nov. 29, 1988, Ser. No. 277,611
Int. Cl.[5] **C07D** *451/02, 211/60, 143/78, 149/41*
U.S. Cl. 546—133 **8 Claims**

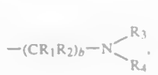
1. A compound of the formula



wherein:
X is hydrogen, hydroxy, amino, mono- and di-loweralkylamino, halo, trifluoromethyl, sulfamyl, mono- and di-loweralkylsulfamyl or loweralkylsulfonyl;
Y is loweralkyl,



Z is



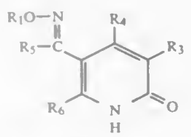
4,920,228
N,N-DISUBSTITUTED, α-(3,5-DIALKYL-4-HYDROXYPHENYL)-α,α-DISUBSTITUTED ACETAMIDES AND COMPOSITION STABILIZED THEREWITH
John Ta-Yuan Lai, Broadview Heights, and Pyong N. Son, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio
Continuation-in-part of Ser. No. 22,183, Mar. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 713,715, Mar. 20, 1985, abandoned, which is a division of Ser. No. 549,036, Nov. 7, 1983, abandoned. This application Feb. 17, 1988, Ser. No. 156,765
Int. Cl.[5] **C07D** *211/58, 211/94*
U.S. Cl. 546—224 **4 Claims**

1. A N-substituted, N-polysubstituted piperidyl, α-(3,5-dialkyl-4-hydroxyphenyl)-α,α-substituted acetamide, represented by the structure

wherein,
R^1 and R^2 each represent C_1–C_{12} alkyl, C_5–C_8 cycloalkyl, phenyl, naphthyl, alkylphenyl and alkyl-naphthyl each alkyl substituent being C_1–C_{12}, and at least one of R^1 and R^2 is t—C_4–C_{12} alkyl,
R^3 and R^4 each represent C_1–C_{18} alkyl, or, when together cyclized, represent C_5–C_{12} cycloalkyl,
R^5 represents hydrogen, C_1–C_{18} alkyl, phenyl, C_1–C_8 hydroxyalkyl, C_1–C_8 aminoalkyl, C_1–C_8 alkoxyalkyl, C_5–C_{12} cycloalkyl, and alkylphenyl having C_1–C_8 alkyl;
R^6, R^7, R^8, R^9, represents C_1–C_{12} alkyl, C_1–C_8 hydroxyalkyl, C_1–C_8 aminoalkyl, C_1–C_8 alkoxyalkyl, and, C_5–C_{12} cycloalkyl, and which in combination, R^6 with R^7, and R^8 with R^9, represent C_5–C_{14} cycloalkyl having at least four of the C atoms cyclized;
R^{10} is selected from the group consisting of hydrogen, oxygen, hydroxyl, C_1–C_{18} alkyl and C_1–C_{18} acyl.

4,920,229
NOVEL ALKOXYIMINO ETHER DERIVATIVES OF 5-ACYL-2(1H)-PYRIDINONES
Winton D. Jones; Richard C. Dage, and Richard A. Schnettler, all of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio
Division of Ser. No. 166,147, Mar. 10, 1988, Pat. No. 4,849,522, which is a division of Ser. No. 834,692, Feb. 28, 1986, Pat. No. 4,732,982, which is a continuation of Ser. No. 548,398, Nov. 3, 1983, abandoned. This application Mar. 10, 1989, Ser. No. 321,704
Int. Cl.[5] **C07D** *405/12*
U.S. Cl. 546—283 **6 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof, wherein
R_1 is $C_{1\text{-}10}$ alkyl,
R_3 is H, lower alkyl, —C≡N, —NH_2, —$CONH_2$ and —COOR with R being hydrogen of lower alkyl,
R_4 is hydrogen or lower alkyl,
R_5 is thienyl or furyl, and
R_6 is hydrogen, $C_{1\text{-}10}$ alkyl, phenyl, X-substituted phenyl, hydroxy or lower alkoxy, and X is lower alkyl, lower alkoxy, lower alkylthio, lower alkyl sulfonyl, lower alkyl sulfoxyl, halogen, nitro, lower alkanoyl, alkoxycarbonyl, carboxy, cyano, NH_2, $CONH_2$, COOR with R being hydrogen or lower alkyl, amidino, imidazol-2-yl, or CF_3.

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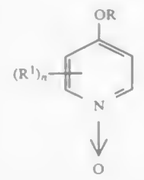
4,920,230

METHOD OF PRODUCING NITROGEN-CONTAINING HETEROAROMATIC COMPOUNDS HAVING AN ALKOXY GROUP

Masayasu Kato, Hyogo, Japan, assignor to Takeda Chemical Industries, Ltd., Higashi, Japan

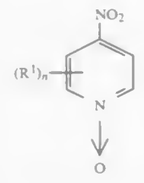
Filed Jun. 21, 1988, Ser. No. 209,374
Claims priority, application Japan, Jun. 29, 1987, 62-161899
Int. Cl.[5] C07D *213/62*
U.S. Cl. 546—290 7 Claims

1. A method of producing a compound of the formula



wherein R is C_{1-8} alkyl, C_{1-8} alkyl halogenated with fluorine, bromine, chlorine or iodine, C_{6-14} aryl or aralkyl which is derived from C_{6-14} aryl and C_{1-3} alkyl, R^1 is C_{1-8} alkyl, C_{1-8} alkoxy, carboxyl or halogen, and n is an integer from 0 to 4, which comprises:

reacting a compound of the formula



wherein R^1 and n are defined above,

with a compound of the formula

ROM

wherein R is as defined above, and M is alkali metal,

in the presence of a phase transfer catalyst selected from the group consisting of quaternary ammonium salt, quaternary phosphonium salt, crown ether, cryptand and mixtures thereof, and a base selected from the group consisting of alkali metal, alkali metal hydride, alcoholate, alkali metal carbonate, alkali metal hydrogen carbonate and alkali metal hydroxide.

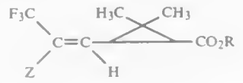
4,920,231

PROCESS OF BRAKING TRIFLOUROMETHYL COMPOUNDS

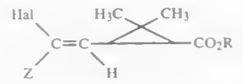
Werner Bonin, Kelkheim; Jean-Pierre Demoute, Neuilly Plaisance, and Jean Tessier, Vincennes, all of France, assignors to Roussel Uclaf, Paris, France

Filed Mar. 30, 1989, Ser. No. 331,732
Claims priority, application France, Mar. 31, 1988, 88 04260
Int. Cl.[5] C07D *213/55*
U.S. Cl. 546—300 13 Claims

1. A process for the preparation of a trifluoromethylvinyl compound of the formula (I) in all its possible stereoisomeric forms or mixtures thereof comprising reacting a salt of trifluoroacetic acid with a halovinyl compound of formula (II) in the presence of a cuprous salt to obtain the same stereo-specific trifluoromethylvinyl compound



(I)



(II)

Z is an electro-attracting group, Hal is a halogen, and R is a residue of a pyrethrinoid alcohol or an acid blocking alcohol.

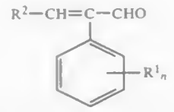
4,920,232

α,β-SUBSTITUTED ACROLEINS

Norbert Goetz, Worms; Stefan Karbach, and Hans-Gert Recker, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 27, 1988, Ser. No. 211,838
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1987, 3722886
Int. Cl.[5] C07D *213/56, 213/46, 211/30, 315/00*
U.S. Cl. 546—338 4 Claims

1. An α,β-substituted acrolein of the formula



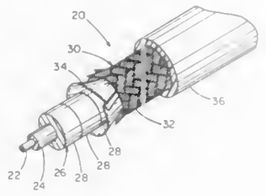
where R^1 is halogen, C_1–C_4-alkoxy, phenoxy, C_1–C_4-haloalkyl, C_1–C_4-haloalkoxy or nitro, n is an integer from 1 to 5, in the case of n being greater than 1 the R^1s being identical or different and in the event of nitro substitution the aromatic ring carrying not more than 3 nitro groups, and where R^2 is 2-pyridyl, 3-pyridyl or 4-pyridyl.

4,920,233

AUDIO CABLE

John W. Kincaid, Batavia, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 23, 1988, Ser. No. 235,297
Int. Cl.[5] H01B *7/34*
U.S. Cl. 174—36 4 Claims



1. A coaxial cable for use in carrying electrical signals in the audio frequency range, said cable comprising:

a relatively flexible elongate metallic core disposed at the center of said cable;

a relatively flexible sleeve of a dielectric material positioned about said core;

a relatively flexible metallic shield disposed outwardly of said sleeve and coaxial with said core; and

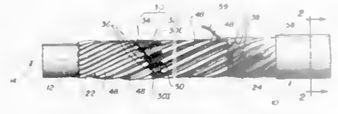
a layer formed of ferrite positioned between said sleeve and said shield, said layer being in contact with the dielectric sleeve substantially throughout the length of said cable, said layer being made up of a series of axially aligned ferrite sleeves, each of said ferrite sleeves being relatively rigid, whereby the layer of ferrite substantially increases the inductance of the cable without a concomitant substantial increase in energy loss so that the cable exhibits substantially constant phase velocity characteristics across the audio frequency band.

4,920,234

ROUND CABLE HAVING A CORRUGATED SEPTUM

Timothy A. Lemke, Carlisle, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 67,767, Jul. 8, 1987, Pat. No. 4,800,236, which is a continuation-in-part of Ser. No. 892,300, Aug. 4, 1986, abandoned. This application Oct. 17, 1988, Ser. No. 258,769
Int. Cl.[5] H01B *7/34*
U.S. Cl. 174—36 19 Claims



1. A cable comprising:

a substantially circular corrugated member having opposed surfaces thereon, each surface having an open groove formed therein, a conductive layer being disposed in each of the grooves, the conductive layers being in electrical contact with each other,

an electrical conductor disposed in each of the grooves, each conductor having a central axis extending therethrough, the axes of the conductors lying on a common, substantially circular locus,

a first and a second substantially circular conductive member respectively disposed in substantially concentric relationship adjacent one of the surfaces of the corrugated member and in electrical contact with the conductive layer on the surface to which it is adjacent,

each conductive member and the conductive layer which it is in contact cooperating to close an open groove and thereby to define an enclose tubular envelope receiving each conductor along its entire axial length,

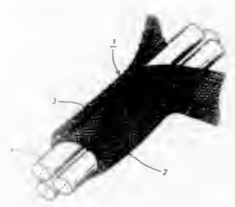
the conductive members and the conductive layers being, in use, at a predetermined electrical potential such that each conductor in each envelope is substantially totally electromagnetically isolated along its entire axial length.

4,920,235

CONDUCTIVE CABLE SHEATH

Akio Yamaguchi, Kasugai, Japan, assignor to Kitagawa Industries Co., Ltd., Aichi, Japan

Filed Nov. 28, 1988, Ser. No. 276,488
Claims priority, application Japan, Dec. 4, 1987, 62-185768[U]
Int. Cl.[5] H01B *7/34*
U.S. Cl. 174—36 4 Claims



1 A cable sheath for forming a conductive surface around a cable comprising

a shielding strip comprising hookable, conductive material, and

at least one fastener comprising a base and hook-like protrusions, wherein the hook-like protrusions are capable of hooking into and retaining the shielding strip securely in position around a cable.

4,920,236

SEALING CABLE JUNCTIONS

Minoru Makiyo, Yachimata; Shigenori Goto; Hiroshi Yokosuka, both of Sakura, all of Japan; Robert L. Curtis, Trowbridge, and Philip J. Wade, Somerset, both of United Kingdom, assignors to Fujikura Ltd., Tokyo, Japan and ALH Systems Limited, Wiltshire, United Kingdom

Continuation of Ser. No. 112,911, Oct. 23, 1987, abandoned. This application Mar. 20, 1989, Ser. No. 326,402
Claims priority, application United Kingdom, Oct. 24, 1986, 8625479; Japan, Jan. 21, 1987, 62-11697; United Kingdom, Aug. 5, 1987, 8718535
Int. Cl.[5] H02G *15/08;* H01R *43/00*
U.S. Cl. 174—77 R 30 Claims

1. An insert part for sealing a cable junction, said insert part comprising.

(a) a block of heat-fusible material, said block having a central region and outer regions on opposite sides of said central region;

(b) a flange of heat-conductive material located beyond one of said ends of said block, said flange being planar;

(c) a tongue of heat-conductive material connecting said flange to said block, said tongue being formed by a single

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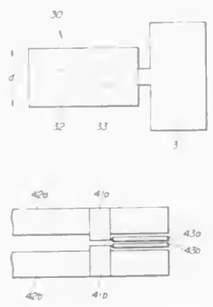
component extending only into said block from said flange; and



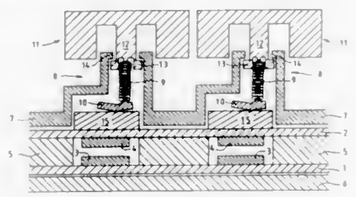
wherein at least a part of said central region of said block is thicker in a direction perpendicular to the plane of said flange than said outer regions.

4,920,237

MEMBRANE KEYBOARDS

Richard A. Eardley, Largs; Brian J. Keenan, Merrybill Park; Ian A. Lawson, Largs, all of Scotland, and John McAllister, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 2, 1989, Ser. No. 305,585
Int. Cl.[5] H01H *1/14*; B41J *19/04, 29/10*
U.S. Cl. 200—5 A 3 Claims



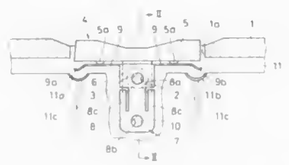
1. A membrane keyboard comprising an array of key buttons, a pair of substantially parallelly disposed flexible membranes (1,2) located beneath the array of key buttons, each membrane carrying a plurality of contact pads (3,4) at positions corresponding to the key buttons, and acoustic noise absorbing material located underneath the key buttons above the membranes, said acoustic noise absorbing material comprising an expanding ink material (15) printed on the membrane (2) adjacent the key buttons at least in the areas corresponding to the positions of the contact pads and key buttons.

4,920,238

SELF-CENTERING SWITCH

Hideo Aso, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan

Filed Nov. 1, 1988, Ser. No. 265,687
Claims priority, application Japan, Nov. 2, 1987, 62-168088[U]
Int. Cl.[5] H01H *21/24*
U.S. Cl. 200—6 R 5 Claims



1. A self-centering switch comprising: a circuit board having a pair of spaced-apart fixed electric contacts mounted on a surface thereof; a stationary support rod disposed between the pair of fixed contacts; a pivotable rocker bar having a bar portion and a leg portion depending from the bar portion, the leg portion comprising a pair of resiliently spreadable fingers resiliently engageable with the support rod to thereby pivotally mount the rocker bar for pivotal movement in opposite directions about the support rod; and an electrical contact member having a pair of resiliently flexible arms each carrying a movable electrical contact and being electrically and structurally connected to said circuit board, the pair of flexible arms being positioned so that the movable contacts are opposite respective ones of the fixed contacts and the flexible arms resiliently engaging with the bar portion of the rocker bar to normally resiliently bias the rocker bar to a neutral position on the support rod in which the movable contacts are spaced from the respective fixed contacts so that pivotal movement of the rocker bar in one direction to one actuated position causes resilient flexure of one arm to move the movable contact carried thereby into electrical contact with one fixed contact and pivotal movement of the rocker bar in the other direction to another actuated position causes resilient flexure of the other arm to move the movable contact carried thereby into electrical contact with the other fixed contact, the rocker bar being returned from the actuated positions to the neutral position by the resilient bias of the arms.

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ELECTRIC SWITCH, ESPECIALLY STEERING COLUMN SWITCH FOR MOTOR VEHICLES

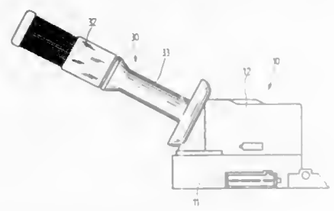
Roland Bühler, Heilbronn; Herbert Erdelitsch, Bietigheim-Bissingen; Walter Hecht, Bietigheim-Bissingen, and Horst Rachner, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

PCT No. PCT/EP87/00637, § 371 Date Jan. 23, 1989, § 102(e) Date Jan. 23, 1989, PCT Pub. No. WO88/09272, PCT Pub. Date Dec. 1, 1988
PCT Filed Oct. 28, 1987, Ser. No. 302,692
Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717251
Int. Cl.[5] H01H *9/00*; B60Q *1/14*
U.S. Cl. 200—61.54 11 Claims

1. In an electric steering column switch;

a hollow housing including a base plate lying in a first general plane and a cover overlying said base plate, said housing having an opening in one side thereof, an intermediate plate fixedly mounted within said housing between said base plate and said cover in spaced parallel relationship to said base plate, means defining a relatively large diameter cylindrical recess in said intermediate plate and a relatively small diameter bore in said cover in coaxial

alignment with each other along a first axis normal to said first general plane, a carrier, first and second pivot means on said carrier respectively received in said cylindrical recess and said bore to support said carrier within said housing for rotation relative to said housing about said first axis, said carrier having an internal recess therein extending inwardly of said carrier from the side of said carrier adjacent said one side of said housing, elongate lever means having a longitudinal axis and an inner end located within said internal recess in said carrier and projecting from said internal recess through said opening in said housing to an outer end accessible at the exterior of said housing, said lever means including a sleeve like outer member and a rod like inner member rotatable within said outer member about said longitudinal axis, third pivot



means mounting said sleeve like member upon said carrier for pivotal movement relative to said carrier about a third axis normal to said longitudinal axis and parallel to said first general plane, a first slide member mounted between said base plate and said intermediate plate for movement relative to said housing along a first linear path parallel to said first general plane, post means coupled to said first slide member and projecting from said first member into said internal recess in said carrier slide through a first opening in said intermediate plate and a second opening extending coaxially through said first pivot means on said carrier, and first coupling means rotatively fixed to said rod like member of said lever means and engaged with said post to drive said first slide member in movement along said first path upon rotation of said rod like member about the longitudinal axis of said lever means.

4,920,240

METHOD OF OPERATING AN ELECTRIC CIRCUIT CONTROLLING DEVICE

Ronald W. Poling, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 107,448, Oct. 13, 1987, abandoned, which is a division of Ser. No. 932,126, Nov. 18, 1986, Pat. No. 4,703,140.
This application Jul. 19, 1988, Ser. No. 221,113
Int. Cl.[5] H01H *35/34*
U.S. Cl. 200—83 P 26 Claims

26. A method of operating an electric circuit controlling device, the device including a housing having a seat therein, a snap disc having opposed convex and concave surfaces with a marginal edge interposed therebetween and being operable generally with discrete snap action movement between a stable configuration and an unstable configuration, force transmitting means for movement in the housing, a caged spring, actuator means for axial movement in the housing, rotatable means for rotatable movement in the housing, and a set of resilient switch elements operable generally between a plurality of circuit controlling positions, respectively, the method comprising the steps of;

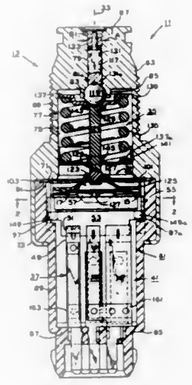
exerting the compressive force of the caged spring against the force transmitting means urging it toward an at-rest position in the housing;

applying the resiliency of at least one of the switch elements in one of the circuit controlling positions thereof onto the rotatable means rotating it into engagement with the actuator means to axially move the actuator means into abutment with the concave surface of the snap disc and biasing thereby the convex surface of the snap disc into engagement with the force transmitting means in the at-rest position thereof with the marginal edge of the snap disc being spaced from the housing seat;

subjecting the force transmitting means to fluid pressure and establishing thereby a force acting on the force transmitting means in opposition to the compressive force of the caged spring and the resiliency of the at least one switch element;

displacing the force transmitting means from its at-rest position when the force acting thereon exceeds a preselected force level and moving the snap disc conjointly with the force transmitting means toward the housing seat;

actuating the actuator means in part through its axial movement and the rotatable means in part through its rotatable movement and operating thereby the at least one switch element from the one circuit controlling position toward another of the circuit controlling positions thereof in



response to the movement of the snap disc toward the housing seat during the moving step;

seating the marginal edge of the snap disc in its stable configuration against the housing seat in response to the conjoint movement of the snap disc with the force transmitting means when the force acting thereon attains another preselected force level predeterminately greater than the first named preselected force level;

effecting the discrete snap action movement of the snap disc from the stable configuration toward the unstable configuration thereof when the force acting on the force transmitting means attains a third preselected force level predeterminately greater than the another preselected force level and transmitting the force from the snap disc in one direction onto the actuator means;

moving further the actuator means axially in response to the force transmitted in the one direction thereon by the snap disc upon its discrete snap action movement during the effecting step;

rotating further the rotatable means in response

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HIGH SENSITIVITY DOOR EDGE SWITCH

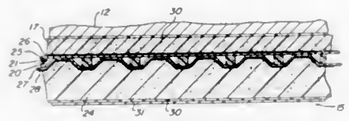
Norman K. Miller, Concordville, Pa., assignor to Miller Edge, Inc., Concordville, Pa.

Continuation of Ser. No. 40,607, Apr. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 812,075, Dec. 23, 1985, Pat. No. 4,661,664. This application Apr. 24, 1989, Ser. No. 342,642

The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.

Int. Cl.[5] H01H *3/16*

U.S. Cl. 200—86 R 12 Claims



1. A high sensitivity door edge switch used with a door having an edge for response to a low unit pressure applied over a large portion of the door edge, said door edge switch comprising, an inner element extending along the edge of said door having one face proximate the door edge, a resiliently compressible perforate spacer in facing relation with the other face of said inner element, said spacer including a plurality of spaced perforations extending generally perpendicular to said inner element, said spacer having a relatively greater elastic compressibility than said inner element, a substantially imperforate outer element in facing relation with said spacer remote from said inner element, said outer element having a relatively greater elastic compressibility than said spacer, said outer element being elastically deformable into the spacer perforations toward the inner element upon low unit pressure being applied over a large portion of the outer element and a pair of relatively flexible conductive elements located on opposite sides of said spacer and positioned respectively between the spacer and said inner and outer elements, said conductive elements being in spaced confronting relation through said spacer perforations in the absence of said low unit pressure and upon application of said low unit pressure to said outer element, at least one of said conductive elements deflecting into engagement with the other of said conductive elements by the elastic deformation of said outer element into all the spacer perforations encompassed by said large portion of the door edge.

4,920,242

ELECTRIC HIGH-VOLTAGE CIRCUIT BREAKER

Helmut Beier; Joaquin-Conrado Bohrdt, and Klaus Schuler, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

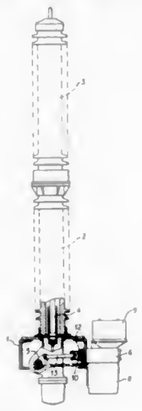
Filed Sep. 29, 1988, Ser. No. 251,107

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3733466

Int. Cl.[5] H01H *33/00*

U.S. Cl. 200—148 B 2 Claims

1. An electric high-voltage circuit breaker, wherein movable contacts are supported by support insulators and arranged in an interrupter unit and actuated by a switching rod of insulating material and a reversing gear at ground potential by a hydraulic drive, the hydraulic drive having a piston rod extending through a seal and being brought out of a hydraulic cylinder and connected by a fork head guided in a protective tube and, on a side facing the piston rod being provided with a guiding ring connected to the reversing gear, the hydraulic cylinder being disposed between two housings for parts associated with the drive, in the interior spaces of which housings a heater and connections for ventilation and exhaust are arranged, passages being provided in the hydraulic cylinder for



connecting the interior spaces of both housings to the interior of the protective tube.

4,920,243

PUSH BUTTON SWITCH DEVICE WITH ILLUMINATING MEANS

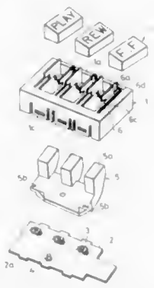
Tadashi Yuge, Iwaki, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1988, Ser. No. 180,297

Claims priority, application Japan, Aug. 11, 1987, 62-122800[U]

Int. Cl.[5] H01H *9/16*

U.S. Cl. 200—314 4 Claims



1. A push button switch device comprising:
a casing having a plurality of walls;
a pair of rockable members formed in an integral relationship with said casing, each of said rockable members extending from a first wall of said casing in a cantilever relationship with said first wall and each of said rockable members terminating in a free end, the free end of each rockable member including a protective wall extending vertically up from said free ends;
a pushing member connecting said free ends of said rockable members;
a key top supported on said protective walls;
a circuit board affixed to said casing and being positioned below and adjacent to said pushing member;
a switch means mounted on said circuit board below said pushing member in an operative relationship with said pushing member such that when said key top is pushed, the deflection of said rockable members causes said pushing member to activate said switch means;
a light introducing member positioned above said circuit board and within said casing, said light introducing member having a portion which extends between said pushing member and under said key top to introduce light to said key top; and
a light source mounted on said circuit board in an operative relationship with said light introducing member, whereby light from the light source is conducted to said key top through said light introducing member.

4,920,244

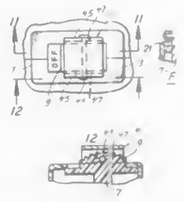
VACUUM CLEANER SWITCH RETAINER

Joseph J. Gundlach, 121 Moonglow Dr., Belleville, Ill. 62221

Continuation of Ser. No. 38,223, Apr. 14, 1987, abandoned. This application Aug. 10, 1988, Ser. No. 233,994

Int. Cl.[5] H01H *3/20*

U.S. Cl. 200—321 6 Claims



1. In an electrically powered appliance having a multiple position switch controlling application of power to the appliance, the switch being biased to one position whereby a user of the appliance can maintain the switch in another non-biased positon only by a constant application of manual force, an improvement comprising means for locking the switch in its non-biased position and maintaining the switch in that position without the constant application of manual force, the locking means including means slidably coacting with the switch and moving from a first position to a second position as the switch is moved from its biased to its non-biased position, the coacting means locking the switch in its non-biased position when the coacting means reaches its second position, the switch comprising a finger operated button movable from one position to another to move the switch from its biased to its non-biased position, and the locking means including a cap fitting over the button and resting on the cover of the appliance.

4,920,245

A PUSH-BUTTON SWITCH WITH UNIFORM ON AND OFF TIMINGS

Yasunari Takano, and Mitsuhiro Okada, both of Iwaki, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

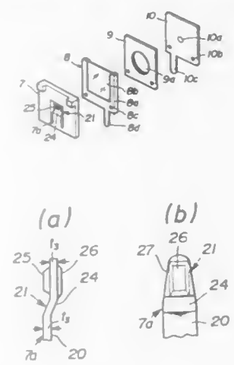
Filed Jun. 30, 1988, Ser. No. 213,374

Claims priority, application Japan, Oct. 22, 1987, 62-160750[U]

Int. Cl.[5] H01N *3/42*

U.S. Cl. 200—533 1 Claim

1. In a push-button switch having a casing, a pressing spring which operates upon movement of said stem, and a switch element disposed in said casing, said switch element operating so that when said stem is depressed, an acting projection of said pressing spring presses against a movable contact element pressing portion at an end of a leg portion of a pressing piece of said switch element causing a movable contact element of said switch element to contact a fixed contact element, and when the depressing force is removed, said push-button switch is returned to its non-depressed original state, the improvement comprising a movable contact element pressing portion of said pressing piece that gradually narrows, wherein said movable contact element pressing portion is of substantially the same thickness of material as said leg portion of said pressing piece, and said movable contact element pressing portion of said pressing piece is offset from said leg portion of said pressing piece, and said movable contact element pressing portion of



said pressing piece has a projection provided on a surface thereof for contacting with said acting projection of said pressing spring, and said movable contact element pressing portion of said pressing piece has a rib provided on the opposite face thereof for pressing against said movable contact element.

4,920,246

HIGH FREQUENCY HEATING APPARATUS USING MICROCOMPUTER CONTROLLED INVERTER

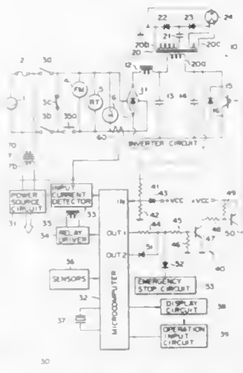
Masayuki Aoki, Ichinomiya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 21, 1989, Ser. No. 326,682

Claims priority, application Japan, Mar. 28, 1988, 63-73793

Int. Cl.[5] H05B *6/68*

U.S. Cl. 219—10.55 B 9 Claims



1. A high frequency heating apparatus comprising:
a high frequency heating source for providing a predetermined high frequency heating output;
inverter means for receiving an AC input and providing a high frequency output for driving said high frequency heating source, said inverter means including rectifying

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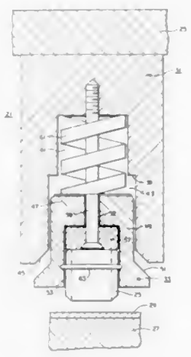
means for rectifying the AC input and a switching element for switching a DC output from said rectifying means;
voltage detecting means for detecting an output voltage value from said switching element of said inverter means;
microprocessing means for outputting on On/Off signal with generation timing determined by interrupt processing in accordance with output voltage value detected by said voltage detecting means, said microprocessing means including:
(a) generating means for generating a reference clock;
(b) counter means for counting reference clocks generated by said generating means in accordance with a set output value associated with the high frequency heating output;
(c) ON/OFF signal generating means for outputting the ON/OFF signal having the ON and OFF periods corresponding to a count result of said counter means;
driving means for driving said switching element of said inverter means in accordance with the ON/OFF signal output from said microprocessing means.

4,920,247

RESISTANCE WELDING

Thomas A. Ward, Holts Summit, and Larry K. Gove, Linn, both of Mo., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 14, 1988, Ser. No. 270,559
Int. Cl.[5] B23K *11/02, 9/24*
U.S. Cl. 219—103 **11 Claims**



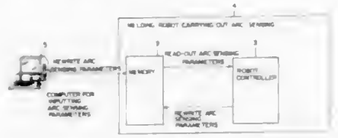
9. In resistance welding apparatus for joining metallurgically a member of small transverse cross-section endwise to a plate by transmitting welding current through welding electrodes and said member and plate; a holder for said member including: an electrically conducting block having a cavity therein, said block being shaped to form a joint of low electrical resistance with one of said electrodes when in engagement therewith, a collet for receiving said member, and means connected to said bloc and collet axially movable within said cavity, said block and collet having means cooperative to actuate said collet to clamp a member and to establish a path of low electrical resistance through said block, said collet and said member by the movement inwardly of the cavity of said collet under the force exerted between said member and plate when said member is brought into engagement with said plate to be metallurgically joined to said plate.

4,920,248

ARC SENSING WELDING APPARATUS CONTROLLED BY PROGRAM

Kenichi Toyoda, Hino; Toru Mizuno, Tama; Nobutoshi Torii; Yuichi Kanda, both of Hachioji, and Shigehiro Morikawa, Atsugi, all of Japan, assignors to Fanuc, Ltd., Yamanashi, Japan

PCT No. PCT/JP88/00048, § 371 Date Sep. 22, 1988, § 102(e) Date Sep. 22, 1988, PCT Pub. No. WO88/05363, PCT Pub. Date Jul. 28, 1988
PCT Filed Jan. 23, 1988, Ser. No. 261,966
Claims priority, application Japan, Jan. 23, 1987, 62-12579
Int. Cl.[5] B23K *9/12*
U.S. Cl. 219—124.34 **6 Claims**



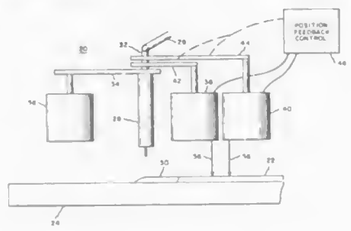
1. An automatic welding apparatus for carrying out an arc sensing control operation in accordance with an operating program which is incorporated therein, comprising:
a deviation detecting means for detecting deviations of a welding electrode from a predetermined path in an up or down direction and right or left direction by detecting variations in a welding current while welding in a weaving manner;
a deviation correcting means for correcting said deviations;
a memory means for storing parameters for arc sensing; and
a memory automatic rewriting means for automatically rewriting parameters in said memory means at a predetermined time in accordance with said operating program.

4,920,249

WELD BEAD WETTING ANGLE DETECTION AND CONTROL

Michael H. McLaughlin, Scotia; Carl M. Penney, Schenectady, and Robert E. Sundell, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 8, 1989, Ser. No. 351,000
Int. Cl.[5] B23K *9/12*
U.S. Cl. 219—130.21 **20 Claims**



1. A method comprising the steps of:
producing a bead by moving a bead producing tool along one or more workpieces, said bead having first and second bead wetting angles, each bead wetting angle being between a corresponding edge of said bead and an adjacent surface on said one or more workpieces;
generating profile information by use of at least a first optical profiler head moved along said bead, said profile information representative of the profile of at least part of said bead behind said bead producing tool;
deriving bead wetting angle data representative of at least one of said first and second bead wetting angles from said profile information;

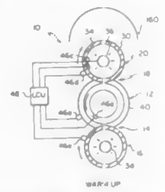
comparing the bead wetting angle data to at least one reference;
calculating a changed value for at least one parameter, which parameter affects at least one of said bead wetting angles, said changed value of said at least one parameter being dependent on the results of the comparison; and
changing the operation of said bead producing tool based on the changed value of said at least one parameter to realize feedback control of said at least one of said first and second bead wetting angles.

4,920,250

FUSING APPARATUS WITH SELF-LEARNING HEATER

Carl T. Urban, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 29, 1988, Ser. No. 291,837
Int. Cl.[5] H05B *1/00;* **G03G** *15/00*
U.S. Cl. 219—216 **10 Claims**



1. In an electrostatographic copier or printer, an apparatus for fusing tone images to suitable substrates or copy sheets of paper by heat and pressure, the apparatus including:
(a) a pressure roller;
(b) a fuser roller forming a fusing nip with said pressure roller through which substrate or copy sheets carrying toner images for fusing can be run; and
(c) a self-learning heater roller in heat transfer relationship with said fuser roller for effectively replacing heat lost by said fuser roller to such substrates or copy sheets, said heater roller including (i) logic and control means capable of monitoring temperature variations due to heat lost by said fuser roller to such substrates or copy sheets, (ii) a heat source for heating said heater roller to original temperature setpoint, and (iii) means for resetting such original temperature setpoint of said heater roller in direct response to such monitored temperature variations.

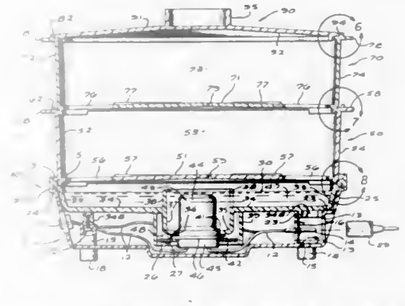
4,920,251

COMPACT, EFFICIENT, EASY-TO-CLEAN FOOD STEAMER FOR HOME USE, WITH SAFETY FEATURES AND VERSATILE MODULAR FOOD COMPARTMENT

Joan E. Whitenack, Arcadia; George Sanchez, Northridge; Earlyn W. Stone, Nuevo, and Buddy A. Colton, El Monte, all of Calif., assignors to Acry Industries, Incorporated, Azusa, Calif.

Filed Feb. 28, 1989, Ser. No. 317,013
Int. Cl.[5] A47J *27/05*
U.S. Cl. 219—401 **11 Claims**

1. Apparatus for steam-cooking food, comprising:
means for receiving a quantity of water and applying heat to convert the water to steam;
at least one unitary molded plastic basket closely but removably fitted to the receiving-and-applying means to capture the steam, and having:
a perforated floor for supporting such food, and for passing the steam upward into the basket and returning condensed steam as water to the receiving-and-applying means for reuse, said floor having a periphery, and
four upstanding walls, erected substantially along the periphery, for confining the steam and such food in mutual contact; and
a plastic cover dimensioned to be closely but removably fitted upon the walls of the basket to confine the steam within the basket and to collect some condensed steam for return through the floor for reuse;
whereby water and food-juice deposits are easily cleaned from the floor of the plastic basket; and
whereby the basket and cover together can retain the steam in contact with such food without any added exterior enclosure;
a second unitary plastic basket interposed between the first-mentioned basket and the cover, and closely but removably fitted to the first-mentioned basket to capture steam rising therefrom, for supporting and confining additional such food and steam in mutual contact, said second basket having:
a perforated floor for supporting such food, and for passing the steam upward into the basket and returning condensed steam as water through the first-mentioned basket to the receiving-and-applying means for reuse, said floor of the second basket having a periphery, and
four upstanding walls erected substantially along the periphery of the second basket floor for confining such additional food and steam in mutual contact; said second-basket walls being dimensioned to be closely but removably interfitted, in place of the first-mentioned-basket walls, with the cover; and



whereby the apparatus is selectably usable, at the option of a user, either for larger quantities of food without duplication of the receiving-and-applying means and cover, or for smaller quantities of food without wasting time and heat required to fill two baskets with steam;
wherein the walls of the baskets are dimensioned for close mutual fitting of the second basket inverted upon the first-mentioned basket to form therewith a single double-height enclosure for large pieces of such food; and
wherein the cover is dimensioned for close fitting upon the floor of the second basket when inverted, to confine the steam within the double-height enclosure;
whereby the apparatus is further selectably usable for such larger quantities of food, at the option of a user, either in the form of shallow pieces of such food which could not be as quickly and effectively cooked if all stacked together in a double-height enclosure, or tall pieces of such food which could not fit within the height of a single basket.

4,920,252

TEMPERATURE CONTROL METHOD FOR DISTRIBUTING POWER TO A PLURALITY OF HEATING ELEMENTS

Tatsuo Yoshino, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 14, 1988, Ser. No. 270,589
Claims priority, application Japan, Feb. 5, 1988, 63-25333
Int. Cl.[5] H05B *1/02*
U.S. Cl. 219—497 **6 Claims**

1. In a temperature control method using a heating means and a temperature detecting means for each of a plurality of

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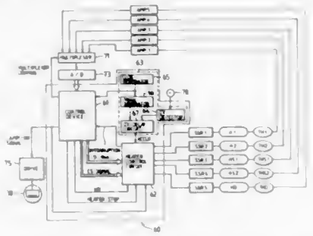
objects which are temperature controlled according to sequential, predetermined intervals of time designated as heater switching control cycles, said method comprising the steps of:

(a) controlling the heating of each of said heating means, for each cycle of said heater switching control cycles, by measuring and storing a temperature of each of said objects using said temperature detecting means, and in response thereto, allocating a specific length of actuating time and a specific cycle portion for controlling a heating means of each respective object, such that a total energy



requirement for activating a subset of said heating means at any given time during said each cycle is maintained within a range of a predetermined rated capacity; and

(b) actuating each of said heating means according to said specific length of actuating time and said specific cycle portion.

4,920,253

CONTROL DEVICE FOR A COOKING APPARATUS WHICH CONTROLS A PLURALITY OF FUNCTIONS USING A SINGLE RESISTANCE ELEMENT

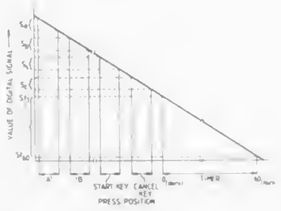
Tamotsu Takei, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Continuation of Ser. No. 65,370, Jun. 23, 1987, abandoned. This application Jan. 5, 1989, Ser. No. 293,611

Claims priority, application Japan, Jun. 24, 1986, 61-147535; Oct. 24, 1986, 61-253205

Int. Cl.[5] H05B *1/02*

U.S. Cl. 219—506 15 Claims



1. A control device for a cooking apparatus, comprising:

input means for allowing designation of commands of a plurality of different cooking conditions, including a plurality of manually operable contact keys;

common resistance means responsive to a manual operation of the contact keys, for generating a voltage within a defined range corresponding to one of the contact keys which has been operated, including a single, continuous resistance element, across which a voltage is applied, and an area of which is connected to produce a voltage based on which key has been operated; and

processor means responsive to the voltage from the resistance means for determining whether said voltage from said resistance means is any one of a plurality of acceptable voltages, generated by a corresponding proper depressing of said input means or an unacceptable voltage having a value between two adjacent acceptable voltages generated by an improper depressing of said input means and for recognizing one of the plurality of commands based on the acceptable voltage, the processor means overriding the unacceptable voltage from the resistance means for avoiding a false recognition of the designated command thereby.

4,920,254

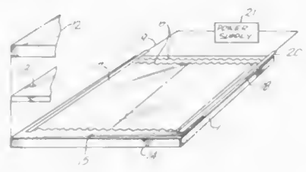
ELECTRICALLY CONDUCTIVE WINDOW AND A METHOD FOR ITS MANUFACTURE

Howard S. DeCamp, Northridge; John A. Raffo, Simi Valley, and Alex Z. Bimanand, Burbank, all of Calif., assignors to Sierracin Corporation, Sylmar, Calif.

Filed Feb. 22, 1988, Ser. No. 158,579

Int. Cl.[5] B60L *1/02*

U.S. Cl. 219—547 23 Claims



1. A method for forming a window including an electrically conductive layer on at least a portion of its surface comprising:

selecting a rigid transparent substrate;

coating a surface of the substrate with a solution comprising an ultraviolet polymerizable acrylate resin and a solvent for the resin;

evaporating substantially all of the solvent to leave a base coat of polymerizable acrylate resin on the substrate;

exposing the base coat to sufficient ultraviolet radiation to polymerize the acrylate, said coating through polymerizing steps being conducted in an environment at a temperature in the range of from 60° to 65° F. and at a relative humidity in the range of from 30 to 50%; and

depositing an electrically conductive metal layer on at least a portion of the base coat.

4,920,255

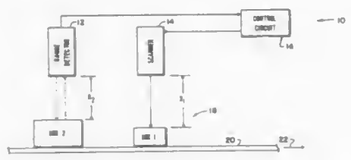
AUTOMATIC INCREMENTAL FOCUSING SCANNER SYSTEM

Stephen C. Gabeler, Sudbury, Mass., assignor to Stephen C. Gabeler, Canton, Mass.

Filed Oct. 31, 1988, Ser. No. 264,872

Int. Cl.[5] G06K *7/10, 7/14*

U.S. Cl. 235—454 15 Claims



1. An automatic incremental focusing scanner system for optically reading a code pattern on an object, comprising:

scanner means for directing a radiation beam onto the object at one of a plurality of focal lengths;

range means for determining the range of the object relative to said scanner means;

means for altering the focal length to selectively focus the radiation beam; and

control means, responsive to said range means, for commanding said means for altering to adjust the focal length established by said means for altering based on the determined range to enable accurate reading of the code pattern.

4,920,256

UNIVERSAL ELECTRONIC PAYMENT TERMINAL BASE INCLUDING MEMORY CARD PROGRAMMING VOLTAGE BOOSTER

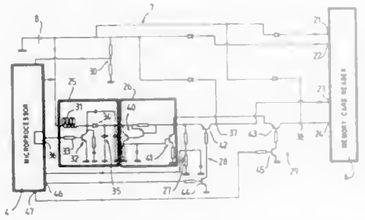
Jacques Marty; Jérome Tremblet, both of Bourg les Valence, and Jean-Jacques Delorme, Valence, all of France, assignors to Crouzet, Paris, France

Filed Mar. 1, 1988, Ser. No. 162,541

Claims priority, application France, Mar. 2, 1987, 87 02788

Int. Cl.[5] G05K *1/00*

U.S. Cl. 235—441 8 Claims



1. A base for an electronic memory card payment terminal, said base comprising a microprocessor connectable to an electric supply source, memory means for storing an application program and a transaction program, said memory means connected to said microprocessor, receiving means included in said microprocessor for the reception of customer identification information, a memory card reader driven by said microprocessor, and a voltage source for programming memory cards, said voltage source being derived from said electric supply source and being variable to meet various programming voltage requirements, said electric supply source being no greater than the smallest of the programming voltages required, said voltage source comprising a voltage booster circuit provided between said electric supply source and said memory card reader and a variable cyclic ratio pulse generator circuit for controlling said voltage booster circuit.

4,920,257

LIGHT FILTER WITH ATUOMATIC REGULATION OF OPTICAL TRANSMISSION

Rupert Fuerthbauer, and Rolf Bruhin, both of Kratzstrasse 35, CH-8620 Wetzikon, Switzerland

Filed Oct. 9, 1987, Ser. No. 107,331

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1986, 3634508

Int. Cl.[5] G02F *1/13; G05D 25/02*

U.S. Cl. 250—201.1 15 Claims

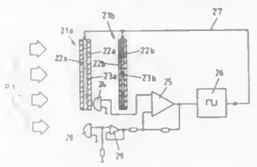
1. Light filter means with automatic regulation of optical transmission comprising:

a liquid crystal filter element which is adjustable to vary the optical transmission of visible light therethrough;

a first optical sensor for detecting incident and background light, said first optical sensor producing an electric signal for regulating the optical transmission of said liquid crystal filter element in accordance with the radiation received by said first sensor, said first optical sensor being located behind said liquid crystal filter element in the direction of radiation emission;

a second optical sensor being arranged beside or in front of said liquid crystal filter element in the radiation emitting direction;

a regulating circuit for controlling the optical transmission of visible light through said liquid crystal filter element including a subtraction circuit which subtracts the signal



generated by one of said first and second optical sensors from the signal of the other of said first and second optical sensors, the output signal of said regulating circuit being at least approximately proportional to the amount of visible light in front of said filter element.

4,920,258

RECORDING APPARATUS WITH CARRIAGE-DRIVING/SHEET-FEEDING MECHANISM

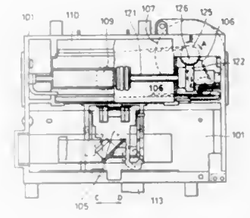
Yasuhide Saito, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1989, Ser. No. 299,343

Claims priority, application Japan, Jan. 30, 1988, 63-20804

Int. Cl.[5] G01D *15/24*

U.S. Cl. 346—134 6 Claims



2. A recording apparatus comprising:

a carriage for carrying a printing head capable of recording on a recording sheet;

a drive belt secured to said carriage for reciprocating said carriage relative to the recording sheet when said drive belt is driven;

a rotatable feed roller for feeding the recording sheet past the printing head when said feed roller is driven;

a reversible motor having a rotatable motor shaft for driving said drive belt and said feed roller;

a drive pulley mounted to said motor shaft to rotate therewith, wherein said drive belt passes over said drive pulley to reciprocate said carriage in different directions when said motor shaft is rotated in respective different directions;

a worm wheel mounted to said feed roller to rotate therewith to feed a recording sheet when said worm wheel is rotated in a predetermined direction;

a worm gear mounted to said motor shaft to rotate therewith, wherein said worm gear meshes with said worm wheel to rotate said worm wheel in different directions when said motor shaft is rotated in respective different directions; and

a one-way clutch cooperating with said feed roller and said

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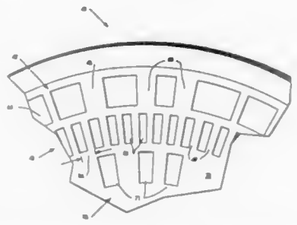
worm wheel to transmit the rotation of said worm wheel to said feed roller only in the predetermined direction.

4,920,259

APPARATUS FOR PRODUCING A PHASE INSENSITIVE INDEX PULSE FOR MOTION ENCODERS

Howard Epstein, Los Altos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 30, 1988, Ser. No. 252,222
Int. Cl.[5] G01D *5/34*
U.S. Cl. 250—237.13 19 Claims



9. An encoder for indicating an object's movement along a route, the encoder comprising:

emitter means for emitting energy along an energy path;

energy modulation means positioned in the energy path for modulating the energy in response to the object's movement along the route, the energy modulation means including a code member having an incremental movement energy modulation track that extends along the route, and at least one set of two index energy modulation tracks, the two index energy modulation tracks of each set being positioned on opposite sides of, and a substantially equal distance from the incremental movement energy modulation track.

incremental movement detector means positioned in the energy path for receiving the energy modulated by the incremental movement energy modulation track and for generating at least one encoder output signal in response to the object's movement along the route;

one set of two index detector means for each set of index energy modulation tracks, the two index detector means of each said set being positioned in the energy path on opposite sides of, and a substantially equal distance from the incremental movement energy modulation track, for receiving the energy modulated by one of the sets of index energy modulation tracks and for generating two index signals that each reach their extreme amplitude at least once during each excursion of the object across the route, the two index signals reaching their respective extreme amplitude simultaneously when there is no misalignment between the energy modulation means and the incremental movement and index detector means; and

means for combining the two analog index signals for obtaining a phase insensitive index pulse.

4,920,260

DETECTOR SYSTEM FOR OPTICAL MOUSE

Kenneth E. Victor, Mountain View, and Carl A. Goy, Fremont, both of Calif., assignors to MSC Technologies, Inc., Fremont, Calif.

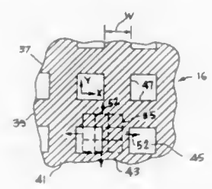
Filed Aug. 30, 1988, Ser. No. 238,716
Int. Cl.[5] G01V *9/04*
U.S. Cl. 250—221 23 Claims

1. An improved optical position detector system comprising, means forming a surface having a grid pattern thereon with two sets of intersecting orthogonal grid lines, said grid lines having a predetermined width and a first reflectivity and defining spaces therebetween of a second contrasting reflectivity;

an optical mouse movable over said surface, and including means for illuminating a portion of said grid pattern on said surface, and

an array of detector elements disposed for imaging areas of said illuminated portion, each of said elements being operative to generate an electrical signal proportional to the quantity of light received from said illuminated portion, said array including

at least four pairs of elements for detecting motion of said mouse in a particular first direction relative to said surface, two of said pairs forming a first set of pairs and two of said pairs forming a second set of pairs, said elements of each said set being disposed within said array such that when any one element of a pair in a set images a space, the other element of the pair images a line, and movement of



said mouse in said first direction over a distance of at least said line width causes a change in the voltage level of the electrical signal generated by one element in said first set which is approximately 180 degrees out-of-phase with the change in the voltage level of the electrical signal generated by another element in said first set, and a change in the voltage level of the electrical signal generated by one element in said second set which is approximately 180 degrees out-of-phase with the change in the voltage level of the electrical signal generated by another element in said second set, and such that the electrical signal generated by said one element in said first set either lags in time or leads in time the electrical signal generated by said one element in said second set; and

system processor means operative to receive said electrical signal from each of said elements and to determine an amount and direction of movement of said mouse in said first direction.

4,920,261

BIREFRINGENT OPTICAL FIBER DEVICE FOR MEASURING OF AMBIENT PRESSURE IN A STABILIZED TEMPERATURE ENVIRONMENT

Wojtek J. Bock, Gloucester, Canada, and Andrzej W. Domanski, Warszawa, Poland, assignors to Universite Du Quebec A Hull, Huli, Canada

Filed May 24, 1989, Ser. No. 356,244
Int. Cl.[5] G02F *1/01*
U.S. Cl. 250—225 11 Claims

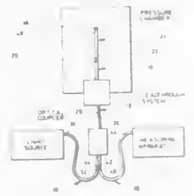
1. Birefringent optical fiber device for measuring of ambient pressure in a stabilized temperature environment, when connected respectively to a light source and a measuring apparatus, comprising:

first means for receiving polarized light from said light source, and transmitting said polarized light;

a birefringent optical fiber having a solid content, said birefringent fiber being connected to said first means for receiving said polarized light which has light signal components polarized along two orthogonal polarization axes of said birefringent fiber, said birefringent optical fiber having a preselected length determined by a range of pressures to be measured, said polarized light being injected into said birefringent fiber in a direction parallel to a

longitudinal axis of said birefringent fiber, said birefringent fiber being adapted to be submitted to said environment; and

second means for receiving light signals emitted from said birefringent fiber, said light signals having an elliptical polarization state characterized by major and minor axes,



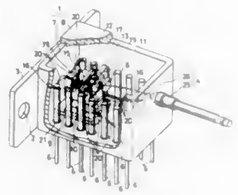
whereby cross-talk between said light signal components along said polarization axes being responsive to said ambient pressure in said environment, said measuring apparatus detecting said light signals from said second means to provide an output signal indicative of said ambient pressure.

4,920,262

PHOTOELECTRIC DEVICE WITH LEADS

Kunio Aiki; Atsushi Sasayama; Tugio Nemoto; Makoto Haneda, all of Komore; Satoru Ishii, Tamamura; Haruo Kugimiya, Komoro, and Tutomu Kawasaki, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Tobu Semiconductor, Saitama, both of, Japan

Division of Ser. No. 54,392, May 26, 1987, Pat. No. 4,803,361.
This application Feb. 3, 1989, Ser. No. 305,542
Claims priority, application Japan, May 26, 1986, 61-119235; May 26, 1986, 61-119234; May 26, 1986, 61-119233; May 26, 1986, 61-119236; May 26, 1986, 61-119219
Int. Cl.[5] H01J *5/16*
U.S. Cl. 250—227.11 12 Claims



1. A photoelectric device mounted in a box shaped package comprising:

a central recess formed by walls extending from a bottom wall and lid covering the recess:

an optical fiber cable passing through a fiber guard in one wall into the recess;

a plurality of first leads extending through the walls of said package, said first leads being aligned in a row and having a portion which is outside of said housing wall and a portion which is positioned in the recess for connection to leads on said photoelectric source by ultrasonic bonding;

a plurality of second leads corresponding to said first leads, each of said second leads being connected to said portion of the corresponding first lead which is outside of said housing wall by welding;

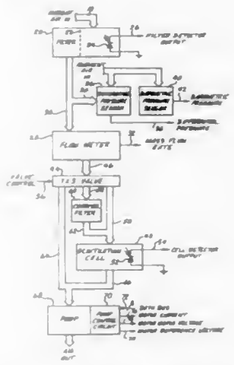
said second leads having a diameter adapted to fit into a socket and providing a first rigidity against vibration that may occur during ultrasonic bonding and at least the portions of said first leads positioned in said recess having a diameter which is greater than that of the second leads and a second rigidity against vibration that may occur during ultrasonic bonding which is greater than the first rigidity.

4,920,263

RADON DETECTION SYSTEM

Keith S. Fimian, Dunn Loring; John E. McGreevy, McLean; Brian P. Fimian, Falls Church, all of Va., and Richard W. Tucker, Timonium, Md., assignors to Gemini Research, Inc., McLean, Va.

Filed Jan. 26, 1988, Ser. No. 148,729
Int. Cl.[5] G01T *1/20;* **G01V** *5/00*
U.S. Cl. 250—255 73 Claims



1 A radon detection system comprising:

first means for measuring an airborne radon level, said first means comprising a particulate filter for collecting at least one radon decay product, means for directing ambient air through said filter, a first detector for detecting radon decay product collected by said filter, and a second detector for detecting radon gas in the filtered air exiting form said filter;

second means for monitoring at least one additional environmental parameter other than radon level; and

recording means connected to said first and second means for recording on a common recording medium the measured radon level and the contemporanious value of said additional environmental parameter.

4,920,264

METHOD FOR PREPARING SAMPLES FOR MASS ANALYSIS BY DESORPTION FROM A FROZEN SOLUTION

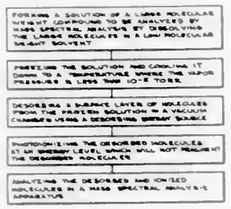
Christopher H. Becker, Menlo Park, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Jan. 17, 1989, Ser. No. 298,649
Int. Cl.[5] H01J *44/04*
U.S. Cl. 250—282 24 Claims

1. A method useful for preparing a sample of nonvolatile molecules for mass spectral analysis which comprises:

(a) providing a solution containing one or more types of molecules to be analyzed dissolved in a solvent selected from the class consisting of water, 1–5 carbon organic solvents, and mixtures thereof to form a solution;

(b) freezing said solution of dissolved molecules to form a frozen solution; and



(c) exposing said frozen solution to a source of laser radiation energy to desorb molecules to be analyzed from the surface of said frozen solution.

4,920,265

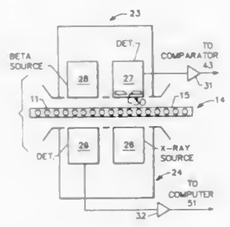
SYSTEM FOR DETERMINING THE BASIS WEIGHT OF CORD REINFORCED TIRE FABRIC

Lee M. Chase; John Goss, and Philip M. Hegland, all of Cupertino, Calif., assignors to Measurex Corporation, Cupertino, Calif.

Continuation of Ser. No. 814,384, Dec. 30, 1985, abandoned. This application Oct. 25, 1988, Ser. No. 265,314

Int. Cl.[5] G01N *23/06*

U.S. Cl. 250—308 20 Claims



1. A system for determining the weight per unit area of a sheet of material having a core comprised of spaced cords which comprises:

(a) a radiation source for irradiating an area of said sheet with radiation;

(b) first means for generating a first signal dependent on the fraction of the radiation from said radiation source which passes through said sheet;

(c) second means for providing a second signal representative of the fractional area of the material between the cords; and

(d) third means for altering said first signal by an amount dependent on the second signal.

4,920,266

CORONA GENERATING DEVICE

Louis Reale, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 27, 1989, Ser. No. 328,844

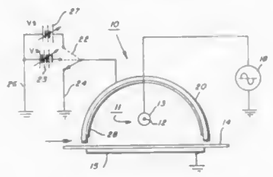
Int. Cl.[5] H01T *19/00*

U.S. Cl. 250—324 17 Claims

1. A corona generating device for depositing a negative charge on an imaging surface carried on a conductive substrate held at a reference potential comprising;

at least one elongated conductive corona discharge electrode supported between insulating end blocks,

means to connect said electrode to a corona generating potential source, at least one element adjacent said corona discharge electrode capable of adsorbing nitrogen oxide species generated when said corona discharge electrode is energized and capable of desorbing nitrogen oxide species when said electrode is not energized, said at least one element being coated with a substantially continuous thin



conductive dry film of aluminum hydroxide containing graphite and powdered nickel, said film having been formed from a liquid dispersion of aluminum hydroxide containing from about 7 to about 13 percent by weight graphite and from about 3 percent to about 10 percent by weight nickel by weight of the total weight of the dispersion.

4,920,267

METHOD OF DETECTING NOISE IN IMAGE SIGNALS

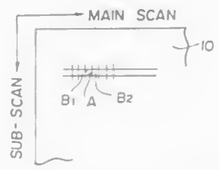
Takehumi Nagata, and Tsutomu Kimura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 11, 1988, Ser. No. 179,821

Claims priority, application Japan, Apr. 15, 1987, 62-92757; Apr. 15, 1987, 62-92761; Apr. 15, 1987, 62-92762; Apr. 16, 1987, 62-93634

Int. Cl.[5] G01N *23/04*

U.S. Cl. 250—327.2 62 Claims



1. A method of detecting noise in image signals which are obtained by exposing a stimulable phosphor sheet carrying a radiation image stored thereon to stimulating rays, and photoelectrically detecting light emitted by the portion of the stimulable phosphor sheet exposed to the stimulating rays in proportion to the stored radiation energy by use of a photodetector, and which represent the radiation image, is detected,

the method of detecting noise in image signals comprising the steps of:

(i) comparing the image signal a at each remark picture element A with values (b1+T1), (b2+T2), ..., (bn+Tn) obtained by adding predetermined values T1, T2, Tn respectively to image signals b1, b2, ..., bn at a plurality of picture elements B1, B2, ..., Bn in the vicinity of said remark picture element A, and

(ii) recognizing that noise is contained in said image signal a in the case where said image signal a attains a value larger than every one of said values (b1+T1), (b2+T2), ..., (bn+Tn).

4,920,268

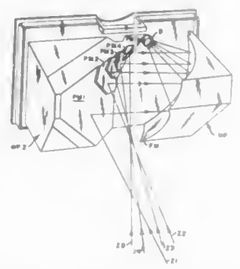
PASSIVE INFRARED DETECTION SYSTEM WITH SUBSTANTIALLY UNIFORM SENSITIVITY OVER MULTIPLE DETECTION ZONES

Robert E. Walters, Webster, and David B. Lederer, Rochester, both of N.Y., assignors to Detection Systems, Inc., Fairport, N.Y.

Filed Jan. 31, 1989, Ser. No. 304,025

Int. Cl.[5] G01J *5/08*

U.S. Cl. 250—353 8 Claims



1. A passive infrared detection system comprises an infrared radiation-sensitive detector and a reflective optical system for focusing infrared radiation emanating from a plurality of detection zones onto said detector, said reflective optical system comprising a focusing element having an apparent focal length dependent upon the displacement of incident rays from the optical axis of said element, and a plurality of planar reflectors arranged at different angles with respect to such optical axis to provide the detection system with said plurality of detection zones, each zone having a different maximum detection range associated with it, said planar reflectors being arranged with respect to said focusing element so that each planar reflector cooperates with a different portion of the focusing element to project onto said detector a relatively constant size image of a given target located at the maximum range associated with that planar reflector.

4,920,269

LIQUID SCINTILLATION SOLUTION FOR MEASURING ^{222}RN IN CHARCOAL

Daniel Perlman, Arlington, Mass., assignor to Brandeis University, Waltham, Mass.

Filed Nov. 7, 1988, Ser. No. 268,172

Int. Cl.[5] G01T *1/20*

U.S. Cl. 250—364 11 Claims

1. A liquid scintillation counting solution for extracting and counting radon in charcoal comprising:

a liquid scintillation counting solvent;

a light emitting fluor; and

a radon extraction solvent wherein said radon extracting solvent increases the release of radon from charcoal, wherein said extracting solvent is one of an alcohol, ketone and ether having a molecular weight of less than 100 daltons.

4,920,270

RADON DETECTION

Lee Grodzins, 14 Stratham Rd., Lexington, Mass. 02173

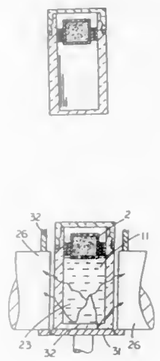
Filed Sep. 8, 1987, Ser. No. 94,192

Int. Cl.[5] G01T *1/204, 1/169*

U.S. Cl. 250—364 17 Claims

1. In a method of measuring the concentration of radon in air by adsorption of radon with an adsorbent in a detector container and subsequent desorption of the radon into a liquid scintillation desorbent and measurement of the radon in the desorbent with a liquid scintillation counter, the improvement comprising:

introducing the liquid scintillation desorbent into the detector container to effect desorption of the radon from the



adsorbent in situ and, thereafter, without removing the adsorbent from the detector container, introducing the detector container into the liquid scintillation counter for measurement of the desorbed radon with the liquid scintillation counter.

4,920,271

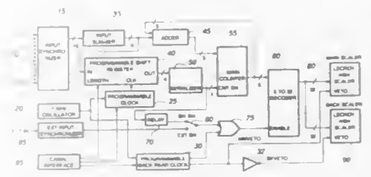
MULTIPLE CHANNEL PROGRAMMABLE COINCIDENCE COUNTER

Gaetano J. Arnone, Los Alamos, N. Mex., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Feb. 27, 1989, Ser. No. 315,871

Int. Cl.[5] G01T *3/00*; H01J *47/12*; G06M *11/02*

U.S. Cl. 250—390.01 17 Claims



1. A high speed counting circuit for accurate neutron coincidence counting comprising:

neutron detection means for supplying electrical pulses on detection of neutrons;

synchronizing means inputted by said neutron detection means for derandomizing and latching said pulses supplied by said neutron detection means:

summing means inputted by said synchronizing means for summing said pulses received during a predetermined period of time;

shift register means inputted by said summing means for shifting said sum of added pulses;

counter means inputted by said summing means for storing said sum of said pulses;

serializing means inputted by said shift register means and outputting the contents of said shift register means as a

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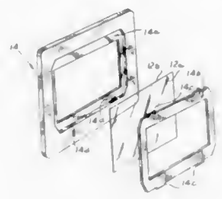
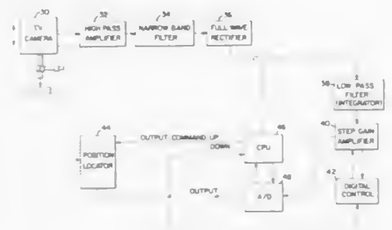
serial stream of pulses for decrementing said sum of said pulses stored in said counter means by one pulse at a time;
decoder means inputted by said counter means after each decrement for producing an output indicative of said sum of pulses stored in said counter means after each decrement;
first scaler means inputted by said decoder means for storing said sum of pulses stored in said counter means after each decrement.

4,920,272
DETECTOR FOR RADON
Robert C. Yoder, Crete, Ill., assignor to Tech/Ops Landauer, Inc., Glenwood, Ill.
Filed Jan. 24, 1988, Ser. No. 211,516
Int. Cl.[5] G01T *1/08, 5/10*
U.S. Cl. 250—475.2 10 Claims



1. A detector for radon gas comprising: a detector member including at least two opposing detection surfaces having respective portions symmetrically exposed on respective opposite sides of the detector member and having the property of forming damage tracks along paths traversed by alpha particles impinging either of said surfaces; and support structure means for supporting and orienting said detector member with both said detection surfaces in symmetrical, simultaneous exposure to said alpha particles during use of said detector.

4,920,273
Z-AXIS MEASUREMENT SYSTEM
Jack Sacks, Thousand Oaks, and Ralph Weisner, Canoga Park, both of Calif., assignors to View Engineering, Inc., Simi Valley, Calif.
Division of Ser. No. 745,192, Jun. 17, 1985, Pat. No. 4,743,771.
This application Apr. 22, 1988, Ser. No. 185,150
Int. Cl.[5] G01N *21/86;* G01V *9/04;* G01C *3/08*
U.S. Cl. 250—560 6 Claims

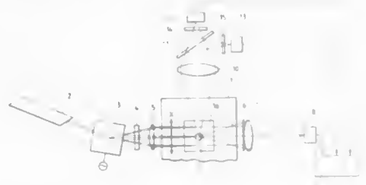


4. The method of ascertaining surface characteristics of an object comprising the steps of:
projecting a spatially distributed periodic image, from a projection source, onto the surface of the object, the image focusing at a preselected image plane from the projection source;
optically scanning the image of the surface of the object and the projected images thereon to derive a signal modulated in accordance with the periodicity of the image;
varying the position of the focal plane in a constant direction relative to the surface of the object so as to vary the modulation characteristic of the signal, thereby, causing the focal plane to transition through and beyond a maximum value of the modulation characteristics; and
identifying a predetermined modulation characteristic in the signal.

4,920,274
METERING APPARATUS AND METHOD FOR THE MEASUREMENT OF A FIXED LENGTH OF CONTINUOUS YARN OR STRAND
Thomas H. Jensen, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Apr. 3, 1989, Ser. No. 331,765
Int. Cl.[5] G01N *21/86;* G01V *9/04*
U.S. Cl. 250—561 19 Claims

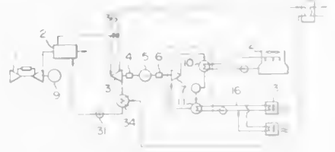
1. An apparatus for measuring strand as it is wound from a strand source onto a take-up reel comprising:
(a) means for supplying strand to the take-up reel from the strand source;
(b) an electrically controlled and appropriately powered winding means operatively connected between the strand source and the take-up reel so as to engage the strand and cause it to move in a path from the strand source and onto the take-up reel;
(c) means for guiding the advancing strand between the strand source and the take-up reel;
(d) a pressurized gas bearing positioned between the strand source and the take-up reel and with respect to the moving strand so that the strand contacts a rotatable metering rim on the pressurized gas bearing thereby causing the rim to rotate, said rim being concentrically mounted about a stationary hub, said hub having means therein for the introduction and exit of a pressurized gas so that an essentially frictionless layer of pressurized gas fills the annular region between said hub and rim thereby allowing said rim to rotate with essentially zero friction; and
(e) a first electrical circuit means for detecting, counting, and storing the number of revolutions of the rim when it is caused to rotate.

4,920,275
PARTICLE MEASURING DEVICE WITH ELLIPTICALLY-SHAPED SCANNING BEAM
Yuji Itoh, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 30, 1988, Ser. No. 292,267
Int. Cl.[5] G01N *15/06*
U.S. Cl. 250—574 13 Claims



1. A particle measuring device provided with:
a light source;
scanning means for optically scanning a light from said light source in a direction intersecting the direction of passage of particles to be examined in a portion to be examined through which the particles to be examined pass;
means for making a shape of the scanning light applied to the particles to be examined into a shape longer than the length of the particles to be examined in the direction of passage of the particles to be examined; and
light receiving means for receiving the light from the portion to be examined.

4,920,276
HEAT-AND-ELECTRICITY SUPPLY SYSTEM
Akitaka Tateishi, Katsuta; Tadao Arakawa, Hitachi; Masaru Kurosawa, Nakaminato; Yoshifumi Kubo, Hitachi, and Yoji Nagai, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 4, 1988, Ser. No. 228,023
Claims priority, application Japan, Aug. 12, 1987, 62-199797
Int. Cl.[5] F01K *17/04*
U.S. Cl. 290—2 13 Claims

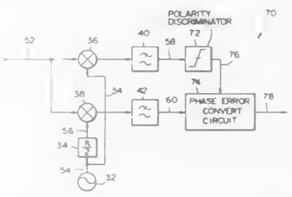


1. A heat-and-electricity supply system in which steam from a steam generator is utilized to supply an electric output and a heat output, said supply system comprising:
a steam turbine driven by the steam generated in said steam generator;
a power generator for providing the electric output, mechanically connected to said steam turbine; and
a compressor mechanically connected to said steam turbine and utilized to provide the heat output, said compressor being utilized for supplying a cooling medium to a refrigerating equipment or for supplying a heating medium to a heating equipment
wherein said steam turbine is connected to said power generator through a clutch means with reduction gear, and said power generator is connected to said compressor through a clutch means with speed increasing gear.

4,920,277
CONTROL SYSTEM FOR A VARIABLE SPEED HYDRO-POWER PLANT APPARATUS
Takao Kuwabara, Hitachi; Hiroto Nakagawa, Osaka, and Eizo Kita, Kyoto, all of Japan, assignors to Hitachi, Ltd., Tokyo and Kansai Electric Power Co., Inc., Osaka, both of, Japan
Filed Aug. 10, 1988, Ser. No. 230,434
Claims priority, application Japan, Aug. 14, 1987, 62-201712; Dec. 18, 1987, 62-318851
Int. Cl.[5] F01D *15/10*
U.S. Cl. 290—40 C 19 Claims

1. In a turbine mode operation of a variable speed hydro-power plant apparatus having a pump turbine (2) which exhibits a S-shaped characteristics in a turbine operation region and includes variable guide vanes (11), and a generator (1) with a frequency converter, which is so constructed as to be driven by said pump turbine (2) and to hold a frequency of a generated electric power thereof equal to a frequency of an electric power system (4) in spite of the fact that a rotating speed (N) of said pump turbine (2) is changed in conformity with an operating state, a control system for said variable speed hydro-power plant apparatus characterized in that,
upon detecting an approach of a turbine operating point of said variable speed hydro-power plant apparatus to an unstable turbine operation region, a rotating speed (N) of said pump turbine (2) is lowered.

4,920,278
PHASE COMPARATOR
Hizuru Nawata, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed May 24, 1988, Ser. No. 197,851
Claims priority, application Japan, May 26, 1987, 62-128971
Int. Cl.[5] H03K *5/00, 9/06*
U.S. Cl. 307—262 4 Claims



1. A phase comparator for comparing two input signals with respect to phase in order to produce a phase difference between the two input signals, said comparator comprising:
first multiplier means supplied with a modulated signal and a reference signal which constitute the two input signals for

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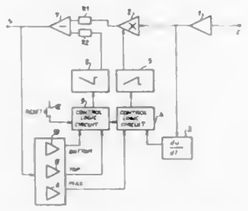
producing an output signal which is representative of a product of the modulation signal and the reference signal;
first low-pass filter means for filtering the output signal of said first multiplier means to produce a first output signal;
$\pi/2$ phase shifter means for shifting a phase of the reference signal by $\pi/2$ to produce a phase shifted output signal;
second multiplier means supplied with the modulated signal and the phase shifted output signal for producing an output signal which is representative of a product of the modulated signal and the phase shifted output signal;
second low-pass filter means for filtering the output signal of said second multiplier means to produce a second output signal;
polarity discriminator means supplied with one of the first and second output signals of said first low-pass filter means and said second low-pass filter means for producing a discrimination signal which is representative of a positive half and a negative half of a period of said one output signal; and
phase error converting means supplied with the other of the first and second output signals of said first low-pass filter means and said second low-pass filter means and the discrimination signal for producing a phase error signal which, when said discrimination signal is representative of the positive half, monotonously increases within one period of said other output signal which is associated with said positive half.

4,920,279

METHOD TO EXPAND AN ANALOG SIGNAL AND DEVICE TO IMPLEMENT THE METHOD

Pascal Charlet, Gardanne; Eric Lauverjat, Tours, and Rafaël Moreno, Marseille, all of France, assignors to SGS Thomson Microelectronics SA, Gentilly, France

Filed Sep. 28, 1988, Ser. No. 250,392
Claims priority, application France, Oct. 6, 1987, 87 13784
Int. Cl.[5] H03L *5/00*; H03K *5/01*
U.S. Cl. 307—264 5 Claims



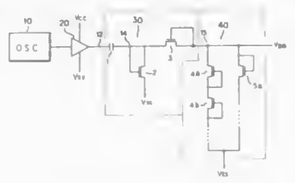
1. A method for automatically modifying the shape of part of an analog signal for emphasizing a specifically interesting portion of the signal, said signal being successively an initial pulse followed by substantially rectangular shaped pulses having a fast rise time and a fast fall time, said method comprising multiplying each pulse of the input signal by a variable coefficient depending on the rise time of said respective pulse, for obtaining an intermediate amplified signal; and subtracting a value from the intermediate amplified signal, for obtaining an output signal, said subtracted value being constant from one pulse to another and being defined by a ramp signal starting when the output signal corresponding to said initial pulse signal reaches a first threshold and stopping when said last mentioned output signal reaches a second threshold.

4,920,280

BACK BIAS GENERATOR

Soo-In Cho, Suwon, and Dong-Sun Min, Seoul, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 29, 1988, Ser. No. 187,930
Claims priority, application Rep. of Korea, Apr. 30, 1987, 1987-4241
Int. Cl.[5] H03L *1/00*; H03K *3/01*
U.S. Cl. 307—296.2 20 Claims



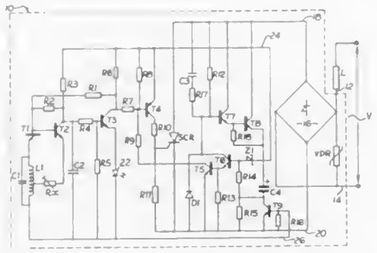
1. A circuit for generating a back bias voltage, to be equipped within a semiconductor memory device having a semiconductor substrate, and for providing said back bias voltage to the semiconductor substrate, said circuit comprising:
oscillator means for generating as a first output, a sequence of square waves having a specified frequency;
buffer means connectable to receive the output of said oscillator, for buffering the output of said oscillator means into a second output, square waves having an amplitude within a first range;
charge pump circuit means for receiving the output of said buffer means and for providing as a third output, a back bias voltage; and
clamping circuit means connectable between the output of said charge pump circuit means and a reference potential, for clamping with a specified range the back bias voltage being provided by said charge pump circuit in accordance with variations of a source supply voltage.

4,920,281

PROXIMITY SWITCH CIRCUIT

Geoffrey J. Harris, Swindon, United Kingdom, assignor to Square D Company, Palatine, Ill.

Continuation of Ser. No. 5,318, Jan. 16, 1987, abandoned, which is a continuation of Ser. No. 588,876, Feb. 11, 1984, abandoned. This application Sep. 12, 1988, Ser. No. 244,548
Claims priority, application United Kingdom, Jun. 11, 1982, 8217084
Int. Cl.[5] H01H *36/00*; H03B *5/12*
U.S. Cl. 307—308 15 Claims



12. A proximity switch for use with a wide range of AC supply voltages to control a load comprising:

an AC supply voltage
an induction coil;
an oscillator means connected to the coil for driving said induction coil;
a detector means connected to said oscillator for generating a detector output signal in response to proximity of a metallic object to said induction coil;
a rectifier means connected in series with said AC supply voltage and said load and to the coil, oscillator and detector means for generating a DC voltage;
a storage capacitor means connected to the oscillator means capable of being charged by the DC output voltage of said rectifier means, said storage capacitor means connected to supply operating power to said induction coil, said oscillator, and said detector;
a solid state switch connected across the output of said rectifier means and having an input responsive to said detector means output signal for switching to and "on" condition to short said DC output voltage of said rectifier means increases AC current flow through said load and removes charging current from said storage capacitor means;
a switching element connected to the storage capacitor means having an output voltage controlled by the voltage across said storage capacitor means;
an AND circuit connected to the input of said switch having a first input connected to receive said detector means output signal, having a second input to receive the output voltage of said switching element, and having an output signal connected to the input of said solid state switch to turn said solid state switch "on" when said first input is at a first predetermined voltage level and said second input is at a second predetermined voltage level, said switching element capable of changing said output voltage from a value on said second predetermined voltage level when a voltage across said storage capacitor means falls below a third predetermined voltage level, and said AND current capable of turning said solid state switch into an "off" condition in the event of a change in said output voltage of said switching element below the third predetermined voltage level; and
said AND circuit periodically turns said solid state switch "on" and "off" when said detector signal indicates the proximity of a metallic object to said induction coil, and when said solid state switch is "off" said storage capacitor means is charged, and a substantially sinusoidal current flows through said load with a first part of a cycle of said substantially sinusoidal currennt flowing through said solid state switch and a second part of said cycle of said substantially sinusoidal current flowing thru said rectifier to charge said storage capacitor means.

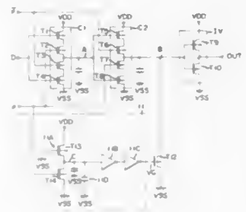
4,920,282

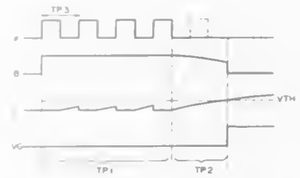
DYNAMIC LATCH CIRCUIT FOR PREVENTING SHORT-CIRCUIT CURRENT FROM FLOWING DURING ABSENCE OF CLOCK PULSES WHEN UNDER TEST

Hiroaki Muraoka, Kawasaki, and Toshiyuki Miyashita, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 20, 1988, Ser. No. 208,441
Claims priority, application Japan, Jun. 23, 1987, 62-154532
Int. Cl.[5] H03K *5/19, 19/007, 19/096*
U.S. Cl. 307—442 17 Claims

1. A dynamic latch circuit comprising:
a control terminal section for receiving a control clock signal formed of clock pulses which are generated at a predetermined frequency;
a plurality of register sections each for detecting a voltage of an input signal, in response to each clock pulse, generated an output signal from a capacitive output node which is charged or discharged in accordance with the voltage of the input signal and is selectively set at one of first and second potentials; and
voltage-generating means for detecting, based on a pulse interval of the control clock signal equivalent to the period of time elapsed from the trailing edge of the last generated clock pulse, that the supply of the clock pulses has been stopped, and for fixing the output nodes of said register sections at a predetermined one of said first and second potentials, upon detecting that the supply of the clock pulses has been stopped,
said voltage-generating means having timer means for detecting that said pulse interval of the control clock signal





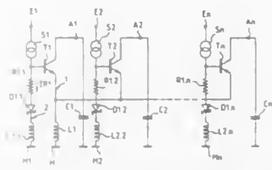
exceeds a reference period equal to an interval determined by said predetermined frequency, a power-supply terminal set at the first potential, and a plurality of switching elements connected between the power-supply terminal and the respective capacitive output nodes of said register sections, said switching elements being turned on under the control of a signal output by said timer means which it is detected that the supply of the clock pulses has been stopped.

4,920,283

HIGH SPEED, LOW NOISE INTEGRATED CIRCUIT

Werner Elmer, Moosburg, and Michael Schmitt, Freising, both of Fed. Rep. of Germany, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 16, 1988, Ser. No. 272,157
Int. Cl.[5] H03K *17/16, 19/003*
U.S. Cl. 307—443 3 Claims



1. Integrated circuit comprising a plurality of output transistors for emitting binary signals to associated output terminals and having at least one ground terminal, characterized in that between a base of each output transistor and the at least one ground terminal a current source controlled by a base voltage is inserted.

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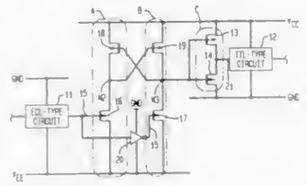
4,920,284

CMOS LEVEL CONVERTER CIRCUIT WITH REDUCED POWER CONSUMPTION

Akira Denda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 24, 1988, Ser. No. 261,634
Claims priority, application Japan, Oct. 22, 1987, 62-267794
Int. Cl.[5] H03K *19/092;* **H03L** *5/00*
U.S. Cl. 307—475 10 Claims



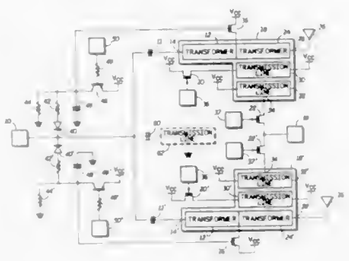
1. A level converter circuit comprising: a first MOS transistor of one conductivity type connected between a first potential power line receiving a first potential of a first polarity and a first node and having a gate receiving a first signal having an amplitude between said first potential and a ground potential, a second MOS transistor of said one conductivity type connected between said first potential power line and a second node and having a gate receiving a second signal having an opposite phase to said first signal, a third MOS transistor of an opposite conductivity type connected between said first node and a second potential power line receiving a second potential of a second polarity opposite to said first polarity and having a gate coupled to said second node, a fourth MOS transistor of said opposite conductivity type connected between said second potential power line and said second node and having a gate coupled to said first node, a fifth MOS transistor of said opposite conductivity type connected between said second potential power line and a third node and having a gate coupled to said second node, and a sixth MOS transistor of said one conductivity type connected between a ground potential line receiving said ground potential and said third node and having a gate coupled to said second node, wherein a third signal obtained by converting said first signal and having an amplitude between said second potential and said ground potential is generated from said third node.

4,920,285

GALLIUM ARSENIDE ANTENNA SWITCH

Edward T. Clark, Plantation, and Enrique Ferrer, Miami, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 21, 1988, Ser. No. 274,167
Int. Cl.[5] H03K *17/687;* **G06G** *7/28;* **H02J** *17/00*
U.S. Cl. 307—571 12 Claims



1. A method of switching a radio frequency signal being capable of representation by a voltage component and a current component the product of which approximates a signal power, said method comprising the steps of:

(a) processing the radio frequency signal to provide a processed signal by decreasing said voltage component and increasing said current component, such that the signal power of said processed signal remains substantially identical to said radio frequency signal; and,

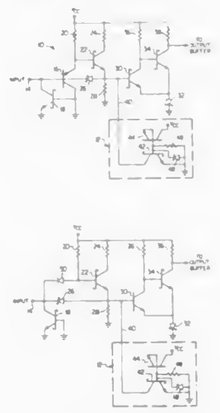
(b) coupling said processed signal to a radio frequency ground when switching the radio frequency signal to the radio frequency ground, and converting said processed signal to provide an output signal by increasing said voltage component and decreasing said current component, such that said output signal is substantially identical to said radio frequency signal, when switching the radio frequency signal to an output port.

4,920,286

METHOD AND CIRCUITRY FOR COMPENSATING FOR NEGATIVE INTERNAL GROUND VOLTAGE GLITCHES

Janet L. Wise, and Steven E. Marum, both of Sherman, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 2, 1986, Ser. No. 881,146
Int. Cl.[5] H03K *19/003, 19/088, 17/16, 17/60*
U.S. Cl. 307—542 9 Claims



1. Circuitry for compensating for internal ground voltage fluctuations comprising:

an output transistor having a base for receiving input signals, said output transistor also including a first electrode for generating output signals and a second electrode coupled to internal ground;

a compensation transistor coupled at its collector to said base of said output transistor and at its emitter to internal ground; and

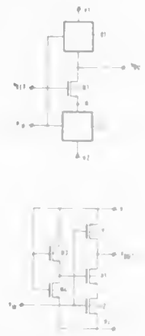
a supply transistor having a collector connected to receive supply voltage and a shorted emitter-base connected to said base of said compensation transistor for supplying current to the base of said compensation transistor, said compensation transistor being rendered conductive by the occurrence of negative voltage fluctuations on internal ground.

4,920,287

OUTPUT BUFFER HAVING REDUCED ELECTRIC FIELD DEGRADATION

Cornelis D. Hartgring, Dublin, Ireland; Jan Dikken, and Tiemen Poorter, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Nov. 1, 1988, Ser. No. 265,660
Claims priority, application Netherlands, Nov. 4, 1987, 8702630
Int. Cl.[5] H03K *17/04, 17/06, 17/687, 19/003*
U.S. Cl. 307—542 5 Claims



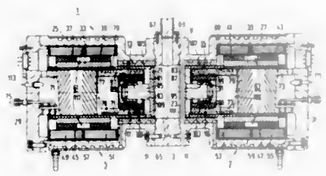
1. An integrated digital circuit, comprising a first MOS transistor of a first conductivity type whose drain is coupled to an output terminal and being coupled to a first power supply terminal by a first means, its gate being connected to a first input terminal and its source being coupled to a second power supply terminal by a second means, said second means comprising at least one second MOS transistor of the first conductivity type, the first and the second means being driven by a second input terminal, and means for suppressing "hot carrier stress" by at least one of providing the first transistor with a threshold voltage which is higher than that of the second transistor and providing the first transistor with a channel length which is greater than that of the second transistor.

4,920,288

PISTON ENGINE WITH DYNAMIC GROOVE BEARING EXTERNAL TO PISTON AND ISOLATED FROM COMPRESSION SPACE

Ronald den Heijer; Godefridus C. Goverde, both of Eindhoven, and Peter G. M. Simons, Best, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 28, 1989, Ser. No. 329,750
Claims priority, application Netherlands, May 19, 1988, 8801293
Int. Cl.[5] H02K *33/00;* **F16C** *31/00*
U.S. Cl. 310—15 24 Claims



1. A piston engine comprising a circular cylinder, a piston that is reciprocable in said cylinder for working on a gaseous medium present in said cylinder during engine operation, and means for reciprocating said piston in said cylinder, the improvement comprising:

said piston being tubular and having an inner and outer wall surface of circular cross-section, said piston being open at one end and having a transverse end face at the opposite end,

said engine having a compression space opposite said piston end face into which said gaseous medium is compressed during piston reciprocation,

an elongate circular-cylindrical guide concentric with said cylinder having an outer surface, and extending into said piston through said open end,

said outer surface of said guide and said inner wall surface of said piston comprising a dynamic groove bearing for centering said piston in said cylinder during reciprocation of said piston, and

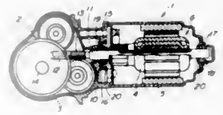
said piston being sized near said end face for forming a sealing gap with said cylinder, whereby said dynamic groove bearing is isolated from said compression space by said sealing gap.

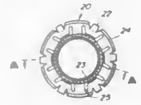
4,920,289

BEARING HOLDER WITH RESILIENT RETAINING PAWLS

Yasujiro Saito, Yokohama, Japan, assignor to Jidosha Denki Kogyo Kabushiki Kaisha, Kanagawa, Japan

Filed Jan. 3, 1989, Ser. No. 292,970
Claims priority, application Japan, Jan. 12, 1988, 63-1683[U]
Int. Cl.[5] H02K *5/16*
U.S. Cl. 310—90 3 Claims





1. A bearing holder for securing a bearing in a bearing fixed part provided in a through hole of a gear case, comprising:

an annular member including a plurality of pawls disposed in an outer circumference of said annular member and extending radially outwardly therefrom;

a bearing contact portion disposed along an inner circumference of said annular member for contacting said bearing; and

a plurality of guide planes disposed on the outer circumference of said annular member and extending axially with respect to said annular member for securing said annular member to said fixed part and a plurality of slots disposed proximate said pawls for maintaining a spring force of said bearing holder against said first part.

4,920,290

ACTIVE MAGNETIC BEARING APPARATUS

Chikara Murakami; Atsushi Nakajima; Hirokuni Hiyama, all of Tokyo; Satoshi Inanaga, and Katsuhide Watanabe, both of Kanagawa, all of Japan, assignors to National Aerospace Laboratory, Chofu and Ebara Research Co., Ltd., Fujisawa, both of, Japan

Filed Nov. 1, 1988, Ser. No. 265,726
Int. Cl.[5] F16C *39/06*
U.S. Cl. 310—90.5 5 Claims

1 An active magnetic bearing apparatus, comprising:

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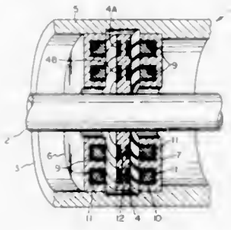
a plurality of active magnetic bearings for rotatably supporting a rotational shaft;
a sensor means for generating position signals corresponding to a detected angular position of said rotational shaft;
electrical control means for suspending said rotational shaft in a non-contact state by altering the amperage of current to be supplied to said bearings in response to a position

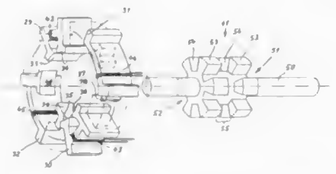
signal transmitted from said sensor means and controlling the magnetic force of said magnetic bearings; and
a delay control means for reducing the starting-up current for a magnetic bearing assembly by sequentially supplying a starting-up current to the respective magnetic bearings with a slight interval between the supply of current to each magnetic bearing.

4,920,291
MAGNETIC THRUST BEARING WITH HIGH FORCE MODULATION CAPABILITY
Lloyd W. McSparran, Pittsburgh, Pa., assignor to Contraves Goerz Corporation, Pittsburgh, Pa.
Filed Jan. 19, 1989, Ser. No. 299,882
Int. Cl.[5] F16C *39/06*
U.S. Cl. 310—90.5 14 Claims



1. In an electromagnetic axial thrust bearing comprising
a rotating member for turning about an axis,
at least one stationary member fixed relative to the axis of the rotating member,
means for generating a m.m.f. associated with said stationary member,
said rotating member and stationary member having adjacent faces in close proximity,
said rotating member, stationary member, and m.m.f. generating means arranged so that the path of magnetic flux resulting from said m.m.f. generating means passes from the stationary member to the rotating member and back, magnetic flux lines passing between the stationary member and rotating member having a component in the axial direction resulting in a magnetic attraction between the members that produces a restraining thrust force,
the improvement comprising:
said stationary member comprised of a solid ferromagnetic material having at least one of arc-shaped grooves substantially concentric with the turning axis of the rotating member, said groove being lined with laminates of a ferromagnetic material thus defining a lined groove, said groove being defined by two sides and a bottom, the long axes of laminates at the bottom of the groove being substantially in the radial and circumferential directions and the long axes of laminates at the sides of the groove being substantially in the axial and circumferential directions,
said m.m.f. generating means comprising a coil laid into the lined groove of the stationary member, and
said rotating member having a groove facing the groove in the stationary member, said groove in the rotating member having laminates of ferromagnetic material stacked therein, the long axes of the laminates in the groove on the face of the rotating member being substantially in the radial and circumferential directions.

4,920,292
MOTOR HAVING ROTOR CAPABLE OF BOTH STEPPED ROTARY AND AXIAL SHIFT MOTIONS
Klaus Albrecht, Königsfeld; Helmut Hans, St. Georgen; Johann von der Heide, Schramberg, and Fritz Schmider, Hornberg, all of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co. KG, Black Forest, Fed. Rep. of Germany
Filed Aug. 28, 1987, Ser. No. 90,743
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629377
Int. Cl.[5] H02K *16/02*
U.S. Cl. 310—114 42 Claims

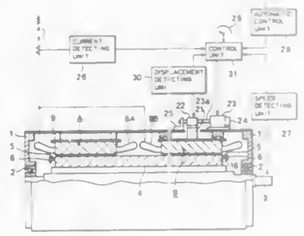


1. An electric motor having a rotor with salient poles, a stator and an exciter system with a winding having coils which are selectively energized to impart step-by-step rotary motion to the rotor, the rotor and stator being supported to move in an axial direction with respect to one another, the exciter system including a first exciter imparting step-by-step rotary movement to the rotor, and a second exciter imparting relative axial movement within a zone to the rotor, both of these exciters being capable of being energized independently of one another, said first exciter having an air-core type multicoil winding generally formed in a cylindrical shape and encompassed within a ferromagnetic envelope, whose individual coils are adjacent one another in the direction of rotor rotation, each coil being generally hexagonal in shape with two of the parallel legs being longer than the other four, the two parallel long legs of the hexagonal extending generally parallel to the motor axis and generally coextensive with the zone of axial motor movement.

4,920,293
SQUIRREL-CAGE INDUCTION MOTOR
Akio Kanda, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 9, 1988, Ser. No. 282,267
Claims priority, application Japan, Dec. 10, 1987, 62-311074
Int. Cl.[5] H02K *17/00*
U.S. Cl. 310—116 5 Claims

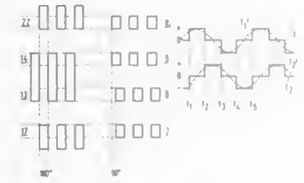
1. A squirrel-cage induction motor comprising;
a frame;
a squirrel-cage rotor rotatably supported on the frame;
a first stator disposed around the squirrel-cage rotor within the frame and fixedly held on the frame; and

a second stator having the same number of poles and slots as the first stator circumferentially movably within an angular range corresponding to one pole pitch of magnetic pole disposed around the squirrel-cage rotor within the frame beside the first stator with respect to the axial direction, stator being interlocked with a control motor through a gear mechanism including a segmental worm



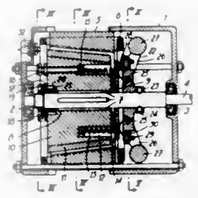
gear provided fixedly on the circumference of said second stator, and a worm meshing with the segmental worm gear is fixed to the output shaft of said control motor, and a control unit determines the direction and amount of angular displacement of the second stator on the basis of operating conditions required by the load and controls said control motor so as to turn the second stator accordingly.

4,920,294
SYNCHRONOUS OR STEPPING MOTOR WITH SIMPLIFIED TOOTH ALIGNMENT
Alois E. Christiaens, Liedekerke, and Leon G. G. Lebon, Waterloo, both of Belgium, assignors to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 212,133 Jun. 27, 1988, abandoned, which is a continuation of Ser. No. 894,438, Jul. 30, 1986, abandoned, which is a continuation of Ser. No. 672,023, Nov. 16, 1984, abandoned. This application May 30, 1989, Ser. No. 361,787
Claims priority, application Netherlands, Aug. 20, 1984, 8402542
Int. Cl.[5] H02K *37/12*
U.S. Cl. 310—162 26 Claims



1. An electric motor, comprising:
two coaxial stator sections which are magnetically interconnected, each section having two sets of coaxially arranged stator teeth, at least one coaxial annular coil, and a magnetically conductive circuit extending between the respective sets of stator teeth of said section, and
a rotor, mounted for rotation coaxially within said stator sections about an axis, and comprising two axially spaced coaxial rotor sections having an axially magnetized permanent magnet disposed therebetween, each rotor section having an outer circumference having a plurality of rotor teeth spaced by air gaps from the stator teeth of a respective stator section,
each rotor section and respective stator section further comprising magnetically conductive members forming a magnetically conductive circuit which surrounds the respective at least one annular coil and includes the air gaps between the respecive rotor teeth and stator teeth of that rotor and stator section,
characterized in that a respective one of the two sets of stator teeth of each of the two stator sections are axially adjacent and have their teeth aligned exactly in line with each other, the other set of stator teeth of each respective section has its teeth offset one-half tooth pitch from said one sets, whereby said other sets of stator teeth are aligned with each other, the rotor teeth of a respective rotor section, spaced by air gaps from a corresponding stator section, are aligned with each other, and the teeth of one rotor section are offset one quarter tooth pitch with respect to the teeth of the other rotor section.

4,920,295
ALTERNATOR
Karel Holden, and Ladislava Holdenova, both of Bleekhofstraat 27, 2018 Antwerp, Belgium
Filed Aug. 10, 1988, Ser. No. 230,534
Claims priority, application Belgium, Aug. 10, 1987, 08700892
Int. Cl.[5] H02K *23/44*
U.S. Cl. 310—209 3 Claims



1 Alternator, comprising in combination a housing, a hollow stator with windings fixed in said housing and having a conical inner shell, an axial rotary shaft in said housing, a rotor with a conical outer shell on said shaft and operating in conjunction with the conical inner shell of said stator, a slide between the shaft and the rotor for the axial motion of said rotor over the shaft and in said stator for the current control, a disc mounted on said shaft and dispersed near one end of said rotor, a compression spring for sliding said rotor over the shaft into said stator and arranged between said rotor and disc, a thrust plate movable over the shaft and disposed near the other end of said rotor, a thrust ring arranged around said shaft, a compression spring for sliding said rotor over the shaft out of the stator and arranged between said thrust plate and thrust ring, setting bolts working in conjunction with said thrust ring for the adjustment of the compression of said compression spring, and a centrifugal voltage controller for fine-adjusting the compression of said compression spring sliding said rotor out of the stator and keeping the induced current voltage the same, said controller fixed on said shaft and having swivel arms with weights to exert a pressure on the adjacent thrust plate and compression spring.

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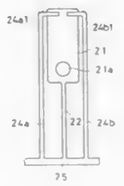
4,920,296

ELECTRONIC COMPONENT HAVING A PLATE-SHAPED ELEMENT

Hiroyuki Takahashi; Takashi Yamamoto, and Takeo Nakadachi, all of Nagaokakyn, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Continuation of Ser. No. 273,109, Nov. 16, 1988, abandoned, which is a continuation of Ser. No. 787,421, Oct. 15, 1985, abandoned. This application Aug. 2, 1989, Ser. No. 388,764
Claims priority, application Japan, Oct. 17, 1984, 59-219285
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—348 15 Claims



1. A piezoelectric component, comprising:

a plate-shaped element which includes a piezoelectric substrate having a right side portion and a left side portion divided by a slit formed from a top end to a middle portion of said substrate in a longitudinal direction of said substrate, respective pairs of vibrating electrodes formed on front surfaces of said right side portion and said left side portion, respective common electrodes formed on rear surfaces of said right side portion and said left side portion so as to oppose said pairs of vibration electrodes, respectively, first connecting electrodes each respectively extended from one electrode of each of said respective pairs vibration electrodes to said top ends of said right side portion and said left side portion, and a second connecting electrode formed on a rear surface of said substrate and extended from said respective common electrodes to a bottom end of said substrate;

a metal plate which is formed with substantially the same shape and substantially the same surface area as said substrate so as to receive said plate-shaped element on a first main surface thereof, on said first main surface of which said rear surface of said substrate is placed, said metal plate having a through-hole which is formed at a position associated with said second connecting electrode;

a conductive connecting member for interconnecting said second connecting electrode and said first main surface of said metal plate through said through-hole on said metal plate;

a first lead terminal integral with and extending from said metal plate; and

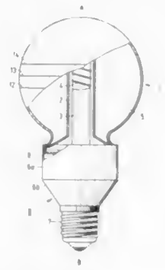
second terminals conductively connected to each of said first connecting electrodes, respectively, each of said second lead terminals having a bent tip portion which is conductively connected to each of said first connecting electrodes such that said second lead terminals can extend in the same extending direction as said first lead terminal and in parallel with both side edges of said substrate, respectively.

4,920,297

ELECTRIC LAMP

Johannes M. A. van der Heijden; Pierre L. L. M. Derks, both of Eindhoven, and Cornelis Penning, Oss, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 43,902, Apr. 29, 1987, abandoned. This application Dec. 21, 1988, Ser. No. 353,201
Claims priority, application Netherlands, Apr. 29, 1986, 8601092; Sep. 22, 1986, 8602378
Int. Cl.[5] H01J *7/00*
U.S. Cl. 313—315 14 Claims



1. An electric lamp, comprising:

(a) a lamp cap;

(b) an outer envelope defining a lamp axis;

(c) a light source arranged within said outer envelope energizable for emitting light;

(d) a base shell comprising synthetic material having a first end connected to said lamp cap and a tubular portion having an inner surface defining a second end for receiving said outer envelope; and

(e) means for securing said outer envelope to said base shell comprising said tubular portion having a plurality of ribs on said inner surface substantially aligned with said lamp axis, a plurality of resilient tongues each secured to said outer envelope and having a barbed portion, and means for securing each tongue to said outer envelope, each of said tongues being positioned such that each barbed portion is resiliently biased against a corresponding rib, and said biased barbed portions being oriented with respect to said ribs such that each barbed portion is anchored against a corresponding rib to prevent translation of said tongues and said outer envelope away from said lamp cap and for slidably engaging a corresponding rib for allowing axial translation of said tongues and said outer envelope in the direction of said lamp cap.

4,920,298

FLAT FLUORESCENT LAMP FOR LIQUID CRYSTAL DISPLAY

Katsuhiro Hinotani, Shijonawate; Shunichi Kishimoto, Kaizuka; Haruhisa Kosaka, Nara; Katsumi Terada, Hirakata, and Goro Hamagishi, Toyonaka, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Mar. 18, 1988, Ser. No. 169,708
Claims priority, application Japan, Mar. 20, 1987, 62-66614; Mar. 20, 1987, 62-66616; Mar. 20, 1987, 62-66617; Mar. 20, 1987, 62-66618
The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.
Int. Cl.[5] H01J *61/35, 61/42;* G02F *1/13*
U.S. Cl. 313—493 17 Claims

1. A flat fluorescent lamp for a liquid crystal panel comprising:

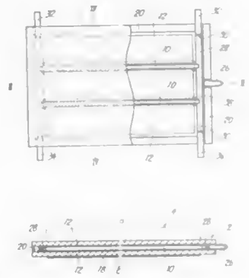
a rectangular lower glass plate coated with a fluorescent film on an inner surface thereof;

a rectangular lower glass plate coated with a fluorescent film on an inner surface thereof and disposed above the lower glass plate;

a glass side wall disposed along peripheral edges of the upper and lower glass plates and having upper and lower end faces thereof hermetically joined to the peripheral edges of the glass plates to form a hermetic discharge space between the upper and lower glass plates;

a pair of discharge electrodes arranged in parallel within the discharge space and opposed to each other; and

at least one reinforcing glass member disposed between the electrodes and for supporting the upper and lower glass



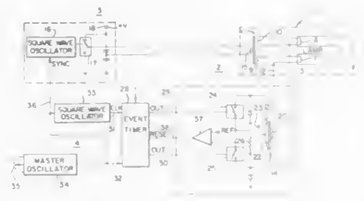
plates, the reinforcing glass member having a height approximately equal to the distance between the upper and lower glass plates, wherein an inner surface of the upper glass plate has an uncoated portion having no fluorescent film at a position where the reinforcing glass member is in contact with the inner surface and further wherein the inner surface of the lower glass plate has an uncoated portion without any fluorescent film at a position where the reinforcing member is in contact with the inner surface, the lower glass plate is provided on a lower surface thereof with a reflecting film positioned corresponding to the uncoated portion thereof.

4,920,299

PUSH-PULL FLUORESCENT DIMMING CIRCUIT

Michael Presz, Dracut, and Guy Dela Rosa, Newton, both of Mass., assignors to General Electric Company, Burlington, Mass.

Filed Apr. 27, 1988, Ser. No. 188,588
Int. Cl.[5] H05B *41/14*
U.S. Cl. 315—98 5 Claims



1. Variable arc-voltage power supply circuitry for a fluorescent lamp light source comprising:

(a) fluorescent lamp means having a plurality of filament electrodes,

(b) a filament current supply source coupled to and heating said lamp filaments,

(c) a push-pull DC arc voltage supply for alternately producing arc supply voltage pulses of opposite polarity including switch means coupled between a DC supply and the primary winding of a transformer the secondary winding of which is coupled to said electrodes; said switch means being opened and closed to permit current flow in one direction to generate a voltage pulse of one polarity in said secondary winding and alternately opened and closed to permit current flow in the opposite direction to generate a voltage pulse of the opposite polarity,

(d) means for coupling said pulses to said lamp electrodes whereby each of said filament electrodes alternately operates as an anode and as a cathode, whereby both filament electrodes are subject to even wear,

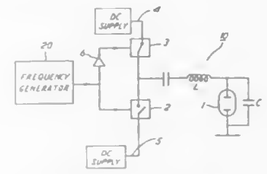
(e) dimming means for said lamp means including means for varying the duty cycle of the output pulses from said arc voltage supply to vary lamp brightness.

4,920,300

POWER SUPPLY

Mark A. Scott, Yiewsley, England, assignor to Thorn EMI plc, London, England

Filed May 11, 1988, Ser. No. 192,636
Claims priority, application United Kingdom, May 12, 1987, 8711131
Int. Cl.[5] H05B *41/24*
U.S. Cl. 315—209 R 10 Claims



1. A power supply suitable for an arc discharge lamp, the power supply comprising a drive circuit arranged to supply voltage to the lamp and control means for causing a characteristic of said voltage to vary, with time, in accordance with a pseudo-random sequence in order to reduce, or eliminate, acoustic resonance in the lamp.

4,920,301

CAPACITOR DISCHARGE STROBE LIGHT

James M. Crooks, P.O Box 131, Verona, Wis. 53593

Continuation-in-part of Ser. No. 927,337, Nov. 6, 1986, abandoned. This application Nov. 15, 1988, Ser. No. 271,500
Int. Cl.[5] F21Q *3/00;* H05B *41/30, 41/34*
U.S. Cl. 315—241 S 25 Claims

1. A capacitor discharge and strobe light beacon system for an incandescent tower light fixture of the type having a cylindrical open ended base to which AC power is supplied and a generally cylindrical high quality glass Fresnel lens which is removably attached to close the open end of the base, comprising:

HVDC means for producing a rectified high voltage, said HVDC means having input terminals for receiving the AC power supplied to the base of the light fixture and having HV output terminals for an output voltage;

first energy storage means for receiving high voltage from said HVDC means and capacitively storing energy therein across two terminals of which one is connected to one end of choke means;

load means for producing light from at least two discharge lamps which are connected to be operated redundantly and simultaneously, each lamp having an anode terminal connected to the other end of said choke means, having a cathode terminal connected to the other of said two terminals of said energy storage means, and having triggering means for discharging said energy storage means through said lamps upon receiving a triggering signal;

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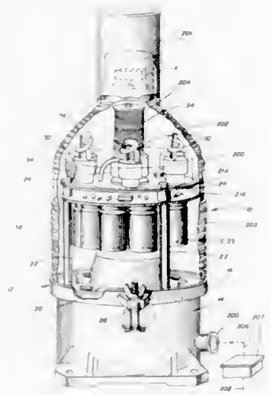
circuit control means for operating a switch to apply said triggering signal to said lamps from said energy storage means after AC power has been applied to said HVDC means for a predetermined time interval; and



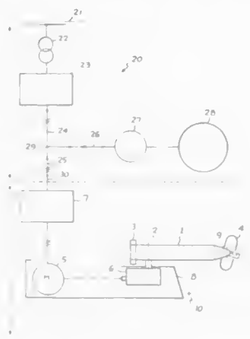
mounting means, carried by the base of the incandescent light fixture and fitting within the Fresnel lens, for mounting said energy storage means and said lamps, said lamps being removably located at a spaced distance from the longitudinal axis of the Fresnel lens.

4,920,302
FLUORESCENT LAMP POWER SUPPLY
John G. Konopka, Ingleside, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.
Continuation of Ser. No. 7,231, Jan. 27, 1987, abandoned. This application Apr. 11, 1988, Ser. No. 177,798
Int. Cl.[5] H05B *37/02*
U.S. Cl. 315—307 8 Claims

1. A power supply for a fluorescent lamp comprising:
generating means for developing a high frequency voltage for supplying high frequency energy to a fluorescent lamp;
switching means, comprising pulse width modulation means, operating at a lower frequency than said high frequency, for periodically interrupting the supply of said high frequency energy to provide bursts of said high frequency energy at said lower frequency rate; and

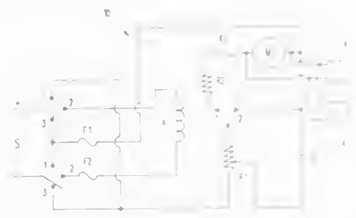
control means for controlling said switching means to control the brightness of said fluorescent lamp by controlling the duration of said bursts of said high frequency energy.

4,920,303
DEVICE FOR ROTARY-DRIVING A CENTRIFUGE ARM AND METHOD FOR POWER-FEEDING SAID DEVICE
Jacques Perdriat, Maule, France, assignor to Acutronic France, Les Clayes-Sous-Bois, France
Filed Apr. 5, 1989, Ser. No. 334,201
Claims priority, application France, Apr. 11, 1988, 88 04774
Int. Cl.[5] H02K *7/02*
U.S. Cl. 318—161 14 Claims



1. A device for rotary driving a centrifuge arm, comprising:
a high power electric motor for driving the centrifuge arm;
an electric power supply source having an average voltage multiphase supply network, wherein the network provides less power to the motor than the theoretical power required by the motor;
a multiphase voltage step-down transformer connected to said network;
a multiphase rotary machine;
a first static device for controlling said rotary machine, said first static device having a multiphase input connected to the secondary winding of the step-down transformer, a multiphase output connected to a node of electric linkages, and the rotary machine is electrically connected to said node;
a high capacity inertia flywheel mechanically coupled to said rotary machine;
output terminals connected to said node;
a second static device connected between the output terminals and the high power electric motor for controlling the high power electric motor.

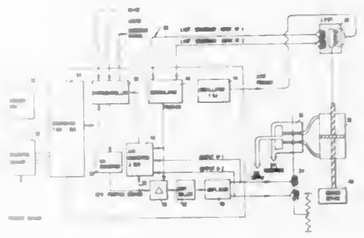
4,920,304
VENT ACTUATOR
Frank P. Antonowitz, 1 Sea Esta Pl., Ventura, Calif. 93003
Filed Jun. 7, 1989, Ser. No. 362,523
Int. Cl.[5] B60J *7/08*
U.S. Cl. 318—466 17 Claims



1. In a vent actuator mechanism for opening a vent, the improvement comprising:
a DC permanent magnet motor;
a capacitor having a first terminal connected to a first armature contact on said motor;
a variable resistor having a first terminal connected to a second terminal of said capacitor;
a relay for connecting a second terminal of said resistor to a second armature contact of said motor when said relay is energized and for connecting said second resistor terminal to said first capacitor terminal when said relay is de-energized; and
a three position switch having a first position for charging said capacitor in a first polarity, a second position for charging said capacitor to an opposite polarity and a third position for energizing said relay to discharge said capacitor through said motor.

11. An actuator for opening a vent in a vehicle, comprising:
a guide track adapted for mounting adjacent said vent;
a slider mounted for reciprocal linear movement along said guide track;
an actuating arm having a first end pivotally mounted to said slider and a second end adapted for pivotal connection to said vent;
a pair of pulleys mounted at opposite ends of said guide tracks;
a flexible endless drive member supported by said pulley;
means securing said slider to said endless drive member;
motor means for selectively rotating one of said pulleys in opposite directions; and
an electromagnetically actuated clamping mechanism for securing said actuating arm in an adjusted position.

4,920,305
AUTO CALIBRATING ELECTRO HYDRAULIC SERVO DRIVER
Richard E. Benson, Mentor, Ohio; Andrew D. Gavrilos, New Kensington, Pa.; Robert S. Rand, Painesville, Ohio; Scott M. Shaw, Allison Park, Pa.; Joel W. Spafford, Cleveland, Ohio, and Ronald J. Walko, Ford City, Pa., assignors to The Babcock & Wilcox Company, New Orleans, La.
Continuation of Ser. No. 62,279, Jun. 12, 1987, abandoned. This application Feb. 8, 1989, Ser. No. 308,989
Int. Cl.[5] G05B *3/20*
U.S. Cl. 318—657 3 Claims



1 An electro-hydraulic servo system having automatic calibration capabilities and having the ability to move a driven device toward a desired position for the driven device comprising:
means for determining % position demand of the driven device;
microcontroller 32 for actuating the driven device through an automatic calibration sequence by ramping the driven device to its 100% mechanical limit P_{100} and it 0% mechanical limit P_0 to obtain calibration data for the driven device, a microprocessor connected responsive to said calibration data from said microcontroller; and
non-volitile memory means 56 connected to said microprocessor for storing said calibration data received by said microprocessor, said microprocessor accessing said calibration data from said memory means and calculating the desired position of the driven device from said calibration data and said % position demand according to the following equation:

$$\left[\begin{matrix}\text{New Position Demand} \\ \text{Desired Position}\end{matrix}\right] = \frac{(\%\text{ position demand})\,(P_{100} - P_0) + P_0}{100}$$

4,920,306
METHOD FOR CONTROLLING THE TORQUE OF A SYNCHRONOUS MACHINE SUPPLIED BY A FREQUENCY CONVERTER
Matti Mard, Kauniainen; Vesa Vaahkosen, Helsinki, and Olavi Kangasaho, Kauniainen, all of Finland, assignors to ABB Stromberg Drives OY, Helsinki, Finland
Filed Aug. 3, 1988, Ser. No. 227,775
Claims priority, application Finland, Aug. 7, 1987, 873433
Int. Cl.[5] H02P *5/40*
U.S. Cl. 318—722 7 Claims

1. A method for controlling the torque of a synchronous machine supplied by a frequency converter and having a rotor winding with separately controlled excitation current, wherein starting from measured variables (i_R, i_S, i_T, i_f) representing the state of the machine, the direct axis flux component (ψ_d), the quadrature axis flux component (ψ_q) and the pole angle (δ) for the machine are determined, and set values are produced for

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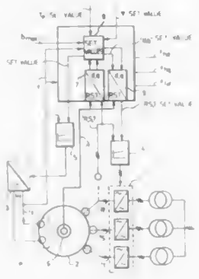
the flux (ψ set value), excitation current (i_{f0} set value) and current building the torque (i_2 set value), comprising the steps of:

forming from the calculated pole angle (δ) by means of a limiting block a limited pole angle (δ_r) that equals the pole angle (δ) if the pole angle has an absolute value smaller than a separately adjustable limit (δ_{max}), but equals the limit (δ_{max}) if the pole angle has an absolute value equal to or greater than the limit (δ_{max});

projecting the set value (i_2 set value) of the current controlling the torque, being perpendicular to the direction forming the limited pole angle (δ_r) with the direct axis (d) of the rotor, as the set value for the direct axis stator current (i_{do} set value) and as the set value for the quadrature axis stator current (i_{qo} set value); and

calculating in order to maintain the direct flux (ψ_d) at a value corresponding to the limited pole angle (δ_r) and the flux set value (ψ set value), the set value for the excitation current (i_{f0} set value) on the basis of the limited pole angle (δ_r), the flux set value (ψ set value) and the set value for the direct stator current (i_{do} set value) so that the set value for the excitation current (i_{f0} set value) compensates for the direct stator set value (i_{do} set value).

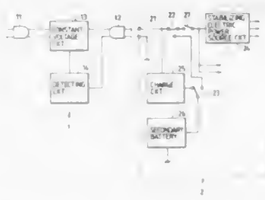


4,920,307

ELECTRIC POWER SOURCE USED TO CHARGE A SECONDARY POWER SOURCE

Kohei Iketani, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1989, Ser. No. 378,874
Claims priority, application Japan, Jul. 19, 1988, 63-179750
Int. Cl.[5] H02J *7/00*
U.S. Cl. 320—28 **8 Claims**



1. An electric power source for supplying a direct current voltage to electronic equipment having a battery which is charged by said electric power source, said electric power source comprising:

first means for detecting an electric current supplied to the electronic equipment from said electric power source; and

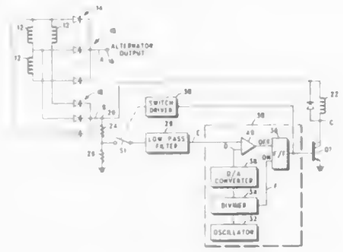
second means for adjusting an output voltage of said electric power source to one of at least two different voltages in accordance with the amount of said detected current.

4,920,308

REGULATOR FOR AUTOMOTIVE CHARGING SYSTEMS

Arthur J. Edwards, Hoffman Estates, Ill., and Randall C. Gray, Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 3, 1989, Ser. No. 332,125
Int. Cl.[5] H02J *7/14;* **H02K** *11/00*
U.S. Cl. 322—58 **5 Claims**



1. In a vehicle charging system that includes: (a) an alternator with a field winding that is excited by a regulator, and a diode trio providing an output from the alternator, and (b) a regulator with a filter for filtering the output of the diode trio and with circuitry for turning off and turning on the excitation to the field winding, a method for rendering the regulator relatively insensitive to voltage steps induced in the output of the diode tri by the turn-on and turn-off of the field excitation, comprising:

sensing the turn-off and turn-on of the field excitation;

disconnecting the filter from the diode trio responsive to the field excitation being turned off; and

connecting the filter to the diode trio responsive to the field excitation being turned on.

4,920,309

ERROR AMPLIFIER FOR USE WITH PARALLEL OPERATED AUTONOMOUS CURRENT OR VOLTAGE REGULATORS USING TRANSCONDUCTANCE TYPE POWER AMPLIFIERS

Tamas S. Szepesi, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

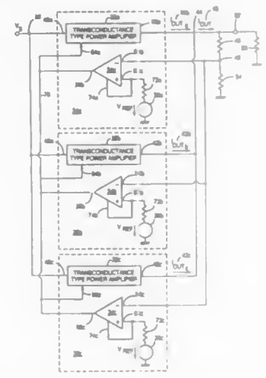
Filed Mar. 24, 1989, Ser. No. 328,166
Int. Cl.[5] G05F *1/46;* **H02M** *3/158*
U.S. Cl. 323—269 **11 Claims**

1. An error amplifier system for use with a transconductance type power amplifier comprising:

a. a plurality of error amplifiers, each of said error amplifiers having an output means;

b. means for electrically coupling each of said output means to every other said output means;

c. means for establishing an asymmetrical current capacity for each of said output means, said asymmetrical current capacity having a current sourcing capability greater than a current sinking capability.

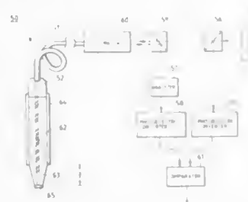


4,920,310

VOLTAGE DETECTOR

Shinichiro Aoshima, and Yutaka Tsuchiya, both of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed May 26, 1988, Ser. No. 199,350
Claims priority, application Japan, May 30, 1987, 62-137317
Int. Cl.[5] G01R *19/00, 31/00;* **G02F** *1/09*
U.S. Cl. 324—96 **8 Claims**



1. A voltage detector for detecting a voltage developing in a selected area of an object to be measured, comprising:

a pulse light source for emitting a pulse light beam;

first guide means for guiding said light beam from said pulse light source;

a voltage-sensing part including an electro-optic material whose refractive index changes according to said voltage developing in said selected area of said object;

splitting and extracting means for extracting a light beam with a first predetermined polarized component from said light beam guided from said first guide means, splitting said light beam with said first predetermined polarized component into a reference light beam and an input light beam which is launched into said electro-optic material, splitting an output light beam emerging from said electro-optic material, and extracting an output light beam with a second predetermined polarized component from one of the split output light beams;

second guide means for guiding said reference light beam and said output light beam with said second predetermined polarized component; and

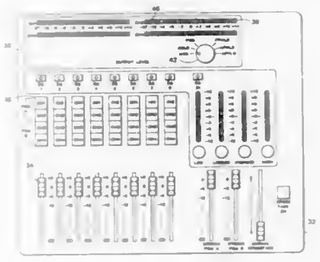
detection means for determining said voltage developing in said selected area of said object, said detecting means including a first photoelectric converter for detecting intensity of said reference light beam guided from said second guide means and a second photoelectric converter for detecting said output light beam with said predetermined polarized component guided from said second guide means.

4,920,311

USER SELECTION OF METER BALLISTICS

Robert Bateman, 12365 Madrona Way, Nevada City, Calif., and Donald R. Christensen, 10134 Ladybird Dr., Grass Valley, Calif.

Filed Oct. 27, 1988, Ser. No. 263,486
Int. Cl.[5] G01R *19/16;* **G01H** *3/14*
U.S. Cl. 324—125 **11 Claims**



1. An apparatus for user selection of meter ballistics comprising.

means for providing a plurality of meter ballistic standards;

means for selecting a meter ballistic standard from said plurality of meter ballistic standards;

means for converting an input signal into a processed signal according to the meter ballistic standard selected from the plurality of meter ballistic standards;

means for processing the processed signal according to the selected meter ballistic standard to produce a display signal; and

means for displaying the display signal to represent the

4,920,312

MULTIPLIER

Ryoji Maruyama, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 22, 1988, Ser. No. 247,617
Claims priority, application Japan, Sep. 24, 1987, 62-237454
Int. Cl.[5] G01R *11/32;* **G06G** *7/16*
U.S. Cl. 324—141 **5 Claims**

1. A multiplier for producing the product of a first input signal and a second input signal comprising:

a first pulse modulator for forming a first modulated pulse train, wherein the difference between the pulse width and half the pulse repetition period is proportional to said first input;

a second pulse modulator for forming a second modulated pulse train wherein the difference between the pulse width and half the pulse repetition period is proportional to said second input;

an oscillator for forming a first reference pulse train;

a coincidence circuit connected to said first and second modulators and said oscillator, for determining coincidences between the levels of said first and second modulated pulse trains and for outputting said first reference pulse train received from said oscillator only when the coincidence takes place;

a first counter connected to said coincidence circuit in order

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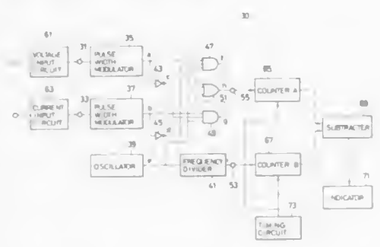
to count said first reference pulse train outputted from said coincidence circuit;

a frequency divider connected to said oscillator for outputting a second reference pulse train at half the frequency of said first reference pulse train;



a second counter connected to said frequency divider for counting said second reference pulse train; and

a subtractor connected to said first and second counters in order to subtract the output of said first counter from the output of said second counter.

4,920,313

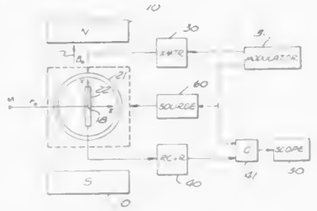
GRAVITATIONAL MASS DETECTOR

James N. Constant, 1603 Danbury Dr., Claremont, Calif. 91711

Continuation-in-part of Ser. No. 2,995, Jan. 11, 1979, abandoned. This application Feb. 11, 1985, Ser. No. 700,871

Int. Cl.[5] G01V *3/00*; G01M *1/12*

U.S. Cl. 324—301 **65 Claims**



1. In a system for detecting at a point P the gravitational field of a mass M located at another point Q at a distance from point P, including in combination:

means for constraining at least one mass m to rotational motion in a path about point P, with the mass m at or near the point P so that the distance between point P and the mass m is small compared to the distance between points P and Q;

said means for constraining being provided by one of a magnetic, electric, electromagnetic and acoustic force acting on mass m and connecting mass m to point P where mass m is a natural mass distinct from a man made mass, and said path being located for maximum response in a plane which contains known tidal forces of mass M; and

means for detecting a signal produced by variations along said path of mass m which variations are produced by tidal forces created by the gravitational field of mass M acting on mass m, which signal includes desired information about mass M.

4,920,314

MAGNETIC RESONANCE IMAGING SYSTEM

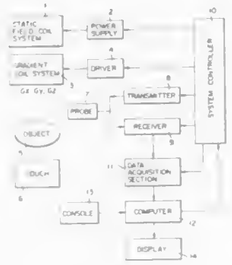
Kozo Satoh, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 4, 1988, Ser. No. 164,496

Claims priority, application Japan, Mar. 6, 1987, 62-50253

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—312 **9 Claims**



1. A magnetic resonance imaging system comprising:

static magnetic field generating means for generating a static homogeneous magnetic field;

slicing gradient magnetic field-generating means for generating a slicing gradient magnetic field whose intensity varies linearly in a direction orthogonal to a slice of interest of an object to be examined, the slicing gradient magnetic field being superimposed on the static magnetic field;

encoding gradient magnetic field-generating means for generating a phase encoding gradient magnetic field whose intensity varies linearly in a predetermined direction in a plane of the slice of interest, the encoding gradient magnetic field being superimposed on the static magnetic field;

reading gradient magnetic field-generating means for generating a reading gradient magnetic field whose intensity varies linearly in a predetermined direction which is in the plane of the slice of interest but is different from the direction of the encoding gradient magnetic field, the reading gradient magnetic field being superimposed on the static magnetic field;

transmitting and receiving means for transmitting high frequency pulses including a selective excitation pulse for exciting magnetic resonance in the slice of interest, and receiving a magnetic resonance signal resulting from magnetic resonance phenomenon excited by the high frequency pulses;

data acquisition means for acquiring magnetic resonance signal data received by the transmitting and receiving means;

sequence control means for driving in a predetermined pulse sequence the slicing gradient magnetic field-generating means, the encoding gradient magnetic field-generating means, the reading gradient magnetic field-generating means, the transmitting and receiving means and the data acquisition means such that the magnetic resonance is excited each time an encoding step determined by the amplitude of the encoding gradient magnetic field is performed and that the data acquisition means acquires the magnetic resonance signal resulting from the magnetic resonance; and

image reconstructing means responsive to the data acquired by the data acquisition means for reconstructing a magnetic resonance image, wherein

said sequence control means producing, with respect to one magnetic resonance image, two types of pulse sequences in which slicing gradient magnetic field pulses are opposite in polarity; and

said reconstructing means including additive combining means for additively combining data based on the two types of pulse sequences to reconstruct said one magnetic resonance image.

4,920,315

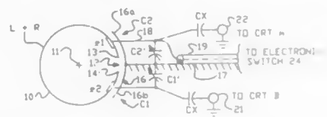
HEAD OF BODY COIL ASSEMBLY FOR MAGNETIC RESONANCE IMAGING APPARATUS

James G. Hokbrook, Mountain View, and Otto J. Jaks, Los Altos, both of Calif., assignors to Resonex, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 890,603, Jul. 25, 1986, abandoned. This application Aug. 24, 1987, Ser. No. 88,680

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—313 **4 Claims**



4. A head or body coil assembly for picking up free induction decay or apin-echo signals for a test specimen produced in a magnetic resonance imaging apparatus comprising:

inductive pick-up coil means associated with said test specimen for receiving said signals;

signal processing means connected to said coil means for providing said induction decay or spin-echo signals, including primary and secondary matching networks, said primary network being in close proximity to said pick-up coil means and said secondary matching network being remote from said pick-up coil means;

said primary and secondary matching networks being connected by a transmission line having a length equal to one-half the wavelength of said signal to be picked up and having a predetermined impedance;

said secondary network including means for detecting phase and magnitude of an RF signal having the wavelength of the signal to be picked up and impressed on said secondary and primary networks, said coil, and said test specimen, and including adjustable capacitors responsive to said detecting means for providing an impedance equal to said characteristic impedance with a 0° phase to provide optimum power transfer.

4,920,316

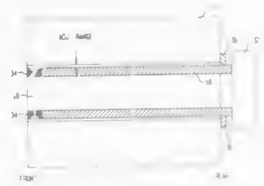
METHOD AND APPARATUS FOR REDUCING BASE FIELD SHIFTS IN A MAGNETIC RESONANCE DEVICE DUE TO PULSED MAGNETIC FIELD GRADIENTS

Heinz Egloff, Fremont, Calif., assignor to Siemens Medical Systems, Inc., Iselin, N.J.

Filed Mar. 30, 1989, Ser. No. 331,424

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—318 **15 Claims**



1. A magnetic resonance device, comprising:

a main magnetic having a bore axially formed therethrough in which a base field is formed;

gradient field forming means positioned inside said bore of said main magnetic for providing at least one field gradient along a given axis inside said bore and said gradient field forming means;

an electrically conductive media located nearby said gradient field forming means which produces at least one disturbing magnetic field along said given axis; and

gradient position adjusting means, including an adjustable positioner, for adjusting the position of said gradient field forming means with respect to said bore of said main magnet so as to cause the center point of the magnetic field along said given axis of said gradient field forming means to substantially coincide with the center point of the disturbing magnetic field along said given axis.

4,920,317

OSCILLATOR FOR MEASURING THE AMBIENT MAGNETIC FIELD

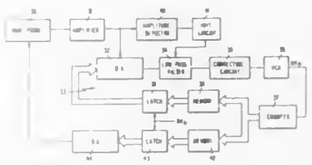
Jean-Louis Lescourret, Bourg Les Valence, France, assignor to Crouzet (Société Anonyme francaise), Montrouge, France

Filed Jan. 23, 1989, Ser. No. 301,523

Claims priority, application France, Jan. 26, 1988, 88 00960

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—318 **6 Claims**



1. An oscillator, used for measuring an ambient magnetic field and having an oscillation frequency substantially proportional to the intensity of said ambient magnetic field, comprising

generation means for generating a low frequency excitation signal,

initialization means for sweeping the frequency of an excitation signal over a range of frequencies,

a magnetic resonance magnetometric probe for detecting a signal at a frequency of magnetic resonance in response to said excitation signal, and

loop means for looking a phase of said excitation signal to a phase of said detected signal,

wherein said generation means delivers said low frequency excitation signal in digital form and said loop uses, as a phase comparator, a first D-A converter whose digital input receives said low frequency excitation signal in digital form and whose bias input receives said signal detected by said probe.

4,920,318

SURFACE COIL SYSTEM FOR MAGNETIC RESONANCE IMAGING

George J. Misic, Hiram; Gregory C. Hurst, Shaker Hts.; G. Neil Holland, Chagrin Falls; John L. Patrick, III, Solon, and Paul T. Orlando, Euclid, all of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Division of Ser. No. 765,708, Aug. 14, 1985, Pat. No. 4,793,356. This application Oct. 3, 1988, Ser. No. 252,819

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—318 **13 Claims**

1. A magnetic resonance apparatus for receiving radio frequency resonance signals generated by resonating nuclei, the apparatus comprising:

an electrically conductive coil which is positionable to receive the radio frequency resonance signals from resonating nuclei;

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a preamplifier mounted to the coil for amplifying the received resonance signals;

a conductive lead means extending from the preamplifier to a remotely located radio frequency signal processing circuit for conveying the received radio frequency resonance signals to the processing circuit and for conveying electrical power to the preamplifier from the processing circuit;

an impedance adjusting means mounted to the coil for selectively adjusting an impedance match between the preamplifier and at least one of the coil and conductive lead;

a resonant frequency adjusting means mounted to the coil for selectively adjusting a resonant frequency of the coil; and,

a control means for selectively controlling the impedance adjusting means and the resonant frequency adjusting means to adjust the impedance match and the coil resonant frequency, the control means being remotely located from the coil.

4,920,319

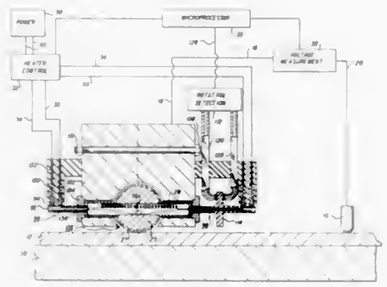
METHOD AND APPARATUS FOR DETERMINING THE THICKNESS OF A COATING ON A METAL SUBSTRATE

John R. M. Viertl, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 3, 1988, Ser. No. 153,292

Int. Cl.[5] G01N *25/00, 25/18*

U.S. Cl. 324—451 13 Claims



1. Apparatus for determining the thickness of a coating on a metal substrate, said apparatus comprising

(a) a first probe for locally heating said coating so as to establish a temperature gradient therein, said first probe being formed from a material having high thermal conductivity and being at least partially plated with a material having high resistance to oxidation and mechanical wear, said plating material comprising a metal selected from the group consisting of platinum, palladium, rhodium, and iridium, said first probe being further disposed so as to provide an electrical contact to said coating,

(b) a second probe disposed so as to provide an electrical return contact to said coated substrate,

(c) means for controllably heating said first probe so as to maintain the temperature thereof at about 450 degrees C.

(d) heat flow means to determine heat flow from said first probe to said coating,

(e) synchronus detector electric circuit means for measuring the thermoelectric voltage between said first and second probes,

(f) calculating means for determining the mean value and the variance for a plurality of said measured thermoelectric voltages.

(g) comparison means for comparing said measured thermoelectric voltage to a plurality of predetermined values which represent known coating thicknesses, and,

(i) conversion means for converting said measured thermoelectric voltage to a binary logic signal.

4,920,320

PHASE LOCKED LOOP WITH OPTIMALLY CONTROLLED BANDWIDTH

Lloyd P. Matthews, Buda, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 19, 1988, Ser. No. 285,997

Int. Cl.[5] H03K *17/00;* **H03L** *7/00*

U.S. Cl. 328—155 6 Claims

1. A method for controlling bandwidth in a filter of a digital phase locked loop to improve speed and stability, comprising the steps of:

receiving an input reference frequency signal having a predetermined phase;

filtering a phase compared signal to provide a control voltage;

coupling the control voltage to an oscillator circuit to provide an output signal which is phase locked to the input reference frequency, said output signal having a frequency varying in proportion to the control signal;

dividing the output signal by an integer multiple to provide a feedback signal having a fundamental frequency of the output signal and a phase; and

comparing the phase of the input reference frequency signal with the phase of the feedback signal to provide the phase compared signal in response thereto, wherein the improvement comprises:

placing the filter in a first predetermined bandwidth in response to a ratio of the phases of the input reference frequency signal and the feedback signal being greater than a predetermined ratio; and either

detecting with a plurality of digital logic gates when the output signal is within a predetermined range of the reference frequency for a predetermined time period by providing a digital counter with a count signal in response to a predetermined number of level transitions of at least one of the input reference frequency signal or feedback signal and counting a predetermined number of count signals, or

counting with the digital counter to detect when the output signal exceeds and falls below a predetermined frequency a predetermined number of times, before placing the digital filter in a second predetermined bandwidth substantially narrower than the first bandwidth in response thereto.

4,920,321

AMPLIFIER CIRCUIT ARRANGEMENT

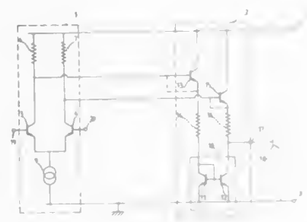
Desmond R. Armstrong, Wallington, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 22, 1988, Ser. No. 289,650

Claims priority, application United Kingdom, Dec. 24, 1987, 8730137

Int. Cl.[5] H03F *3/45*

U.S. Cl. 330—257 8 Claims



1. An amplifier circuit arrangement comprising: first and second stages in cascade, the first stage comprising a long tail pair of first and second transistors of the same conductivity type and first and second resistors coupling output electrodes of said first and second transistors, respectively, to a first voltage reference point and the second stage comprising a current amplifier circuit and a third resistor, the output electrode end of said first resistor being coupled to a second voltage reference point via said third resistor and the input current path of said current amplifier circuit in that order, and the output electrode end of said second resistor being coupled to said second voltage reference point via a fourth resistor in series with the output current path of said current amplifier circuit, wherein the output current path end of said fourth resistor constitutes an output of the second stage, and wherein the resistance values of said first, second, third and fourth resistors, and the gain of said current amplifier, are chosen such that in operation the voltage at the output of the second stage is substantially independent of variations in the potential on the first voltage reference point relative to the potential on the second voltage reference point.

4,920,322

VOLTAGE CONTROLLED R-C OSCILLATOR AND PHASE LOCKED LOOP

Jan B. F. W. Ruijs, Hilversum, Netherlands, assignor to AT&T Philips Telecommunications, Hilversum, Netherlands

Filed Feb. 23, 1989, Ser. No. 314,532

Claims priority, application Netherlands, Feb. 25, 1988, 8800480

Int. Cl.[5] H03B *5/20;* **H03K** *3/03, 7/06;* **H03L** *7/08*

U.S. Cl. 331—17 3 Claims

1. A voltage controlled oscillator, comprising:

a series arrangement of a first and a second signal inverter, each signal inverter producing a substantially binary signal with preset voltage levels and the output of the second signal inverter operating as the output of the oscillator, and

a feedback loop comprising:

a resistor whose one end is connected to the output of one of the signal inverters and a capacitor whose one end is connected to the output of the other signal inverter and whose remaining interconnected ends are connected to the input of the first signal inverter through a coupling circuit; and

a control circuit for varying the frequency of the oscillator over a continuous range in accordance with a continuously variable control voltage;

characterized in that the control circuit forms a part of the coupling circuit and comprises:

a second resistor whose one end is connected to the interconnected ends of the first resistor and the capacitor; and

a series arrangement of two equally directed diodes, whose interconnected electrodes are connected to the other end of the second resistor and whose remaining electrodes form the respective control inputs for two oppositely varying control voltages having a symmetrical position with respect to the mean value of the voltages in the interconnected ends of the first resistor and the capacitor, the interconnected electrodes of the diodes being coupled to the input of the first signal inverter.

3. A phase-locked loop comprising a signal controlled oscillator, a phase detector for generating an error signal which is representative of a phase difference between a reference signal and a signal taken from the oscillator and a loop filter for producing from the error signal a control signal for the signal controlled oscillator;

the oscillator comprising a series arrangement of a first and a second EXOR gate, each producing a substantially binary signal with present voltage levels and the output of the second EXOR gate operating as the output of the oscillator, and a feedback loop;

the feedback loop comprising a coupling circuit and a resistor whose one end is connected to the output of the first EXOR gate and a capacitor whose one end is connected to the output of the second EXOR gate and whose remaining interconnected ends are connected to the input of the first EXOR gate through the coupling circuit;

the coupling cirucit comprising a control circuit for varying the frequency of the oscillator over a continuous range in accordance with a continuously variable control voltage;

the control circuit comprising a second resistor whose one end is connected to the interconnected ends of the first resistor and the capacitor, and a series arrangement of two equally directed diodes, whose interconnected electrodes are connected to the other end of the second resistor and whose remaining electrodes form the respective control inputs for two oppositely varying control voltages having a symmetrical position with respect to the mean value of the voltages in the interconnected ends of the first resistor and the capacitor, the interconnected electrodes of the diodes being coupled to the input of the first signal inverter;

the phase detector comprising an EXOR gate with a first input for a substantially binary reference signal voltge and a second input for the substantially binary output voltage of the oscillator, and having an ouput which is connected to one of the control inputs of the oscillator through a first passive low-pass filter and to the other control input of the oscillator through an EXOR gate operating as a logic

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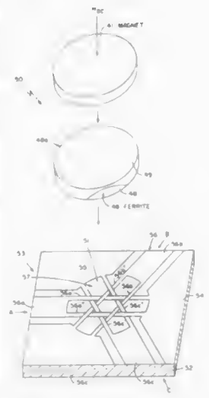
signal inverter and a subsequent second passive low-pass filter corresponding to the first low-pass filter.

4,920,323

MINIATURE CIRCULATORS FOR MONOLITHIC MICROWAVE INTEGRATED CIRCUITS

Ernst F. R. A. Schloemann, Weston; Ronald E. Blight, Framingham, and Robert L. Mozzi, Lincoln, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 27, 1988, Ser. No. 289,895
Int. Cl.[5] H01P *1/387*
U.S. Cl. 333—1.1 **20 Claims**



1. A non-reciprocal microwave device responsive to a DC magnetic field and having at least a pair of ports, comprising:
a dielectric substrate;
a ground plane conductor disposed on a first surface of said substrate;
a patterned strip conductor disposed on said first surface of said substrate, dielectrically isolated from said ground plane conductor, with said patterned strip conductor having a common central portion and at least two strip conductor portions, each one having a first end respectively connected to the common central portion and a second end which provides port connections for the circulator;
a ferrite body, through which said DC field is applied, disposed over said common central portion of said patterned strip conductor; and
a conductive layer disposed around said ferrite body except in regions of said body which come into contact with said strip conductor portions.

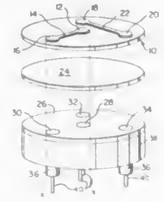
4,920,324

HIGH POWER RF SWITCH

Neil Whittaker, Hudson, and Denis Boulanger, Montreal, both of Canada, assignors to Canadian Patents and Development Limited/Societe Canadienne Des Brevets Et D'Exploitation Limitee, Canada

Filed May 5, 1988, Ser. No. 190,424
Claims priority, application Canada, May 5, 1987, 536435
Int. Cl.[5] H01P *1/10, 5/12*
U.S. Cl. 333—106 **5 Claims**

1. In an RF switch comprising a pair of switch contacts and means mounting said switch contacts for rotary movement into and out of a closed position in which a switch connection is established between said switch contacts, the improvement comprising a tuned RF circuit formed on rotatable dielectric material located between said switch contacts, said dielectric material and said switch contacts constituting a capacitive RF



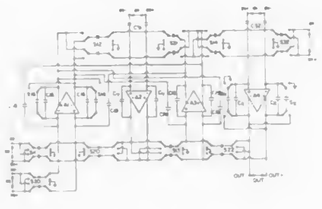
connection between said switch contacts in said closed position.

4,920,325

INTEGRATED ACTIVE ELECTRONIC SWITCHED CAPACITOR FILTER HAVING EXTREMELY LOW SENSITIVITY TO VARIATIONS OF THE COMPONENTS

Germano Nicollini, Piacenza, Italy, and Daniel Senderowicz, Berkeley, Calif., assignors to SGS-Thomson Microelectronics S.p.A., Cantania, Italy

Filed Feb. 26, 1988, Ser. No. 160,643
Claims priority, application Italy, Mar. 5, 1987, 19590 A/87
Int. Cl.[5] H03H *11/12*
U.S. Cl. 333—173 **3 Claims**



1. An active filter having an input and an output, and comprising four operational amplifiers coupled in cascade and each having an input and an output, the output of the fourth of said amplifiers being the output of the filter, with respective switched capacitors coupled in series between the output of the first of said amplifiers and the input of the second of said amplifiers, between the output of the second of said amplifiers and the input of the third of said amplifiers and between the output of the third of said amplifiers and the input of the fourth of said amplifiers, and a switched capacitor coupled from the input of the filter to the input of the first amplifier, with fixed capacitors coupled in parallel to the second and third of said amplifiers, respectively, with fixed and switched capacitors coupled in parallel to the first and fourth amplifiers, respectively, wherein a parallel combination of fixed and switched capacitors connects the input of the filter to the input of the fourth amplifier, and a fixed capacitor connects the input of the filter to the input of the second amplifier.

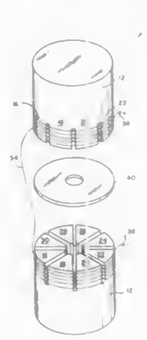
4,920,326

METHOD OF MAGNETIZING HIGH ENERGY RARE EARTH ALLOY MAGNETS

Ashok K. Agarwala, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 26, 1989, Ser. No. 301,687
Int. Cl.[5] H01F *13/00*
U.S. Cl. 335—284 **6 Claims**

1. A method of magnetizing high energy rare earth alloy magnets to saturation which comprises, subsequent to formation of the alloy, heating to a temperature at least 10° C. above



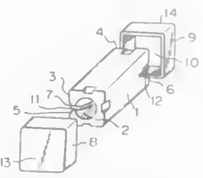
room temperature to less than one-half the cure temperature and applying a magnetizing charging field less than 24 Kilo-Oersteds.

4,920,327

CHIP-TYPE MICRO-FUSE

Hiroo Arikawa, Tokyo, and Yasutada Yuza, Kanagawa, both of Japan, assignors to SOC Corporation, Tokyo, Japan

Filed Sep. 30, 1988, Ser. No. 251,441
Claims priority, application Japan, Oct. 1, 1987, 62-149330[U]
Int. Cl.[5] H01H *85/16*
U.S. Cl. 337—231 **10 Claims**



1. A chip-type micro-fuse comprising:
a body made of heat-resistant and insulative material, said body having a pair of end faces spaced opposed to each other, an outer peripheral surface extending between said pair of end faces, a hole defined in said body and extending through said body between said pair of end faces, at least two recesses respectively provided on said outer peripheral surface at each one of said pair of end faces of said body;
an elongated fusible element, the length of said fusible element being longer than that of said hole, said fusible element being disposed within and extending through said hole in said body, one of a pair of end portions of said fusible element being disposed on one of said pair of end faces and in one of said recesses provided at one of said pair of end faces of said body, the other one of said pair of end portions of said fusible element being disposed on the other one of said pair of end faces and in the other one of said recesses provided at the other one of said pair of end faces of said body, and the remaining portion of said fusible element extending between said pair of end faces through said hole in said body; and
a pair of conductive and solderable terminal members respectively fitted onto a corresponding one of said pair of end faces of said body, each one of said pair of terminal members including a wall having an inner face opposing the respective end face of said body, a peripheral portion connected angularly to the periphery of said wall and covering said outer peripheral surface at each one of said pair of end faces of said body, each one of said end portions of said fusible element disposed on each one of said pair of end faces being firmly held between each of one of said pair of end faces of said body and each one of said inner faces of said terminal members, and each one of said end portions of said fusible element being electrically connected to each one of said inner faces of said terminal members.

4,920,328

MATERIAL FOR RESISTOR BODY AND NON-LINEAR RESISTOR MADE THEREOF

Masahiko Hayashi, Kanagawa; Yoshiyuki Innami, Tokyo, and Naoto Teshima, Shizuoka, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 270,084
Claims priority, application Japan, Nov. 12, 1987, 62-286155
Int. Cl.[5] H01C *7/10*
U.S. Cl. 338—21 **14 Claims**

1. A non-linear resistor which includes a resistor body formed with a composite material composed of:

Bi_2O_3	0.25 to 1.0 mol %;
Sb_2O_3	0.5 to 2.0 mol %;
Co_2O_3	0.25 to 1.0 mol %;
MnO_2	0.25 to 1.0 mol %;
Cr_2O_3	0.1 to 1.0 mol %;
NiO_2	0.1 to 1.0 mol %;
SiO_2	0.25 to 2.0 mol %; and
ZnO	remainder for 100 mol %, and

said resistor body including ZnO crystal, average particle size of which is adjusted within a range of 5 μm to 10 μm.

4,920,329

IMPEDANCE-COMPENSATED THICK-FILM RESISTOR

John M. Tischer, Streamwood, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 13, 1989, Ser. No. 406,661
Int. Cl.[5] H01C *3/00, 1/012*
U.S. Cl. 338—333 **4 Claims**

1. An impedance-compensated thick-film resistor (TFR) having at least one terminal, comprising:
a thick-film capacitor (TFC) coupled to said terminal, said TFC comprising a generally rectangular-shaped metallized portion having a length extending a finite distance (L) away from said terminal, L based at least in part on $(\beta - K_1 - K_2 * R_{fired})/K_3$, where

β = the TFR's final effective capacitance,

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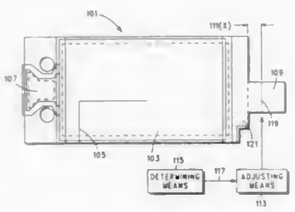
K_1=the TFR's fixed capacitance,

K_2=the TFR's capacitance slope,



R_{fired}=the TFR's fired resistance, and

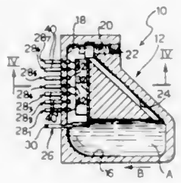
K_3=the TFC's capacitance slope.

4,920,330

MERCURY INERTIAL TRANSDUCER AND LIGHT-EMITTING INDICATOR FOR MOTOR VEHICLES

Lisio Plozner, Pordenone, Italy, assignor to B.P.T. S.p.A., Venice, Italy

Filed Jul. 18, 1988, Ser. No. 220,149
Claims priority, application Italy, Jul. 16, 1987, 67614 A/87
Int. Cl.[5] B60Q *1/50*; H01H *35/02*
U.S. Cl. 340—467 22 Claims



1. A mercury inertial transducer comprising:

a casing which defines a substantially L-shaped cavity with a substantially horizontal lower arm and a substantially vertical ascending arm, with reference to its position of use;

a volume of mercury which, in A rest condition, occupies the lower arm and essentially does not occupy the ascending arm;

an input electrode which penetrates the lower arm from the outside and is permanently immersed in the mercury, and

output electrode means which penetrate the ascending arm from the outside and can be reached by the mercury when the mercury rises in the ascending arm due to an inertial force directed along the lower arm and towards the ascending arm,

wherein the output electrode means are constituted by a series of separate output electrodes which are spaced along the ascending arm and can be reached in succession by the mercury and

wherein said transducer includes a support which can be fixed to a movable object, such as a motor vehicle, and on which the transducer is mounted so as to enable the adjustment of the inclination of its lower arm to the horizontal and of its ascending arm to the vertical.

4,920,331

SECURITY BARRIER WITH INTRUSION SESNING AND DELAYING MEANS

Hendrik M. Ver Loren van Themaat and Pieter L. Raath, both of Pretoria, South Africa, assignors to Sekerheid En Elektronika Laboratoria, Pretoria, South Africa

Filed Oct. 18, 1988, Ser. No. 259,282
Claims priority, application South Africa, Oct. 19, 1987, 87/7852
Int. Cl.[5] G08B *13/12, 15/00*
U.S. Cl. 340—541 17 Claims

1. A security installation for a property, which includes

an imperforate protective barrier extending upwardly from the ground and having a first side facing away from a property protected by the barrier, as well as a second side facing towards the property, with at least the second side extending vertically upwardly;

detection means in or on the barrier for detecting the presence of an intruder breaching, or attempting to breach, the barrier; and

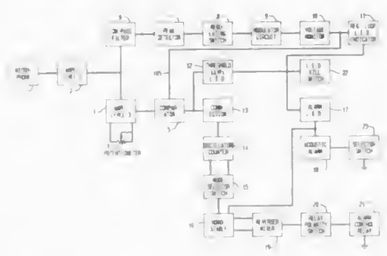
delaying means protruding from the second side of the barrier at the lower lever than the detection means, and adapted to delay the intruder on the intruder's breaching the barrier.

4,920,332

DIFFERENTIAL DETECTOR OF ACOUSTIC PRESSURE

Francois Philippe, Cai 33 Ave du Docteur Lefebure, 06270 Villeneuve Loubet, France

Filed Oct. 31, 1988, Ser. No. 265,249
Int. Cl.[5] G08B *13/20*
U.S. Cl. 340—544 10 Claims



1. Differential detector of acoustic pressure, for detecting an aperiodic wave resulting from opening of a door or a window is closed premises while disregarding passing pressure variations caused by air leaks and flexing of building materials, including a microphone (1) and means for setting a threshold value level,

comprising,

means for regulating (6, 10) in order to vary said threshold value in accordance with the microphone output, including a regulating loop, including a filtering circuit (6), receiving as an input a signal coming from the microphone, and generating an output signal (105) filtered of said passing variations, and

said detector further comprises

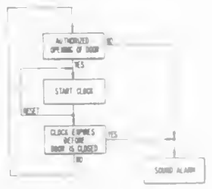
a comparator (5) having two inputs, one receiving said regulating loop output signal (105), and the other receiving another signal coming from the microphone.

4,920,333

INTERNAL PILFERAGE ALARM

Robert Barr, 1412 Rail Ave., Clovis, 93612, and Joel A. Fletcher, San Francisco, Calif., assignors to Robert Barr, Clovis, Calif.

Filed May 26, 1988, Ser. No. 199,064
Int. Cl.[5] G08B *13/08*
U.S. Cl. 340—545 14 Claims



1. A method of activating an indication device, to indicate the unauthorized opening of a door, which may be temporarily deactivated for only a preset period of time, comprising the steps of

determining whether opening of the door is authorized;

activating the indication device if opening of the door is unauthorized;

activating a timing clock set to run for a preselected period of time if opening of the door is authorized, and

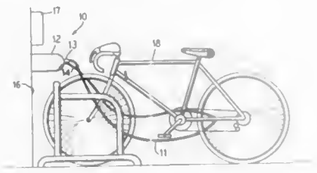
activating the indication device if the door is not closed within the time period set for the timing clock to run.

4,920,334

SECURITY SYSTEM FOR BICYCLES, SKI RACKS AND COAT RACKS

Dean R. DeVolpi, 603 Columbine, Lisle, Ill. 60532

Filed Apr. 24, 1989, Ser. No. 341,837
Int. Cl.[5] G08B *13/14*; H01H *47/00*
U.S. Cl. 340—568 7 Claims



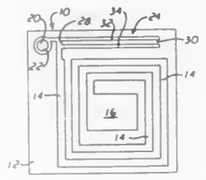
1. A locking system comprising, a holding member, a flexible locking cable with its first end attached to said holding member and adapted to be passed through an article which is to be locked to said holding member, the second end of said cable formed with a locking shoulder, a pair of locking jaws attached to said holding member and said second end of said cable insertable therein to lock said jaws behind said shoulder, a flexible conduit means which extends through said cable from said first to said second end, an energy transmitter connected to one end of said flexible conduit, and an energy sensor coupled to the other end of said flexible conduit to detect when said cable and flexible conduit are severed, including a micro-controller connected to said locking jaws to lock and unlock them, including a solenoid connected to said locking jaws and to said micro-controller and including an alarm connected to said micro-controller and said energy sensor connected to said micro-controller.

4,920,335

ELECTRONIC ARTICLE SURVEILLANCE DEVICE WITH REMOTE DEACTIVATION

George F. Andrews, Cocoa, Fla., assignor to Interamerican Industrial Company, Miami, Fla.

Filed Jan. 31, 1989, Ser. No. 304,202
Int. Cl.[5] G08B *13/24*
U.S. Cl. 340—572 7 Claims



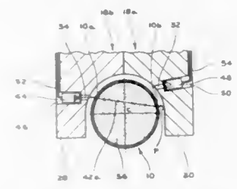
1. In an electronic article surveillance device of the type employing a parallel resonant circuit designed to respond to a first frequency, F_1, of transmitted electromagnetic radiation; the improvement comprising deactivation means formed in the parallel resonant circuit, said deactivation means comprising a transmission line resonator having a first end shorted to the parallel resonant circuit and a second open end, said transmission line resonator having a length defined by said first and second ends and said length being substantially equal to one quarter of the wavelength of a second frequency, F_2, of transmitted electromagnetic radiation used to excite said transmission line resonator to interrupt the parallel resonant circuit at said first end of said transmission line resonator, whereby the electronic article surveillance device is deactivated.

4,920,336

METHOD AND APPARATUS FOR MONITORING THE LEVEL OF THE CONTENTS IN A CONTAINER

Robert S. Meijer, San Diego, Calif., assignor to Fisher Scientific Company, Pittsburgh, Pa.

Filed Nov. 22, 1988, Ser. No. 275,323
Int. Cl.[5] G01F *23/00*
U.S. Cl. 340—619 43 Claims



1. A monitor of the contents in a container for detecting when the contents are below a predetermined level, said monitor comprising:

(a) emitting means on a first side of the container for producing an intermittent optical metering signal directed into the container;

(b) receiving means on a second side of the container opposite said first side thereof for generating an electronic

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signal proportional to illumination incident on said receiving means, said optical metering signal being incident to said receiving means only when the contents of the container are below the predetermined level;

(c) detection means coupled electronically to said emitting means and said receiving means for producing a verification signal when said electronic signal is synchronized with said metering signal; and

(d) alerting means coupled electronically to said detection means for generating a status signal in response to said verification signal, said status signal indicating that the level of the contents of the container is below the predetermined level.

4,920,337

DISPLAY APPARATUS

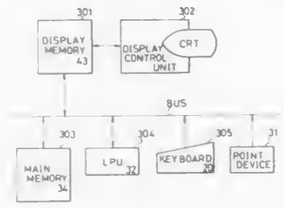
Hideo Kuo, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 660,988, Oct. 15, 1984, abandoned. This application Oct. 13, 1987, Ser. No. 106,888

Claims priority, application Japan, Oct. 17, 1983, 58-193874; Oct. 17, 1983, 58-193875

Int. Cl.[5] G09G *1/00*

U.S. Cl. 340—721 13 Claims



1. A display apparatus comprising:

memory means for storing therein image data to be edited and command image data representing a command for editing the image data to be edited, said image data and said command image data being stored in first and second memory areas, respectively;

display means for displaying the image data and the command image data stored in said memory means, said display means having first and second display areas;

control means adapted to display a part of the image data on said first display area and to display the command image data, in place of the remaining image data, on said second display area, said control means including a register for storing data corresponding to a display address of a boundary between said first display area and said second display area, said control means adapted to stop reading image data from said first memory area when a display address of the image data is coincident with data corresponding to a display address of the boundary during display of the image data, and further adapted to read the command image data from said second memory area and display same on said display means; and

erasure means for changing data corresponding to a display address of the boundary stored in said register and erasing the command image displayed on said display means.

4,920,338

AUTOMATIC SEAT POSITIONING DEVICE FOR AUTOMOTIVE VEHICLE AND THE LIKE

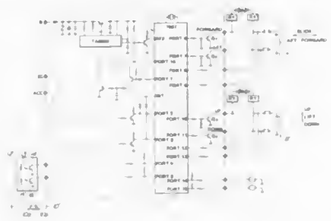
Masakazu Tsunoda, Fujisawa; Akimitsu Inoue, Toride, and Tsutomu Yamamoto, deceased, late of Ibaragi, all of Japan (by Tatsuyo Yamamoto, Hirofumi Yamamoto, Toshifumi Yamamoto, Ikuko Yamamoto, legal representatives), assignors to Nissan Motor Co., Ltd., Yokohama and Niles Parts Co., Ltd., Tokyo, both of, Japan

Filed Jun. 3, 1988, Ser. No. 201,995

Claims priority, application Japan, Jun. 4, 1987, 62-139024

Int. Cl.[5] H04Q *3/02*; B60R *25/04*

U.S. Cl. 340—825.300 10 Claims



10. A seat position control arrangement as claimed in claim 7 wherein said control circuit comprises:

first and second analog multiplexers, said first and second multiplexers each having first, second and third ports, the first ports of said first and second multiplexers being connected with said key reader, said second and third ports of said first and second multiplexers being connected respectively with the first and second variable resistors of said first and second seat position control switches;

third and fourth variable resistors;

first and second differential amplifiers, said first and differential amplifier being connected with an output port of said first multiplexer and said third variable resistor, said second differential amplifier being connected with an output port of said second multiplexer and said fourth variable resistor;

first and second comparators, said first and second comparators being connected between said first differential amplifier and said first motor; and

third and fourth comparators, said third and fourth comparators being connected between said second differential amplifier and said second motor.

4,920,339

SWITCHABLE BUS TERMINATION AND ADDRESS SELECTOR

Robert C. Friend, Laguna Niguel, and Charles R. Patton, III, Long Beach, both of Calif., assignors to Western Digital Corp., Irvine, Calif.

Filed Jan. 6, 1989, Ser. No. 295,070

Int. Cl.[5] H04J *3/02*

U.S. Cl. 340—825.520 16 Claims

1. In a communication network having a plurality of devices for communication therebetween over at least one transmission path coupling the devices together, at least one said device being addressable and responsive to a selected address for communication, a switchable termination module associated with said at least one addressable device, the module comprising:

a port for connection to the at least one transmission path;

a controllable terminator for the at least one transmission path connected to the port; and

a switch having a first set of switch conditions for enabling the terminator to terminate the transmission path and for simultaneously selecting one of a plurality of addresses to which the at least one device responds, and a second set of switch conditions for disabling the terminations of the

terminator and for simultaneously selecting any one of a plurality of addresses for the at least one device.

4,920,340

VEHICLE DETECTING METHOD AND SYSTEM WHICH CAN COMMUNICATE WITH VEHICLES

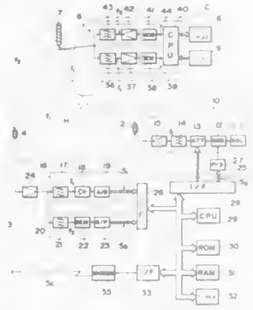
Masao Mizuno, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Apr. 21, 1986, Ser. No. 854,312

Claims priority, application Japan, Apr. 22, 1985, 60-86064

Int. Cl.[5] G08G *1/09*

U.S. Cl. 340—905 20 Claims



1. A vehicle detecting method which can communicate with vehicles, comprising the steps of:

arranging a transmitting coil on one side of a predetermined detection area set over a roadway of vehicles and a receiving coil on the other side of said detection area, the transmitting coil emitting a first high frequency signal having a first frequency and the receiving coil receiving the first high frequency signal of the first frequency and a second high frequency signal having a second frequency different from said first frequency;

applying said first high frequency signal of said first frequency to said transmitting coil to form a high frequency magnetic field between the transmitting coil and the receiving coil, and detecting the existence of a vehicle by detecting a change in a signal characteristic of a signal induced in said receiving coil when the vehicle enters said magnetic field;

modulating said first high frequency signal which is applied to the transmitting coil by data to be transmitted to the vehicle; and

receiving by the receiving coil said second high frequency signal which is transmitted from the vehicle and also demodulating the received second high frequency signal, thereby executing at least a unidirectional communication with the vehicle.

4,920,341

MAGNETIC ROTARY ENCODER DEVICE

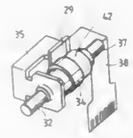
Tsuyoshi Aoki, Wakuya, and Yasuhisa Ohsumi, Sendai, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1988, Ser. No. 282,806

Claims priority, application Japan, Mar. 8, 1988, 63-29844[U]; Mar. 9, 1988, 63-30316[U]

Int. Cl.[5] H03M *1/00*; G01B *7/30*

U.S. Cl. 341—15 6 Claims



1. A magnetic rotary encoder device, comprising a fixed shaft fixedly supported at least at one portion thereof, an inner bearing means provided on an outer periphery of said fixed shaft, an outer bearing means disposed in an opposing relationship to and held in engagement with said inner bearing means with a low coefficient of friction, a cylindrical member having said outer bearing means provided on an inner periphery thereof, a magnetic means provided on an outer periphery of said cylindrical member and extending perpendicularly to the direction of an axis of said outer bearing means, said magnetic means having magnetic poles formed thereon, a magnetic sensor for detecting a magnetic flux from any of said magnetic poles, a mounting plate for fixedly supporting said magnetic sensor on said fixed shaft, and a detecting member mounted in sliding contact with said cylindrical member to rotate said magnetic means around its axis.

4,920,342

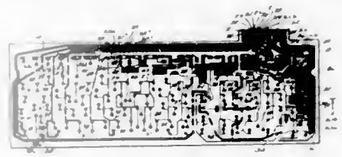
MEMBRANE SWITCHCORES WITH HIGH RESISITIVITY INK CIRCUITS

Norman G. Gratke, Elm Grove, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Oct. 25, 1988, Ser. No. 262,568

Int. Cl.[5] H03M *11/00*

U.S. Cl. 341—22 5 Claims



1. A membrane switchcore of flexible plastic film for use in an alphanumeric keyboard and adapted for connection to electronic device circuitry for transmitting an electrical signal to the switchcore and electronic sense circuitry for detecting a change in the electrical signal transmitted across the switchcore, comprising:

an insulating layer;

a plurality of conductive row traces along a first surface of the insulating layer;

a plurality of conductive column traces along a second surface of the insulating layer opposite the first surface;

at least 36 key cells, each key cell being connected between one of said row conductive traces on the first surface and one of said column conductive traces on the second surface, and each key cell including conductive key cell elements for effecting a change in impedance between

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drive and sense connections to the row and column traces in response to manual actuation of the key cell; and

the row traces, the column traces, and the key cell elements define paths for the transmission of electrical signals between drive and sense connections to the switchcore and are formed of a conductive high resistivity ink having a resistivity of at least about 10 ohms per square per 0.001" of ink thickness, and wherein the net resistance for one of the row traces and one of the column traces in at least one said path defined by said one row trace, said one column trace, and one of the key cells connected to said one row trace and one column trace is greater than approximately 5,000 ohms for each of said one row trace and said one column trace.

4,920,343

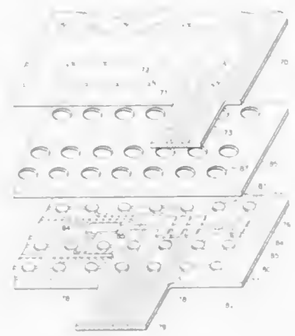
CAPACITIVE KEYSWITCH MEMBRANE WITH SELF CONTAINED SENSE-TO-GROUND CAPACITANCE

Kenneth E. Schwartz, El Paso, Tex., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 30, 1988, Ser. No. 252,228

Int. Cl.[5] H03M *11/00, 17/98*

U.S. Cl. 341—33 7 Claims



1. A key actuable capacitive switch membrane assembly comprising:

flexible dielectric sheet means having first and second parallel proximate portions each with first and second surfaces arranged so that the first surfaces are adjacent and the second surfaces are separated by at least the first and second portions;

first, second and third patterns of electrically conductive material on the first surface of the first portion of said sheet means, the first surface of the second portion of said sheet means and the second surface of the second portion of said sheet means respectively, portions of said first, second and third patterns being aligned in a direction perpendicular to the portions of the sheet means so as to form first, second and third plates of an array of capacitors, portions of said first and third patterns forming first and second pluralities of conductors respectively arranged in a cross point matrix, the first and second pluralities of conductors being connected to the first and third plates of the capacitors in the array so that each capacitor is connected to a unique pair of conductors, portions of the second and third patterns forming coupling capacitor means for coupling the second plurality of conductors together ; and

spacer means interposed between the first surfaces of the first and second portions of said sheet means so as to normally maintain a predetermined separation between the first surfaces, said spacer means being of a design which permits the spacing of the first and second plates of capacitors in the array to be varied, whereby each capacitor has a variable capacitance between its first and second plates in series with a fixed capacitance between its second and third plates.

4,920,344

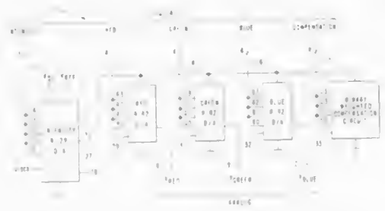
DIGITALLY COMPENSATED MULTIPLYING DIGITAL TO ANALOG CONVERTER

David L. Henderson, and Carl M. Stanchak, both of Colorado Springs, Colo., assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 3,153, Jan. 14, 1987, abandoned, Division of Ser. No. 710,658, Mar. 11, 1985, Pat. No. 4,779,029. This application Jun. 2, 1988, Ser. No. 205,046

Int. Cl.[5] H03M *1/76*

U.S. Cl. 341—118 9 Claims



1. A multiplying digital to analog converter comprising:

a first digital to analog converter providing an analog output in response to a first digital word input;

a second digital to analog converter connected to receive the output from the first digital to analog converter and provide an output responsive to a second digital input word and in proportion to the magnitude of the output of the first digital to analog converter; and

compensation means, connected to the second digital to analog converter and varying in magnitude based upon the data represented by the second digital input word, for offsetting loading effects on the first digital to analog converter caused by changes in the second digital word.

4,920,345

DEVICE OPERATING ON THE DOPPLER PRINCIPLE TO DETERMINE THE DISTANCE TRAVELED BY A VEHICLE

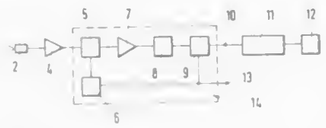
Ernst Lissel, and Raimond Holze, both of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany

Filed Oct. 21, 1988, Ser. No. 261,171

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1987, 3736762

Int. Cl.[5] G01S *13/60, 13/62*

U.S. Cl. 342—70 3 Claims



1. Apparatus for indicating the distance traveled by a vehicle comprising microwave signal-generating means including transmitter means and antenna means for emitting rays at a predetermined angle with respect to a surface on which the vehicle is traveling, receiver means for receiving the reflected rays and providing signals representing the differential frequency between the frequencies of emitted and reflected rays, variable band pass filter means having a variable lower frequency limit trailing the differential frequency, comparator means following the variable band pass filter means to generate a synchronizing signal, phase-locked loop circuit means responsive to the synchronizing signal to produce a pulse output signal whose frequency is a function of the vehicle speed and an analog voltage output signal whose voltage is a function of the vehicle speed, counter means responsive to the pulse output signal from the phase-locked loop means to provide signals indicating the distance traveled by the vehicle, and a tuning oscillator to control the lower frequency limit of the variable band pass filter means, one of said pulse and analog voltage signals being supplied to the tuning oscillator to control said lower frequency limit.

4,920,346

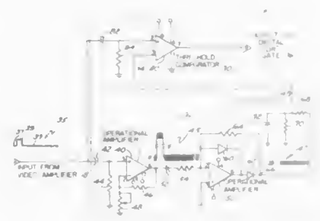
UNIDIRECTIONAL AMPLITUDE SENSITIVE NOISE RIDING THRESHOLD CIRCUIT

William P. Huntley, Old Lyme, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 176,958, Apr. 4, 1988, Pat. No. 4,860,013. This application Jun. 30, 1989, Ser. No. 373,955

Int. Cl.[5] G01S *13/00*

U.S. Cl. 342—91 2 Claims



1. A unidirectional amplitude sensitive noise riding threshold circuit comprising:

a noise compensator connected to receive a signal, said noise compensator having processing means for generating a DC voltage proportional to the noise within said received signal, said noise compensator further comprising, first amplification means connected to receive said signal, said first amplification means having a wide dynamic range for amplifying said signal, a high pass filter, connected to receive said amplified signal from said first amplification means, for discriminating against low frequency and DC noise components thereof, and second amplification means connected to receive said amplified and filtered signal from said high pass filter, said second amplification means for rectifying said received signal and for generating a DC voltage proportional to the noise within the signal received by said first amplification means; and

a comparator connected to receive at one input the same signal as that received by said noise compensator, and to receive at another input said DC voltage from said noise compensator, said comparator providing a predetermined output signal when said amplitude of said signal received by said noise compensator and said comparator exceeds said DC voltage from said noise compensator.

4,920,347

PULSE DOPPLER RADAR SYSTEM

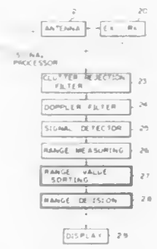
Nobora Kurihara, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1989, Ser. No. 337,182

Claims priority, application Japan, May 7, 1988, 63-167314; Jul. 11, 1988, 63-172206

Int. Cl.[5] G01S *13/34*

U.S. Cl. 342—130 12 Claims



1. A pulse doppler radar system for transmitting pulse-modulated signals from an antenna apparatus and for receiving an echo signal from a target through said antenna apparatus to measure the range to the target, comprising:

exciter-receiver means operable to alternately generate a first signal having a constant frequency in a first period and a second signal modulated with a linearly-changing frequency in a second period and to pulse-modulate said first and second signals at a predetermined pulse repetition rate so as to supply the pulse-modulated first and second signals to said antenna apparatus and for receiving an echo signal from said antenna apparatus, thereby enabling said antenna apparatus to alternately transmit the pulse-modulated first signal and the pulse-modulated second signal;

signal processing means coupled to said exciter-receiver means to detect doppler frequencies included in said echo signal received in said first period and doppler frequencies included in said echo signal received in said second period, respectively, for calculating the value indicating the range to said target on the basis of the differences between said doppler frequencies received in said first period and those received in said second period, said signal processing means being operable, when a plurality of doppler frequency signals are received in both of said first and second periods, to calculate the range values on the basis of all the differences between said plurality of doppler frequencies received in said first period and those received in said second period, thereby enabling the number of same range values to be obtained so that the range value corresponding to the largest number can be determined to be a value indicating the range to said target; and

means for displaying the range of said target on the basis of the so determined range value.

4,920,348

METHOD AND APPARATUS FOR SIGNAL MODULATION AND DETECTION

Elie J. Baghdady, 21 Overlook Dr., Weston, Mass. 02193

Filed Oct. 8, 1987, Ser. No. 106,126

Int. Cl.[5] G01S *5/04;* **H04B** *1/10*

U.S. Cl. 342—433 33 Claims

1. A method of receiving a signal wave occupying a predetermined bandwidth that imparts to it a digital modulation whose level depends on the direction of arrival of the signal wavefront, and which as a result creates a digitally modulated component signal embodying energy diverted from the arriving signal to a more widely spread spectrum, and hence re-

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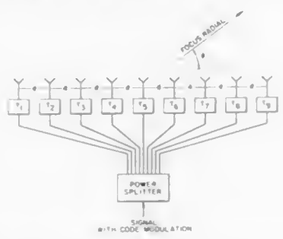
duces the signal spectral density within said predetermined bandwidth, the fraction of the total arriving signal energy so diverted being dependent on the direction of arrival of the signal wavefront, comprising the steps of:

providing a set of different positions in space for intercepting an arriving signal wavefront;



controlling the time of the reception from each of said different positions to abruptly hop among said positions, which in effect times the introduction into the received signal of an abrupt direction-dependent shift;

adjusting the separation between successively hopped positions of signal wavefront interception; and

adjusting the orientation of the line segment between successively hopped positions of signal wavefront interception.

4,920,349

ANTENNA MOUNTING WITH PASSIVE STABILIZATION

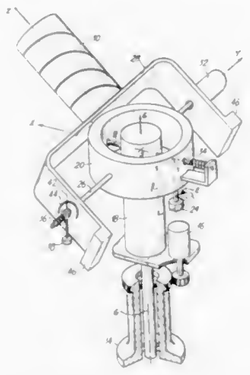
Jean C. Le Gall, Perros Guirec, France, assignor to Centre National d'Etudes des Telecommunications, France

Filed Jul. 26, 1984, Ser. No. 634,582

Claims priority, application France, Aug. 3, 1983, 83 12821

Int. Cl.[5] H01Q *1/34*

U.S. Cl. 343—709 **12 Claims**



1. For use on a ship, an antenna mounting system with controlled movement about bearing and elevation axes and passive stabilization about a transverse axis orthogonal to the bearing and elevation axis, comprising:

(a) a stationary stand;

(b) gimbal suspension means having: a gimbal support pivotally connected to said stand for rotation thereon about a bearing axis; an intermediate unit mounted on said gimbal support for oscillating movement thereon about a transverse axis at right angles to said bearing axis and having a center of gravity below said transverse axis; and an antenna support pivotally mounted on said intermediate unit for rotation thereon about an elevation axis at right angles to said intermediate axis;

(c) gravity responsive return means operatively connecting said intermediate unit and said gimbal support and arranged for retaining said intermediate unit into a predetermined direction relative to horizontal, said return means including: a pendular body pivotally connected to said gimble support about an axis parallel to said transverse axis for indicating an apparent vertical direction; and a gear train operatively connecting said intermediate unit and pendular body, said gear train being arranged so that any angular deviation of the intermediate unit from a predetermined set direction causes deviation of the angular body from said vertical position in the same angular direction.

4,920,350

SATELLITE TRACKING ANTENNA SYSTEM

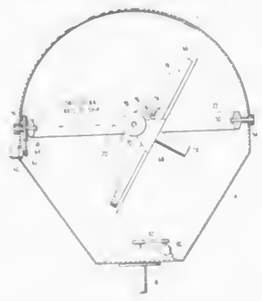
William H. McGuire, Montgomery, Md., and Thomas J. Tilden, Falls Church, Va., assignors to Comsat Telesystems, Inc., Fairfax, Va.

Continuation of Ser. No. 89,005, Aug. 20, 1987, which is a continuation of Ser. No. 873,301, Jun. 9, 1986, abandoned, which is a continuation of Ser. No. 581,164, Feb. 17, 1984, abandoned.

This application Jul. 6, 1988, Ser. No. 224,186

Int. Cl.[5] H01Q *1/18, 3/08*

U.S. Cl. 343—709 **12 Claims**



1. A satellite tracking system comprising:

a radome mount fixed to an unstabilized movable structure;

a ring journalled for rotation on said mount and arrange such that the axis of rotation of said ring is aligned with a principal longitudinal axis of said structure;

means for rotating said ring relative to said mount comprising a stepper motor fixed to a wall of said radome mount, and gear means inside said radome mount for converting stepper motor movement into rotation of said ring;

an antenna journalled for rotation on said ring, said antenna contained in said ring and having an axis of rotation substantially perpendicular to the axis of rotation of said ring; and

means for rotating said antenna relative to said ring.

4,920,351

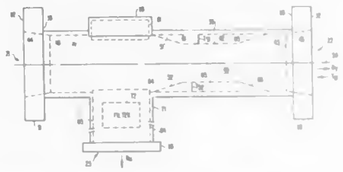
DIPLEXER FOR ORTHOGONALLY POLARIZED TRANSMIT/RECEIVE SIGNALLING ON COMMON FREQUENCY

Homer E. Bartlett, Palm Bay, and Kevin P. Gallagher, Indian Harbor Beach, both of Fla., assignors to Computer Science Inovations, Inc., Palm Bay, Fla.

Filed Mar. 24, 1986, Ser. No. 843,008

Int. Cl.[5] H01Q *13/00*; H01P *1/213*

U.S. Cl. 343—756 **20 Claims**



1. A microwave coupling device comprising:

a first waveguide section having a first end which forms a first port of said device and a second end which forms a second port of said device, said first port coupling into said first waveguide section a first signal, lying in a first frequency band, having a first polarization and a second signal, lying in said first frequency band, having a second polarization orthogonal to said first polarization, said second port coupling into said first waveguide section a third signal naving said second polarization and lying in a second frequency band, higher than said first frequency band;

a second waveguide section having one end thereof coupled to said first waveguide section at a location between the first and second ends thereof and having a second end forming a third port of said device;

frequency selective, polarization filter means, disposed within said first waveguide section between said location and the second end of said first waveguide section, for preventing said second signal from being coupled from said location to said second port, while permitting the passage of said first and third signals through said first waveguide section between said first and second ports; and

frequency filter means, disposed within said second waveguide section and having a passband corresponding to said first frequency band, for passing said second signals therethrough while preventing the coupling of said third signals between said location and said third port.

4,920,352

RETRACTABLE ANTENNA

Nils E. V. Martensson, Long Acre, and Michael B. Ashdown, Kingshill, both of England, assignors to Technophone Limited, United Kingdom

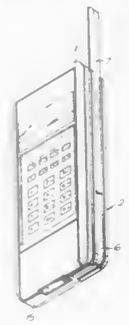
Filed May 12, 1989, Ser. No. 351,866

Claims priority, application United Kingdom, May 27, 1988, 8812703

Int. Cl.[5] H01Q *1/24*

U.S. Cl. 343—702 **20 Claims**

1. An antenna assembly comprising an antenna support and an antenna retractably mounted at least partially within said support, the antenna being in the form of a tape, the support defining a passageway in which the tape is slidably received, and contact means for making electrical connection to the antenna being provided on the support in the passageway, wherein the tape, and passageway are shaped so as to impose a bend transversely across the tape at least in the region of the contact means such that the convex side of the tape confronts



the contact means and rigidity is imparted to the tape when extended from the passageway.

4,920,353

ANTENNA FOR PORTABLE RADIO COMMUNICATION APPARATUS

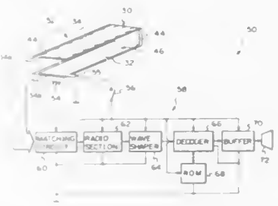
Toshihiro Mori, and Kazuyuki Tsunoda, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jun. 29, 1988, Ser. No. 213,290

Claims priority, application Japan, Jun. 29, 1987, 62-159888

Int. Cl.[5] H01Q *1/24*

U.S. Cl. 343—702 **25 Claims**



1. In an antenna of a radio communication apparatus which is powered by at least one generally flat battery with positive and negative terminals, the improvement wherein at least one flat part of said antenna is integrally constituted by a flat conductive sheath member which comprises a flat portion of said battery.

4,920,354

MANUALLY EXTENDABLE TELESCOPING ANTENNA

Bernard Rauser, Gaimersheim, and Robert Harth, Ingolstadt, both of Fed. Rep. of Germany, assignors to Audi Ag, Ingolstadt, Fed. Rep. of Germany

Filed Dec. 1, 1987, Ser. No. 127,195

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1986, 3641530

Int. Cl.[5] H01Q *1/10*

U.S. Cl. 343—901 **9 Claims**

1. In a manually operated telescoping antenna assembly having a plurality of nested hollow telescoping tubular sections, an upper terminal section having an upper end and a lower end, and a lower guide tube mountable to a substantially planar base member into which the antenna sections receivably retract and from which said antenna sections are manually

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extensible, the improvement which comprises in operative combination therewith of:

(a) a continuous one piece vibration damping non-electrically conductive core member disposed inside said hollow telescoping sections;

(b) said lower guide tube is mounted below the plane of said base member so that said antenna sections are manually retracted to a position substantially flush with said base member plane;

(c) said vibration damping core member extending continuously from said upper terminal section into said lower guide tube;

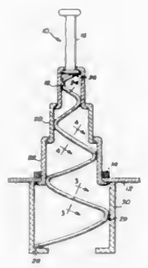
(d) said core member:

(i) is fixed adjacent an upper end thereof to the lower end of said upper antenna terminal section;

(ii) terminates in said guide tube; and

(iii) is fixed at a lower end thereof to said guide tube;

(e) said continuous vibration damping core member is formed in a generally helical spiral having a large spiral diameter portion oriented to be received in said guide tube, said vibration damping core member maintaining a helical spiral configuration in all retracted and extended positions;



(f) said core member being of sufficient length and flexibility:

(i) to permit said vibration damping core member to move loosely, and to be extended and retracted, without eigen vibration properties in a helical spiral configuration during extension from said guide tube and retraction of said antenna sections; and

(ii) to touch each of said telescoping tubular sections non-continuously but in at least one place per antenna section when extended in order to dampen motion and wind-induced eigen vibrations of said antenna sections, to reduce transmission of said vibrations as noise to a base member to which said antenna assembly is mounted, and to reduce propagation of noise vibrations by said base member to which said antenna assembly is mounted; and

(g) said core member being of insufficient length and of sufficient flexibility, and disposed entirely within said telescoping sections and said guide tube, to exclude power raising of said antenna sections by power drive means acting on said flexible vibration damping core member, while permitting manual raising and lowering of said antenna by lifting or pushing, respectively, on said upper terminal section.

4,920,355

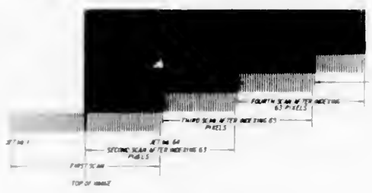
INTERLACE METHOD FOR SCANNING PRINT HEAD SYSTEMS

James A. Katerberg, Kettering, Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 31, 1989, Ser. No. 386,746

Int. Cl.[5] G01D *15/16;* **H04N** *1/21*

U.S. Cl. 346—1.1 **5 Claims**



1. An improved method of printing using a print head having a linear array of print elements adapted to be indexed in a direction parallel to the line of the array line to address successive groups of rows of print media pixels moved therepast in a direction generally perpendicular to the array direction, said method comprising:

(a) selecting such print head to comprise an even number (A) of print elements located in a linear array and having with a uniform 2 pixel spacing;

(b) alternately indexing the print head, in a direction parallel to the array direction by the amounts of A−1 and A+1 pixels; and

(c) in correspondence with such alternate indexings respectively printing on even or odd rows of the print medium in accord with image information.

4,920,356

ELECTROGRAPHIC RECORDING RECEIVER

William K. Goebel, and David M. Rakov, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 19, 1988, Ser. No. 286,190

Int. Cl.[5] G01D *9/00, 15/10;* **B05D** *5/12;* **B32B** *3/00*

U.S. Cl. 346—1.1 **14 Claims**

1. An electrographic recording receiver for use in a process where styli in a writing head deposit electric charges on an electrographic receiver comprising

(A) a substrate that comprises a conductive layer on an insulating support;

(B) a dielectric layer having an image area on said conductive layer;

(C) conductive particles that are embedded in said image area of said dielectric layer, are in contact with said conductive layer and extend through the surface of said dielectric layer to provide an electrical path between a ground and said conductive layer through said conductive particles; and

(D) insulating particles that are embedded in said image area of said dielectric layer and extend through the surface of said dielectric layer beyond said conductive particles to provide a substantially uniform distance between said styli and said dielectric layer.

14. A method of making an electrographic recording receiver comprising

(A) depositing on an insulating support a conductive layer containing conductive particles that extend through the surface of said conductive layer, and

(B) depositing a dielectric layer on said conductive layer at a thickness such that said conductive particles protrude through the surface of the dielectric layer, said dielectric layer containing insulating particles that also protrude through its surface.

4,920,357

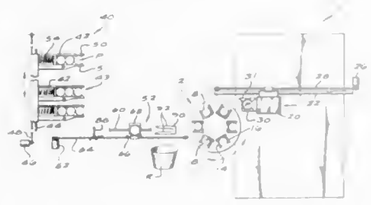
UNATTENDED REPLACEMENT OF PLOTTER PENS

David A. Johnson, Escondido, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 29, 1989, Ser. No. 373,415

Int. Cl.[5] G01D *9/30*

U.S. Cl. 346—49 **6 Claims**



1. In a computer driven plotter pen apparatus having a moveable plotter pen carriage which has means thereon for releaseably holding a plotter pen in drafting position, the improvement comprising apparatus for the unattended replacement of a spent plotter pen comprising:

(a) a pen turret mountable on said plotter pen apparatus, said turret having a plurality of pen slots to hold a variety of usable plotting pens, each of said plurality of pen slots having gripping means mounted therein to hold a pen and said pen gripping means being moveable, upon rotation of said turret, between a first pen transfer position and a second pen transfer position,

(b) means for rotating said turret for moving said pen slots and pen gripping means therein between said first and second positions;

(c) a plurality of pen magazines each being capable of holding a plurality of fresh plotting pens and having gripping means at one end thereof to hold a fresh pen in a third pen transfer position, and means for moving fresh pens in said magazine towards said third pen transfer position into said pen gripping means;

(d) means for moving said plurality of pen magazines to selectively position the gripping means of one of said magazines of pens at said third pen transfer position;

(e) a pen transfer carriage and means for moving said pen transfer carriage between said second pen transfer position for transferring pens to and from said turret, and said third pen transfer position for receiving a fresh pen from one of said pen magazines, said pen transfer carriage having pen gripping means thereon; and

(f) a spent pen discharge gate disposed between said turret and said magazines for engaging a spent pen in said transfer carriage and releasing said spent pen from said transfer carriage as said transfer carriage moves toward said magazines;

said pen gripping means on said transfer carriage being engageable with said pen gripping means on said turret when both said turret and said transfer carriage are in said second pen transfer position for transferring a pen therebetween in either direction and being engageable with said pen gripping means on said magazine when said pen carriage is in said third pen transfer position for transferring a pen from said magazine to said transfer carriage, and said means on the plotter pen carriage which releaseably hold a pen in drafting position when said pen gripping means on said turret is in said first pen transfer position for transferring pens between said turret and said plotter pen carriage in either direction.

4,920,358

IMPRINTING APPARATUS

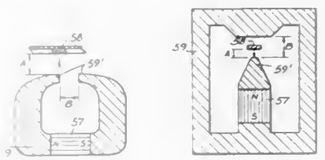
Katsumori Takei, Nagano, Japan, assignor to Seiko Epson Corporation, a Japanese Corporation, Tokyo, Japan

Continuation of Ser. No. 222,450, Feb. 22, 1988, which is a continuation of Ser. No. 841,925, May 20, 1986, Pat. No. 4,769,649. This application Jun. 23, 1989, Ser. No. 370,951

Claims priority, application Japan, Mar. 22, 1985, 60-57960; Mar. 22, 1985, 60-57961; Mar. 22, 1985, 60-57962

Int. Cl.[5] G01D *15/00*

U.S. Cl. 346—74.2 **63 Claims**



1 An imprinting apparatus for printing on a transfer medium by transferring thermoplastic magnetic ink having a recording portion and a non-recording portion to said transfer medium, comprising:

heating means for controlling application of thermal energy to the recording portion of said thermoplastic magnetic ink; and

magnetic force means for applying magnetic force to the recording portion of said ink being transferred to said transfer medium by said magnetic force, the magnetic force means including a first magnetic force member and a second magnetic force member, the thermoplastic magnetic ink positioned intermediate said first and second magnetic force members.

4,920,359

OPTICAL INFORMATION RECORDING MEDIUM HAVING PROTECTIVE LAYER

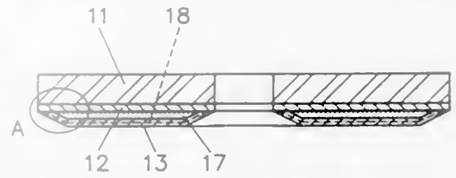
Yuji Arai; Emiko Hamada; Yuaki Shin, and Takashi Ishiguro, all of Tokyo, Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Jul. 3, 1989, Ser. No. 376,213

Claims priority, application Japan, Nov. 23, 1987, 62-294965

Int. Cl.[5] G01D *15/24, 9/00*

U.S. Cl. 346—137 **7 Claims**



1 An optical information recording medium comprising:

a substrate;

an optical recording layer formed over the surface of the substrate;

a protective layer covering the optical recording layer, said protective layer having incorporated therein antireflec-

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tion means for preventing the reflection of a laser beam, said antireflection means being means for absorbing the laser beam in combination with means for scattering the laser beam; and

a buffer layer made of gaseous matter interposed between the optical recording layer and the protective layer.

4. An optical information recording medium comprising:

a substrate;

an optical recording layer formed over the surface of the substrate;

a protective layer covering the optical recording layer; and

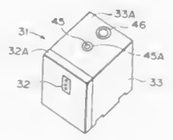
a buffer layer interposed between the optical recording layer and the protective layer, said buffer layer having incorporated therein antireflection means for preventing the reflection of a laser beam, said antireflection means being two or more members selected from the group consisting of means for absorbing the laser beam, means for scattering the laser beam and means for transmitting the laser beam.

4,920,360

LIQUID EJECTION RECORDING UNIT AND LIQUID EJECTION RECORDING APPARATUS

Koji Terasawa, Mitaka; Akira Miyakawa, Tanashi, and Takehiko Kiyohara, Zama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 56,347, May 27, 1987, Pat. No. 4,785,314, which is a continuation of Ser. No. 709,298, Mar. 7, 1985, abandooed. This application Apr. 6, 1988, Ser. No. 178,379
Claims priority, application Japan, Mar. 14, 1984, 59-48683; Mar. 14, 1984, 59-48685; Mar. 14, 1984, 59-48686
Int. Cl.[5] G01D *15/18*
U.S. Cl. 346—140 R 27 Claims



1. A liquid ejection recording unit comprising:

ink discharge means including means defining an orifice and means for discharging ink from said orifice;

ink containing means for containing ink to be supplied to said ink discharge means; and

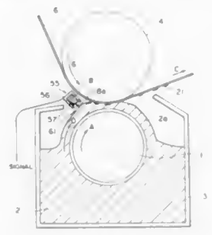
communication means provided on said ink containing means and including a movable member formed in a wall of said ink containing means for causing the interior of said ink containing means to communicate with the outer atmosphere by breaking away from said wall to form a hole in said wall having a predetermined shape when said movable member is moved by an external force acting thereon, wherein said communication means further has a portion of less strength than remaining portions of said containing means so that communication between an air layer in said containing means and the outer atmosphere can be provided by opening said communication means by the external force.

4,920,361

IMAGE RECORDING METHOD AND APPARATUS THEREFOR

Kohzoh Arahara; Hiroshi Fukumoto, both of Kawasaki; Toshiya Yuasa, Mitaka; Toshikazu Ohnishi, Atsugi; Fumitaka Kan, deceased, late of Tokyo (by Akiko Kan, legal successor); Hiroshi Tanioka; Norihiko Koizumi, both of Yokohama, and Noboru Tohyama, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1988, Ser. No. 214,374
Claims priority, application Japan, Jun. 26, 1987, 62-157574; Sep. 3, 1987, 62-219087
Int. Cl.[5] C01D *15/16*; C09D *11/02*
U.S. Cl. 346—140 R 16 Claims



1. An image recording method, comprising:

providing an ink which is substantially non-adhesive and capable of being imparted with an adhesiveness when subjected to a pH change;

causing a pattern of pH change corresponding to a given image signal on a layer of said ink formed on an ink-carrying member to form an adhesive pattern of the ink corresponding to the image signal; and

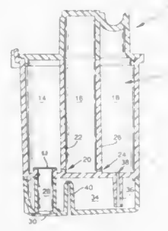
transferring the adhesive pattern of the ink to a transfer-receiving medium to form thereon an ink pattern corresponding to the adhesive pattern.

4,920,362

VOLUMETRICALLY EFFICIENT INK JET PEN CAPABLE OF EXTREME ALTITUDE AND TEMPERATURE EXCURSIONS

Bruce Cowger, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 16, 1988, Ser. No. 286,567
Int. Cl.[5] G01D *15/18*
U.S. Cl. 346—140 R 13 Claims



1. An ink jet pen comprising:

an ink reservoir comprised of a plurality of interconnected ink storage chambers;

a drop generator coupled to one of said chambers; and

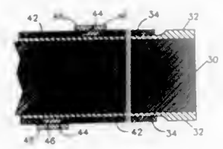
accumulator means coupled to another of said chambers for accumulating ink expelled from the reservoir by the expansion of air therein.

4,920,363

METHOD OF MANUFACTURING ELECTROSTATIC PRINTER HEADS

James R. Hack, Villa Park, Calif., assignor to Calcomp Inc., Anaheim, Calif.

Filed Jan. 4, 1989, Ser. No. 293,823
Int. Cl.[5] G01D *15/00*
U.S. Cl. 346—155 2 Claims



1. The method of manufacturing an electrostatic printhead for a wide electrostatic plotter comprising the steps of:

(a) forming a pattern of parallel, spaced, first printwire traces and connective conductors on one side of a first insulative substrate with ends of the first printwire traces terminating in a common plane defining a printface of a first printhead portion;

(b) adding additional conductive material to the first printwire traces adjacent the common plane to give them a substantially square cross-section;

(c) forming a pattern of parallel, spaced, second printwire traces and connective conductors on a second side of the first insulative substrate with ends of the second printwire traces terminating in the common plane defining the printface of the first printhead portion;

(d) adding additional conductive material to the second printwire traces adjacent the common plane to give them a substantially square cross-section;

(e) trimming the ends of the first and second printwire traces and the first substrate thereunder along a straight line adjacent the common plane to form the printface of the first printhead portion;

(f) forming a pattern of parallel, spaced, third printwire traces and connective conductors on one side of a second insulative substrate with ends of the third printwire traces terminating in a common plane defining a printface of a second printhead portion;

(g) adding additional conductive material to the third printwire traces adjacent the common plane to give them a substantially square cross-section;

(h) forming a pattern of parallel, spaced, fourth printwire traces and connective conductors on a second side of the second insulative substrate with ends of the fourth printwire traces terminating in the common plane defining the printface of the second printhead portion;

(i) adding additional conductive material to the fourth printwire traces adjacent the common plane to give them a substantially square cross-section;

(j) trimming the ends of the third and fourth printwire traces and the second substrate thereunder along a straight line adjacent the common plane to form the printface of the second printhead portion;

(k) positioning the first and second printhead portions side by side in a first common plane, with their printfaces in a second common plane and with their adjacent first, second, third, and fourth printwire traces registered with respect to one another;

(l) bonding the first and second printhead portions together to form a single, lengthened, combined printhead; and,

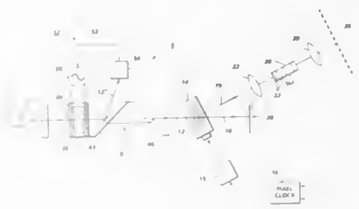
(m) encasing the combined printhead in a potting material with the printfaces of the first and second printhead portions exposed.

4,920,364

LIQUID CRYSTAL DYNAMIC ATTENUATOR FOR LASER PRINTERS

John R. Andrews, Fairport; Werner E. Haas, Webster, both of N.Y., and Jean-Michel Guerin, Glendale, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 10, 1989, Ser. No. 349,667
Int. Cl.[5] G01D *15/00*
U.S. Cl. 346—160 10 Claims



1. In a raster output scanner having a laser providing a high intensity beam, and a modulator for modulating the beam in response to an image signal input to provide an image beam for exposing a recording member, a variable attenuator upstream of said modulator for controlling the intensity of said beam, comprising:

(a) a liquid crystal cell for imparting controlling alteration of the polarization of said beam;

(b) a source of electrical potential for generating an external electric field across said crystal cell to vary the degree of alteration of the polarization of said beam by said crystal cell; and

(c) a polarization analyzer for detecting the degree of alteration of the polarization of said beam effected by said crystal cell, said analyzer including

(1) a polarizing beam splitter following said crystal cell for separating said beam into primary and secondary beams, and

(2) control means responsive to the intensity of said secondary beam for controlling said source of electrical power to vary the electrical field across said crystal cell whereby to vary the degree of rotation of said beam by said crystal cell so as to maintain the intensity of said beam substantially constant.

4,920,365

ELECTRONIC DIGITAL TIMEPIECE HAVING A SEPARATE KEY FOR CONTROLLING THE SWITCHING OF THE DISPLAY FROM STANDARD TO DAYLIGHT SAVINGS TIME

Joergen Marx, and Artur Weich, both of Nuremberg, Fed. Rep. of Germany, assignors to Siemens Aktiengeselischaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 12, 1989, Ser. No. 336,775
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1988, 3813922
Int. Cl.[5] G04C *17/00*
U.S. Cl. 368—242 2 Claims

1. An electronic digital timepiece having a display for the digital display of the actual time-of-day, said display having a colon located between an hours display and a minutes display and flashing in a seconds cycle, said timepiece further having a plurality of keys to cyclically shift the hours and minutes and to adjust any additional data in said display, the timepiece comprising:

(a) a separate key for controlling the switching of the display from daylight saving time to standard time and from standard time to daylight saving time;

(b) said colon serving as a means for displaying both daylight saving time and standard time by further comprising:

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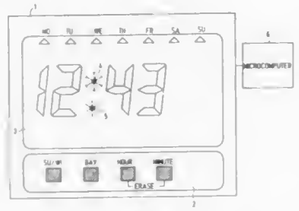
(i) a first symbol indicating daylight saving time associated with one point of the colon;
(ii) a second symbol indicating standard time associated with the other point of the colon wherein one of said first and second symbols is selected and appears continuously on the display;
(c) said selected symbol functioning to only appear on the display for a period of time upon recalling the selected symbol;

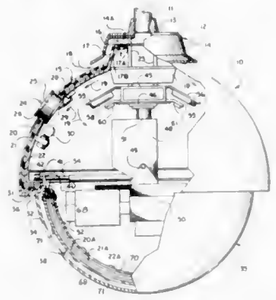


(d) said timepiece further functioning wherein upon resetting the display, the first and second symbols flash without the colon points, and further wherein, after activating the separate key for daylight saving time or standard time, the selected symbol appears statically on the display and the colon points flash; and
wherein the actual time-of-day can only be adjusted after the selected symbol is entered.

4,920,366
CONSTRUCTION OF AN OPTICAL FIBER WITH A CONNECTOR
Terry P. Bowen, Etters; Emil W. Deeg, Lemoyne; James G. Helm, and Larry R. Stauffer, both of Camp Hill, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed May 31, 1989, Ser. No. 359,190
Int. Cl.[5] G02B *6/36*
U.S. Cl. 350—96.20 20 Claims

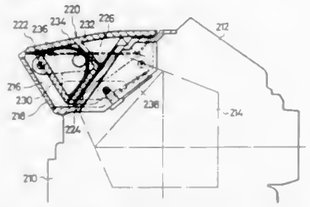
1. A connector for an optical fiber comprising, an alignment body, and a length of optical waveguide in the alignment body for optical coupling with an external optical fiber, wherein the improvement comprises;
the alignment body is unitary with the length of optical waveguide, and the length of optical waveguide is shortened while unitary with the alignment body to provide a passage in the alignment body receiving therein an optical fiber for optical coupling with said length of optical waveguide.

4,920,367
BALLISTIC RATED CAMERA HOUSING AND METHOD FOR FORMING
Raymond V. Pagano, P.O. Box 802, Lithonia, Ga. 30058
Division of Ser. No. 64,401, Jun. 22, 1987, Pat. No. 4,796,039. This application Dec. 5, 1988, Ser. No. 280,305
Int. Cl.[5] G03B *29/00*
U.S. Cl. 354—81 1 Claim



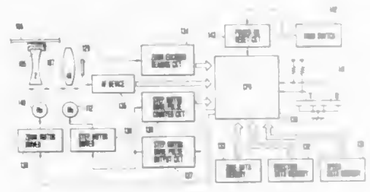
1. A housing for a surveillance camera said housing including an upper dome, a boss extending centrally upwardly from said upper dome and defining openings therethrough, a shroud generally covering and spaced above said boss for allowing air flow between said shroud and said boss, a filter housing in said boss covering said openings for providing a flow of filtered air through said boss and into said housing, and a blower mounted within said housing below said boss for dispersing said filtered air throughout said housing, and further including a camera motor disposed below said blower, said blower acting to cool said camera motor, said upper dome being hemi-spherical, said boss being located at the upper polar position on the hemisphere so that warm air rises towards said boss and said blower, said blower being so constructed and arranged as to direct air along the hemi-spherical interior surface of said upper dome so that said filtered air is mixed with said warm air and dispensed in said housing.

4,920,368
BUILT-IN FLASH SYSTEM
Akihiro Arai, and Tetsuji Shono, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 143,488, Jan. 13, 1988, abandoned. This application Feb. 3, 1989, Ser. No. 306,436
Claims priority, application Japan, Jan. 13, 1987, 62-5815; Jan. 13, 1987, 62-5816; Jan. 13, 1987, 62-5817; Feb. 6, 1987, 62-16209[U]; Feb. 9, 1987, 62-27898; Feb. 9, 1987, 62-27899
Int. Cl.[5] G03B *15/05*
U.S. Cl. 354—145.1 5 Claims



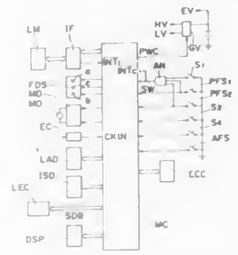
1. In a built-in flash system including a housing chamber provided in the upper front of a penta-house of a finder optical system, and a casing provided in said housing chamber and having a flashlight emitter arranged so as to be movable between a projecting position where said casing is projected for light emission and a housing position where said casing is housed in said housing chamber,
a built-in flash pop-up mechanism characterized in that said casing is arranged to be moved between said projecting position and said housing position by at least one four-point linkage mechanism disposed at a side of said built-in flash system, said four-point linkage mechanism being constituted by a pair of front and rear turning levers, said pair of front and rear turning levers being pivoted at their respective one ends to a corresponding side of said casing.

4,920,369
LENS POSITION CONTROL DEVICE
Naoya Kaneda; Hiroyuki Wada; Mashide Hirasawa, and Hirofumi Suda, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 2, 1989, Ser. No. 346,630
Claims priority, application Japan, May 6, 1988, 63-109966; Jun. 16, 1988, 63-149201
Int. Cl.[5] G03B *3/00*
U.S. Cl. 354—400 13 Claims



1. A lens position control device comprising:
(a) a first lens group movable along an optical axis for varying an image magnification;
(b) a second lens group for performing (1) a function of compensation when varying the image magnification, and (2) a focusing function;
(c) detecting means for detecting positions of said first lens group and said second lens group;
(d) a memory having stored therein moving speed information of said second lens group, said moving speed of said second lens group being stored in a plurality of kinds of moving speed information according to the positions of said first lens group and said second lens group and a predetermined moving speed of said first lens group; and
(e) control means for controlling movements of said first and said second lens groups in response to actuation for causing the image magnification to be varied, said control means selecting a specific moving speed from said memory depending on the positions of said first and said second lens groups detected by said detecting means, and causing said second lens group to move on the basis of said specific moving speed, and said control means causing said first lens group and said second lens group to move at almost the same time.

4,920,370
PHOTO SIGNAL PROCESSING APPARATUS
Nobuyuki Taniguchi, Nishinomiya; Toshihiko Ishimura, Habikino; Norio Ishikawa, Osaka; Reiji Seki, Sakai, and Yasuaki Akada, Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Mar. 24, 1987, Ser. No. 29,755
Claims priority, application Japan, Mar. 25, 1986, 61-66670; Mar. 25, 1986, 61-66671; Mar. 25, 1986, 61-66672; Mar. 25, 1986, 61-66673
Int. Cl.[5] G03B *3/00*
U.S. Cl. 354—402 6 Claims



1 A photo signal processing apparatus which comprises:
a light receiving means of charge accumulation type for outputting data corresponding to a condition of light received thereby;
a data processing means for applying a predetermined processing to the data outputted from the light receiving means;
an accumulation initiating means for causing the light receiving means to initiate a charge accumulating operation;
an accumulation interrupting means for interrupting the charge accumulating operation of the light receiving means;
a count means for counting a time passed during a period subsequent to the start of the charge accumulating operation of the light receiving means and until the termination of the charge accumulating operation of the light receiving means; and
a control means for activating the accumulation initiating means at a timing required to interrupt the charge accumulating operation of the light receiving means at the time of termination of the data processing performed by the data processing means.

4,920,371
CAMERA CONTROL DEVICE
Kiyotaka Kaneko, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 27, 1988, Ser. No. 187,039
Claims priority, application Japan, Apr. 27, 1987, 62-101989; May 6, 1987, 62-108859; May 8, 1987, 62-110834
Int. Cl.[5] G03B *7/00*
U.S. Cl. 354—410 3 Claims

1. A camera control device for controlling the shutter release operations of a master camera and an electronic still camera to be synchronous with emission of a strobe light from a strobo device, comprising:
a shutter release switch for controlling the opening of shutters of said master camera and said electronic still camera when actuated;
means for receiving a shutter full-open signal from said master camera and said electronic still camera when their shutters are respectively fully opened and outputting a

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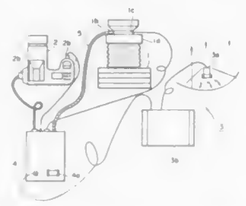
strobo sync signal when both shutter full-open signals coincide; and

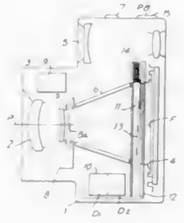


means for supplying said strobo sync signal to said strobo device to cause emission of said strobe light.

4,920,372
CAMERA

Tadashi Nakagawa; Nobuo Shinozaki; Hiroyuki Koizumi; Hiroshi Yamazaki; Hiroyuki Saito; Katsuhiko Matsushita, and Miyoshi Tanikawa, all of Chiba, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1989, Ser. No. 376,722
Claims priority, application Japan, Jul. 11, 1988, 63-172188
Int. Cl.[5] G03B *7/08, 9/08*
U.S. Cl. 354—412 21 Claims

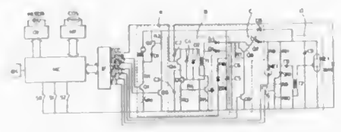


1. A camera having a lens shutter for performing a programmed exposure operation and a diaphragm-adjusting operation, and a focal-plane shutter, said camera comprising:
(a) selector means for selecting one of the following modes of operation:
(i) a lens shutter mode in which the lens shutter is operated as a programmed shutter, and
(ii) a focal-plane shutter mode in which the shutter speed is controlled by the focal-plane shutter and an aperture is controlled by the lens shutter;
(b) first driving means for controlling one of the following:
(i) a programmed exposure value of the lens shutter, and
(ii) the size of said aperture;
(c) said first driving means including:
(i) a motor, and
(ii) an actuating member driven by said motor, said actuating member having first cam means for controlling the programmed exposure value of the lens shutter in response to rotation of the motor in a first direction, and second cam means for controlling the size of the aperture in response to rotation of the motor in a second, opposite direction;
(d) second driving means for controlling the time in which the focal-plane shutter mode is operated; and
(e) sequential control means for controlling said first and second driving means.

4,920,373
DEVICE FOR DRIVING SHUTTER

Shinji Tominaga, and Takeshi Hashimoto, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 3, 1988, Ser. No. 202,023
Claims priority, application Japan, Jun. 4, 1987, 62-141073; Jun. 4, 1987, 62-141074; Jun. 4, 1987, 62-141075
Int. Cl.[5] G03B *7/096*
U.S. Cl. 354—457 4 Claims

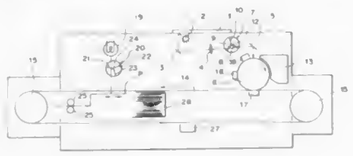


1. A driving device for use in a camera comprising:
piezo-electric means displaceable by applying thereto an electrical voltage;
driving means for driving said piezo-electric means by applying an electrical voltage to the piezo-electric means;
short-circuiting means connected in parallel to said piezo-electric means for short-circuiting said piezo-electric means;
controlling means for controlling said driving means and said short-circuiting means so as to short-circuit said piezo-electric means except when said driving means is in an active state; and
shutter means driven by said piezo-electric means to be opened and closed for performing an exposure operation wherein said controlling means controls the driving means and thus the piezo-electric means, thereby controlling an exposure operation.

4,920,374
PICTURE RECORDING APPARATUS

Kazuo Sangyoji; Takemi Yamamoto, both of Nagoya; Tsugio Okamoto, Kani; Naoyuki Hatta, Gamagori; Yuji Asano, Nagoya; Kenji Sakakibara, Ichinomiya; Hitoshi Nakai, Nagoya; Michitoshi Akao, Nagoya; Jun Sakai, Nagoya, and Yumio Matsumoto, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 50,313, May 14, 1987, Pat. No. 4,810,614.
This application Dec. 12, 1988, Ser. No. 283,223
Claims priority, application Japan, May 19, 1986, 61-113872; May 19, 1986, 61-113873; May 19, 1986, 61-113876; May 19, 1986, 61-113877; Aug. 1, 1986, 61-182529; Nov. 20, 1986, 61-277595
Int. Cl.[5] G03B *27/32, 27/52*
U.S. Cl. 355—27 9 Claims

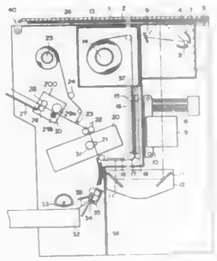


1. An apparatus for recording a picture onto a photosensitive and pressure-sensitive sheet, comprising:
forming means for forming plural mask original forms based on picture information entered through an input means which electronically emulates said picture so that said mask original forms have light-transmitting portions and non-light-transmitting portions corresponding to picture information of said original picture;
positioning means for accurately adjusting each of said plural mask original forms with respect to the photosensitive and pressure-sensitive sheet;
exposure means for exposing said photosensitive and pressure-sensitive sheet through said mask original forms to light of plural different wavelengths whereby to produce a latent image of said picture on said photosensitive and pressure-sensitive sheet; and
pressure-fixing means for pressing said photosensitive and pressure-sensitive sheet having said latent image thereon to thereby develop said latent image.

4,920,375
IMAGING DEVICE

Michitoshi Akao, Nagoya; Kenji Sakakibara; Tokunori Katoh, both of Ichinomiya; Yukichi Sawaki, Gifu; Takakuni Sonoda, and Makoto Suzuki, both of Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Mar. 15, 1989, Ser. No. 324,292
Claims priority, application Japan, Mar. 16, 1988, 63-62814; Mar. 19, 1988, 63-36762[U]; Sep. 8, 1988, 63-225312
Int. Cl.[5] G03B *27/32*
U.S. Cl. 355—27 8 Claims

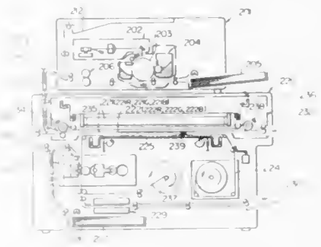


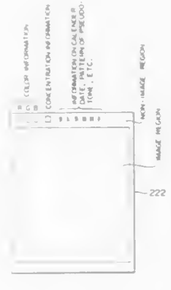
1. An imaging device employing a continuous-form recording medium coated with a plurality of photo and pressure sensitive microcapsules, each of said microcapsules enveloping therein a chromogenic material and a photo-sensitive resin, said imaging device comprising:
exposure means for exposing an optical image on said recording medium;
a pair of pressure-developing rollers, adapted to be brought into and out of contact with each other, for pressurizing the exposed recording medium to develop a visible image;
drive means for rotating a first roller of the pressure-developing rollers;
shift means for shifting a second roller of the pressure-developing rollers toward or away from the first roller of the pressure-developing rollers; and
control means for controlling said drive means and said shift means in such a fashion that said first roller of the pressure-developing rollers is kept rotating by said drive means when said second roller of the pressure-developing rollers is shifted out of contact with said first roller.

4,920,376
PHOTO-SENSITIVE RECORDING MEDIUM CARTRIDGE FOR USE WITH IMAGE RECORDING APPARATUS

Takemi Yamamoto; Jun Sakai, and Takakuni Sonoda, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Jun. 30, 1988, Ser. No. 213,350
Claims priority, application Japan, Jul. 7, 1987, 62-104310[U]; Jul. 7, 1987, 62-104311[U]; Jul. 17, 1987, 62-110375[U]
Int. Cl.[5] G03B *27/80*
U.S. Cl. 355—38 8 Claims





1. A color image recording apparatus utilizing a photo-sensitive recording medium and a set of a plurality of color-decomposed mask original plates, each mask original plate being provided with image information containing data as to what color the mask original plate corresponds, which comprises:
reader means for successively reading out the data contained in the image information provided respectively, on said mask original plates, to generate signals indicative of the respective data;
said mask original plates being successively superposed upon said photo-sensitive recording medium;
exposure means operative in response to said signals from said reader means for exposing said photo-sensitive recording medium successively to lights with their respective wavelengths in conformity respectively with said mask original plates which are successively superposed upon said photo-sensitive recording medium, thereby forming color-decomposed latent images corresponding to the respective mask original plates, onto said photo-sensitive recording medium; and
developing means for developing a color image in accordance with said color-decomposed latent images.

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4,920,377

COPYING APPARATUS CAPABLE OF AUTOMATICALLY SELECTING COPY PAPER SIZE AND CONTROL METHOD FOR CONTROLLING OPERATION OF COPYING APPARATUS

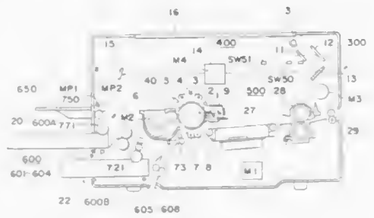
Masazumi Ito, and Tomoji Murata, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 8, 1989, Ser. No. 308,181

Claims priority, application Japan, Feb. 10, 1988, 63-29869; Feb. 15, 1988, 63-32491; Feb. 15, 1988, 63-32492; Feb. 15, 1988, 63-32493; Feb. 18, 1988, 63-36387; Feb. 18, 1988, 63-36388; Feb. 18, 1988, 63-36389; Feb. 18, 1988, 63-36390

Int. Cl.[5] G03B *27/52*

U.S. Cl. 355—55 18 Claims



1. A copying apparatus comprising:

image forming means capable of forming an image of an original document at a plurality of copying magnifications which are correlated with predetermined copy paper sizes, respectively;

a plurality of paper feeding means, each of which accommodates the copy paper sheets the sizes of which are different from each other;

first selection means for manually selecting one of the copying magnifications; and

second selection means for automatically selecting one of said paper feeding means in which the copy paper sheets having the size correlated with the copying magnification selected by said first selection means are accommodated, wherein the selection of said paper feeding means is effected, regardless of a size of the original document, in response to the selection of the copying magnification.

4,920,378

METHOD AND A MEASURING APPARATUS FOR DETERMINING THE EXPOSURE TIME IN PHOTOGRAPHIC COPYING

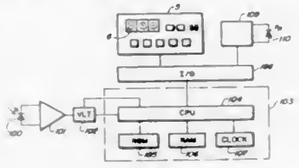
Alex Vhatzer, Brixen/Milland, Italy, assignor to Durst Phototechnik GmbH, Bozen, Italy

Filed Dec. 14, 1988, Ser. No. 284,877

Claims priority, application Italy, Dec. 16, 1987, 4858 A/87

Int. Cl.[5] G03B *27/80*

U.S. Cl. 355—68 9 Claims



1. A method for determining the exposure time in photographic copying by means of photographic enlarging or copying apparatuses, the photographic enlarging or copying apparatus having a copying light source of variable intensity and being adapted to form a projected picture, in a copying plane, of an original to be copied, comprising in combination the steps of measuring the light intensity of the projected picture in the copying plane at a plurality of different measuring points of the projected picture, for a given copying light source intensity, to provide a corresponding light measuring value for each of the different measuring points, forming a mean value of the light measuring values of said plurality of different measuring points, determining an exposure time for said given copying light source intensity in accordance with said mean value, measuring a continuous light measuring value at a selected one of said measuring points after forming the mean value, and continuously modifying the exposure time resulting from the mean value in accordance with a proportional action factor which expresses the relationship between the light measuring value entered into the formation of the mean value at a selected one of said measuring points and the continuous light measuring value at the selected measuring point.

4,920,379

IMAGE FORMING APPARATUS WITH A COMMON POWER SOURCE FOR VARIOUS CHARGERS AND A SIMPLIFIED ARRANGEMENT FOR SUBJECTING THE PHOTOSENSITIVE DRUM TO BLANK EXPOSURE

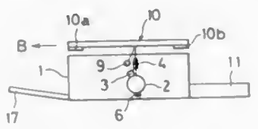
Yasushi Nakanishi, Yamatokoriyama; Takahiro Fukunaga, and Manabu Matsumoto, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 31, 1989, Ser. No. 359,276

Claims priority, application Japan, May 31, 1988, 63-135123

Int. Cl.[5] G03G *13/00, 15/00*

U.S. Cl. 355—210 4 Claims



1. An image forming apparatus which comprises, in a main body thereof, a light source, a photoreceptor, charging means for electrostatically charging the surface of the photoreceptor, developing means for supplying toner particles to the surface of the photoreceptor, transferring means for transferring onto a copying sheet a toner image formed on the surface of the photoreceptor, and high-voltage applying means for applying a high voltage trigger to both said charging means and said transferring means simultaneously, said apparatus being designed to execute original scanning as an original glass plate is moved with respect to said main body, characterized in comprising a reflecting unit for reflecting the light from the light source to illuminate the surface of the photoreceptor at an area between the charging means and the developing means, said reflecting unit being disposed at a position corresponding to the trailing end of the original glass plate in its forward movement for original scanning, and control means for causing the original glass plate to stop at an original scanning completing station after the end of the original scanning until the end of the stage of image transferring by the transferring means and for causing the light source to continue light emission so that the charge which is applied to a non-image area of the photoreceptor surface after the end of the original scanning until the end of the stage of image transferring is removed by the light from the light source that is reflected by said reflecting unit to illuminate the surface of the photoreceptor.

4,920,380

SURFACE POTENTIAL CONTROL DEVICE OF PHOTOCONDUCTIVE MEMBER

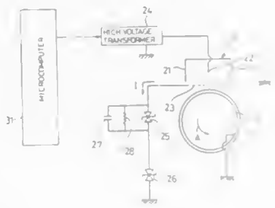
Masahide Ueda, and Yoshihiro Hanada, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 29, 1988, Ser. No. 226,056

Claims priority, application Japan, Jul. 31, 1987, 62-193085; Oct. 23, 1987, 62-268892

Int. Cl.[5] G03G *15/02, 21/00*

U.S. Cl. 355—219 14 Claims



7. An image forming apparatus, comprising: photoconductive drum;

means for charging the surface of the photoconductive drum;

means for forming electrostatic latent image on the photoconductive drum by exposing images;

means for developing the electrostatic latent image;

means for actuating the charging means; and

control means for controlling output of the charging means to start with a lower value than a predetermined value according to the time during which the charging means suspended its operation and to gradually make the value to match up to the predetermined value.

4,920,381

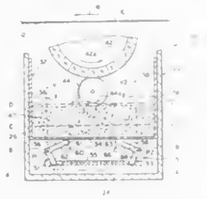
TONER CONTAINER LIFT MECHANISM

Gregory P. Mahoney, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 3, 1989, Ser. No. 293,033

Int. Cl.[5] G03G *15/06*

U.S. Cl. 355—260 10 Claims



7. A mechanism for lifting and lowering a toner container in an electrostatographic development apparatus, the mechanism comprising:

(a) a pair of pivotable cams mounted spaced apart for supporting the toner container, said pair of cams having a raised position and a lowered position, and each said cam having (i) a first portion including a first distal end and a flat side for contacting the toner container, and (ii) a second portion including a second distal end, said first and second portions of each said cam forming an elbow, and each said cam including a pivot point at each said elbow respectively; and

(b) a horizontal spring for automatically lifting said pair of cams to said raised position thereby automatically lifting the toner container therewith, said spring being connected to each said cam at said second distal end directly below said pivot point thereof, and said spring, as connected, cooperating with said flatsides of said cams to automatically lift and lower the toner container throughout with a constant momentum.

4,920,382

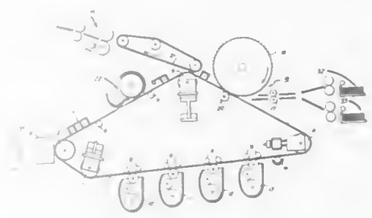
FIXING METHOD FOR RESIN BASED SHEETS

Borden H. Mills, and David F. Cahill, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 25, 1988, Ser. No. 223,829

Int. Cl.[5] G03G *15/20*

U.S. Cl. 355—284 7 Claims



1. A process of fixing color toner images carried on a resin based sheet using a fixing device of the type having at least one roller having a surface which contacts the toner image during fixing and to which a release liquid is applied by a release liquid applying means to prevent the offset of toner to the roller surface, said process including the steps of

applying release liquid to said roller surface, using a wick having a fabric surface that rotates with the surface of said one roller,

terminating the application of release liquid to said surface, then contacting said surface with a sheet of material more absorbent of said liquid than said resin based sheet, and

then carrying out said fixing process including the step of bringing said roller surface into contact with said toner image without recontacting the wicking roller.

4,920,383

PAPER HANDLING FOR REPETITIVE MOVEMENT OF VARIABLE LENGTH MEDIA THROUGH AN IMAGE TRANSFER STATION

William P. Cook, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 14, 1989, Ser. No. 322,961

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—311 10 Claims

9. A method for optimizing the throughput rate of a machine which must repetitively pass cut sheets through a work station wherein said sheets may have a length within a range defined by a predetermined minimum and a predetermined maximum comprising the steps of

establishing at least first and second return paths from the work station output to its input with said first path having a length corresponding to said predetermined minimum and said second path having a length corresponding to said predetermined maximum,

determining the length of a media sheet introduced to the work station,

directing the media sheet into said first path in response to a said determining step result indicative that the media

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length is equal to or less than said predetermined minimum, and

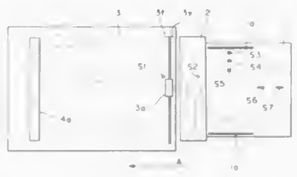
directing the media sheet into said second path in response to a said determining step result indicative that the media is of a length greater than said minimum.

4,920,384

COPYING MACHINE WITH AUTOMATIC DOCUMENT FEEDING MEANS

Yuji Okamoto, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 240,392, Aug. 29, 1988, abandoned, which is a continuation of Ser. No. 131,343, Dec. 9, 1987, abandoned, which is a continuation of Ser. No. 895,991, Aug. 13, 1986, abandoned. This application May 18, 1989, Ser. No. 356,669
Claims priority, application Japan, Aug. 28, 1985, 60-190202
Int. Cl.[5] G03G *21/00, 15/06*
U.S. Cl. 355—311 12 Claims



1. A copying machine with automatic document feeding means, said copying machine being operable selectably in a magnification priority mode of operation wherein said copying machine is operated at a specified magnification and in a paper size priority mode of operation wherein a copy is produced on a paper sheet of a specified size, said copying machine comprising

a document carrying table for placing documents thereon,

a document transportation means for sequentially and automatically transporting documents in a specified direction from said document carrying table, and

document size detecting means for detecting the size of said documents, said document size detecting means including,

a first detector means for detecting the size of a stationary document by a plurality of sensors disposed on said document carrying table,

a second detector means for detecting at least the length of a document along said specified direction as said document is transported in said specified direction by said document transporting means, and

a control means for comparing document sizes detected by said first and second detecting means and selecting a magnification value in said paper size priority mode and a copy paper size in said magnification priority mode of operation of said copying machine on the basis of document size detected by said second detecting means if document sizes detected by said first and second detecting means do not match.

4,920,385

PANEL SURFACE FLAW INSPECTION

Donald A. Clarke; Rodger L. Reynolds, and Timothy R. Pryor, all of Windsor, Canada, assignors to Diffracto Ltd., Windsor, Canada

Continuation of Ser. No. 933,851, Nov. 24, 1986, abandoned, which is a division of Ser. No. 579,971, Feb. 14, 1984, Pat. No. 4,629,319. This application Apr. 6, 1989, Ser. No. 333,776
The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.
Int. Cl.[5] G01N *21/88*
U.S. Cl. 356—237 39 Claims

1. Method for inspecting surfaces for defects comprising the steps of:

illuminating said surface with a beam of light which is projected along a beam axis to said surface and reflected therefrom,

positioning a retro reflective material comprising a plurality of minute elements such that a zone of light is produced on said retro reflective material by the reflected beam of light and such that the light forming the zone is retro reflected from said retro reflective material and is re-reflected from said surface as a cone of light centered about said beam axis,

detecting a portion of said re-reflected cone of light and forming an image of the zone on a light sensing detector having a viewing axis at an angle to said beam axis so as to be substantially unresponsive to light re-reflected along the beam axis, and

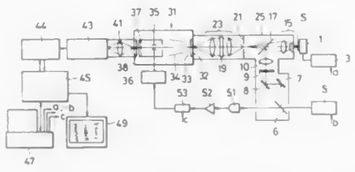
determining from said detected image of said re-reflected light any defects in said surface.

4,920,386

HIGH SPATIAL AND TIME RESOLUTION MEASURING APPARATUS

Yutaka Tsuchiya, and Yoshihiro Takiguchi, both of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 88,284, Aug. 24, 1987, abandoned. This application Apr. 19, 1989, Ser. No. 339,920
Claims priority, application Japan, Aug. 25, 1986, 61-197031
Int. Cl.[5] G01N *21/64, 21/59*
U.S. Cl. 356—417 27 Claims



1. A high spatial and time resolution measuring apparatus for optically measuring a desired area in a specimen, said apparatus comprising:

a stage for mounting the specimen thereon;

a light source for generating a first light;

first optical means for directing said first light from said light source to said specimen;

an objective means for forming the image of second light emanating form said specimen;

a width variable slit located at the image plane of said objective means for limiting the visual field of the specimen,

relay lens means for forming an image of light emanating from said width variable slit at an image plane;

a streak tube including a photocathode at the image plane of said relay lens means, said streak tube forming a streak image of an image formed by said relay lens made on said photocathode; and

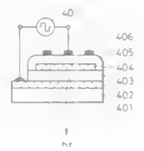
a housing for shielding said first optical means, said objective means, said width variable slit, and said relay lens from ambient light.

4,920,387

LIGHT EMITTING DEVICE

Katsuji Takasu; Masafumi Sano; Hisanori Tsuda, all of Atsugi, and Yutaka Hirai, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 302,082, Jan. 26, 1989, abandoned, which is a continuation of Ser. No. 899,244, Aug. 22, 1986, abandoned. This application Sep. 13, 1989, Ser. No. 406,182
Claims priority, application Japan, Aug. 26, 1985, 60-187069; Aug. 26, 1985, 60-187741; Sep. 2, 1985, 60-194098; Sep. 3, 1985, 60-195081; Sep. 4, 1985, 60-196191; Sep. 19, 1985, 60-207021; Sep. 20, 1985, 60-209330
Int. Cl.[5] H01L *33/00*
U.S. Cl. 357—17 25 Claims



1. A light emitting device comprising:

a luminescent portion having at least two laminated layers comprising non-single crystalline silicon containing hydrogen atoms and having a homo-junction; and

at least a pair of electrodes connected electrically to said luminescent portion, and wherein each non-single crystalline silicon layer has an optical band gap of at least 2.0 eV and a localized level density at mid-gap no greater than 10^{16} $cm^{-3}.eV^{-1}$.

4,920,388

POWER TRANSISTOR WITH INTEGRATED GATE RESISTOR

Richard A. Blanchard, Los Altos, and Adrian I. Cogan, San Jose, both of Calif., assignors to Siliconix Incorporated, Santa Clara, Calif.

Continuation of Ser. No. 14,962, Feb. 17, 1987, abandoned. This application Sep. 19, 1988, Ser. No. 246,937
Int. Cl.[5] H01L *29/78, 27/02, 29/04*
U.S. Cl. 357—23.4 3 Claims

1. A vertical DMOS power transistor with an integrated gate resistor comprising:

a semiconductor substrate having a first region of a first conductivity type and a second region of a second, opposite conductivity type generally surrounding the first region and forming a junction with the first region;

an insulting layer on the substrate over the first region and at least a portion of the second region;

a doped polycrystalline silicon layer on the insulating layer a portion of which acts as a gate;

a first conductive gate element on the polycrystalline silicon layer and positioned generally over the first region;

a second conductive gate element on the polycrystalline silicon layer and spaced from and generally surrounding the first conductive gate element;

a drain contact on the substrate and spaced apart from the insulating layer; and

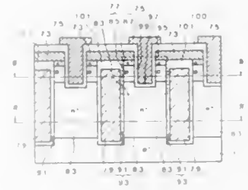
the portion of the polycrystalline silicon layer connecting the first and second conductive gate elements being a resistor element having a plurality of openings provided therethrough, the polycrystalline silicon layer thereby including a plurality of resistor regions, each of said resistor regions being connected to said first conductive gate element and said second conductive gate element, and whereby a resistance of said resistor element is a function of the sizes of said openings.

4,920,389

MEMORY CALL ARRAY STRUCTURE AND PROCESS FOR PRODUCING THE SAME

Masahiro Itoh, Minato, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1989, Ser. No. 320,232
Claims priority, application Japan, Mar. 8, 1988, 63-54487
Int. Cl.[5] H01L *29/78, 29/06, 27/02*
U.S. Cl. 357—23.6 18 Claims



1. A memory cell array comprising:

a semiconductor substrate of first conductivity type having a substrate surface including a plurality of first regions and a second region, the first regions being respectively surrounded by the second region;

a plurality of first semiconductor layers of a second conduc-

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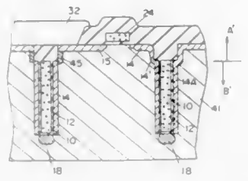
tivity type each isolatedly formed on the first regions of the substrate surface, each of said first semiconductor layers having first top, bottom and side surfaces;
a second semiconductor layer of the first conductivity type formed on the first top surface of each of said first semiconductor layers, said second semiconductor layer having second top, bottom and side surfaces, and further having a first interior surface defining a first hole extending from the second top surface to the second bottom surface thereof;
a first insulating layer covering said first interior surface;
a first electrode provided in the first hole of said second semiconductor layer so as to confront the first interior surface of said second semiconductor layer through said first insulating layer;
a third semiconductor layer of the second conductivity type formed on the top surface of said second semiconductor layer, said third semiconductor layer having a third side surface;
a second insulating layer covering the first, second and third side surfaces and the second region of the substrate surface; and
a second electrode disposed adjacent to each of said first semiconductor layers so as to confront the side surface of each of said first semiconductor layers through the second insulating layer.

4,920,390

SEMICONDUCTOR MEMORY DEVICE AND METHOD OF FABRICATING THE SAME

Genshu Fuse; Toshio Yamada, both of Hirakata; Shinji Odanaka, Sakai, and Masaki Fukumoto, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 877,968, Jun. 24, 1986, abandoned. This application Jul. 7, 1988, Ser. No. 218,456
Claims priority, application Japan, Jul. 2, 1985, 60-145568; Sep. 6, 1985, 60-198076
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.6 **13 Claims**



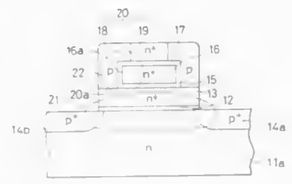
1. A semiconductor memory device comprising:
a semiconductor substrate having an upper surface and at least one groove therein, each said at least one groove extending around a part of said substrate and including a first groove portion proximate the upper surface of said substrate and a second groove portion extending from the bottom of said first groove portion to a location disposed within said substrate, the part of the substrate around which said at least one groove extends defining a respective island region, said island region including a first portion around which said first groove portion extends and a second portion around which said second groove portion extends;
a first electrode of a storage cell capacitor extending in each said second groove portion;
a dielectric layer of the storage cell capacitor disposed between said first electrode and the second portion of said island region;
a second electrode of the storage cell capacitor extending between and in contact with an outer circumferential side surface of the second portion of said island region and said dielectric layer;
an electrical insulating isolation layer disposed in and extending over the first groove portion of said at least one groove;
an MOS transistor having source, drain and channel regions and disposed at the first portion of said island region adjacent said electrical insulating isolation layer;
a connection region disposed alongside part of the first portion of said island region adjacent said dielectric layer, said connection region extending substantially vertically from said second electrode to one of said drain and said source regions of the MOS transistor for operatively conductively connecting said second electrode to said one of said source and said drain regions; and
a separation region disposed alongside another part of the first portion of said island region adjacent said dielectric layer, said separation region extending substantially vertically from said second electrode to the other of said drain and said source regions of the MOS transistor for operatively electrically insulating said second electrode from said other of said source and said drain regions.

4,920,391

SEMICONDUCTOR MEMORY DEVICE

Hidetsugu Uchida, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 3, 1989, Ser. No. 332,584
Claims priority, application Japan, Apr. 5, 1988, 63-82311
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.6 **14 Claims**



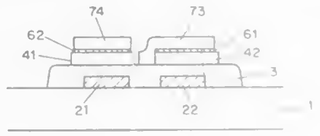
1. A semiconductor memory device formed on a semiconductor substrate (**11**), comprising:
an active region (**11***a*) forming part of a semiconductor substrate (**11**);
a gate insulating film (**12**) formed on the active region (**11***a*);
a first polysilicon film (**13**) of a first conductivity type formed over said gate insulating film (**12**);
a second polysilicon film (**16**) formed over the first polysilicon film (**13**);
an insulating film (**17**) formed on the side of said second polysilicon film (**16**) and over said second polysilicon film (**16**); and
a third polysilicon film (**20**) formed on the side of said second polysilicon film (**16**) and over said second polysilicon film (**16**), being separated by the insulating film (**17**), and having a second conductivity type opposite to said first conductivity type, a contacting end (**20***a*) of said third polysilicon film (**20**) being in contact with said first polysilicon film (**13**), part of said third polysilicon film formed over said second polysilicon film (**16**) having an impurity-doped region (**19**) of said first conductivity type;
said active region (**11***a*), said gate insulating film (**12**) and said first polysilicon film (**13**) forming a first FET (**21**);
said first, second and third polysilicon films (**13**, **16**, **20**) forming a second FET (**22**), said second polysilicon film (**16**) forming a gate electrode; and
that part of said third polysilicon film (**20**) which is between said impurity-doped region (**19**) and said contacting end (**20***a*) and adjacent to said second polysilicon film (**16**) forming a channel of said second FET (**22**).

4,920,392

COMPLEMENTARY FIELD EFFECT TRANSISTOR AND METHOD OF FORMING THE SAME

Masaharu Nishiura, Matsumoto, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 18, 1987, Ser. No. 122,114
Claims priority, application Japan, Nov. 20, 1986, 61-277434
Int. Cl.[5] H01L *29/72*
U.S. Cl. 357—23.7 **4 Claims**



1. A complementary field effect transistor device comprising:
an insulating substrate having a gate electrode formed on a major surface thereof;
an insulating film covering said gate electrode and the area surrounding said gate electrode;
a substantially intrinsic semiconductor thin film covering said insulating film;
first and second islands of semiconductor thin film of one conductivity type formed over said intrinsic semiconductor thin film in a first paired relationship and positioned to both overlie a first region of said gate electrode, and first and second islands of semiconductor thin film of opposite conductivity type formed over said intrinsic semiconductor thin film in a second paired relationship and positioned to both overlie a second region of said gate electrode, one of the islands formed of said one conductivity type film being paired with one of the islands formed of said opposite conductivity film;
electrodes formed over the surface of each island formed of said opposite conductivity type semiconductor thin film opposite said gate electrode; and
electrodes formed over the surface of each island formed of said one conductivity type semiconductor thin film opposite said gate electrode on the same side of said intrinsic semiconductor thin film as the electrodes formed over the islands formed of said opposite conductivity type semiconductor thin film such that the electrode formed over said first island of said opposite conductivity type thin film and the electrode formed over said first island of said one conductivity type thin film are electrically connected with each other thereby to form a complementary fielded effect transistor.

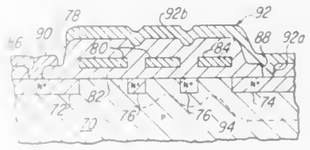
4,920,393

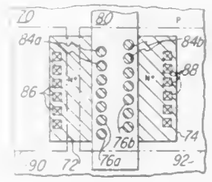
INSULATED-GATE FIELD-EFFECT SEMICONDUCTOR DEVICE WITH DOPED REGIONS IN CHANNEL TO RAISE BREAKDOWN VOLTAGE

Masumi Kawakami, Miho, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 1,789, Jan. 8, 1987, abandoned. This application Feb. 13, 1989, Ser. No. 310,497
Int. Cl.[5] H01L *29/90, 29/78*
U.S. Cl. 357—23.8 **15 Claims**

1. An insulated-gate field-effect semiconductor device comprising:
(a) a semiconductor layer of a first conductivity type, the semiconductor layer having a surface portion;
(b) heavily doped source and drain regions of a second conductivity type in said semiconductor layer, said source and drain regions being spaced apart from each other along the surface portion of said semiconductor layer;
(c) a plurality of heavily doped island regions of said second conductivity type in said semiconductor layer, the plurality of heavily doped island regions located between and spaced apart from said source and drain regions, said island regions occupying locations disposed transversely of the direction between said source and drain regions;





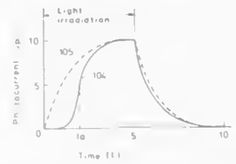
(d) an insulating layer on said surface portion;
(e) a conductive layer overlaying said insulating layer and electrically isolated from said island regions, said conductive layer extending between said source and drain regions and said conductive layer having a plurality of closed boundary apertures aligned with individual ones of said island regions in said semiconductor layer.

4,920,394

PHOTO-SENSING DEVICE WITH S-SHAPED RESPONSE CURVE

Noboru Yukami; Mitsusuke Ikeda, both of Hirakata; Masaharu Ohno, Higashiosaka, and Mikihiko Nishitani, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kodama, Japan

Continuation of Ser. No. 768,842, Aug. 23, 1985, abandoned. This application May 4, 1988, Ser. No. 191,783
Claims priority, application Japan, Aug. 31, 1984, 59-181751
Int. Cl.[5] H01L *27/14*
U.S. Cl. 357—30 **6 Claims**



1. A photo-sensing device for detecting light signals under application of a biasing light comprising:
a photo-electric transducing element of a material having a given response characteristic of photocurrent to time, namely a rise characteristic which is S-shaped;
said material of said photo-sensing device being a II-VI compound semiconductor made of a CdS-CdSe solid

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solution including at least 40 mol percent CdSe and having a Cu material added thereto;

said Cu material constituting 0.01 mol % or more and 0.03 mol % or less of said material of said photo-sensing device;

said photocurrent being detected from said photo-sensing device irradiated by a main light which is adapted to be reflected onto a manuscript and to be further irradiated directly by a biasing light; and

the intensity of said biasing light being 1/100 to 1 of the intensity of said main light.

4,920,395

HIGH SENSITIVITY PHOTODIODE

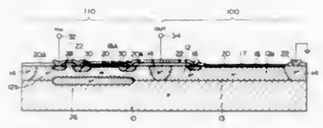
Hideo Muro, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 925,219, Oct. 31, 1986, abandoned. This application Aug. 23, 1988, Ser. No. 235,803

Claims priority, application Japan, Nov. 8, 1985, 60-248795

Int. Cl.[5] H01L *27/14*

U.S. Cl. 357—30 2 Claims



1. A single-chip semiconductor photodetection device comprising:

a semiconductor substrate of first-type conductivity;

a semiconductor layer of opposite second-type conductivity formed on a principal surface of said substrate;

a photodiode part which comprises a first island region of said semiconductor layer surrounded by a first diffused region of the first-type conductivity formed through the entire thickness of said semiconductor layer, a second diffused region of the second-type conductivity formed for use as an electrode in a surface region of a selected area of said first island region and a shallow laminar region of the first-type conductivity formed in the surface of a major area of said first island region, wherein first and second active junctions are respectively formed at an interface of said first island region and said semiconductor substrate and an interface of said shallow laminar region and said first island region; and

a junction-gate field-effect transistor (JFET) part which comprises as a gate region a second island region of said semiconductor layer surrounded by the first diffused region, a diffused source region of the first-type conductivity formed in a surface region of said second island region, a diffused drain region of the first-type conductivity formed in a surface region of said second island region as a channel region a shallow laminar region of the first-type conductivity formed in the surface of said second island region in a location between said source region and said drain region and electrode means for interconnecting said source region with said gate region, the JFET part being electrically connected with said photodiode part such that in operation the JFET part provides a constant current to the photodiode part and compares the output current of the photodiode part with a predetermined current.

4,920,396

CMOS HAVING BURIED LAYER FOR CARRIER RECOMBINATION

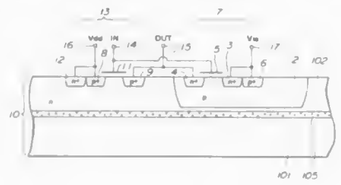
Toshiro Shinohara; Teruyoshi Mihara, and Kenji Yao, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 8, 1988, Ser. No. 179,315

Claims priority, application Japan, Apr. 13, 1987, 62-88912

Int. Cl.[5] H01L *27/02, 29/167, 29/161*

U.S. Cl. 357—42 10 Claims



1. A CMOS device comprising:

a first substrate region of a first conductivity type located in a semiconductor body which includes upper and lower single crystals, said first substrate region including an upper portion in said upper single crystal and a lower portion in said lower single crystal,

a second substrate region of a second conductivity type, opposite of said first conductivity type, located in said semiconductor body so as to form a pn junction with said first substrate region,

a first conductivity type channel MOSFET in said second substrate region, and a second conductivity type channel MOSFET in said first substrate region, and

a recombination layer in said first substrate region facilitating recombination of minority carriers, said recombination layer being separate from said pn junction, said recombination layer being between said upper and lower portions of said first substrate region.

4,920,397

STRUCTURE OF COMPLEMENTARY FIELD EFFECT TRANSISTOR

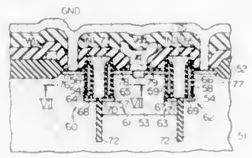
Toshiyuki Ishijima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 173,478

Claims priority, application Japan, Mar. 26, 1987, 62-73241

Int. Cl.[5] H01L *27/02*

U.S. Cl. 357—42 11 Claims



1. A complementary field effect transistor fabricated in a semiconductor substrate of a first conductivity type, comprising:

(a) a well formed in a surface portion of said semiconductor substrate and having a second conductivity type opposite to said first conductivity type, a groove being defined by a first side wall of the surface portion of said semiconductor substrate, a first bottom wall of the surface portion, a second side wall of said well and a second bottom wall of the well, said groove having a rectangular cross section;

(b) a first drain region of said second conductivity type formed in said semiconductor substrate and exposed to said first bottom wall;

(c) a first source region of said second conductivity type formed in said surface portion and spaced apart from said first drain region;

(d) a first gate insulating film formed on said first side wall;

(e) a first gate electrode formed on said first gate insulating film and operative to cause a channel to take place between said first drain region and said first source region, said first drain region, said first source region, said first gate insulating film and said first gate electrode forming in combination a first MIS type field effect transistor;

(f) a second drain region of said first conductivity type formed in said well and exposed to said second bottom wall;

(g) a second source region of said first conductivity type formed in a surface portion of said well and spaced apart from said first drain region;

(h) a second gate insulating film formed on said second side wall;

(i) a second gate electrode formed on said second gate insulating film and operative to cause a channel to take place between said second drain region and said second source region, said first and second gate electrodes being formed in a ring shaped conductive material, and said second drain region, said second source region, said second gate insulating film and second gate electrode forming in combination a second MIS type field effect transistor;

(j) a conductive material provided in said groove and contacting with said first and second drain regions for electrically interconnecting said first drain region and said second drain region, thereby forming said complementary field effect transistor; and

(k) an insulating wall region formed between said first drain region and said second drain region and having a rectangular cross section.

4,920,398

SEMICONDUCTOR MIS INTEGRATED CIRCUIT DEVICE

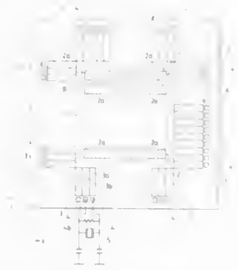
Shintani Yoshio, Kokubungi, and Inatsu Mikio, Mitaka, both of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Filed Jun. 9, 1989, Ser. No. 363,835

Claims priority, application Japan, Jun. 29, 1988, 63-162156

Int. Cl.[5] H01L *27/02*

U.S. Cl. 357—42 8 Claims



1. A semiconductor integrated circuit device comprising:

a semiconductor pellet;

a rectangular internal cell array consisting of a plurality of basic cell lines each being formed by arranging a plurality of basic cells formed on said semiconductor pellet and juxtaposed in the same direction;

a plurality of basic cells for input/output buffer circuits disposed in the outer peripheral direction of said internal cell array and including MISFETs for output circuit for forming an output circuit and MISFETs for input circuit for forming an input circuit;

external terminals disposed in such a manner as to correspond to said basic cells for the input/output buffer circuits and to be positioned more outward than said basic cells for the input/output buffer circuits;

an oscillator disposed outside said semiconductor pellet; and

an oscillation circuit consisting of said oscillator and said MISFETs for said output circuit, with said MISFETs for said output circuit forming an amplification circuit portion of said oscillation circuit.

4,920,399

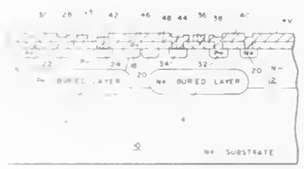
CONDUCTANCE-MODULATED INTEGRATED TRANSISTOR STRUCTURE

John H. Hall, San Jose, Calif., assignor to Linear Integrated Systems, Inc., Fremont, Calif.

Continuation of Ser. No. 243,428, Sep. 12, 1988, abandoned. This application Oct. 10, 1989, Ser. No. 418,962

Int. Cl.[5] H01L *27/02*

U.S. Cl. 357—42 6 Claims



1. An integrated CMOS transistor structure comprising a semiconductor body having a major surface with a first device region of a first conductivity type and a second device region of a second conductivity type therein,

a first device formed in said first device region and including a source region and a drain region of said second conductivity type, said source and drain regions being spaced apart by a channel region and each of said source and drain regions forming a p-n junction with said first device region, a gate contact between said source and drain regions and insulatively spaced from said device region, an ohmic contact solely to said source region and a Schottky contact solely to said drain region, said Schottky contact forming a Schottky diode with said drain region which is forward biased and injecting minority carriers into said channel region when said gate contact is voltage biased on.

a second device formed in said second device region and including a source region and a drain region of first conductivity type, said source and drain regions being spaced apart by a channel region and each of said source and said drain regions forming a p-n junction with said second device region, a gate contact between said source and drain regions and insulatively spaced from said second device region, an ohmic contact solely to said source region and a Schottky contact solely to said drain region, said Schottky contact forming a Schottky diode with said drain region which is forward biased and injecting minority carriers into said channel region when said gate contact is voltage biased on.

input connector means interconnecting said gate contacts of said first and second devices, and

output connector means interconnecting said Schottky contacts of said first and second devices.

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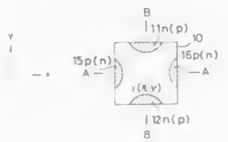
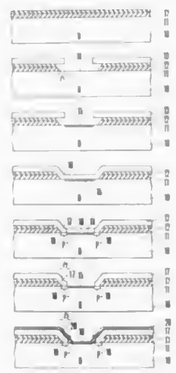
4,920,400
SEMICONDUCTOR DEVICE
Istyán Bársony, Budapest, Hungary, assignor to Research Development Corporation of Japan, Tokyo, Japan and Barsony Istvan, Istenhegyi, Hungary
Continuation of Ser. No. 925,368, Oct. 30, 1986, abandoned. This application Jan. 18, 1989, Ser. No. 298,841
Claims priority, application Japan, Nov. 1, 1985, 60-244091
Int. Cl.[5] H01L 29/12, 29/00, 27/02
U.S. Cl. 357—58 5 Claims



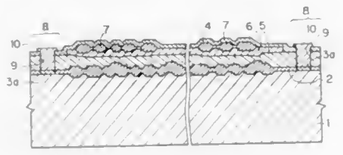
1. A semiconductor device having a main body region of a substantially intrinsic semiconductor two pairs of terminals defined by electrode regions, one of said pairs being of a p-type conductivity and the other pair being of an n-type, the built-in potentials of said terminals inducing a single potential barrier in said main body, whereby two controlled current paths are formed, each passing through said potential barrier and between a different one of said pairs of terminals, so that said two current paths comprise one electron path for allowing flow of a majority current formed of electrons and one hole path for allowing flow of a majority current formed of holes, the two paths being non-interacting, each current path having a current flow defined by a predetermined transfer function representing the relationship between current in the respective path and the height of said single potential barrier structure, said device being constructed so that said potential barrier height is controlled by input voltages applied to said pairs of terminals of the device.

4,920,401
BIPOLAR TRANSISTORS
Tetsushi Sakai, Sayama; Yoshizi Kobayasi; Hironori Yamauchi, both of Tokyo, and Yoshinobu Arita, Hoya, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp., Japan
Continuation of Ser. No. 524,470, Aug. 19, 1983, abandoned, which is a continuation of Ser. No. 158,784, Jun. 12, 1980, abandoned, which is a continuation of Ser. No. 898,074, Apr. 20, 1978, abandoned. This application Mar. 14, 1985, Ser. No. 710,950
Claims priority, application Japan, Apr. 25, 1977, 52-46737
Int. Cl.[5] H01L 29/72, 29/34, 29/04, 23/48
U.S. Cl. 357—59 6 Claims

1. A planar type bipolar transistor with a vertical transistor structure comprising:
a collector region of a first conductivity type;
an insulating layer formed on said collector region and defining an opening to said collector region;
a base region formed in said collector region at said opening and having an impurity of a second conductivity type opposite said first conductivity type, said base region having a periphery;
a base contact region provided at and contacting the entire periphery of said base region, said base contact region containing an impurity of said second conductivity type in higher concentration than the concentration of impurity in said base region;
an emitter region of said first conductivity type disposed as an island in said base region and having an outer peripheral edge portion abutting said base region at an emitter-base junction having a top planar side and circumscribing said emitter region;
a base electrode of polycrystalline silicon containing an impurity of said second conductivity type formed in contact with said base contact region and extending onto said insulating layer, said base electrode having an inner peripheral edge portion spaced from and circumscribing said emitter region;
an emitter electrode in contact with said emitter region and having an outer peripheral edge portion; and
an insulating film covering and contacting at least the inner peripheral edge portion of said base electrode and extending outwardly therefrom onto said base electrode, said insulating film circumscribing and contacting the entire outer peripheral edge portion of said emitter electrode and covering and contacting the top planar side of the emitter-base junction for electrically isolating said base electrode from said emitter electrode;
wherein said base electrode contacts said base contact region along a band of constant width, said band having an inner circumference circumscribing said emitter region and spaced from the outer peripheral edge of said emitter region by a constant distance everywhere along the length of the band.



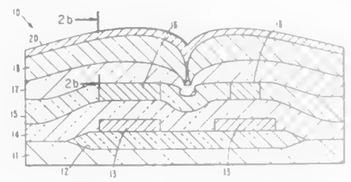
4,920,402
INTEGRATED CIRCUIT DEVICE
Masao Nakaya, and Yasutaka Horiba, both of Itami, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 3, 1988, Ser. No. 251,768
Claims priority, application Japan, Feb. 15, 1988, 63-33221
Int. Cl.[5] H01L 27/02
U.S. Cl. 357—68 6 Claims



1. An integrated circuit device having multilayer structure, comprising:
a substrate;

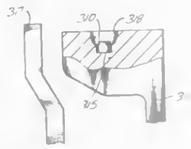
an integrated circuit formed on one major surface of said substrate;
an insulating layer formed on said integrated circuit;
dummy elements provided on a prescribed region of said insulating layer and formed by the same material as that for said integrated circuit;
a protective film formed on said insulating layer to cover said dummy elements;
bonding holes formed in the upper surface of said protective film to reach upper surface parts of said integrated circuit through said insulation layer while avoiding said region provided with said dummy elements; and
bonding pads formed in said bonding holes to have upper ends exposed from the upper surface of said protective film and lower ends electrically connected to said integrated circuit.

4,920,403
SELECTIVE TUNGSTEN INTERCONNECTION FOR YIELD ENHANCEMENT
Yu C. Chow; Kuan Y. Liao, both of Irvine; Maw-Rong Chin, and Charles S. Rhoades, both of Huntington Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Apr. 17, 1989, Ser. No. 338,682
Int. Cl.[5] H01L 23/48; B44C 1/22; C23F 1/02
U.S. Cl. 357—71 16 Claims



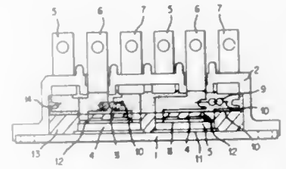
10. In an integrated circuit having at least two layers of metal interconnection lines separated by an oxide layer and comprising:
a layer of metal interconnection formed lines over an oxide layer; and
a tungsten layer selectively deposited onto the layer of metal interconnection lines to form fully interconnected metal lines.

4,920,404
LOW STRESS LIGHT-EMITTING DIODE MOUNTING PACKAGE
Dinesh C. Shrimali, San Ramon; Frank M. Steranka, San Jose, and Cheryl L. McLeod, Mountain View, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed May 12, 1989, Ser. No. 351,194
Int. Cl.[5] H01L 23/28, 33/00
U.S. Cl. 357—72 30 Claims



1. A light-emitting diode package comprising:
a metal lead;
a cavity having walls, a bottom and an open end in the metal lead;
a light-emitting diode having sides and a front face in the bottom of the cavity in electrical contact with the metal lead; and
a rigid plastic potting material between the light-emitting diode and the walls of the cavity, and
means for minimizing light degradation of the light-emitting diode comprising a sufficiently small clearance between the sides of the light-emitting diode and the walls of the cavity that the amount of plastic potting material between the sides of the light-emitting diode and the walls is insufficient for applying light degrading stresses on the light-emitting diode due to differential thermal expansion.

4,920,405
OVERCURRENT LIMITING SEMICONDUCTOR DEVICE
Shinichi Itoh, and Hisao Shigekane, Kawasaki, both of Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan
Filed Nov. 25, 1987, Ser. No. 125,688
Claims priority, application Japan, Nov. 28, 1986, 61-283533; Feb. 5, 1987, 62-25059
Int. Cl.[5] H01L 23/02, 23/12, 23/16, 23/28
U.S. Cl. 357—74 11 Claims



1. An overcurrent limiting semiconductor device comprising:
a package formed with a base plate, sidewalls and a cover plate;
at least one transistor fixed onto said base plate;
an encapsulation layer comprising a first resin layer formed on said base plate and a second resin layer formed on said first resin layer, said first resin layer and said second resin layer being made of different materials;
terminal conductors respectively connected to the base, emitter and collector electrodes of said transistor, and being led out through the cover plate; and,
a plurality of diodes electrically connected in series across base and emitter terminal conductors of said transistor, said being located in a space provided between said cover plate and said base plate of said package and being connected to the base and emitter terminal conductor of said transistor, said diodes comprising overcurrent limiting diodes enclosed in said second resin layer.

4,920,406
SEMICONDUCTOR DEVICE
Yoshio Watanabe, Kawasaki, and Shinji Emori, Urawa, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
PCT No. PCT/JP87/00079, § 371 Date Oct. 7, 1987, § 102(e) Date Oct. 7, 1987, PCT Pub. No. WO87/04855, PCT Pub. Date Aug. 13, 1987
PCT Filed Feb. 6, 1987, Ser. No. 124,944
Claims priority, application Japan, Feb. 7, 1986, 61-024181
Int. Cl.[5] H01C 23/02, 23/12
U.S. Cl. 357—74 18 Claims

1. A semiconductor devices operatively connectable to a drive side transmission line and a to a terminating side transmission line, comprising:
a pair of package leads each with an external end and an

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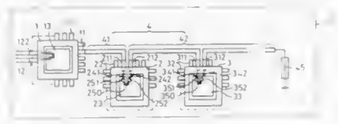
internal end, the external end of one of said package leads being electrically connectable to the drive side transmission line and the external end of another one of said package leads being electrically connectable to the terminating side transmission line;

an integrated circuit chip having pads, the internal ends being electrically connected to said integrated circuit chip through at least one of said pads; and



a pair of conductors each having first and second ends, the first ends are respectively connected to said pair of package leads and the second ends are connected to at least one of said pads, the internal ends are electrically connected together via said pair of conductors and at least one of said pads.

4,920,407

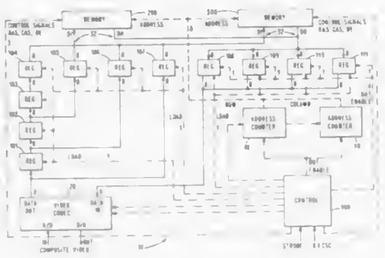
COMPOSITE VIDEO FRAME STORE

James C. Stoddard, Wayland, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 3, 1989, Ser. No. 292,784

Int. Cl.[5] H04N *9/64, 5/91*

U.S. Cl. 358—21 R 3 Claims



1. Apparatus for storing a composite video frame including synchronization signals, color burst signals, and analog signals comprising:

sampling means providing digitized samples of the synchronization signals, color burst signals and analog signals of a video frame;

a first memory addressed by rows and columns;

a second memory addressed by rows and columns;

an input register coupled to said first and second memories for buffering a plurality of digitized samples; an output register coupled to said first and second memories

for buffering the outputs of said memories; addressing means for providing sequential addresses to said

first and second memories for each cycle; control means for providing, during a write cycle, control

signals for enabling said input register to buffer said samples and alternately write enabling said first memory and said second memory to store said samples, and, for providing during a read cycle, control signals for

alternately read enabling said first memory and said second memory to output said samples and to enable said

output register to buffer said output; and means for converting said output into analog.

4,920,408

CIRCUIT FOR SEPARATING COMPOSITE COLOR TELEVISION SIGNAL INTO LUMINANCE SIGNAL AND CHROMINANCE SIGNAL

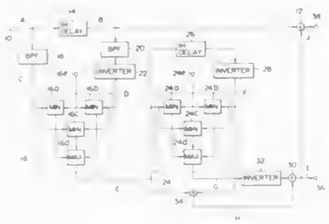
Toshimitu Umezawa, Kazo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 24, 1989, Ser. No. 314,773

Claims priority, application Japan, Mar. 2, 1988, 63-48893

Int. Cl.[5] H04N *9/78*

U.S. Cl. 358—31 16 Claims



1. A circuit for separating a luminance signal and a chrominance signal from a composite color television signal supplied to an input terminal and outputting the luminance and chrominance signals, comprising:

first delay means for delaying the composite color television signal supplied to said input terminal by one horizontal line period;

first extracting means for extracting frequency components in the vicinity of a color subcarrier frequency from the composite color television signal supplied to said input terminal;

second extracting means for extracting frequency components in the vicinity of the color subcarrier frequency from an output signal of said first delay means;

first waveform selecting mean connected to receive a first signal obtained by inverting one of the output signals of said first and second extracting means and a second signal corresponding to another output signal of said first and second extracting means, for extracting only those components of the first and second signals which have the same waveform at the same time;

second delay means for delaying an output signal of said first waveform selecting means by one horizontal line time;

second waveform selecting means connected to receive a third signal obtained by inverting one of the output signals of said first waveform selecting means and said second delay means and a fourth signal corresponding to another output signal of said first waveform selecting means and said second delay means, for extracting only those components of the third and fourth signals which have the same waveform at the same time;

adder means for adding the third and fourth signals;

first signal synthesizing means for performing subtraction between the output signal of said second waveform selecting means and the output signal of said adder means to provide the chrominance signal; and

second signal synthesizing means for adding the output signal of said first signal synthesizing means and the output signal of said first delay means to provide the luminance signal.

4,920,409

MATRIX TYPE COLOR LIQUID CRYSTAL DISPLAY DEVICE

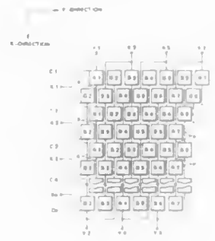
Kooji Yamagishi, Oome, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1988, Ser. No. 209,422

Claims priority, application Japan, Jun. 23, 1987, 62-96233[U]; Jun. 23, 1987, 62-96234[U]; Jul. 29, 1987, 62-115048[U]; Jul. 29, 1987, 62-115049[U]; Jul. 29, 1987, 62-115050[U]

Int. Cl.[5] H04N *9/30*

U.S. Cl. 358—56 25 Claims



1. A matrix type color liquid crystal display device, comprising:

a plurality of stripe-shaped common electrodes having a long edge extending along a horizontal direction, and also a short edge extending along a vertical direction perpendicular to the horizontal direction;

a plurality of substantially square-shaped segment electrodes for displaying at least three different color pixels, positioned opposite to said plurality of stripe-shaped common electrodes so as to form a matrix pattern, a width of each of said segments electrodes along the vertical direction being equal to approximately only one half that of said short edge of each of said common electrodes, and said segment electrodes being aligned along first and second lines, which are positioned parallel to each other along the horizontal direction, with respect to each of said common electrodes under the condition that said segment electrodes arranged in said first line are positionally shifted by a predetermined positional shift amount with respect to said segment electrodes arranged in said second line, and also said segment electrodes for displaying same color pixels are alinged along the vertical direction;

signal lines connected to said segment electrodes for selectively displaying the same color pixels along the vertical direction through said segment electrodes, for displaying the different color pixels and supplying drive signals thereto, thereby forming segment electrode columns for the same color pixels and different color pixels; and

connection lines for connecting said segment electrode columns that display the same color pixels and which columns are positioned adjacent to each other in the vertical direction, so as to form individual pairs of adjoining same color segment electrode columns that sandwich segment electrode columns which display pixels of a different color among said segment electrode columns connected by said signal lines, said individual pairs of adjoining same color segment electrode columns arranged to be simultaneously energized via said connection lines and said signal lines.

4,920,410

DRIVE METHOD FOR SYNCHRONIZING SCANNING AND MODULATION OF FLAT-CONFIGURATION COLOR CRT

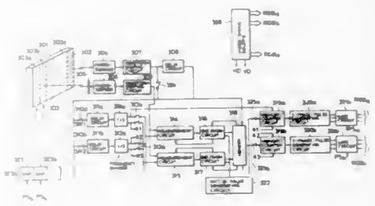
Kaoru Tomii, Isehara; Hiroshi Miyama, Yokohama; Yoshikazu Kawauchi, Kawasaki, and Jun Nishida, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 25, 1988, Ser. No. 185,628

Claims priority, application Japan, Apr. 24, 1987, 62-102255; Apr. 27, 1987, 62-103501; Aug. 6, 1987, 62-196716

Int. Cl.[5] G09G *1/00*

U.S. Cl. 358—67 12 Claims



1. A method of controlling, in synchronism with electron beam scanning of successive fluorescent element color trios of a color cathode ray tube, timings of primary color components of a point-sequential video signal for driving a modulation electrode of the cathode ray tube, the method comprising:

(a) deriving an index signal comprising, during each of successive horizontal scanning intervals of said electron beam scanning, a pulse train having a frequency identical to a trio frequency of said electron beam scanning;

(b) deriving a scanning timing signal comprising, during each of said horizontal scanning intervals, a train of pulses respectively generated at timings coinciding with timings of electron beam scanning of a predetermined fluorescent element in corresponding ones of said color trios;

(c) frequency dividing said index signal to obtain n-phase index signals comprising, during each of said horizontal scanning intervals, n pulse trains mutually differing in phase by 360/n degrees, where n is an integer of value greater than one;

(d) measuring time differences between each of $(1+m\cdot n)^{th}$ pulses of said scanning timing signal and a pulse of a first one of said n-phase index signals, time differences between each of $(2+m\cdot n)^{th}$ pulses of said scanning timing signal and a pulse of a second one of said n-phase index signals, . . . and between each of $(n+m\cdot n)^{th}$ pulses of said scanning timing signal and a pulse of an n^{th} one of said n-phase index signals, where m takes the values 0, 1, 2, . . . ;

(e) storing said time differences as respective data values in memory means; and,

(f) subsequently reading out said time difference values sequentially from said memory means and producing successive pulses at respective timings relative to said n-phase index signals that are determined by said time difference values, to thereby regenerate said scanning timing signal, and applying said scanning timing signal to control said primary color component timings of said video signal.

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4,920,411

METHOD FOR PROCESSING IMAGE SIGNALS SO AS TO COLOR CORRECT THEM

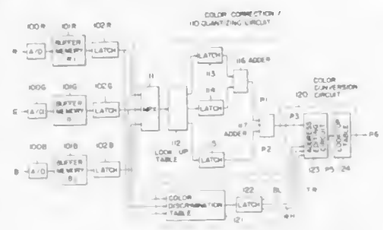
Tadashi Miyakawa, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 3, 1988, Ser. No. 229,729

Claims priority, application Japan, Apr. 11, 1984, 59-71000; Apr. 12, 1984, 59-73590; May 1, 1984, 59-88059

Int. Cl.[5] **G03F** *3/08;* **H04N** *1/46*

U.S. Cl. 358—80 **6 Claims**



1. An image signal processing method for a picture output device, said processing method of the type which converts three color separation signals of an original into digital signals, color corrects the digital signals and records a color image in accordance with the color corrected signals, said method comprising the steps of:

storing in a memory as a data table multiplied results of said three color separation signals and corresponding predetermined color correction coefficients;

sequentially reading out respective multiplied results from said memory in accordance with the value of each of the digital signals converted from said three color separation signals;

adding said sequentially read out multiplied results; and

outputting color corrected signals according to said added multiplied results for recording of said color image;

wherein a predetermined operating time for generating each of said color corrected signals for each pixel of said color image during said recording of said color image is divided into N operating times;

wherein a different one of the digital signals is inputted into the memory in a predetermined order during each of said N operating times;

wherein said adding step is conducted during each of the 2nd through Nth operating times using a temporary memory means, and

wherein N is an integer greater than 1.

2. An image signal processing method for a picture output device, said processing method of the type which converts three color separation signals RGB of an original into digital signals, color corrects the digital signals and records a color image using the color corrected signals, said method comprising the steps of:

storing data as a color conversion table for outputting specific color signals in correspondence with respective specific color distributions of said three color separation signals RGB;

discriminating the color distribution of said three color separation signals RGB by inputting the digital signals converted from the three color separation signals RGB to a color discriminating table, wherein said color discriminating table outputs a specific color discriminating signal when the color separation signals have a respective specific color distribution;

inputting as an address signal said output specific color discriminating signal into said color conversion table via an address editing circuit; and

outputting from said color conversion table the specific color signal corresponding to the output specific color discriminating signal.

4. An image signal processing method for a picture output device, said processing method of the type which converts three color separation signals RGB of an original into digital signals, color corrects the digital signals and records a color image using the color corrected signals, said method comprising the steps of:

setting a number of output colors of said color image;

setting a number of quantization levels for digitizing said three color separation signals RGB in accordance with said set number of output colors;

processing the digital signals converted from the three color separation signals RGB to have the set number of quantization levels;

color correcting the processed digital signals; and

outputting analog signals in accordance with said color corrected signals to record a color image having said set number of output colors.

4,920,412

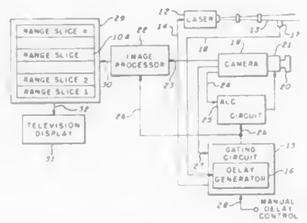
ATMOSPHERIC OBSCURANT PENETRATING TARGET OBSERVATION SYSTEM WITH RANGE GATING

David W. Gerdt, and Lawrence H. Gilligan, both of Charlottesville, Va., assignors to Sperry Marine Inc., Charlottesville, Va.

Filed Dec. 22, 1988, Ser. No. 288,549

Int. Cl.[5] **H04N** *7/18, 7/00*

U.S. Cl. 358—95 **13 Claims**



1. Apparatus for use in a target observation system for clearing obscurants from a scene to be observed, said system including a source of pulses of illuminant energy for illuminating said scene, comprising

gated receiver means for receiving illuminant energy from said pulses reflected back from said scene, and providing an image in accordance therewith,

gating means for providing a gating pulse to said gated receiver means to receive said illuminant energy over the width of said gating pulse,

delay means for delaying said gating pulse in accordance with the travel time required for a pulse of illuminant energy to travel from said source to a range slice of said scene and back to said gated receiver means so that said gated receiver means is disabled during said travel time from receiving said reflected illuminated energy,

thereby providing an image of range slice cleared of said obscurants,

adjustment means for adjusting said delay means in accordance with successive range slices of said scene, and

isolating and assembling means cooperative with said adjustment means for isolating images of said successive range slices and assembling said images into an image of said scene cleared of said scene obscurants.

4,920,413

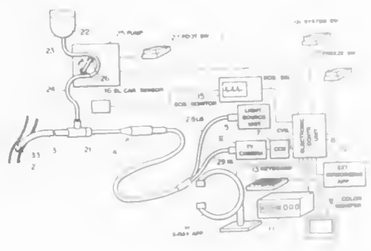
BLOOD-VESSEL ENDOSCOPE SYSTEM FOR STORING A FROZEN PICTURE IN SYNCHRONIZATION WITH HEART PULSATION

Ichiro Nakamura, Koknbunji; Naruto Shinkai, Tokyo, both of Japan; David Barlow, Hicksville, and Akio Nakada, Lake Success, both of N.Y., assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1989, Ser. No. 317,247

Int. Cl.[5] **A61B** *1/06;* **H04N** *7/18*

U.S. Cl. 358—98 **13 Claims**



1. A blood-vessel endoscope system comprising:

(a) an electronic endoscope including

an inserting section inserted into a blood vessel in a living body,

a light guide means, inserted through said inserting section, for transferring illumination light from a trailing end to a leading end and for emitting said illumination light from said leading end,

an objective optical system disposed at the leading end of said inserting section focusing an object illuminated by said illumination light emitted from said leading end of said light guide means, and

an imaging device photoelectrically converting an optical image obtained by said objective optical system;

(b) light source means for supplying said illumination light to the trailing end of said light guide means;

(c) a drive circuit outputting a drive signal to read a photoelectrically converted image signal from said imaging device;

(d) a signal processing circuit for generating a standard video signal by signal processing said image signal read from said imaging device by applying said drive signal;

(e) a color monitor displaying a picture from said video signal;

(f) a heart pulsation measuring means for measuring heart pulsation of said living body;

(g) frozen-picture memorizing means for storing, as a frozen picture, an endoscopic image obtained by imaging in said imaging device; and

(h) frozen-picture release controlling means for generating, from a signal waveform output from said heart pulsation measuring means, a plurality of timing signals, during one cycle of heart pulsation, synchronized with said signal waveform and for then supplying said timing signals to a frozen-picture memorization controlling terminal of said frozen-picture memorizing means.

4,920,414

DIGITAL VIDEO SIGNAL ENCODING ARRANGEMENT, AND CORRESPONDING DECODING ARRANGEMENT

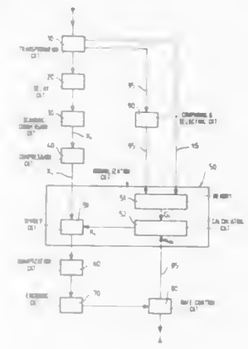
Christian Remus, Joinville-le-Pont, and Olivier Chantelou, Paris, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 27, 1988, Ser. No. 250,019

Claims priority, application France, Sep. 29, 1987, 87 13429

Int. Cl.[5] **H04N** *7/12, 11/06*

U.S. Cl. 358—133 **6 Claims**



1 A digital video signal encoding arrangement, comprising a correlation reducing circuit (**10**) receiving said digital signals which are representative of the luminance or the chrominance of a certain number of elements of a picture which has been divided into blocks, a scanning conversion circuit (**30**) transforming the bidimensional sequence of the values of the output coefficients $F_i(u,v)$ of the correlation reducing circuit (**10**) into a monodimensional sequence, a normalization circuit (**50**), a quantizing circuit (**60**) which converts each normalized output value of the normalization circuit into an integral value, a circuit (70) for encoding said quantized values, a rate controlling circuit (**80**) receiving in accordance with the variable rate said encoded values and, on the one hand, returns to the normalization circuit (**50**) a mean standard value N_m which is linked to said rate and, on the other hand, supplies encoded values at a constant rate from the output of the encoding arrangement, characterized in that the normalization circuit itself comprises:

(a) a memory (**51**) for storing the weighting coefficients, which on the one hand is addressed by the index i indicating the position of each value $F_i(u,v)$ of the current block, available at a first input line (**15**) of the normalization circuit (**50**) and on the other hand by a value which is representative of the activity of the current block, available at a second input line (**95**);

(b) a circuit (**52**) for calculating the standard K_i on the basis of, on the one hand, said mean standard value N_m supplied by the rate controlling circuit and, on the other hand, of the weighting coefficient supplied by said storage memory of the normalization circuit;

(c) a circuit (**59**) for dividing the output of the scanning conversion circuit by the coefficient K_i corresponding to the output of said standard calculating circuit.

4,920,415

SELF KEYER

Daniel J. Chaplin, Nevada City, Calif., assignor to The Grass Valley Group, Inc., Nevada City, Calif.

Filed Mar. 20, 1989, Ser. No. 325,844

Int. Cl.[5] **H04N** *5/272*

U.S. Cl. 358—183 **11 Claims**

1 An improved self keyer of the type having means for

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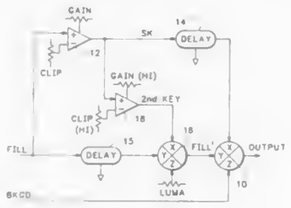
deriving a self key signal from a fill video and means for mixing the fill video with a background video under control of the self key signal to produce an output video, the improvement com-



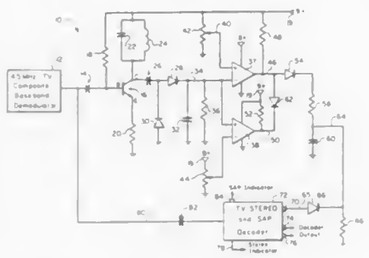
prising means for preconditioning the fill video prior to input to the mixing means by replacing low luminance portions of the fill video with a variable transition signal.

4,920,416

METHOD AND APPARATUS FOR DETECTING A DESIRED TELEVISION SIGNAL

Tsutomu Motoyama, Knoxville, Tenn., assignor to North American Philips Corp., New York, N.Y.

Filed Mar. 17, 1988, Ser. No. 169,793
Int. Cl.[5] H04N *5/60, 1/16*
U.S. Cl. 358—198 17 Claims



1. In a television receiver for receiving a multichannel television sound signal, a signal detector for detecting the presence of a desired signal in a composite baseband input signal including said multichannel television sound signal in the BTSC format, said desired signal having a predetermined frequency and amplitude in a background of other signals, noise, and harmonics, said signal detector comprising:

first means for receiving the composite baseband input signal, for detecting the desired signal having the predetermined frequency in the composite baseband input signal, and for producing a signal corresponding to the amplitude of the signals having the predetermined frequency; and

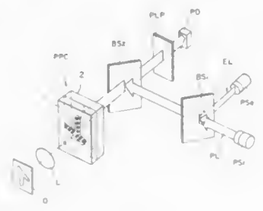
second means for receiving the corresponding signal, for comparing the corresponding signal to a predetermined amplitude range that is defined by and between first and second thresholds and that corresponds to an acceptable amplitude range for the desired signal, for detecting when the amplitude of the corresponding signal is below the first threshold, for detecting when the amplitude of the corresponding signal is above the second threshold, and for producing a detect signal only when said corresponding signal is within said predetermined amplitude range between the first and second thresholds, whereby said detect signal is produced only when said composite baseband input signal includes signals within the acceptable amplitude range having the predetermined frequency.

4,920,417

PHOTO-TO-PHOTO CONVERSION ELEMENT AND ITS APPLIED SYSTEM

Itsuo Takanashi, Kamakura; Sbintaro Nakagaki, Fujisawa; Hirohiko Shinonaga, Yokohama; Tsutou Asakura, Yokohama, and Masato Furuya, Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation-in-part of Ser. No. 139,005, Dec. 29, 1987, Pat. No. 4,831,452. This application Feb. 21, 1989, Ser. No. 313,073
Claims priority, application Japan, Feb. 21, 1988, 63-37800
Int. Cl.[5] H04N *5/30*
U.S. Cl. 358—209 5 Claims



1. A photo-to-photo conversion element comprising, in an arranged sequence in line;

a first optical member having a wavelength selectivity passing a write light having a first wavelength range, and blocking an erase light;

a first transparent electrode;

a photoconductive layer;

a second optical member having a wavelength selectivity reflecting a read light having a second wavelength range and passing said erase light;

a third optical member for electrooptically modulating a light incident thereto through the second optical member in response to the strength distribution of n electric field applied thereto; and

a second transparent electrode

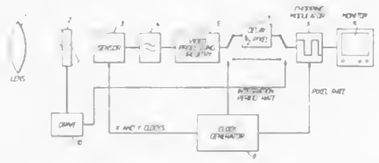
said erase light having a wavelength outside of both said first and second wavelength ranges.

4,920,418

IMAGING SYSTEM HAVING A SWING-DRIVEN IMAGE SENSOR

Christopher P. Robinson, Shepton Mallet, United Kingdom, assignor to GEC-Marconi Limited, Stanmore, United Kingdom

Filed Apr. 26, 1988, Ser. No. 186,268
Claims priority, application United Kingdom, Apr. 27, 1987, 8709916
Int. Cl.[5] H04N *3/14*
U.S. Cl. 358—213.28 11 Claims



1. An imaging system comprising:

an array of solid state imaging elements for producing an image signal corresponding to an optical input to said imaging elements;

means for optically shifting said optical input out of spacial coincidence, in synchronism with a pixel rate so that the image signal produced by said array is out of spacial coincidence;

primary sampling means for sequentially sampling the out of coincidence image signal from said imaging elements at a pixel rate to produce an out of spacial coincidence field signal;

means for processing the out of coincidence field signal to produce a video signal for display of said field signal in spatial coincidence, representative of the optical input;

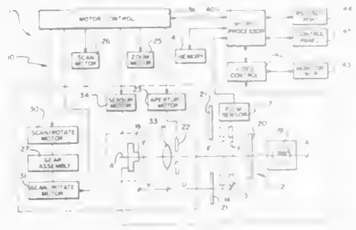
and secondary sampling means for sampling the video signal at a rate synchronous to said pixel rate, including a chopping modulator for generating a square waveform synchronous to said pixel rate wherein said video signal is sampled by said secondary sampling means during every other half cycle of said waveform.

4,920,419

ZOOM LENS FOCUS CONTROL DEVICE FOR FILM VIDEO PLAYER

Robert W. Easterly, Churchville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 31, 1988, Ser. No. 200,327
Int. Cl.[5] G02B *7/11*
U.S. Cl. 358—214 13 Claims



1. A device to control the focus in a film video player for projection of at least a portion of a film image carried by a film image mount onto a sensor which generates a corresponding video signal from a sensor image, the film video player having a fixed focal length lens located on an optical axis between said film image mount and said sensor to project said portion onto said sensor, said device comprising: means for moving said lens axially of said film image mount for selectively changing the magnification of the sensor image with respect to the film image; means for moving said sensor axially of said film image mount mechanically independently of movement of said lens by said lens moving means for adjusting the focus of the sensor image; and, means for determining the necessary adjustment and for controlling said means for adjusting to maintain the focus of the sensor image for changes in the selected magnification.

4,920,420

AUTOMATIC FOCUSING SYSTEM

Kenji Sano; Takesuke Maruyama; Hironobu Satoh; Masaharu Deguchi, and Toshio Murakami, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 10, 1988, Ser. No. 269,699
Int. Cl.[5] H04N *5/232*
U.S. Cl. 358—227 5 Claims

1. An automatic focusing system comprising:

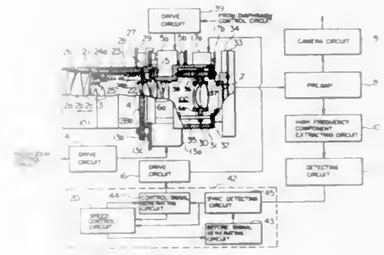
an image pickup device;

image forming means which includes at least a master lens and an objective lens and forms an image of an object to be photographed onto a photo sensing surface of said image pickup device;

moving means for moving said master lens in its optical axis direction while finely vibrating said master lens at a predetermined reference frequency;

high frequency component extracting means for extracting a high frequency component signal from a video signal which is output from said image pickup device;

vibration component detecting means for extracting a signal of a component based on said reference frequency from the high frequency component signal which is output from said high frequency component extracting means and for detecting a polarity and an amplitude of said extracted signal;



maximum position detecting means for detecting a position of the maximum value of the high frequency component signal on the basis of at least the polarity detected by said vibration component detecting means;

speed setting means for outputting a speed setting signal to change a speed of said master lens for a period of time when said master lens is moved by said moving means; and

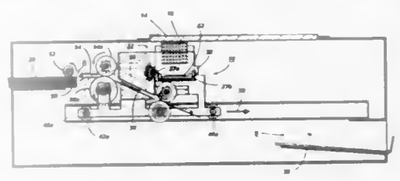
control means for controlling said moving means on the basis of an output signal of said speed setting means and an output signal of said maximum position detecting means.

4,920,421

SIMULTANEOUS READ/WRITE COPIER

Denis J. Stemmle, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 13, 1988, Ser. No. 257,366
Int. Cl.[5] H04N *1/024, 1/23;* G01D *15/16*
U.S. Cl. 358—296 16 Claims



1. In a system having a co-mounted unit of reading and printing elements, the method of making a copy of a document onto a copy sheet without information storage comprising the steps of:

scanning the co-mounted unit across the document and copy sheet in a first direction,

indexing the co-mounted unit a predetermined distance relative to the document and copy sheet in a second direction, and

repeating the scanning and indexing motion relative to the document and copy sheet, said scanning element reading a portion of said document during said movements across said document, and said printing element printing a por-

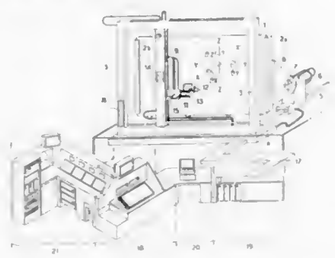
tion of a copy during said movement across said document wherein said reading and printing occur essentially simultaneously.

4,920,422

PROCESSES AND AUTOMATIC DEVICES FOR HIGH-RESOLUTION WRITING ON A SUPPORT BY PROJECTING DROPS OF COLORED LIQUIDS

Gilles H. Lapierre, 33 rue de la République, 13500 Martigues, France

Filed Mar. 16, 1989, Ser. No. 324,607
Claims priority, application France, Mar. 18, 1988, 88 03767
Int. Cl.[5] H04N *1/393;* G01D *15/18;* G06F *15/62*
U.S. Cl. 358—296 11 Claims



1. A process for automatically writing a high-resolution polychrome graphic on a fixed support comprising the following successive operations:

mounting a plurality of nozzles, each projecting a liquid of a determined colour, on a tool-holder which is placed in front of said support and which is adapted to be displaced along three rectangular axes of which one is perpendicular to said support,

automatically controlling the displacements of said tool-holder by a central processing unit with the result that each outlet orifice of a nozzle scans line by line a surface parallel to said support, which nozzles are perpendicular to said support and parallel to one another and are offset in the direction perpendicular to the scanning lines, so that they scan different lines,

recording in the memory of said central unit the coordinates of a network of dots of the graphic and the colour of each dot and, during the displacements of the tool holder,

measuring the successive real positions of each nozzle,

comparing them with the coordinates recorded in the memory and, when the real position of a nozzle which projects a liquid of a determined colour coincides with the coordinates of a dot of the graphic of this same colour, the central unit causes the ejection of a drop of liquid via said nozzle onto said support so that a high-resolution polychrome graphic is obtained thereon which is composed of a network of juxtaposed monochromatic dots.

4,920,423

VIDEO PRINTER

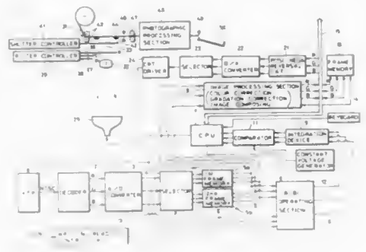
Kazuo Shiota, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 5, 1988, Ser. No. 215,145
Claims priority, application Japan, Jul. 3, 1987, 62-167534
Int. Cl.[5] H04N *5/76*
U.S. Cl. 358—335 15 Claims

1. A video printer for making a hard copy of one of a plurality of continuous video images recorded in a video image recording medium, said video printer comprising:

means for detecting a value substantially corresponding to a degree of correlation between each pair of adjacent frames of said continuous video images reproduced time serially.

means for comparing said detected value with a preset value; and



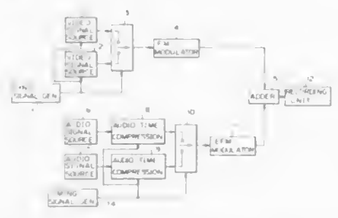
means for making a hard copy of a frame which is reproduced a predetermined time period later if said comparing means outputs a comparison value indicative of said detected value being smaller than said preset value.

4,920,424

METHOD OF RECORDING AND REPRODUCING MULTI-CHANNEL INFORMATION ON AND FROM RECORDING MEDIUM

Sumio Hosaka; Toshiyuki Amaya; Toshiji Daito; Hiroshi Itoh, and Takumi Jinguji, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 26, 1988, Ser. No. 199,179
Claims priority, application Japan, Aug. 6, 1987, 62-196875
Int. Cl.[5] G11B *7/00;* H04N *5/76*
U.S. Cl. 358—343 6 Claims



1. A method of recording a plurality of channels of video signals and a plurality of channels of audio signals associated with said video signals, on a recording medium, comprising the steps of:

periodically sampling each video signal at consecutive unit periods, thereby obtaining consecutive unit period samples of each video signal;

combining the sampled video signals by a time division multiplexing operation to form a single multiplex video signal comprising every other one of said unit period samples of each of said video signals;

digitizing each of said audio signals into a series of digital data, each series corresponding to a particular audio signal of said plurality of channels of audio signals;

dividing each of said series of digital data into a plurality of data blocks and effecting a time compression of the data blocks by a predetermined factor;

compressing in time each of the data blocks in each of said series of digital data;

combining said compressed data blocks of each of said series of digital data thereby forming a single digitized audio signal; and

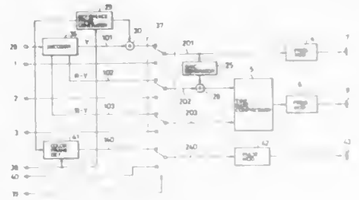
recording said multiplex video signal and said digitized audio signal at the same time on said recording medium.

4,920,425

VIDEO SIGNAL RECORDING AND REPRODUCING APPARATUS

Kunio Sekimoto, and Takeshi Morimoto, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 8, 1988, Ser. No. 153,406
Claims priority, application Japan, Feb. 9, 1987, 62-27730
Int. Cl.[5] H04N *9/80, 9/88*
U.S. Cl. 358—334 10 Claims



1. A video signal recording and reproducing apparatus comprising:

(a) an input terminal receiving a video signal;

(b) means for recording the video signal, received by the input terminal, as component signals;

(c) means for generating a color frame signal from color frame information contained in the video signal received by the input terminal;

(d) means for recording the color frame signal generated by the generating means;

(e) means for reproducing the component signals recorded by the recording means (b) and for reproducing the color frame signal recorded by the recording means (d); and

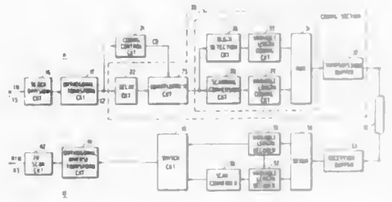
(f) output terminals outputting the component signals reproduced by the reproducing means and outputting the color frame signal reproduced by the reproducing means.

4,920,426

IMAGE CODING SYSTEM CODING DIGITAL IMAGE SIGNALS BY FORMING A HISTOGRAM OF A COEFFICIENT SIGNAL SEQUENCE TO ESTIMATE AN AMOUNT OF INFORMATION

Yoshinori Hatori, Kanagawa; Toshio Koga, Tokyo; Kiichi Matsuda, and Naoki Mukawa, both of Kanagawa, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd.; NEC Corporation; Fujitsu Limited and Nippon Telegraph and Telephone Corporation, all of Tokyo, Japan

Filed Nov. 9, 1987, Ser. No. 118,128
Claims priority, application Japan, Nov. 10, 1986, 61-267340
Int. Cl.[5] H04N *1/415, 1/413*
U.S. Cl. 358—433 5 Claims



1. In an image coding system for use in coding a sequence of digital image signals into a sequence of coded signals, said digital image signal sequence being divisible into predetermined intervals of time, said image coding system comprising dividing means responsive to said digital image signal sequence for dividing said digital image signal sequence into a sequence of blocks within each of said predetermined intervals, converting means coupled to said dividing means for successively carrying out predetermined conversion of the digital image signals of said blocks in each predetermined interval to produce a sequence of coefficient signals representative of coefficients resulting from said predetermined conversion, controllable coding means which has a plurality of coding characteristics and which is responsive to said coefficient signal sequence and to a characteristic selection signal for coding said coefficient signal sequence into said coded signal sequence in accordance with a selected one of said coding characteristics that is indicated by said characteristic selection signal, coding control means responsive to said coefficient signal sequence for producing a coding control signal determined in relation to an amount of information carried by said coefficient signal sequence, and supplying means for supplying said coding control signal to said controllable coding means as said characteristic selection signal, the improvement wherein said coding control means comprises:

histogram forming means responsive to the coefficient signal sequence for forming a histogram representative of a distribution of said coefficients in each predetermined interval, said histogram forming means producing a histogram signal representative of said histogram; and

estimating means coupled to said histogram forming means and responsive to said histogram signal for estimating the amount of information carried by the coefficient signal sequence in every one of said predetermined intervals to produce, as said coding control signal, an estimation signal representative of a result of the estimation in every one of said predetermined intervals.

4. In an image coding system for use in coding a sequence of digital image signals into a sequence of coded signals, said digital image signal sequence being divisible into predetermined intervals of time, said image coding system comprising dividing means responsive to said digital image signal sequence for dividing said digital image signal sequence into a sequence of blocks within each of said predetermined intervals, controllable coding means which has a plurality of coding characteristics and which is responsive to said digital image signal sequence and to a characteristic selection signal for coding said digital image signal sequence into said coded signal sequence in accordance with a selected one of said coding characteristics that is indicated by said characteristic selection signal, coding control means responsive to said digital image signal sequence for producing a coding control signal determined in relation to an amount of information carried by said digital image signal sequence, and supplying means for supplying said coding control signal to said controllable coding means as said characteristic selection signal, the improvement wherein said coding control means comprises:

histogram forming means responsive to the digital image signal sequence for forming a histogram representative of a distribution of said digital image signals in each of said predetermined intervals, said histogram forming means producing a histogram signal representative of said histogram; and

estimating means coupled to said histogram forming means and responsive to said histogram signal for estimating the amount of information carried by the digital image signal sequence in every one of said predetermined intervals to produce, as said coding control signal, an estimation signal representative of a result of the estimation in every one of said predetermined intervals.

5. An image decoding system for use in combination with a coding system which produces a sequence of coded signals by dividing a sequence of digital image signals into a sequence of blocks in every one of predetermined intervals of time, by carrying out predetermined conversion of the digital image

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signals of the blocks in every one of said predetermined intervals into a sequence of coefficient signals which are representative of coefficients resulting from said predeterimined conversion, by forming a histogram representing an amount of information carried by said coefficient signal sequence and producing a histogram signal representative of said histogram, and by coding said coefficient signal sequence into said coded signal sequence in accordance with said histogram signal, said image decoding system comprising:

decoding means for decoding said coded signal sequence into a reproduction of said coefficient signal sequence; and

inverse conversion means coupled to said decoding means for carrying out inverse conversion of said reproduction of said coefficient signal sequence relative to said predetermined conversion to produce a reproduction of said sequence of digital image signals.

4,920,427

FACSIMILE APPARATUS

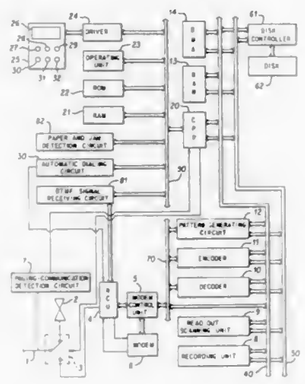
Yoshihiro Hirata, Koganei, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 240,440, Sep. 2, 1988, which is a continuation of Ser. No. 128,440, Dec. 3, 1987, abandoned, which is a division of Ser. No. 812,467, Dec. 23, 1985. This application May 22, 1989, Ser. No. 354,851

Claims priority, application Japan, Dec. 21, 1984, 59-268400; Dec. 21, 1984, 59-270463; Dec. 21, 1984, 59-270468

Int. Cl.[5] H04N *1/00*

U.S. Cl. 358—437 **4 Claims**



1. A facsimile apparatus comprising:

storing means for storing received picture image information;

printing means for printing out picture image information;

trouble detecting means for detecting a trouble occurrence at the printing means; and

control means for causing, when the trouble detecting means detects a trouble occurrence at the printing means, the printing means to print out picture image information on the basis of the picture image information stored in the storing means, after the trouble occurrence is eliminated.

4,920,428

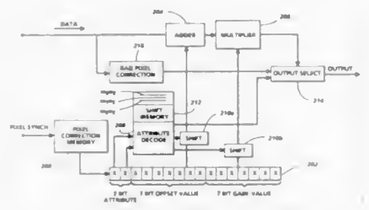
OFFSET, GAIN AND BAD PIXEL CORRECTION IN ELECTRONIC SCANNING ARRAYS

Ying-wei Lin, Penfield, and Anthony F. Calarco, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 8, 1988, Ser. No. 216,475

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—461 **21 Claims**



1. An image scanning device having a scanning array with a plurality of photosites detecting light from an image, each photosite producing a response indicative of light intensity, and including means for correction of responsivity of the photosites, comprising:

a memory storing correction values for photosites along the array;

correction means for applying said correction values to the responses from the photosites;

said correction values each including a correction portion and an attribute value;

means to apply said correction portions to the photosite responses;

a decoder for detecting said attribute values;

shift means for shifting said correction portions prior to application to the photosite responses by a selected number of places, said shift means responsive to detection by said decoder of attribute values indicating that shifting should occur.

19. A method of correcting the responsivity of photosites in an image scanning device having a scanning array with a plurality of photosites detecting light from an image, each photosite producing a response indicative of light intensity, said method comprising the steps:

storing binary values for correction of offset and gain of photosite responses along the array in a

21. A method of correcting the responsivity of photosites in an image scanning device having a scanning array with a plurality of photosites detecting light from an image, each photosite producing a response indicative of light intensity, said method comprising:

for each photosite response correctable to a normalized value, storing a correction value in a correction memory to be applied to the photosite response for correction thereof;

for each photosite response not correctable to a normalized value, storing a distinctive value in said correction memory indicating that an approximated photosite response should be substituted for the actual photosite response;

detecting each said distinctive value and enabling a photosite response approximation function to produce an approximated photosite response;

applying each correction value to the associated photosite response to correct said photosite response to a normalized value;

substituting each approximated photosite response for the associated actual photosite response not correctable to a normalized value.

4,920,429

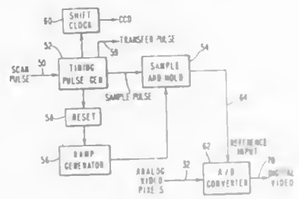
EXPOSURE COMPENSATION FOR A LINE SCAN CAMERA

Robert S. Jaffe, Shenorock; Mark A. Lavin, Katonah; Rick A. Rand, Somers, and Paul Schreiner, New York, all of N.Y., assignors to International Business Machines, Armonk, N.Y.

Filed Jan. 24, 1989, Ser. No. 301,622

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—471 **9 Claims**



1. In a scanning imager which includes a line camera and motive means to present successive regions of an item to be imaged to said line camera, initiation means associated with said motive means for controlling time of exposure of said camera for each said region, said initiation means subject to motion variations of said motive means to vary the time between successive operations of said camera and exposure times for successive regions, thereby producing analog image pixel outputs exhibiting exposure variations, an exposure correction system comprising:

means responsive to a signal from said initiation means for generating a signal related to the time between successive operations of said camera; and

conversion means responsive to said signal to normalize said analog image pixel outputs.

4,920,430

METHOD OF AND APPARATUS FOR JITTER CORRECTION OF A POLYGON MIRROR IN AN IMAGE RECORDING APPARATUS

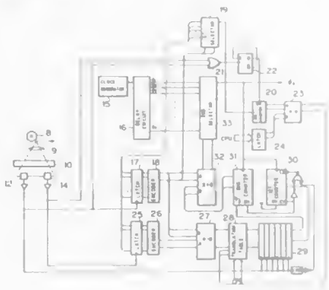
Koichi Isono, Otsu; Kunio Tovohisa, Kyoto; Junichi Oka, Hikone, and Takashi Sakamoto, Otsu, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Division of Ser. No. 113,743, Oct. 28, 1987, Pat. No. 4,872,065. This application May 18, 1989, Ser. No. 353,850

Claims priority, application Japan, Oct. 29, 1986, 257727; Nov. 21, 1986, 61-279288

Int. Cl.[5] H04N *1/04*

U.S. Cl. 358—481 **8 Claims**



1. A method of performing polygon mirror image recording jitter correction by using a polygon mirror to scan a recording beam modulated in synchronization with a dot recording clock signal for recording an image on a photosensitive material, said method comprising the steps of:

generating a plurality N of dot recording clock signals by delaying a dot recording clock signal of a cycle time t by t/N;

detecting said recording beam by a start sensor in advance of scanning one scanning line;

detecting passage of said recording beam after completion of said scanning of one scanning line by an end sensor;

counting an interval between detection times when said beam impinges on said start and end sensors with a time resolution of t/N for each surface of said polygon mirror to obtain a difference between a counted value and a prescribed reference count value as a number of clock crossover times with a sign of said difference as a crossover phase direction;

selecting one of said N dot recording clock signals in synchronization with a detection output of said start sensor for each surface of said polygon mirror;

generating a crossover dot recording clock signal by performing a crossover correction from said selected dot recording clock signal sequentially to a dot recording clock signal adjacent in phase to said selected dot recording clock signal by said number of clock crossover times in said crossover phase direction; and

performing image recording by said crossover dot recording clock signal.

4,920,431

IMAGE READING APPARATUS WITH JAM-PREVENTION FEATURE

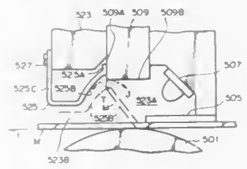
Makoto Ogura; Tatsundo Kawai; Katsuhiko Yamada, all of Hiratsuka, and Shinichi Seito, Isehara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 751,128, Jul. 2, 1985, abandoned. This application Jan. 11, 1988, Ser. No. 144,644

Claims priority, application Japan, Jul. 14, 1984, 59-145256; Jul. 31, 1984, 59-158659

Int. Cl.[5] H04N *1/12, 1/028*

U.S. Cl. 358—496 **17 Claims**



1. An image reading apparatus for reading an original conveyed along a predetermined path by a conveying means having a roller provided adjacent a predetermined reading position, said apparatus comprising:

means for reading a portion of the original located at the predetermined reading position in the predetermined path;

a light source for illuminating the portion of the original located at said predetermined reading position; and

original guiding means provided at a side of said means for reading and downstream of said predetermined reading position along the predetermined path along which the conveying means conveys the original;

wherein said original guiding means is so disposed and so shaped that it non-nippingly guides the leading edge of the original being conveyed to prevent the leading edge of the original from catching on and being jammed by said original guiding means; and

wherein said original guiding means comprises a guide surface which is non-convex as seen from said predetermined reading position.

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6. An image reading apparatus for reading an original conveyed by a conveying means along a predetermined path, said apparatus comprising:

means for reading a portion of the original located at a predetermined reading position in the predetermined path;

a light source for illuminating the portion of the original located at said predetermined reading position; and

original guiding means provided downstream of said predetermined reading position along the predetermined path along which the conveying means conveys the original;

wherein said apparatus has a portion located downstream along the predetermined path from said predetermined reading position and out of the predetermined path, said portion being so positioned and so shaped that the leading edge of the original being conveyed past said predetermined reading position by the conveying means could catch on and be jammed by said portion if not prevented from doing so;

wherein said original guiding means is so disposed and so shaped that it non-nippingly guides the leading edge of the original being conveyed to prevent the leading edge of the original from catching on and being jammed by said portion of said apparatus; and

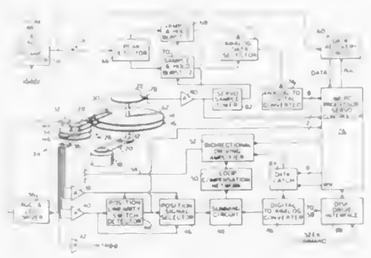
wherein said original guiding means comprises an original guide roller which non-nippingly guides the original.

4,920,432

SYSTEM FOR RANDOM ACCESS TO AN AUDIO VIDEO DATA LIBRARY WITH INDEPENDENT SELECTION AND DISPLAY AT EACH OF A PLURALITY OF REMOTE LOCATIONS

Derek C. Eggers; David V. Holben, both of 4217 Highland Rd., Suite 275, Pontiac, Mich. 48054, and Mark E. Robinson, 1080 Cliff Dr., Lapeer, Mich. 48446

Filed Jan. 12, 1988, Ser. No. 143,575
Int. Cl.[5] H04N *5/78, 7/16;* G11B *15/68*
U.S. Cl. 360—33.1 3 Claims



1. A system for providing selective random access to a library of segments of prerecorded audio-video data for display at any of a plurality of remote locations, the system comprising:

a plurality of user display means, one at each of said remote locations for displaying an audio video signal at said location;

an audio-video data library comprising a plurality of discrete audio-video record items, each containing prerecorded audio-video data;

filer means including a housing having a plurality of storage sites each adapted to receive an audio-video data record item;

a plurality of playback devices located at said filer means, each adapted to generate an audio-video signal from an audio-video record item operatively associated therewith;

a cable network interconnecting said playback devices and user display means for the purpose of transfering audio-video signals between playback devices and user display means;

retriever means operatively associating any selected record item in a storage site with an available one of said playback devices for playback, and disassociating said record item there from after playback;

selection means including a user interface means included in each user display means for selecting a particular segment of audio-video data in said library for playback, said selection means further including means controlling said retriever means to cause a particular record item having said particular segment of audio-video data thereon to be played back by an available one of said playback devices and causing said audio-video signal to be read out at said user video display means at said location whereat said selection is made;

signal combiner means causing said generated audio-video signals from each playback device to be transmitted onto said cable network at a unique frequency;

each of user display means including tuner means able to tune to any of said frequencies transmitted onto said cable network and demodulate signals from a single playback device;

supervisory computer means monitoring the availability of playback devices and audio-video record items and causing said retriever means to transport a selected data record item to an available playback device;

a data communications network separate from said cable network interconnecting said user display means, said playback devices, and said supervisory computer means for the purpose of internal system communications;

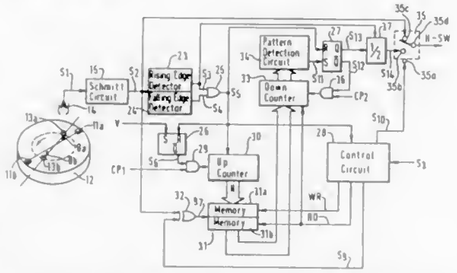
said supervisory computer means also including means for causing said user display means at said location to tune to said frequency of said assigned playback device by sending instructions via said data communications network.

4,920,433

ROTARY RECORDING/PLAYBACK HEAD ANGULAR POSITION CORRECTION APPARATUS

Kenji Ito, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 25, 1987, Ser. No. 29,907
Claims priority, application Japan, Mar. 31, 1986, 61-72812
Int. Cl.[5] G11B *15/14*
U.S. Cl. 360—64 11 Claims



1. A rotary recording/playback head angular position correction apparatus for outputting an angular position indicating signal in a data reproduction machine having a rotary head element rotatably positioned in a rotary plane for reproducing data, the data including a reference signal, said apparatus including:

angular position detection means for producing a detection signal in response to detection of an angular position of the rotary head element;

counting means operatively coupled to said rotary head element and to said angular position detection means for measuring a time difference between receipt of the detection signal and receipt of the reference signal;

memory means operatively coupled to said counting means for storing the time difference; and

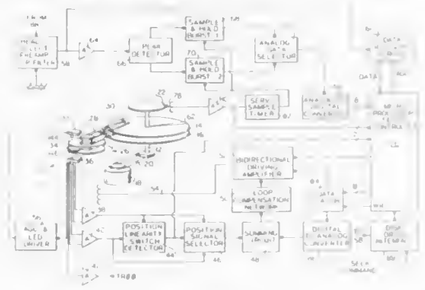
adjustment means operatively coupled to said memory means for generating and outputting the angular position indicating signal in accordance with the time difference.

4,920,434

FIXED DISK DRIVE

David A. Brown, Saratoga, Calif.; Donald V. Daniels, Friday Harbor, Wash., and Joel N. Harrison, Monte Sereno, Calif., assignors to Quantum Corporation, Milpitas, Calif.

Continuation of Ser. No. 326,166, Mar. 20, 1989, Pat. No. 4,872,074, which is a continuation of Ser. No. 150,994, Feb. 1, 1988, Pat. No. 4,814,909, which is a continuation of Ser. No. 28,977, Mar. 23, 1987, abandoned, which is a continuation of Ser. No. 496,924, May 23, 1983, Pat. No. 4,660,106, which is a continuation of Ser. No. 190,198, Sep. 24, 1980, now Re. 32,075.
This application Jun. 9, 1989, Ser. No. 364,810
The portion of the term of this patent subsequent to Aug. 2, 2000, has been disclaimed.
Int. Cl.[5] G11B *21/08, 21/10;* H02K *37/00*
U.S. Cl. 360—77.08 30 Claims



1. A disk drive for increasing the density or concentric storage tracks on a data storage surface of a rotating data storage disk without requiring a disk servo surface, the disk drive comprising:

an enclosed housing,

at least one disk rotatably mounted within the housing,

each such disk having concentric data storage tracks on each surface thereof,

motor means for rotating the disk at a predetermined angular velocity,

at least one data head for reading and writing user data from and to each data storage surface while flying in close proximity thereto,

a mass balanced electromechanical rotary actuator structure mounted within the housing, the data head being mounted on and positioned by the rotary actuator structure,

an optical polyphase head position transducer coupled closely to the rotary actuator structure and the housing for generating plural phase cyclical signals in quadrature, a selected one of the phase signals providing a servo reference for track following, at least four adjacent storage track locations being included within a range of movement of the actuator structure relative to the housing and disk within one cycle of one of the plural phases,

position linearity switch detector means connected to the optical polyphase head position transducer for generating storage track location signals from the plural phase signals,

position signal selector means connected to the optical polyphase head position transducer and the position linearity switch detector means for selecting one of the phase signals as the servo reference corresponding to a selected storage track location for track following,

track seeking means which includes controller means and bidirectional driving amplifier means and which is responsive to the location signals, for controlling the actuator structure to move the data head to selected storage track locations,

at least one storage surface being recorded with head position correction information which is readable by the data head,

the controller means comprising: (a) means for causing the data head to read the correction information, (b) means for processing the correction information, and (c) means for putting out a correction value for the selected storage track location for track following,

a head positioner circuit including summing junction means for combining the selected one of the phase signals from the position signal selector means and the correction value from the controller means to produce a position signal, and further including the bidirectional driving amplifier means for driving the electromechanical rotary actuator structure in response to the position signal during track following,

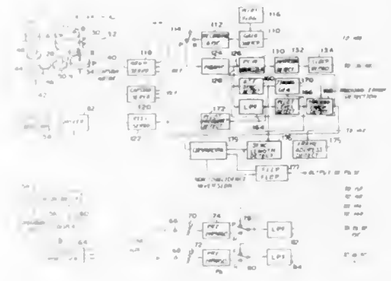
interface means for providing data selection information from a host computing system for transferring data between the host computing system and the data storage surface via the data head.

4,920,435

MAGNETIC RECORDING AND REPRODUCING DEVICE WITH IMPROVED TRACK SERVO

Shobei Yamazaki, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Jan. 25, 1988, Ser. No. 147,448
Claims priority, application Japan, Jan. 27, 1987, 62-16385
Int. Cl.[5] G11B *5/52, 5/58*
U.S. Cl. 360—77.15 8 Claims



1. A magnetic recording and reproducing device comprising:

a rotary head incorporating a plurality of heads of different azimuths for recording and reproducing an input signal by tracing tracks of a magnetic recording medium, said heads also reproducing signals recorded on left and right adjacent tracks simultaneously with reproduction from a desired track, and data recorded on each track of said magnetic recording medium including the input signal, a synchronizing signal used for timing control of recording and reproducing of said input signal and a pilot signal of a predetermined frequency used for tracking control, the synchronizing signal having a form which is different alternately in a series of a tracks of the same azimuth; and

tracking control means comprising:

tracking error signal generation means for generating, based on timing of said synchronizing signal, a tracking error signal by detecting crosstalk components of the pilot

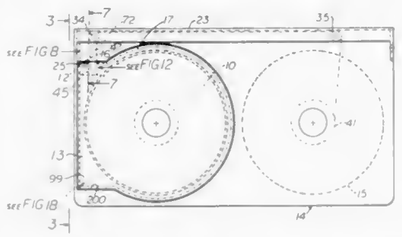
signals on left and right adjacent racks and comparing these components with each other;
relative speed control means for controlling, responsive to the tracking error signal, a relative speed of said magnetic recording medium with respect to said heads of said rotary head;
synchronizing signal form detection means of detecting the form of the synchronizing signal which has been reproduced by said heads;
synchronizing signal form designation means for producing a signal which is inverted each time said rotary head has scanned two tracks of said magnetic recording medium and designating the form of the synchronizing signal with this signal; and
synchronizing signal form coincidence/non-coincidence detecting means for detecting coincidence or non-coincidence in the form of the synchronizing signal on the basis of the detection by said synchronizing signal form detecting means and the designation by said synchronizing signal form designation means and for causing the tracking control to be controlled in accordance with result of detection of coincidence or non-coincidence in the form in such a manner that the tracking control is applied during coincidence and the tracking control is not applied and the designation signal of said synchronizing signal form designation means is inverted during non-coincidence.

4,920,436

MAGNETIC TAPE CASSETTE SYSTEM

Warren D. Novak, Chappaqua, N.Y., assignor to Rank Video Services America, Northbrook, Ill.

Filed Jun. 24, 1988, Ser. No. 211,545
Int. Cl.[5] G11B *15/66*
U.S. Cl. 360—96.1 133 Claims



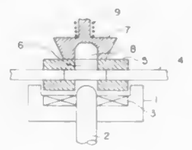
1. In a method of providing magnetic tape for use in standardized apparatus designed to receive tape of that kind in a two-reel-type cassette for transducing signals relative to the tape, the improvement comprising in combination the steps of:
providing said magnetic tape with a first tape coupling device;
loading said magnetic tape and first tape coupling device into a one-reel-type cartridge;
providing the cassette with a takeup reel;
providing said takeup reel in said cassette with a second tape coupling device interconnectable with said first tape coupling device and adapting said first and second tape coupling devices for automatic interconnection upon insertion of said loaded cartridge into said cassette; and
providing the cassette with space for receiving said loaded cartridge in lieu of a tape supply reel and for said automatic interconnection of said first and second tape coupling devices by insertion of said loaded cartridge into said cassette space.

4,920,437

DISC CLAMPING DEVICE

Junichi Washo, Ikoma; Shigeo Terashima, Tenri; Toshibisa Deguchi, Nara; Masahiro Horii, Nara; Takao Hyuga, Nara, and Kenji Ohta, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 25, 1987, Ser. No. 29,610
Claims priority, application Japan, Mar. 25, 1986, 61-67640
Int. Cl.[5] G11B *17/028, 5/012*
U.S. Cl. 360—99.05 4 Claims



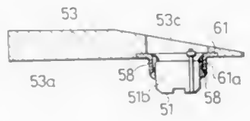
1. A disc clamping device capable of clamping a disc with or without a centering hub comprising;
a rotatably mounted disc base for supporting an information recording disc;
a spindle extending from the center of said disc base and fixed thereto, said spindle having a center line;
a disc holding member spaced above said spindle and supported for movement in an axial direction along a center line thereof toward said spindle;
said spindle center line and said disc holding member center line being in alignment;
said disc base including magnetic means positioned around said spindle for interaction with any disc having a hub made of a ferromagnetic substance; and
said disc holding member including means for pressing a disc with a centering hub against said disc base and separate means for engagement with the center hole of a disc with no centering hub in order to press such a disc against said disc base.

4,920,438

MAGNETIC HEAD UNIT AND METHOD OF MANUFACTURING THE SAME

Masatoshi Furukawa, Nagaoka, and Kazuo Kobayshi, Furukawa, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 925,825, Oct. 30, 1986, abandoned.
This application Apr. 6, 1989, Ser. No. 334,788
Claims priority, application Japan, Oct. 30, 1985, 60-241654
Int. Cl.[5] G11B *5/48*
U.S. Cl. 360—104 2 Claims



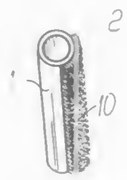
1. A magnetic head and slider assembly comprising:
a magnetic head including a slider having side surfaces;
a magnetic head and slider supporting member having a portion defining a receiving hole for said magnetic head and slider;
a mount attached to said supporting member having a tubular portion formed as a hollow elongated cylinder for loosely receiving said magnetic head and slider, said tubular portion having an inner surface surrounding said side surfaces of said slider;
an adhesive for attaching said side surfaces of said slider to the inner surface of said tubular portion of said mount.

4,920,439

GUIDE ELEMENT STRUCTURE ENGAGEABLE IN SLIDING CONTACT WITH A MAGNETIC SUPPORT

Abramo Bordignon, Via Palmiro Togliatti, 32 - 20030 Senago (Province of Milan), Italy

Filed May 16, 1988, Ser. No. 194,600
Claims priority, application Italy, Jun. 1, 1987, 20743 A/87
Int. Cl.[5] G11B *13/60;* **B65H** *23/04*
U.S. Cl. 360—130.21 13 Claims



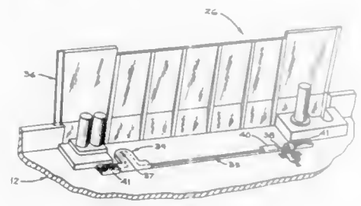
1. In combination, a magnetic tape and a magnetic tape guide element, comprising:
a body positioned adjacent to said magnetic tape,
at least one portion defined on said body, and
a plurality of monofilaments each having an end and a free end, said monofilaments being located at least at said one portion of said body, said end of each of said monofilaments being fixed to said body, said free end of eachof said monofilaments engaging said magnetic tape, in sliding contact engagement therewith.

4,920,440

COMPOSITE LID ASSEMBLY

James H. Andrews, Opelika, Ala., assignor to Ampex Corporation, Redwood City, Calif.

Filed Dec. 22, 1988, Ser. No. 288,516
Int. Cl.[5] G11B *23/087;* **B65D** *45/16*
U.S. Cl. 360—132 6 Claims



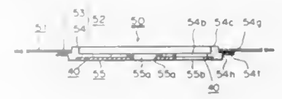
1. A tape cassette having a supply reel for holding a supply of tape at a first position for transport to a take up reel for receiving the tape transported from the supply reel, the cassette comprising:
a housing having a top wall, a bottom wall and associated side walls defining an interior for rotatably supporting respective supply reel and takeup reel therein;
a sidewall portion defining an opening in the cassette;
means for guiding tape between said reels and across said opening to provide a tape access area at the opening, said access opening permitting the withdrawal of the tape from the cassette; and
a composite lid assembly mountable on the cassette at the opening to close the tape access area, said composite lid assembly including a door and a hinge assembly integral with the door, said hinge assembly including a longitudinal hinge pin having opposite ends, a first torsion spring element disposed at one end of the hinge pin and mounted in the door to be integral therewith, a second torsion spring element disposed at an opposite end of the pin for mounting on the cassette, and said opposite ends of the hinge pin fixedly mountable on the cassette so as to position said first and second torsion spring elements to retain the door in a closed position with respect to the cassette.

4,920,441

FLEXIBLE MAGNETIC DISKETTE

Takashi Kimura, Kawasaki; Kenichi Chihara, Yokohama; Masahiro Tomatsu, Yokohama; Kazunobu Inoue, Yokohama; Norio Yano, and Osamu Adachi, both of Yokosuka, all of Japan, assignors to Nippon Telegraph and Telehpone Corp., Tokyo; Fujitsu Limited, Kawasaki and Fujitsu Kasei Ltd., Yokohama, all of, Japan

Continuation of Ser. No. 839,035, Mar. 12, 1986, abandoned.
This application May 20, 1988, Ser. No. 196,866
Claims priority, application Japan, Mar. 13, 1985, 60-048165
Int. Cl.[5] G11B *23/02, 5/82*
U.S. Cl. 360—133 22 Claims



1. A flexible magnetic diskette for magnetically storing various information recorded and read by a magnetic head and engagable with and rotationally driven by a driving unit, said diskette comprising:
a plastic disk sheet having two sides which are uniformly coated with magnetic material and having a mount hole at a center thereof and including a periphery; and
holding means, mounted at the periphery of said mount hole, for securing said plastic disk sheet, said holding means comprising:
a holder body, made of plastic and held to said flexible disk sheet at the periphery of said mount hole;
a double-sided adhesive ring between said holder body and one side of said plastic disk sheet, adhesively securely said plastic disk sheet to said holder body; and
a core member, made of magnetic metal having a high abrasive resistance, rigidly attached to said holder body and spaced from said plastic disk sheet, a center of the core member aligning with the center of said plastic disk sheet,
wherein said holder body and said core member each have corresponding shaft insert holes passing therebetween through which the center shaft is inserted, and the disk sheet is thus positioned relative to the magnetic head.

4,920,442

RELEASABLE SERVO WRITING FIXTURE CONNECTOR

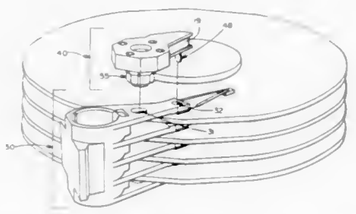
Walter S. Dimmick, Atherton, Calif., assignor to Quantum Corporation, Milpitas, Calif.

Filed Sep. 8, 1988, Ser. No. 242,067
Int. Cl.[5] G11B *00/00*
U.S. Cl. 360—137 18 Claims

1. An apparatus for temporarily attaching a servo writing tool to a head transducer arm assembly of a rigid disk drive, the

arm assembly defining a topmost arm having a plurality of attachment locations, comprising:

a body for supporting the tool in prearranged alignment;



releasable engagement means for engaging the topmost arm at the attachment locations; and

registration means for alignment registration of the body.

4,920,443

ELECTRICAL PROTECTION ASSEMBLIES

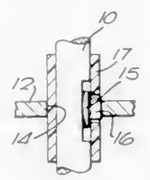
Brian Shepherd, Wendover, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Oct. 24, 1989, Ser. No. 427,212

Claims priority, application United Kingdom, Nov. 25, 1988, 8827627

Int. Cl.[5] H02H *9/04*

U.S. Cl. 361—56 10 Claims



1. An electrical assembly comprising: a plurality of electrical conductors; a first common electrical plane; a plurality of first unidirectional current. devices connected between the plane and respective ones of the conductors in the same sense; a second common electrical plane; a plurality of second unidirectional current devices connected between said second plane and said conductors in the opposite sense to said first unidirectional current devices; first and second energy-dissipating means; and means connecting said energy-dissipating means between ground and respective ones of the electrical planes such that an excessive positive voltage excursion on any one of the said conductors is conducted via a respective one of said first unidirectional current devices to said first plane and from said first plane to ground via the first energy-dissipating means, and such that an excessive negative voltage excursion on any one of said conductors is conducted via a respective one of said second unidirectional current devices to said second plane and from said second plane to ground via the second energy-dissipating means.

4,920,444

ARRANGEMENT FOR DECOUPLING INTEGRATED CIRCUITS ELECTRICALLY

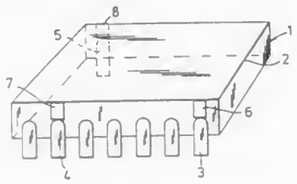
Alf Friman, Växjö , Sweden, assignor to Carmis Enterprises S.A., Geneva, Switzerland

Filed Oct. 3, 1988, Ser. No. 251,640

Claims priority, application Sweden, Oct. 9, 1987, 8703913

Int. Cl.[5] H08H *3/20*

U.S. Cl. 361—56 3 Claims



1. An arrangement for electrically decoupling integrated circuits (1) by means of decoupling capacitors located between an earth connection (3) and at least one of a signal output (4) and a supply conductor (5), characterized in that at least the major part of an upper surface or a bottom surface of such an integrated circuit (1) is covered with a metal foil (2) which is connected at an edge to the earth connection (3) of the circuit by means of a short conductor (6), and to at least one of said circuit signal output (4) and said supply conductor (5) via the decoupling capacitors (7, 8) which are also connected to the foil edges.

4,920,445

JUNCTION-BREAKDOWN PROTECTION SEMICONDUCTOR DEVICE

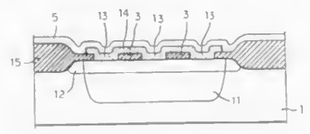
Dong Soo Jun, Taegu, Rep. of Korea, assignor to Samsung Semiconductor and Telecommunications Co., Ltd., Guml, Rep. of Korea

Filed Nov. 17, 1987, Ser. No. 121,843

Claims priority, application Rep. of Korea, Nov. 19, 1986, 86-9799

Int. Cl.[5] H02H *3/20*

U.S. Cl. 361—91 4 Claims



1. In a semiconductor integrated circuit, a structure for preventing an electrical discharge breakdown at the junction of a metal pad conductor and a non-metallic conductive region of said semiconductor comprising;

a semiconductor substrate having a first conductivity type;

a first semiconductor region of high impurity concentration and having a conductivity type opposite to that of said first conductivity type;

an insulating film over said first semiconductor region and having a plurality of openings therein;

a metal pad conductor over said insulating film and extending through said plurality of openings to make electrical contact with said first semiconductor region; and

a second semiconductor region of the same conductivity type as said first semiconductor region formed under said pad conductor and said first semiconductor region to a depth substantially deeper than said first semiconductor region.

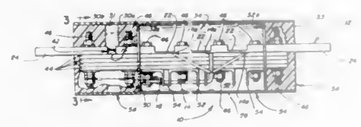
4,920,446

PYROTECHNICALLY-ASSISTED CURRENT INTERRUPTER

Herbert M. Pflanz, Westwood, Mass., assignor to G & W Electric Co., Blue Island, Ill.

Continuation of Ser. No. 853,695, Apr. 18, 1986, abandoned. This application Sep. 27, 1988, Ser. No. 252,014

Int. Cl.[5] H02H *3/00;* **H01H** *37/76*

U.S. Cl. 361—93 7 Claims

1. Apparatus for selectively interrupting electric current comprising:

elongation bus means;

explosive means for segmenting said bus means;

resistive means connected in series with said bus means;

detonator means in parallel with said resistive means to detonate said explosive means in response to current flow through said detonator means above a predetermined level resulting from current flow through said apparatus in excess of a predetermined trigger level; and

adjustable control means to permit presetting of said trigger level;

said control means including a plurality of control elements having resistance which varies in response to voltage, and manually operable switch means for selectively shunting current around one or more of said control elements to provide stepwise adjustment of the sensitivity of the apparatus.

4,920,447

METHOD FOR PROTECTING THE GATE UNIT FOR A GTO THYRISTOR

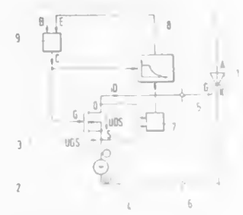
Michael Peppel, Weinheim, Fed. Rep. of Germany, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed Dec. 8, 1988, Ser. No. 281,516

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1987, 3741713

Int. Cl.[5] H02H *7/12, 3/08*

U.S. Cl. 361—93 6 Claims



1. Method for protecting the gate unit for a GTO thyristor, in which a controllable electronic switch operates to turn off the GTO thyristor by means of an erase pulse, comprising the step of:

detecting a voltage drop across said controllable electronic switch;

comparing in an evaluation device the voltage drop with a given threshold curve, wherein said threshold curve is defined on the basis of the maximal short term load carrying capacity of said electronic switch, during which term the threshold curve has a constant value in a first time interval immediately after switching on said electronic switch, which is never reached during normal operation, but is exceeded in case of a short-circuit at the output of said electronic switch; and wherein said threshold curve is further defined on the basis of the long term load-carrying capacity of said electronic switch, during which term the value of the threshold curve is reduced to a lower value than said constant value, during a second time interval following said first time interval; and

blocking said electronic switch at the moment the voltage drop across said electronic switch exceeds a value of said threshold curve.

4,920,448

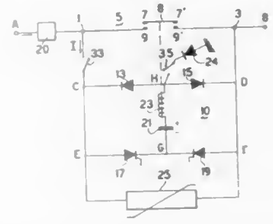
SEMICONDUCTOR-ASSISTED ULTRA-FAST CONTACT BREAKER

Henri Bonbomme, Ans, Belgium, assignor to Acec Transport S.A., Charleroi, Belgium

Filed Jan. 6, 1988, Ser. No. 141,225

Int. Cl.[5] H02H *3/00*

U.S. Cl. 361—102 9 Claims



1. An ultra-fast contact breaker including an ultra-fast cut-off mechanism provided with a repulsion disk fitted with moving contacts, the said mechanism also including fixed contacts, to input and output terminals of which there is connected an assistance circuit including a capacitor and a coil as well as a group of semiconductors, the coil wholly or partly constituting a repulsion coil of said ultra-fast mechanism, the assistance circuit having at least two parallel branches, a first of said branches including two opposed diodes or similar in series, each directed in a non-conducting direction for current entering the circuit, a second of said branches including two opposed thyristors or similar, each directed in a conducting direction for current entering the circuit, and an LC oscillating circuit formed by said capacitor and said coil which connects a common point of the two diodes or similar and a common point of the two thyristors or similar, the two thyristors or similar being remote controlled or controlled via a current sensor which is built in and which detects the exceeding of a previously fixed triggering threshold which can be adjusted in control electronics.

4,920,449

CONDUCTIVE BONDING OF COMPOSITE STRUCTURES

James H. Covey, Snohomish, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 19, 1988, Ser. No. 145,048

Int. Cl.[5] H05F *3/02*

U.S. Cl. 361—216 17 Claims

1 An apparatus for preventing the destruction of gra-

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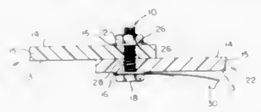
phite/epoxy composite material in an aircraft structure when said aircraft structure is struck by lightning comprising:

a first graphite/epoxy composite member coupled to said aircraft structure, said first composite member having an insulating surface region and an inner region including a plurality of individual conductive fibers;

a second graphite/epoxy composition member coupled to said aircraft structure, said second composite member having an insulating surface region and an inner region including a plurality of individual conductive fibers;



a fastener means having threads for attaching the first composite member to the second member, the fastener means contacting said surface region and being threadably coupled with an interface fit to the inner regions of both members for providing good electrical conductivity between the fastener means and individual fibers within each of the two members to prevent arcing between the fastener means and the composite members when lightning strikes said apparatus; and

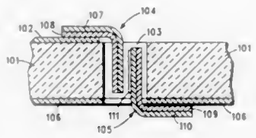
a member of good electrical conductivity coupled to the fastener means.

4,920,450

TEMPERATURE DEPENDENT CAPACITOR

Joseph Masiulis, Elmhurst, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 23, 1989, Ser. No. 370,535
Int. Cl.[5] H01G 7/00; H01P 5/107; H05K 1/18
U.S. Cl. 361—282 4 Claims



1. On a substrate having a first conductive surface and a second conductive surface separated by a dielectric material, and having an opening at least through the dielectric material, a temperature dependent capacitor comprising:

a first plate having a proximal portion operatively connected to the first conductive surface and a distal portion extending into the opening;

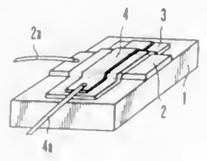
a second plate having a proximal portion operatively connected to the second conductive surface and a distal portion extending into the opening, such that the distal portions of the first and second plates move with respect to one another in response to changes in temperature to provide a temperature dependent capacitance between the first and second conductive surfaces.

4,920,451

MOISTURE-SENSITIVE ELEMENT

Yoshiro Sakai; Yoshihiko Sadaoka, both of Ehime; Takaai Kuroiwa, Kanagawa; Tooru Abe, Kanagawa, and Tetsuya Miyagishi, Kanagawa, all of Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan

Filed May 18, 1989, Ser. No. 353,903
Claims priority, application Japan, May 23, 1988, 63-66813[U]; Jun. 14, 1988, 63-144665; Aug. 17, 1988, 63-203154
Int. Cl.[5] H01G 5/20; G01N 25/64
U.S. Cl. 361—286 8 Claims



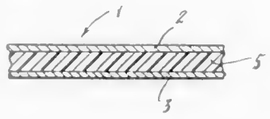
7. A humidity detector, wherein at least one opening portion is formed in a case housing a moisture-sensitive element, and a hydrophobic filter is arranged on said opening portion via a bonding agent, said moisture-sensitive element comprising a moisture-sensitive film consisting of a polymer prepared by polymerizing a methacrylate monomer not having a hydroxyl group.

4,920,452

METALLIZED CAPACITOR WITH CORROSION RESISTANT ELECTRODES

Donald V. Lackey, Salt Point, N.Y., assignor to Dunmore Corporation, Brewster, N.Y.

Filed Sep. 18, 1989, Ser. No. 408,808
Int. Cl.[5] H01G 1/017
U.S. Cl. 361—305 13 Claims



1. A capacitor adapted to inhibit corrosion in the presence of high AC voltages, said capacitor including

a foil dielectric, electrode coatings on at least one side of said foil dielectric, said electrode coatings being formed of an aluminum alloy,

said alloy containing aluminum, from about 0.2% to about 8.0% by weight of copper, and from about 0.2% to about 3% by weight of a metal having a higher valence than aluminum.

4,920,453

PROGRAMMABLE CONTROLLER MODULE

Kazuhiko Onose, Aichi, Japan, and Willard B. Ott, New Berlin, Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis. and Nippondenso Company, Ltd., Japan

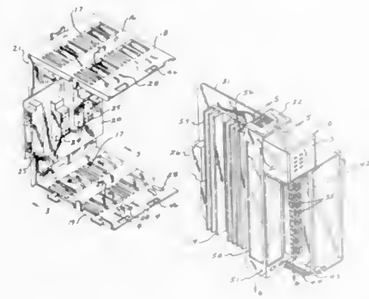
Filed Oct. 13, 1988, Ser. No. 257,400
Int. Cl.[5] H05K 7/00
U.S. Cl. 361—392 4 Claims

1. A module for electrical connection to a rack forming part of a programmable controller which comprises:

a body member having a display portion and a circuit board connector portion;

a circuit board connected to said body member connector portion;

a door hingedly attached to said body member; and



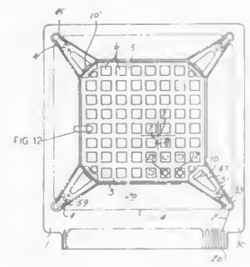
snap fitment means extending from said body member for engagement with an engageable surface of an electrical rack forming a part of a programmable controller, said snap fitment means including a biased latch arm pivotally attached to said body member for releasable engagement with the engageable surface of the rack by a pivoting of said arm.

4,920,454

WAFER SCALE PACKAGE SYSTEM AND HEADER AND METHOD OF MANUFACTURE THEREOF

Herbert Stopper, Orchard Lake, and Cornelius C. Perkins, Birmingham, both of Mich., assignors to Mosaic Systems, Inc., Troy, Mich.

Continuation of Ser. No. 581,975, Feb. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 532,391, Sep. 15, 1983, abandoned. This application Jul. 1, 1988, Ser. No. 217,146
Int. Cl.[5] H05K 1/00
U.S. Cl. 361—398 11 Claims



1. A wafer scale package system, comprising:

a substantially rigid wafer based substrate which supports a plurality of integrated circuits, said substrate including a network of electrically conductive lines for selectively interconnecting said circuits together on said substrate, and a plurality of sites disposed generally around the periphery of said substrate for enabling external electrical connections to be made with at least some of said lines;

a substantially rigid circuit board; and

flexible header means disposed generally between the periphery of said substrate and said circuit board for providing a flexible interface between said substrate and said circuit board, said header means having a plurality of inner sites for facilitating selected electrical connections between said substrate and said header means, a plurality of outer sites for facilitating selected electrical connections between said header means and said circuit board, and an electrically conductive line extending between and joining corresponding pairs of said inner and outer sites, and said header means being formed to permit said substrate to move relative to said circuit board in response to relative thermal expansion and contraction of said substrate with respect to said circuit board, so as to permit said substrate to lift slightly from said circuit board in response to a predetermined change in temperature; and

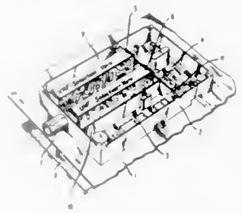
wherein said header means has aperture means for permitting a linear lift of said substrate with respect to said circuit board.

4,920,455

RADIO FREQUENCY DEVICE CIRCUIT ARRANGEMENT

Gerhard Maier, Dauchingen, and Betram Fischer, Deisslingen, both of Fed. Rep. of Germany, assignors to Deutsche Thompson-Brandt GmbH, Villingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 626,676, Jul. 2, 1984, abandoned. This application Dec. 19, 1988, Ser. No. 286,631
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1983, 8319031
Int. Cl.[5] H04B 1/08; H05K 9/00
U.S. Cl. 361—424 31 Claims



1 A radio frequency apparatus subassembly comprising

a single base circuit board having a side loaded with device components and having a soldering side;

device components employed in radio frequency circuits and integrated onto the side of the single base circuit board loaded with device components;

a rectangular box frame having box walls placed and attached onto the component side of the single base circuit board;

a separating wall disposed in the box frame and between box frame walls;

a first subcircuit module board attached between the single base circuit board, the separating wall, and one of the walls of the box frame, and disposed parallel to a second wall of the box frame, said second wall of the box frame forming a corner with the first wall of the box frame, and said second wall of the box frame maintaining the separating wall in position, where function elements of the first subcircuit module board are provided with device elements on the side of the first subcircuit module board facing the second wall of the box frame, and where the second side of the first subcircuit board module is substantially a soldering side;

a second subcircuit module board attached between the single base circuit board, the separating wall, and another of the walls of the box frame, and having a substantially soldering side facing the soldering side of the first subcircuit board module and loaded with components on its second side, wherein the first subcircuit board module and/or the second subcircuit board module comprise application-dependent selectable specific UHF and/or,

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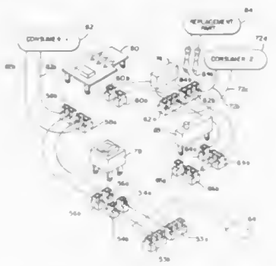
respectively, VHF selection and pre-stages, and wherein the respective subcircuit board modules further contain some variable component elements.

4,920,456

CURRENT SUPPLY ARRANGEMENT FOR HOUSEHOLD APPLIANCES AND METHOD OF MAKING THE SAME

Rolf Pirdzuns, Wuppertal, Fed. Rep. of Germany, assignor to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 92,060, Sep. 2, 1987, abandoned. This application Sep. 19, 1988, Ser. No. 246,200
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1986, 3629853
Int. Cl.[5] H02B *1/20*
U.S. Cl. 361—428 8 Claims



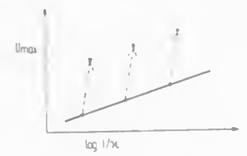
5. A household appliance such as a floor-cleaning apparatus, the apparatus comprising:
a housing having an inside wall surface;
a plurality of electrical components;
a plurality of terminals blocks mounted on said wall surface and arranged in spaced relationship to each other;
each of said terminal blocks having a predetermined number of slotted cavities;
a plurality of wire segments obtained by laying down at least one uninterrupted wire interconnecting said slotted cavities and then cutting out a length of wire between at least one selected pair of said terminals;
each one of said wire segments being disposed in preselected ones of said cavities so as to provide an electrical connection between said preselected ones of said cavities;
a plurality of sets of interconnected cutting contacts;
each one of said sets being assigned to a selected number of cavities in each of a predetermined number of said terminal blocks and the cutting contacts of each set being seated in corresponding ones of the selected number of said cavities;
each of said wire segments being in electrical contact engagement with the electrical contact in the preselected cavity wherein a corresponding wire segment is disposed; and,
each of said electrical components being connected across two preselected ones of said cutting contacts.

4,920,457

ALUMINUM ELECTROLYTE CAPACITOR AND METHOD FOR THE MANUFACTURE THEREOF

Wilhelm Schweikert, Heidenheim-Mergelst; Norbert Will, Heidenheim, and Wilhelm Lauer, Giengen-Huerben, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 1, 1988, Ser. No. 278,349
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1988, 3800641; Feb. 8, 1988, 3803768; Jun. 10, 1988, 3819850
Int. Cl.[5] H01G *9/00*
U.S. Cl. 361—530 19 Claims



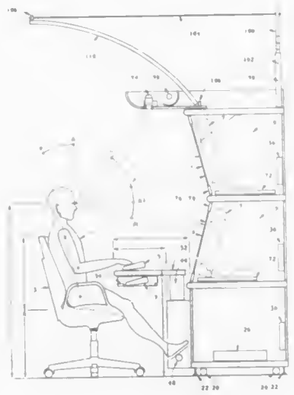
1. An aluminum electrolyte capacitor that is composed of wound layers of two aluminum foils, whereof the foil serving as anode is provided with an oxide layer acting as dielectric, whereby this anode foil is produced by cutting from a larger, formed foil web, whereby spacers saturated with an operating electrolyte are arranged between the two aluminum foils and whereby the aluminum foils are contacted with riveted and/or welded power supply terminal strips, the terminal elements and cut edges of the aluminum foil arranged at the face sides of the winding are covered with a fine-grained, electrolyte-compatible material to reduce the effective cross-section of the electrolyte by the fine-grained material to increase the sparking voltage of the operating electrolyte and thus to achieve an inactivation of weak points.

4,920,458

INTERACTIVE WORKSTATION

Benjamin P. Jones, P.O. Box 9342, Berkeley, Calif. 94708

Filed Jun. 29, 1989, Ser. No. 375,141
Int. Cl.[5] A61G *13/00*; F21V *13/00*
U.S. Cl. 362—33 5 Claims



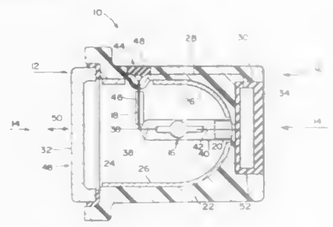
1. An equipment housing comprising:
a base module having a substantially planar upper surface for providing a base foundation;
a worksurface module coupled to said base module and having a substantially planar upper surface to accommodate a device for human interaction;
said worksurface module being adjustable to adjust the height of said upper surface for providing ergonomic positioning of said device for human interaction;
a first tier display housing module residing on said upper surface of said base module for housing a first display unit;
said first tier display housing module residing on said upper panel of said first tier display housing display comprised of a back, two sides, an upper and a front panels;
a second tier display housing module residing on said upper surface of said first tier display housing module for housing a second display unit;
said second tier display housing module comprised of a back, two sides, an upper and a front panels, wherein said front panel of said first tier display housing module is angled approximately 15° upward from the vertical, away from an operator, and said front panel of said second tier display housing module is angled approximately 15° downward from the vertical, towards said operator.

4,920,459

ARC DISCHARGE HEADLAMP SYSTEM

Harold L. Rothwell, Jr., Georgetown, and George J. English, Reading, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Dec. 21, 1988, Ser. No. 287,925
Int. Cl.[5] B60Q *1/02*
U.S. Cl. 362—61 19 Claims



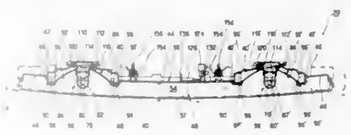
1. An arc discharge headlamp system comprising:
a) a lamp housing including an internal surface defining a reflector cavity,
b) a double ended arc discharge lamp having a first lead at a first end and a second lead at a second end, substantially offset from the first lead, enclosed in the reflector cavity,
c) a first lamp support coupled to the first end of the lamp, and coupled to the lamp housing,
d) a first lead connection for the first lead of the lamp coupled through the lamp housing at a first lamp housing position to receive input current,
e) a second lamp support coupled to the second end of the lamp, and coupled to the lamp housing,
f) a second lead connection for the second lead of the lamp, coupled through the lamp housing at a second lamp housing position and offset from the first lamp housing position; and
g) an insulated high potential conductor, connected to the second lead connection, embedded in the lamp housing, and extending in the lamp housing to a third housing position to receive input current.

4,920,460

SELF-ILLUMINATED GRILL FOR MOTOR VEHICLES

Hideshi Mori, Kitawaki, Japan, assignor to Kolto Seisakusho Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1989, Ser. No. 337,225
Claims priority, application Japan, Apr. 12, 1988, 63-90091
Int. Cl.[5] B60Q *1/02*
U.S. Cl. 362—61 11 Claims



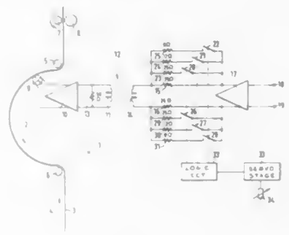
1. A self-illuminated grill for a motor vehicle of the type having a pair of headlamps disposed in horizontally spaced apart positions on the front end of a vehicle body, comprising:
(a) an elongate grill body to be mounted to the vehicle body so as to be disposed horizontally between the pair of headlamps, the grill body being generally open forwardly of the motor vehicle;
(b) an elongate lens mounted to the open front side of the grill body and coacting therewith to define an enclosed lighting chamber; and
(c) said headlamps disposed in the lighting chamber for illuminating substantially the complete length of the lens.

4,920,461

BROADBAND MAGNETIC TAPE RECORDING WITH COMPENSATION FOR BANDWIDTH CHANGES RELATED TO DATA RATE

Berthold Eiberger, Darmstadt, Fed. Rep. of Germany, assignor to BTS Broadcast Television Systems GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jan. 12, 1989, Ser. No. 296,521
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1988, 3800827
Int. Cl.[5] G11B *5/02, 5/14*
U.S. Cl. 360—68 4 Claims



1 Method for transmitting signals from stationary circuits including a driver amplifier connected to a recording amplifier and a magnetic head on a rotary body of a magnetic recording device for broadband signals through a rotary transformer having a predetermined transmission frequency range, a first group of electrical components mounted on said rotary device being associated with said recording amplifier being connected to a rotor winding of said rotary transformer and a second group of electrical components being associated with said driver amplifier and being connected to the stator of said rotary transformer, comprising the steps of:
performing magnetic recording on said head and amplifier at a maximum relative speed of said recording head with respect to tape on which recording is performed with a

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driver series resistance provided by said second electric component group for said driver amplifier and an input terminating resistance provided by said first electric component group for said recording amplifer which resistances provide at least an approximate impedance match across said rotary transformer, and

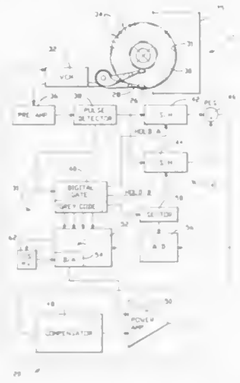
performing recording at lower relative speeds of said recording head with respect to tape on which recording is performed with changes of either said driver series resistance or said input terminating resistance or of both said driver series resistance and said input terminating resistance to produce a mismatch lowering the upper cut-off frequency of the transmission band of said rotary transformer for the benefit of lowering the lower cut-off frequency thereof.

4,920,462

DISC DRIVE FINE SERVO VELOCITY CONTROL AND METHOD FOR HEAD POSITIONING RELATIVE TO A DISC

Robert F. Couse, Saratoga, and Patrick G. Mercer, Santa Clara, both of Calif., assignors to Syquest Technology, Fremont, Calif.

Filed Mar. 7, 1988, Ser. No. 164,881
Int. Cl.[5] G11B *5/55, 21/08, 21/10*
U.S. Cl. 360—78.04 16 Claims



10. A method for causing a data transfer head to seek and settle onto a destination data track in a quick and smooth manner including the steps of:

providing a servo velocity control for seeking to a destination data track;

providing a servo position control for locating a centerline of a destination data track and for centering the head about on the centerline;

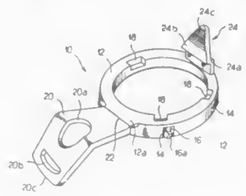
providing a fine servo velocity control for the communication of centerline centering information from the servo position control to the servo velocity control, to assist in track seeking, as the destination data track is approached and reached by the head, beginning when the servo velocity control determines the head is a preselected distance from tbe destination data track.

4,920,463

LAMPHOLDER FOR AN AUTOMOBILE VEHICLE HEADLIGHT

Maurice Montet, Paris, France, assignor to Valeo Vision, Bobigny Cedex, France

Filed Jul. 14, 1989, Ser. No. 380,546
Claims priority, application France, Jul. 20, 1988, 88 09815
Int. Cl.[5] H01R *33/00*
U.S. Cl. 362—61 9 Claims



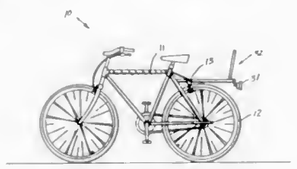
1. A lampholder for mounting a lamp in an opening of a reflector for an automotive vehicle headlight, the lampholder comprising a ring, mounting means for mounting said ring in the opening of the reflector, said ring defining locating means for locating a lamp on said ring in a position predetermined both axially and circumferentially, and securing means for securing the lamp removably in said ring in said location, said securing means comprising a radially extending tongue and a locking finger for said tongue, diametrically opposed to each other and formed integrally with said ring, said tongue being hinged on said ring and having a longitudinal profile such that, when it is moved into a position diametrically overlying said ring, it covers a portion of the lamp, said tongue further comprising means for engaging said locking finger to thereby retain said tongue removably in said position, said tongue being resiliently deformable to thereby, when thus retained in said position, hold the lamp firmly in position by virtue of a biassing force resulting from deformation of said tongue.

4,920,464

BICYCLE BRAKE LIGHT

Alfred Balentine, III, 1616 Kemble, N. Chicago, Ill. 60064

Filed Aug. 7, 1989, Ser. No. 390,977
Int. Cl.[5] B62J *6/00*
U.S. Cl. 362—72 9 Claims



1. A bicycle brake light apparatus in combination with a bicycle including a bicycle framework having secured thereto a plurality of spaced wheels with at least one brake caliper member in operative association with at least one of said wheels, the caliper member including first and second spaced brake engagement members secured to forward ends of pivotally arranged first and second caliper arms, and the first caliper arm including a switch member,

wherein the switch member includes first and second contact members, and the switch member is fixedly mounted on a rear terminal end of the first caliper arm, and

a brake cable fixedly mounted to a rear terminal end of the second caliper arm and reciprocatably received to the switch member, and

a light means in electrical communication with the switch member for illumination upon physical contact of the first contact with the second contact within the switch member, and

a battery in electrical communication with the switch member and the light means.

4,920,465

FLOATING FOUNTAIN DEVICE

Ronald J. Sargent, Escondido, Calif., assignor to Alopex Industries, Inc., San Marcos, Calif.

Filed Nov. 15, 1988, Ser. No. 271,735
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—96 7 Claims

1. A floating fountain device for use in a swimming pool comprising:

a central housing having a plurality of hollow, radially projecting arms thereon each having a pod-like float on its outer end, said housing and said arms being buoyant to float the device on the surface of a pool, and one of said floats having a separate bottom wall sealed to the underside of the float;

means defining an inlet for admitting water under pressure into a lower end of said housing and an outlet for water to flow out of the upper end of the housing;

a fountainhead connected to the central housing for receiving flowing pressurized water that passes through the housing and ejecting the water from the housing to form a fountain of water;

an electric lamp mounted in said one float on said bottom wall thereof, and positioned to direct a beam of light into the fountain of water;

a waterproof sealed envelope in said housing supported in spaced relation with the housing to form flow passages from the inlet toward the outlet;

an electricity generator sealed in said envelope and having wires for electrically connecting the generator to said lamp through one of said arms;

a water turbine mounted in said housing above said envelope and having inlet openings for receiving water under pressure from said flow passages and forming driving jets for the turbine, said turbine being positioned beneath said outlet to deliver the water from the turbine to the fountainhead;

and a magnetic coupling having a first coupling half carried by said turbine and a second coupling half spaced beneath said turbine within said envelope and coupled to said generator to drive the generator and thereby provide electricity to said lamp.

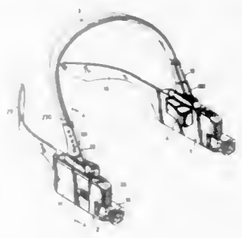
4,920,466

HEADPHONE TYPE ILLUMINATING DEVICE WITH MASSAGE

Ju-Fu Liu, No. 298, Tung Ta Rd., Sec. 3, Hsin Tzu City, Taiwan

Filed Jun. 30, 1989, Ser. No. 373,434
Int. Cl.[5] F21L *15/14*
U.S. Cl. 362—105 5 Claims

1. A headphone type illuminating device with massage means including a pair of spectacle frame-like supporting members to which a pair of lamp cases and a pair of illuminating devices are secured; a pair of supporting arms disposed at the top of said lamp cases and arranged to extend upward in an inclined angle; an auxiliary loop adjustably connected to said pair of supporting arms with both ends; a pair of vibrators and the related power supply means, each power supply means



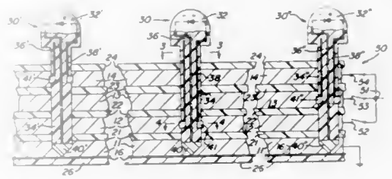
being set in an inner chamber of said lamp cases; a pair of hollow cushion blocks secured to said supporting members at the inner side; wherein said power supply means provide said vibrators with working power of vibrate said cushion blocks to produce massaging effect while said illuminating devices are simultaneously or separately arranged to provide illumination.

4,920,467

CONTROLLED STRATIFIED RANDOM AREA ILLUMINATOR

Calvin P. Hounsberger, 1275 Grange Ave., Collegeville, Pa. 19426

Filed May 5, 1988, Ser. No. 190,331
Int. Cl.[5] G09F *3/04*
U.S. Cl. 362—226 11 Claims



1 A random area illuminator comprising:

a base including a plurality of conductive layers and a plurality of insulating layers, said conductive and insulating layers being arranged in alternating layers,

a plurality of illuminating means adapted to be mounted on said base in an illuminating array,

each of said illuminating means having a light source and a post having said light source at one end thereof,

each of said posts comprising first and second insulated electrical leads for supplying electric current to said light source mounted thereon,

each of said posts being adapted to extend from the outer layer of said base to a common conductive layer of said base,

said first lead of each post having an electrical contact arranged to provide electrical connection to said common conductive layer,

said second lead of each post having an electrical contact arranged to provide electrical connection to another one of said conductive layers, and

control means for supplying electric current to selected ones of said otherconductive layers.

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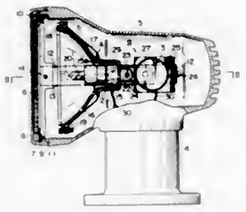
4,920,468

MECHANISM FOR MOUNTING A LIGHT SOURCE AND A LAMP TILTING SECTION OF A SEARCHLIGHT

Yuichi Narita, Urawa, Japan, assignor to Sanshin Dengu Manufacturing Co., Ltd., Japan

Filed Feb. 2, 1989, Ser. No. 305,934
Claims priority, application Japan, Feb. 9, 1988, 63-15215[U]
Int. Cl.[5] F21V *19/02*
U.S. Cl. 362—287 3 Claims



1. A mechanism for mounting a light source which in turn includes a lamp, a reflector and a socket, and a lamp tilting section for swinging the light source vertically, within a housing of a searchlight including the light source and the lamp tilting section, comprising:

means slidingly insertable within the housing for supporting the light source and the tilting section, said supporting means including a substantially U-like support frame, the light source being supported swingably across the branches of the U-like support frame, and the lamp tilting section is fixed to a connection portion of the support frame which connects both the branches;

means formed in the inner surface of the housing for guiding the supporting means; and

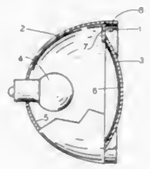
means for fixing the supporting means removably to a front opening end of the housing.

4,920,469

LIGHT BEAM AMPLIFIER

David K. Harding, c/o Sixpence Inn, 625 Queen St., Southington, Conn. 06489

Filed Nov. 2, 1988, Ser. No. 265,940
Int. Cl.[5] F21V *7/06*
U.S. Cl. 362—300 5 Claims



1. A light beam amplifier comprising:

a light source;

a generally paraboloidal primary reflector having a vertex at the light source and an opening at a base at the opposite side of the light source;

a generally paraboloidal light-concentration reflector having a diameter selectively smaller than the primary reflector and permanently affixed at the base from the light source and positioned to reflect light and heat back toward the primary reflector and the light source; and

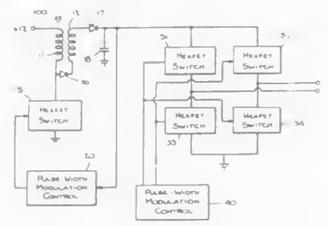
an annular light emission orifice adjacent to and extending between the outside periphery of the light-concentration reflector and the inside periphery of the primary light reflector, wherein the ratio of the light-concentration reflector to the orifice is such that the light emitted through the orifice is amplified and converges at some point of distance in front of the orifice.

4,920,470

VOLTAGE INVERTER

Philip E. Clements, Littleton, Colo., assignor to Zirco, Inc., Wheat Ridge, Colo.

Filed May 17, 1989, Ser. No. 352,860
Int. Cl.[5] H02M *3/335*
U.S. Cl. 363—21 8 Claims



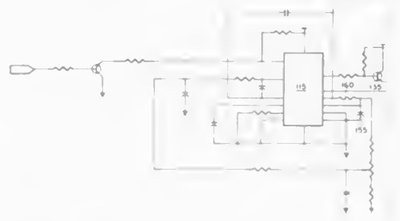
1. An inverter circuit comprising a transformer having a primary winding with a first end adapted to be connected to a d.c. source, a switch connecting the other end of said primary winding to a reference potential, a secondary winding coupled to said primary winding, means for rectifying the output of said secondary winding, and a bridge switch circuit connected to invert the rectified secondary winding voltage to produce an a.c output voltage, said inverter circuit further comprising a first control circuit for producing a first pulse train of pulses having a first given frequency and a pulse width responsive to the rectified output voltage of said secondary winding, and means for applying said pulse train to said switch for controlling said switch to open and close at said given frequency, said inverter circuit further comprising a second control circuit for producing a second pulse train of pulses of a second given frequency and constant pulse width, and means controlling said bridge switch circuit with said second pulse train of pulses.

4,920,471

AC HIGH VOLTAGE POWER SUPPLY

Robert N. Livingston, Johnson City, and Michael Kosteva, Endwell, both of N.Y., assignors to Imagitek, Binghamton, N.Y.

Filed Mar. 11, 1988, Ser. No. 167,031
Int. Cl.[5] H02M *3/335*
U.S. Cl. 363—22 8 Claims



1. A high voltage AC power supply for use in a reproduction machine, comprising:

a transformer having a high turns winding ratio, including a primary side having a low voltage winding, said primary side including means for sampling voltage proportional to secondary side voltage in said power supply;

said transformer having a high voltage secondary winding including means for sampling a load current through said winding;

comparing means adapted to receive and compare said voltage from said current sampling means with a reference voltage and to generate an error signal;

a buck regulator adapted to receive said error signal from said comparator, said buck regulator including means to convert said error signal into a variable DC voltage signal;

an oscillator adapted to receive said variable DC voltage signal from said buck regulator, said oscillator including overvoltage protection means for said power supply; and

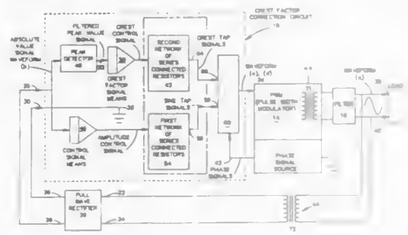
inductive means for limiting current surge of said variable DC voltage signal to said overvoltage protection means.

4,920,472

CREST FACTOR CORRECTION CIRCUIT

Howard Handler, Westminster, Calif., assignor to Deltec Electronics Corporation, San Diego, Calif.

Filed May 31, 1989, Ser. No. 359,356
Int. Cl.[5] H02M *7/44*
U.S. Cl. 363—95 13 Claims



1. A control circuit for providing a composite control signal to a control input of an ac inverter, said ac inverter providing an ac output from a dc power source, said control circuit comprising:

A. first means, receiving said ac output of said ac inverter, for generating an amplitude control signal based on one of an average or RMS value of said ac output;

B. second means, receiving said ac output of said ac inverter, for generating a crest control signal for controlling the amplitude of the peak value of said ac output; and

C. means, connected to said first and second means and to said control input of said ac inverter, for feeding said amplitude control signal and said crest control signal to said control input of said ac inverter as said composite control signal.

4,920,473

METHOD AND ARRANGEMENT TO COMMUTATE THE CURRENT BETWEEN TURN-OFF VALVE ARMS OF AN I-TYPE STATIC CONVERTER

Wolfgang Frankenberg, Erlangen; Hans Laber, Erlangen-Bruck, and Alois Weschta, Buckenhof, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 14, 1989, Ser. No. 310,728
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1988, 3804808
Int. Cl.[5] H02M *7/521*
U.S. Cl. 363—96 11 Claims

7. A static converter device for a load-independent current, comprising:

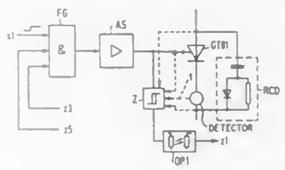
a plurality of valve arms, wherein each valve arm includes:

a valve device with current blocking ability in a reverse direction and having a control input;

a valve damping circuit coupled to said valve device;

a control circuit coupled to said valve device which generates a turn off signal to turn off the valve device and an actuation signal to switch on the valve device;

a status acquisition device coupled to the valve device



which detects a zero current level of the valve device and generates a status signal indicating the zero current level of the valve device;

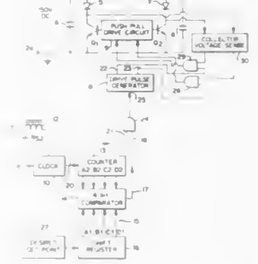
an unblocking device coupled to the control circuit which enables the control circuit to supply the actuation signal to the valve device in the valve arm in response to the generation of the status signal in another of said valve after the another valve arm has been turned off.

4,920,474

HIGH FREQUENCY HIGH VOLTAGE POWER SUPPLY WITH CONTROLLED OUTPUT POWER

Gert W. Bruning, Tuckahoe, and Edward H. Stupp, Spring Valley, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 328,377, Mar. 23, 1989, Pat. No. 4,882,666. This application Aug. 29, 1989, Ser. No. 400,181
Int. Cl.[5] H02M *7/537*
U.S. Cl. 363—97 3 Claims



1. A high frequency high voltage oscillator circuit with controlled output power comprising:

a resonant LC tank circuit coupled to a source of DC supply voltage and to at least one controlled semiconductor switching device,

a drive circuit coupled to a control electrode of said semiconductor switching device for supplying drive pulses thereto, and

a control circuit coupled to said drive circuit so as to periodically disable the supply of drive pulses from the drive circuit to the control electrode of the semiconductor switching device as a function of the desired output power of the oscillator circuit whereby a self-oscillation voltage

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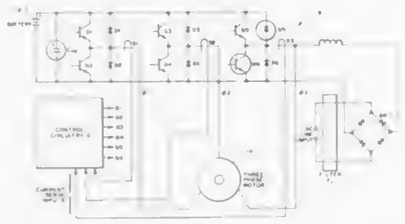
of decreasing amplitude is generated by said oscillator circuit, said control circuit being operative to periodically enable the supply of said drive pulses from the drive circuit to the control electrode of the semiconductor switching device before the self-oscillation voltage decays to a zero voltage level.

4,920,475

INTEGRATED TRACTION INVERTER AND BATTERY CHARGER APPARATUS

Wally E. Rippel, Altadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Mar. 7, 1988, Ser. No. 164,868
Int. Cl.[5] H02M 7/537
U.S. Cl. 363—132 7 Claims



1. An integrated inverter/charger apparatus, comprising:
a polyphase bridge inverter adapted to be connected to a polyphase load said inverter including a plurality of switch elements and current path blocking elements;
an input capacitor, said capacitor and inverter adapted to be connected in parallel across a DC source;
a rectifier having an input and an output connected at its input to an AC input line;
inductor means connected between said inverter and said output of the rectifier; and
control circuitry coupled to said inverter and being adapted to control the invertor in either a drive mode wherein, with the AC input line being disconnected from said input of the rectifier and with said inverter being connected to the polyphase load, said inverter is rendered active by said control circuitry so as to be operated by the DC source to drive the polyphase load or a charge mode wherein, with the AC input line being connected to said input of the rectifier and with said inverter remaining connected to the polyphase load, only a portion of said inverter is rendered active by said control circuitry so as to connect the DC source and input capacitor with said inductor means and rectifier and to be operated by the AC input line to charge the DC source.

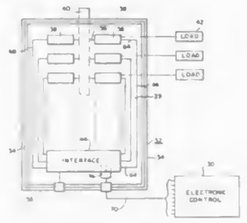
4,920,476

ELECTRONIC CONTROL FOR LIGHTING PANELBOARDS

Bruce L. Brodsky, South Fayette Twp., Allegheny County; David L. Davidson, New Alexandria; Dwight L. Hutton, Monroeville; William L. Vasiladiotis, Bell Acres, and Mark D. White, South Park Twp., Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 27, 1988, Ser. No. 199,488
Int. Cl.[5] H02H 3/08
U.S. Cl. 364—140 7 Claims

1. In an integrated building electrical load management system, the combination of, a power line panelboard having a plurality of circuit breakers for controlling electrical loads;
printed circuit board means having a plurality of conductor connections and of breaker connections;
electronic control means for providing electronic control and diagnostics for the circuit board means and having a plurality of conductors leading to the conductor connections; and
each circuit breaker including a remotely controlled solenoid for mechanically actuating the circuit breaker for opening and closing a circuit through a load and which solenoid includes control wires connected to selected



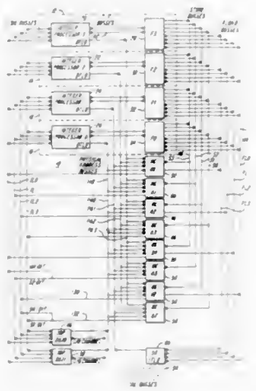
breaker connections, said circuit breaker as thusly configured operating as a controlled switch in addition to providing a circuit protective function;
whereby the printed circuit board means functions as a circuit breaker interface between the separate circuit breakers and the electronic control means.

4,920,477

VIRTUAL ADDRESS TABLE LOOK ASIDE BUFFER MISS RECOVERY METHOD AND APPARATUS

Robert P. Colwell; John O'Donnell; David B. Papworth, all of Guilford, and Paul K. Rodman, Madison, all of Conn., assignors to Multiflow Computer, Inc., Branford, Conn.

Filed Apr. 20, 1987, Ser. No. 40,990
Int. Cl.[5] G06F 12/08, 9/38, 11/00
U.S. Cl. 364—200 6 Claims



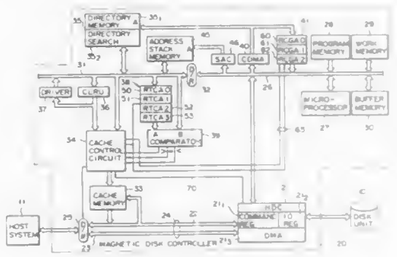
1. In a data processor having
a central processing unit, and
at least one pipelined memory controller circuitry responsive to the central processing unit and having a memory pipeline, said central processing unit addressing data using a virtual address memory table look aside buffer, miss recovery circuitry comprising
a virtual address first in-first out buffer means for storing virtual address data from the central processing unit during at least each memory access instruction,
an instruction status first in-first out buffer means for storing instruction status data generated in the memory circuitry during at least each memory access instruction,
means for detecting a memory access error condition during execution of a memory access instruction in the memory circuitry, and
a resequencing means having
means responsive to detection of the memory access error condition for at least correcting said memory access error condition, and
means for replaying, in sequence, after said error is corrected, the instruction causing the error condition and those instructions entering and in the memory pipeline after the instruction causing the error condition, said replaying means being responsive to the virtual address and instruction status first in-first out buffer means for replaying said instructions.

4,920,478

CACHE SYSTEM USED IN A MAGNETIC DISK CONTROLLER ADOPTING AN LRU SYSTEM

Akihiko Furuya; Kouiti Kanamaru, and Junichi Inoue, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Toshiba Computer Engineering Corporation, Tokyo, both of, Japan

Division of Ser. No. 867,449, May 28, 1986, Pat. No. 4,835,686. This application Mar. 24, 1989, Ser. No. 329,019
Claims priority, application Japan, May 29, 1985, 60-115918; Jun. 19, 1985, 60-133432; Aug. 29, 1985, 60-190308; Feb. 27, 1986, 61-42258
Int. Cl.[5] G06F 12/12
U.S. Cl. 364—200 3 Claims



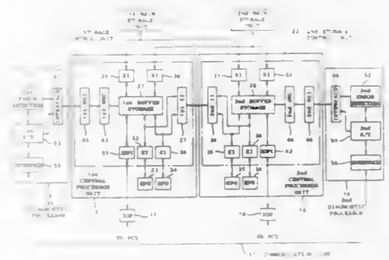
1. A magnetic disk controller incorporating a cache memory, comprising:
determining means for determining if data requested on the basis of a disk access request from a host system is stored in said cache memory;
cache operation designation data storage means for storing cache operation designation data consisting of a cache memory address, the number of transfer sectors, a data transfer direction, and data representing necessity or lack of necessity of data transfer to said host system;
sector number reading means for reading a sector number stored in an ID field of a current read sector when a read miss is determined by said determining means upon a disk access request from said host system;
cache operation designation data producing means for producing the cache operation designation data on the basis of contents of the disk access request from said host system and a determination result from said determining means, and for storing the cache operation designation data in said cache operation designation data storage means, said cache operation designation data producing means, in the case of a read miss, to produce the cache operation designation data for each one of a plurality of subunits of a cache block to be replaced according to a cache memory address corresponding to a sector adjacent to the sector whose number is ready by said sector number reading means, a cache address corresponding to a start sector of a disk area from which data is to be transferred to said host system, and a cache memory address corresponding to a last sector from which data is to be transferred to said host system; and to sequentially store the cache operation designation data corresponding to the subunits of said cache block in said cache operation designation data storage means, the cache operation designation data including, a cache memory address corresponding to the sector adjacent to the sector whose number is read by said reading means, said cache memory address serving as start cache operation designation data; and
data transfer means for reading out the cache operation designation data from said cache operation designation data storage means in an order starting from the start cache operation designation data, and for performing data transfer operation on the basis of the readout data.

4,920,479

MULTIPROCESSOR SYSTEM WITH STORAGE CONTROL UNITS INCLUDING BUFFER STORAGE UNITS COMPRISING AN ERROR RECOVERY SYSTEM FOR STORAGE CONTROL UNITS

Tatsuro Hashiguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 160,757
Claims priority, application Japan, Feb. 28, 1987, 62-44079
Int. Cl.[5] G06F 11/16
U.S. Cl. 364—200 6 Claims



1. In an error recovery system for used in a multiprocessor system comprising a first and a second main storage means for storing first and second data each including programs, respectively, a first and a second storage control means coupled to said first and said second main storage means, respectively, said first and second storage control means comprising a first and a second buffer storage means of a store-in type operatively coupled to a particular one of said first and said second main storage means and a remaining one of said first and said second main storage means, respectively, said first and said second buffer storage means storing, as first and second buffer data, blocks of data read out from said particular one and said remaining one of said first and said second main storage means, respectively, and a plurality of execution processor means coupled to said first and said second storage control means for executing programs in said first and said second buffer storage means, said first and said second storage control means controlling data transfer between said particular one of said first and said second main storage means and said first buffer storage means and between said remaining one of said first and said second main storage means and said second buffer storage means, respectively, said first and said second storage control means further controlling data transfer between said first buffer storage means and said execution processor means and between said second buffer storage means and said execution

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processor means, respectively, the improvement which comprises:

error detection means coupled with said first storage control means for detecting an error caused at any portion in said first storage control means during a period when a particular one of said plurality of execution processor means executes, as a current program, a program in said first buffer data, said error detection means producing a reading signal when confirming that said first buffer storage means is normal on detection of said error;

reading means responsive to said reading signal for reading out said first buffer data from said first buffer storage means to deliver said first buffer data as read-out data;

transmitting means coupled to said reading means for transmitting said read-out data;

receiving means coupled to said transmitting means for receiving said read-out data through said transmitting means to produce said read-out data as write-in data;

signal producing means coupled with said receiving means for producing a storing signal when said receiving means receives said write-in data; and

writing means responsive to said storing signal writing and write-in data in said second buffer storage means to thereby enable said particular execution processor means to restart the execution of said current program by use of said write-in data stored in said second buffer storage means;

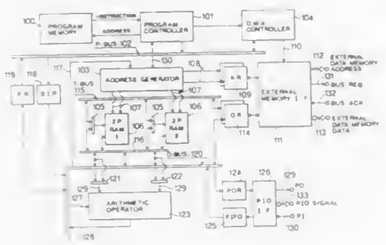
said second storage control means responsive to said storing signal for transferring said second buffer data into said remaining one of said first and said second main storage means prior to writing of said write-in data into said second buffer storage means by said writing means.

4,920,480

DIGITAL SIGNAL PROCESSOR

Tokumichi Murakami; Koh Kamizawa, and Masatoshi Kameyama, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1988, Ser. No. 164,257
Claims priority, application Japan, Mar. 5, 1987, 62-50755
Int. Cl.[5] G06F *13/14*
U.S. Cl. 364—200 5 Claims



1. A digital signal processor comprising:

a bus structure including a program bus for instruction transfer, a data bus only for internal data transfer and a data input/output bus only for data input and output;

a program memory which is separated from data memories for storing a certain program;

a program controller connected to said program memory and to said program bus for reading out said program from said program memory and for executing instruction transfer, internal operation and data input/output in parallel fashion;

an internal data memory comprising a plurality of 2-port memories, connected selectively to said data bus and said data input/output bus, and adapted to store data in block units;

an arithmetic operator connected selectively to said data bus and said internal memory for executing internal operations including binomial operations;

a direct memory access (DMA) controller connected to said program controller and to said program bus and connecting said internal data memory with an external data memory through said data input/output bus to implement DMA transfer for block data in parallel to said internal operation;

an address generator which generates an address of said internal data memory for internal operation by said arithmetic operator and an address of said external data memory for DMA transfer by said DMA controller concurrently and in parallel to said internal operation, said address generator being connected to said program bus, said data bus and said internal data memory; and

parallel data input/output interface means which include a first-in first-out (FIFO) memory and which connect an external device to said data bus and said FIFO memory to implement parallel data communication with said external device independently of input/output operations and in asynchronous fashion.

4,920,481

EMULATION WITH DISPLAY UPDATE TRAPPING

Joseph H. Binkley; Perry A. Caro; John B. Dillon, all of Palo Alto; Charles R. Fay, Long Beach; Jonathan Gibbons, Mountain View; Hilary N. Hooks, Newark; Abdo G. Kadifa; Jeffery W. Lee, both of Palo Alto; William C. Lynch, Palo Alto; Clayton W. Mock, Redwood City; Everett T. Neely, Montara; Michael L. Tallan, Mountain View; Geoffrey O. Thompson, Palo Alto; Gaya Vukkadala, Sunnyvale; John D. Wick, Palo Alto, and Donald R. Woods, Los Altos, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 856,526, Apr. 28, 1986. This application Dec. 8, 1987, Ser. No. 130,369
Int. Cl.[5] G06F *15/16, 3/153*
U.S. Cl. 364—200 15 Claims

1. A system for emulating a target system having a central processor for executing a set of target system instructions and a display memory for storing image data defining an image to be displayed, the emulating system comprising:

a host system having a host processor for executing a set of host system instructions different from the target system instructions; the host system further comprising display means for providing a display; and

an emulating processor for executing a sequence of the target system instructions; the emulating processor providing signals during execution of the sequence of target system instructions, one of the signals being a display update signal indicating an update of the image data in the display memory of the target system; the display update signal being a memory access signal requesting access to a location in the display memory of the target system, the display update signal including a memory address;

the host system further comprising a host memory that includes a display memory region for storing the image data, the display memory region comprising a respective location for the location in the display memory of the target system; the image data at the respective location in the display memory region being accessed and updated in response to the display update signal;

the host system further comprising environment means for providing an environment for the emulating processor so that the emulating processor continues to execute the sequence of target system instructions; the environment means comprising display update monitoring circuitry connected for detecting when the emulating processor provides the display update signal and for obtaining display update monitoring data relating to the image data update indicated by the display update signal;

the host processor independently executing a sequence of the host system instructions while the emulating processor executes the sequence of target system instructions; the host processor being connected for receiving the display update monitoring data and for controlling the display means; the host processor, in executing the sequence of host system instructions, operating to cause the display means to provide the display in accordance with the display update monitoring data.

4,920,482

MULTIPLE MODE MICROPROGRAM CONTROLLER

Atsushi Hasebe, Kangawa, Japan, and Ryohei Kato, College Park, Md., assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 19, 1985, Ser. No. 932,277
Claims priority, application Japan, Nov. 19, 1985, 60-259543
Int. Cl.[5] G06F *9/24, 9/26*
U.S. Cl. 364—200 7 Claims

1. An information processing apparatus comprising

a program supplying portion;

write signal generator means; and

a data processor including a microprogram controller, microprogram memory, arithmetic unit, and selector means for selecting an address from said microprogram controller and an address from said program supplying portion and supplying the selected address to said microprogram memory; and

a manually actuatable mode signal generator for generating mode signals to effectuate a plurality of modes selected by the user of the apparatus, wherein

in response to a first mode signal, said selector means supplies an address from said microprogram controller to said microprogram memory and a program is thereby executed,

in response to a second mode signal, said selector means supplies an address from said microprogram controller to said microprogram memory and said microprogram controller is caused to generate program start addresses, and

in response to a third mode signal, said selector means supplies an address from said program supplying portion to said microprogram memory and in response to a write signal from said write signal generator means fed to said program supplying portion, the program from said program supplying portion is written in the microprogram memory.

4,920,483

A COMPUTER MEMORY FOR ACCESSING ANY WORD-SIZED GROUP OF CONTIGUOUS BITS

Michael A. Pogue; Morgan J. Dempsey, both of Framingham; Shreyaunsh R. Shah, Milford, and Leo C. Waible, III, Northboro, all of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Nov. 15, 1985, Ser. No. 798,665
Int. Cl.[5] G06F *12/04*
U.S. Cl. 364—200 6 Claims

1 A method of operating a memory in a digital data system, the memory being used for addressably storing and retrieving any of a plurality of n-bit words,

the memory comprising a plurality of storage chips organized such that:

(a) each storage chip stores bits associated with only one bit position of the n-bit words; and

(b) each combination of address bits elicits a single bit from each of n storage chips, each containing a different bit position of the n-bit word,

the digital data system including means for decrementing addresses by one;

the method of comprising the steps of:

(a) determining for each memory access an n-bit number "m" denoting a bit position offset within a n-bit word of the rightmost bit of a desired group of n contiguous bits;

(b) using, for all chips storing bits of bit position equal to or less than m, the undecremented address; and

(c) using, for all chips storing bits of bit position greater than m, the decremented address,

whereby any n contiguous bits may be accessed.

4,920,484

MULTIPROCESSOR/MEMORY INTERCONNECTION NETWORK WHEREIN MESSAGES SENT THROUGH THE NETWORK TO THE SAME MEMORY ARE COMBINED

Abhiram G. Ranade, Berkeley, Calif., assignor to Yale University, New Haven, Conn.

Filed Oct. 5, 1988, Ser. No. 253,961
Int. Cl.[5] G06R *13/00;* H04Q *11/04*
U.S. Cl. 364—200 16 Claims

1. A method for enabling efficient communication in a network between a plurality of target address modules and a plurality of source address generators, said source address generators able to generate target addresses contained within said target address modules, said network including a plurality of interconnected nodes, each node having M inputs and N outputs where M and N are positive integers and M is equal to or greater than 2, each node having queue means coupled to each said input, each said queue means for storing data in a first-in first-out manner, the first-in data in said queue being at a head of said queue, and means for carrying out a communication protocol, said method comprising the steps of:

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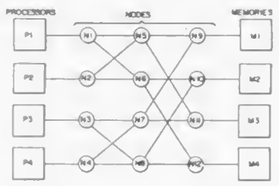
placing target addresses from messages received on each said node input into a queue means;

examining the target addresses at heads of at least two said queue means; and



transmitting from a node, only when at least two target addresses are present in different queue means, one said message whose target address is found to bear a predetermined relationship to a target address of another said message contained at the head of another said queue means.

4,920,485

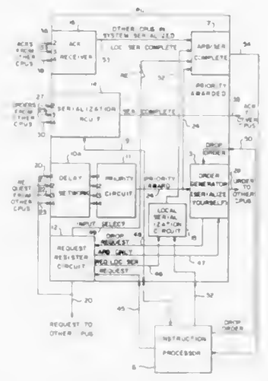
METHOD AND APPARATUS FOR ARBITRATION AND SERIALIZATION IN A MULTIPROCESSOR SYSTEM

Ali Vahidsafa, Tokyo, Japan, assignor to Amdahl Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 902,497, Sep. 2, 1986, abandoned. This application Aug. 31, 1988, Ser. No. 239,067

Int. Cl.[5] **G06F** *13/14*

U.S. Cl. 364—200 **9 Claims**



1. A distributed multiprocessor system comprising:

a plurality of distributed central processing units (CPUs) for processing data in response to instructions, wherein each given CPU in said plurality of distributed CPUs comprises:

means, responsive to a predetermined instruction in said given CPU, for generating a REQUEST TO SERIALIZE OTHER CPUs signal (REQUEST);

means, connected to the REQUEST generating means in said given CPU, for transmitting a REQUEST generated by said REQUEST generating means in said given CPU to all of said plurality of distributed CPUs;

means, coupled to said REQUEST transmitting means in said plurality of distributed CPUs and having a plurality of outputs, for simultaneously supplying at said outputs all REQUESTs simultaneously generated by CPUs in said plurality of distributed CPUs, including

a plurality of inputs for receiving REQUESTS from all CPUs in said system; and

a delay circuit means for providing in series with each of said plurality of inputs a predetermined delay having a magnitude which is inversely proportional to an amount of time it takes to transmit a REQUEST from a sending CPU to one of said plurality of inputs; and

means, connected to receive REQUESTs from said plurality of outputs and responsive to simultaneously received REQUESTs, for awarding priority to one REQUEST from a single CPU of said simultaneously received REQUESTs for processing by said given CPU.

4,920,486

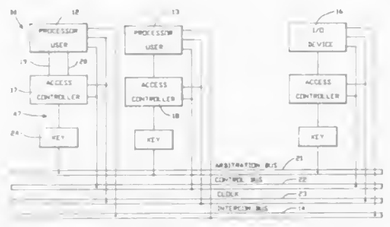
DISTRIBUTED ARBITRATION APPARATUS AND METHOD FOR SHARED BUS

Michael J. K. Nielsen, Palo Alto, Calif., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Nov. 23, 1987, Ser. No. 123,382

Int. Cl.[5] **G06F** *15/16*

U.S. Cl. 364—200 **11 Claims**



1. In a computer system having a multiplicity of subunits connected to a shared bus, distributed bus arbitration apparatus comprising:

an arbitration bus with means for carrying a multiplicity of substantially simultaneous bus request signals; and

a multiplicity of arbitration means, each coupled to the shared bus, the arbitration bus and a corresponding one of the subunits, for determining the relative priorities by which said subunits shall access said shared bus; each said arbitration means determining only whether said subunit coupled to said arbitration means is to be granted access to said shared bus;

each said arbitration means including:

status means for storing status signals denoting which ones of said subunits have higher priority and which ones have lower priority than the subunit corresponding to said arbitration means;

bus requesting means coupled to said arbitration bus for asserting a bus request signal on said arbitration bus; and

access control means, coupled to said arbitration bus and said status means, for receiving bus request signals asserted on said arbitration bus and for granting said corresponding subunit access to said shared bus only when said bus requesting means has asserted a bus request signal and none of the received bus request signals were asserted by the arbitration means of subunits denoted by said status means as having higher priority than said corresponding subunit;

wherein said multiplicity of arbitration means simultaneously arbitrate access to the shared bus.

4,920,487

METHOD OF UP-FRONT LOAD BALANCING FOR LOCAL MEMORY PARALLEL PROCESSORS

Paul T. Baffes, Houston, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 12, 1988, Ser. No. 283,106

Int. Cl.[5] **G06F** *9/46, 15/16*

U.S. Cl. 364—300 **8 Claims**

1. In a parallel processing computer system including a plurality of processing units and shared memory, and containing a network having identical computations to be executed at each connection therein, and said network further having a constant aggregate computational load, a method of up-front, load balancing comprising

generating a first signal representative of said plurality of processing units in said network,

generating a first plurality of signals with each such signal representing a corresponding one of said identical computations in said network,

generating in response to said first signal and said first plurality of signals a second signal representing a balance load in said network,

generating a second plurality of signals functionally establishing a preselected plurality of partitions of said memory,

generating in response to said first and second pluralities of signals, a first sequence of signals functionally dividing said computational load into a plurality of process sets,

generating in response to said second signal and said first sequence of signals, a second sequence of signals functionally allocating said process sets among said memory partitions, and

generating in response to said second sequence of signals, a third sequence of signals functionally merging said process sets until they are equal in number to said plurality of processing units.

4,920,488

PHYSICAL INVENTORY SYSTEM

Oliver D. Filley, 440 Holland Rd., Far Hills, N.J. 07931

Continuation of Ser. No. 132,960, Dec. 15, 1987, abandoned. This application Jun. 26, 1989, Ser. No. 372,188

Int. Cl.[5] **G06F** *15/24*

U.S. Cl. 364—403 **5 Claims**

1. A method for the inventory of a large number of items comprising buildings, real estates and their fixtures, including the steps of:

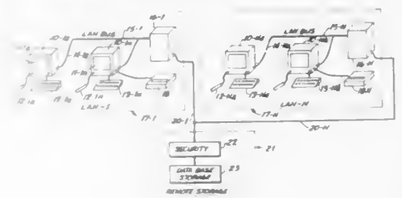
affixing a bar code label to each item to uniquely identify that item by a bar code designation data;

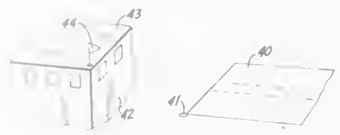
reading said labels using a portable hand-held bar code reader means to obtain designation data;

storing a collection of said code designation data in an initial bar code data storage means in said reader means and subsequently transferring said designation data to a digital computer system;

selecting a geographic marker at an airport runway as the basis for the geographic location of items;

obtaining geographic location data for each item providing the absolute geographic location comprising the latitude and longitude and elevation thereof within one foot of accuracy in relationship to the geographic marker, and associating said geographic location data with said code designation data to form inventory data in the computer system so that each item is identified by a code designation and a geographic location accurate within one foot;





displaying the said inventory data on the screen of computer work station terminal means under control of the computer system; said work station terminal means incuding a graphics display screen and using input means to alter the inventory data displayed on said screen.

4,920,489

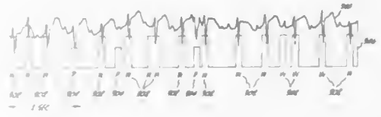
APPARATUS AND METHOD FOR SOLID STATE STORAGE OF EPISODIC SIGNALS

Mark Hubelbank, Sudbury, and David Shadmon, Westbury, both of Mass., assignors to CardioData Inc., Northboro, Mass.

Filed Aug. 14, 1987, Ser. No. 85,879

Int. Cl.[5] **G06F** *15/42*

U.S. Cl. 364—413.06 **91 Claims**



1. A method of digitally storing electrocardiogram signals in solid state memory, including the steps of:

(a) sampling analog electrocardiogram signals at a fixed sampling rate from at least one channel of an electrocardiogram apparatus,

(b) converting each sampled signal to a multibit digital sample representing its amplitude,

(c) calculating the differences in amplitude between each consecutive digital sample,

(d) identifying a predetermined number of groups of a predetermined number of consecutive digital samples having the highest sums of the absolute values of said differences,

(e) storing a number related to each digital sample from the ones of said predetermined number of groups,

(f) storing a number related to every Rth digital sample from the digital samples outside of said predetermined number

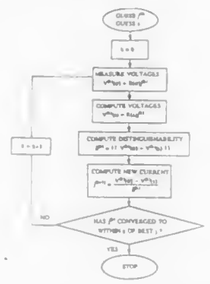
of groups, where R is an integer greater than one and is a function of the sampling rate.

4,920,490

PROCESS AND APPARATUS FOR DISTINGUISHING CONDUCTIVITIES BY ELECTRIC CURRENT COMPUTED TOMOGRAPHY

David Isaacson, Latham, N.Y., assignor to Rensselaer Polytechnic Institute, Troy, N.Y.

Filed Jan. 28, 1988, Ser. No. 149,407
Int. Cl.[5] A61B *5/05*
U.S. Cl. 364—413.13 3 Claims



1. In an electrical current computed imaging system, having a selected precision for the smallest voltage difference the system can measure in an array of electrodes on the surface of a body, a method of producing the best current pattern for applying to the array to distinguish between an unknown conductivity(σ) inside the body and a selected conductivity(s), comprising:

(a) applying an arbitrary current pattern (I^k) to the array to generate a voltage pattern ($V^k(\sigma)$) on the array for the unknown conductivity;

(b) measuring the voltage pattern for the unknown conductivity;

(c) calculating a voltage pattern (V^k(s)) for the selected conductivity;

(d) calculating the difference (δV^k)between the values $V^k(\sigma)$ and V^k(s), according to the formulas:

$$\delta V^k = V^k(\sigma) - V^k(s)$$

and where L is the total number of electrodes 1 in the array;

(e) calculating a new current pattern (I^{k+1}) according to the equation;

$$I^{k+1} = \delta I^k / \| \delta I^k \|$$

where $\| \delta I^k \| = \left[\sum_{l=1}^{L} (\delta V_l^k)^2 \right]^{\frac{1}{2}}$, and

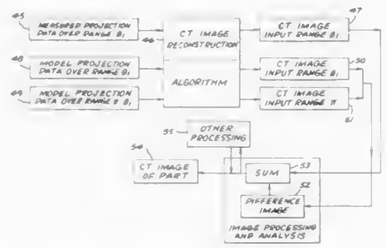
(f) if the absolute value of the difference between the arbitrary current pattern and the new current pattern is equal to or less than the selected precision, applying the arbitrary current pattern to the array of electrodes as the best current pattern, and if the absolute value of the difference between the arbitrary current pattern and the new current pattern is greater than the selected precision, applying the new current pattern to the array of electrodes and repeating steps (b) through (f), until the difference between the absolute value of the new current pattern and a preceding current pattern is equal to or less than the selected precision.

4,920,491

ENHANCEMENT OF IMAGE QUALITY BY UTILIZATION OF A PRIORI INFORMATION

Jeffrey W. Eberhard, and Kristina H. Hedengren, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 16, 1988, Ser. No. 194,235
Int. Cl.[5] G01N *23/04*; G06F *15/42*
U.S. Cl. 364—413.19 10 Claims



1. A method of NDE (non-destructive evaluation) imaging by incorporating a priori information comprising:

scanning a part with an imaging agent over an available scanning range an generating measured imaging parameter data;

providing a three-dimensional model of said part and calculating relevant part geometry, and providing selected physical properties of said part and said imaging agent;

combining said part geometry and physical properties and determining calculated imaging parameter data over an unavailable scanning range that cannot be scanned due to a constraint by calculating imaging agent path lengths through said model and calculating attenuation of said imaging agent from said physical properties; and

forming an image of said part from said measured and calculated data.

4,920,492

METHOD OF INPUTTING CHINESE CHARACTERS AND KEYBOARD FOR USE WITH SAME

Jeff Wang, Taipei, Taiwan, assignor to Buck S. Tsai, Taipei, Taiwan, a part interest

Filed Dec. 1, 1987, Ser. No. 127,069
Claims priority, application China, Jun. 22, 1987, 76103564
Int. Cl.[5] G06F *15/38*
U.S. Cl. 364—419 2 Claims

1. An improved method of inputting Chinese characters and phrases, each of the phrases including more than two characters, each of the character including at least one radical, and each of the radical including at least one stroke, wherein 244 basic radicals for forming the characters are associated with 41 keys of a computer keyboard, comprising the following steps:

(A) Tracking stroke orders of the Chinese character, indexing the character by keying in the corresponding radicals, each of the radicals being keyed in with a code keying in one time, and completing the entry of the character with four codes at most, including a first, a second, a third and a last code, in which the steps for inputting the radicals comprising:

(1) selecting a radical covering as many strokes as possible without taking consideration of stroke orders;

(2) using at most four codes for a character while omitting the code between the third code and the last code;

(3) entering first the radical in the middle portion of a character in case the middle portion is flanked symmetrically by a left side portion and a right side portion, with the exception that the side portions are " ", " ", " " or " ";

(4) entering first a radical enclosing the remaining strokes of a character on four sides or three sides or upper left and right sides;

(5) entering a radical enclosing the remaining stroke of a character on lower left and right sides after inputting the remaining stroke, for example, " " and " ";

(6) entering directly the radicals of " " and " " if their strokes are completed before crossing by the other stroke, for example, " " and " "; otherwise, the radical of " " is keyed in alternatively, for example, " " and " ";

(7) entering the radical of " " by " " instead of " " in case the radical is crossed with other stroke, for example, " " being keyed in by " " instead of " "; and

(8) entering directly the radical of " " is without taking consideration of the stroke contained therein; and

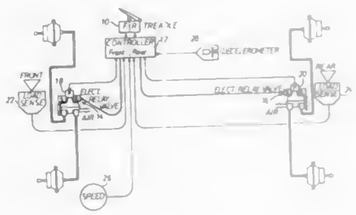
(B) entering the phrases of two characters by inputting at most four codes, including the first and the last code of each character; and keying in the phrases of more than two characters by inputting at most four codes, including the first code of each of the former three characters and the last code of the last character.

4,920,493

TRANSDUCER CONTROL IN VEHICLE BRAKING SYSTEMS

Malcolm Brearley, Solihull, and Richard B. Moseley, Birmingham, both of England, assignors to Lucas Industries public limited company, Birmingham, England, England

Filed May 18, 1987, Ser. No. 56,625
Claims priority, application United Kingdom, May 17, 1986, 8612065
Int. Cl.[5] G01L *25/00*; G06F *15/20*
U.S. Cl. 364—426.01 9 Claims



1. In a braking system of the type having electronic control for determining the extent of application of the vehicle brakes in accordance with driver braking demands, the system comprising:

(a) an electronic control computer; and

(b) a plurality of analog transducers which provide analog input signals to said electronic control computer representative of a corresponding plurality of variable braking operating parameters;

the improvement wherein, in order to enable recalibration of said transducers, the system further comprises within said computer

(c) an operator-controlled gate means;

(d) a comparator means having first and second inputs;

(e) the outputs of said transducers being selectably connectable to said first input of the comparator means by way of said gate means;

(f) non-volatile read/write memory means for storing zero and tare values for said variable braking operatng parameters;

(g) the output of said non-volatile rear/write memory means being connected to said second input of said comparator means, whereby existing zero and tare values stored in said memory means can be compared in said comparator means with new zero and tare values supplied by said transducers; and

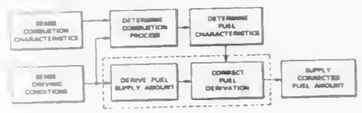
(h) the output of said comparator means providing a control signal coupled to said non-volatile read/write memory, whereby, if the result of said comparison lies within prescribed limits, said new zero and tare values are accepted and introduced into said non-volatile read/write memory means to override the existing zero and tare values but only after pre-established conditions have been met.

4,920,494

FUEL MONITORING ARRANGEMENT FOR AUTOMOTIVE INTERNAL COMBUSTION ENGINE CONTROL SYSTEM

Toshimi Abo, Yokohama; Hiroshi Satoh, and Nobutaka Takahashi, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 9, 1987, Ser. No. 94,979
Claims priority, application Japan, Sep. 9, 1986, 61-212006
Int. Cl.[5] F02D *43/00*
U.S. Cl. 364—431.05 21 Claims



1. In a method of controlling an internal combustion engine the steps of:

sensing a parameter which varies with the combustion process which occurs in a combination chamber;

determining a first variable based on the sensing of said parameter; and

determining the type of fuel being supplied to the engine using said first variable;

wherein said sensing step takes the form of sensing the pressure which develops in the combustion chamber, wherein said pressure is sensed over a predetermined crank angle range and wherein the magnitude of the sensed pressure is recorded along with the corresponding crank angle at predetermined intervals;

wherein said step of determining said first variable includes determining and recording the maximum pressure and corresponding crank angle for each of a predetermined number of engine cycles; and

wherein said fuel type determining step comprises: determining the cycle at which the highest maximum pressure occurs; comparing this with a predetermined cycle; and

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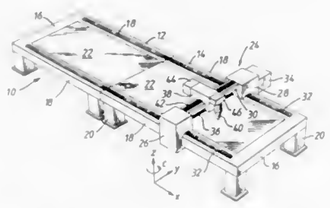
determining the fuel to be a first type when the cycle at which the highest maximum pressure occurs, occurs before said predetermined cycle; and determining the fuel to a second type when the cycle at which the highest maximum pressure occurs, occurs after said predetermined cycle.

4,920,495

SHEET CUTTING MACHINE

Donald J. Pilkington, Kettering, United Kingdom, assignor to GFM Holdings AG, Austria

Filed Jul. 15, 1988, Ser. No. 219,670
Int. Cl.[5] G06F *15/00*; G05B *19/00*
U.S. Cl. 364—474.37 **29 Claims**



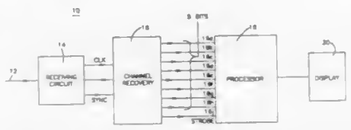
1. A machine for cutting sheet-like workpieces, comprising:
a work surface on which to lay a sheet-like workpiece;
a cutting blade;
a guidance system for guiding the blade along a cutting path to cut the workpiece along that path; and
means to adjust the height of the blade as the blade moves along the cutting path;
characterised in that:
the height adjusting means includes a memory which stores data indicative of irregularities of the guidance system and the work surface relative to each other, the height adjusting means being responsive to the stored data in adjusting the height of the blade.

4,920,496

APPARATUS AND METHOD FOR CALCULATING SIGNAL LEVEL IN DECIBELS

Ed Szczebak, Jr., Plano, assignor to Reliance Comm/Tec Corporation, Chicago, Ill.

Filed Apr. 1, 1988, Ser. No. 176,766
Int. Cl.[5] G01R *29/26*; G06F *15/332*
U.S. Cl. 364—481 **14 Claims**



1. Apparatus for calculating signal level in decibels of a digitally encoded signal, said apparatus comprising:
(a) data storage means having stored therein in a first plurality of locations a first plurality of values representing signal amplitude squared, each of said first locations storing an associated one of said first values, said data storage means also having a second plurality of locations forming a table, each of said second plurality of locations having stored therein an associated one of a second plurality of values representing a range of amplitude level in decibels, each of said plurality of values differing from an adjacent value by a predetermined amount;
(b) means for periodically sampling a predetermined number of times said digitally encoded signal for addressing that one of said first locations associated with each of said samples and reading out said associated one of said first plurality of values;
(c) means responsive to each of said readout first values for determining for said predetermined number of times a sum of all of said readout first values; and
(d) means responsive to said sum for calculating from where in said table that one of said second locations wherein said stored associated second value is just less than said sum is located, one end of said range and said predetermined differing amount, said amplitude level in decibels.

4,920,497

METHOD FOR RENDERING USUABLE A DEFECTIVE RAW PROGRAMMABLE LOGIC ARRAY AND A DEFECTIVE PROGRAMMABLE LOGIC ARRAY RENDERED USABLE BY THIS METHOD

Shambhu J. Upadhyaya, Williamsville, and Michael Demjanenko, North Tonawanda, both of N.Y., assignors to State University of New York, Albany, N.Y.

Filed Oct. 27, 1987, Ser. No. 114,290
Int. Cl.[5] G06F *11/20*
U.S. Cl. 364—491 **14 Claims**

1. A method of rendering usable a defective raw Programmable Logic Array (PLA) to obtain the same results as would be obtained if the PLA was not defective and mapped with a mask logic array, said method comprising:
locating the defects within said defective raw logic array;
reconfiguring the columns of the mask logic array to avoid such defects; and
mapping said reconfigured mask logic array onto said raw logic array so as to "mask said defects", wherein said reconfiguring and mapping utilizes non-defective elements of at least one column which contains a defect.

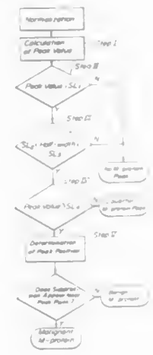
4,920,498

METHOD OF PROCESSING AND ANALYZING ELECTROPHORETIC IMAGE, AND METHOD OF DISPLAYING ELECTROPHOREGRAM AND A MEDIUM FOR RECORDING ELECTROPHOREGRAM

Nobutaka Kaneko, Hachioji, assignor to Olympus Optical Co., Ltd., Japan

Filed Aug. 6, 1986, Ser. No. 893,814
Claims priority, application Japan, Aug. 17, 1985, 60-180031; Aug. 17, 1985, 60-180032; Aug. 27, 1985, 60-186533; May 28, 1986, 61-122883
Int. Cl.[5] G06F *15/42*; C25D *13/06*
U.S. Cl. 364—497 **34 Claims**

1. A method of producing a normalized electrophoregram, comprising the steps of:
photoelectrically scanning an electrophoretic image of a test sample to derive an electrophoretic image signal;
sampling the electrophoretic image signal to derive a number of data samples and storing said samples in a memory of a digital computer;
referencing said stored data samples to detect at least two reference points on the electrophoretic image; and



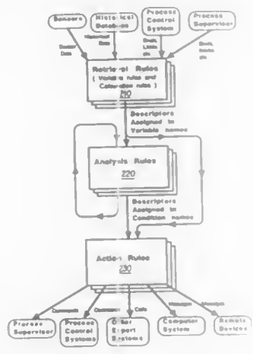
adjusting said stored data samples to make said reference points coincident with at least two predetermined points on an electrophoregram having a predetermined electrophoretic expansion length to produce a normalized electrophoregram.

4,920,499

EXPERT SYSTEM WITH NATURAL-LANGUAGE RULE UPDATING

Richard D. Skeirik, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 30, 1987, Ser. No. 103,050
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—513 **32 Claims**



1. An expert system comprising:
a processor connected to receive inputs from a plurality of sources;
a collection of inference rules which are executable by said processor; and
one or more output channels, connected so that said processor provides outputs on said output channels in accordance with inputs received on said input channels;
wherein said processor is also configured to, on command of a user, present said inference rules in a constrained format which is readily understandable by a user who is not necessarily competent in any computer language, and permit said user to alter said executable rules by modifying said rules within said constrained substantially natural language format.

4,920,500

METHOD AND ROBOT INSTALLATION FOR PROGRAMMED CONTROL OF A WORKING TOOL

Amund Hetland, Voll, and Odd T. Hoie, Sandnes, both of Norway, assignors to Trallfa Robot A/S, Bryne, Norway

PCT No. PCT/NO86/00021, § 371 Date Oct. 28, 1987, § 102(e) Date Oct. 28, 1987, PCT Pub. No. WO87/04968, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 25, 1986, Ser. No. 112,720
Int. Cl.[5] G06F *15/46*; G05B *19/42*
U.S. Cl. 364—513 **12 Claims**

1 A method for programmed control of a working tool to perform processing operations on an object by means of a movable servo-actuated robot arm system having more than six degrees of freedom and on the basis of preprogrammed tool path data stored in a data memory, comprising:
deriving the stored tool path data in an outer coordinate system separate from the robot arm coordinate system;
subdividing the robot arm system into system parts for coordinate transformation to an inner reference coordinate system associated with the robot arm system and which are movable with respect to each other and each having at least six degrees of freedom;
deriving the positional data for each system part, apart from at least one system part connected with the inner reference coordinate system;
storing in a memory said positional data in addition to the preprogrammed tool path data; and
using said stored data in conjunction with directly sensor-derived information as to the positional relation between said inner and outer coordinate systems as coordinate transformation data for appropriately correlating the programmed control of the working tool on the basis of the stored tool path data in the outer coordinate system at all times with the inner reference coordinate system associated with the robot arm system.

4,920,501

DIGITAL HALFTONING WITH MINIMUM VISUAL MODULATION PATTERNS

James R. Sullivan, Spencerport, and Rodney L. Miller, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 19, 1988, Ser. No. 259,940
Int. Cl.[5] H04N *1/40*; G06F *15/62*
U.S. Cl. 364—518 **18 Claims**

1. A method of generating a halftone image with an electronic digital computer, comprising the steps of:
a. providing a set of minimum visual noise L×M bit binery patterns by employing a stochastic combinatorial minimi-

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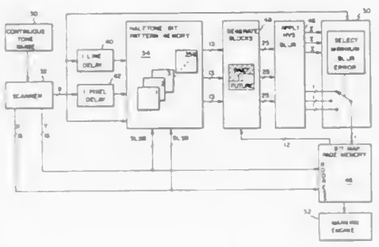
zation technique and a human visual modulation transfer function (MTF) weighting function to generate a halftone bit pattern for each density level of the multi-level digital image signal, each pattern corresponding to a possible density level of a multiple level digital image signal;

b. providing a digital image having pixel values representing density levels; and



c. for each pixel value of the digital image signal, modularly selecting a portion of the binary bit pattern from the corresponding pattern of the set by addressing the bit pattern with lower significant bits of an x,y pixel address associated with each pixel, and employing the selected portion to form the halftone image.

4,920,502

IMAGE PROCESSING APPARATUS WHICH SELECTABLY OUTPUTS IMAGE INFORMATION

Masanori Yamada, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 93,083, Aug. 31, 1987, abandoned, which is a continuation of Ser. No. 673,410, Nov. 20, 1984, abandoned. This application Mar. 3, 1988, Ser. No. 166,801

Claims priority, application Japan, Nov. 25, 1983, 58-222837; Nov. 25, 1983, 58-222617; Nov. 25, 1983, 58-222618

Int. Cl.[5] G06F *15/62*

U.S. Cl. 364—518 **46 Claims**

1. An image processing system comprising:

image input means for reading image information;

data input means for inputting data relative to a plurality of image areas containing the image information, wherein said data input means includes indicating means for indicating the order in which the image information should be output;

instructing means for providing a start instruction signal to initiate image processing; and

control means for controlling said image input means such that input processing by said image input means is executed the same number of times as the number of the plurality of image areas corresponding to said input data, in response to a start instruction signal from said instructing means,

wherein said control means controls said image input means such that only one image area is input for each input processing.

4,920,503

COMPUTER REMOTE CONTROL THROUGH A VIDEO SIGNAL

Gary M. Cook, Pepperell, Mass., assignor to PC Connection, Inc., Marlow, N.H.

Filed May 27, 1988, Ser. No. 199,624

Int. Cl.[5] G06F *3/00;* **H04N** *7/08*

U.S. Cl. 364—521 **18 Claims**

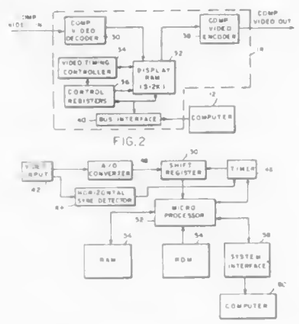


FIG. 2

15. A system for simultaneously providing computer data and a video picture comprising;

means for providing a video signal;

means for modifying said video signal by substituting black or white pixels representative of computer data for a plurality of video pixels;

a transmitter which transmits said modified video signal;

a receiver which receives said modified video signal;

means for displaying a video picture corresponding to said modified video signal;

a horizontal sync detector;

timer means for counting out time intervals after a horizontal sync pulse is detected by said horizontal sync detector;

a shift register for successively obtaining a bit from said modified video signal in response to said timer means so as to extract from the modified video signal a byte of the computer data represented by said substituted black and white pixels; and

an interface which permits a computer to access said byte of computer data.

4,920,504

DISPLAY MANAGING ARRANGEMENT WITH A DISPLAY MEMORY DIVIDED INTO A MATRIX OF MEMORY BLOCKS, EACH SERVING AS A UNIT FOR DISPLAY MANAGEMENT

Hachiro Sawada; Tadashi Fujitsu; Ken-ichi Takahashi, and Hideaki Honma, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 17, 1986, Ser. No. 908,432

Claims priority, application Japan, Sep. 17, 1985, 60-203478; Dec. 13, 1985, 60-280368

Int. Cl.[5] G06F *3/153*

U.S. Cl. 364—521 **4 Claims**

1. In a display managing arrangement comprising a display memory for memorizing an image part of an image datum and a display memory controller for controlling said display memory to specify a display part on said image part, said display

memory comprising a plurality of memory blocks arranged as a matrix of rows, N in number, and columns, M in number, each of said memory blocks comprising a plurality of memory elements arranged as another matrix of rows, n in number, and columns, m in number, and having serial memory element addresses, respectively, said serial memory element addresses consecutively increasing along each row of the memory elements of said display memory and stepwise increasing by a block step value mM between two column-wise consecutive ones of said memory elements, wherein said display memory controller comprises:

a determinant register for storing signals representative of the numbers m and n, said step value, a block column range, and a block row range, said block column and row ranges specifying specific ones of said memory blocks as specific memory blocks by the numbers M and N;

a top address register for storing a signal representative of a top address for each of the memory blocks of said display memory, said top address being the serial memory element address which is least among the serial memory element addresses of said each of the memory blocks;

a first address generator coupled to said determinant register and to said top address register for generating a first address signal representative of a first portion of said serial memory element addresses for each of said specific memory blocks, said first portion being consecutive from said top address to one of said serial memory element addresses that is equal to said top address plus m less one;

a second address generator coupled to said determinant register and to said top address register for generating a second address signal representative of a second portion of said serial memory element addresses, said second portion being congruent modulo said block step value with the top address plus integral multiples of said step value, said integral multiples being from zero to the number n less one; and

accessing means connected to said first and said second address generators and to said display memory for accessing the serial memory element addresses of each of said specific memory blocks.

4,920,505

PROJECTION EXPOSURE APPARATUS

Kazuaki Suzuki, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 938,610, Dec. 5, 1986, abandoned. This application Aug. 2, 1989, Ser. No. 390,482

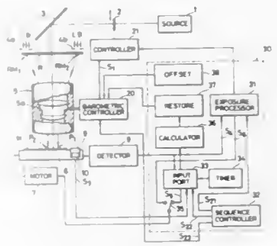
Claims priority, application Japan, Dec. 11, 1985, 60-278277

Int. Cl.[5] G03B *27/52*

U.S. Cl. 364—525 **11 Claims**

7. In a projection exposure apparatus provided with (i) a projection optical system employing light energy from an illuminated object to form an image of the object on a workpiece, (ii) means for monitoring the light energy supplied to said projection optical system, (iii) means for prestoring a time constant relating to changes in imaging characteristics of said projection optical system caused by heat absorption and radiation of said optical system, (iv) means for predicting changes in said imaging characteristics on the basis of a relationship among said time constant, an output from said monitoring means, and a time lapse, and (v) means for adjusting the positional relation between said image and said workpiece on the basis of an output from said predicting means, a method for adjusting a state of the object image on said workpiece when said relationship has been interrupted, comprising the steps of:

(a) measuring values of an imaging characteristic of said projection optical system at plural discrete moments during a measurement period, said measuring being performed when said relationship has been interrupted;



(b) determining deviations of respective measured values from designed values to product data representing corresponding change values of said imaging characteristics;

(c) determining said relationship on the basis of said prestored time constant and said data; and

(d) adjusting the positional relation between said image and said workpiece according to the determined relationship.

4,920,506

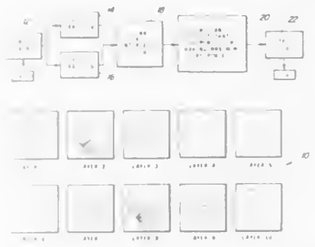
ULTRA-HIGH SPEED TWO-DIMENSIONAL COORDINATE TRANSFORM PROCESSOR

Patrick F. Castelaz, Yorba Linda, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 7, 1988, Ser. No. 255,083

Int. Cl.[5] G06J *1/00;* **G06G** *7/22*

U.S. Cl. 364—602 **19 Claims**



1. In a processor for performing coordinate transformations the improvement comprising:

a first set of layers of planar members each having signal conducting lines representing coordinate lines in a first coordinate system;

a second set of layers of planar members each having signal conducting lines representing coordinate lines in a second coordinate system;

layers in said first set being positioned adjacent to said layers in the second set so that each layer in said first set is positioned between successive layers in said second set;

means for applying a signal to selected ones of said signal conducting lines in said first set of layers, said selected

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lines intersecting at a point that represents a point in said first coordinate system;

means for detecting a signal in lines in said second set of layers, said signal being induced by said signal applied at said first intersection in said first set of layers; and

means for comparing said detected signal at various intersecting points in said second set of layers, wherein the intersecting point that is nearest said first intersecting point in said first set of layers can be determined by the strength of the detected signal.

4,920,507

RECURSIVE DIGITAL FILTER WITH LESS NO-SIGNAL NOISE

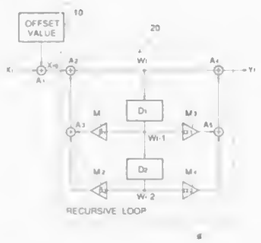
Masahiro Takeda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 31, 1989, Ser. No. 387,298

Claims priority, application Japan, Jul. 29, 1988, 63-189840

Int. Cl.[5] G06F *15/31*

U.S. Cl. 364—724.17 5 Claims



1. A recursive digital filter comprising an input terminal receiving an input signal, an output terminal for outputting a filtered signal, an offset value circuit for outputting a predetermined offset value, an offsetting adder having a first input connected to said input terminal and a second input connected to receive said predetermined offset value from said offset value circuit, and a recursive digital filter loop having an input connected to an output of said offsetting adder and an output connected to said output terminal, whereby even if no signal is inputted, the recursive digital filter operates without occurrence of a limit cycle.

4,920,508

MULTISTAGE DIGITAL SIGNAL MULTIPLICATION AND ADDITION

Mohamad H. Yassaie, Bristol; Anthony D. King-Smith, Dursley, and Clive M. Dyson, Bristol, all of England, assignors to Inmos Limited, Bristol, England

Filed May 19, 1987, Ser. No. 52,249

Claims priority, application United Kingdom, May 22, 1986, 8612453

Int. Cl.[5] G06F *7/38*

U.S. Cl. 364—736 17 Claims

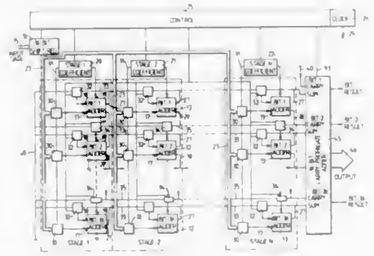
1. Multistage digital signal multiplying and adding apparatus for effecting repeated addition to achieve multiplication and addition together of a plurality of results of said multiplication, said apparatus comprising a plurality of addition stages, each stage having:

a plurality of adding circuits at successive bit positions of different significance in a product to be formed by multiplication of a first digital signal for that stage with a second digital signal for that stage,

each adding circuit being coupled (a) for forming partial products within each stage by successive operations using the first digital signal and a selected bit of the second digital signal, and (b) for adding successive partial products derived from use of bits of the second digital signal thereby forming the product after accumulation of a last partial product,

each adding circuit providing after each partial product accumulation a first output indicating a sum for that bit position and a second output indicating any carry signal to be carried from that bit position to a bit position of greater significance, and

selector circuitry interconnecting said adding circuits for selecting between (a) a first condition to supply signals from said first and second outputs of adding circuits



within a stage to respective adding circuit within said stage for use in accumulation with further partial products and (b) a second condition to supply signals from the first and second outputs of adding circuits within a stage after accumulation of the last partial product as to input to adding circuitry external to said stage for forming an addition of the products of more than one stage, said selector circuitry being operative for any one addition stage to change to said second condition without resolving carry signals in said one addition stage through all bit positions within said one addition stage.

4,920,509

BINARY CALCULATION CIRCUIT

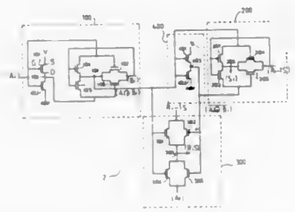
Hedi Hmida, Paris, and Pierre Duhamel, Issy Les Moulineaux, both of France, assignors to Etat Francais, represente par le ministres Delegue des Postes et Telecommunications (Centre National d'Etudes des Telecommunications), Issy Les Moulineaux, France

Filed Mar. 11, 1988, Ser. No. 167,787

Claims priority, application France, Mar. 18, 1987, 87 03758

Int. Cl.[5] G06F *7/50*

U.S. Cl. 364—784 12 Claims



1. A binary complementary MOS calculation cell, having:

a first input for receiving a first input bit;

a second input for receiving a second input bit;

a third input for receiving a third input bit;

a first logic operator means comprising:

(i) a first pair of same polarity transistors forming a series source-to-drain arrangement between a reference voltage terminal and a free drain of one of said transistors, with each of the gates of the transistors of the first pair receiving one of said first and second input bits, said free drain delivering a first intermediate signal, said first intermediate signal being a complemented exclusive-OR function of said first and second input bits;

(ii) a second pair of same polarity transistors, said polarity being opposite the polarity of the first pair and forming a symmetrical drain-to-gate arrangement, the gate of each transistor of the second pair being connected to the drain of the other transistor of the second pair, with the sources of the second pair being connected to said free drain of said first pair, and each of the drains of the second pair receiving one of said first and second input bits;

a logic invertor means, connected to said free drain of the first pair, for delivering a second intermediate signal said second intermediate signal being a complement of said first intermediate signal;

a second logic operator means for generating a first output bit, said first output bit being a symmetrical exclusive-OR function of said third input bit and both said first and second intermediate signals;

a third logic operator means for generating a second output bit, said second output bit being a logic symmetrical trigger function representing either a preselected one of said first and second input bits and said third input bit depending upon both said first and second intermediate signals;

a first output for receiving said first output bit; and

a second output for receiving said second output bit

4,920,510

SAMPLE DATA BAND-PASS FILTER DEVICE

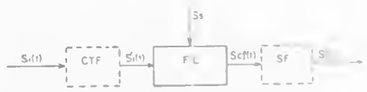
Daniel Senderowicz, Berkeley, Calif.; Guido Torelli, South Alessio, and Germano Nicollini, Piacenza, both of Italy, assignors to SGS Microelectronica SpA, Cantania, Italy

Filed Jun. 17, 1987, Ser. No. 63,258

Claims priority, application Italy, Jun. 20, 1986, 20876 A/86

Int. Cl.[5] G06G *7/02*; H03H *19/00*

U.S. Cl. 364—825 5 Claims



1. A signal processing system comprising, in combination:

a sampled-data band-pass filter means connected to receive an unattenuated input signal at a frequency included within an interval comprised between a first frequency (fsL) and a second frequency (fsH), which encompass a third frequency (fsO); said sampled-data band-pass filter means including a sampler means operating at a sampling frequency (fs) and band-pass means,

said sampler means automatically performing a low-frequency shift of said unattenuated input signal which encompasses a fourth frequency (f0), wherein said sampling frequency is equal to a whole submultiple of the sum of said third frequency (fsO) and said fourth frequency (f0),

said band-pass means having, as its lower cutoff frequency, the difference between the sampling frequency and the second frequency (fs—fsH) and as its upper cutoff frequency the difference between the sampling frequency and the first frequency (fs—fsL).

4,920,511

DATA PORT SELECTION

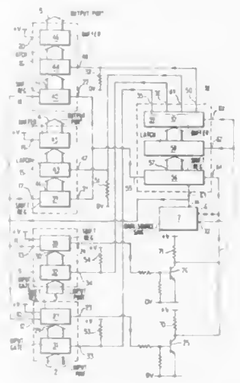
Geoffrey Brier, and Mark W. Rayne, both of Cambridge, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 9, 1987, Ser. No. 130,814

Claims priority, application United Kingdom, Dec. 12, 1986, 8629755

Int. Cl.[5] G06F *13/00*

U.S. Cl. 364—900 23 Claims



1 Apparatus for selecting one of a plurality of parallel data ports and for transferring data between the one port and a serial data path, the apparatus comprising:

(a) a first shift register having a serial data input coupled to the serial data path and having a parallel output;

(b) at least one respective further shift register for coupling with a respective one of the parallel data ports and having a respective serial data terminal coupled to the serial data path and having a plurality of stages, the serial data terminal being one of an input and an output, according to whether the further shift register is for coupling with an output or an input parallel data port, respectively;

(c) a plurality of respective means for coupling the stages of said at least one further shift register to the plurality of parallel data ports, there being one respective means for coupling for each of the plurality of parallel data ports and each of said respective means for coupling having a respective enable control input;

(d) further means for coupling the parallel output of the first shift register to the enable control inputs of the respective means for coupling; and

(e) means for enabling said further means for coupling to select and enable one of said respective means for coupling, that corresponds to the one port, according to contents of the first shift register.

4,920,512

NON-VOLATILE SEMICONDUCTOR MEMORY CAPABLE OF READILY ERASING DATA

Hiroshi Miyamoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1988, Ser. No. 213,106

Claims priority, application Japan, Jun. 30, 1987, 62-160837; Jul. 13, 1987, 62-175250

Int. Cl.[5] G11C *7/00, 11/40, 11/44*

U.S. Cl. 365—160 8 Claims

1. A non-volatile semiconductor memory comprising:

a semiconductor substrate having a main surface and a predetermined impurity concentration of a first conductivity type;

impurity regions of a second conductivity type formed

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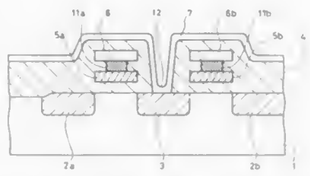
spaced apart from each other on the main surface of said semiconductor substrate, an area between said impurity regions of the second conductivity type defining a channel region;

a first conductive layer formed at least on said channel region with an insulating film interposed therebetween;



a second conductive layer formed on said first conductive layer with an insulating film interposed therebetween; and

switching means comprising a superconductive material for connecting said first conductive layer and said second conductive layer.

4,920,513

SEMICONDUCTOR MEMORY DEVICE USING DIODE-CAPACITOR COMBINATION

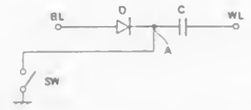
Kaneyoshi Takeshita, Tokyo, and Takeshi Matsushita, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 21, 1988, Ser. No. 171,486

Claims priority, application Japan, Mar. 24, 1987, 62-070950

Int. Cl.[5] G11C *7/00, 11/36*

U.S. Cl. 365—175 **9 Claims**



1. A semiconductor memory device having a number of memory cells, each of which is written to and read from individually, each of said cells comprising:

a diode having first and second electrodes, the first electrode beng connected to a bit line;

a storage capacitor having first and second terminals, the first terminal being connected at a point to the second electrode of the diode, the second terminal being connected to a word line; and

switch means for resetting said point to a predetermined potential, whereby said capacitor is positively reset in response to operation of said switch means.

4,920,514

OPERATIONAL INFORMATION DISPLAY SYSTEM

Shigeo Aoki, Inagi, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Apr. 13, 1988, Ser. No. 181,041

Claims priority, application Japan, Apr. 13, 1987, 62-88638

Int. Cl.[5] G06F *3/14, 15/40*

U.S. Cl. 364—521 **4 Claims**

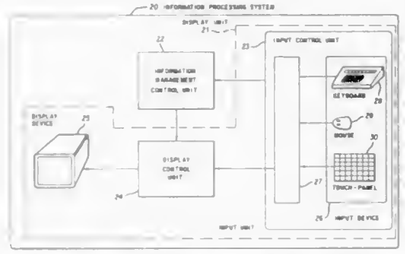
1. An operational information display system for a plurality of information processing functions, the execution of which are dependent on the previous execution of required functions in a sequential priority relationship, the system comprising:

a display for displaying information input to the system;

means for selectively displaying a diagram of the sequential priority relationship between the plurality of functions;

control means for indicating, on the diagram the identity of each previously executed required function; and

input means for sequentially selecting for execution any of



said required functions in the displayed priority order upon which a desired processing function is dependent, for reducing the time required for execution of the desired processing function.

4,920,515

PROGRAMMABLE LOGIC ARRAY HAVING AN IMPROVED TESTING ARRANGEMENT

Takeo Obata, Osaka, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 19, 1988, Ser. No. 259,884

Claims priority, application Japan, Oct. 23, 1987, 62-268840

Int. Cl.[5] G11C *7/00;* **H03K** *19/173*

U.S. Cl. 365—189.08 **3 Claims**

1. A programmable logic array having an AND array, comprising:

a plurality of input lines (**1***a*–**1***c*);

a plurality of product term lines (**30***a*, **30***b*);

a plurality of non-volatile memory elements (Q_{11}–Q_{16}, Q_{21}–Q_{26}) respectively interposed between said input lines and said product term lines;

a test line (**1***d*) for inputting a test signal, and test elements (Q_{17}, Q_{18}) respectively interposed between said test line and said product term lines; and

control means for, in a test mode for measuring AC characteristics of said programmable logic array, turning OFF those non-volatile memory elements which are connected to said input lines other than said test input line and setting to a low level all product term lines other than said product term line whose AC characteristics are to be measured to a low level, said means selectively applying to said test line a test signal causing said test elements to selectively alternate setting to a high level and a low level the product line whose AC characteristics are to be measured;

said programmable logic array including a program circuit (**9**), a gate transistor Q_0 through which said program circuit is coupled to said product term lines, line selection transistors (Q_1, Q_2) interposed in respective product term

lines between the point at which the product term lines are coupled with said program circuit through said gate transistor and the points at which the product term lines are coupled with said non-volatile elements, a decoder (**8***a*) coupled with said line selection transistors to control their OFF/ON states, and a pull-up transistor (Q_3) coupled to said product term lines at points thereof which are between said gate transistor and said line selection transistors to selectively set respective lines to a low level.

4,920,516

READ ONLY MEMORY CIRCUIT HAVING A PRECHARGED SELECTED BIT LINE

Yuji Tsuchimoto, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 5, 1988, Ser. No. 190,447

Claims priority, application Japan, May 12, 1987, 62-115314

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—203 **18 Claims**

1. A read only memory circuit comprising:

a memory cell array having a plurality of bit lines, a plurality of word lines and cells connected between the bit lines and word lines;

bit line selecting means operably coupled to said memory cell array for selecting one of the bit lines designated by a Y address and for precharging the selected bit line at a precharged potential;

word line selecting means operably coupled to said memory cell array for selecting one of the word lines by an X address;

signal output means operably connected to said plurality of cells for extracting a datum stored in one cell connected between said one bit line and said one word line designated by the supply of the X and Y addresses; and

discharge means having discharge lines respectively connected to said plurality of bit lines for discharging all the bit lines except for said one bit line designated by the Y address to thereby preclude delay in a signal rise in said one bit line selected by said bit line selecting means having said precharged potential

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4,920,517

SEMICONDUCTOR MEMORY DEVICE HAVING SUB BIT LINES

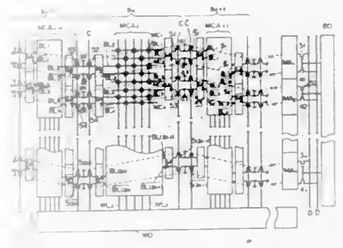
Hiroyuki Yamauchi, Hirakata; Toshio Yamada, Sakai, and Michihiro Inoue, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 40,471, Apr. 20, 1987, Pat. No. 4,807,194. This application Apr. 18, 1988, Ser. No. 182,895

Claims priority, application Japan, Apr. 24, 1986, 61-95364; Apr. 16, 1987, 62-93604; Jul. 1, 1987, 62-164544

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—207 **7 Claims**



1 A semiconductor memory device comprising:

a memory cell array having a plurality of bit lines disposed in a parallel manner, a plurality of word lines disposed in a parallel manner and intersected with said bit lines perpendicularly, a plurality of memory cells coupled between said bit and word lines for storing data therein;

a plurality of sense amplifiers disposed at both sides of said memory cell array in such manner that odd numbered sense amplifiers are disposed at one side of said memory cell array and even numbered sense amplifiers are disposed at the other side of said memory cell, said odd numbered sense amplifiers being coupled to odd numbered bit lines and said even numbered sense amplifiers being coupled to said even numbered bit lines;

a plurality of sub bit lines for coupling said sense amplifiers disposed at both sides of said memory cell array;

voltage control circuits coupled to said sense amplifiers for restricting an amplitude of signal voltages appearing on said sub bit lines; and

a pair of data busses coupled to said sub bit lines.

4,920,518

SEMICONDUCTOR INTEGRATED CIRCUIT WITH NONVOLATILE MEMORY

Hideo Nakamura, Tokyo, and Terumi Sawase, Sayama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 174,975, Mar. 29, 1988, Pat. No. 4,821,240, which is a continuation of Ser. No. 854,889, Apr. 23, 1986, Pat. No. 4,744,062. This application Mar. 28, 1989, Ser. No. 329,515

Claims priority, application Japan, Apr. 23, 1985, 60-86797; Apr. 26, 1985, 60-90268; Jul. 3, 1985, 60-144719

Int. Cl.[5] G11C *11/40*

U.S. Cl. 365—228 **7 Claims**

1. A microcomputer comprising:

a nonvolatile semiconductor memory, and

a processing unit,

said nonvolatile semiconductor memory comprising:

a plurality of data memory elements arranged in a matrix;

a first means for accessing a selected one element within said plurality of data memory elements in accordance with an address signal specified with respect to said matrix;

a protecting data memory element for storing at least 1-bit protection data disposed within said matrix; and

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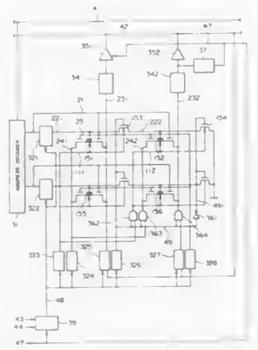
a second means for reading out the content of said protecting data memory element, whereby whether a programming, erasing or reading operation with respect to said selected one element is to be allowed or inhibited is



determined in accordance with the content of said protecting data memory element, said content being read by said second means, wherein said data memory elements are respectively comprised of an electrically erasable and programmable memory element.

4,920,519

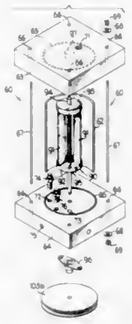
DUAL-PUMP MIXING AND FEEDING APPARATUS

Carl L. Brazelton, Austin, Tex.; Troy C. Litherland, Bradley, and James G. Johnston, Yorkville, both of Ill., assignors to Stranco, Inc., Bradley, Ill.

Filed Oct. 3, 1985, Ser. No. 783,854

Int. Cl.[5] B01F *5/04, 7/20, 15/02;* **G05D** *11/02*

U.S. Cl. 366—161 **13 Claims**



1. Mixing and feeding apparatus for receiving polymer and water and for activating and diluting the polymer, comprising a frame, a vessel mounted on said frame defining a substantially cylindrical chamber therein, said vessel having a water inlet and a first polymer inlet and a second polymer inlet and an outlet, means for carrying water to said water inlet, first diaphragm-type metering pump means for pumping an emulsion polymer to said first polymer inlet, second gear pump means for pumping a solution polymer to said second polymer inlet, an impeller mounted in said chamber for rotation about the cylindrical axis thereof for mixing the polymer and the water, means for energizing said first pump means, means for energizing said second pump means, and control means for selectively controlling the operation of both of said means for energizing.

4,920,520

METHOD OF AND A DEVICE FOR SAFEGUARDING A VEHICLE OR MACHINERY MOVABLE IN SPACE

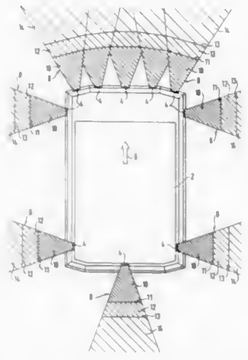
Ewald Göbel; Dieter Maurer, both of Karlsruhe, and Rigobert Opitz, Waldbronn, all of Fed. Rep. of Germany, assignors to IBP Pietzsch GmbH, Ettlingen, Fed. Rep. of Germany

Filed Sep. 7, 1988, Ser. No. 241,363

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1987, 3730105

Int. Cl.[5] G01S *15/00*

U.S. Cl. 367—99 **21 Claims**



1. A method of safeguarding a vehicle or machinery movable in space, such as a robot, a stacker, or an operatorless transporting vehicle against collision, wherein by the use of distance sensors, especially ultrasonic sensors with echo time measurement, the distance from an obstacle is measured and a reaction signal for acting on the vehicle movement is initiated when predetermined threshold values are not reached, said method comprising the steps of initiating the distance measurements in time synchronism for all sensors, and jointly processing the obtained measuring signals for producing at least a reaction signal.

4,920,521

METHOD AND SYSTEM FOR INTERPOLATION-PROCESSING DELAY TIME DATA

Tsuyoshi Yoshie, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 23, 1988, Ser. No. 159,336

Claims priority, application Japan, Feb. 24, 1987, 62-39154

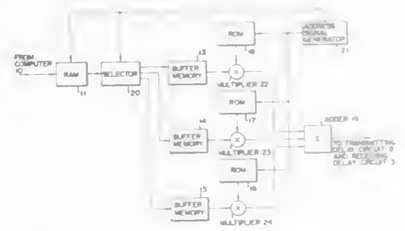
Int. Cl.[5] G01S *15/06*

U.S. Cl. 367—103 **10 Claims**

1. A method for interpolation-processing delay time data utilized for operating a plurality of transducers incorporated in an ultrasonic probe, the method comprising the steps of:

setting delay time data;

interpolation-processing the set delay time data by calculating interpolative delay time data on the basis of the set time data; and



operating the transducers in accordance with the set delay time data and the interpolative delay time data.

4,920,522

METHOD AND APPARATUS FOR MEASURING ELECTRICAL OR MAGNETIC FIELDS

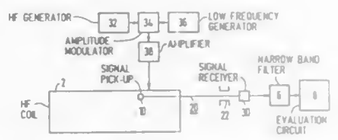
Wilhelm Duerr, Erlangen, and Ralph Oppelt, Uttenreuth-/Weiher, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 22, 1987, Ser. No. 41,216

Claims priority, application Fed. Rep. of Germany, May 6, 1986, 3615197

Int. Cl.[5] G01V *1/00*

U.S. Cl. 367—134 **7 Claims**



1. A method for measuring an electric or magnetic field comprising the steps of:

introducing a magnetic or electric dipole probe into a field to be measured which generates an electric signal characteristic of at least one parameter of said field;

converting said electric signal into a corresponding ultrasound signal;

transmitting said ultrasound signal to an ultrasound receiver remote from said probe; and

re-converting the received ultrasound signal into an electric signal capable of evaluation.

4,920,523

HYDROPHONE MOUNT

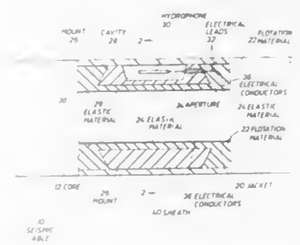
Vitold R. Kruka; Robert M. Kipp, and Edward R. Cadena, all of Houston, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 22, 1981, Ser. No. 333,527

Int. Cl.[5] H04R *11/00*

U.S. Cl. 367—188 **12 Claims**

1. A hydrophone mount for use in a marine seismic cable having a central core, said mount comprising: a first housing portion having first and second apertures, first and second edges, and a cavity adapted for holding a hydrophone; a second housing portion having first and second apertures and first and second edges, said first and second housing portions being sized and shaped so that said first and second housing portions can be positioned adjacent to said core to form a housing around said core with said first edge of said first housing portion interlocking with said first edge of said second housing portion, said second edge of said first housing portion interlocking with said second edge of said second housing portion, and said first and second apertures of said first housing portion axially aligning respectively with said first and second apertures of said second housing portion; and a first member positioned in said aligned first apertures and a second member positioned in said aligned second apertures.



4,920,524

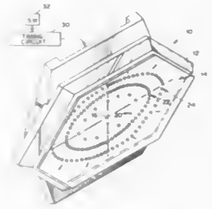
MULTIMODE DIGITAL TIMEPIECE

Mohammed N. Kotob, 58 Princeton St., 2nd Flr., Bridgeport, Conn. 06605

Filed Aug. 22, 1988, Ser. No. 234,537

Int. Cl.[5] G04C *17/02*

U.S. Cl. 368—240 **4 Claims**



1. In a timepiece, a display comprising:

means for generating timing signals;

a first array of elements illuminable in sequence in response to the timing signals to indicate hours;

a second array of sixty elements illuminable in sequence in response to the timing signals to indicate minutes; and

switch means for selecting between a normal mode of operation wherein the sixty elements of the second array are illuminated sequentially to indicate the passage of minutes in one-minute increments and a teaching mode of operation wherein only every fifth element of the second array is illuminated sequentially to indicate the passage of minutes in five-minute increments.

4,920,525

QUIET ALARM CLOCK

Jack B. Meister, 68 Chimney Ridge Dr., Covent Station, N.J. 07961

Continuation-in-part of Ser. No. 197,742, May 23, 1988, abandoned. This application Nov. 3, 1988, Ser. No. 267,236

Int. Cl.[5] G04C *21/00;* **G04B** *37/00*

U.S. Cl. 368—250 **10 Claims**

1. An alarm clock comprising:

a flat rectangular enclosure,

a vibrator including an electric motor positioned within said enclosure and responsive to application of electrical power for emitting mechanical vibration energy,

an electronic clock mouted within said enclosure and including a self-contained battery power source, means for set-

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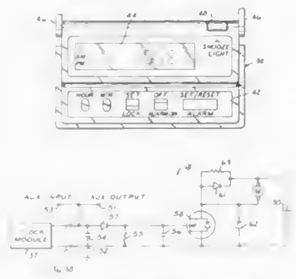
ting time of day and alarm time at said clock, an alphanmeric clock display positioned in one wall of said enclosure, and an alarm output, and

means including a second battery power source and solid-state electronic switch means within said enclosure responsive to said alarm output for connecting said second battery power source to said electric motor,

said electronic clock, including said self-contained battery



power source, said time setting means and said display, comprising a separate module removably fastened within said enclosure,

said enclosure including a generally rectangular pocket on said one wall, said electronic clock module being removable positioned in said pocket, there being mating electrical connection means on said module and in said pocket for securing said module in said pocket and feeding said alarm signal to said solid-state switch means.

4,920,526

TIMEPIECE ASSEMBLY INCLUDING SHEET WITH WRISTWATCH REMOVABLE THEREFROM

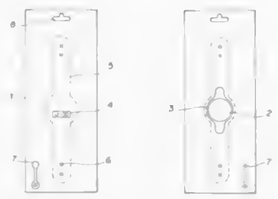
Yasuhiko Saito, Tokyo, Japan, assignor to Sony Creative Products Incorporation, Tokyo, Japan

Filed Aug. 15, 1988, Ser. No. 232,603

Claims priority, application Japan, Feb. 10, 1988, 63-16746[U]

Int. Cl.[5] G04B *37/00*

U.S. Cl. 368—281 13 Claims



1. A timepiece assembly that easily can be displayed by a merchant and that then may be converted into a wristwatch by a customer, said assembly comprising:

a sheet of a material that is suitable for forming a wristwatch band;

a timepiece movement fixed to a rear surface of said sheet, said timepiece movement having a time display section;

said sheet having formed therethrough an opening at a position and of a shape corresponding to said time display section; and

means defining on said sheet an outline of a shape suitable for use, upon removal of said shape from said sheet, as a wristwatch and an integral wristwatch band, said outline encompassing said opening and that area of said sheet to which is fixed said timepiece movement;

whereby, upon removal by a customer of said shape from said sheet, said removed shape having fixed thereto said timepiece movement may be employed by the customer as a wristwatch.

4,920,527

FOCUSING ERROR DETECTION APPARATUS

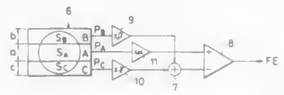
Takanori Maeda, Saitama, Japan, assignor to Pioneer Electronic Corp., Tokyo, Japan

Filed Jan. 7, 1988, Ser. No. 141,394

Claims priority, application Japan, Jan. 7, 1987, 62-2160

Int. Cl.[5] G11B *7/13*

U.S. Cl. 369—45 8 Claims



1. In a disk reproducing apparatus, a light beam focusing apparatus comprising:

a light beam source;

a light reception member divided, with respect to a first axis, into three light receiving portions, including a first light receiving portion having a first width a measured along a second axis perpendicular to said first axis, and second and third light receiving portions, one on either side of said first light receiving portion in a direction of said second axis, and having second and third widths b and c, respectively, measured along said second axis, said light reception member being positioned so as to intersect an optical axis of the light being emitted by said light beam source, first, second, and third photodetector outputs respectively being output in response to said light beams striking said first, second and third light receiving portions, said light beam having a radius r at a point of contact with said light reception surface; and

focus error signal producing means for combining said first, second, and third outputs to provide a focus error signal indicative of focus error,

wherein said first, second, and third widths are determined in accordance with the following formula:

$$2r+dc>a+b+c,$$

wherein dc is a maximum distance that said light beam can deviate along said second axis from a center of said first light receiving portion while said level of said focus error signal remains below a predetermined reference value.

4,920,528

METHOD OF DISK RECORDING USING ALTERNATIVE RECORDING TRACKS

Noriaki Sakamoto, Soraku; Yoshiki Nishioka, Tenri; Toshihiro Yamanaka, Ikoma; Nobuyuki Horie, Yamatokoriyama; Shozou Kobayashi; Toshihisa Deguchi, both of Nara, and Shigemi Maeda, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 19, 1987, Ser. No. 16,258

Claims priority, application Japan, Feb. 20, 1986, 61-36066; Feb. 20, 1986, 61-36069

Int. Cl.[5] G11B *27/36*

U.S. Cl. 369—54 3 Claims

1. A method for recording data on a disklike recording medium in a read after write system having a plurality of primary recording tracks, and a substitute map recording area with each of the plurality of primary recording tracks having a predetermined number of primary recording sectors and a

predetermined number of alternate recording sectors comprising the steps of:

(a) accessing one of said plurality of primary recording tracks;

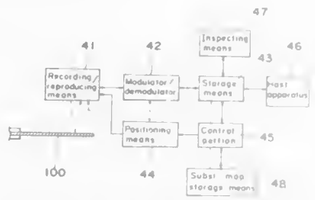
(b) accessing one of said predetermined number of primary recording sectors of said one primary recording track;

(c) determining whether said one primary recording sector contains errors;

(d) writing data to said one primary recording sector when errors are determined to be absent from said one recording sector;

(e) accessing one of said predetermined number of alternate recording sectors when errors are determined to exist in said one recording sector;

(f) determining whether said one alternate recording sector is available for writing data;



(g) writing data to said one alternate recording sector when said one alternate recording sector is available for writing data;

(h) determining whether one of said predetermined number of alternate recording sectors is available to be accessed when said one alternate recording sector fails to be available for writing data and accessing said one alternate recording sector that is determined to be available;

(i) repeating steps (f) - (h) when one of said predetermined number of alternate recording sectors is available to be accessed; and

(j) writing data to an alternate recording track and writing substitute map information to the substitute map recording area indicative of the location of said one primary recording track and said one primary recording sector when each of said predetermined number of alternate recording sectors fails to be available for access.

4,920,529

NETWORK CONTROL METHOD AND APPARATUS THEREFOR

Ryoichi Sasaki, Fujisawa; Tsutomu Nakamura, Musashino; Michio Suzuki, Yokohama; Kohsuke Shinnai, Machida; Nobuhiko Ido, Yokohama, and Tomoaki Tsunoda, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Micro Computer Engineering Ltd., Kodaira, both of, Japan

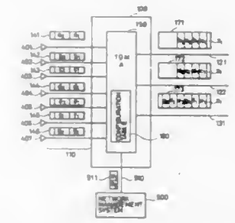
Filed Feb. 12, 1988, Ser. No. 155,416

Claims priority, application Japan, Feb. 27, 1987, 62-42676; Mar. 6, 1987, 62-50030

Int. Cl.[5] H04L *11/08*

U.S. Cl. 370—16 7 Claims

1. In a system comprising a TDM network, comprising a plurality of TDMs each comprising means for multiplexing data from subscriber circuits for communication and means for managing a local station, and communicating trunks connecting said TDMs mutually, and a network management system executing management of the network by interchanging management information through the means for managing of each TDM, a network control method wherein the aforesaid communicating trunks are divided into main communicating channels for interchanging user data and subordinate communicating channels for interchanging management information, and wherein communications of user data are executed by using the main communicating channels in accordance with a fixed routing table set before-hand, while communications of the



management information are executed by using one of flooding and source-routing functions, selected in accordance with the state of the aforesaid TDM network.

4,920,530

ADAPTIVE TIME-DISCRETE FILTER FOR FORMING A CANCELLING SIGNAL FROM SYNCHRONOUS DATA SYMBOLS

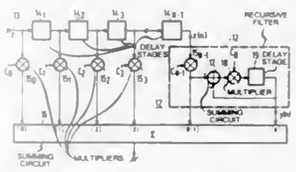
Kornelis J. Wouda, and Simon J. M. Toi, both of Hilversum, Netherlands, assignors to AT&T and Philips Telecommunications B.V., Hilversum, Netherlands

Filed Dec. 15, 1987, Ser. No. 132,293

Claims priority, application Netherlands, Dec. 22, 1986, 8603247

Int. Cl.[5] H04J *15/00*

U.S. Cl. 370—32.1 4 Claims



1 An adaptive time-discrete filter having an impulse response h(i) with i=0, 1, 2, . . . for forming a cancelling signal from synchronous data symbols,, this filter comprising a transversal filter section having adjustable coefficients C_i with i=0,1,2, . . . , N−1 for realising the initial N values h(i) of the aforesaid impulse response, means for adaptively adjusting the filter coefficients C_i, a recursive filter section having coefficients for realising the values h(i) of the impulse response for i=N, N+1, . . . , as well as means for summing the output signals of both filter sections for obtaining the cancelling signal, characterized in that the time-discrete input signal x(n) of the recursive filter section is formed by the adaptive filter input signal delayed over N−1 discrete time intervals and the recursive filter section is suitable for forming a time-discrete output signal y(n) having a relationship with the input signal x(n) as expressed in the following equation

$$y(n)=C_B[C_A\times(n-1)+y(n-1)]$$

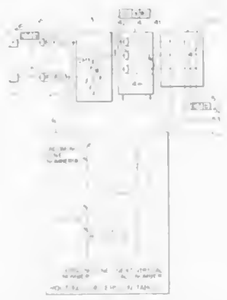
where C_A is equal to the last adjustable coefficient C_{N-1} of the transversal filter section and C_B is a predetermined fixed coefficient.

4,920,531

HEADER DRIVEN PACKET SWITCHING SYSTEM AND METHOD

Osamu Isono; Tetsuo Nishino, both of Kawasaki, and Eisuke Iwabuchi, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 19, 1988, Ser. No. 157,621
Claims priority, application Japan, Feb. 19, 1987, 62-36736
The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.
Int. Cl.[5] H04J *3/26*
U.S. Cl. 370—60 13 Claims



1. A header driven packet switching system including hardware for routig a data packet coming through one of incoming lines and rewriting a header of said data packet according to routing information added to said header of said data packet, comprising:

a pluraity of packet header processing circuits disposed indpendently from said incoming lines, for controlling the routing and header rewriting of said data packet; and

connecting means for detecting free circuits from among said plurality of packet header processing circuits, and for connecting said one incoming line with one of the detected free packet header processing circuits.

4,920,532

ELECTRICAL DEVICE COMMAND SYSTEM, SINGLE WIRE BUS AND SMART SINGLE CONTROLLER ARRANGEMENT THEREFOR

Thomas R. Wroblewski, Sterling Heights, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

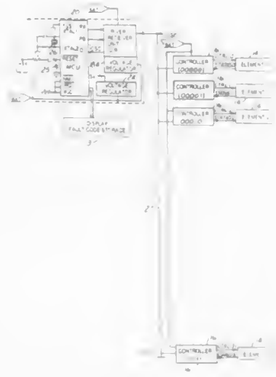
Filed Dec. 7, 1988, Ser. No. 280,917
The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.
Int. Cl.[5] H04J *3/26*
U.S. Cl. 370—85.1 5 Claims

1. A multiplex system within a motor vehicle for commanding and monitoring the status of a plurality of electrical devices or elements disposed throughout the motor vehicle, each of the elements having command terminals for receiving commands in the form of a discrete voltage signal for activating or deactivating each of the elements, one of the command terminals also being used to provide a status indication of each of the elements in the form of a current signal upon being commanded, said system comprising:

(a) a bi-directional, single wire bus for transmitting in a first direction a series of square wave double duty cycle voltage signals used for commanding ON or OFF the plurality of elements and for transmitting in a second direction, a series of current signals used for indicating the ON or OFF status of the plurality of elements;

(b) a plurality of smart single controllers disposed throughout the motor vehicle, each one of said single controllers being disposed near one of the elements for commanding the element ON or OFF, each one of said single controllers having:

1. a single input/output terminal connected by a single wire to a single point along said bus for receiving the square-wave voltage signal;
2. integration means for converting the square-wave voltage signal into a dual-amplitude, sawtooth-pulse waveform containing address and data information wherein a first amplitude pulse represents LOW bit and a second amplitude pulse represents HIGH bits;
3. detection means for detecting an address code of said sawtooth-pulse waveform in order to enable said single controller to command the accompanying element when the detected address code matches a preprogrammed address of said single controller;
4. means for detecting a data bit code from said sawtooth-pulse waveform in order to determine whether to turn ON or OFF the accompanying element;
5. means for commanding the accompanying element ON or OFF, said commanding means including means for transmitting a current signal back over said bus indicative of the status of the element after commanding the element ON or OFF;



c. a driver and receiver means, receiving power from a power source of the vehicle and connected to said single-wire bus, for generating the series of square-wave, double-duty cycle voltage signals used by each of said single controllers; said driver and receiver means also including means for receiving the status of the elements indicating current signals transmitted over said bus;

d. display means for displaying the status of the plurality of elements; and

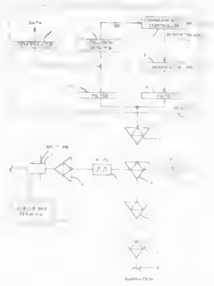
e. a microcomputer means interconnecting said driver and receiver means and said display means for (1) writing logic commands to said driver and receiver means for controlling the generating of the series of square-wave, double-duty cycle voltage signals used for placing address and command information on said bus; (2) reading the current signals indicative of the status of the commanded element; (3) establishing a history of performance of each of the commanded elements; and (4) transferring updated status information to said display means.

4,920,533

CATV SUBSCRIBER TERMINAL TRANSMISSION CONTROL

Michel Dufresne, Boucherville; Samir Sammoun, Brossard; Dave Gregory, Calgary; Jean-Paul Champagne, Brossard; Alain Tessier, Piedmont; Pierre Scott, and Francois Methot, both of Montreal, all of Canada, assignors to Videotron LTEE, Montreal, Canada

Filed Oct. 26, 1988, Ser. No. 262,802
Claims priority, application Canada, Nov. 2, 1987, 550764
Int. Cl.[5] H04N *7/08*
U.S. Cl. 370—85.2 30 Claims



1. A bidirectional cable communication system comprising:

(a) a head end,

(b) a bidirectional transmission network connected to the head end for transmitting signals downstream from the head end to a plurality of subscriber stations and for transmitting data signals upstream to the head end from the subscriber stations,

(c) means at the head end for detecting collisions between signals received from the subscriber stations and for generating a collision signal,

(d) means at the head end for transmitting downstream on the transmission, network status bits of data signals indicative of said collision, whereby upon detection thereof by a subscriber station it can be enabled to cease transmission.

4,920,534

SYSTEM FOR CONTROLLABLY ELIMINATING BITS FROM PACKET INFORMATION FIELD BASED ON INDICATOR IN HEADER AND AMOUNT OF DATA IN PACKET BUFFER

Harry W. Adelmann, Neptune, and James D. Tomcik, Aberdeen, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 28, 1986, Ser. No. 834,904
Int. Cl.[5] H04L *11/20*
U.S. Cl. 370—94.1 9 Claims

1. Apparatus for use in an arrangement for transmitting packets, each of the packets having a header and an information field including a plurality of bits, comprising,

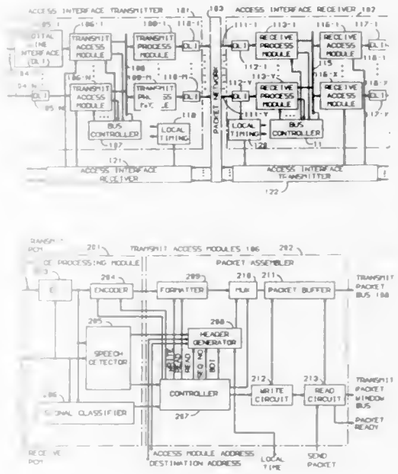
a field in the header of each current packet including a bit elimination indicator indicating whether or not bits may be eliminated from the current packet information field,

buffer storage means for storing bits of currently supplied packets,

means for determining the amount of packet bits presently stored in said buffer storage means,

means for comparing an amount of packet bits presently stored in said buffer storage means to predetermined threshold levels to generate bit elimination control signals, and

means responsive to said bit elimination control signals and to said bit elimination indicator for controllably eliminating bits from the packet information field of a current packet being supplied to said buffer storage means, if necessary, wherein the length of said packet is shortened, if necessary.

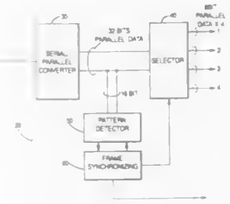


4,920,535

DEMULTIPLEXER SYSTEM

Toshiaki Watanabe, Kawasaki; Kazuo Iguchi, Yokohama; Tetsuo Soejima, Tokyo, and Shinji Ohta, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 14, 1988, Ser. No. 284,395
Claims priority, application Japan, Dec. 14, 1987, 62-315821
Int. Cl.[5] H04J *3/06*
U.S. Cl. 370—105.1 9 Claims



8. A demultiplexer system for demultiplexing frames including frame bytes, comprising:

converting means for receiving and converting serial multiplexed frame bytes into parallel multiplexed frame bytes;

frame synchronization means for simultaneously detecting a predetermined frame synchronization pattern and a prede-

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termined byte within said frame synchronization pattern; and

selector means for arranging the frames based on said predetermined byte.

4,920,536

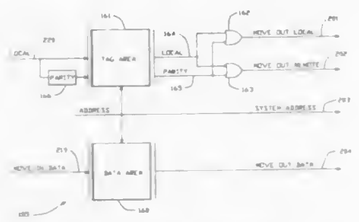
ERROR RECOVERY SCHEME FOR DESTAGING CACHE DATA IN A MULTI-MEMORY SYSTEM

Gary N. Hammond; Michael D. Taylor, and Nongnuch Taylor, all of San Jose, Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Oct. 14, 1988, Ser. No. 258,202

Int. Cl.[5] G06F *11/10, 11/16*

U.S. Cl. 371—10.1 **16 Claims**



1. A data processing system, comprising:

at least a first memory facility and a second memory facility;

a processor connected to the memory facilities addressing data in the first memory facility and the second memory facility by a system address, wherein the processor includes:

a cache for storing data staged from the memory facilities, including means for storing the system addresses of the data staged and means for storing indicators which identify the memory facilities from which the data is staged;

means coupled to the cache for detecting errors in an indicator during a destaging operation;

means coupled to the cache for destaging data and addresses to a memory facility identified by the corresponding indicator if no error in the indicator is detected;

means coupled to the cache for destaging data and the corresponding system address to each of the memory facilities if an error is detected in a corresponding indicator; and the each of said memory facilities includes:

means for receiving the system addresses and data destaged from the processor, including means for checking system addresses destaged from the processor to determine to which memory facility the corresponding destaged data belongs.

4,920,537

METHOD AND APPARATUS FOR NON-INTRUSIVE BIT ERROR RATE TESTING

Andrew S. Darling, 10725 Santa Anita Terrace, Damascus, Md. 20872, and Mark R. Testardi, 17128 King James Way #202, Gaithersburg, Md. 20877

Filed Jul. 5, 1988, Ser. No. 215,394

Int. Cl.[5] G06F *11/00*

U.S. Cl. 371—5.1 **11 Claims**

1. A method of measuring a bit error rate of a data stream in a digital communications circuit comprising the steps of:

repeatedly intermittently sampling data bits in the data stream according to a sampling algorithm at upstream and downstream monitor points to produce upstream and downstream sets of sampled data bits;

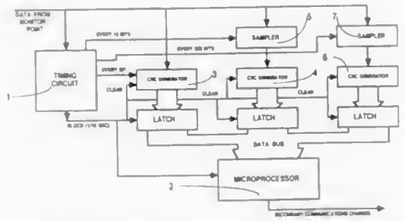
dividing the upstream set of sampled data bits into upstream blocks of predetermined block size;

computing upstream block check codes on the upstream blocks;

dividing the downstream set of sampled data bits into downstream blocks of predetermined block size;

computing downstream block check codes on the downstream blocks;

synchronizing the sampling of the data bits at the upstream and downstream monitor points, the dividing of the upstream and downstream sets of sampled data bits into the upstream and downstream blocks, and the computing of the upstream and downstream block check codes in order to ensure that the upstream block check codes are computed on the upstream blocks that are made up of the data bits that represent the same positions in the data stream as the data bits that make up the downstream blocks on which the downstream block check codes are computed;



comparing the upstream block check codes that are computed on the upstream blocks that are made up of the data bits that represent the same positions in the data stream as the data bits that make up the downstream blocks on which the downstream block check codes are computed and the downstream block check codes with each other to determined a number of miscompares; and

determing a bit error rate or a quantity representative thereof based on the number of miscompares.

4,920,538

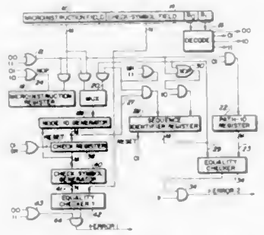
METHOD OF CHECKING THE EXECUTION OF MICROCODE SEQUENCES

Joni N. Chan, Los Altos Hills, and Andrew Moy, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1985, Ser. No. 750,346

Int. Cl.[5] G06F *11/00*

U.S. Cl. 371—19 **6 Claims**



1. A method for detecting impermissible traversals in a system in which selective traversals (jumps or branches) along extents of the symbol string are dictated by embedded pointers, and further in which the symbol string includes single entrance, single exit (SESE) substrings, comprising the steps of:

(a) processing the symbol string by:

(1) deriving the labeling ones of a set of permissible traversals from the SESE substrings;

(2) generating a global label indicative of one permissible traversal through the symbol string of the set of permissible traversals and then scaling the labels obtained in step (a1) of remaining ones of the set of permissible traversals such that transitioning along a permissible traversal always yields the same global label;

(3) embedding the labels within SESE substrings;

(b) executing the processed symbol string by:

(4) reading the SESE substrings from a boundary (entrance/exit) of an arbitrary substring to a boundary of another arbitrary substring and computing from each read substring at least one label indicative of the traversal and

(5) comprising the embedded label with computed label such that a mismatch is indicative of error.

4,920,539

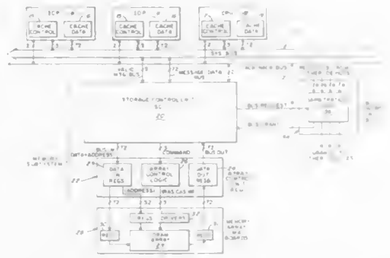
MEMORY ERROR CORRECTION SYSTEM

David Albonesi, Hudson, Mass., assignor to Prime Computer, Inc., Natick, Mass.

Filed Jun. 20, 1988, Ser. No. 209,285

Int. Cl.[5] G06F *11/10*

U.S. Cl. 371—40.2 **42 Claims**



1. In a computer system having a processing unit, memory, memory control unit, system communication bus, and bus control unit, a method of correcting memory errors, comprising the steps of, detecting a data error while data is being transferred from memory to the system bus and generating corresponding corrected data if a data error is detected, storing at the memory control unit at least the address field and source identification code associated with the just detected data error, generating a bus request signal coupled to the bus control unit, said bus control unit, in turn, generating a bus grant signal, said memory control unit in response to said bus grant signal issuing a read message on the system bus having an address field and destination identification code corresponding to said stored address field and source identification code, and in response to said read message, the device indicated by said identification code, writing back to memory the correct data corresponding to said address field.

4,920,540

FAULT-TOLERANT DIGITAL TIMING APPARATUS AND METHOD

Kurt F. Baty, Medway, Mass., assignor to Stratus Computer, Inc., Marlboro, Mass.

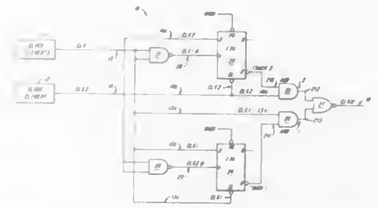
Filed Feb. 25, 1987, Ser. No. 18,629

Int. Cl.[5] G06F *1/04, 11/20;* H04Q *3/54*

U.S. Cl. 371—61 **2 Claims**

2. Computer timing apparatus for producing a single stream of timing pulses continually when at least any one of first and second input sequences of timing signals are present, said apparatus comprising

A. multi-stable binary logic means for receiving said first and second input sequences of timing signals and for producing, in response thereto, first and second sequences of clock-tracking signals, each sequence of clock-tracking signals being responsive to occurrence of a transition in at least one input sequence of timing signals, and



B output logic means for logically combining each input sequence of timing signals with its corresponding clock-tracking signal to generate a corresponding resultant signal, and for logically combining the resultant signals to produce a single stream of output signals responsive to a next transition in any of said first and second input sequences of timing signals.

4,920,541

APPARATUS FOR GENERATING VARIOUS LASER WAVELENGTHS FROM THE SAME LASER MEDIUM

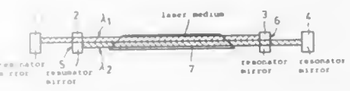
Reinbold Baumgartner, Freising; Hans Lenz, Munich; Herbert Stepp, Gräfelfing, and Eberhard Unsöld, Oberschleissheim, all of Fed. Rep. of Germany, assignors to Gesellschaft für Strahlenund Umweltforschung mbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 155,593, Feb. 12, 1988, abandoned. This application May 25, 1989, Ser. No. 357,654

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1987, 3704338

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—23 **12 Claims**



1 In a laser device for producing laser light outputs having various groups of laser wavelengths from a same laser medium with the use of resonator mirrors, the laser device having a laser cavity and resonator mirrors, the laser medium being disposed in the cavity, two of the resonator mirrors being end resonators disposed at opposite ends of the cavity on opposite sides of the laser medium, the improvement wherein the resonator mirrors include at least four resonator mirrors linearly arranged outside of the laser medium, two of which are the end resonator mirrors and at least two of which are disposed between the end resonator mirrors and serve as respective resonator boundaries for respective ones of the various groups of laser wavelengths and constitute respective intracavity elements for the other of the various groups of laser wavelengths, transmitting the others of the various groups of laser wavelengths therethrough, the device further comprising means for at least one of switching and regulating the intensity of the wavelength groups, said means including means for tilting said two end resonator mirrors.

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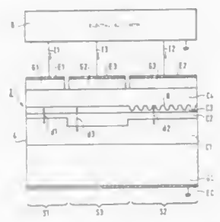
4,920,542

TUNABLE SEMICONDUCTOR LASER

Philippe Brosson, Forges Les Bains; Joël Jacquet, Orsay; Claude Artigue, Paris; Denis Leclerc, Bourg La Reine, and Jacques Benoit, Orsay, all of France, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Mar. 22, 1989, Ser. No. 351,893
Claims priority, application France, Nov. 25, 1988, 88 15467
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—50 10 Claims



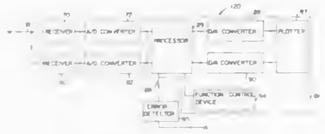
1. An improved tunable semiconductor laser comprising:
a monolithic semiconductor wafer made up of layers (C1, C2, C3, C4) whose thicknesses are superposed in a superposition direction, said layers extending and/or following one another in a longitudinal direction and in a transverse direction and constituting an internal longitudinal light guide (C2, C3) between confinement layers (C1, C4) having lower refractive indices in order to guide a light beam to be emitted, said light guide comprising:
an active layer (C2) having a forbidden energy band which is narrower than in the adjacent layers (C1, C3), and
a grating layer (C3),
first and second ones of said confinement layers (C1, C4) having opposite conductivity types so that electrical injection currents passing from one of said first and second confinement layers to the other pass through said light guide, injecting free carriers therein and consequently modifying its optical gain and its refractive index;
three sections of said plate following one another in said longitudinal direction as follows:
an amplification section (S1) in which the thickness of said active layer is suitable for amplifying said light and constitutes an amplification thickness;
a phase tuning section (S3); and
a grating section (S2) which is situated at a first end of said plate and in which the thickness of said grating layer (C3) varies in alternation at a grating pitch along said longitudinal direction, thereby forming a distributed Bragg reflector grating (R) having an equivalent pitch for said light, said equivalent pitch being controllable by controlling the refractive index of a control layer (C2) of said light guide in said grating section;
said laser also comprising:
amplification electrodes (E1, EC) for injecting one of said injection currents into said amplification section, said current being an amplification current and being suitable for causing positive optical gain for said light to appear in said active layer;
phase tuning electrodes (E3, EC) for injecting one of said injection currents into said phase tuning section (S3), said current being a phase tuning current and being suitable for controlling the refractive index of said control layer (C2), thereby controlling the optical length for said light of said phase tuning section;
grating control electrodes (E2, EC) for injecting one of said injection currents into said grating section, said current being a grating control current suitable for controlling said equivalent pitch of said distributed reflector (R); and
a second reflector (4) at a second end of said plate in order to constitute a laser oscillator suitable for emitting said light, thereby enabling a central frequency of said light to be controlled by the value of said grating control current and enabling stable monomode operation of said laser oscillator to be obtained by controlling said phase tuning current;
improvement whereby said active layer (C2) extends over at least one of said phase tuning section (S3) and said grating section (S2) in such a manner as to constitute said control layer therein, thereby widening the tuning range and/or reducing the spectrum line width of said laser.

4,920,543

CHARACTERIZATION OF DIGITAL RADIO SIGNALS

Andrew L. Martin, Ferny Creek, Australia, assignor to Australian Telecommunication Corporation, Melborne, Australia

Division of Ser. No. 829,150, Feb. 24, 1986, Pat. No. 4,766,600.
This application May 25, 1988, Ser. No. 198,459
Claims priority, application Australia, May 15, 1984, PG4999; Dec. 24, 1984, PG8701
Int. Cl.[5] H04B *17/00*
U.S. Cl. 375—10 16 Claims



8. A method of characterising the performance of a digital microwave receiver connected to receive and demodulate a digitally modulated microwave carrier signal which may be subject to distortion due to multipath fading, said method comprising the steps of:
detecting and monitoring the error rate in the signal as received and demodulated by the receiver under test,
when said error rate lies between predetermined limits,
repetitively measuring at time-spaced intervals during a test period the level and sign of the amplitude dispersion of the signal as received, and
accumulating first counts of the number of times that said dispersion measurement fall within each one of a series of ranges of possible dispersion levels, both positive and negative, and
displaying said first count against measurement range for both positive and negative dispersion levels.

4,920,544

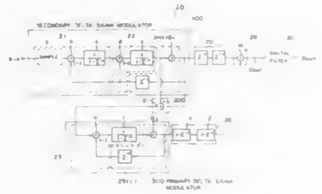
DELTA-SIGMA MODULATOR

Seiji Endo, Kawasaki; Osamu Kobayashi, Yokohama, and Masatsugu Kamimura, Kobe, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 10, 1989, Ser. No. 308,555
Claims priority, application Japan, Feb. 10, 1988, 63-29291
Int. Cl.[5] H04B *14/04*
U.S. Cl. 375—26 11 Claims

1. A delta-sigma modulator comprising:
secondary delta-sigma modulation means for carrying out a secondary delta-sigma modulation for an analog input signal, thereby producing a first quantization signal;
quantization noise extracting means for extracting a quantization noise occurring in said secondary delta-sigma modulation means;
primary delta-sigma modulation means for carrying out a first delta-sigma modulation for said quantization noise, thereby producing a second quantization signal;
differentiating means for differentiating said second quantization signal supplied from said primary delta-sigma modulation means; and

adding means for adding said first quantization signal and an output signal of said differentiating means, thereby producing a digital output signal corresponding to said analog input signal.

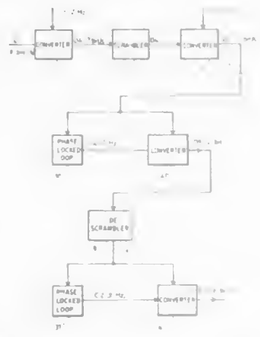


4,920,545

METHOD AND APPARATUS FOR TRANSMITTING A SYNCHRONOUS DATA SIGNAL ON A TRANSMISSION MEDIUM ON WHICH THE TRANSMISSION RATE IS GREATER THAN THE DATA SIGNAL BIT RATE

Gunnar S. Forsberg, Stockholm, and Stefan E. Josefsson, Hägersten, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE88/00100, § 371 Date Nov. 14, 1988, § 102(e) Date Nov. 14, 1988, PCT Pub. No. WO88/07301, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 3, 1988, Ser. No. 275,052
Claims priority, application Sweden, Mar. 11, 1987, 8701013-8
Int. Cl.[5] H04B *15/00*
U.S. Cl. 375—58 8 Claims



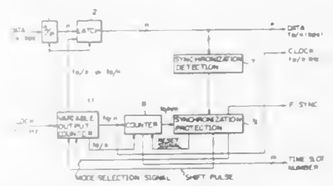
1. Method of transmitting a synchronous data signal on a transmission medium on which the transmission rate is greater than the data signal bit rate, which includes the steps of, oversampling the data signal in a transmitter with a sampling frequency which is equal to the transmission rate on the transmission medium, transmitting the data signal on the transmission medium, generating a clock signal in a receiver such that the clock signal is phase-locked to the transmitted data signal and has a frequency which is substantially equal to the bit rate of the original synchronous data signal, and resampling the transmitted data signal with the clock signal formed in the receiver, wherein the improvement comprises the step of: modifying the synchronous data signal in the transmitter such that an uneven distribution of the transmitted data signal's edge positions in relation to their mean positions is avoided, whereby incorrect locking-in of the clock signal formed in the receiver is avoided.

4,920,546

FRAME SYNCHRONIZING APPARATUS

Kazuo Iguchi, Yokohama; Tetsuo Soejima, Tama; Kazuo Murano, Shibuya; Shigeo Amemiya, Yokohama; Hiroaki Komine; Toshiaki Watanabe, both of Kawasaki, and Tomohiro Shinomiya, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 31, 1988, Ser. No. 176,294
Claims priority, application Japan, Mar. 31, 1987, 62-078168; Mar. 31, 1987, 62-078169
Int. Cl.[5] H04L *7/00*
U.S. Cl. 375—106 18 Claims



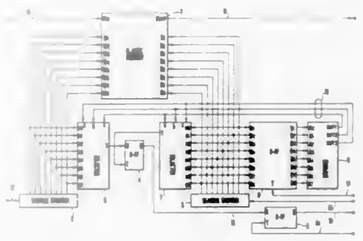
1 A frame synchronizing apparatus in a receiving apparatus for receiving digital signals for PCM communication, said digital signals including serial signals at a rate of f_0 bits per second (bps), said serial signals including a frame synchronizing signal with n bits or a part of the frame synchronizing signal, collectively arranged in one frame, said frame synchronizing apparatus comprising:
latching means for converting said serial signals into parallel signals and for latching said parallel signals in response to a latch timing pulse;
synchronization detecting means for detecting said frame synchronizing signal from said parallel signals;
latch timing signal generating means for generating said latch timing pulse at a rate of f_0/k (bps) where $1<k<n$, so that said latching means latches said parallel signals a plurality of times while receiving a frame of said digital signals; and
phase shifting means for changing the rate of said latch timing pulse in response to said synchronization detecting means not detecting said frame synchronizing signal while receiving said frame.

4,920,547

STUFF SYNCHRONIZATION CIRCUIT

Kureani Murakami, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Dec. 1, 1987, Ser. No. 127,498
Claims priority, application Japan, Dec. 2, 1986, 61-287448
Int. Cl.[5] H04L *7/00*
U.S. Cl. 375—112 10 Claims



1 A stuff synchronization circuit comprising:

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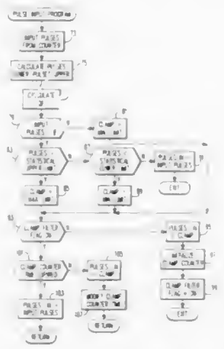
a memory in which writing and reading are performed at different timings;
phase comparison means for detecting a phase difference between a write timing for a specific bit included in data input to said memory and a read timing for the specific bit;
stuff judgment means for judging an insertion timing of stuff pulses on the basis of the detected phase difference;
and control means for keeping a time interval between a time at which the phase difference is detected by said phase comparison means and a time at which the insertion timing of stuff pulses is judged by said stuff judgment means constant.

4,920,548

SOURCE RANGE NEUTRON FLUX COUNT RATE SYSTEM INCORPORATING METHOD AND APPARATUS FOR ELIMINATING NOISE FROM PULSE SIGNAL

Louis W. Gaussa, Jr., Penn Township, Westmoreland County; Kingsley F. Graham, Murrysville; John B. Lipchak, Forest Hills, and Lesley Greenberg, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 28, 1988, Ser. No. 250,471
Int. Cl.[5] G21C *17/00*
U.S. Cl. 376—255 20 Claims



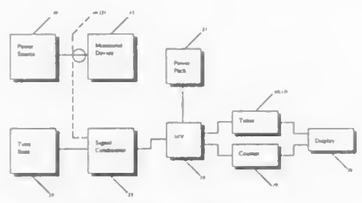
1. Apparatus for generating nuclear reactor source level neutron pulse count rates selectively filtered to reduce frequency burst noise, said apparatus comprising:
detector means generating a pulse signal representative of neutron emissions and containing frequency burst noise;
pulse count rate signal generating means repetitively generating a pulse count rate signal from said pulse signal representative of pulses counted in a time interval of selected duration, with the pulse count rate signal for the most recent interval being the current pulse count rate signal;
pulse count rate signal limit generating means generating from previous values of said pulse count rate signal a statistical limit inside of which said current pulse count rate signal should statistically remain within a preselected probability;
comparison means comparing said current pulse count rate signal with said statistical limit; and
output generating means including means generating a selectively filtered pulse count rate signal having a value of said current pulse count rate signal when said current pulse count rate signal is inside of said statistical limit and clamping means clamping said selectively filtered pulse count rate signal to said statistical limit when said current pulse count rate signal is outside said statistical limit.

4,920,549

TIME DEMAND COUNTER

John Dinovo, 4026 W. St. John, Glendale, Ariz. 85308

Filed Feb. 8, 1988, Ser. No. 153,260
Int. Cl.[5] G07C *5/02, 3/02*
U.S. Cl. 377—16 20 Claims



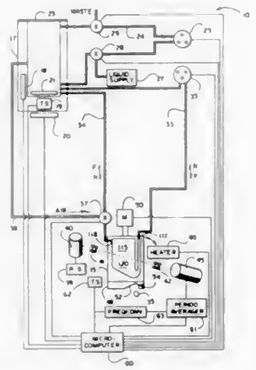
1. In a time demand counter having
current sensing means for detecting, by current flow, the actuation of a device being monitored;
timing means for timing and accumulating a record of total elapsed time of actuation of a device being monitored; and
actuating means coupling said sensing means and said timing means for actuating said timing means when the device being monitored it itself activated and for dectuating said timing means when the device being monitored is not activated;
the improvement wherein:
said current sensing means is a nonloading device so as to cause insignificant loading on the operation of a device being monitored.

4,920,550

X-RAY PARTICLE SIZE ANALYZER

James P. Olivier, Lawrenceville; Mary F. Kane, Atlanta; Clyde Orr, Jr., Dunwoody; Charles L. Laughinghouse, Stone Mountain; Jack J. Wagner, Dunwoody, and Samuel V. Tidwell, Norcross, all of Ga., assignors to Micromeritics Instrument Corporation, Norcross, Ga.

Continuation-in-part of Ser. No. 115,499, Oct. 30, 1987. This application Nov. 25, 1987, Ser. No. 125,395
Int. Cl.[5] G01N *23/06*
U.S. Cl. 378—51 29 Claims



1. A method of acquiring information relating to the distribution of particle sizes in a sample undergoing sedimentation in a suspension of said sample in a fluid medium contained in a sample cell, while passing an x-ray beam from a single x-ray source mounted for movement relative to said cell through said suspension of said sample, comprising the steps of:
(a) moving one of said cell and said x-ray source to aim said x-ray beam at a first predetermined location along said cell spaced apart from the location at which said x-ray source is aimed at the start of sedimentation;
(b) waiting at said predetermined location until one or more selected times after the beginning of sedimentation; and
(c) while relative movement of said cell and said x-ray source is stopped, measuring and recording the transmittance of x-rays through said cell containing said suspension of said one or more selected times.

4,920,551

ROTATING ANODE X-RAY TUBE

Hiroshi Takahashi, and Kenichi Takahara, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 912,911, Sep. 29, 1986, abandoned. This application May 9, 1989, Ser. No. 349,927
Claims priority, application Japan, Sep. 30, 1985, 60-216581
Int. Cl.[5] H01J *35/26*
U.S. Cl. 378—125 5 Claims

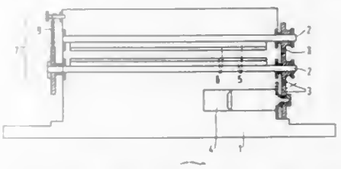
1. A rotating anode x-ray tube comprising:
a vacuum housing;
an anode support shaft located at least in part inside said housing;
means for rotating said support shaft;
a ring-shaped target which generates x-rays in response to thermion bombardment;
an anode disk having a central axis of rotation and a circumferential peripheral edge lying in a plane perpendicular to said axis of rotation, said target mounted to said disk adjacent said peripheral edge, said disk including means, formed as a solid unitary structure with said disk and remote from said peripheral edge, for mounting said disk to said support shaft within said housing to permit rotation of said disk about said axis of rotation, said means for mounting located inside and remote from said ring-shaped target to leave a portion of said disk between said target and said means for mounting, said disk formed as a solid unitary structure along said plane, including that portion of said disk coincident with said axis of rotation, and said disk having a thickness which increases exponentially radially inward from said peripheral edge of said disk to said means for mounting at a rate sufficient to equalize stress radially within said disk upon rotation of said support shaft; and
means for bombarding said target with thermions to generate said x-rays.

4,920,552

X-RAY APPARATUS COMPRISING AN ADJUSTABLE SLIT-SHAPED COLLIMATOR

Joannes L. G. Hermens, Hoensbroek, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 16, 1989, Ser. No. 324,380
Claims priority, application Netherlands, Mar. 24, 1988, 8800738
Int. Cl.[5] G21K *1/04*
U.S. Cl. 378—153 20 Claims



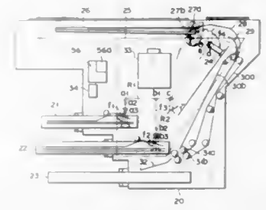
1. An X-ray apparatus, comprising an X-ray source for generating an X-ray beam for irradiating an object space, detection means for detecting X-rays from said source having passed through the object space, and a collimator which is positioned between the X-ray source and the object space in order to collimate the X-ray beam so as to obtain a fan-shaped beam of adjustable thickness for irradiating said object space, wherein the collimator comprises a pair of opposed collimator slats which are pivotable about parallel axes, each slat extending from the axis about which said slat is pivotable to a free end of said slat remote from said axis for intercepting any portions of said X-ray beam lying outside a slit aperture of desired width determining the beam thickness, each slat carrying at its free end an X-ray absorbing bar, the bars carried by the slats having respective opposed smooth arcuate surfaces for defining between the bars the width of said slit aperture, and means for angularly positioning said collimator slats about said axes.

4,920,553

FILM FEEDER OF A CASSETTELESS X-RAY PHOTOGRAPHIC APPARATUS

Shigeru Sasaki, and Hisashi Sakakihara, both of Ootawara, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 27,130, Mar. 16, 1987, abandoned, which is a continuation of Ser. No. 583,228, Feb. 24, 1984, abandoned. This application Jan. 2, 1988, Ser. No. 205,035
Claims priority, application Japan, Feb. 26, 1983, 58-31590
Int. Cl.[5] G03B *42/04*
U.S. Cl. 378—173 10 Claims



1. A film feeder of a cassetteless x-ray photographic apparatus, comprising:
a frame;
at least first and second magazines for respectively storing a plurality of unexposed films of first and second sizes;
a recovery magazine for storing exposed films;
a holder movable between first and second positions for

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holding an unexposed film therein, the holder having an end for insertion of the unexposed film into the holder when the holder is in the first position, the exposed film in the holder being positioned for exposure with the holder in the second position, and after exposure the film being supported for discharge from the holder at said end thereof with the holder in the first position;

a common suction means of picking up and holding one of the unexposed films stored in the first and second magazines;

a first guide path extending to said first position from the first and second magazines;

film return guide path extending to the recovery magazine from said first position, the second guide path being different from the first guide path;

a driving means for moving the suction holding the unexposed film in vertical and horizontal directions, rotating the suction means, and moving the suction means to said first position of said holder along the first guide path; and

a return mechanism for transporting the exposed film along said film return guide path to the recovery magazine from said first position.

4,920,554

COMPACT TYPE X-RAY EMITTER

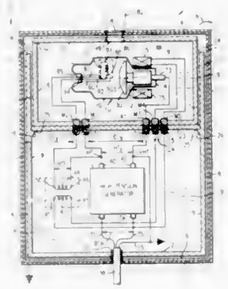
Emile Gabbay, and Jacques Le Guen, both of Paris, France, assignors to General Electric CGR SA, Paris, France

Filed Oct. 28, 1988, Ser. No. 263,898

Claims priority, application France, Oct. 30, 1987, 87 15054

Int. Cl.[5] H01J *35/10*

U.S. Cl. 378—200 **10 Claims**



1. An X-ray emitting device of the X-ray unit type, comprising:

a metallic casing, said casing containing an X-ray tube and a power supply means to supply the X-ray tube with high voltage and low voltage,

said X-ray tube and said supply means are respectively immersed in separate electrically insulating fluids, wherein

the X-ray tube and the supply means are respectively contained in first and second imperviously sealed chambers and which are detachable electrically connected with each other, with said two chambers being entirely or partially made of an electrically insulating material.

4,920,555

COMPACT TELEPHONE LINE TEST APPARATUS

Daryl E. Ingalsbe, Blair, Nebr., assignor to Independent Technologies, Inc., Omaha, Nebr.

Filed Sep. 27, 1988, Ser. No. 249,825

Int. Cl.[5] H04M *1/24;* **H04B** *3/46*

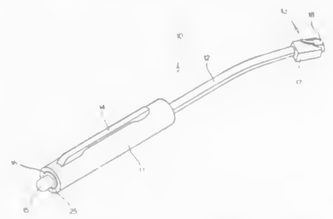
U.S. Cl. 379—21 **17 Claims**

1. A compact telephone line test apparatus to determine the operative status of a telephone line having a modular connector comprising:

(a) a housing structure having a hollow interior and opposing first and second apertured ends;

(b) a tri-state light emitting diode of a predetermined length having predetermined activation states and being partially disposed within said housing structure and through said first aperture along its length so that it extends to the exterior of said housing structure to provide a wide angle viewing perspective;

(c) current limiting means disposed within said housing structure interior;



(d) a printed circuit board to electrically connect in series, said light emitting diode and said current limiting means, said printed circuit board being fixed within said housing structure and engaged by said housing structure interior so that it maintains said light emitting diode in said extended position; and

(e) modular connection means being communicatively connected to said printed circuit board and extending from said second aperture of said housing structure whereby said tri-state light emitting diode visually indicated the operative status of the telephone line when said modular connection means is connected to the telephone line.

4,920,556

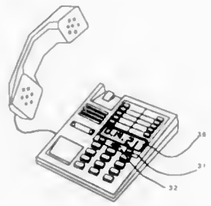
TELEPHONE WITH BUILT-IN EMERGENCY PANIC SWITCH, LONG DISTANCE TOLL TIMER AND MUSIC ON HOLD CARDS

Keith K. Wong, 15 Wilderness Trail, Warren, N.J. 07060

Filed Feb. 13, 1989, Ser. No. 309,497

Int. Cl.[5] H04M *1/21, 1/27, 11/04, 15/00*

U.S. Cl. 379—51 **10 Claims**



1. A telephone comprising one, two, or, all of the following:

a timer circuit to save long distance tolls;

a panic switch to activate a circuit to automatically call multiple numbers and to broadcast an emergency message;

a means to allow the phone user to play different music recordings when the phone is on HOLD by plugging in different music generator cards.

4,920,557

RADIO COMMUNICATION APPARATUS

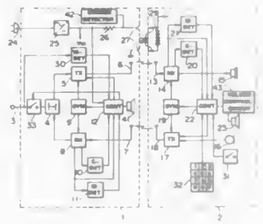
Yuji Umemoto, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 13, 1983, Ser. No. 243,751

Claims priority, application Japan, Sep. 14, 1987, 62-230232

Int. Cl.[5] H04Q *7/04*

U.S. Cl. 379—61 **9 Claims**



1. A radio communication apparatus comprising:

a base unit connected to a communication line;

a radio terminal unit driven by a battery and connected to the base unit via a radio circuit;

a speaker provided at the base unit for generating a ring tone when there is an incoming signal from the communication line;

means for detecting physical connection of the radio terminal unit to the base unit to charge the battery of the terminal unit; and

control means for causing the speaker to generate a ring tone when there is an incoming signal from the communication line in a state where the radio terminal unit is physically connected to the base unit for charging the battery, and causing the radio terminal unit to generate a ring tone for a predetermined time when there is an incoming signal from the communication line in a non-charging state in which the radio terminal unit is not physically connected to the base unit.

4,920,558

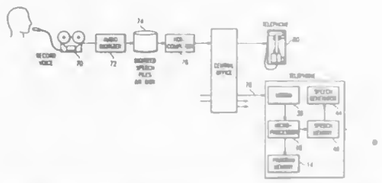
METHOD AND APPARATUS FOR DOWNLOADING SPEECH FILES

John A. Hird, Dallas; Lindsey D. Owen, and Michael R. Rice, both of Carrollton, all of Tex., assignors to Intellicall, Inc., Carrollton, Tex.

Filed Jan. 23, 1989, Ser. No. 300,835

Int. Cl.[5] H04M *17/00*

U.S. Cl. 379—67 **21 Claims**



1. A system for programming a local telecommunications device for use with a telecommunications network comprising:

prompts to be used by the telecommunications device to inform a user of the telecommunications device and a called party;

a formatting device for organizing said prompts into a formatted file;

a transmitter for transmitting said formatted file to the telecommunications device over the telecommunications network; and

a message memory resident in the telecommunications device for storing said formatted file such that said prompts may be selectively converted into messages and used to inform the user of the telecommunications device and the called party during the completion of telephone calls from telecommunications device.

4,920,559

TELEPHONE ANSWERING DEVICE WITH REMOTE CONTROL TIMING MARK

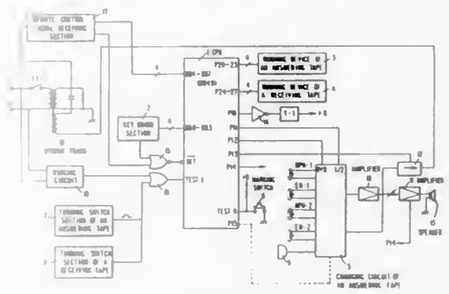
Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Dec. 28, 1987, Ser. No. 138,897

Claims priority, application Japan, Dec. 27, 1986, 61-310669

Int. Cl.[5] H04M *1/65*

U.S. Cl. 379—74 **5 Claims**



1. A telephone answering device, comprising:

means for recording an outgoing message on an outgoing message recording medium;

means for confirming the outgoing message;

a switch for a marking signal which is momentarily turned on during said outgoing message confirming operation;

means for storing into a first memory means a first marking position on the outgoing message recording medium where said marking switch is turned on during announcement of a specific word which is known only to a user of the device;

means for storing into a second memory means a second marking position on the outgoing message recording medium where said marking switch is released;

means for setting the device to the standby mode after said marking positions are stored;

means for engaging the telephone line in response to a ringing signal which arrives in the standby mode, and for playing back said outgoing message to send out; and

means for enabling a remote retrieval of an incoming message recording medium in response to a remote control signal which arrives between said first marking position and said second marking position during the playback of said outgoing message.

4,920,560

METHOD OF AUTOMATIC DIALING AND AUTOMATIC DIALING DEVICE FOR FACSIMILE APPARATUSES

Kenichi Kageyama, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 18, 1988, Ser. No. 156,888

Claims priority, application Japan, Feb. 18, 1987, 62-21296[U]

Int. Cl.[5] H04M *11/00;* **H04N** *1/32*

U.S. Cl. 379—100 **2 Claims**

1. A method of automatic dialing for facsimile apparatuses, comprising the steps of:

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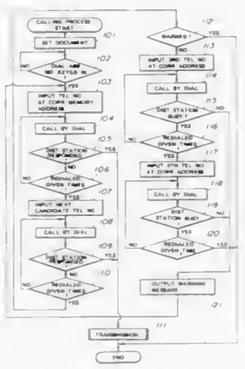
registering, in a memory, a plurality of abbreviated numbers;
storing, in said memory, telephone numbers of a first and second facsimile apparatus of a receiving side, of a predetermined receiving side telephone set, and of a predetermined calling side telephone set, for each of the plurality of abbreviated numbers;
selecting one of the stored abbreviated numbers coinciding with an input abbreviated number;
reading four telephone numbers corresponding to the selected abbreviated number, said four telephone numbers including said telephone numbers of the receiving side's first facsimile apparatus, of the receiving side's second facsimile apparatus, of the receiving side telephone set, and of the calling side telephone set;
first, automatically dialing the corresponding telephone number of the receiving side's first facsimile apparatus and confirming a response thereto;
transmitting predetermined picture image data to the receiving side's first facsimile apparatus when a response is received at the first automatically dialing step;
second, automatically dialing the corresponding telephone number of the receiving side's second facsimile apparatus and confirming a response thereto when no response is received at the first automatically dialing step;
transmitting predetermined picture image data to the receiving side's second facsimile apparatus when a response is received at the second automatically dialing step;



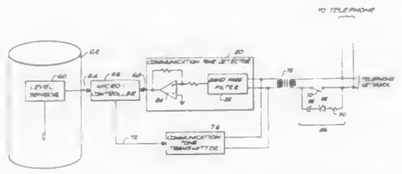
third, automatically dialing the corresponding telephone number of the receiving side telephone set and confirming a response thereto when no response is received at the second automatically dialing step;
transmitting to the receiving side telephone set a first voice message indicative of an abnormality at the receiving side's first and second facsimile apparatuses when a response is received at the third automatically dialing step;
fourth, automatically redialing, after the voice message transmission step, the corresponding telephone number of the receiving side's first facsimile apparatus and confirming a response thereto;
transmitting predetermined picture image data to the receiving side's first facsimile apparatus when a response is received at the fourth automatically redialing step;
fifth, automatically redialing the corresponding telephone number of the receiving side's second facsimile apparatus and of confirming a response thereto, when no response is received at the fourth automatically redialing step;
transmitting predetermined picture image data to the receiving side's second facsimile apparatus when a response is received at the fifth automatically redialing step;
sixth, automatically dialing the corresponding telephone number of the calling side telephone set and confirming a response thereto, when no response is received at the third automatically dialing step; and
transmitting to the calling side telephone set a second voice message indicative of an abnormal facsimile communication when a response is received at the sixth automatically dialing step.

4,920,561

RING DETECTOR FOR TELEPHONE LINE

Andrew C. Mitchell, Chelmsford, Mass., assignor to Scully Signal Company, Wilmington, Mass.

Filed Oct. 28, 1988, Ser. No. 263,716
Int. Cl.[5] H04M *1/00*
U.S. Cl. 379—106 20 Claims



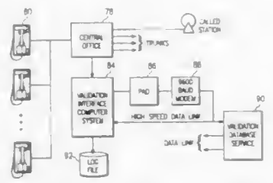
1. In a communication device for receiving information over a telephone line, said device having receiver circuitry for receiving information having frequencies within the telephone voice band and extracting data therefrom, an apparatus for detecting incoming ring signals and outgoing pulse dial signals on said telephone line, said apparatus comprising:
means responsive to said incoming ring signals and to said outgoing pulse dial signals for generating intermediate signals having frequencies within said telephone voice band;
means for providing said intermediate signals directly to said receiver circuitry so that said receiver circuitry can extract ringing and dialing data therefrom; and
means responsive to said ringing and dialing data for detecting incoming ring signals and outgoing dial pulses on said telephone line.

4,920,562

AUTOMATIC GENERATION OF BILLING RECORDS AT A TELEPHONE PAYSTATION

John A. Hird, Dallas; Lindsey D. Owen, and Michael R. Rice, both of Carrollton, all of Tex., assignors to Intellicall, Inc., Carrollton, Tex.

Filed Jan. 23, 1989, Ser. No. 300,828
Int. Cl.[5] H04M *15/30, 17/02*
U.S. Cl. 379—132 35 Claims



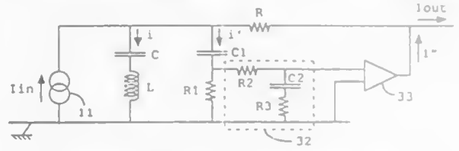
1. A telecommunications system for processing a telephone call made by a user of the system, comprising:
a pay telephone station;
circuitry at said station for creating and storing a billing record associated with the call containing information relating to the identity of an appropriate party to be billed for the call and information relating to a rate to be charged for the call and a chargeable amount of time for the call; and
circuitry for transferring the billing record from said station to a storage unit to enable the subsequent billing of charges associated with the call to said appropriate party.

4,920,563

CIRCUIT COMPENSATING FOR THE ATTENUATION OF A NOTCH FILTER AT FREQUENCIES LESS THAN CUT-OFF FREQUENCY THEREOF

Frédéric Lemaire, Saint Egreve, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Feb. 14, 1989, Ser. No. 310,113
Claims priority, application France, Feb. 16, 1988, 88 02176
Int. Cl.[5] H03H *5/02*
U.S. Cl. 379—413 5 Claims



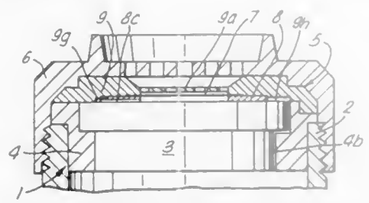
1. A compensation circuit for the attenuation caused on a line by a series LC type notch filter at frequencies less than the filter cut-off frequency, such filter being connected across the line and a reference voltage node, comprising:
a first resistor (R) in series in the line and having first and second terminals,
a series circuit comprising a capacitor (C1) and a second resistor (R1) connected across the line and the reference voltage node, the capacitor being connected on the side of the first terminal of said first resistor, and
an amplifier (33), the input of which is connected to the connection point of the said capacitor (C1) and of the second resistor (R1) and the output of which is connected to the second terminal of the first resistor (R), such amplifier having a transconductance at said frequencies lower than the filter cut-off frequency of such a value as to feed to the second terminal of said first resistor a current substantially equal to the sum of the currents carried by said series circuit and said notch filter.

4,920,564

MOISTURE BARRIER ASSEMBLY

Martin D. Allkins, Ipswich, England, assignor to British Telecommunications public company limited, London, England

Filed Nov. 16, 1988, Ser. No. 271,816
Claims priority, application United Kingdom, Nov. 19, 1987, 8727072
Int. Cl.[5] H04M *1/03;* **H04R** *1/28*
U.S. Cl. 379—437 12 Claims



1. A microphone unit for a telephone handset, the microphone unit comprising a microphone mount, a microphone mounted in the microphone mount, and a demountable moisture barrier assembly for preventing ingress of moisture into the microphone, the moisture barrier assembly comprising a support plate, a moisture barrier, and a generally annular seal, the support plate having a perforated portion covered by the moisture barrier, the annular seal being fixed to the peripheral portion of the moisture barrier and to the support plate so as to be sealable against the front face of the microphone, wherein the moisture barrier is fixed to the support plate so as to be spaced by a predetermined distance from the perforated portion, and venting passageway means are provided for venting the space between the moisture barrier and the microphone to a space within said handset on that side of the microphone remote from the moisture barrier.

4,920,565

METHOD FOR CONNECTION OF SECURE CONFERENCE CALLS

Leo Strawczynski, Ottawa, and David G. Steer, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 18, 1988, Ser. No. 220,190
Int. Cl.[5] H04L *9/04*
U.S. Cl. 380—6 51 Claims

41. A secure teleconference network for interconnecting a number of secure telephone sets, comprising:
communications network means having switching nodes and transmission links for establishing a chain-like connection pattern between said secure telephone sets, such that each teleconference user communicates with a user of an adjacent set;
each secure telephone set being comprised of:
means for decrypting a first incoming secure call from a first teleconference user to provide a first incoming signal;
means for decoding said first incoming signal to provide a first incoming speech signal;
means for decrypting a second incoming secure call from a second teleconference user to provide a second incoming signal;
means for decoding said second incoming signal to provide a second incoming speech signal;
user interface means having an input and an output;
means for detecting the presence of and decoding a user's output speech signal from the output of said user interface means;
signal processing circuit means having a first and a second input for receiving said first and second incoming speech signal and a third input for receiving said output speech signal;
first means at said signal processing means for summing said first and second speech signals to provide a first summed signal;
code translation circuit means for conversion of said first summed signal and for forwarding to the input of said user interface means;
second means at said signal processing means for summing said speech signals of said second and third inputs to provide a first outgoing speech signal;
first means for coding said first outgoing speech signal to provide a first outgoing signal;
means for encrypting said first outgoing signal to provide an outgoing secure call for transmission to another teleconference user;
third means at said signal processing means for summing said

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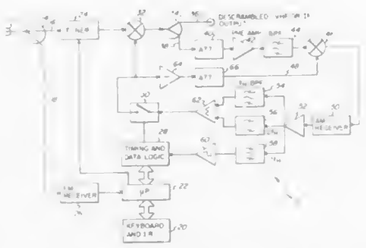
speech signals of said first and third inputs to provide a second outgoing speech signal;
second means for coding said second outgoing speech signal to provide a second outgoing signal for transmission to a second adjacent user;
means for encrypting said second outgoing signal to provide an outgoing secure call for transmission to another teleconference user;
and conference control means for requesting, setting-up and supervising the interconnections of said secure telephone sets through said communications network means.

4,920,566

DUAL LOOP SINEWAVE DESCRAMBLER AND METHOD OF DESCRAMBLING

Clyde Robbins, Maple Glen, and Daniel Marz, Dresher, both of Pa., assignors to General Instrument Corporation, New York, N.Y.

Filed Feb. 1, 1989, Ser. No. 305,434
Int. Cl.[5] H04N 7/167
U.S. Cl. 380—19 4 Claims



1. A method of descrambling a television signal, the video portion of which has been scrambled by a sinewave scrambling signal which is also impressed on the audio portion of the television signal, said method comprising:
receiving a scrambled television signal, said scrambled television signal having a picture carrier and a sound carrier, both of which carriers have AM sinewave modulation for effecting scrambling of the television signal;
applying the received television signal to a dual loop circuit to detect the AM sinewave modulation on the sound carrier;
applying the detected AM sinewave modulation to the picture carrier in a first loop of said circuit to cancel the AM sinewave modulation on the picture carrier; and
applying the detected AM sinewave modulation to the sound carrier in a second loop of said circuit to increase the AM sinewave modulation on the sound carrier.

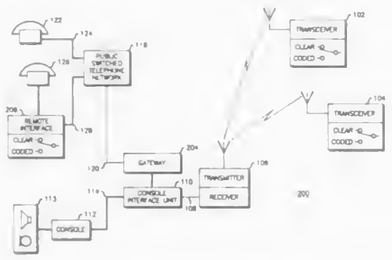
4,920,567

SECURE TELEPHONE TERMINAL

Charles J. Malek, Crystal Lake, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 3, 1986, Ser. No. 682,652
Int. Cl.[5] H04M 11/00; H04L 9/00
U.S. Cl. 380—33 22 Claims

1. A secure communications system for a plurality of predetermined subscribers, each accessible on a conventional telephone via the telephone network, such that clear analog or encrypted digital message signals may be exchanged end-to-end automatically, the system comprising:
a telephone network having a plurality of predetermined subscribers;
at least two remote interface means, one co-located at each predetermined subscriber's conventional telephone, each including:
(a) signal converting means, including at least a half-duplex modem having a signalling format compatible with other systems, for accommodating clear or encrypted message signals; and
(b) mode selecting means, responsive to said half-duplex modem based upon characteristics of a received inbound message signal applied thereto as well as responsive to a desired mode by the predetermined subscriber, for automatically selecting a clear or encrypted mode in said



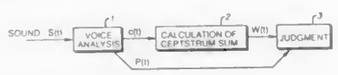
signal converting means, and switching to the encrypted mode upon receipt of a first train which disables echo cancellers on the telephone network and which adjusts adaptive equalizers in the modem to permit passage of high-speed digital data in the encrypted mode, and a second train preceding each transmission of an encrypted message signal, so that secure, end-to-end communications take place automatically over said telephone network.

4,920,568

METHOD OF DISTINGUISHING VOICE FROM NOISE

Shin Kamiya, and Toru Ueda, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 882,233, Jul. 7, 1986, abandoned. This application Oct. 11, 1988, Ser. No. 256,151
Claims priority, application Japan, Jul. 16, 1985, 60-159149; Jun. 4, 1986, 61-130604
Int. Cl.[5] G10L 3/00
U.S. Cl. 381—46 5 Claims



1. A method of distinguishing voice from noise in a sound signal comprising the steps of
sampling a sound signal periodically at a fixed frequency over a sampling period to obtain sampled values,
dividing said sampling period equally into a plural N-number of intervals,
identifying each of said intervals as a vowel interval, a noise interval or a no-sound interval by a predefined identification procedure,
obtaining an N_1-number which is the total number of said intervals identified as a vowel interval, and an N_2-number which is the total number of said intervals identified as a noise interval, and
concluding that said sampling period is a voice period if $(N_1+N_2)/N$ is greater than a predetermined first critical number r_1 and $N_1/(N_1+N_2)$ is greater than a predetermined second critical number r_2,
said predefined procedure for each of said intervals including the steps of

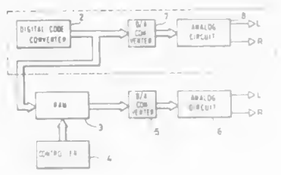
calculating a power value from the absolute squares of said sampled values,
calculating a cepstrum sum from the absolute values of linear predictive (LPC) cepstrum coefficients obtained from said sampled values, and
identifying said interval to be a vowel interval if said power value is greater than an empirically predetermined first threshold value and said cepstrum sum is greater than an empirically predetermined second threshold value.

4,920,569

DIGITAL AUDIO SIGNAL PLAYBACK SYSTEM DELAY

Junichi Yoshio, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 1, 1987, Ser. No. 127,140
Claims priority, application Japan, Dec. 1, 1986, 61-286441
Int. Cl.[5] H03G 3/00; H04H 5/00
U.S. Cl. 381—61 4 Claims



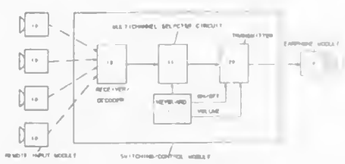
1. A signal processing circuit in a playback system for playing back and processing a digital audio signal, said playback system including a digital output stage for producing a digital audio signal, means for converting said digital audio signal to an analog signal and means for providing said analog signal to a first sound reproduction means, said circuit comprising:
storage means for temporarily storing data corresponding to said digital audio signal output from said digital output stage of said playback system:
control means for controlling said storage means in such a manner that said data will be output from said storage means with a time difference with respect to said digital audio signal; and
means for performing computation on said digital audio signal and the data output from said storage means;
wherein an output of said computation performing means is combined with said digital audio signal and the combination thereof is input to said storage means.

4,920,570

MODULAR ASSISTIVE LISTENING SYSTEM

Henry L. West, 169 Rosemont Dr., Rochester, N.Y. 14617, and Joseph D. Kozelsky, 1214 Gerrads Cross, Webster, N.Y. 14580

Filed Dec. 18, 1987, Ser. No. 134,829
Int. Cl.[5] H04R 25/00; H04B 5/00
U.S. Cl. 381—68 11 Claims



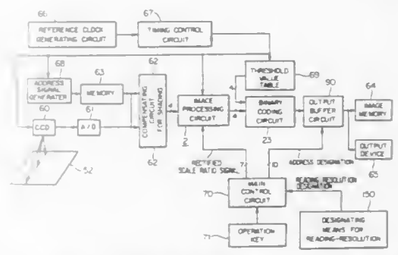
1. A modular assistive listening system comprising:
a. a plurality of remote input modules for wireless transmission of a signal;
b. a hand-held switching/control module for receiving the signals transmitted from said plurality of remote input modules and selecting one or more of the signals transmitted from the plurality of remote input modules to form a selected signal, said switching/control module transmitting said selected signal via wireless transmission, wherein said hand-held switching/control module comprises a receiver/decoder circuit, a multichannel selector circuit coupled to said receiver/decoder circuit, a transmitter coupled to said multichannel selector circuit, and an override circuit coupled to said receiver/decoder circuit and said transmitter; and
c. an earphone module for receiving the selected signal transmitted by said switching/control module and reproducing the selected signal as audible sound.

4,920,571

IMAGE PROCESSING SYSTEM WITH CAPABILITY OF ENLARGING AND REDUCING OPERATIONS

Yoshinori Abe; Masahiko Matsunawa, and Hiroyuki Yamamoto, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 277,460, Nov. 23, 1988, abandoned, which is a continuation of Ser. No. 5,553, Jan. 20, 1987, abandoned. This application May 8, 1989, Ser. No. 349,952
Claims priority, application Japan, Jan. 22, 1986, 61-9946; Mar. 22, 1986, 61-64503; Mar. 22, 1986, 61-64505; Mar. 22, 1986, 61-64506
Int. Cl.[5] G06K 9/42
U.S. Cl. 382—47 30 Claims



1. An image processing apparatus for producing an image from image data of pixels and capable of enlarging or reducing the scale of the produced image by interpolating among the image data of pixels to produce an interpolated image, said apparatus comprising:
(a) means for generating image data;
(b) means for producing a scale signal related to a selected scale ratio;
(c) first memory means for storing interpolation data in look-up table form which has a list of plural sets of image data, with each of said plural sets of image data having plural sampling positions corresponding, respectively, to selection signals, each of said sampling positions being provided with interpolation data, whereby said interpolation data is retrievable by addressing said first memory means with any of said plural sets of image data and a selection signal from said selection signals for respectively designating a particular sampling position,
(d) second memory means for storing plural sets of processing data, each such set of processing data comprising said selection signal and a timing signal, wherein said plural sets of processing data correspond to every available scale ratio to form a group of data so that a group of processing data is identifiable by addressing said second memory means with a scale signal related to a selected scale ratio,

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(e) outputting means responsive to the means for producing a scale signal for retrieving from the second memory means in response to the scale signal a set of a selection signal and a timing signal corresponding to the selected scale ratio, and

(f) a control means having signal input means for receiving signals from the means for generating image data, the outputting means, and the second memory means, and signal output means coupled to the first memory means, for regulating signal passage to an output device,

said control means feeding said image data and said selection signal into said first memory means so as to address said interpolation data, and

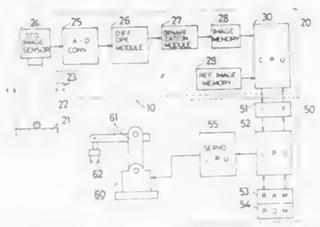
said control means determining the passage of said addressed interpolation data to said output device in accordance with said timing signal.

4,920,572

OBJECT RECOGNITION SYSTEM FOR A ROBOT

Kazuhiko Sugita, Anjyo; Shigeo Hotta, Nagoya; Osamu Matsuda, and Yoichi Yamakawa, both of Kariya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 1, 1989, Ser. No. 304,563
Claims priority, application Japan, Feb. 1, 1988, 63-21455
Int. Cl.[5] G06K *9/20*
U.S. Cl. 382—48 4 Claims



1. An object recognition system for an industrial robot, comprising:

an image sensor for taking up a gray level image of said object to be handled by said robot;

differentiation means responsive to said gray level image of said object for differentiating said gray level image;

binarization means for binarizing the gray levels of picture elements constituting said gray level image, on the basis of a predetermined threshold value so as to extract an accentuated pattern image inherent to the shape of said object;

reference image storage means for storing an accentuated reference pattern image which is inherent to the shape of a model object;

image collation means for collating said accentuated pattern image extracted by said binarization means with said reference accentuated pattern image stored in said reference image storage means; and

position calculation means for calculating the location of said object based on the result of collation obtained by said image collation means;

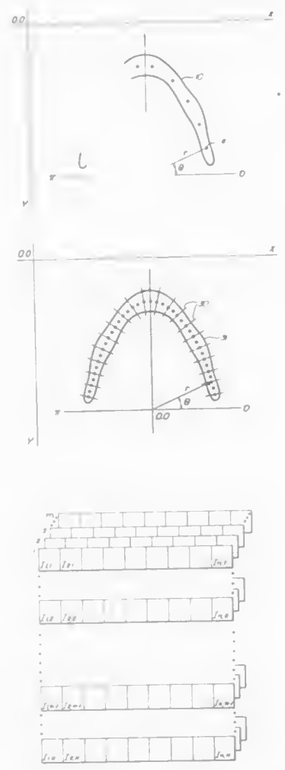
wherein said object takes the form of a substantially cylindrical object, and wherein said image sensor scans said object in a direction transverse to the axis of said cylindrical object so that said binarization means is able to output said accentuated pattern image wherein two parallel strips appear extending in the axial direction of said cylindrical shaft.

4,920,573

METHOD FOR GENERATING PERPENDICULAR SYNTHESIZED CROSS-SECTIONAL IMAGES

Michael L. Rhodes; Ada Kan, and Eva Tivattanasuk, all of Los Angeles, Calif., assignors to MPDI, Inc., Torrance, Calif.

Filed May 9, 1988, Ser. No. 193,331
Int. Cl.[5] G06K *9/00*
U.S. Cl. 382—6 5 Claims



1. A method for selecting and displaying image data corresponding to the intersection of (1) at least one generated line derived initial from an initial curve conforming to a set of initial data points input by a user, with (2) a set of image data produced in a two-dimensional field by a non-intrusive cross-sectional image generating device, comprising the steps of:

a. calculating the coordinates of at least one primary data point on the initial curve;

b. calculating the slope of a perpendicular at the calculated primary data points;

c. at each of the calculated primary data points, calvulating the coordinates of secondary data points a preset distance along a line having the calculated slope of the perpendicular, the secondary data points defining the at least one generated line derived from the initial curve;

d. addressing the set of image data by the coordinates of selected ones of the secondary data points;

e. selecting the image data at each such address; and

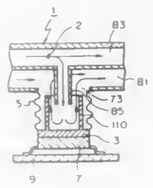
f. displaying the selected image data on a display means as an apparent cross-sectional image.

4,920,574

COOLING SYSTEM FOR AN ELECTRONIC CIRCUIT DEVICE

Haruhiko Yamamoto, Yokohama; Masahiro Suzuki, Inagi; Yoshiaki Udagawa, Tokyo; Mitsuhiko Nakata, Kawasaki; Koji Katsuyama, Yokohama; Izumi Ono, Hachioji, and Shunichi Kikuchi, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 914,942, Oct. 3, 1986, Pat. No. 4,879,632.
This application Jul. 30, 1987, Ser. No. 79,876
Claims priority, application Japan, Oct. 4, 1985, 60-221209; Oct. 4, 1985, 60-152137; Nov. 19, 1985, 60-259284; Dec. 3, 1985, 60-273069; Dec. 3, 1985, 60-273070; Dec. 3, 1985, 60-273071; Dec. 3, 1985, 60-273072; Dec. 3, 1985, 60-273073; Dec. 3, 1985, 60-273068; Jan. 28, 1986, 61-17031
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—385 11 Claims



1. In an electronic circuit device comprising a printed circuit board supporting thereon at least one electronic circuit component, a cooling system for the component comprising a cooling module which includes nozzle means for ejecting a coolant therefrom, a first heat transfer plate having a surface directly exposed to the flow of ejected coolant for transferring heat dissipated from the circuit component to the coolant, means on said surface for producing turbulence in the flow of coolant ejected from the nozzle means, and elastic means connected between the cooling module and the first heat transfer plate for resiliently biasing the first heat transfer plate toward the circuit component, said means for producing turbulence comprising a plurality of annular projections which are coaxial to each other and to the center of the flow of the ejected coolant, said projections being arranged on said surface of the first heat transfer plate

DESIGNS

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307,350
SHOE UPPER
Paul D. Brown, Hingham, and Judith Ringel, Milton, both of Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Filed Feb. 8, 1989, Ser. No. 307,567
Term of patent 14 years
U.S. Cl. D2—314

307,351
SHOE SOLE
Toshikazu Kayano, Kobe, Japan, assignor to Asics Corporation, Kobe, Japan
Filed Feb. 4, 1988, Ser. No. 152,226
Claims priority, application Japan, Aug. 8, 1987, 62-32340
Term of patent 14 years
U.S. Cl. D2—320

307,352
PROTECTIVE COVER FOR A TIE
Andre Donnie, and Linda M. Oliver, both of 19004 Haigler Dr., Carson, Calif. 90746
Filed Jul. 30, 1987, Ser. No. 80,461
Term of patent 14 years
U.S. Cl. D2—609

307,353
CRUTCH PAD OR THE LIKE
Yvonne L. Greatwood, 1515 Great Falls St., Apt. 403, McLean, Va. 22101
Filed Apr. 10, 1987, Ser. No. 36,698
Term of patent 14 years
U.S. Cl. D3—10

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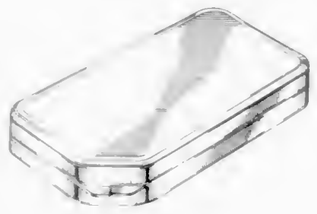
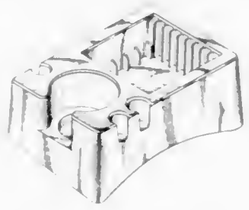
307,354
CASE
David G. Knotter, 3522 E. Pasadena Ave., Phoenix, Ariz. 85018, and Jody L. Numbers, 7908 E. Oak, Scottsdale, Ariz. 85257
Filed Sep. 29, 1986, Ser. No. 912,817
Term of patent 14 years
U.S. Cl. D3—30.1

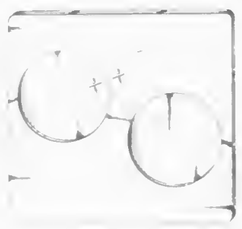


307,355
CAR CADDY
Cornelius D. Page, Jr., Lincolnton, N.C., assignor to Allied Plastics, Inc., Gastonia, N.C.
Filed Oct. 13, 1987, Ser. No. 108,358
Term of patent 14 years
U.S. Cl. D3—40

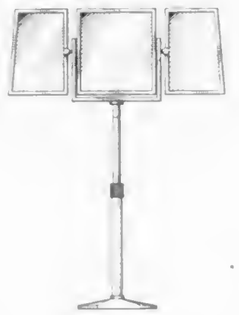


307,356
FRAMING MAT FOR A PHOTO OR THE LIKE
Mark H. Roberts, 34 Cherry Wood La., Flower Hill, N.Y. 11050
Filed Feb. 26, 1986, Ser. No. 836,586
The portion of the term of this patent subsequent to Mar. 27, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—301

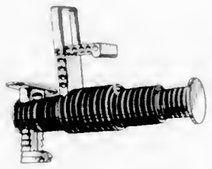
307,357
FRAMING MAT FOR A PHOTO OR THE LIKE
Mark H. Roberts, Flower Hill, N.Y., assignor to Art Leather Manufacturing Co., Elmhurst, N.N.Y.
Filed Feb. 26, 1986, Ser. No. 836,587
The portion of the term of this patent subsequent to Mar. 27, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—301



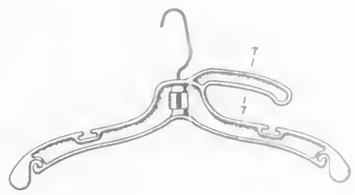
307,358
FREE STANDING PORTABLE ADJUSTABLE MIRROR
Carmel L. Gertson, 14811 Nicholas, Houston, Tex. 77085
Filed Mar. 2, 1988, Ser. No. 162,855
Term of patent 14 years
U.S. Cl. D6—302



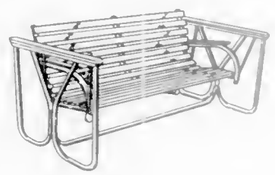
307,359
CLOTHING HANGER BRACKET FOR AUTOMOBILES
Michael T. White, 833 W. 57th Ter., Kansas City, Mo. 64123
Filed Nov. 2, 1987, Ser. No. 115,095
Term of patent 14 years
U.S. Cl. D6—323



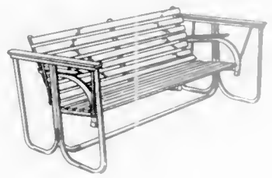
307,360
COMBINED CLOTHES HANGER AND HANDLE
Joseph D. McAllister, 3339 Ellengale Drive, Mississauga, Ontario L5C 125, Canada
Filed Jan. 19, 1988, Ser. No. 145,195
Term of patent 14 years
U.S. Cl. D6—318



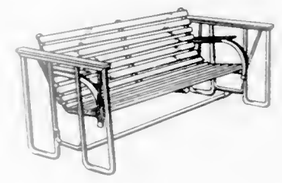
307,361
GLIDER
Charles Pomeroy, and John T. Bycraft, both of South Bend, Ind., assignors to Jack-Post Corporation, Buchanan, Mich.
Filed Jul. 26, 1985, Ser. No. 759,224
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—347



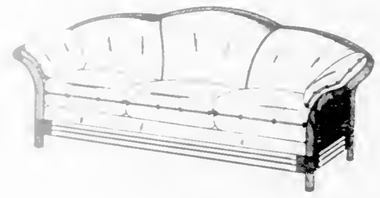
307,362
GLIDER
Charles Pomeroy, and John T. Bycraft, both of South Bend, Ind., assignors to Jack-Post Corporation, Buchanan, Mich.
Filed Jul. 26, 1985, Ser. No. 759,226
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—347



307,363
GLIDER
Charles Pomeroy, and John T. Bycraft, both of South Bend, Ind., assignors to Jack-Post Corporation, Buchanan, Mich.
Filed Jul. 26, 1985, Ser. No. 759,231
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—347



307,364
SOFA
Darrell G. Lowman, Hickory, N.C., assignor to The Lane Company, Alta Vista, Va.
Filed Jan. 13, 1987, Ser. No. 3,375
Term of patent 14 years
U.S. Cl. D6—381



307,365
FISH CLEANING TABLE
James R. Dry, 1348 Rue Crozat, Baton Rouge, La. 70810, and Mark T. Barns, 40166 Autum Hill Dr., Prairieville, La. 70769
Filed Dec. 22, 1986, Ser. No. 944,616
Term of patent 14 years
U.S. Cl. D6—429

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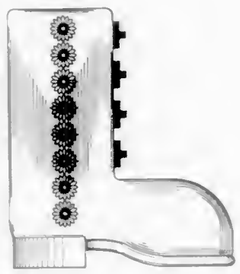
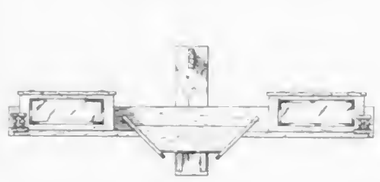
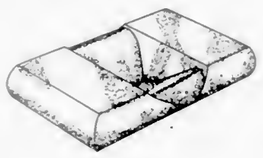
307,366
COMBINED SOAP AND TOOTH BRUSH HOLDER
Kenneth R. Merritt, 410 Pilot St., Apt. A-1, Durham, N.C. 27707
Filed Oct. 19, 1987, Ser. No. 110,510
Term of patent 14 years
U.S. Cl. D6—529



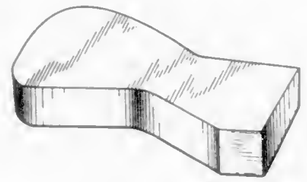
307,367
STORAGE AND DISPLAY UNIT FOR GAME BOARD AND PIECES
Paul Provins, 5211 Marion Ave., Cypress, Calif. 90630
Filed Nov. 5, 1987, Ser. No. 117,143
Term of patent 14 years
U.S. Cl. D6—552



307,368
POSTURE PILLOW
Philip B. Lockhart, and Gene A. Noonan, both of Dubuque, Iowa, assignors to Noolock, Inc., Dubuque, Iowa
Filed Sep. 18, 1987, Ser. No. 98,514
Term of patent 14 years
U.S. Cl. D6—601



307,369
BODY PILLOW
Chester L. Zollinger, 175 E. 200 North, Providence, Utah 84332
Filed Nov. 17, 1987, Ser. No. 121,733
Term of patent 14 years
U.S. Cl. D6—601



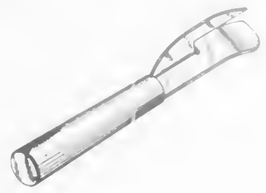
307,370
PARTIAL SEAT COVER FOR USE IN VEHICLES
Bob Bailey, Ballston Lake, and Jeffrey L. Stucker, Salem, both of N.Y., assignors to Racemark International, Inc., Ballston Spa, N.Y., a part interest
Filed Aug. 23, 1988, Ser. No. 236,111
Term of patent 14 years
U.S. Cl. D6—611

307,371
DOUGH FORMING AND CUTTING DEVICE
Michael D'Orlando, 8701 Shore Rd., Brooklyn, N.Y. 11209
Filed Nov. 6, 1987, Ser. No. 117,576
Term of patent 14 years
U.S. Cl. D7—677

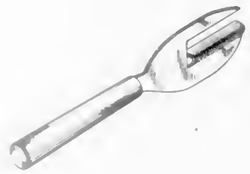
307,372
CAN HOLDER
Richard W. Aysworth, 74 Victoria Street, Clinton, Ontario N0M 1L0, Canada
Filed Oct. 6, 1987, Ser. No. 105,162
Claims priority, application Canada, Apr. 21, 1987, 21-04-87-5
Term of patent 14 years
U.S. Cl. D7—622

307,373
WINE BOTTLE HOLDER
Harold Bearak, 8221 Del Camino Dr., Scottsdale, Ariz. 85258
Filed Jul. 13, 1987, Ser. No. 72,605
Term of patent 14 years
U.S. Cl. D7—616

307,374
SHELLFISH OPENING TOOL
Kip C. Lubcke, 277 Gemini Dr., 2C, Somerville, N.J. 08876
Filed Jan. 13, 1988, Ser. No. 143,600
Term of patent 14 years
U.S. Cl. D7—695

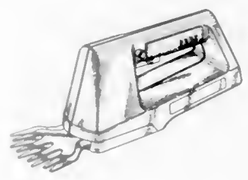


307,375
SHELLFISH OPENING TOOL
Kip C. Lubcke, 277 Gemini Dr., 2C, Somerville, N.J. 08876
Filed Jan. 13, 1988, Ser. No. 143,601
Term of patent 14 years
U.S. Cl. D7—695



307,376
KNIFE
Kazuo Kawasaki, Fukui, Japan, assignor to Ex-Design Corporation, Fukui, Japan
Filed Sep. 23, 1987, Ser. No. 99,989
Term of patent 14 years
U.S. Cl. D7—652

307,377
GRASS SHEAR
Masakazu Sakamoto, and Kiyoshi Hoshino, both of Tokyo, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Apr. 19, 1988, Ser. No. 185,769
Claims priority, application Japan, Oct. 23, 1987, 62-43468
Term of patent 14 years
U.S. Cl. D8—8



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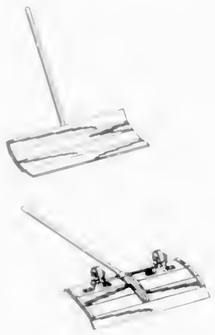
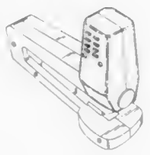
307,378
SNOW PLOW
Sandy R. D'Alessandro, 540 Powers Way, Girard, Ohio 44420
Filed Nov. 13, 1987, Ser. No. 124,119
Term of patent 14 years
U.S. Cl. D8—10

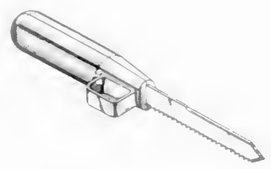


307,379
GLUE GUN
Barry Knispel, Hillsdale, N.J., assignor to Electro-Matic Staplers, Inc., Saddle Brook, N.J.
Filed Jul. 1, 1986, Ser. No. 881,012
Term of patent 14 years
U.S. Cl. D8—14.1

307,380
STAPLER
Carlos L. Jimena, 501 S. Marengo, Pasadena, Calif. 91101
Filed Dec. 30, 1988, Ser. No. 291,992
Term of patent 14 years
U.S. Cl. D8—61

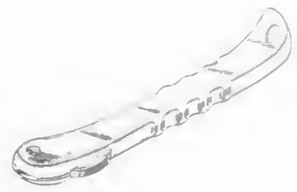


307,381
DRY WALL CUTTER
Hugh J. Kirkpatrick, 505 May Dr., Madison, Tenn. 37115; Thomas J. Lee, and James M. Lee, both of 403 Goldie Ct., Goodlettsville, Tenn. 37072
Filed May 9, 1988, Ser. No. 191,481
Term of patent 14 years
U.S. Cl. D8—95



307,382
HANDLE FOR BOW SAW
Tord Englund, Edsbyn, Sweden, assignor to Sandvik AB, Sandviken, Sweden
Filed Dec. 19, 1986, Ser. No. 943,585
Term of patent 14 years
U.S. Cl. D8—97

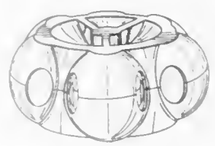
307,383
SAW HANDLE
Jung-Hua Huang, Lane 7, Sec. 1, Lu Ho Rd., Lukang 50511, Chang Hua, Taiwan
Filed May 19, 1987, Ser. No. 51,605
Term of patent 14 years
U.S. Cl. D8—97



307,384
LADDER HOOK
Charles M. Phillips, 133-10 Cherry Ave., Tyrone, Pa. 16686
Filed Feb. 8, 1988, Ser. No. 153,804
Term of patent 14 years
U.S. Cl. D8—373

307,385
COLLAPSIBLE BEVERAGE CONTAINER
Kiniehi Kimura, No. 3-21-11, Akazuka Shinmachi, Itabashi-Ku, Tokyo, Japan
Filed Jun. 11, 1987, Ser. No. 60,431
Term of patent 14 years
U.S. Cl. D9—302

307,386
EGG CARTON
Willy Nussbaumer, 15 rue de Metz, 68260 Kingersheim, France
Filed Jun. 22, 1987, Ser. No. 64,350
Term of patent 14 years
U.S. Cl. D9—341



307,387
SPOON
Jean-Pierre Bonnet, 1 rue Jean Jaurès, 92800 Puteaux, France
Filed Jan. 19, 1988, Ser. No. 144,000
Term of patent 14 years
U.S. Cl. D7—667

307,388
SPOON
Jean-Pierre Bonnet, 1 rue Jean Jaurès, 92800 Puteaux, France
Filed Jan. 19, 1988, Ser. No. 144,001
Term of patent 14 years
U.S. Cl. D7—667

307,389
SPOON
Jean-Pierre Bonnet, 1 rue Jean Jaurès, 92800 Puteaux, France
Filed Jan. 19, 1988, Ser. No. 144,002
Term of patent 14 years
U.S. Cl. D7—667

307,390
SPOON
Jean-Pierre Bonnet, 1 rue Jean Jaurès, 92800 Puteaux, France
Filed Jan. 19, 1988, Ser. No. 144,003
Term of patent 14 years
U.S. Cl. D7—667

307,391
SPOON
Jean-Pierre Bonnet, 1 rue Jean Jaurès, 92800 Puteaux, France
Filed Jan. 19, 1988, Ser. No. 144,004
Term of patent 14 years
U.S. Cl. D7—667

307,392
SPOON
Jean-Pierre Bonnet, 1 rue Jean Jaurès, 92800 Puteaux, France
Filed Jan. 19, 1988, Ser. No. 144,005
Term of patent 14 years
U.S. Cl. D7—667

307,393
SPOON
Jean-Pierre Bonnet, 1 rue Jean Jaurès, 92800 Puteaux, France
Filed Jan. 19, 1988, Ser. No. 144,006
Term of patent 14 years
U.S. Cl. D7—667

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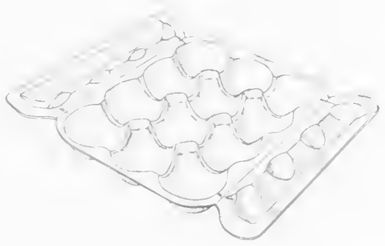
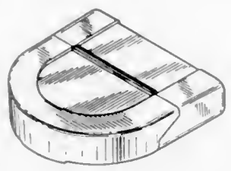
307,387
PRODUCE CONTAINER
Joe R. Payne, La Habra, and Kenneth A. Magoffin, Lake Elsinore, both of Calif., assignors to Dolco Packaging Corporation
Filed Jul. 27, 1987, Ser. No. 78,494
Term of patent 14 years
U.S. Cl. D9—341

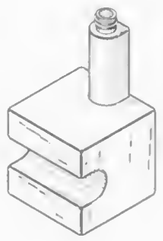


307,388
CONTAINER
Robert E. Newell, Pinner, and Paul K. Rand, Hitchin, both of England, assignors to Glaxo Group Limited, London, England
Filed Feb. 19, 1987, Ser. No. 16,322
Claims priority, application United Kingdom, Aug. 29, 1986, 1036397
Term of patent 14 years
U.S. Cl. D9—345



307,389
BOTTLE
Raymond L. Larson, Fargo, N. Dak., assignor to BMR Investments, Inc., Fargo, N. Dak.
Continuation-in-part of Ser. No. 906,156, Sep. 11, 1986. This application Dec. 11, 1986, Ser. No. 940,842
Term of patent 14 years
U.S. Cl. D9—370

307,390
BOTTLE
Juris M. Mednis, Howell, N.J., assignor to Universal Symetrics Corporation, Howell, N.J.
Filed Nov. 6, 1986, Ser. No. 927,697
Term of patent 14 years
U.S. Cl. D9—375



307,391
BOTTLE BODY
Graham J. Blair, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Apr. 15, 1987, Ser. No. 38,800
Claims priority, application United Kingdom, Oct. 16, 1986, 1037425
Term of patent 14 years
U.S. Cl. D9—376

307,392
BOTTLE
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio
Filed Aug. 24, 1987, Ser. No. 88,790
Term of patent 14 years
U.S. Cl. D9—376

307,393
FLUID CONTAINER
George R. Conrad, Dunwoody, Ga., assignor to General Electric Company, Mt. Vernon, Ind.
Filed Jun. 8, 1988, Ser. No. 203,799
Term of patent 14 years
U.S. Cl. D9—376

307,394
BOTTLE
Richard B. Wetherell, Jr., Gales Ferry, Conn., assignor to Innopak Plastics Corporation, Chesterfield, Mo.
Filed Dec. 29, 1986, Ser. No. 947,470
Term of patent 14 years
U.S. Cl. D9—378

307,395
FOOD RECEPTACLE
Rodney D. Borst, Oregon, Wis., assignor to Hoechst Celanese Corporation
Filed Dec. 2, 1986, Ser. No. 937,121
Term of patent 14 years
U.S. Cl. D9—428

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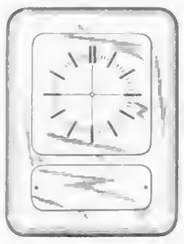
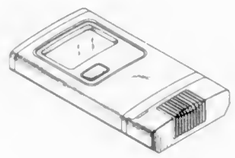
307,396
COMBINED CLOCK AND WALL PLAQUE
Peter V. Ilaria, East Hanover, and William Macowski, Caldwell, both of N.J., assignors to Tropar Manufacturing Co., Inc., Florham Park, N.J.
Filed Dec. 3, 1986, Ser. No. 937,671
Term of patent 14 years
U.S. Cl. D10—24



307,397
PAPER TESTING MACHINE
Olavi Lehtikoski, Varkaus, Finland, assignor to Robotest Oy, Kangaslampi, Finland
Filed Mar. 9, 1987, Ser. No. 23,468
Term of patent 14 years
U.S. Cl. D10—46

307,398
ATOMIC ABSORPTION SPECTROPHOTOMETER
Shouji Umemoto, Kodaira; Masamichi Tsukada, Ibaragi, and Masatoshi Kitagawa, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 7, 1987, Ser. No. 70,536
Claims priority, application Japan, Jan. 7, 1987, 62-37
Term of patent 14 years
U.S. Cl. D10—46

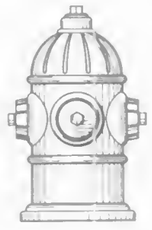
307,399
REFLECTANCE METER
Kenneth D. Collister, Elkhart, Ind., assignor to Miles Inc., Elkhart, Ind.
Filed Oct. 28, 1987, Ser. No. 113,728
Term of patent 14 years
U.S. Cl. D10—46



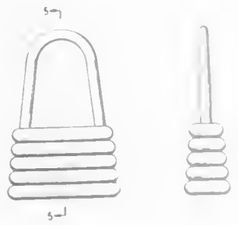
307,400
ELECTRONIC ARTICLE SURVEILLANCE ANTENNA STRUCTURE
Eric J. Armstrong, Pennsburg; James B. Eldon, Barto, and Lee T. Lamond, North Wales, all of Pa., assignors to Checkpoint Systems, Inc., Thorofare, N.J.
Filed Jan. 25, 1988, Ser. No. 147,672
Term of patent 14 years
U.S. Cl. D10—106

307,401
BADGE
Gregory D. Sunstrum, 2307 Westmount Road NW., Calgary, Alberta, Canada (T2N 3N7)
Filed Mar. 11, 1987, Ser. No. 24,394
Term of patent 14 years
U.S. Cl. D11—108

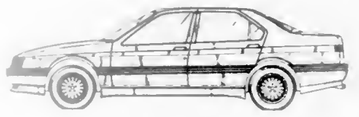
307,402
COMBINED LAWN ORNAMENT AND SPRINKLER
Raymond R. Rouse, Jr., 518 Washington St., and Donald Basen, 828 Union St., both of Hudson, N.Y. 12534
Filed Aug. 24, 1987, Ser. No. 88,900
Term of patent 14 years
U.S. Cl. D11—157

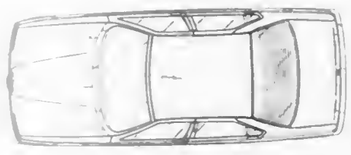


307,403
PULL TAB OF SLIDER FOR SLIDE FASTENER
Sadaho Asahi, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan
Filed Feb. 18, 1987, Ser. No. 15,968
Claims priority, application Japan, Mar. 11, 1986, 61-8675
Term of patent 14 years
U.S. Cl. D11—221



307,404
AUTOMOTIVE VEHICLE
Giorgio Guelfi, Milan; Ezio Villa; Franco Mendicino, both of Arese; Renato Pasquali, Garbagnate, and Alberto Alberti, Legnano, all of Italy, assignors to Alfa Lancia Industriale S.r.l., Arese, Italy
Filed Feb. 25, 1987, Ser. No. 18,980
Term of patent 14 years
U.S. Cl. D12—92





307,405
BICYCLE STEM
Hiroyuki Kiyota, Tokyo, Japan, assignor to Sakae Ringyo Co., Ltd., Tokyo, Japan
Filed Apr. 3, 1987, Ser. No. 33,633
Term of patent 14 years
U.S. Cl. D12—118

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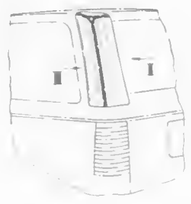
307,406
AUTOMOBILE TIRE
Kouichi Tatsumi, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Japan
Filed Mar. 17, 1987, Ser. No. 26,563
Claims priority, application Japan, Dec. 9, 1986, 61-48714
Term of patent 14 years
U.S. Cl. D12—147

307,407
VEHICLE TIRE
Masaaki Minamitani, Osaka, Japan, assignor to The Ohtsu Tire & Rubber Co., Ltd., Izumi-Ohtsu, Japan
Filed Aug. 11, 1987, Ser. No. 84,000
Claims priority, application Japan, Mar. 13, 1987, 62-9678
Term of patent 14 years
U.S. Cl. D12—147

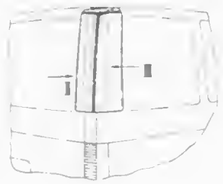
307,408
VEHICLE WINDSHIELD WIPER UNIT
Peter Mower, Whitton, and Peter C. Pethers, Winkfield, both of England, assignors to Trico Products Corporation, Buffalo, N.Y.
Filed Mar. 20, 1986, Ser. No. 845,410
Claims priority, application United Kingdom, Sep. 24, 1985, 1029455
Term of patent 14 years
U.S. Cl. D12—155

307,409
WIND DEFLECTOR
John A. Bott, 931 Lakeshore Dr., Groose Pointe Shores, Mich. 48236
Filed Mar. 4, 1987, Ser. No. 21,439
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—181

307,410
WIND DEFLECTOR
John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236
Filed Mar. 4, 1987, Ser. No. 21,440
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—181



307,411
WIND DEFLECTOR
John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236
Filed Mar. 19, 1987, Ser. No. 27,815
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—181



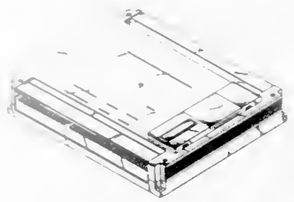
307,412
VEHICLE HOOD ORNAMENT
Elmar Kaiser, Jr., 6 Route de Meyrin, CH-1202 Geneva, Switzerland
Filed Mar. 20, 1987, Ser. No. 28,325
Claims priority, application World Int. Prop. O., Sep. 29, 1986, DM007540
Term of patent 14 years
U.S. Cl. D12—198

307,413
COMBINED VEHICLE FENDER AND RUNNING BOARD UNIT
David L. Bradley, Edwardsburg, Mich., assignor to Quality Components, Inc., Elkhart, Ind.
Filed Sep. 4, 1987, Ser. No. 93,385
Term of patent 14 years
U.S. Cl. D12—203

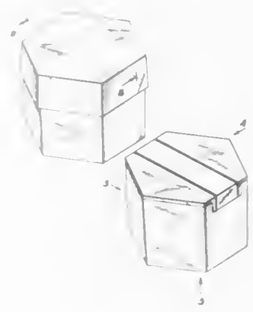
307,414
WATERCRAFT
Denys Lapointe, St-Elie d'Orford, Canada, assignor to Bombardier Inc., Canada
Filed Mar. 14, 1983, Ser. No. 167,417
Term of patent 14 years
U.S. Cl. D12—307

307,415
PROGRAMMING AND CONTROL BOX FOR AN INDUSTRIAL ROBOT
Anders Holmer, Västerås; Owe Pettersson, Surahammar; Mats Tornros, Västerås, and Peter Maddock, Stockholm, all of Sweden, assignors to Asea AB, Västerås, Sweden
Filed Dec. 5, 1986, Ser. No. 938,763
Claims priority, application Sweden, Jun. 5, 1986, 86-1370
Term of patent 14 years
U.S. Cl. D13—164

307,416
PROGRAMMABLE CONTROLLER
Yoshinori Abe, Kanagawa; Muneaki Inoue, and Kazuhiro Hata, both of Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 29, 1987, Ser. No. 139,241
Claims priority, application Japan, Aug. 31, 1987, 62-35759
Term of patent 14 years
U.S. Cl. D13—164



307,417
MAGNET PICK-UP
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011
Filed Nov. 4, 1986, Ser. No. 927,411
Term of patent 14 years
U.S. Cl. D13—183



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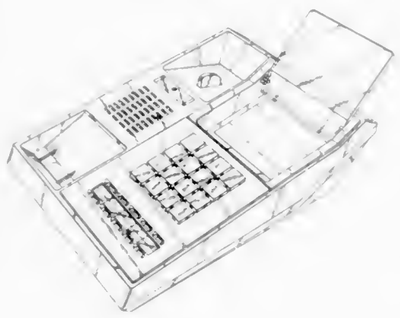
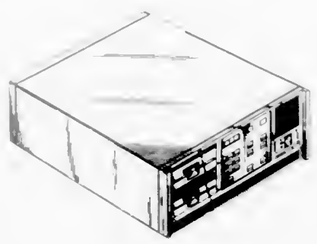
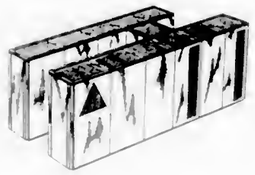
307,418
TELEPHONE BASE
Joseph G. Aschauer, Newtown, and John Cuccio, Westport, both of Conn., assignors to TIE Communications, Inc., Shelton, Conn.
Filed Jun. 15, 1988, Ser. No. 207,305
Term of patent 14 years
U.S. Cl. D14—151



307,419
DISPLAY TERMINAL CONTROLLER
David L. Schaum, Woodstock, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 9, 1986, Ser. No. 940,719
Term of patent 14 years
U.S. Cl. D14—100

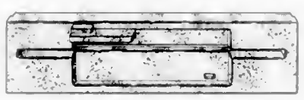


307,420
CENTRAL PROCESSOR UNIT
Koushiro Adachi, Tokorozawa; Shinji Shibuya, Kodaira; Tamotsu Tsukaguchi, Hiratsuka, and Mitsuo Miyamoto, Hatano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 23, 1987, Ser. No. 76,661
Claims priority, application Japan, Jan. 28, 1987, 62-2716
Term of patent 14 years
U.S. Cl. D14—102

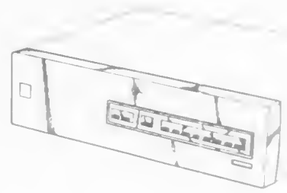


307,421
DIGITIZING PEN
Thomas A. Tedham, Salem, and Kenichi Akagi, Littleton, both of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.
Filed Oct. 20, 1988, Ser. No. 260,545
Term of patent 14 years
U.S. Cl. D14—114

307,422
FRONT PANEL FOR FLOPPY DISK DRIVE
Peter A. Ronzani, Los Gatos, Calif., assignor to Konica Corporation, Tokyo, Japan
Filed Jan. 15, 1987, Ser. No. 3,704
Term of patent 14 years
U.S. Cl. D14—115



307,423
FRONT PANEL FOR A LINK PROTOCOL CONVERTER
David W. Hill, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed May 18, 1987, Ser. No. 51,111
Term of patent 14 years
U.S. Cl. D14—115

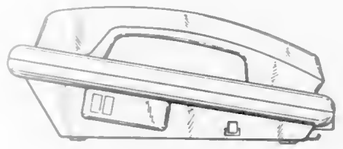


307,424
VIDEO CASSETTE RECORDER
Jae J. Shim, Kwachon, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Feb. 27, 1987, Ser. No. 20,315
Claims priority, application Rep. of Korea, Nov. 12, 1986, 15929/86
Term of patent 14 years
U.S. Cl. D14—135

307,425
VIDEO CASSETTE RECORDER
Jae J. Shim, Kwachon, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Feb. 27, 1987, Ser. No. 20,319
Claims priority, application Rep. of Korea, Sep. 2, 1986, 12568/86
Term of patent 14 years
U.S. Cl. D14—135

307,426
TELEPHONE SET
Fumiharu Ohta, Atsugi, and Kazumasa Takenaka, Sagamihara, both of Japan, assignors to Matsushita Electric Industrial Co.
Filed Jul. 20, 1988, Ser. No. 221,912
Claims priority, application Japan, Mar. 10, 1988, 63-9744
Term of patent 14 years
U.S. Cl. D14—142

307,427
TELEPHONE SET
Marian H. Polhemus, Chicago, Ill., assignor to NEC Home Electronics U.S.A. Inc., Wood Dale, Ill.
Filed Jun. 3, 1988, Ser. No. 203,023
Term of patent 14 years
U.S. Cl. D14—151



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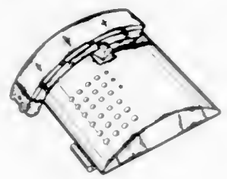
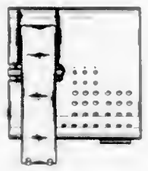
307,428
HANDSET AND STAND TELECOMMUNICATION INSTRUMENT
Herbert Pfeifer, Campbell; Paul Montgomery, San Francisco, and Dan Sturges, Campbell, all of Calif., assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Aug. 16, 1988, Ser. No. 232,883
Claims priority, application Rep. of Korea, Apr. 19, 1988, 1988-5289
Term of patent 14 years
U.S. Cl. D14—151

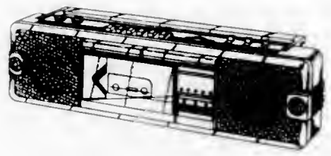


307,429
HANDSET AND STAND TELECOMMUNICATION INSTRUMENT
Herbert Pfeifer, Campbell; Paul Montgomery, San Francisco, and Dan Sturges, Campbell, all of Calif., assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Aug. 16, 1988, Ser. No. 233,252
Claims priority, application Rep. of Korea, Apr. 19, 1988, 1988-5290
The portion of the term of this patent subsequeot to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—151



307,430
TELEPHONE BASE UNIT
Guy E. Desbarats, London, England, assignor to British Telecommunications public limited company, London, England
Filed Nov. 30, 1988, Ser. No. 277,920
Claims priority, application United Kingdom, Jun. 1, 1988, 1051084
Term of patent 14 years
U.S. Cl. D14—151

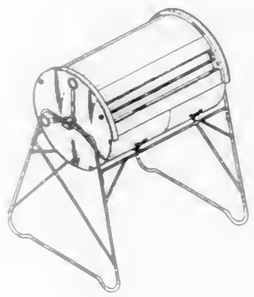
307,431
CASSETTE TAPE RECORDER
Young H. Ham, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed Oct. 27, 1987, Ser. No. 113,270
Claims priority, application Rep. of Korea, May 6, 1987, 6666/1987
Term of patent 14 years
U.S. Cl. D14—165



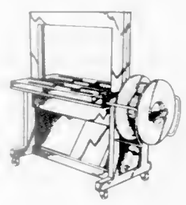
307,432
REMOTE CONTROLLER FOR VIDEO TAPE RECORDER
Seiji Usami; Yoshihiro Yanagihara, and Hiroyuki Mitsui, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Nov. 14, 1988, Ser. No. 271,073
Claims priority, application Japan, Jun. 2, 1988, 63-21769
Term of patent 14 years
U.S. Cl. D14—218

307,433
TELEPHONE COMMUNICATION MODULE OR SIMILAR ARTICLE
Rodney J. White, Hertford, Great Britain, assignor to Speakerbus Limited, Hoddesdon, England
Filed Nov. 18, 1988, Ser. No. 273,009
Claims priority, application United Kingdom, May 19, 1988, 1050851
Term of patent 14 years
U.S. Cl. D14—240

307,434
COMPOST MIXER
Robert A. Payack, Schenectady, and Alfred J. Bold, Waterford, both of N.Y., assignors to Garden Way Incorporated, Troy, N.Y.
Filed Apr. 17, 1987, Ser. No. 39,365
Term of patent 14 years
U.S. Cl. D15—10



307,435
AUTOMATIC STRAPPING MACHINE
Yasunori Sakaki, Tokyo, and Tsutomu Tagomori, Yokohama, both of Japan, assignors to Strapack Corporation, Tokyo Japan
Filed Nov. 19, 1987, Ser. No. 122,430
Claims priority, application Japan, May 27, 1987, 62-20658
Term of patent 14 years
U.S. Cl. D15—145



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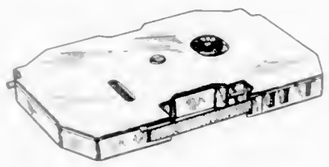
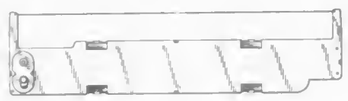
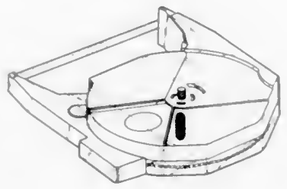
307,436
INK RIBBON CASSETTE FOR ELECTRONIC TYPEWRITER
Aiko Endo, Tokyo, and Koh Hasegawa, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Japan
Filed Dec. 15, 1986, Ser. No. 941,946
Claims priority, application Japan, Jun. 17, 1986, 61-23365
Term of patent 14 years
U.S. Cl. D18—12



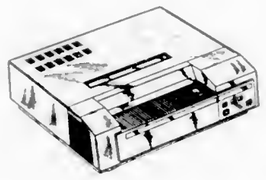
307,438
INK RIBBON CASSETTE FOR AN ELECTRONIC COMPUTER
Hidetoshi Kodama, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Aug. 24, 1987, Ser. No. 88,944
Claims priority, application Japan, Feb. 24, 1987, 62-6770
The portion of the term of this patent subsequent to Apr. 17, 2004, has beeo disclaimed.
Term of patent 14 years
U.S. Cl. D18—12



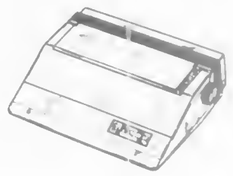
307,437
RIBBON CASSETTE FOR A TYPEWRITER OR THE LIKE
Jorge Costa, Yverdon-les-Bains, Switzerland, assignor to Hermes Precisa International SA, Switzerland
Filed Apr. 28, 1987, Ser. No. 43,687
Claims priority, application Int'l Pat. Institute, Nov. 19, 1986, DM/007806
Term of patent 14 years
U.S. Cl. D18—12



307,439
PRINTER
Susumu Doi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 20, 1987, Ser. No. 16,840
Claims priority, application Japan, Aug. 28, 1986, 61-33766
Term of patent 14 years
U.S. Cl. D18—13

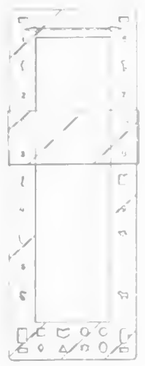


307,440
PRINTER
Seiichi Omino; Aiko Endo, both of Tokyo, and Katsuhiro Watanabe, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 4, 1987, Ser. No. 81,162
Claims priority, application Japan, Feb. 9, 1987, 62-4941
Term of patent 14 years
U.S. Cl. D18—13

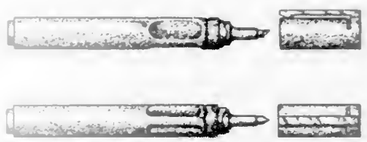


307,441
SELF-ADJUSTING BOOK MARK
Walter H. Roberson, Jr., 1002 Raymond Ave., Altamonte Springs, Fla. 32701
Filed Sep. 8, 1986, Ser. No. 905,031
Term of patent 14 years
U.S. Cl. D19—34

307,442
COMBINED BOOK MARK AND TEMPLATE
William K. Cooper, 9406 Manchester, Kansas City, Mo. 64138
Filed Jan. 20, 1987, Ser. No. 5,406
Term of patent 14 years
U.S. Cl. D19—34



307,443
MARKING INSTRUMENT
Norman D. Poisson, Andover, Mass.; Walter B. Herbst, Evanston, and Kurt Peterson, Park Ridge, both of Ill., assignors to The Gillette Company, Boston, Mass.
Filed Feb. 9, 1987, Ser. No. 12,709
Term of patent 14 years
U.S. Cl. D19—43



307,444
GRIP PORTION FOR A WRITING INSTRUMENT
Norman D. Poisson, Andover; Scott G. Searle, Sudbury; Robert D. Warren, Wellesley, all of Mass.; Jeffrey Kapec, Westport, and Kazuna Tanaka, Cos Cob, both of Conn., assignors to The Gillette Company, Boston, Mass.
Filed Feb. 9, 1987, Ser. No. 12,708
Term of patent 14 years
U.S. Cl. D19—55

307,445
COMBINED WRITING PAD AND PENCIL HOLDER
Steven E. Greenhut, 2781 Belgrave Rd., Pepper Pike, Ohio 44124, and Sheldon Goodman, 4079 Princeton Blvd., South Euclid, Ohio 44121
Filed Nov. 21, 1986, Ser. No. 933,695
Term of patent 14 years
U.S. Cl. D19—78

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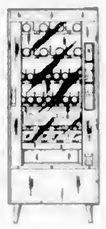
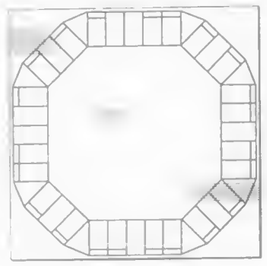
307,446
VENDING MACHINE FOR FOODS
Leonard A. Ficken, St. Louis, Mo., assignor to Unidynamics Corporation, New York, N.Y.
Filed Jul. 14, 1986, Ser. No. 885,483
Term of patent 14 years
U.S. Cl. D20—4



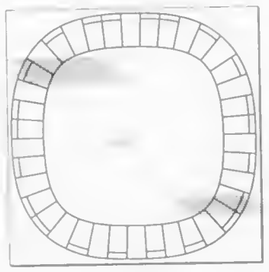
307,447
SIGN
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Sep. 8, 1987, Ser. No. 93,873
Term of patent 14 years
U.S. Cl. D20—10

307,448
PEG BOARD SIGN HOLDER
W. Stephen Akard, 405 N. 1000 East, Zionsville, Ind. 46077
Filed Jun. 9, 1987, Ser. No. 59,833
Term of patent 14 years
U.S. Cl. D20—43

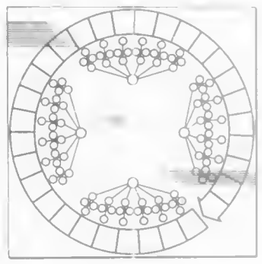
307,449
GAME BOARD OR SIMILAR ARTICLE
Paul B. McKeehan, 8507 Farralone Ave., West Hills, Calif. 91304
Filed Nov. 17, 1986, Ser. No. 931,159
Term of patent 14 years
U.S. Cl. D21—34



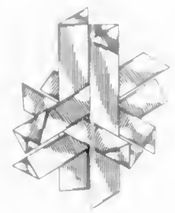
307,450
GAME BOARD OR SIMILAR ARTICLE
Paul B. McKeehan, 8507 Farralone Ave., West Hills, Calif. 91304
Filed Nov. 17, 1986, Ser. No. 931,158
Term of patent 14 years
U.S. Cl. D21—35



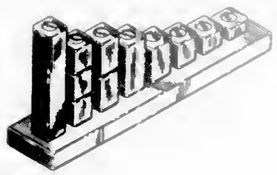
307,451
GAME BOARD OR SIMILAR ARTICLE
Paul B. McKeehan, 8507 Farralone Ave., West Hills, Calif. 91304
Filed Nov. 17, 1986, Ser. No. 931,161
Term of patent 14 years
U.S. Cl. D21—35



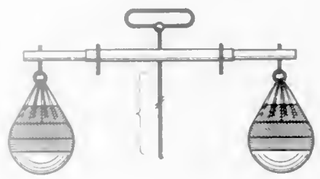
307,452
TOY PUZZLE
Donald J. Laubscher, Buckeye, Ariz., assignor to Delbert W. Hicks, Phoenix, Ariz.
Filed Nov. 2, 1987, Ser. No. 115,181
Term of patent 14 years
U.S. Cl. D21—107



307,453
FRACTIONAL BLOCK SET
Charles A. Russel, Oklahoma City, Okla., assignor to Tangible Concepts, Inc., Oklahoma City, Okla.
Filed Jun. 24, 1986, Ser. No. 877,978
Term of patent 14 years
U.S. Cl. D21—108



307,454
PORTABLE WEIGHT EXERCISER
James C. Driscoll, 335 E. Harmon, Apt. 153, Las Vegas, Nev. 89109
Filed Jan. 15, 1988, Ser. No. 144,072
Term of patent 14 years
U.S. Cl. D21—196



307,455
GOLF CLUB PUTTER HEAD
David D. Boone, El Toro, Calif., assignor to Lynx Golf, Inc., City of Industry, Calif.
Filed Apr. 6, 1987, Ser. No. 34,581
Term of patent 14 years
U.S. Cl. D21—219

307,456
SLINGSHOT FRAME
Raynold A. Eld, 302 E. 39 St., Boise, Id. 83714, assignor to Raynold A. Eld, Boise, Id.
Filed Sep. 26, 1986, Ser. No. 852,502
Term of patent 14 years
U.S. Cl. D22—106

307,457
SLINGSHOT FRAME
Raynold A. Eld, 302 E. 39 St., Boise, Id. 83714, assignor to Raynold A. Eld, Boise, Id.
Filed Sep. 26, 1986, Ser. No. 852,503
Term of patent 14 years
U.S. Cl. D22—106

307,458
SLINGSHOT FRAME
Raynold A. Eld, 302 E. 39 St., Boise, Id. 83714, assignor to Raynold A. Eld, Boise, Id.
Filed Sep. 26, 1986, Ser. No. 852,504
Term of patent 14 years
U.S. Cl. D22—106

307,459
SLINGSHOT FRAME
Raynold A. Eld, 302 E. 39 St., Boise, Id. 83714, assignor to Raynold A. Eld, Boise, Id.
Filed Sep. 26, 1986, Ser. No. 852,505
Term of patent 14 years
U.S. Cl. D22—106

307,460
SLINGSHOT FRAME
Raynold A. Eld, 302 E. 39 St., Boise, Id. 83714, assignor to Raynold A. Eld, Boise, Id.
Filed Sep. 26, 1986, Ser. No. 852,506
Term of patent 14 years
U.S. Cl. D22—106

307,461
SLINGSHOT FRAME
Raynold A. Eld, 302 E. 39 St., Boise, Id. 83714, assignor to Raynold A. Eld, Boise, Id.
Filed Sep. 26, 1986, Ser. No. 852,507
Term of patent 14 years
U.S. Cl. D22—106

307,462
SLINGSHOT FRAME
Raynold A. Eld, 302 E. 39 St., Boise, Id. 83714, assignor to Raynold A. Eld, Boise, Id.
Filed Sep. 26, 1986, Ser. No. 852,508
Term of patent 14 years
U.S. Cl. D22—106

307,463
SLINGSHOT FRAME
Raynold A. Eld, 302 E. 39 St., Boise, Id. 83714, assignor to Raynold A. Eld, Boise, Id.
Filed Sep. 26, 1986, Ser. No. 852,509
Term of patent 14 years
U.S. Cl. D22—106

307,464
SLINGSHOT FRAME
Raynold A. Eld, 302 E. 39 St., Boise, Id. 83714, assignor to Raynold A. Eld, Boise, Id.
Filed Sep. 26, 1986, Ser. No. 852,510
Term of patent 14 years
U.S. Cl. D22—106

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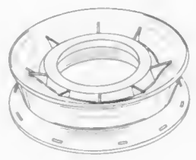
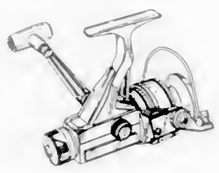
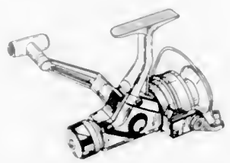
307,457
FISHING HAND CASTER
Alexander S. Corrie, 36 Manilla Street, East Brisbane, Australia (4169)
Filed Mar. 2, 1987, Ser. No. 20,677
Claims priority, application Australia, Dec. 15, 1986, 7919/86
Term of patent 14 years
U.S. Cl. D22—137



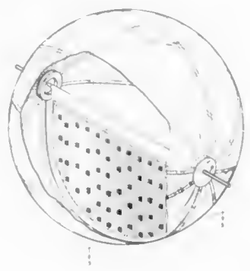
307,458
REEL FOR FISHING
Kanji Iinuma, Musashino, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Aug. 31, 1987, Ser. No. 90,921
Claims priority, application Japan, Mar. 4, 1987, 8206/87
Term of patent 14 years
U.S. Cl. D22—141



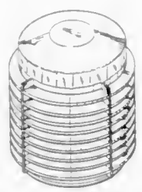
307,459
REEL FOR FISHING
Yasuhisa Kameda, Musashino, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Aug. 31, 1987, Ser. No. 90,922
Claims priority, application Japan, Mar. 4, 1987, 8205/87
Term of patent 14 years
U.S. Cl. D22—141



307,460
INFLATABLE, REFLECTIVE SOLAR EVAPORATOR
Rodney Bradford, 1210 Kennamer Dr., SE., Huntsville, Ala. 35801, and Lott W. Brantley, 117 Ninth Ave., Arab, Ala. 35016
Filed Jun. 22, 1987, Ser. No. 64,921
Term of patent 14 years
U.S. Cl. D23—207

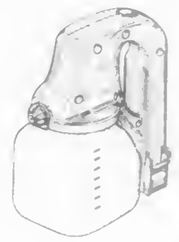


307,461
ENGINE OIL FILTER FOR A MOTOR VEHICLE
Byoung D. Kim, 649-5, Hannam-Dong, Yongsan-Ku, Seoul, Rep. of Korea
Filed Apr. 7, 1987, Ser. No. 35,289
Term of patent 14 years
U.S. Cl. D23—209



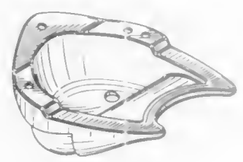
307,462
GREASE FILTER FOR USE IN RESTAURANTS OR THE LIKE
Christ S. Merkouris, 8546 S. McVicker, Burbank, Ill. 60459
Filed May 21, 1987, Ser. No. 52,741
Term of patent 14 years
U.S. Cl. D23—209

307,463
ELECTRIC SPRAYER
Fusao Fushiya, and Katsumi Tozawa, both of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan
Filed Aug. 11, 1987, Ser. No. 84,671
Claims priority, application Japan, Feb. 13, 1987, 62-5352
Term of patent 14 years
U.S. Cl. D23—225

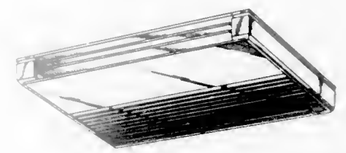


307,464
FAUCET HANDLE
Gerhard E. Joerger, Hans-Thoma-Strasse 93, G-6800 Mannheim 25, Fed. Rep. of Germany
Filed Mar. 31, 1987, Ser. No. 32,823
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1986, MR V/1333
Term of patent 14 years
U.S. Cl. D23—251

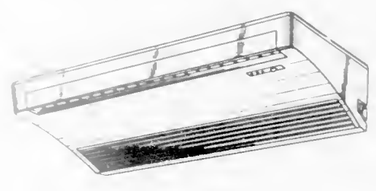
307,465
SHAMPOO BASIN
Michael Phillips, P.O. Box 35395, Houston, Tex. 77235-5395
Continuation of Ser. No. 826,723, Feb. 6, 1986. This application Mar. 6, 1989, Ser. No. 318,380
Term of patent 14 years
U.S. Cl. D23—289



307,466
AIR CONDITIONER
Masahito Takasuna, Chiba, and Takuma Watanabe, Kanagawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Jan. 19, 1988, Ser. No. 145,197
Claims priority, application Japan, Oct. 21, 1987, 62-42756
Term of patent 14 years
U.S. Cl. D23—351



307,467
AIR CONDITIONER
Kenji Shimano; Sbusuke Yamazaki, both of Tokyo, and Yoshinori Katagami, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Mar. 24, 1988, Ser. No. 172,340
Claims priority, application Japan, Sep. 24, 1987, 62-38493
Term of patent 14 years
U.S. Cl. D23—351



307,468
AIR FRESHENER DISPENSER
Alfred E. Booth, Jr., Torrance, Calif., assignor to Products by DesignAir, Inc., Marina del Ray, Calif.
Filed Apr. 15, 1988, Ser. No. 182,310
Term of patent 14 years
U.S. Cl. D23—366

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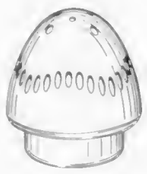
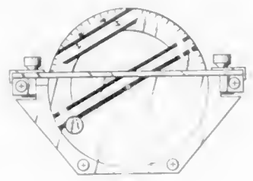
307,469
AIR FRESHENER
Ronald R. Gutkowski, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Mar. 31, 1987, Ser. No. 32,650
Term of patent 14 years
U.S. Cl. D23—367

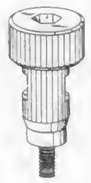


307,470
ELECTRIC FAN
Toshiyuki Utsuki, Tachikawa; Shuichi Kouno, Tokorozawa, and Kenichi Watanabe, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 4, 1987, Ser. No. 21,432
Claims priority, application Japan, Nov. 25, 1986, 61-46216
Term of patent 14 years
U.S. Cl. D23—378

307,471
DENTAL INSTRUMENT HONE
Steven B. Moore, 7846 S. Logan St., Littleton, Colo. 80122
Filed Aug. 31, 1987, Ser. No. 91,428
Term of patent 14 years
U.S. Cl. D24—16



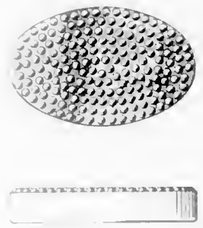
307,472
DRILL-MOUNTABLE TOOL FOR THE INSTALLATION AND REMOVAL OF THREADED DENTAL PROSTHETIC ELEMENTS
Per O. Söderberg, Stockholm, Sweden, assignor to Astra Meditec Aktiebolog, Mölndal, Sweden
Filed Oct. 21, 1987, Ser. No. 112,141
Claims priority, application Sweden, Apr. 22, 1987, 870922
Term of patent 14 years
U.S. Cl. D24—16



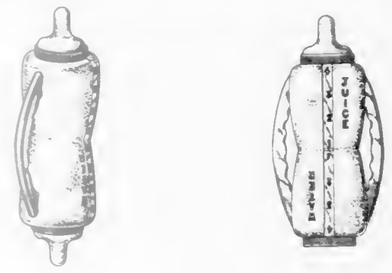
307,473
DENTAL PLIERS SHIELD
Donald L. Hannula, San Diego, Calif., assignor to Johnson & Johnson Consumer Products, Inc., New Brunswick, N.J.
Filed Jan. 12, 1988, Ser. No. 143,105
Term of patent 14 years
U.S. Cl. D24—16

307,474
SYRINGE SHIELD
June C. Cook, Rte. 1, Box 260, Altus, Ark. 72821
Filed Nov. 9, 1987, Ser. No. 118,357
Term of patent 14 years
U.S. Cl. D24—25

307,475
SCALP MASSAGER
Fred A. Bomkamp, 1715 W. Lawrence, Phoenix, Ariz. 85021
Filed Mar. 17, 1987, Ser. No. 26,652
Term of patent 14 years
U.S. Cl. D24—36



307,476
BABY BOTTLE
Vivian Gonzalez, 920 E. 11 Pl., Hialeah, Fla. 33010, and Rebeca Trujillo, 8010 NW. 167 Ter., Miami Lakes, Fla. 33016
Filed Aug. 4, 1987, Ser. No. 81,177
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—47



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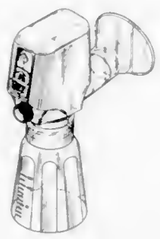
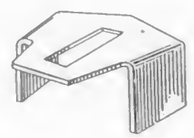
307,477
BABY BOTTLE
Vivian Gonzalez, 920 E. 11 Pl., Hialeah, Fla. 33010, and Rebeca Trujillo, 8010 NW. 167 Ter., Miami Lakes, Fla. 33016
Filed Aug. 4, 1987, Ser. No. 81,178
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—47

307,478
BREAST PUMP
Yasuo Morifuji, Osaka, Japan, assignor to Jex Co., Ltd., Osaka, Japan
Filed Aug. 3, 1988, Ser. No. 227,747
Term of patent 14 years
U.S. Cl. D24—51

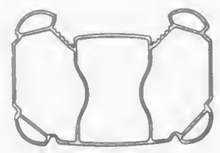


307,479
SECURITY DOOR
Richard Bennett; Steven B. Evans, both of Detroit, and Damon A. Davis, Ann Arbor, all of Mich., assignors to Daris Design Company, Detroit, Mich.
Filed Aug. 20, 1987, Ser. No. 87,622
Term of patent 14 years
U.S. Cl. D25—48

307,480
SPACER ELEMENT FOR SCAFFOLDING
John G. Brasil, Mississauga, Canada, assignor to Anthes Industries, Inc., Ontario, Canada
Filed Oct. 19, 1988, Ser. No. 260,352
Term of patent 14 years
U.S. Cl. D25—68

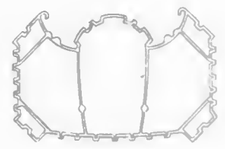


307,481
DECORATIVE EXTRUSION
Peter M. Stagl, Morris Plains, N.J., assignor to Avnet, Inc., Great Neck, N.Y.
Filed Mar. 21, 1988, Ser. No. 170,467
Term of patent 14 years
U.S. Cl. D25—122

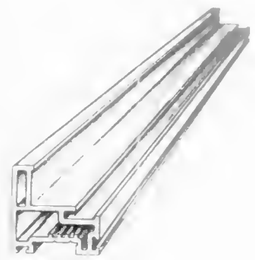


307,482
DECORATIVE EXTRUSION
Peter M. Stagl, Morris Plains, N.J., assignor to Avnet, Inc., Great Neck, N.Y.
Filed Mar. 21, 1988, Ser. No. 170,468
Term of patent 14 years
U.S. Cl. D25—122

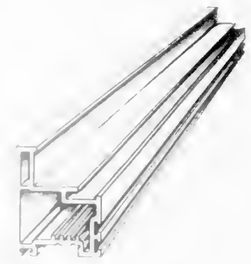
307,483
DECORATIVE EXTRUSION
Peter M. Stagl, Morris Plains, N.J., assignor to Avnet, Inc., Great Neck, N.Y.
Filed Mar. 21, 1988, Ser. No. 170,470
Term of patent 14 years
U.S. Cl. D25—122



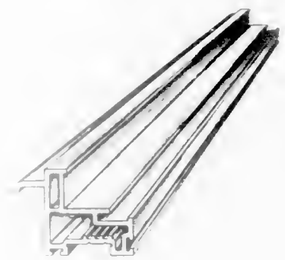
307,484
DESIGN FOR A WINDOW COMPONENT EXTRUSION
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Jan. 13, 1989, Ser. No. 297,262
Term of patent 14 years
U.S. Cl. D25—124



307,485
WINDOW COMPONENT EXTRUSION
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Jan. 13, 1989, Ser. No. 297,533
Term of patent 14 years
U.S. Cl. D25—124



307,486
DESIGN FOR A WINDOW COMPONENT EXTRUSION
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Jan. 13, 1989, Ser. No. 297,672
Term of patent 14 years
U.S. Cl. D25—124



307,487
LAMP
Raymond J. Noe, Highland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.
Filed Nov. 14, 1986, Ser. No. 930,826
Term of patent 14 years
U.S. Cl. D26—2

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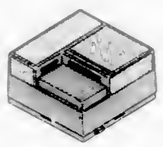
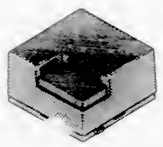
307,488
FLASHLIGHT
Raymond L. Sharrah, Collegeville, Pa., assignor to Streamlight, Inc., Norristown, Pa.
Filed May 6, 1987, Ser. No. 46,947
Term of patent 14 years
U.S. Cl. D26—49

307,489
CONTAINER FOR RELEASING PERFUME
Tadao Watanabe, Suita, Japan, assignor to DIA Chemical Co., Ltd., Japan
Filed Mar. 14, 1988, Ser. No. 167,519
Claims priority, application Japan, Sep. 17, 1987, 62-38066; Sep. 17, 1987, 62-38067
Term of patent 14 years
U.S. Cl. D28—5



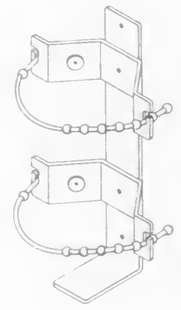


307,490
SUNTAN LOTION APPLICATOR
Alan J. Thieroff, Jr., 530 Winchester Rd., Warminster, Pa. 18974; Larry T. Kaplan, 72 Kingsclere Rd., Southampton, Pa. 18966, and Andrew Banchi, 685 Cheryl Dr., Warminster, Pa. 18974
Filed May 23, 1989, Ser. No. 355,375
Term of patent 14 years
U.S. Cl. D28—7

307,491
COMBINED ELECTRIC SHAVER AND CAP THEREFOR
Eiji Okada, Nakanobu 5-5-12, Shinagawa-ku, Tokyo, Japan
Filed Aug. 7, 1987, Ser. No. 83,833
Claims priority, application Japan, Jun. 16, 1987, 62-024346
Term of patent 14 years
U.S. Cl. D28—50

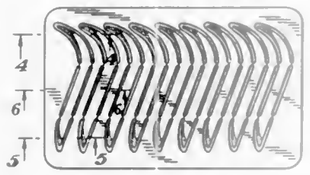
307,492
CUTICLE TREATMENT KIT
James H. S. Whitney, 114 Fairway Dr., Harrisonburg, Va. 22801
Filed May 16, 1988, Ser. No. 217,892
Term of patent 14 years
U.S. Cl. D28—61

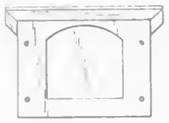
307,494
FIRE EXTINGUISHER MOUNTING BRACKET
Fred B. Goodnight, Leeds, Ala., assignor to Amerex Corporation, Trussville, Ala.
Filed Jun. 11, 1987, Ser. No. 60,440
Term of patent 14 years
U.S. Cl. D29—5



307,495
PET SHELTER
Clifford K. Logan, Jr., 9810 Hefner Village Blvd., Oklahoma City, Okla. 73132
Filed Jun. 5, 1987, Ser. No. 58,541
Term of patent 14 years
U.S. Cl. D30—108

307,493
FLAT TOOTHPICK DISPENSER CARD
Peter S. C. Cheng, 5 Ross Street, Toronto, Ontario, Canada (M5T 1Z8)
Filed Nov. 3, 1988, Ser. No. 266,626
Term of patent 14 years
U.S. Cl. D28—64





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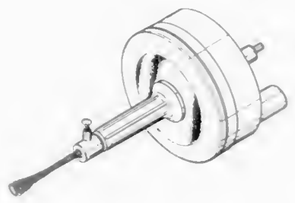
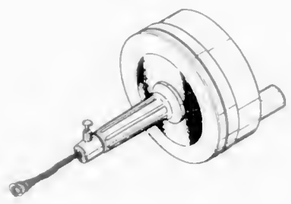
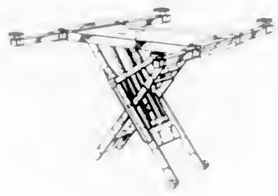
307,496
AUGER HOUSING
Nicholas W. Moss, 1905 Country Club Dr., Cherry Hill, N.J. 08003
Filed Dec. 4, 1986, Ser. No. 938,175
Term of patent 14 years
U.S. Cl. D32—14



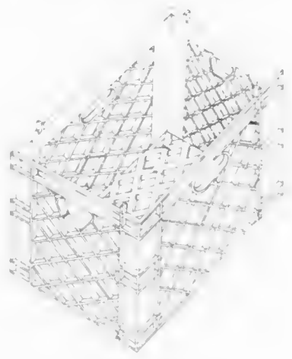


307,497
CHAMOIS AND PILE COVERED SPONGE
Michael A. Giallourakis, Tarpon Springs, Fla., assignor to Sponge Fishing Co., Inc., Tarpon Springs, Fla.
Filed Jun. 5, 1987, Ser. No. 58,538
Term of patent 14 years
U.S. Cl. D32—40

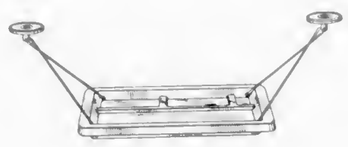
307,498
VEHICLE LIFT
Yusuke Kawana, Otowa, Japan, assignor to Sugiyasu Industries Co., Ltd., Aichi, Japan
Filed Feb. 3, 1988, Ser. No. 152,081
Claims priority, application Japan, Dec. 3, 1987, 62-49644
Term of patent 14 years
U.S. Cl. D34—31



307,499
BEVERAGE CASE
Thomas Box, Tinton Falls, N.J., assignor to Spectrum International, Inc., Tinton Falls, N.J.
Filed Aug. 17, 1987, Ser. No. 86,653
Term of patent 14 years
U.S. Cl. D34—43



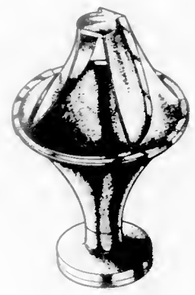
307,500
TOOL TRAY
Scott Mullaly, 7928 Bacadi Dr., San Diego, Calif. 92126
Filed Jul. 3, 1986, Ser. No. 881,711
Term of patent 14 years
U.S. Cl. D34—45



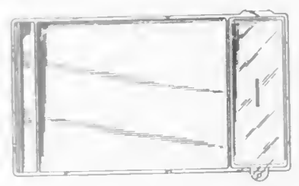
307,501
ROSARY
Donald J. Abel, 712 Summit Ave., Franklin Lakes, N.J. 07417
Filed Nov. 13, 1984, Ser. No. 670,265
Term of patent 14 years
U.S. Cl. D99—26

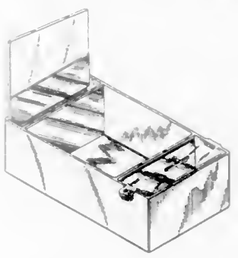
307,502
ROSARY
Daniel T. Mielnicki, 303 Hacienda Cir., Haughton, La. 71037
Filed Mar. 18, 1987, Ser. No. 27,025
Term of patent 14 years
U.S. Cl. D99—26

307,503
COIN COLLECTOR
Stevan M. Divnick, Spring Valley, Ohio, assignor to Divnick International, Inc., Spring Valley, Ohio
Filed Mar. 23, 1987, Ser. No. 29,491
Term of patent 14 years
U.S. Cl. D99—34



307,504
COMBINED CONFECTIONERY TRAY, ADVERTISING HOLDER AND DONATION BOX
Charles E. Silcox, Rte. #3, Box 499, Proctorville, Ohio 45669
Continuation-in-part of Ser. No. 886,508, Jul. 16, 1986. This application Oct. 17, 1986, Ser. No. 921,011
The portion of the term of this patent subsequent to Nov. 14, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D99—36





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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF APRIL, 1990

NOTE — Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See—*
Frejborg, Frey A., 4,918,807, Cl. 29-163.800
Kokkonen, Seppo K.; and Qvintus, Harri T., 4,919,158, Cl. 134-15.000.
Vikio, Pentti A., 4,919,796, Cl. 209-211.000.

A 'n D Cable Products, Inc.: *See—*
Chompff, Conrad, 4,919,619, Cl. 439-371.000.

ABB Stromberg Drives OY: *See—*
Mard, Matti; Vauhkonen, Vesa; and Kangasaho, Olavi, 4,920,306, Cl. 318-722.000.

Abba, Rodney L.: *See—*
Parsons, Mark N.; and Abba, Rodney L., 4,919,877, Cl. 264-282.000.

Abe, Hitoshi: *See—*
Nishiyama, Masanobu; Abe, Hitoshi, and Ochi, Yasuo, 4,919,314 Cl. 222-643.000.

Abe, Ichiro: *See—*
Honma, Tohru; Mori, Shigeki, Ohya, Kunihiko; Matsumoto, Shiro; Nakata, Akira; Abe, Ichiro; and Hosaka, Naoto, 4,918,902, Cl. 53-403.000.

Abe, Makoto; Tanimoto, Ichiro; Fujiki, Akira; Suzuki, Keitaro; Endo, Hiroyuki; and Ikenoue, Yutaka, to Nissan Motor Co., Ltd., and Hitachi Powdered Metals Co., Ltd. High temperature wear resistant sintered alloy. 4,919,719, Cl. 75-243.000.

Abe, Masatoshi; Okamoto, Shin; and Naraki, Akihiro, to Nippon Mektron Limited. Process for producing fluorine-containing elastic copolymer. 4,920,170, Cl. 526-247.000.

Abe, Tomiya: *See—*
Nakakuki, Noboru; Oda, Kazuhide; Tagami, Masatoshi; Okino, Kouichi; Abe, Tomiya; and Ishibashi, Takanobu, 4,919,513, Cl. 350-96.330.

Abe, Tomoaki: *See—*
Ishiguro, Yuji; Hosokawa, Hiroyuki; Koyama, Nobuhiko; Hiramatsu, Eiji; Takao, Mitsunori; Abe, Tomoaki, Kiyono, Masashi; Maeda, Katsuya; and Kamio, Shigeru, 4,919,103, Cl. 123-514.000.

Abe, Tooru: *See—*
Sakai, Yoshiro; Sadaoka, Yoshihiko; Kuroiwa, Takaai; Abe, Tooru; and Miyagishi, Tetsuya, 4,920,451, Cl. 361-286.000.

Abe, Yoshinori; Matsunawa, Masahiko; and Yamamoto, Hiroyuki, to Konishiroku Photo Industry Co., Ltd. Image processing system with capability of enlarging and reducing operations. 4,920,571, Cl. 382-47.000.

Abels, Martin: *See—*
Kurz, Gunter; Abels, Martin; Schwirtlich, Ingo; and Woditsch, Peter, 4,919,913, Cl. 423-348.000.

Abo, Toshimi; Satoh, Hiroshi; and Takahashi, Nobutaka, to Nissan Motor Company, Limited. Fuel monitoring arrangement for automotive internal combustion engine control system. 4,920,494, Cl. 364-431.050.

Absil, Robert P. L.; Chang, Clarence D.; Chu, Cynthia T-W.; and Klocke, Donald J., to Mobil Oil Corporation. Method for hydrocarbon dewaxing utilizing a reactivated spent MTG zeolite catalyst 4,919,790, Cl. 208-78.000.

ABU Garcia Producktion AB: *See—*
Johansson, Arne, 4,919,362, Cl. 242-303.000.

Abu-Shumays, Ibrahim K.; and Abu-Shumays, Mary D. Dual sun visors. 4,919,468, Cl. 296-97.400.

Abu-Shumays, Mary D.: *See—*
Abu-Shumays, Ibrahim K.; and Abu-Shumays, Mary D., 4,919,468, Cl. 296-97.400.

Acec Transport S.A.: *See—*
Bonhomme, Henri, 4,920,448, Cl. 361-102.000.

Achterman, Kermit L.: *See—*
Bates, H. John; Achterman, Kermit L.; Gearin, Peter; and Halpin, Terence, 4,919,582, Cl. 414-233.000.

Ackerman, James H.: *See—*
Bell, Malcolm R.; and Ackerman, James H., 4,920,128, Cl. 514-293.000.

Acry Industries, Incorporated: *See—*
Whitenack, Joan E.; Sanchez, George; Stone, Earlyn W.; and Colton, Buddy A., 4,920,251, Cl. 219-401.000.

Acutronic France: *See—*
Perdriat, Jacques, 4,919,646, Cl. 494-1.000.
Perdriat, Jacques, 4,920,303, Cl. 318-161.000.

Adachi, Keiichi: *See—*
Ohno, Shigeru; Inagaki, Yoshio; Adachi, Keiichi; and Momoki, Yasuhito, 4,920,031, Cl. 430-522.000.

Adachi, Osamu: *See—*
Kimura, Takashi; Chihara, Kenichi; Tomatsu, Masahiro; Inoue, Kazunobu; Yano, Norio, and Adachi, Osamu, 4,920,441, Cl. 360-133.000.

Adachi, Ryoichi; and Muraoka, Shyuji, to Mazda Motor Corporation. Automobile front body structure. 4,919,474, Cl. 296-194.000.

Adachi, Ryoichi: *See—*
Shibata, Mitsuru; Hiramatsu, Yoshiyuki; Adachi, Ryoichi; and Mitsutake, Kenichiro, 4,919,705, Cl. 71-90.000.

Adams, Alan D.: *See—*
Breslow, Ronald; Brandl, Michael; Adams, Alan D.; and Hunger, Jurgen, 4,920,216, Cl. 540-110.000.

Adams, Gerd: *See—*
Fuss, Josef; and Adams, Gerd, 4,919,643, Cl. 474-46.000.

Adams, Keith D.; Gruenbacher, Dana P.; and Noble, Kathleen H., to Procter & Gamble Company, The. Shelf stable, highly aerated reduced calorie food products. 4,919,964, Cl. 426-564.000.

Adams, Martha S.: *See—*
Keller, Stephen A., Spry, Piper A.; Adams, Martha S.; and Harper, Ralph G., 4,920,072, Cl. 437-192.000.

Adelmann, Harry W.; and Tomcik, James D., to AT&T Bell Laboratories. System for controllably eliminating bits from packet information field based on indicator in header and amount of data in packet buffer. 4,920,534, Cl. 370-94.100.

Ademmer, Heinz: *See—*
Weigel, Peter; Holland-Letz, Guenter; Ademmer, Heinz; and Nottelmann, Ulrich, 4,919,412, Cl. 271-110.000.

Adlhoch, Wolfgang H.: *See—*
Lambertz, Johannes; Adlhoch, Wolfgang H.; Mittelstadt, Alfred G.; and Hermann, Wolfgang, 4,919,687, Cl. 48-62.00R

Adolph Coors Company: *See—*
Menardi, Elaine A.; Rhodes, Terrence E.; and Siemer, David R., 4,919,799, Cl. 209-538.000.
Young, David C.; and Willcoxen, Mark A., 4,919,310, Cl. 222-386.500.

Advanced Fiber Technology, Inc.: *See—*
Gerber, Milton, 4,919,340, Cl. 241-5.000.

Aerospatiale Societe Nationale Industrielle: *See—*
Martin, Gerard M.; Claramonte, Manuel P.; Auffret, Jean-Claude; Bonnet, Guy M.; and Delarue, Jean-Jacques, 4,919,900, Cl. 422-245.000.
Rollet, Robert, 4,918,985, Cl. 73-471.000.

AG Processing Technologies, Inc.: *See—*
Nulman, Jaim; Bacile, Nick J.; and Blonigan, Wendell T., 4,919,542, Cl. 374-9.000.

Agarwala, Ashok K., to Eastman Kodak Company. Method of magnetizing high energy rare earth alloy magnets. 4,920,326, Cl. 335-284.000.

Agbay, Albert J., Sr., to Robert Linkletter Assoc. Hinged closure and container. 4,919,286, Cl. 215-235.000.

Agence Spatiale Europeenne: *See—*
Cable, Neil, 4,919,627, Cl. 439-263.000.

Agency of Industrial Science & Technology, Ministry of International Trade & Industry: *See—*
Nakao, Yukimichi; Kaeriyama, Kyoji; and Yamauchi, Aizo, 4,919,716, Cl. 423-658.500.

Agfa-Gevaert Aktiengesellschaft: *See—*
Huber, Leonhard; Nagel, Erich; Payrhammer, Bernd; Lermann, Peter; Treiber, Helmut; and Wilsch, Herbert, 4,919,354, Cl. 242-67.30R.

Aggarwal, Bharat B., to Genentech, Inc. Human lymphotoxin. 4,920,196, Cl. 530-351.000.

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Hirata, Sadao: *See*—
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Hirata, Yoshihiro, to Kabushiki Kaisha Toshiba. Facsimile apparatus. 4,920,427, Cl. 358-437.000.

Hird, John A.; Owen, Lindsey D.; and Rice, Michael R., to Intellicall, Inc. Method and apparatus for downloading speech files. 4,920,558, Cl. 379-67.000.

Hird, John A.; Owen, Lindsey D., and Rice, Michael R., to Intellicall, Inc. Automatic generation of billing records at a telephone paystation. 4,920,562, Cl. 379-132.000.

Hitachi Cable, Ltd.: *See*—
Nakakuki, Noboru; Oda, Kazuhide; Tagami, Masatoshi; Okino, Kouichi; Abe, Tomiya, and Ishibashi, Takanobu, 4,919,513, Cl. 350-96.330.

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Hitachi, Ltd.: *See*—
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Hitachi Micro Computer Engineering Ltd.: *See*—
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Hobbs, Claude C.: *See*—
Carpenter, Tim D.; and Hobbs, Claude C., 4,918,861, Cl. 47-59.000.

Hobson, David O.; Alexeff, Igor; and Sikka, Vinod K., to United States of America, Energy. Method and apparatus for atomization and spraying of molten metals. 4,919,335, Cl. 239-3.000.

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Hoekstra, Frans, to Thomassen & Drijver-Verblifa N.V. Method and device for packaging an elongate body. 4,918,905, Cl. 53-411.000.

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Horaguchi, Mitsuhiro; Tomizawa, Shigechika; and Kaihara, Yuji, to Mitsubishi Jukogyo Kabushiki Kaisha. Process for the systematic treatment of exhaust gases. 4,919,905, Cl. 423-239.000.

Horbett, Thomas A.; Ratner, Buddy D.; Chinn, Joseph A.; and Haque, Yasmeen, to University of Washington, The Board of Regents for

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Huang, Fu-chi; Galemmo, Robert A., Jr.; and Campbell, Henry F., to Rorer Pharmaceutical Corp. Quinoline derivatives and use thereof as antagonists of leukotriene D_4. 4,920,132, Cl. 514-314.000.

Huang, Fu-chi; Galemmo, Robert A., Jr.; and Campbell, Henry F., to Rorer Pharmaceutical Corp. Quinoline derivatives and use thereof as antagonists of leukotriene D_4. 4,920,133, Cl. 514-314.000.

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Yuge, Tadashi, to Alps Electric Co., Ltd. Push button switch device with illuminating means. 4,920,243, Cl. 200-314.000.

Yuhara, Tetsuo: *See*—
Kawamoto, Yoji; Yuhara, Tetsuo; Takagi, Koichi; and Udagawa, Kanji, 4,919,294, Cl. 220-70.000.

Yukami, Noboru; Ikeda, Mitsusuke; Ohno, Masaharu; and Nisihtani, Mikihiko, to Matsushita Electric Industrial Co., Ltd. Photo-sensing device with S-shaped response curve. 4,920,394, Cl. 357-30.000.

Yuza, Yasutada: *See*—
Arikawa, Hiroo; and Yuza, Yasutada, 4,920,327, Cl. 337-231.000.

Zabrocki, Karl; Lindner, Christian; Koch, Otto; and Braese, Hans-Eberhard, to Bayer Aktiengesellschaft. Seeded emulsion polymerization of α-methylstyrene and acrylonitrile. 4,920,178, Cl. 525-262.000.

Zahedi, Bijan. Carpet fastener. 4,918,782, Cl. 16-11.000.

Zapandi, Vladimir A.: *See*—
Yarmashev, Jury N.; Zapandi, Vladimir A.; Tkachev, Valentin N., and Peder, Olev I., 4,919,641, Cl. 460-69.000.

Zarnowski, Alfred J.: *See*—
Averill, Robert G.; Zarnowski, Alfred J.; and Lyons, Matthew V., 4,919,679, Cl. 623-23.000.

Zatkulak, Tony D.; Rodini, David J.; and Hodge, James D., to Du Pont de Nemours, E. I., and Company. Apparatus for and process of treating shrinkable fibers. 4,919,869, Cl. 264-78.000.

Zebco, Corporation: *See*—
Roberts, Dennis E., 4,919,360, Cl. 242-260.000.

Zeigler, Henry J.; and Frisinger, Bruce L., to Martin Marietta. Rivetless nut plate and fastener. 4,919,578, Cl. 411-113.000.

Zellen, Wendy: *See*—
Sadaranganey, Gobind T.; Zellen, Wendy; and Michaelides, John, 4,919,952, Cl. 426-254.000.

Zeller, Gary P.: *See*—
Savage, Russell C.; Zeller, Gary P.; and Skirha, Martin D., 4,919,876, Cl. 264-258.000.

Zelman, Allen, to Rensselaer Polytechnic Insitute. Membrane pouch. 4,920,105, Cl. 514-59.000.

Zenith Electronics Corporation: *See*—
Konopka, John G., 4,920,302, Cl. 315-307.000.

Zibell, Steven E., to Wm. Wrigley Jr. Company. Chewing gum containing delayed release protein sweetener and method. 4,919,941, Cl 426-5.000.

Ziegler, George M., Jr.: *See*—
Kadan, Ranjt S.; and Ziegler, George M., Jr., 4,919,958, Cl. 426-573.000.

Ziek, Robert: *See*—
Holston, Sylvester; Ziek, Robert; and Woodruff, William, 4,918,903, Cl. 53-471.000.

Zier, Horst D.; Kerner, Wolfgang; and Pfeiffer, Ernst F., to Institute fur Diabetestechnologie Gemeinnutzige Forschungs- und Entwicklungs-

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gesellschaft mbH. Implantable electrochemical sensor. 4,919,141, Cl. 128-635.000.

Zimpro/Passavant Inc.: *See*—
Copa, William M.; and Vollstedt, Thomas J., 4,919,815, Cl. 210-603.000.

Zink, Thomas: *See*—
Handke, Heinz; Zink, Thomas; and Sougioltzis, Vasilios, 4,919,967, Cl. 427-8.000.

Zinser Textilmaschinen GmbH: *See*—
Grau, Gerhard; and Derichs, Josef, 4,918,911, Cl. 57-100.000.

Zirco, Inc.: *See*—
Clements, Philip E., 4,920,470, Cl. 363-21.000.

Zorb, James E.: *See*—
Ball, W. Kenneth; Goulait, David J. K.; and Zorb, James E., 4,919,738, Cl. 156-73.500.

Zupancic, Joseph J.: *See*—
Swedo, Raymond J.; and Zupancic, Joseph J., 4,919,808, Cl. 210-490.000.

Zurlippe, Clemens F.: *See*—
Manning, Jeffrey L.; and Zurlippe, Clemens F., 4,918,963, Cl. 72-199.000.

Zushi, Shizuo: *See*—
Takahashi, Kenji; Torii, Takuji; Senshu, Takao; Yamashita, Tetsuji; and Zushi, Shizuo, 4,918,944, Cl. 62-471.000.

Zweymuller, K.; and Koch, Rudolf, to Sulzer Brothers Limited. Metal shell for an artificial hip joint socket. 4,919,676, Cl. 623-22.000.

378134 Alberta Ltd.: *See*—
Kehler, Garry, 4,919,443, Cl. 280-304.100.

501 Mitsubishi Paper Mills Limited: *See*—
Ohashi, Minoru; and Horii, Shoichi, 4,920,043, Cl. 430-611.000.

780863 Ontario Limited: *See*—
Smith, James W.; Barton, Robert A., and Knight, Cyril H., deceased, 4,919,914, Cl. 423-576.200.

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PATENTS WERE ISSUED ON THE 24TH DAY OF APRIL, 1990

NOTE.--Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Atlas Powder Company: *See*—
Janoski, Florian B., Re. 33,202, Cl. 102-202.300.

Blake, Frederick H., to Multipoint Control Systems, Inc. Linear analog light-level monitoring system having short leads to reduce electronic noise. Re. 33,205, Cl. 250-214.0AL.

Froom, Thomas W., to Rolph-Clark-Stone Packaging Corporation. Carton for packaging ice cream or like frozen initially liquid or semi-solid material. Re. 33,204, Cl. 206-626.000.

Janoski, Florian B., to Atlas Powder Company. Energy transmission device. Re. 33,202, Cl. 102-202.300.

Multipoint Control Systems, Inc.: *See*—
Blake, Frederick H., Re. 33,205, Cl. 250-214.0AL.

Reimers, Eric W. Golf bag device. Re. 33,203, Cl. 206-315.500.

Rolph-Clark-Stone Packaging Corporation: *See*—
Froom, Thomas W., Re. 33,204, Cl. 206-626.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

J. S. Popper Inc.: *See*—
Popper, Robert H., Jr., B1 4,254,929, Cl. 248-447.000.

Popper, Robert H., Jr., to J. S. Popper Inc. Apparatus for enabling movement of a binder. B1 4,254,929, 4-24-90, Cl. 248-447.000.

Seeley, Edward H.: *See*—
Seeley, Larry E.; and Seeley, Edward H., B1 3,942,680, Cl. 220-324.000.

Seeley, Larry E.; and Seeley, Edward H. Spray paint container and attachment therefor. B1 3,942,680, 4-24-90, Cl. 220-324.000.

LIST OF DESIGN PATENTEES

Abe, Yoshinori; Inoue, Muneaki and Hata, Kazubiro, to Mitsubishi Denki Kabushiki Kaisha. Programmable controller. 307,416, 4-24-90, Cl. D13-164.000.

Abel, Donald J. Rosary. 307,501, 4-24-90, Cl. D99-26.000.

Adachi, Koushiro; Shibuya, Shinji; Tsukaguchi, Tamotsu; and Miyamoto, Mitsuo, to Hitachi, Ltd. Central processor unit. 307,420, 4-24-90, Cl. D14-102.000.

Akagi, Kenichi: *See*—
Tedham, Thomas A.; and Akagi, Kenichi, 307,421, Cl. D14-114.000.

Akard, W. Stephen. Peg board sign holder. 307,448, 4-24-90, Cl. D20-43.000.

Alberti, Alberto: *See*—
Guelfi, Giorgio; Villa, Ezio; Mendicino, Franco; Pasquali, Renato; and Alberti, Alberto, 307,404, Cl. D12-92.000.

Alfa Lancia Industriale S.r.l.: *See*—
Guelfi, Giorgio; Villa, Ezio; Mendicino, Franco; Pasquali, Renato; and Alberti, Alberto, 307,404, Cl. D12-92.000.

Allied Plastics, Inc.: *See*—
Page, Cornelius D., Jr., 307,355, Cl. D3-40.000.

Amerex Corporation: *See*—
Goodnight, Fred B., 307,494, Cl. D29-5.000.

Anthes Industries, Inc.: *See*—
Brasil, John G., 307,480, Cl. D25-68.000.

Armstrong, Eric J.; Eldon, James B.; and Lamond, Lee T., to Checkpoint Systems, Inc. Electronic article surveillance antenna structure. 307,400, 4-24-90, Cl. D10-106.000.

Art Leather Manufacturing Co.: *See*—
Roberts, Mark H., 307,357, Cl. D6-301.000.

Asahi, Sadaho, to Yoshida Kogyo K. K. Pull tab of slider for slide fastener. 307,403, 4-24-90, Cl. D11-221.000.

Aschauer, Joseph G.; and Cuccio, John, to TIE Communications, Inc. Telephone base. 307,418, 4-24-90, Cl. D14-151.000.

Asea AB: *See*—
Holmer, Anders; Pettersson, Owe; Tornros, Mats; and Maddock, Peter, 307,415, Cl. D13-164.000.

Asics Corporation: *See*—
Kayano, Toshikazu, 307,351, Cl. D2-320.000.

Astra Meditec Aktiebolog: *See*—
Soderberg, Per O., 307,472, Cl. D24-16.000.

Avnet, Inc.: *See*—
Stagl, Peter M., 307,481, Cl. D25-122.000.
Stagl, Peter M., 307,482, Cl. D25-122.000.
Stagl, Peter M., 307,483, Cl. D25-122.000.

Aylsworth, Richard W. Can holder. 307,372, 4-24-90, Cl. D7-622.000.

Bailey, Bob; and Stucker, Jeffrey L., to Racemark International, Inc., a part interest. Partial seat cover for use in vehicles. 307,370, 4-24-90, Cl. D6-611.000.

Banchi, Andrew: *See*—
Thieroff, Alan J., Jr.; Kaplan, Larry T.; and Banchi, Andrew, 307,490, Cl. D28-7.000.

Basen, Donald: *See*—
Rouse, Raymond R., Jr.; and Basen, Donald, 307,402, Cl. D11-157.000.

Bearak, Harold. Wine bottle holder. 307,373, 4-24-90, Cl. D7-616.000.

Bennett, Richard; Evans, Steven B.; and Davis, Damon A., to Darts Design Company. Security door. 307,479, 4-24-90, Cl. D25-48.000.

Blair, Graham J., to Lever Brothers Company. Bottle body. 307,391, 4-24-90, Cl. D9-376.000.

BMR Investments, Inc.: *See*—
Larson, Raymond L., 307,389, Cl. D9-370.000.

Bold, Alfred J.: *See*—
Payack, Robert A.; and Bold, Alfred J., 307,434, Cl. D15-10.000.

Bombardier Inc.: *See*—
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Bomkamp, Fred A. Scalp massager. 307,475, 4-24-90, Cl. D24-36.000.

Boone, David D., to Lynx Golf, Inc. Golf club putter head. 307,455, 4-24-90, Cl. D21-219.000.

Booth, Alfred E., Jr., to Products by DesignAir, Inc. Air freshener dispenser. 307,468, 4-24-90, Cl. D23-366.000.

Borst, Rodney D., to Hoechst Celanese Corporation. Food receptacle. 307,395, 4-24-90, Cl. D9-428.000.

Bott, John A. Wind deflector. 307,409, 4-24-90, Cl. D12-181.000.

Bott, John A. Wind deflector. 307,410, 4-24-90, Cl. D12-181.000.

Bott, John A. Wind deflector. 307,411, 4-24-90, Cl. D12-181.000.

Box, Thomas, to Spectrum International, Inc. Beverage case. 307,499, 4-24-90, Cl. D34-43.000.

Bradford, Rodney; and Brantley, Lott W. Inflatable, reflective solar evaporator. 307,460, 4-24-90, Cl. D23-207.000.

Bradley, David L., to Quality Components, Inc. Combined vehicle fender and running board unit. 307,413, 4-24-90, Cl. D12-203.000.

Brantley, Lott W.: *See*—
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Brasil, John G., to Anthes Industries, Inc. Spacer element for scaffolding. 307,480, 4-24-90, Cl. D25-68.000.

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Cheng, Peter S. C. Flat toothpick dispenser card. 307,493, 4-24-90, Cl. D28-64.000.
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Conrad, George R., to General Electric Company. Fluid container. 307,393, 4-24-90, Cl. D9-376.000.
Cook, June C. Syringe shield. 307,474, 4-24-90, Cl. D24-25.000.
Cooper, William K. Combined book mark and template. 307,442, 4-24-90, Cl. D19-34.000.
Corrie, Alexander S. Fishing hand caster. 307,457, 4-24-90, Cl. D22-137.000.
Costa, Jorge, to Hermes Precisa International SA. Ribbon cassette for a typewriter or the like. 307,437, 4-24-90, Cl. D18-12.000.
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Gonzalez, Vivian; and Trujillo, Rebeca, 307,476, Cl. D24-47.000.
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Umemoto, Shouji; Tsukada, Masamichi; and Kitagawa, Masatoshi, to Hitachi, Ltd. Atomic absorption spectrophotometer. 307,398, 4-24-90, Cl. D10-46.000.
Unidynamics Corporation: *See*—
Ficken, Leonard A., 307,446, Cl. D20-4.000.
Universal Symetrics Corporation: *See*—
Mednis, Juris M., 307,390, Cl. D9-375.000.
Usami, Seiji; Yanagihara, Yoshihiro; and Mitsui, Hiroyuki, to Sharp Corporation. Remote controller for video tape recorder. 307,432, 4-24-90, Cl. D14-218.000.
Utsuki, Toshiyuki; Kouno, Shuichi; and Watanabe, Kenichi, to Hitachi, Ltd. Electric fan. 307,470, 4-24-90, Cl. D23-378.000.
Villa, Ezio: *See*—
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Wang Laboratories, Inc.: *See*—
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Watanabe, Tadao, to DIA Chemical Co., Ltd. Container for releasing perfume. 307,489, 4-24-90, Cl. D28-5.000.
Watanabe, Takuma: *See*—
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Weckman, Richard L., to Owens-Illinois Plastic Products Inc. Bottle. 307,392, 4-24-90, Cl. D9-376.000.
Westphal, Dennis; and Piles, Jonathan, to CertainTeed Corporation. Design for a window component extrusion. 307,484, 4-24-90, Cl. D25-124.000.
Westphal, Dennis; and Piles, Jonathan, to CertainTeed Corporation. Window component extrusion. 307,485, 4-24-90, Cl. D25-124.000.

Westphal, Dennis; and Piles, Jonathan, to CertainTeed Corporation. Design for a window component extrusion. 307,486, 4-24-90, Cl. D25-124.000.
Wetherell, Richard B., Jr., to Innopak Plastics Corporation. Bottle. 307,394, 4-24-90, Cl. D9-378.000.
White, Michael T. Clothing hanger bracket for automobiles. 307,359, 4-24-90, Cl. D6-323.000.
White, Rodney J., to Speakerbus Limited. Telephone communication module or similar article. 307,433, 4-24-90, Cl. D14-240.000.
Whitney, James H. S. Cuticle treatment kit. 307,492, 4-24-90, Cl. D28-61.000.
Yamazaki, Shusuke: *See*—
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Yoshida Kogyo K. K.: *See*—
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Zollinger, Chester L. Body pillow. 307,369, 4-24-90, Cl. D6-601.000.

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H. J. A. Rooyakkers B.V.: *See*—
van Eijk, Joseph P., 7,223, Cl. 68.000.
Schmidt, Kathleen A.: *See*—
Schmidt, Melvin L., 7,222, Cl. 51.000.

Schmidt, Melvin L., to Schmidt, Melvin L.; and Schmidt, Kathleen A. Magnificent Magenta Maple. 7,222, 4-24-90, Cl. 51.000.
van Eijk, Joseph P., to H. J. A. Rooyakkers B.V.; and World Flower B.V. Iris plant named Paris. 7,223, 4-24-90, Cl. 68.000.
World Flower B.V.: *See*—
van Eijk, Joseph P., 7,223, Cl. 68.000.

CLASSIFICATION OF PATENTS

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NOTE.—First number, class; second number, subclass; third number, patent number

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94 4,919,800
104 4,919,801
188 4,919,802
198.2 4,919,803
4,919,804
332 4,919,805
334 4,919,806
388 4,919,807
490 4,919,808
500.23 4,919,809
500.34 4,919,810
500.36 4,919,811
519 4,919,812
603 4,919,813
4,919,814
4,919,815
638 4,919,816
639 4,919,817
660 4,919,818
662 4,919,819
671 4,919,820
698 4,919,821
747 4,919,822
749 4,919,823
770 4,919,824
783 4,919,825
788 4,919,826

CLASS 211

1.5 4,919,275
13 4,919,276
41 4,919,277
4,919,287
49.1 4,919,278
70.2 4,919,279
87 4,919,280
116 4,919,281
134 4,919,282

CLASS 212

160 4,919,283

CLASS 215

12.1 4,919,284
230 4,919,285
235 4,919,286
284 4,919,288

CLASS 219

10.55 B 4,920,246
103 4,920,247
124.34 4,920,248
130.21 4,920,249
216 4,920,250
401 4,920,251
497 4,920,252
506 4,920,253
547 4,920,254

CLASS 220

1 B 4,919,289
1 T 4,919,290
2.2 4,919,291
3.2 4,919,292
23.2 4,919,293
23.83 4,919,295
70 4,919,294
85 H 4,919,296
85 S 4,919,301
86 R 4,919,297
94 R 4,919,298
324 B1 3,942,680
404 4,919,299
408 4,919,300

CLASS 221

34 4,919,302

CLASS 222

1 4,919,303
3 4,919,304
55 4,919,305
105 4,919,306
137 4,919,307
146.5 4,919,308
153 4,919,309
386.5 4,919,310
401 4,919,311
402.2 4,919,312
541 4,919,313
643 4,919,314

CLASS 223

76 4,919,315

CLASS 224

42.42 4,919,316
151 4,919,317

CLASS 226

17 4,919,318
197 4,919,319

CLASS 227

19 4,919,320
69 4,919,321

CLASS 228

20 4,919,322
157 4,919,323

CLASS 229

68 R 4,919,324
71 4,919,325
109 4,919,326

CLASS 235

441 4,920,256
454 4,920,255

CLASS 236

49.1 4,919,327
49.3 4,919,328
93 R 4,919,329

CLASS 238

8 4,919,330

CLASS 239

2.2 4,919,331
3 4,919,335
11 4,919,336
205 4,919,332
4,919,337
223 4,919,333
587 4,919,338
600 4,919,334

CLASS 241

5 4,919,339
4,919,340
18 4,919,341
25 4,919,342
32 4,919,344
36 4,919,343
4,919,345
46.02 4,919,346
65 4,919,347
215 4,919,348
4,919,349

CLASS 242

55.2 4,919,350
56.A 4,919,352
56 R 4,919,351
58.6 4,919,353
67.3 R 4,919,354
68.4 4,919,358
107.4 A 4,919,355
125.1 4,919,359
130.2 4,919,363
199 4,919,356
4,919,357
260 4,919,360
303 4,919,362
309 4,919,361

CLASS 244

55 4,919,364
153 R 4,919,365
160 4,919,366
164 4,919,367

CLASS 248

27.3 4,919,369
56 4,919,370
4,919,371
4,919,372
4,919,373
74.3 4,919,374
95 4,919,368
121 4,919,375
152 4,919,381
154 4,919,382
178 4,919,376
185 4,919,377
225.1 4,919,379
231.6 4,919,378
295.1 4,919,380
311.2 4,919,383
349 B1 4,254,929
447 4,919,385
475.1 4,919,386
544 4,919,384
646 4,919,387
921

CLASS 249

115 4,919,388

CLASS 250

201.1 4,920,257
214 AL Re.33,205
221 4,920,260
225 4,920,261
227.11 4,920,262
237.13 4,920,259
255 4,920,263
282 4,920,264
308 4,920,265
324 4,920,266
327.2 4,920,267
353 4,920,268
364 4,920,269
4,920,270
390.01 4,920,271
475.2 4,920,272
560 4,920,273
561 4,920,274
574 4,920,275

CLASS 251

6 4,919,389
129.15 4,919,390
148 4,919,391

CLASS 252

8.553 4,919,827
8.75 4,919,828
25 4,919,829
47.5 4,919,831
50 4,919,832
77 4,919,833
90 4,919,834
91 4,919,835
94 4,919,836
106 4,919,837
117 4,919,838
153 4,919,839
182.3 4,919,840
186.26 4,919,841
186.43 4,919,842
327 E 4,919,830
358 4,919,843
373 4,919,844
526 4,919,845
542 4,919,846
558 4,919,847
600 4,919,848

CLASS 254

126 4,919,392
337 4,919,393

CLASS 256

65 4,919,394

CLASS 261

36.1 4,919,849

CLASS 264

1.4 4,919,850
1.5 4,919,851
3.1 4,920,079
6 4,919,852
12 4,919,853
4,919,854
21 4,919,855
22 4,919,856
4,919,857
24 4,919,858
29.1 4,919,860
29.5 4,919,859
36 4,919,861
40.1 4,919,862
42 4,919,863
45.1 4,919,865
45.3 4,919,866
45.9 4,919,864
57 4,919,867
65 4,919,868
70 4,919,870
78 4,919,869
82 4,919,871
103 4,919,872
130 4,919,873
168 4,919,874
171 4,919,875
258 4,919,876
282 4,919,877
300 4,919,878
509 4,919,879
536 4,919,880

CLASS 266

103 4,919,395
182 4,919,396
267 4,919,397
283 4,919,398

CLASS 267

31 4,919,399
140.1 4,919,400
4,919,401
4,919,402
165 4,919,403
260 4,919,404

CLASS 269

38 4,919,405
43 4,919,406
118 4,919,407
296 4,919,408

CLASS 271

34 4,919,409
4,919,410
35 4,919,411
110 4,919,412
133 4,919,413
227 4,919,414
284 4,919,415

CLASS 272

69 4,919,416
75 4,919,417
129 4,919,418
134 4,919,419

CLASS 273

1 GG 4,919,429
1.5 A 4,919,425
26 R 4,919,422
29 B 4,919,421
73 C 4,919,438
81 B 4,919,420
109 4,919,423
148 R 4,919,426
155 4,919,427
164 4,919,424
4,919,428
169 4,919,430
4,919,431
191 A 4,919,432
192 4,919,433
235 R 4,919,434
339 4,919,435
346 4,919,436
410 4,919,437

CLASS 277

27 4,919,439

CLASS 280

21.1 4,919,441
43.1 4,919,442

149.2 4,919,445
304.1 4,919,443
414.1 4,919,446
604 4,919,447
618 4,919,448
688 4,919,449
707 4,919,440
4,919,444
803 4,919,450
804 4,919,451
809 4,919,452

CLASS 285

3 4,919,453
18 4,919,454
23 4,919,455
39 4,919,456
4,919,457
110 4,919,458
140 4,919,459
141 4,919,460
174 4,919,461
175 4,919,462

CLASS 290

2 4,920,276
40 C 4,920,277

CLASS 292

120 4,919,463
251.5 4,919,464

CLASS 294

67.2 4,919,465
170 4,919,466

CLASS 296

24.1 4,919,467
4,919,477
97.4 4,919,468
97.6 4,919,469
153 4,919,470
154 4,919,471
180.2 4,919,472
188 4,919,473
194 4,919,474
213 4,919,475

CLASS 297

85 4,919,478
195 4,919,479
244 4,919,480
258 4,919,481
379 4,919,482
395 4,919,483
443 4,919,485
4,919,486
445 4,919,487
468 4,919,488
474 4,919,484

CLASS 301

44 T 4,919,489
63 PW 4,919,490
124 R 4,919,491

CLASS 303

3 4,919,492
15 4,919,493
100 4,919,494
113 4,919,495
114 4,919,496
119 4,919,497

CLASS 307

262 4,920,278
264 4,920,279
296.2 4,920,280
308 4,920,281
442 4,920,282
443 4,920,283
475 4,920,284
542 4,920,286
4,920,287
571 4,920,285

CLASS 310

15 4,920,288
90 4,920,289
90.5 4,920,290
4,920,291
114 4,920,292
116 4,920,293
162 4,920,294
209 4,920,295
348 4,920,296

CLASS 312

241 4,919,498

CLASS 313

315 4,920,297
493 4,920,298

CLASS 315

98 4,920,299
209 R 4,920,300
241 S 4,920,301
307 4,920,302

CLASS 318

161 4,920,303
466 4,920,304
657 4,920,305
722 4,920,306

CLASS 320

28 4,920,307

CLASS 322

58 4,920,308

CLASS 323

269 4,920,309

CLASS 324

96 4,920,310
125 4,920,311
141 4,920,312
301 4,920,313
312 4,920,314
313 4,920,315
318 4,920,316
4,920,317
4,920,318
451 4,920,319

CLASS 328

155 4,920,320

CLASS 330

257 4,920,321

CLASS 331

17 4,920,322

CLASS 333

1.1 4,920,323
106 4,920,324
173 4,920,325

CLASS 335

284 4,920,326

CLASS 337

231 4,920,327

CLASS 338

21 4,920,328
333 4,920,329

CLASS 340

467 4,920,330
541 4,920,331
544 4,920,332
545 4,920,333
568 4,920,334
572 4,920,335
619 4,920,336
721 4,920,337
825.300 4,920,338
825.520 4,920,339
905 4,920,340

CLASS 341

15 4,920,341
22 4,920,342
33 4,920,343
118 4,920,344

CLASS 342

70 4,920,345
91 4,920,346
130 4,920,347
433 4,920,348

CLASS 343

702 4,920,352
4,920,353
709 4,920,349
4,920,350
756 4,920,351
901 4,920,354

CLASS 346

1.1 4,920,355
4,920,356
49 4,920,357
74.2 4,920,358
134 4,920,258
137 4,920,359
140 R 4,920,360
4,920,361
4,920,362
155 4,920,363
160 4,920,364

CLASS 350

6.6 4,919,499
4,919,500
6.8 4,919,501
4,919,502
96.12 4,919,504
96.18 4,919,505
4,919,506
96.19 4,919,507
96.2 4,919,503
96.20 4,919,508
4,920,366
96.21 4,919,509
4,919,510
96.29 4,919,511
4,919,512
96.33 4,919,513
96.34 4,919,514
128 4,919,515
4,919,518
171 4,919,516
174 4,919,517
253 4,919,519
331 T 4,919,520
362 4,919,521
389 4,919,522
450 4,919,524
567 4,919,523
604 4,919,525
4,919,526
613 4,919,527
620 4,919,528

CLASS 351

50 4,919,529
85 4,919,530

CLASS 354

81 4,920,367
145.1 4,920,368
400 4,920,369
402 4,920,370
410 4,920,371
412 4,920,372
457 4,920,373

CLASS 355

27 4,919,531
4,920,374
4,920,375
38 4,920,376
55 4,920,377
68 4,920,378
210 4,920,379
219 4,920,380
260 4,920,381
284 4,920,382
311 4,920,383
4,920,384

CLASS 356

28.5 4,919,532
4,919,536
30 4,919,533
73 4,919,534
237 4,920,365
328 4,919,537
417 4,920,386
429 4,919,535

CLASS 357

17 4,920,387
23.4 4,920,388
23.6 4,920,389
4,920,390
4,920,391
23.7 4,920,392
23.8 4,920,393
30 4,920,394
4,920,395
42 4,920,396
4,920,397
4,920,398
4,920,399
58 4,920,400
59 4,920,401
68 4,920,402
71 4,920,403
72 4,920,404
74 4,920,405
4,920,406

CLASS 358

21 R 4,920,407
31 4,920,408
56 4,920,409
67 4,920,410
80 4,920,411
95 4,920,412
98 4,920,413
133 4,920,414
183 4,920,415
198 4,920,416
209 4,920,417
213.28 4,920,418
214 4,920,419
227 4,920,420
296 4,920,421
4,920,422
334 4,920,425
335 4,920,423
343 4,920,424
433 4,920,426
437 4,920,427
461 4,920,428
471 4,920,429
481 4,920,430
496 4,920,431

CLASS 360

33.1 4,920,432
64 4,920,433
68 4,920,461
77.08 4,920,434
77.15 4,920,435
78.04 4,920,462
96.1 4,920,436
99.05 4,920,437
104 4,920,438
130.21 4,920,439
132 4,920,440
133 4,920,441
137 4,920,442

CLASS 361

56 4,920,443
4,920,444
91 4,920,445
93 4,920,446
4,920,447
92 4,920,448
216 4,920,449
282 4,920,450
286 4,920,451
305 4,920,452
385 4,920,574
392 4,920,453
398 4,920,454
424 4,920,455
428 4,920,456
530 4,920,457

CLASS 362

3 4,920,458
61 4,920,459
4,920,460
4,920,463
72 4,920,464
96 4,920,465
145 4,920,466
226 4,920,467
287 4,920,468
300 4,920,469

CLASS 363

21 4,920,470
22 4,920,471
95 4,920,472
96 4,920,473
97 4,920,474
132 4,920,475

CLASS 364

140 4,920,476
208 4,920,477
4,920,478
4,920,479
4,920,480
4,920,481
4,920,482
4,920,483
4,920,484
4,920,485
4,920,486
300 4,920,487
403 4,920,488
413.06 4,920,489
413.13 4,920,490
413.19 4,920,491
419 4,920,492
426.01 4,920,493
431.05 4,920,494
474.37 4,920,495
481 4,920,496
491 4,920,497
497 4,920,498
513 4,920,499
4,920,500
518 4,920,501
4,920,502
521 4,920,503
4,920,504
525 4,920,505
602 4,920,506
724.17 4,920,507
736 4,920,508
784 4,920,509
825 4,920,510
900 4,920,511

CLASS 365

160 4,920,512
175 4,920,513
189.08 4,920,515
203 4,920,516
207 4,920,517
228 4,920,518

CLASS 366

4 4,919,538
94 4,919,539
132 4,919,540
136 4,919,541
161 4,920,519

CLASS 367

99 4,920,520
103 4,920,521
134 4,920,522
188 4,920,523

CLASS 368

240 4,920,524
242 4,920,365
250 4,920,525
281 4,920,526

CLASS 369

45 4,920,527
54 4,920,528

CLASS 370

16 4,920,529
32.1 4,920,530
60 4,920,531
85.1 4,920,532
85.2 4,920,533
94.1 4,920,534
105.1 4,920,535

CLASS 371

5.1 4,920,537
10.1 4,920,536
19 4,920,538
40.2 4,920,539
61 4,920,540

CLASS 372

23 4,920,541
50 4,920,542

CLASS 374

9 4,919,542
139 4,919,543

CLASS 375

10 4,920,543
26 4,920,544
58 4,920,545
106 4,920,546
112 4,920,547

CLASS 376

255 4,920,548
260 4,919,881
293 4,919,882
352 4,919,883
419 4,919,884

CLASS 377

16 4,920,549

CLASS 378

51 4,920,550
125 4,920,551
153 4,920,552
173 4,920,553
200 4,920,554

CLASS 379

21 4,920,555
51 4,920,556
61 4,920,557
67 4,920,558
74 4,920,559
100 4,920,560
106 4,920,561
132 4,920,562
399 4,919,544
413 4,920,563
437 4,920,564

CLASS 380

6 4,920,565
19 4,920,566
25 4,919,545
33 4,920,567

CLASS 381

46 4,920,568
61 4,920,569
68 4,920,570

CLASS 382

6 4,920,573
47 4,920,571
48 4,920,572

CLASS 383

33 4,919,546

CLASS 384

15 4,918,846
19 4,919,548
110 4,919,547
113 4,919,549
133 4,919,550
482 4,919,551
492 4,919,552

CLASS 400

120 4,919,553
224.2 4,919,555
419 4,919,554

CLASS 401

57 4,919,556

CLASS 402

41 4,919,557

CLASS 403

9 4,919,558
13 4,919,559
16 4,919,562
268 4,919,560
305 4,919,561

CLASS 404

6 4,919,563
25 4,919,564
41 4,919,565
121 4,919,566

CLASS 405

19 4,919,567
43 4,919,568
128 4,919,569
4,919,570
199 4,919,571
212 4,919,572

CLASS 407

40 4,919,573

CLASS 409

219 4,919,574
231 4,919,575

CLASS 411

34 4,919,576
43 4,919,577
55 4,919,579
113 4,919,578
173 4,919,580
353 4,919,581

CLASS 414

233 4,919,582
528 4,919,583
540 4,919,584
718 4,919,585
735 4,919,586
795.8 4,919,587
798.4 4,919,588
798.9 4,919,589

CLASS 415

116 4,919,590
152.1 4,919,591
207 4,919,592

CLASS 416

223 A 4,919,593
230 4,919,594

CLASS 417

18 4,919,595
4,919,596
63 4,919,600
362 4,919,598
403 4,919,597
423.4 4,919,599

CLASS 418

51 4,919,601

CLASS 420

104 4,919,885
420 4,919,886

CLASS 422

26 4,919,888
40 4,919,889
56 4,919,890
58 4,919,891
4,919,892
67 4,919,887
78 4,919,893
104 4,919,894
129 4,919,895
142 4,919,896
165 4,919,897
219 4,919,898
245 4,919,899
4,919,900
249 4,919,901

CLASS 423

213.5 4,919,902
4,919,903
225 4,919,904
239 4,919,905
323 4,919,906
326 4,919,907
328 4,919,908
348 4,919,913
360 4,919,909
422 4,919,910
499 4,919,911

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574 R 4,919,912
576.2 4,919,914
658.5 4,919,716

CLASS 424

7 1 4,919,915
10 4,919,916
4,919,917
44 4,919,918
45 4,919,919
61 4,919,920
62 4,919,921
63 4,919,922
70 4,919,923
72 4,919,924
76.1 4,919,925
81 4,919,926
85.91 4,919,927
4,919,928
88 4,919,929
4,919,930
95 4,919,931
114 4,919,932
196.1 4,919,933
401 4,919,934
405 4,919,935
442 4,919,936
449 4,919,937
450 4,920,016
480 4,919,938
493 4,919,939

CLASS 425

12 4,919,602
4,919,603
458 4,919,604
467 4,919,605
531 4,919,607
549 4,919,606
556 4,919,608

CLASS 426

2 4,919,940
5 4,919,941
38 4,919,942
39 4,919,943
4,919,944
69 4,919,945
89 4,919,946
94 4,919,947
106 4,919,948
128 4,919,949
233 4,919,950
241 4,919,951
254 4,919,952
273 4,919,953
308 4,919,954
394 4,919,955
465 4,919,956
513 4,919,957
564 4,919,964
573 4,919,958
574 4,919,959
580 4,919,960
4,919,961
594 4,919,962
599 4,919,963
615 4,919,965

CLASS 427

2 4,919,966
8 4,919,967
37 4,919,968
58 4,919,969
96 4,919,970
98 4,919,971
160 4,919,972
213 4,919,973
249 4,919,974
260 4,919,975
373 4,919,976
379 4,919,977
381 4,919,978

CLASS 428

2 4,919,979
4 4,919,980
26 4,919,981
34.2 4,919,982
35.7 4,919,983
36.4 4,919,984
36.6 4,919,985
43 4,919,986
60 4,919,987
64 4,919,988
65 4,919,989
100 4,919,990
113 4,919,991
131 4,919,992
134 4,919,993
141 4,919,994
189 4,919,995
221 4,919,996
227 4,919,997
265 4,919,998
284 4,919,999
288 4,920,000
289 4,920,001
325 4,920,002
391 4,920,003
407 4,920,004
411.1 4,920,005
432 4,920,006
457 4,920,007
458 4,920,008
552 4,920,009
570 4,920,010
596 4,920,011
634 4,920,012
694 4,920,013
698 4,920,014

CLASS 429

17 4,920,015
42 4,920,017
65 4,920,018
122 4,920,019
230 4,920,020

CLASS 430

45 4,920,024
56 4,920,021
59 4,920,022
126 4,920,023
128 4,920,025
138 4,920,026
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192 4,920,028
264 4,920,029
4,920,034
267 4,920,035
270 4,920,030
4,920,036
287 4,920,037
315 4,920,038
324 4,920,039
363 4,920,040
380 4,920,041
4,920,042
522 4,920,031
536 4,920,032
611 4,920,043

CLASS 431

7 4,919,609
274 4,919,610
330 4,919,611

CLASS 432

58 4,919,613
259 4,919,614

CLASS 433

3 4,919,615
6 4,919,612
26 4,919,616
4,919,617

CLASS 434

198 4,920,033
251 4,919,618

CLASS 435

1 4,920,044
7 4,920,045
4,920,046
4,920,047
4,920,063
69.1 4,920,048
105 4,920,049
119 + 4,920,050
147 4,920,055
215 + 4,920,051
234 4,920,052
235 4,920,209
240.1 4,920,053
252.31 4,920,054

CLASS 436

50 4,920,056
77 4,920,057
85 4,920,058
86 4,920,059
178 4,920,060
526 4,920,061

CLASS 437

6 4,920,062
41 4,920,064
52 4,920,065
57 4,920,066
81 4,920,067
4,920,068
90 4,920,069
173 4,920,070
188 4,920,071
192 4,920,072
200 4,920,073
211 4,920,074
228 4,920,075
238 4,920,076
240 4,920,077
243 4,920,078

CLASS 439

15 4,919,620
70 4,919,623
76 4,919,624
118 4,919,625
191 4,919,621
260 4,919,626
263 4,919,627
371 4,919,619
395 4,919,622
858 4,919,628

CLASS 440

62 4,919,629
79 4,919,630

CLASS 441

40 4,919,631
44 4,919,632

CLASS 445

24 4,919,633
49 4,919,634

CLASS 446

128 4,919,635
159 4,919,636
162 4,919,637
462 4,919,639
490 4,919,638

CLASS 455

164 4,919,640

CLASS 460

69 4,919,641
80 4,919,642

CLASS 474

46 4,919,643
72 4,919,007
80 4,919,644
245 4,919,645

CLASS 475

44 4,919,009
183 4,919,011
234 4,919,008
281 4,919,010

CLASS 494

1 4,919,646

CLASS 501

31 4,920,080
47 4,920,081
59 4,920,082
84 4,920,083
94 4,920,084
97 4,920,085

CLASS 502

63 4,920,086
68 4,920,087
326 4,920,088
335 4,920,089
439 4,920,090

CLASS 503

211 4,920,091
227 4,920,092

CLASS 505

1 4,920,093
4,920,094
4,920,095

CLASS 512

5 4,920,096

CLASS 514

2 4,920,097
4,920,098
23 4,920,100
24 4,920,101
26 4,920,099
28 4,920,102
30 4,920,103
54 4,920,104
59 4,920,105
63 4,920,106
134 4,920,108
171 4,920,109
4,920,111
4,920,112
4,920,113
177 4,920,114
178 4,920,115
210 4,920,116
212 4,920,117
224.2 4,920,118
243 4,920,119
244 4,920,107
254 4,920,120
4,920,122
255 4,920,121
4,920,123
256 4,920,124
272 4,920,125
274 4,920,126
278 4,920,127
293 4,920,128
300 4,920,129
311 4,920,130
4,920,131
314 4,920,132
4,920,133
344 4,920,135
4,920,136
372 4,920,137
383 4,920,138
4,920,139
394 4,920,140
398 4,920,141
399 4,920,142
410 4,920,143
412 4,920,144
420 4,920,145
437 4,920,146
438 4,920,110
450 4,920,147
4,920,148
474 4,920,150
557 4,920,149
634 4,920,151

CLASS 521

31 4,920,152
60 4,920,153
131 4,920,154
154 4,920,155

CLASS 522

31 4,920,156
96 4,920,157

CLASS 523

111 4,920,158
153 4,920,159
201 4,920,160
220 4,920,161
400 4,920,162
440 4,920,163
466 4,920,164

CLASS 524

91 4,920,165
141 4,920,166
155 4,920,167
188 4,920,168
219 4,920,169
446 4,920,171
502 4,920,172
590 4,920,173

CLASS 525

66 4,920,174
110 4,920,175
185 4,920,176
195 4,920,177
262 4,920,178
285 4,920,179
327.5 4,920,181
328.9 4,920,180
409 4,920,203
438 4,920,182
464 4,920,183
477 4,920,184
506 4,920,185
4,920,186

CLASS 526

193 4,920,187
196 4,920,188
204 4,920,189
247 4,920,170
288 4,920,190

CLASS 528

26 4,920,191
48 4,920,192
171 4,920,193
190 4,920,197
201 4,920,198
272 4,920,199
370 4,920,200
486 4,920,201
500 4,920,202

CLASS 530

351 4,920,196
385 4,920,194

CLASS 534

15 4,920,204
16 4,920,195
582 4,920,205
753 4,920,206
4,920,208

CLASS 535

16.8 4,920,215
24 4,920,210
27 4,920,211
4,920,213
103 4,920,214
124 4,920,207

CLASS 540

110 4,920,216
135 4,920,217
456 4,920,218
523 4,920,219

CLASS 544

90 4,920,220
125 4,920,221
158 4,920,222
182 4,920,223
284 4,920,224
316 4,920,134

CLASS 546

21 4,920,225
80 4,920,226
133 4,920,227
224 4,920,228
283 4,920,229
290 4,920,230
300 4,920,231
338 4,920,232

CLASS 549

214 4,920,212

CLASS 600

16 4,919,647

CLASS 604

20 4,919,648
65 4,919,649
67 4,919,650
96 4,919,651
97 4,919,121
110 4,919,652
4,919,655
117 4,919,653
180 4,919,654
192 4,919,656
232 4,919,657
265 4,919,658

CLASS 606

42 4,919,129
46 4,919,131
54 4,919,119
93 4,919,153
107 4,919,130
159 4,919,133

CLASS 623

1 4,919,659
3 4,919,661
6 4,919,662
4,919,663
15 4,919,664
16 4,919,666
18 4,919,665
4,919,667
4,919,668
19 4,919,669
4,919,670
20 4,919,660
4,919,671
22 4,919,672
4,919,674
4,919,675
4,919,676
4,919,677
23 4,919,673
4,919,678
4,919,679

D2—	314	307,350			307,375		157	307,402			307,428		196	307,454		68	307,480
	320	307,351	D8—	8	307,377		221	307,403			307,429		219	307,455		122	307,481
	609	307,352		10	307,378	D12	92	307,404			307,430	D22—	106	307,456			307,482
D3—	10	307,353		14.1	307,379		118	307,405		165	307,431		137	307,457			307,483
	30.1	307,354		61	307,380		147	307,406		218	307,432		141	307,458		124	307,484
	40	307,355		95	307,381			307,407		240	307,433			307,459			307,485
D6—	301	307,356		97	307,382		155	307,408	D15—	10	307,434	D23—	207	307,460			307,486
		307,357			307,383		181	307,409		45	307,435		209	307,461	D26—	2	307,487
	302	307,358		373	307,384			307,410	D18—	12	307,436			307,462		49	307,488
	318	307,360	D9—	302	307,385			307,411			307,437		225	307,463	D28—	5	307,489
	323	307,359		341	307,386		198	307,412			307,438		251	307,464		7	307,490
	347	307,361			307,387		203	307,413		13	307,439		289	307,465		50	307,491
		307,362		345	307,388		307	307,414			307,440		351	307,466		61	307,492
		307,363		370	307,389	D13—	164	307,415	D19—	34	307,441			307,467		64	307,493
	381	307,364		375	307,390			307,416			307,442		366	307,468	D29—	5	307,494
	429	307,365		376	307,391		183	307,417		43	307,443		367	307,469	D30—	108	307,495
	529	307,366			307,392	D14	100	307,419		55	307,444		378	307,470	D32—	14	307,496
	552	307,367			307,393		102	307,420		78	307,445	D24—	16	307,471		40	307,497
	601	307,368		378	307,394		114	307,421	D20—	4	307,446			307,472	D34—	31	307,498
		307,369		428	307,395		115	307,422		10	307,447			307,473		43	307,499
	611	307,370	D10—	24	307,396			307,423		43	307,448		25	307,474		45	307,500
D7—	616	307,373		46	307,397		135	307,424	D21—	34	307,449		36	307,475	D99—	26	307,501
	622	307,372			307,398			307,425		35	307,450		47	307,476			307,502
	652	307,376			307,399		142	307,426			307,451			307,477			307,503
	677	307,371		106	307,400		151	307,418		107	307,452		51	307,478		34	307,504
	695	307,374	D11—	108	307,401			307,427		108	307,453	D25—	48	307,479		36	

CLASSIFICATION OF PLANTS

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PATENTS

01	4,918,933	4,919,232	4,919,939	4,920,538	10	4,918,912	17 4,918,767
	4,919,160	4,919,283	4,919,950	4,920,573		4,918,981	4,918,785
	4,919,233	4,919,291	4,919,979	08 4,918,861		4,919,490	4,918,804
	4,919,253	4,919,298	4,919,980	4,918,862		4,919,706	4,918,805
	4,919,528	4,919,322	4,919,981	4,918,992		4,919,711	4,918,833
	4,919,782	4,919,323	4,919,982	4,919,132		4,919,872	4,918,843
	4,919,899	4,919,325	4,919,983	4,919,310		4,919,874	4,919,040
	4,919,906	4,919,346	4,919,990	4,919,316		4,920,000	4,919,043
	4,919,929	4,919,370	4,920,005	4,919,365		4,920,499	4,919,080
	4,920,440	4,919,382	4,920,028	4,919,508	12	4,918,761	4,919,164
04	4,919,405	4,919,387	4,920,044	4,919,523		4,918,765	4,919,186
	4,919,562	4,919,408	4,920,055	4,919,644		4,918,772	4,919,201
	4,919,594	4,919,411	4,920,071	4,919,799		4,918,824	4,919,213
	4,919,661	4,919,479	4,920,101	4,919,813		4,918,898	4,919,222
	4,919,686	4,919,481	4,920,167	4,919,966		4,918,917	4,919,260
	4,919,861	4,919,482	4,920,196	4,920,344		4,919,107	4,919,265
	4,920,067	4,919,483	4,920,213	4,920,383		4,919,126	4,919,278
	4,920,549	4,919,512	4,920,251	4,920,470		4,919,127	4,919,287
05	4,919,165	4,919,529	4,920,254	09 4,918,809		4,919,258	4,919,295
	4,919,819	4,919,536	4,920,259	4,918,820		4,919,466	4,919,373
06	4,918,764	4,919,537	4,920,260	4,918,871		4,919,558	4,919,389
	4,918,768	4,919,542	4,920,264	4,918,926		4,919,567	4,919,397
	4,918,782	4,919,547	4,920,265	4,919,019		4,919,578	4,919,452
	4,918,786	4,919,554	4,920,273	4,919,033		4,919,593	4,919,505
	4,918,789	4,919,566	4,920,304	4,919,112		4,919,630	4,919,574
	4,918,790	4,919,576	4,920,309	4,919,131		4,919,654	4,919,612
	4,918,817	4,919,577	4,920,311	4,919,227		4,919,692	4,919,622
	4,918,821	4,919,582	4,920,313	4,919,270		4,919,739	4,919,625
	4,918,840	4,919,584	4,920,315	4,919,289		4,919,800	4,919,672
	4,918,841	4,919,585	4,920,316	4,919,312		4,919,804	4,919,808
	4,918,845	4,919,592	4,920,333	4,919,320		4,919,814	4,919,818
	4,918,870	4,919,595	4,920,336	4,919,368		4,919,882	4,919,821
	4,918,886	4,919,596	4,920,339	4,919,472		4,919,916	4,919,879
	4,918,887	4,919,604	4,920,357	4,919,549		4,919,975	4,919,902
	4,918,904	4,919,617	4,920,363	4,919,649		4,920,285	4,919,920
	4,918,923	4,919,619	4,920,388	4,919,701		4,920,335	4,919,941
	4,918,929	4,919,626	4,920,399	4,919,702		4,920,351	4,919,960
	4,918,931	4,919,631	4,920,403	4,919,703	13	4,918,815	4,919,973
	4,918,972	4,919,651	4,920,404	4,919,750		4,918,873	4,919,989
	4,918,987	4,919,655	4,920,415	4,919,773		4,918,897	4,920,015
	4,919,063	4,919,657	4,920,434	4,919,838		4,919,269	4,920,033
	4,919,066	4,919,730	4,920,442	4,919,883		4,919,480	4,920,098
	4,919,078	4,919,743	4,920,458	4,919,934		4,919,309	4,920,214
	4,919,081	4,919,744	4,920,462	4,919,976		4,920,086	4,920,233
	4,919,118	4,919,749	4,920,465	4,920,050		4,920,168	4,920,240
	4,919,129	4,919,777	4,920,472	4,920,068		4,920,367	4,920,244
	4,919,133	4,919,817	4,920,475	4,920,096		4,920,550	4,920,272
	4,919,143	4,919,820	4,920,481	4,920,221	15	4,918,779	4,920,302
	4,919,151	4,919,834	4,920,484	4,920,224		4,919,035	4,920,308
	4,919,153	4,919,889	4,920,486	4,920,346	16	4,918,890	4,920,329
	4,919,154	4,919,891	4,920,506	4,920,469		4,919,344	4,920,334
	4,919,167	4,919,895	4,920,510	4,920,477		4,919,853	4,920,450
	4,919,225	4,919,907	4,920,536	4,920,524		4,920,018	4,920,464

	4,920,567	4,920,459	4,919,196	4,920,081		4,920,088	4,919,454
18	4,918,798	4,920,483	4,919,221	4,920,082	41	4,918,825	4,919,456
	4,918,802	4,920,489	4,919,304	4,920,128		4,919,302	4,919,459
	4,918,919	4,920,503	4,919,307	4,920,149		4,919,348	4,919,460
	4,918,927	4,920,539	4,919,313	4,920,164		4,919,349	4,919,560
	4,918,950	4,920,540	4,919,358	4,920,183		4,919,374	4,919,563
	4,918,962	4,920,561	4,919,383	4,920,191		4,920,362	4,919,597
	4,919,140	26 4,918,758	4,919,417	4,920,200	42	Re.33,202	4,919,602
	4,919,243	4,918,781	4,919,433	4,920,249		4,918,755	4,919,665
	4,919,255	4,918,791	4,919,463	4,920,250		4,918,814	4,919,670
	4,919,290	4,918,826	4,919,504	4,920,266		4,918,822	4,919,740
	4,919,340	4,918,850	4,919,506	4,920,268		4,918,851	4,919,793
	4,919,399	4,918,853	4,919,507	4,920,319		4,918,910	4,919,827
	4,919,450	4,918,874	4,919,544	4,920,326		4,918,976	4,919,840
	4,919,484	4,918,921	4,919,679	4,920,356		4,918,991	4,919,842
	4,919,876	4,918,961	4,919,708	4,920,364		4,919,146	4,919,912
	4,920,052	4,919,006	4,919,712	4,920,381		4,919,192	4,919,918
	4,920,102	4,919,008	4,919,746	4,920,382		4,919,212	4,919,947
	4,920,103	4,919,010	4,919,785	4,920,419		4,919,254	4,919,955
	4,920,152	4,919,012	4,919,787	4,920,421		4,919,300	4,919,970
	4,920,199	4,919,017	4,919,788	4,920,428		4,919,305	4,920,056
19	4,918,900	4,919,023	4,919,789	4,920,429		4,919,306	4,920,072
	4,919,060	4,919,057	4,919,790	4,920,436		4,919,329	4,920,073
	4,919,234	4,919,068	4,919,792	4,920,452		4,919,465	4,920,192
	4,919,279	4,919,088	4,919,794	4,920,471		4,919,468	4,920,286
	4,919,311	4,919,239	4,919,830	4,920,474		4,919,615	4,920,320
	4,919,442	4,919,274	4,919,831	4,920,490		4,919,616	4,920,343
	4,919,642	4,919,277	4,919,896	4,920,491		4,919,647	4,920,487
	4,919,894	4,919,331	4,919,904	4,920,497		4,919,697	4,920,496
20	4,918,858	4,919,355	4,919,910	4,920,501		4,919,698	4,920,519
	4,919,973	4,919,403	4,919,948	4,920,570		4,919,700	4,920,523
	4,918,978	4,919,415	4,919,962	3,942,680		4,919,733	4,920,558
	4,919,053	4,919,436	4,919,972	3 4,918,856		4,919,735	4,920,562
	4,919,413	4,919,439	4,920,078	4,918,980		4,919,748	49 4,918,784
21	4,918,810	4,919,491	4,920,106	4,919,021		4,919,816	4,918,863
	4,919,203	4,919,570	4,920,109	4,919,082		4,919,844	4,919,013
	4,919,285	4,919,607	4,920,111	4,919,208		4,919,852	4,919,108
	4,919,301	4,919,628	4,920,112	4,919,359		4,919,871	4,919,134
	4,919,375	4,919,667	4,920,113	4,919,380		4,919,881	4,919,812
	4,919,418	4,919,689	4,920,116	4,919,623		4,919,901	50 4,919,406
	4,919,764	4,919,691	4,920,117	4,919,681		4,920,006	51 4,918,849
	4,919,825	4,919,805	4,920,125	4,919,760		4,920,080	4,918,891
22	4,918,816	4,919,868	4,920,145	4,919,801		4,920,121	4,918,963
	4,919,210	4,919,903	4,920,146	4,919,828		4,920,123	4,919,076
	4,919,218	4,919,974	4,920,159	4,919,940		4,920,130	4,919,199
	4,919,275	4,920,009	4,920,172	4,919,946		4,920,131	4,919,264
	4,919,564	4,920,120	4,920,179	4,919,965		4,920,132	4,919,276
	4,919,568	4,920,161	4,920,203	4,919,998		4,920,133	4,919,803
	4,919,583	4,920,162	4,920,204	4,920,003		4,920,139	4,919,850
	4,919,715	4,920,432	4,920,216	4,920,083		4,920,165	4,919,869
	4,919,786	4,920,454	4,920,218	4,920,210		4,920,177	4,919,997
	4,919,958	4,920,532	4,920,226	38 4,918,875		4,920,209	4,920,001
	4,920,097	27 4,918,823	4,920,488	39 4,918,754		4,920,219	4,920,057
23	4,919,069	4,918,878	4,920,525	4,918,756		4,920,227	4,920,105
	4,919,169	4,918,932	4,920,534	4,918,760		4,920,234	4,920,115
	4,919,367	4,918,995	4,920,556	4,918,848		4,920,241	4,920,263
	4,919,422	4,919,121	4,254,929	4,918,859		4,920,274	4,920,412
24	4,919,149	4,919,259	35 4,920,271	4,918,866		4,920,291	52 4,919,240
	4,919,419	4,919,261	36 Re.33,204	4,918,879		4,920,366	53 Re.33,205
	4,919,430	4,919,267	4,918,766	4,918,881		4,920,467	4,918,857
	4,919,431	4,919,308	4,918,777	4,918,903		4,920,476	4,919,130
	4,919,453	4,919,441	4,918,799	4,918,956		4,920,548	4,919,144
	4,919,637	4,919,532	4,918,800	4,919,092		4,920,566	4,919,145
	4,919,737	4,919,662	4,918,807	4,919,148	44	4,918,949	4,919,190
	4,919,829	4,919,663	4,918,811	4,919,178		4,919,185	4,919,229
	4,920,046	4,919,741	4,918,812	4,919,183		4,919,280	4,919,428
	4,920,087	4,919,956	4,918,831	4,919,235		4,919,293	4,919,659
	4,920,350	4,919,994	4,918,877	4,919,251	45	4,918,795	4,919,753
	4,920,537	28 4,918,770	4,918,942	4,919,263		4,919,041	4,919,888
25	4,918,774	4,918,797	4,919,003	4,919,266		4,919,432	4,919,993
	4,918,792	4,918,839	4,919,025	4,919,281	46	4,918,896	4,920,063
	4,918,907	4,919,478	4,919,027	4,919,324		4,919,942	4,920,449
	4,918,925	4,920,147	4,919,152	4,919,326	47	4,918,888	54 4,919,330
	4,918,930	29 4,918,773	4,919,223	4,919,333		4,919,000	4,919,807
	4,918,990	4,918,943	4,919,318	4,919,350		4,919,156	4,919,875
	4,919,039	4,918,959	4,919,343	4,919,351		4,919,176	4,920,156
	4,919,044	4,919,037	4,919,377	4,919,588		4,919,335	55 4,918,759
	4,919,084	4,919,115	4,919,409	4,919,738		4,919,543	4,918,763
	4,919,182	4,919,117	4,919,410	4,919,756		4,919,718	4,918,834
	4,919,286	4,919,245	4,919,487	4,919,797		4,919,791	4,918,836
	4,919,426	4,919,334	4,919,489	4,919,811		4,919,930	4,918,864
	4,919,500	4,920,141	4,919,510	4,919,824		4,919,954	4,918,939
	4,919,522	4,920,247	4,919,569	4,919,886		4,920,008	4,919,009
	4,919,545	30 Re.33,203	4,919,586	4,919,963		4,920,076	4,919,016
	4,919,557	4,919,109	4,919,638	4,919,964		4,920,107	4,919,020
	4,919,608	4,919,632	4,919,648	4,920,114		4,920,211	4,919,026
	4,919,609	31 4,918,968	4,919,656	4,920,176		4,920,416	4,919,116
	4,919,668	4,919,214	4,919,683	4,920,228	48	4,918,854	4,919,215
	4,919,732	4,919,693	4,919,684	4,920,229		4,918,855	4,919,249
	4,919,768	4,920,555	4,919,685	4,920,305		4,918,882	4,919,250
	4,919,784	32 4,919,191	4,919,688	4,920,318		4,918,883	4,919,271
	4,919,864	4,919,228	4,919,720	4,920,355		4,918,935	4,919,284
	4,919,865	4,919,337	4,919,758	4,918,757		4,918,941	4,919,317
	4,919,898	4,919,366	4,919,826	40 4,918,894		4,918,952	4,919,338
	4,919,924	33 4,919,416	4,919,841	4,919,050		4,918,999	4,919,352
	4,920,039	4,919,519	4,919,849	4,919,150		4,919,030	4,919,394
	4,920,051	4,919,534	4,919,880	4,919,209		4,919,048	4,919,414
	4,920,060	4,919,559	4,919,971	4,919,257		4,919,123	4,919,421
	4,920,104	4,919,729	4,919,991	4,919,282		4,919,135	4,919,425
	4,920,153	4,920,171	4,920,004	4,919,360		4,919,204	4,919,530
	4,920,255	34 4,918,829	4,920,012	4,919,445		4,919,205	4,919,815
	4,920,269	4,918,880	4,920,017	4,919,477		4,919,206	4,919,835
	4,920,270	4,918,915	4,920,019	4,919,498		4,919,219	4,919,877
	4,920,299	4,918,937	4,920,023	4,919,538		4,919,391	4,919,943
	4,920,323	4,918,966	4,920,024	4,919,540		4,919,393	4,920,301
	4,920,348	4,919,011	4,920,047	4,919,892		4,919,398	4,920,342
	4,920,407	4,919,029	4,920,058	4,919,893		4,919,446	56 4,918,794
	4,920,446	4,919,083	4,920,069				

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DESIGN PATENTS

01	307,460		307,451		307,362		307,413		307,501		307,503
	307,494		307,455		307,363		307,479	36	307,356		307,504
04	307,354		307,468		307,399	27	307,423		307,357	40	307,453
	307,373		307,473		307,448	29	307,359		307,370		307,495
	307,452		307,500	19	307,368		307,442		307,371	42	307,384
	307,475	08	307,471	20	307,484		307,446		307,402		307,400
05	307,474	09	307,394		307,485	32	307,454		307,417		307,488
06	307,352		307,418		307,486	34	307,374		307,419		307,490
	307,367	12	307,441	22	307,365		307,375		307,434	47	307,381
	307,380		307,476		307,502		307,379	37	307,355	48	307,358
	307,387		307,477	25	307,350		307,390		307,364		307,465
	307,422		307,497		307,421		307,396		307,366	49	307,369
	307,428	13	307,393		307,443		307,481	38	307,389	51	307,353
	307,429	16	307,456		307,444		307,482	39	307,378		307,492
	307,447	17	307,427	26	307,409		307,483		307,392	55	307,395
	307,449		307,462		307,410		307,496		307,445		307,469
	307,450	18	307,361		307,411		307,499		307,487		

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20	7,222					

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